Administration Guide

FortiEDR 7.2.3

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February 26, 2026
FortiEDR 7.2.3 Administration Guide
63-723-1234899-20260226

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Change log

Date	Change Description
2026-02-26	Initial release.

Introducing FortiEDR

This chapter describes the FortiEDR system components, FortiEDR technology and the workflow for protecting your organization using FortiEDR.

Introduction

FortiEDR provides multi-layered, post- and pre-infection protection that stops advanced malware in real time. FortiEDR recognizes that external threat actors cannot be prevented from infiltrating networks, and instead focuses on preventing the exfiltration and ransoming of critical data in the event of a cyber-attack. FortiEDR's unique virtual patching technique, which only blocks malicious outbound communications, enables employees to continue working as usual even when their devices are infected.

Execution prevention

FortiEDR stops both known and unknown malware types using machine-learning-based Next-Generation Anti-Virus (NGAV), a signature-less approach that detects and mitigates zero-day attacks by filtering out known malware variations. This blocks the execution of files that are identified as malicious or suspected to be malicious. For this policy, each file is analyzed to find evidence for malicious activity.

In addition to machine-learning-based NGAV protection, Execution Prevention policy is augmented by other techniques such as signature-based detection, sandboxing, and more.

Data exfiltration

Data exfiltration is the unauthorized transfer of sensitive information from a target's network to a location that a threat actor controls.

FortiEDR is a realtime targeted-attack exfiltration prevention platform.

Threat actors only benefit when they actually succeed in stealing your data.

FortiEDR ensures that your data is not exfiltrated by threat actors, regardless of the methods that they use.

FortiEDR can prevent malicious exfiltration attempts of any kind of data, from any application, from any process, using any protocol or port.

FortiEDR becomes your last line of defense in case of a data exfiltration attempt. All malicious connections are blocked and precise details of the infected devices and their associated components are available for your review.

FortiEDR is a software-only solution that can be installed with your current standard equipment.

FortiEDR protects your data from exfiltration both On-Premises and Off-Premises.

Ransomware

Ransomware is malware used by attackers to infect a device, hijack files on that device and then lock them, via encryption, so that they cannot be accessed until the attacker decrypts and releases them. A successful ransomware attack represents the exploit of a greater security vulnerability in your environment. Paying the attacker is only a short-term solution that does not address the root of the problem, as it may likely lead to another attack that is even more malicious and more expensive than the previous one.

FortiEDR prevents, in real time, an attacker's attempt to encrypt or modify data. FortiEDR then generates an alert that contains the information needed to initiate an investigation, so the root breach can be uncovered and fully remediated. Moreover, the end user can continue to work as usual even on an infected device.

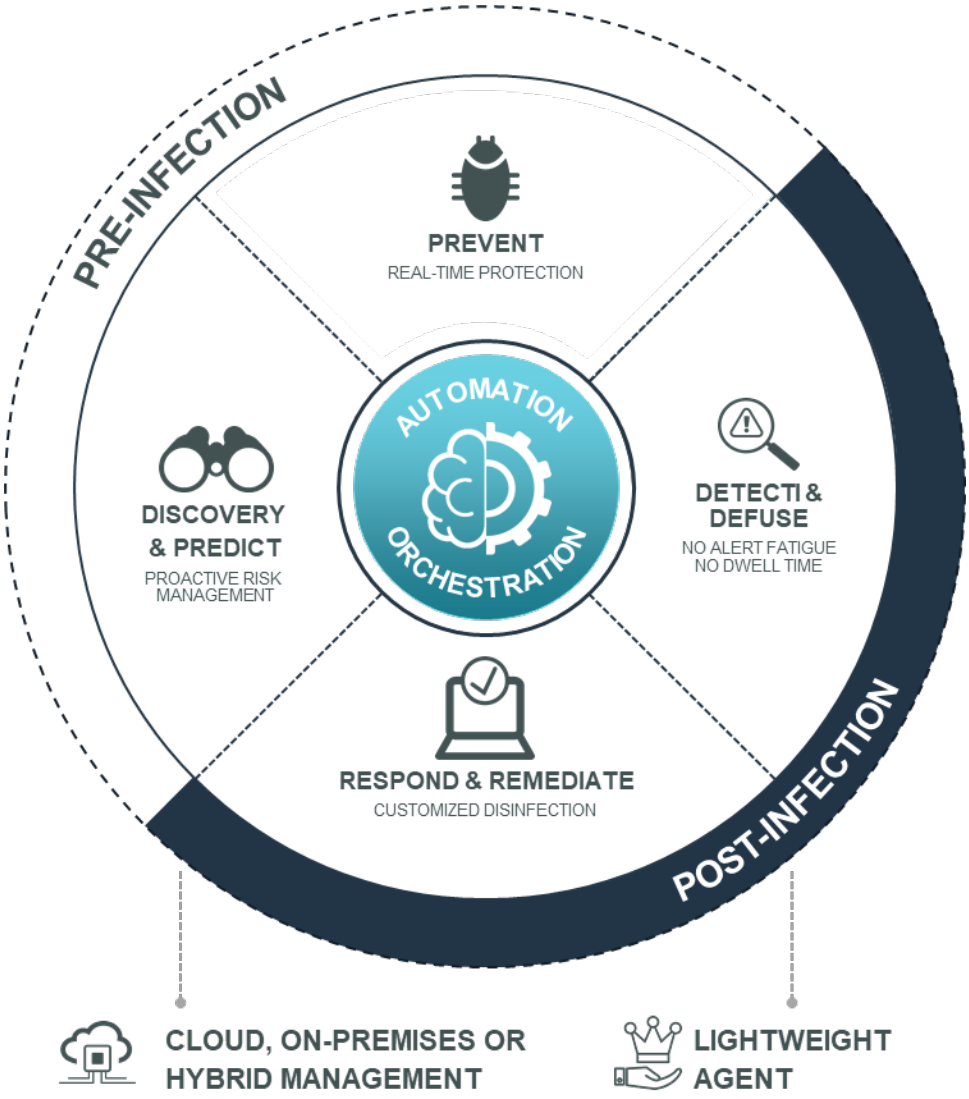
Threat hunting

FortiEDR's threat-hunting capabilities features a set of software tools and information sources focused on detecting, investigating, containing and mitigating suspicious activities on end-user devices.

FortiEDR provides post- and pre-infection endpoint protection management, while delivering high detection rates with realtime blocking and response capabilities when compared to traditional Endpoint Detection and Response (EDR) tools.

FortiEDR provides malware classification, displays Indicators of Compromise (IOCs) and delivers full attack-chain views – all while simultaneously enabling users to conduct further threat hunting, if and when needed.

FortiEDR technology



When looking at how external threat actors operate, we recognize two important aspects. The first is that the threat actors use the network in order to exfiltrate data from an organization. Second, they try to remain as stealthy as possible in order to avoid existing security measures. This means that threat actors must establish outbound communications in a non-standard manner.

FortiEDR's technology prevents data exfiltration by identifying, in real time, malicious outgoing communications that were generated by external threat actors. Identification of malicious outgoing communications is the result of our research conducted on both operating system internals and malware operation methods.

Our research revealed that all legitimate outgoing communications must pass through the operating system. Thus, by monitoring the operating system internals it is possible to verify that a connection was established in a valid manner. FortiEDR gathers OS stack data, thread and process related data and conducts executable file analysis to determine the nature of the connection. Additionally, any type of threat

attempting to bypass the FortiEDR driver is detected as the connection will not have the corresponding data from FortiEDR.

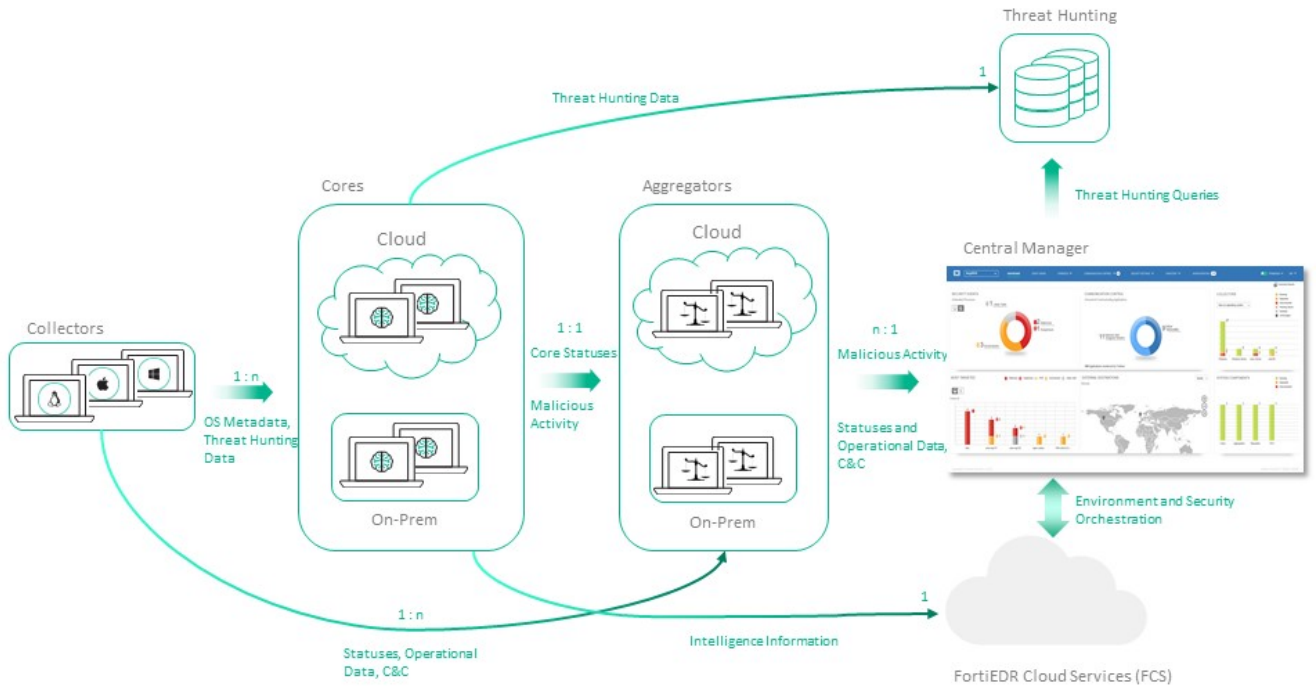
FortiEDR's technology prevents data exfiltration by identifying, in real time, malicious outgoing communications that were generated by external threat actors. Identification of malicious outgoing communications is the result of our research conducted on both operating system internals and malware operation methods.

FortiEDR components

Overview

The FortiEDR platform is a distributed architecture that collects the connection establishment flow of your organization's communicating devices directly from each device's operating system internals. FortiEDR analyzes the flow of events that preceded the connection establishment and determines whether the connection establishment request was malicious. The system can enforce your organization's policy by blocking the connection establishment request in order to prevent exfiltration.

The FortiEDR platform is comprised of the following components:



FortiEDR Collector

The FortiEDR Collector is an agent that resides on every communicating device in your enterprise, including desktops, laptops and servers.

By default, the Collector runs in autonomous mode. Upon every attempt made by the communicating device to establish a network connection or change a file, the Collector collects all required metadata and analyzes it to determine whether the process performing the action is legitimate. You can configure the Collector to use a Core for the metadata analysis, in which case the Collector holds the establishment of the connection until authorization is received from the Core.

- **Pass**: Legitimate requests are allowed with extremely negligible latency.
- **Block**: Malicious exfiltration and file changing attempts are blocked.

If third-party software attempts to stop the FortiEDR Collector service, the system prompts for the registration password. This is the same password used when installing the Collector. If an incorrect password is supplied at the prompt, the message Access Denied displays on the Collector device. In this case, the FortiEDR Collector service is not stopped. For more details about the required password to supply in this situation, you may refer to Component Authentication on page 393.

A FortiEDR Collector should be installed on each communicating device in your organization. The same FortiEDR Collector can be installed on all Windows, macOS, and Linux systems. The following are the connections established between the FortiEDR Collector and other FortiEDR components:

- **To the FortiEDR Aggregator**: The FortiEDR Collector initially sends registration information to the FortiEDR Aggregator via SSL and then it sends ongoing health, status information, and security events.
- **From the FortiEDR Aggregator**: The FortiEDR Collector receives its configuration from the FortiEDR Aggregator.
- **To the FortiEDR Core**: The FortiEDR Collector sends the following information:
  - Compressed activity events that are later used for Threat Hunting
  - Communication-related data to be used for the Communication Control
  - **(Non-autonomous mode only)** Metadata for determining whether a specific action should be blocked or passed

When a Core is used for the metadata analysis, which means the Collector is not running in autonomous mode, if all Cores are unreachable due to connection issues or errors, the Collector switches to autonomous mode automatically after one minute where it continues to run and protect the device by analyzing the metadata locally. The Collector then keeps trying to establish a connection with the Core every few seconds to few minutes, depending on the number of errors in previous attempts.

- **From the FortiEDR Core**: The FortiEDR Collector receives connection establishment authorization or denial (blocking) from the FortiEDR Core.

Negligible footprint

The FortiEDR Collector retains only a limited amount of metadata on the device in order to keep CPU usage to virtually zero and the storage requirements to a minimum. FortiEDR's traffic consumption requirements are low because the FortiEDR Collector sends to the Core its activity events, the size of which depends on the amount of activity, and sends to the Aggregator security events which are small in size. Additionally, FortiEDR uses message compression in order to further reduce the traffic sent to the network. You may refer to Collector System Requirements for the exact specifications of the system requirements.

Quick and easy installation

The FortiEDR Collector comes as a standard installer package that is easily installed via standard remote unattended deployment tools, such as Microsoft SCCM. No local configuration or reboot is required; however, a reboot of the system ensures that any malicious connections that were previously established before the installation are thwarted and tracked via FortiEDR after the reboot is complete. Upgrades can be performed remotely and are rarely needed, because all the brains of the FortiEDR system are in the FortiEDR Core.

Incidents view

The Windows *Incidents* view records whenever a FortiEDR Collector blocks communication from a device, as described in Incidents on page 85.

FortiEDR Core

The FortiEDR Core is the security policy enforcer and decision-maker. It determines whether a connection establishment request is legitimate or represents a malicious exfiltration attempt that must therefore be blocked.

FortiEDR collects OS stack data, thread and process-related data and conducts executable file analysis to determine the nature of every connection request, as follows.

- When working in prevention mode, all the connection establishment requests in your organization must be authorized by a FortiEDR Core, thus enabling it to block each outgoing connection establishment request that is malicious.
- When the FortiEDR Core receives a connection establishment request, it comes enriched with metadata collected by the FortiEDR Collector that describes the operating system activities that preceded it.
- The FortiEDR Core analyzes the flow of events that preceded the connection request and determines whether the connection request was malicious. The system then enforces your organization's policy by blocking (or only logging) the connection request in order to prevent/log exfiltration.
- The collection of the flow of events that preceded the connection request enables FortiEDR to determine where the foul occurred.

One or more FortiEDR Cores are required, according to the size of your network based on deployment size (up to 50 FortiEDR Cores). Refer to Appendix C – ON PREMISE DEPLOYMENTS on page 472 for the exact

specifications of the system requirements.) The following are the connections established between the FortiEDR Core and other FortiEDR components:

- **To the FortiEDR Aggregator**: The FortiEDR Core sends registration information the first time it connects to the FortiEDR Aggregator and then sends events and ongoing health and status information.
- **From the FortiEDR Aggregator**: The FortiEDR Core receives its configuration from the FortiEDR Aggregator.

The FortiEDR Core is located on exit points from your organization. It only reviews FortiEDR Collector metadata; it does not see the outgoing traffic. It is a central Linux-based software-only entity that can run on any workstation or VM that is assigned with a static IP address.

FortiEDR Aggregator

The FortiEDR Aggregator is a software-only entity that acts as a proxy for the FortiEDR Central Manager and provides processing load handling services. All FortiEDR Collectors and FortiEDR Cores interact with the Aggregator for registration, configuration and monitoring purposes. The FortiEDR Aggregator aggregates this information for the FortiEDR Central Manager and distributes the configurations defined in the FortiEDR Central Manager (such as exceptions, policies, and rules) to the FortiEDR Collectors and FortiEDR Cores. The configuration update latency is usually around 60-120 seconds but can take up to 20 minutes in edge cases.

Most deployments only require a single FortiEDR Aggregator. Additional FortiEDR Aggregators may be required for larger deployments of over 10,000 FortiEDR Collectors.

FortiEDR Central Manager

The FortiEDR Central Manager is a software-only central web user interface and backend server for viewing and analyzing events and configuring the system. Chapters from Profiles on page 201 to Threat Hunting on page 131 describe the user interface of the FortiEDR Central Manager. The FortiEDR Central Manager is the only component that has a user interface. It enables you to:

- Control and configure FortiEDR system behavior
- Monitor and handle FortiEDR events
- Perform deep forensic analysis of security issues
- Monitor system status and health

FortiEDR Cloud Service

The FortiEDR Cloud Service (FCS) enriches and enhances system security by performing deep, thorough analysis and investigation about the classification of a security event. The FCS is a cloud-based, GDPR-compliant, software-only service that determines the exact classification of security events and acts accordingly based on that classification – all with a high degree of accuracy.

The FCS security event classification process is done via data enrichment and enhanced deep, thorough analysis and investigation, enabled by automated and manual processes. The enhanced processes may

include (partial list) intelligence services, file analysis (static and dynamic), sandboxing, flow analysis via machine learning, commonalities analysis, crowdsourced data deduction and more.

Along with potential classification reassurance or reclassification, once connected, FCS can also enable several followed actions, which can be divided into two main activities:

- Tuning: Automated security event exception (allowlisting). After a triggered security event is reclassified as Safe, an automated cross-environment exception can be pushed downstream and expire the event, preventing it from triggering again. For more details, see Exception Manager on page 211
- Playbook Actions: All Playbook policy remediation actions are based on the final determination of the FCS. For more details see Remediation on page 327.

How does FortiEDR work?

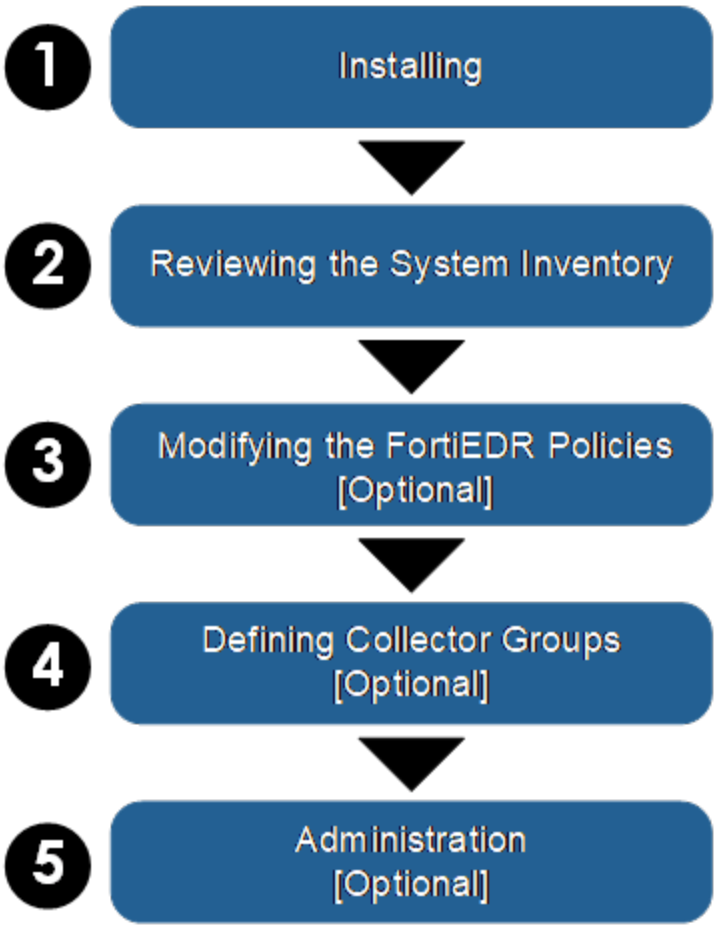
1. **The FortiEDR Collector collects OS metadata**: A FortiEDR Collector runs on each communicating device in the organization and transparently collects OS metadata on the computing device.
2. **Communicating device makes a connection establishment request**: When any connection establishment request is made on a device, the FortiEDR Collector sends a snapshot of the OS connection establishment to the FortiEDR Core, enriched with the collected OS metadata. Meanwhile, FortiEDR does not allow the connection request to be established.
3. **The FortiEDR Core identifies malicious requests**: Using FortiEDR's patented technology, the FortiEDR Core analyzes the collected OS metadata and enforces the policies.
4. **Pass or block**: Only legitimate connections are allowed outbound communication. Malicious outbound connection attempts are blocked.
5. **Event Generation**: Each FortiEDR policy violation generates a realtime security event (alert) that is packaged with an abundance of device metadata describing the internals of the operating system leading up to the malicious connection establishment request. This security event is triggered by the FortiEDR Core and is viewable in the FortiEDR Central Manager console. FortiEDR can also send email alerts and/or be integrated with any standard Security Information and Event Management (SIEM) solution via Syslog.
6. **Forensic analysis**: The Forensic Analysis add-on enables the security team to use the various options provided by the FortiEDR Central Manager console to delve deeply into the actual security event and the internal stack data that led up to it.

Using FortiEDR - workflow

The following is a general guideline for the general workflow of using FortiEDR and specifies which steps are optional.

Setup workflow overview

The following describes the workflow for getting FortiEDR up and running in your organization:



1. **Installing**: Install all FortiEDR components, as described in Installing FortiEDR Collectors on page 23 and Appendix C – ON PREMISE DEPLOYMENTS on page 472.
2. **Reviewing the Inventory**: Review the health status and details of all the FortiEDR components in the Dashboard on page 75 and Assets on page 337. FortiEDR Collectors are automatically assigned FortiEDR's default policies.
3. **[Optional] Modifying the FortiEDR Policies**: By default, the FortiEDR policies are ready to log out-of-the-box. If needed, use the Profiles on page 201 to modify the default policies for blocking and/or to create additional policies.
4. **[Optional] Defining Collector Groups**: By default, the FortiEDR default policies are assigned to a default Collector Group that contains all FortiEDR Collectors. Policies in FortiEDR are assigned per Collector Group. You can define additional Collector Groups in . You can then assign the required policy to each Collector Group (see Assigning a security policy to a Collector Group on page 209)
5. **[Optional] Administration**: The FortiEDR system installs with a single administrator user. This user can:
   - Create additional users of the FortiEDR Central Manager.
   - Define the recipients to receive email notifications of FortiEDR events.
   - Configure a SIEM to receive notifications of FortiEDR events via Syslog.

Ongoing workflow overview

The following is the workflow for monitoring and handling FortiEDR security events on an ongoing basis:

- **Monitoring**: Monitor and analyze the events triggered by FortiEDR in the following locations:
  - Dashboard on page 75
  - Incidents on page 85
  - Syslog on page 331
- **[Optional] Creating Event Exceptions**: FortiEDR precisely pinpoints interesting system events. However, if needed, you can create exceptions in order to stop certain events from being triggered for certain IP addresses, applications, protocols and so on. See Playbooks on page 321.
- **[Optional] Investigating Events**: Deep investigation into a security event, including meta data. With a Threat Hunting on page 131 license add-on, you can also audit all operating system activities.
- **[Optional] Handling Events**: Mark security events that you have handled and optionally describe how they were handled. See Marking a security event as handled/unhandled on page 115.

Deploying FortiEDR Cloud

This topic explains how to deploy FortiEDR Cloud. This topic assumes that you already purchased the desired subscription licenses for your deployment from a Fortinet partner or reseller and received your license activation codes.

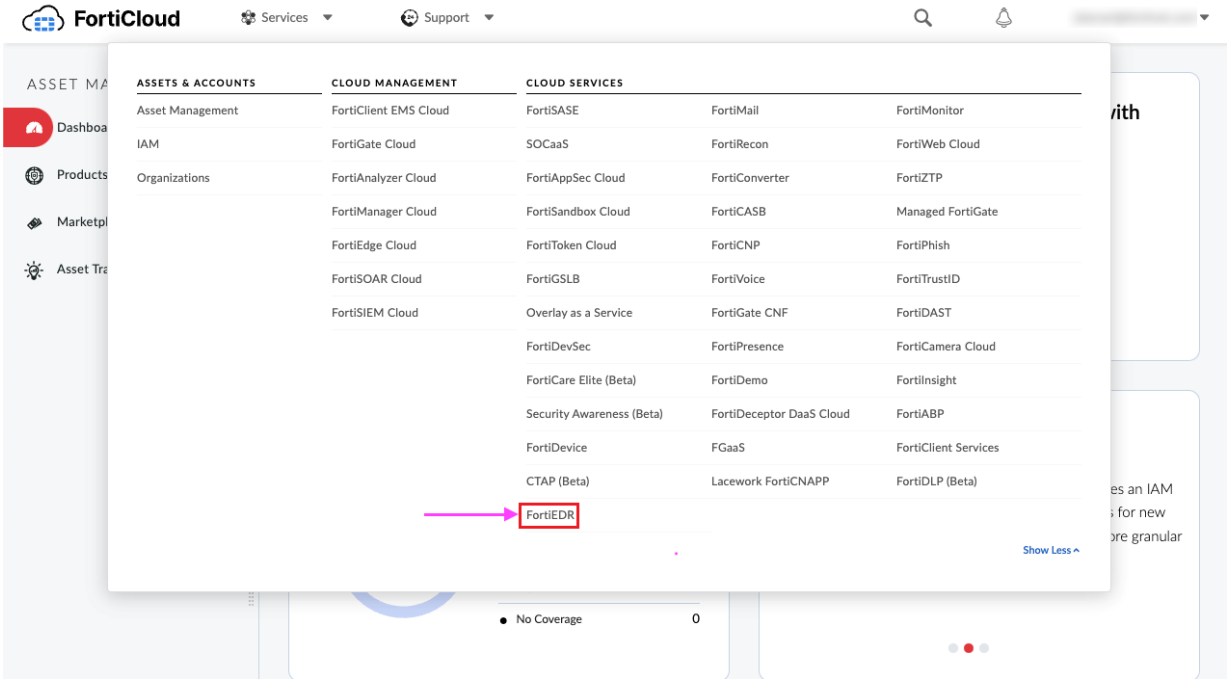
You can create only one FortiEDR Cloud instance per FortiCloud account.

To deploy FortiEDR Cloud:

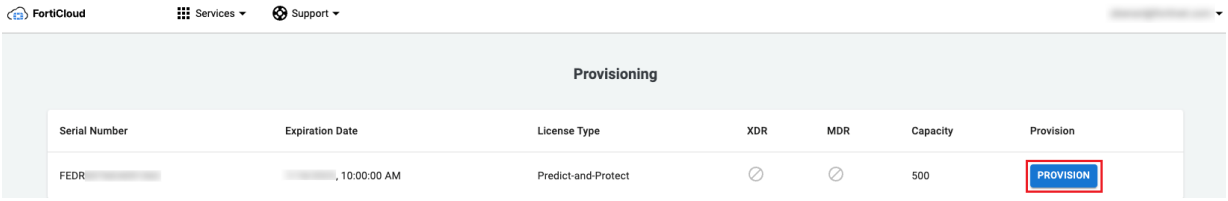
1. Register the FortiEDR Cloud subscription contract to your FortiCloud account:
   a. On the Customer Service & Support site, go to *Asset Management* > *Register Now*.
   b. In the *Registration Code* field, enter your license activation code and select *Next* to continue registering the product.
   c. Enter your details in the other fields and complete the registration.

   You may need to wait a few minutes for the cloud instance to initialize before you can proceed.

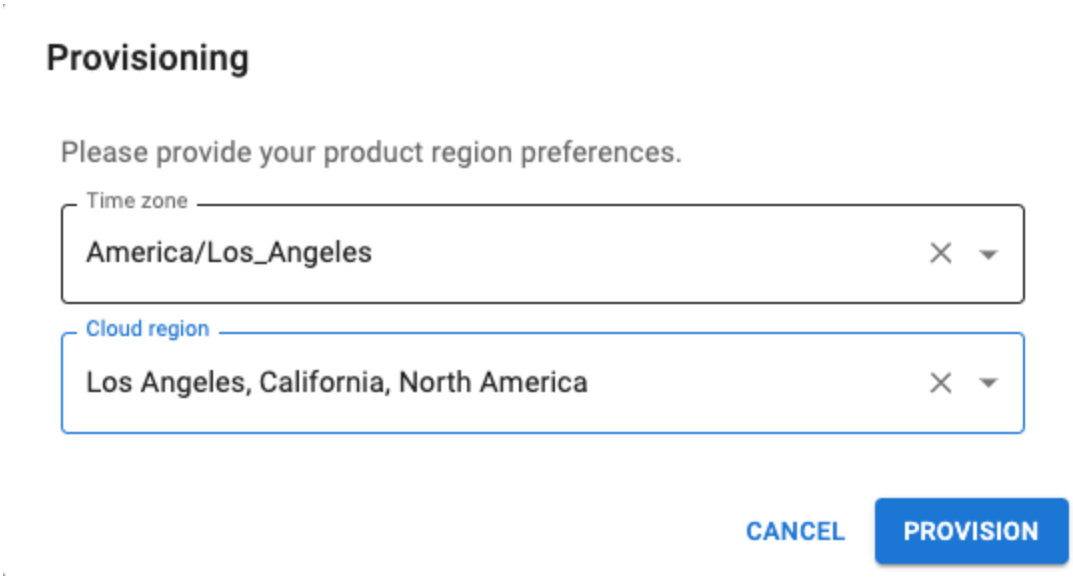
2. Provision your FortiEDR Cloud environment:
   a. In FortiCloud, go to *Services* > *Cloud Services* and click *FortiEDR*.



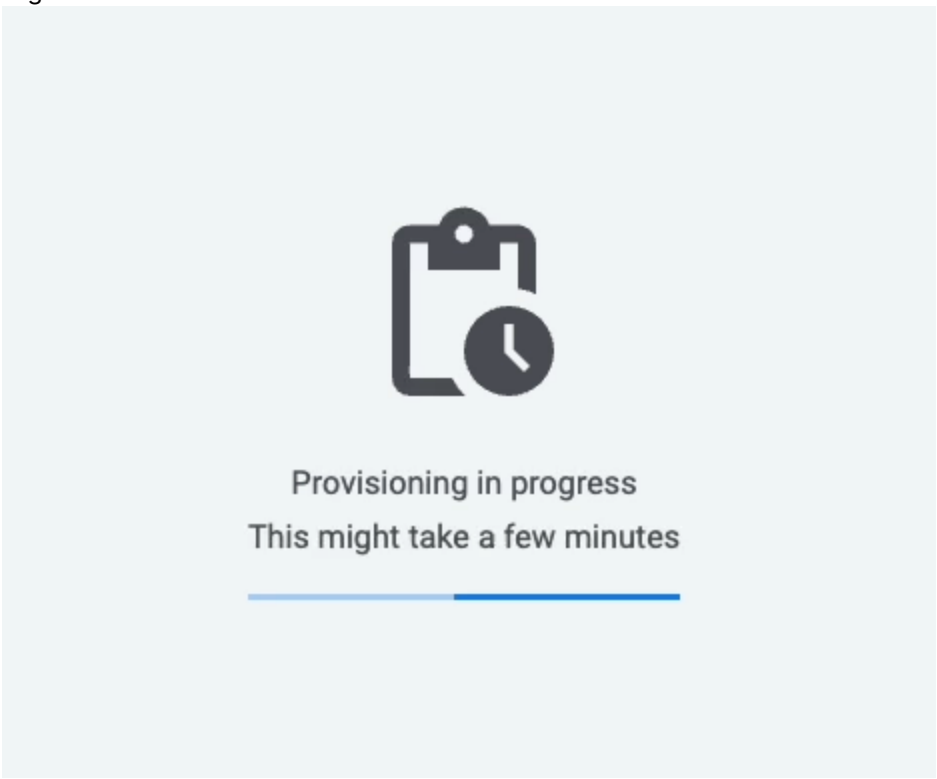
b. Click *PROVISION*.



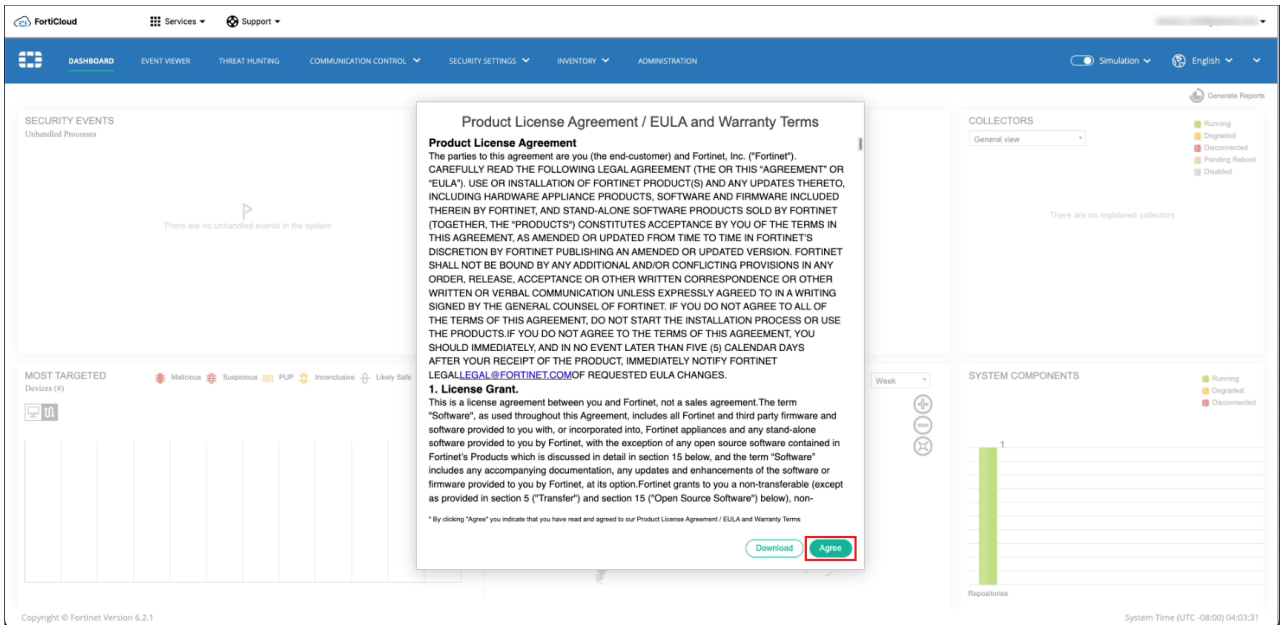
c. Select the time zone and cloud region to provision your FortiEDR Cloud instance.



d. Click *PROVISION* to start the provisioning process, which takes about 5 minutes for a new organization in a shared environment and 40 minutes for a dedicated environment.



3. After the provisioning process is complete and the environment is ready, click *Agree* to access the FortiEDR Central Manager console.



Deploying FortiEDR Collectors

This chapter describes how to deploy FortiEDR Collectors, which is the only component you need to install for FortiEDR cloud deployment. All backend components, including FortiEDR Central Manager, Aggregator, Threat Hunting Repository, and Core, are installed and managed in the cloud by Fortinet.

- Installing FortiEDR Collectors on page 23
- Uninstalling FortiEDR Collectors on page 70
- Upgrading the Collector on page 73

If you want to deploy any of the backend components on your organization's premises (on-premises), see Appendix C – ON PREMISE DEPLOYMENTS on page 472.

Installing FortiEDR Collectors

You can install the FortiEDR Collector on any communicating device that meets the requirements in Collector System Requirements. Your license determines the number of FortiEDR Collectors allowed to register with the FortiEDR Central Manager. When you reach the maximum number of Collectors, you must uninstall a FortiEDR Collector from a device and delete it from the FortiEDR INVENTORY before you can add another FortiEDR Collector.

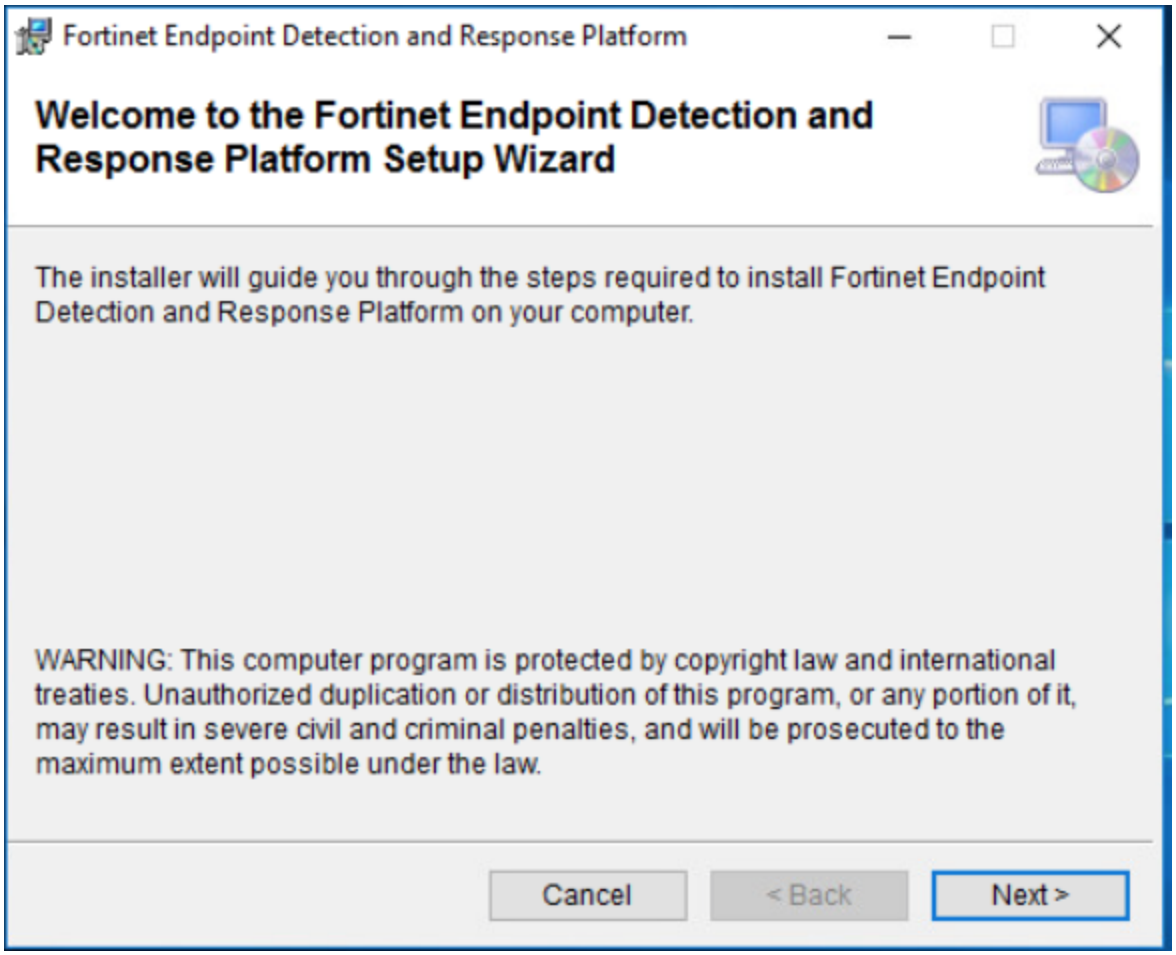
You can get a Collector that is customized to your environment's settings, as described in Requesting and obtaining a Collector installer on page 422. If a custom Collector is used during the installation, all input fields such as Aggregator address and registration password are auto-filled.

- Installing a FortiEDR Collector on Windows on page 23
- Installing a FortiEDR Collector on macOS on page 28
- Installing a FortiEDR Collector on Linux on page 53
- Automated FortiEDR Collector deployment on page 55
- Installing FortiEDR on MacOS devices using Jamf PRO on page 58
- Working with FortiEDR on VDI environments on page 69

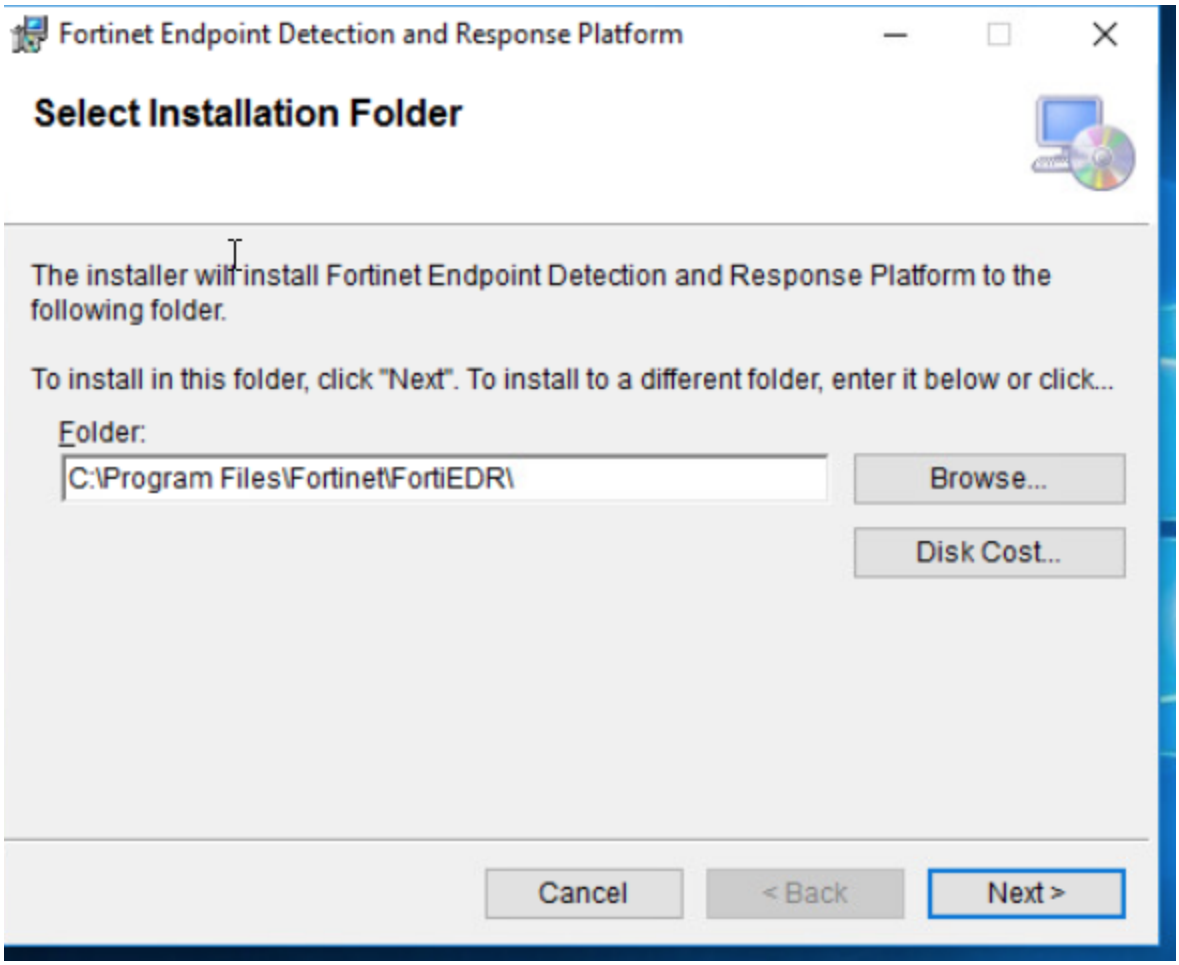
For more details about installing a Collector in a multi-organization environment, see Collector registration on page 429.

Installing a FortiEDR Collector on Windows

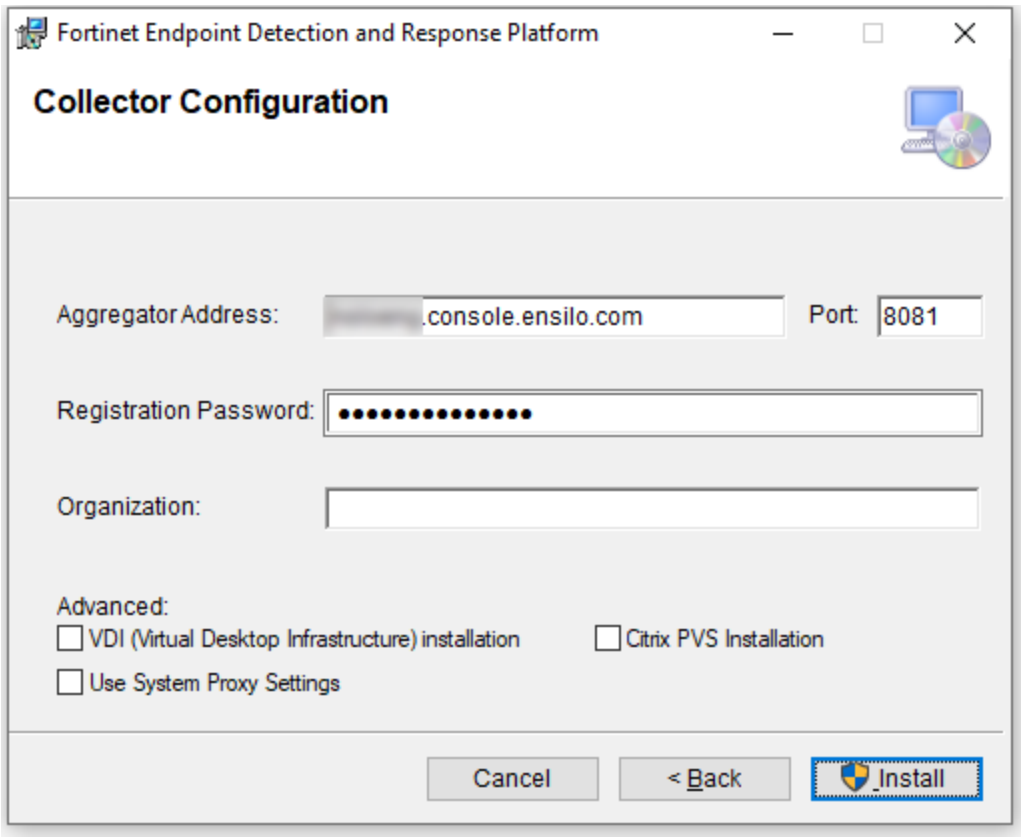
1. It is recommended to get a pre-populated customized Collector installer for Windows, as described in Requesting and obtaining a Collector installer on page 422.

2. Run the FortiEDR Collector installation file. Use the `FortiEDRCollectorInstaller32.msi` file if you are using a 32-bit operating system; or use the `FortiEDRCollectorInstaller64.msi` file if you are using a 64-bit operating system.
3. 

Click *Next*.

4. 

Leave the default FortiEDR Collector installation folder or change it as necessary. Click *Next*.

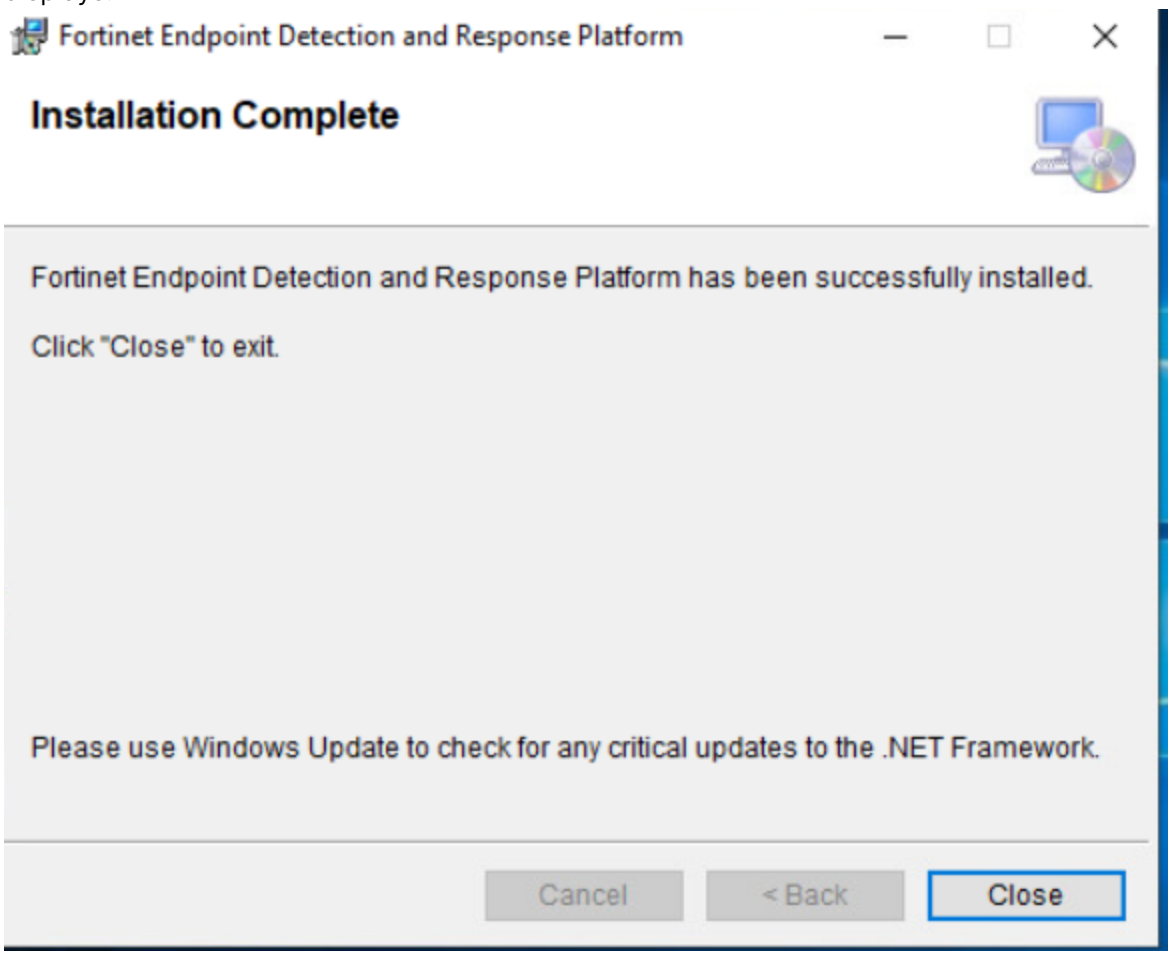
5. 

   If a non-customized installer is used, in the *Aggregator Address* field, specify the FortiEDR Aggregator domain name or IP address.
6. If a non-customized installer is used, in the *Port* field, specify the FortiEDR Aggregator port (8081).

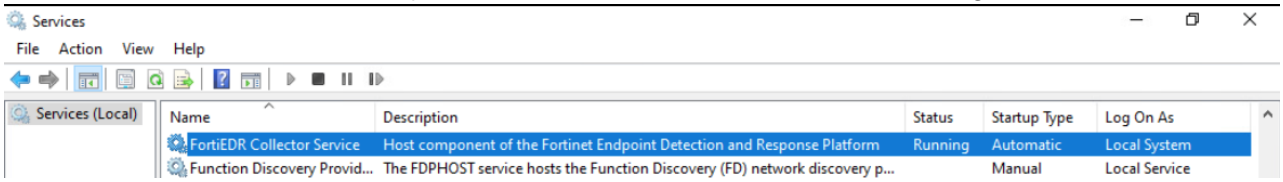
   When upgrading a FortiEDR Collector, the Aggregator address field can be left empty – in order to retain the previously defined Aggregator address.

7. If a non-customized installer is used, in the *Registration Password* field, enter the device registration password that you defined, as described in Configuring the FortiEDR Central Manager server and console on page 556.
8. For a multi-organization FortiEDR system, enter the name of the organization in the *Organization* field. For more details, see the Collector registration on page 429.
9. If you are installing the Collector on a VDI environment, check the *VDI* checkbox. For more details, see Working with FortiEDR on VDI environments on page 69.
10. If you use a web proxy to filter requests in this device's network, then check the *Use System Proxy Settings* checkbox. Note that Windows must be configured to use a proxy and tunneling must be allowed from the Collector to the Aggregator on port 8081 and from the Collector to the Core on port 555. (Run as Administrator: **netsh winhttp set proxy <proxy IP >**).
11. If you are installing the Collector on a Citrix PVS golden image, check the *Citrix PVS installation* checkbox.
12. Click *Next* twice to start the installation. Windows may possibly display a message requesting that you confirm the installation. Please do so.

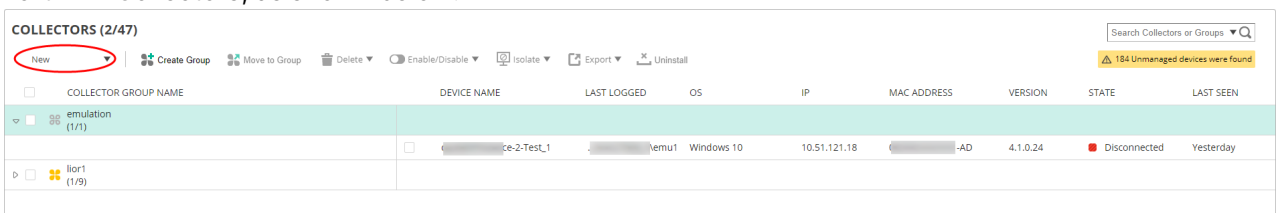
13. After the installation of the FortiEDR Collector has been successfully completed, the following window displays:



Check Windows Services to verify that the FortiEDR Collector Service is running, as shown below:



14. Verify that the FortiEDR Collector details are listed in the INVENTORY tab of the FortiEDR Central Manager console (see Assets on page 337. Select the New filter to display a list of newly registered FortiEDR Collectors, as shown below:



15. If another AV product is also installed on the machine, exclude AV exceptions by following the instructions in Exclusion paths.

Installing a FortiEDR Collector on macOS

The process described below includes a description of how to allow the following upon first FortiEDR Collector installation:

- System Extensions
- Network Extensions
- Full Disk Access

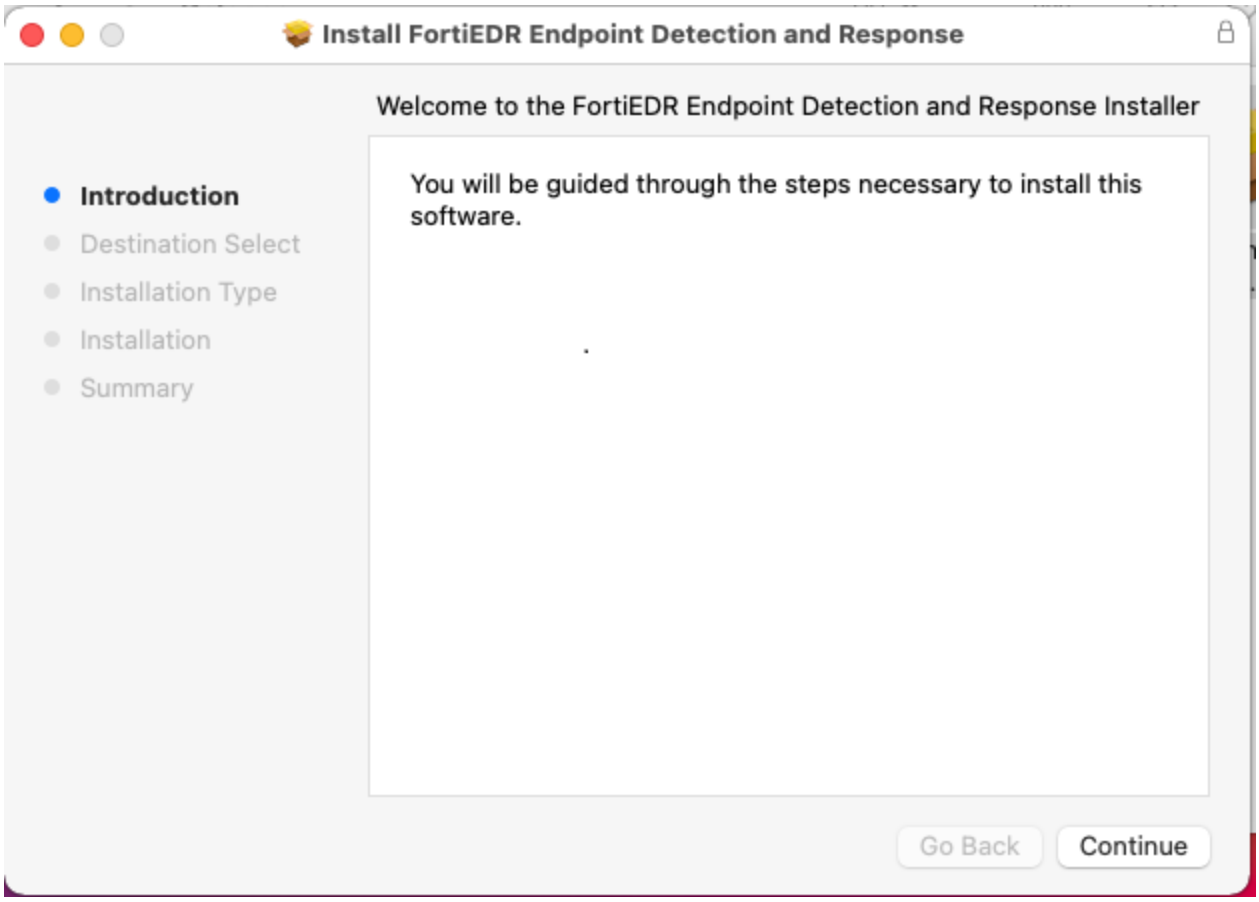
IMPORTANT: Failure to add these permissions will result in incomplete protection.

Deployment can also be managed using an MDM, such as Jamf.

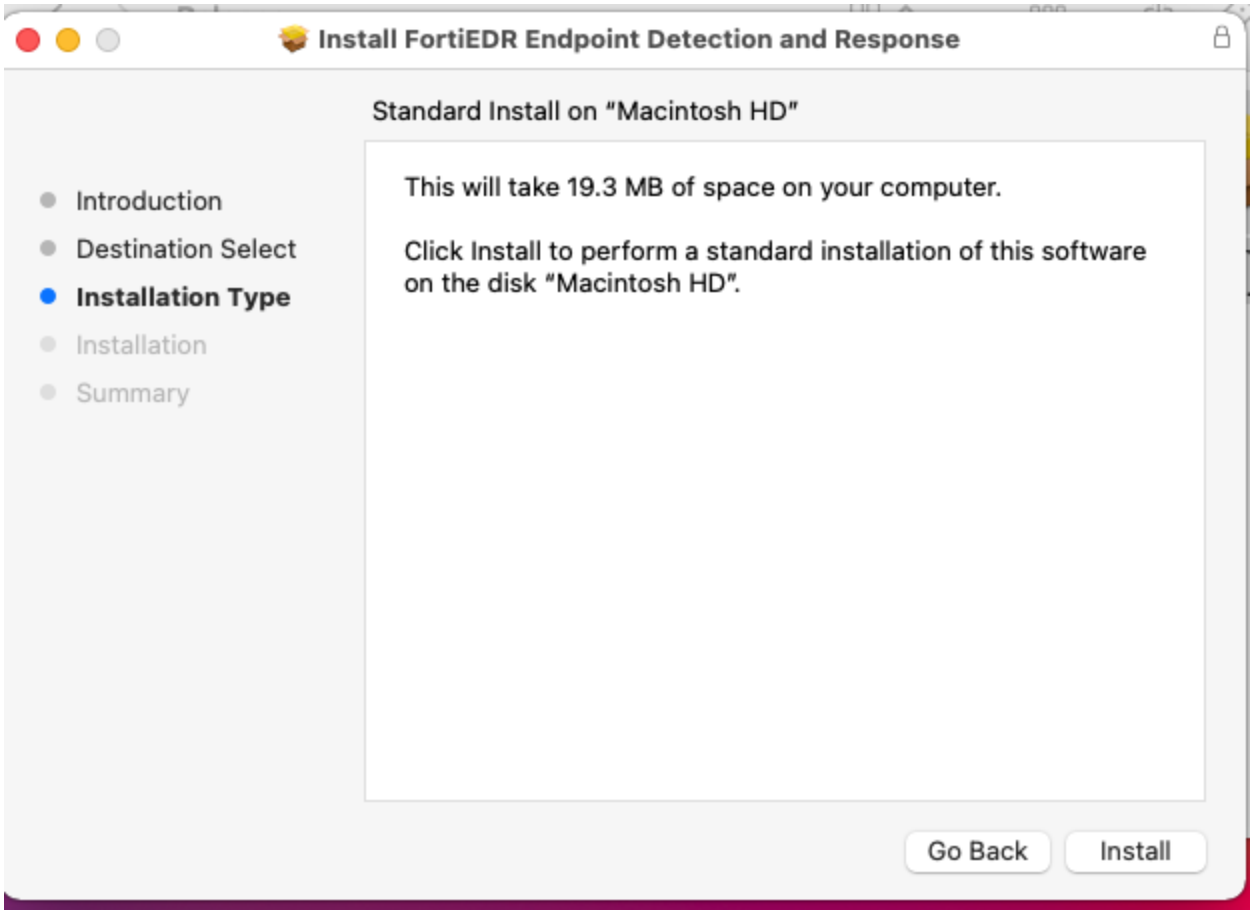
To install a FortiEDR Collector on macOS that is running with Big Sur (version 11) or later:

To start the installation:

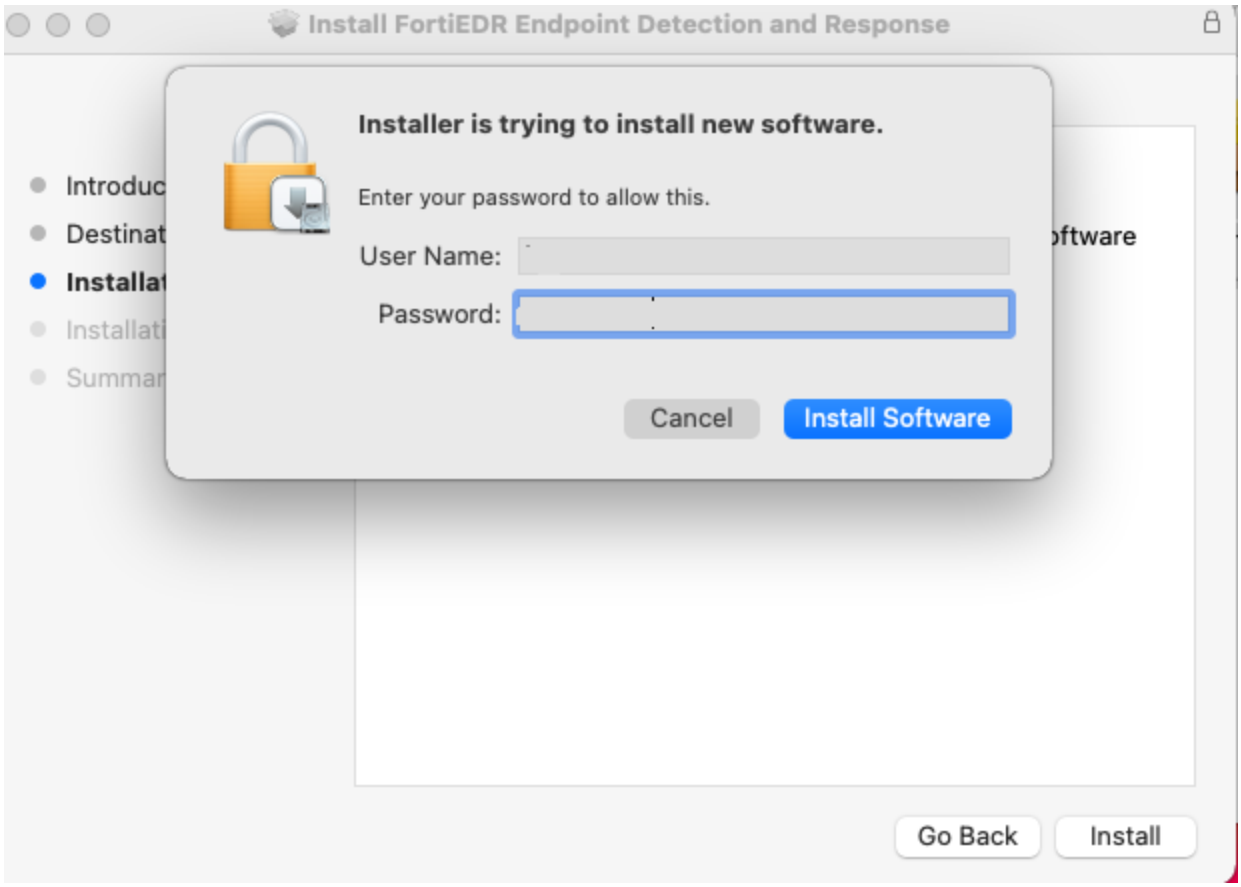
1. It is recommended to get a pre-populated customized Collector installer for macOS, as described in Requesting and obtaining a Collector installer on page 422.
2. Double-click the `*.dmg` file named `FortiEDRCollectorInstallerOSX_<version>.dmg`.
3. Click *Continue*.



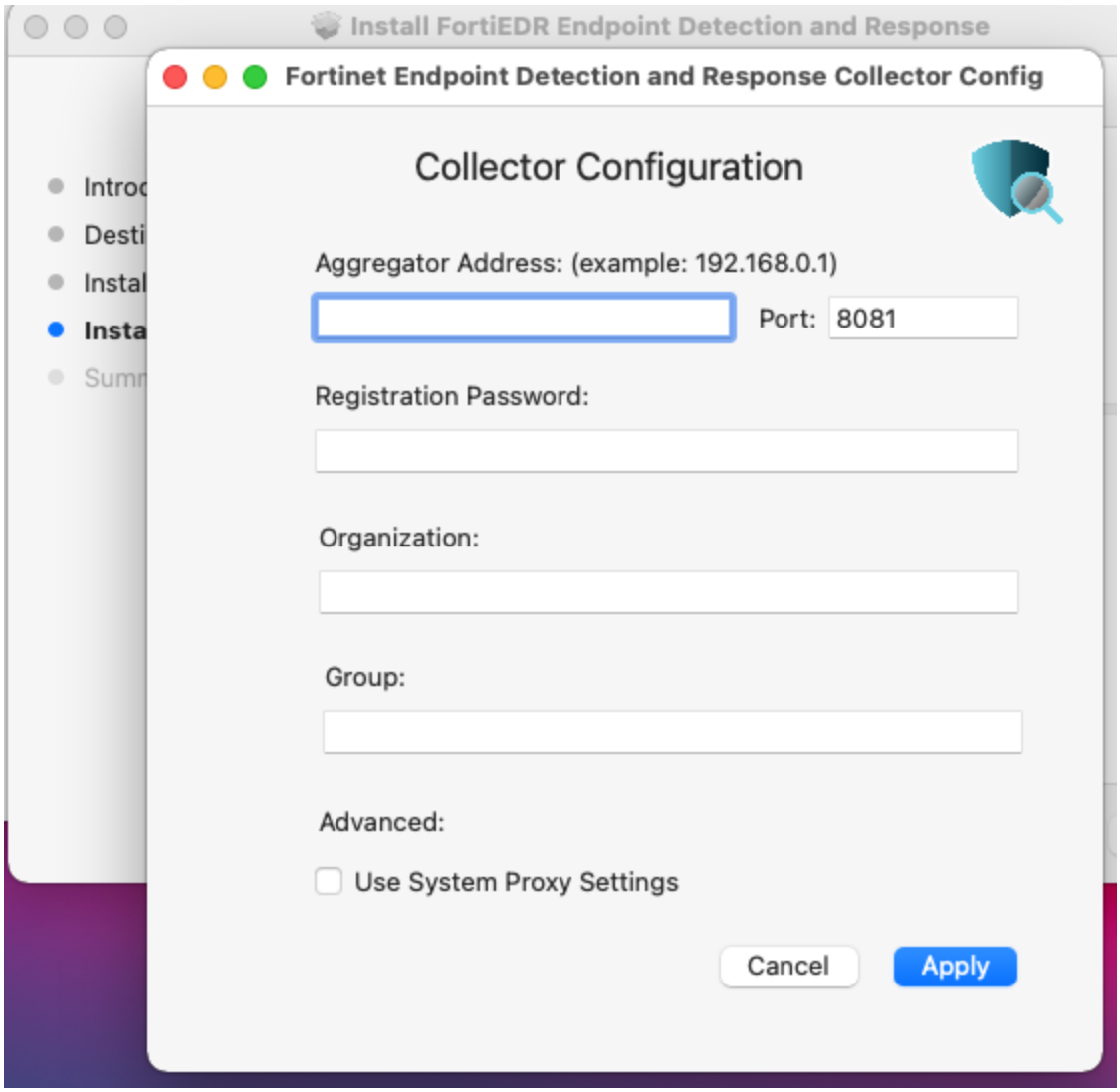
4. Click *Install*.



5. Enter the Mac password at the prompt and click *Install Software*.



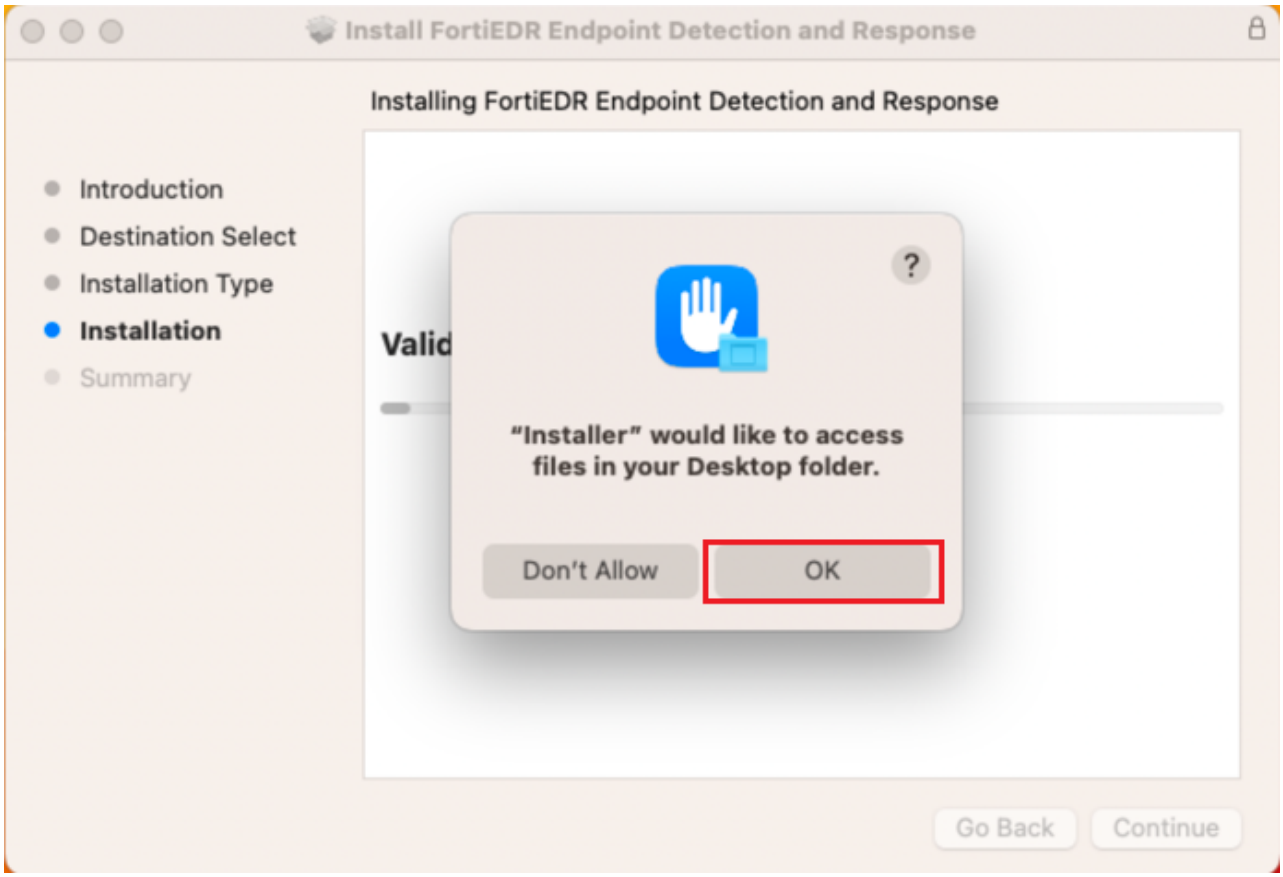
6. If a non-customized installer is used, in the *Collector Conifguration* page, specify the Aggregator's address and FortiEDR registration password. Optionally, you can select a destination Organization and Collector Group and/or installation using a system proxy.



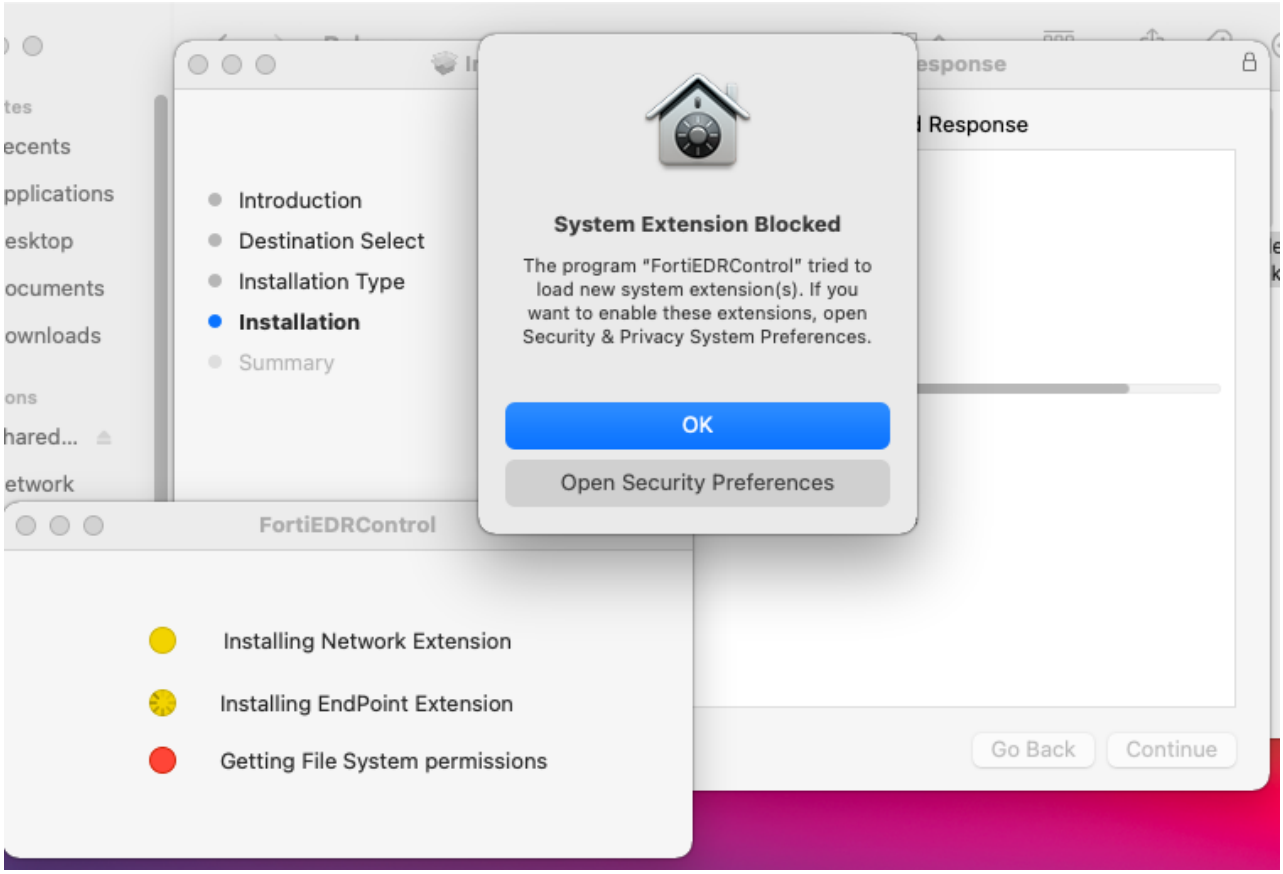
7. Click *Apply* to start the installation process.
8. Continue the installation:
   - macOS 15 or later
   - macOS 13 or 14
   - macOS 11 or 12

To continue the installation on macOS 15 or later:

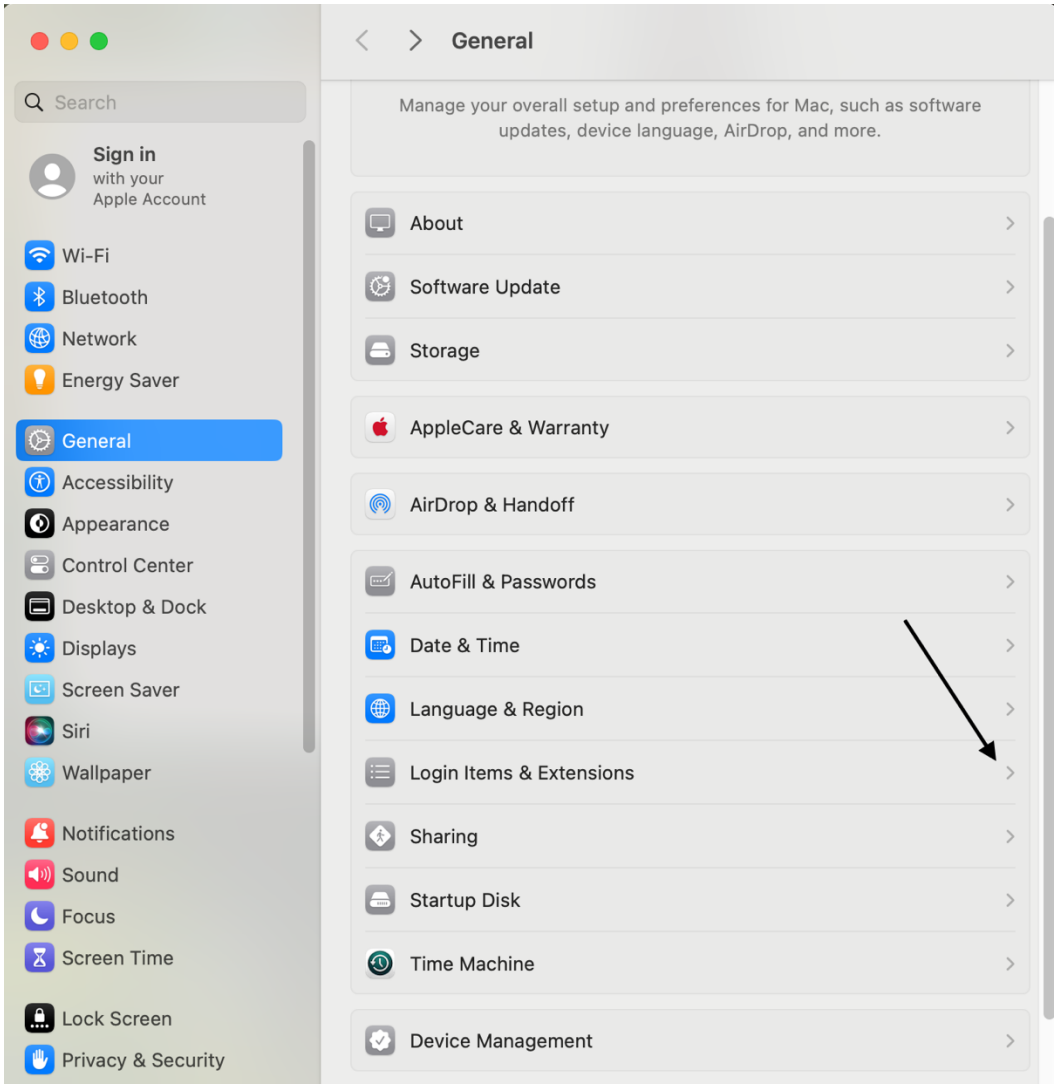
1. In the popup window, click *OK* to allow the installer to access files:

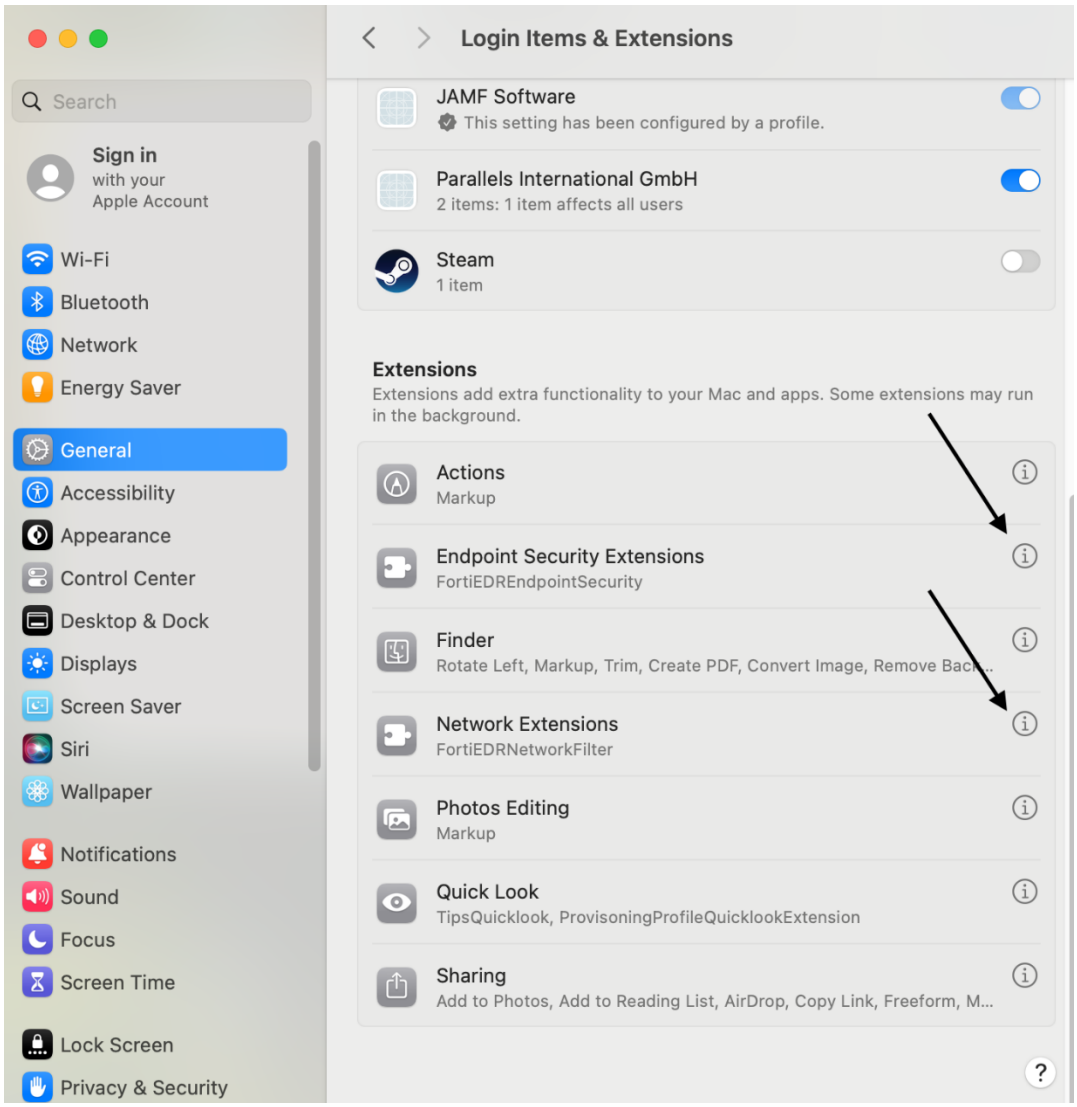


2. Enable Network and System Extensions:

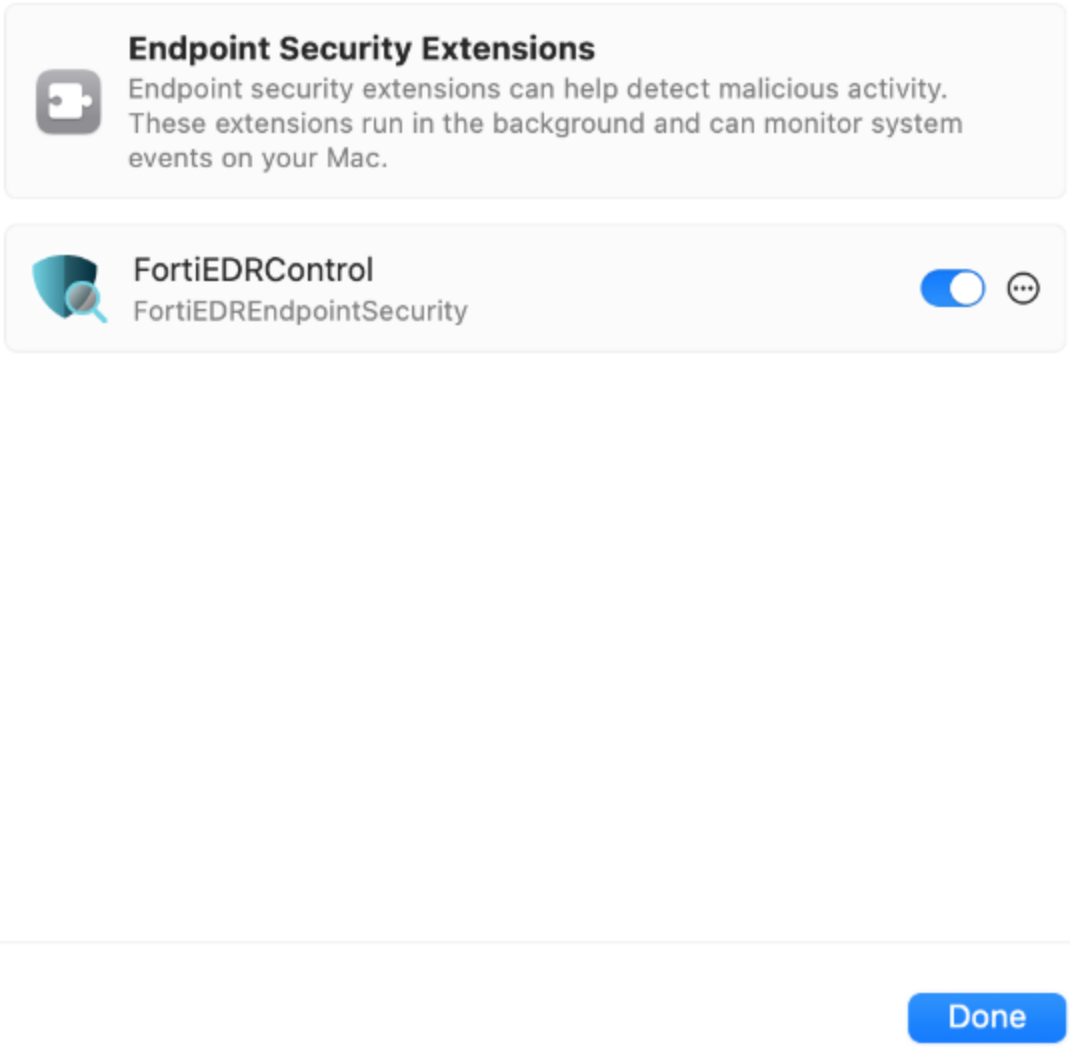

Introduction
Destination Select
Installation Type
Installation
Summary
System Extension Blocked
The program "FortiEDRControl" tried to load new system extension(s). If you want to enable these extensions, open Security & Privacy System Preferences.
OK
Open Security Preferences
FortiEDRControl
Installing Network Extension
Installing EndPoint Extension
Getting File System permissions
Response
Go Back
Continue

a. Open *General* > *Login Items & Extensions* and scroll down to *Extensions*.



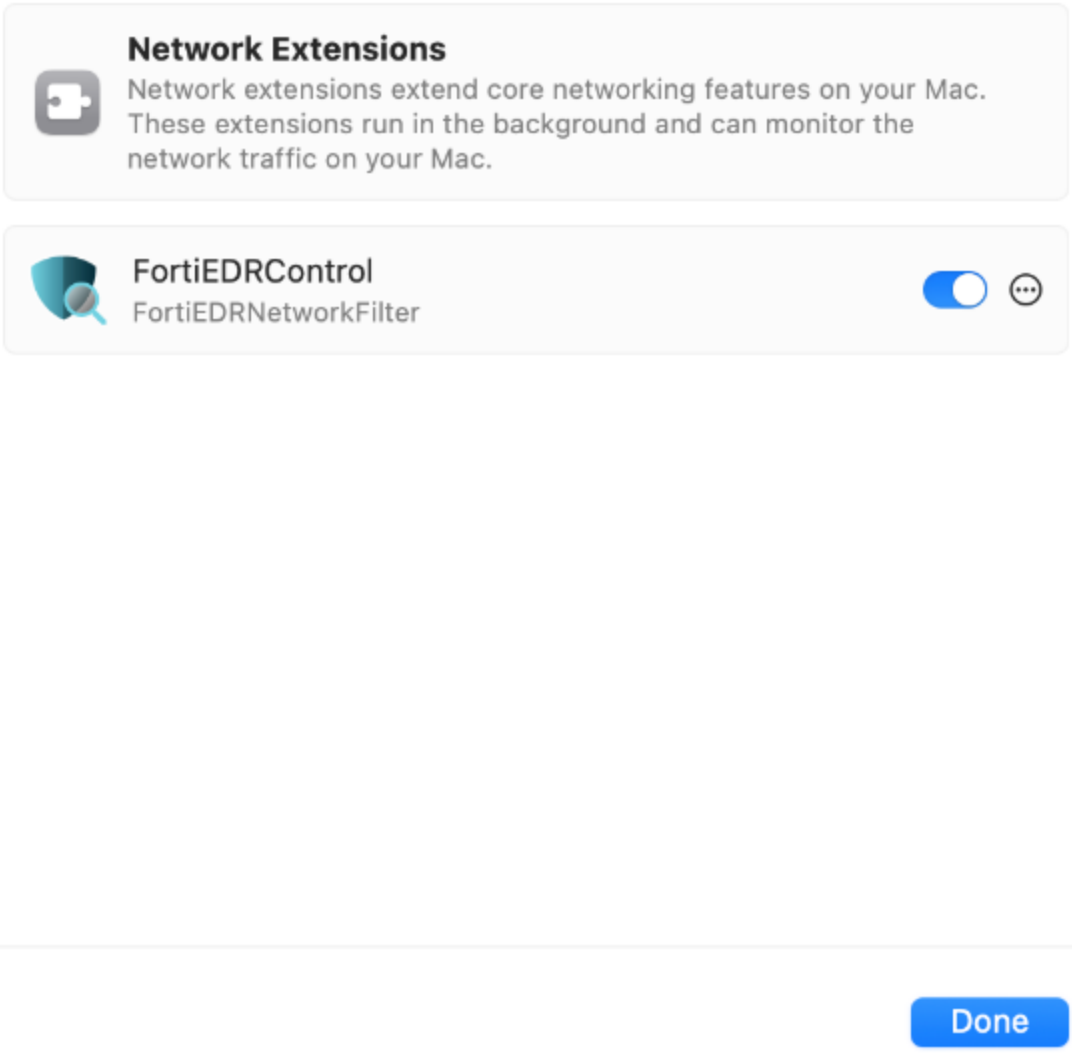


b. Click *Endpoint Security Extension* and toggle on *FortiEDRControl*.
The Mac password is required for this change.



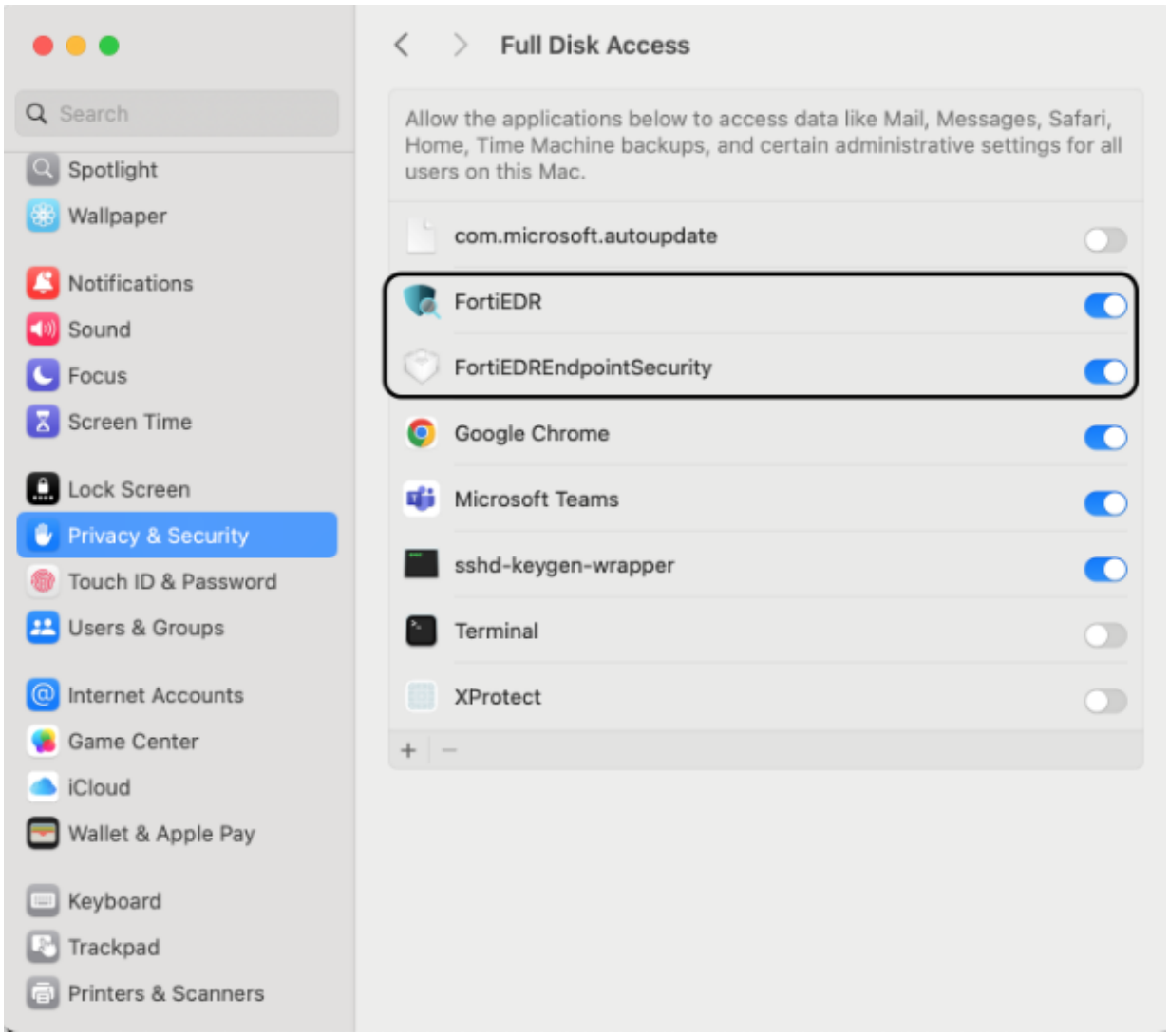
c. Click *Done*.

d. Click *Network Extension* and toggle on *FortiEDRControl*.
The Mac password is required for this change.



e. Click *Done*.

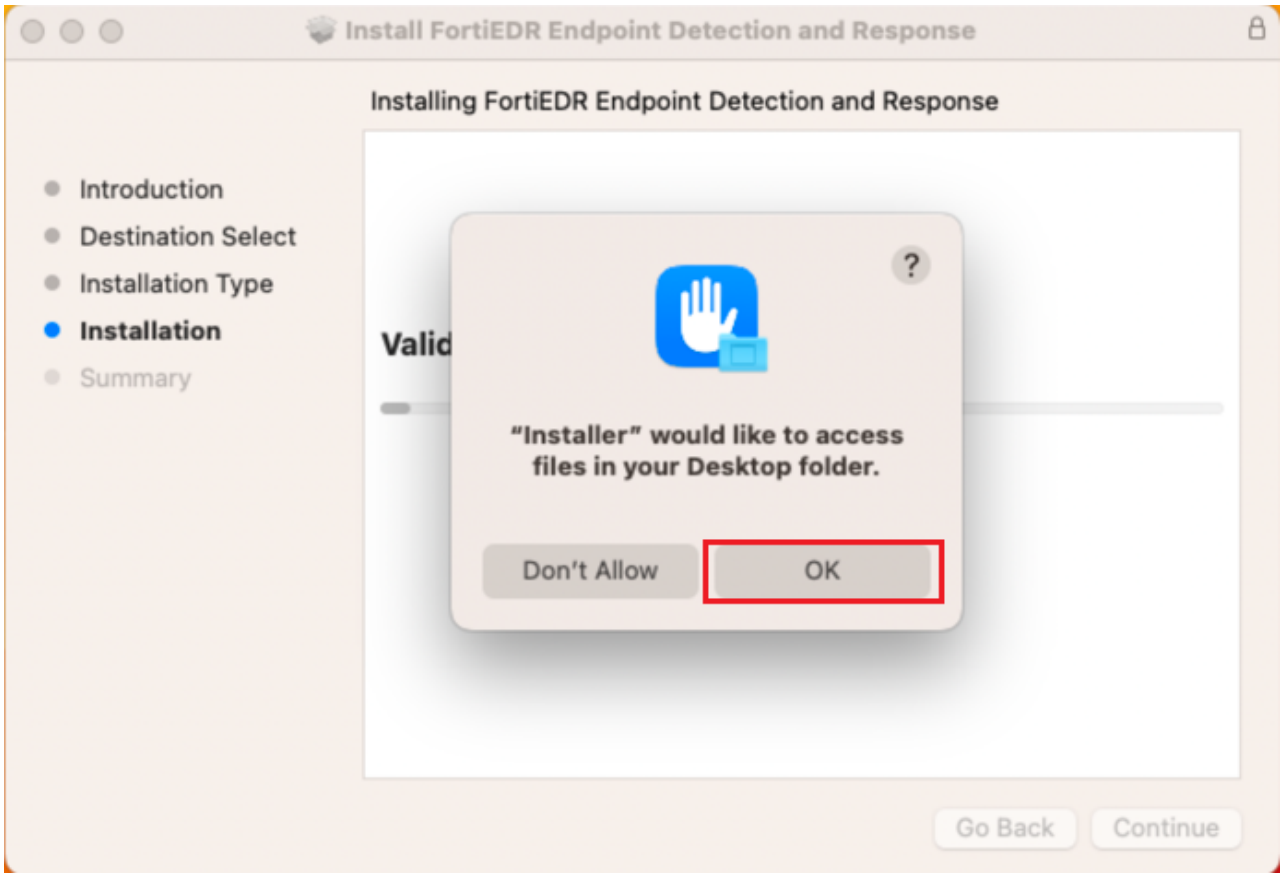
3. Enable Full Disk Access:
   a. Open Full Disk Access on *Privacy & Security*.
   b. Toggle on the two FortiEDR-related options to authorize full disk access for FortiEDR, as shown below:



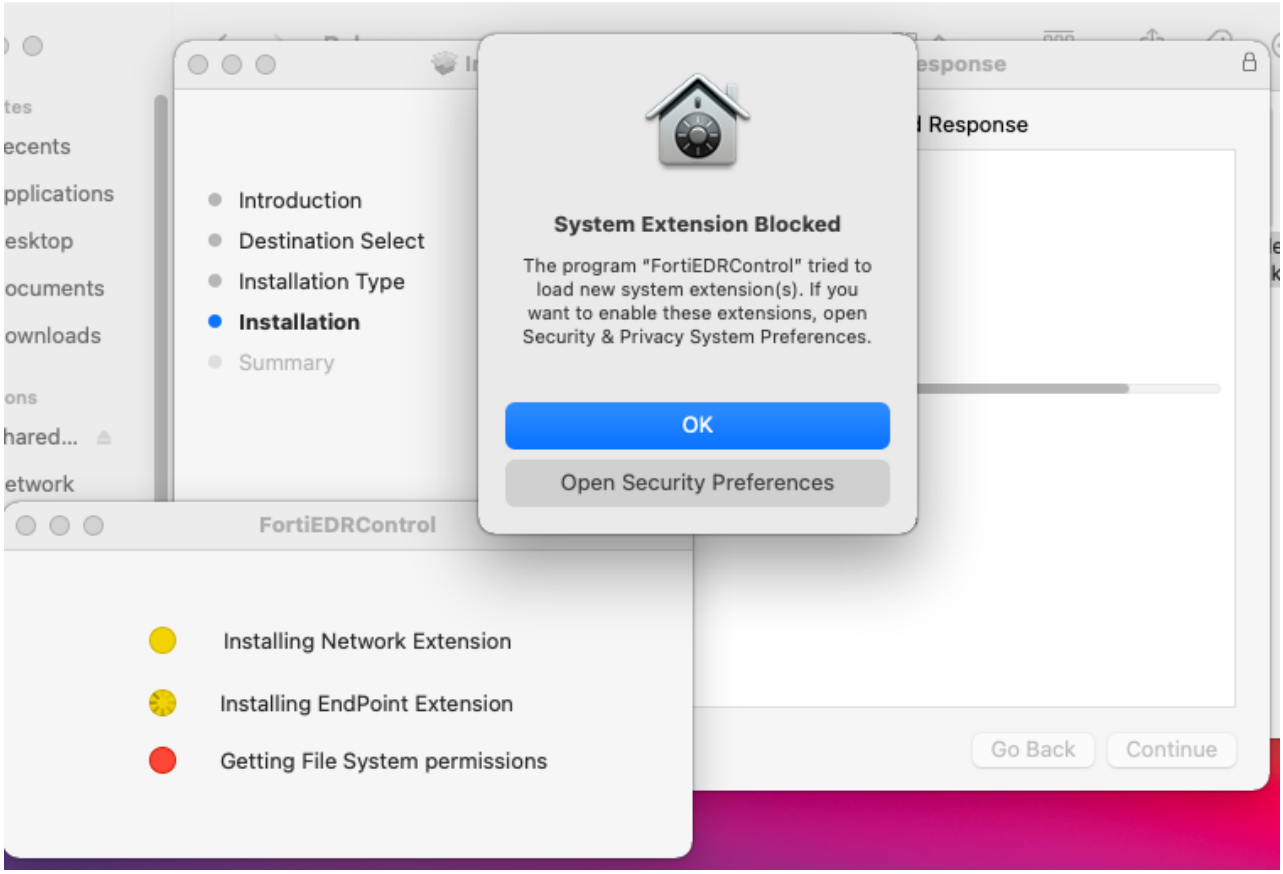
4. See To finish the installation.

To continue the installation on macOS 13 or 14:

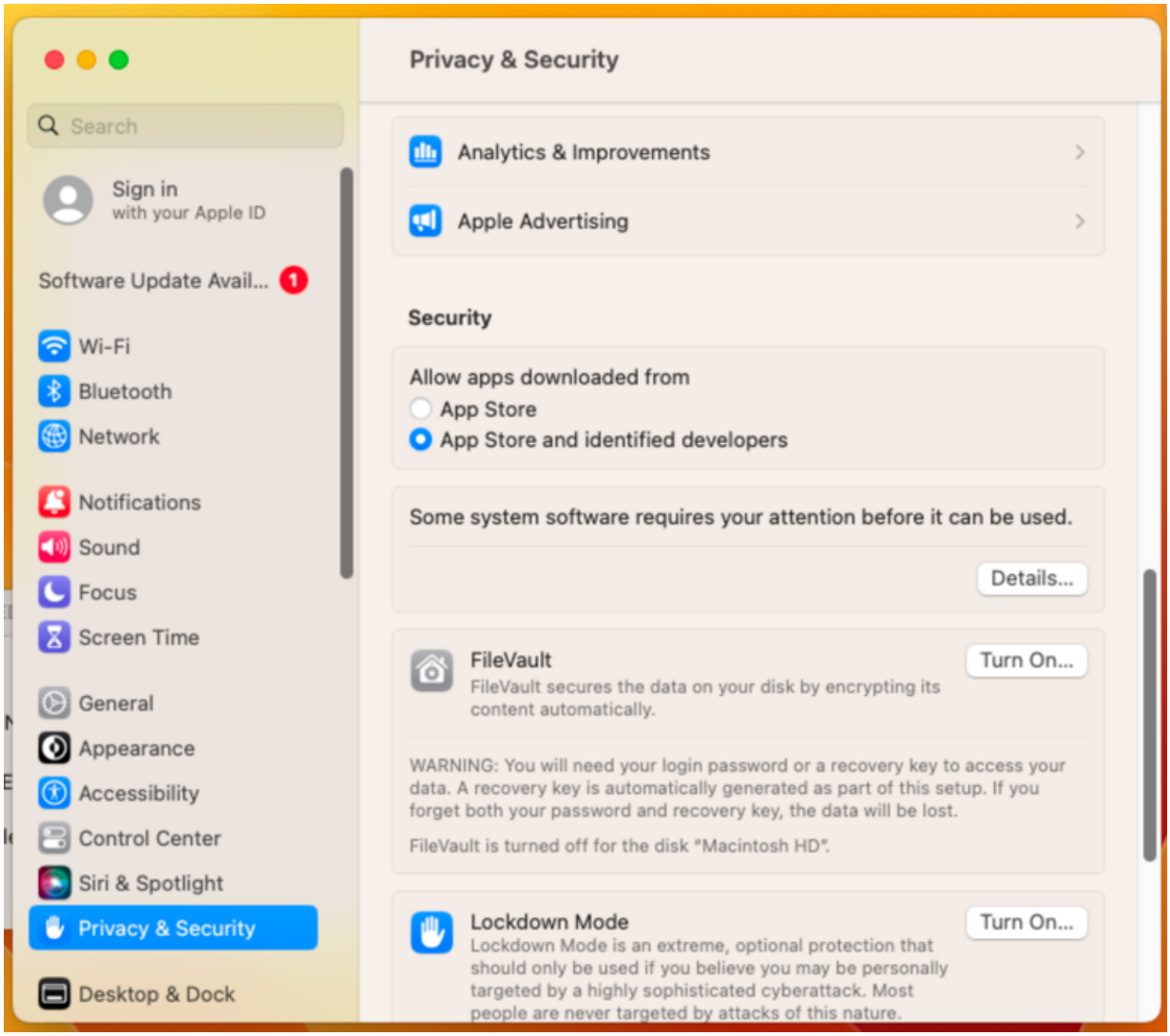
1. In the popup window, click *OK* to allow the installer to access files:



2. Enable Network and System Extensions:


Introduction
Destination Select
Installation Type
Installation
Summary
System Extension Blocked
The program "FortiEDRControl" tried to load new system extension(s). If you want to enable these extensions, open Security & Privacy System Preferences.
OK
Open Security Preferences
FortiEDRControl
Installing Network Extension
Installing EndPoint Extension
Getting File System permissions
Response
Go Back
Continue

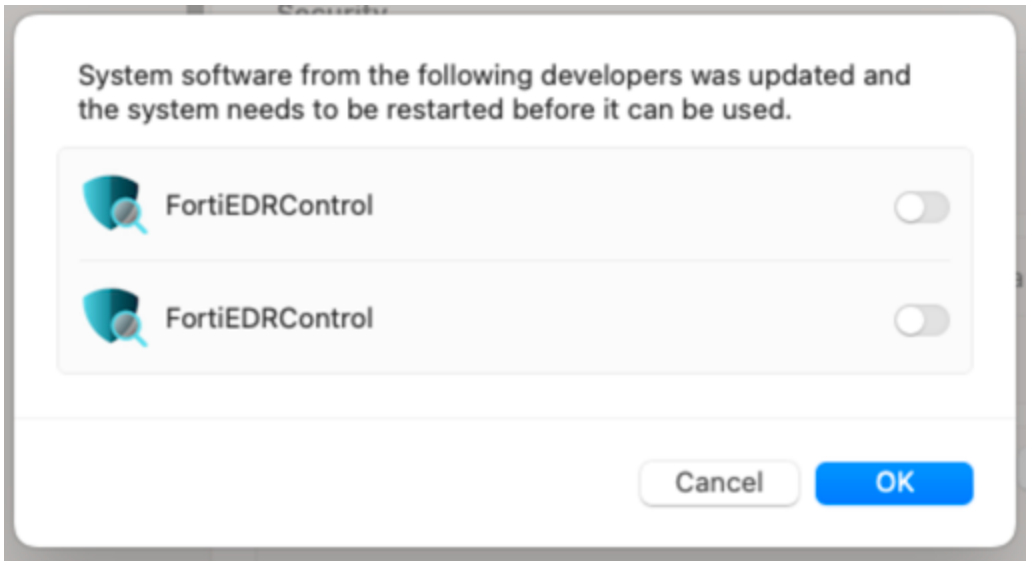
a. Open *Privacy & Security* and scroll down to the *Security* section:



b. Under *Some system software requires your attention before it can be used*, Click *Details*.

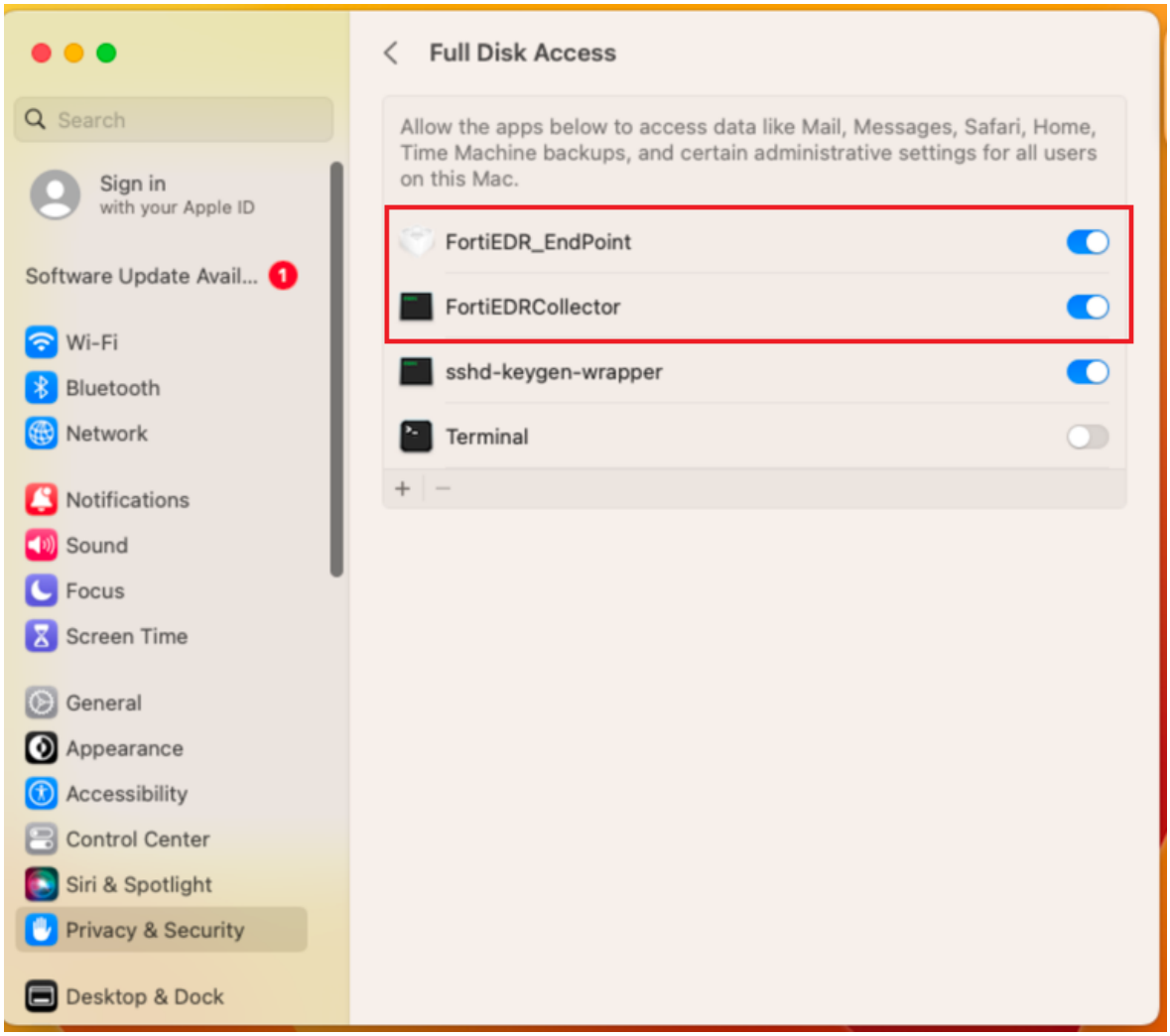
c. Enter the Mac password at the prompt.

d. Toggle on both toggles in order to allow FortiEDR to use Network and System Extensions and click *OK*.

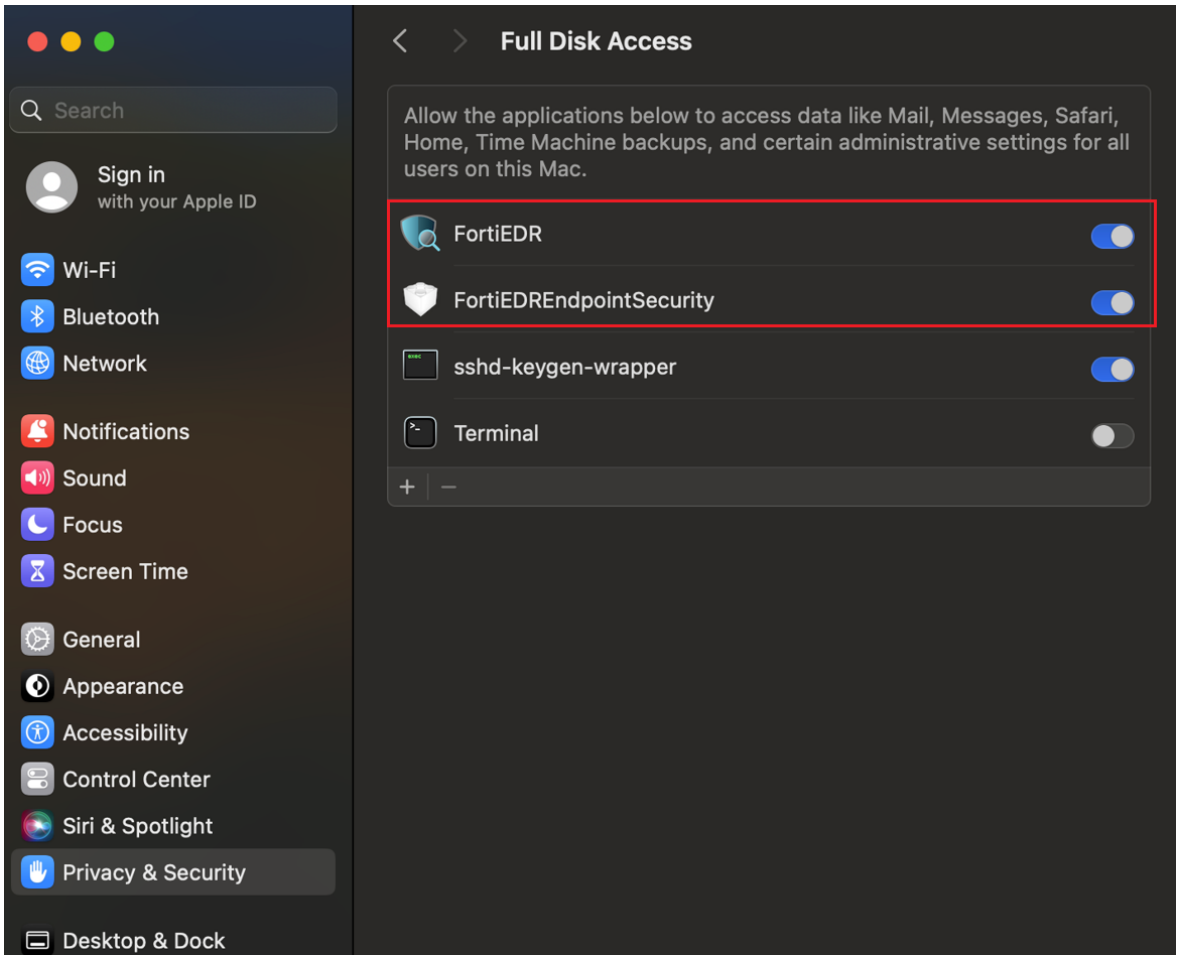


3. Enable Full Disk Access:
   a. Open Full Disk Access on *Security Preferences*.
   b. Toggle on the two FortiEDR-related options to authorize full disk access for FortiEDR, as shown below:

- **Collector earlier than 6.0:**



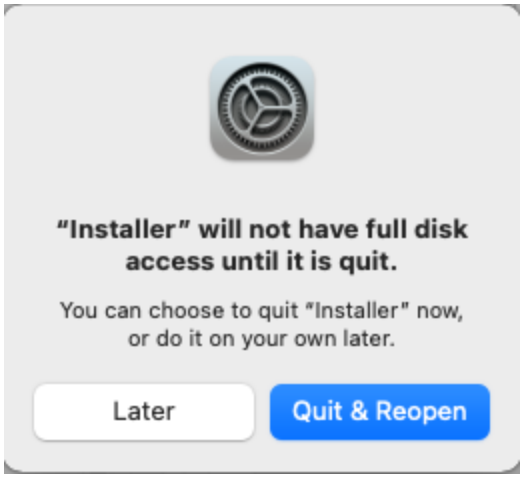
- **Collector 6.0 or later:**



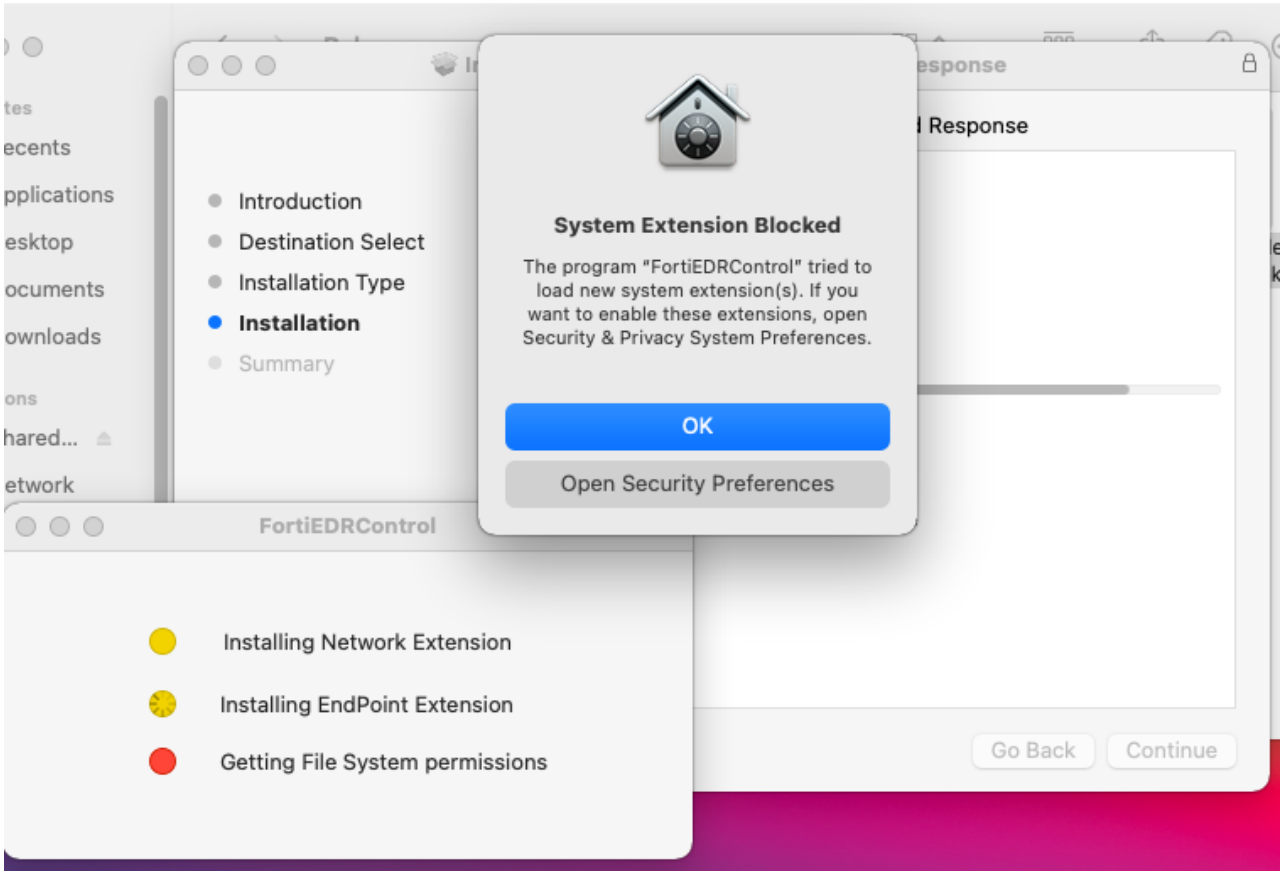
4. See To finish the installation.

To continue the installation on macOS 11 or 12:

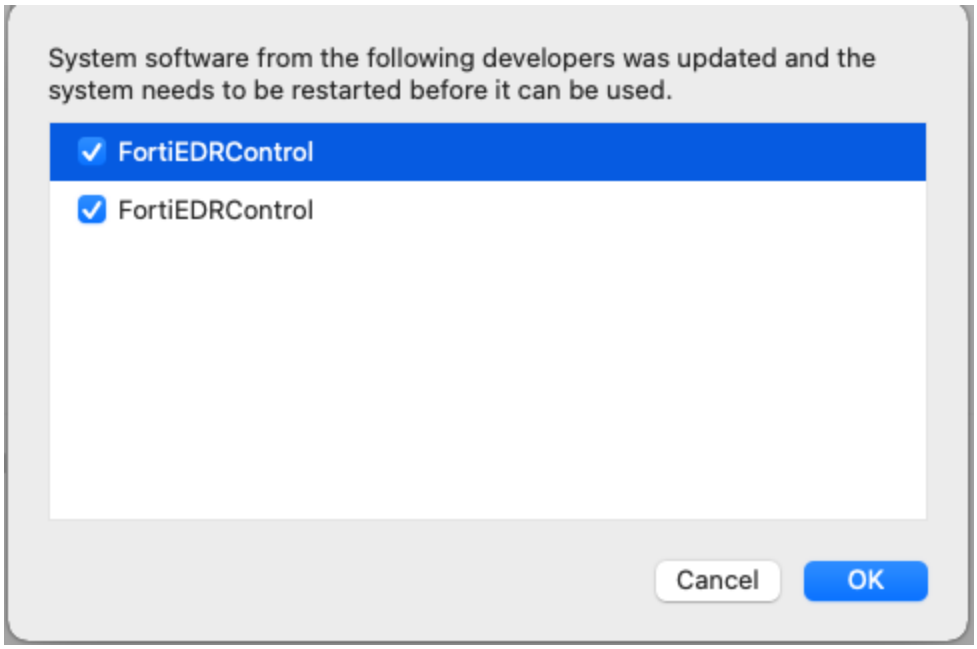
1. In the popup window, click *Later*:



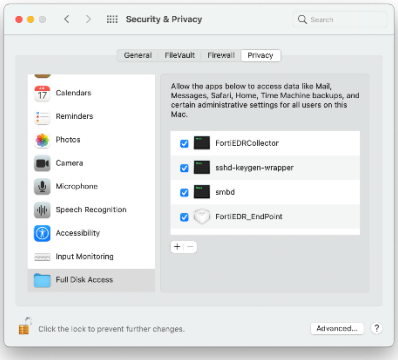
2. Enable Network and System Extensions:



   a. Open *Security Preferences*.
   b. Click the lock at the bottom of the window in order to make changes.
   c. In the *General* tab, click *Details*.
   d. Mark both checkboxes to allow FortiEDR to use Network and System Extensions. Click *OK*.



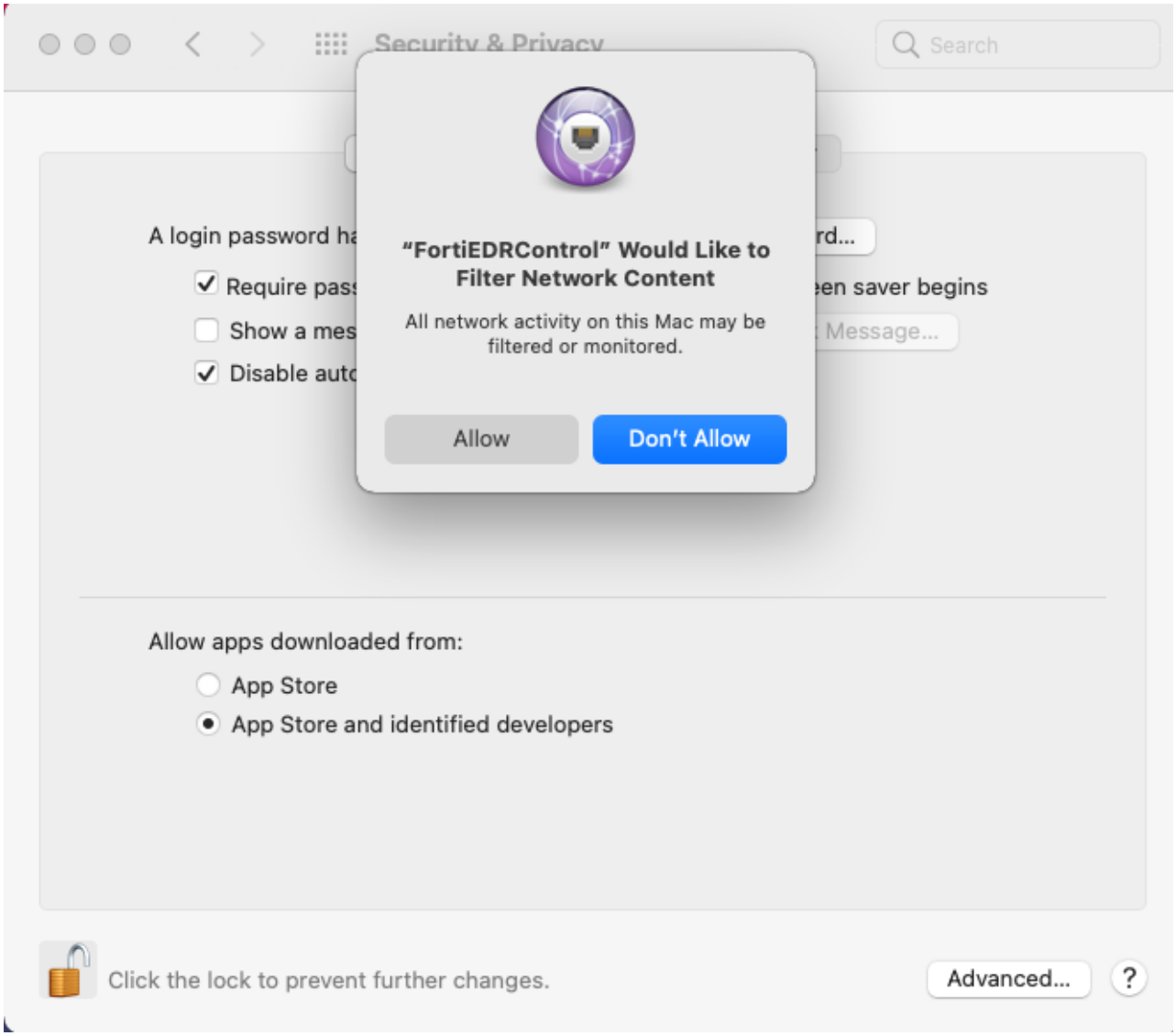
3. Enable Full Disk Access:
   a. Open *Security Preferences*.
   b. Click the lock at the bottom of the window in order to make changes.
   c. In the *Privacy* tab, select *Full Disk Access* from the left pane.
   d. Select the checkboxes of both the *FortiEDRCollector* and the *FortiEDR_EndPoint* applications:



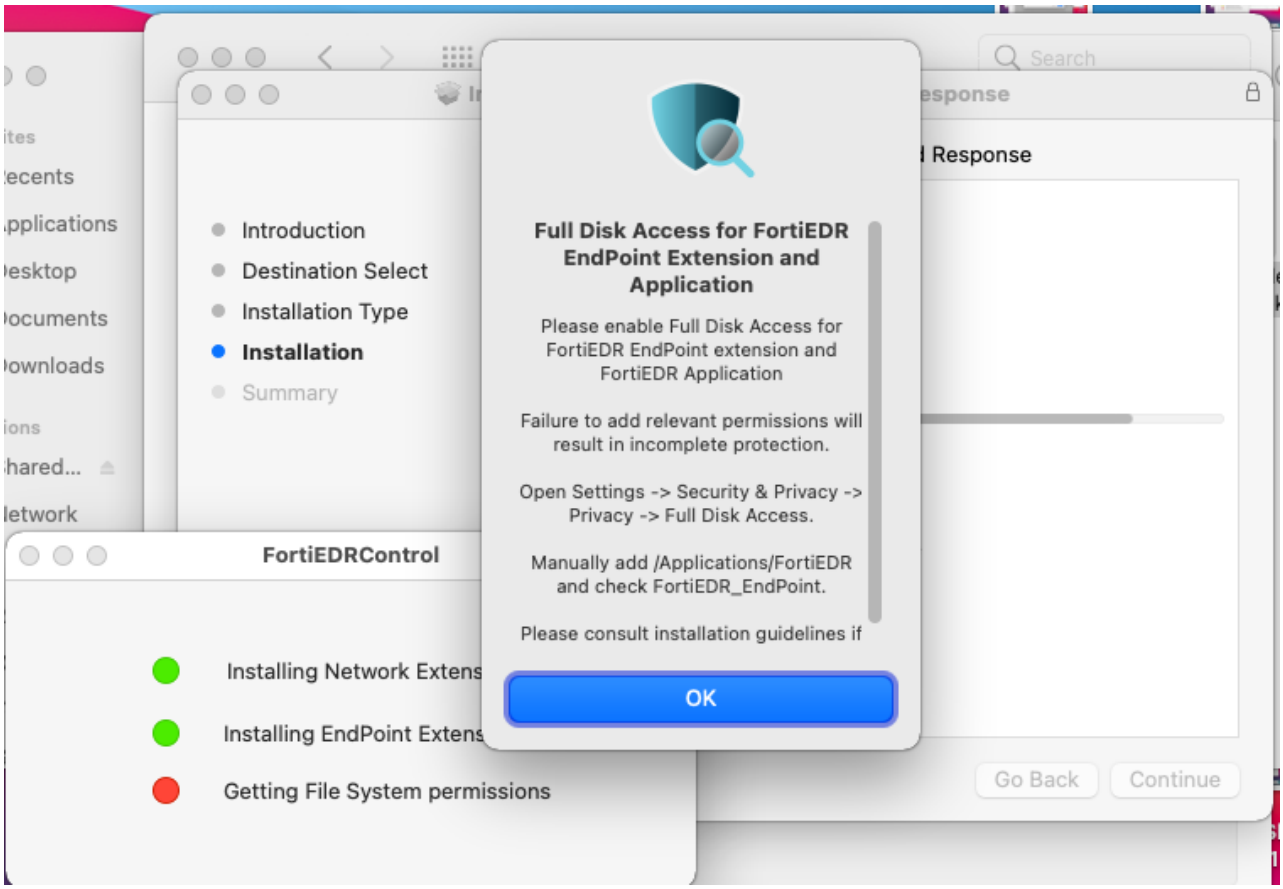
4. See To finish the installation.

To finish the installation:

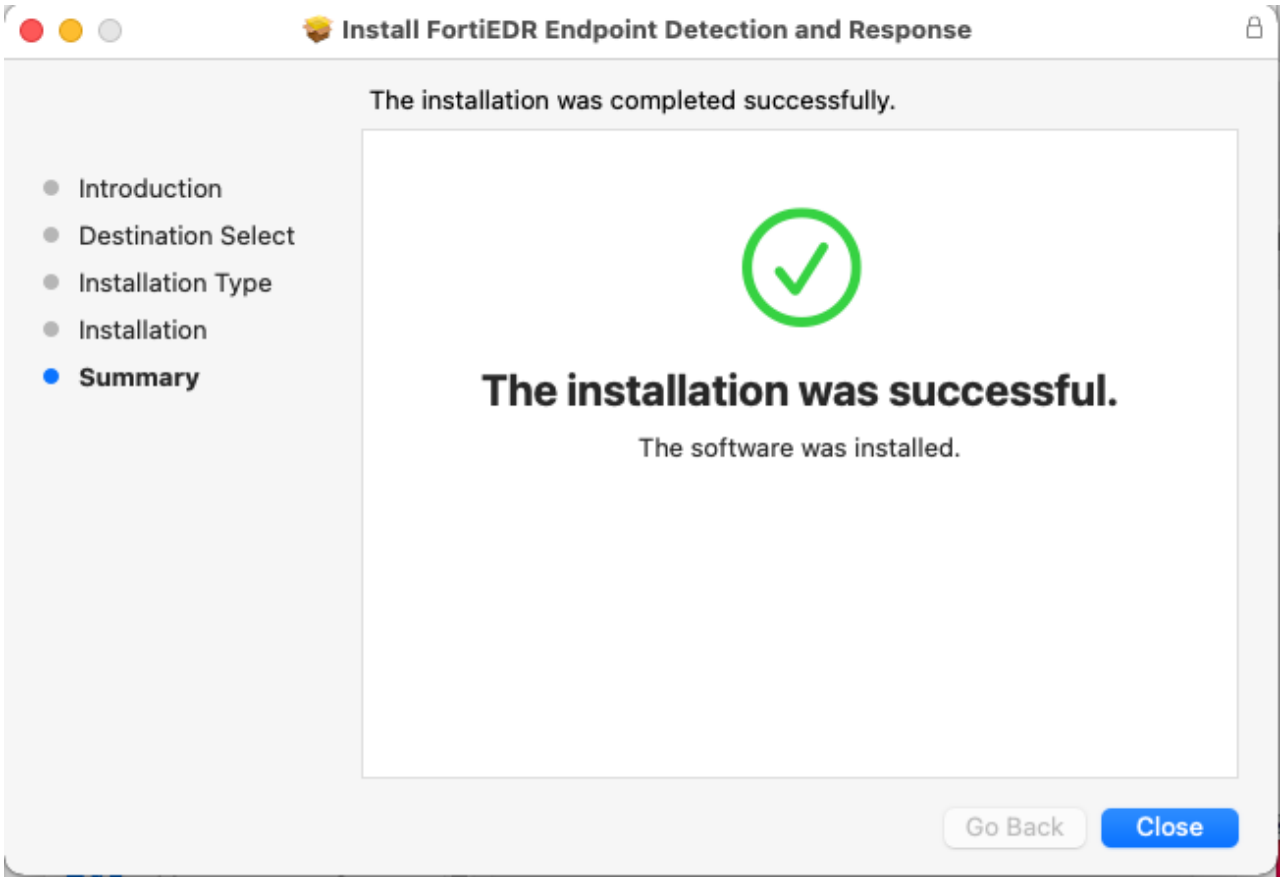
1. Click *Allow*.



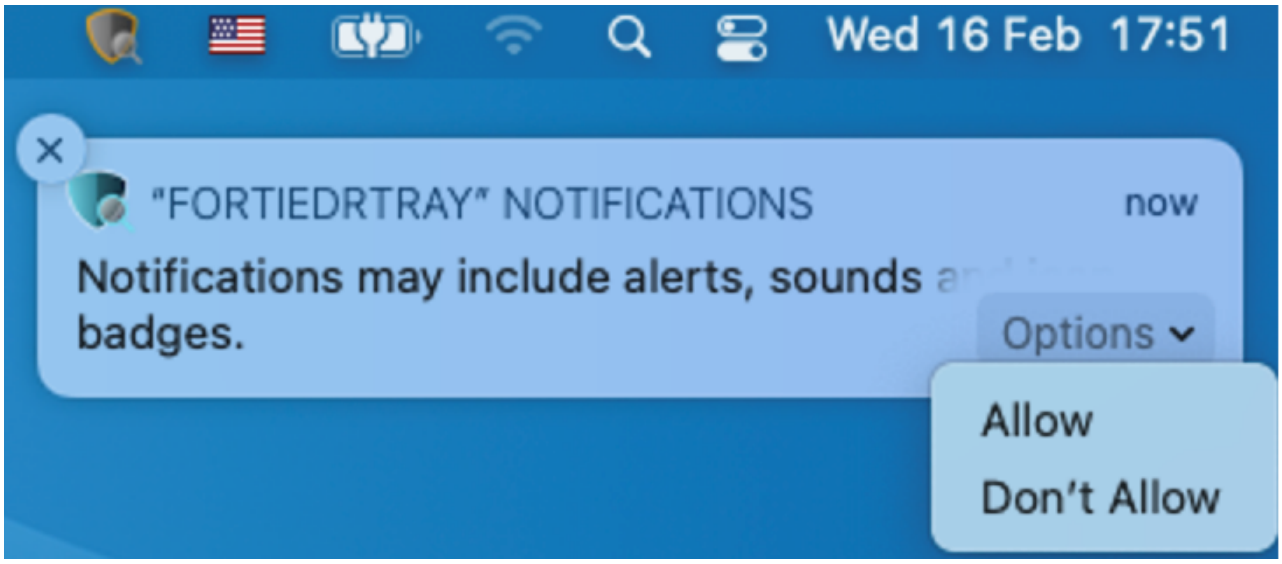
2. Click *OK*.



3. Click *Close* to complete the process.



4. When prompted to allow FORTIEDRTRAY notifications, click *Allow*.



5. Reboot the device.
6. Run the following command to check the status of the Collector:

- **Collector 6.0 or later**:

```
/Applications/FortiEDR.app/Contents/Library/LaunchServices/fortiedr_collector.sh status
```

- **Collector earlier than 6.0**:

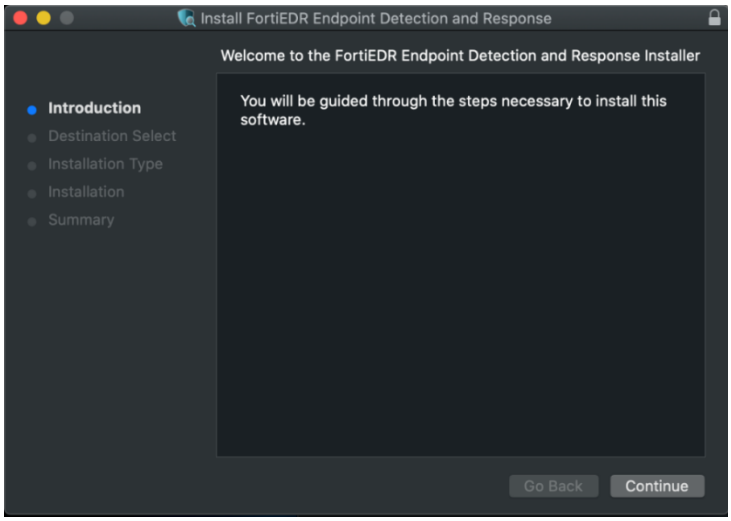
```
/Applications/FortiEDR.app/fortiedr_collector.sh status
```

7. If another AV product is also installed on the machine, exclude AV exceptions by following the instructions in Setting up exclusions with other AV products on page 69.

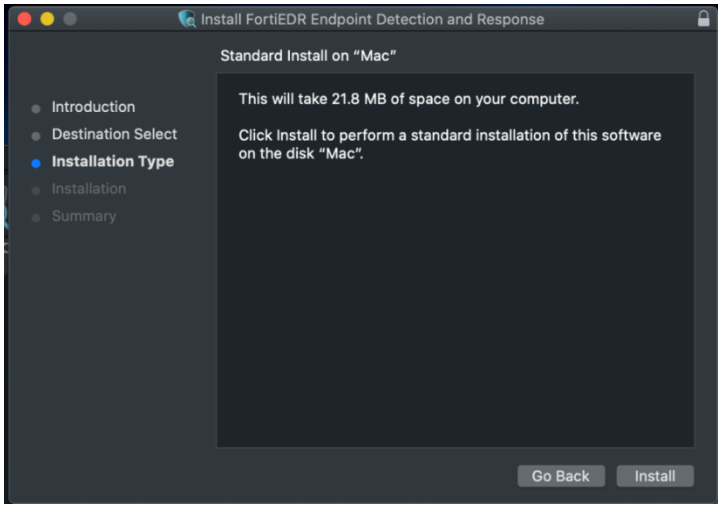
To install a FortiEDR Collector on macOS with versions prior to Big Sur (11), such as Catalina or Mojave:

1. It is recommended to get a pre-populated customized Collector installer for macOS, as described in Requesting and obtaining a Collector installer on page 422.
2. Double-click the `*.dmg` file named `FortiEDRCollectorInstallerOSX_1.3.0.xxx.dmg`.
3. Double-click the `*.pkg` file named `FortiEDRCollectorInstallerOSX_1.3.0.xxx.pkg`.

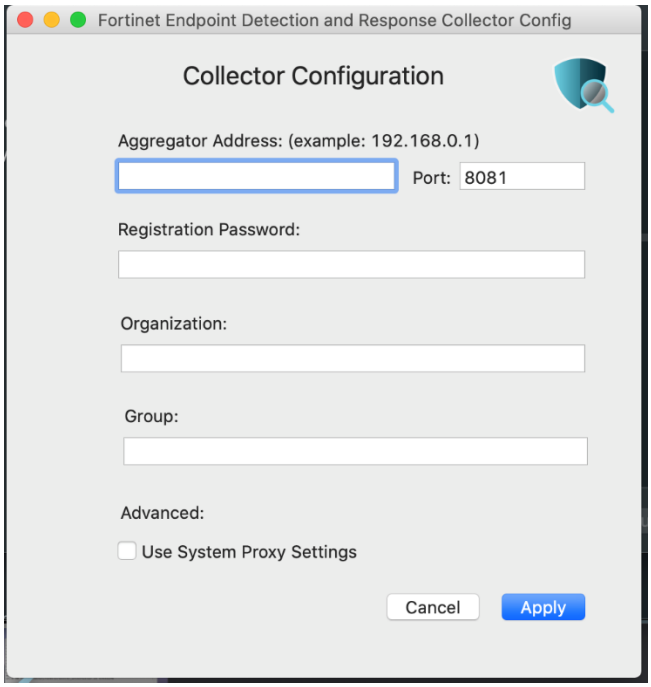
4. Click *Continue*.



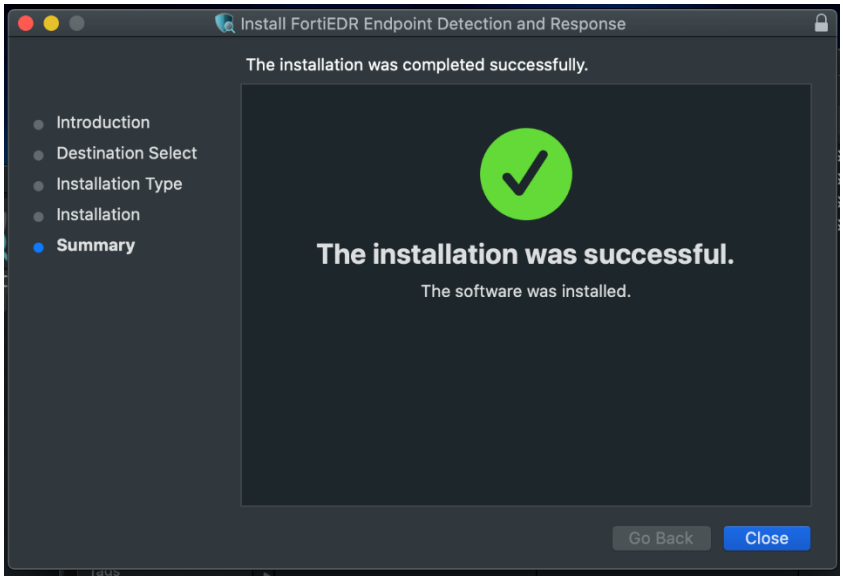
5. Select the destination disk and click *Continue*.
6. Specify the installation location and click *Install*.



7. If a non-customized installer is used, in the *Aggregator Address* field, enter the IP address of the Aggregator in the first box and the port of the Aggregator in the adjacent (*Port*) box.



8. If a non-customized installer is used, in the *Registration Password* field, enter the registration password as described in Configuring the FortiEDR Central Manager server and console on page 556.
9. Leave the *Organization* field empty or for a multi-tenant setup, insert the organization to which this Collector belongs (as it appears under the *ADMINISTRATION > ORGANIZATIONS* tab of the FortiEDR Central Manager).
10. If you use a web proxy to filter requests in this device's network, then check the *Use System Proxy Settings* checkbox. Note that the MacOS must be configured to use a proxy and that the proxy must support HTTPS before installing the Collector (*System Preferences > Network > Advanced > Proxies*).
11. Click *Apply*.
12. Click *Close*.



13. If another AV product is also installed on the machine, exclude AV exceptions by following the instructions in Setting up exclusions with other AV products on page 69.

Installing a FortiEDR Collector on Linux

The FortiEDR Collector installation requires some dependencies. Ensure the Linux endpoint has network connection to the respective upstream package managers.

To install a customized FortiEDR Collector on Linux:

1. It is recommended to get a pre-populated customized Collector installer for Linux, as described in Requesting and obtaining a Collector installer on page 422.
2. Copy the custom Linux Collector installer zip file, `FortiEDRSilentInstall_5.1.0.195_envname_Tenant.zip` to the device. This file was downloaded from the provided link as described in Requesting and obtaining a Collector installer on page 422.
3. Unzip using the following command:

```
sudo unzip ./FortiEDRSilentInstall_5.1.0.195_envname_Tenant.zip
```

   If you don't have zip software on the device, install it using:

```
yum install zip
```

4. Extract the installer using the following command:

```
sudo gunzip ./FortiEDRSilentInstall_5.1.0.195_envname_Tenant.sh.gz
```

5. Change the installation script permission with the following command:

```
chmod 755 FortiEDRSilentInstall_5.1.0.195_envname_Tenant.sh
```

6. Run the following to execute the installation script:

```
sudo ./FortiEDRSilentInstall_5.1.0.195_envname_Tenant.sh
```

7. If another AV product is also installed on the machine, exclude AV exceptions by following the instructions in Exclusion paths.

To install a non-customized FortiEDR Collector on Linux:

1. Run the FortiEDR Collector installation file for 64-bit servers using the following command:
   - CentOS/RHEL/Oracle/AMI:
     `sudo yum install ./FortiEDRCollectorInstaller_%Linux_distribution%-%version_number%.x86_64.rpm`
     For example, `sudo yum install ./FortiEDRCollectorInstaller_CentOS6-3.1.0-74.x86_64.rpm`.
   - Ubuntu:
     `sudo apt-get install ./FortiEDRCollectorInstaller_Ubuntu-%version_number%.deb`
     For example, `sudo apt-get install ./FortiEDRCollectorInstaller_Ubuntu-3.1.0-74.deb`.
   - SUSE Linux:
     `rpm --import RPM-GPG-KEY.key`
     The FortiEDR PGP key is included in the download link of the pre-populated installer, see the Requesting and obtaining a Collector installer on page 422.
     `zypper install FortiEDRCollectorInstaller_%distribution% -%version_number%.rpm`
     For example: `zypper install FortiEDRCollectorInstaller_openSUSE15-4.5.0-88.x86_64.rpm`
2. After the installation is completed, run the following:

```
sudo /opt/FortiEDRCollector/scripts/fortiedrconfig.sh
```

3. Specify the domain name/IP address and port (8081) of the Aggregator that the Collector registers with.

If you are installing the Linux Collector on an Aggregator, you cannot register the Collector with the same Aggregator that the Collector runs on. Register the Collector with another Aggregator instead.

4. For a multi-tenant setup, enter the organization. Otherwise, leave the organization empty.
5. Enter Collector Group information or leave empty to be registered to the default Collector Group.
6. Enter the device registration password, described in Configuring the FortiEDR Central Manager server and console on page 556.
7. At the *Do you want to connect via proxy (Y/N)?* prompt, type `Y` if your setup includes a web proxy.
8. If you are installing the Linux Collector build 5.1.5.1062 or later on a machine with secure boot enabled, at the *One or more modules are not signed. Would you like to sign them now?* prompt, type *Y* to sign the unsigned kernel modules or *N* to leave them unsigned.
9. If your software distribution system does not allow the addition of specific parameters to the command, you can use the custom FortiEDR Collector installer, which can be accessed via the Central Manager Console using the required DNS or IP address and password that is already embedded inside. For more details, see Requesting and obtaining a Collector installer on page 422.
10. If another AV product is also installed on the machine, exclude AV exceptions by following the instructions in Exclusion paths.

Automated FortiEDR Collector deployment

Automated FortiEDR Collector deployment on Windows

FortiEDR can be installed automatically via any software installation and distribution system.

To deploy a custom FortiEDR Windows Collector via a command line:

1. Get a pre-populated customized Collector installer for Windows, as described in Requesting and obtaining a Collector installer on page 422.
2. Use the following command syntax:

```
msiexec /i FortiEDRCollectorInstaller64.msi
```

3. If another AV product is also installed on the machine, exclude AV exceptions by following the instructions in Setting up exclusions with other AV products on page 69.

To deploy a non-customized FortiEDR Windows Collector via a command line:

1. Use the following command syntax:

```
msiexec /i FortiEDRCollectorInstaller64.msi /qn AGG=10.0.0.1:8081 PWD=1234
```

For example, to install a FortiEDR Collector on a 64-bit machine, connect it to a FortiEDR Aggregator on IP address 10.0.0.1 and use the device registration password 1234, enter the following command:

```
msiexec /i FortiEDRCollectorInstaller64.msi /qn AGG=10.0.0.1:8081 PWD=1234
```

You can specify which organization or Collector group to assign this Collector to by adding the ORG or DEFGROUP parameter. These parameters are optional. Values with spaces must be wrapped in double quotation marks.

For example, to install a FortiEDR Collector with the same configurations as above and assign it to the default organization and default Collector group, enter the following command:

```
msiexec /i FortiEDRCollectorInstaller64.msi /qn ORG="Default Organization" AGG=10.0.0.1:8081
PWD=1234 DEFGROUP="Default Collector Group"
```

The name of the Collector MSI file may be different.

For Collectors version 3.0.0 and above, you can set a designated group and/or organization. To do so, enter the following command:

```
./CustomerBootstrapGenerator --aggregator [IP] --password '[PASSWORD]' --organization '
[ORGANIZATION]' --group '[GROUP]' > CustomerBootstrap.js
```

2. Using web proxy can be configured for Collectors version 3.0.0 and above. To do so, append the parameter PROXY=1 to the command syntax shown above.
3. In general, a FortiEDR Collector does not require the device on which it is installed to reboot after its installation. However, in some cases, you may want to couple the installation of the FortiEDR Collector with a reboot of the device. To do so, append the parameter NEEDREBOOT=1 to the command syntax shown above.
   Collectors that are installed with this flag appear in the FortiEDR Central Manager as Pending Reboot (page 87) and will not start operating until the after the device is rebooted.

In general, rebooting the device after installing a FortiEDR Collector is good practice, but is not mandatory. Rebooting may prevent a threat actor from attempting to exfiltrate data on a previously existing connection that was established before installation of the FortiEDR Collector.

4. When installing on a Citrix PVS golden image, append the parameter **CITRIXPVS=1** to the command syntax shown above.
5. If your software distribution system does not allow the addition of specific parameters to the command, you can use the custom FortiEDR Collector installer, which can be accessed via the Central Manager Console using the required DNS or IP address and password that is already embedded inside. For more details see Requesting and obtaining a Collector installer on page 422.
6. If another AV product is also installed on the machine, exclude AV exceptions by following the instructions in Setting up exclusions with other AV products on page 69.

Automated FortiEDR Collector deployment on Mac

To deploy a custom FortiEDR macOS Collector via a command line:

1. Get a pre-populated customized Collector installer for macOS as described in Requesting and obtaining a Collector installer on page 422.
2. Run the following command in order to install using the specified settings:

```
sudo installer -pkg <package path> -target /
```

For example, if the package file is FortiEDRInstallerOSX_2.5.2.38.pkg, use the following command:

```
sudo installer -pkg ./FortiEDRInstallerOSX_2.5.2.38.pkg -target /
```

To deploy a non-customized FortiEDR macOS Collector via a command line:

Run the following command line to generate the settings file:

```
./CustomBootstrapGenerator --aggregator [IP] --password [PASSWORD] > CustomerBootstrap.jsn
```

If the Aggregator port is different than 8081 (which is set by default), you can add the following:

```
./CustomBootstrapGenerator --aggregator [IP] --password [PASSWORD] --port 8083 >
CustomerBootstrap.jsn
```

The following are optional parameters that can be used with the custom installer generator:

- If the Collector should be part of a designated Collector Group, use --group '[GROUP]'.
- For a multi-tenant setup, the organization to which this device belongs to can be added using

  ```
  --organization '[ORGANIZATION]'
  ```

- If a web proxy is being used to filter requests in this device's network, use

  ```
  --useProxy '1'
  ```

The following is an example that includes all optional parameters:

```
./CustomBootstrapGenerator --aggregator [IP] --password [PASSWORD] --useProxy '1' --organization
'[ORGANIZATION]' --group '[GROUP]' > CustomerBootstrap.jsn
```

If another AV product is also installed on the machine, exclude AV exceptions by following the instructions in Setting up exclusions with other AV products on page 69.

Automated FortiEDR macOS Collector deployment on Big Sur operating system devices with MDM

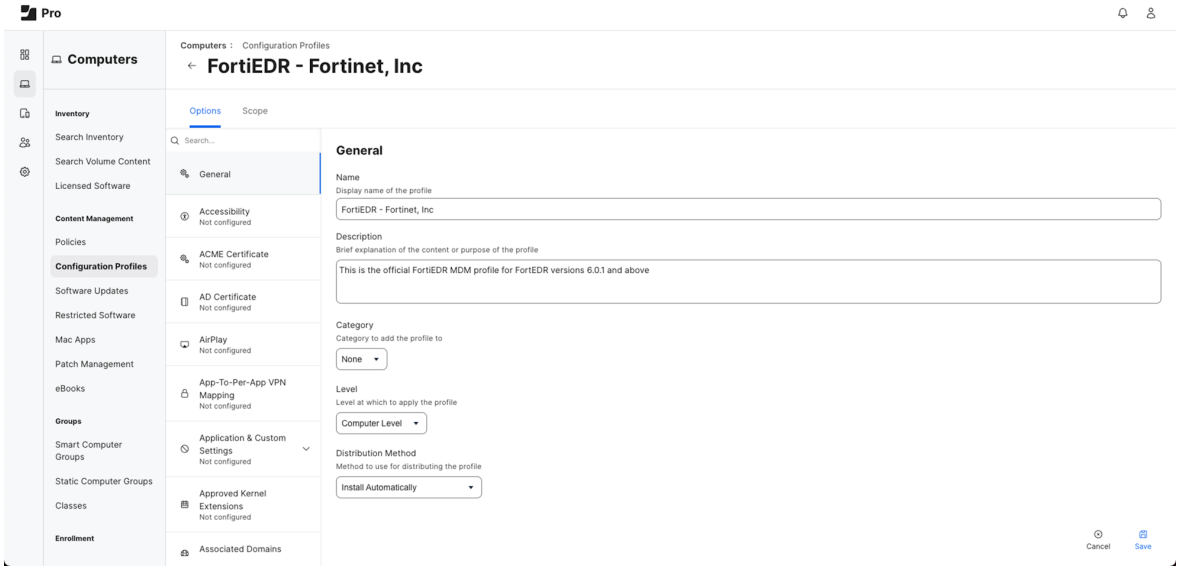
When distributed with MDM solutions such as Jamf, FortiEDR can be allowlisted with the following Team ID and Bundle ID identifiers:

- A97R6J3L29 com.ensilo.ftnt
- A97R6J3L29 com.ensilo.ftnt.sysext

Installing FortiEDR on MacOS devices using Jamf PRO

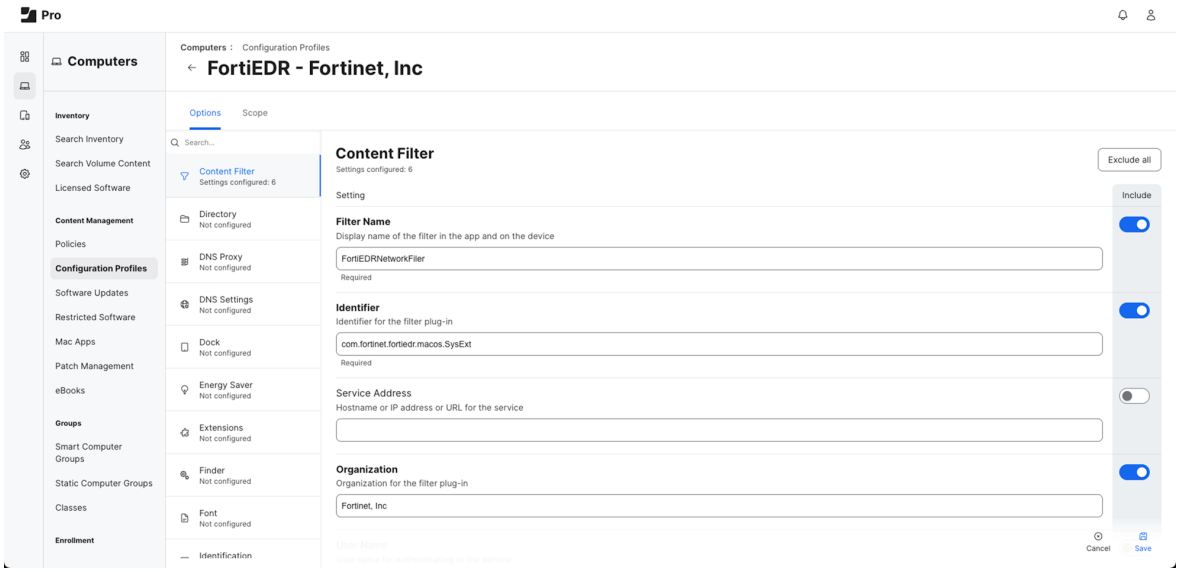
To install FortiEDR using Jamf PRO:

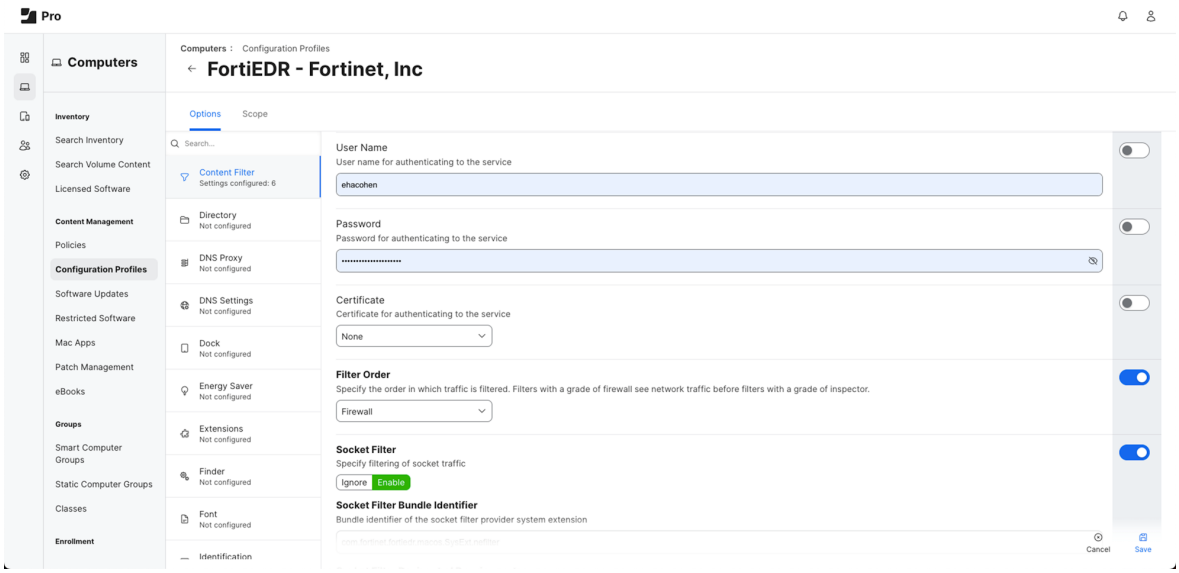
1. In Jamf PRO, navigate to *Computers* > *Configuration Profiles* > *New*.
2. Create a configuration profile as shown in the following screenshots:
   - **Collector version 6.0 and later:**
     i. Go to *Computer* > *Configuration Profiles*.
     ii. In the *General* tab, click *Edit*.



     iii. Configure the relevant settings, then click *Save*.
     iv. In the *Content Filter* tab, click *Edit*, and configure the relevant settings.
     Specify the values for the following fields:

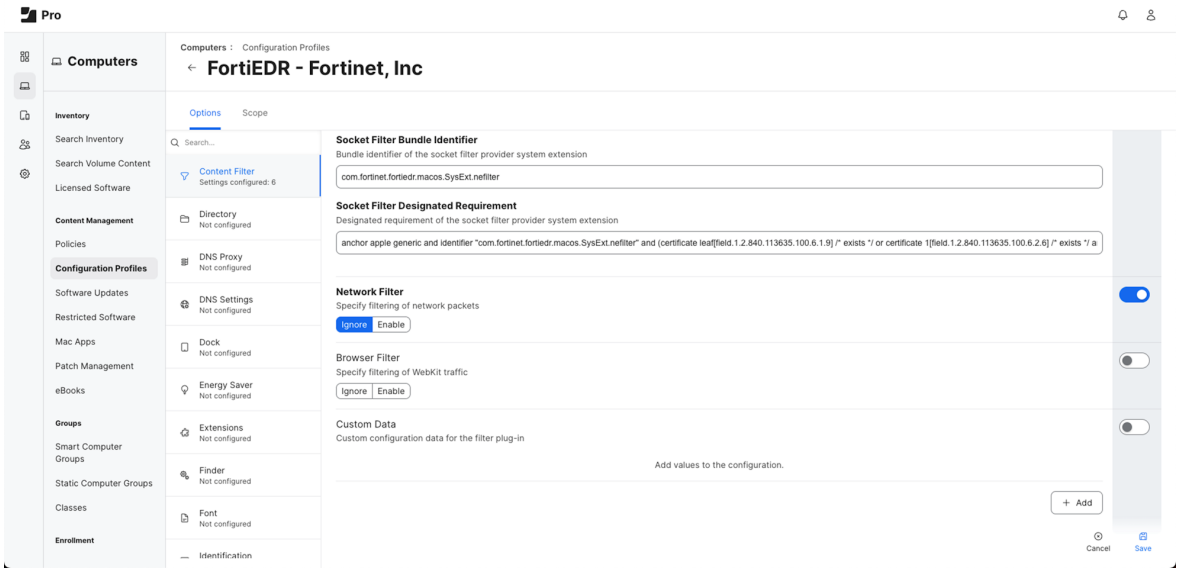
Filter Name	FortiEDRNetworkFilter
Identifier	com.fortinet.fortiedr.macos.SysExt
Organization	Fortinet Inc.





Specify the values for the following fields:

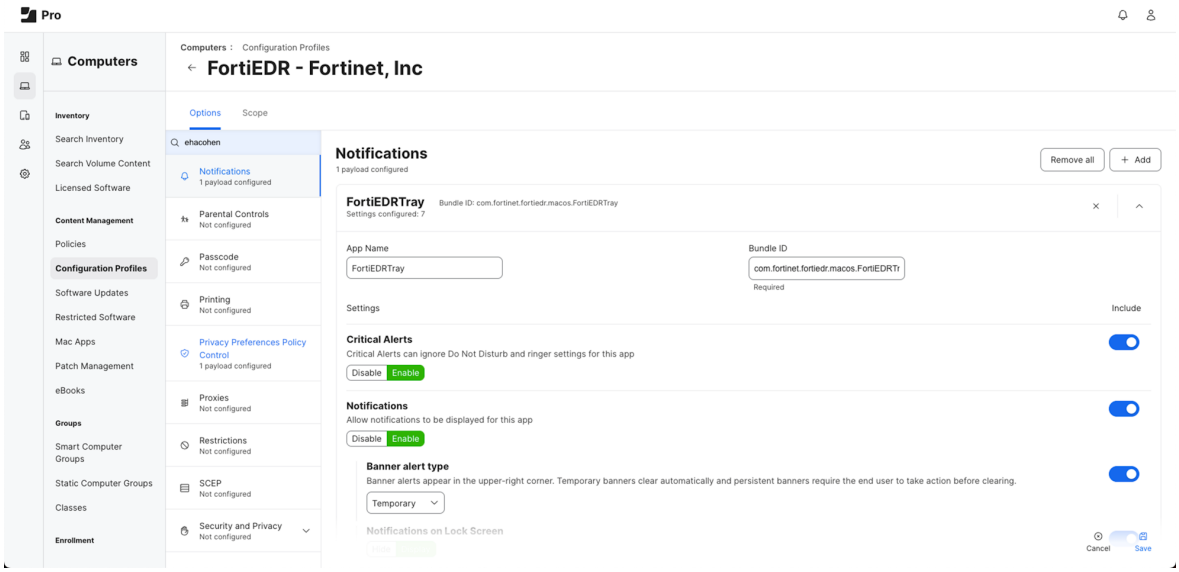
Socket Filter Bundle Identifier	com.fortinet.fortiedr.macos.SysExt.nefilter
Socket Filter Designated Requirement	anchor apple generic and identifier "com.fortinet.fortiedr.macos.SysExt.nefilter" and (certificate leaf[field.1.2.840.113635.100.6.1.9] /* exists */ or certificate 1 [field.1.2.840.113635.100.6.2.6] /* exists */ and certificate leaf [field.1.2.840.113635.100.6.1.13] /* exists */ and certificate leaf [subject.OU] = AH4XFXJ7DK)

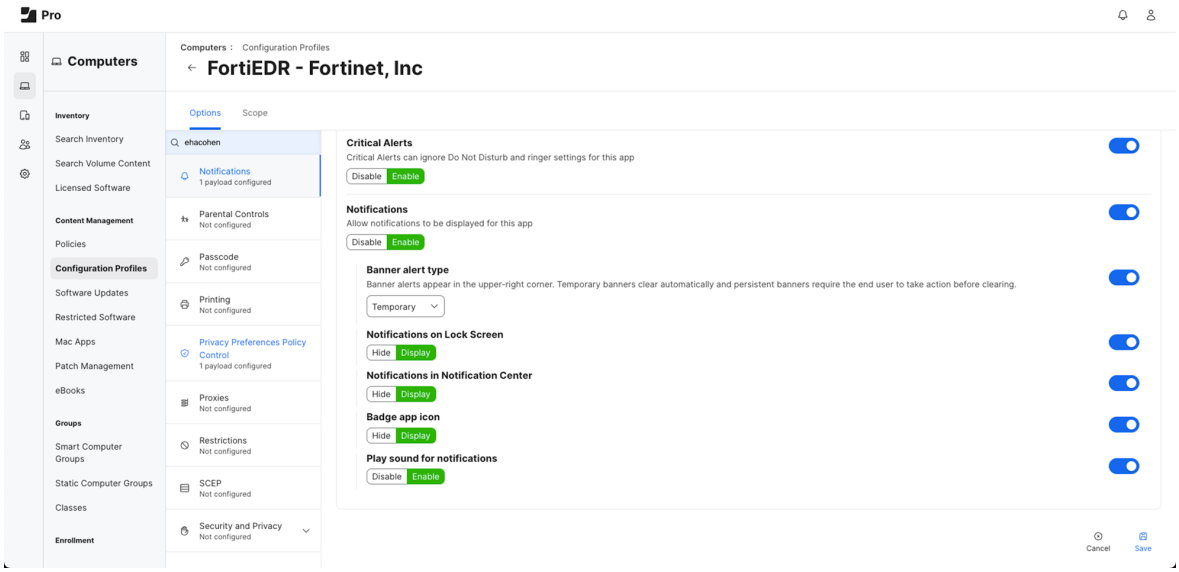


v. Click *Save*.

vi. In the *Notifications* tab, click *Edit*, and configure the relevant settings.

App Name	FortiEDRTray
Bundle ID	com.fortinet.fortiedr.macos.FortiEDRTray

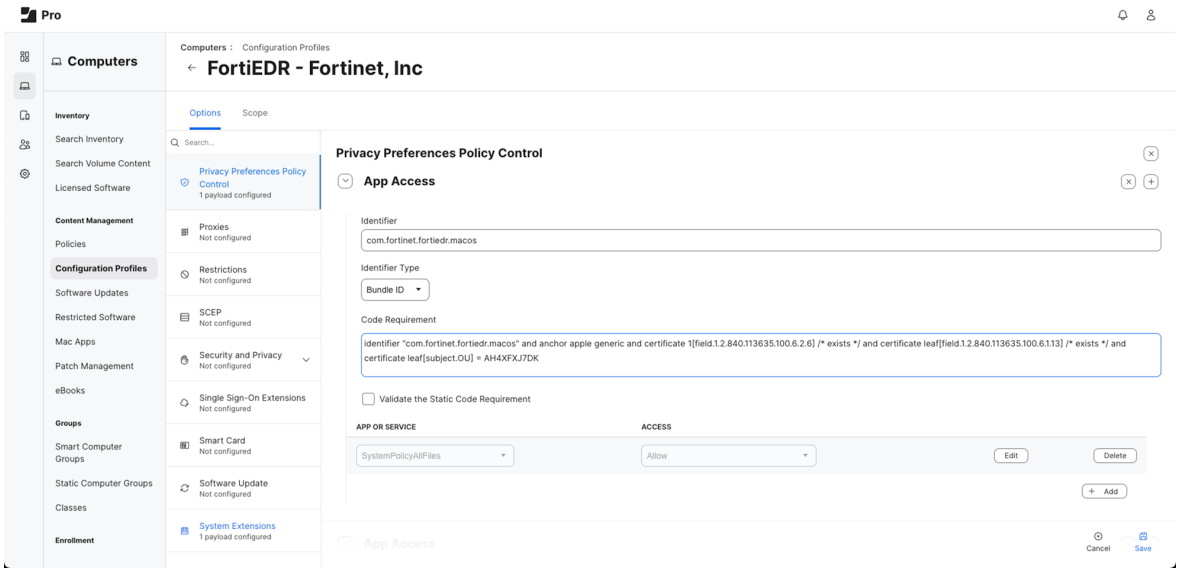


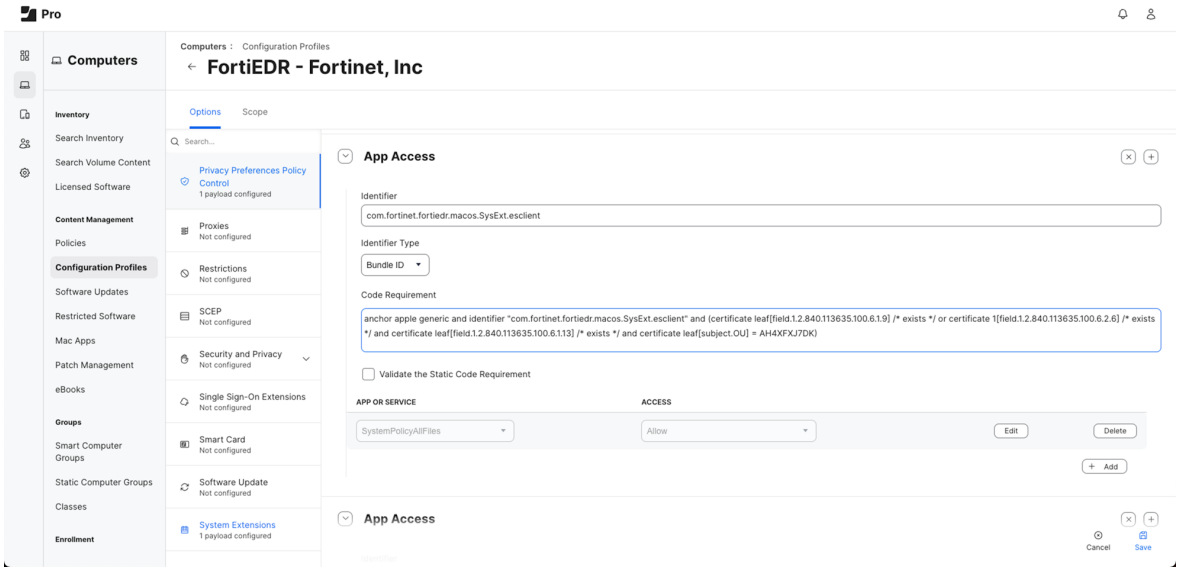


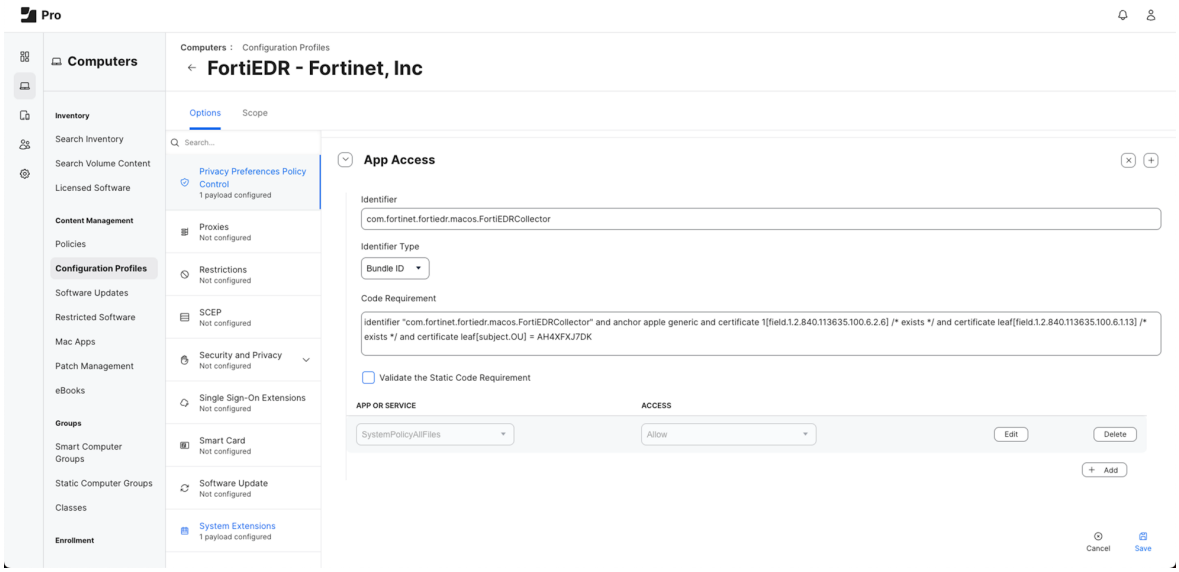
vii. Click *Save*.

viii. In the *Privacy Preferences Policy Control* tab, click *Edit*, and configure three apps using the following values.

	App 1	App 2	App 3
Identifier	com.fortinet.fortiedr.macos	com.fortinet.fortiedr.macos.SysExt.esclient	com.fortinet.fortiedr.macos.FortiEDRCollector
Identifier Type	Bundle ID		
Code Requirement	identifier "com.fortinet.fortiedr.macos" and anchor apple generic and certificate 1 [field.1.2.840.113635.100.6.2.6] /* exists */ and certificate leaf [field.1.2.840.113635.100.6.1.13] /* exists */ and certificate leaf [subject.OU] = AH4XFXJ7DK	anchor apple generic and identifier "com.fortinet.fortiedr.macos.SysExt.esclient" and (certificate leaf [field.1.2.840.113635.100.6.1.9] /* exists */ or certificate 1 [field.1.2.840.113635.100.6.2.6] /* exists */ and certificate leaf [field.1.2.840.113635.100.6.1.13] /* exists */ and certificate leaf[subject.OU] = AH4XFXJ7DK)	identifier "com.fortinet.fortiedr.macos.FortiEDRCollector" and anchor apple generic and certificate 1 [field.1.2.840.113635.100.6.2.6] /* exists */ and certificate leaf [field.1.2.840.113635.100.6.1.13] /* exists */ and certificate leaf[subject.OU] = AH4XFXJ7DK
Access	Allow		


Pro
Computers
Computers : Configuration Profiles
FortiEDR - Fortinet, Inc
Options
Scope
Inventory
Search Inventory
Search Volume Content
Licensed Software
Content Management
Policies
Configuration Profiles
Software Updates
Restricted Software
Mac Apps
Patch Management
eBooks
Groups
Smart Computer Groups
Static Computer Groups
Classes
Enrollment
Privacy Preferences Policy Control
1 payload configured
Proxies
Not configured
Restrictions
Not configured
SCEP
Not configured
Security and Privacy
Not configured
Single Sign-On Extensions
Not configured
Smart Card
Not configured
Software Update
Not configured
System Extensions
1 payload configured
Privacy Preferences Policy Control
App Access
Identifier
com.fortinet.fortiedr.macos
Identifier Type
Bundle ID
Code Requirement
identifier "com.fortinet.fortiedr.macos" and anchor apple generic and certificate 1[field.1.2.840.113635.100.6.2.6] /* exists */ and certificate leaf[field.1.2.840.113635.100.6.1.13] /* exists */ and certificate leaf[subject.OU] = AH4XFXJ7DK
Validate the Static Code Requirement
APP OR SERVICE
ACCESS
SystemPolicyAllFiles
Allow
Edit
Delete
Add
Cancel
Save

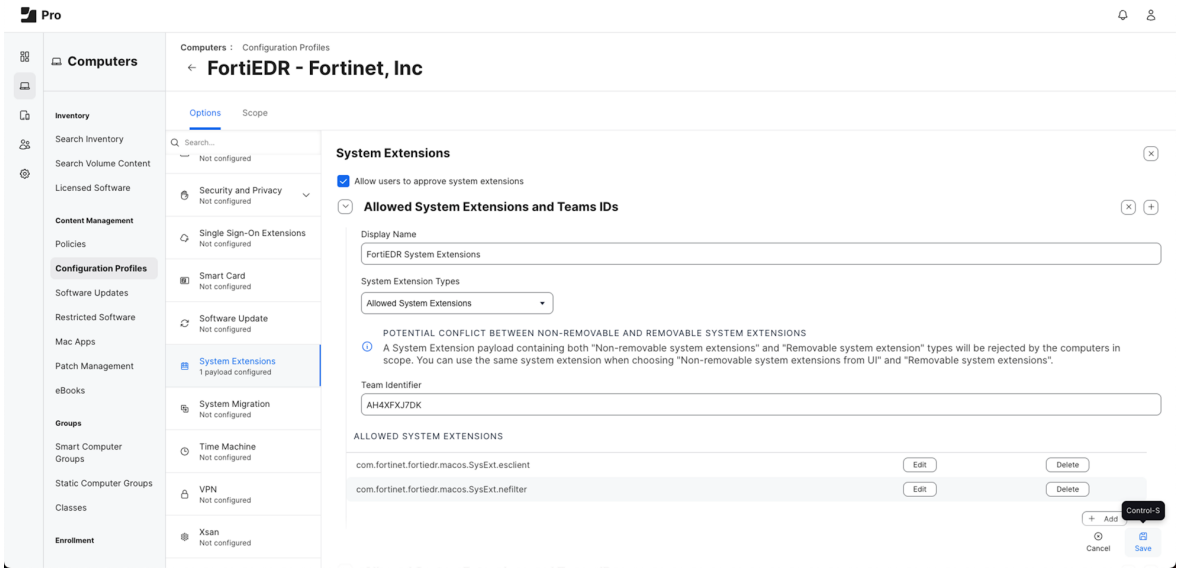

Pro
Computers
Computers : Configuration Profiles
FortiEDR - Fortinet, Inc
Options
Scope
Inventory
Search Inventory
Search Volume Content
Licensed Software
Content Management
Policies
Configuration Profiles
Software Updates
Restricted Software
Mac Apps
Patch Management
eBooks
Groups
Smart Computer Groups
Static Computer Groups
Classes
Enrollment
Privacy Preferences Policy Control
1 payload configured
Proxies
Not configured
Restrictions
Not configured
SCEP
Not configured
Security and Privacy
Not configured
Single Sign-On Extensions
Not configured
Smart Card
Not configured
Software Update
Not configured
System Extensions
1 payload configured
App Access
Identifier
com.fortinet.fortiedr.macos.SysExt.esclient
Identifier Type
Bundle ID
Code Requirement
anchor apple generic and identifier "com.fortinet.fortiedr.macos.SysExt.esclient" and (certificate leaf[field.1.2.840.113635.100.6.1.9] /* exists */ or certificate 1[field.1.2.840.113635.100.6.2.6] /* exists */ and certificate leaf[field.1.2.840.113635.100.6.1.13] /* exists */ and certificate leaf[subject.OU] = AH4XFXJ7DK)
Validate the Static Code Requirement
APP OR SERVICE
ACCESS
SystemPolicyAllFiles
Allow
Edit
Delete
Add
App Access
Cancel
Save



ix. Click *Save*.

x. In the *System Extensions* tab, click *Edit*, and configure the relevant settings.

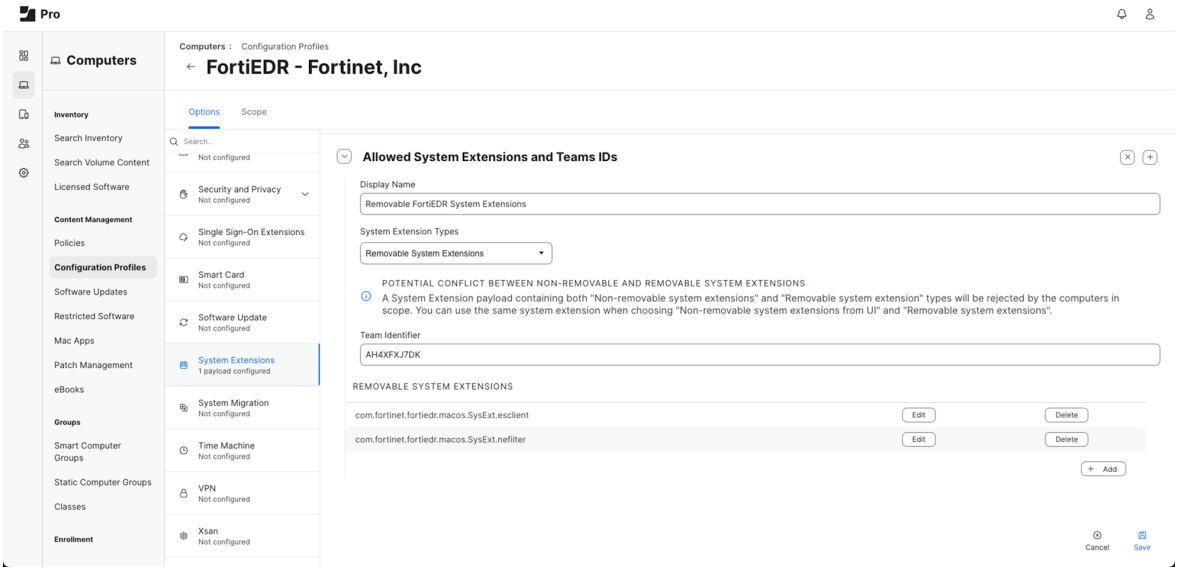
Display Name	FortiEDR System Extensions
System Extensions Types	Allowed System Extensions
Team Identifier	AH4XFXJ7DK
Allowed System Extensions	• com.fortinet.fortiedr.macos.SysExt.esclient • com.fortinet.fortiedr.macos.SysExt.nefilter



Click *Add* and configure another system extension with the following values:

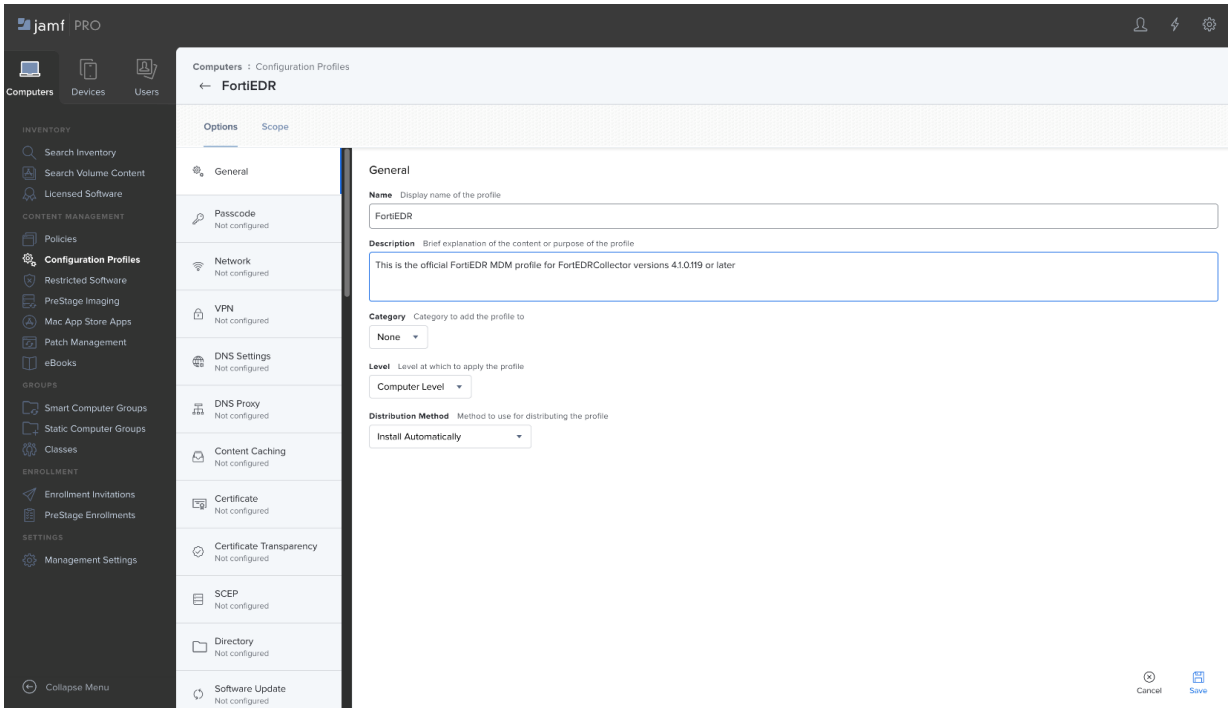
Display Name	Removeable FortiEDR System Extensions

System Extensions Types	Removeable System Extensions
Team Identifier	AH4XFXJ7DK
Allowed System Extensions	• com.fortinet.fortiedr.macos.SysExt.esclient • com.fortinet.fortiedr.macos.SysExt.nefilter

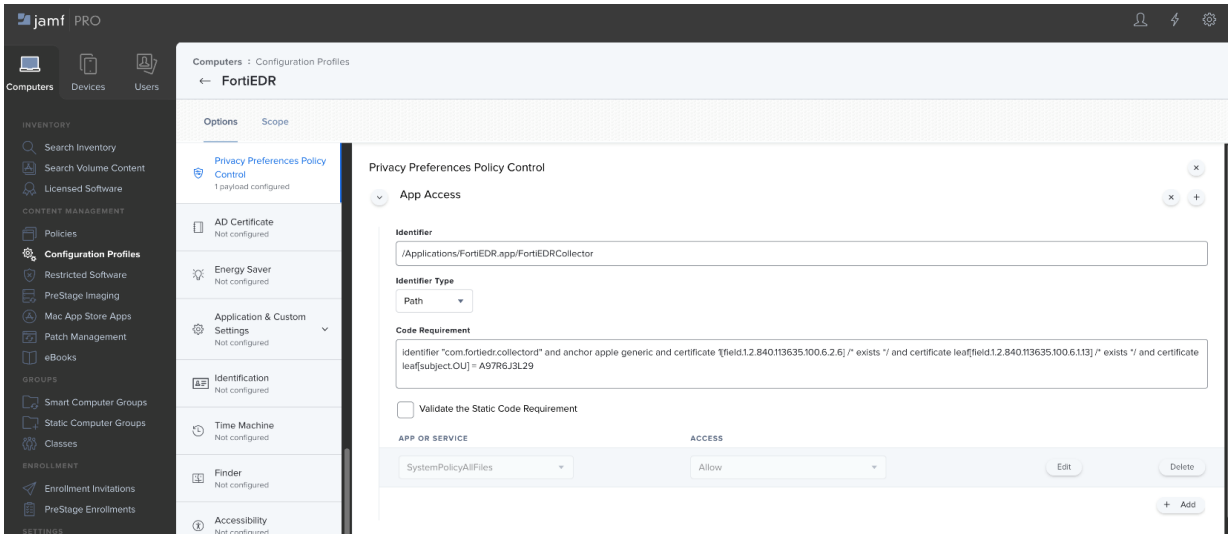


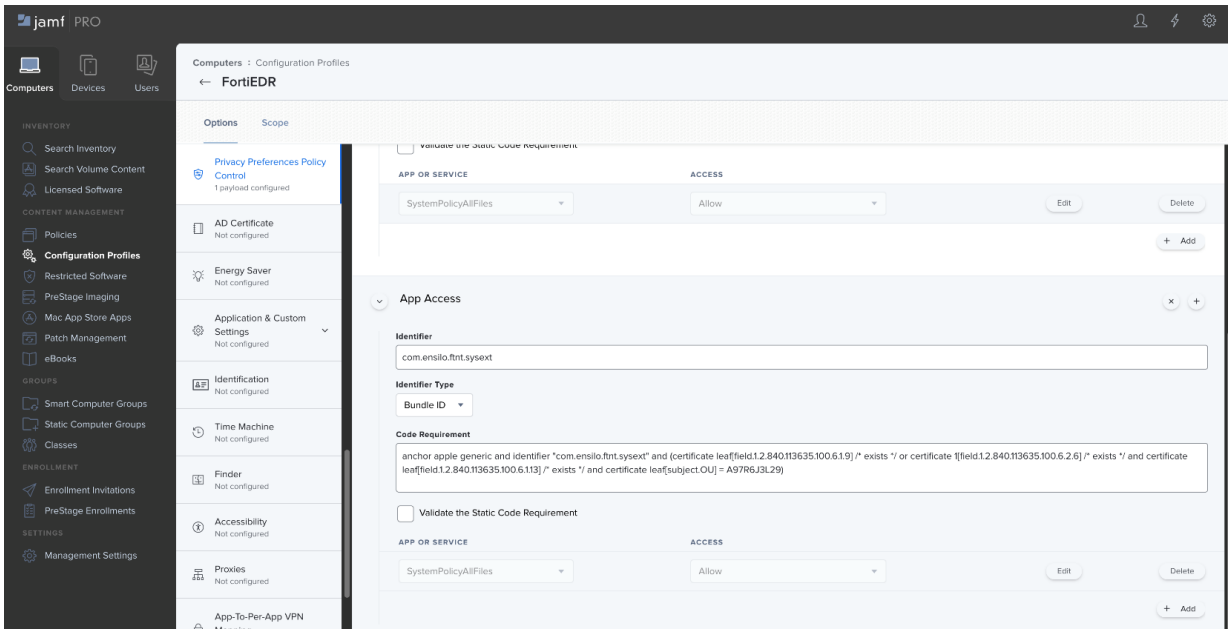
xi. Click *Save*.

- **Collector versions earlier than 6.0:**

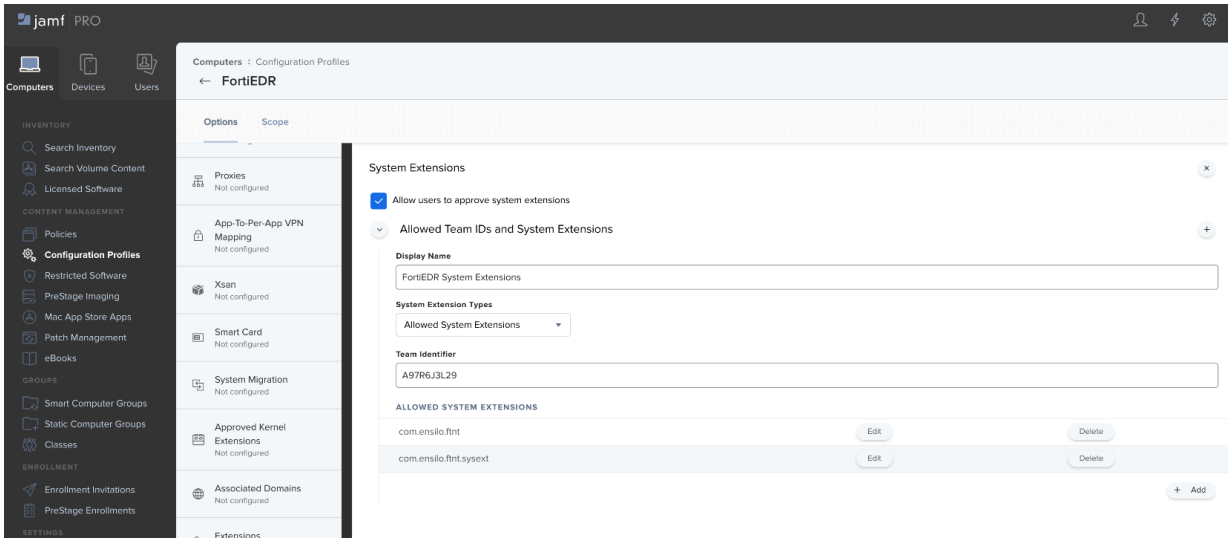


	App 1	App 2
Identifier	/Applications/FortiEDR.app/FortiEDRCollector	com.ensilo.ftnt.sysext
Identifier Type	Path	Bundle ID
Code Requirement	identifier "com.fortiedr.collectord" and anchor apple generic and certificate 1 [field.1.2.840.113635.100.6.2.6] /* exists */ and certificate leaf [field.1.2.840.113635.100.6.1.13] /* exists */ and certificate leaf[subject.OU] = A97R6J3L29	anchor apple generic and identifier "com.ensilo.ftnt.sysext" and (certificate leaf [field.1.2.840.113635.100.6.1.9] /* exists */ or certificate 1 [field.1.2.840.113635.100.6.2.6] /* exists */ and certificate leaf [field.1.2.840.113635.100.6.1.13] /* exists */ and certificate leaf [subject.OU] = A97R6J3L29)
Access	Allow	

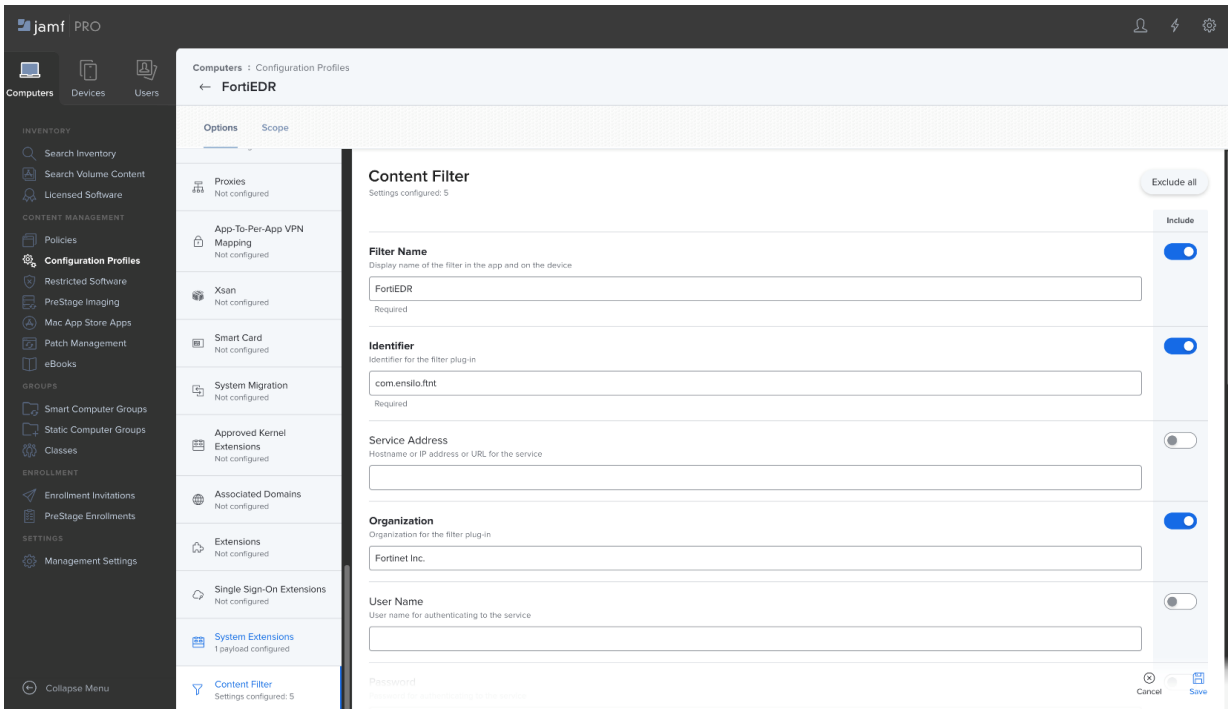


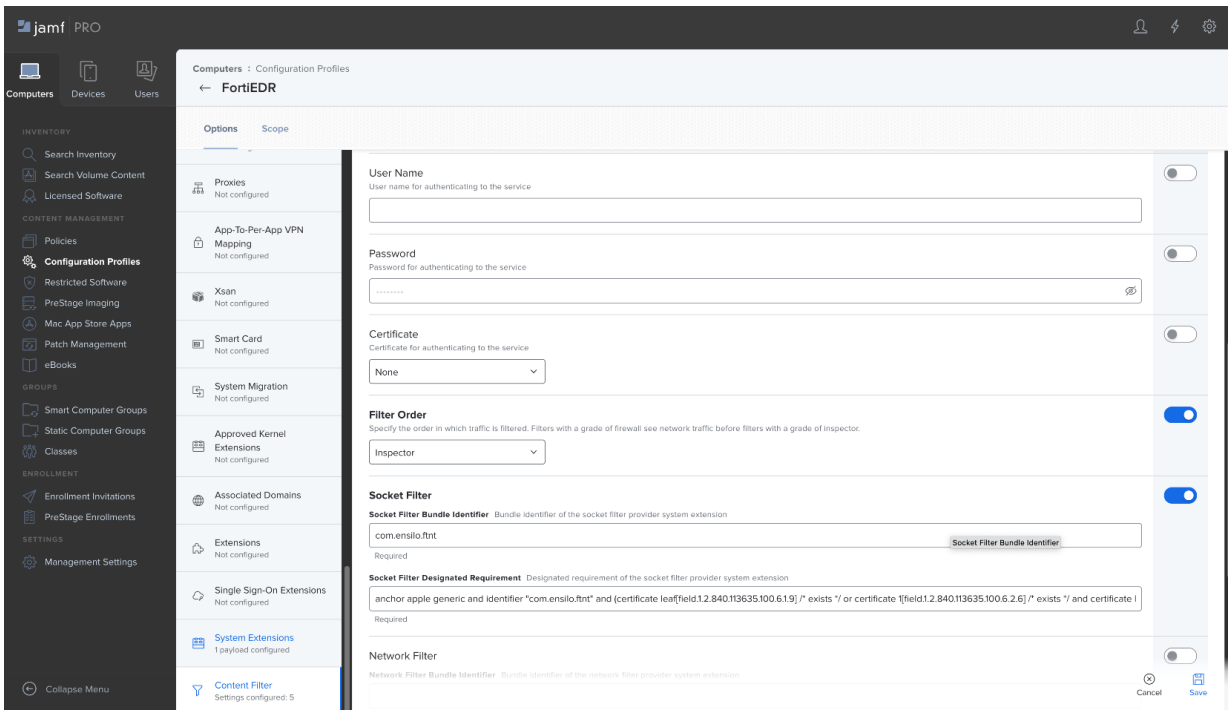


Display Name	FortiEDR System Extensions
System Extensions Types	Allowed System Extensions
Team Identifier	A97R6J3L29
Allowed System Extensions	• com.ensilo.ftnt • com.ensilo.ftnt.sysext



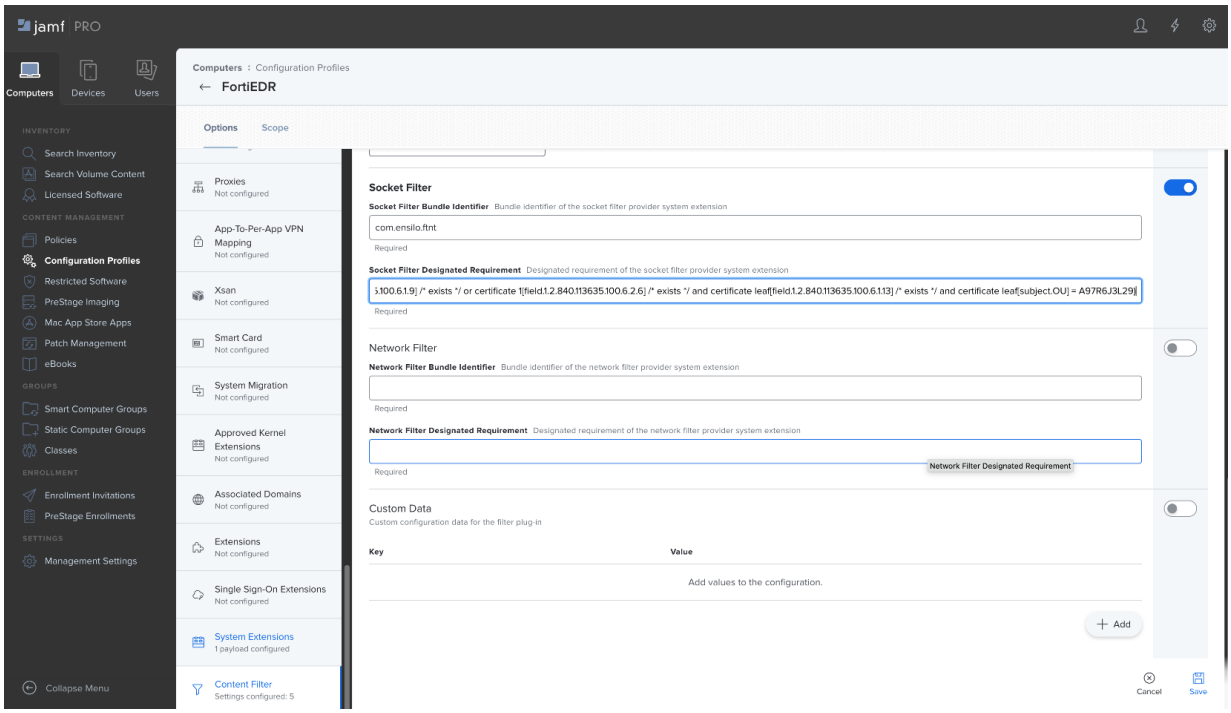
Filter Name	FortiEDR
Identifier	com.ensilo.ftnt
Organization	Fortinet Inc.



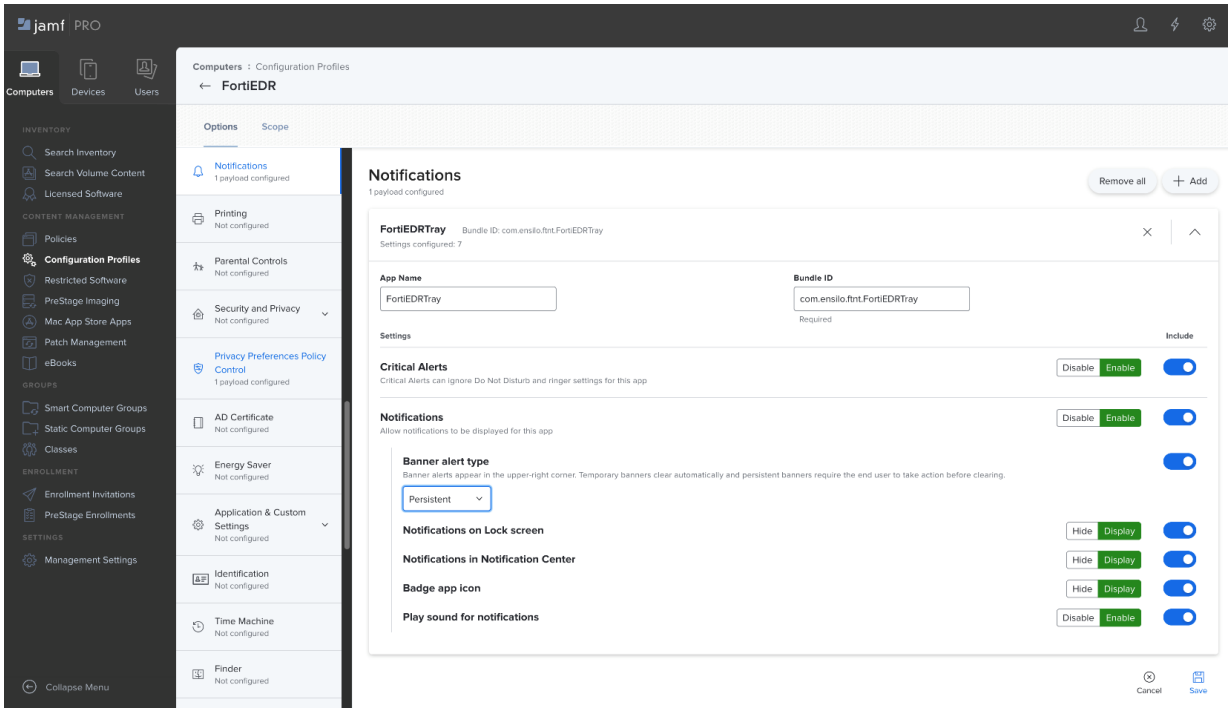


Socket Filter	com.ensilo,ftnt
Socket Filter Designated Requirement	anchor apple generic and identifier "com.fortinet.fortiedr.macos.SysExt.nefilter" and (certificate leaf [field.1.2.840.113635.100.6.1.9] /* exists */ or certificate 1 [field.1.2.840.113635.100.6.2.6] /* exists */ and certificate leaf

	[field.1.2.840.113635.100.6.1.13] /* exists */ and certificate leaf [subject.OU] = A97R6J3L29)



App Name	FortiEDRTray
Bundle ID	com.ensilo.ftnt.FortiEDRTray



A sample Jamf profile for upload can be provided upon request.

3. If another AV product is also installed on the machine, exclude AV exceptions by following the instructions in Exclusion paths.

Setting up exclusions with other AV products

If another AV product (such as FortiClient) is also installed on the machine, you must exclude AV exceptions in both FortiEDR and the other AV product to avoid collision which might cause the endpoint to run slowly or hang:

1. In FortiEDR, add exclusion paths for the other AV product according to the directions in the other AV product. Note that FortiEDR supports exclusions on Windows only.
2. In the other AV product, add the following exclusion paths for FortiEDR:

Windows	macOS	Linux
• %ProgramData%\FortiEDR\ • %ProgramFiles%\Fortinet\FortiEDR • %ProgramFiles%\Fortinet\FortiEDR\FortiEDRCollector.exe • %ProgramFiles%\Fortinet\FortiEDR\FortiEDRCollectorService.exe • %ProgramFiles%\Fortinet\FortiEDR\FortiEDRAvScanner.exe • %ProgramFiles%\Fortinet\FortiEDR\FortiEDRInventoryScanner.exe • %ProgramFiles%\Fortinet\FortiEDR\FortiEDRIotDiscovery.exe • %windir%\System32\drivers\FortiEDRAvDriver_*.sys • %windir%\System32\drivers\FortiEDRBaseDriver_*.sys • %windir%\System32\drivers\FortiEDRElamDriver_*.sys • %windir%\System32\drivers\FortiEDRIotDriver_*.sys • %windir%\System32\drivers\FortiEDRWinDriver_*.sys	• /Library/FortiEDR • /Applications/FortiEDR.app • /Library/FortiEDR/FortiEDRCollector • /Library/FortiEDR/FortiEDRCollectorTray • /Library/FortiEDR/FortiEDRConfig • /Library/FortiEDR/FortiEDRDrive • /Library/Extensions/FortiEDRDriver.kext	• /opt/FortiEDRCollector

Working with FortiEDR on VDI environments

The FortiEDR Collector must only be installed on the master image (not on a clone) of the VMware Horizon or Citrix XenDesktop in order to ensure that the virtual environment is protected. On Citrix, it is also recommended to install the Collector on the Windows servers that run the entire Citrix platform.

When installing the Collector, set the VDI-designated installation flag. To do so, append the parameter **VDI=1** to the command syntax shown above or check the *VDI* checkbox in the installation wizard, as shown in Installing FortiEDR Collectors on page 23.

When installing on a Citrix PVS golden image, append an additional parameter **CITRIXPVS=1** to the command syntax shown above.

After the Collector is successfully installed and running on the golden image and before the image is being cloned, the FortiEDR Collector configuration must be erased such so that cloned images will not show up as the same Collector on the Central Manager console. To do that so, run the following command as an administrator:

```
FortiEDRCollectorService.exe --stop --clean
```

In VDI installations where VDI pools are used, there is no need to generate Collector groups in the user interface. Any newly generated virtual desktop is automatically assigned to the default VDI Collectors group. Upon first user login to the virtual desktop, FortiEDR automatically generates a Collector group that corresponds with the respective pool name, as specified in VMware Horizon. Any Collector that is installed on a virtual desktop that is part of this pool is automatically assigned from the default VDI Collectors group to the corresponding Collector group, regardless of whether the pool definition in VMware is *dedicated* or *floating*. In effect, Collector groups in the FortiEDR user interface are a copy of the virtual machines' pool on VMware Horizon or Citrix.

Any newly created Collector group is automatically assigned to an out-of-the-box predefined policy. This mechanism ensures that any newly created virtual machine is automatically and immediately protected by a unique instance of the FortiEDR Collector.

When using FortiEDR automatic updates to Collectors via the Central Manager, make sure to update the master image too. Otherwise, every time that a new environment is created from the master image, an automatic update is performed, which can overload network traffic.

Uninstalling FortiEDR Collectors

You can uninstall a FortiEDR Collector using the following methods:

- From the Central Manager *INVENTORY > Collectors* page

This method is recommended for Windows, Linux, and macOS 10.11 to 10.15.

For macOS 11 or later, due to a macOS design limitation, this method does not remove the FortiEDR Collector system extension, which can only be uninstalled using an MDM solution.

- Through the operating system's application management (for example, Add or Remove Programs on Windows)
- Using dedicated FortiEDR scripts

The following section describes how to uninstall a FortiEDR Collector with Fortinet scripts.

Windows

Uninstall the Collector by running either of the following commands as administrator. Replace ***REGPWD*** with the registration password used for the installation, which is available in Component Authentication on page 393.

- `msiexec.exe /x ***GUID*** /qn UPWD=***REGPWD*** RMCONFIG=1 /l*vx log.txt`

  Replace ***GUID*** with the FortiEDR uninstallation product key, which can be found by following the steps below:

  a. Select *Start >> Run*.

  b. Type `regedit` to open the *Registry Editor* window.

  c. Navigate to `HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Uninstall\`.

  d. Expand the *Uninstall* subkeys in the left-hand pane and search for "FortiEDR" to locate the subkey for FortiEDR.

  e. Open the FortiEDR subkey and copy the *UninstallString* value in the right pane, for example, *{01C88AE6-6782-4798-81C6-954E0D14FCF5}*.

  f. Close the *Registry Editor* window.

- `msiexec /x FortiEDRCollectorInstaller_X.msi /qn UPWD=***REGPWD*** RMCONFIG=1`

  You must run this command from same directory as the msi installer. Or you can replace the msi filename with the full path to the msi file, such as `C:\Users\Allen\Desktop\FortiEDRCollectorInstaller64_4.1.0.491.msi`, which allows you to run the command anywhere.

macOS

To uninstall the Collector on macOS with versions prior to Big Sur (11), such as Catalina or Mojave:

```
sudo /Library/FortiEDR/fortiedr_uninstaller.sh 'REGISTRATION PASSWORD'
```

It is good practice to use REGISTRATION PASSWORD wrapped with single quotes so that it is interpreted correctly by the shell. For example,

```
sudo /Library/FortiEDR/fortiedr_uninstaller.sh '!EPdzv30break'
```

To uninstall the Collector on macOS with Big Sur (version 11) or above:

- **Collector versions earlier than 6.0:**

  ```
  /Applications/FortiEDR.app/fortiedr_uninstaller.sh 'REGISTRATION PASSWORD'
  ```

- **Collector version 6.0:**

```
/Applications/FortiEDR.app/Contents/Library/LaunchServices/fortiedr_uninstaller.sh
'REGISTRATION_PASSWORD'
```

Linux

Uninstalling a Linux Collector removes all configuration files. You must reconfigure all settings after installing a new Linux Collector.

If you are uninstalling a non-customized Linux Collector installer and would like to retain the configuration for later use, Fortinet recommends that you upgrade the Linux Collector instead of uninstalling the current Collector and re-installing a new one. However, you cannot perform an upgrade on a custom Linux Collector.

To uninstall a Collector on Linux:

1. Check the status of the Collector using the following command:

   ```
   /opt/FortiEDRCollector/control.sh --status
   ```

   The Collector should be stopped before running the uninstall command.
2. If the status is not stopped, stop the Collector using the following command:

   ```
   /opt/FortiEDRCollector/control.sh --stop <registration password>
   ```

   For example:

   ```
   / opt/FortiEDRCollector/control.sh --stop 12345678
   ```
3. Uninstall the Collector using the following command:
   - CentOS, RHEL, Oracle, AMI, SLES:
     - ```
       yum remove <package name>
       ```

       OR
     - ```
       rpm -qa | grep -i fortiedr | xargs rpm –e
       ```

- Ubuntu:

```
sudo dpkg --purge fortiedrcollectorinstaller
```

Upgrading the Collector

After a Collector has been installed in the system, you can upgrade it using one of the following methods:

- Updating the Collector version on page 418
- As described in the procedure below.

To upgrade the Collector manually (not via the user interface):

Windows

1. Copy the `FortiEDRCollectorInstallaler32_x.x.x.xxx.msi` or `FortiEDRCollectorInstallaler64_x.x.x.xxx.msi` file (as appropriate) to the Collector machine. For example, `FortiEDRCollectorInstallaler32_2.0.0.330.msi` or `FortiEDRCollectorInstallaler64_2.0.0.330.msi`.
2. Double-click the `FortiEDRCollectorInstallaler32_x.x.x.xxx.msi` or `FortiEDRCollectorInstallaler64_x.x.x.xxx.msi` file and follow the displayed instructions.

Linux

You can only manually upgrade non-customized Linux Collectors. For custom Linux Collectors, you must first uninstall the current Collector and then install a new one, which requires reconfiguration.

To upgrade a non-customized Collector on Linux:

1. Check the status of the Collector using the following command:

```
/opt/FortiEDRCollector/control.sh --status
```

   The Collector should be stopped before running the upgrade command.
2. If the status is not stopped, stop the Collector using the following command:

```
/opt/FortiEDRCollector/control.sh --stop <registration password>
```

   For example:

```
/ opt/FortiEDRCollector/control.sh --stop 12345678
```

3. Copy the installer file to the Collector machine (either `FortiEDRCollectorInstaller_Linux_distribution-version_number.x86_64.rpm` or `FortiEDRCollectorInstaller_Ubuntuversion_number.deb`).
4. Upgrade the Collector using the following command:
   - CentOS/RHEL/Oracle/AMI:

     ```
     sudo yum install FortiEDRCollectorInstaller_Linux_distribution-version_number.x86_64.rpm
     ```

   - Ubuntu:

     ```
     Ubuntu: Run sudo apt install FortiEDRCollectorInstaller_Ubuntu-version_number.deb
     ```

   - SLES:

     ```
     zypper install FortiEDRCollectorInstaller_distribution-version_number.rpm
     ```

5. Enter y when asked if you want to upgrade.
6. After the upgrade is complete, start the Collector using the following command:

   ```
   /opt/FortiEDRCollector/control.sh --start
   ```

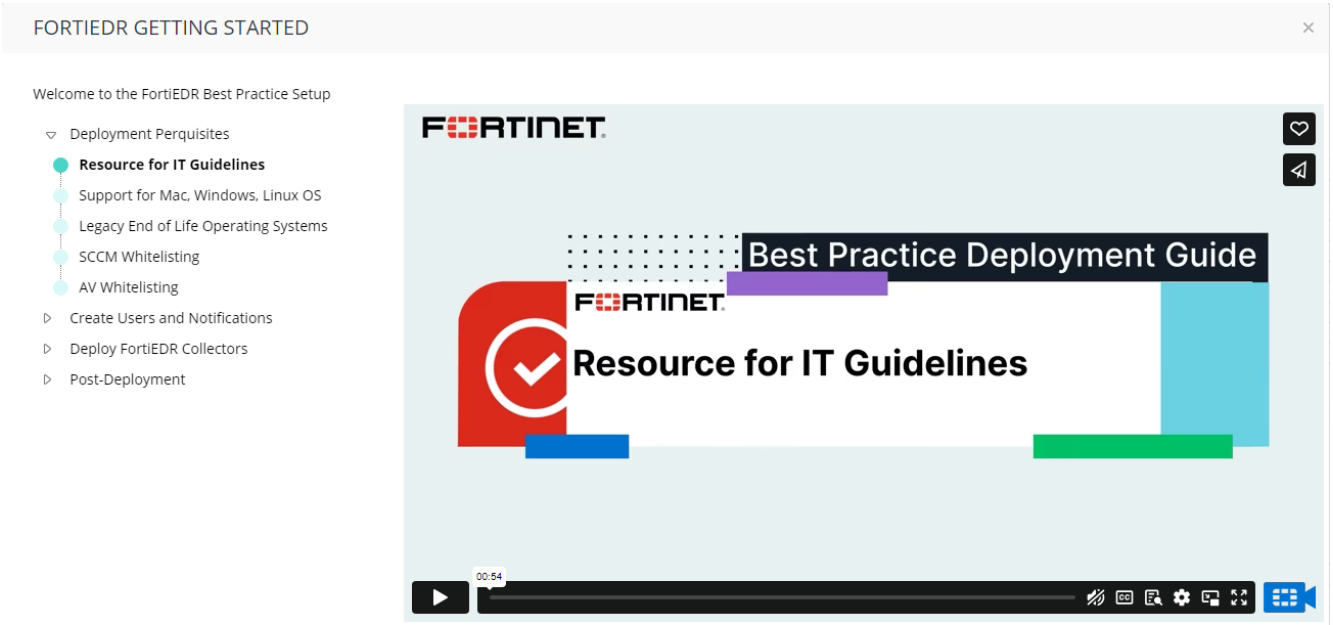
If your FortiEDR Threat Hunting Repository, Central Manager, Aggregator or Core are deployed on your organization's premises (on-premises), see Upgrading FortiEDR components on page 611 for instructions of upgrading these components.

Dashboard

This chapter describes the FortiEDR DASHBOARD for monitoring security events.

Introduction

The FortiEDR Dashboard provides a visual overview of the FortiEDR protection of your organization. It provides an at-a-glance view of the current security events and system health. The first time you log in, the *FortiEDR Getting Started*window launches where you can watch a series of getting started videos for orientation within the FortiEDR environment. Use the videos to learn more about how to deploy and use FortiEDR.

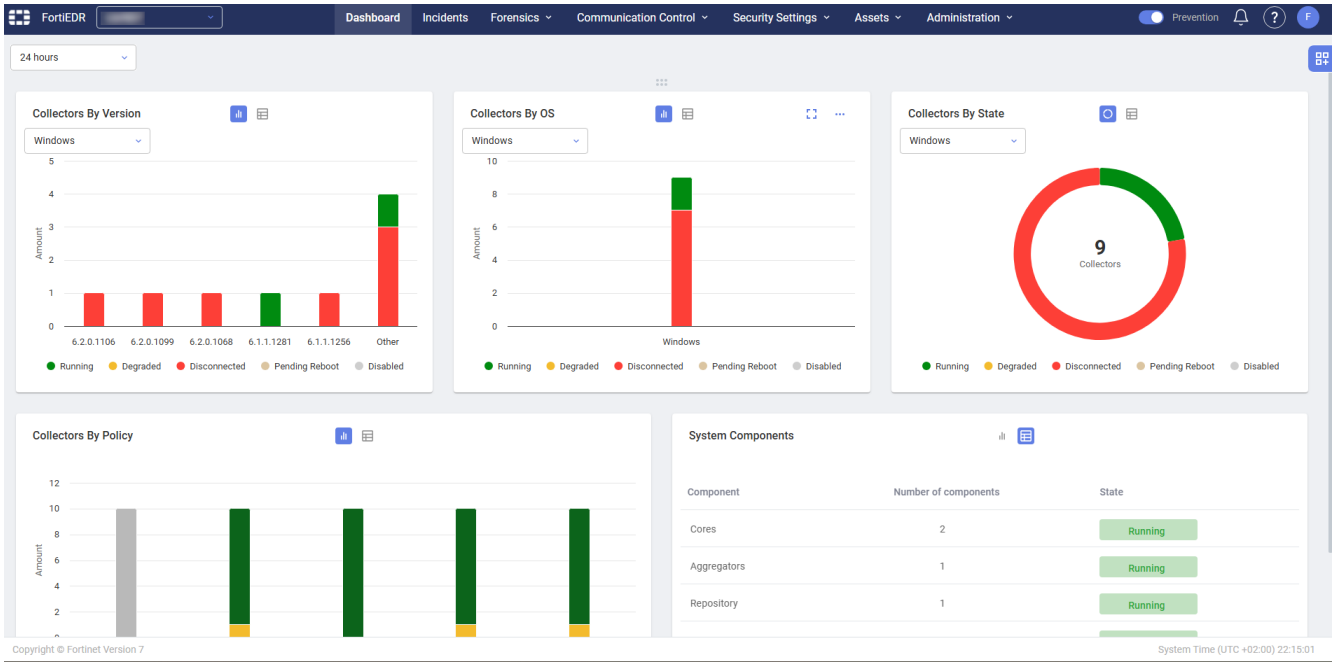


You can change the window location over the screen, resize or minimize the window using the provided buttons at the bottom right. Progress of the current video is not kept after you switch to another one. You have to start over with the current video after switching back.

The following videos are currently available but the list is subject to change without notice:

Section	Videos
Deployment Perquisites	Resource for IT Guidelines
	Support for Mac, Windows, Linux OS
	Legacy End of Life Operating Systems
	SCCM Whitelisting
	AV Whitelisting
Create Users and Notifications	Central Manager: Create Secondary Admin
	Enable 2FA
	Create Email Distribution List
Deploy FortiEDR Collectors	Request FortiEDR Collector
	Create Server Collector Group
	Install Collector Win64
	Win Collector Command Line Install
	Linux Collector Command Line Install
	Win Collector Troubleshooting
Post-Deployment	BPS Lite Checklist
	Collector Troubleshooting

The Dashboard is automatically displayed after you exit the getting started window or when you click the *DASHBOARD* tab.



The system time is displayed in all pages at the bottom right of the status bar. It represents the local FortiEDR server time. For example, if the FortiEDR server is located in London, and you log in from Los Angeles, USA, then the time shown is the current time in London, and not the current time in Los Angeles.

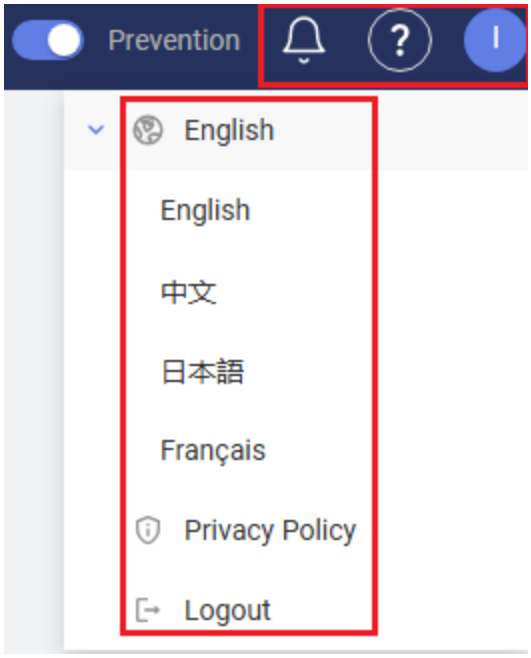
The Dashboard enables you to display two different slices or views of the data collected by FortiEDR in each widget. Click the applicable view button at the top left of the window to display that view in the *DASHBOARD* tab:

- *Graph View* (): This view presents information in a graph or pie chart.
- *Table View* (): This view presents information in a table.

The information presented in the Dashboard represents an aggregation of events. For more details, you may refer to the Event Aggregation on page 85. FortiEDR aggregates security events in both the Device view and the Process view in the Dashboard.

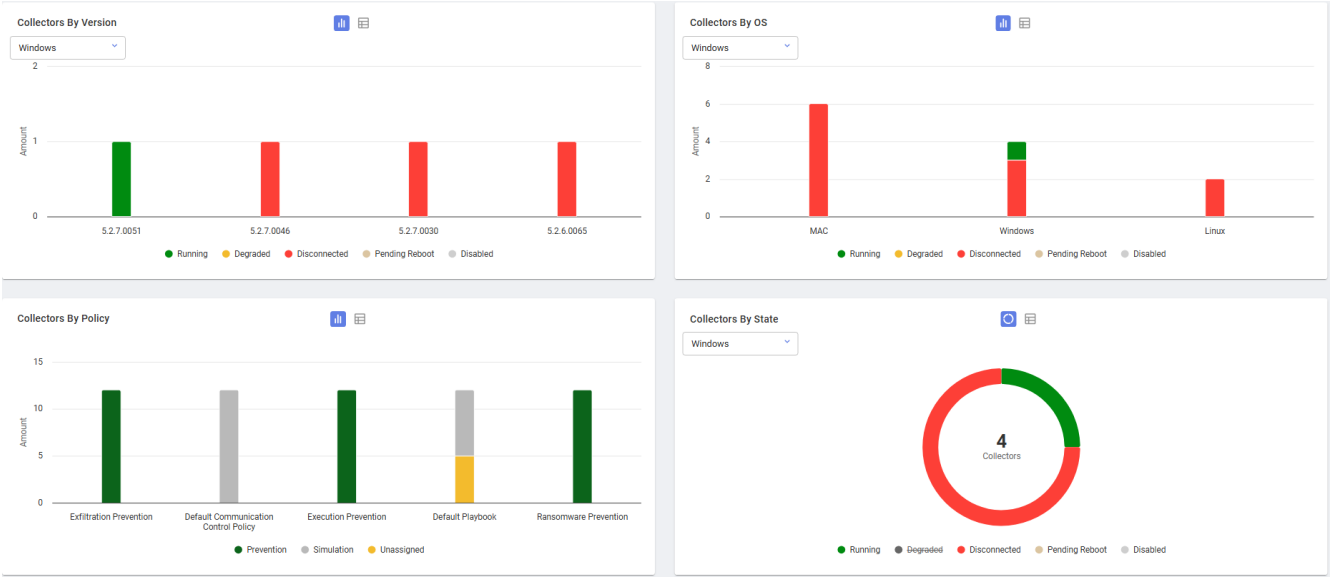
The top right corner includes the notification center where you can access notifications, the *Help* button to access the FortiEDR documentation portal where you can access all FortiEDR documents, such as the FortiEDR Administration Guide and Release Notes, and the *Logged-in User* dropdown list with the following options:

- *English*: Expand to switch the UI language from English to a supported language, such as Japanese. The default is English.
- *Privacy Policy*: Downloads the FortiEDR privacy policy.
- *Logout*: Exits the FortiEDR application.



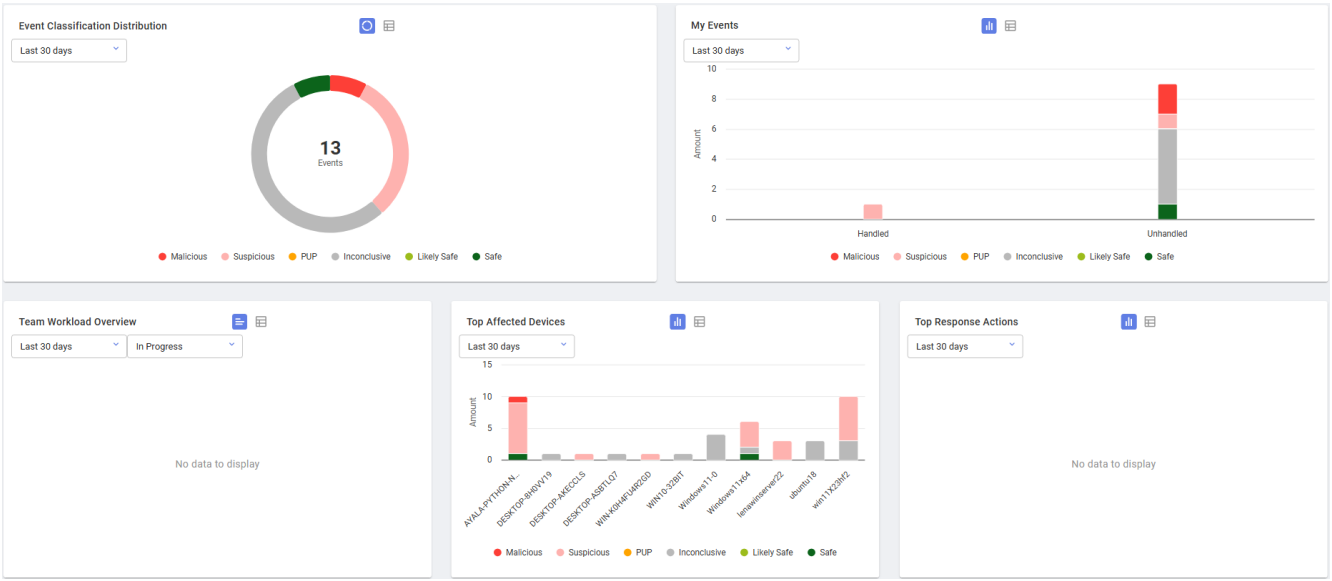
Collectors chart

The *COLLECTORS* chart provides an overview of FortiEDR Collectors. You can view Collectors by OS, policy, state, or version.



Disconnected status may indicate that the device on which the FortiEDR Collector is installed is simply powered down or disconnected from the network. It does not necessarily mean that there is a problem with that FortiEDR Collector or that device.

Event Handling widgets

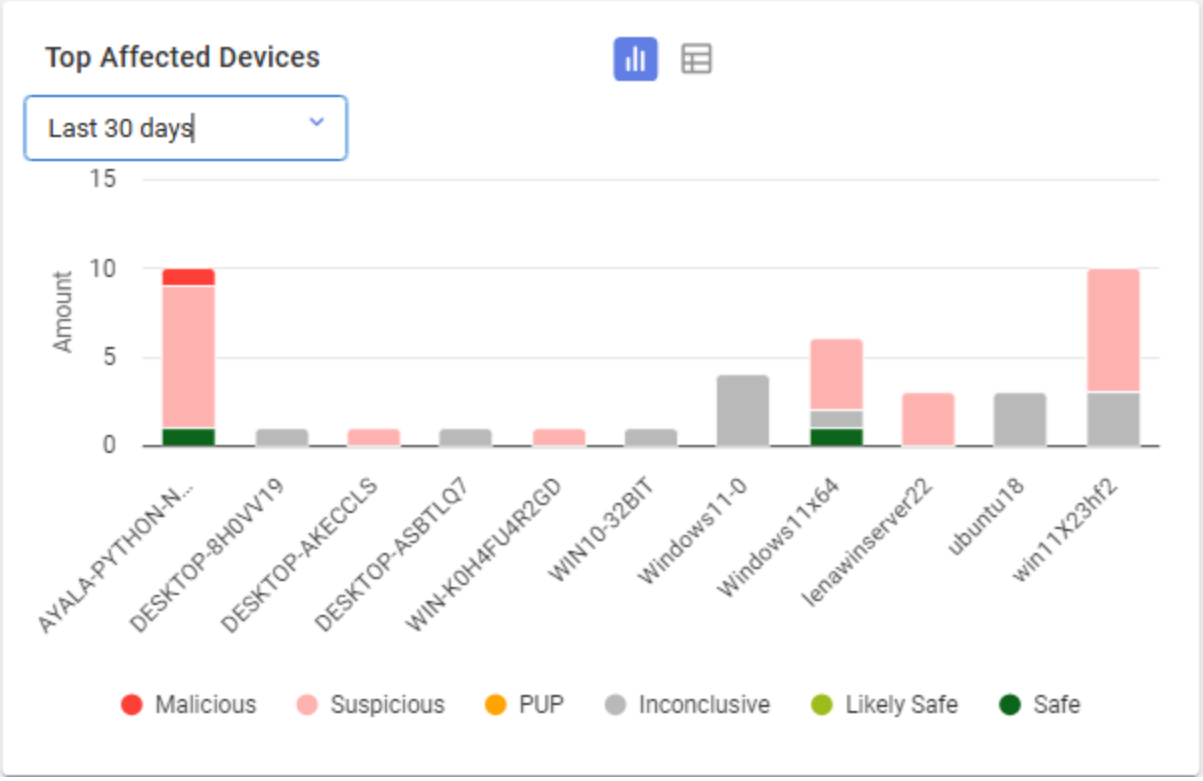


The *Event Handling* widgets show the number and classification of the FortiEDR security events. The charts and graphs are color-coded according to security event classification:

- **Red**: Critical
- **Yellow**: High
- **Grey**: Medium
- **Green**: Safe

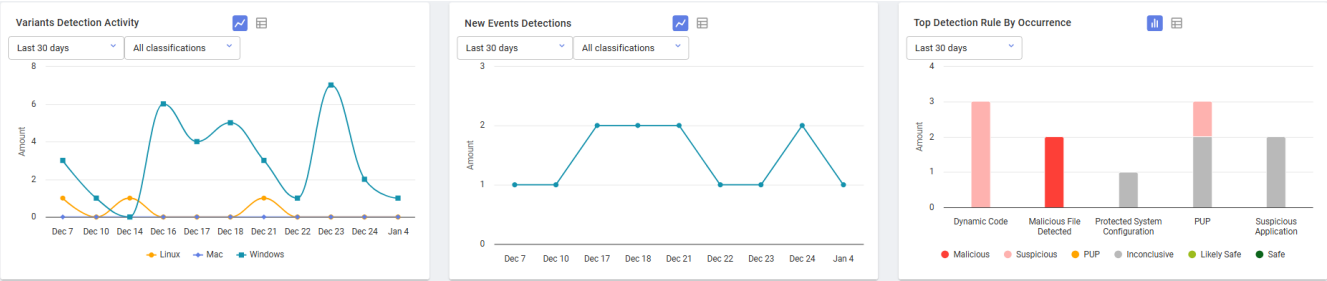
Each security event that is detected by the FortiEDR system is initially marked as unread and unhandled. Multiple users may be using the FortiEDR Central Manager in parallel. The *Unread* and *Unhandled* statuses enable users to keep track of whether anyone has read and handled the message.

Top Affected Devices chart



The *Top Affected Devices* chart displays the history of the most-infected and targeted processes, applications and devices. This chart is color-coded according to the classification of the attacks. The information is displayed per last day, last week or last month, according to your selection.

Detection trends and analysis widgets



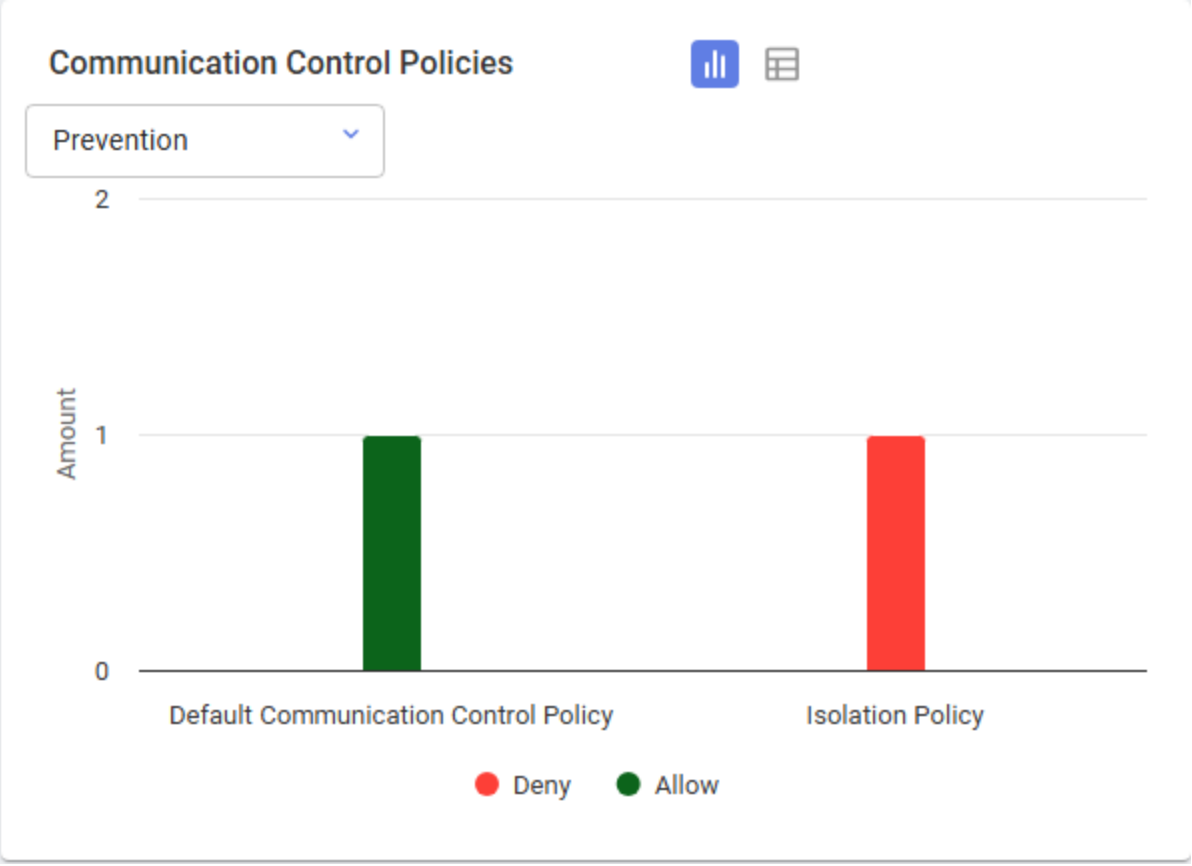
The *Detection trends and analysis* widgets show the trends and analysis of the FortiEDR security events.

The graphs in the *Top Detection Rule By Occurrence* widget are color-coded according to security event classification:

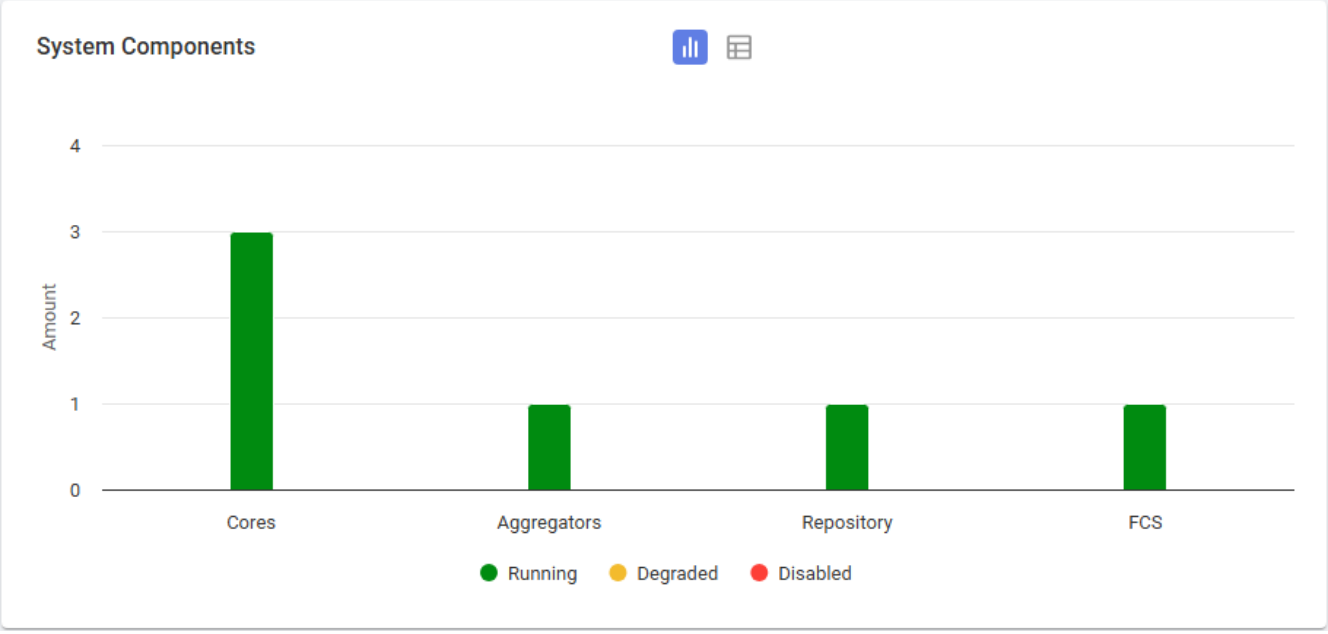
- **Red**: Critical
- **Yellow**: High
- **Grey**: Medium
- **Green**: Safe

Communication Control Policies graph

The *Communication Control Policies* graph displays a breakdown of the applications that are allowed or denied in your organization.

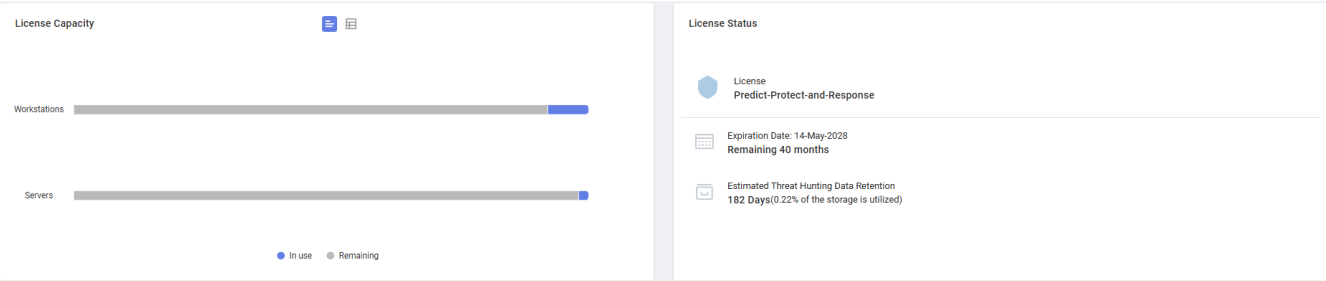


System Components



The *System Components* graph shows the status of the Cores, Aggregators, Threat Hunting Repository, and FCS.

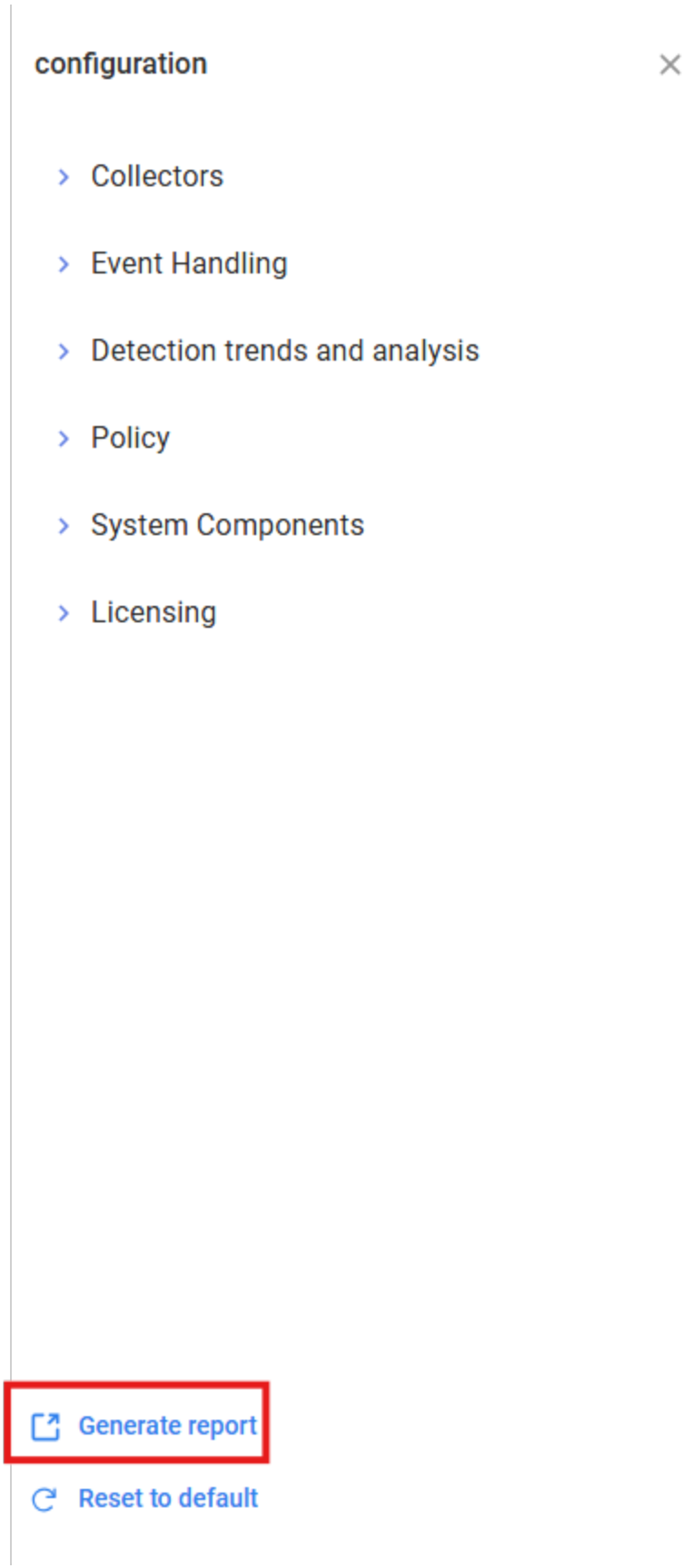
Licensing widgets



The *Licensing* widgets provide an overview of the FortiEDR license status, including licensing type and status, capacity and usage information, and threat hunting data retention usage.

Generating reports

On the dashboard, click the *Configuration* icon ( ) on the top-right of the dashboard and click *Generate report* to download a PDF report with a summary of the security events and system health within the specified time range.


configuration
Collectors
Event Handling
Detection trends and analysis
Policy
System Components
Licensing
Generate report
Reset to default

Incidents

This chapter describes the FortiEDR Incidents view for monitoring and handling security events.

Introducing the Incidents view

Upon connection establishment attempt, each FortiEDR Collector sends relevant metadata to the FortiEDR Core, which sends it on to the FortiEDR Aggregator so that it can be displayed in the FortiEDR Central Manager Incidents view. The *Incidents* tab enables you to view, investigate, and acknowledge handling of each such security event. A row is displayed for each event.

The *Incidents* tab enables you to display two different views of the event data collected by FortiEDR:

- *All Incidents* (): This view shows all the security events detected on all devices within the specified time range (up to 30 days).
- *Mobile Incidents* (): This view shows security events detected on mobile devices within the specified time range (up to 30 days).

Security events that were triggered by Saved Queries appear slightly different in the *Incidents* tab.

Event Aggregation

For convenience and easier navigation, FortiEDR aggregates security events in the *Incidents* tab.

- Each primary-level row represents an incident entity with its own state independent from the associated child events.

  You can filter incidents with a time rang of up to 30 days. Filters are applied to both the top-level incidents and their child events. An incident may appear on its own if it matches the filter criteria even if none of its child events do.

- You can drill down on a device/process to display the security events for that device/process. Each security event row is marked with a flag indicator.
  In the Process view, the Destinations column indicates the number of destinations to which the process attempted to connect. If only one destination was accessed, its IP address is shown. If more than one destination was accessed, the number of destination IPs is shown in the Destinations column.
  In the Process view, the Device column indicates the number of devices the malware attempted to attack. If only one device was attacked, its device name is shown. If more than one device was

attacked, the number of devices is shown in the Device column.

- You can drill down further in a security event row to view the variants for that event by clicking on the icon. Variants display the relevant information collected by FortiEDR from the device. For example, if a specific process was connecting to 500 destinations, then 500 variant rows display for that security event. For example, in the figure below, the security event comprises 2 variants, coming from different devices and going to different destinations. You can click the < Back icon to return to the aggregated security event view.

The following actions can be performed in the Incidents view:

- Marking a security event as handled/unhandled on page 115
- Manually changing the classification of a security event on page 116
- Viewing Application Control security events on page 123
- Viewing Device Control security events on page 123
- Other options in the Incidents viewer on page 124

When a new security event is generated by FortiEDR, an indicator number displays or is incremented.

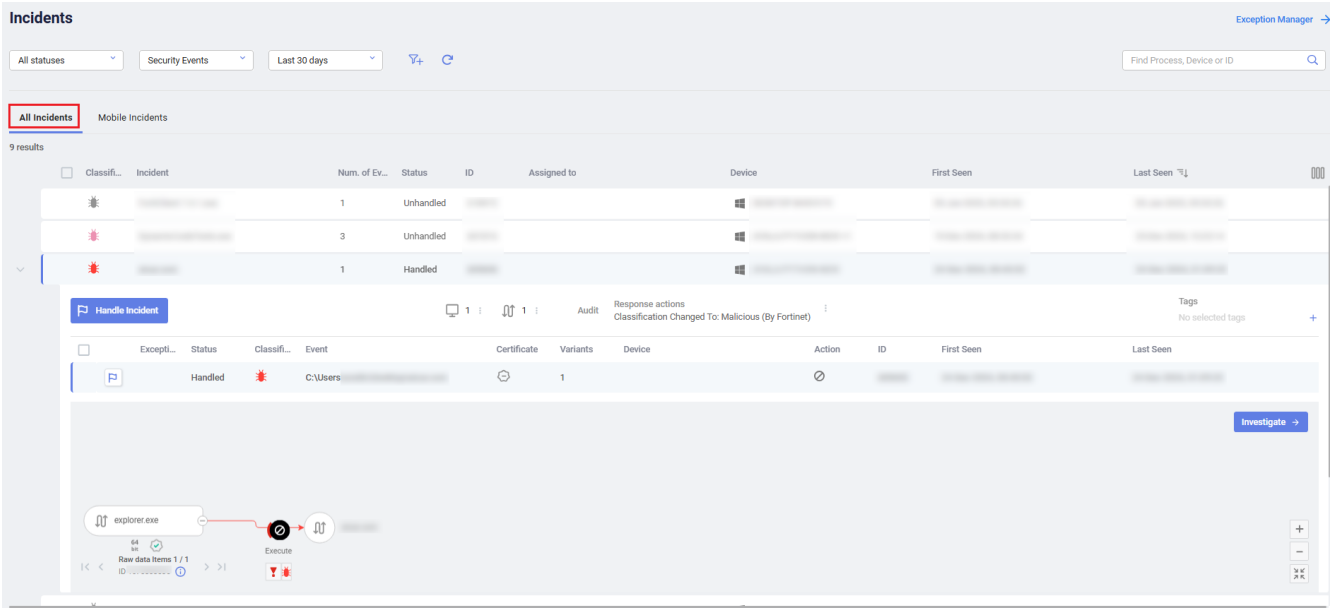
Hovering over this number indicates the number of new unread security events.

In some cases, *Updated* displays next to the number of new unread security events indicator. Updated means that FortiEDR originally classified one of the unread events, but that classification was later changed by the user. After more data for this security event was received, FortiEDR overrode the manual classification of the event by the user and changed the classification for the event again, based on the newly received data.

Incidents pane

Clicking a security event expands it to show more details and enables the buttons at the top of the window. The following information is provided for each security event:

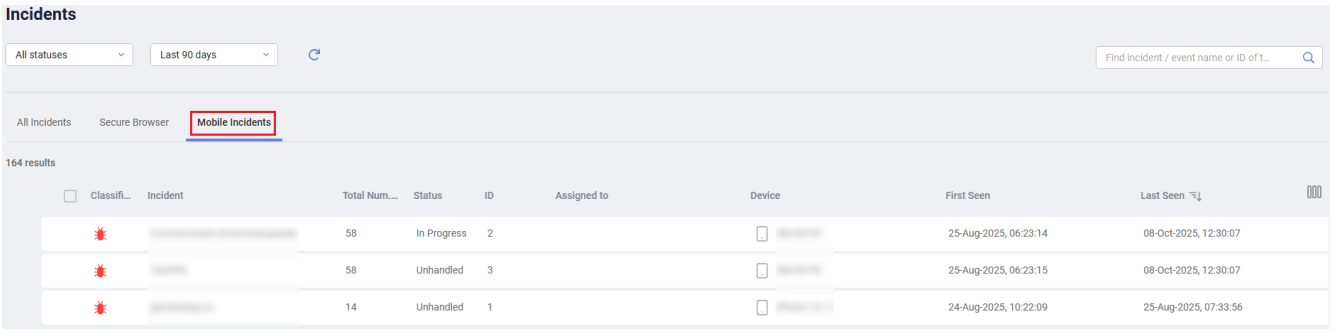
Desktop incidents:

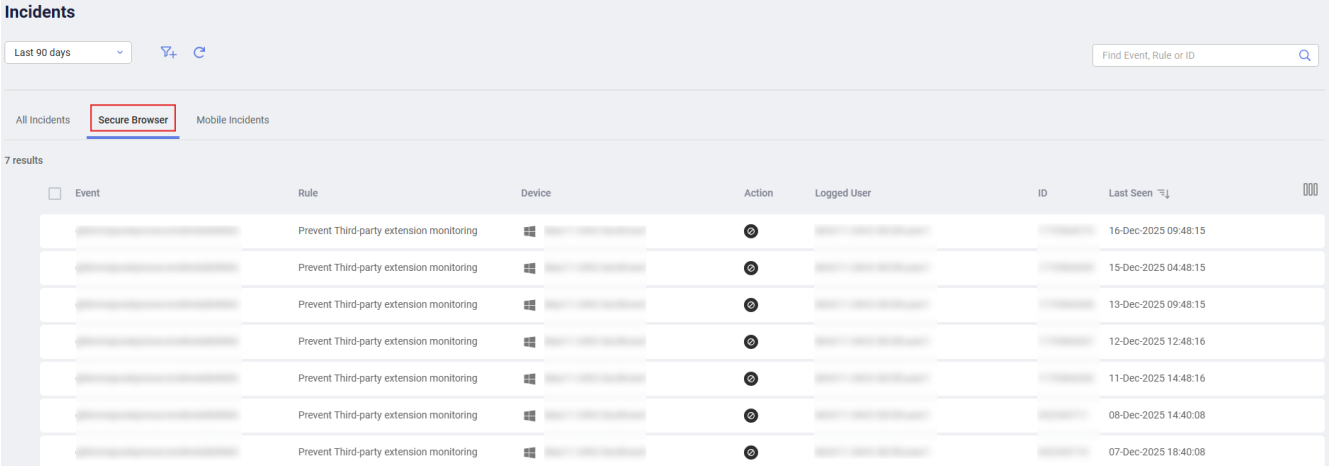


The Extended Detection policy provides detection features (meaning that events are logged and displayed in the *Incidents* tab). No protection (blocking) features are provided. The exceptions options are not available in the *Incidents* tab for security events triggered by the Extended Detection policy, because these events were not collected by a FortiEDR Collector.

Mobile Incidents and **Secure Browser**:

The *Mobile incidents* and *Secure Browser* tabs are available only if mobile or secure browser is enabled in the organization setting. See Step 2 – Defining or importing an organization on page 432.





The mobile incidents view displays incidents specific to Mobile on page 342 and secure browser view displays incidents specific to Secure Browser Collector 6.1.1.1281 or later on page 244. The details for each mobile or secure browser incident are similar to those in the desktop incidents view except that the *Investigate* button is unavailable.

Information Field	Description
View Indicator	Indicates the view context for the security event aggregation. displays for a device and displays for a process.
Handled/Not Handled	Specifies whether any FortiEDR Central Manager user handled this security event, as described on Marking a security event as handled/unhandled on page 115
ID	Specifies an automatically assigned unique identifier for each security event generated by FortiEDR. This identifier is particularly useful for security event tracking purposes when monitoring security events using an external system, such as a SIEM.
Device	Specifies the device name on which the security event has occurred.
Process	Specifies the process that is infected. This is not necessarily the process that made the connection establishment request (such as Firefox, which might be being controlled by the infected application). If the security event was triggered by a script, then the script name is specified.
Classification	Specifies how malicious the security event is, if at all. Classifications are initially determined by the Core but can be changed either automatically as the result of additional post-processing, deep, thorough analysis and investigation by the FortiEDR Cloud Service (FCS) or manually. See Overview on page 91 for more detailed information about the classification of the event, such as the classification history. Classifications are as follows:

<table>
<tr><th>Information Field</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>Icon</th><th>Classification</th><th>Definition</th><th>Recommended Action</th></tr>
<tr><td> </td><td>Malicious</td><td>Events with the following characteristics:
Verified to have malicious capability
Intended to harm the infected device
Have no commercially viable use</td><td>Remediate</td></tr>
<tr><td> </td><td>Suspicious</td><td>Events that behave in ways that strongly indicate malware, but are not verified malware.</td><td>Review and remediate</td></tr>
<tr><td> </td><td>Inconclusive</td><td>Further investigation needed to determine if the event is malicious.</td><td>Administrator review</td></tr>
<tr><td> </td><td>PUP (Potentially Unwanted Program)</td><td>Events triggered by programs that are bundled with legitimate software or commercial software that may be used for malicious purposes, for example, torrents.</td><td>Administrator to review whether the program should be removed (recommended) or allowed</td></tr>
<tr><td> </td><td>Likely Safe</td><td>Events that probably carry no risk, and are most likely legitimate.</td><td>Administrator review</td></tr>
<tr><td> </td><td>Safe (Confirmed Safe Software)</td><td>Events triggered by legitimate software that was intended for use by the customer, for example, security software.</td><td>No action necessary</td></tr>
</table>
</td></tr>
<tr><td>Received</td><td>Specifies the first time that this security event was triggered. For aggregations, the earliest received time is displayed.</td></tr>
</table>

Information Field	Description
Last Updated	Specifies the last time that the security event was triggered. For aggregations, the most-recent time is displayed.
Action	Specifies the action that was enforced: • **Block**: The exfiltration attempt was blocked and this blocking event was generated. • **Simulated Block**: The policy that protected this device was set to *Simulation* mode. Therefore, the exfiltration attempt was **NOT** blocked and this blocking event was generated. FortiEDR would have blocked this exfiltration security event if the policy had been set to *Prevention* mode. • **Log**: The security event was only logged and was not blocked. • **Post Detection**: The exfiltration attempt was detected after the FCS verdict, which means the event is already running on the Collector. We recommend isolating the Collector for security. • **Simulated Post Detection**: The policy that protected this device was set to *Simulation* mode. Therefore, the exfiltration attempt was detected after the FCS verdict but the event is not running on the Collector. If the policy had been set to *Prevention* mode, the event would have been running on the Collector and you would have to follow the recommenation of isolating the Collector for security.

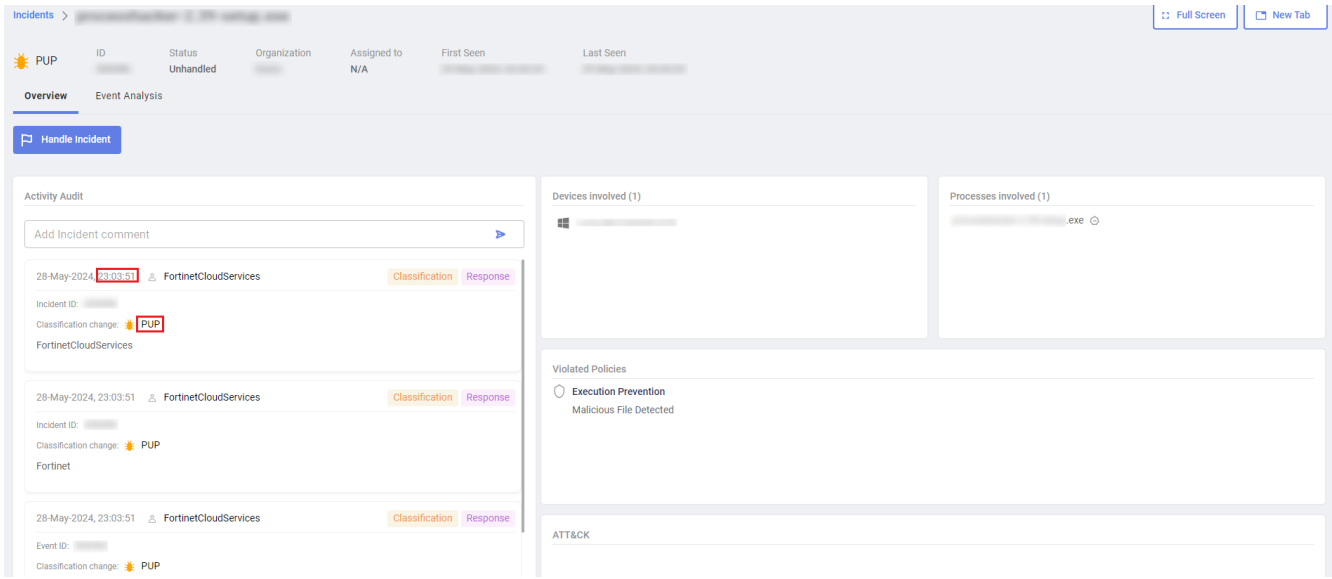
For variants, the following information is available:

Information	Description
Device	Specifies the device name on which the security event has occurred.
First Seen	The *Incidents* tab aggregates the occurrences of the same security events into a single row when it represents the same attack on the same device. This timestamp specifies the first time this security event occurred. The row of this security event pops to the top of the list in the *Incidents* tab each time it occurs again. If a change is made to the FortiEDR policy used by a specific FortiEDR Collector, then the security events before and after that change are not aggregated together.
Last Seen	Specifies the most recent time this same security event occurred. See FIRST SEEN described above.
Process Owner	Specifies the user who ran the process that triggered the security event.
Process Type	Specifies whether the infected process is 32-bit or 64-bit.
Use	Specifies the domain of the computer/user of the device.
Process Path	Specifies the path of the infected process.
Count	Specifies the number of occurrences of the same raw event on the same device.

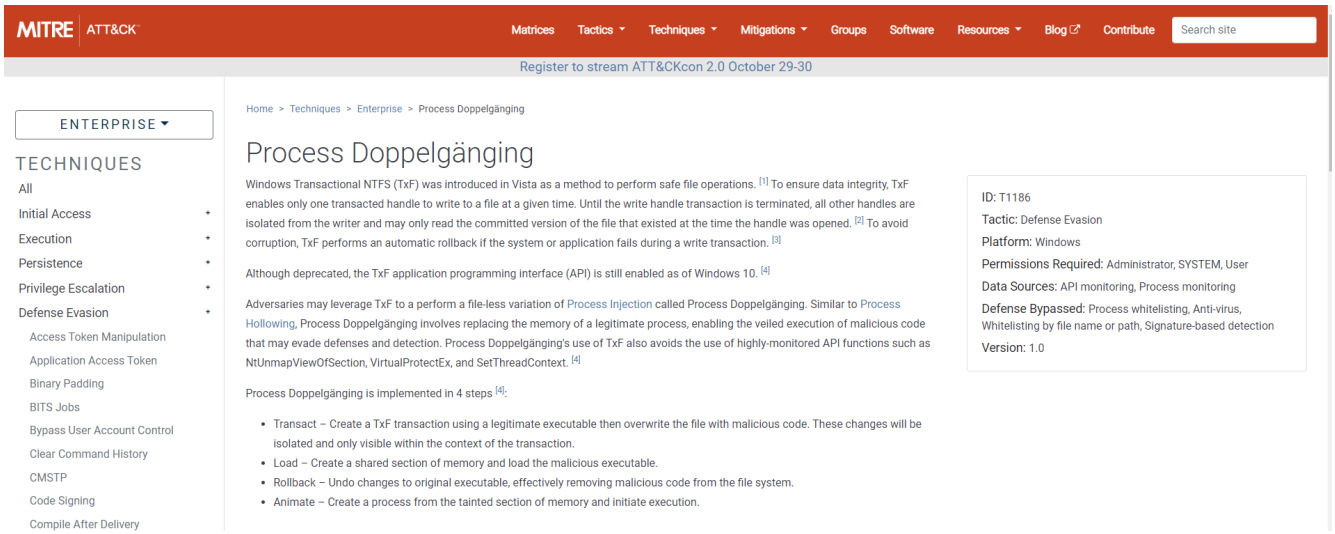
Overview

After you select an incident in the Incidents pane on page 86 and click *Investigate*, the *Overview* pane displays detailed information about the audit history, violated policies, and rules assigned to the FortiEDR Collector that triggered this security event.

The audit history shows the chronology for classifying the security event, and the actions performed by FortiEDR for that event. This area also displays relevant details when the FortiEDR Cloud Service (FCS) reclassifies a security event after its initial classification by the Core. For example, the following example shows that the security event was reclassified by the FCS and given a notification status of *PUP* at 23:03:51.

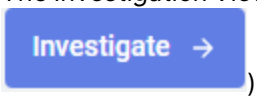


The ATT&CK section lists techniques that were used in this incident based on the MITRE ATT&CK common techniques scheme. Clicking the technique opens the MITRE web page, providing additional details, as shown below.



In the *Violated Policies* pane, only policies that were violated are displayed. The rule's configured action is displayed for each rule, as defined in *POLICIES*. The Action that was actually executed is displayed in the action column of the *Incidents* pane of this window. The action taken is determined by the rule with the highest priority.

Investigation View

The *Investigation View* is accessible in the Event Analysis tab using the *Investigation* button (

) when you select an incident in the *Incidents* tab. It helps understand the flow of activity events during Threat Hunting with a dynamic and interactive graphical view of the activity events details: source, action and target.

The graphical view provides the ability to add more activity events to the graph and show the relationship and timeline of the occurrence of those activities, such as the following:

- All actions performed by a given process
- All files the process has created or updated
- All IPs the process has initiated communication with

It also allows you to interactively view a chain of activity events in the following ways:

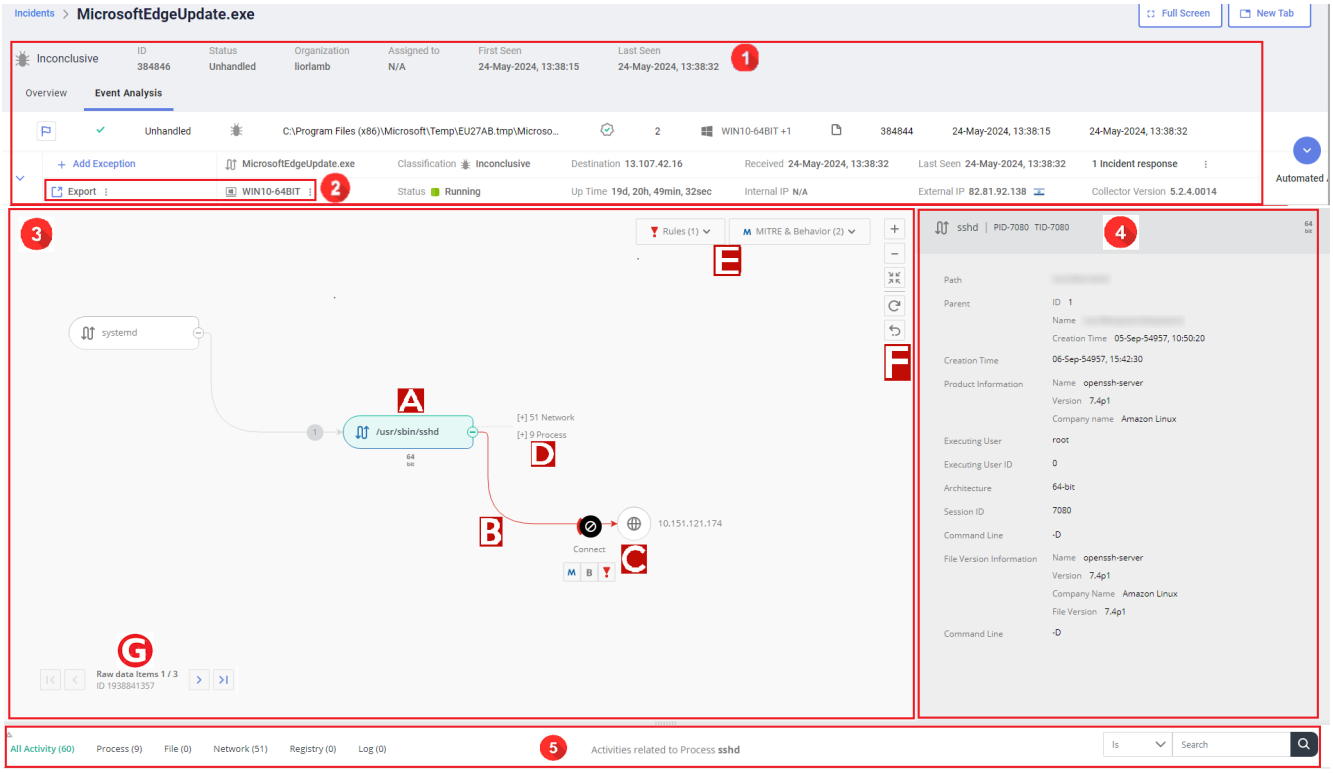
- Browse between the various processes involved in the chain
- See all activity events related to one node in the Security Event graph
- Filter activity events table to include or exclude a specific value
- Switch and see the graph chain on the other involved endpoints while analyzing security event on one device

You can also perform certain actions, such as:

- Retrieve or remediate files
- Connect to a device or isolate a device
- Move a device to high security group
- See the graph chain on the other involved endpoints while analyzing security event on one device

- The *Investigation View* is not available to IT users (see Users on page 359). *Read-Only* user can only view and manipulate graphs but cannot remediate or perform other actions.
- The view adds visualization and interaction of existing data that is already available in other non-graphical and non-interactive forms without creating or generating any additional data.

The following figure illustrates the various components of an *Investigation View* window launched from the *Incidents* view.

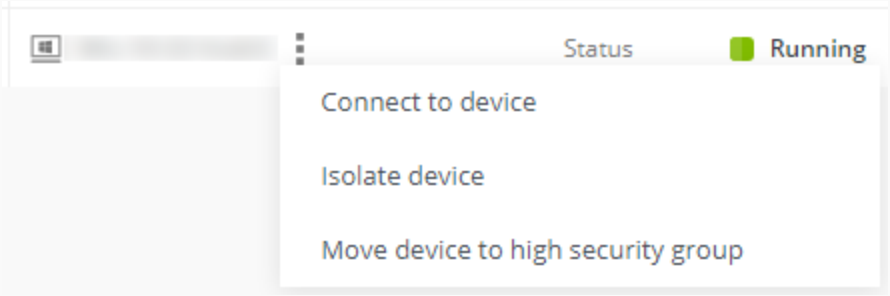
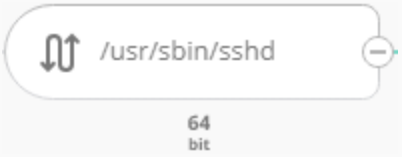


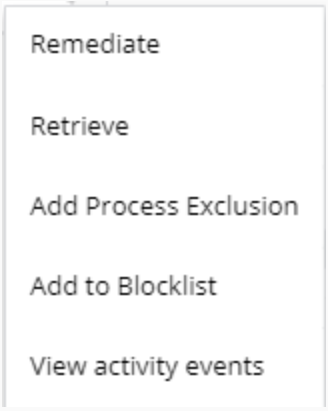
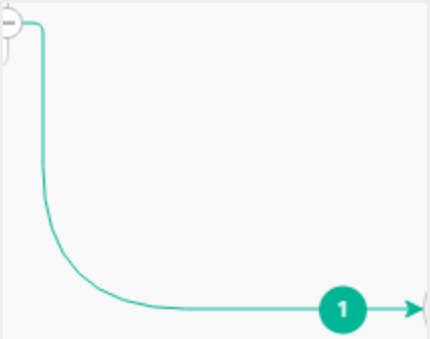
Compared with the investigation view window launched from the *Details Pane* under *Threat Hunting*, this view includes the following additional functionality:

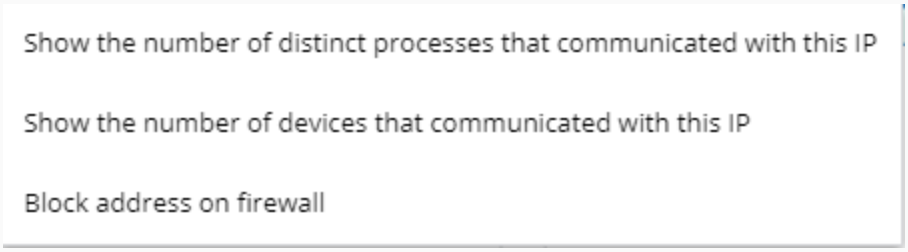
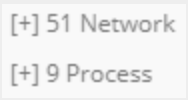
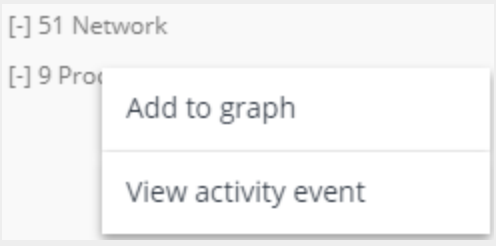
- Advanced threat hunting and investigation capabilities, such as exporting the graph as JSON, variants navigation graph, and Stacks view on page 99.
- General event details in the first row, such as classification and incident response.

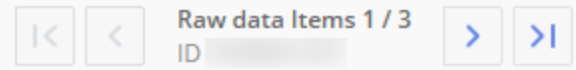
Component	Description
1	General details about the event, such as event ID, process name, classification, IP address, and incident responses.

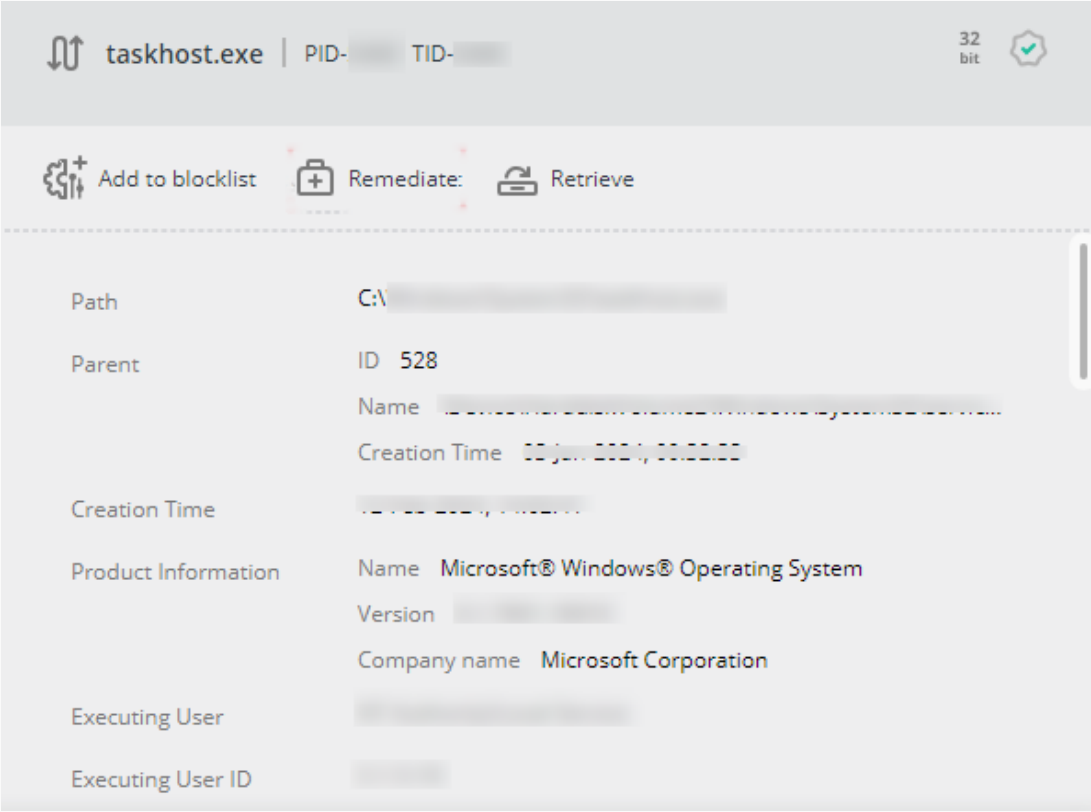
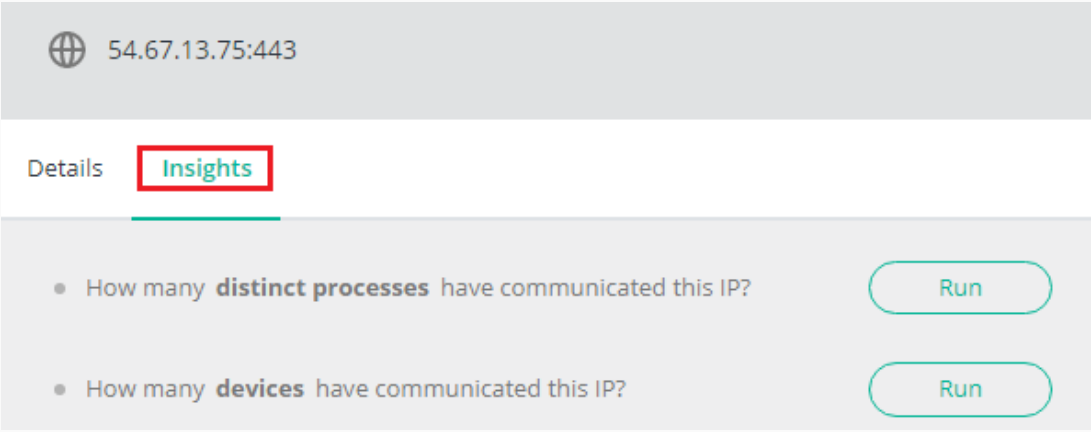
2	• Use the *Export* button (Export) to save files for sharing or record reasons:
	  • *JSON*—Export the event data as a JSON file.
	  • *SVG*—Export the investigation view graph as an SVG file. This is the only option to save a graph that includes dynamic changes based on the default graph view, such as adding processes.
	
	• Use the following buttons, accessible by clicking the eclipses on the right of the

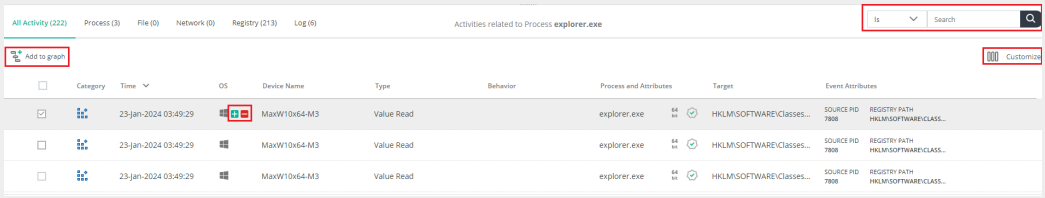
Component	Description
	device name, to connect to a device, isolate a device, or move the device to high security group. 
3	Graphical flow diagram with a process tree that you can build according to your investigation needs, from left to right and top to bottom. The tree is also interactive, which means you can click on a specific component to drill down for more details or contextual actions.
A	**Node**—Source of an activity or event, which can be a process, an endpoint, a thread or service, or another security product. Nodes are represented by boxes with icons for the activity type, some with descriptions under the boxes.  • Click on a node to display the Details pane on page 151 on the right and the Activity events tables on page 147 on the bottom with contextual information about that specific node. • Click the *Collapse* ( ) or *Expand* ( ) icon in the right of a node icon to show or hide all the downstream nodes, edges, and leaves. • Right-click a node to perform actions allowed on the node, including any custom actions you defined. These action buttons also appear in the *Details Pane*, which is available on the right after you click the node. The list of available options varies by node type. The following is an example list of actions for a process node.

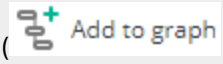
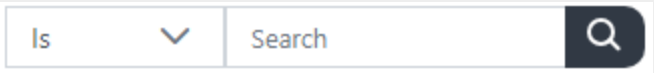
Component	Description
	
B	**Edge**—Activity event type or action represented by a curved line with an arrow. An edge can be one activity event/action or an aggregation of several. The numbered arrows indicate the sequence of actions and specify the action that was performed, such as *Process Creation*, *Socket Close*, *Block* and so on. Multiple operations performed between two processes are represented by multiple arrows between them. Edges that triggered the event are indicated in red.  Click on an edge to display the Details pane on page 151 on the right and the Stacks view on page 99 on the bottom with contextual information about that specific edge. Edges may also have icons below them indicating classification or violation of certain rules and MITRE & Behavior models. Click on an icon for more detailed information.

Component	Description
C	**Leaf**—Target of activity event of type File, Registry Key, Registry Value, Network components (IP/DNS/URL). A leaf can also be a group of artifacts. For example, all the files created or modified by a process. Leaves have a round shape ( ). • Click on a leaf to display the Details pane on page 151 on the right and the Activity events tables on page 147 on the bottom with contextual information about that specific leaf. • Right-click a leaf to perform actions allowed on the leaf, including any custom actions you defined. These action buttons are also available in the *Details Pane*, which appear on the right after you click the leaf. The list of available options varies by leaf type. The following is an example list of actions for a network leaf: 
D	**Hint**—Categorized groups of activities related to a node that are not part of the main chain of activity events and thus not represented in the graphical diagram. Click a node to show the number of relevant activities. The hints no longer display after you move the selection to another node or edge.  • Click the *Expand* ([+]) or *Collapse* ([-]) icon near a leaf hint to show or hide the node or leaf list of that type. • Right-click the type name of a hint and select *Add to graph* to add the relevant leaves to the graph or select *View activity event* to pull out the Activity events tables on page 147 for this specific file type. The *Add to graph* option is unavailable when the number of hints exceeds 500, in which case you can only choose to view the activity event. 

Component	Description	
	E	Use the *Rules* or *MITRE & Behavior* legends to highlight the corresponding icons below relevant edges in the diagram.
	F	• Use the *Zoom In* ( ), *Zoom Out* ( ), and *Zoom To Fit* ( ) buttons to adjust the graph window size. • Use the *Reset* ( ) button to restore the graph to the default view. • Use the *Undo* ( ) button to cancel an operation.
	G	Navigate between the graphs of the various variants for a security event using the right and left arrows. 
4	Details pane on page 151 for the selected node, edge, or leaf where you can view details of the activity, action, or target, and perform common actions on a node or leaf, such as retrieving a file, remediating devices upon malware detection, or adding an application to the Application Control policy blocklist. The actions can also be performed by right-clicking a node or leaf and selecting the option from the menu.	

Component	Description
	 For specific leaf types, this pane also includes an *Insights* tab which allows you to run queries to retrieve analytics data, such as the number of communicating processes or devices of a certain IP. The *Insights* options are also available from the right-click menu of those leaf types. 
5	• When a node or leaf is selected, the contextual Activity events tables on page 147 appears at the bottom, which is organized by tabs of activity types. Drag the top edge of the table up for a fuller view of the table. Activities with a number at the front of the row are already in the graph and the number matches the one in the graph.

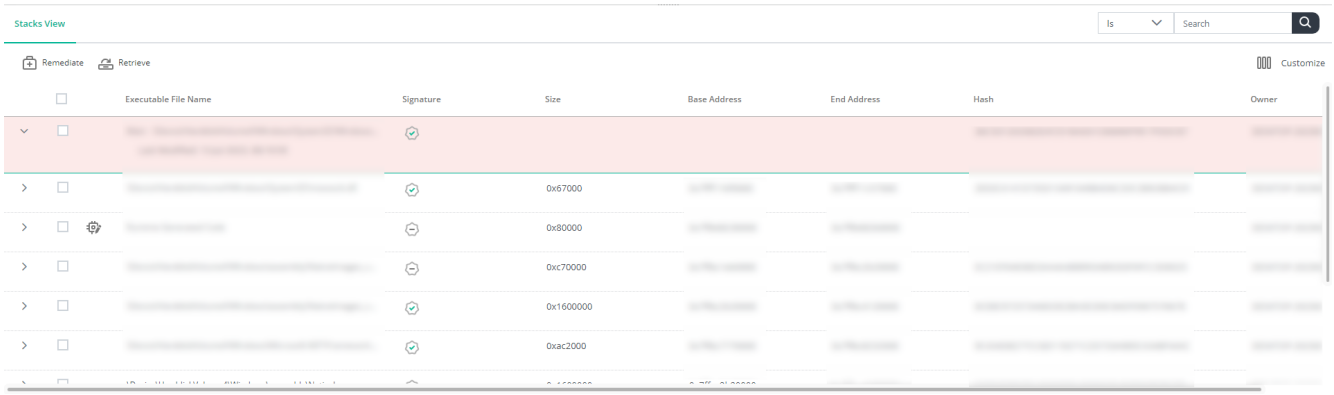
Component	Description
	

- To add activities to the graph, select the corresponding rows and click *Add to graph* ().
- To customize the columns to display in the table, click *Customize* ( ).
- To search for a specific activity or event, enter keywords in the search bar on the top right corner ().
- To filter the results in the Activity Events table to include or exclude a specific value, use the green plus ( ) and red minus ( ) icons that appear when you hover over the value. Multiple filters are supported. To delete a filter, click the cancel icon that appear when you hover over the filter on the top-left of the table.

- When an edge is selected, the Stacks view on page 99 appears at the bottom instead.

Stacks view

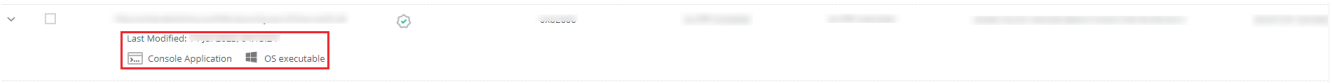
The stacks view displays the stacks that were collected during the action performed between two process nodes in the Investigation View on page 92 when an edge is selected. The stack entries include the executables and DLLs involved in the process stack. The stack entries due to which the event was triggered are highlighted with a red background. The main stack entry, which means the first one, is marked with a separator.



For each executable, you can see the following information:

- Executable File Name: Specifies the filename of the executable.
- Signature: Specifies whether or not the file was signed. Possible values: Signed, Unsigned, Self-signed, Invalid timestamp, Signed (no timestamp).
- Size: Specifies the size of the file.
- Base Address of this entry in memory.
- End Address of this entry in memory.
- Hash: Specifies the file hash. No hash is available for memory items.
- Owner: Specifies the owner of the file.
- Writable memory is indicated by the icon at the front of the stack.

You can also expand a stack to view more details, such as the last modified time (not available for writable memory entries), whether or not the stack entry is of OS executable or console application for executables and DLLs.



You can perform the following actions in the stacks view table:

- Remediate a file or retrieve memory using the *Remediate* or *Retrieve* buttons (Remediate Retrieve) at the top-left of the table.
- Customize the columns to display in the table using the *Customize* button (Customize).
- Search for a specific stack entry using the search bar on the top right corner (Is Search).

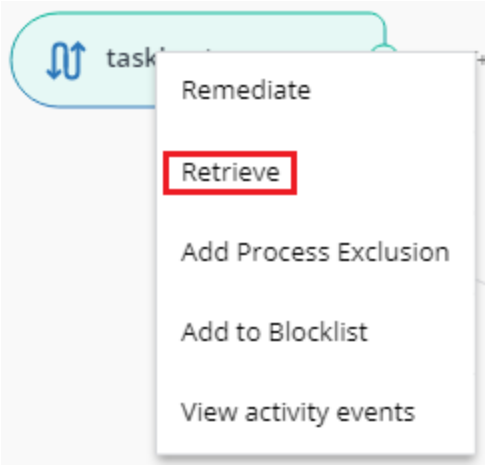
Retrieving memory

The Retrieve Memory function enables you to retrieve the stack-memory of a specific Collector to perform deeper analysis by analyzing the actual memory from the device. Memory is fetched by the Collector in binary (`*.bin`) format, compressed, encrypted and then sent to the user's local machine. The returned file is password-protected with the password `enCrypted`. If the file cannot be sent, it is saved locally on the host by the Collector.

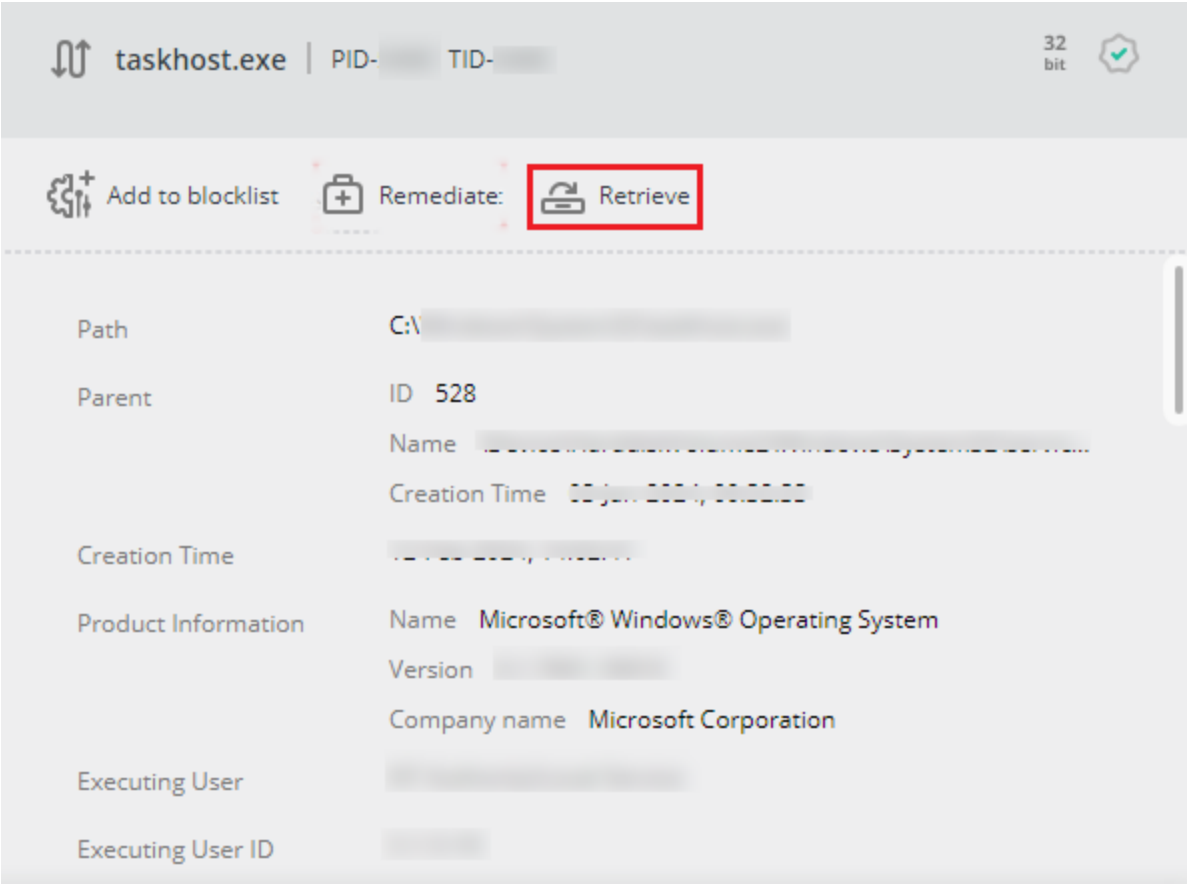
This function is accessible from the Investigation View on page 92 (detailed in the procedure below) or by connecting to the device directly using the FortiEDR Connect on page 109 functionality.

To retrieve memory for a Collector from the investigation view:

1. Right-click the node of the relevant activity event and select *Retrieve*.

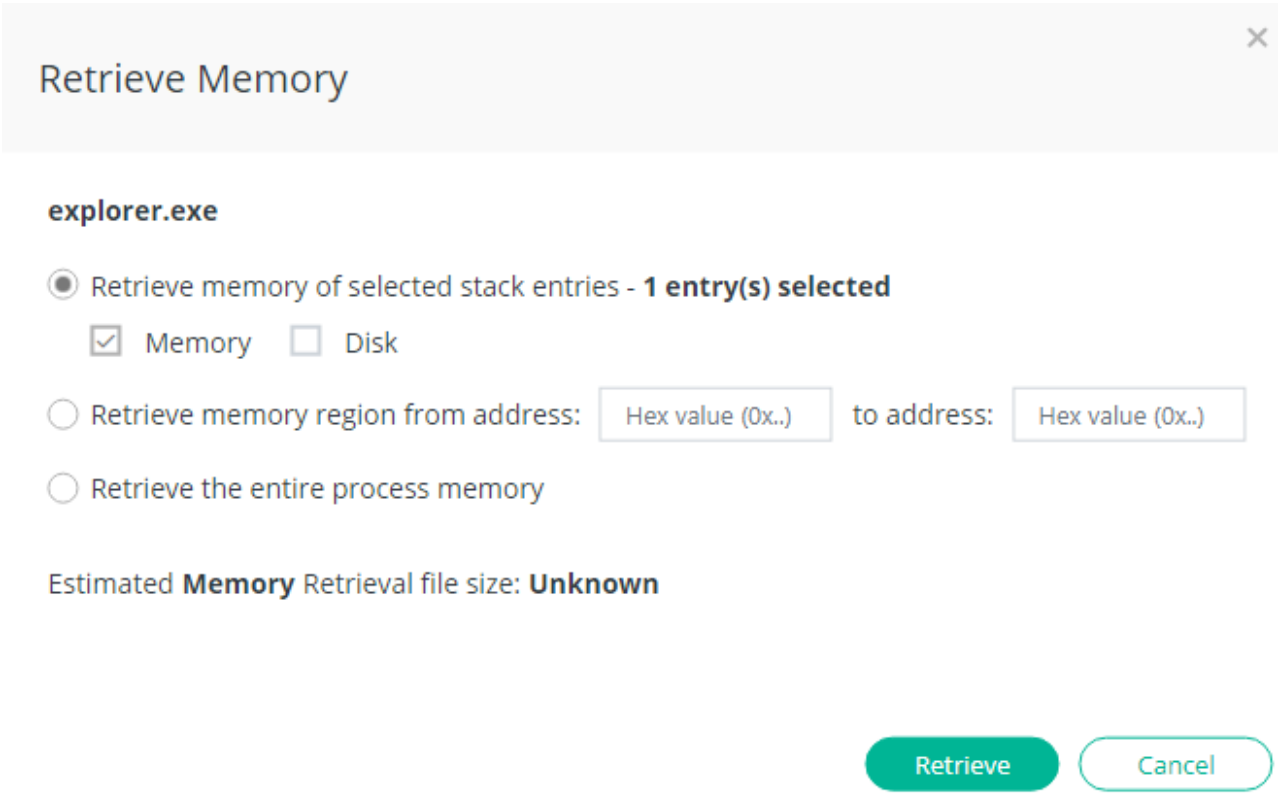


Alternatively, select the node of the relevant activity event and click the *Retrieve* button in the *Details Pane* that appears on the right.



The *Retrieve* button is also available from the Stacks view on page 99, which is available when an edge is selected.

2. The following window displays:



3. Select one of the following options:
   a. *Retrieve memory of selected stack entries*: Select this radio button to retrieve memory for one or more specific stack entries. Then, select the stack entries you want to analyze by checking their checkboxes.
   You must also specify whether to retrieve the memory from memory, disk, or both by selecting the respective checkbox. The *Memory* option is the default. You can select either option or both options. It is important to remember that the retrievable data may be different in the memory and on disk. In addition, the stack entry may no longer reside in memory, for example, if the system was rebooted. After you make your selection, the window indicates how many stack entries were selected.
   b. *Retrieve memory region from address*: Select this option to retrieve memory from a specific memory region. Specify the *To* and *From* addresses for the region in the adjacent fields.
   c. *Retrieve the entire process memory*: Select this option to retrieve memory for an entire process. This option retrieves all the stack entries comprising the process.
4. Click *Retrieve*.

Isolating a device

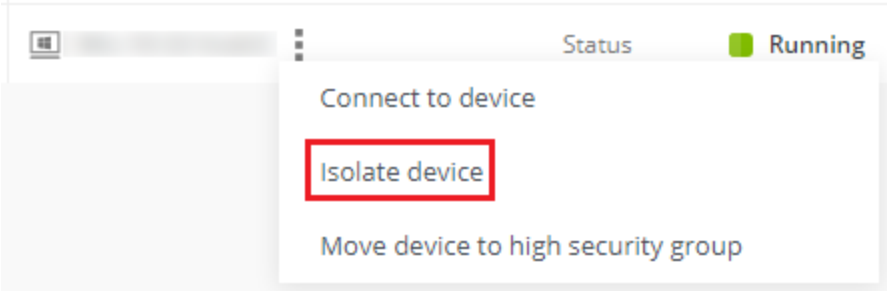
An isolated device is one that is blocked from communicating with the outside world (for both sending and receiving). A device can be isolated manually from the *Inventory > Collectors* page or the Investigation View on page 92 (detailed below).

Isolation mode takes effect upon any attempt to establish a network session after isolation mode has been initiated. Connections that were established before device isolation was initiated remain intact. The same applies for Communication Control denial configuration changes. Note that both Isolation mode and Communication Control denial do not apply on incoming RDP connections and ICMP connections.

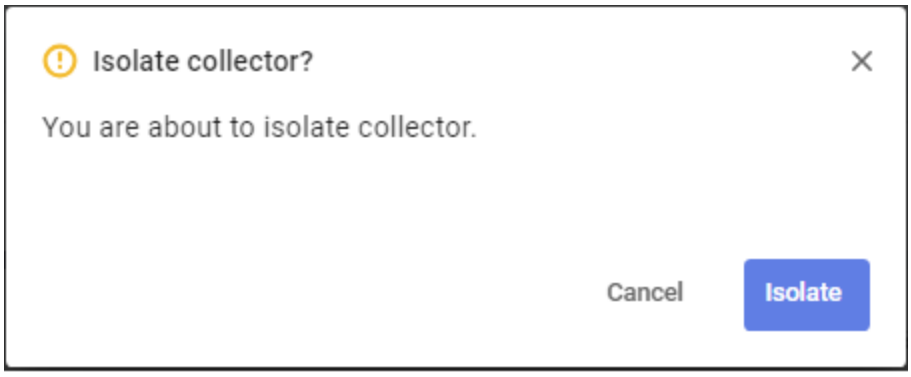
For more details about device isolation, see Investigation on page 326.

To isolate a device from the investigation view:

1. In the Investigation View on page 92 of an event with an associated device that you want to isolate, click the eclipses on the right of the device name and select *Isolate device*, as shown below:

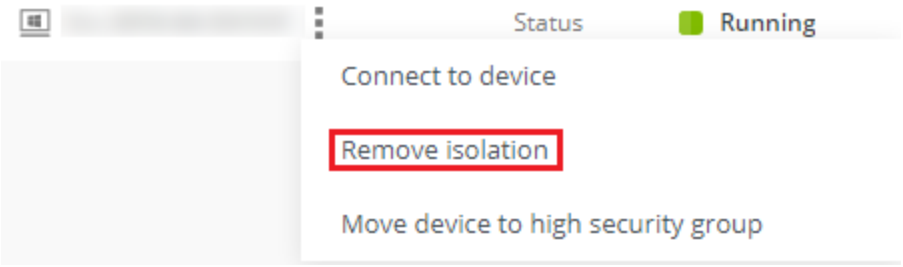


2. In the window that appears, click *Isolate*.

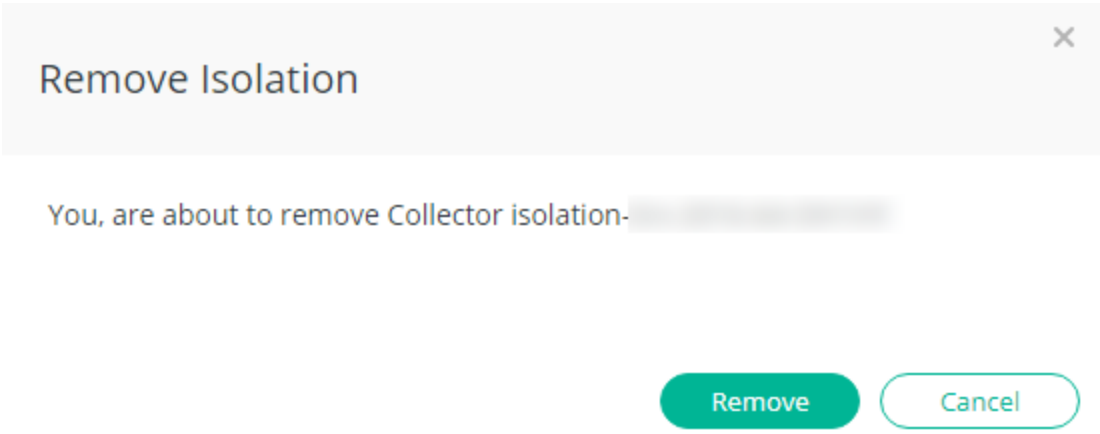


To remove isolation from a device in the investigation view:

1. In the Investigation View on page 92 of the same event, click the eclipses on the right of the device name and select *Remove isolation*, as shown below:



2. In the window that appears, click *Remove*.



Remediating a device upon malware detection

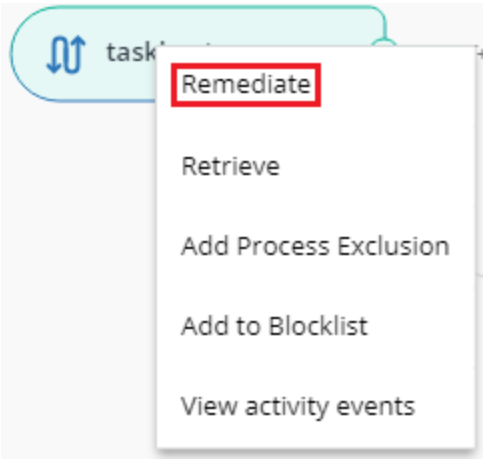
After malware is detected on a device, you can remediate the device from the Investigation View on page 92 (detailed in the procedure below) or by connecting to the device directly using the FortiEDR Connect on page 109 functionality.

The following options are available when you remediate the situation in the FortiEDR system:

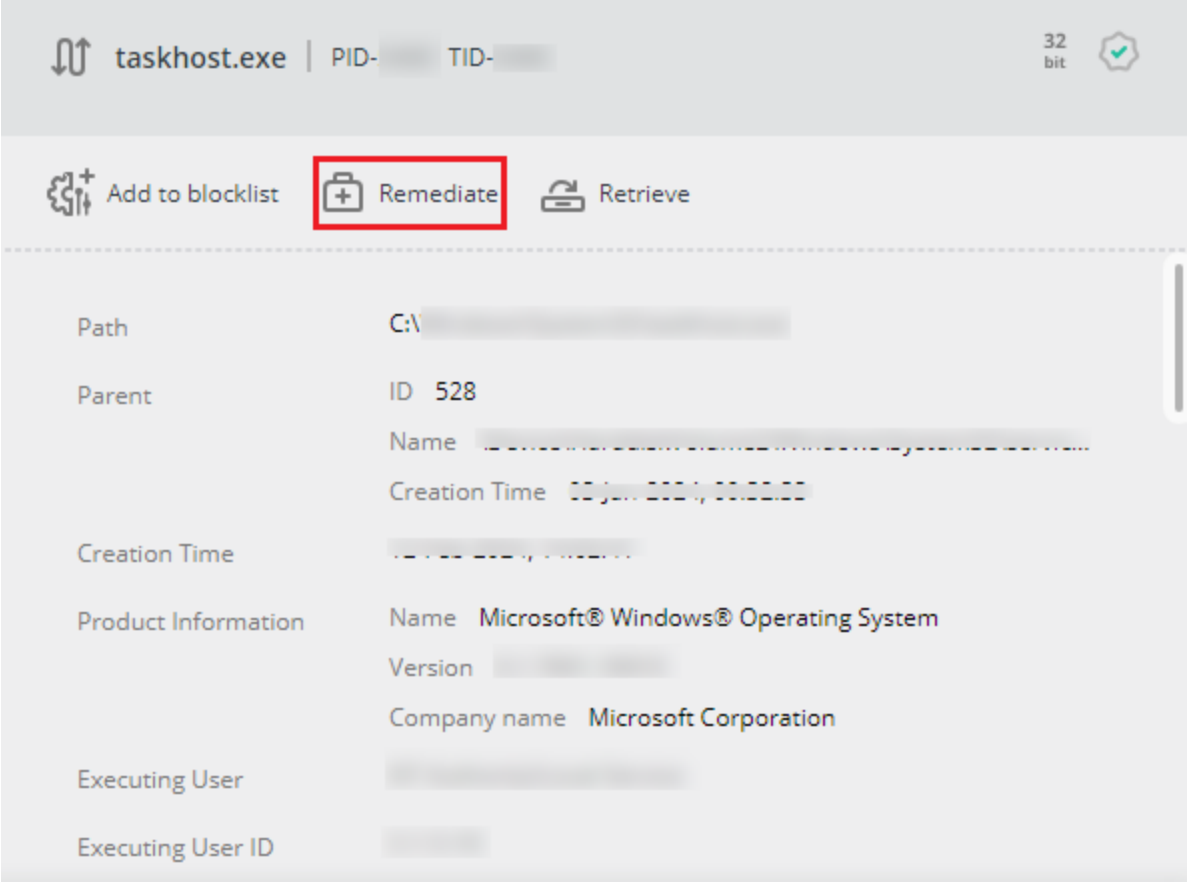
Method	Description
Terminate the Process	This method does not guarantee that the affected process will not attempt to execute again.
Delete the Affected File from the Computer	This method ensures that the file does not attempt to exfiltrate data again, as the file is permanently removed from the device. When using this method, be careful not to delete files that are important to the system, in order to protect system stability.
Remove or Modify the Registry Key	This method removes a registry key or updates a registry key's value. This method changes malicious registry key modifications by removing newly created keys or returning key values to their original form. Some malware have persistency capabilities, which makes the infection appear again. In addition, in some rare cases, malware can cause the system to crash if you try to remove them. Both of these methods can be performed using the Forensics add-on.

To remediate a device from the Investigation View on page 92:

1. Right-click the node of the relevant activity event and select *Remediate*.

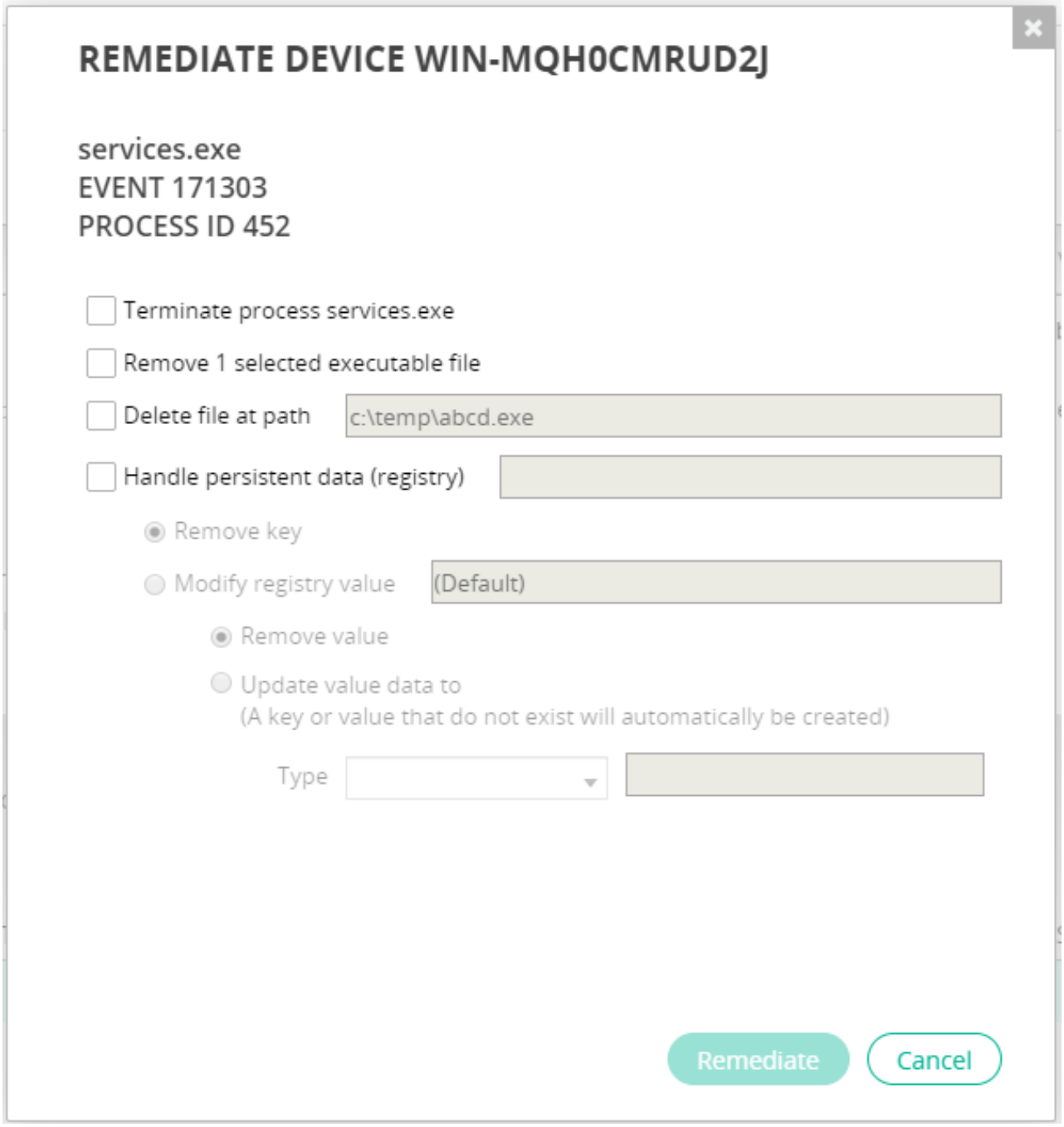


Alternatively, select the node of the relevant activity event and click the *Remediate* button in the *Details Pane* that appears on the right.

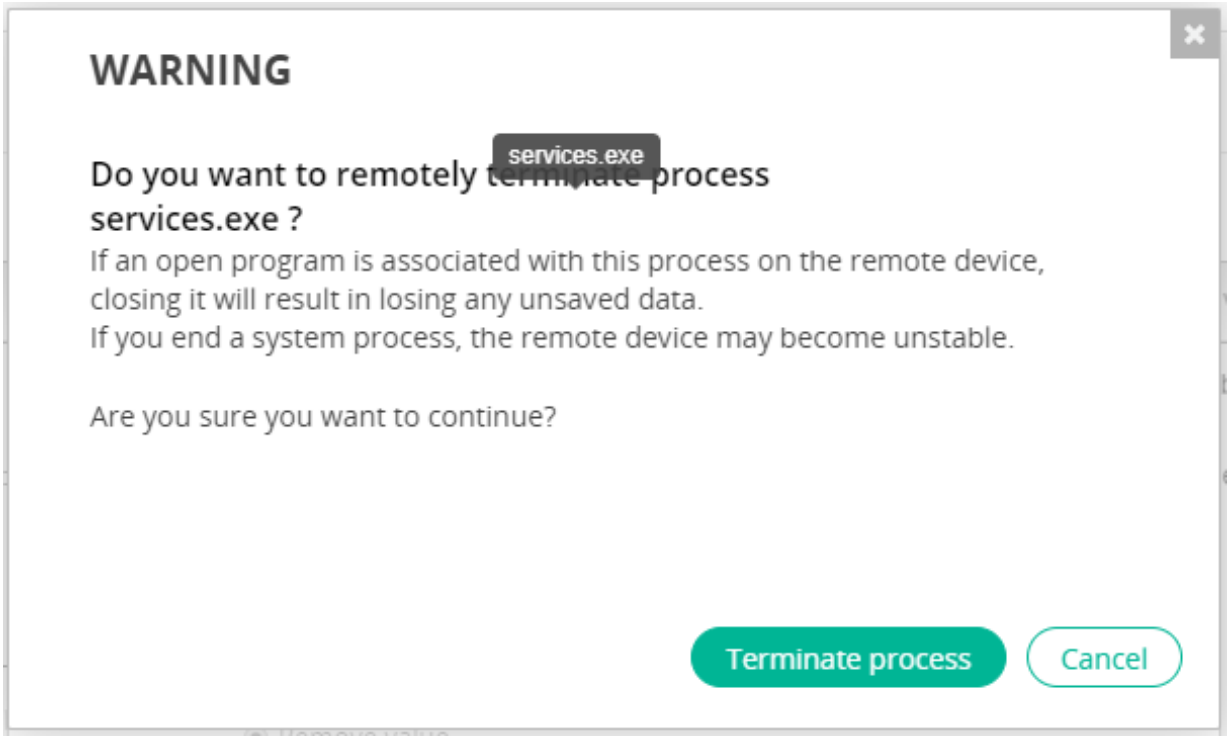


The *Remediate* button is also available from the Stacks view on page 99, which is available when an edge is selected.

2. The following window displays:

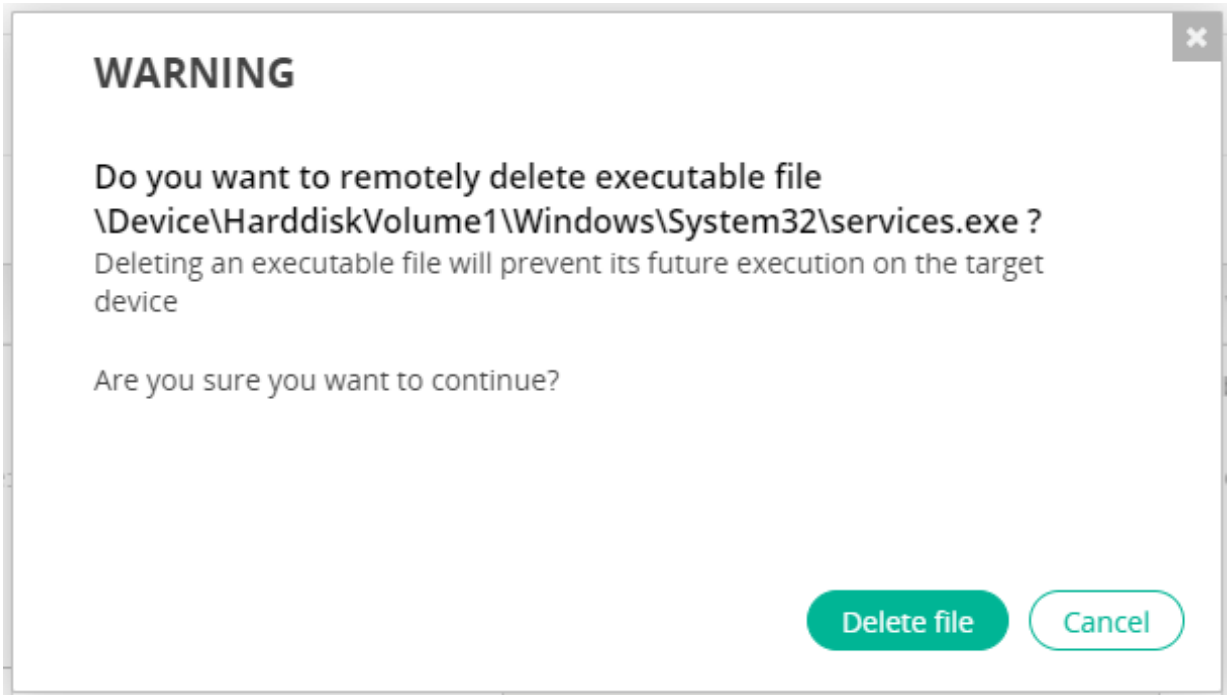


3. Do one of the following:
   a. Check the *Terminate process* checkbox to terminate the selected process. A warning message displays.



Click *Terminate process* to terminate the selected process.

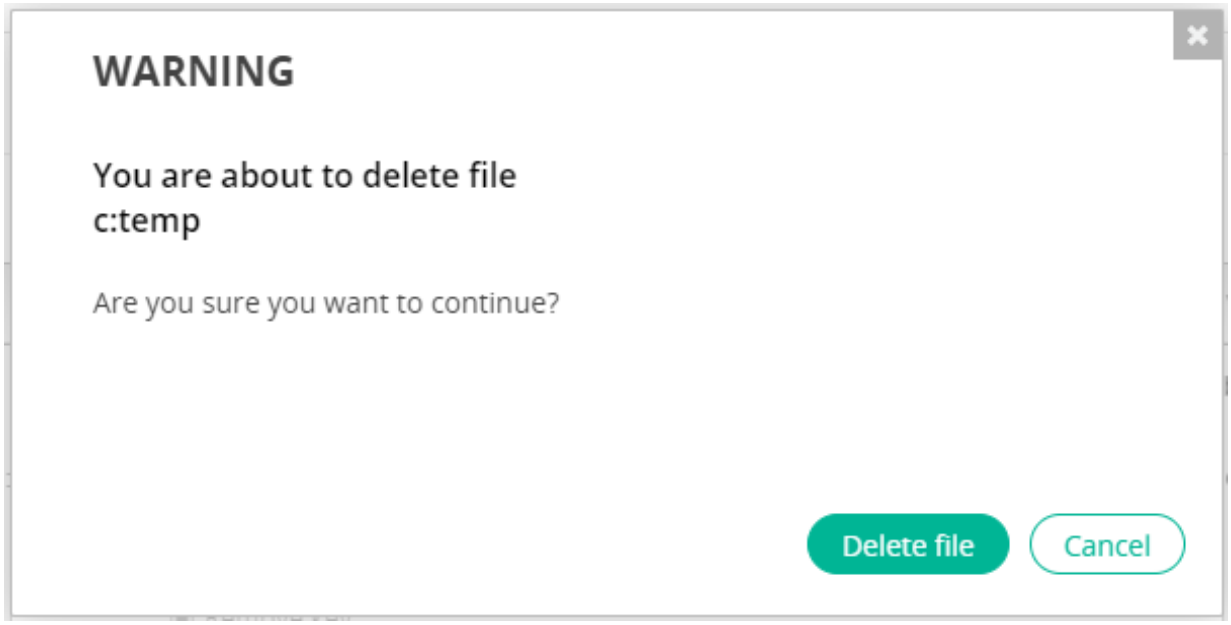
b. Check the *Remove selected executable file* checkbox to delete the specified file from the device. A warning message displays.



Click *Delete file* to remove the selected file.

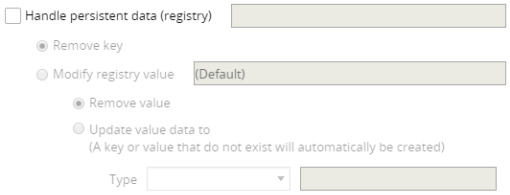
c. Check the *Delete file at path* checkbox. In the adjacent field, enter the file path on the device that contains the file to be removed.

A warning message displays.



Click *Delete file* to remove the file from the specified path.

d. Check the *Handle persistent data (registry)* checkbox to clean the registry keys in Windows. In the adjacent field, enter the value of the registry key to be removed or modified.



Value data should be provided in the required format, based on the value type selected in the dropdown list, as follows:

- *String* for types REG_SZ(1), REG_EXPAND_SZ(2), REG_DWORD(4) and REG_QWORD(11).
- *Base64* for types REG_BINARY(3), REG_DWORD_BIG_ENDIAN(5), REG_LINK(6), REG_MULTI_SZ (7), REG_RESOURCE_LIST(8), REG_FULL_RESOURCE_DESCRIPTOR(9) and REG_RESOURCE_ REQUIREMENTS_LIST(10).

Select the *Remove key* radio button to remove the registry key value.

Select the *Modify registry value* radio button to change the current registry key value. When selecting this option, you must also specify the new value for the registry key in the gray box and the key's value type in the adjacent dropdown menu (for example, string, binary and so on).

4. Click *Remediate*.

FortiEDR Connect

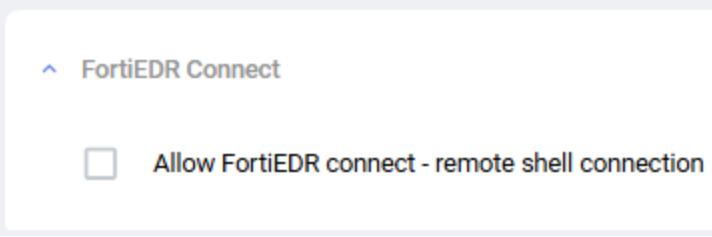
The FortiEDR Connect feature opens a console that provides direct access to a FortiEDR-protected device running a v5.2 Windows Collector through a remote Shell connection. This enables you to respond to incidents immediately and to perform in-depth investigation by running commands and scripts on the device, collecting and downloading forensic data from the device, remediating threats, and so on.

A FortiEDR Connect console can be accessed from various FortiEDR pages that list devices, such as the *Inventory* tab, the *Threat Hunting on page 131* tab, and the Investigation View on page 92.

- A *Connect to Device* button appears at the top of these pages, which enables you to connect to the device that is selected in the list.
- You can only connect to a single device in each FortiEDR Connect session. See Connecting to a FortiEDR-protected device on page 109.
- A device can only be connected to a single session at a time.
- Each FortiEDR user can have up to ten FortiEDR Connect sessions open and connected at the same time – each to a different device.
- Multiple users in your organization can open up FortiEDR Connect sessions (on the FortiEDR Manager), but no more than 30 sessions can be opened at the same time.

To allow a user access to the FortiEDR Connect functionality, configure the following options. Otherwise, the *Connect to Device* button is deactivated for the user.

- In *Administration > Settings*, ensure that the *Allow FortiEDR Connect – remote shell connection* checkbox is selected, which enables the FortiEDR Connect functionality for the organization. See FortiEDR Connect on page 410.



- Select the *FortiEDR Connect* option in the user role capability to grant the user access to the FortiEDR Connect functionality. See Users on page 359.

This checkbox is available for Admin, Analyst, and Senior Analyst users only.

Connecting to a FortiEDR-protected device

The following describes how to open a FortiEDR Connect console session that connects you directly to a FortiEDR-protected device.

To directly access a FortiEDR-protected device:

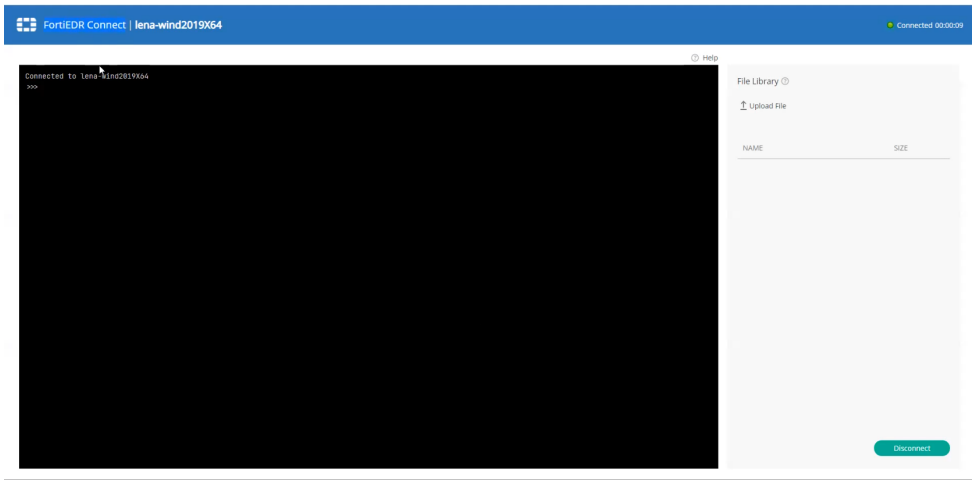
1. A FortiEDR Connect console can be accessed from various FortiEDR pages that list devices, such as the *Assets on page 337* tab, the *Threat Hunting on page 131* tab, and the Investigation View on page 92. The operation of the FortiEDR Connect console is the same regardless of where it was accessed from.
2. Select the relevant device from the list.
   You can only connect to a single device at a time, and therefore, if you select more than one device, the *Connect to Device* button is deactivated.
   You can only connect to accessible devices. For example, the *Connect to Device* button is deactivated, when you select a disconnected device.

   If the list only displays a single device, then the *Connect to Device* button automatically applies to that device without you needing to select it.

3. Click the *Connect to Device* button at the top of the list. For example, as shown below –

   Connect to Device

   A Shell window opens in a new browser tab. You may be requested to wait while the connection is established.
   The following displays after the connection has been established:



   The name of the device is displayed in the top left corner of the page.
   The connection status and a timer is displayed in the top right corner of the page.
4. The main part of this page shows a terminal screen (black) with a prompt (>>>) at the top left where you can type commands.
   Clicking the *Help* button at the top right of the terminal screen displays a list of the commands (and their parameters) that you can run. To run a command, simply type it (for example, %dir) with its parameters and press `Enter`. Note that when the parameter should be Path, full path should be provided. For example: `c:\MyDirectory or c:\MyDirectory\MyPath.`

Commands help

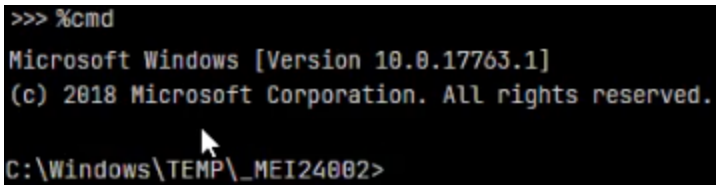
Command	Parameters	Description
%dir	Folder or file path	Returns information about a specific file or folder.
%ipconfig		Returns IP information.
%ipconfig_all		Returns extended IP information.
%download_file	Files path	Downloads the file to your browser.
%upload_file	Path to which to upload the file, File in the "File Library"	Uploads the file to the specified path.
%upload_and_run	Path to which to upload the file, File in the "File Library"	Uploads the file to the specified path and runs it.
%logged_in_users		Returns a list of the logged in users.

Close

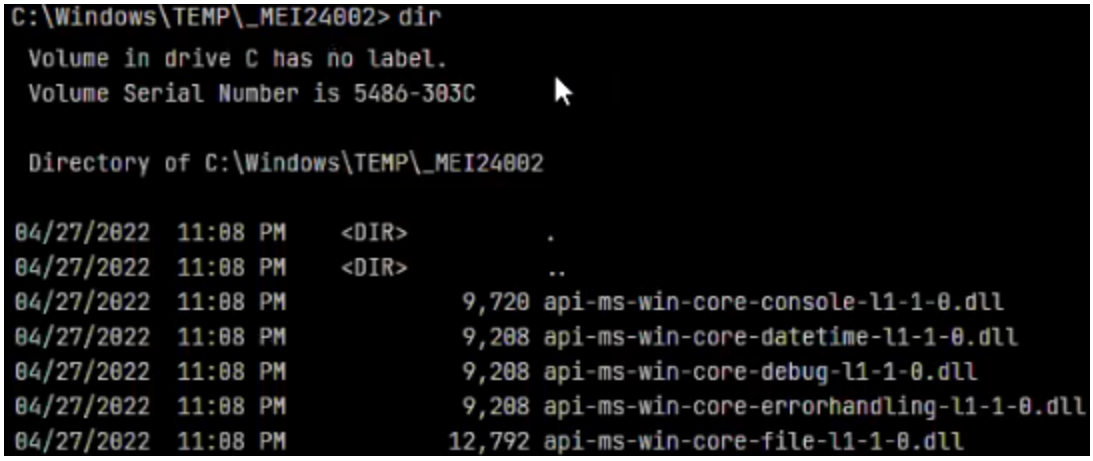
Most of these are FortiEDR-specific commands. For example, typing `%dir \` displays the following:

```
>>> %dir \
 Volume in drive C has no label.
 Volume Serial Number is 5486-303C

 Directory of C:\

12/24/2018  03:19 AM    <DIR>          Apps
09/15/2018  12:19 AM    <DIR>          PerfLogs
04/07/2022  02:46 AM    <DIR>          Program Files
04/07/2022  02:57 AM    <DIR>          Program Files (x86)
12/24/2018  02:51 AM    <DIR>          Python36
09/02/2020  07:23 AM    <DIR>          qa
04/05/2022  02:22 AM    <DIR>          Users
04/04/2022  02:06 AM    <DIR>          Windows
               0 File(s)              0 bytes
               8 Dir(s)  32,372,695,040 bytes free

>>>
```

In addition, you can use the `%cmd` command to open a command prompt view, as shown below.



This view enables you to enter standard Microsoft terminal (cmd) commands, such as `dir`. For example, the following displays:



In addition, you can run Python command at the prompt. The supported Python version is 3.*x*.

The FortiEDR Audit Trail on page 391 feature records the connection of a FortiEDR Connect session and every action that was performed in the session.

File Library pane

The File Library pane on the right enables you to upload, download and reuse files during FortiEDR Connect sessions from/to FortiEDR-protected device. No other users can see these files or upload/download from/to your FortiEDR Connect session. These files are deleted everywhere when you close the FortiEDR Connect Console, as described in Disconnecting FortiEDR Connect session on page 114. A FortiEDR Connect session enables you to:

- Upload a file to the FortiEDR File Library on the FortiEDR Manager.
- Upload a file from the FortiEDR File Library to a FortiEDR-protected device by running the `%upload_file` or `%upload_and_run` command. For example, to upload a forensics script to the device.
- Download a file from the FortiEDR-protected device. For example, to download an executable from the device for further inspection in a sandbox.

Uploading a file to the FortiEDR file library

The *File Library* page lists the files that you have uploaded to the FortiEDR file library on the FortiEDR Manager during the current FortiEDR Connect sessions, and that are available to be uploaded on the

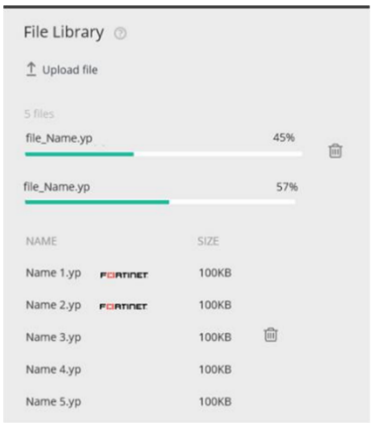
devices.

To upload a file to the FortiEDR file library:

1. Open a FortiEDR Connect session with a FortiEDR-protected device, as described on Updating the Collector version on page 418.
2. Click the *Upload File* button in the *File Library* pane. A standard file selection window is displayed.
3. Select a file and click the *Open* button.

   You can hover over the question mark icon ( ) at the top right of the *File Library* pane to display a tooltip showing the file size limitation.

   A progress bar is displayed while the file is uploading, as shown below. After the file has been uploaded (100%), it appears in the list at the bottom of the pane.



- To stop an upload that is in progress, click the *Delete* button ( ) next to its progress bar.
- To delete a file that has already been uploaded into the file library, click the *Delete* button ( ) next to its name.

Uploading a file from the FortiEDR file library to a FortiEDR-protected device

The following describes how to upload a file from the FortiEDR file library to a FortiEDR-protected device.

To upload a file to a FortiEDR-protected device:

1. Open a FortiEDR Connect session with a FortiEDR-protected device, as Connecting to a FortiEDR-protected device on page 109.

2. In case the file doesn't appear at the file library, upload a file to the FortiEDR file library on the FortiEDR Manager, as described on File Library pane on page 112. The File Library page lists the files that you have uploaded to the FortiEDR file library.
3. At the prompt in the FortiEDR console, enter the `%upload_file` or `%upload_and_run` command and specify the path to which it should be uploaded, including the name it should have at the uploaded location, and file name to be uploaded. For example:

```
>>> %upload_file C:\Windows\TEMP\_MEI37122\StatScript.bat StatScript.bat
Upload file StatScript.bat success.
```

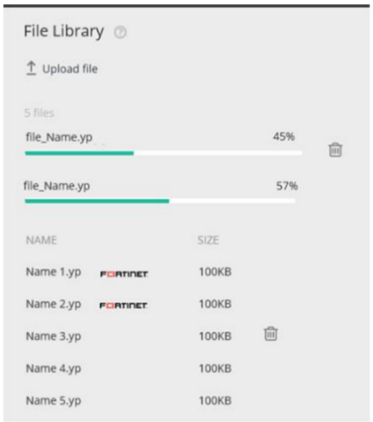
Download a file from a FortiEDR-protected device

The following describes how to download a file from a FortiEDR-protected device.

To download a file from a FortiEDR-protected device:

Open a FortiEDR Connect session with a FortiEDR-protected device, as described on Connecting to a FortiEDR-protected device on page 109. At the prompt in the FortiEDR console, enter the `%download_file` command and specify the full path and file name to be downloaded. For example, `%download_file c:\SuspiciousDir\abcfilename`

Files are downloaded directly to the `Downloads` folder on the device in which the FortiEDR Connect session is running in a browser.



Disconnecting FortiEDR Connect session

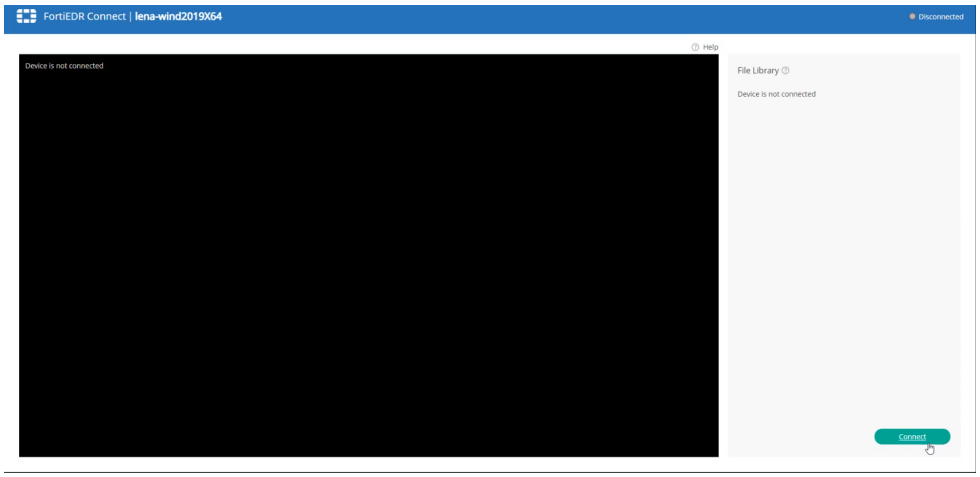
Disconnect a FortiEDR Connect session in one of the following ways:

- Clicking the *Disconnect* button at the bottom right of the *File Library* pane.
- Closing the browser tab by clicking the *Close* button.
- Logging out of the FortiEDR Console.
- Rebooting/shutting down the FortiEDR-protected device. For example, using `reboot/sh`.

- Timing out. If you are not working with the FortiEDR console session, then at some point the session will timeout and disconnect it.

After you disconnect, the message `Device is not connected` is displayed in the FortiEDR console session.

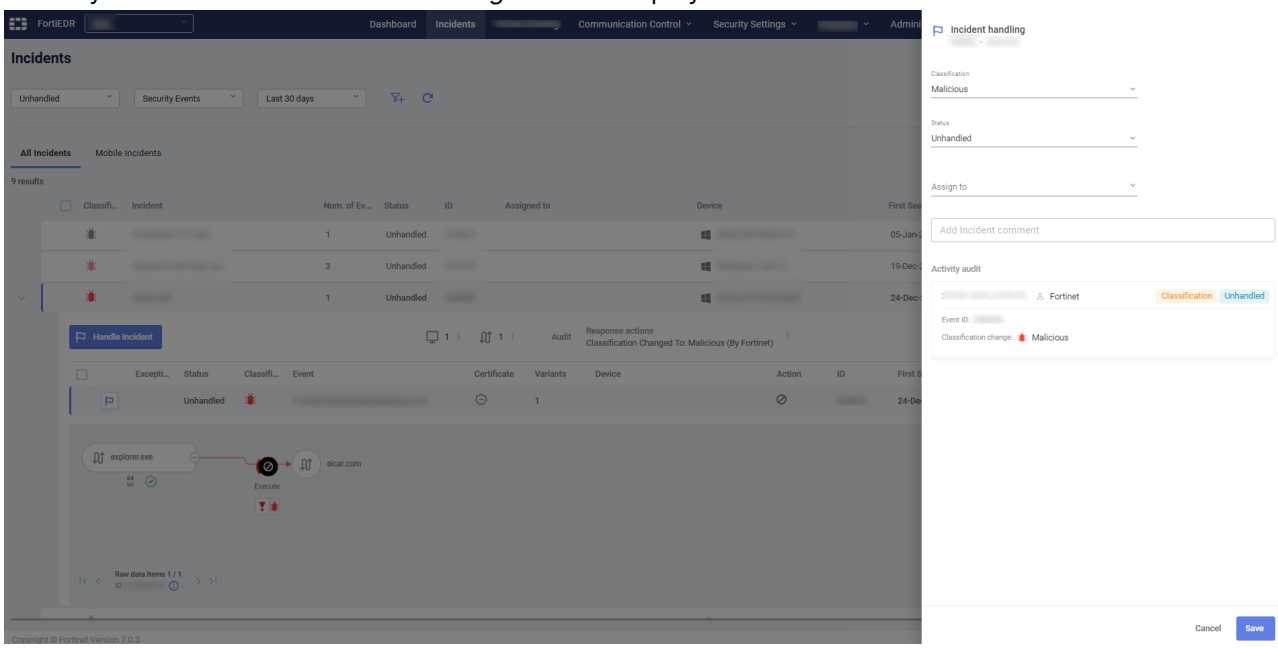
A connected button is then displayed which you can click to reconnect to the same session, as shown below:



Marking a security event as handled/unhandled

The following describes how to specify that you have handled a security event. When any FortiEDR Central Manager user marks a security event as *Handled*, all users see it as having been handled.

1. Select the rule's checkbox and then click the *Handle Incident* button or just click the flag icon of the security event row. The *Incident handling* window displays.



If an exception was already defined for this security event, then the words event includes exceptions are displayed at the top of the *Incident handling* window.

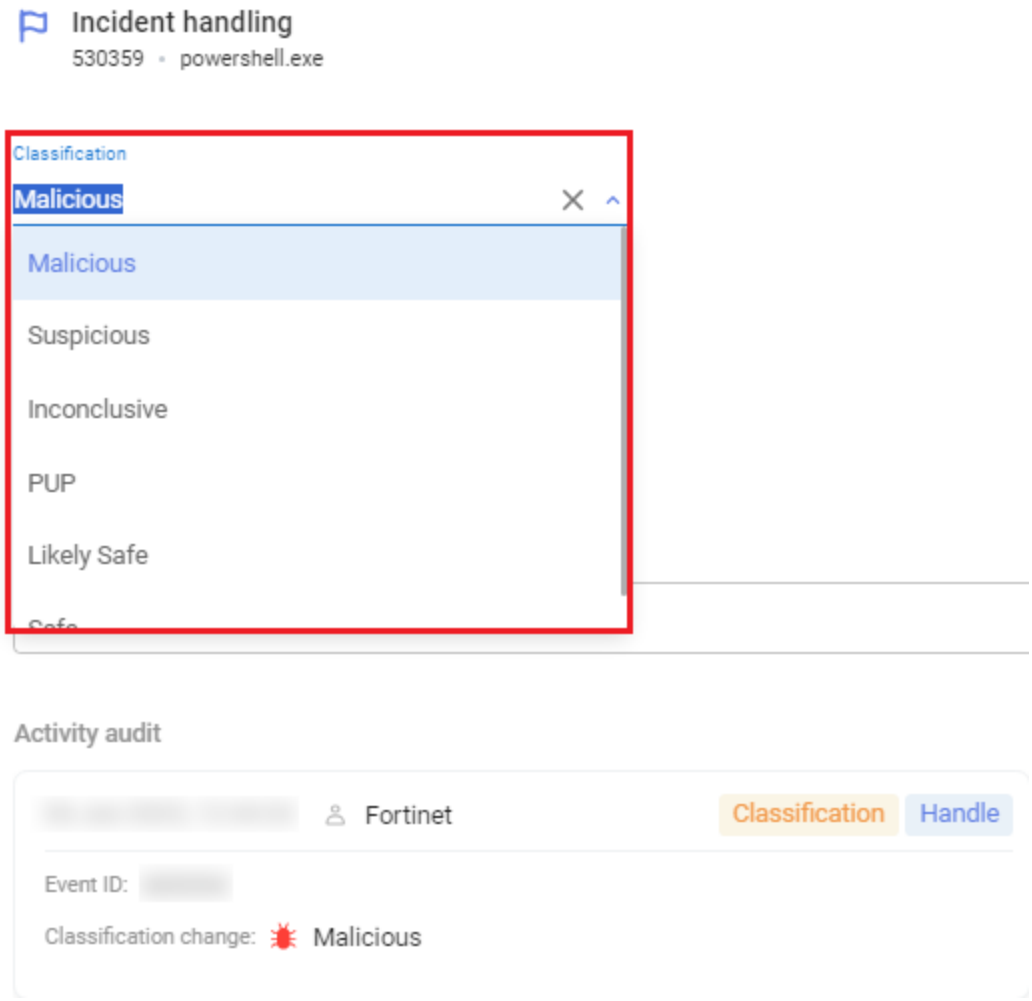
2. In the *Classification* dropdown list, change the classification for the security event, if needed. For more details, see Manually changing the classification of a security event on page 116.
3. In the comments box, use free text to describe how you handled the security event.
4. Click the *Save* button.

Manually changing the classification of a security event

You can manually change the classification of a security event, if needed.

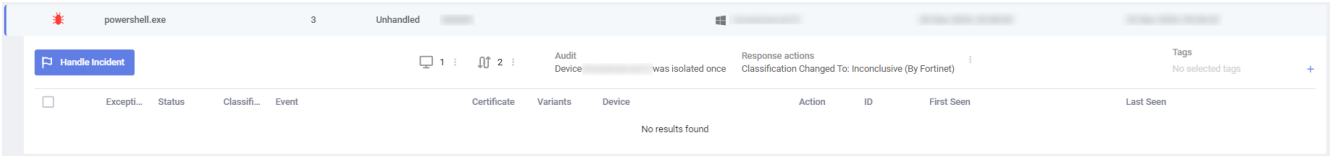
1. Select the rule's checkbox and then click the *Handle Incident* button or just click the flag icon of the security event row. The *Incident handling* window displays.

2. In the *Classification* dropdown list, change the classification for the security event, as needed.



3. Click *Save*.

After changing the classification of a security event, the Overview on page 91 pane displays the history of any actions (Playbook policy-related actions and others) that were made automatically by FortiEDR. For Playbook policy actions, the timestamp shows when the action was performed, as defined in the Playbook policy. For more details about Playbook policy actions, see Playbooks on page 321.



When the Fortinet logo appears next to an entry in the Overview on page 91 pane, it indicates that the security event was automatically classified by FortiEDR. Security events that are manually classified do not display the Fortinet logo.

Notifications for security events are not shown in the *Overview* pane.

Defining security event exceptions

The following describes how to create a new exception and how to edit an existing one.

Exceptions enable you to limit the enforcement of a rule, meaning to create a white list for a specific flow of security events that was used to establish a connection request or perform a specific operation.

FortiEDR exception management is highly flexible and provides various options that enable you to define pinpointed, granular exceptions.

Details describing how to edit an existing exception are described in Editing security event exceptions on page 121. You can access the Exception Manager by clicking the *Exception Manager* button at the top of the *Incidents* pane or by selecting *SECURITY SETTINGS > Exception Manager*. Additional options for managing exceptions are provided in the *SECURITY SETTINGS* tab, as described in Exception Manager on page 211.

An exception that applies to a security event can result in the creation of several exception pairs.

An exception pair specifies the rule that was violated and the *process* on which the violation occurred, including or excluding its entire location path. For more details, see Playbooks on page 321

After an exception is defined for a security event, new identical events are not triggered.

Security events that occurred in the past appear with an icon to indicate that an exception has been defined for them, even though at the time they were triggered, the exception did not exist. This icon on past security events serves as an indication to you that there is no need to create an exception for it, since one was already created (but after the event occurred).

In cases where an exception was defined for the security event but it does not fully cover all the existing occurrences or variants of this event, a slightly different icon is displayed, as described and shown below.

When defining an exception for Listen on Port Attempt events, listening on 0.0.0.0 means listening on all interfaces. In such cases, you should use All Destinations.

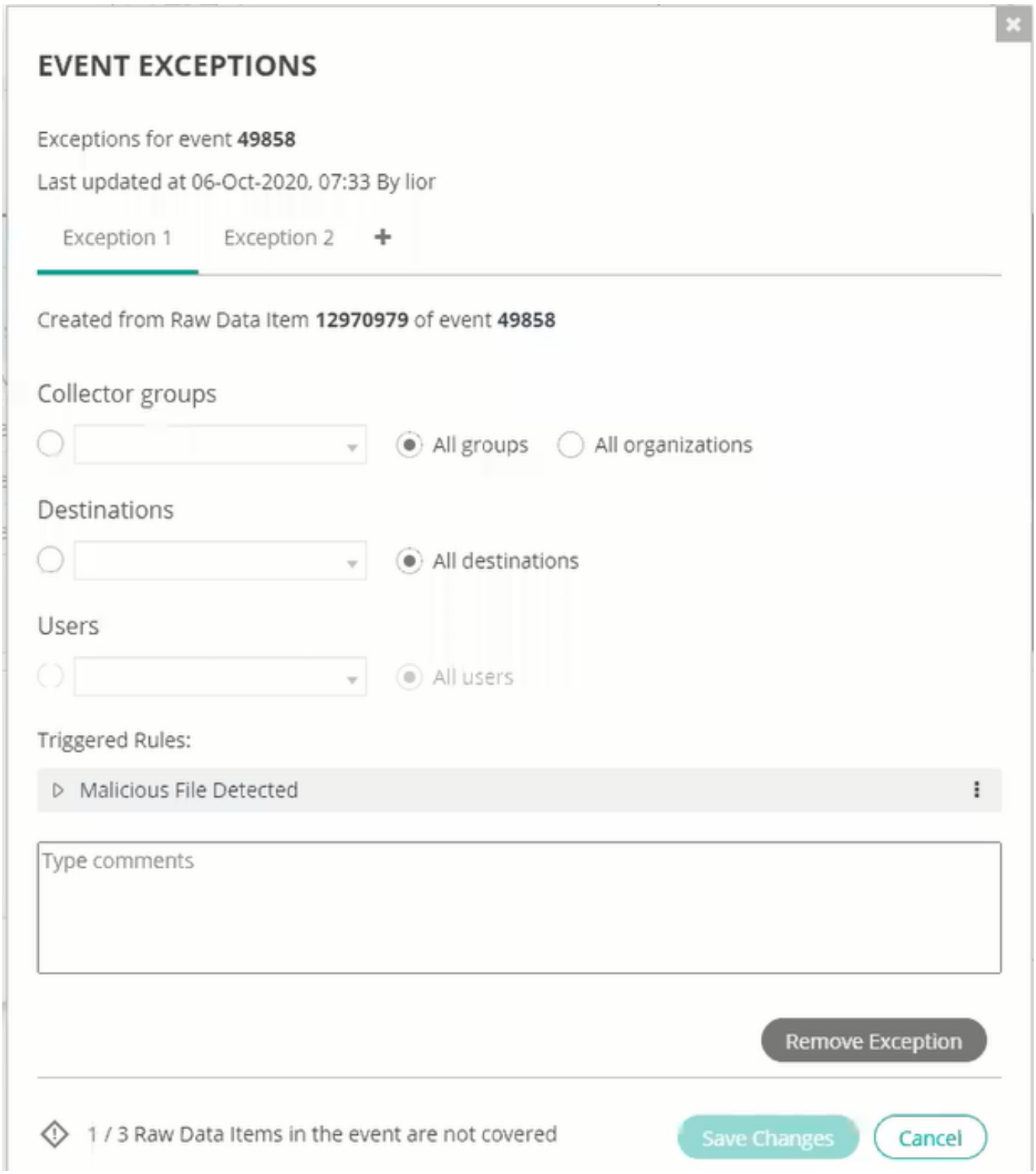
Defining the scope of an exception

When defining an exception, it is important not to make it too broad or too narrow in scope, so that it properly identifies and *catches* the data items that you want.

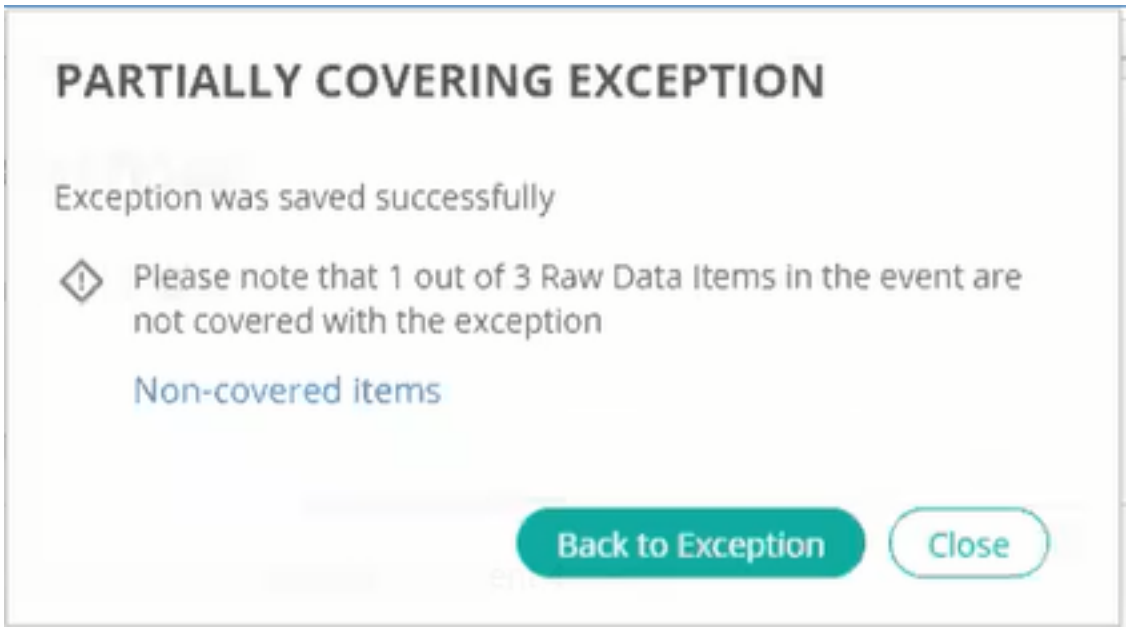
If an exception does not cover all the variants for a security event, the icon displays for that exception. This can happen, for example if the exception was defined only on part of the collector groups and the security event occurred on devices that are not part of the collector groups on which the exception was set.

In addition, the variants comprising a security event distinguish between data items that are covered ( ) and not covered ( ) by the exception, based on the exception's current definition.

For example, if you see that the current exception is too narrow and excludes a variant that you want to include in the exception, you can click the icon and then modify and broaden the exception sufficiently so that it will also include that variant. When you click the icon, the *Event Exceptions* window automatically opens and displays the existing exception which can be broadened. Alternatively, you can click the **+** icon to create another exception that will include the non-covered variant. Clicking the **+** icon after the exception is opened using the covered icon next to the variant opens a new exception from the perspective of that variant, meaning that it includes all the data that is relevant for that variant, as shown below:



In addition, when saving an exception, if the exception does not cover all variants for a security event, a message such as the following displays.



You can click the *Non-covered items* link in this message to open the *Incidents* tab in a new window, and display only not-covered variants.

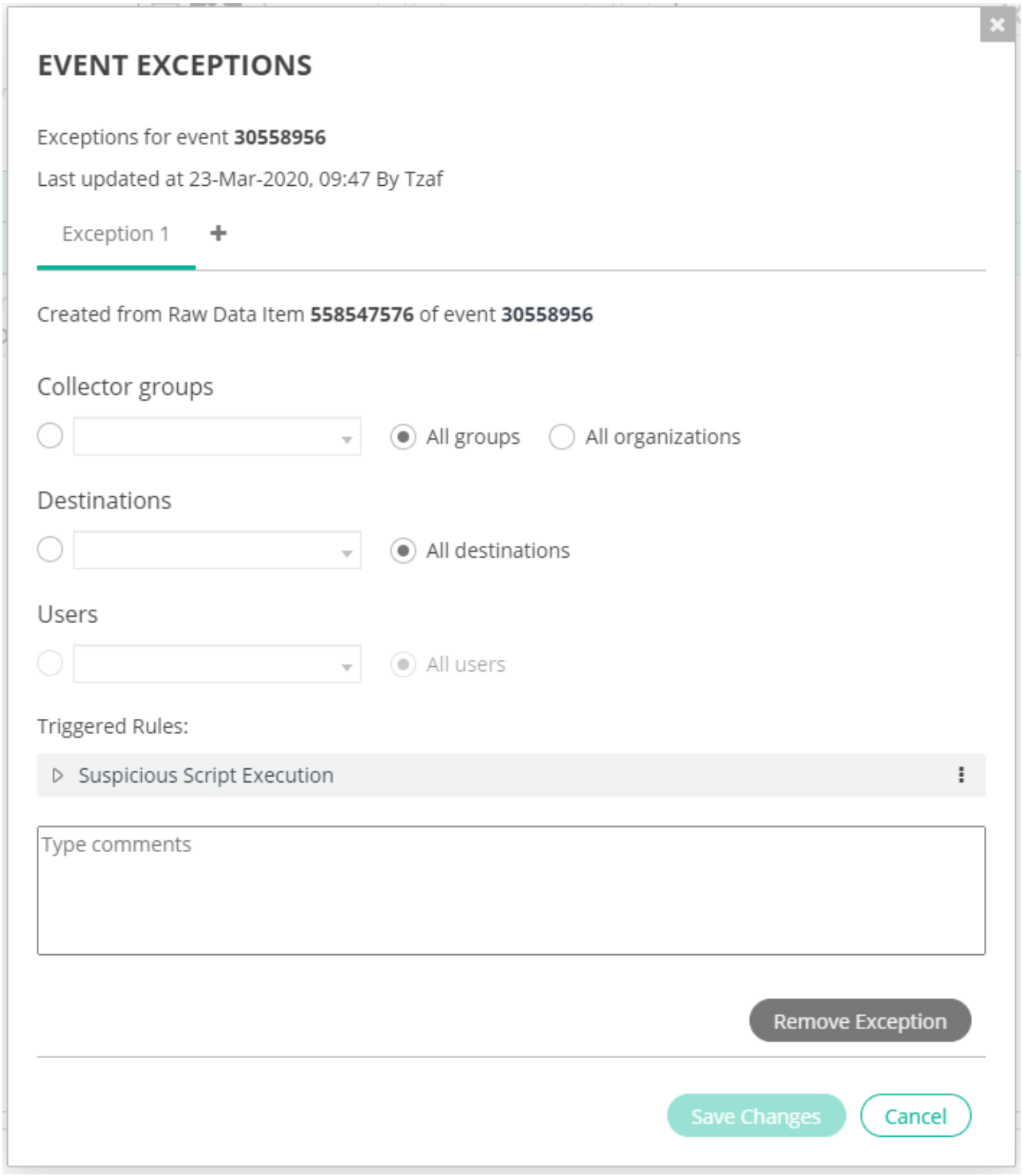
Device Control exceptions

Exceptions on device control security events are similar to other exceptions, with several additional capabilities that enable you to set the exception on a device name, description, serial number or a combination, as follows:

- The USB device's description is specified under the *Process Name* field.
- The device's serial number is listed in order to exclude a specific USB device with the designated serial number.
- The device's name is specified under the second *Process name*.

Editing security event exceptions

1. Click the *Edit Exception* button in the security event row for the exception you want to modify. The following window displays:

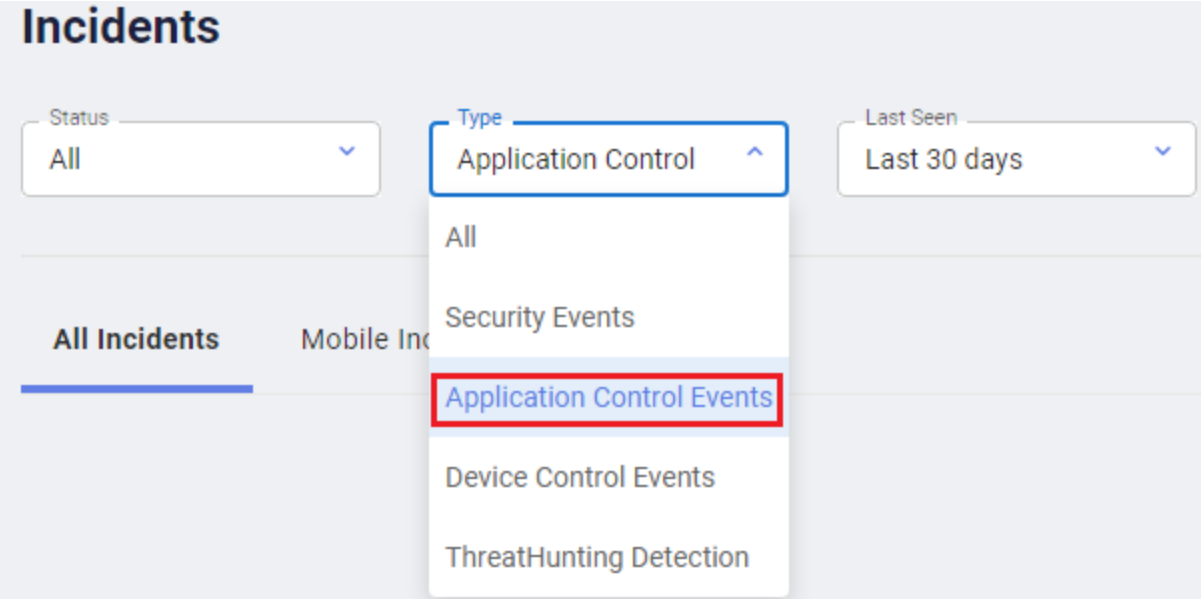


2. Modify the Collector Groups, Destinations and Users to which the exception applies and the pairs of rules and processes that operate together to define an exception in the *Triggered Rules* area, as needed.
   For a multi-organization FortiEDR system, an Administrator can also specify whether the exception applies to all organizations. The *All organizations* option applies the exception to all organizations, regardless of whether or not the security event already occurred.

3. Click *Save Changes*.

Viewing Application Control security events

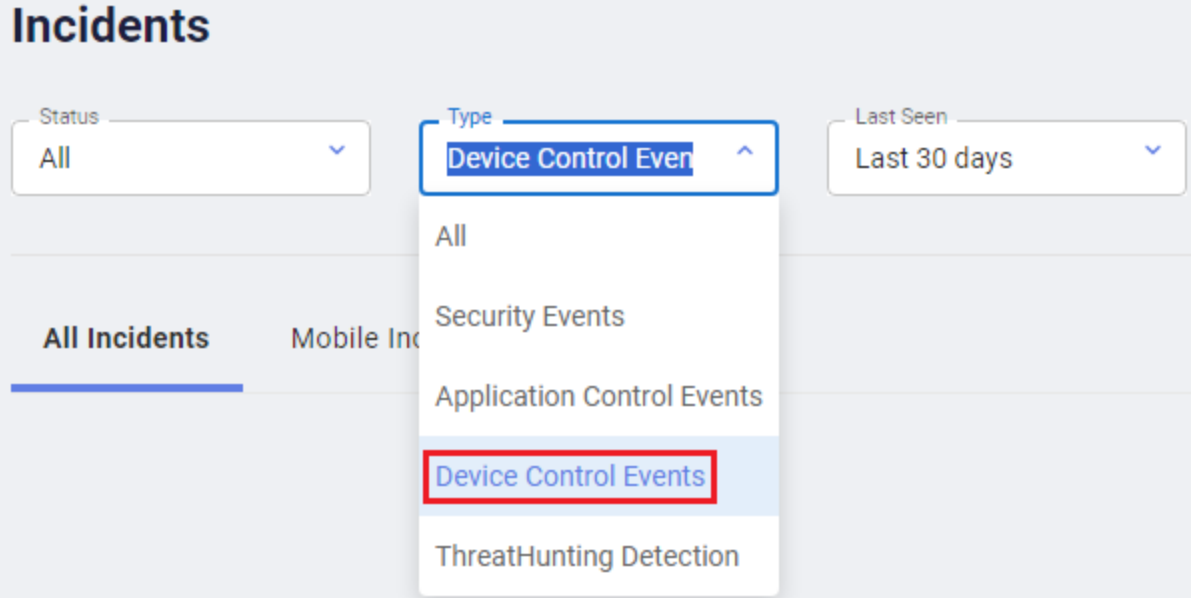
Security events in the *Incidents* tab can be filtered to show only Application Control security events. Application control security events are events that were triggered on rules that are part of the Application Control policy. Such events do not necessarily mean that there was malicious activity but indicate an attempt to execute an application that is listed in the user-defined blocklist. These security events are displayed separately from other security events. Defining an exception for them can be done in a similar manner as for other security events. The exception specifies which applications are blocked by its hash.



Viewing Device Control security events

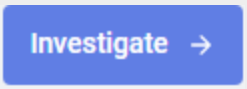
Device Control capabilities are license-dependent. You may contact Fortinet Support for more information.

Security events in the *Incidents* view can be filtered to show device control security events. Device control security events are events that were triggered on rules that are part of the Device Control policy. Such events do not necessarily mean that there was malicious activity but indicate USB peripheral access. These security events are displayed separately from other security events. Defining an exception for them can be done in a similar manner as for other security events. The exception can be set on the device name, vendor, serial number or a combination.



Other options in the Incidents viewer

Option	Description
Sorting incidentss	Click any column name to sort security events. For example, you may want to sort by process and collector in order to see the history of everything that happened to that process on that device.
Free text search	Enter text in the search field to search by process, device, or ID.
Time Filter	Click the down arrow in the Time Filter to display a list of time period options. The default is *Last 30 days*.
Deleting incidents	Select an event and click the *Delete* button ( ) to completely delete a security event from the FortiEDR system. A deleted incident cannot be restored or retrieved. Unless you are having storage capacity issues, we highly recommend just hiding incidents and not deleting them.
Exception Manager	Click the *Exception Manager* button (Exception Manager) at the top right corner to access the Exception Manager on page 211.
Forensics	The FortiEDR Forensics add-on enables you to perform deep analysis of security events, as described in Forensics on page 126.

Option	Description
Investigating incidents	Click the *Investigate* () button for a graphical and interactive view to further drill down the chain of activities involved in the event. See Investigation View on page 92.

Forensics

The Forensics functionality is unavailable for mobile incidents or secure browser incidents.

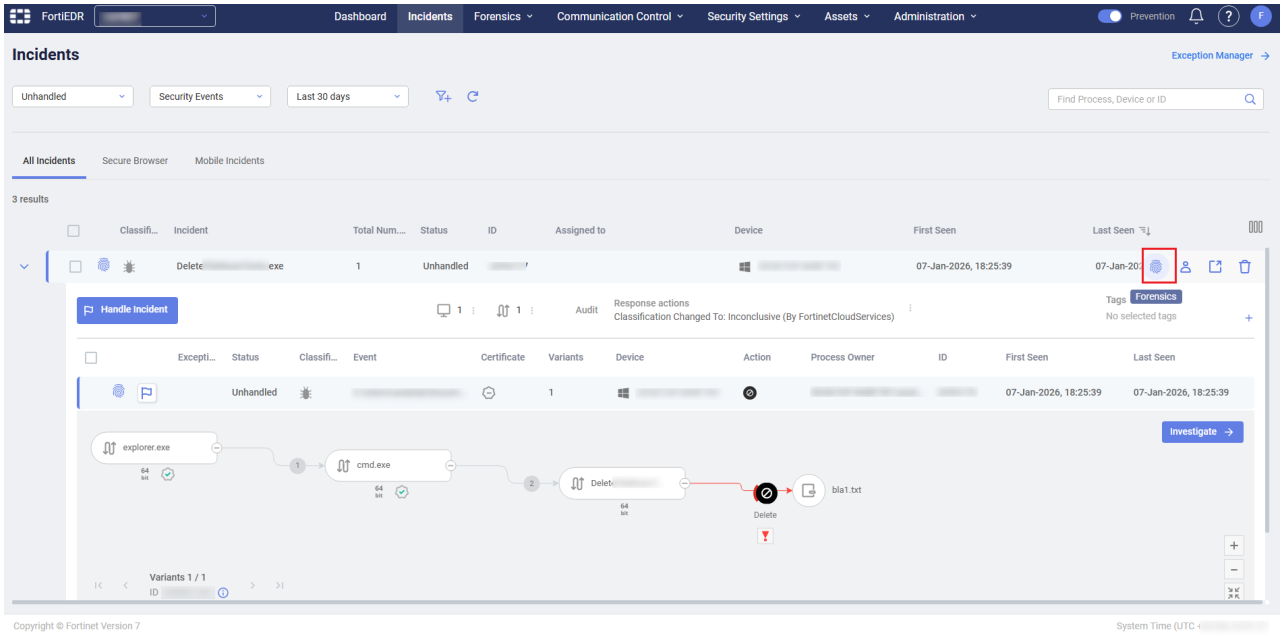
Use the *Forensics* menu to delve deeply into the actual internals of the communicating devices' operating system that led up to the security event.

The *Forensic Viewer* provides an abundance of deep analysis and drill-down options that reveal the process flows, memory stacks and a variety of operating system parameters in a graphic view, such as:

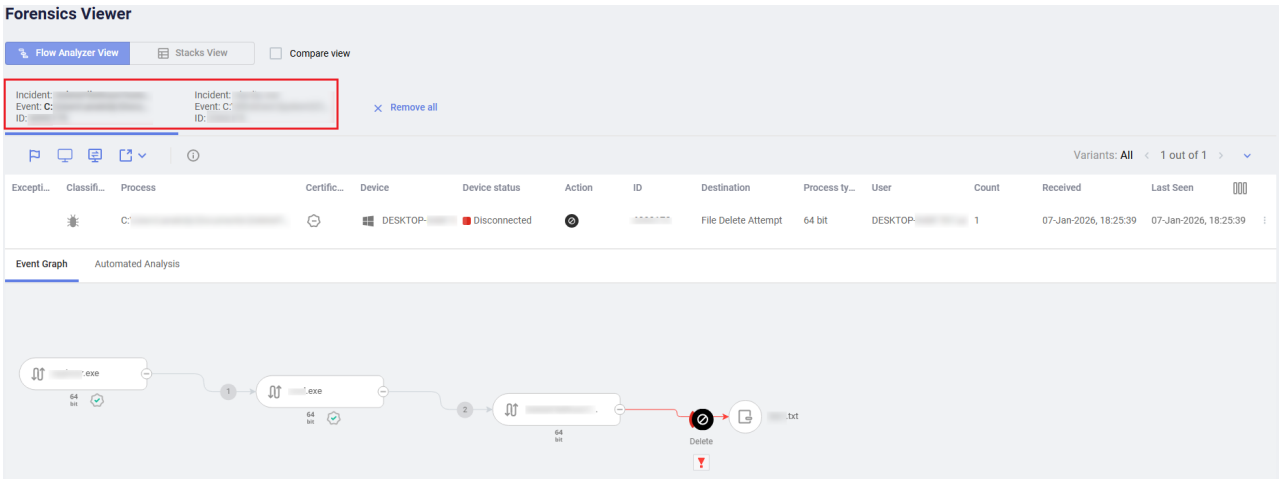
- Infected device and application details.
- Evidence path, which includes the process that the threat actor violated and which type of violation was executed.
- Side-by-side security event comparisons.

The first stage of working with Forensics is to select one or more security event aggregations or security events to analyze. To do so, use one of the methods below:

- In the *Incidents* view, select a security event aggregation and then click the *Forensics* button ( ). Selecting a security event aggregation lets you analyze the aggregation of events triggered on this process.



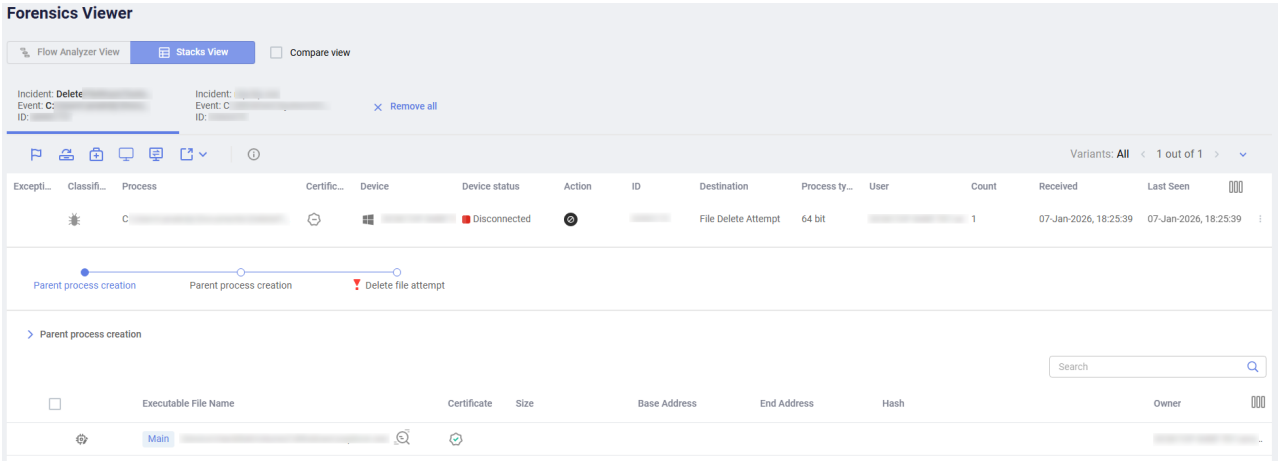
In this case, the Forensics viewer shows a separate tab for each security event associated with the security event aggregation. For example, the figure below shows 4 tabs for a security event aggregation containing two events.



- Select an individual security event in the Event Viewer and then click the *Forensics* button ( ). In this case, the Forensics viewer shows a single tab for the selected security event, with all of its related variants.
- Select a variant when in drill down, and then click the *Forensics* button ( ). In this case, the Forensics Viewer shows a single tab for the selected security event with a single variant.

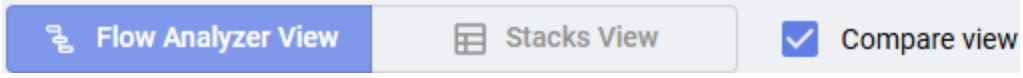
To perform deep Forensic analysis:

1. Select the security events to analyze using one of the methods described on Incidents on page 85. Selected security events that are currently loaded to the *Forensics Viewer* are marked in the *Incidents* with a fingerprint icon.
2. Each selected security event is then displayed in the *Incidents* as a separate tab:

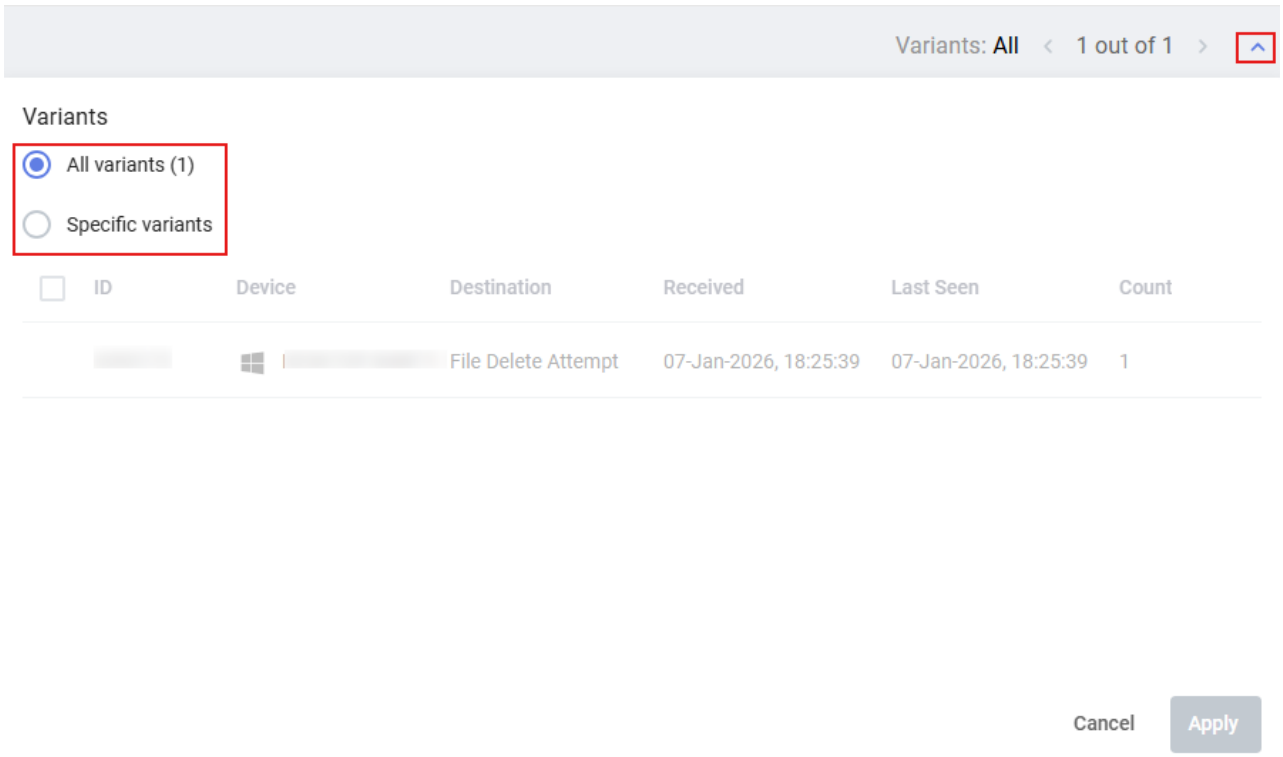


Each tab shows the same information as in the Incidents on page 85, with additional information as described below.

The following options for viewing more information are provided:



In the *Variants* area, expand and select all or specific variants to display for a security event.



Click the *Threat Hunting* button to review relevant Activity Events in the *Threat Hunting* tab.

The *Connect to Device* button opens a console that provides direct access to FortiEDR-protected devices. See Administration on page 359.

Flow Analyzer view

The *Flow Analyzer* view ( ) shows a graphic flow diagram depicting the history of what happened before the security event was triggered, from left to right. Each node can represent a process, a thread or a service.

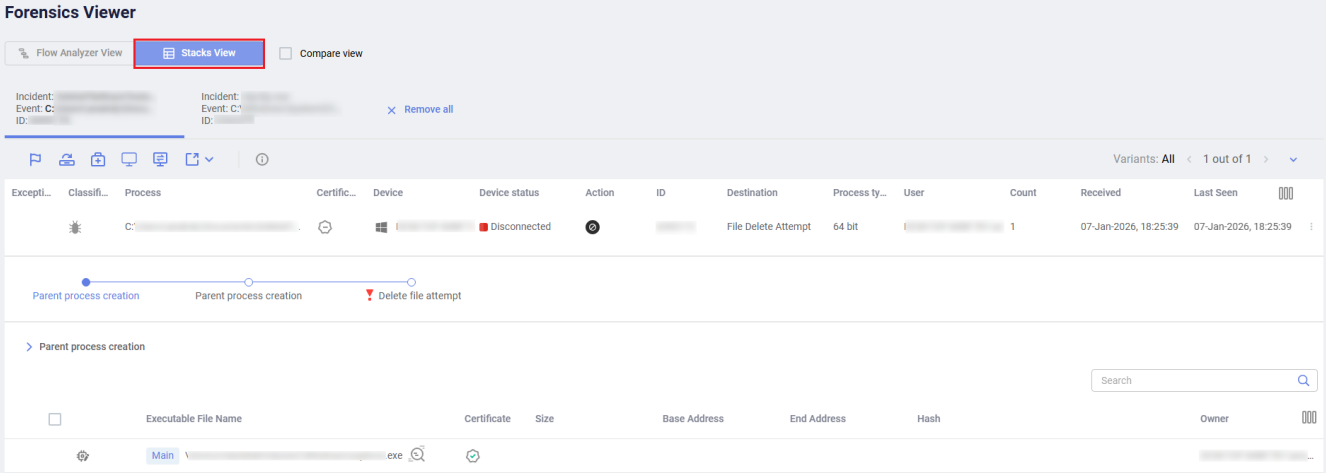
The arrows indicate the sequence of processes and specify the operation that was performed, such as *Create*, *Inject*, *Open* and so on. If multiple operations were performed between two processes, then multiple arrows are shown between them.

Typically, the next to last rightmost node represents a connection request and specifies the IP address to which it attempted to establish a connection. It can also represent an attempt to lock or encrypt a file by ransomware.

The rightmost node represents the action performed by FortiEDR, such as *Log*, *Block*, or *Simulated Block*.

The flow chart is interactive. Clicking on a specific node or arrow drills down to perform further investigation. See Investigation View on page 92 for more details.

Stack view



The Stack view displays the following sections of information:

Field	Description
Incident	Shows the same information as in the Incidents on page 85.
Stacks	A control toolbar that depicts the stacks that were collected in each step prior to the connection establishment requester file access. A red exclamation mark ❗ means that a rule violation was observed in this stack. You can click the different stack names to see the collected stack data.
Stack Content Details	The bottom of the window displays each stack in the flow of the selected step. The stack entries represent the executable files that resided in the stack upon collecting the stack data. Click the stack node to filter the display to show that stack. Click the *Process Hash* link to display a dropdown menu with the following options: • *VirusTotal*: Checks whether this hash was seen elsewhere. This

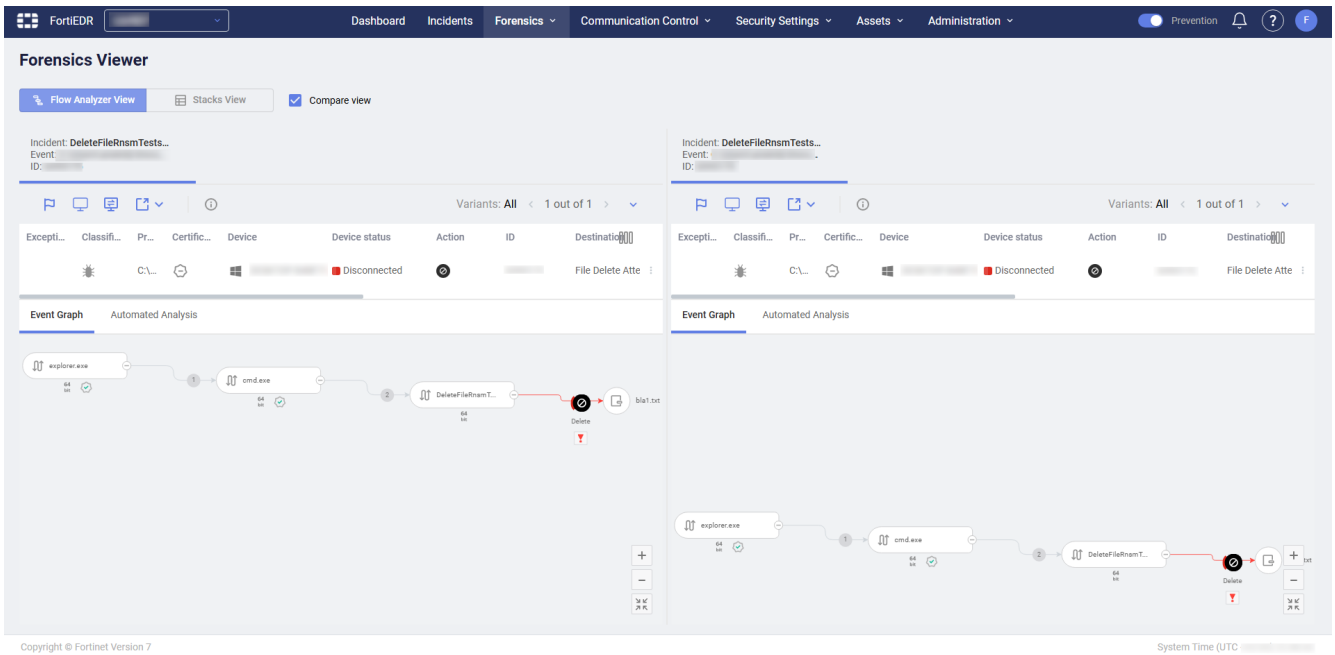
Field	Description
	involves searching another external website (VirusTotal). Clicking the link runs the query in VirusTotal. Alternatively, you can go to www.virustotal.com, click the *Search* tab, paste the hash from FortiEDR and then click *Search It*. • *Threat Hunting*: Checks the activity events that are relevant to this hash. Clicking this option takes you to the *Threat Hunting* page. • *Add to Blocklist*: Adds this hash to the Application Control block list, as described in Application Control on page 234. Clicking this option opens up the *Add Application* Window with this hash specified.

For each executable, you can see the following information:

- Executable File Name
- Writable: Specifies whether the executable code can be modified.
- Certificate: Specifies whether or not the certificate was signed.
- Repetitions: Specifies how many times this executable was detected in the stack.
- Base Address of this entry in memory.
- End Address of this entry in memory.
- Hash: Specifies the file hash.

The row of the executable that triggered the FortiEDR security event is highlighted with a red exclamation mark ❗. This indicates the row that you may want to investigate further. You can expand an executable row to display an even deeper level of information describing that process.

Compare view



The Compare view enables you to display two views side-by-side. They can both be either Flow Analyzer view on page 128 or Stack view on page 129.

Threat Hunting

FortiEDR's Threat Hunting functionality enables you to search for many types of Indicators of Compromise (IOCs) and malware across your entire environment in order to enable enhanced detection. Searching can be based on various attributes of files, registry keys and values, network, processes, event log and activity event types. Search operations apply to both Windows and Linux operating system activity.

Threat Hunting is ideal in situations where you have identified malware on one endpoint and want to search throughout your organization to determine whether this same malware exists on another endpoint, even though it may not be currently running (stealth mode) or in situations where you would like to hunt for the existence of a specific IoC within your organization.

Threat Hunting is a license-dependent add-on and supports only Collectors that run FortiEDR 5.0 or later. You may contact Fortinet Support for more information.

Threat Hunting utilizes *activity events*, which specify an action taken by an entity. Each type of entity may be involved in a variety of types of actions. An activity event consists of a *source* (usually a process), an *action* (the activity event type) and a *target* (Process, file, Registry key/value, network item(, where the source performs the designated action on the target.

For example, when a process runs, it can perform various actions on files, such as File Open, File Read, File Delete and so on. In this case, the process is the source, and it performs an action such as File Open on a target File.

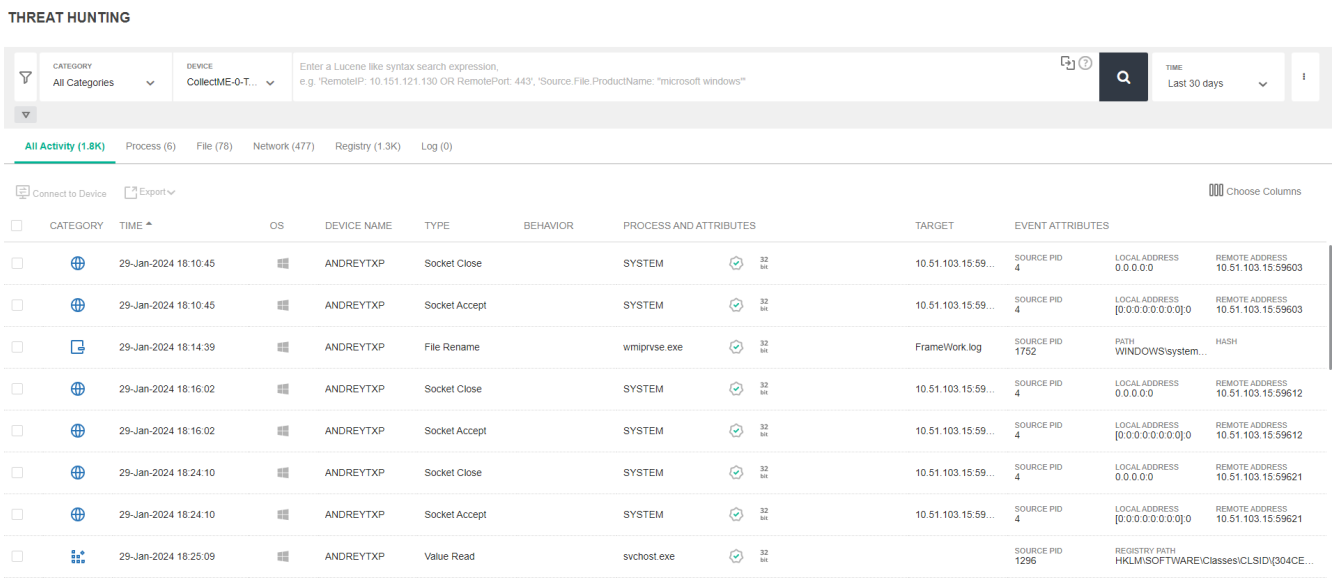
Activity events are not the same as the security events identified in the *Incidents* tab. Unlike *Incidents* tab security events, which are only reported in the *Incidents* tab as they occur and are detected, activity events are continuously collected based on a wealth of data, activity and actions occurring in your system and the chosen Threat Hunting Profile. You may refer to EDR on page 250 for more information.

FortiEDR categorizes the various actions that can be performed into the following categories:

Action	Description
Registry Key Actions	All targets are either registry keys or registry values and all actions are registry-related, such as Key Created, Key Deleted, Value Set and so on.
File Actions	All targets identify the target file on which the action was performed and all actions are file-related, such as File Create, File Delete, File Rename and so on.
Process Actions	The target is another process and all actions are process related, such as Process Termination, Process Creation, Executable Loaded and so on.

Action	Description
Network Actions	The target is a network item (such as connection or URL) and all actions are Network related, such as Socket Connect, Socket Close and Socket Bind.
Event Log Actions	The only action is Log Entry Created and relates to the logs of the operating system - Windows and Linux.

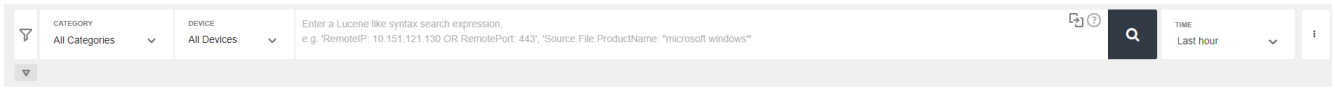
The *Threat Hunting* page contains the following areas:



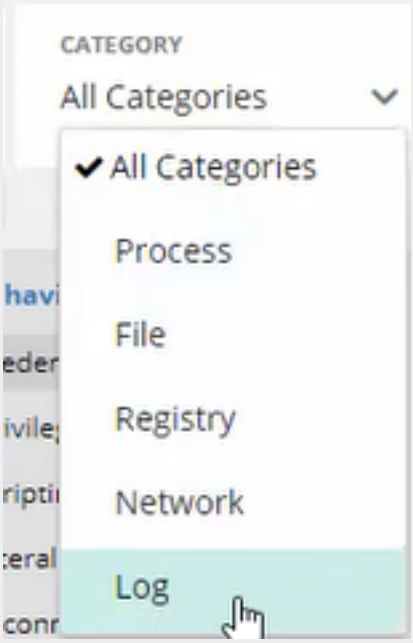
- Filters on page 132
- Facets on page 144
- Activity events tables on page 147
- Details pane on page 151
- Investigation View on page 160
- Exporting threat hunting logs on page 171

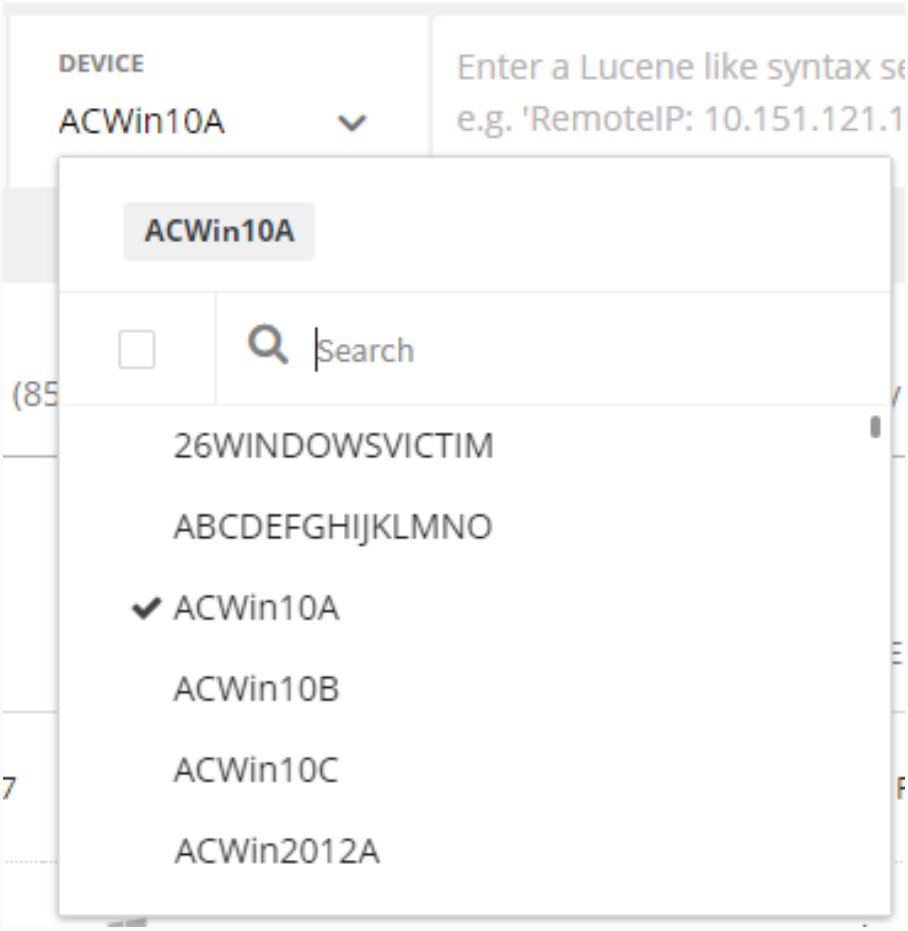
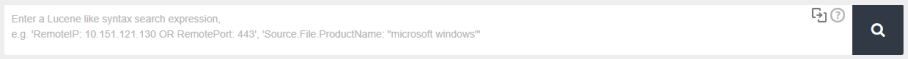
Filters

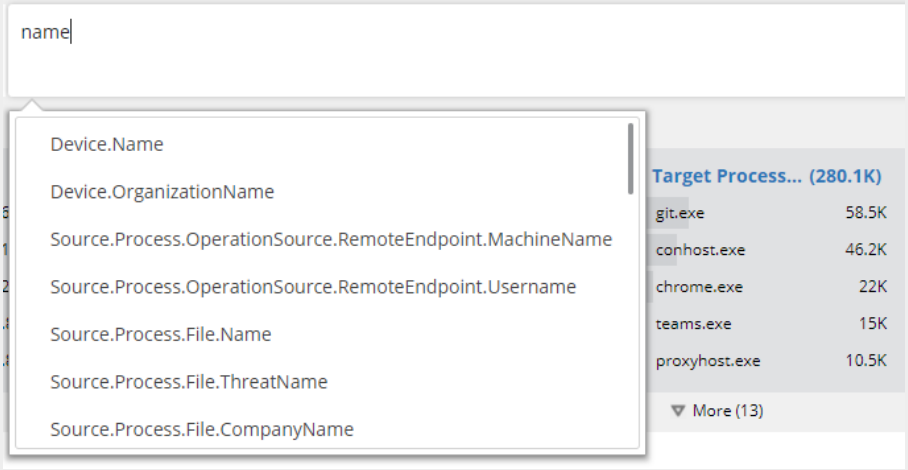
The Filters area enables you to define a query that filters the activity events to display in the result tables. It comprises the following filters:

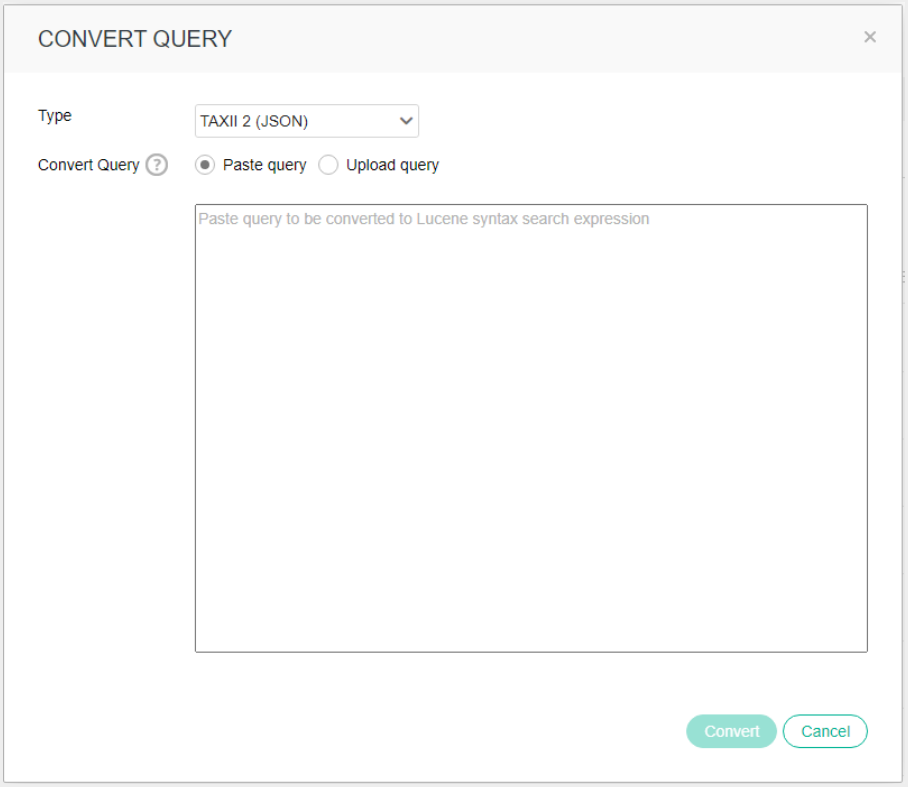
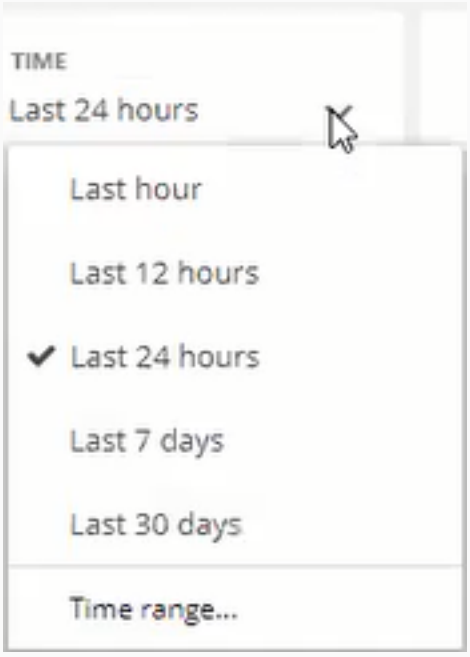


This area also enables you to save queries and to redisplay saved queries, as described in Saving queries and saved queries on page 137.

Filter	Description
Category	The *Category* filter enables you to filter the activity events by their category. 
Device	The *Device* filter enables you to filter by a specific device[s].

Filter	Description
	
Free-text Query	This filter enables you to specify a free-text Lucene-syntax query to filter the results. You can also convert STIX JSON and STIX XML syntax queries into Lucene syntax using the *Convert Query* button.  For Lucene-syntax queries, to simplify definition, the free-text query filter has an auto-complete helper dropdown list that contains all the available activity event fields, as well as available syntax operators. Simply start typing to see a dropdown menu of options. The automatic-complete helper guides you through the process of creating a query by displaying appropriate options in the dropdown menus, such as fields and operators when appropriate.

Filter	Description
	 For JSON and XML syntax queries, use the *Convert Query* button to convert the query into Lucene syntax. You can then select the file type and paste the query or upload a JSON or XML file in the *CONVERT QUERY* window. The following indicators are supported and will be translated into Lucene syntax: hashes, file names, files size, paths, IPs, usernames, registry keys, URLs and domain names.

Filter	Description
	
Time	The *Time* filter enables you to filter for a specific time period. The default is the last hour. 

Filter	Description
	When you run a Threat Hunting query with a *Time* filter, the response time can vary depending on the period and the amount of collected data. When the time is set to *Last 30 days*, the query can run for a few minutes.

To clear the contents of all the filters in the *Filters* area, at the far right of the page, click the eclipsis icon ( ) and select *Clear all*.

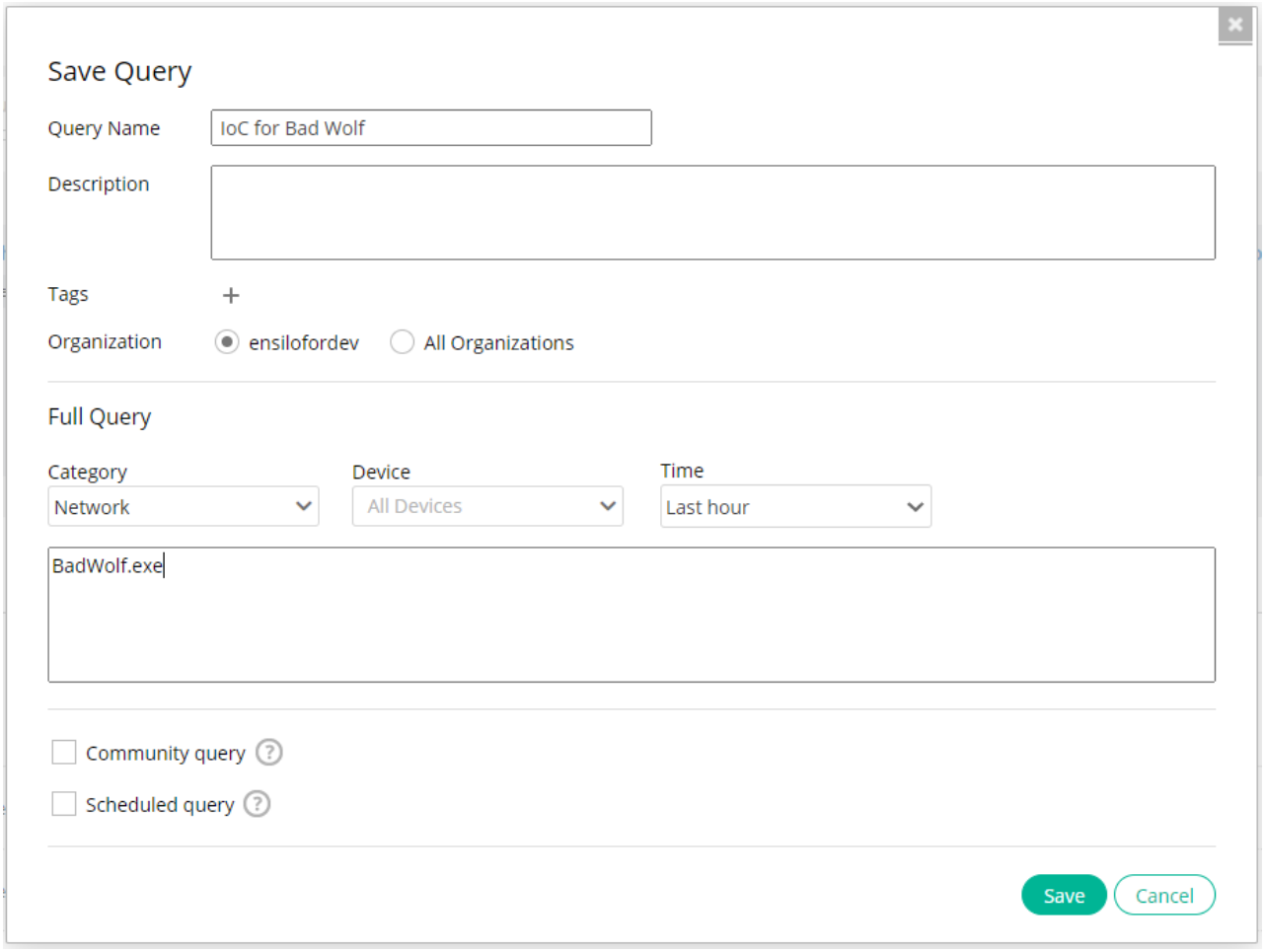
Saving queries and saved queries

After filtering the activity events displayed in the result tables, you can save the query to be redisplayed when needed. Saving a query in this manner also enables you to define it as a scheduled query in order to automate the process of threat detection.

Out-of-the-box queries, provided by Fortinet, are marked with the logo FORTINET. You can change the scheduling of a query defined by Fortinet and/or disable the execution of a query. However, the query itself and its name cannot be edited. If you need to edit one of the Fortinet-defined queries, copy the query itself and paste it in a newly created query. In this case, it is recommended to disable the original Fortinet-defined query.

To save a query:

1. Use the filters to display the desired filtered events in the result tables.
2. In the Filters area, at the far right of the page, click the button and select *Save Query*. The following displays populated with the current filter definitions. The *Category*, *Device*, and *Time* dropdown menus show the filter selections and the box underneath it shows the actual query string. For example, as shown below:



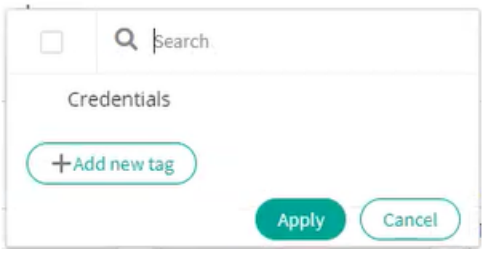
3. Fill in or modify the definitions of this saved query, as follows:
   - *Query Name*: Enter any free text name describing this query.
   - *Description*: Enter any free text description of this query.
   - *Tags*: Enables you to assign one or more metadata tags to this query. You can assign a previously defined tag to this query or define a new tag. These tags can then be used for general information purposes and for searching through queries in the *Incidents* tab.

   These tags only relate to saved queries.

   Tags +

   Click the *Add* button to assign tag(s) to this query. The following displays:

Tags

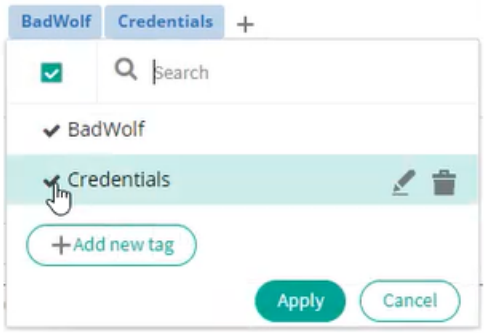


All previously defined tags (for any query in your organization) are listed for your selection.

If this tag is assigned to this query, a checkmark appears on its left: ✔ Credentials .

To assign a tag to this query, simply click on it. It will then show the checkmark to its left. Each tag that you assign appears as an icon, as follows:

Tags



To unassigned a tag from a query, click on it in the list so that its checkmark is removed or hover over it to display a *Cancel* button (X) and then click the *Cancel* button (X) to delete it, as shown below:

Tags

To create a new tag, click the *+ Add new tag* button.

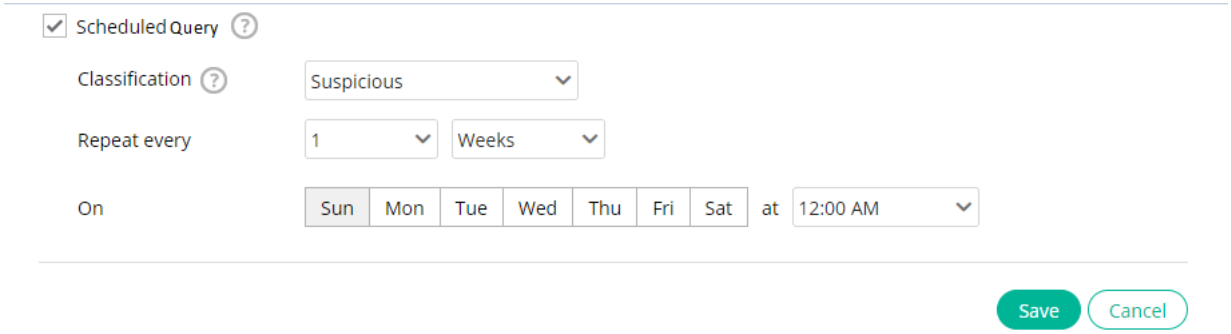
To modify the name of the tag or to delete it from the list (and from all queries to which it was assigned previously in the organization(s) of the logged in user), hover over it and click the *Edit* or *Delete* icon, as needed.

Click the *Apply* button to assign all the selected tags (with checkmarks) to this query.

- *Organization*: Specifies the name of the organization in a multi-organization FortiEDR environment when the logged in user has a Hoster role. In a single-organization FortiEDR system, this field does not appear.
- The *Category, Device and Time* dropdown menus show the filter selections and enable you to modify the selection.
- *Query String Box*: Displays the actual query string according to the selections made above and enables you to modify it.
- *Community Query*: Select this option to specify that it is shared with the entire FortiEDR community including other organizations.

After you have defined a Community Query and saved it, you can edit it. Unchecking the Community Query option means that this query is no longer available to the FortiEDR community. If however, a community member already copied this query, they will still have it, even after you unshare it here.

- *Scheduled Query*: Mark this option to automate the process of detecting threats so that this query is run automatically according to the schedule that you define. A security event is automatically created in the *Incidents* tab upon detecting threats (query matches). Notifications are sent according to the security event's definition, such as via email, Syslog and so on. You can also configure playbook actions for the triggered security events from the scheduled query.
  Enabling this checkbox shows the following options:



  The time range of the activity events that this query matches is determined by the frequency of the schedule. For example, if you define that the query automatically runs once a week, then each time it runs, it will match and create a security event for all the activity events in the most recent week; the same goes for it being scheduled once a month – in this case, the query will match all the activity events in the most recent month.

  Define the scheduled query, as follows:

Field	Definition
Classification	Select the classification of the Security Event to be issued when the scheduled query has run and found matches. The Classification specifies how malicious the security event is, if at all. Classifications are initially determined by FortiEDR automatically or manually and are shown in the *Incidents* tab, as described in Overview on page 91. They can be: • Malicious • Suspicious • Inconclusive • Likely Safe • PUP (Potentially Unwanted Program) • Safe
Repeat Every/On	These options enable you to define the frequency and schedule when this query will be run. For example, to repeat the query every week on Sunday, make the selections shown in the screen above.
Trigger Playbook Actions	Specifies whether to allow FortiEDR to trigger the corresponding Playbook action of the triggered security event from the scheduled query. Enabling this checkbox allows FortiEDR to automatically apply the action of the Playbook that is assigned to the Collector Group the triggering device belongs to. Configure the following options:

Field	Definition

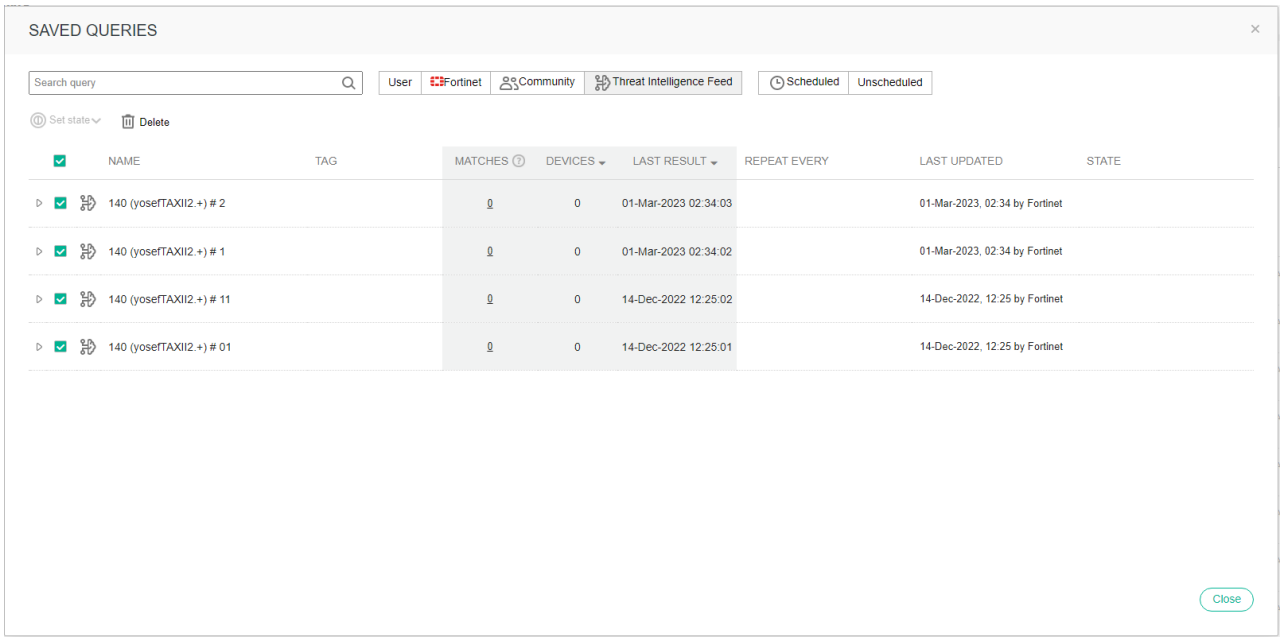
	• *Terminate Process*—Specifies which process in the Activity Event, which resulted from the execution of the saved query, should be terminated:
	  • *Source Process*
	  • *Source Process Parent*
	  • *Target Process*
	• *Delete File*—Specifies which file in the Activity Event, which resulted from the execution of the saved query, should be deleted:
	  • *Source Process File*
	  • *Target File*
	  • *Target Process File*
	  • *Target Executable Image File*

4. Click *Save* to save this query so that it is available to be redisplayed, as described below. The system runs the query immediately in order to verify that it is functional.

If the system detects a large quantity of events about which to send notifications, then a warning message is displayed suggesting that you refine the query so that there are fewer matches. The reason being that extremely large quantities of notifications may be more of a hindrance than a help.

To display a saved query:

1. In the *Filters* area, at the far right of the page, click the eclipsis icon (⋮) and select *Saved Queries*. The following displays listing all the queries that were saved using the *Save Query* option.



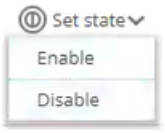
For each saved query, this list shows the quantity of matches detected (*MATCHES*), the quantity of devices on which these matches were detected and the last time the query was run (*LAST RESULT*). These three columns are highlighted in gray, as shown above. Additional details about the queries definition are also displayed in each row. Out-of-the-box queries, provided by Fortinet, are marked with the Fortinet logo .

2. Click on the row of a saved query to display additional details about that query's most recent run. For example, as shown below:

3. You can filter this list of saved queries by typing into the *Search* field and/or selecting one of the following options:
   a. /*User*: To select defined queries. Selecting *User* filters by saved queries that were created by a user.
   b. *Community/User*: To specify that Community Queries are listed in this window, click the *Community* option. A Community Query is one whose Community Query field was marked when it was created/modified. appears in the list next to *Community Queries*. *User* refers to queries that are not Community Queries, meaning that each one is only available to the Organization for which it was created.
   c. *Threat Intelligence Feed*: To specify that Threat Intelligence queries are listed in this window, click the *Threat Intelligence Feed* option. Upon each retrieval of Threat Intelligence Collection data, one or multiple queries with the name *Collection ID/Name (Connector Name) #x* are created by the Threat Intelligence Feed connector that you configure under *Profiles > Integrations > Connectors*. As one Threat Hunting query can include only 150 to 1000 conditions, depending on the indicator type, FortiEDR may create multiple Threat Intelligence query entries for the same Collection.
   d. *Scheduled/Unscheduled*: To specify that Scheduled Queries are listed in this window, click the *Scheduled* option. A Scheduled Query is one with the *Scheduled Query* field marked when it was created/modified.
4. You can modify a saved query by hovering over it. The following tools are displayed on the right of the row:

Tool	Definition
Run Now	To run and detect activity events now according to this saved query.
Edit	To edit the *Saved Query* definition.
Delete	To delete the saved query. Multiple queries can be deleted at once by marking the checkboxes on the left side of each row and then clicking the *Delete* icon at the top of the window.

5. To enable/disable a saved query, mark the checkboxes on the left side of the relevant rows and select the *Enable/Disable* option in the *Set State* dropdown menu.

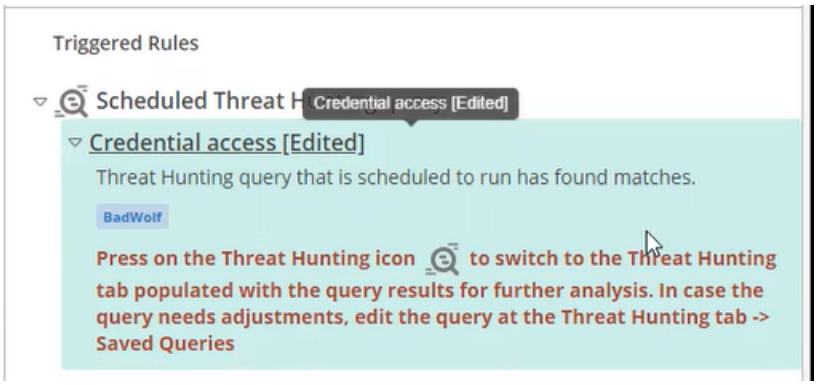


Scheduled queries

Scheduled queries enable you to automate the process of detecting threats so that it is activated automatically according to the schedule that you define. This will enable timely and continuous detection and notification of threats. A scheduled query runs automatically when you define a query as a scheduled query, as described below. Each time it runs and detects a match, it generates a security event in the *Incidents* tab, and sends a notification (via email, Syslog and so on) according to the security event's definition.

The security event that is generated by a scheduled query in the *Incidents* tab is similar to a standard security event, except for the following:

- The *Create Exception* ( ) button is not available as you cannot define an exception for saved query security events.
- In the Process View of the *Incidents* tab, a saved query security event shows the name of the saved query instead of the process name.
  The classification (in the *CLASSIFICATION* column) is determined by the definition of the saved query.
  In the same manner as other security events it indicates the quantity of devices (in the *DEVICE* column) on which this type of activity events were found. All other aspects of a saved query security event are the same as other security events.
- Clicking the *Threat Hunting* option on the right side of the saved query security event in the *Incidents* tab displays the *Threat Hunting* tab and the saved query that was run, because that is what triggered the security event.
- The *Incidents* tab does not show any advanced data for a saved query security event.
- *Triggered Rules*: When a saved query security event is selected in the *Incidents* tab, the *Triggered Rules* pane on the bottom right of the page indicates that this security event was triggered by a *Scheduled Threat Hunting Query*, as shown below:
  The name of the saved query is listed below it. Click that saved query's name (for example, *Credential Access (Edited)*) to display additional details about this saved query, such as its description and the tags that were defined when it was created/modified, as shown below:



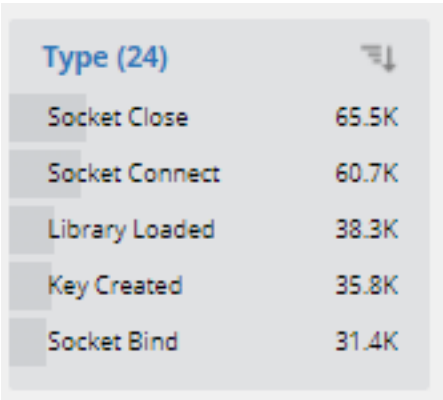
- In the *Device View* of the *Incidents* tab, a saved query security event appears under the devices that were affected. It also shows the name of the saved query instead of the process name.
  If this security event was triggered for more than 100 devices, then this row shows a notification indicating that they are not all listed here and that you can use the *Threat Hunting* option on the right of this event's row to investigate further.

Facets

As expected, the continuous, realtime collection of Threat Hunting data produces numerous activity events. The sheer volume of activity data makes working directly with these activity events almost unmanageable. Therefore, FortiEDR uses facets to summarize the data displayed in the results tables. Facets are predefined in FortiEDR and represent the same data that is displayed in the results tables, but in an aggregated form. As such, facets represent the aggregation of the values in the results tables.

Each individual facet pane summarizes the top five items for that facet. For example, in the *Type* (action) facet below, the facet lists the top five actions, based on the filters applied in the query. The number at the top in parentheses () indicates the total number of different values for this facet in the results table, in this case 24. In this case, the top five actions are *Socket Close*, *Socket Connect*, *Library Loaded*, *Key created*, and *Socket ind*.

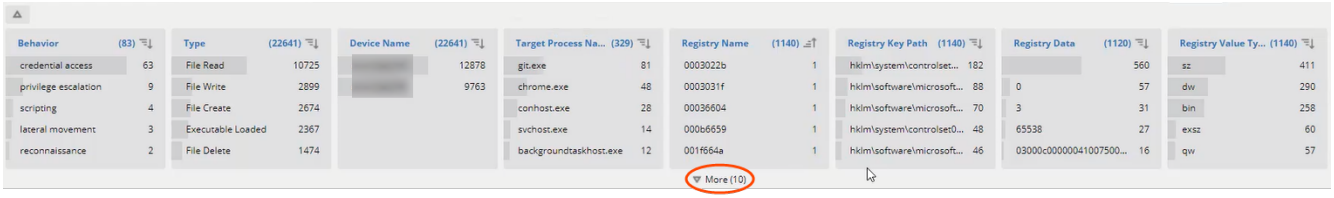
Facet can show the bottom five instead of the top five. In order to switch from the top five to the bottom five for this specific facet, click on the arrow on the right side of the number .



The filters applied in the *Filters* area affect the results displayed in the *Facets* and *Results Tables* areas.

The displayed facets vary according to the filters used in the *Filters* area.

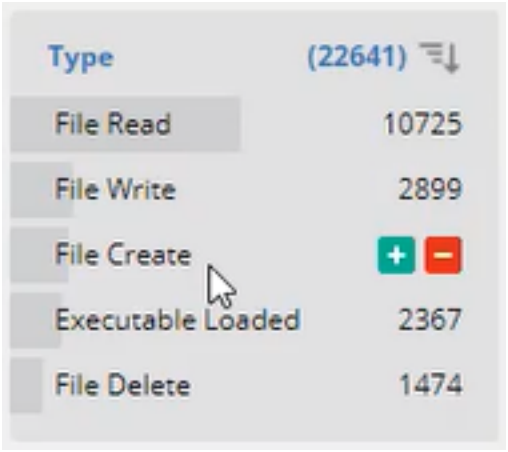
You can click the *More* link to display additional facets.



You can click the button to minimize the *Facets* area.

Filtering using facets

Facets provide an easy-to-use mechanism to aggregate the results in the *Activity Events* tables. In addition, you can also further narrow the results in the *Activity Events* table directly from the facets by including or excluding specific values. For example, when you hover over an item in a facet pane, a green and red button appear in its row. Click the green plus button to include that item as a filter or click the red minus button to exclude that item as a filter.



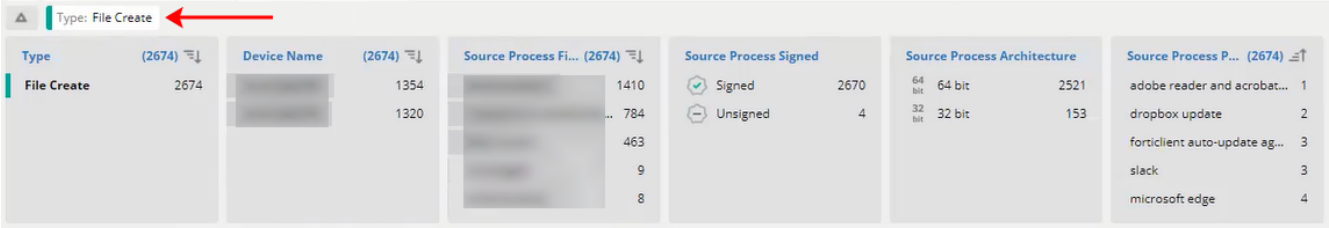
Then, click the *Apply* button.

An item highlighted in green

indicates that it has been marked as an inclusion filter, but has not yet been applied by clicking the *Apply* button. An item highlighted in red

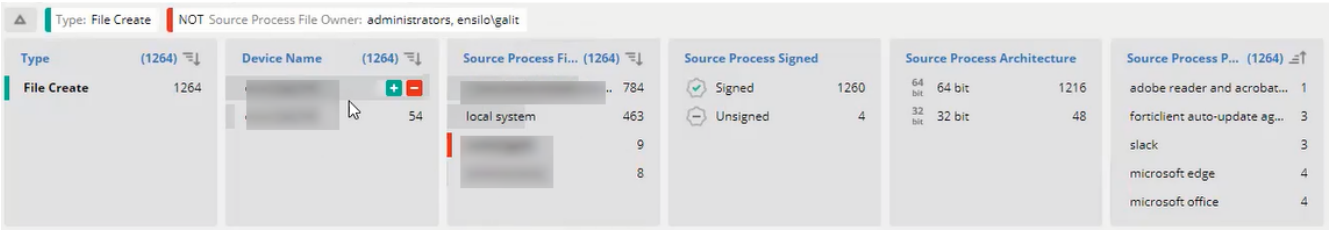
indicates that it has been marked as an exclusion filter, but has not yet been applied by clicking *Apply*.

Clicking the *Apply* button applies the additional filtering criteria to the threat hunting query. In addition, it creates a *chip* (indicated by the arrow in the following picture), which represents that additional filter and displays it at the top of the Facets area. In the example below, the query has been further filtered to only show the *File Create* type of action. Each chip is also part of the threat hunting query.



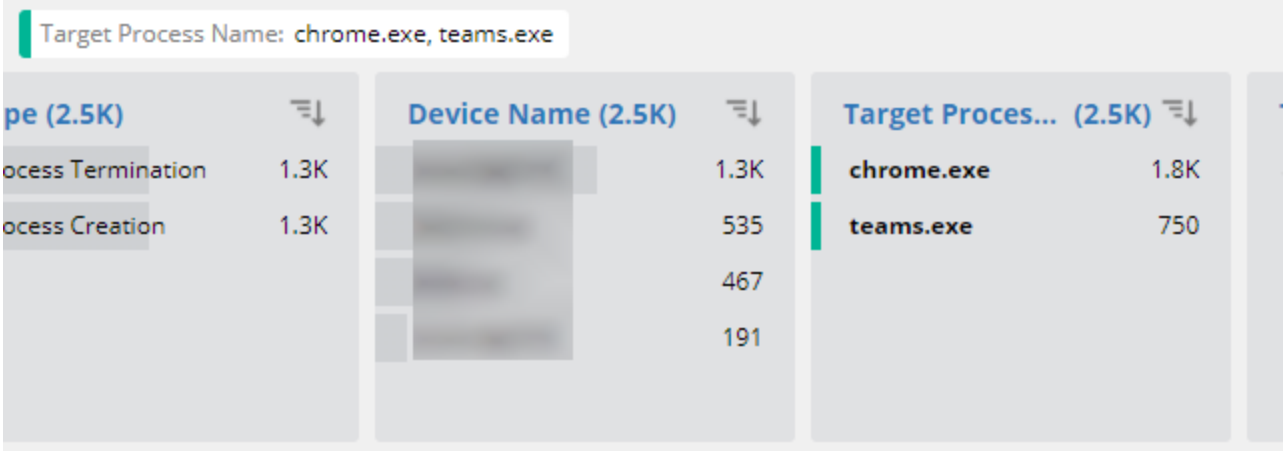
Each chip has either a green or red border on its left side to indicate whether it was defined to include (green) or exclude (red) that item in the filter.

Each Facet pane may have a green or red left border to indicate whether it has been applied in the query, meaning that the displayed results are filtered by it.

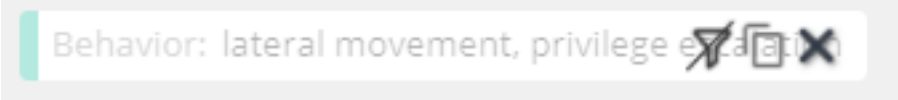


You can define an unlimited number of chip filters, with an AND relationship between multiple filters. Each facet can create up to two chips, one for the inclusion of values and one for the exclusion of values.

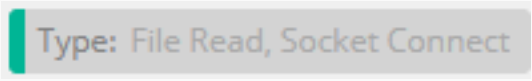
If two values have been added to the query from the same *Facet* pane, the relationship between the values in the chip is OR. The following example shows that the query includes activity events in which their *Target Process Name* is either `chrome.exe` or `teams.exe`, which is shown below in both the chip and in the facet.



Hovering over a chip enables you to remove, disable or copy it, as follows:



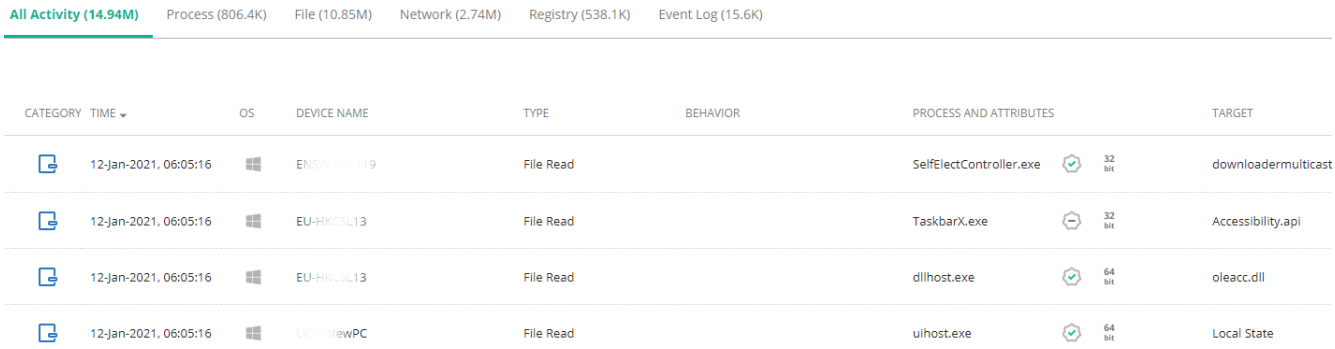
Tool	Definition
Remove	The chip is removed and the Facets and Result tables are updated accordingly.

Tool	Definition
Disable	A disabled chip no longer affects the results. The Facets and the Results tabs are updated as if the chip was removed and the chip appears as follows: 
Copy	The chip content is copied to memory and can be pasted into the query for further editing.

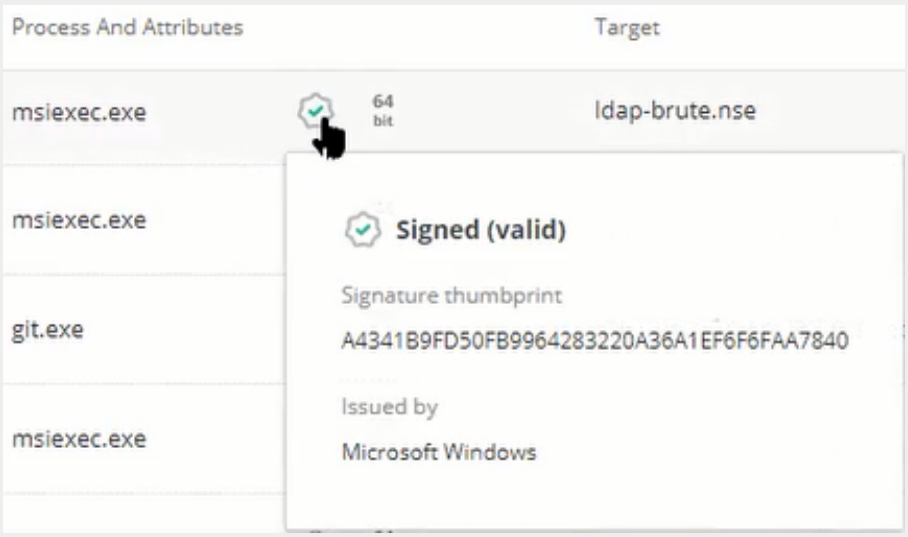
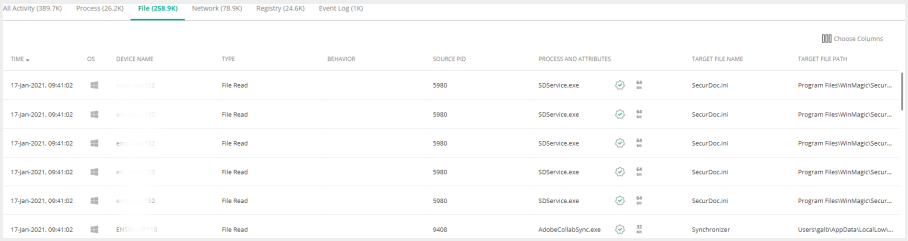
In order to enable a disabled chip and update the results according to its criteria, click the *Enable* icon.

Activity events tables

The results presented in the tables in this area are activity events. The activity events table area contains six tabs, each representing one category of activity events, as follows:

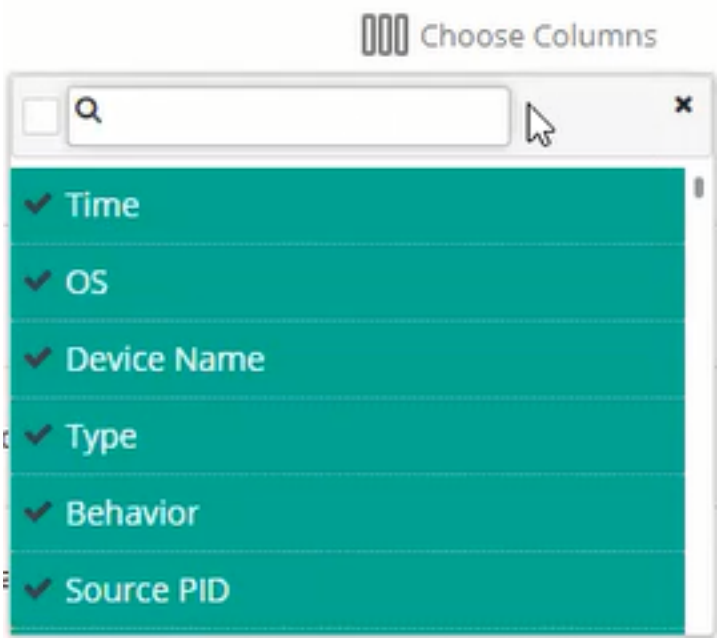


Category	Definition
All Activity	This tab lists all activity events, based on the filters defined for the Threat Hunting query. The number in parentheses () specifies the total number of activity events, based on your query criteria. This total equals the sum of the activity events in the other five tabs. Each Category of activity events is represented by a different icon, as follows: • Process • File • Registry • Network • Log You can hover over the icon in the *Process and Attributes* column to temporarily display additional details about the source process, including whether it is signed, its signature, issuer and so on.

Category	Definition
	 There are several types of attribute icons, such as Signed/Unsigned.
Process	This tab shows all matching activity events of category Process.
File	This tab shows all matching activity events of category File. 
Network	This tab shows all matching activity events of type Network.
Registry	This tab shows all matching activity events of type Registry.
Event Log	This tab shows all matching activity events of type Event Log.

Each table contains a row for each matching activity event and each table includes different columns according to the category.

You can select which columns should appear in any of the tables using the *Choose Columns* option at the far right of the page. You can type in the *Search* box to help narrow the list of columns that display.

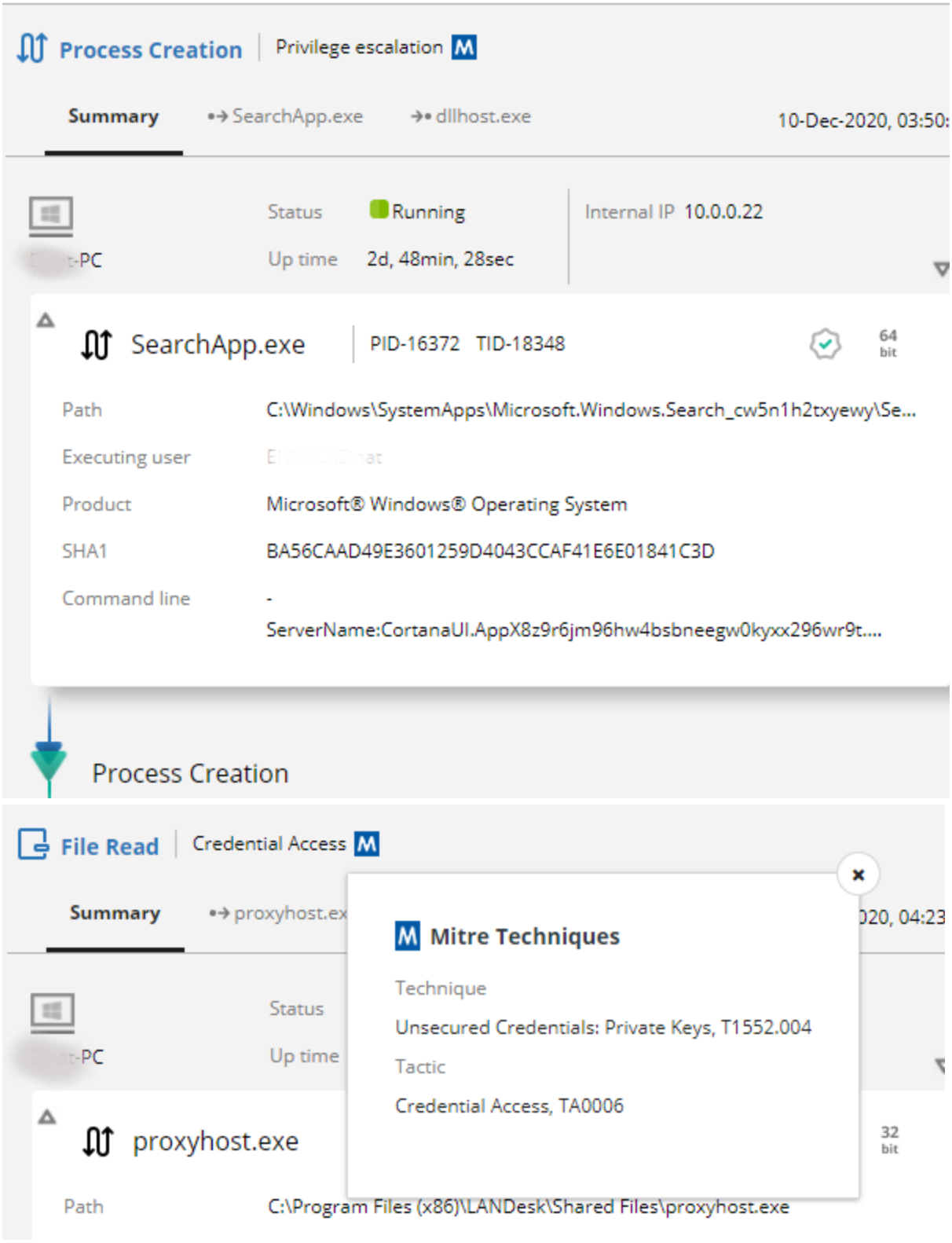


Each activity event may also be a part of a *behavior* and/or a MITRE Technique. A behavior indicates that this activity event is part of a specific behavior as determined by FortiEDR. A MITRE type (Technique or Tactic) indicates that the activity event is part of specification of a technique and tactic as classified by MITRE.

The activity events that have such behaviors and/or MITRE indications have values in the related columns in the activity events tables, as shown below:

DEVICE NAME	TYPE	BEHAVIOR	MITRE TACTIC	MITRE TECHNIQUE	PR(
Emat-PC	File Delete	Log deletion	Defense Evasion	Indicator Removal on Host: File Deletion	sla
[illegible]	File Read	Credential Access	Credential Access	Unsecured Credentials: Private Keys	prc

When an activity event has a related MITRE indication, it is indicated in the Details pane on page 151 (see below). You can hover over the associated icon to display more details.



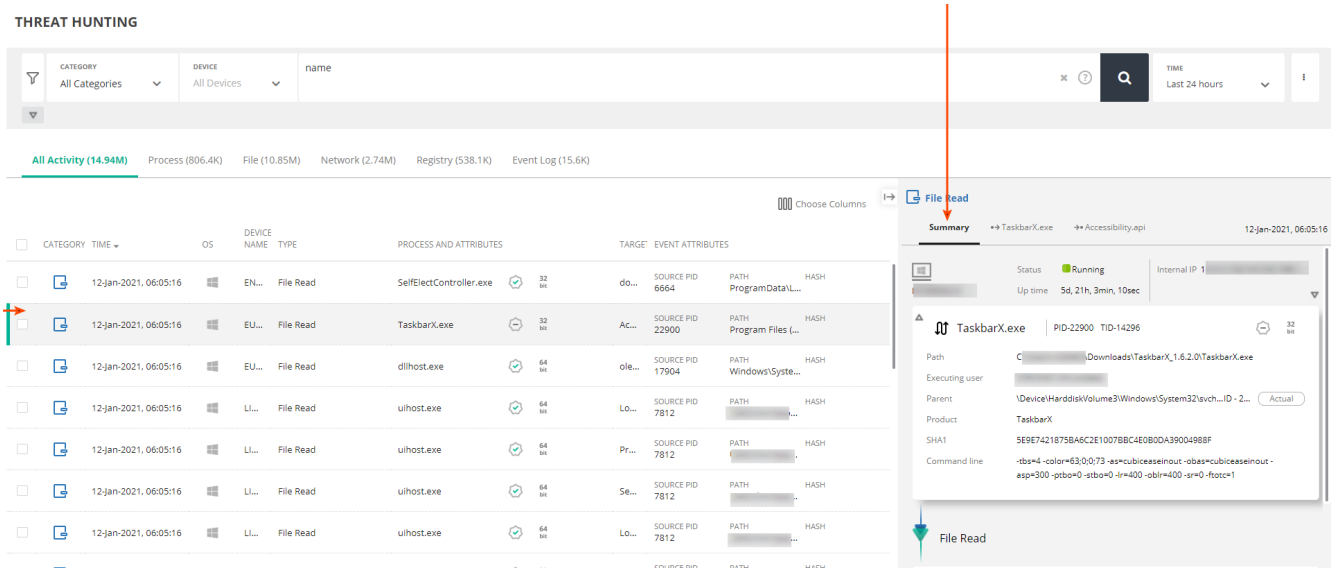
Filtering using activity events tables

The activity events tables area can be used to add filters to the query in a similar manner as facets.

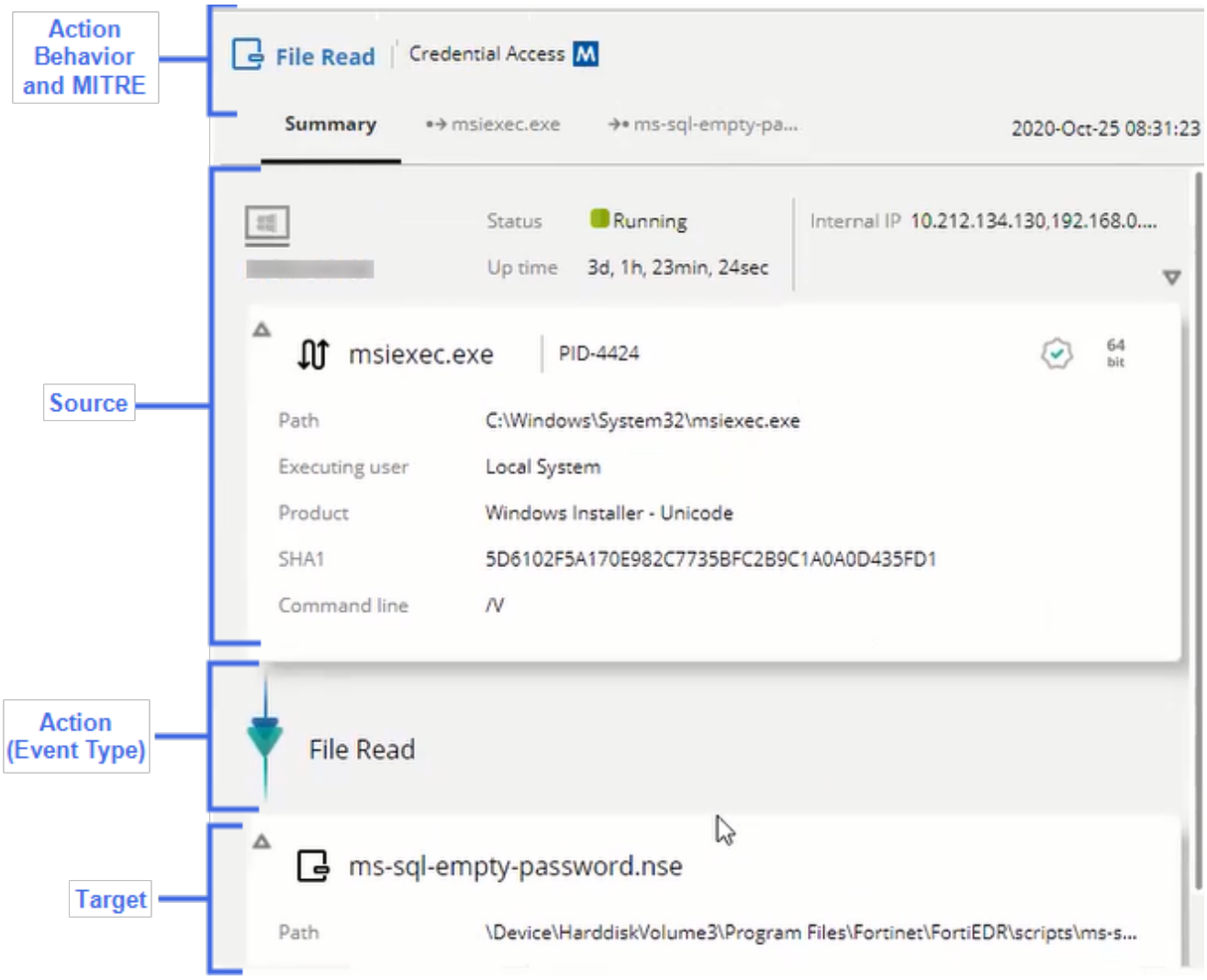
When you hover over an item in the table, a green and red button appear to its right. Click the green plus button ( )to include that item as a filter or click the red minus button ( ) to exclude that item as a filter. For more details, see Filtering using facets on page 145.

Details pane

You can click anywhere in a row in any of the Activity Events tables to display more details about the specific activity event in a Details pane on the right. The selected row is marked by a green border on its left.

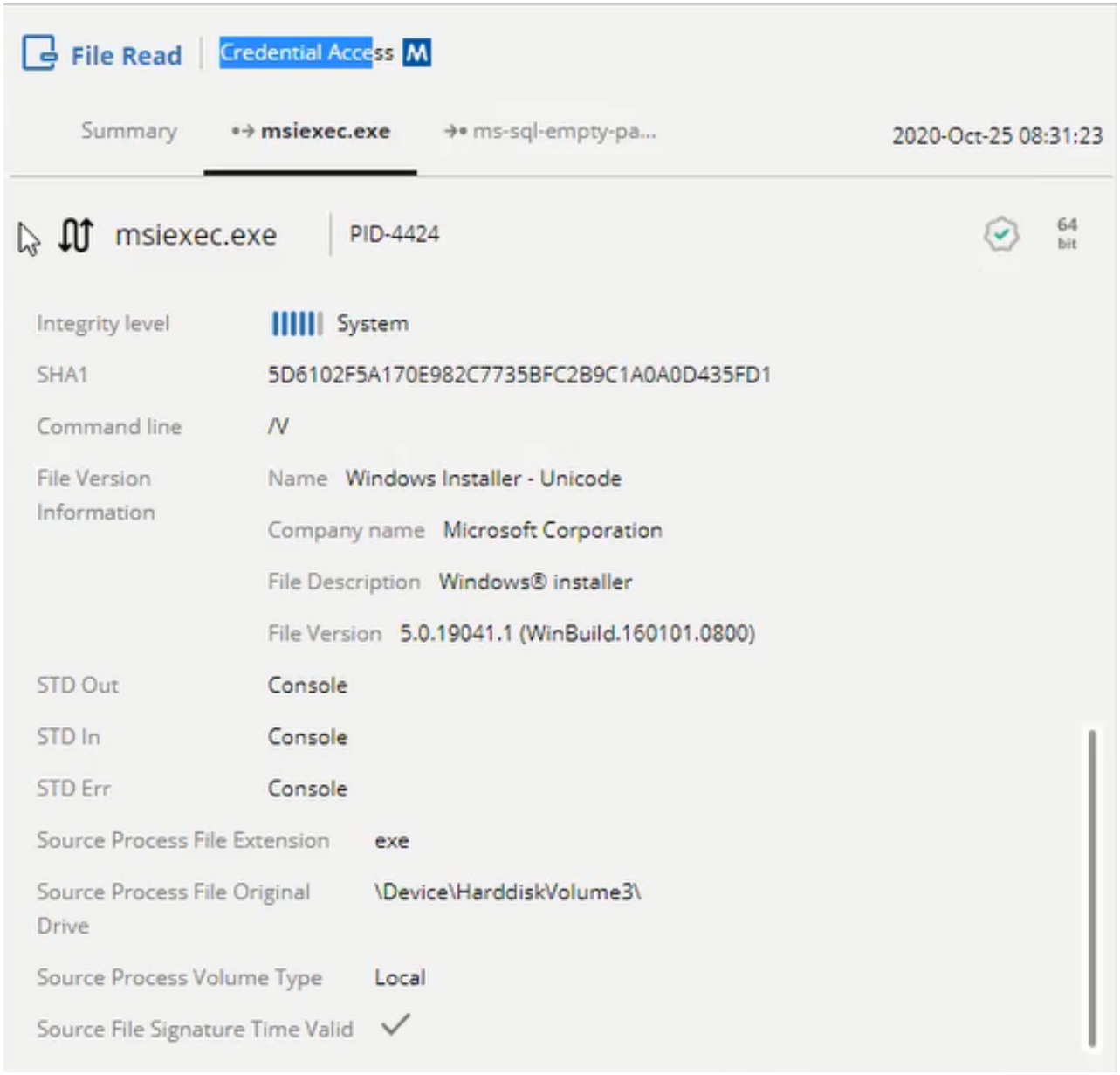


The Details pane for an activity event contains a *Summary* tab, one or two other tabs, and the *Investigation View* (Investigate →) button, as follows:

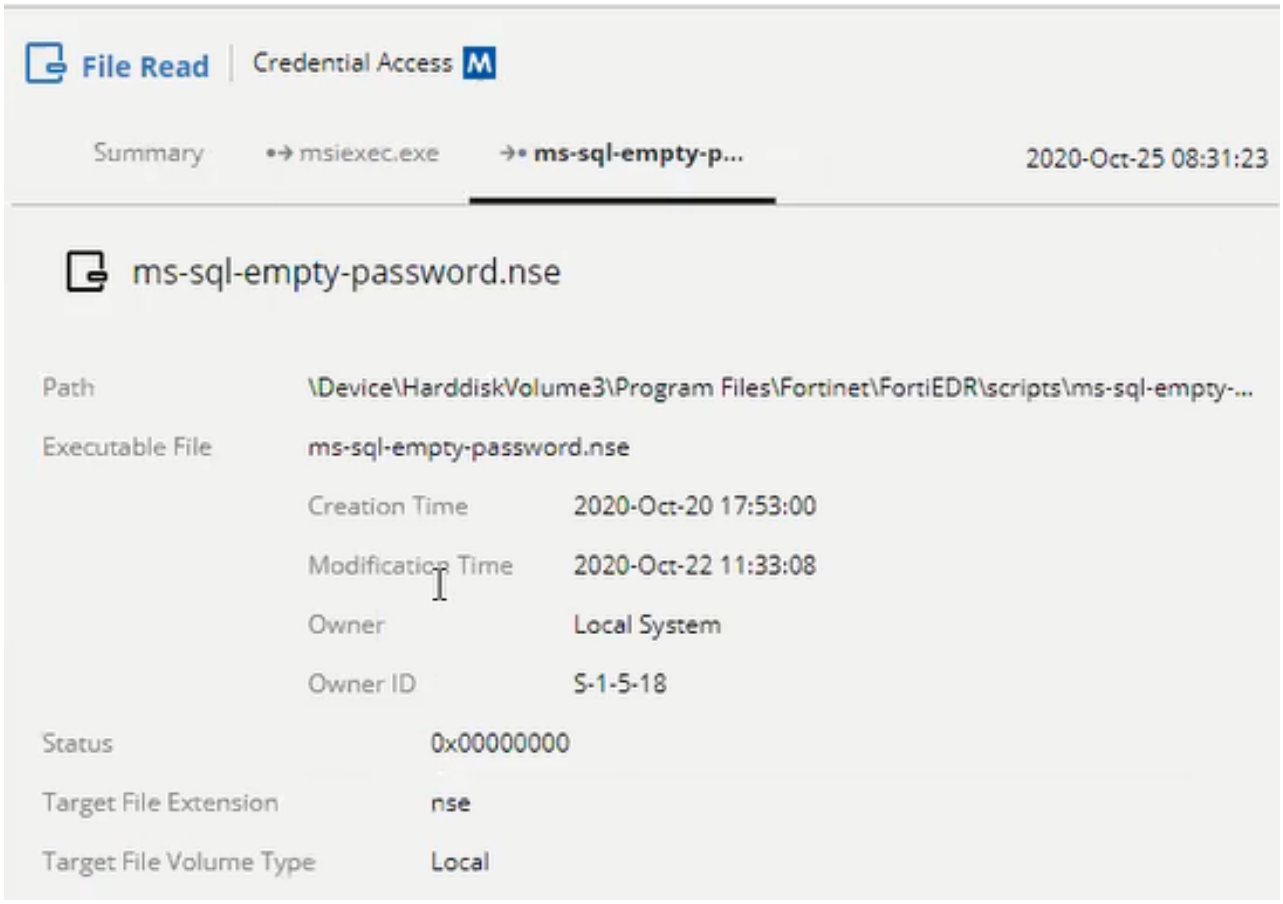


- *Summary* tab: This tab specifies a summary of the activity event. At the top of the tab, it shows details about the endpoint, including the endpoint and its IP, path, operating system, and so on. The area below the endpoint section shows the source process and its detail. The area below the source graphically shows the action again, which is the activity event type, as well as some additional data regarding the action, if any. The area at the bottom of the pane shows the target and its details. You can click the *Expand* ( ) or *Collapse* ( ) arrows in an area of this pane to show or hide additional relevant details, respectively.

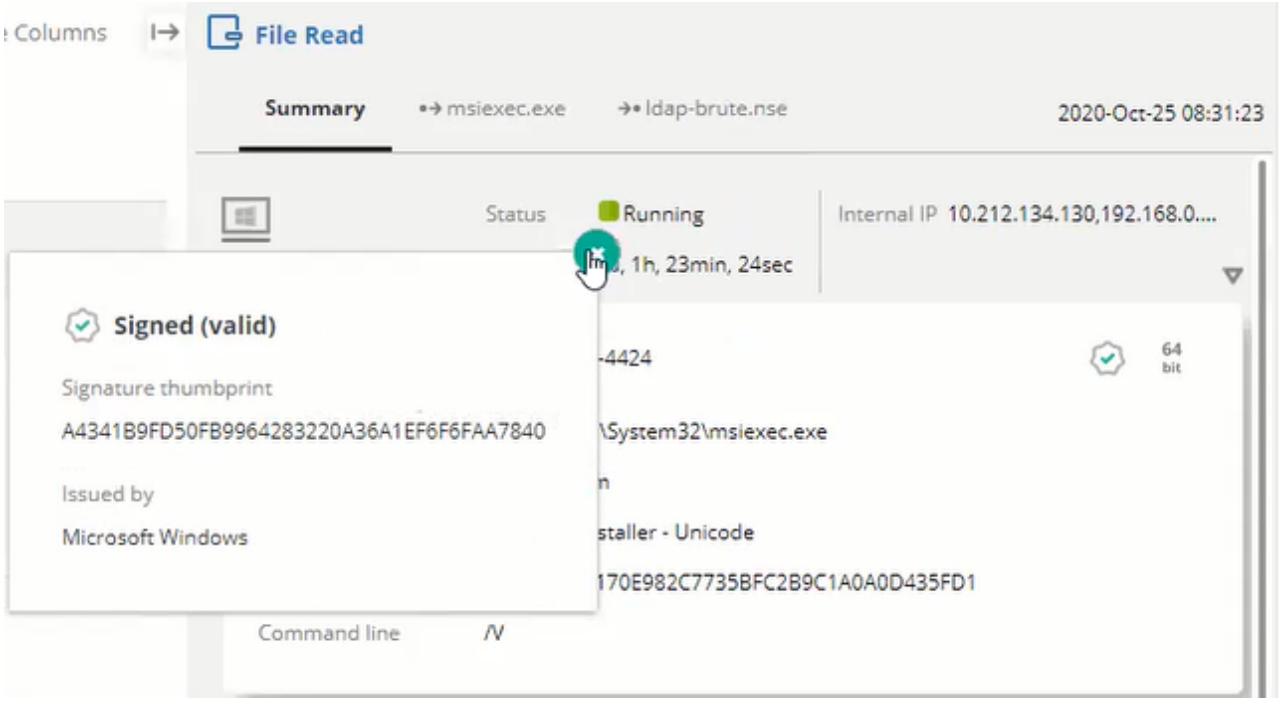
- *Process* tab: This tab shows additional details about the source process.



- *Target* tab: This tab only displays if the target is of type *Process* or *File*, and details additional data regarding such.



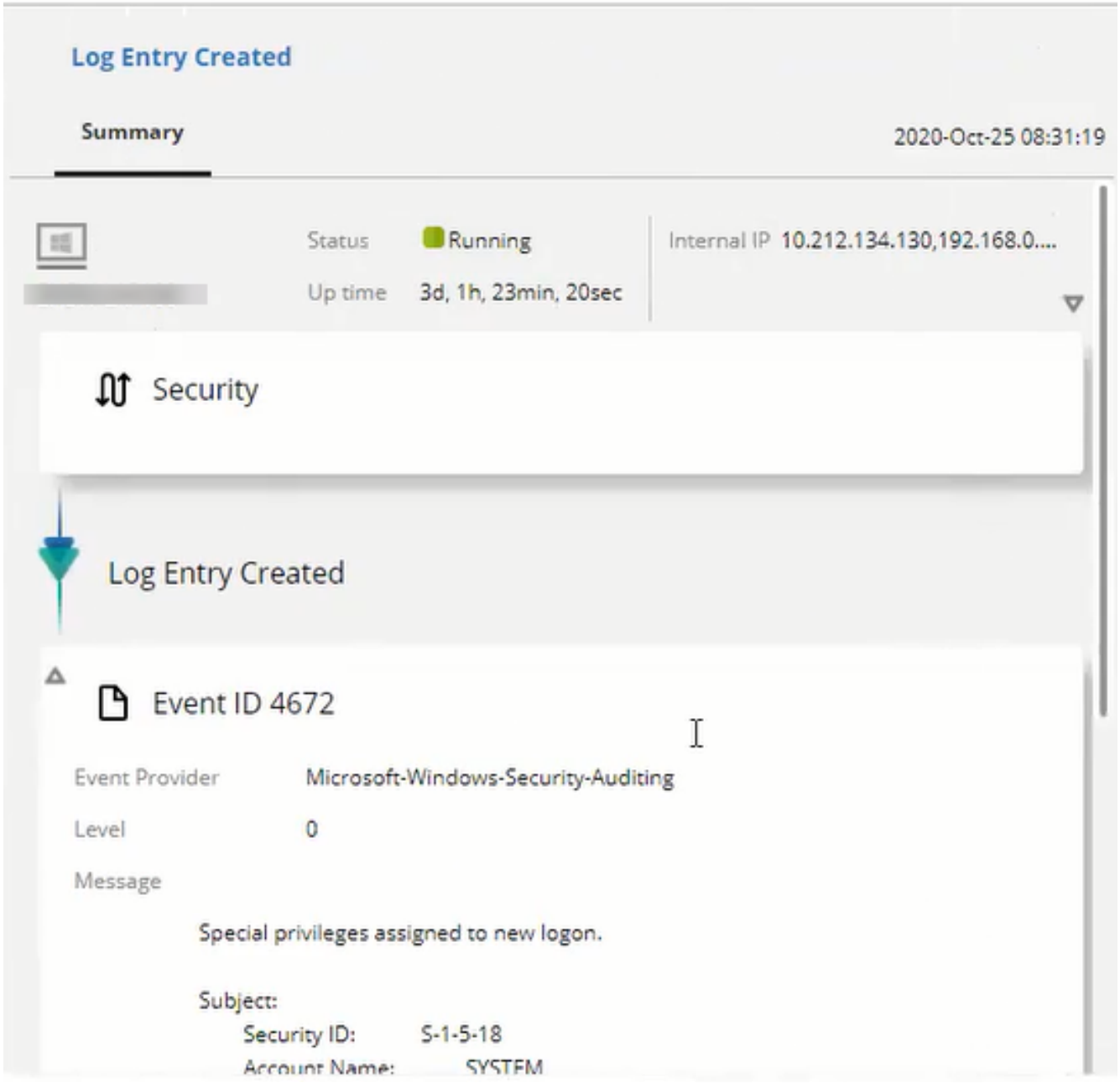
You can click an icon in the Details pane to display additional details, as shown below:



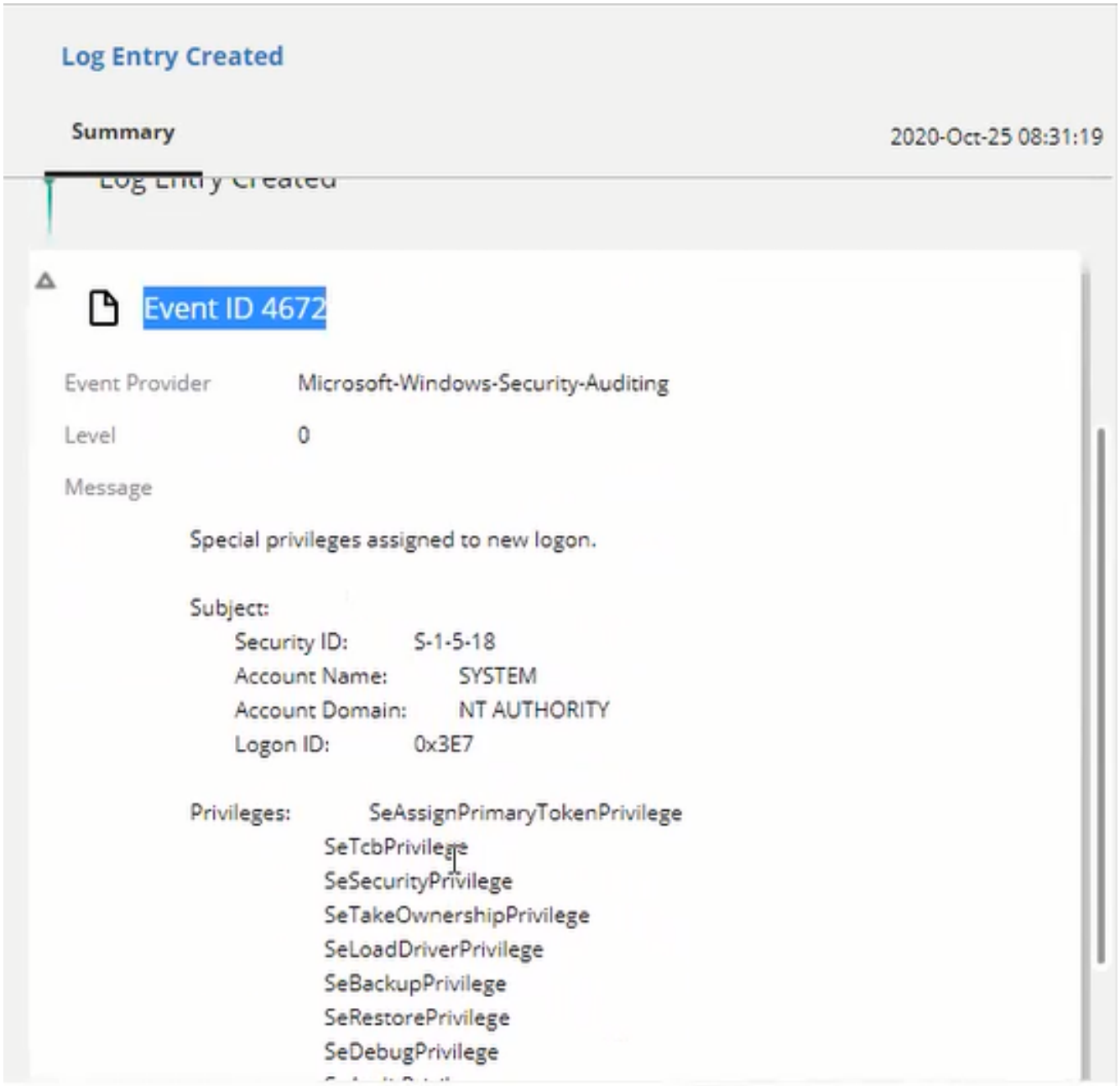
- *Investigation View* (Investigate →) button: This button opens a graphical Investigation View on page 160 of the activity events details: source, action and target. The graphical view provides the ability to add more activity events to the graph and show the relationship and timeline of the occurrence of those activities for better understanding of the flow of activity events.

Event Log Details pane

The Details pane for an activity event of type Event Log Created appears somewhat differently, as shown below. In this case, the action is always *Log Entry Created* and the target is always the event ID.



You can scroll down in the Target area to view the actual log entry.

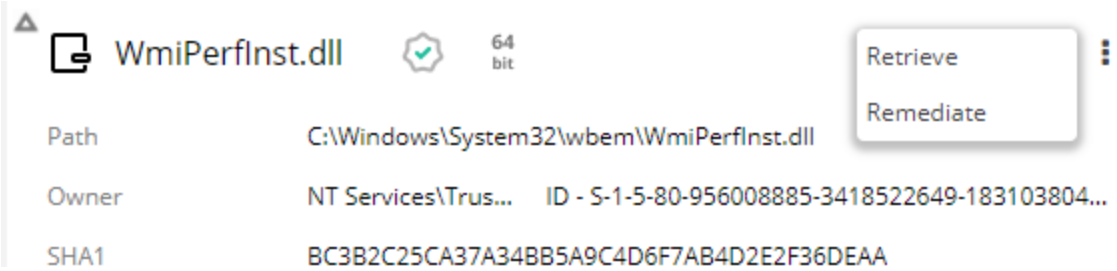


Retrieving a file / Remediating devices upon malware detection

You can remediate any file that is a target of an activity event. You can also download a copy of any file (Retrieve action) that is a target of an activity event.

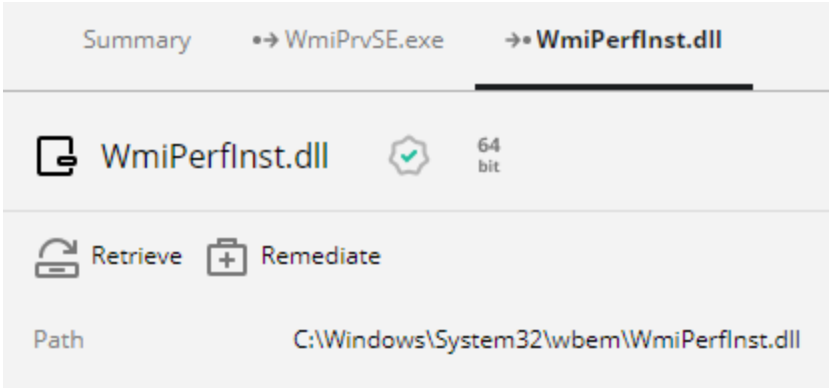
To retrieve a file or remediate the process:

1. Select the relevant activity event and open its Details Pane.
2. When hovering over the filename, you can select either of the following options:
   - In the *Summary* pane, select the three dot dropdown menu and then select *Retrieve* of *Remediate* the file, as shown below:



   – OR –

   - In the Details pane, click the *Retrieve* or *Remediate* button, as shown below:

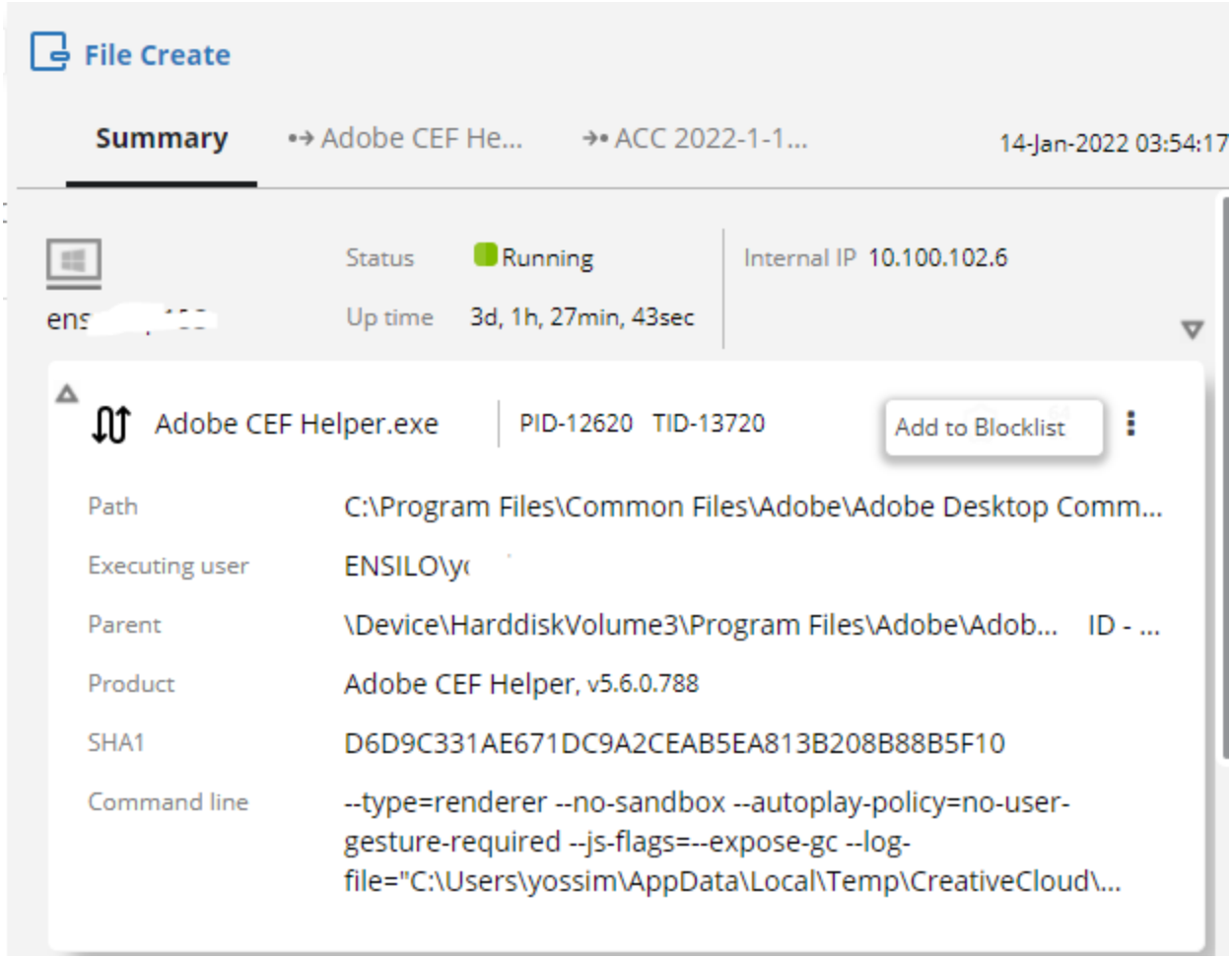


Adding an application to the Application Control policy blocklist

You can add any process that is either the source or the target of an activity event to the Application Control Policy blocklist such that this process won't launch on the devices that are assigned to that Application Control policy.

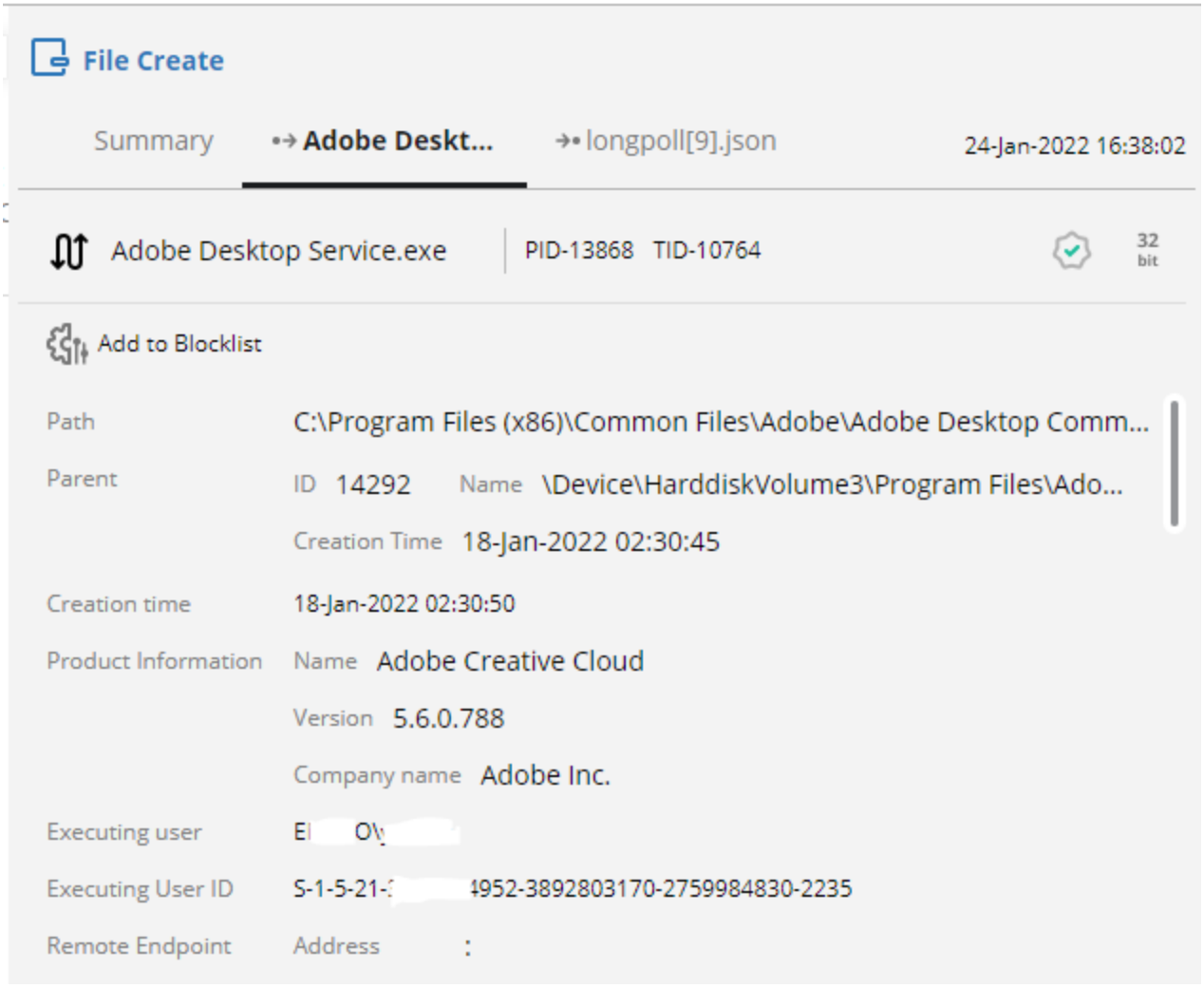
To add a process to an Application Control policy:

1. Select the relevant activity event and open its Details Pane.
2. In the *Summary* page, click the *More* (⋮) option next to the process name and select *Add to Blocklist*, as shown below:



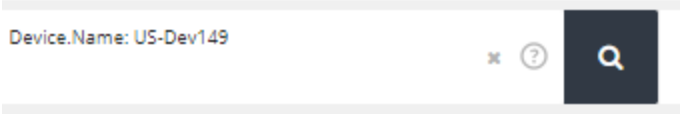
OR

Go to either the *Source* or the *Target* tab of type process and click the *Add to Blocklist* button, as shown below:



GDPR and activity event data

The FortiEDR system fully complies with the General Data Protection Regulation (GDPR) standard, as described in Personal Data Handling on page 401. When you use the Personal Data Handling feature to delete data, it also deletes activity event data. However, the *Personal Data Handling Search* option does not search for and display the activity data that it will delete. Just for your own knowledge, in order to see a list of the activity data that will be deleted you can view it here before you delete it. To do so, simply enter a query here that includes the chosen record from the Activity Report (that can be accessed by selecting *Administration > Settings > Personal Data Handling*) in order to find the data to be removed. For example, if you have provided the string 149 in *Personal Data Handling* for Search by *Device name*, then in the displayed Activity Report, select the record containing the device name to be deleted. In this example, it is *US-Dev149*. Then, in order to display all the activity events that are related to this device, enter the query `Device.Name: US-Dev149`, as shown below in order to display the relevant records.



To find all activity related to a user chosen from a Personal Data Handling Activity Report, enter the following query, and select the required time range:

"Source.File.Owner:<*username*> OR Source.User:<*username*> OR Process.File.Owner:<*username*> OR Process.User:<*username*> OR Target.File.Owner:<*username*>"

Similarly, to find all activity related to an IP chosen from a Personal Data Handling Activity Report, enter the following query:

"Device.IPInternal:<*IP*> OR LocalIP:< *IP* > OR RemoteIP:< *IP* > OR Target.Network.AdditionalData.RemoteIp:<*IP*>"

Investigation View

The *Investigation View* window is accessible from the Details Pane using the *Investigation View* button ( ) of an event under *Threat Hunting*. It helps understand the flow of activity events during Threat Hunting with a dynamic and interactive graphical view of the activity events details: source, action and target.

The graphical view provides the ability to add more activity events to the graph and show the relationship and timeline of the occurrence of those activities, such as the following:

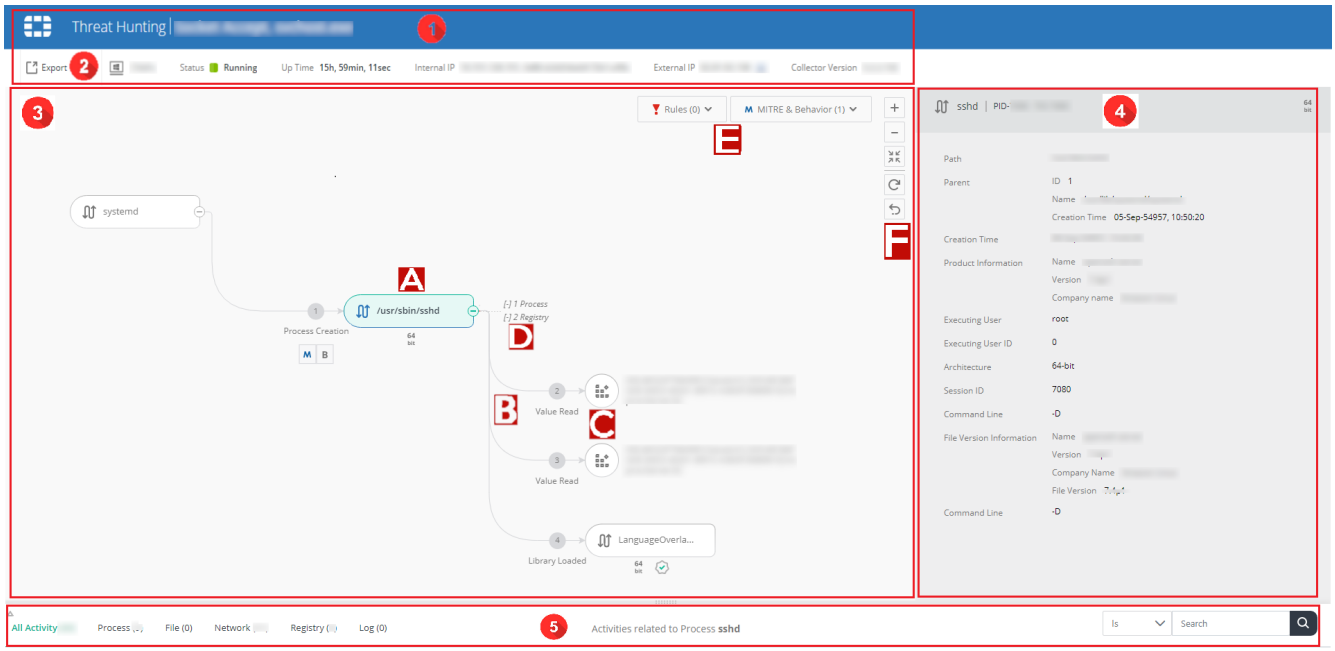
- All actions performed by a given process
- All files the process has created or updated
- All IPs the process has initiated communication with

It also allows you to interactively view a chain of activity events in the following ways:

- Browse between the various processes involved in the chain
- See all activity events related to one node and decide which nodes to add to the graph

- The *Investigation View* is not available to IT users (see Users on page 359). *Read-Only* user can only view and manipulate graphs but cannot remediate or perform other actions.
- The view adds visualization and interaction of existing data that is already available in other non-graphical and non-interactive forms without creating or generating any additional data.

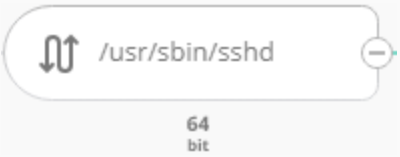
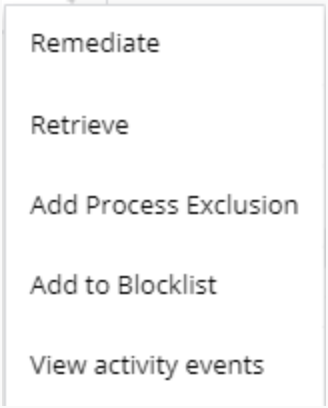
The following figure illustrates the various components of an *Investigation View* window launched from the *Details Pane* under *Threat Hunting*, which has the window title "*Threat Hunting* + `activity name`.

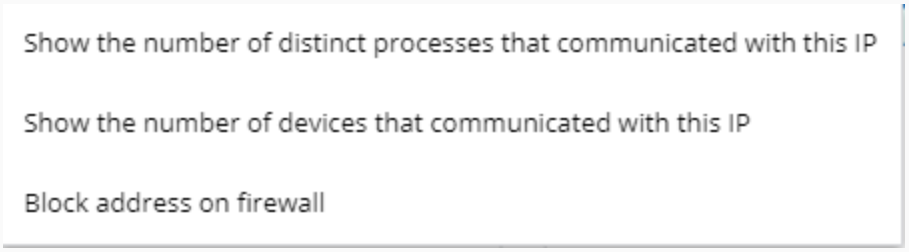
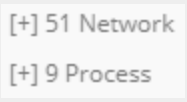


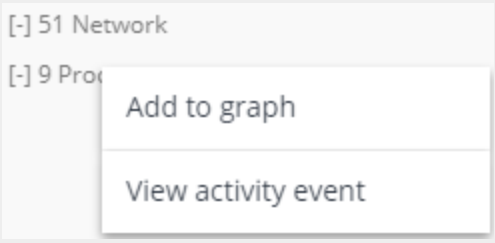
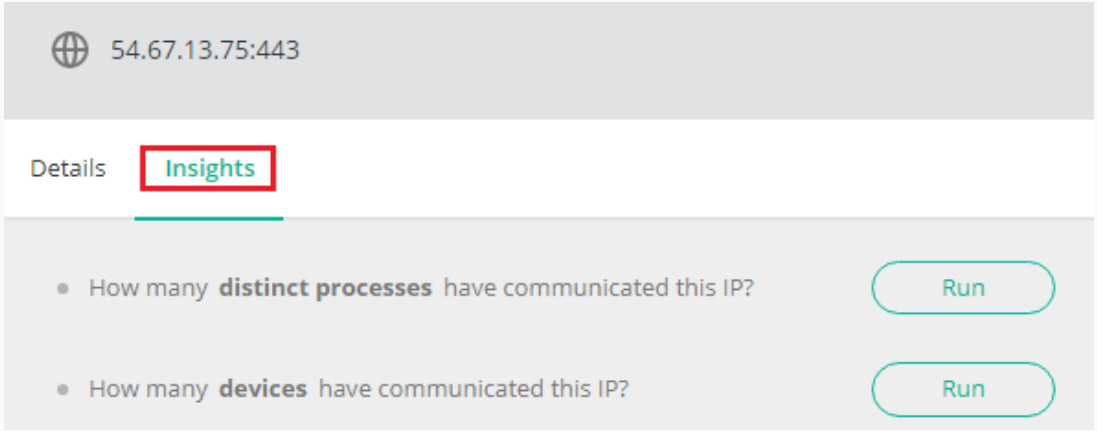
Compared with the Investigation View on page 92 window launched from the *Incidents* view, this view has the following limitations:

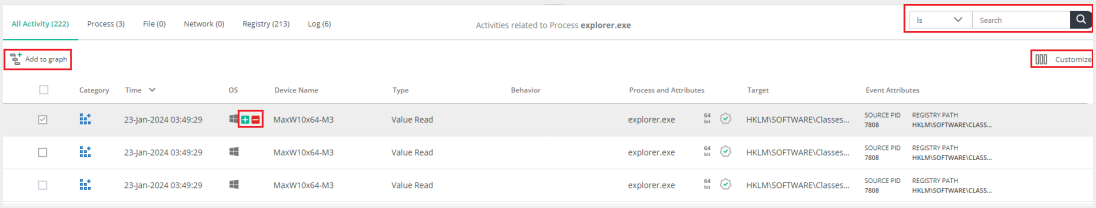
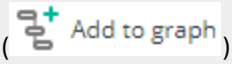
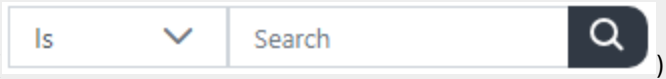
- Some threat hunting and investigation capabilities are unavailable, such as exporting the graph as JSON, variants navigation graph, and Stacks view on page 99.
- Some general event details are missing in the first row, such as classification and incident response.

Component	Description
1	General details about the device that generated the event, such as Collector status, process name, and IP address.
2	Use the *Export* button (Export) to export the *Investigation View* window as an SVG file to share with others or for record reasons. This is the only option to save a graph that includes dynamic changes based on the default graph view, such as adding processes.
3	Graphical flow diagram with a process tree that you can build according to your investigation needs, from left to right and top to bottom. The tree is also interactive, which means you can click on a specific component to drill down for more details or contextual actions. A **Node**—Source of an activity or event, which can be a process, an endpoint, a thread or service, or another security product. Nodes are represented by boxes with icons for the activity type, some with descriptions under the boxes.

Component	Description
	 • Click on a node to display the Details pane on page 151 on the right and the Activity events tables on page 147 on the bottom with contextual information about that specific node. • Click the *Collapse* ( ) or *Expand* ( ) icon in the right of a node icon to show or hide all the downstream nodes, edges, and leaves. • Right-click a node to perform actions allowed on the node, including any custom actions you defined. These action buttons also appear in the *Details Pane*, which is available on the right after you click the node. The list of available options varies by node type. The following is an example list of actions for a process node. 
B	**Edge**—Activity event type or action represented by a curved line with an arrow. An edge can be one activity event/action or an aggregation of several. The numbered arrows indicate the sequence of actions and specify the action that was performed, such as *Process Creation*, *Socket Close*, *Block* and so on. Multiple operations performed between two processes are represented by multiple arrows between them. Edges that triggered the event are indicated in red.

Component	Description
	Click on an edge to display the Details pane on page 151 on the right with contextual information about that specific edge. Edges may also have icons below them indicating classification or MITRE & Behavior models. Click on an icon for more detailed information.
C	**Leaf**—Target of activity event of type File, Registry Key, Registry Value, Network components (IP/DNS/URL). A leaf can also be a group of artifacts. For example, all the files created or modified by a process. Leaves have a round shape ( ). • Click on a leaf to display the Details pane on page 151 on the right and the Activity events tables on page 147 on the bottom with contextual information about that specific leaf. • Right-click a leaf to perform actions allowed on the leaf, including any custom actions you defined. These action buttons are also available in the *Details Pane*, which appear on the right after you click the leaf. The list of available options varies by leaf type. The following is an example list of actions for a network leaf: 
D	**Hint**—Categorized groups of activities related to a node that are not part of the main chain of activity events and thus not represented in the graphical diagram. Click a node to show the number of relevant activities. The hints no longer display after you move the selection to another node or edge.  • Click the *Expand* ([+]) or *Collapse* ([-]) icon near a leaf hint to show or hide the node or leaf list of that type. • Right-click the type name of a hint and select *Add to graph* to add the relevant leaves to the graph or select *View activity event* to pull out the

Component	Description
	Activity events tables on page 147 for this specific file type. The *Add to graph* option is unavailable when the number of hints exceeds 500, in which case you can only choose to view the activity event. 
E	Use the *MITRE & Behavior* legend to highlight the corresponding icons below relevant edges in the diagram.
F	• Use the *Zoom In* ( ), *Zoom Out* ( ), and *Zoom To Fit* ( ) buttons to adjust the graph window size. • Use the *Reset* ( ) button to restore the graph to the default view. • Use the *Undo* ( ) button to cancel an operation.
4	Details pane on page 151 for the selected node, edge, or leaf where you can view details of the activity, action, or target, and perform common actions on a node or leaf, such as retrieving a file, remediating devices upon malware detection, or adding an application to the Application Control policy blocklist. The actions can also be performed by right-clicking a node or leaf and selecting the option from the menu. For specific leaf types, this pane also includes an *Insights* tab which allows you to run queries to retrieve analytics data, such as the number of communicating processes or devices of a certain IP. The *Insights* options are also available from the right-click menu of those leaf types. 

Component	Description
5	Contextual Activity events tables on page 147 for the selected node or leaf organized by tabs of activity types. Drag the top edge of the table up for a fuller view of the table. Activities with a number at the front of the row are already in the graph and the number matches the one in the graph.  • To add activities to the graph, select the corresponding rows and click *Add to graph* (). • To customize the columns to display in the table, click *Customize* ( ). • To search for a specific activity or event, enter keywords in the search bar on the top right corner (). • To filter the results in the Activity Events table to include or exclude a specific value, use the green plus ( ) and red minus ( ) icons that appear when you hover over the value. Multiple filters are supported. To delete a filter, click the cancel icon that appear when you hover over the filter on the top-left of the table.

Remediating a device upon malware detection

After malware is detected on a device, you can remediate the device from the Investigation View on page 92 (detailed in the procedure below) or by connecting to the device directly using the FortiEDR Connect on page 109 functionality.

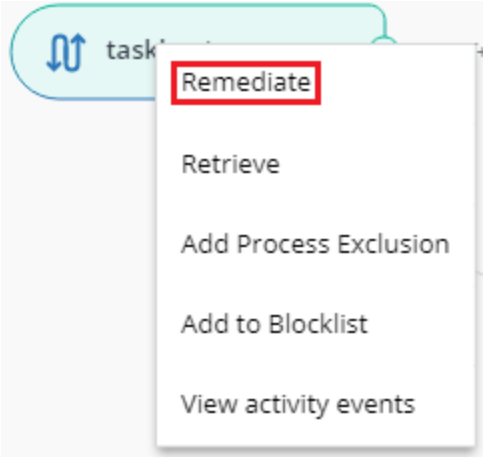
The following options are available when you remediate the situation in the FortiEDR system:

Method	Description
Terminate the Process	This method does not guarantee that the affected process will not attempt to execute again.
Delete the Affected File from the Computer	This method ensures that the file does not attempt to exfiltrate data again, as the file is permanently removed from the device. When using this method, be careful not to delete files that are important to the system, in order to protect system stability.
Remove or Modify the Registry Key	This method removes a registry key or updates a registry key's value. This method changes malicious registry key modifications by removing newly created keys or returning key values to their original form.

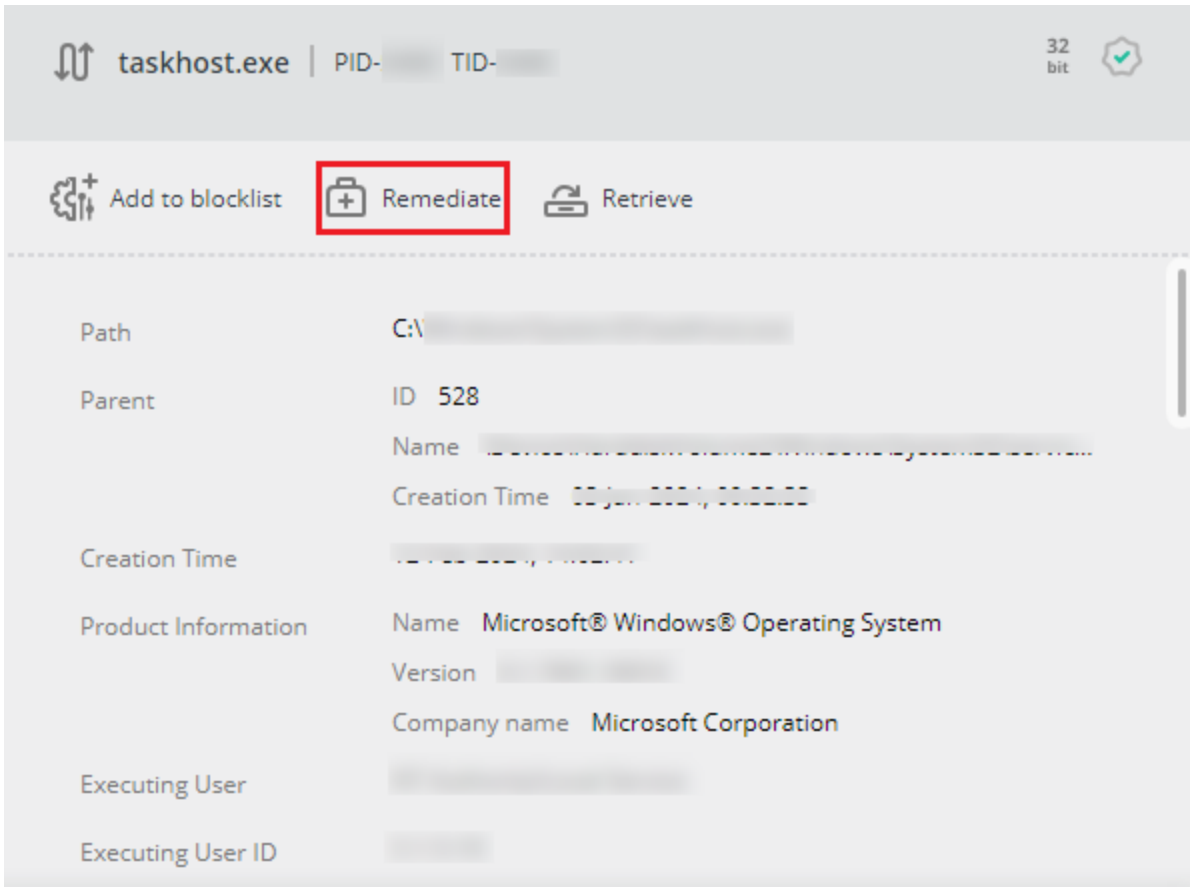
Method	Description
	Some malware have persistency capabilities, which makes the infection appear again. In addition, in some rare cases, malware can cause the system to crash if you try to remove them.
	Both of these methods can be performed using the Forensics add-on.

To remediate a device from the Investigation View on page 92:

1. Right-click the node of the relevant activity event and select *Remediate*.

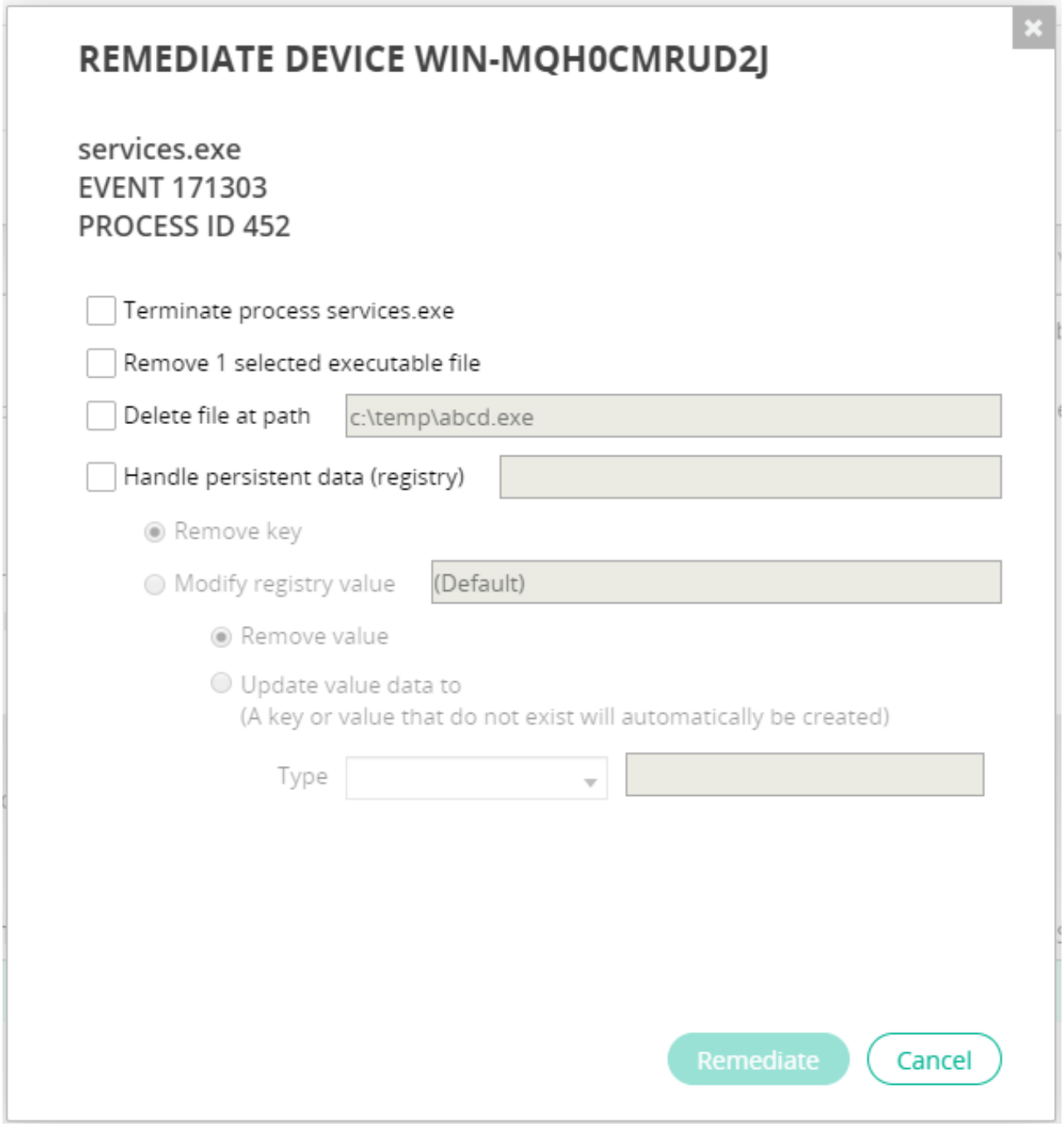


Alternatively, select the node of the relevant activity event and click the *Remediate* button in the *Details Pane* that appears on the right.

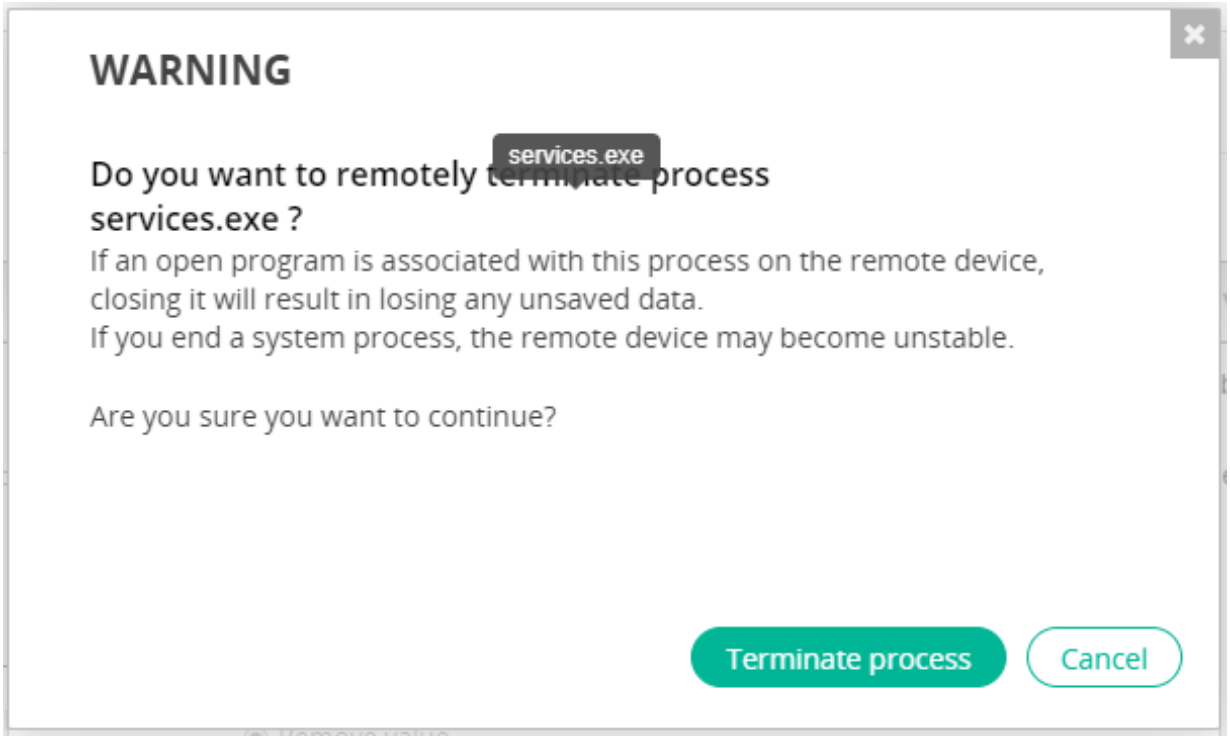


The *Remediate* button is also available from the Stacks view on page 99, which is available when an edge is selected.

2. The following window displays:

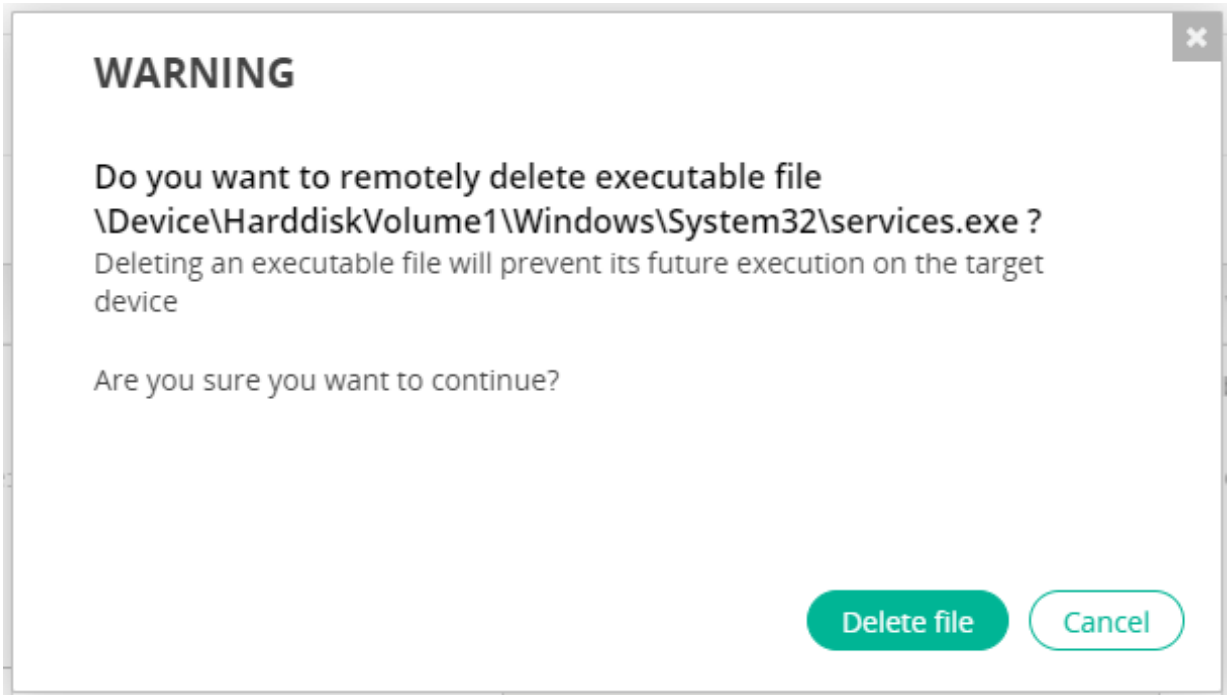


3. Do one of the following:
   a. Check the *Terminate process* checkbox to terminate the selected process. A warning message displays.



Click *Terminate process* to terminate the selected process.

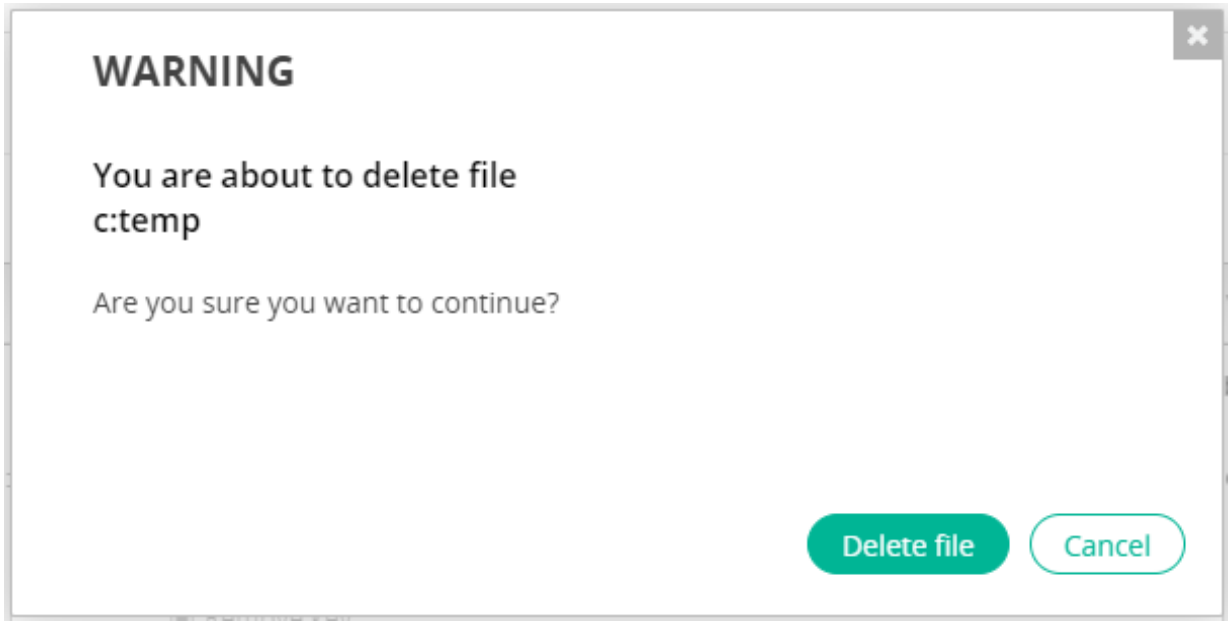
b. Check the *Remove selected executable file* checkbox to delete the specified file from the device. A warning message displays.



Click *Delete file* to remove the selected file.

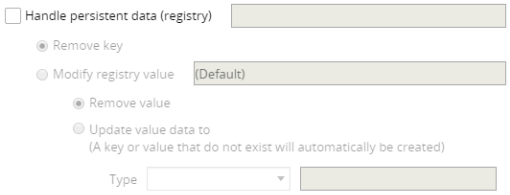
c. Check the *Delete file at path* checkbox. In the adjacent field, enter the file path on the device that contains the file to be removed.

A warning message displays.



Click *Delete file* to remove the file from the specified path.

d. Check the *Handle persistent data (registry)* checkbox to clean the registry keys in Windows. In the adjacent field, enter the value of the registry key to be removed or modified.



Value data should be provided in the required format, based on the value type selected in the dropdown list, as follows:

- *String* for types REG_SZ(1), REG_EXPAND_SZ(2), REG_DWORD(4) and REG_QWORD(11).
- *Base64* for types REG_BINARY(3), REG_DWORD_BIG_ENDIAN(5), REG_LINK(6), REG_MULTI_SZ (7), REG_RESOURCE_LIST(8), REG_FULL_RESOURCE_DESCRIPTOR(9) and REG_RESOURCE_ REQUIREMENTS_LIST(10).

Select the *Remove key* radio button to remove the registry key value.

Select the *Modify registry value* radio button to change the current registry key value. When selecting this option, you must also specify the new value for the registry key in the gray box and the key's value type in the adjacent dropdown menu (for example, string, binary and so on).

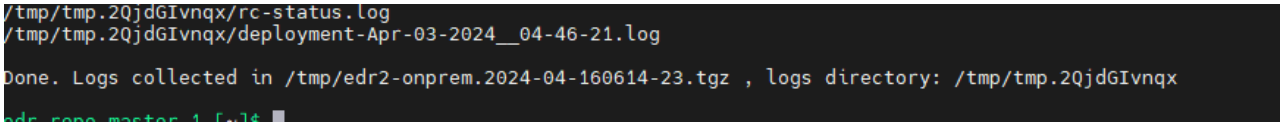
4. Click *Remediate*.

Exporting threat hunting logs

For on-premise deployments, when you submit a support ticket about issues with Threat Hunting Repository installation, upgrade, or general functioning, you must include the threat hunting logs.

To collect threat hunting logs:

1. Run the following command:
   `sudo bash /opt/FortiEDR/deployments/latest/deployment/ci-tools/get_logs.sh`
   The script will create logs archive in the `/tmp/` directory.



2. Use the SCP client to download the `.tgz` file.
   You can then attach the file to the support ticket.

To retrieve Collector, Core, and Aggegator logs, see the following:

- Exporting logs for Collectors on page 355
- Exporting logs for Cores on page 356
- Exporting logs for Aggregators on page 357

Communication control

This chapter describes the FortiEDR communication control mechanism for monitoring and handling non-disguised security events.

Application communication control - how does it work?

FortiEDR provides visibility into any communicating application in your organization, enabling you to control which applications can communicate.

After FortiEDR installation, the system automatically maps all applications in your network that communicate externally. After that, you then decide which of these applications to allow to communicate externally when used by a legitimate user in your organization (allowlist). After the allowlist of communicating applications is defined, only applications in the allowlist can communicate externally. If an attacker abuses an application in the allowlist, FortiEDR's patented technology (Exfiltration and Ransomware prevention policies) blocks the communication and displays a security event in the *Incidents* tab.

FortiEDR Communication Control uses a set of policies that contain recommendations about whether an application should be approved or denied of communication. These policies can be configured as a next-generation firewall in order to automatically block communications of potentially unwanted applications. For example, applications with a known bad reputation or that are distributed by questionable vendors.

Moreover, FortiEDR Communication Control provides data and tools for efficient vulnerability assessment and control. Virtual patching is made possible with Communication Control policies that can be configured to automatically block connections from vulnerable applications.

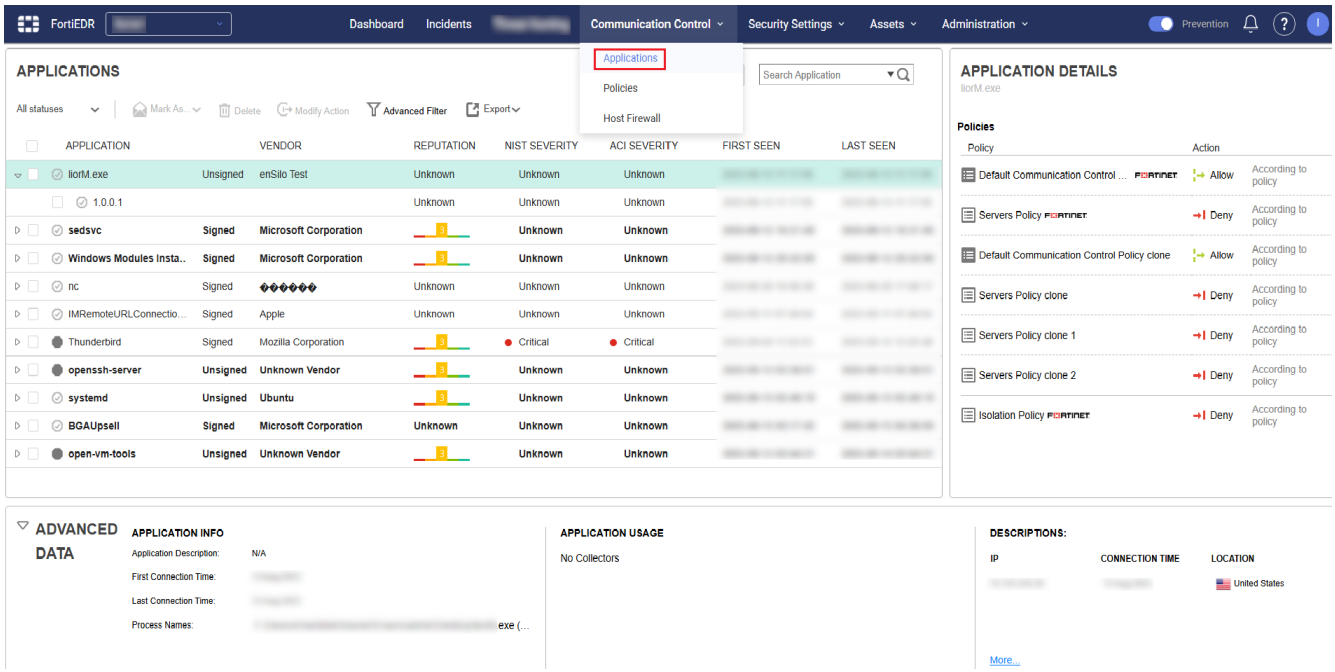
You can also configure host firewall policies to control incoming and outgoing in network traffic to protect endpoints against unwanted connections based on remote addresses, protocols, or applications in use to reflect the organization's network policies.

FortiEDR's Communication Control mechanism provides the following key advantages:

Mechanism	Description
Realtime Proactive Risk Mitigation	Attack surface reduction using risk-based proactive policies that are based on application CVE and rating data.
Avoids Productivity Inhibitors	Non-authorized applications can still execute. Only their outgoing communication is prevented.
Manageability	Reduces the scope of the problem, which means that Security/IT needs to handle only applications that communicate externally.
Frictionless Application Control	Reduces users' requests from Security/IT to approve applications.

Introducing communication control

The *COMMUNICATION CONTROL* tab identifies all the communicating applications detected in your organization. To access this page, click the down arrow next to *COMMUNICATION CONTROL* and then select *Applications*.

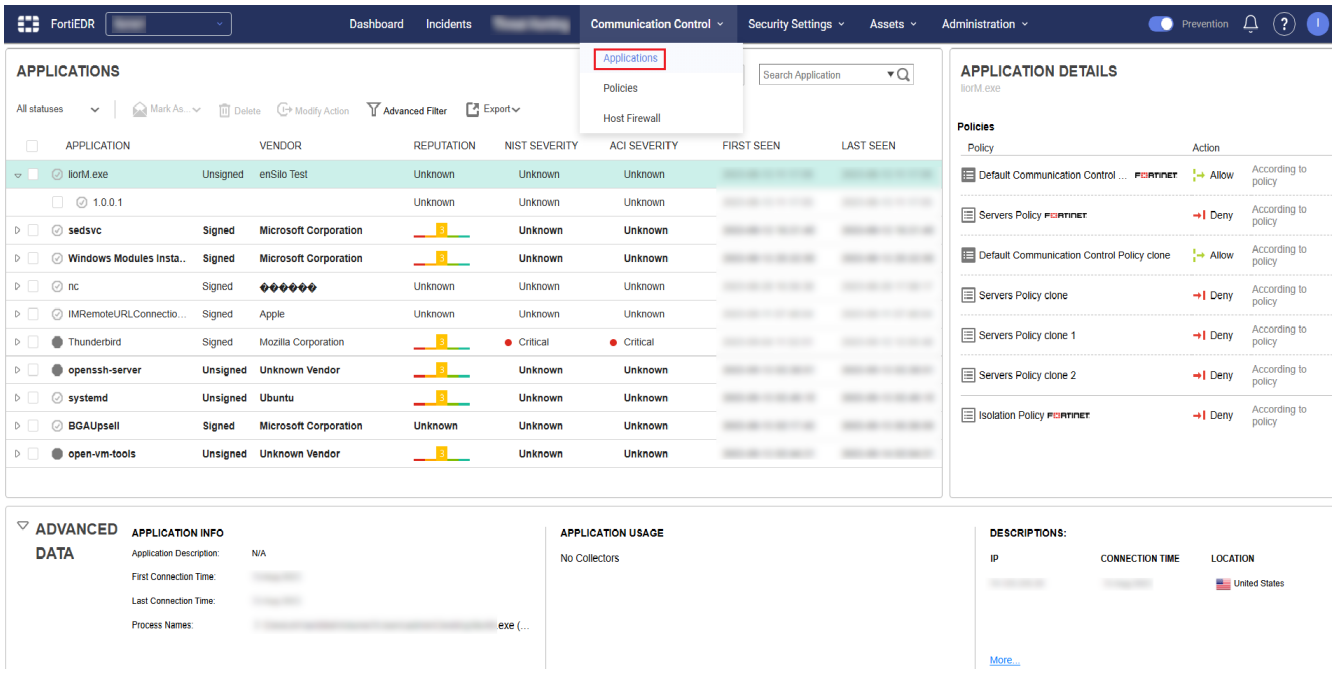


The *COMMUNICATION CONTROL* tab contains the following pages:

- Applications on page 173
- Policies on page 189
- Host Firewall Collector 6.1 or later on page 199

Applications

The *APPLICATIONS* page lists all communicating applications detected in your organization that have ever attempted to communicate. By default, applications are sorted according to their first-seen indicator, placing new applications at the top. To access this page, click the down arrow next to *COMMUNICATION CONTROL* and then select *Applications*.



Information is organized hierarchically in a two-level tree. The first (top) level specifies the name of the application. The second level specifies the application version.

The following information displays for each application in the application list:

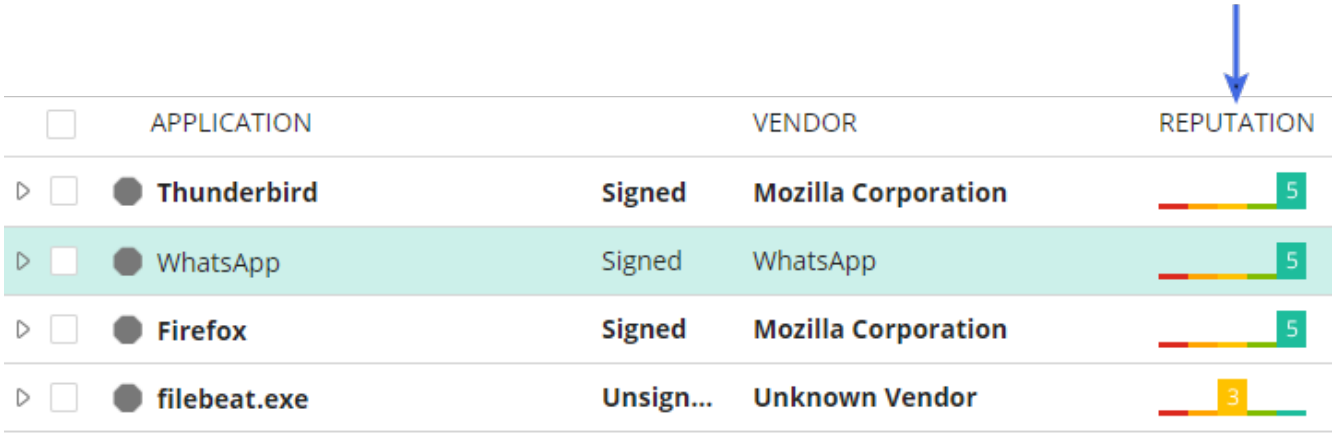
- Selection checkbox
- Resolving status icon
- Signed/Unsigned indication
- *APPLICATION/VERSION*: The name of the application/version.
- *VENDOR*: The application's vendor and certificate details.
- *REPUTATION*: The reputation score of the application. For more details, Reputation score on page 174
- *VULNERABILITY*: The highest CVE vulnerability score for the application. For more details, see Severity on page 175
- *FIRST SEEN*: The date and time when the application was first seen in the organization.
- *LAST SEEN*: The date and time of the last connection of this application.

The *APPLICATION DETAILS* area of the window on the right displays policy-related details for the entity (application or version) selected in the application list. This area displays the policy action (Allow or Deny) for each communication control policy.

The *Advanced Data* area at the bottom of the window presents statistics about the selected application/version in the application list. For more details, see Advanced Data on page 183.

Reputation score

Each application in the *APPLICATIONS* page shows a *REPUTATION* indicator. Reputation scores are determined by a third-party service, and are based on the hash (signature) of the file.



Reputation scores use the following range to indicate the reputation for an application:

Reputation Score	Reputation Description
1	Known as bad
2	Assumed as bad
3	Unclear, indication a contradiction or inability to determine the reputation
4	Assumed as good
5	Known as good

The *REPUTATION* indicator displays *Unknown* if the reputation score is unknown.

Severity

FortiEDR's severity scoring system provides a useful tool for vulnerability assessment and enables you to review the weaknesses detected in your environment that could be exploited by attackers before they actually occur. You can then use virtual patching to block applications with known critical vulnerabilities so that they cannot connect until the system is patched for the CVEs listed.

It also provides comprehensive visibility into the organization's external attack surface so that analysts can prioritize security alerts and incidents based on risk factors such as severity of vulnerabilities, relevance of threat intelligence feeds, and severity of affected endpoints, ensuring that efforts are focused on addressing the most significant risks to the organization.

Each application and version in the application list shows two severity ratings:

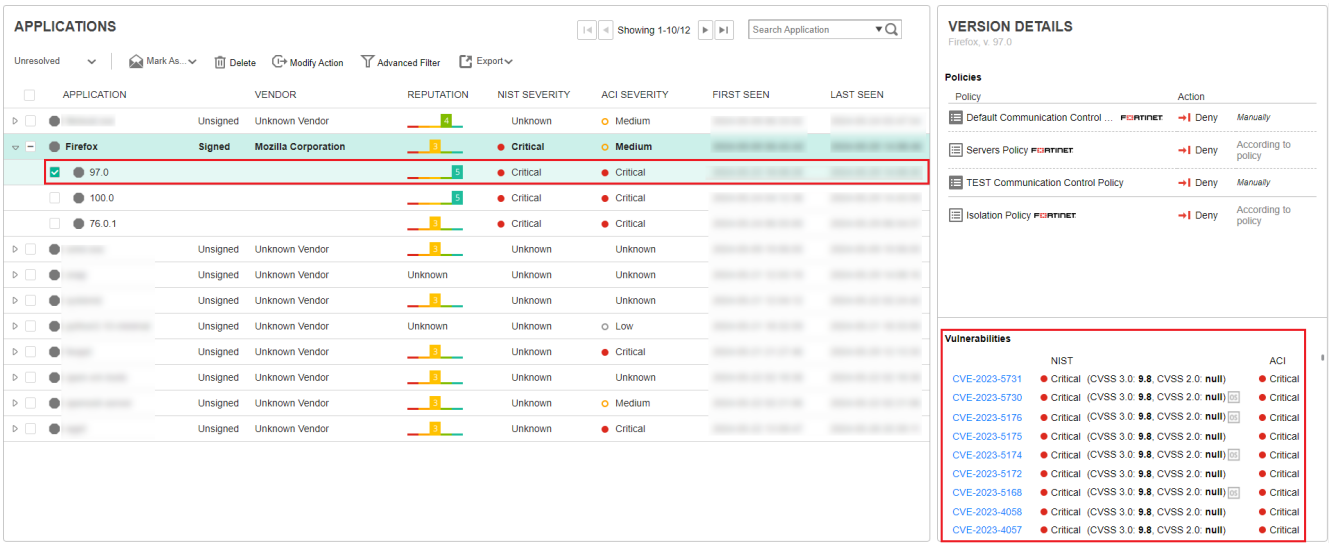
The ratings are only available to users who have purchased the *Discover and Protect* license or the *Discover, Protect and Response* license.

- NIST Severity—Rating provided by FortiEDR's vulnerability scoring system leveraging the NIST Cybersecurity Framework.

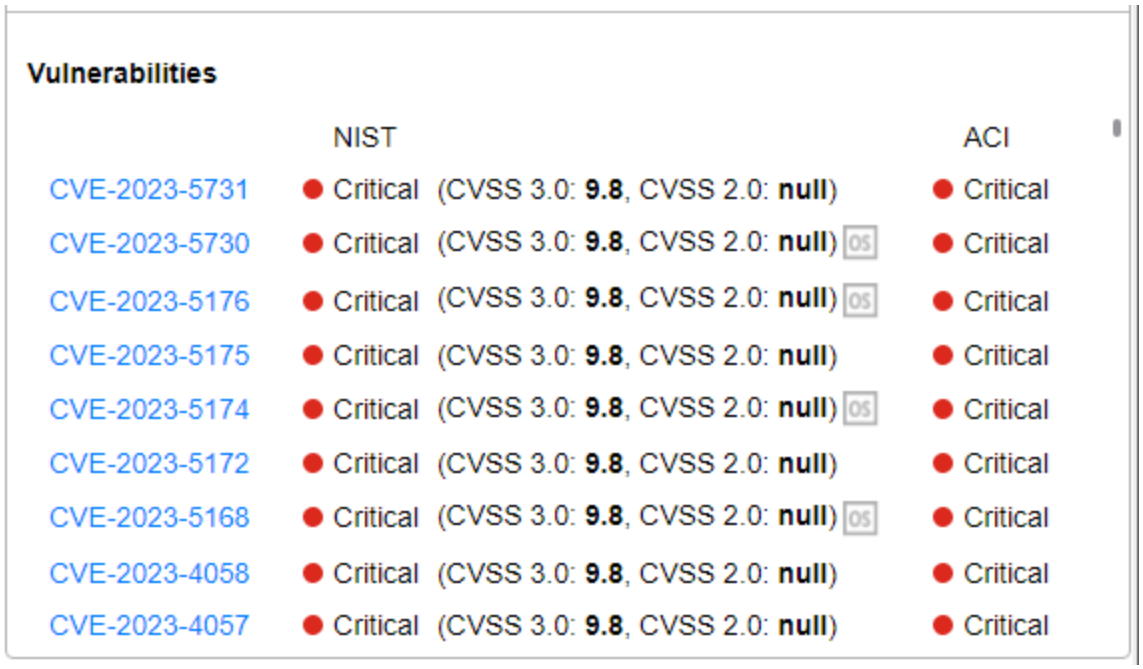
- ACI Severity—Adversary Centric Intelligence (ACI) rating provided by FortiRecon leveraging FortiGuard Threat Analysts to provide comprehensive coverage of dark web, open source, and technical threat intelligence, including threat actor insights. This information enables administrators to proactively assess risks, respond faster to incidents, better understand their attackers, and protect assets.

FortiEDR categories vulnerabilities into the following categories based on National Vulnerability Database (NVD) severity ratings:

- Unknown
- Low
- Medium
- High
- Critical

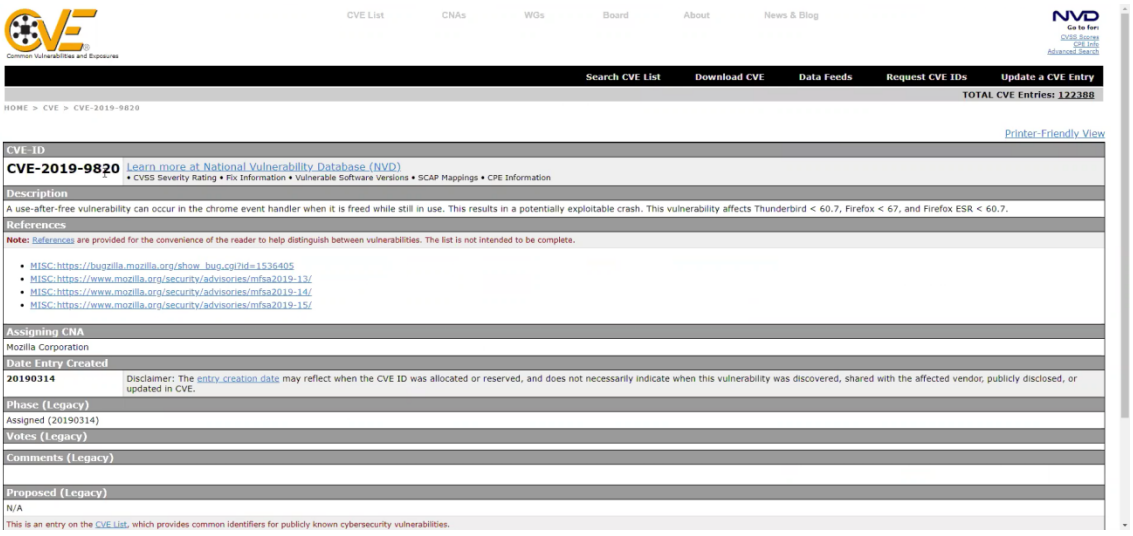


The Vulnerabilities area at the bottom right of the window lists the CVE-identified vulnerabilities for the selected application and version. Each CVE row includes the CVE identifier, the NIST and ACI severity category and the Common Vulnerability Scoring System (CVSS) vulnerability score .



CVSS scoring utilizes two systems: CVSS 3.0, the most recent, and CVSS 2.0, its predecessor. FortiEDR vulnerability information presents both CVSS 3.0 and CVSS 2.0 scores.s

You can click a CVE identifier link to view more details about that vulnerability in your browser, including the type of vulnerability, the application(s) it affects, the version(s) it affects and so on.



After a vulnerability is detected in your system, you can decide the type of the action needed to address it. Typically, it is recommended to upgrade to a newer version of the application, meaning one that does not have the identified vulnerability. Alternatively, virtual patching can be applied with vulnerability-based policy that is configured to block communication of any application with known critical vulnerability. For more details, see Policies on page 189. The information presented in the *Advanced Data* area of the window

also provides useful information to help protect against vulnerabilities. For more details, see Advanced Data on page 183.

Resolved vs. unresolved applications

By default, all new applications have an Unresolved status. Unresolved means that either FortiEDR or the user have not examined the application to ensure that it is safe. Applications with the Unresolved status are indicated by the ● icon in the application list.

FortiEDR automatically resolves an application as safe by checking the application's characteristics. For example, checking the application's reputation and vulnerabilities to ensure that it does not have a bad reputation or critical vulnerabilities. Applications that meet these criteria are automatically changed to the Resolved status by FortiEDR. Applications with the Resolved status are indicated by the ⊘ icon in the application list. You can also change applications to the Resolved status manually.

Sorting the Application List

The application list can be sorted alphabetically by product, vendor, reputation score, vulnerability or arrival time (first seen or last seen). By default, the list is sorted by arrival time, with the most recent communication at the top.

Marking an Entry as Read/Unread

The following describes how to specify that you have viewed an entity in the application list. You can mark applications or versions as read/unread.

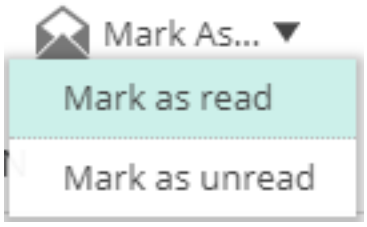
The first time that an application/version is detected in the application list, it is shown in **bold**. **Bold** indicates that the item is unread (see below).

APPLICATION		VENDOR	REPUTATION	VULNERABILITY	FIRST SEEN	LAST SEEN
Thunderbird	**Signed**	**Mozilla Corporation**	5	**Critical**	**18-Dec-2019**	**24-Dec-2019**
WhatsApp	Signed	WhatsApp	5	Critical	18-Dec-2019	18-Dec-2019
Firefox	**Signed**	**Mozilla Corporation**	5	**Critical**	**18-Dec-2019**	**25-Dec-2019**
filebeat.exe	**Unsign...**	**Unknown Vendor**	3	**Unknown**	**19-Dec-2019**	**09-Feb-2020**
Google Chrome	**Signed**	**Google**	5	**Critical**	**19-Dec-2019**	**19-Dec-2019**

To mark an entity as read:

Select the entity's (application or version) checkbox and then click the down arrow on the

button and select **Mark as read**. The text no longer displays in bold.

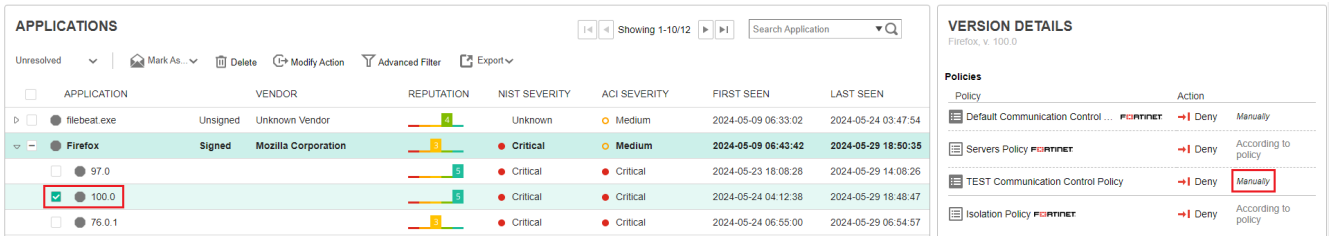


Note – If you mark an application version as read, all lower levels in the version hierarchy for that application are also marked as read.

Modifying a Policy Action

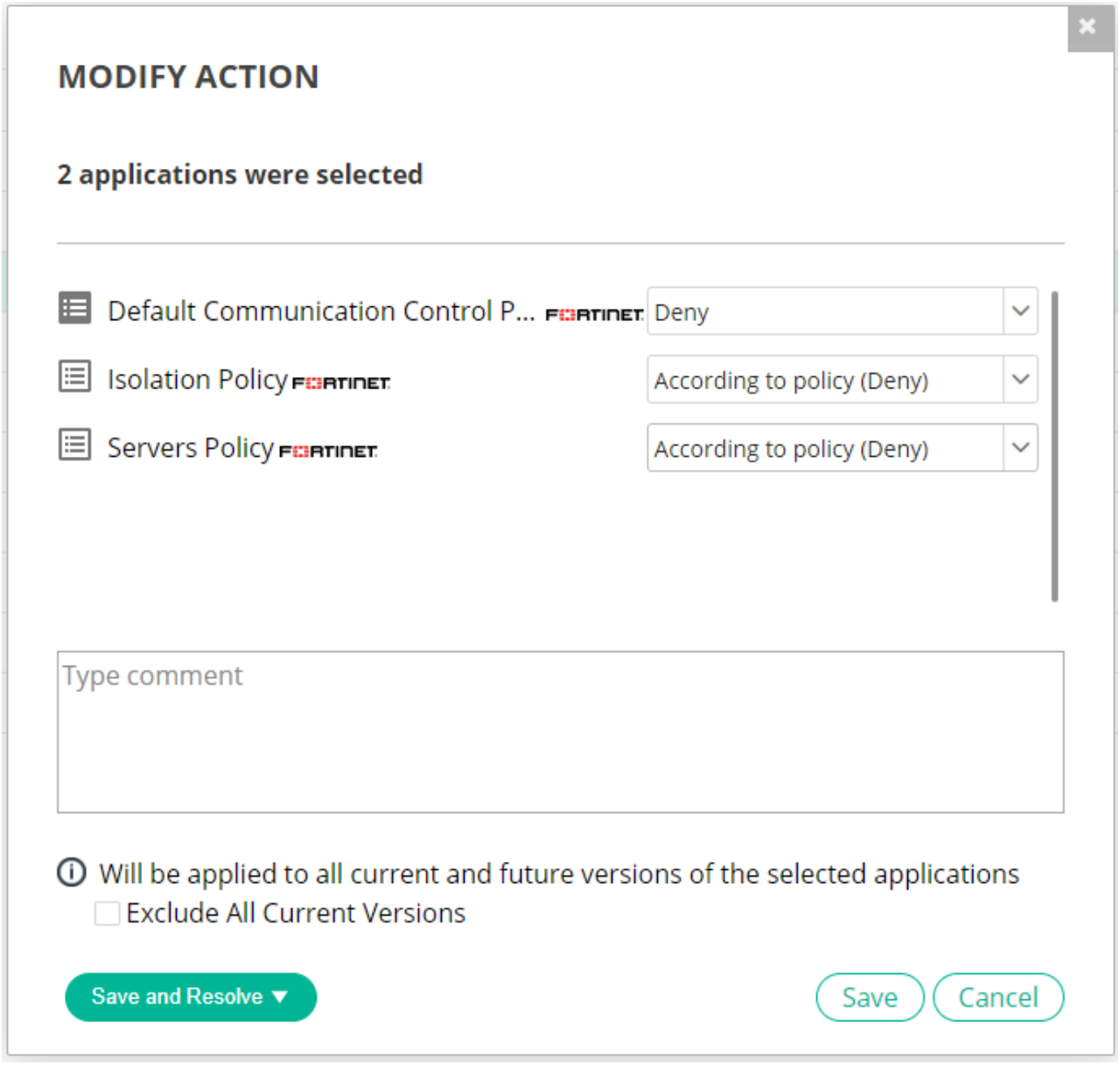
The following describes how to apply a different action to an application/version other than that specified in the current policy for that application/version. In this case, the application/version is excluded from the current action defined in the policy (Allow or Deny).

When modifying a policy action in this manner, the Application/Version Details area displays **Manually** to indicate that the action was modified manually, and is excluded from the action defined in the policy.



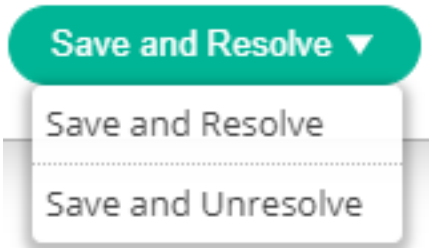
To modify a policy action:

1. Select the application/version checkbox and then click the Modify action button. The Modify Action window displays.



2. In the dropdown list on the right of the policy row whose action you want to change, click the down arrow and then select the action to apply to the selected entity. You can change the action for one or more policies.
3. [Optional] In the Comment field, enter a free-text comment describing the action change. By default, the date and time when the policy action was changed automatically displays.

4. [Optional] Check the Exclude All Current Versions checkbox if you want to exclude existing application versions from the decision. In this case, the new communication control decision only applies to a future version of the product. The application of the policy action change applies for current versions of the application. When this checkbox is not selected, the change is applied to all versions of the application.

5. Click the arrow next to the 

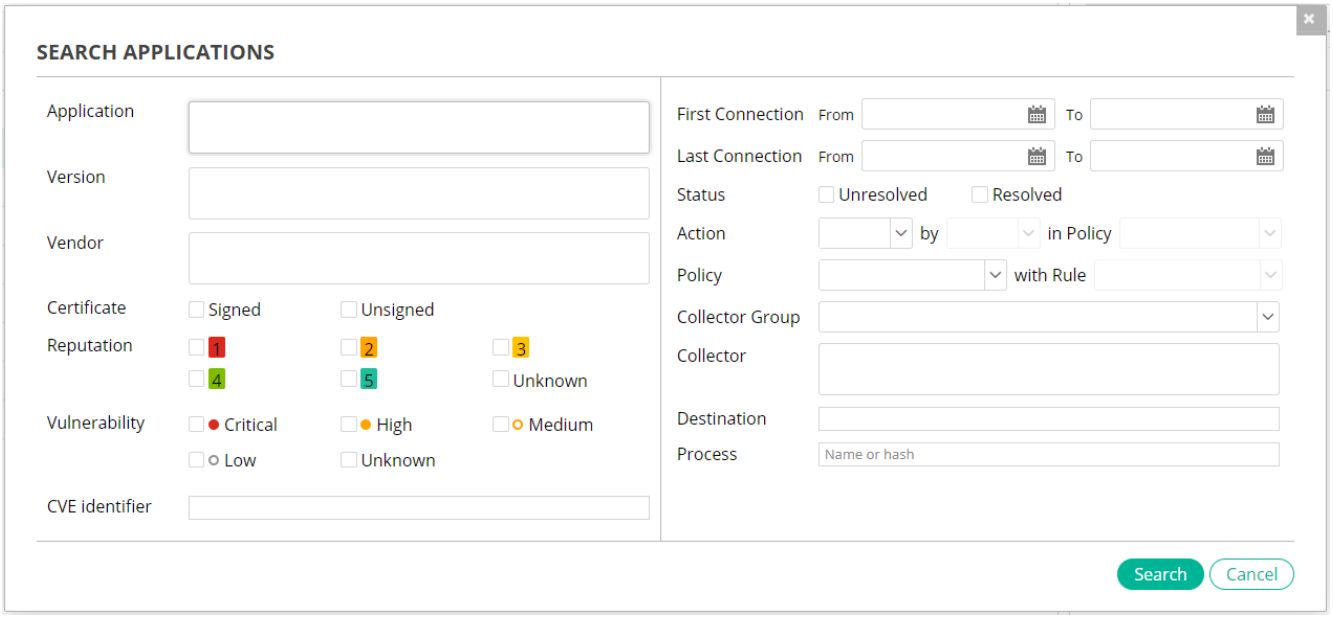
button to save the new communication control decision for the selected application(s).

When any FortiEDR Central Manager user marks an application/version as **Resolved**, all users see it as having been resolved. You can also mark an application/version as resolved using the ⊘ icon in its row in the application list.

Searching the Application List

You can use the

field to perform an advanced search. Click the down arrow to open the Search Applications window, in which you specify your search criteria.



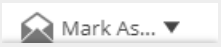
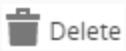
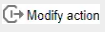
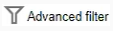
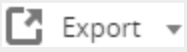
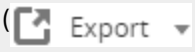
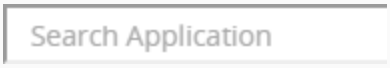
You can filter the application list by the following criteria:

Filter	Criteria
Application	Filters by application name
Version	Filters by version. This is a free-text field.
Vendor	Filters by vendor name.
Certificate	Filters by signed or unsigned certificate.
Reputation	Filters by reputation score. Check the checkbox(es) for the reputation

Filter	Criteria
	score(s) of interest.
Vulnerability	Filters by vulnerability score.
CVE Identifier	Filters by exact match of the vulnerability identifier, using the following format – CVE-YYYY-nnnn.
First Connection / Last Connection	Filters by the specified date range when the first/last connection of the application was detected in the system.
Status	Filters by status (Resolved, Unresolved,).
Action	Filters by action.
In Policy	Filters by policy. If you specify a specific action in the Action field, then you can only select from policies with that specific action.
Policy	Filters by a specific policy.
With Rule	Filters by a specific policy predefined rule.
Collector Group	Filters by the Collector Group used to communicate. This means that a device(s) in the specified Collector Group was used to communicate.
Collector	Filters by the Collector (device) used to communicate.
Destination	Filters by the Collector destination (IP address).
Process (Name/Hash)	Filters by the process name or hash value.

Other options in the Application pane

Option	Function
	Click the down arrow in the button and then select an option in the dropdown list to filter the application list accordingly. You can filter the list by:
All	Lists all applications for the organization.
Unresolved	Lists applications that have not been resolved by either the user or FortiEDR. Applications with this status are indicated by the ● icon in the application list. This is the default filter.
Resolved	Lists applications that have been resolved by either the user or FortiEDR. Applications with this status are indicated by the ⊘ icon in the application list.
Unknown Vendors	Lists applications whose for which the vendor is not known in the system.
Low Reputation	Lists applications with a low reputation score.

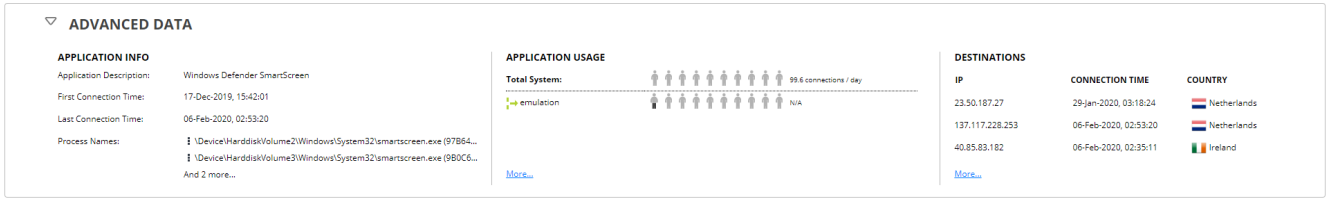
Option	Function
Critical CVE	Lists applications with a Critical CVE score.
Unread	Lists applications that have not yet been viewed in the application list.
	Click the down arrow on the  button and then select *Mark as read* or *Mark as unread*. For more details, you may refer to the Marking an Entry as Read/Unread on page 178.
	Click to delete the entity selected in the application list. Note that if the deleted entity attempts external communication again, it will be added back to the application list. In this case, any action defined in the policy for this entity must be redefined.
	Click the button to change the current policy action to be applied for the selected entity, as described in Modifying a Policy Action on page 179
	Click the advanced filter to review applications by suspicious characteristics, such as existing vulnerabilities or reputation score. This filter can be used to set up policy rules. See Policy rules on page 193.
	Click the down arrow in the *Export* button ( and select the format for exporting data. You can select *Excel* or *JSON*.
	Use the *Search Application* field to perform an advanced search, as described in Searching the Application List on page 181.

Advanced Data

The Advanced Data area presents statistics about the selected entity in the application list. The information that displays varies, depending on the entity selected (application or version).

Application Advanced Data

When an application is selected in the application list, the *ADVANCED DATA* area displays the following information for it:

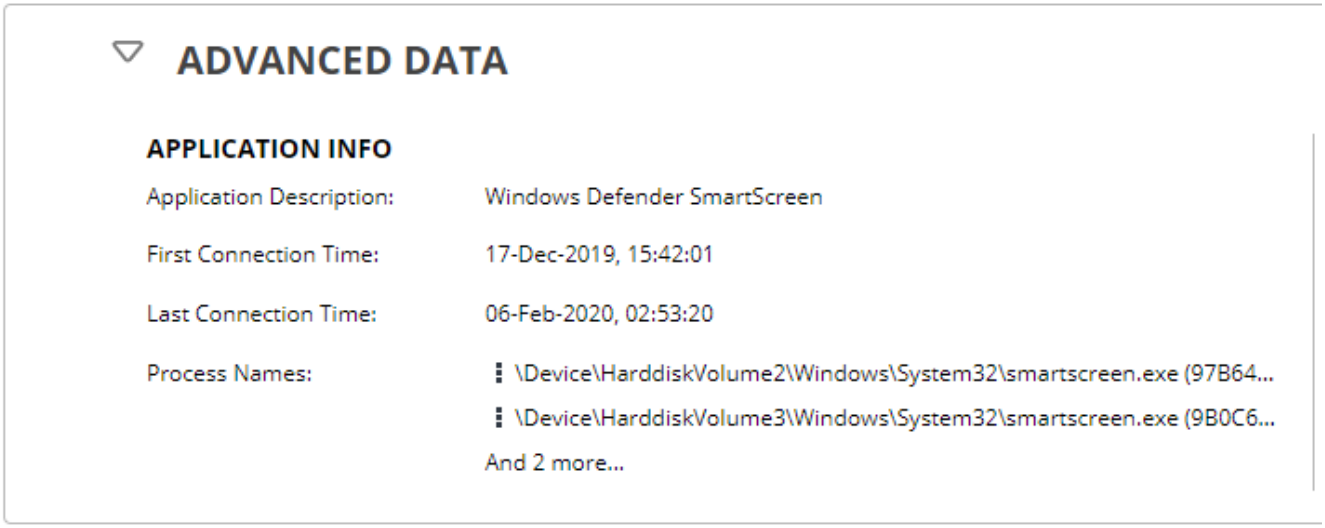


- Application information on page 184
- Application Usage on page 185

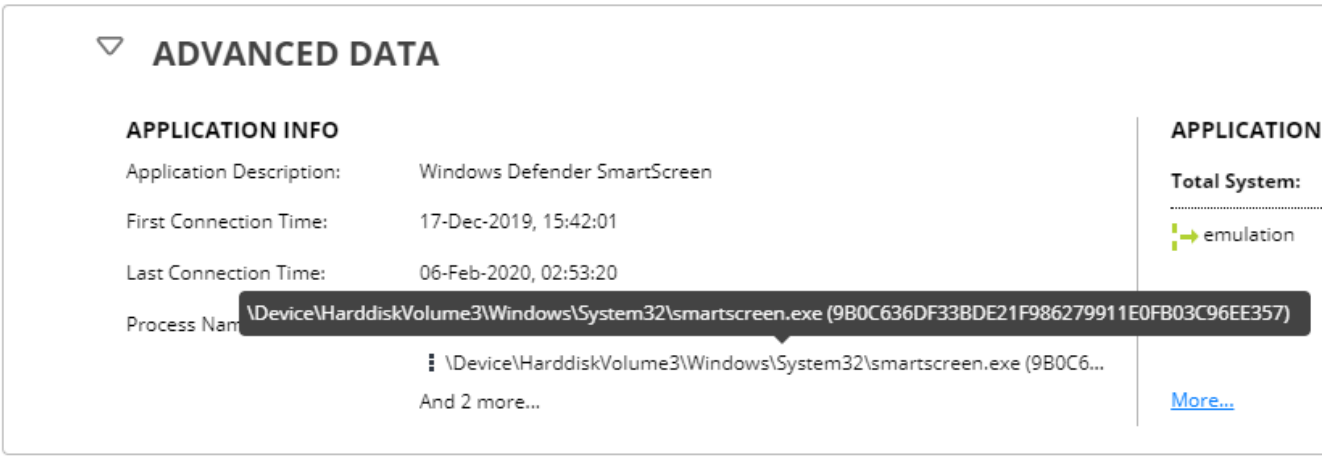
- Destinations on page 186

Application information

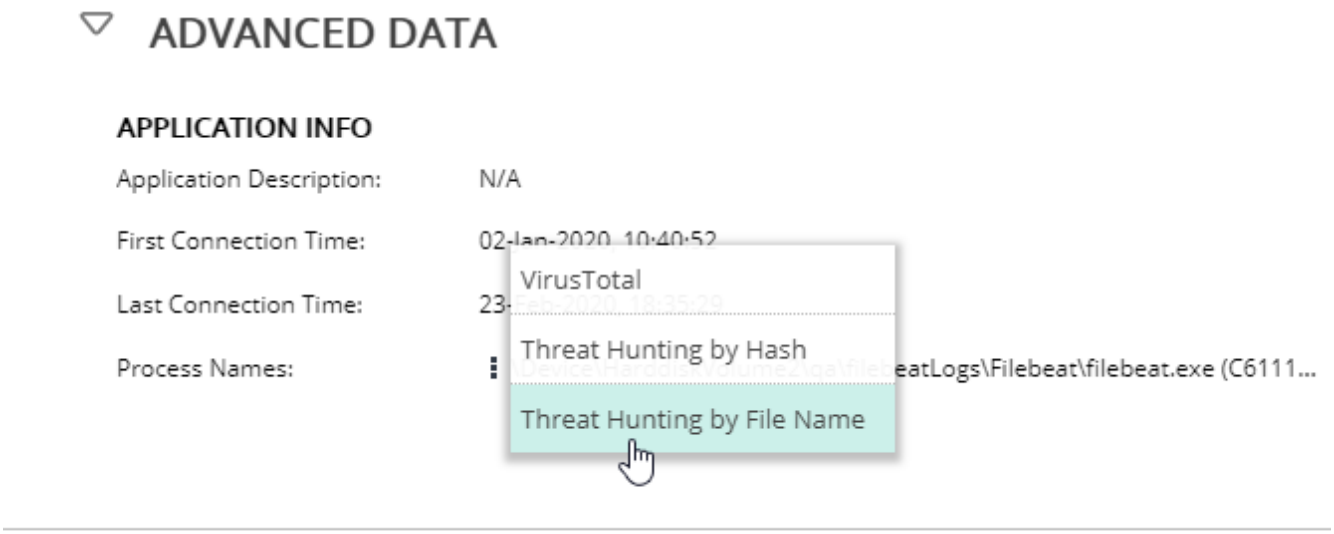
The *APPLICATION INFO* area displays summary information about the selected application.



In the *Process Names* field, a separate row appears for each application that shares the same vendor, product and version properties. The *Process Names* field displays the full file path for each such application.

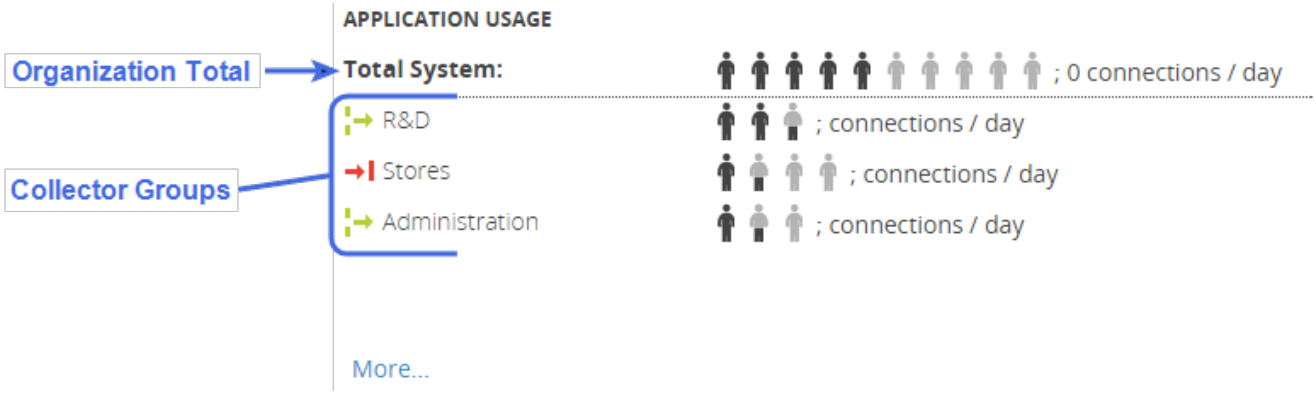


You can click the three dots next to the *Process names* field to navigate to the Threat Hunting window for that process name or hash, or to explore the hash in VirusTotal, as shown below:



Application Usage

The *APPLICATION USAGE* area displays details about usage of the selected application.

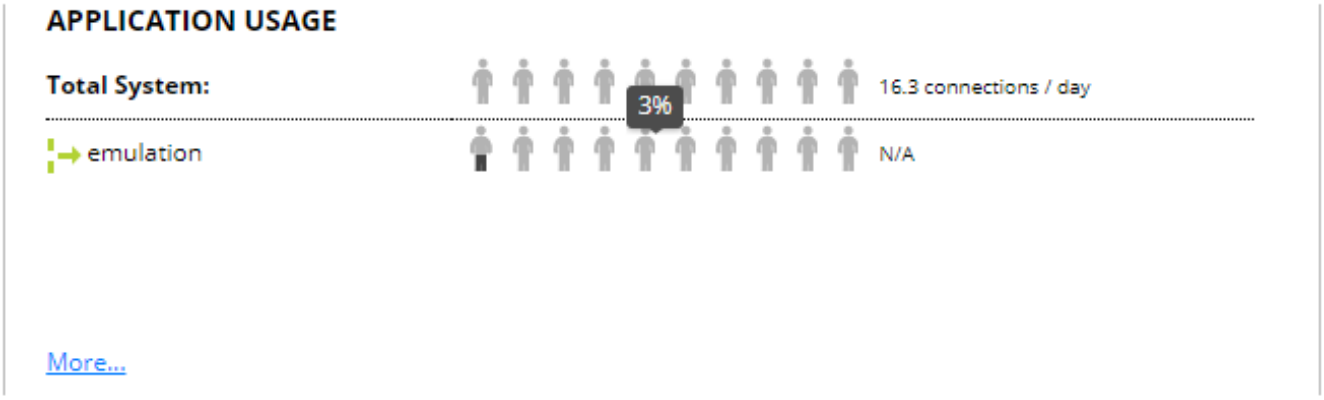


This area shows the number of connections (communication sessions) per day. The top line shows the total number of devices within the organization on which the selected application is installed.

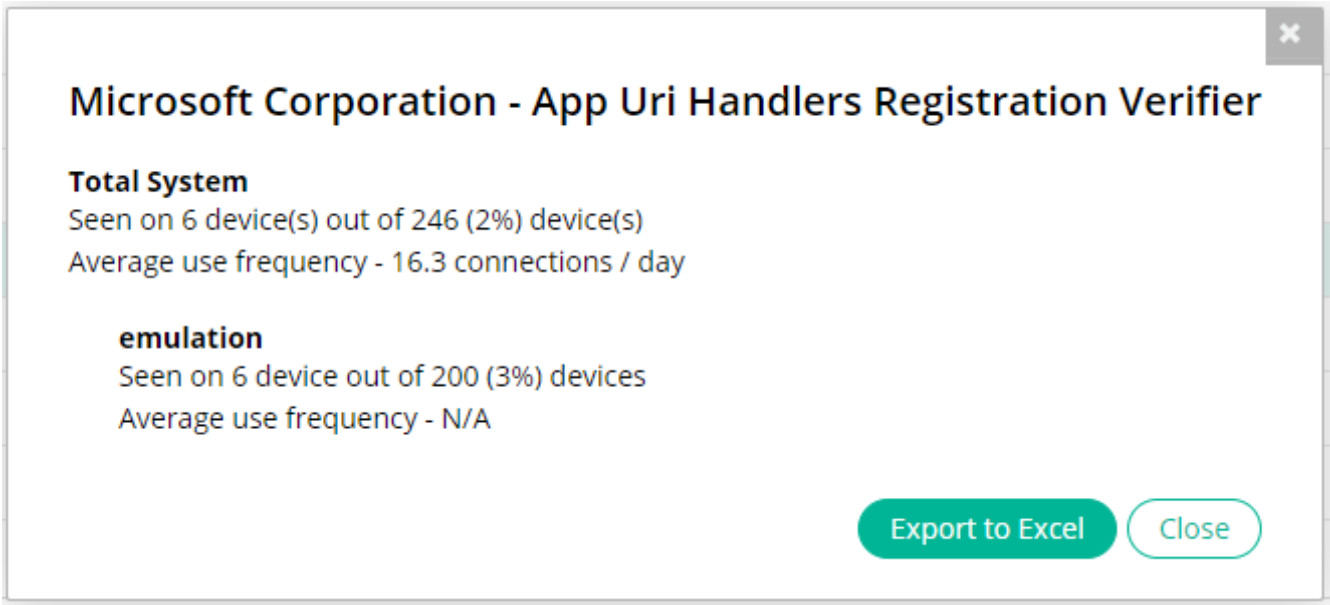
Each row below the underline represents a different Collector Group, and shows the number of devices in the organization in that Collector Group.

Each person icon represents 10% of the total devices in the organization/Collector Group. Black icons represent devices that communicate externally using the selected application, and gray icons represent devices that did not communicate externally using the application.

You can hover over the people icons to see the percentage of devices that communicate externally per day using the selected application. For example, the figure below shows that only 3% of the devices in the organization have the selected application installed.



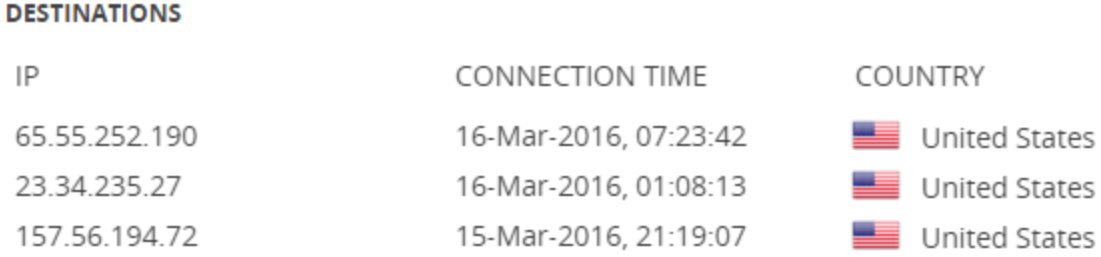
Click the *More* link to open the following window, in which you can view additional details about the selected application.



Click the *Export to Excel* button in this window to export application usage information to Excel.

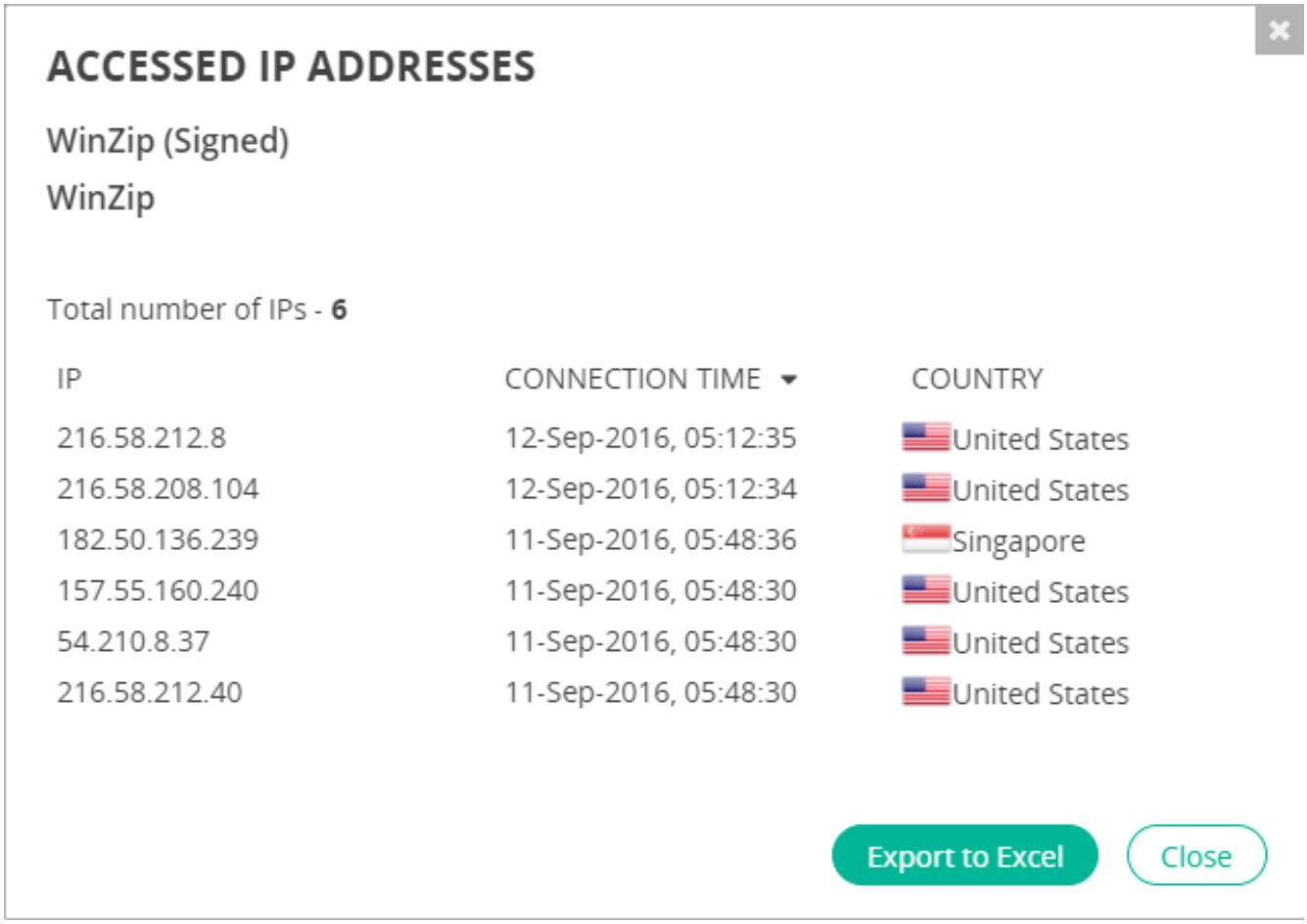
Destinations

The *Destinations* area shows the destinations to which the selected application communicated (Allowed) or attempted to communicate (Denied).



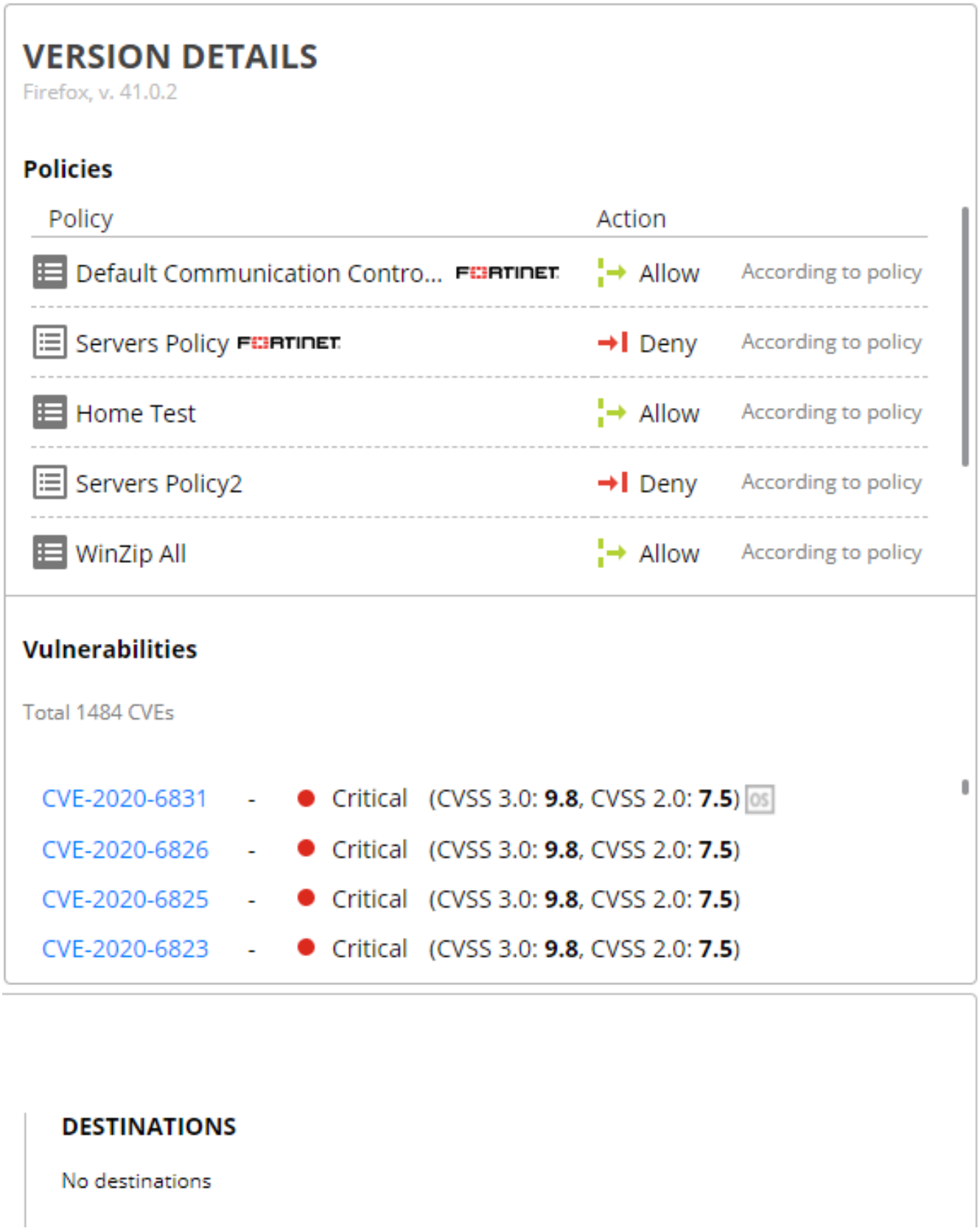
Each row shows the IP address, connection time and country of the destination.

By default, this area displays the five most-recent destinations. Click the *More* link to open the following window, which displays the last 50 destinations.



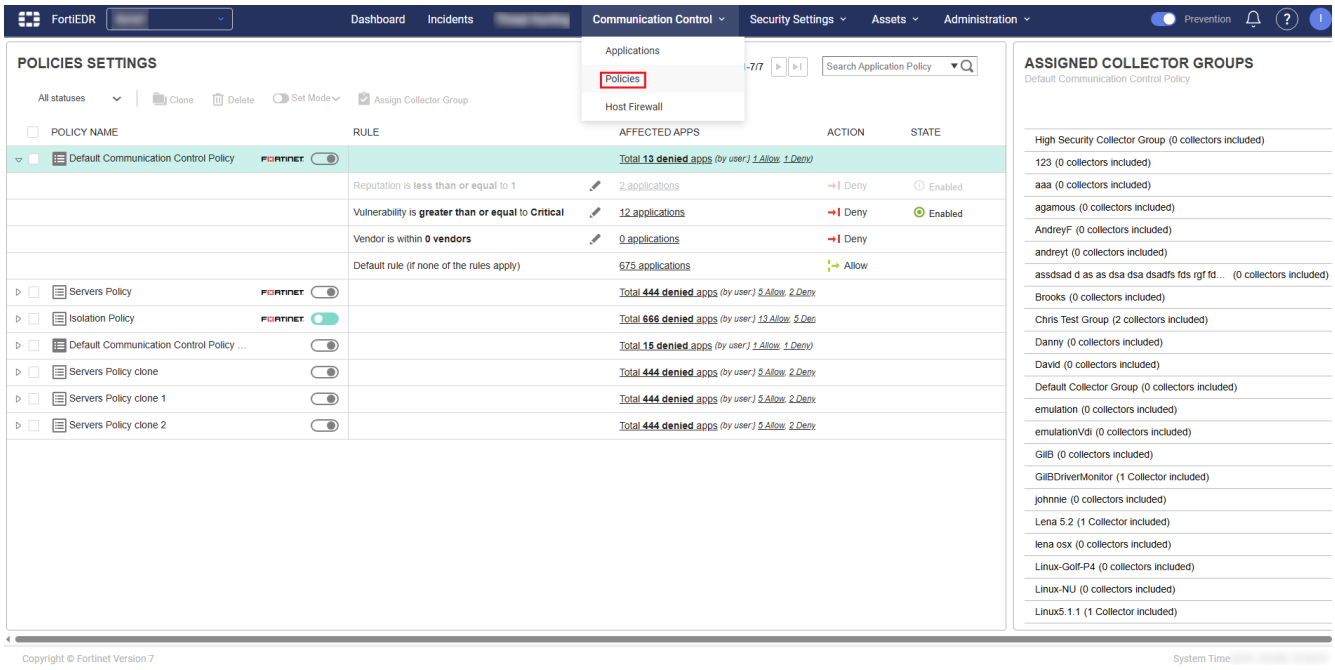
Version Details

The *Version Details* area displays the action defined for the application in each policy, plus its vulnerability details and affected destinations.


VERSION DETAILS
Firefox, v. 41.0.2
Policies
Policy
Action
Default Communication Contro...
Allow
According to policy
Servers Policy
Deny
According to policy
Home Test
Allow
According to policy
Servers Policy2
Deny
According to policy
WinZip All
Allow
According to policy
Vulnerabilities
Total 1484 CVEs
CVE-2020-6831 - Critical (CVSS 3.0: 9.8, CVSS 2.0: 7.5)
CVE-2020-6826 - Critical (CVSS 3.0: 9.8, CVSS 2.0: 7.5)
CVE-2020-6825 - Critical (CVSS 3.0: 9.8, CVSS 2.0: 7.5)
CVE-2020-6823 - Critical (CVSS 3.0: 9.8, CVSS 2.0: 7.5)
DESTINATIONS
No destinations

Policies

The *POLICY SETTINGS* page displays the Communication Control policies that can be applied to an application or version in the application list. Communication Control has its own policies. Each policy row can be expanded to show the rules for that policy. To access this page, click the down arrow next to *COMMUNICATION CONTROL* and then select the Policies.

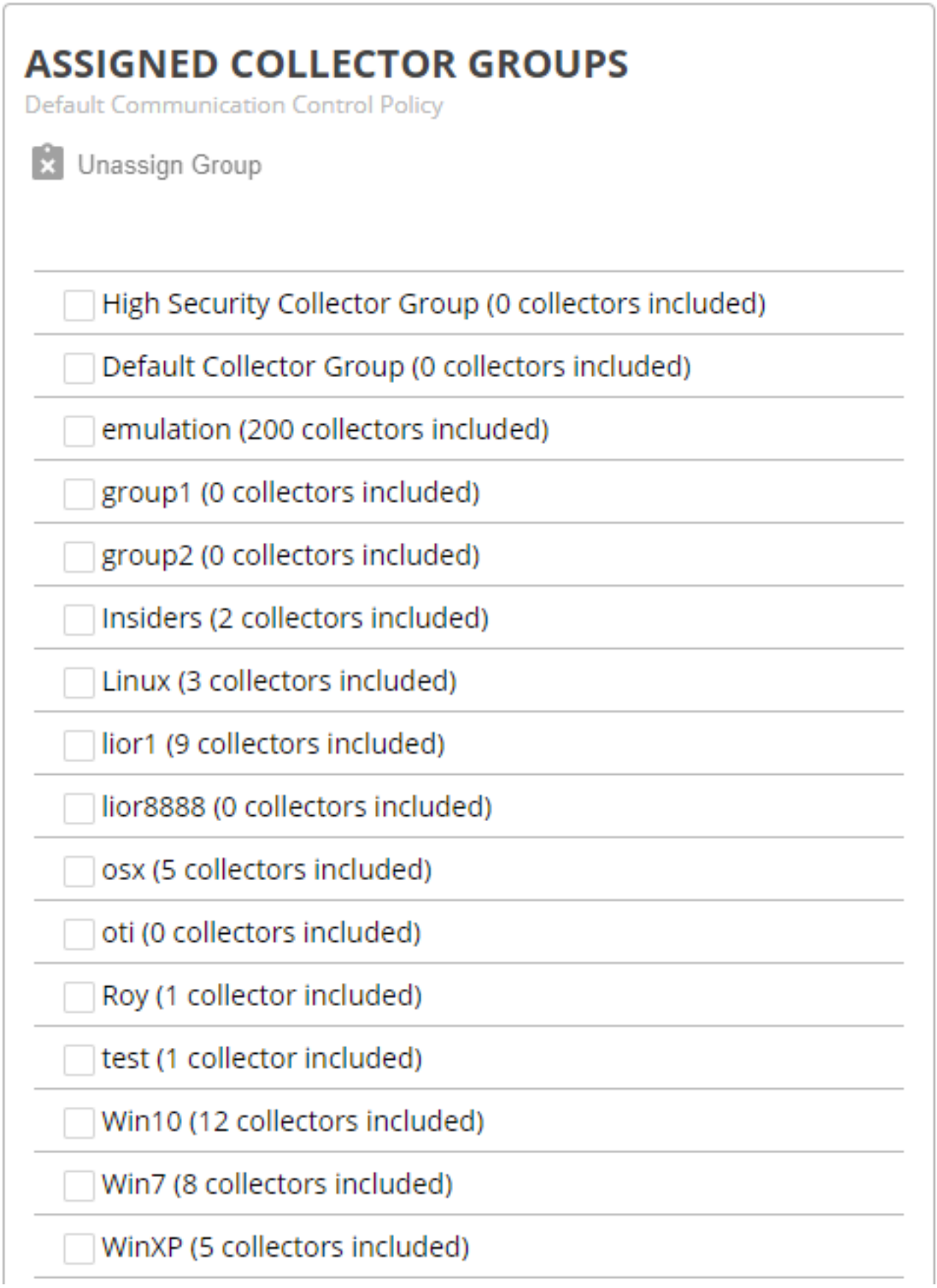


Communication Control policies define the actions to be taken for a given application or application version. Each policy applies to a different Collector Group(s), and all the devices that belong to that Collector Group (s). A Collector Group can only be assigned to one policy.

The following information is defined for each communication policy:

Information Field	Description
Policy Name	The policy name appears in the leftmost column. The policy name is defined when the policy is created.
Rule	The rule as it applies to the policy. The default action for the policy is displayed under the default rule of the policy. For more details, see the Policy rules on page 193.
Affected Apps	The number of applications affected by the policy.
Action	Specifies the action that is enforced when this rule is violated (Allow or Deny).
State (Enabled/Disabled)	This option enables you to disable/enable this rule.

The Assigned Collector Groups area on the right lists the Collector Group(s) assigned to the policy.


ASSIGNED COLLECTOR GROUPS
Default Communication Control Policy
Unassign Group
High Security Collector Group (0 collectors included)
Default Collector Group (0 collectors included)
emulation (200 collectors included)
group1 (0 collectors included)
group2 (0 collectors included)
Insiders (2 collectors included)
Linux (3 collectors included)
lior1 (9 collectors included)
lior8888 (0 collectors included)
osx (5 collectors included)
oti (0 collectors included)
Roy (1 collector included)
test (1 collector included)
Win10 (12 collectors included)
Win7 (8 collectors included)
WinXP (5 collectors included)

Predefined policies

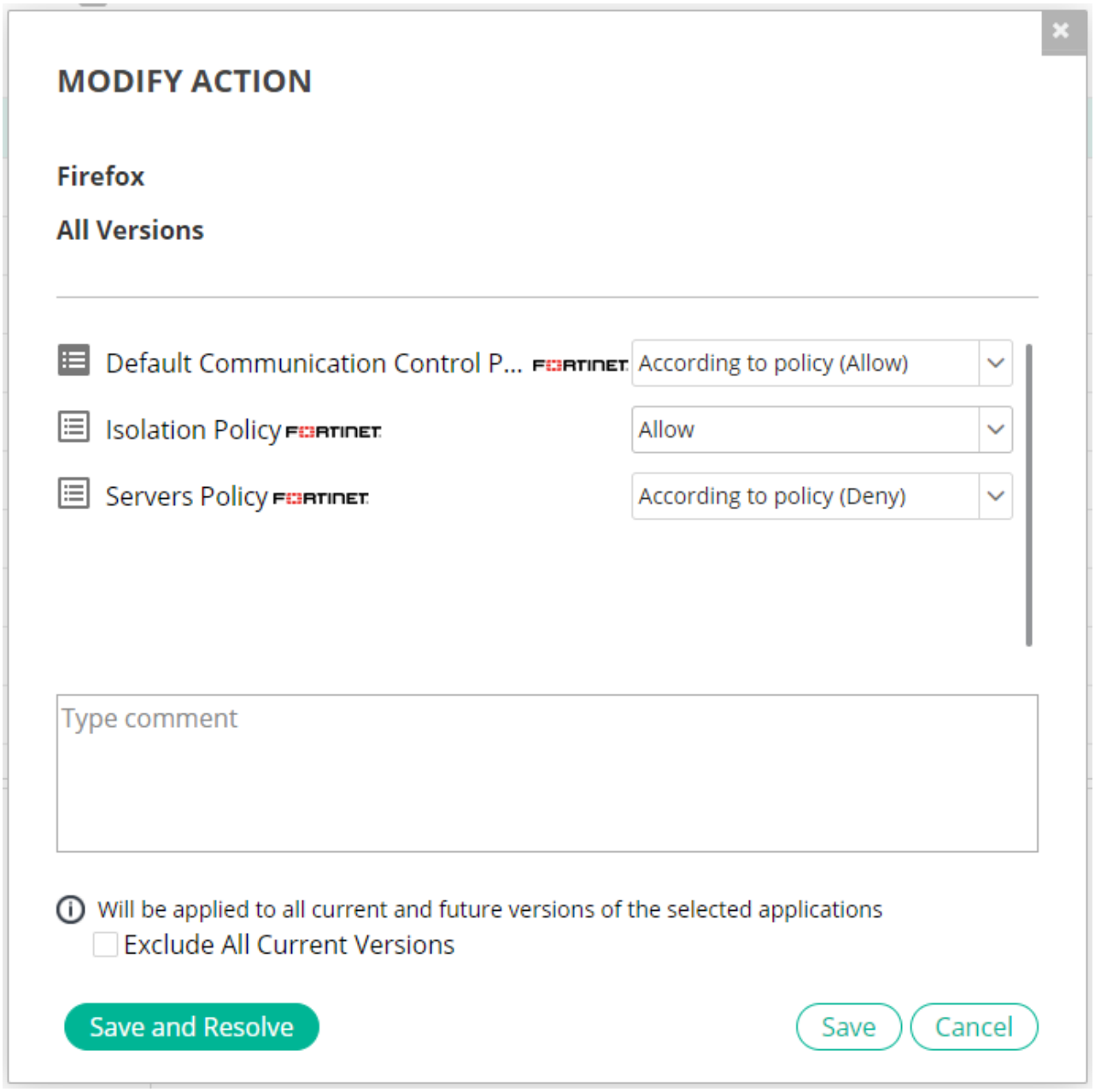
FortiEDR is provided out-of-the-box with several predefined policies, ready for you to get started. These policies are marked with the FORTINET logo.

- The Default Communication Control policy is one such policy, and is always listed first in the list of policies. The Default Communication Control policy is a blocklisting policy that is automatically applied to any Collector Group that is not assigned to any of the other Communication Control policies.
- The *Servers* predefined policy is an allowlist policy that assigns a Deny action to all applications by default, except for a list of known, recognized and legitimate applications, which are allowed. This policy gives your organization a jump-start, as some of the leg work to identify legitimate applications in your organization has already been done for you.
- The Isolation predefined policy isolates (blocks) communication to/from a device. This policy cannot be deleted and only applies in Prevention mode. When this policy is in force and communication for a given device has been blocked, you can manually permit communication to/from the device for a specific application using the procedure below.

To permit communication to/from the device for a specific application:

1. Select the *APPLICATIONS* page.
2. Select the application/version to which you want to permit communication.

3. Click the *Modify Action* button. The following displays:



4. In the *Isolation Policy* row, select *Allow* in the dropdown menu.

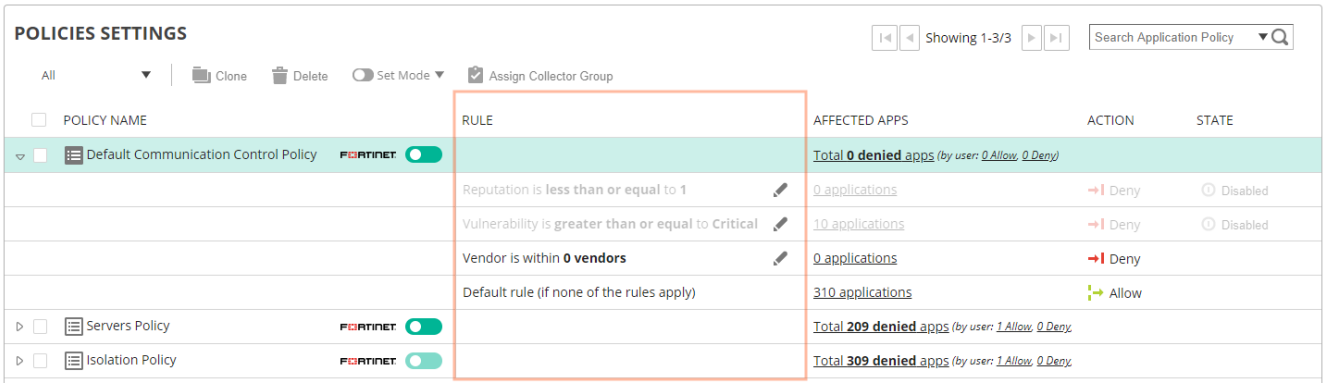
Policy mode

The slider for a policy indicates the current mode for the policy. A green slider indicates Prevention mode and a gray slider indicates Simulation mode. You can change the mode using the *Set mode* (

Set mode) button at the top of the *Policies* pane. For more details about these modes, you may refer to Protection or Simulation mode on page 203.

Policy rules

For each communication policy, FortiEDR provides four rules out of the box. These rules can be modified to specify the connections to be blocked/unblocked according to several parameters. FortiEDR provides the following communication policy rules:



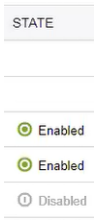
Policy Rule	Description
Default rule	This rule applies when none of the other three rules apply.
Reputation is less than or equal to X	This rule enables FortiEDR to block/unblock by reputation score.
Vendor is within X vendors	This rule enables FortiEDR to block/unblock by vendor. For this rule, you specify the vendor(s) to include and to exclude.
Vulnerability is greater than or equal to X	This rule enables FortiEDR to block/unblock by vulnerability. In the rules, X represents a user-defined value.

In the rules, **X** represents a user-defined value.

For example, the figure below shows that the Servers Policy has the following rules defined for it:

- Vendor is within 12 vendors. This rule is enabled for the policy. The action for this rule is Allow.
- Default rule (if none of the rules apply). This rule is always enabled.

You can enable or disable a rule for a policy by clicking the Enabled/Disabled button in the State column of the applicable rule. This button toggles between **Enabled/Disabled**.

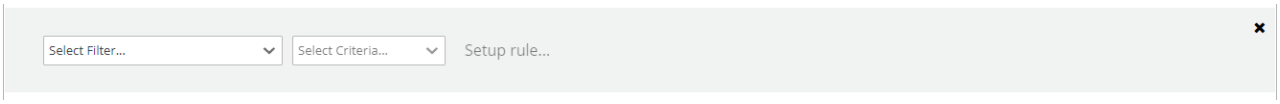


Editing a policy rule

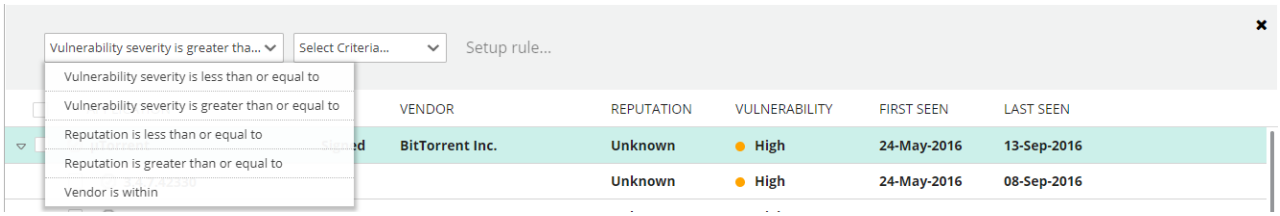
The four rules for a policy can be modified, as needed.

To edit a rule:

1. Click the *Edit* ( ) button for the rule of the policy that you want to modify. This switches the view to the *APPLICATIONS* page, enabling you to review the applications affected by this rule before saving it. The following displays:

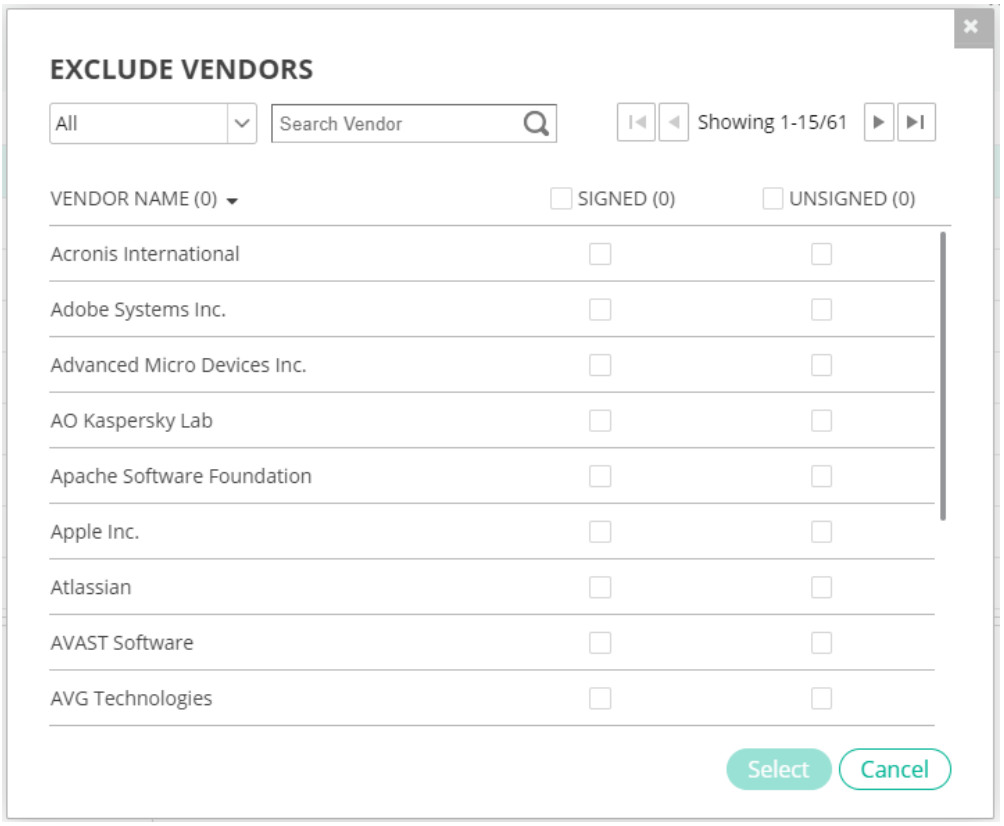


2. In the *Select Filter* dropdown list, select the parameter whose value you want to set in the rule. This dropdown list lists the parameters available to configure for the rule.

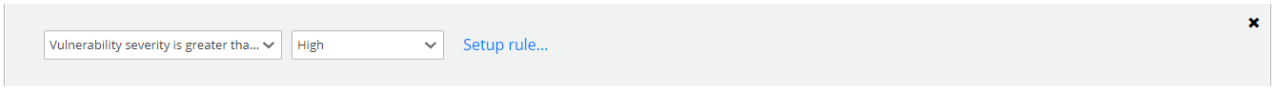


3. In the rightmost *Select Criteria* dropdown list, select the value for the parameter. This dropdown list lists the values available to configure for the parameter specified in step 2.

When modifying the Vendor is within X vendors rule, you specify the vendor(s) to include and those to exclude for the rule.

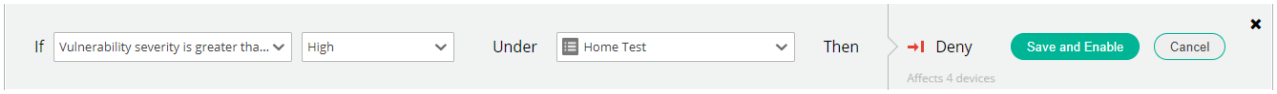


4. Click the *Setup rule* link.

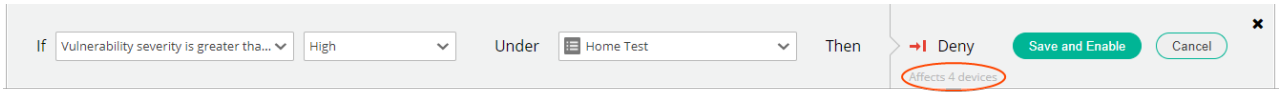


5. In the *Under* dropdown list, select the policy to which this rule applies.

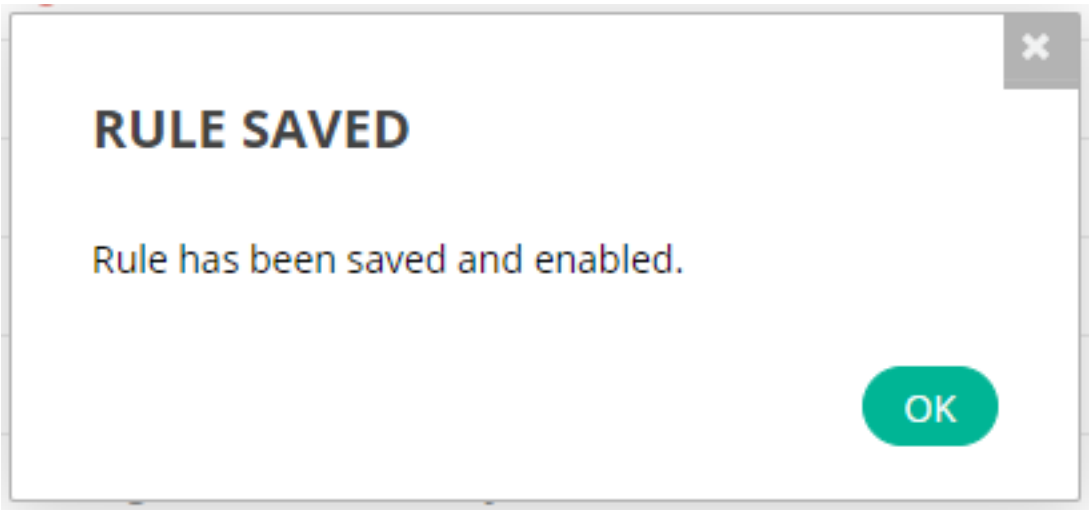
6. In the *Then* field, specify whether to Allow or Deny the application based on this rule.



The application list now shows the number of application(s) affected by the rule change.



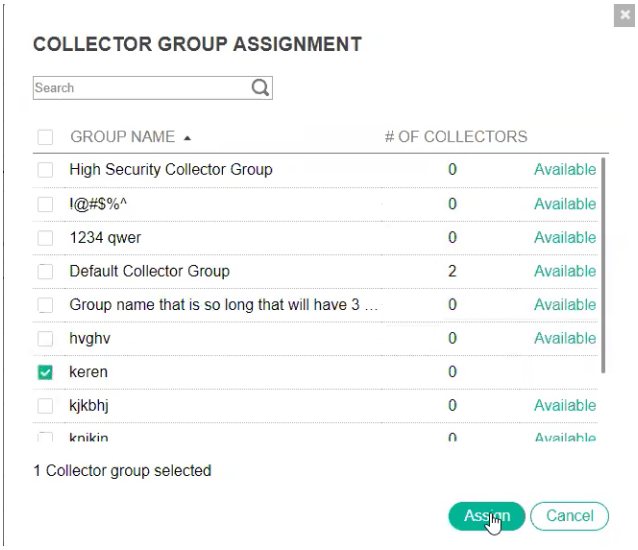
7. Click the *Save and Enable* button to save and enable the changes to the rule. A confirmation window displays, confirming the rule change.



8. Click *OK*.

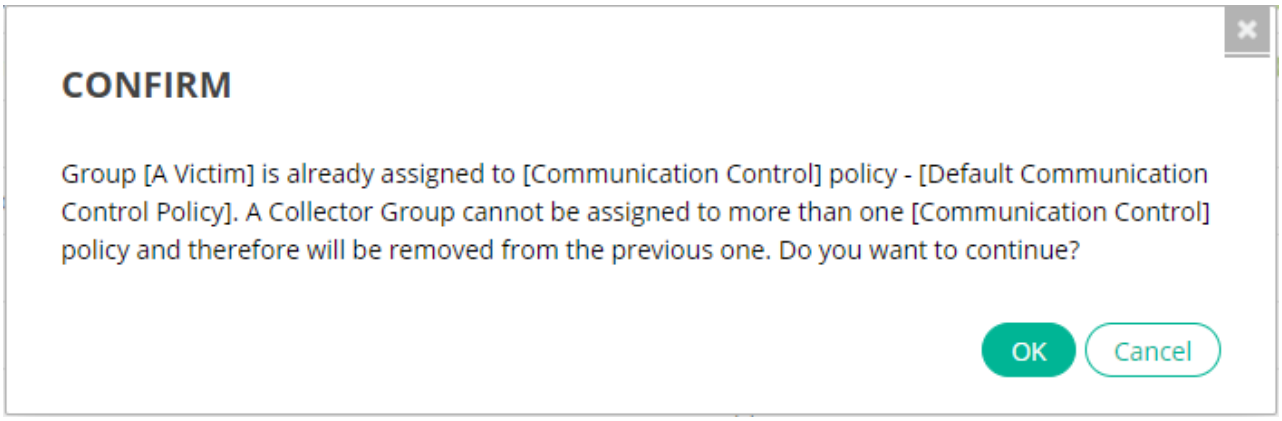
Assigning a policy to a Collector Group

1. Check the policy that you want to change in the policy list and then click the*Assign Collector Group* button. The following displays:

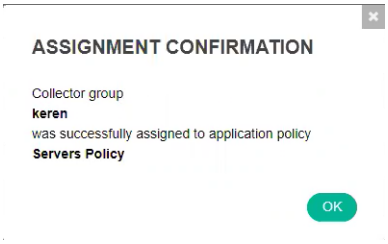


2. Check the checkbox of the Collector Group you want to assign to the policy.

3. Click *Assign*. A window displays, prompting you to confirm the reassignment.



4. Click *OK*. The following displays:



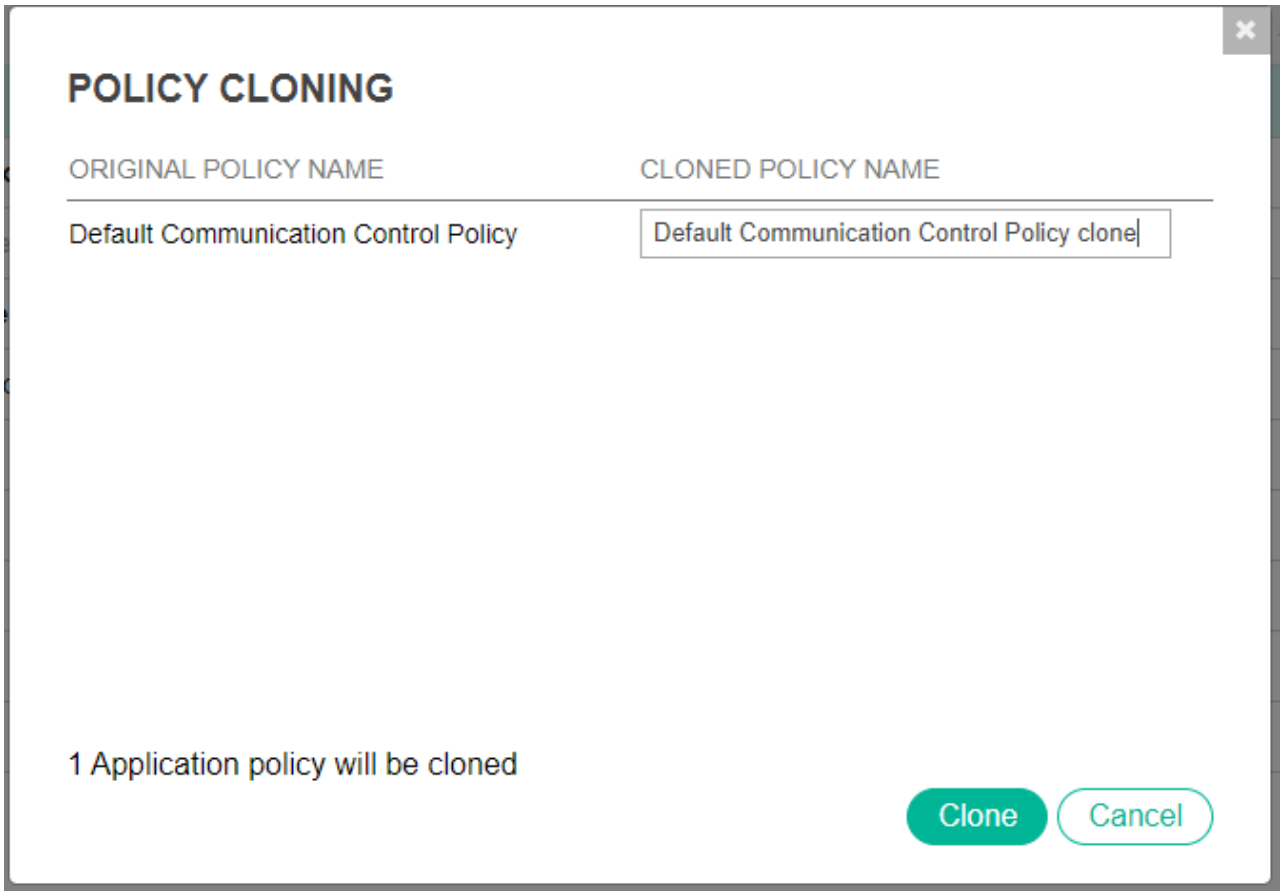
5. Click *OK*.

Creating a new Communication Control policy

A new Communication Control policy can be created by cloning an existing policy, as described below. New policies are only needed if you are going to assign different policies to different Collector Groups. Otherwise, you can simply modify one of the default policies that come out-of-the-box and apply it to all FortiEDR Collector Groups by default. Modifications made on one policy do not affect any other policies.

1. In the policy list, check the policy that you want to clone. There are two types of Communication Control policies: blocklisting policies ( ), such as the Default communication control policy, which allows any connection by default, and allowlisting policies ( ), such as the Servers policy, which denies any connection by default.

2. Click the *Clone* button. The following window displays:



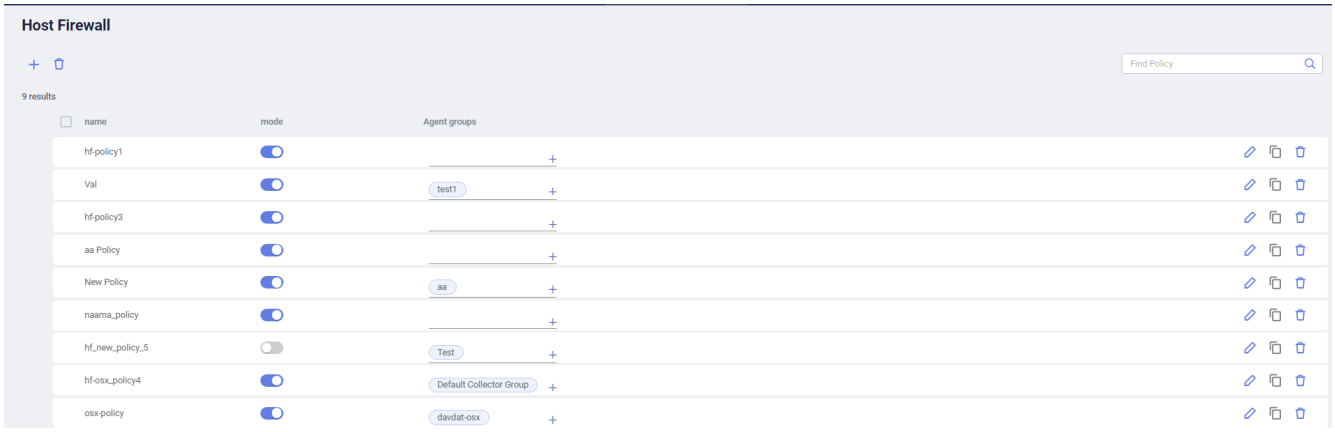
3. In the *Cloned Policy Name* field, specify a name for the cloned policy.
4. Click *Clone*.

Other options in the Policies pane

Option	Description
All	Click the down arrow in the All button and then select an option in the dropdown list to filter the policy list accordingly.
Clone	Click this button to clone a policy.
Delete	Click this button to delete a policy. Before deletion, a confirmation message displays, prompting you to confirm the deletion of the policy.
Set mode	Click the down arrow in the Set mode button and then select the mode for the policy, as described in Policy mode on page 192

Host Firewall COLLECTOR 6.1 OR LATER

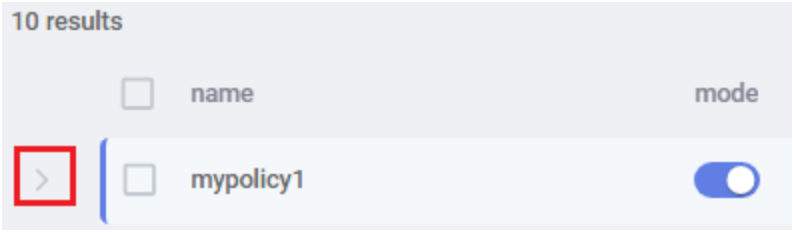
Use the *Communications Control* > *Host Firewall* page to configure host firewall policies to control incoming and outgoing network traffic to protect endpoints against unwanted connections based on remote addresses, protocols, or applications in use to reflect the organization's network policies. Host firewall policies reduce the attack surface by protecting the host while working outside the enterprise network (public Internet, home, or other networks).



To configure a host firewall policy:

1. In the *Communications Control* > *Host Firewall* page, click the *Add* button at the top left corner.
2. Specify a name for the host firewall policy.
3. Select the Collector groups that the host firewall policy applies to.
4. Click *Save* to save the host firewall policy.
   The host firewall policy appears in the list.
5. **(Optional)** Add or remove Collector groups for the host firewall policy in the *Collector group* column.
6. Define rules to associate with the host firewall policy:

a. Expand the row of the host firewall policy in the table.



b. Click the *Add* button under the host firewall policy.
c. Enable the rule if you want to enforce the rule immediately after creation. You can also choose to enable it later.
d. Specify a name for the rule.
e. Specify the application name or IP address and port combination that the rule applies to.
   The IP address and port can be single or a range, including wildcard. For example, 192.168.0.1 or 192.168.0.1-192.168.0.100.
f. Select the protocol, which can be TCP, UDP, or any.
g. In the *Process* field, specify an application name to apply the rule to one specific application or use the default *Any*, which means the rule applies to all applications.
h. In the *Action* dropdown, select whether to allow or deny matching connections.
   The action applies to both incoming and outgoing traffic.
i. **(Optional)** Add a description for the rule.
j. Click *Save* to save the rule.
   The rule appears under the host firewall policy in the table.
k. Add more rules by repeating the steps above as needed.
l. When more than one rule exists, drag and drop the rules in the order of priority. When the criteria of multiple groups are met, the first matching rule will be used.

7. Enable or disable the host firewall policy or a specific rule using the mode button.
8. To log connections blocked by a Collector, check the *Firewall Block* action in the Collector's assigned Threat Hunting Collection profiles on page 258.

Host firewall policies work side by side with existing Communication Control policies. In case of contradictions, FortiEDR applies the more restrictive out of the two. For example, if a group is assigned to a host firewall policy that allows any connection to a specific remote address but the Communication Control policy assigned to the group restricts connections to low reputation applications, connections to the remote address will be blocked if the connection goes to low reputation applications.

Profiles

This chapter describes FortiEDR security policies and Playbook policies for defining, monitoring and handling FortiEDR security.

Security policies

The most powerful proprietary feature of the FortiEDR platform is its predefined and configurable security policies.

To access the FortiEDR *Security Policies* page, click the down arrow next to *Profiles* > *Security* > *Policies*.

Out-of-the-box policies

FortiEDR provides the following out-of-the-box policies. Each policy comes with multiple highly intelligent rules that enforce it.

You will receive one or all policies, depending on your FortiEDR license.

- *Application Control*: This policy enables FortiEDR to block user-defined applications from running, so that they do not launch. Blocklist management is done on the Application Control on page 234 page.

  Application Control security events are displayed under dedicated *Application Control* filter in the *Incidents* page and are not listed as part of the *All* filter.

- *Device Control*: This policy enables FortiEDR to detect and block the usage of USB devices, such as USB mass storage devices. In this policy, detection is based on the device type.

  This feature is a license-dependent and requires the Vulnerability Management add-on (meaning License Type that is either Discover and Protect or Discover, Protect and Response). Device Control security events are displayed under dedicated *Device Control* filter in the *Incidents* page and are not listed as part of the *All* filter.

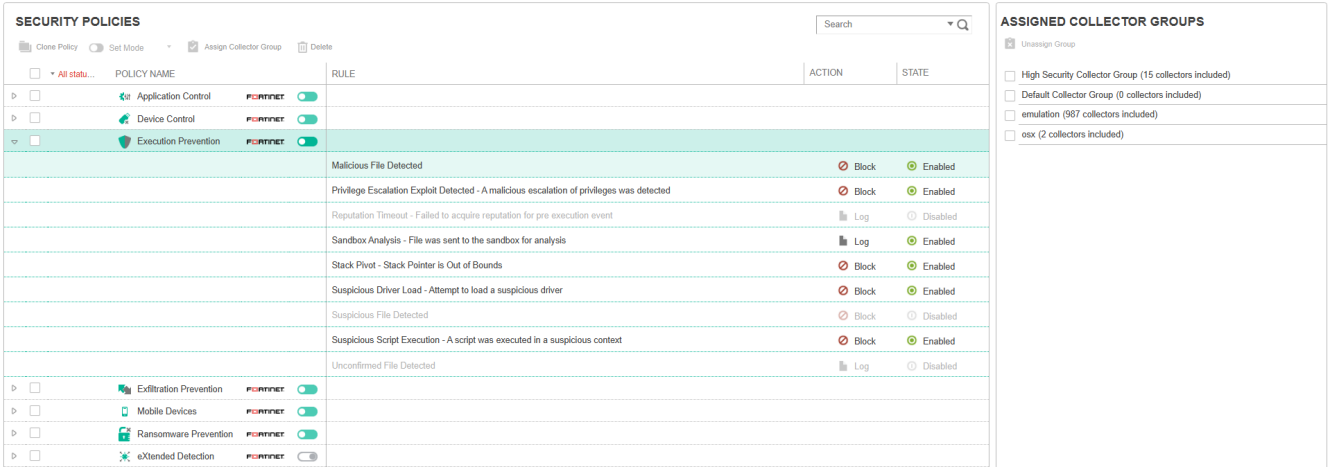
- *Execution Prevention*: This policy blocks the execution of files that are identified as malicious or suspected to be malicious. For this policy, each file is analyzed to find evidence for malicious activity. One of the following rules is triggered, based on the analysis result:

  - *Most Likely a Malicious File*: A Malicious File Execution rule is triggered with a critical severity. By default, the file is blocked.
  - *Probably a Malicious File*: A Suspicious File Execution rule is triggered with a high severity. By default, the file is blocked.
  - *Show Evidence of Malicious File*: An Unresolved file rule is triggered with a medium severity. By default, the file is logged, but is not blocked.
- *Exfiltration Prevention*: This policy enables FortiEDR to distinguish which connection establishment requests are malicious ones.
- *Mobile Devices*: This policy enables FortiEDR to detect and prevent access to malicious URL and IP addresses from the mobile devices.

The *Mobile Devices* policies are available only if mobile is enabled in the organization setting. See Step 2 – Defining or importing an organization on page 432.

- *Ransomware Prevention*: This policy enables FortiEDR to detect and block malware that prevents or limits users from accessing their own system.
- *eXtended Detection Policy*: This policy provides visibility into data across multiple security systems and identifies abnormal or malicious activity by applying analytics and correlating data from various systems. Events are logged and displayed in the *Incidents* tab. No blocking options are provided. The exceptions options are not available in the *Incidents* tab for security events triggered by this policy.

This policy requires that you configure an XDR source connector in the *Profiles* > *Integrations* > *Connectors* section. This feature is a license-dependent add-on. You may contact Fortinet Support for more information.



All security policies can run simultaneously. However, these security policies detect rule violations at different places and points in time in the operating system. When multiple security policies are triggered, FortiEDR uses the following guidelines to avoid generating duplicate security events:

- For connection establishment attempts, the Exfiltration Prevention rule violation is detected.
- For attempts to lock files or access their data (for example, by encrypting the data), the Ransomware rule violation is detected.

- When a malicious file is being executed by the user or by the operation system, the Execution Prevention rule violation is detected.
- For attempts to use a USB device, such as a mass storage device, the Device Control rule violation is detected. It is supported on Windows devices only.
- For execution attempts of an application that is included in the blocklist, the Application Control rule violation is detected.
- When malicious activity is identified across network, endpoints, and cloud, an Extended Detection rule violation is detected.

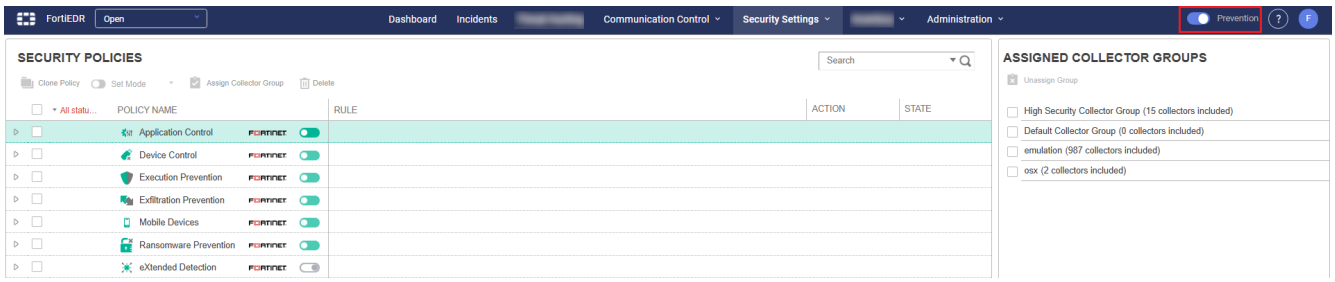
Protection or Simulation mode

During an initial acquaintance period or at any time, you can decide that FortiEDR acts as either of the following:

- *Protection:* FortiEDR enforces its active exfiltration prevention policy that blocks all connections that violate the relevant FortiEDR security policy rules.
- *Simulation (Notification Only):* FortiEDR *only* issues an alert (described below) for all connections that violate any rule in the FortiEDR security policy. In this mode, FortiEDR does not block exfiltration. FortiEDR comes out-of-the-box set to this mode.

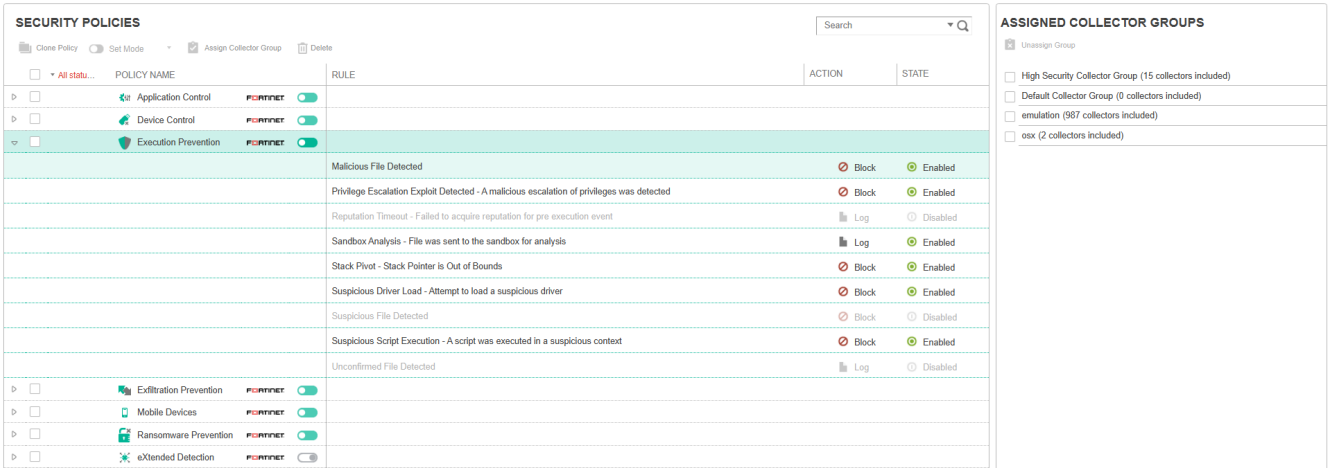
If you have purchased a Content add-on license, policy rules and built-in exceptions are periodically automatically added or updated by Fortinet. When a new security policy is added, an indicator number displays on the *SECURITY SETTINGS* tab.

Use the *Protection/Simulation* slider at the far right of the window to enable the applicable mode, as shown below:



Security Policies page

The *Profiles > Security > Policies* page displays a row for each security policy. Each policy row can be expanded to show the rules that it contains, as shown below.



FortiEDR is provided out-of-the-box with several predefined security policies (depending on your license), ready for you to get started. By default, all policies are set to Simulation mode (meaning that they only log and do not block) and show the FORTINET logo. This page also enables you to define additional policies. See Out-of-the-box policies on page 201 for more details.

Security Policy	Icon
Application Control Policies	
Device Control Policies	
Execution Prevention	
Exfiltration Prevention	
Mobile Devices	
Ransomware Prevention	
Extended Detection	

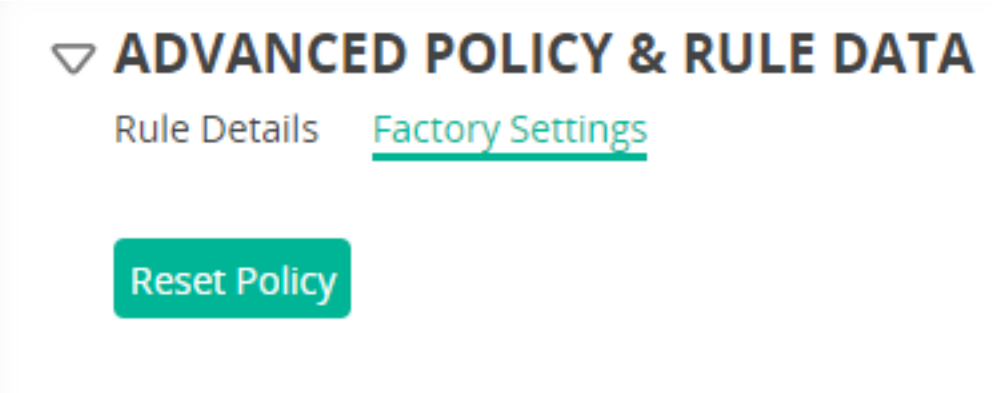
This section is available only if mobile is enabled in the organization setting. See Step 2 – Defining or importing an organization on page 432.

The following information is defined per security policy:

Information Field	Description
Policy Name	The policy name appears in the left most column. The policy name is defined when the policy is created. The name of the *Default Policy* cannot be changed.

Information Field	Description
Rule Name	FortiEDR's proprietary rules come predefined and are the primary component of FortiEDR's proprietary security solution. This column displays a short description for the purpose of this rule. You can expand the *ADVANCED POLICY & RULES DATA* area at the bottom left of the window to display a more detailed description of what the rule does and how it works.
Action	Specifies the action that is enforced when this rule is violated. You can change this field, as follows: • *Block* Block: When this policy is set to *Prevention* mode (Setting a security policy's Prevention or Simulation mode on page 205), the exfiltration attempt is blocked and a blocking event is generated. When this policy is set to *Simulation* mode, the outgoing connection attempt is NOT blocked and a simulated-blocking event is generated (this indicates that FortiEDR ***would have*** blocked the exfiltration if the policy had been set to Prevention mode). • *Log* Log : The event is only logged regardless of whether the policy is set to Prevention or Simulation mode. The outgoing connection attempt is not blocked.
State	(Enabled/Disabled) This option enables you to disable/enable this rule. FortiEDR's rules have been created as a result of extensive expertise and experience. Therefore, we do not recommend disabling any of them.

To reset a FortiEDR security policy to its out-of-the-box settings, click the *Reset Policy* button in the *ADVANCED POLICY & RULE DATA* section, as shown below:



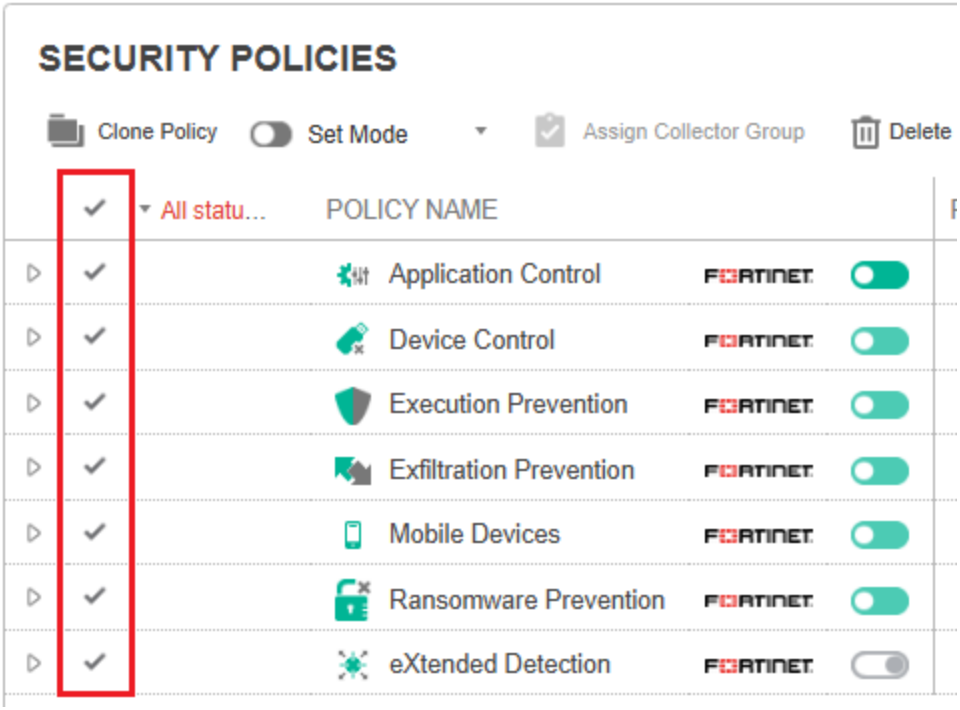
Setting a security policy's Prevention or Simulation mode

Each FortiEDR security policy can be set to operate in one of the following modes:

- *Prevention*: FortiEDR enforces its active prevention policy that blocks all activity that violates relevant rules in the FortiEDR security policy.
- *Simulation/Notification Only*: FortiEDR logs and alerts only violations of FortiEDR security policy. The events are shown in the FortiEDR Central Manager. In this mode, FortiEDR does not block malicious activity. This is the default mode of all FortiEDR security policies out of the box. You can decide to use this mode during an initial acquaintance period or at any time.

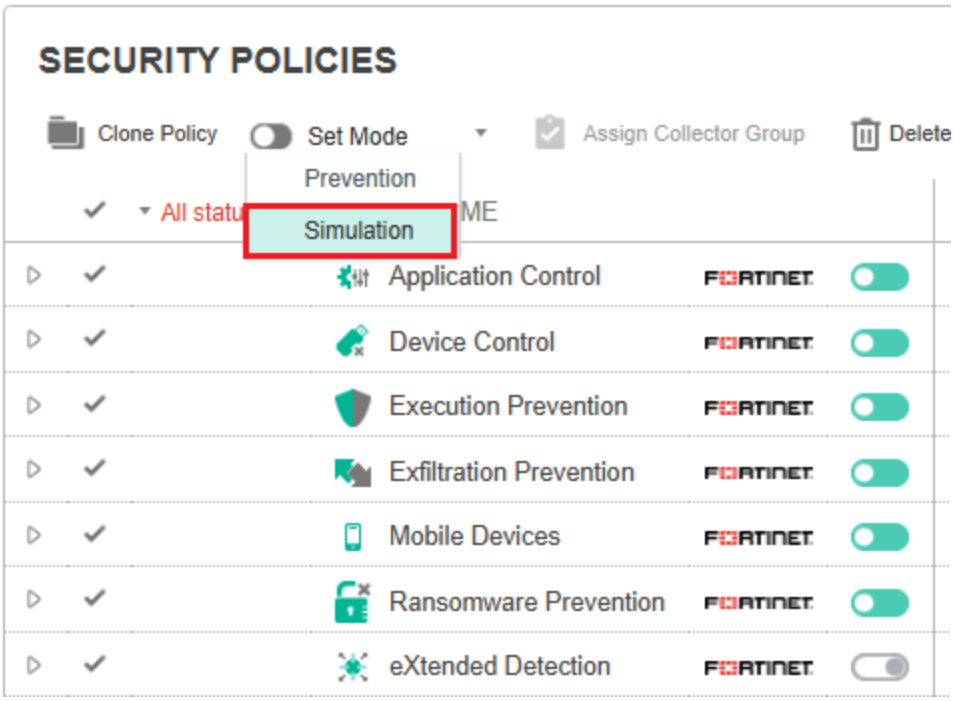
To set a security policy to Prevention or Simulation mode:

1. Select the checkbox of the security policy to be configured. Alternatively, you can select the top-left checkbox to configure all security policies at once.



2. You can now either:
   a. Set mode : Click *Set Mode* and select either *Prevention* or *Simulation*, as shown above.
   b. : Move the slider to the left for Prevention or to the right for Simulation.

You can also set all FortiEDR policies to Simulation mode at once by moving the slider at the top-left corner to Simulation, as shown below:

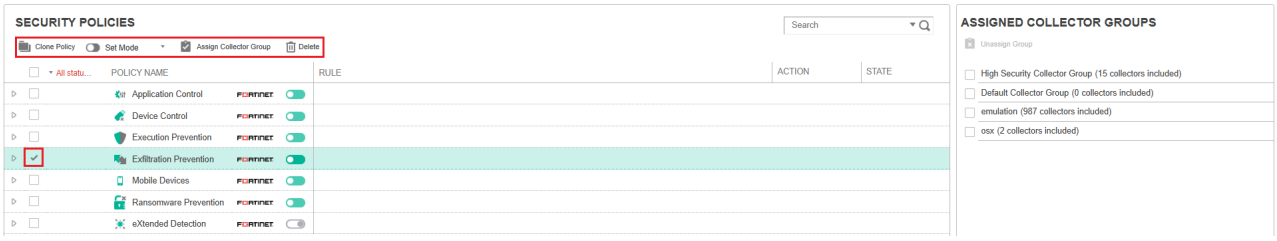


Creating a new security policy

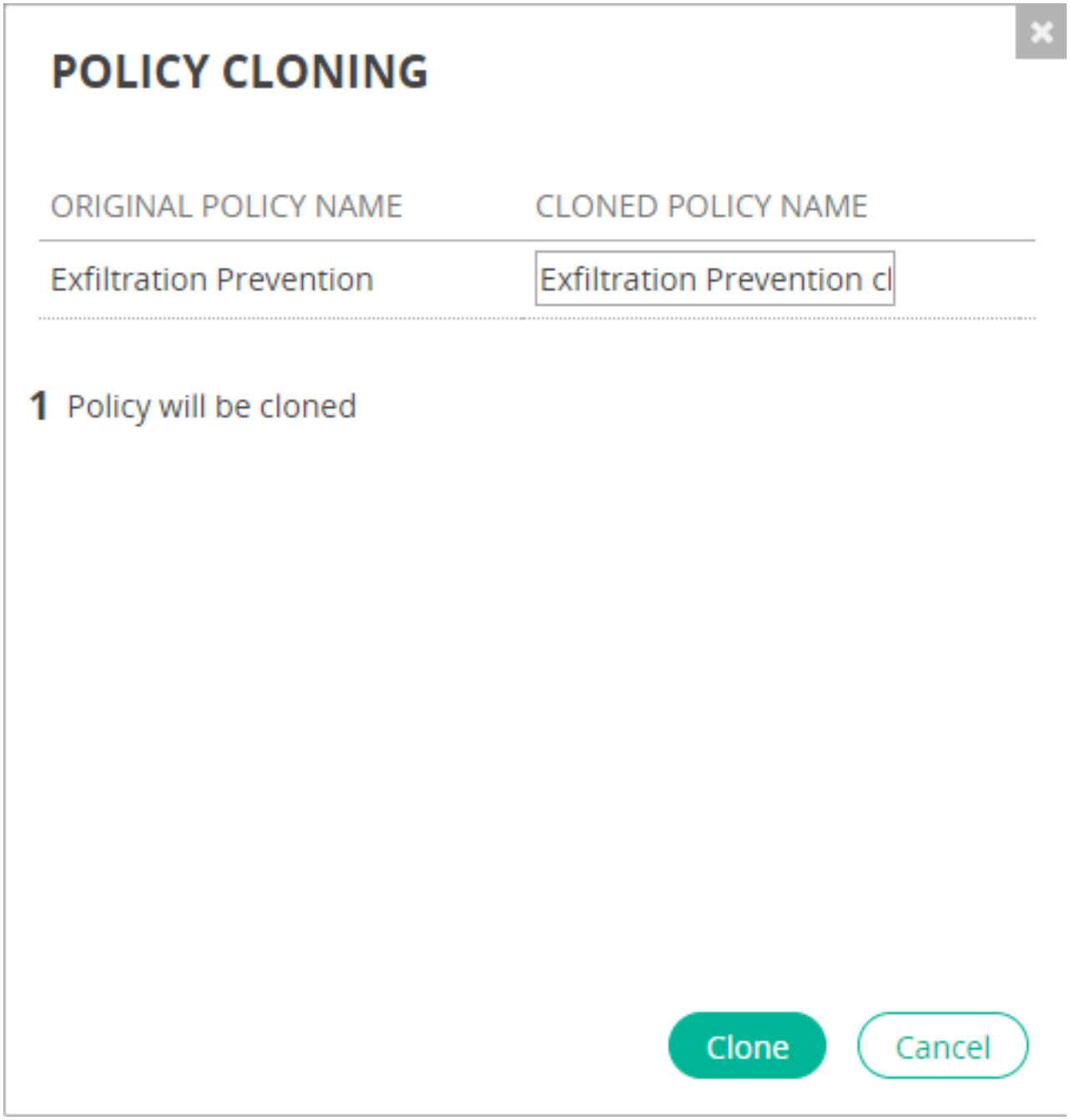
A new security policy can be created by cloning an existing policy, as described below. New security policies are only needed if you are going to assign different policies to different Collector Groups. Otherwise, you can simply modify one of the default policies that are provided out-of-the-box and apply it to all FortiEDR Collectors by default. Modifications made on one security policy do not affect any other policies.

To create a new security policy:

1. In the *Profiles* > *Security* > *Policies* page, check the checkbox of the security policy to be cloned. The buttons at the top of the window then become active.



2. Select the *Clone Policy* button. The following window displays:



3. Specify the name of the new security policy and click the *Clone* button.
4. If needed, assign the security policy to the required Collector Group so that it protects all the FortiEDR Collectors in that group, as described in Assigning a security policy to a Collector Group on page 209.

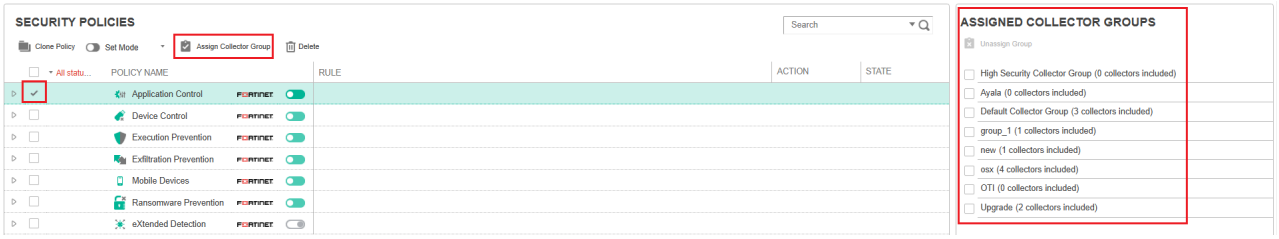
Assigning a security policy to a Collector Group

By default, a security policy protects the FortiEDR Collectors that belong to that Collector Group. A security policy can be assigned to more than one Collector Group. Multiple security policies can be assigned to each Collector Group.

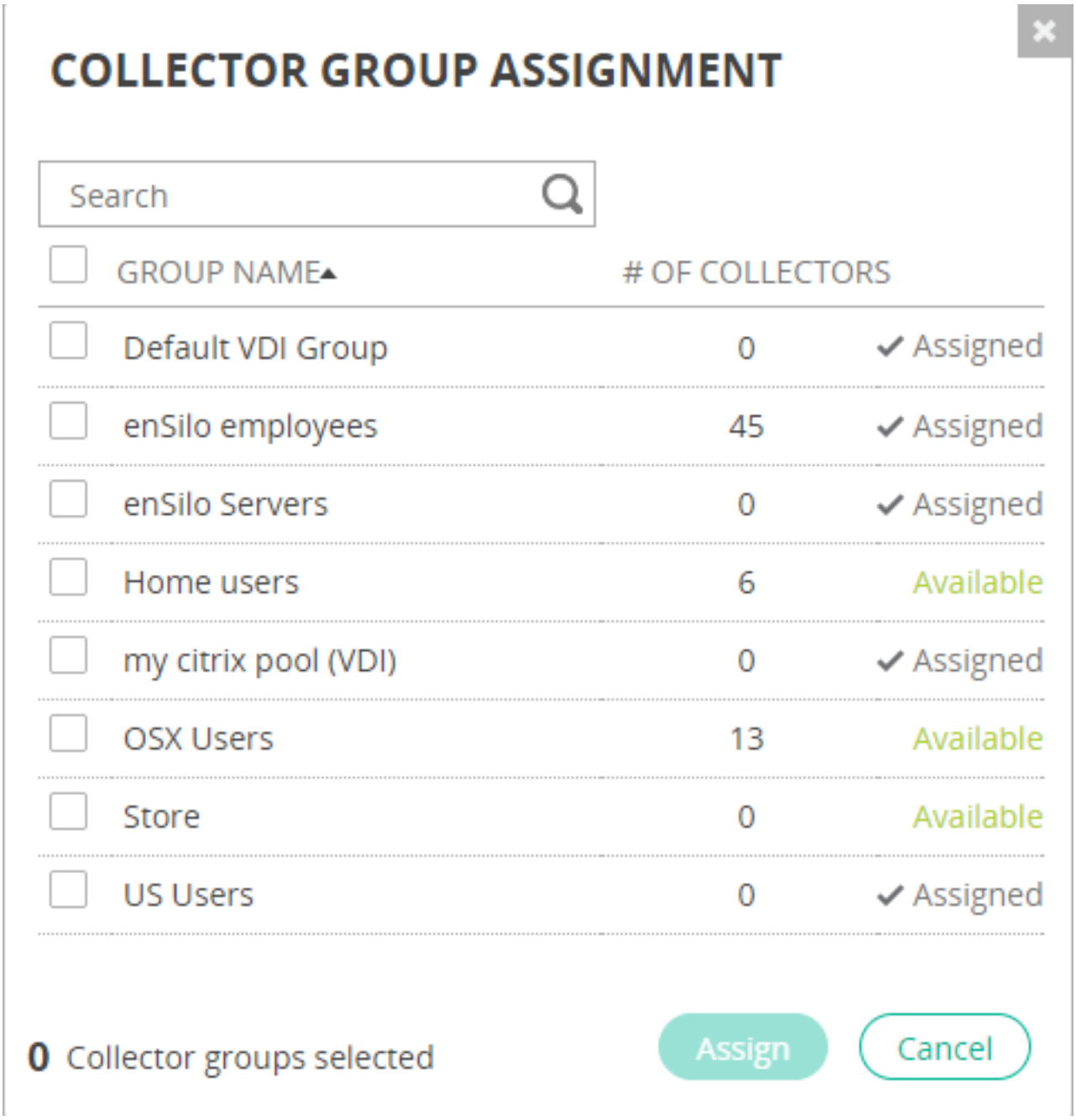
It is not recommended to assign multiple security policies that have the same or overlapping rules to a Collector Group, as this means that the same security events will be triggered in response to both policies, producing duplicated events.

Refer to Defining a new Collector Group on page 344 for a description of how to define a new Collector Group in the *INVENTORY* tab.

1. In the *Profiles* > *Security* > *Policies* page, select the name of the security policy to be assigned by clicking its checkbox. The right side of the window displays the Collector Groups to which this policy is assigned.



2. Click the *Assign Collector Group* toolbar button, which displays the following window in which you can select the Collector Groups to which to assign this policy.



The *ASSIGNED COLLECTORS GROUPS* area lists all the Collector Groups that have been assigned a security policy to protect them. You can also simply drag-and-drop a Collector Group from this list onto a policy in the left pane of this window to assign the Collector Group to be protected by that policy.

Deleting a security policy

Select the policy's checkbox and then click the *Delete* button.

The Exfiltration Prevention, Ransomware Prevention, Device Control, Application Control, eXtended Detection, and Execution Prevention FortiEDR security policies provided out-of-the-box (FORTINET) cannot be deleted.

Exception Manager

Exceptions enable you to limit the enforcement of a rule, meaning to create a white list for a specific flow of events that was used to establish a connection request or perform a specific operation.

An exception can be made for a Collector Group (several specific ones or for all) and a destination IP (a specific one, IP-set or all). The event is then no longer triggered for that specific Collector Group or destination IP. This exception can be added on part or the entire set of rules and the process that triggered this event.

When an exception is defined, it results in one or more exception pairs. An exception pair specifies the rule that was violated, and the process on which the violation occurred, including its entire location path. For example, the following shows several examples of exception pairs:

- Rule – File encryptor with Process – `c:\users\root\Desktop\ransom\RnsmTOX.exe`
- Rule – Process hollowing with Process – `c:\users\root\AppData\Local\hipmiav.exe`

An exception that applies to a security event can result in the creation of several exception pairs. Each exception is associated with a specific process path. You determine whether the exception pair can run from the event-specific path or whether to apply the exception for this process so that it can run from any path.

If the exception pair includes more than one process, you can include the other processes too, as well as determine whether they can run from the event-specific path or from any path.

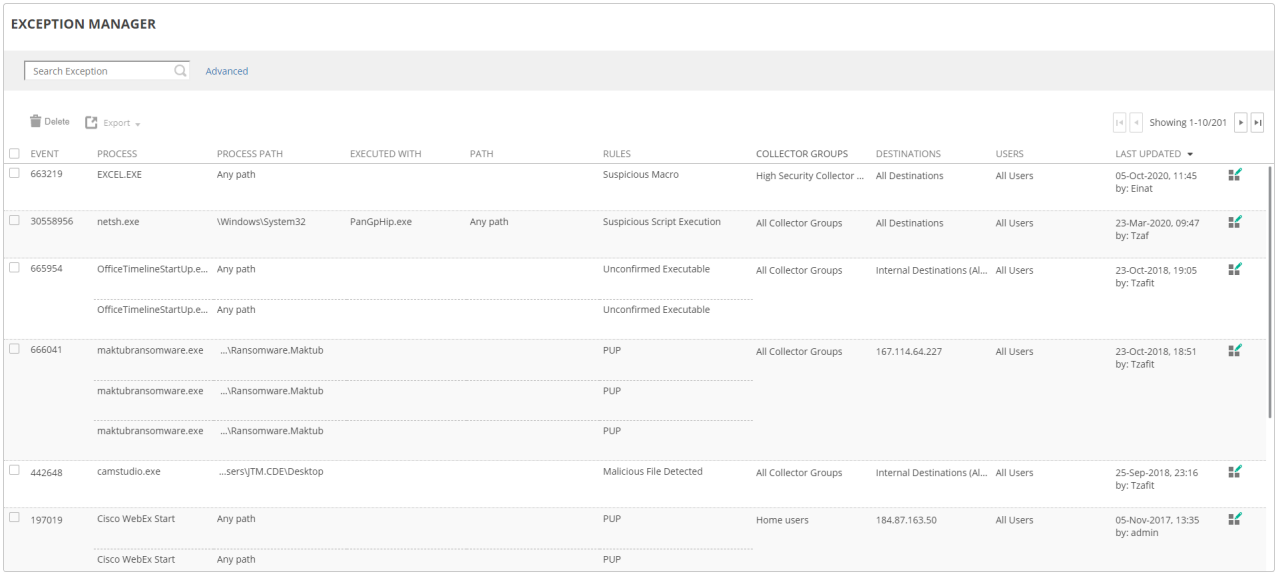
Any exception that you define applies to all policies.

Exceptions are created in the *Incidents* tab, as described onDefining security event exceptions on page 118

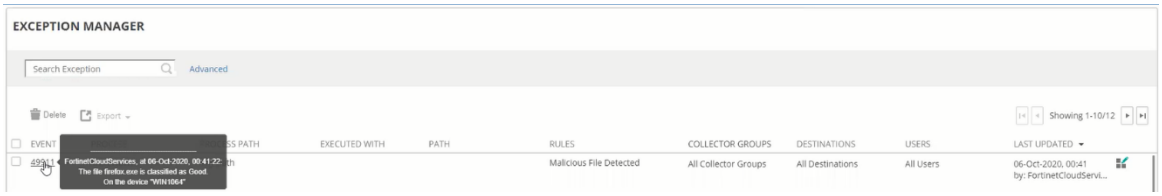
Fortinet Cloud Services (FCS) may push an automated exception in cases where extended analysis and investigation of a security event leads to its reclassification as Safe. This prevents the security event from triggering again. In such cases, the security event is moved under handled events and the exception that was set is added in the Exception Manager with FortiEDRCloudServices as the handling user.

To manage exceptions:

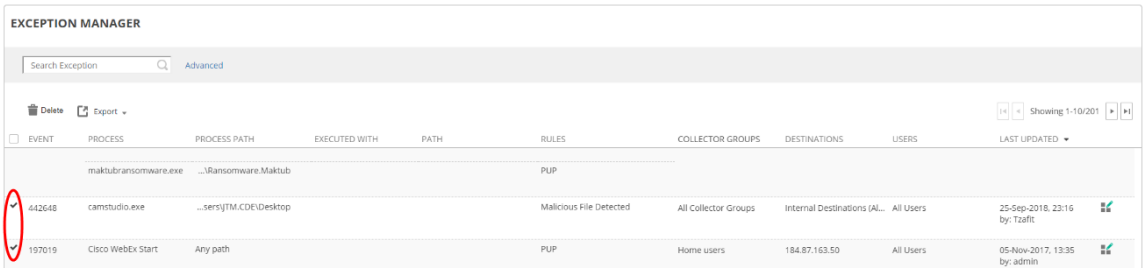
1. Select *Profiles* > *Security* > *Exception Manager*. Alternatively, in the *Incidents* tab, click the *Exception Manager* button. The following window displays, showing the list of previously created exceptions:



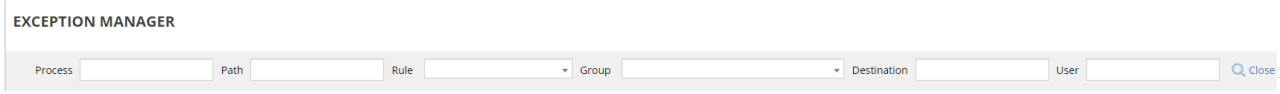
If the exception includes a free-text comment, you can hover over the Event ID in the Exception Manager to display it.



You can delete one or more exceptions simultaneously by selecting the checkbox at the beginning of its row and then clicking the *Delete* button.



2. To filter the exception list, click the *Advanced* button. The window displays various filter boxes at the top of the window, which you can use to filter the list by specific criteria.

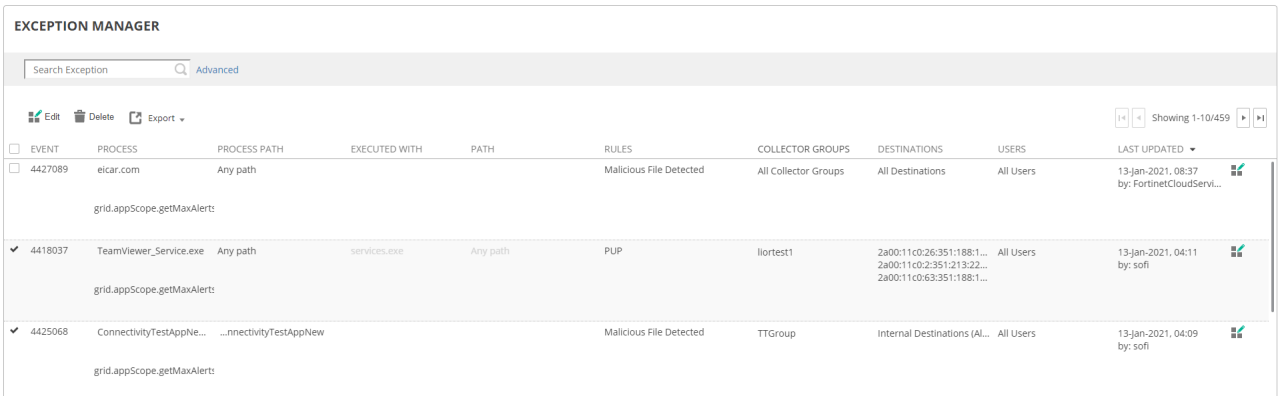


Click the *Basic search* button to access the standard search options.

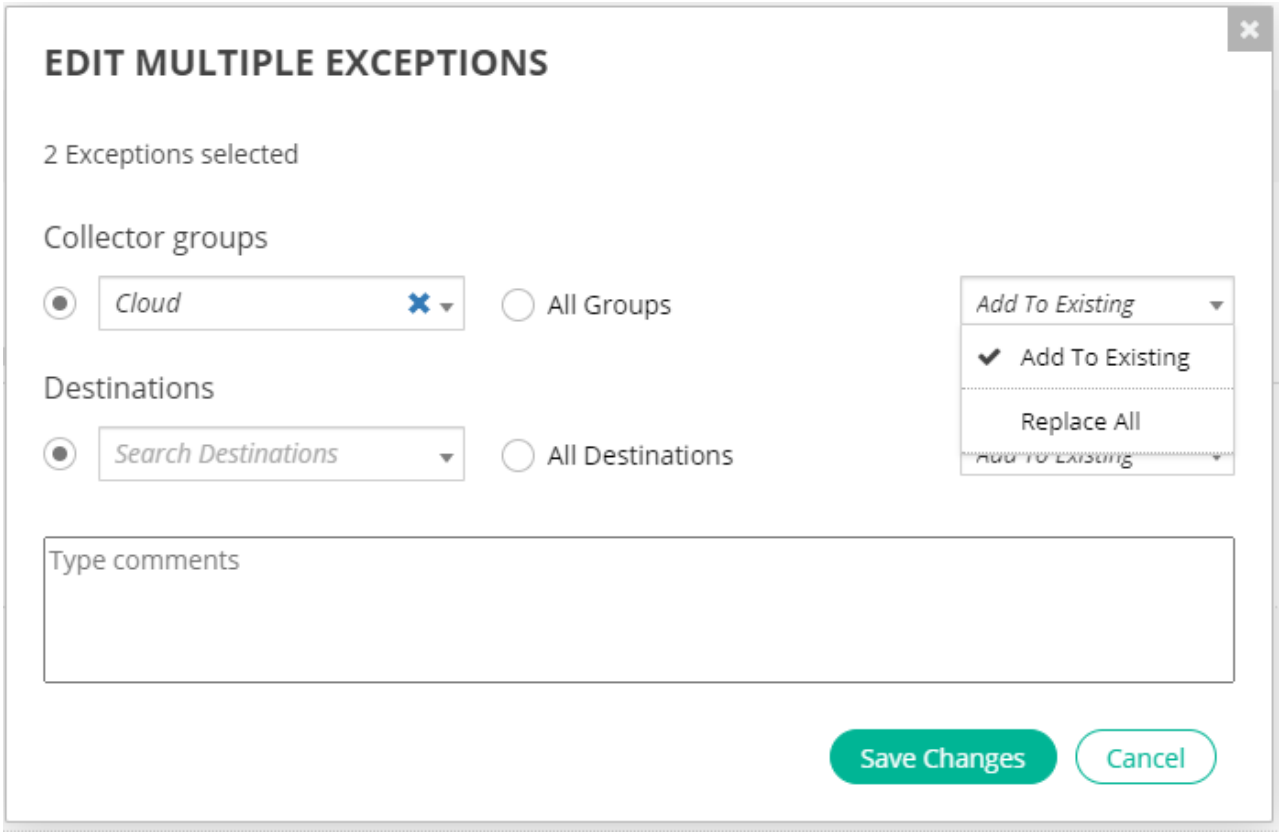
Click the *Edit Exception* button in an exception row to edit that exception. For more details, see Editing Security Event Exceptions on Editing security event exceptions on page 121.

Click the *Delete* button in an exception row to delete that exception.

Changes can be made on multiple exceptions at the same time by checking the Exceptions that you would like to edit and then clicking on the Edit tool, as shown below:



The following window displays in the which you can choose to add new Collector Groups in addition to existing ones or to replace all Collector Groups with the new Collector Group values that you select:



This same procedure can be used to edit the IP sets of the destination addresses of the selected exceptions.

Exclusion Manager

The Exclusion Manager enables you to define which processes, files, or domains are excluded from Security Policies monitoring. Three types of exclusions can be defined in the Exclusion Manager:

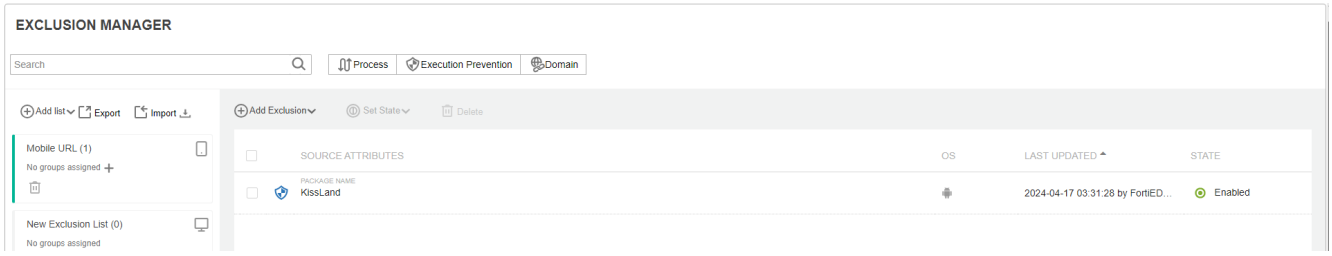
- **(PC only) Process Exclusions**: This type of exclusion specifies that FortiEDR does not inspect the actions that are performed by specific processes, so that these processes do not trigger security events. The processes that are excluded are identified by the attributes of the processes, according to your definitions.

  There may be various reasons for excluding a process in this manner. For example, when a process's performance/functionality is affected by FortiEDR's inspection, but the customer knows that this process is good/safe (this example is relevant, even when the process does not trigger security events). Therefore, in this case, the exclusion will specify that FortiEDR no longer inspects the specified processes.

  Please note that adding this type of exclusion excludes this process from being monitored by all FortiEDR features and all activities of this process are ignored.
- **Execution Prevention Exclusions**: The Execution Prevention policy inspects/scans files and then blocks their execution if they are identified as malicious or suspected to be malicious. Execution Prevention Exclusions specify that FortiEDR does not apply the Execution Prevention policy inspection, which analyzes files in order to find evidence of malicious activity, as described in Profiles on page 201. The files that are excluded are identified by the attributes of the files that are the target of the Execution Prevention actions, according to your definitions.
- **(Mobile only) Domain Exclusions**: The Malicious URL/IP Detected policy inspects/scans URLs/domains and blocks connections to them if they are identified as malicious or suspected to be malicious. Domain Exclusions specify that FortiEDR does not apply the Malicious URL/IP Detected policy inspection. The domains that are excluded are identified according to your definitions.

To manage exclusions:

Select *Profiles* > *Security* > *Exclusion Manager*. The following window displays, showing the list of previously created exclusions:



The list of exclusions in the *Exclusion Manager* page contains the following columns:

Column	Description
Checkbox	Enables you to select multiple rows.
Icon	Represents the type of exclusion • - Process

Column	Description
	• - Execution Prevention • - Domain
SOURCE ATTRIBUTES	Specifies the attributes that were defined in order to identify the Process/File/Domain, as described in Defining exclusions on page 217
OS	Specifies the operating system to which the exclusion applies.
LAST UPDATED	Specifies when this exclusion was last updated and by whom.
STATE	Specifies whether this exclusion is enabled or disabled.
	Edit and delete excursion tools.

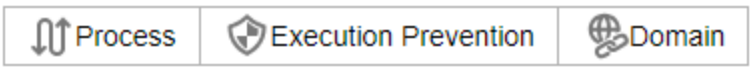
The following actions can be performed in the *Exclusion Manager* page:

- Filtering on page 215
- Defining Exclusion Lists on page 215
- Defining exclusions on page 217
- Exporting and importing exclusion lists on page 226

Filtering

To filter the Exclusion List names and their content, simply enter text in the *Search* field. Afterwards, only the Exclusion Lists that match the provided text are displayed showing only the relevant exclusions.

To filter the list of exclusions by type, click one of the following options:



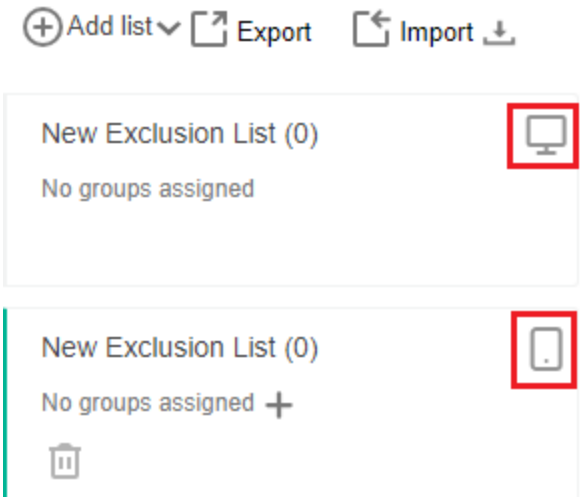
Defining Exclusion Lists

An Exclusion List contains a list of exclusions. You can assign Collector Groups to an Exclusion List in order to specify that the exclusions in the Exclusion List apply to the Collectors in the Collector Groups assigned to it. Exclusion Lists enable you to logically organize, categorize and group exclusions based on the type of activity data they are to exclude.

For example, let's say that you want to collect network activity data for your system, but a specific application generates quite a bit of uninteresting logistical network activity that you do not want to collect. In this case, you can define an Exclusion List named after that application that contains one or more exclusions that relate specifically to the network activity generated by that application. Exclusion Lists can be organized anyway you see fit. For example, you can create an Exclusion List for security products, a different one for PDF documents, a different one for HR-related software and so on.

FortiEDR provides two types of exclusion lists: PC and mobile, which can be applied to PC Collector groups and mobile Collector groups, respectively. The type is indicated by the PC or mobile icon at the top right corner of the exclusion list card.

The *Mobile* option is available only if mobile is enabled in the organization setting. See Step 2 – Defining or importing an organization on page 432.



Adding an Exclusion List

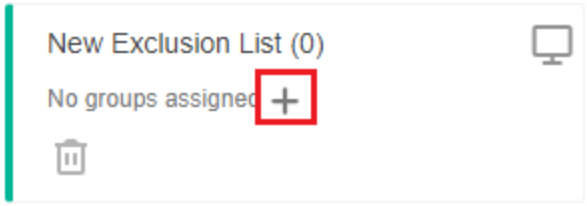
To define an Exclusion List:

1. Click the *+ Add List* option, select the type (*PC* or *Mobile*), and provide a name to create a new Exclusion List.

   The *Mobile* option is available only if mobile is enabled in the organization setting. See Step 2 – Defining or importing an organization on page 432.

2. Add (define) the exclusions of this Exclusion List (as described on the following page). Each exclusion that you add belongs to a specific Exclusion List.
3. Assign Collector Groups to this Exclusion List (as described below) in order to determine to which Collector Groups these exclusions apply. A Collector Group can be assigned to multiple Exclusion Lists.

Assigning a Collector Group to an Exclusion List



You can perform the following operations on an Exclusion List:

Operation	Description
Assign a Collector Group	Click the + button in the Exclusion List to which to assign a Collector Group. Then, select the Collectors groups to which to assign this list and approve it. Note that a Collector Group can be assigned to multiple Exclusion Lists.
Unassign a Collector Group	Click the + button and uncheck the Collector Group to be removed from an Exclusion List.
Delete Exclusions List	Click the *Delete* button. Note that all Exclusions in this list will be removed and will no longer be applied to the assigned Collector groups.

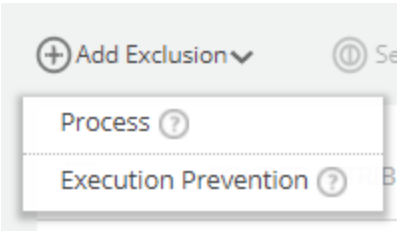
Defining exclusions

All exclusions must belong to an exclusion list. Select an exclusion list on the left to display the exclusions that are defined in it.

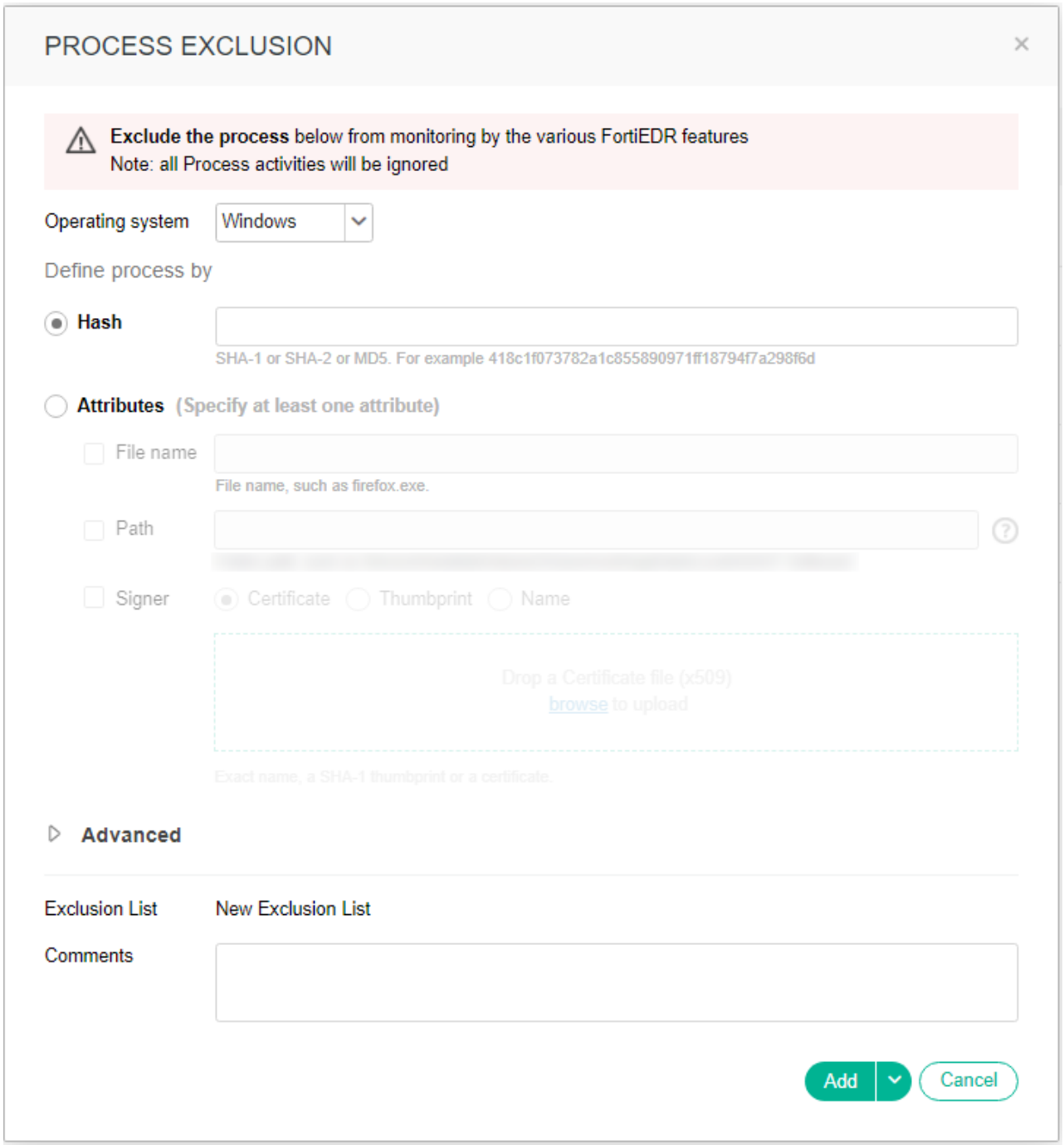
The following describes how to define a Process Exclusion (PC only), Execution Prevention Exclusion, and Domain Exclusion (mobile only).

Adding a Process Exclusion

1. In the left pane, click the PC Exclusion List to which to add the process exclusion.
2. In the right pane, click the *+ Add Exclusion* button. The following displays providing a choice of the two types of exclusions that you can define.

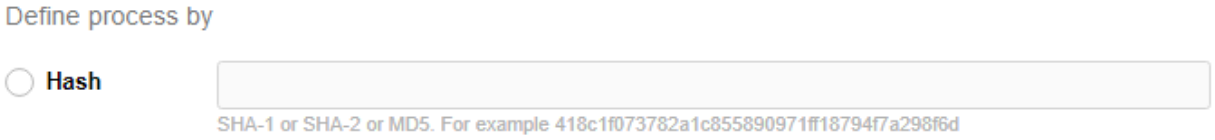


3. Select *Process*. The following displays:

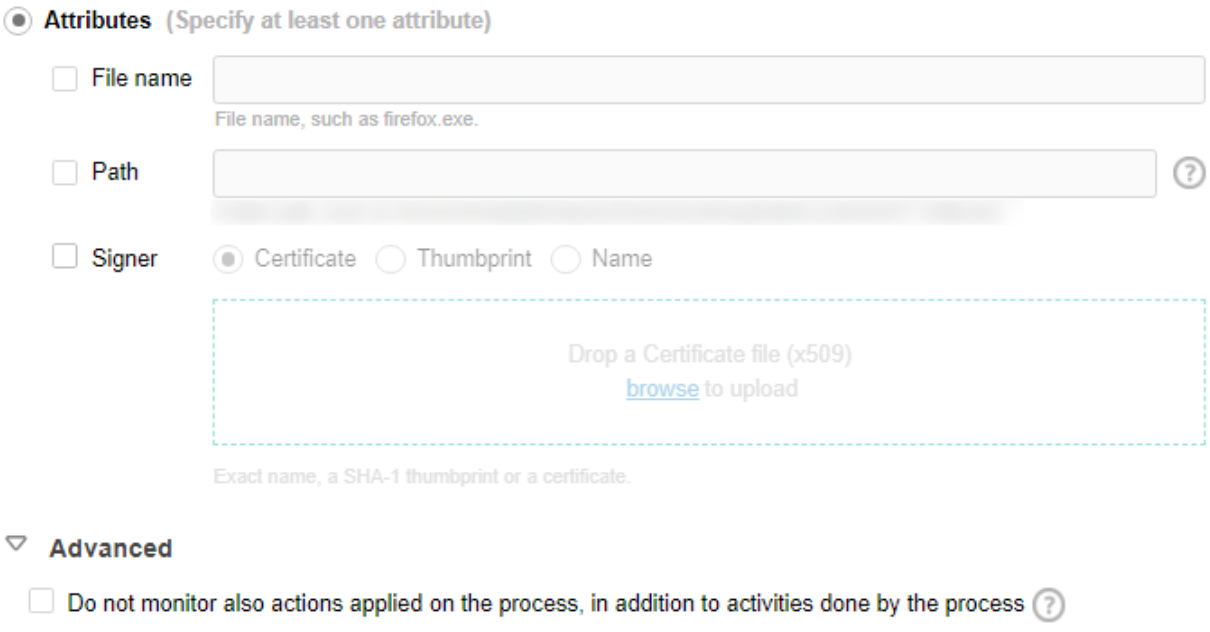


4. The *Operating system* dropdown menu specifies *Windows*, which is currently the only operating system supported for exclusions.
5. Define the processes to be excluded using one of the following options: **Hash** or any combination of **File Name / Path / Signer**, as follows:

- **Hash**: Mark the Hash radio button and specify the Hash that uniquely identifies this process.



- **File Name / Path / Signer**: Mark the *Attributes* radio button and check at least one of the *File Name* / *Path* / *Signer* fields checkboxes and fill the relevant values, as follows:

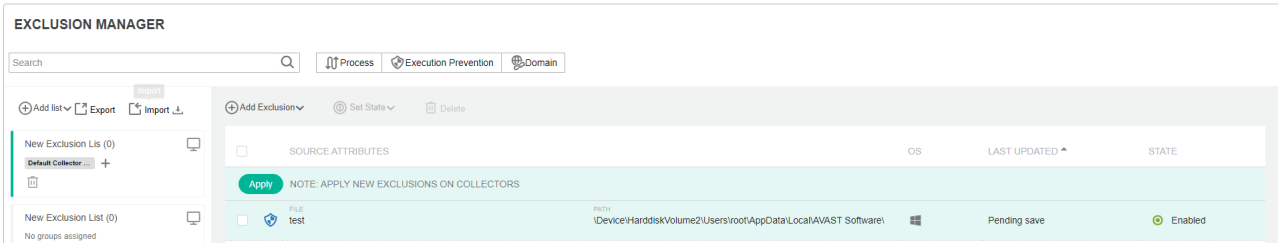


  - Specify the file and/or directory to be excluded by filling in the *File name* field, the *Path* field or both. If you fill in both fields, then that file is only excluded in that path. If you only fill in the *File name* field, then that file is excluded wherever it appears. Refer to the Defining an exclusion path on page 224 section for more details about defining an exclusion path.
  - If you want to specify a signer, select *Signer*, then either upload the Signer's Certificate, provide its thumbprint or provide the Signer's name.
  - When a process is identified by file name and/or path only (which means *Signer* is not selected), you can disable monitoring of the process completely, including actions applied on the process, by selecting *Do not monitor also actions applied on the process, in addition to activities done by the process* under *Advanced*.

This option significantly reduces FortiEDR protection on the process and lowers the security level of the process. Use this option only for issues that regular exclusions cannot solve, such as VDI freezes or other application malfunctions due to basic monitoring of the process by the FortiEDR Collector.

6. The *Exclusion List* field specifies the Exclusion List that was selected, when the *Add Exclusion* option was selected. This field is not editable.

7. Click the *Add* button. This new exclusion is then listed in the *Exclusion Manager* page, as shown below:

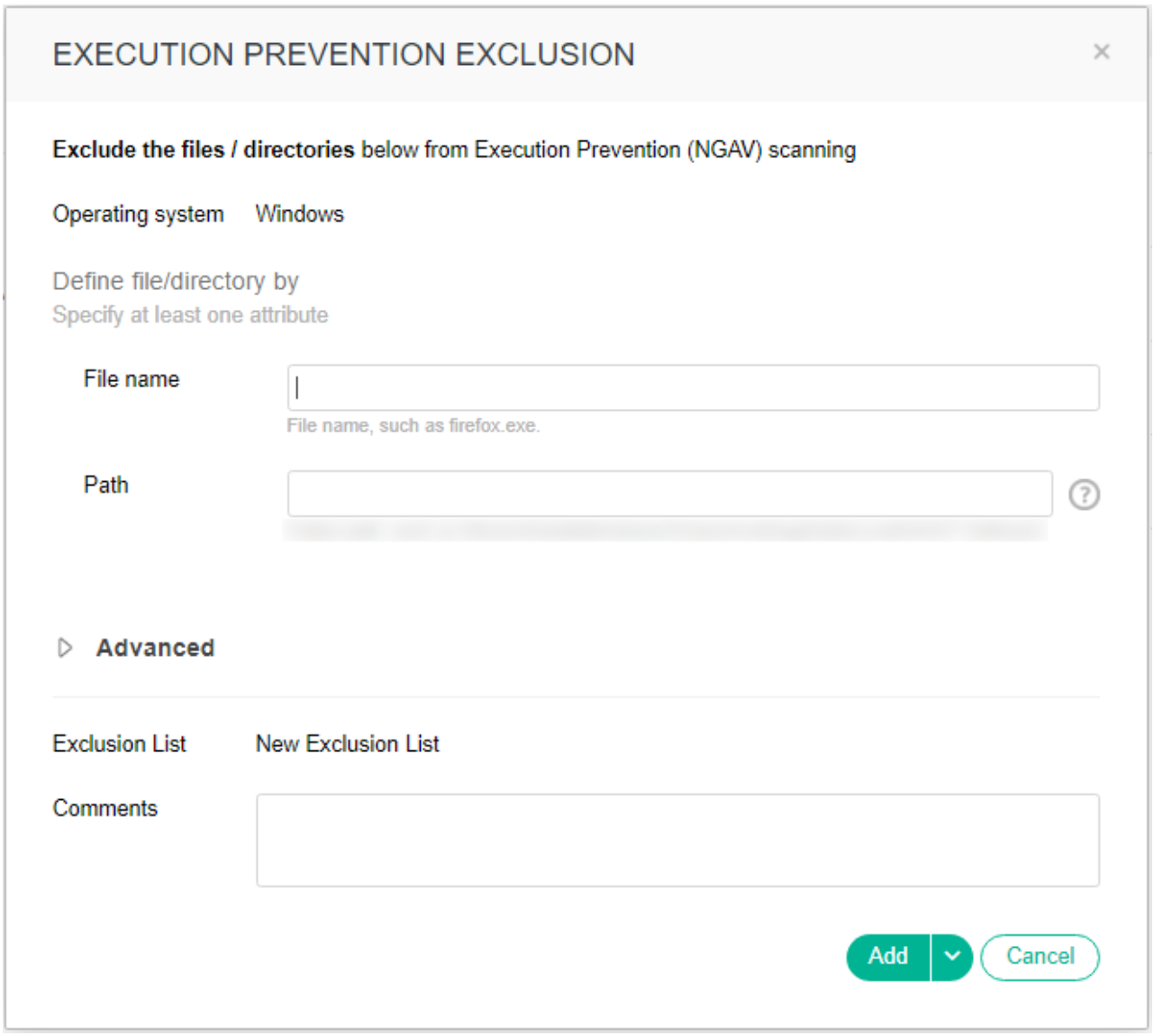


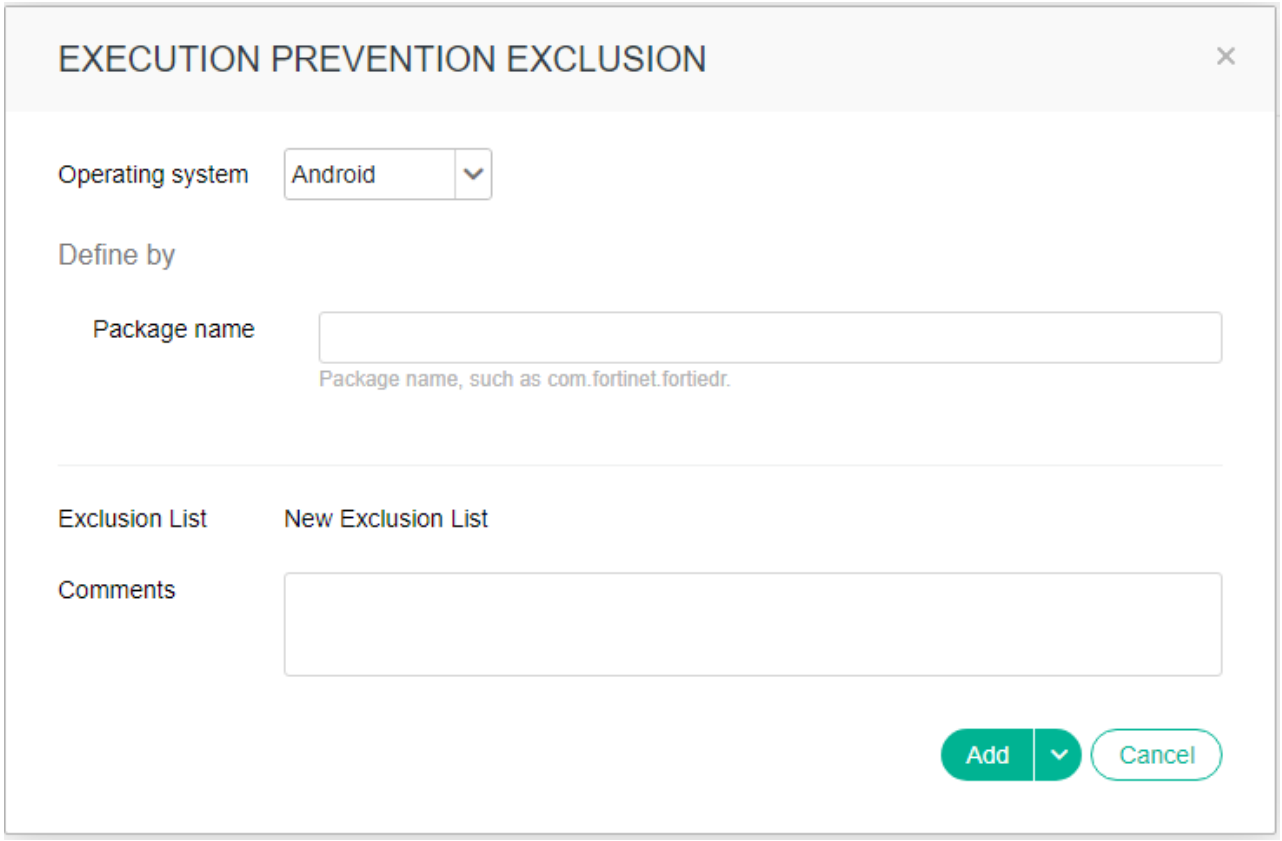
8. The newly defined exclusions appear with a green background and the words *Pending save* appear in their *LAST UPDATED* column. To define that these exclusions take effect, you must click the *Apply* button and then click the *Save* button in the window that pops up. Their *LAST UPDATED* column then shows the timestamp when they were saved.

Adding an Execution Prevention Exclusion

1. In the left pane, click the Exclusion List to which to add the exclusion.
2. In the right pane, click the *+ Add Exclusion* button and select *Execution Prevention*. Depending on the exclusion list type (PC or mobile), one of the following windows displays:

3.


EXECUTION PREVENTION EXCLUSION
Exclude the files / directories below from Execution Prevention (NGAV) scanning
Operating system
Windows
Define file/directory by
Specify at least one attribute
File name
File name, such as firefox.exe.
Path
Advanced
Exclusion List
New Exclusion List
Comments
Add
Cancel

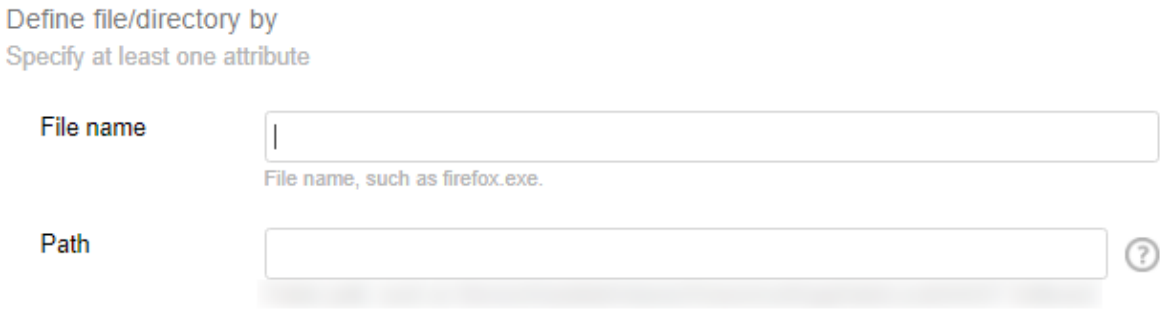


The *Android* option is available only if mobile is enabled in the organization setting. See Step 2 – Defining or importing an organization on page 432.

4. Specify the values to define the exclusion:
   - For PC, follow the steps below:

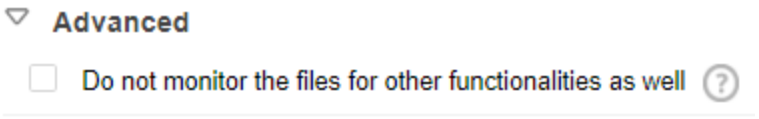
     The *Operating system* dropdown menu specifies *Windows*, which is currently the only operating system supported for exclusions.

     i. Specify the file and/or directory to be excluded by filling in the *File name* field, the *Path* field or both. If you fill in both fields, then that file is only excluded in that path. If you only fill in the *File name* field, then that file is excluded wherever it appears. Refer to the Defining an exclusion path on page 224 section for more details about defining an exclusion path.



ii. Under *Advanced*, you can select *Do not monitor the files for other functionalities as well* to disable monitoring of the file/directory completely, including backup of the files for Ransomware protection.

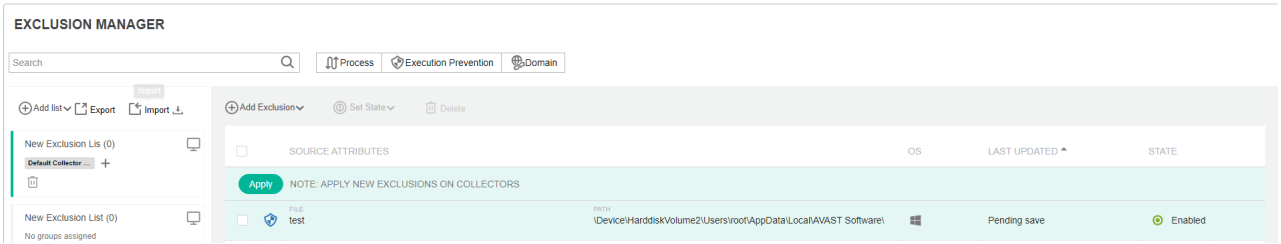
This option significantly reduces FortiEDR protection on the files and lowers the security level of the files. Use this option only for issues that regular exclusions cannot solve, such as VDI freezes or other application malfunctions due to basic monitoring of the files by the FortiEDR Collector.

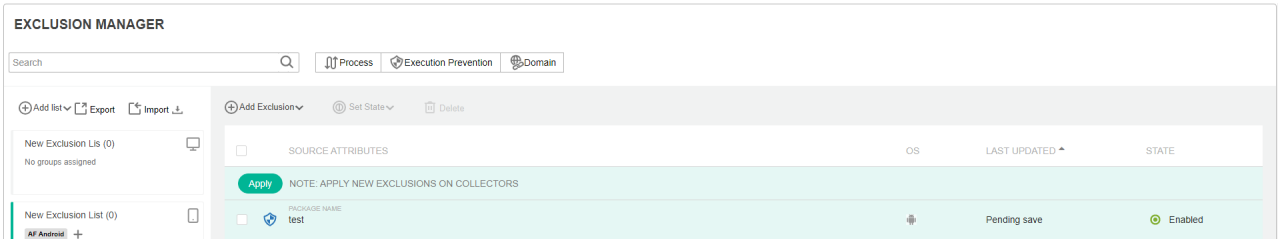


iii. The *Exclusion List* field specifies the Exclusion List that was selected, when the *Add Exclusion* option was selected. This field is not editable.

- For mobile, select *Android* for *Operating system* and specify the package name. Note that FortiEDR does not support execution prevention on iOS.

5. Click the *Add* button. This new exclusion is then listed in the *Exclusion Manager* page, as shown below:

6. 

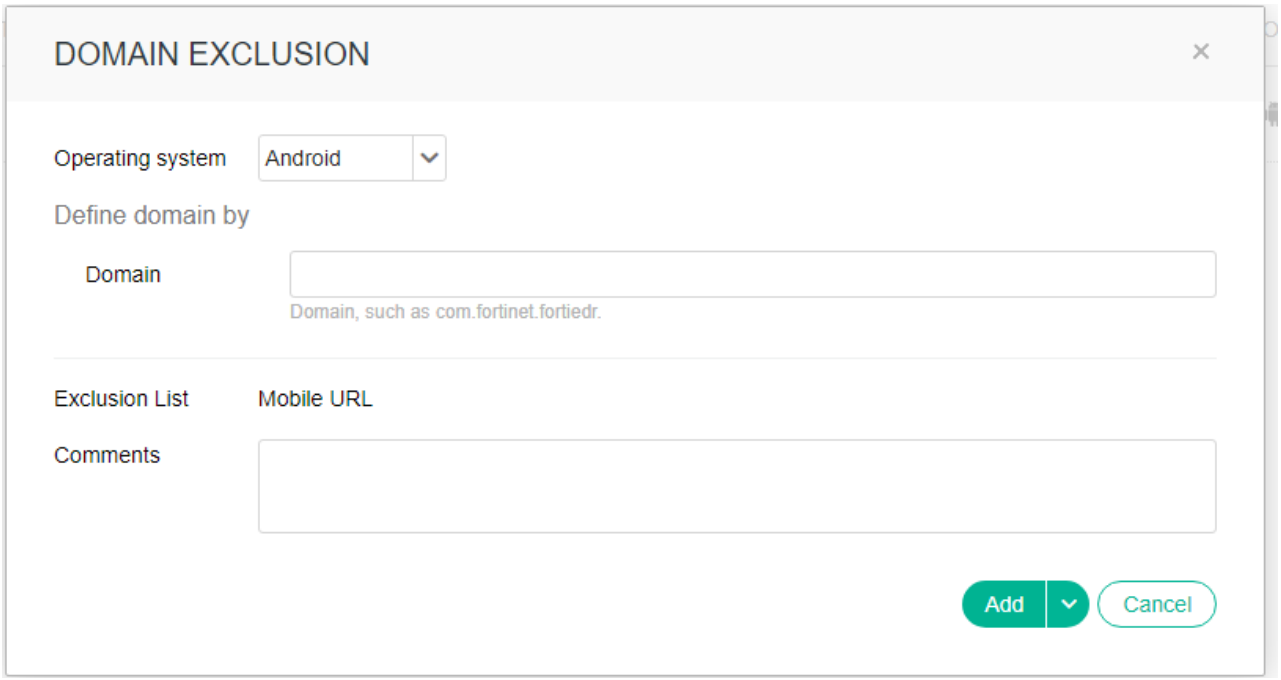


7. The newly defined exclusion appears with a green background and the words *Pending save* appear in its *LAST UPDATED* column. To define that these exclusions take effect, you must click the *Apply* button and then click the *Save* button in the window that pops up. Their *LAST UPDATED* column then shows the timestamp when they were saved.

(Mobile only) Adding a Domain Exclusion

1. In the left pane, click the mobile Exclusion List to which to add the domain exclusion.
2. In the right pane, click the *+ Add Exclusion* button. The following displays providing a choice of the two types of exclusions that you can define.

3. Select *Domain*. The following displays:



4. In the *Operating system* dropdown menu, select *Android* or *iOS*.
5. Specify the domain to exclude.
6. Click the *Add* button. This new exclusion is then listed in the *Exclusion Manager* page., as shown below:
7. The newly defined exclusions appear with a green background and the words *Pending save* appear in their *LAST UPDATED* column. To define that these exclusions take effect, you must click the *Apply* button and then click the *Save* button in the window that pops up. Their *LAST UPDATED* column then shows the timestamp when they were saved.

Defining an exclusion path

The table below provides examples of exclusion paths with explanations of which folders apply or do not apply:

Exclusion path	Folders that apply	Folders that do not apply
`\Documents\Personal\`	`\Documents\Personal`	• `\Documents` • `\Documents\Personal\temp`
`\Documents\Personal\*`	• `\Documents\Personal\subfolder\` • `\Documents\Personal\subfolder\subfolder\etc\`	• `\Documents` • `\Documents\Personal`
`\Documents\Personal*\`	• `\Documents\Personal` • `\Documents\Personal2` • `\Documents\Personal\subfolder\`	`\Documents`
`*\Documents\Personal\`	• `\Documents\Personal` • `\Windows\Documents\Personal`	• `\Documents` • `\Documents\Personal\temp`
`*\Documents\Personal\*`	• `\Documents\Personal\subfolder\` • `\Parent\Documents\Personal\subfolder`	• `\Documents` • `\Documents\Personal`

- Including a wildcard in a path excludes only the parent folders and/or sub-folders and files within those parent and/or sub-folders but not the folder itself. To exclude a directory and also the parent or sub-directories, you must define an exclusion path for each case. For example, to exclude `\Documents\Personal` and all the sub-folders, define the following exclusion paths:
  - `\Documents\Personal`
  - `\Documents\Personal\*`
- Physical prefix (e.g. `\Device`) and logical prefix or drive (e.g., `C:\`) are not required in the exclusion path.

Setting the state of an exclusion

The *Set State* button enables you to enable or disable the selected exclusion(s). By default, an exclusion is enabled.

For changing the state of multiple Exclusions, check the checkboxes of all relevant exclusions and then select the state from the *Set State* dropdown under the toolbar.

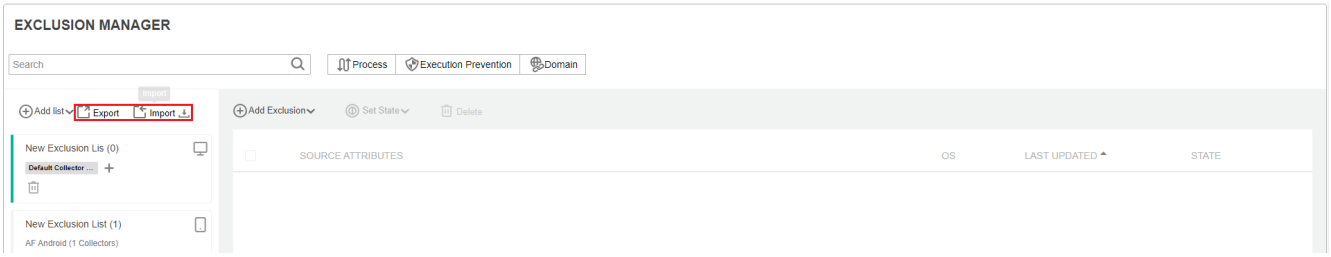
Deleting an exclusion

The *Delete* Exclusion button enables you to delete the selected exclusion(s).

To delete multiple Exclusions, check the checkboxes of all relevant exclusions and then select the *Delete* option in the toolbar.

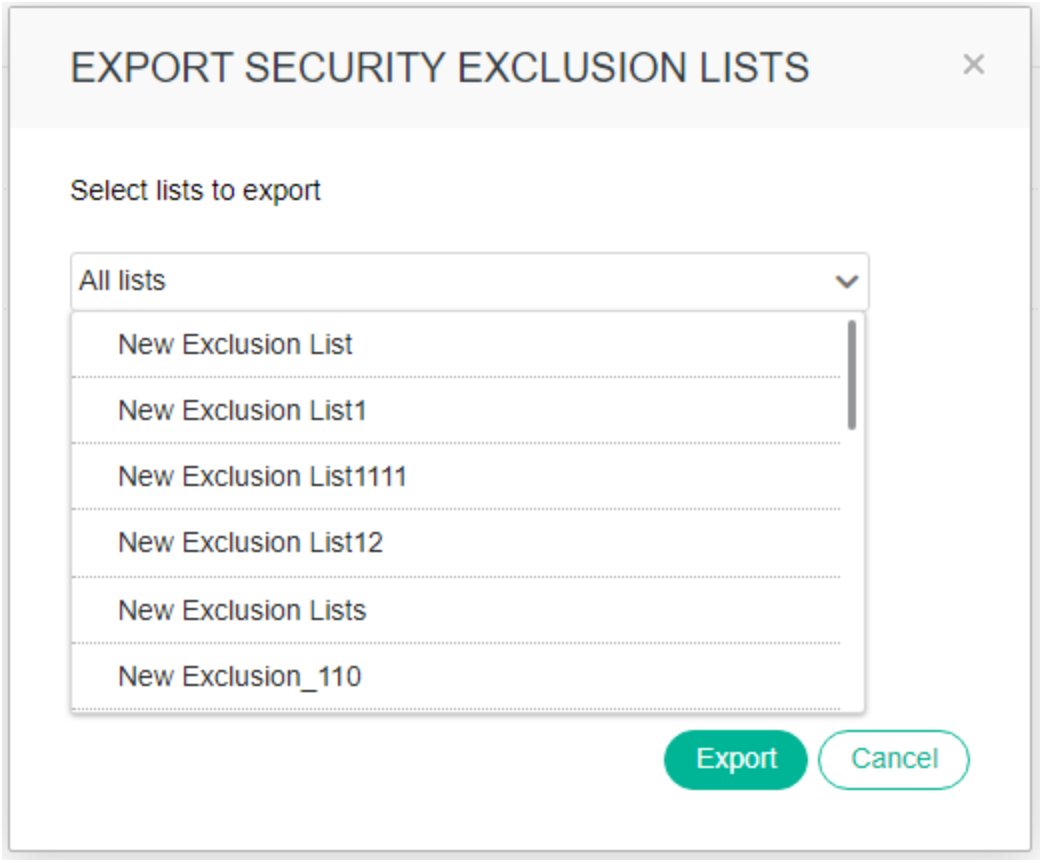
Exporting and importing exclusion lists

You can export or import exclusion lists for Process Exclusions and Execution Prevention Exclusions using the *Export* and *Import* buttons at the top-left of the Exclusion Manager page. This function is handy in a muiti-tenant environment where you can easily duplicate the exclusion lists for some or all organizations without the need to re-define exclusions for each organization separately.



To export one or multiple exclusion lists:

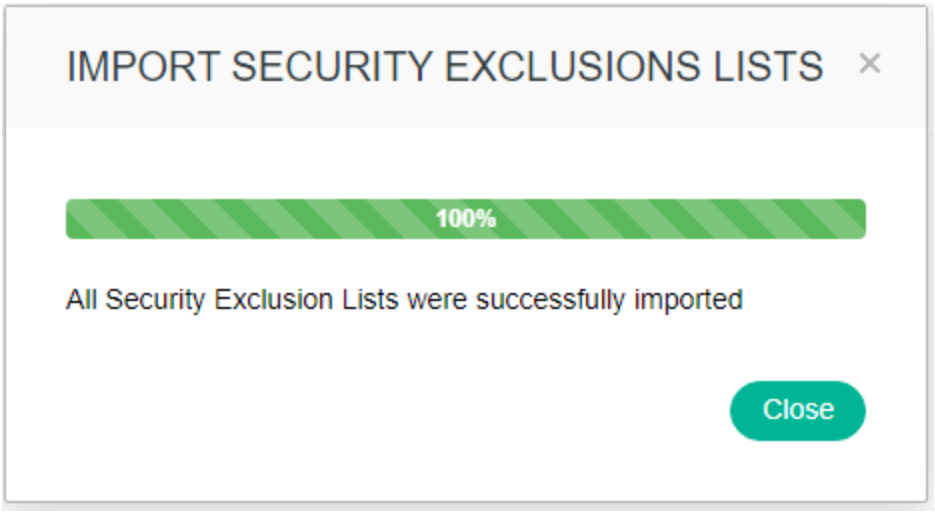
1. In the Exclusion Manager page, click *Export* at the top-left corner.
2. In the window that appears, select the list(s) to export. To export all lists, select *All lists*.



3. Click *Export*.
4. After the export is complete, click *Download* to save the file and then click *Close*.
   The file includes all exported exclusions and the exclusion lists that each exclusion belongs to.

To import one or multiple exclusion lists:

1. In the Exclusion Manager page, click *Import* at the top-left corner.
2. Select the list(s) to import (that you have saved or exported) and click *Open*.
3. Wait for the import to complete and click *Close*.

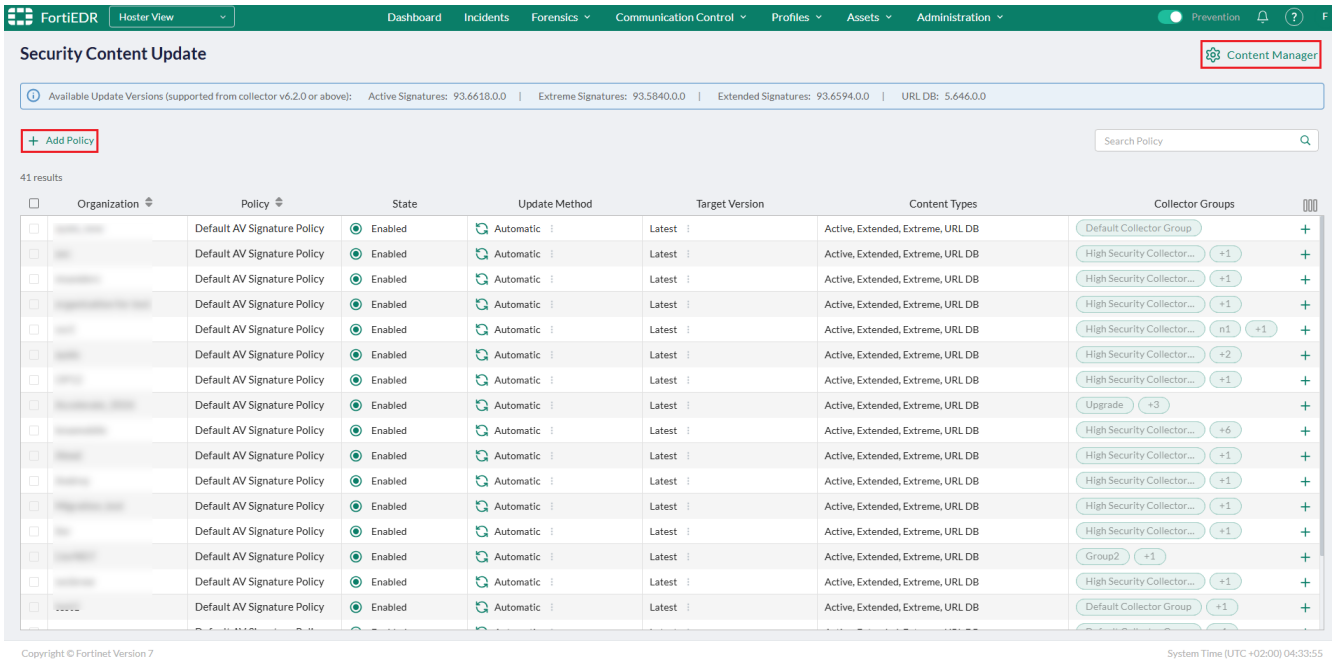


If a list name in the imported list already exists in the system, FortiEDR adds a suffix to the name of the newly imported list without touching the existing list.

For example, if the list name "AV" already exists, FortiEDR renames the imported list as "AV_1" that will appear in addition to the existing "AV" list. If such a list name ("AV") gets imported again, FortiEDR increments the number in the suffix of the list name for each subsequent import, which would be "AV_2", "AV_3", etc.

Security Content Update COLLECTOR 6.2 OR LATER

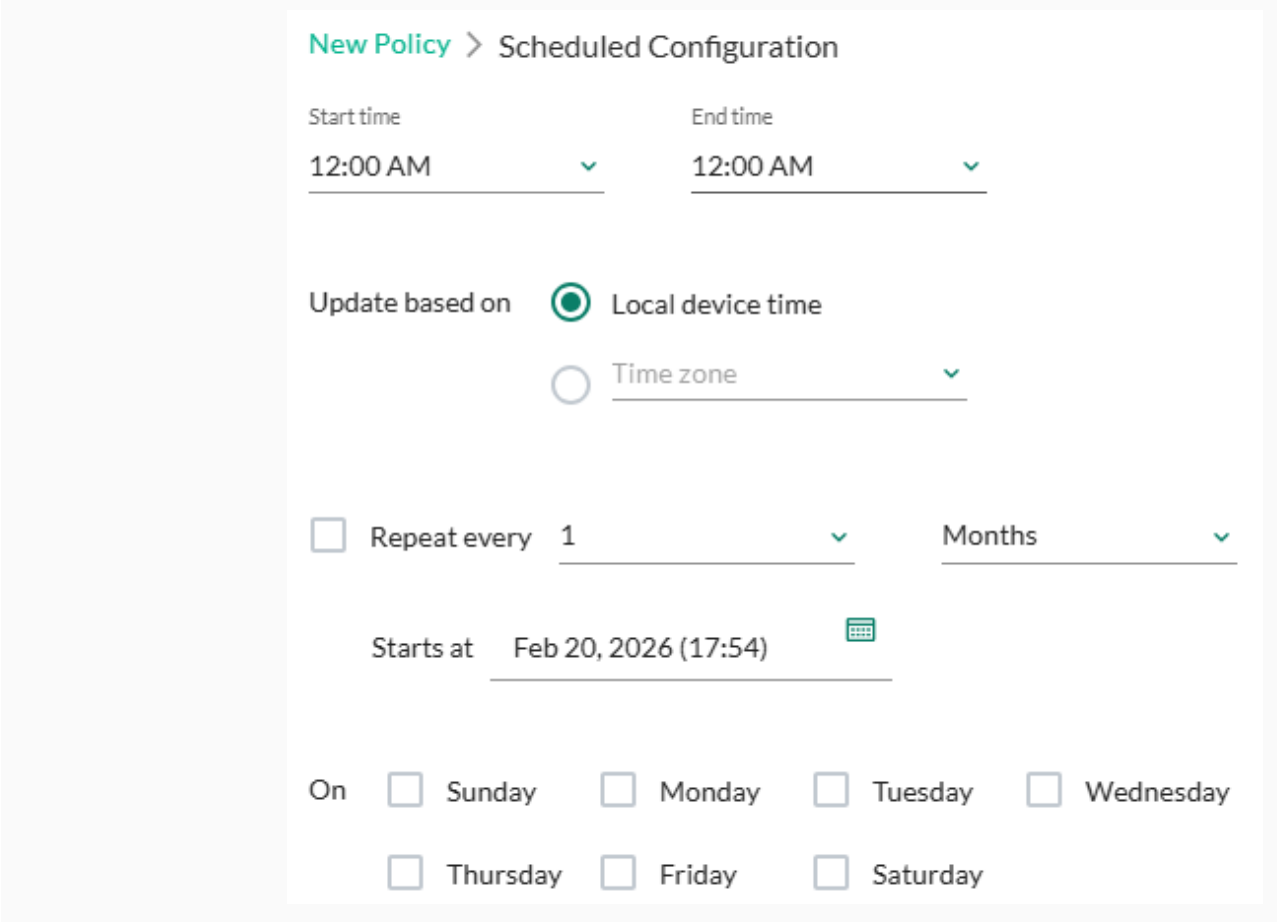
Use the *Profiles* > *Security* > *Security Content Update* page to configure AV signature policies to define when and how Collector groups download AV signatures for each type (Active, Extended, Extreme, and URL DB) based on time-based rules and time zones. You can also manually upload and manage AV signatures using the *Content Manager* button at the top-right corner in hoster view, which is particularly useful for air-gapped environments (see Appendix D – On-premise deployment for air-gapped environments on page 541).



To configure an AV signature policy:

1. In the *Profiles* > *Security* > *Security Content Update* page, click the *Add Policy* button at the top left corner.
2. Specify a name for the AV signature policy.
3. Select the Collector groups that the AV signature policy applies to.
4. Select the update method, which can be the following:

Automatic	FortiEDR automatically updates AV signatures to the latest or a specific version when it becomes available.
Scheduled	FortiEDR updates AV signatures to the latest or a specific version based on the configured schedule. Click *Add Config* to set up an update schedule. You can add multiple schedules.



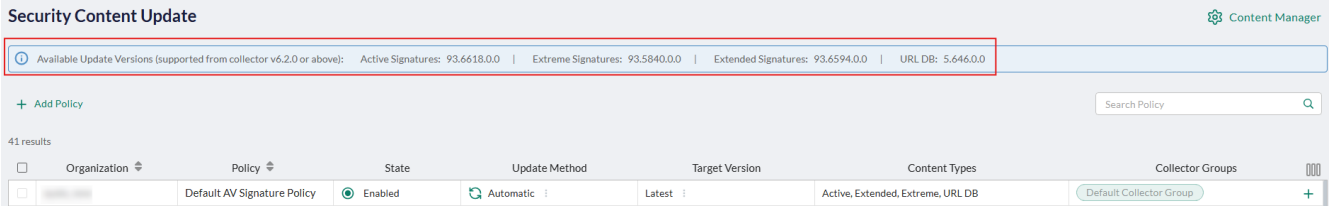
5. Select the content types to update, which can be the following:
   - Active
   - Extended
   - Extreme
   - URL DB

   See the FortiOS documentation for details about the content types.
6. Select the target version of AV signatures to update to, which can be the latest (default) or a specific version (you can specify the version for each type).
7. Click *Save* to save the AV signature policy.

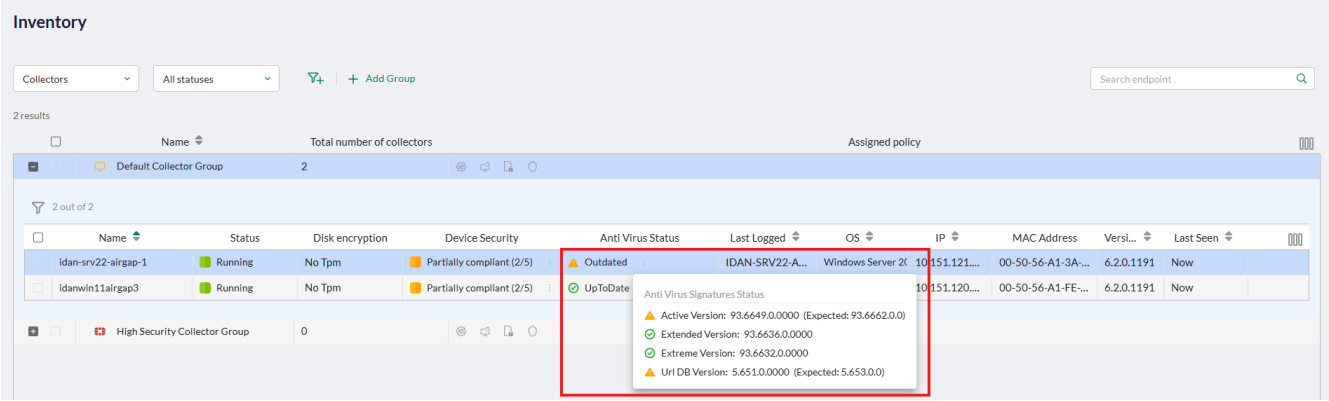
   The AV signature policy appears in the list.
8. **(Optional)** Add or remove Collector groups for the AV signature policy in the *Collector Groups* column.
9. Enable or disable the AV signature policy by clicking the *Enabled/Disabled* button in the *State* column.

   Once the configuration update with the new AV Signature updates, the Collectors will retrieve and download the signature updates according to the policy.

The AV signature versions are displayed at the top of the page.

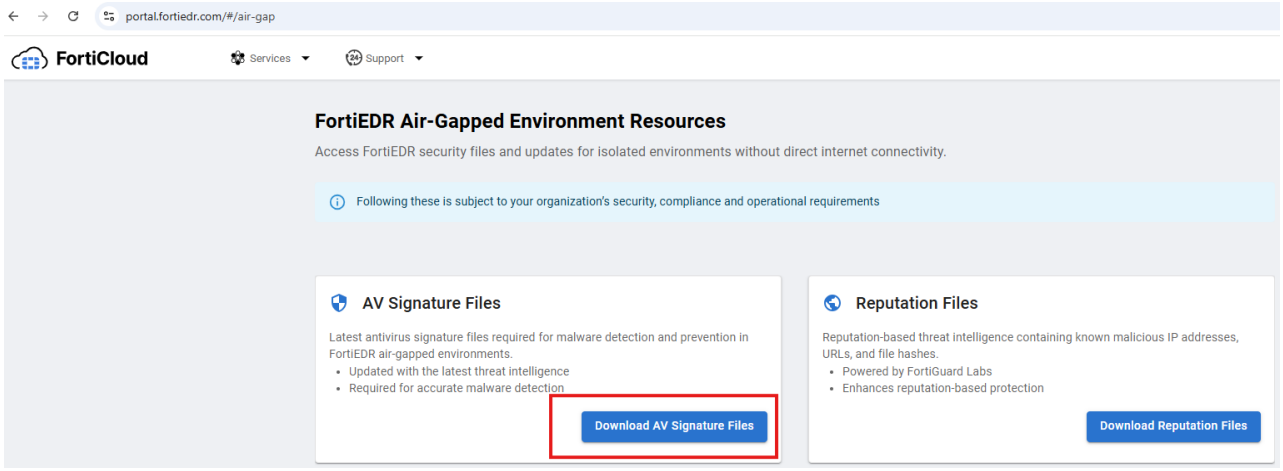


Under *Assets > Inventory*, you can view the up-to-date status of AV signatures for each Collector in the new *Anti Virus Status* column.

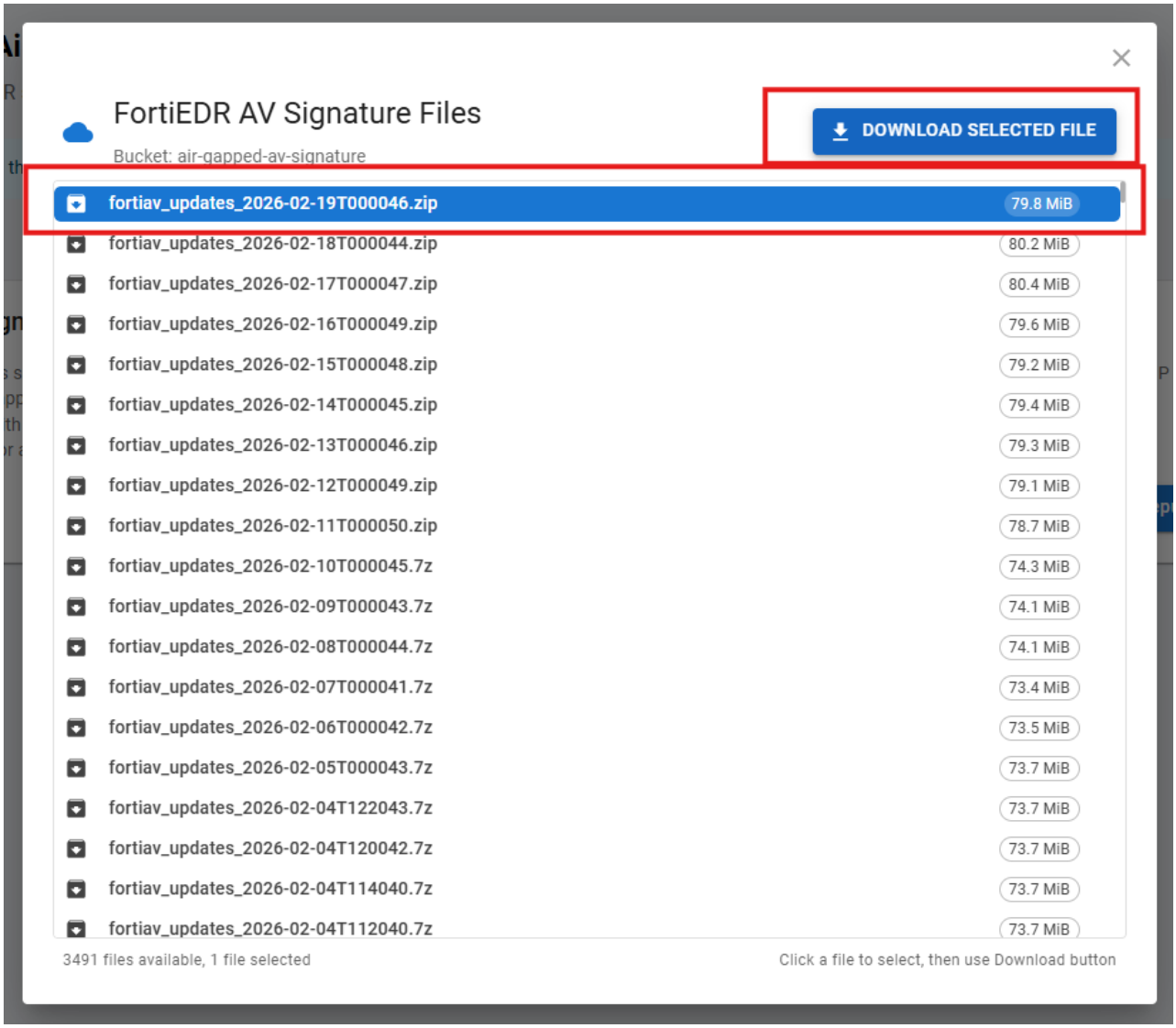


To manually upload AV signatures and manage AV signature versions for air-gapped environments:

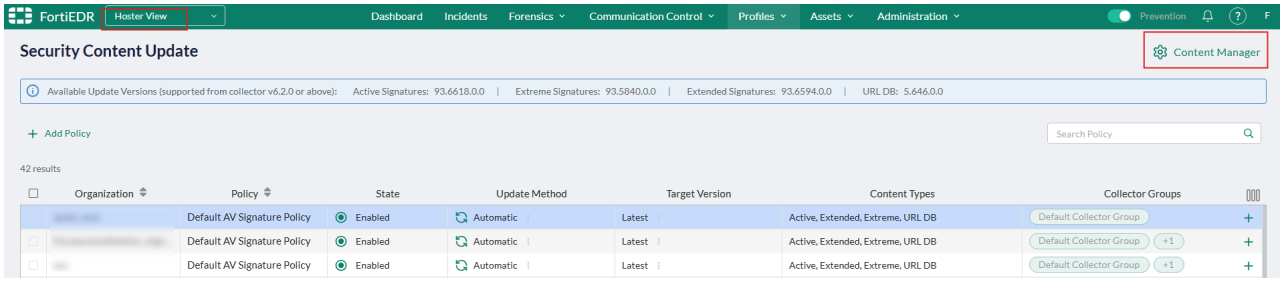
1. Log into the FortiCloud Portal and click *Download AV Signature Files*.



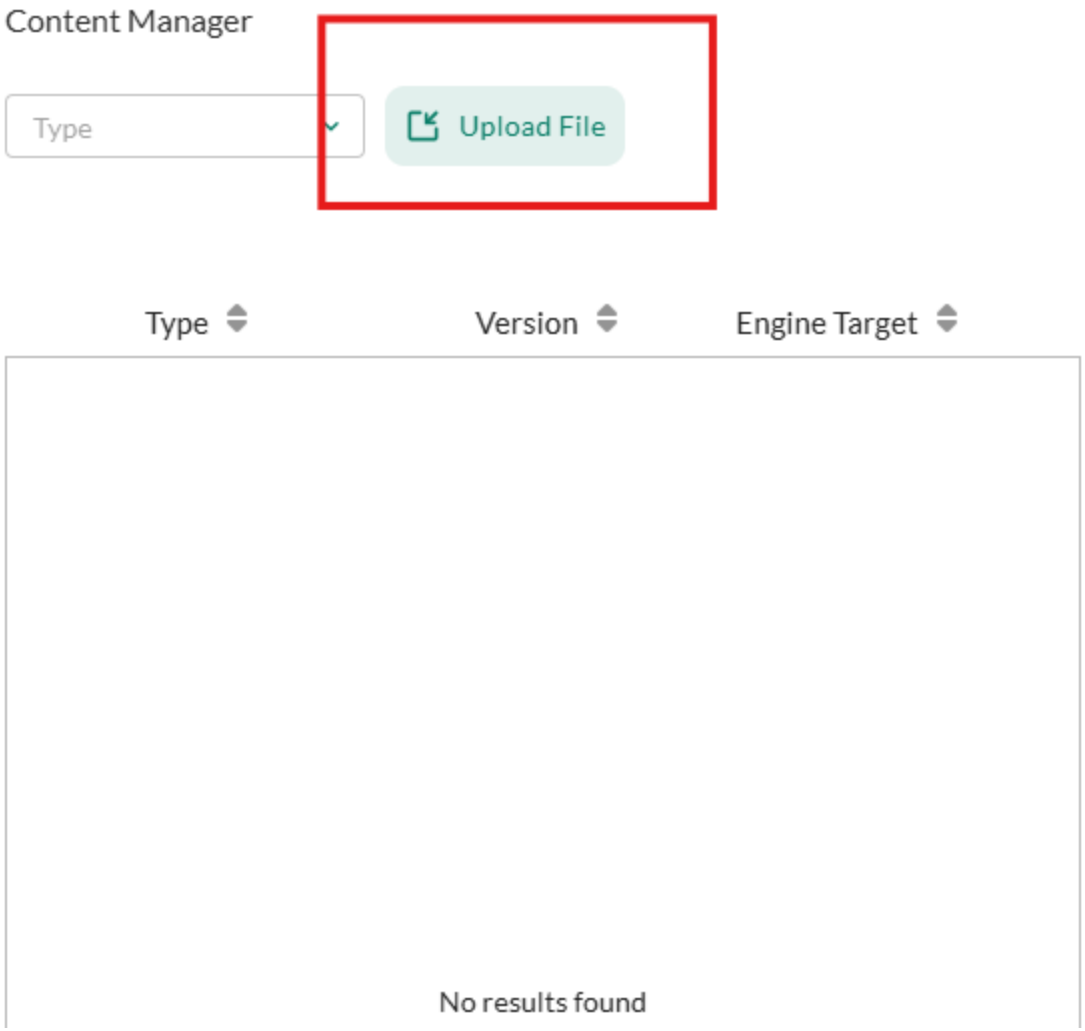
2. Select the latest available `fortiav_update.zip` file and download it.



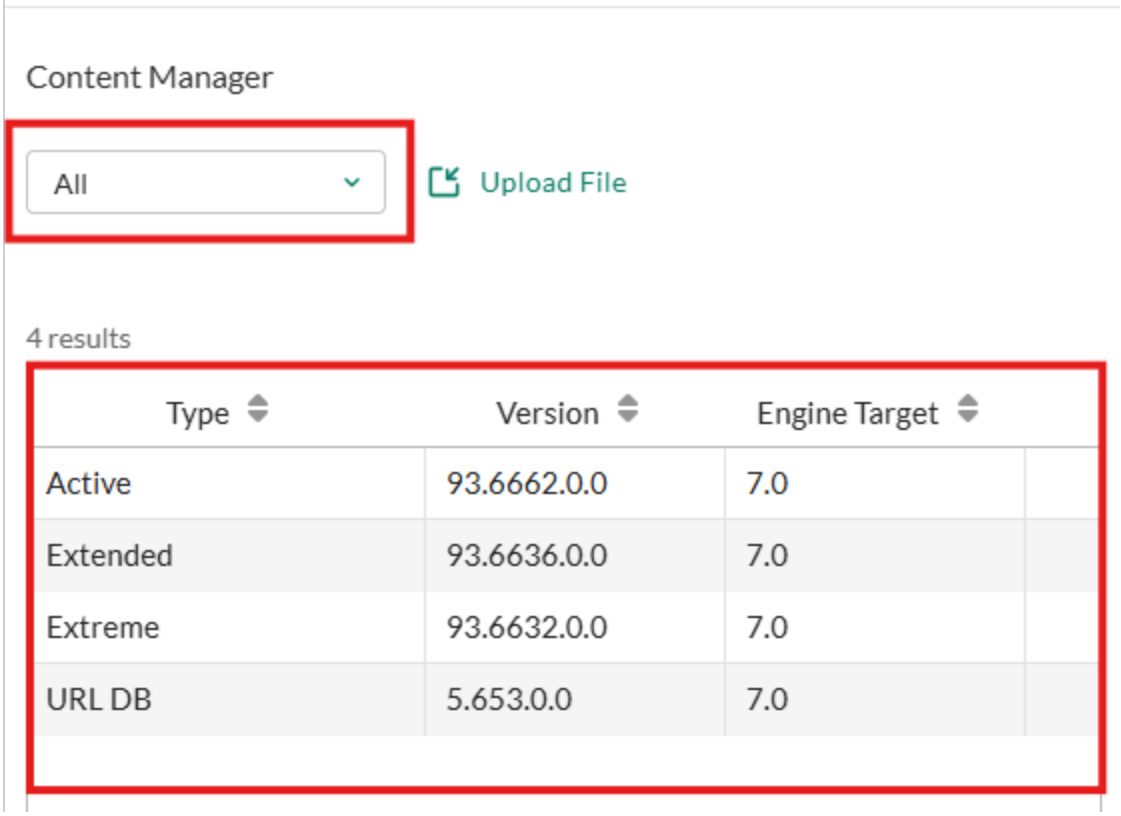
3. In hoster view, go to the *Profiles* > *Security* > *Security Content Update* page and click the *Content Manager* button at the top right corner.



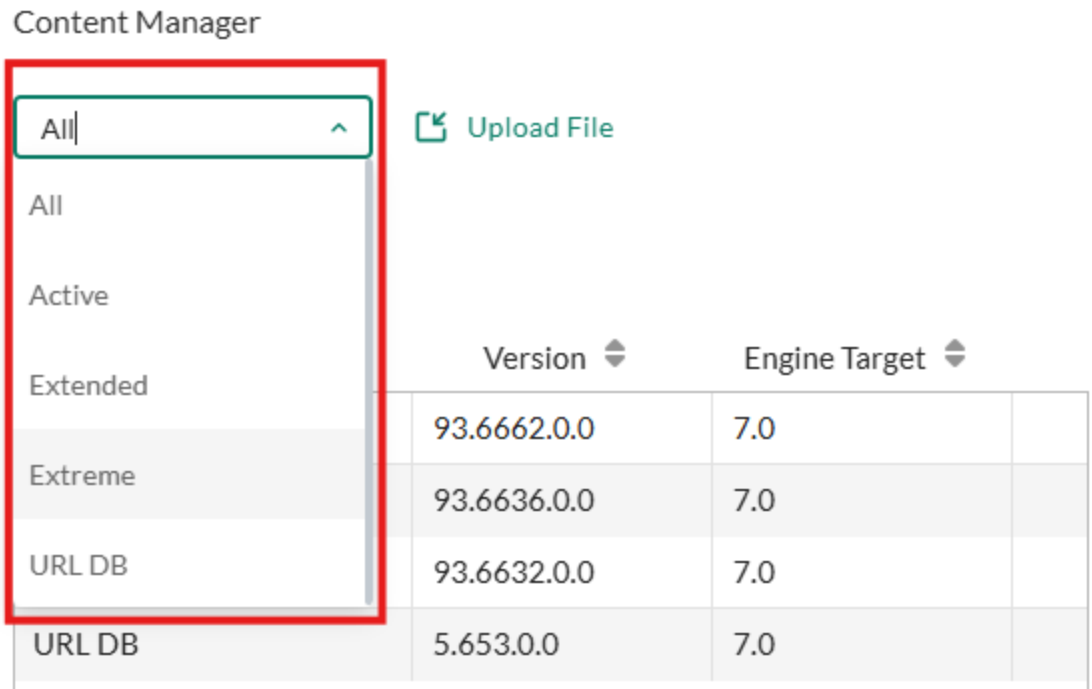
4. Click *Upload File* and upload the AV signature `fortiav_update.zip` file you just downloaded.



5. Once the upload is completed, notice the loaded AV Signature types and their versions in the list below.



6. In the drop down you can choose and filter the displayed AV Signature type.



7. Click *Close* and apply the newly uploaded signatures to any AV signature policies as needed. See previous section for details.

Application Control

The Application Control policy enables FortiEDR to block pre-defined applications from running, so that it does not launch. It enables limiting the usage of non-desired applications on specific collector groups.

This differs from Applications on page 173 under *Communication Control*, which enables you to control which applications can communicate outside of the organization, but does not stop them from launching.

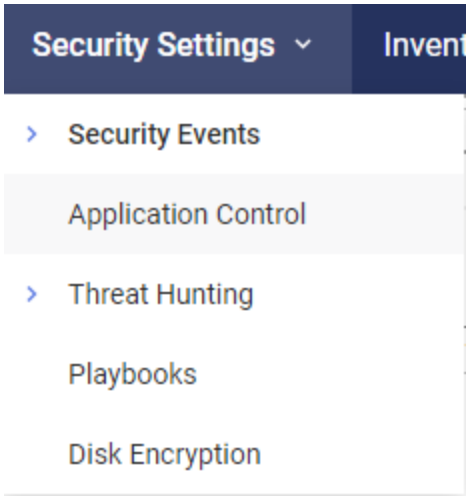
This section describes how to define the applications to be blocked by adding them in the Application Control. In addition, applications can be added to the list of applications to be blocked by adding them from the Investigation View on page 92. These applications are then listed in the Application Control Manager.

In general, in order to block applications so that they are not launched

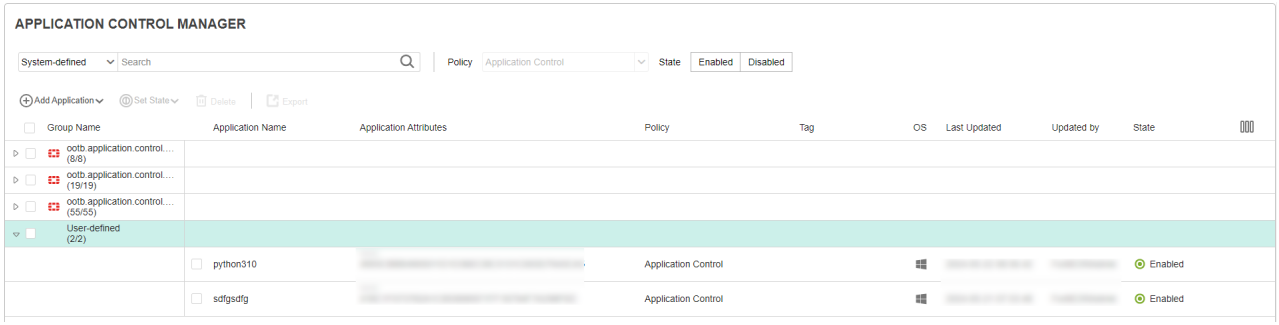
- The applications must be added to the Application Control Manager under the user-defined group
- Collector groups must be assigned to this policy
- The blocklist rule must be enabled on the Application Control Policy.

To add applications to the blocklist:

1. Select *Profiles* > *Security* > *Application Control* .



The following window displays, showing a list of different groups of applications that have been defined to be blocked by the Application Control policies.



Predefined application groups (indicated by the Fortinet logo by the group name) are always at the top of the application list and are assigned to the *Application Control* policy by default. You cannot add or delete applications from predefined application groups but you can disable specific applications or change the policy settings.

Applications added by the user are automatically categorized under the *User-defined* group with a default state of disabled, which means they are not blocked by default.

To change the default state of new applications to enabled so that they are blocked by default, enable the *Enable Default application state* option in the *Application Control Manager on page 410* section under *Administration* > *Tools*.

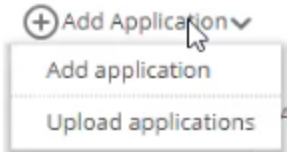
2. You can then perform any of the following actions:
   - Adding application(s) to be blocked on page 235
   - Exporting the list of applications to be blocked on page 241
   - Enabling/disabling application blocking on page 242
   - Changing the policy under which the application is blocked on page 242
   - Searching and filtering applications on page 243
   - Editing an Application by selecting the *Edit* button on the right side of that Application's row.
   - Deleting an Application by selecting the *Delete Application* option at the top of the window or selecting the *Delete* button on the right side of that Application's row.

You cannot delete a group, change or search any group names.

Adding application(s) to be blocked

To add an application(s) to be blocked:

1. Click the *+ Add Application* option. The following displays:



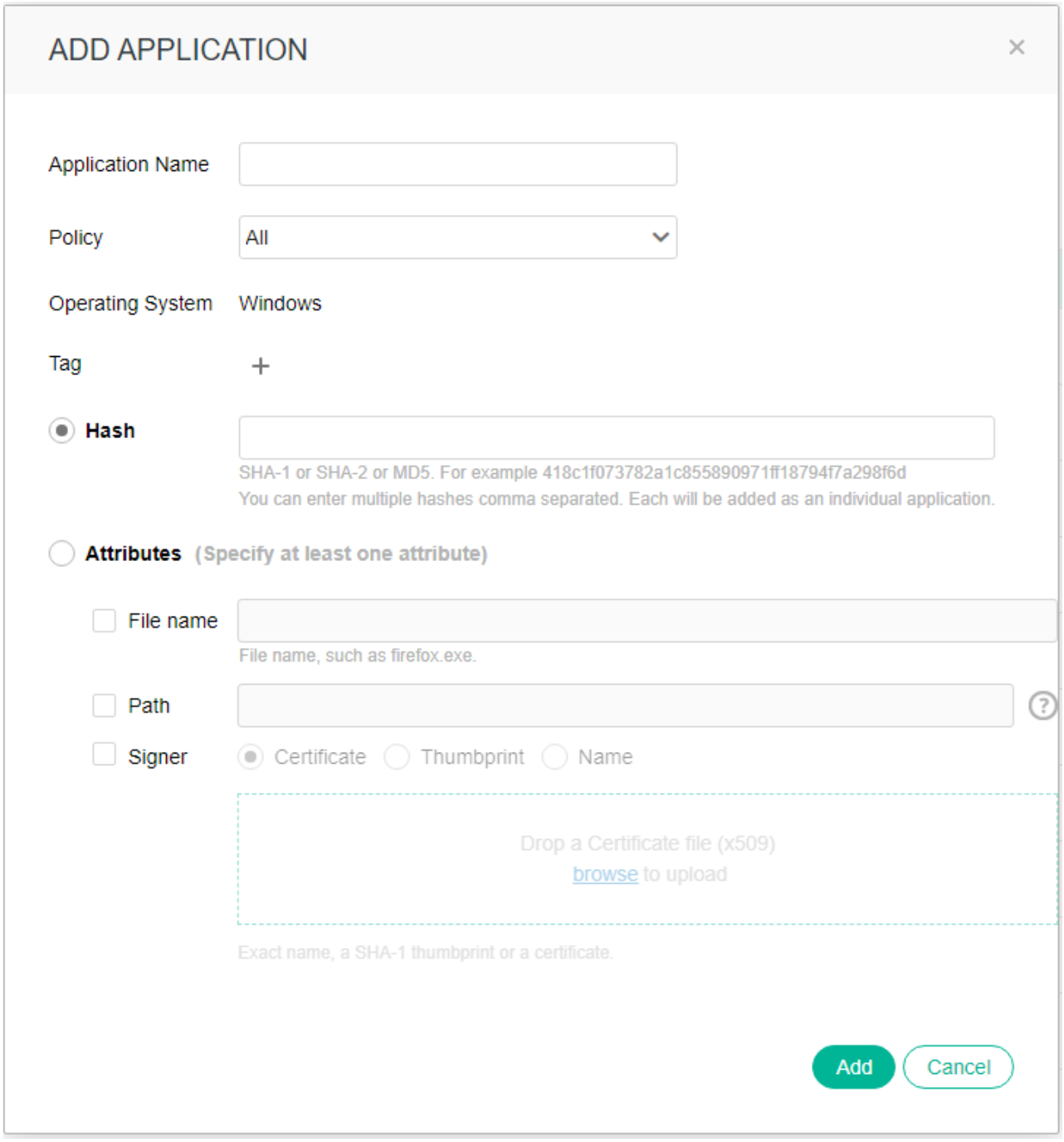
This dropdown menu provides two options for adding applications to be blocked:

- Manually adding an application to be blocked on page 237
- Uploading application(s) to be blocked on page 240

Manually adding an application to be blocked

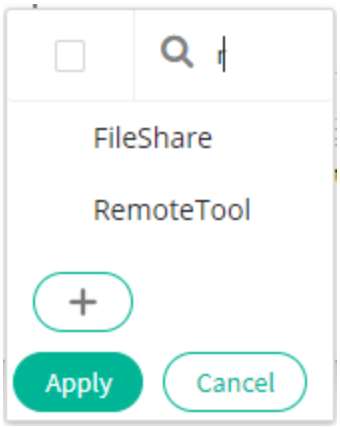
To manually add an application to be blocked:

1. Select *Add application*. The following displays:



2. In the *Application Name* field, specify a name to identify the application. The application name must be unique within the *User-defined* group.

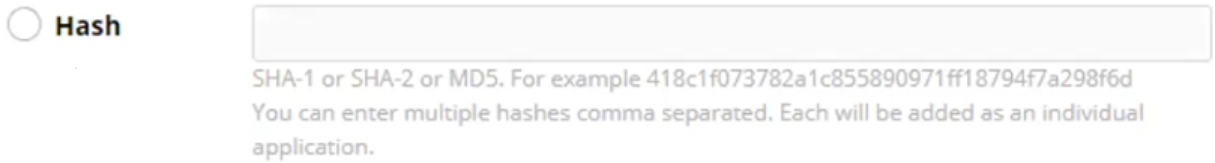
3. From the *Policy* dropdown menu, select one or more of the *Application Control* policies in which to block this application or select the *All* option to specify that this application is to be blocked by all Application Control type policies. FortiEDR is provided out-of-the-box with a single Application Control type policy and you can clone it in order to create additional Application Control type policies as needed.
4. You can optionally use the *Tag* field in order to classify this application. Tags can be helpful for classifying and filtering long lists of applications. In the *Tag* field, click the *Add* button + to specify the tag to be added to the application. You can assign a previously defined tag or define a new tag.



5. Define the application(s) to be blocked (so that they are not executed) using one of the following options: **Hash** or any combination of **File Name / Path / Signer**, as follows:

FortiEDR blocks only executables and DLLs that meet the defined criteria. When determining whether a file is an executable, DLL, or another type, FortiEDR adheres to the file nature rather than the file name (such as the `.exe` extension).

- Hash: Mark the Hash radio button and specify one or more Hashes. Each hash is the unique identifier of an individual application. If you enter multiple hashes, then they must be comma separated. Supported hash formats are specified under the field.



OR

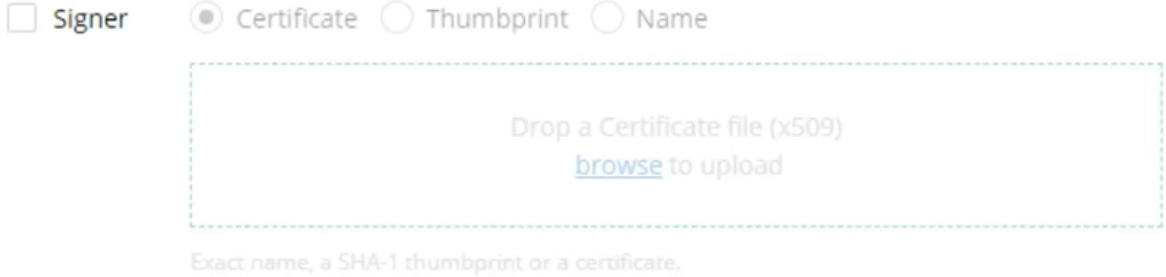
- **File Name / Path / Signer**: Mark the *Attributes* radio button, check at least one of the *File Name / Path / Signer* fields checkboxes and fill the relevant values, as follows:
  - Specify the executable file of the application to be blocked by filling in the *File name* field.
  - Specify the path to the executable file of the application to be blocked by filling in the Path field.

    If you fill in both the *File name* field (described above) and the *Path* field, then that application is only blocked if its executable is in that path. If you only fill in the *File name* field, then that application is blocked no matter where its executable file appears.

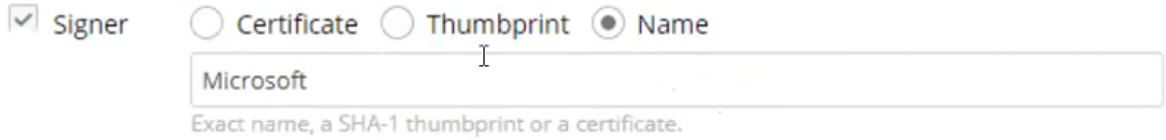
    Wildcards can be used in a folder name by placing a single wildcard (*) at the beginning, end and middle of the path.

    For example: `*\folder0\folder1*\folder2*`

- If you select *Signer*, then either upload the Signer's Certificate (as shown below), provide its thumbprint or type in the Signer's name. Uploading a certificate or specifying thumbprint is more secured that specifying signer name and hence recommended.



For example, selecting the *Name* radio button, then entering the word `Microsoft`, blocks the execution of any application that was signed by Microsoft. You must enter the exact name of the Signer.

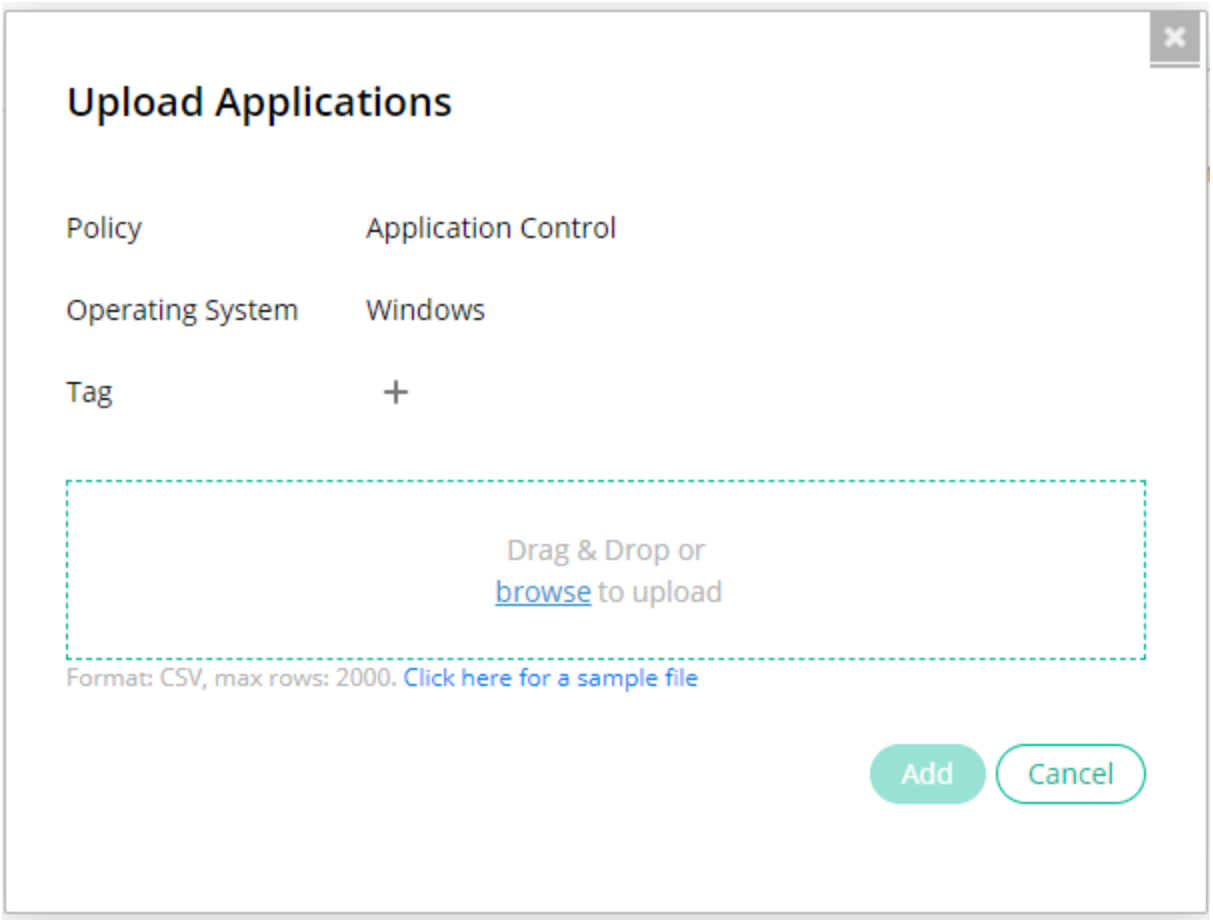


6. Click the *Add* button. The application is then listed under the *User-defined* group.
   When a Collector Group is assigned to the application control policy (specify above), then all these applications are blocked and cannot be launched.

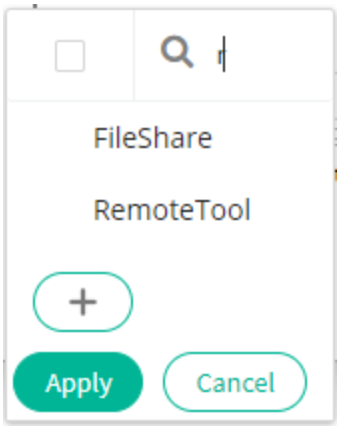
Uploading application(s) to be blocked

To upload a list of applications to be blocked from a file:

1. Select *Add Application* > *Upload Applications*. The following displays:



2. From the *Policy* dropdown menu, select one or more of the *Application Control* policies in which to block the applications specified in the file to be uploaded.
3. You can optionally use the *Tag* field in order to classify this application. Tags can be helpful for classifying and filtering long lists of applications. In the *Tag* field, click to specify the tag to be added to the application. You can assign a previously defined tag or define a new tag.



4. In the bottommost field of this window, select the CSV file that contains the list of applications to be blocked. This file should be a CSV file in which the five leftmost columns (shown below) identify the application to be blocked. A sample file can be downloaded from this window. Alternatively, you can use the same file as can be exported, as described in Exporting the list of applications to be blocked on page 241.

FORTINET — Report created by user — Confic

APPLICATIONS CONTROL

GROUP NAME	APPLICATION NAME	HASH	SIGNER THUMBPRINT	SIGNER NAME	PATH	FILE NAME	POLICY	TAG	OS	LAST UP
User-defined	aaaaaaa								Windows	2024-02-0
User-defined	aaaaaaa								Windows	2024-02-0
User-defined	aaaaaaa								Windows	2024-02-0
User-defined	uuuuu2								Windows	2024-02-0
User-defined	uuuuu2								Windows	2024-02-0
User-defined	Application_-1749470844								Windows	2024-02-0
User-defined	uuuu								Windows	2024-02-0
User-defined	test								Windows	2024-02-0
User-defined	sewefsefsfse								Windows	2024-01-2
User-defined	hash13								Windows	2024-01-2

5. Click the *Add* button. The Application Control Manager then lists a row for each application in the uploaded file under the *User-defined* group.
   When a Collector Group is assigned to the Application Control policy (specify above), then all the applications that are added will be blocked and will not be launched.

Exporting the list of applications to be blocked

To export the list of FortiEDR applications to be blocked:

1. Select the group(s) that you want to export.
2. Click *Export* to export the applications list as an Excel file.

Enabling/disabling application blocking

If you wish to disable the blocking of all the applications that are under a specific policy, we recommend simply disabling the blocklist rule of that policy. Alternatively, in order to temporarily block only specific applications, then we recommend enabling/disabling each application separately. If an application no longer needs to be on the blocklist, then we recommend deleting it using the *Delete* button in the right-most column or in the toolbar.

To enable/disable the blocking of specific applications:

1. Select *Profiles* > *Security* > *Application Control* to display the Application Control Manager. Each row represents an application to be blocked.
2. Select the application(s) to block. To block all applications in a specific group, select the group instead.
3. In the *STATUS* column on the right, toggle the value between *Enabled* and *Disabled*. Alternatively, you can check the checkboxes of the desired application rows, and then select the *Enabled* or the *Disabled* option from the *Set State* dropdown.

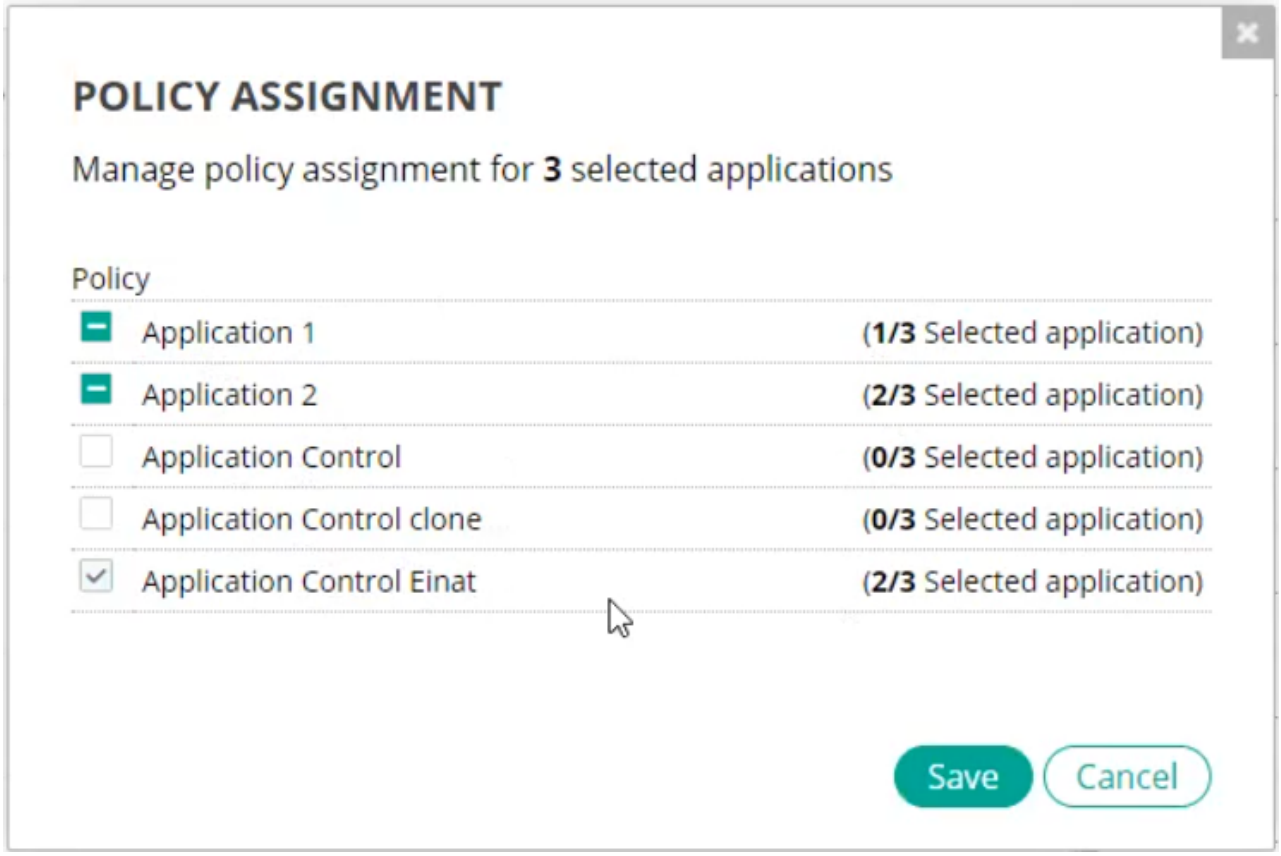
Newly added applications are set to be disabled by default, which means they are not blocked. To change the default state of new applications to enabled (so that they are blocked by default), enable the *Enable Default application state* option in the *Application Control Manager on page 410* section under *Administration* > *Settings*.

Changing the policy under which the application is blocked

To change the policy that blocks an application:

1. Select *Profiles* > *Security* > *Application Control* to display the Application Control Manager. Each row represents an application to be blocked.
2. In the Application Control Manager window, select the application(s) to change policy. To change policy of all applications in a specific group, select the group instead.

3. Click the *Policy Assignment* option. The following displays.



The policies that have a checkbox to their left have already been assigned all the selected applications. The policies that have a green minus sign to their left have already been assigned some of the applications. The right side of the window indicates how many of the applications that you selected in the Application Control Manager window have been assigned to that policy. The policies that have an empty box to their left were not assigned any of the selected applications.

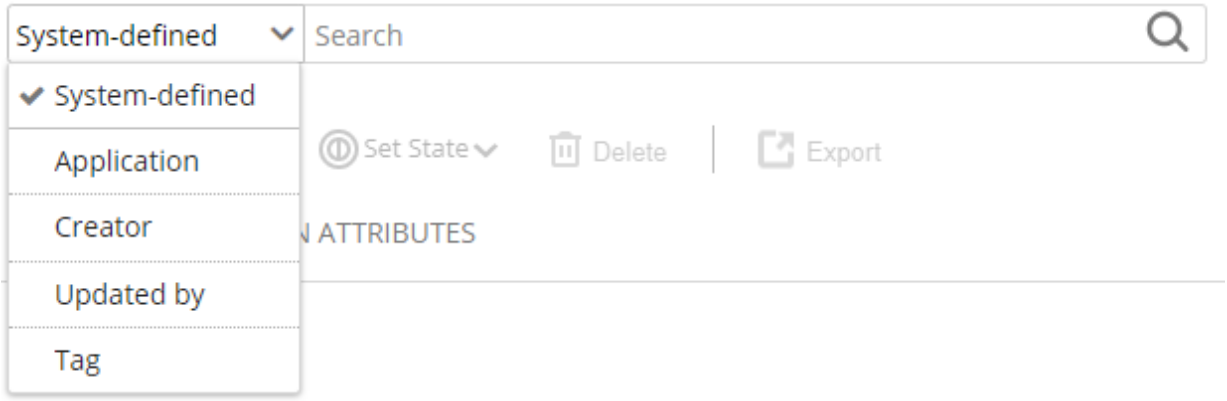
4. In the *Policy Assignment* window, check (or uncheck) the checkboxes of the policies that should block the currently selected applications.
5. Click the *Save* button.

Alternatively, in order to modify the policy to which a specific application is assigned, select the *Edit* button in the Application Control Manager window in the right side of that application's row.

Searching and filtering applications

To filter the list of applications defined in the Application Control Manager, use the fields at the top of the window, as follows:

1. Enter text in the *Search* field. This search field uses exact word matching.
   - By default, the *System-defined* option is selected, which specifies that the search is performed on the most relevant fields and then the list is filtered accordingly. Alternatively, from this dropdown menu, you can select the column that is searched, as follows:



2. Select the relevant policy from the *Policy* field.
3. In the *State* field, select *Enabled* or *Disabled*.

Secure Browser COLLECTOR 6.1.1.1281 OR LATER

The secure browser feature is disabled by default and will be gradually rolled out. To be considered as an early adopter, please contact Fortinet Support. The feature supports the following OSes only:

- Windows 11 - 21H2/22H2/23H2/24H2/25H2 (64-bit)
- Windows 10 22H2 (64-bit)
- Windows server 2012/2012 R2/2016/2019/2022/2025

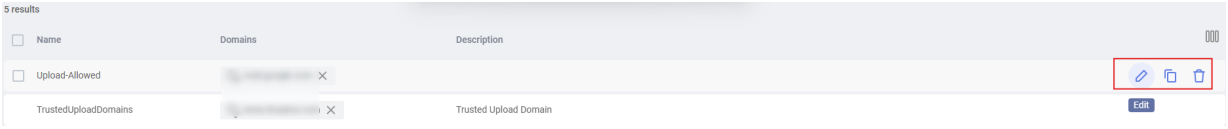
Use the *Profiles* > *Security* > *Secure Browser* pages to secure browsing in Google Chrome on the endpoint:

- Approve or protect for file upload/download for specific domains.
- Protect data in specific domains by preventing pasting content from those domains.
- Block traffic to specific website categories.
- Block specific third-party extensions.

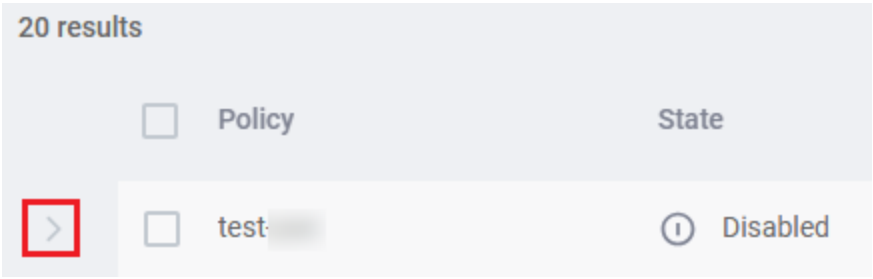
To configure secure browsing:

1. Ensure the organization has the *Secure Browser* option enabled, which is required to enable all secure browser-related pages and options in FortiEDR. See Step 2 – Defining or importing an organization on page 432.
2. Create a list of domains and URLs to allow file upload/download or data transfer as needed:
   a. Go to the *Profiles* > *Security* > *Secure Browser* > *Domain Groups* page and click *Add Group*.
   b. Specify a name for the domain group. For example, *Allow file upload*. The domain group name is case-sensitive.

c. Optionally, provide a description.
d. Click *Add Domain* and specify the exact URL of the website to approve or protect. For example, `www.abc.com`. Wildcard is unsupported.
   Repeat this step to add more URLs to the group as needed.
e. Click *Save*.
f. Repeat the procedure to add more domain group as needed.
   You can also edit, clone, or delete a domain group using the following options:



3. Create a secure browser policy and connect the domain groups to it:
   a. Go to the *Profiles > Security > Secure Browser > Policies* page and click *Add Policy*.
   b. Specify a name for the policy. The policy name is case-sensitive.
   c. Select the Collector groups that the policy applies to.
   d. Click *Save* to save the policy.
      The policy appears in the list.
   e. **(Optional)** Add or remove Collector groups for the policy in the *Collector group* column.
      A Collector group can only be added to one secure browser policy.
   f. Expand the row of the policy in the table and configure the rules to associate with the policy.

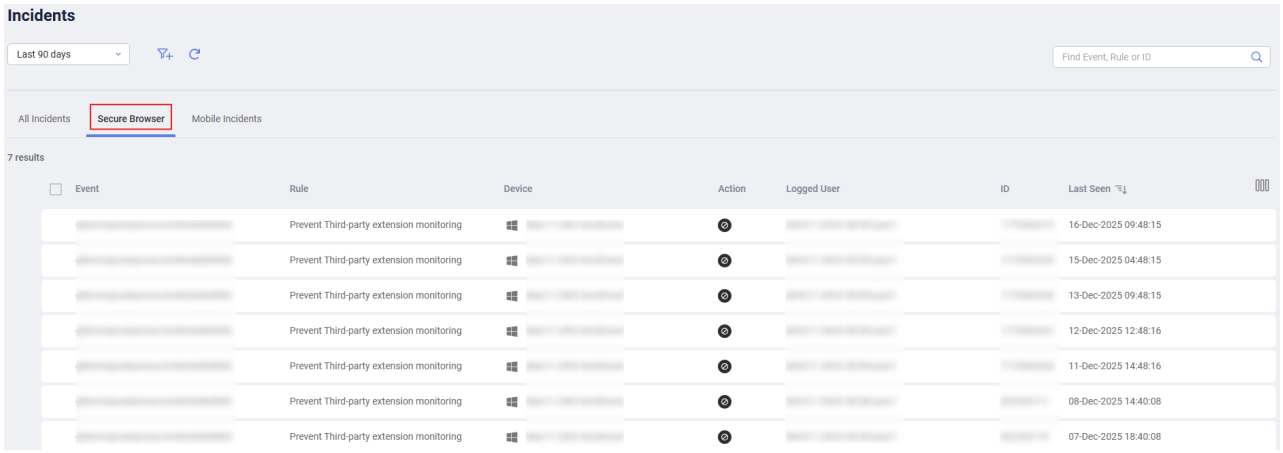


FortiEDR provides the following built-in rules, which are all enabled by default. Click the *Enable* button to disable it. To edit a rule, click the *Edit* button to the right of the rule.

Rule	Description
Prevent upload	By default, all file uploads are blocked in the policy. To allow upload from specific websites, edit the rule and click *Add Domain Group* to select the relevant domain groups, such as *Allow file upload*.
Prevent download	By default, all file downloads are blocked in the policy. To allow download from specific websites, edit the rule and click *Add Domain Group* to select the relevant domain groups, such as *Allow file download*.
Prevent data transfer	By default, all data transfers are allowed in the policy, which means you can copy content from any website and paste it to another website. To prevent pasting content copied from specific websites, edit the rule and click *Add Domain Group* to select the relevant domain groups to the protected domain groups list. Content copied from the protected domains will then only be allowed to be pasted into the same domain or another protected domain.

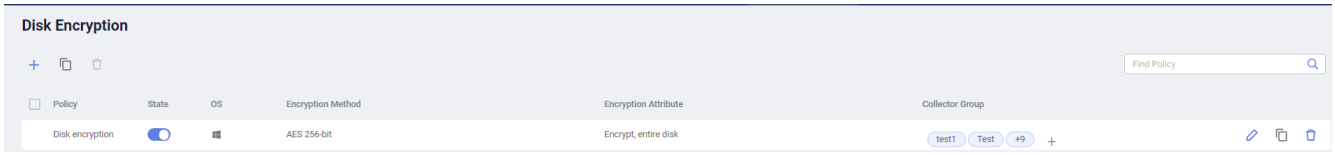
Rule	Description
URL reputation	By default, all website categories are allowed in the policy. To block or log traffic to specific website categories, edit the rule and click *Add category* to select the relevant categories and configure the block or log action. **Block** — Prevent user access to the website category. **Log** — Allow user access to the website category but a notification will be sent about the activity.
Prevent Third-party extension monitoring	By default, all third-party extensions are allowed by the policy. **To block or log specific third-party extensions:** **a.** Edit the rule by clicking the *Edit* button to the right of the rule. **b.** Configure the block or log action, which applies to all third-party extensions in the block list. **Block** — Disable the block list of third-party extensions. **Log** — Allow user access to the block list of third-party extensions but a notification will be sent about the activity. **c.** Click *Add Extension* to define a list of third-party extensions to block using the extension ID. You can retrieve the extension ID by turning on *Developer mode* in `chrome://extensions/`.

4. Check incidents for secure browser in the *Secure Browser* tab of the *Incidents* view.



Disk Encryption COLLECTOR 6.1 OR LATER

Use the *Profiles* > *Disk Encryption* page to configure disk encryption policies to enforce disk encryption on Windows 7 or later (using BitLocker, TPM required) and macOS (using FileVault) endpoints to ensure consistent security configurations and compliance with regulatory requirements. You can also configure disk decryption policies to allow users to decrypt an encrypted disk.



To configure a disk encryption policy to enforce disk encryption on specific Collector groups:

1. In the *Profiles* > *Disk Encryption* page, click the *Add* button at the top left corner.
2. Specify a name for the policy.
3. Enable the policy if you want to enforce the policy immediately after creation. You can also choose to enable it later.
4. Select the OS and configure the relevant options:

Windows	macOS
1. Under *Action*, select *Encrypt all disks* or *Encrypt only used disk*. 2. Under *Method*, select an encryption method for Windows 10 or later.	1. Under *Action*, select *Encrypt*. 2. Under *Method*, select the number of allowed user logins with an unencrypted disk. For example, if *3* is selected, the user will not be able to log in on the third attempt without confirming the disk encryption. 3. Upload the FileVaultMaster certificate.

5. Click *Save*.
   The policy appears in the disk encryption policies table.
6. Enable or disable the policy by toggling the button in the *State* column.
7. Add or remove Collector groups for the policy in the *Collector Group* column.

8. **(macOS)** To verify the disk encryption status, run `sudo fdesetup status` on the endpoint. You can run the command multiple times to see the progress. When the encryption is complete, the status will show that FileVault is on. Encryption speed depends on HD size and Mac model.

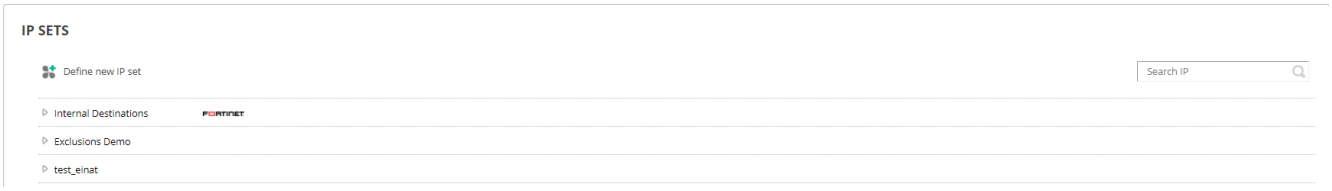
To configure a disk decryption policy to allow users of specific Collector groups to decrypt an encrypted disk:

1. In the *Profiles* > *Disk Encryption* page, click the *Add* button at the top left corner.
2. Specify a name for the policy.
3. Enable the policy if you want to enforce the policy immediately after creation. You can also choose to enable it later.
4. Select the OS and select *Decrypt* under *Action*.
5. Click *Save*.
   The policy appears in the disk encryption policies table.
6. Enable or disable the policy by toggling the button in the *State* column.
7. Add or remove Collector groups for the policy in the *Collector Group* column.
   (macOS) Users from those Collector groups can then manually disable FileVault (user credentials required) from *Setting* > *FileVault* > *Disable FileVault*. If the Collector is not assigned to the decrypt policy, the disk will be automatically encrypted again even after the user manually disables FileVault.
8. **(macOS)** To verify the disk decryption status, run `sudo fdesetup status` on the endpoint. You can run the command multiple times to see the progress. When the decryption is complete, the status will show that FileVault is off. Decryption speed depends on HD size and Mac model.

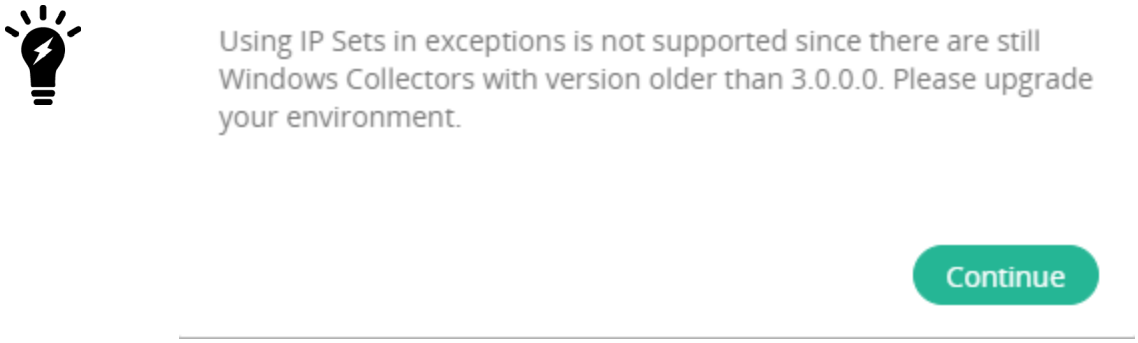
IP sets

IP Sets enable you to define a set(s) of IPs to include or exclude for some security events. This feature is used when defining exceptions.

This page is only available to users with Admin, IT, or Senior Analyst permissions.



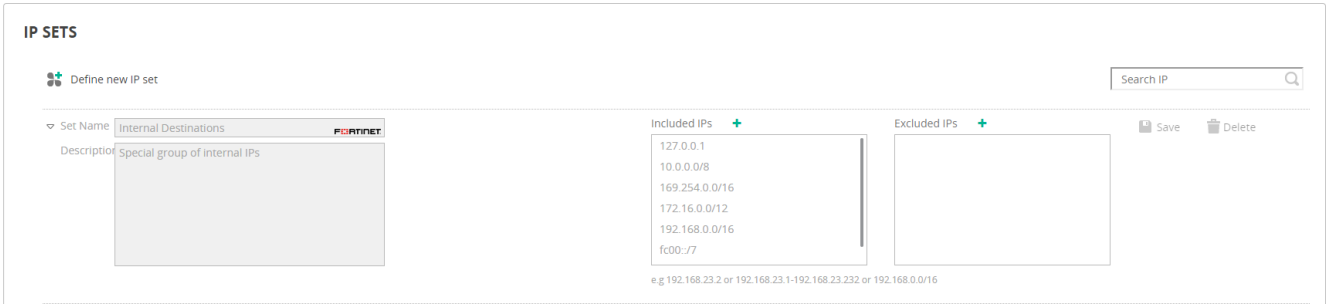
IP Sets can only be defined if all Collectors are V3.0.0.0 and up. If you attempt to define an exception and all Collectors are not V3.0.0.0 or above, the following error message displays:



Each row in the IP Sets window represents an IP inclusion/exclusion definition. The *Internal Destinations* row is provided by default (as indicated by the adjacent FortiEDR logo), which defines the default IPs that are included in and excluded from the FortiEDR system. All organizations in a multi-organization system are provided with this default IP set. In a single-organization system, the main organization is provided with it. The Internal Destinations IP set cannot be deleted. However, an Administrator can add Included IPs or Excluded IPs to it.

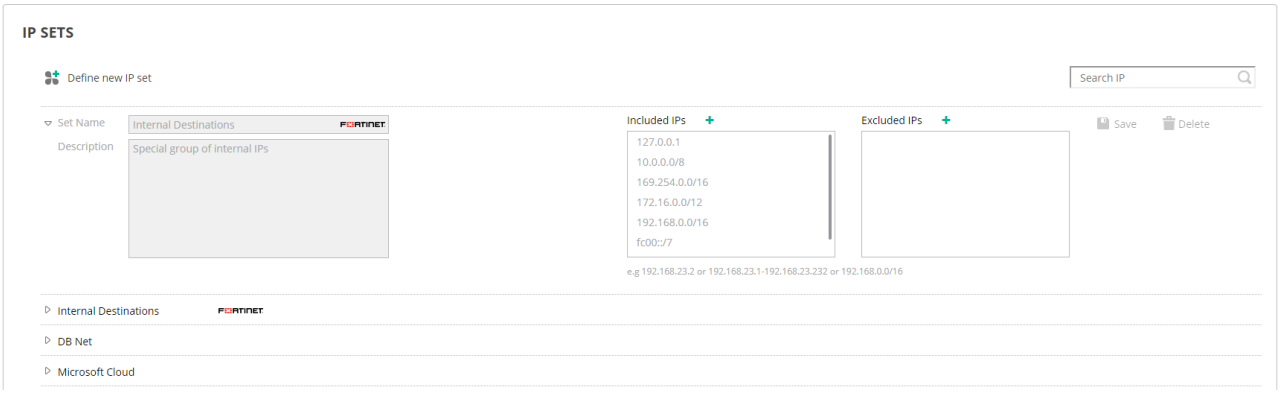
The *IP Sets* page lists all the IP sets. Users can only edit an IP set that was specifically created for his/her organization. For example, if the administrator is assigned to only organization A, he/she can edit an IP set create for organization A but not an IP set that applies to all organizations.

Click the FORTINET logo in the Internal Destinations row to view its definition, as shown below:



To define an IP set:

1. Click the *Define new IP set* button (Define new IP set) button. The following window displays:



2. In the *Set Name* field, enter a name for the IP set.
3. In the *Organization* dropdown list, select the organization to which the IP set applies or select All organizations for the IP set to apply to all organizations in the FortiEDR system.
4. In the *Description* field, enter a description for the IP set.
5. In the *Included IPs* area, click the *Add* button (+) to add an IP, IP range, or IP mask to be included in the IP set's definition. Each click of the *Add* button (+) adds a new line to the list. Each entry appears in its own line. For example, you could add 192.168.23.2, 192.168.23.1-192.168.232 or 192.168.0.0/16. Similarly, in the *Excluded IPs* area, click the *Add* button (+) to add an IP, IP range, or IP mask that is to be excluded.
6. Click the *Save* button.

The *Search IP* field at the top-right of the page enables you to search for a specific IP in all of the IP sets defined. The search option identifies matching IPs, even if they are part of a range in an IP set's definition.

To use an IP set:

Select an IP set in the *Destinations* area when defining an exception.

EDR

Use the *Profiles > EDR* tab to configure profiles and exclusions for FortiEDR threat hunting, which features a set of software tools and information sources focused on detecting, investigating, containing, and mitigating suspicious activities on end-user devices.

Threat Hunting Settings is a license-dependent add-on. You may contact Fortinet Support for more information.

To set up Threat Hunting in FortiEDR, configure the following:

- Collection profiles on page 258
- Collection Exclusions on page 251
- Threat Hunting data retention on page 260

Collection Exclusions

Exclusions are needed for reducing the amount of Threat Hunting data that is collected and by doing so prolonging the data retention. The less data that is collected, the longer it will be stored in the databases.

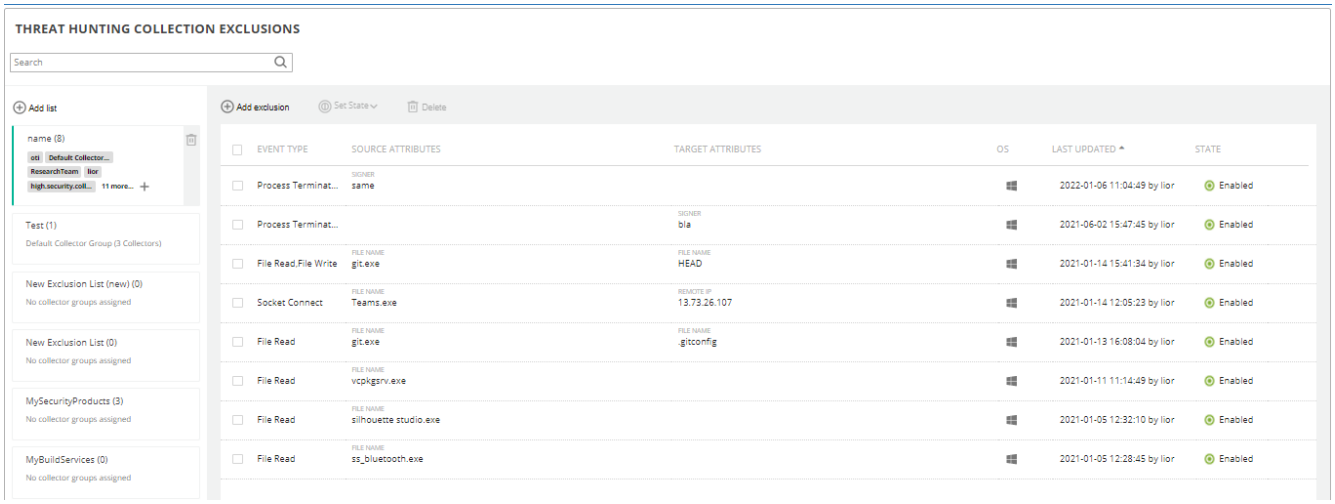
Exclusions enable you to define certain types of activity events to be excluded from being collected by Threat Hunting data (even though should be collected according to the Threat Hunting Collection Profile assigned to a Collector group, which was described in Collection profiles on page 258). For example, if you know that a certain process is legitimate, but it creates many activity events that are not relevant to your Threat Hunting investigation, you can use the Collection Exclusions to define that these activities are not collected.

The Collection Exclusions enables you to define and manage exclusion lists and the exclusions that they contain.

Exclusions are different than security event exceptions, as follows:
- Exclusions define which activity events should be collected. They are exclusions to the Threat Hunting Profile.
- Security event exceptions are defined after a particular security event has occurred. They are an exception to the assigned Security Policy.

To access the Collection Exclusions, select *SECURITY SETTINGS > Threat Hunting > Collection Exclusions*.

The Collection Exclusions page contains the following areas:



Filters

To filter the Collection Exclusion list names and its content, simply enter text in the *Search* field. Afterwards, only the Exclusion lists that match the provided text are displayed showing only the relevant exclusions.

Defining Collection Exclusion Lists

A Collection Exclusion List contains a list of exclusions. You can assign Collector Groups to an Exclusion List in order to specify that the exclusions in the Exclusion List apply to the Collectors in the Collector Groups assigned to it. Exclusion Lists enable you to logically organize, categorize and group exclusions based on the type of activity data they are to exclude.

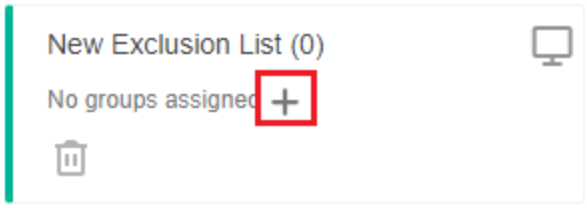
For example, let's say that you want to collect network activity data for your system, but a specific application generates quite a bit of uninteresting logistical network activity that you do not want to collect. In this case, you can define an Exclusion List named after that application that contains one or more exclusions that relate specifically to the network activity generated by that application. Exclusion Lists can be organized anyway you see fit. For example, you can create an Exclusion List for security products, a different one for PDF documents, a different one for HR-related software and so on.

Adding an Exclusion List

To define an Exclusion List:

1. Click the *+ Add List* option and provide a name to create a new Exclusion List.
2. Add (define) the exclusions of this Exclusion List (as described on the following page). Each exclusion that you add belongs to a specific Exclusion List.
3. Assign Collector Groups to this Exclusion List (as described below) in order to determine to which Collector Groups these exclusions apply. A Collector Group can be assigned to multiple Exclusion Lists.

Assigning a Collector Group to an Exclusion List



You can perform the following operations on an Exclusion List:

Operation	Description
Assign a Collector Group:	Click the + button in the Exclusion List to which to assign a Collector Group. Then, select the Collectors groups to which to assign this list and approve it. Note that a Collector Group can be assigned to multiple Exclusion Lists.
Unassign a Collector Group	Click the + button and uncheck the Collector Group to be removed from an Exclusion List.
Delete Exclusions List	Click on the *Delete* button. Note that all Exclusions in this list will be removed and will no longer be applied to the assigned Collector groups.

Defining Collection Exclusions

All exclusions must belong to an Exclusion List. Select an Exclusion List on the left to display the exclusions that are defined in it.

Exclusions can be defined for a

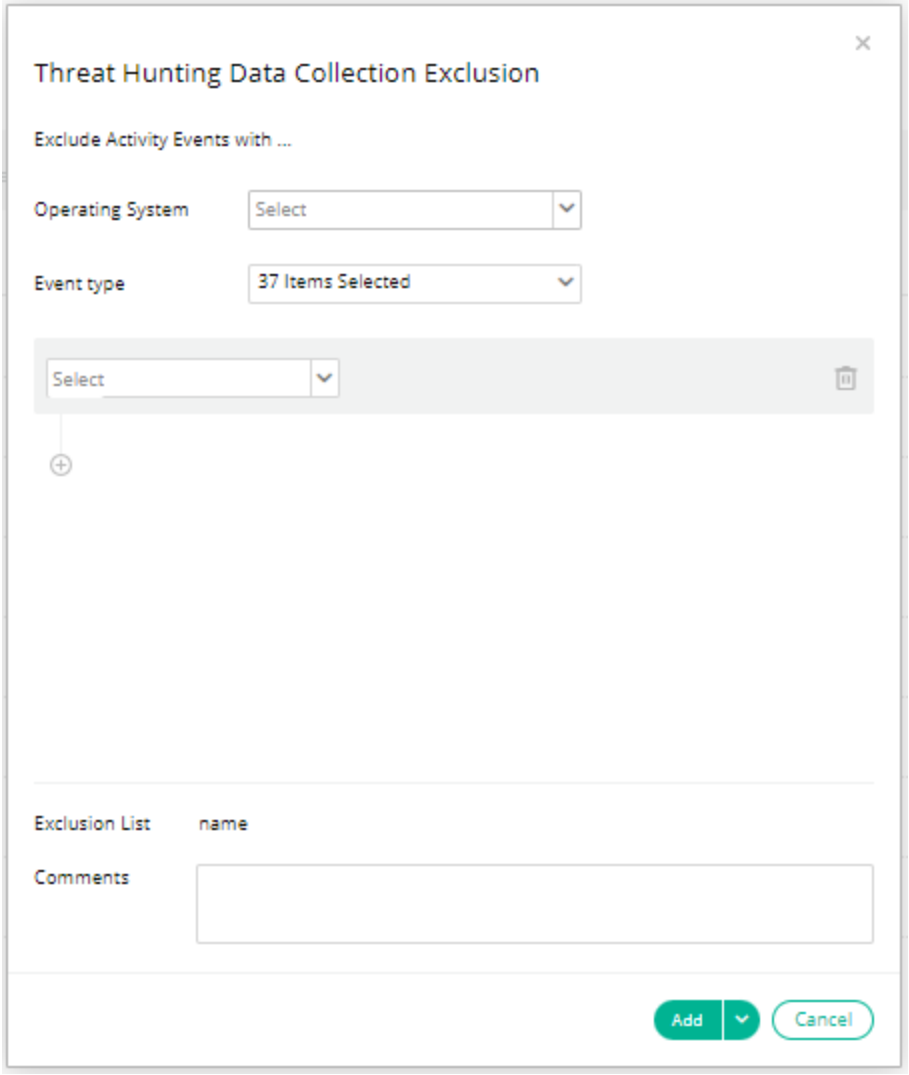
- **Source (process)** – Which is identified by a source attribute, such as a Signer.
- **Type/Action** – Activity event types, as described in Threat Hunting on page 131.
- **Target** – Which is identified by a target attribute, such as IP & Port.

Exclusion can include all of these three or any combination. However, defining an exclusion that only contains a Type is not valid, because this kind of exclusion should be defined in a Threat Hunting Profile.

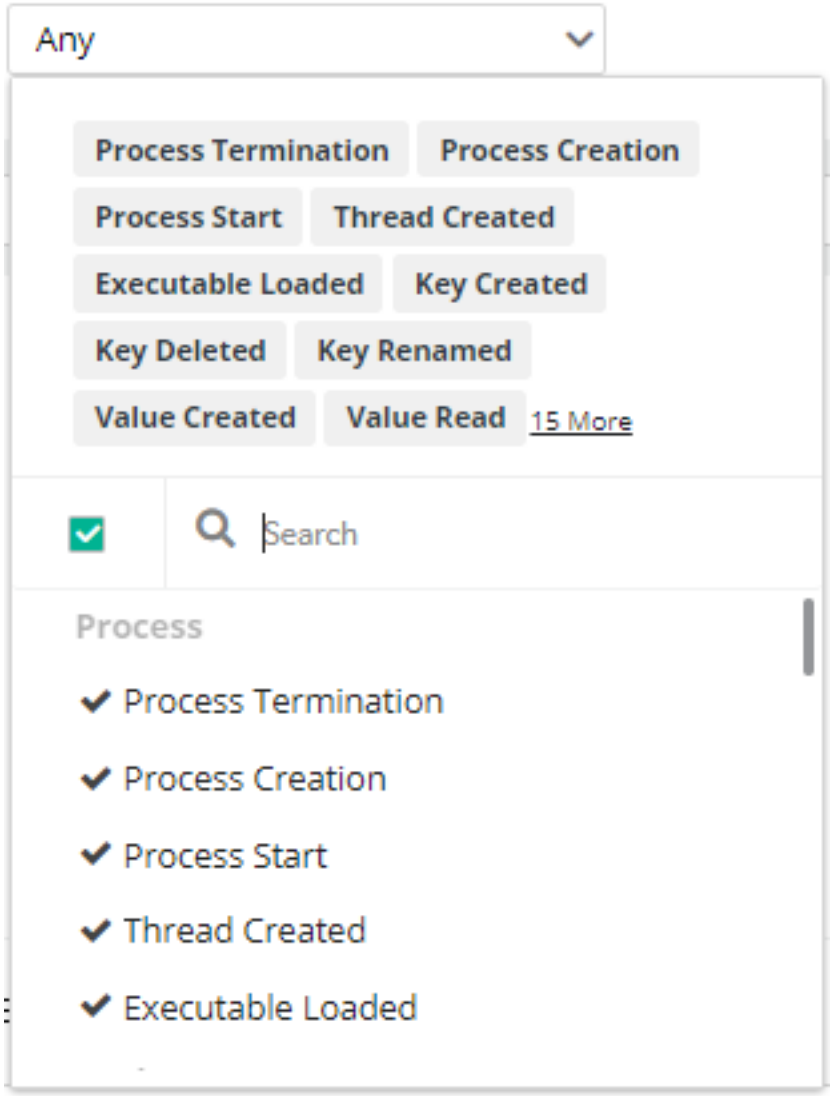
For example, you can define to exclude activity events of a specific Type that have a specific source and a specific target or to exclude (for example) activity events that have a specific source and any activity or target.

Adding an Exclusion

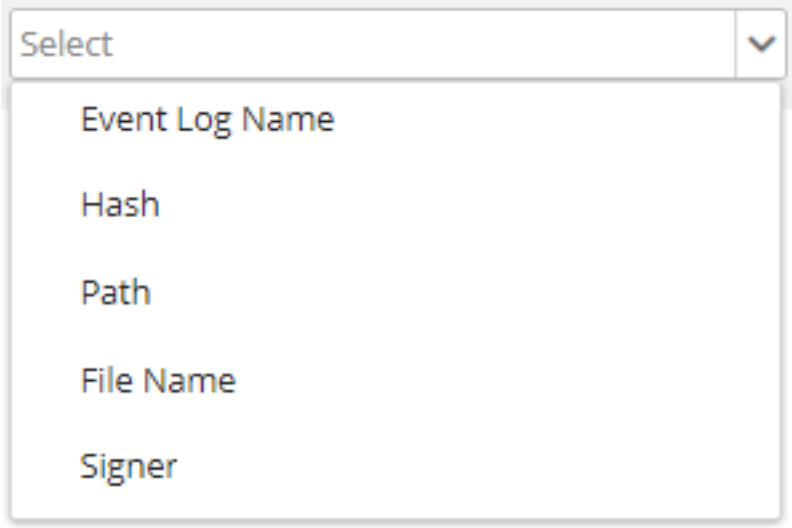
1. In the left pane, click the Exclusion List to which to add the exclusion.
2. In the right pane, click the *+ Add Exclusion* button. The following displays:



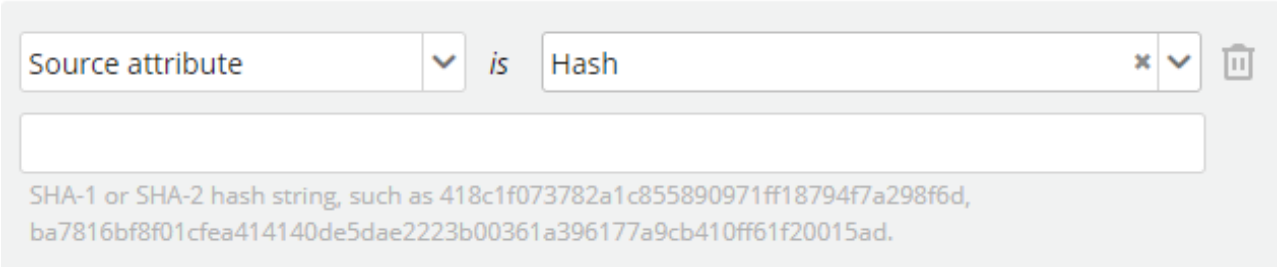
3. From the *Operating system* dropdown menu, select the OS, such as *Windows*.
4. To define that an exclusion includes a specific Activity Event Type, select the type of action(s) to exclude from the displayed dropdown list. Alternatively, select the Any option (the default option), which means that you are not specifying a specific action type.
   All action types to be collected are listed according to Category. You can select one or more actions from a single Category. Actions cannot be selected from different categories. For example, you can select the *Process Termination* and the *Process Start* options from the Process Category in the same exclusion. However, you cannot select the *Key Created* option together and the *Thread Created* options in the same exclusion – to do this you must create two different exclusions.



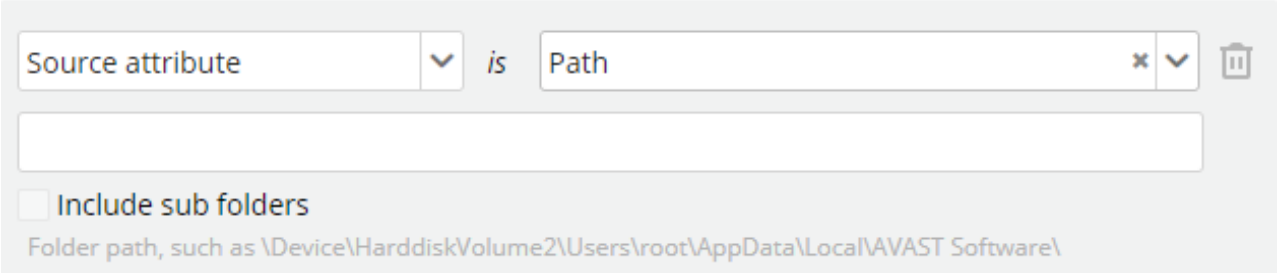
5. To define that an exclusion includes a *Source* attribute condition, from the *Select* box, select *Source attribute*, which can be identified by file name, path, hash and signer for Source Process or Event Log Name for event log related activity events, as shown below:



If you select *Hash*, then specify the hash, as shown below:

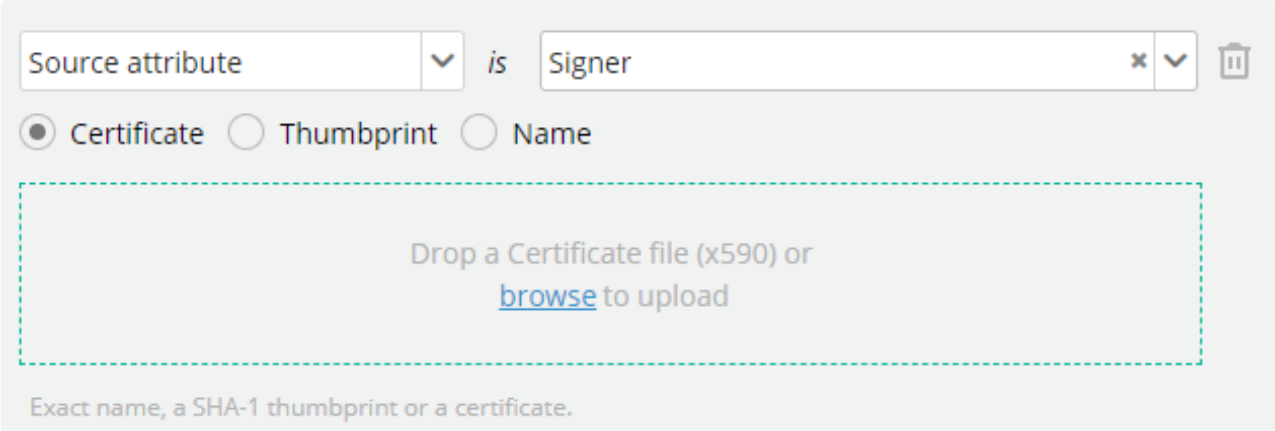


If you select *Path*, then specify the *Path*, as shown below. A path can include wild cards. If you wish to include sub-folders as well, check the *Select sub folders* checkbox.



If you select File Name, then enter the file name.

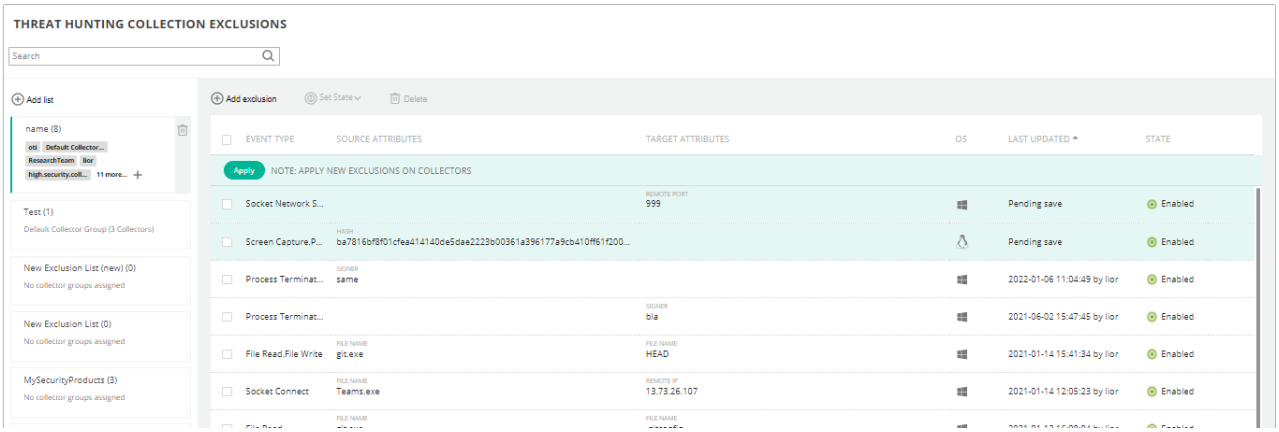
If you select Signer, then either upload the Signer's Certificate, provide its thumbprint or provide the Signer's name.



6. To define that an exclusion includes a *Target* attribute condition, click the *+* button. From the *Select* box, select the *Target Attribute* and then define the target criteria, as described below:
   Targets can be identified by various criteria, depending on the selected Activity Event Category.
   - A process Category event is identified by hash, path, file name or Signer.
   - A network Category event is identified by network-related properties, such as a remote IP and port.
   - A registry Category event is identified by a registry key path, value name, value type or value size.
   - An Event log Category event is identified by the Event Log ID.

   When defining an exclusion that contains multiple conditions, an AND relationship exists between the conditions.

   Note: If an OR relationship is needed between the conditions that you define, simply create another exclusion.
7. Click the *Add* button. This new exclusion is then listed in the Collection Exclusions page, as shown below:



8. The newly defined exclusions appear with a green background and the words **Pending save** appear in their **LAST UPDATED** column. To define that these exclusions take effect, you must click the Apply button and then click the Save button in the window that pops up. Their *LAST UPDATED* column then shows the timestamp when they were saved.

Setting the state of an Exclusion

The *Set State* button enables you to enable or disable the selected exclusion(s). By default, an exclusion is enabled.

Deleting an Exclusion

The *Delete* button enables you to delete the selected exclusion(s).

To delete multiple exclusions, check the requested exclusions checkboxes and click *Delete* in the toolbar.

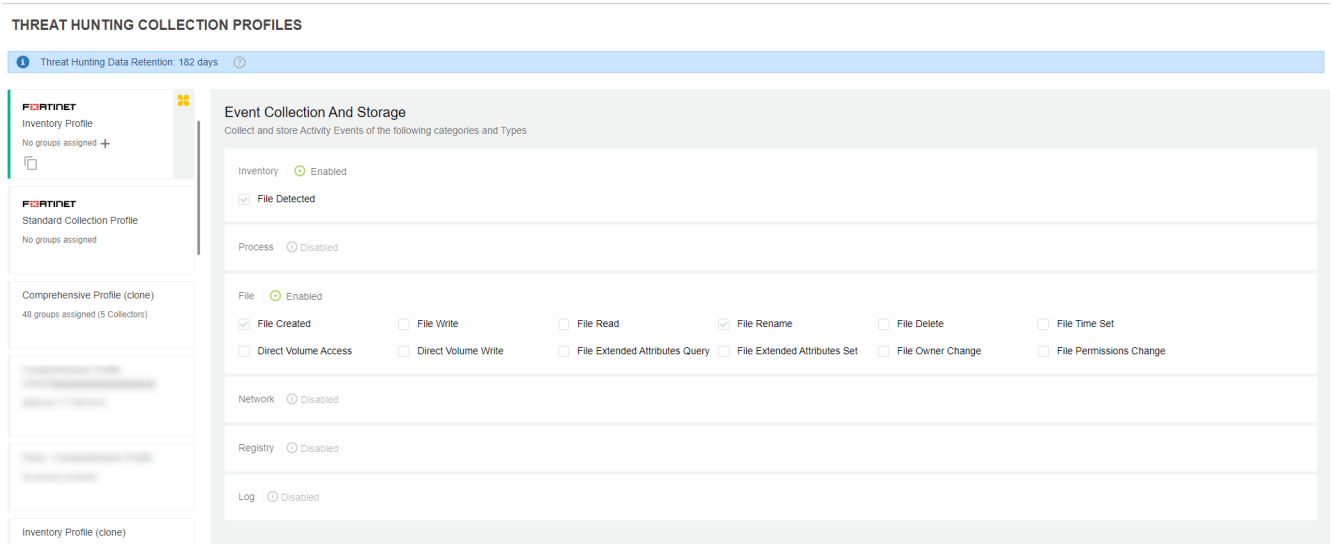
Collection profiles

Threat Hunting Settings is a license-dependent add-on. You may contact Fortinet Support for more information.

Threat Hunting Collection Profiles control the type of activity data that is collected for the Threat Hunting feature (which is described in Threat Hunting on page 131). Activity data that is collected is stored on the Repository server.

To access Threat Hunting settings, select *SECURITY SETTINGS > Threat Hunting Setting > Collection Profiles*.

The following page displays:



The left side of the *Threat Hunting Settings* page shows a list of profiles. A profile defines the activity event categories and actions to be collected. FortiEDR comes with several predefined profiles, which cannot be modified. In addition to the pre-defined profiles, you can define your own custom profiles by cloning an existing profile.

The default collection profile for Collector groups is *Inventory Profile*, which is indicated by the *Default Collection Profile* ( ) icon). To change the default profile, hover over to the top-right corner of the target profile card and click the *Set profile as the default profile* ( ) icon.

You can also assign a collection profile to one or more Collector groups. See Assigning a Collector group to a profile on page 259.

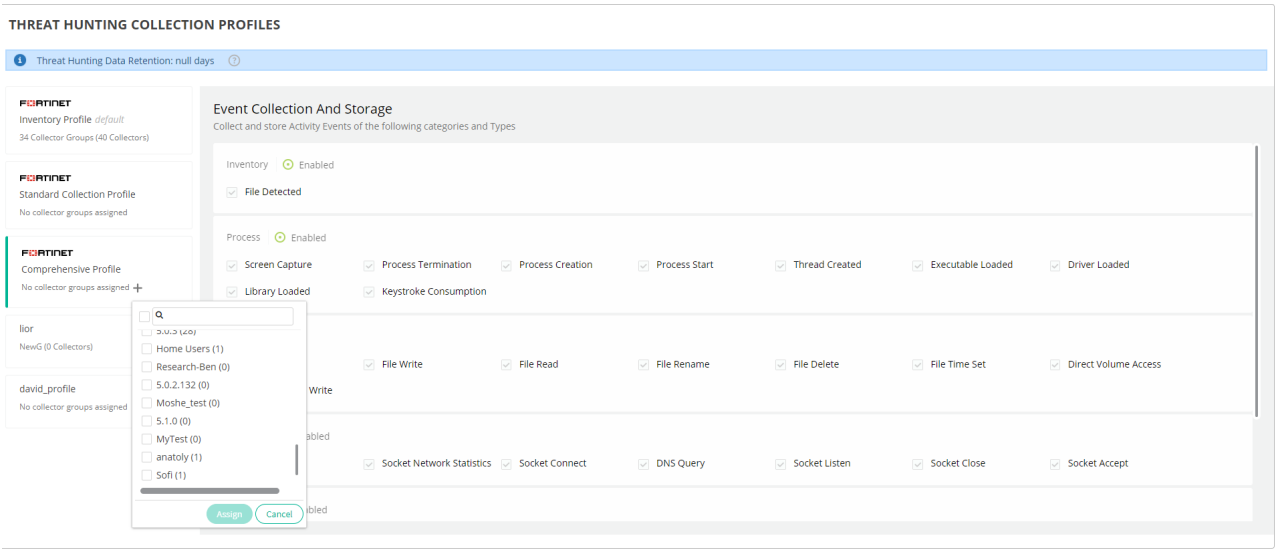
The pane on the right side of the page lists all activity event categories and their associated actions. These categories are the same as those described on Threat Hunting on page 131. Selecting a profile on the left displays the categories and actions defined for that profile in the right pane. Check the checkboxes of the actions for which FortiEDR will collect activity data.

Assigning a Collector group to a profile

Profiles are assigned to Collector groups. Only a single profile can be assigned to each Collector group.

To assign a Collector group to a profile:

1. In the *Profiles* pane, click the + button of the profile to which to assign a Collector group. The following displays showing the list of all Collector groups:

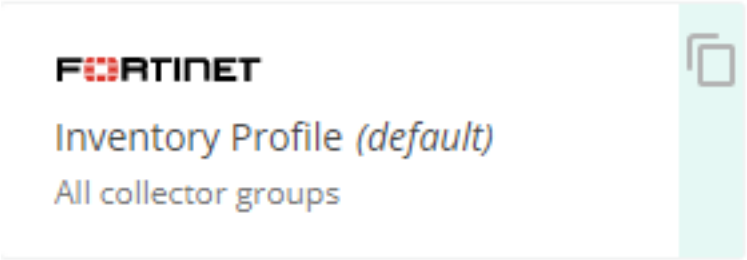


2. Select the checkbox(s) of the Collector group(s) to assign to the profile.
3. Click *Assign*.
4. When prompted with a message that the selected groups are currently assigned to another profile and will be reassigned, click *Assign* to confirm.

Creating/cloning a profile

In order to create a new Profile, you must first clone an existing Profile and then customize the clone.

1. Click the *Clone* icon that appears on the right of the profile to be cloned.



2. Enter the name of the new profile.
3. On the right side, enable the activity events to be collected and disable the activity events that should not be collected.
4. Click *Save*.
5. Assign the Collector group(s) on which to apply the newly created profile. See Assigning Collectors to a Collector Group on page 345.

Threat Hunting data retention

Because the size of the Threat Hunting Repository database is limited, the data that is written to it is overwritten in a cyclical manner when it gets full.

Therefore, the amount of time that the data is retained is dependent upon –

- The size of the repository database.
  – AND –
- The amount of data that is collected.

The amount of data that is collected is dependent upon –

- The Threat Hunting Data Collection Profiles, which is defined in *Profiles > EDR > Collection Profiles*
  – AND –
- The Threat Hunting Data Collection Exclusions, which is defined in *Profiles > EDR > Collection Exclusions*

In order to extend the data retention period, you can –

- Increase the size of the repository database by purchasing additional Threat Hunting Repository add-ons.
  – AND/OR –
- Reduce the amount of data that is collected, by either defining the Collection Profiles (so that they collect less data) or defining more Collection Exclusions (so that they exclude more data), as described above.

Regarding Threat Hunting Collection Profiles, switching from the Inventory Scan Profile typically reduces data retention by at least 50% and switching to the Comprehensive Profile typically reduces data retention by an additional 50%.

To see an estimate of the Threat Hunting data retention:

- Select *ADMINISTRATION* > *LICENSING* and look next to the *Threat Hunting* row.
  – OR –
- Select *Profiles* > *EDR* > *Collection Profiles*. The data retention period is displayed in the top left corner.

Integrations

Connectors enable you to configure connectors to external systems, which enables you to trigger predefined types of actions. FortiEDR provides various connectors out-of-the-box, such as Firewalls and NAC systems. The out-of-the-box FortiEDR connectors utilize Fortinet products' APIs to automatically perform the required actions in order to extend its automatic Playbook actions.

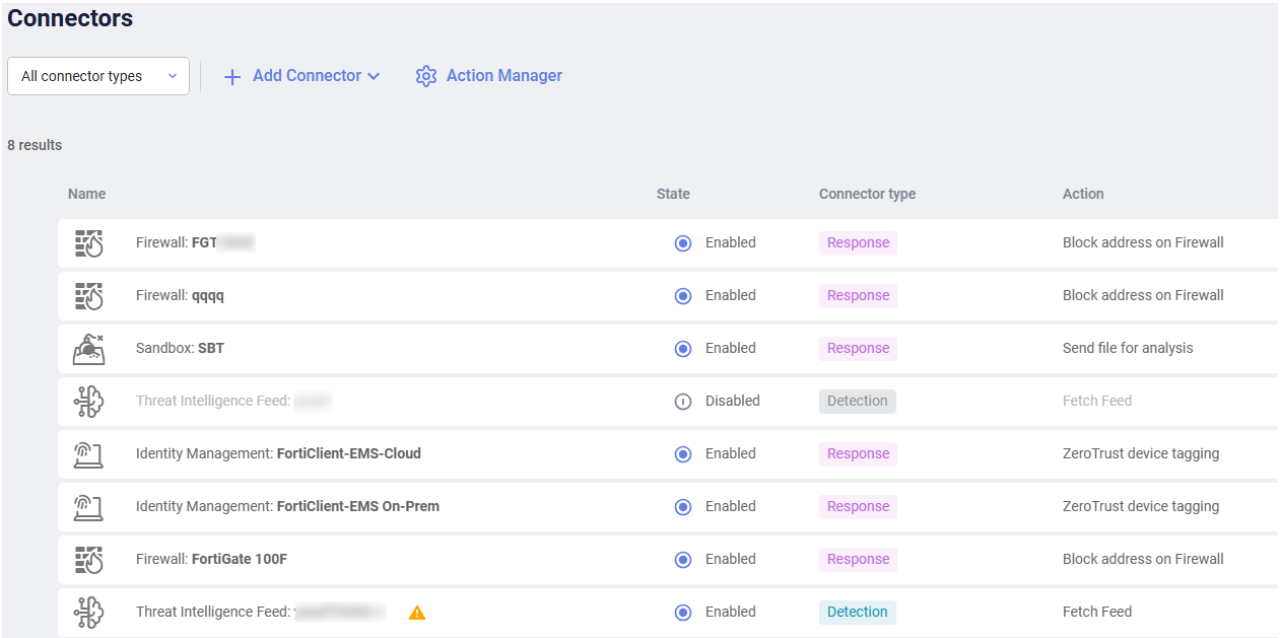
Admin and IT users with custom script permission can also define customized connectors to any third-party system in order to trigger any action on that system using an API. For more information about user roles and permissions, see Users on page 359.

You can set up an unlimited number of connectors for each type and use them by associating Playbook policies or Security policies to the actions defined for these integration connectors, as described below.

The *Connectors* menu is only available when the environment is connected to Fortinet Cloud Services (FCS).

To display the *Connectors* page:

1. Select *Profiles* > *Integrations* > *Connectors*.



The top left of this page provides two buttons, as shown below:

- Adding connectors on page 262 enables you to add and configure connectors for integration with FortiEDR.
- Action Manager on page 314 enables you to upload and manage (add, modify and delete) actions (Python scripts that call third-party system APIs) to be automatically triggered by FortiEDR as incident responses. Python 2.7 or later is supported.

The *Action Manager* button is only available to users with Admin or IT permissions and have the *Custom script* option enabled. For more information about user roles and permissions, see Users on page 359.

Adding connectors

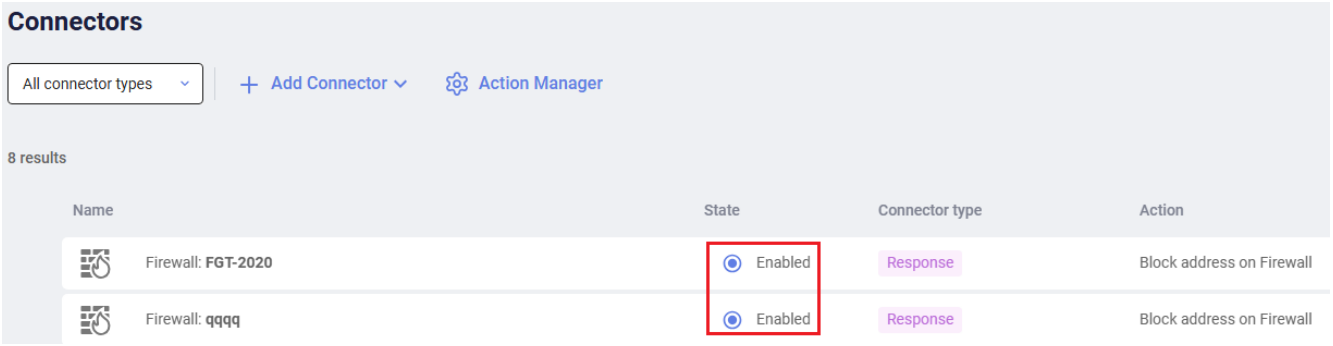
The following types of integration connectors are provided to be configured:

- Firewall integration on page 263
- Network Access Control (NAC) integration on page 271
- Sandbox integration on page 277
- eXtended detection source integration on page 279
- Custom integration on page 291

Custom integration is only available to users with Admin or IT permissions and have the *Custom script* option enabled. For more information about user roles and permissions, see Users on page 359.

- Identity Management integration on page 297
- User Access integration on page 305
- Threat Intelligence Feed integration on page 312

You can enable or disable a connector by clicking the *Enabled/Disabled* button next to the connector name. This button toggles between *Enabled/Disabled*.



Firewall integration

When a firewall connector is set and Playbook policies are configured, automatic incident response actions can include blocking of malicious IP addresses by a firewall upon security event triggering.

For more details about integrating FortiEDR with FortiGate or FortiManager, refer to the FortiGate Integration Guide or FortiManager Integration Guide.

Before you start firewall configuration, make sure that:

- Your FortiEDR deployment includes a Jumpbox that has connectivity to the firewall. Details about how to install a FortiEDR Core and configure it as a Jumpbox are described in Setting up the FortiEDR Core on page 524. You may refer to Cores on page 416 for more information about configuring a Jumpbox.
- The FortiEDR Central Manager has connectivity to the Fortinet Cloud Services (FCS).
- You have a valid API user with access to the external firewall. See the FortiGate Integration Guide or FortiManager Integration Guide for detailed instructions.

Follow the steps below to automatically deny access on the firewall to malicious destination addresses detected by FortiEDR.

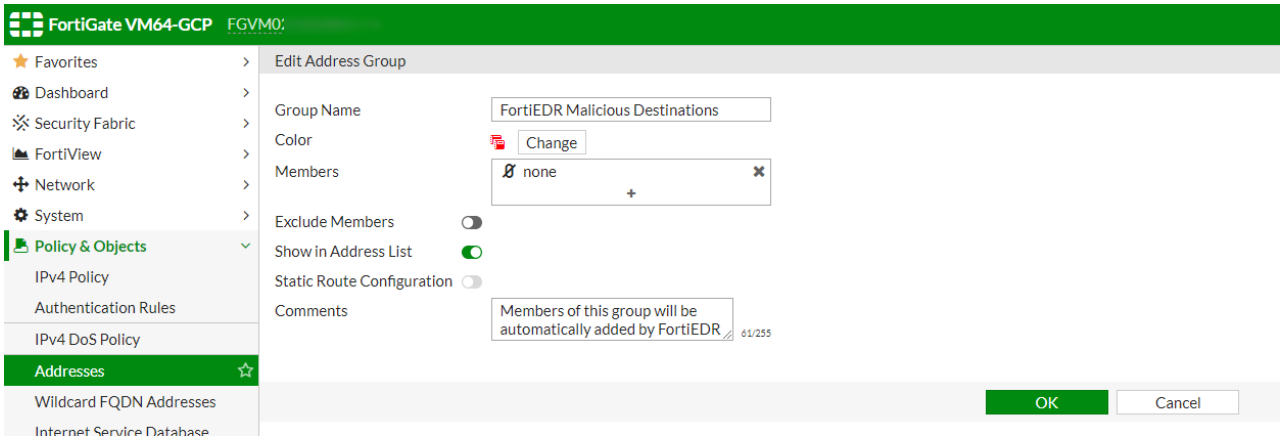
The example below describes how to define an address group on FortiGate and associate it with a FortiGate policy rule, such that it blocks connections to the addresses in the group. The address group is then used when configuring the FortiEDR connector so that it is automatically populated with malicious destinations upon detection by FortiEDR.

The same address group can obviously be used for multiple firewall policies in order to cover any VLAN-to-WAN interface in the network.

FortiGate configuration

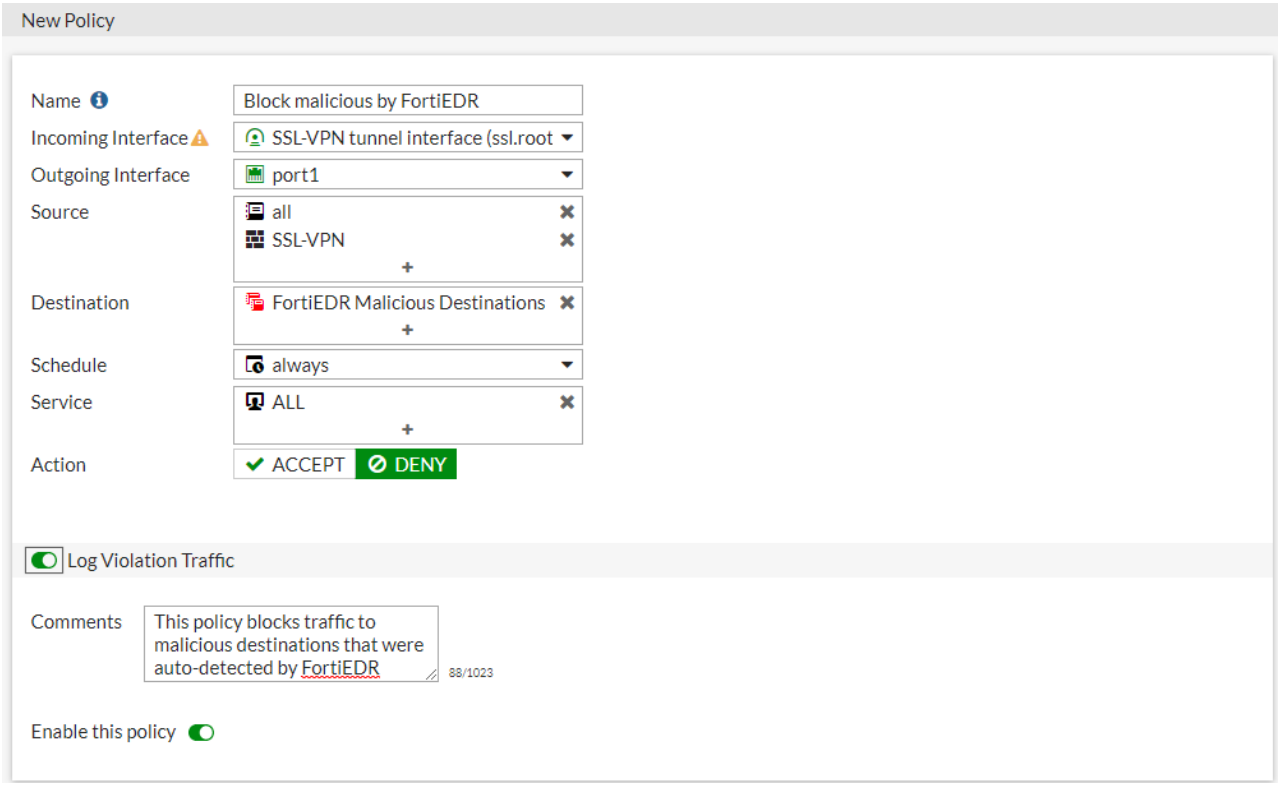
To set up an address group and policy on FortiGate:

1. Go to *Policy & Objects* > *Addresses*.
2. Create a new address group to be populated by FortiEDR. The new address group now appears in the FortiGate Addresses table.



3. Go to *Policy & Objects* > *IPv4 Policy*.

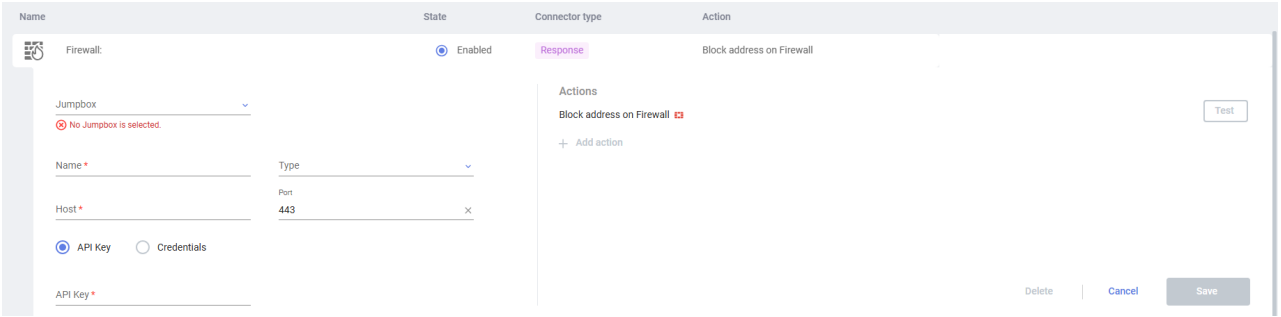
4. Create a new policy to deny traffic to any address in the address group that was created as part of step 2. The new policy now appears in the FortiGate Policies table.



FortiEDR firewall connector configuration

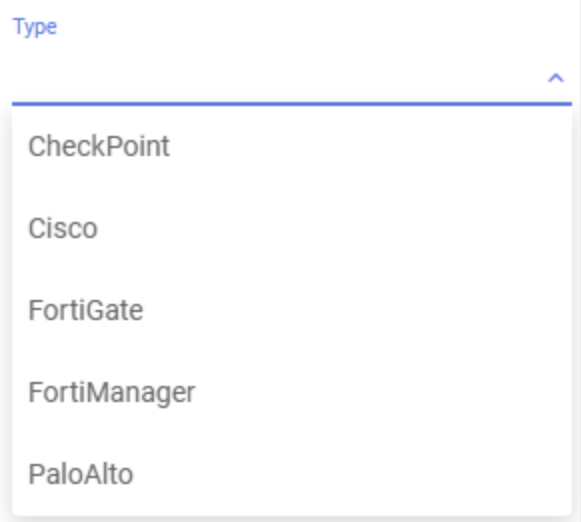
To set up a Firewall connector with FortiEDR:

1. Click the *Add Connector* button and select *Firewall* in the *Connectors* dropdown list. The following displays:

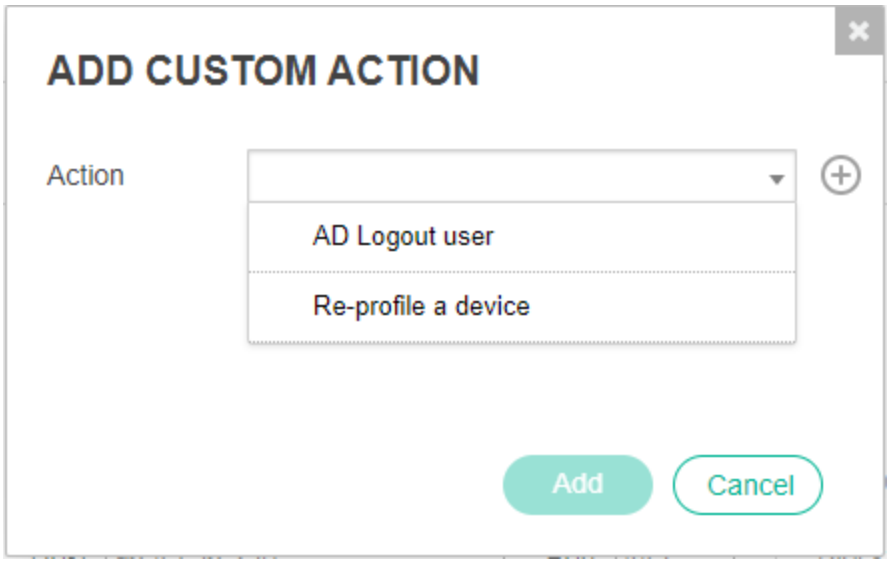


2. Fill in the following fields:

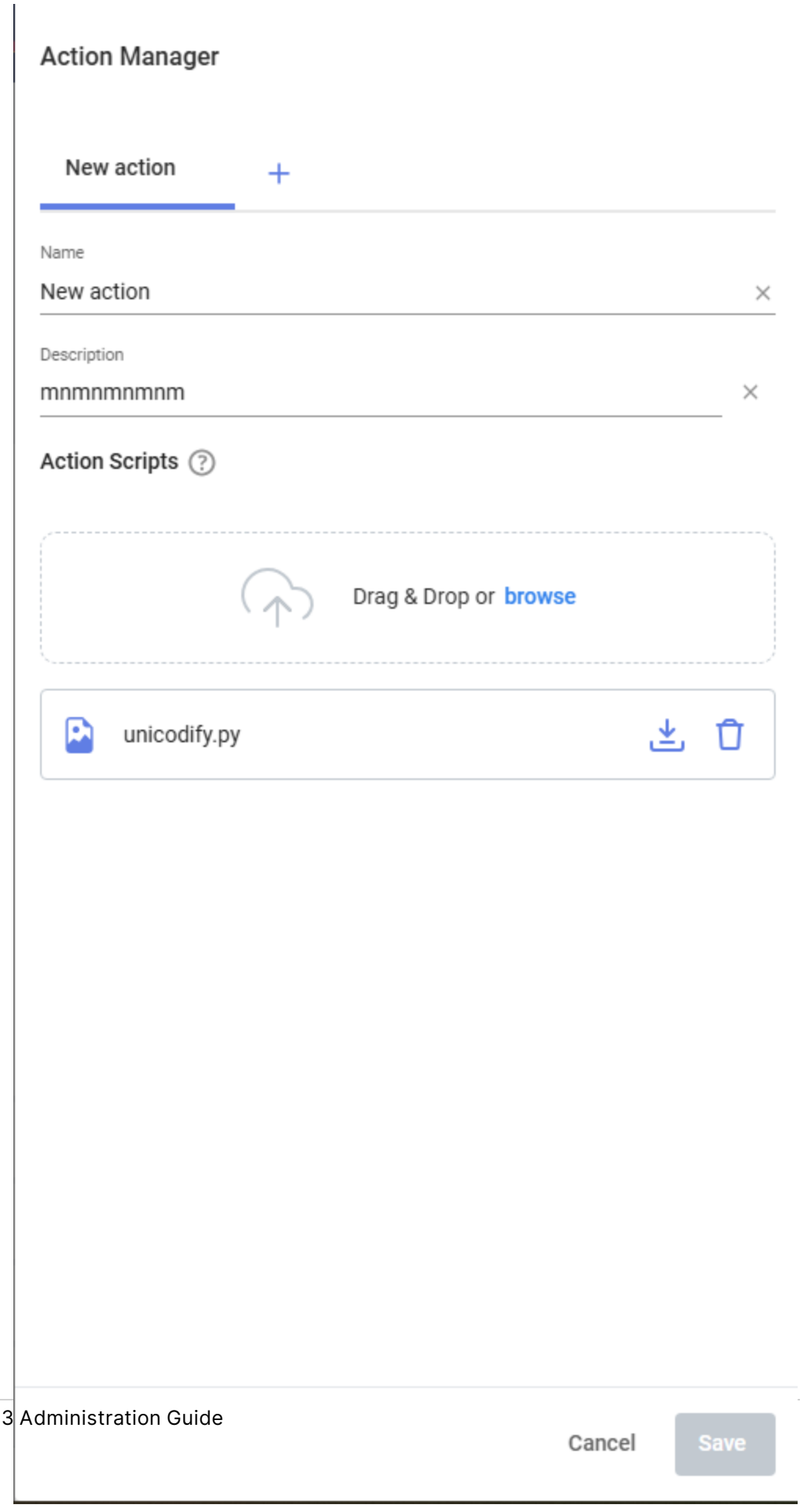
Field	Definition
Jumpbox	Select the FortiEDR Jumpbox to communicate with the firewall.

Field	Definition
Name	Specify a name of your choice to be used to identify this firewall.
Type	Select the type of firewall to be used in the dropdown list. 
Host	Specify the IP or DNS address of your firewall.
Port	Specify the port that is used for API communication with your firewall.
API Key / Credentials	Specify authentication details of your firewall. To use an API token, click the *API Key* radio button and copy the token value into the text box. To use API credentials, click the *Credentials* radio button and enter the Firewall API username and password.

3. In the *Actions* area on the right, define an action to be taken by this connector.
   You have the option to either use an action provided out-of-the-box with FortiEDR (for example, *Block address on Firewall*) or to create and use your own custom actions.
   a. To block an address on the Firewall, in the *Address Group* field, specify the name of a previously defined address group on the firewall. For FortiManager and FortiGate integrations, you can optionally specify the name of the VDOM domain in the *VDOM* field. FortiEDR uses the default root VDOM if the *VDOM* field is empty.
      - OR -
   b. To trigger a custom action on the Firewall, click the *Add Action* button to display the following popup window:



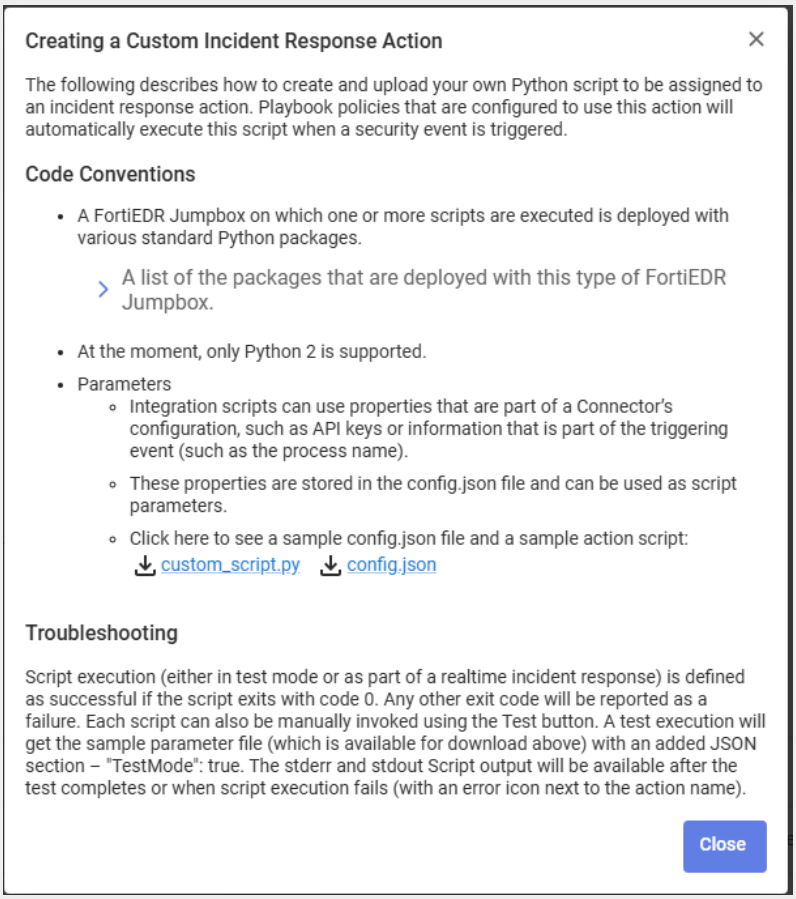
- In the *Action* dropdown menu, select one of the previously defined custom integration actions (which were defined in FortiEDR as described in Custom integration on page 291).
  – OR –
- Click the *Create New Action* button in this popup window to define a new action on the Firewall to be triggered according to the definitions in the Playbook, as described below. The following displays:


Action Manager
New action
Name
New action
Description
mnmnmnmnm
Action Scripts
Drag & Drop or browse
unicodify.py
Cancel
Save

Fill out the fields of this window as follows in order to define a new action to be triggered in response to an incident.

In order to trigger this action, a Playbook policy must be defined that triggers this action to execute the script when a security event is triggered. The definition of this new action here automatically adds this action as an option in a Playbook policy. This action however, is not selected by default in the Playbook policy. Therefore, you must go to the Playbook policy and select it in order for it to be triggered when a security event is triggered.

Field	Definition
Name	Enter any name for this action.
Description	Enter a description of this action.
Upload	Upload a Python script that calls an API in the third-party system in order to perform the relevant action. Python 2.7 or later is supported. This Python script must be created according to the coding conventions that can be displayed by clicking the icon next to the *Action Scripts* field. The following displays providing an explanation of these coding conventions and provides various links that you can click to see more detail and or/to download sample files.

Field	Definition
	

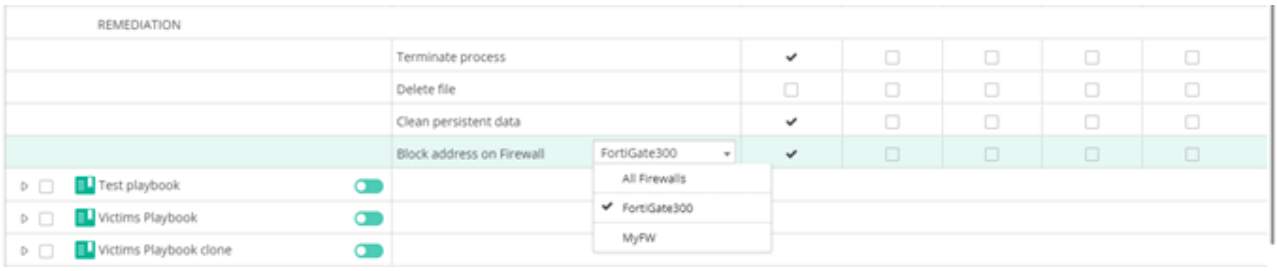
4. Click *Save*. The new action is then listed in the *Actions* area.
5. You can click the *Test* button next to an action to execute that action.

If you are working with a FortiManager in order to manage firewalls, use the same instructions to integrate with the firewall, but select *FortiManager* as the integrated device Type when configuring the FortiEDR Connector in the *Profiles* > *Integrations* > *Connectors* page.

Playbooks configuration

To configure an automated incident response that uses a firewall connector to block malicious destinations upon security event triggering:

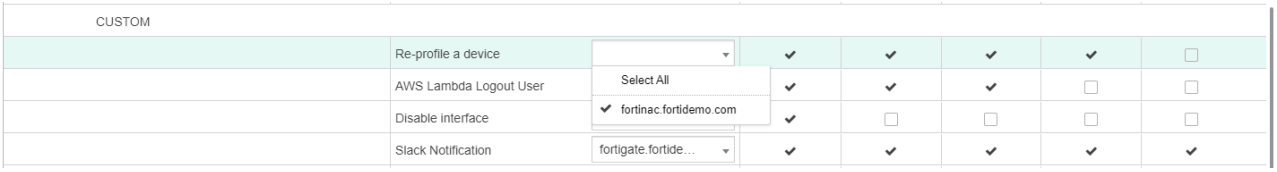
1. Navigate to the *Profiles* > *Playbooks* page.
2. Open the Playbook policy that is applied on devices for which you want the block IP incident response to apply and place a checkmark in the relevant *Classification* column next to the *Block address on Firewall* row that is under the *REMEDIATION* section. In the dropdown menu next to the action, you can specify which firewalls to use to perform the block or select all of them, as shown below:



FortiEDR is now configured to add malicious IP addresses to the blocking policy on the firewall upon triggering of a security event. You can check that malicious IP addresses are added to the address group that was configured on the firewall following FortiEDR security events.

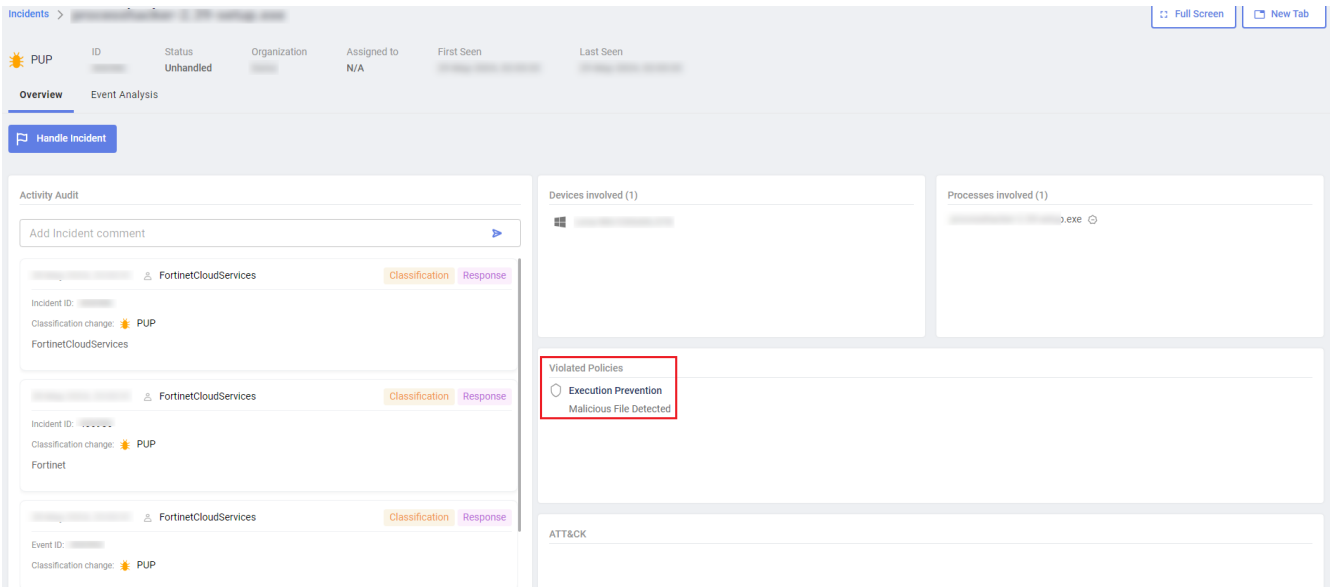
To configure an automated incident response that uses a firewall connector to perform a custom action upon the triggering of a security event:

1. Navigate to the *Profiles* > *Playbooks* page.
2. Open the Playbook policy that is applied on devices for which you want the custom action (defined above) to apply.
3. In the *CUSTOM* section, place a checkmark in the relevant *Classification* columns next to the row of the relevant custom action.
4. In the dropdown menu next to the relevant custom action, select the relevant firewall connector with which to perform the action, as shown below:



FortiEDR is now configured to trigger this action in the third-party system upon the triggering of a security event.

Automatic incident response actions are listed in the *Overview* tab when you select the incident and click *Investigate* in the *Incidents* pane, as shown below:



Network Access Control (NAC) integration

When a Network Access Control connector such as FortiNAC is set and Playbook policies are configured, automatic incident response actions can include isolating a device by a NAC system upon security event triggering.

Before you start NAC configuration, make sure that:

- Your FortiEDR deployment includes a Jumpbox that has connectivity to the NAC server.
  Details about how to install a FortiEDR Core and configure it as a Jumpbox are described in Setting up the FortiEDR Core on page 524. You may refer to Cores on page 416 for more information about configuring a Jumpbox.
- The FortiEDR Central Manager has connectivity to the Fortinet Cloud Services (FCS).
- You have a valid API user with access to FortiNAC or equivalent network access control system.

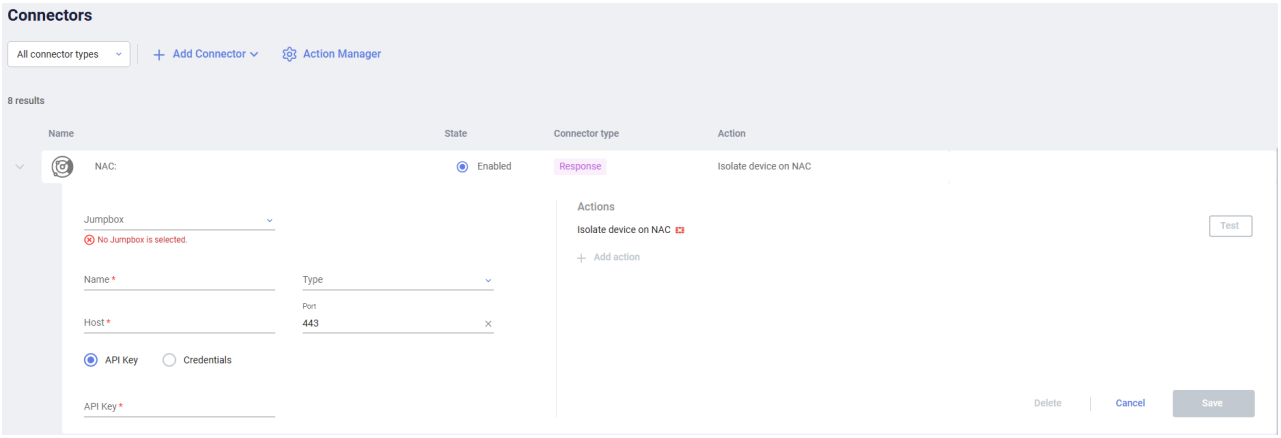
Follow the steps below in order to automatically isolate a device by NAC upon the detection of a FortiEDR security event. The example below describes how to define an API user on FortiNAC in order to enable FortiEDR to perform automatic device isolation after a FortiEDR security event.

Make sure to add FortiEDR domains and/or IP addresses to the exclusion list on the VLAN that is being used for isolation on the FortiNAC system such that the FortiEDR Collector would still be able to communicate with its servers when the device is being isolated.

FortiEDR Connector configuration

To configure NAC integration:

1. Click the *Add Connector* button and select *NAC* in the *Connectors* dropdown list. The following displays:

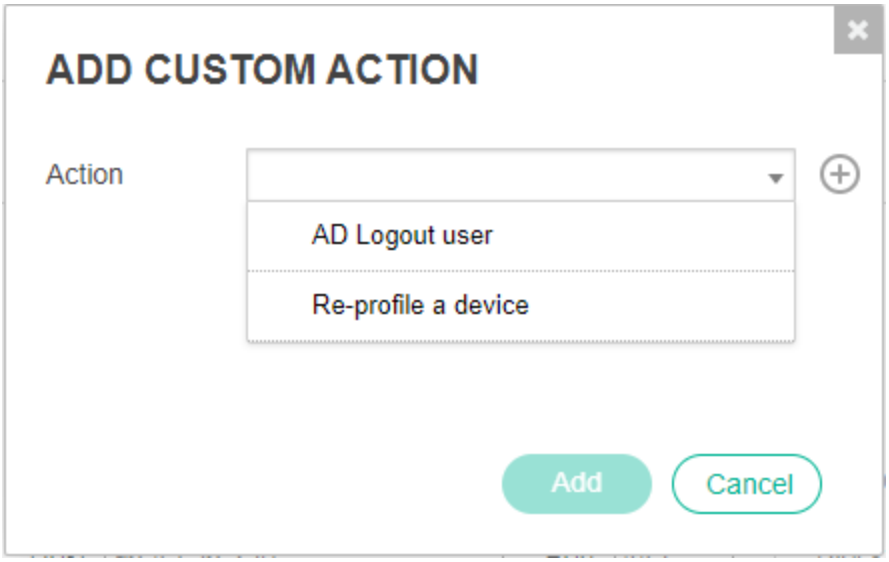


2. Fill in the following fields:

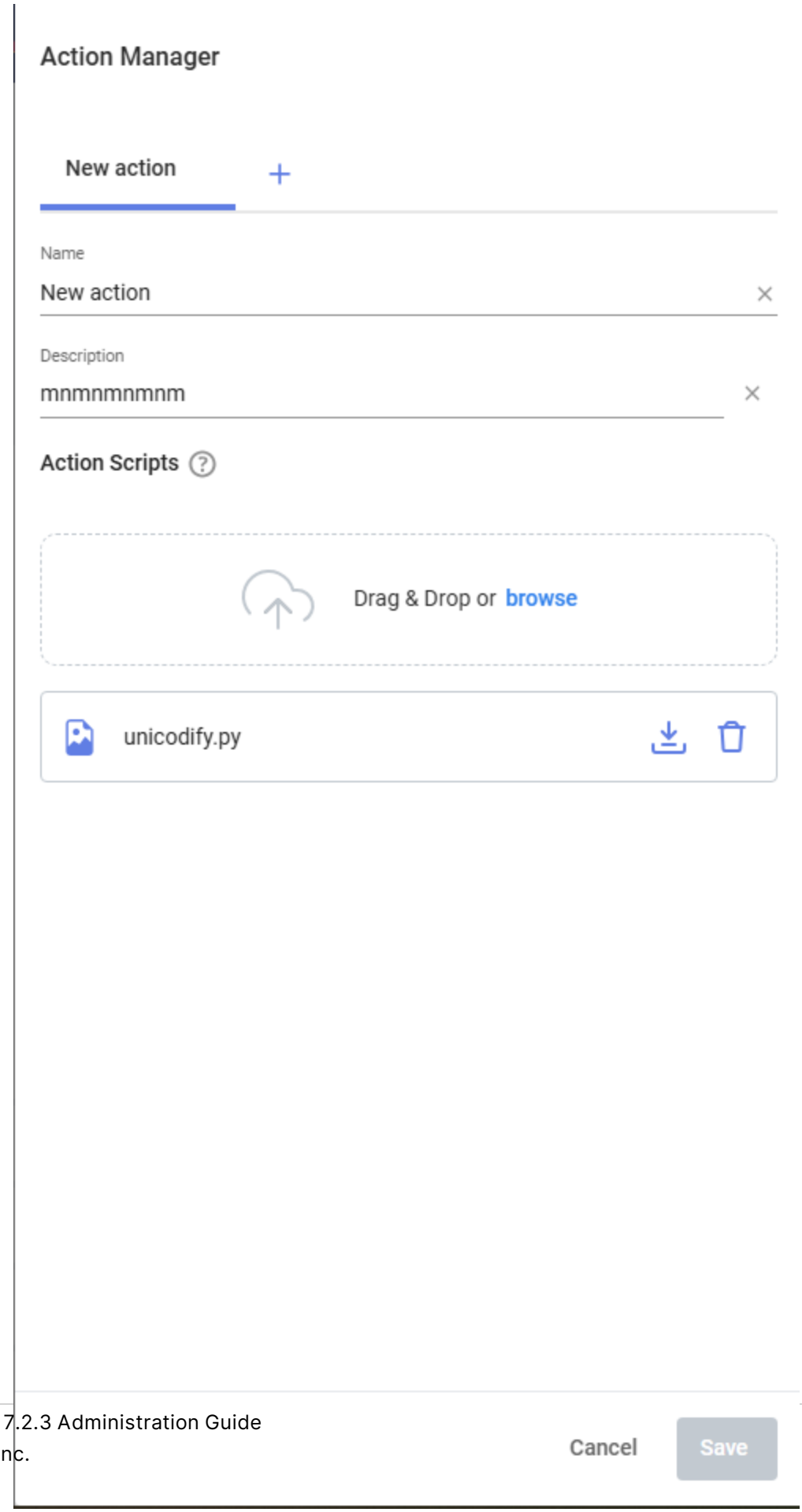
Field	Definition
Jumpbox	Select the FortiEDR Jumpbox that will communicate with this NAC system.

Field	Definition
Name	Specify a name of your choice which will be used to identify this NAC system.
Type	Select the type of NAC to be used in the dropdown list, for example: FortiNAC.
Host	Specify the IP or DNS address of the external NAC system.
Port	Specify the port that is used for communication with the external NAC system.
API Key	Specify authentication details of the external NAC system. To use an API token, click the API Key radio button and copy the token value into the text box. To use API credentials, click the *Credentials* radio button and fill in the external NAC system API username and password.

3. 3 In the *Actions* area on the right, define the action to be taken by this connector.
   You have the option to either use an action provided out-of-the-box with FortiEDR (for example, *Isolate Device on NAC*)
   – OR –
   To create or select one of the Custom Integration actions (if one or more have already been defined in FortiEDR, as described in Custom integration on page 291.
   - To trigger an action on a custom connected third-party system, click the *+ Add Action* button to display the following popup window:



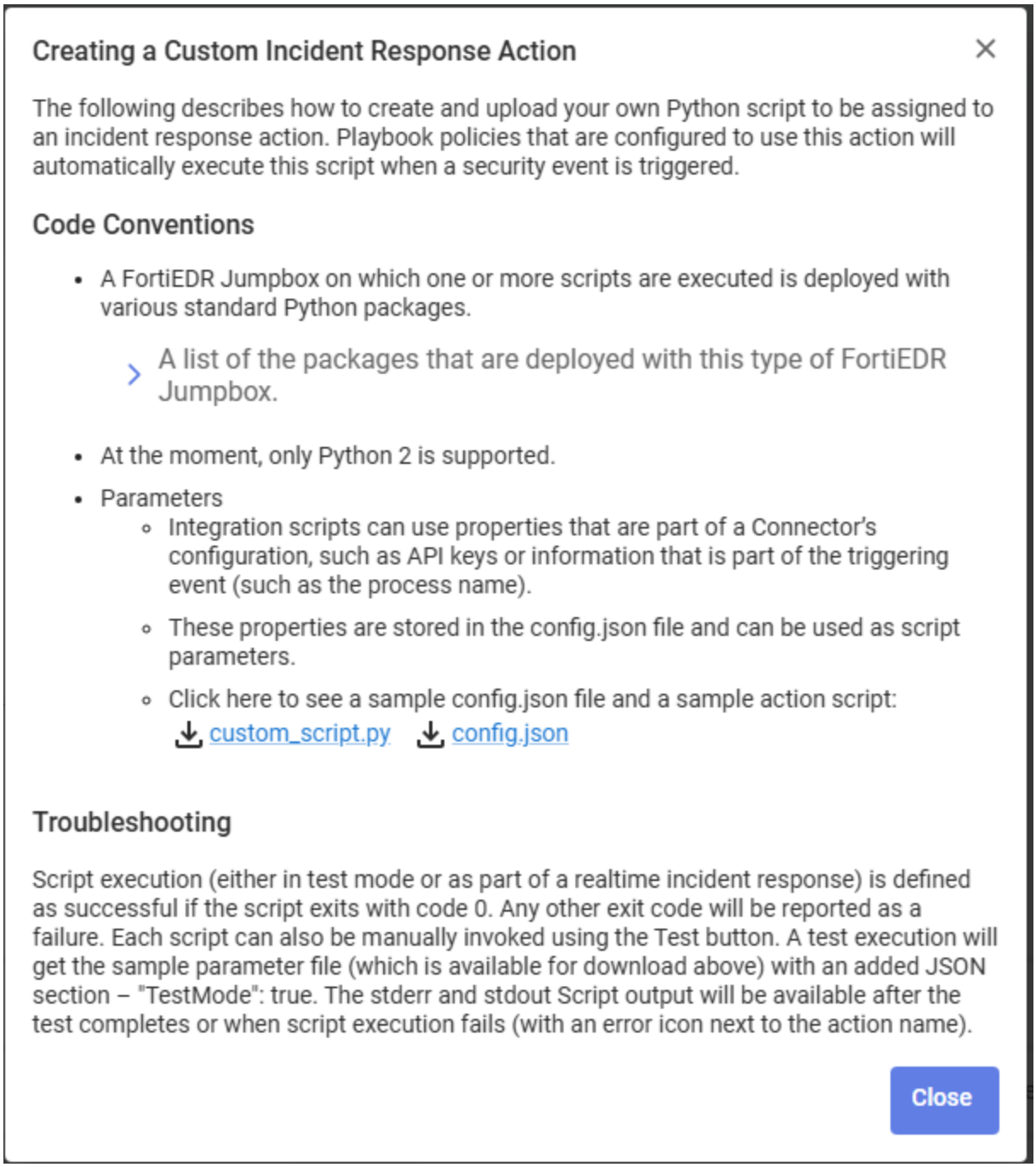
   a. In the *Action* dropdown menu, select one of the previously defined actions (which were defined in FortiEDR as described in Custom integration on page 291).
      - OR -
   b. Click the *Create New Action* ⊕ button in this popup window to define a new action that can be triggered according to the definitions in the Playbook, as described below. The following displays:


Action Manager
New action
Name
New action
Description
mnmnmnmnm
Action Scripts
Drag & Drop or browse
unicodify.py
Cancel
Save

Fill out the fields of this window as follows in order to define a new action to be triggered in response to an incident.

In order to trigger this action, a Playbook policy must be defined that triggers this action to execute the script when a security event is triggered. The definition of this new action here automatically adds this action as an option in a Playbook policy. This action however, is not selected by default in the Playbook policy. Therefore, you must go to the Playbook policy and select it in order for it to be triggered when a security event is triggered.

Field	Definition
Name	Enter any name for this action
Description	Enter a description of this action
Upload	Upload a Python script that calls an API from the third-party system in order to perform the relevant action. Python 2.7 or later is supported. This Python script must be created according to the coding conventions that can be displayed by clicking the icon next to the *Action Scripts* field. The following displays providing an explanation of these coding conventions and provides various links that you can click to see more detail and/or to download sample files.

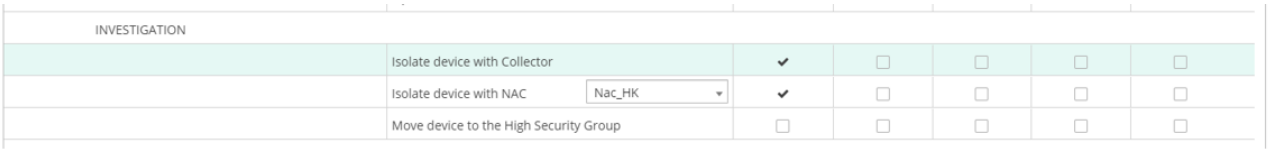


4. Click *Save*. The new action is then listed in the Actions area.
5. You can click the *Test* button next to an action to execute that action.

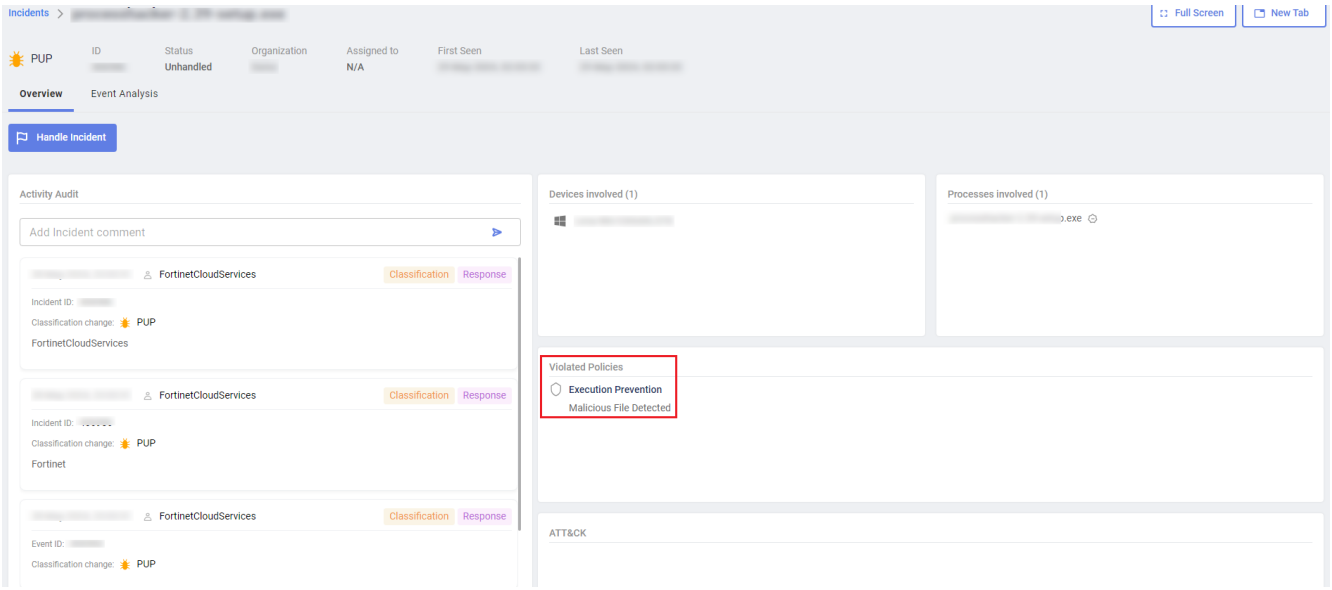
Playbooks configuration

To configure an automated incident response that uses a NAC connector to isolate a device upon security event triggering:

1. Navigate to the *Profiles* > *Playbooks* page.
2. Open the Playbook policy that is applied on devices for which you want the isolation response to apply and place a checkmark in the relevant Classification column next to the Isolate device with NAC row that is under the *INVESTIGATION* section.



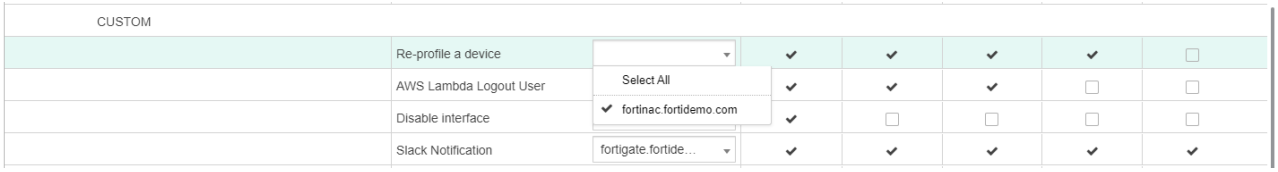
FortiEDR is now configured to automatically isolate the device upon triggering of a security event. Automatic incident response actions are listed in the *Overview* tab when you select the incident and click *Investigate* in the *Incidents* pane, as shown below:



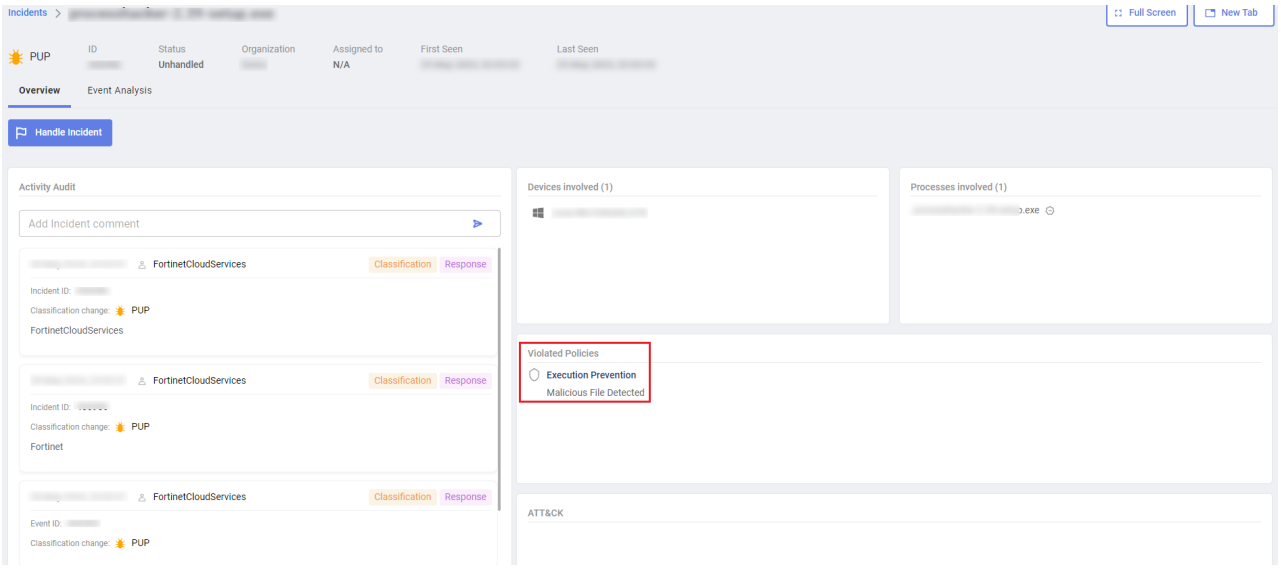
Note that isolation by NAC will only be done for devices that are managed on the specified NAC.

To configure an automated incident response that uses a NAC connector to perform a custom action upon the triggering of a security event:

1. Navigate to the *Profiles* > *Playbooks* page.
2. Open the Playbook policy that is applied on devices for which you want the custom action (defined above) to apply.
3. In the *CUSTOM* section, place a checkmark in the relevant *Classification* columns next to the row of the relevant custom action.
4. In the dropdown menu next to the relevant custom action, select the relevant NAC connector with which to perform the action, as shown below:



FortiEDR is now configured to trigger this action in the third-party system upon the triggering of a security event. This automatic incident response action appears in the*Overview* tab when you select the incident and click *Investigate*.



Sandbox integration

When a sandbox such as FortiSandbox is configured and the Sandbox Analysis Policy rule is enabled, files that meet several conditions and that have not been previously analyzed trigger a sandbox analysis event on FortiEDR and are sent to the sandbox. The conditions are a combination of several items, such as the file was downloaded from the Internet and was not signed by a known vendor. If the file is found to be clean, the event is automatically classified as safe and marked as handled. If the file is determined by the sandbox to be suspicious or malicious, then the event is classified as non-safe and any future execution attempt of the file in the environment is blocked by one of the Pre-execution (NGAV) Policy rules. Note that in all cases the first file execution is not delayed or blocked.

For more details about integrating FortiEDR with FortiSandbox, refer to the FortiSandbox Integration Guide.

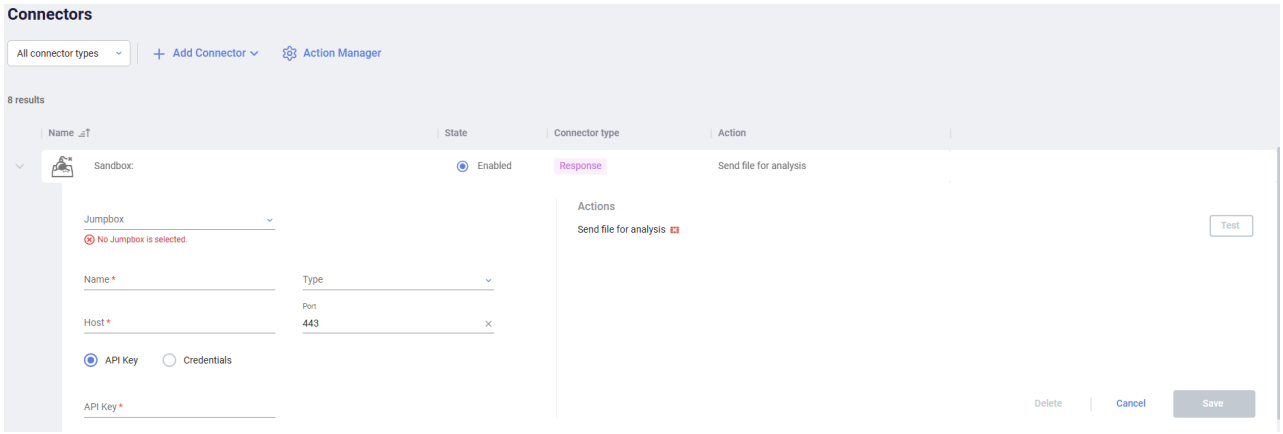
Before you start sandbox configuration, make sure that:

- Your FortiEDR deployment includes a Jumpbox that has connectivity to the sandbox.
  - Refer to Setting up the FortiEDR Core on page 524 for details about how to install a FortiEDR Core and configure it as a Jumpbox.
  - Refer to Cores on page 416 for more information about configuring a Jumpbox.
- The FortiEDR Central Manager has connectivity to Fortinet Cloud Services (FCS).
- **(FortiSandbox)** A FortiSandbox administrator account with JSON API access enabled. Refer to the FortiSandbox Integration Guide for detailed instructions.

- **(FortiSandbox Cloud)** A valid FortiCloud API user under a permission profile with read/write access to the FortiSandbox Cloud portal. See the FortiCloud IAM documentation for detailed instructions about creating a permission profile and an API user.

To set up a sandbox connector with FortiEDR:

1. Click the *Add Connector* button and select *Sandbox* in the *Connectors* dropdown list. The following displays:



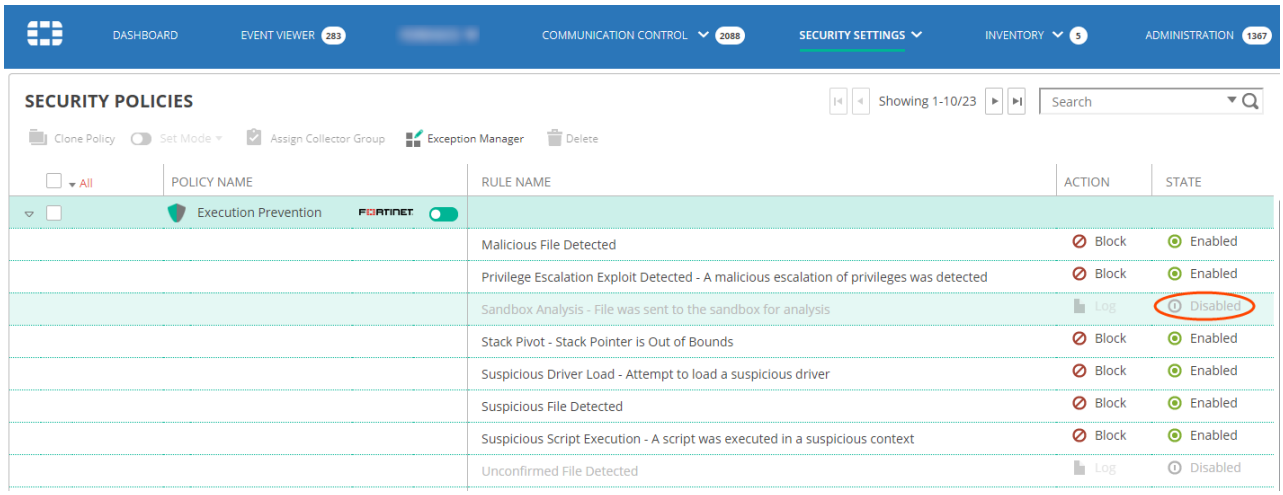
2. Fill in the following fields:

Field	Definition
Jumpbox	Select the FortiEDR Jumpbox that will communicate with this sandbox.
Name	Specify a name of your choice which will be used to identify this sandbox.
Type	Select the type of sandbox to be used in the dropdown list, for example: *FortiSandbox*.
Host	Specify the IP or DNS address of you sandbox.
Port	Specify the port that is used for API communication with your sandbox.
API Key / Credentials	Specify authentication details of the FortiSandbox or FortiSandbox Cloud. • **(FortiSandbox)** To use an API token, select *API Key* and copy the token value into the text box. To use credentials, select *Credentials* and fill in the FortiSandbox username and password. • **(FortiSandbox Cloud)** Select *API Key* and copy the token value into the text box.

3. Click *Save*.
In order to complete sandbox integration, the Sandbox Scan rule must be enabled with the FortiEDR Central Manager.

To enable the Sandbox scan rule:

1. Navigate to the *SECURITY SETTINGS* > *Security Policies* page.
2. Open the Execution Prevention policy that is applied on devices for which you want the sandbox scan to apply and click the *Disabled* button next to the Sandbox Analysis rule to enable it, as shown below:



FortiEDR is now configured to send unknown files to the sandbox.

You can check file analysis on your sandbox console.

In addition, you can see sandbox analysis events in the*Overview* tab when you select the incident and click *Investigate* in the *Incidents* pane. Events of files that were found to be clean appear under the *Handled* filter and events of files that were found to be risky are displayed under the *All statuses* filter. A sandbox analysis digest is added to the security event's handling comment.

eXtended detection source integration

You can connect to external systems to collect activity log by adding a new connector for extended detection. The aggregated data is then being sent to Fortinet Cloud Services (FCS) where it is correlated and analyzed to detect malicious indications that will result in security events of eXtended Detection policy rule violations.

FortiEDR supports extended detection with the following external systems:

- FortiAnalyzer or FortiAnalyzer Cloud on page 279
- FortiSIEM or FortiSIEM Cloud
- Google Cloud Security Command Center (SCC) on page 282
- AWS GuardDuty on page 285
- Custom on page 288

FortiAnalyzer or FortiAnalyzer Cloud

You can integrate FortiEDR with FortiAnalyzer or FortiAnalyzer Cloud to correlate data between FortiEDR and the Fortinet Security Fabric and issue eXtended detection alerts. To complete the integration, you must

configure an eXtended detection source connector for FortiAnalyzer or FortiAnalyzer Cloud and enable the eXtended detection rules and FortiEDR Threat Hunting events collection.

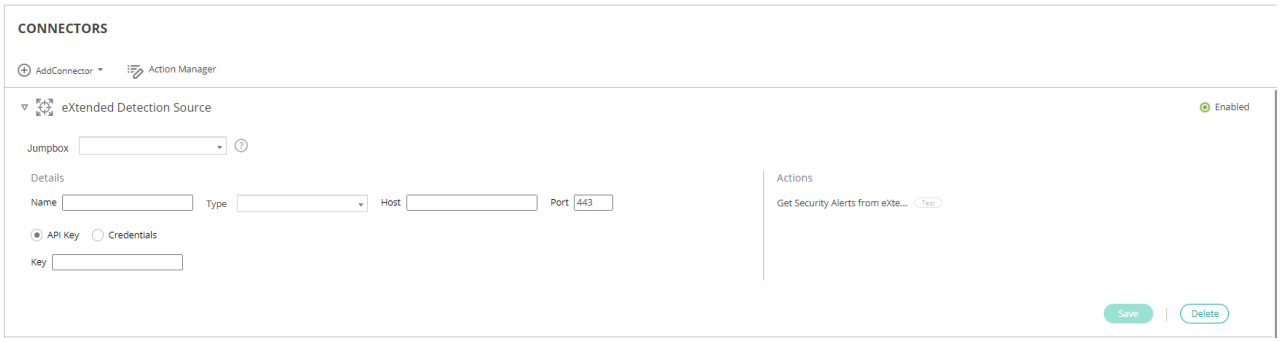
Prerequisites

Before you start integrating FortiEDR with FortiAnalyzer or FortiAnalyzer Cloud, verify you have the following:

- A valid license for eXtended Detection Response—While you can create an eXtended detection source connector without a valid license for eXtended Detection Response, the license is required for a successful XDR definition.
- A Jumpbox with connectivity to FortiAnalyzer:
  - Refer to Setting up the FortiEDR Core on page 524 for details about how to install a FortiEDR Core and configure it as a Jumpbox.
  - Refer to Cores on page 416 for more information about configuring a Jumpbox.
- Connectivity from the FortiEDR Central Manager to the Fortinet Cloud Services (FCS).
- **(FortiAnalyzer)** A FortiAnalyzer administrator account with JSON API access enabled. Refer to the FortiAnalyzer Administration Guide for more information.
- **(FortiAnalyzer Cloud)** A valid FortiCloud API user under a permission profile with read/write access to the FortiAnalyzer Cloud portal. See the FortiCloud IAM documentation for detailed instructions about creating a permission profile and an API user.

Setting up a connector for FortiAnalyzer or FortiAnalyzer Cloud

1. Click the *Add Connector* button and select *eXtended Detection Source* in the *Connectors* dropdown list. The following displays:



2. Fill in the following fields:

Field	Definition
Enabled	Check this checkbox to enable blocking of malicious IP addresses by the FortiAnalyzer or FortiAnalyzer Cloud.
Jumpbox	Select the FortiEDR Jumpbox that will communicate with the FortiAnalyzer or FortiAnalyzer Cloud.
Name	Specify a name of your choice to identify the connector.
Type	Select *FortiAnalyzer*.

Field	Definition
Host	Specify the IP or DNS address of the FortiAnalyzer or FortiAnalyzer Cloud.
Port	Specify the port that is used for API communication with the FortiAnalyzer or FortiAnalyzer Cloud.
API Key/Credentials/Authentication	Specify authentication details of the FortiAnalyzer or FortiAnalyzer Cloud. • **(FortiAnalyzer)** Select *Credentials* and fill in the FortiAnalyzer username and password. • **(FortiAnalyzer Cloud)** Specify the username and password of the FortiCloud API user with read/write access to the FortiAnalyzer Cloud portal.
Actions	Configure the FortiGate and VDOM logs to be correlated with FortiEDR data by specifying the FortiGate or VDOM name in the following fields. If both fields are empty, FortiEDR uses the default value, which is *All*.

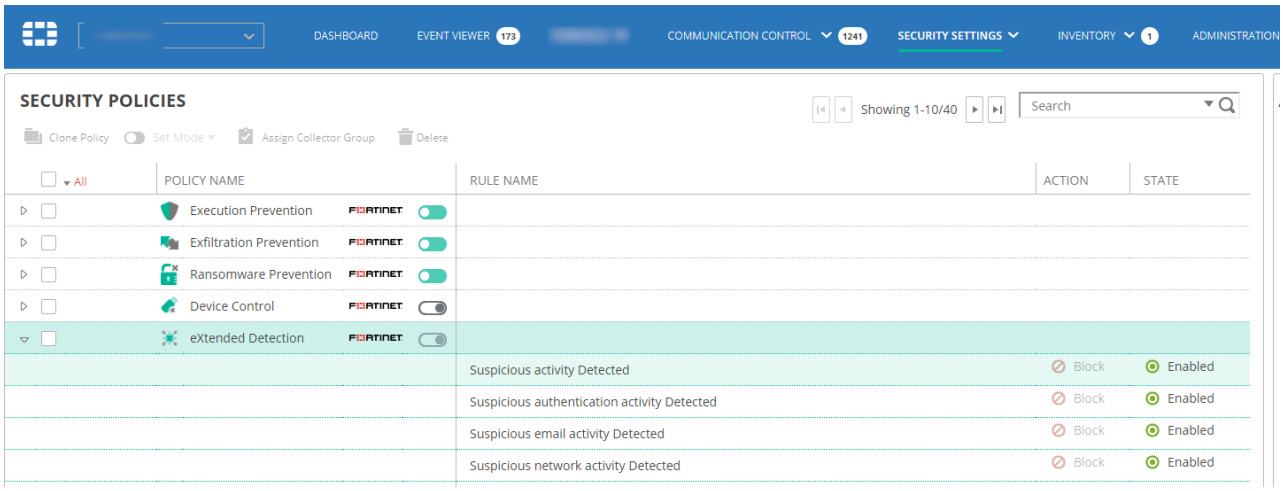
3. Click *Save*.

Setting up FortiEDR Central Manager

In order to complete the integration with FortiAnalyzer or FortiAnalyzer Cloud, the eXtended detection rules and FortiEDR Threat Hunting events collection must be enabled with the FortiEDR Central Manager, as follows.

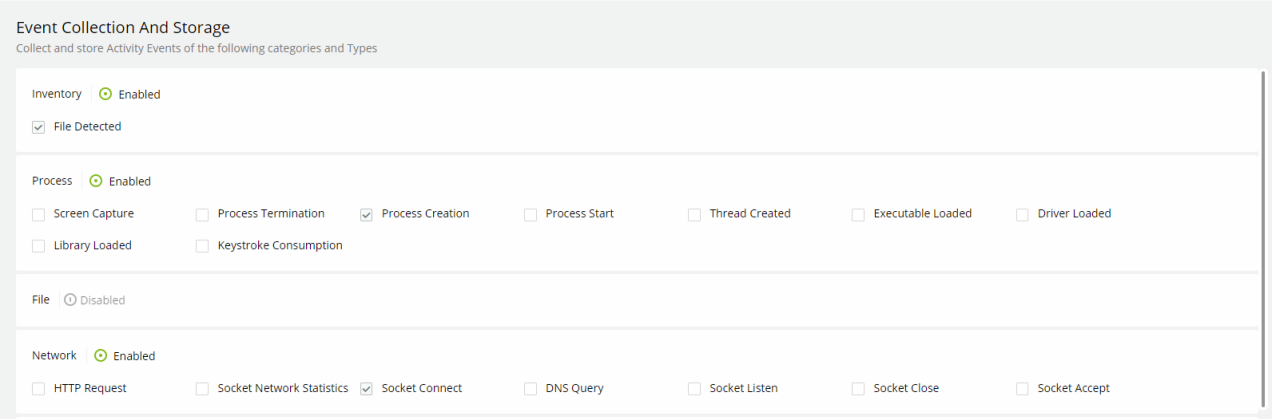
To enable eXtended detection rules:

1. Navigate to the *SECURITY SETTINGS > Security Policies* page.
2. Open the eXtended detection policy that is applied on devices on which you want the eXtended detection policy to apply and click the *Disabled* button next to each of the underlying rules to enable it, as shown below:



To enable FortiEDR Threat Hunting events collection:

1. Navigate to the *SECURITY SETTINGS > Threat Hunting > Collection Profiles* page.
2. Open the Threat Hunting collection profile that is applied on devices on which you want the eXtended detection policy to apply.
3. Select the following event types on that profile:
   - Socket Connect
   - Process Creation
   - File Create
   - File Detected



FortiEDR is now configured to issue eXtended detection alerts from FortiAnalyzer or FortiAnalyzer Cloud.

Google Cloud Security Command Center (SCC)

To integrate FortiEDR with Google Cloud Security Command Center (SCC) to collect activity log and issue eXtended detection alerts, you must configure Google SCC for threat logging and API access, configure an eXtended detection source connector with Google Cloud SCC in FortiEDR, and enable the eXtended detection rules and FortiEDR Threat Hunting events collection in FortiEDR.

Prerequisites

Before you start integrating FortiEDR with Google SCC, verify you have the following:

- Google Cloud licensing of Security Command Center Premium tier that has Event Threat Detection feature.
- A valid FortiEDR license for eXtended Detection Response—While you can create an eXtended detection source connector without a valid license for eXtended Detection Response, the license is required for a successful XDR definition.
- A Jumpbox with connectivity to Google SCC. Details about how to install a FortiEDR Core and configure it as a Jumpbox are provided in Setting up the FortiEDR Core on page 524. You may refer to Cores on page 416 for more information about configuring a Jumpbox.
- Connectivity from the FortiEDR Central Manager to the Fortinet Cloud Services (FCS).

Configuring Google SCC

Perform the following steps to configure Google SCC:

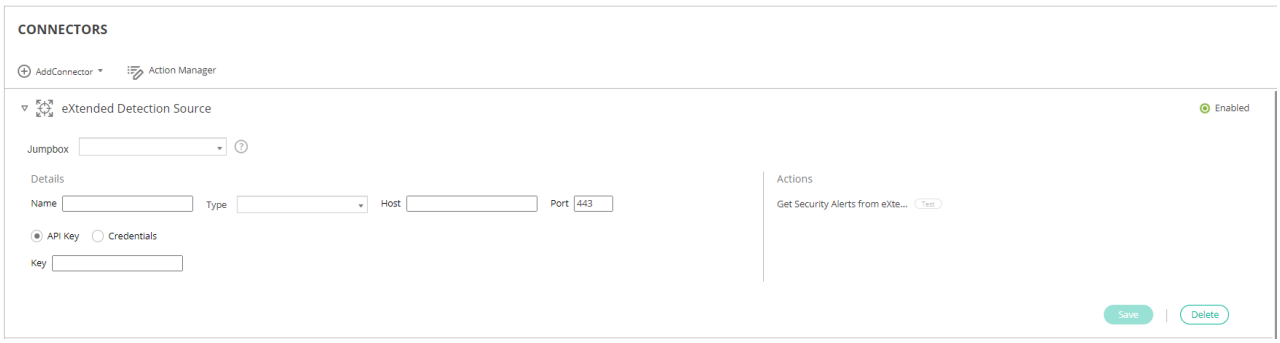
1. Enable threat logging in Google SCC:
   a. Enable Event Threat Detection per monitored project in the organization. The following Event Threat Detection rules are required:
      - Malware: bad IP
      - Malware: bad domain

      Make sure to enable all log source types that are needed for these rules detectors to work, such as Cloud DNS logs and Admin Activity log. For more details about Event Threat Detection rules and the required log sources, see Google Documentation.
   b. Verify that raw log items now show on Google's Logs Explorer and Event Threat Detection findings show on Security Command Center as described in Google Documentation.
2. Enable API access to Google for fetching threat logs:
   a. Set up a service account on Google, as described in Google Documentation.
   b. Download the json key file for this service account. This file should be uploaded via FortiEDR console as part of setting up the extended detection source connector (see section below).
   c. Grant the following permission to the service account to allow API access:
      - Organization Admin (resourcemanager.organizationAdmin)
      - Security Command Center Admin (securityCenter.admin)

      See Google Documentation for more details about permissions.

Setting up a connector for Google SCC

1. Click the *Add Connector* button and select *eXtended Detection Source* in the *Connectors* dropdown list. The following displays:



2. Fill in the following fields:

Field	Definition
Enabled	Check this checkbox to enable blocking of malicious IP addresses by Google SCC.
Jumpbox	Select the FortiEDR Jumpbox that will communicate with Google SCC.
Name	Specify a name of your choice to identify the connector.
Type	Select *Google SCC*.
Authentication	Upload the JSON file that was created for your Google Service account.
Actions	Specify the unique organization resource identifier in Google cloud or ID of Google cloud project to use for fetching alerts.

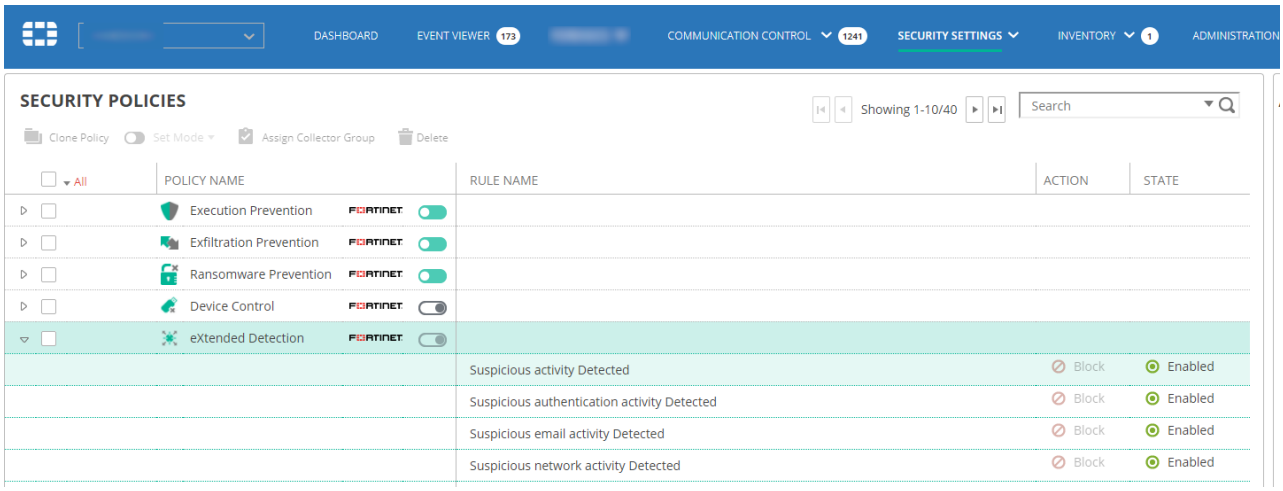
3. Click *Save*.

Setting up FortiEDR Central Manager

In order to complete the integration with Google SCC, the eXtended detection rules and FortiEDR Threat Hunting events collection must be enabled with the FortiEDR Central Manager, as follows.

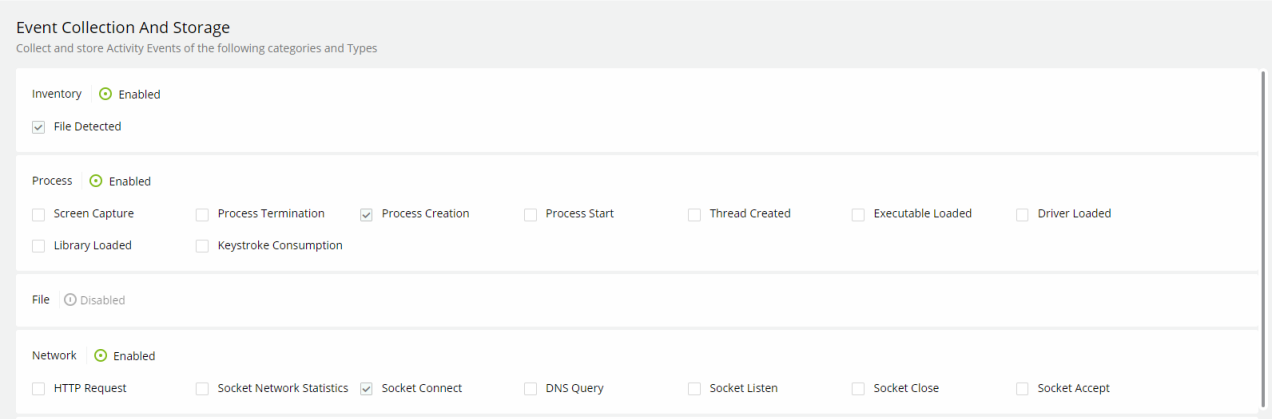
To enable eXtended detection rules:

1. Navigate to the *SECURITY SETTINGS > Security Policies* page.
2. Open the eXtended detection policy that is applied on devices on which you want the eXtended detection policy to apply and click the *Disabled* button next to each of the underlying rules to enable it, as shown below:



To enable FortiEDR Threat Hunting events collection:

1. Navigate to the *SECURITY SETTINGS > Threat Hunting > Collection Profiles* page.
2. Open the Threat Hunting collection profile that is applied on devices on which you want the eXtended detection policy to apply.
3. Select the following event types on that profile:
   - Socket Connect
   - Process Creation
   - File Create
   - File Detected



FortiEDR is now configured to issue eXtended detection alerts from Google SCC.

AWS GuardDuty

To integrate FortiEDR with AWS GuardDuty to collect activity log and issue eXtended detection alerts, you must configure AWS GuardDuty, configure an eXtended detection source connector with AWS GuardDuty in FortiEDR, and enable the eXtended detection rules and FortiEDR Threat Hunting events collection.

Prerequisites

Before you start integrating FortiEDR with AWS GuardDuty, verify you have the following:

- A valid license for eXtended Detection Response—While you can create an eXtended detection source connector without a valid license for eXtended Detection Response, the license is required for a successful XDR definition.
- A Jumpbox with connectivity to AWS GuardDuty. Details about how to install a FortiEDR Core and configure it as a Jumpbox are provided in Setting up the FortiEDR Core on page 524. You may refer to Cores on page 416 for more information about configuring a Jumpbox.
- Connectivity from the FortiEDR Central Manager to the Fortinet Cloud Services (FCS).

Configuring AWS GuardDuty

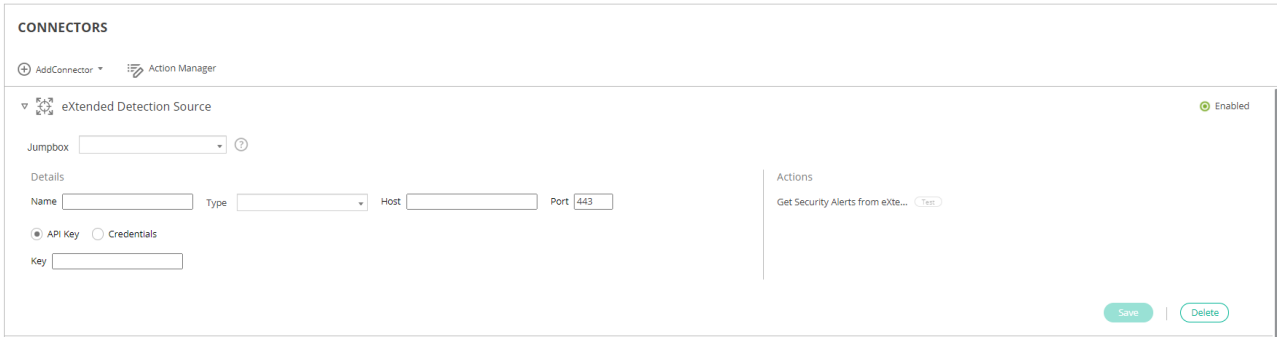
Perform the following steps to configure AWS GuardDuty:

1. Enable Amazon GuardDuty in your account as described in AWS Documentation.
   The following GuardDuty finding types are correlated with the FortiEDR events:
   - Backdoor:EC2/C&CActivity.B!DNS
   - Discovery:Kubernetes/MaliciousIPCaller

   You are encouraged to test that GuardDuty generates these findings as described on AWS documentation.
2. Create IAM user on AWS console as described here:
   a. Set Programmatic Access for this user to allow API calls.
   b. Set full permissions to access GuardDuty service.
   c. Show and copy access key ID and secret access key of this user, which will be used on FortiEDR console when you set up the extended detection source connector in the following section.

Setting up a connector for AWS GuardDuty

1. Click the *Add Connector* button and select *eXtended Detection Source* in the *Connectors* dropdown list. The following displays:



2. Fill in the following fields:

Field	Definition
Enabled	Check this checkbox to enable blocking of malicious IP addresses by AWS GuardDuty.

Field	Definition
Jumpbox	Select the FortiEDR Jumpbox that will communicate with AWS GuardDuty.
Name	Specify a name of your choice to identify the connector.
Type	Select *AWS GuardDuty*.
Authentication	Specify the access key ID and secret access key.
Actions	Specify the AWS region for API calls.

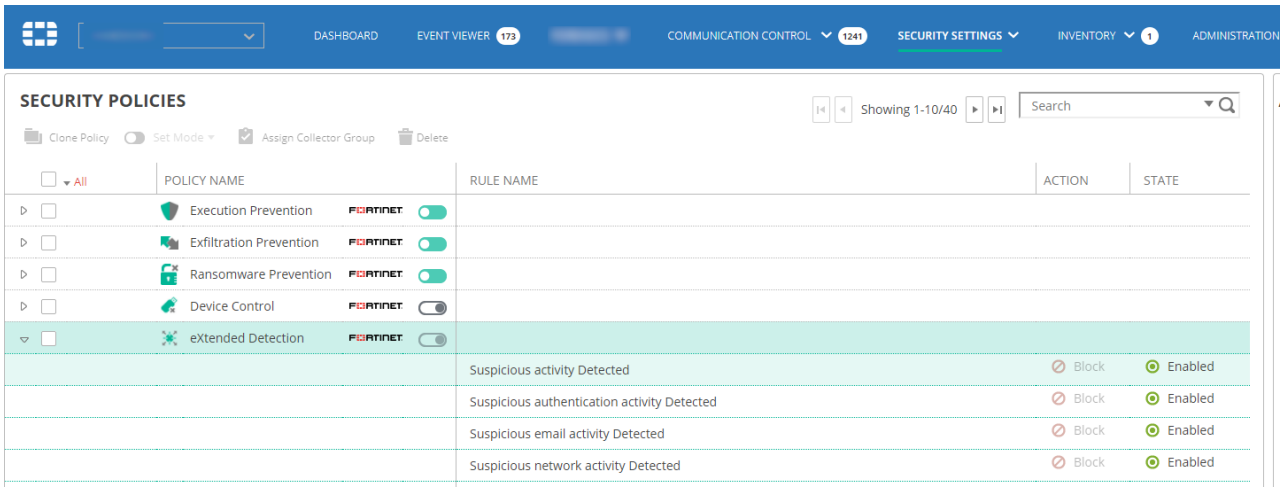
3. Click *Save*.

Setting up FortiEDR Central Manager

In order to complete the integration with AWS GuardDuty, the eXtended detection rules and FortiEDR Threat Hunting events collection must be enabled with the FortiEDR Central Manager, as follows.

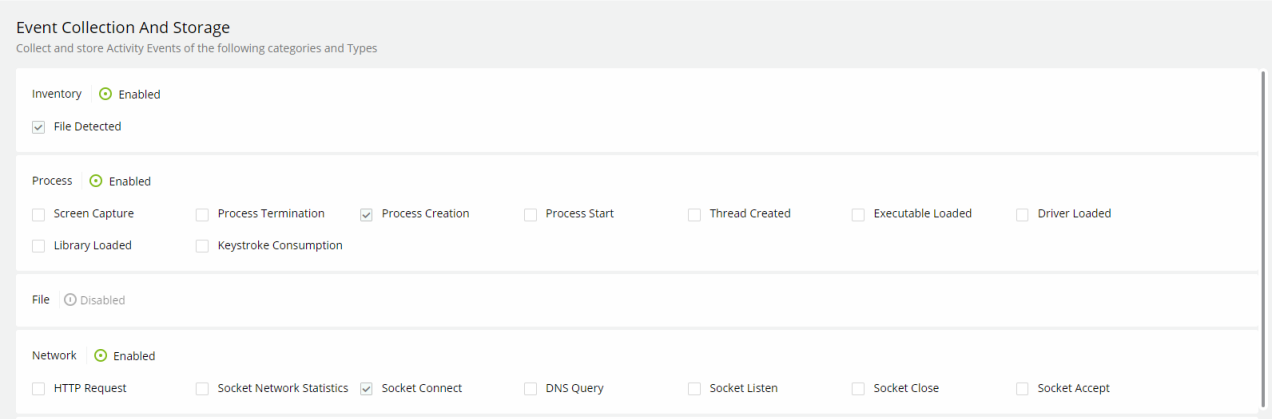
To enable eXtended detection rules:

1. Navigate to the *SECURITY SETTINGS* > *Security Policies* page.
2. Open the eXtended detection policy that is applied on devices on which you want the eXtended detection policy to apply and click the *Disabled* button next to each of the underlying rules to enable it, as shown below:



To enable FortiEDR Threat Hunting events collection:

1. Navigate to the *SECURITY SETTINGS > Threat Hunting > Collection Profiles* page.
2. Open the Threat Hunting collection profile that is applied on devices on which you want the eXtended detection policy to apply.
3. Select the following event types on that profile:
   - Socket Connect
   - Process Creation
   - File Create
   - File Detected



FortiEDR is now configured to issue eXtended detection alerts from AWS GuardDuty.

Custom

To integrate FortiEDR with a custom system to collect activity log and issue eXtended detection alerts, you must configure an eXtended detection source connector with the custom system and enable the eXtended detection rules and FortiEDR Threat Hunting events collection.

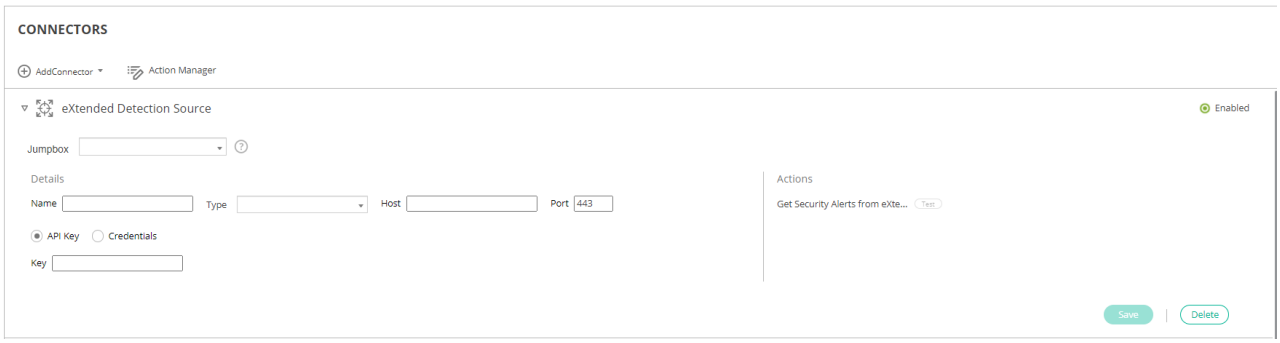
Prerequisites

Before you start integrating FortiEDR with a custom system, verify you have the following:

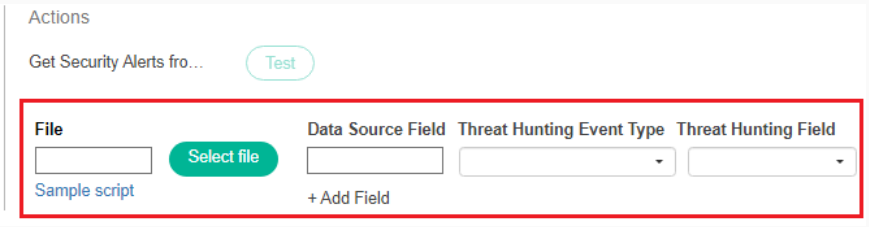
- A valid license for eXtended Detection Response—While you can create an eXtended detection source connector without a valid license for eXtended Detection Response, the license is required for a successful XDR definition.
- A Jumpbox with connectivity to the custom system. Details about how to install a FortiEDR Core and configure it as a Jumpbox are provided in Setting up the FortiEDR Core on page 524. You may refer to Cores on page 416 for more information about configuring a Jumpbox.
- Connectivity from the FortiEDR Central Manager to the Fortinet Cloud Services (FCS).

Setting up a connector for the custom system

1. Click the *Add Connector* button and select *eXtended Detection Source* in the *Connectors* dropdown list. The following displays:



2. Fill in the following fields:

Field	Definition
Enabled	Check this checkbox to enable blocking of malicious IP addresses by the custom system.
Jumpbox	Select the FortiEDR Jumpbox that will communicate with the custom system.
Name	Specify a name of your choice to identify the custom system.
Type	Select *Custom*.
Host	Specify the IP or DNS address of the custom system.
Port	Specify the port that is used for API communication with the custom system.
API Key/Credentials	Specify authentication details of the custom system.
Actions Parameters	1. Upload a script file that contains all the authentication details for the external system and the query for FortiEDR to pull data from the system. Use the sample script as a starting point to build your own script by replacing all the values with those for your system. 2. Specify the name of the data source field in the external system for FortiEDR to correlate with. You can add fields as needed. 3. For each data source field, select the corresponding *Threat Hunting Event Type* and *Threat Hunting Field* for FortiEDR to correlate data with. 

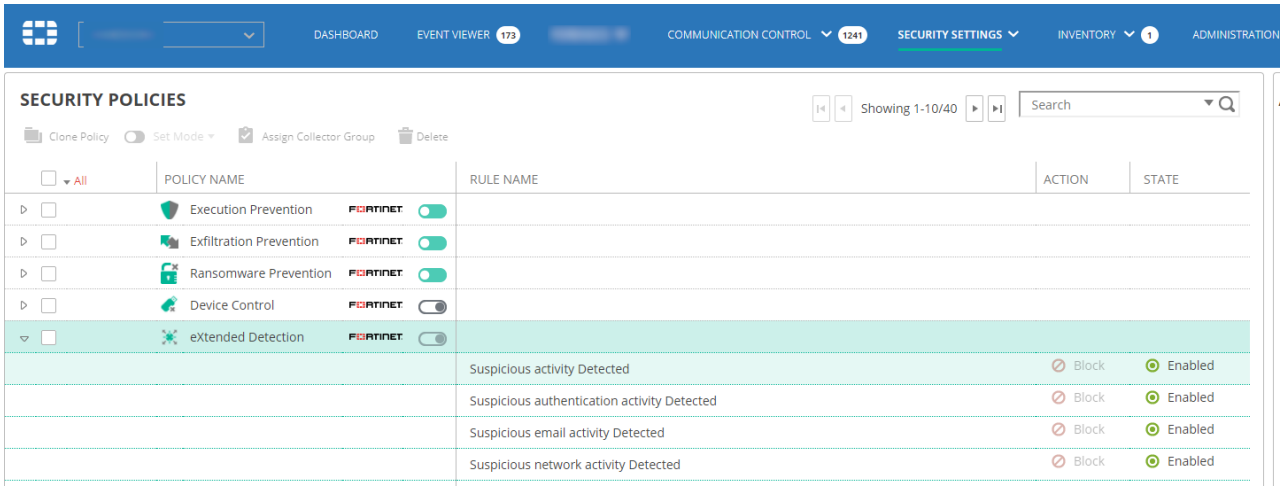
3. Click *Save*.

Setting up FortiEDR Central Manager

In order to complete the integration with the custom system, the eXtended detection rules and FortiEDR Threat Hunting events collection must be enabled with the FortiEDR Central Manager, as follows.

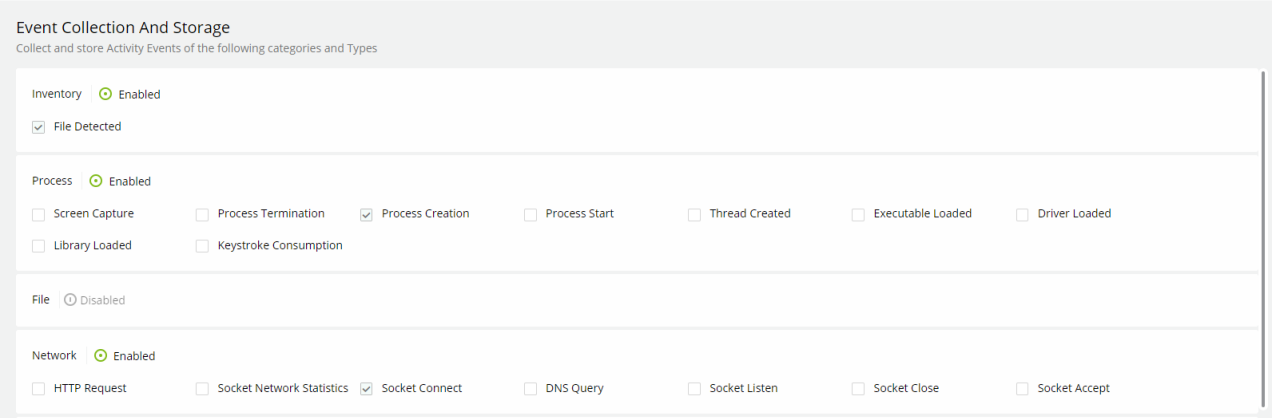
To enable eXtended detection rules:

1. Navigate to the *SECURITY SETTINGS > Security Policies* page.
2. Open the eXtended detection policy that is applied on devices on which you want the eXtended detection policy to apply and click the *Disabled* button next to each of the underlying rules to enable it, as shown below:



To enable FortiEDR Threat Hunting events collection:

1. Navigate to the *SECURITY SETTINGS > Threat Hunting > Collection Profiles* page.
2. Open the Threat Hunting collection profile that is applied on devices on which you want the eXtended detection policy to apply.
3. Select the following event types on that profile:
   - Socket Connect
   - Process Creation
   - File Create
   - File Detected



FortiEDR is now configured to issue eXtended detection alerts from the custom system.

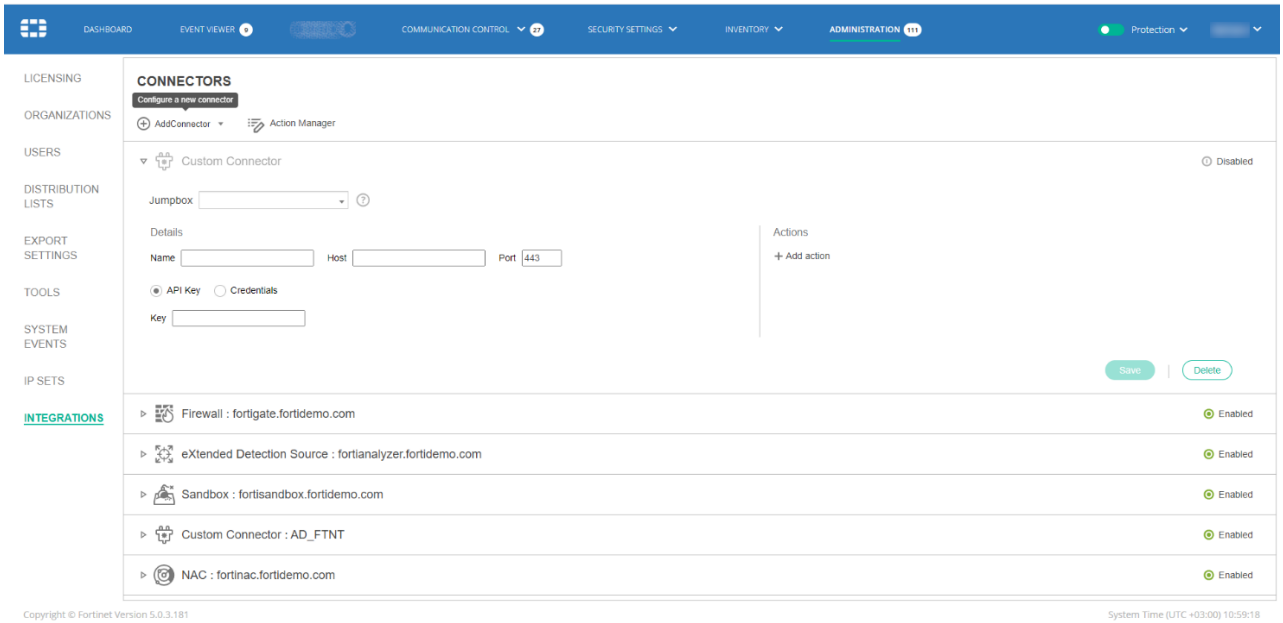
Custom integration

The *CUSTOM* section enables you to connect to any third-party system in order to automatically trigger an incident response in that third-party system as the result of a security event detected by FortiEDR. After you define a Custom Integration connector (and its actions) and configure a relevant Playbook policy, an automatic incident response action will be triggered in the third-party system upon the triggering of a security event.

Custom integration is only available to users with Admin or IT permissions and have the *Custom script* option enabled. For more information about user roles and permissions, see Users on page 359.

To set up a custom integration connector in FortiEDR:

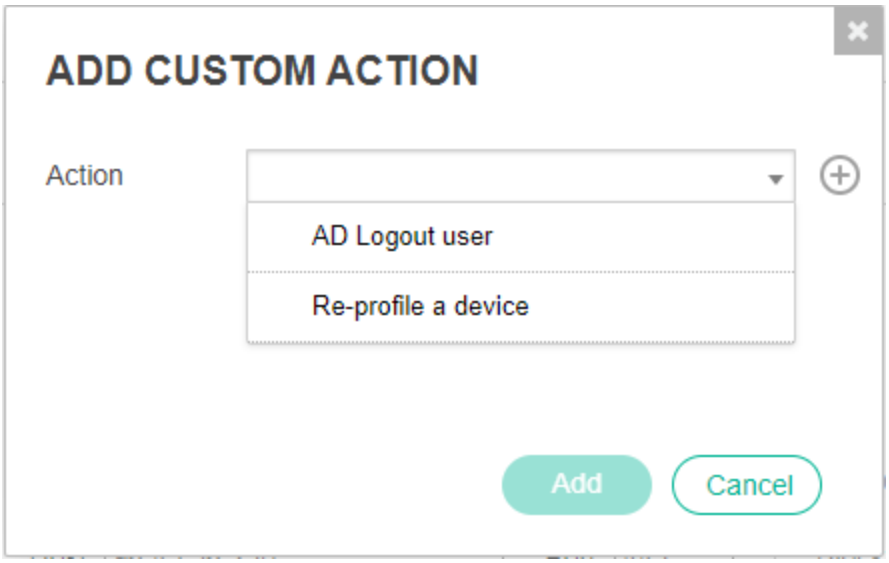
1. Click the *Add Connector* button and select *Custom Connector* from the dropdown list. The following displays:



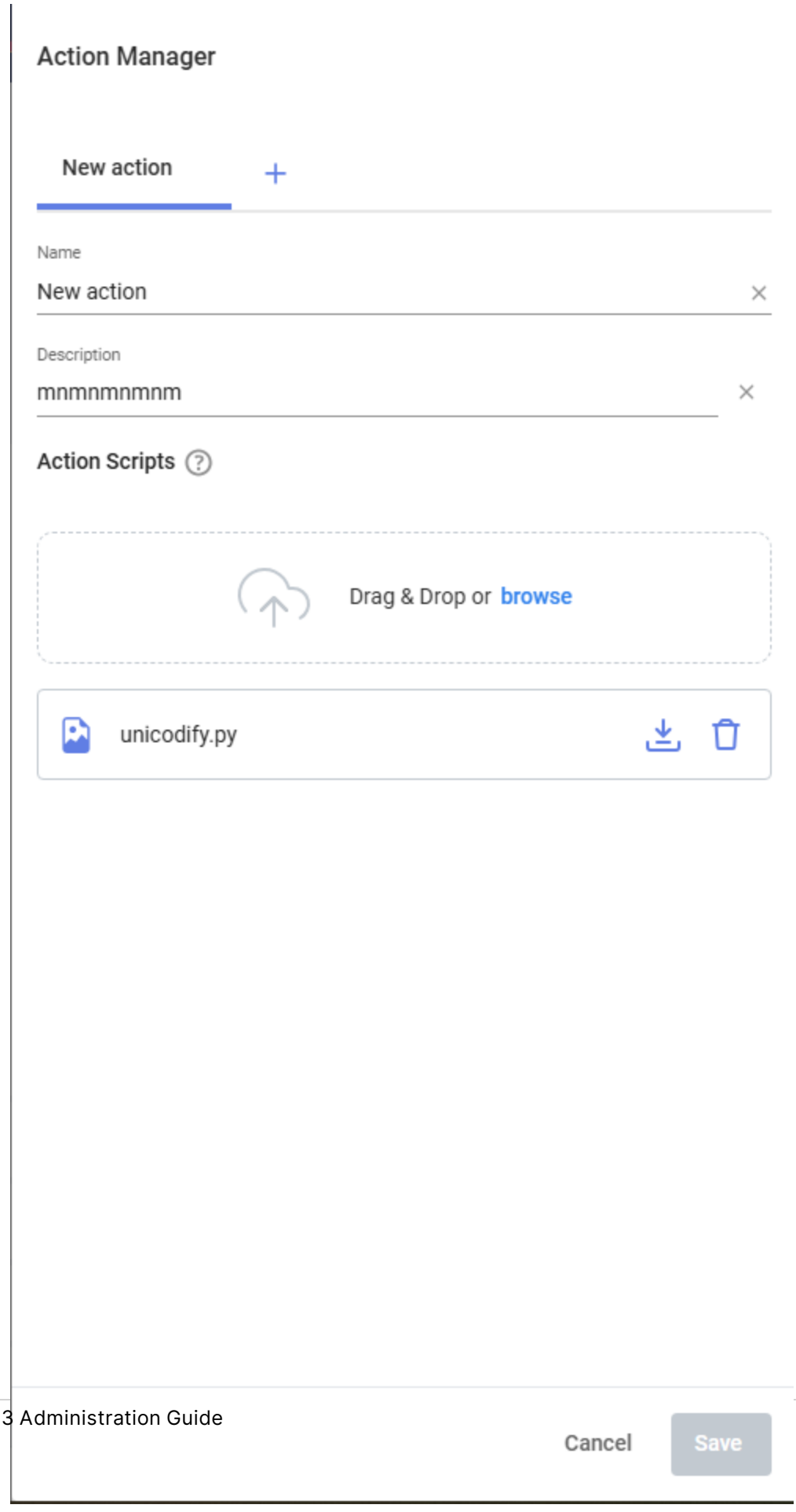
2. Fill in the following fields:

Field	Description
Jumpbox	Select the FortiEDR Jumpbox that will communicate with the third-party system. A FortiEDR deployment must include a Jumpbox that has connectivity to the external system of this custom integration connector. This Jumpbox must be exclusive to this organization and cannot function as a Core.
Name	Specify a name of your choice to be used to identify this custom connector.
Host	Specify the IP or DNS address of the relevant third-party application.
Port	Specify the port that is used for API communication with the relevant third-party application.
API Key/Credentials	Specify authentication details of the relevant third-party application. To use an API token, click the *API Key* radio button and copy the token value into the text box. To use API credentials, click the *Credentials* radio button and enter the relevant third-party application's API username and password.

3. In the *Actions* area on the right, define the action to be taken by this custom connector, as follows:
   - To trigger an action on a custom connected third-party system, click the **+ Add Action** button to display the following popup window:



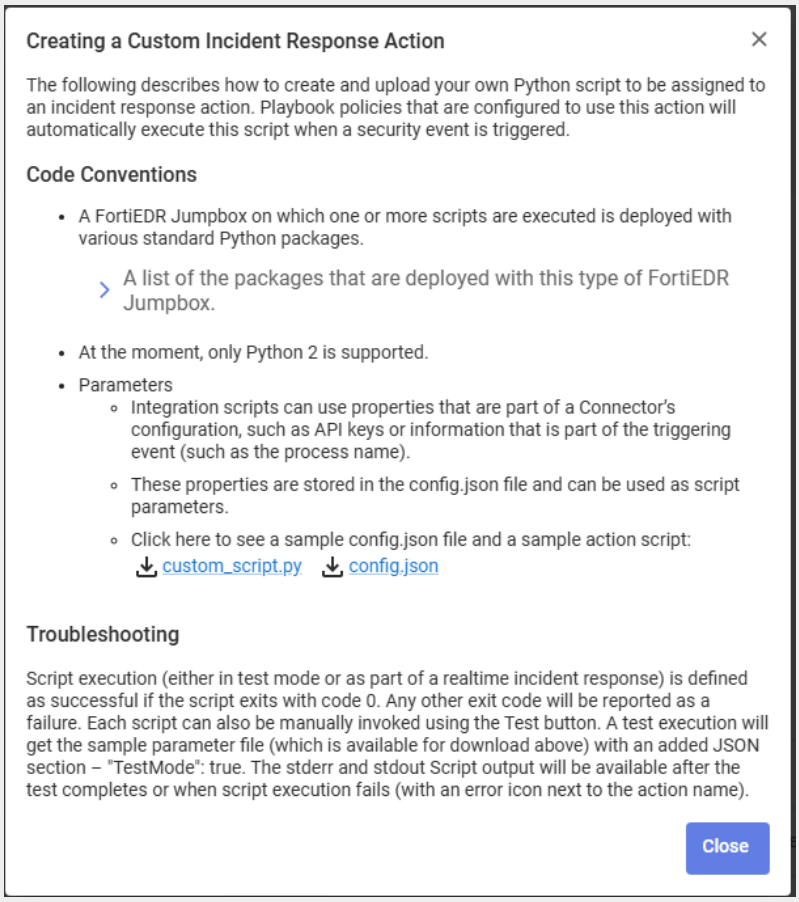
1. In the *Action* dropdown menu, select one of the previously defined actions (which were defined in FortiEDR as described Custom integration on page 291).
   -OR-
2. Click the *Create New Action* button in this popup window to define a new action that can be triggered according to the definitions in the Playbook, as described in the next section below. The following displays:


Action Manager
New action
Name
New action
Description
mnmnmnmnm
Action Scripts
Drag & Drop or browse
unicodify.py
Cancel
Save

Fill out the fields of this window as follows in order to define a new action to be triggered in response to an incident.

In order to trigger this action, a Playbook policy must be defined that triggers this action to execute the script when a security event is triggered. The definition of this new action here automatically adds this action as an option in a Playbook policy. This action however, is not selected by default in the Playbook policy. Therefore, you must go to the Playbook policy and select it in order for it to be triggered when a security event is triggered.

Field	Definition
Name	Enter any name for this action.
Description	Enter a description of this action.
Upload	Upload a Python script that calls an API from the third-party system in order to perform the relevant action. Python 2.7 or later is supported. The Python script must be created according to the coding conventions that can be displayed by clicking the icon next to the *Action Scripts* field. The following displays providing an explanation of the coding conventions and provides various links that you can click to see more detail and/or to download sample files.

Field	Definition
	

3. Click *Save*. The new action is then listed in the Actions area.

4. Select this action to associate it with the custom connector.

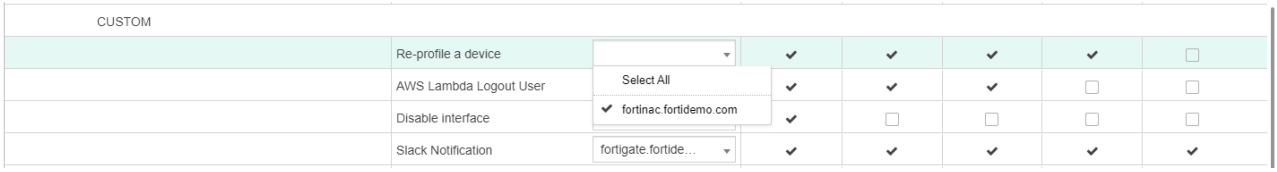
5. You can click the *Test* button next to it to execute this action.
A new row is added to the *CUSTOM* section of the *Automated Incident Response – Playbooks* page. In order for this custom integration connector to trigger an action, you must define it in the Playbook, as described below.

The actions that you define here can also be selected as an action for a Firewall integration on page 263 connector or Network Access Control (NAC) integration on page 271 connector. These integration connectors might use the same API. Alternatively, you may need to upload a different script that will be used to perform the same action on different third-party products. You can associate several scripts with the same action and select the appropriate one per connector. For example, an IM notification action could have two scripts – one for notifications via Slack and the other for notifications via Teams.

Playbooks configuration

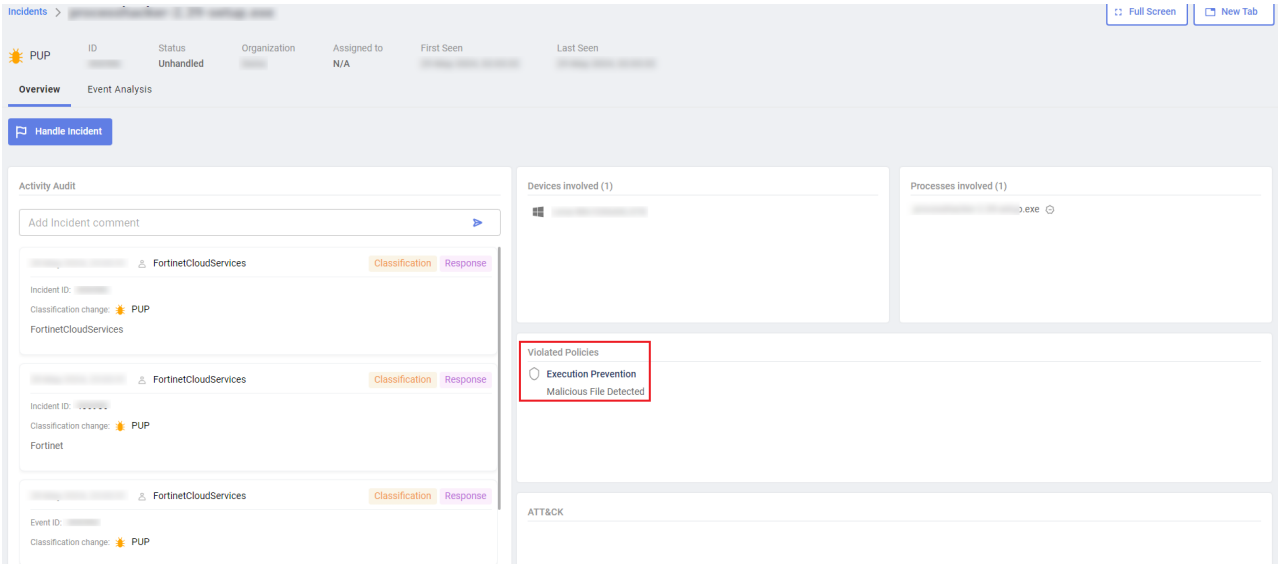
To configure an automated incident response that triggers an action using this custom integration connector upon the triggering of a security event:

1. Navigate to the *Profiles* > *Playbooks* page.
2. Open the Playbook policy that is applied on devices for which you want the custom action (defined above) to apply.
3. In the *CUSTOM* section, place a checkmark in the relevant Classification columns next to the row of that action.
4. In the dropdown menu next to the action, select the connector with which to perform the action or click *Select All*, as shown below:



The example above showed how to configure two custom connectors by using the same action named IM notification in the Playbook – one for notifications via Teams and the other for notifications via Slack.

FortiEDR is now configured to trigger this action in the third-party system upon the triggering of a security event. This automatic incident response action appears in the *Overview* tab when you select the incident and click *Investigate* in the *Incidents* pane.



Identity Management integration

When an Identity Management connector, such as FortiClient Endpoint Management Server (EMS), is set and Playbook policies are configured, automatic incident response actions can include ZeroTrust device tagging on FortiClient EMS upon security event triggering.

For more details about integrating FortiEDR with FortiClient EMS, refer to the FortiClient EMS Integration Guide.

Prerequisites

Before you start Identity Management configuration, verify the following:

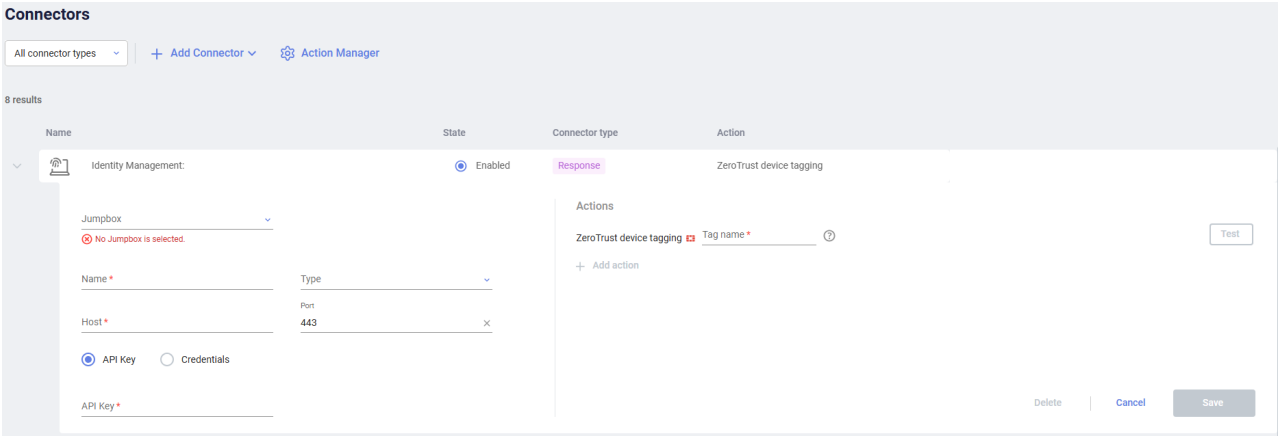
- Your FortiEDR deployment includes a Jumpbox that has connectivity to the identity management server.
  - Refer to Setting up the FortiEDR Core on page 524 for details about how to install a FortiEDR Core and configure it as a Jumpbox.
  - Refer to Cores on page 416 for more information about configuring a Jumpbox.
- The FortiEDR Central Manager has connectivity to the Fortinet Cloud Services (FCS).
- You have a valid user with access to the identity management system. For FortiClient EMS, the following type of user is required depending on the deployment type:
  - **FortiClient EMS On-Premise**—A valid API user. See the FortiClient EMS Integration Guide for detailed instructions.
  - **FortiClient EMS Cloud**— FortiCloud master user (e.g. email address) with read/write access to the FortiClient EMS Cloud portal. Sub user accounts cannot be used. See the FortiCloud IAM documentation for detailed instructions about creating a permission profile and an API user.

Follow the steps below to tag a device as non-trusted automatically upon the detection of a FortiEDR security event.

Configuring a FortiEDR Connector

To configure Identity Management integration:

1. Click the *Add Connector* button and select *Identity Management* from the dropdown list.
   The following displays:



2. Fill in the following fields:

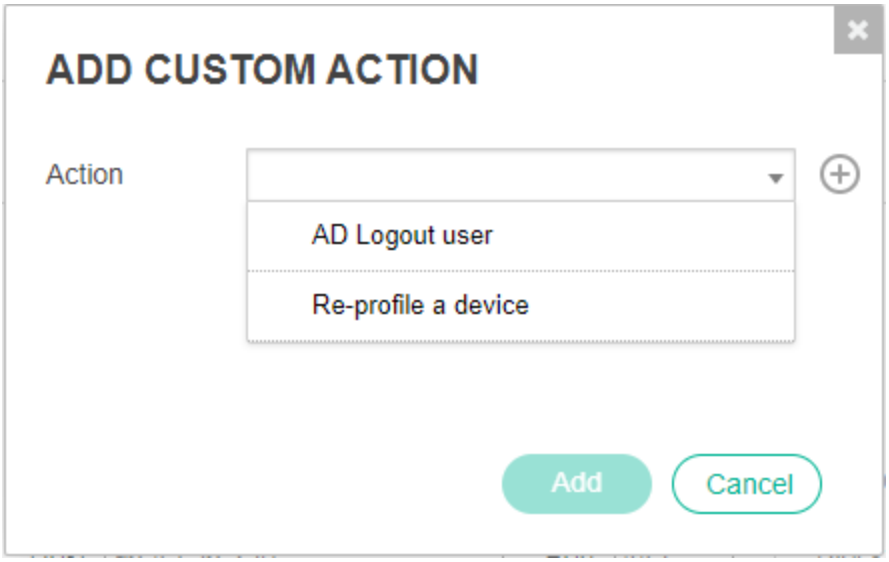
Field	Description
Jumpbox	Select the FortiEDR Jumpbox that will communicate with this Identity Management system.
Name	Specify a name of your choice to be used to identify this Identity Management system.
Type	Select the type of Identity Management to be used in the dropdown list. For example, *FortiClient EMS*.

Field	Description
Host	Specify the IP or DNS address of the external Identity Management system.
Port	Specify the port that is used for communication with the external Identity Management system.
API Key/Credentials	Specify authentication details of the external Identity Management system. Fill in the external Identity Management system API username/Account and password/key. For FortiClient EMS, specify the following depending on your deployment type: • **(FortiClient EMS on-premise)** Specify the username and password of the FortiClient EMS Admin User. • **(FortiClient EMS cloud)** Specify the account (e.g. email address) and password of the FortiCloud master user with read/write access to the FortiClient EMS Cloud portal. Sub user accounts cannot be used.

3. In the *Actions* area on the right, define the action to be taken by this connector:
   - To use an action provided out-of-the-box with FortiEDR (for example, Zero Trust device tagging on FortiClient EMS), tag the device as non-trusted the Identity management system and specify the classification tag to apply on the device in the *Tag name* field.
     This step is optional for FortiClient EMS 7.2 or later as it has the following fabric tags predefined for FortiEDR. Both the predefined fabric tags and classification tags, if any, will be used by FortiClient EMS 7.2 or later to tag the device.
     - **FortiEDR_Malicious**: FortiEDR has classified this endpoint as malicious.
     - **FortiEDR_PUP**: FortiEDR has detected a potentially unwanted program on this endpoint.
     - **FortiEDR_Suspicious**: FortiEDR has detected suspicious activity on this endpoint.
     - **FortiEDR_Likely_Safe**: FortiEDR has detected this endpoint as likely to be safe.
     - **FortiEDR_Probably_Good**: FortiEDR has determined that this endpoint is not a safety risk.

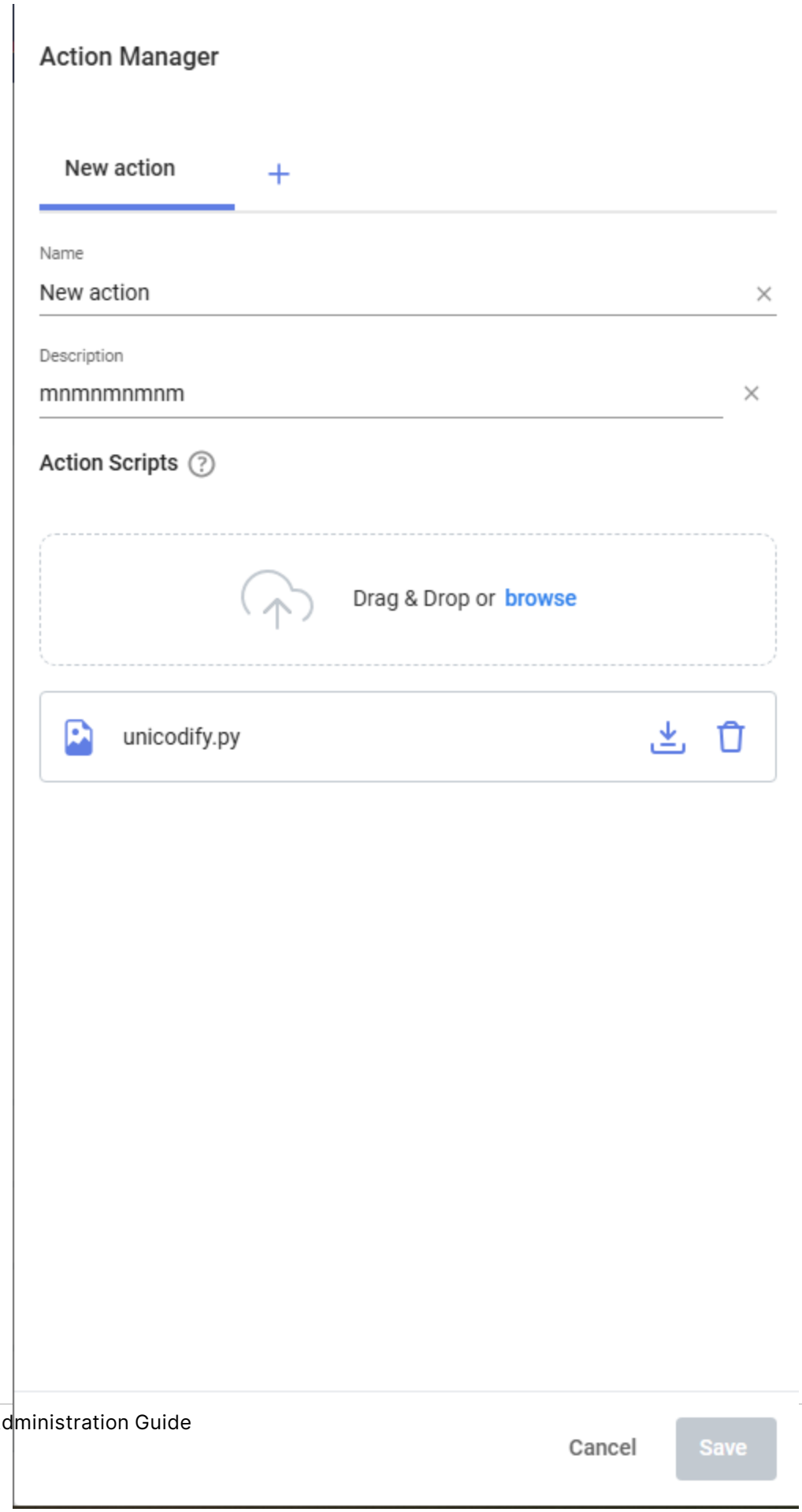
     See the FortiClient EMS Administration Guide for more information about endpoint tagging in FortiClient EMS.

- To use a custom integration action:
  i. Click the *+ Add Action* button. The following popup window displays:



  ii. In the *Action* dropdown menu, select one of the previously defined actions (which were defined in FortiEDR as described in Custom integration on page 291), or define a new action that can be triggered according to the definitions in the Playbook:

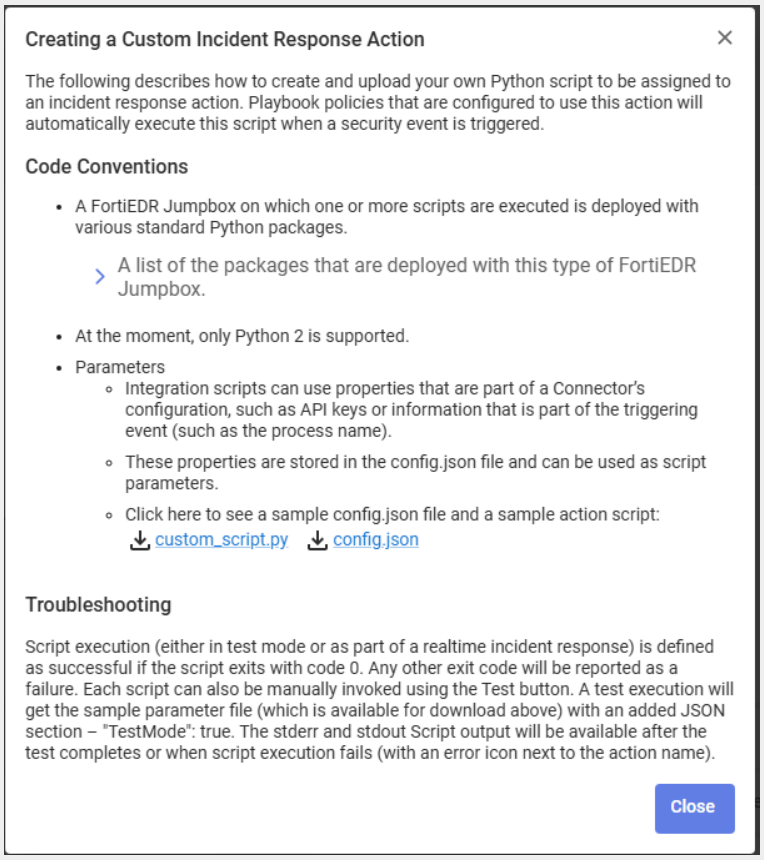
i. Click the *Create New Action* button. The following displays:


Action Manager
New action
Name
New action
Description
mnmnmnmnm
Action Scripts
Drag & Drop or browse
unicodify.py
Cancel
Save

ii. Fill out the fields of this window as follows in order to define a new action to be triggered in response to an incident.

In order to trigger this action, a Playbook policy must be defined that triggers this action to execute the script when a security event is triggered. The definition of this new action here automatically adds this action as an option in a Playbook policy. However, this action is not selected by default in the Playbook policy. Therefore, you must go to the Playbook policy and select it in order for it to be triggered when a security event is triggered.

Field	Definition
Name	Enter any name for this action.
Description	Enter a description of this action.
Upload	Upload a Python script that calls an API from the third-party system in order to perform the relevant action. Python 2.7 or later is supported. The Python script must be created according to the coding conventions that can be displayed by clicking the icon next to the *Action Scripts* field. The following displays providing an explanation of the coding conventions and provides various links that you can click to see more detail and/or to download sample files.

Field	Definition
	

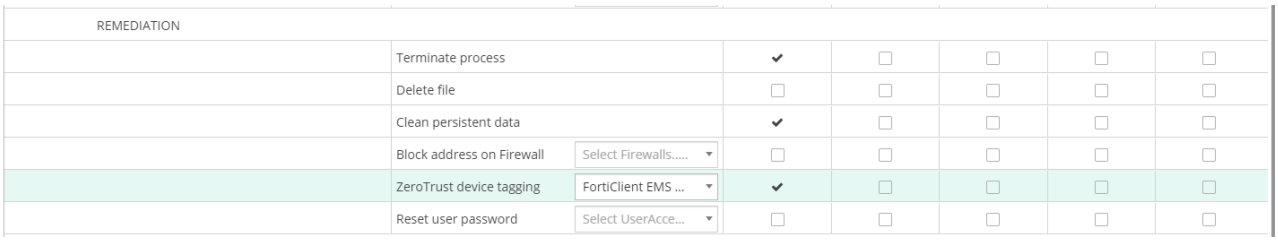
iii. Click *Save*. The new action is then listed in the *Actions* area.

4. You can click the *Test* button next to an action to execute that action.
5. Click *Save* to save the connector configuration.

Configuring Playbooks

To configure an automated incident response that uses an Identity Management connector to tag a device upon security event triggering:

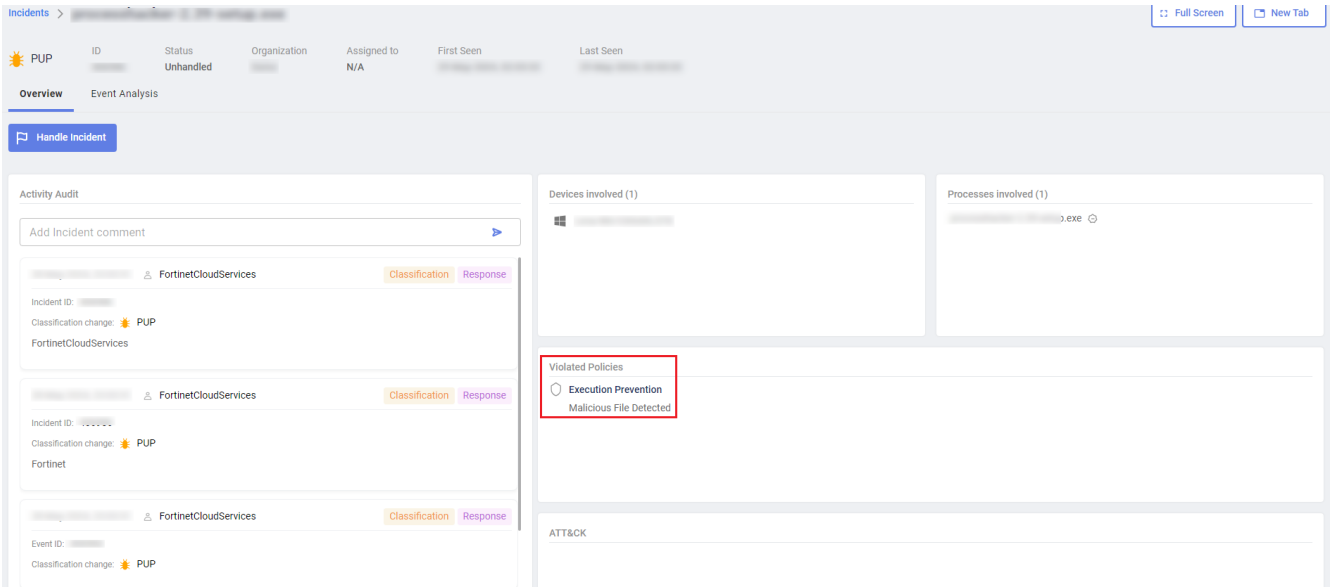
1. Navigate to the *Profiles* > *Playbooks* page.
2. Open the Playbook policy that is applied on devices for which you want the identity management response to apply.
3. Place a checkmark in the relevant *Classification* column next to the *Zero Trust device tagging* row under the *REMEDIATION* section.
   FortiEDR is now configured to automatically tag a device as non-trusted upon triggering of a security event.



To configure an automated incident response that uses an Identity Management connector to perform a custom action upon the triggering of a security event:

1. Navigate to the *Profiles* > *Playbooks* page.
2. Open the Playbook policy that is applied on devices for which you want the custom action (defined above) to apply.
3. In the *CUSTOM* section, place a checkmark in the relevant *Classification* columns next to the row of the relevant custom action.
4. In the dropdown menu next to the relevant custom action, select the relevant Identity Management connector with which to perform the action.
   FortiEDR is now configured to trigger this action in the third-party system upon the triggering of a security event.

Automatic incident response actions are listed in the *Overview* tab when you select the incident and click *Investigate* in the *Incidents* pane, as shown below:



User Access integration

When a user access connector, such as Active Directory, is set and Playbook policies are configured, automatic incident response actions can include resetting user's password or disabling user account on domain controller upon security event triggering.

For more details about integrating FortiEDR with Active Directory, refer to the Active Directory Integration Guide.

Prerequisites

Before you start User Access configuration, verify the following:

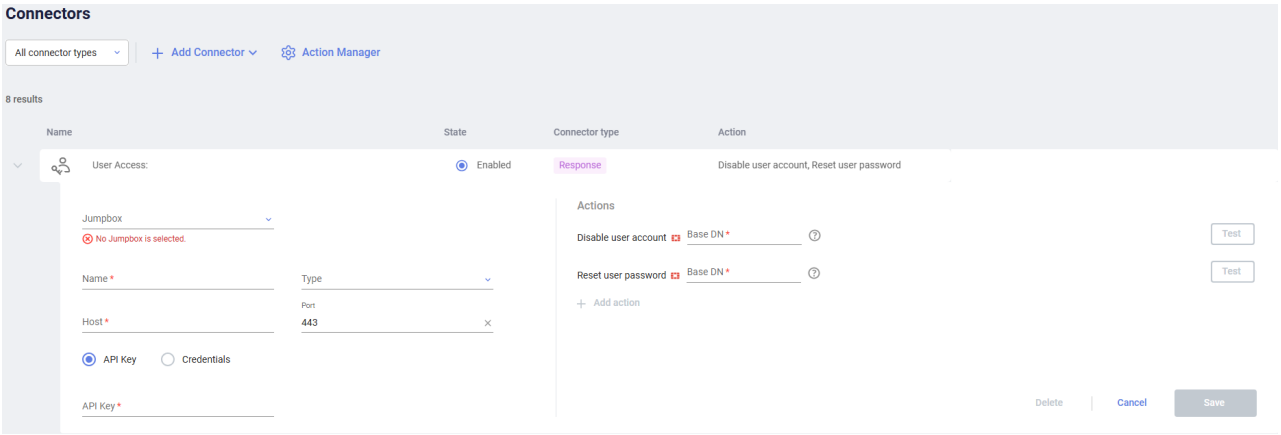
- Your FortiEDR deployment includes a Jumpbox that has connectivity to the domain controller server. Details about how to install a FortiEDR Core and configure it as a Jumpbox are described in Setting up the FortiEDR Core on page 524. You may refer to Cores on page 416 for more information about configuring a Jumpbox.
- The FortiEDR Central Manager has connectivity to the Fortinet Cloud Services (FCS).
- You have a valid API user with access to Active Directory or equivalent domain control system. See the Active Directory Integration Guide for detailed instructions about creating an Active Directory admin user.

Follow the steps below to perform user access actions automatically upon the detection of a FortiEDR security event.

Configuring a FortiEDR Connector

To configure User Access integration:

1. Click the *Add Connector* button and select *User Access* from the dropdown list.
   The following displays:

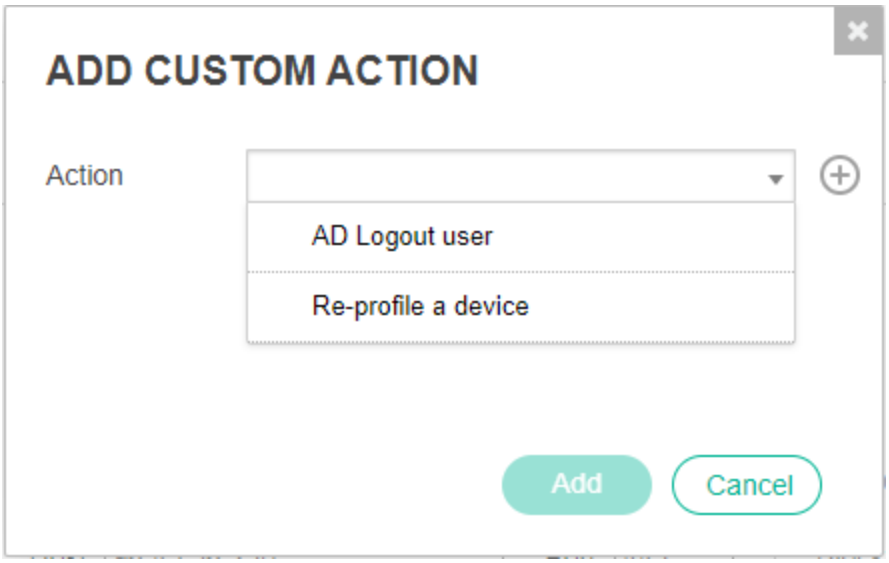


2. Fill in the following fields:

Field	Description
Jumpbox	Select the FortiEDR Jumpbox that will communicate with this User Access system.
Name	Specify a name of your choice to be used to identify this User Access system.

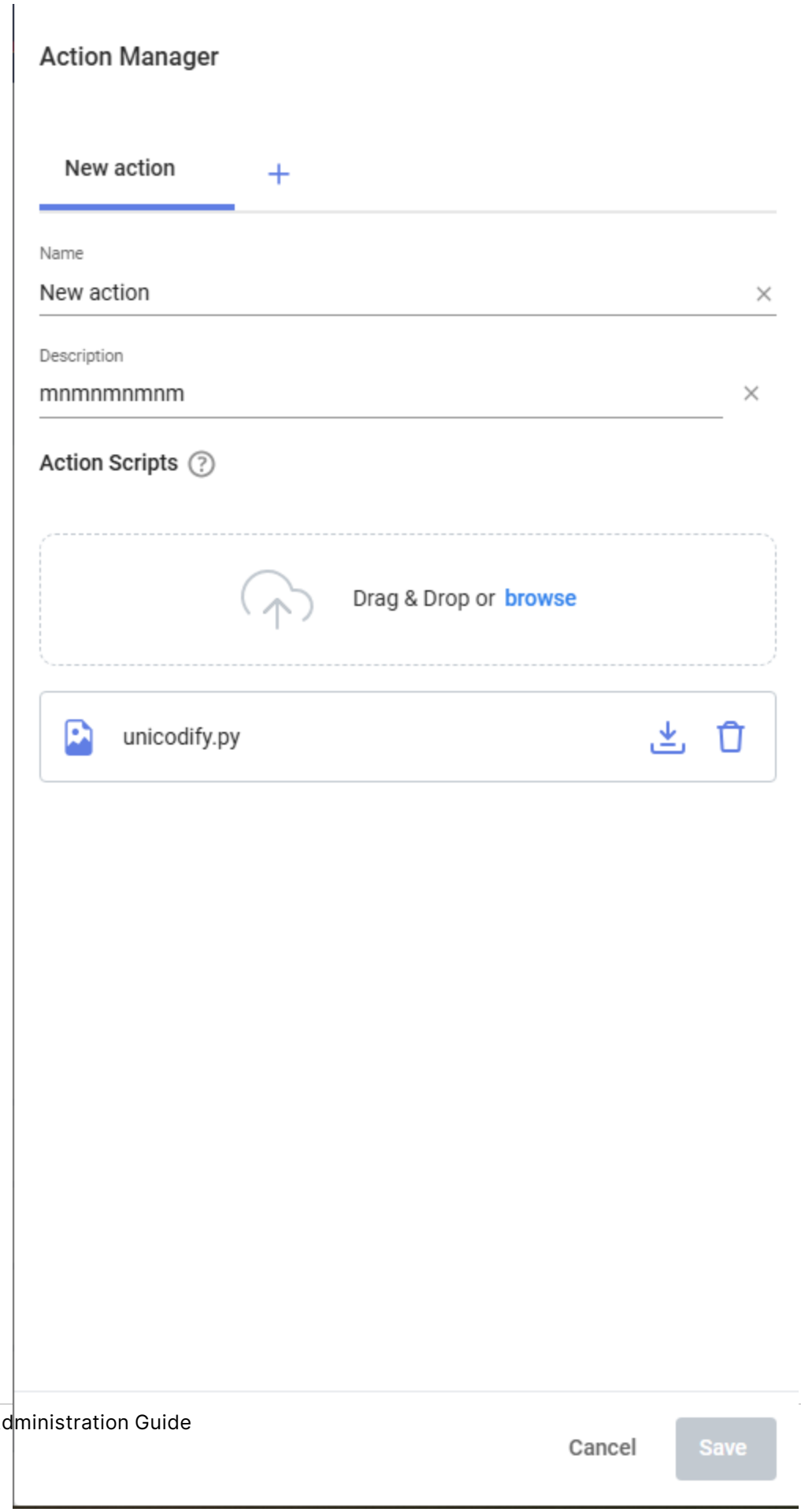
Field	Description
Type	Select the type of user access to be used in the dropdown list. For example, *Active Directory*.
Host	Specify the IP or DNS address of the external User Access system.
Port	Specify the port that is used for communication with the external User Access system.
API Key/Credentials	Specify authentication details of the external user access system: • To use an API token , click the *API Key* radio button and copy the token value into the text box. • To use API credentials, click the *Credentials* radio button and fill in the external User Access system API username (or Bind User DN) and password.

3. In the *Actions* area on the right, define the action to be taken by this connector:
   - To use an action provided out-of-the-box with FortiEDR (for example, Disable user account on Active Directory), in the *baseDN* field of *Disable user account* or *Reset user password*, specify where FortiEDR starts searching for the user upon which actions are performed.
   - To use a custom integration action:
     i. Click the *+ Add Action* button. The following popup window displays:



     ii. In the *Action* dropdown menu, select one of the previously defined actions (which were defined in FortiEDR as described in Custom integration on page 291), or define a new action that can be triggered according to the definitions in the Playbook:

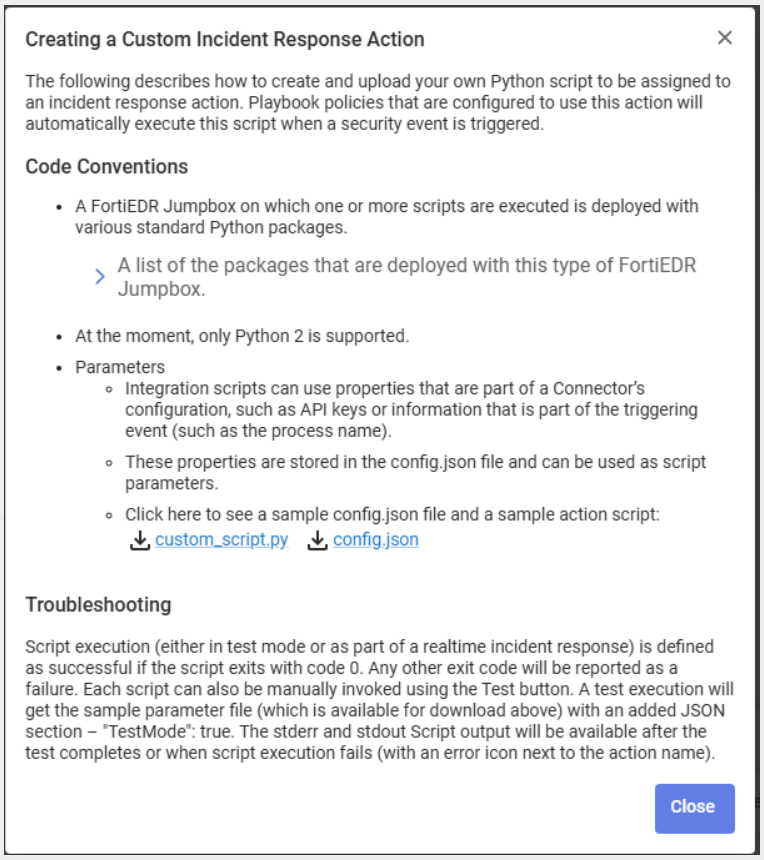
i. Click the *Create New Action* button. The following displays:


Action Manager
New action
Name
New action
Description
mnmnmnmnm
Action Scripts
Drag & Drop or browse
unicodify.py
Cancel
Save

ii. Fill out the fields of this window as follows in order to define a new action to be triggered in response to an incident.

In order to trigger this action, a Playbook policy must be defined that triggers this action to execute the script when a security event is triggered. The definition of this new action here automatically adds this action as an option in a Playbook policy. However, this action is not selected by default in the Playbook policy. Therefore, you must go to the Playbook policy and select it in order for it to be triggered when a security event is triggered.

Field	Definition
Name	Enter any name for this action.
Description	Enter a description of this action.
Upload	Upload a Python script that calls an API from the third-party system in order to perform the relevant action. Python 2.7 or later is supported. The Python script must be created according to the coding conventions that can be displayed by clicking the icon next to the *Action Scripts* field. The following displays providing an explanation of the coding conventions and provides various links that you can click to see more detail and/or to download sample files.

Field	Definition
	

iii. Click *Save*. The new action is then listed in the *Actions* area.

4. You can click the *Test* button next to an action to execute that action.
5. Click *Save* to save the connector configuration.

Configuring Playbooks

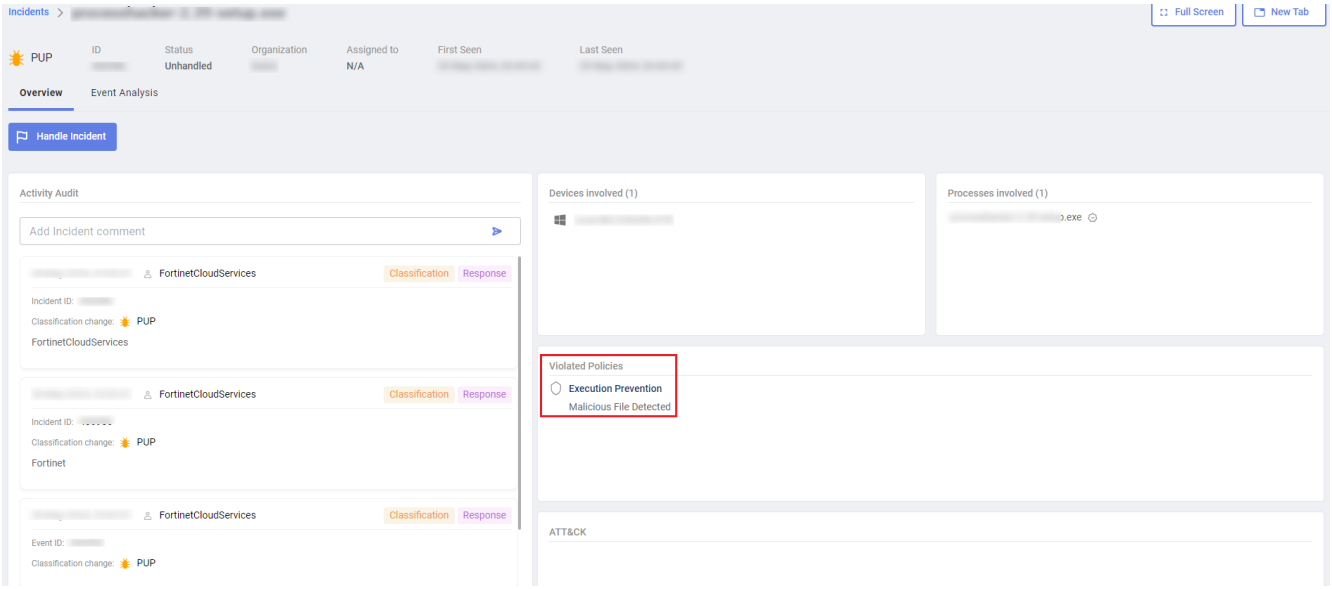
To configure an automated incident response that uses a user access connector to reset user password or disable a user upon security event triggering:

1. Navigate to the *Profiles* > *Playbooks* page.
2. Open the Playbook policy that is applied on devices for which you want the user access response to apply.
3. Place a checkmark in the relevant *Classification* column next to the *Disable user* row under the *INVESTIGATION* section or the *Reset user password* row under the *REMEDIATION* section.
   FortiEDR is now configured to automatically perform user access actions upon triggering of a security event.

To configure an automated incident response that uses a User Access connector to perform a custom action upon the triggering of a security event:

1. Navigate to the *Profiles* > *Playbooks* page.
2. Open the Playbook policy that is applied on devices for which you want the custom action (defined above) to apply.
3. In the *CUSTOM* section, place a checkmark in the relevant *Classification* columns next to the row of the relevant custom action.
4. In the dropdown menu next to the relevant custom action, select the relevant User Access connector with which to perform the action.
   FortiEDR is now configured to trigger this action in the third-party system upon the triggering of a security event.

Automatic incident response actions are listed in the*Overview* tab when you select the incident and click *Investigate* in the *Incidents* pane, as shown below:



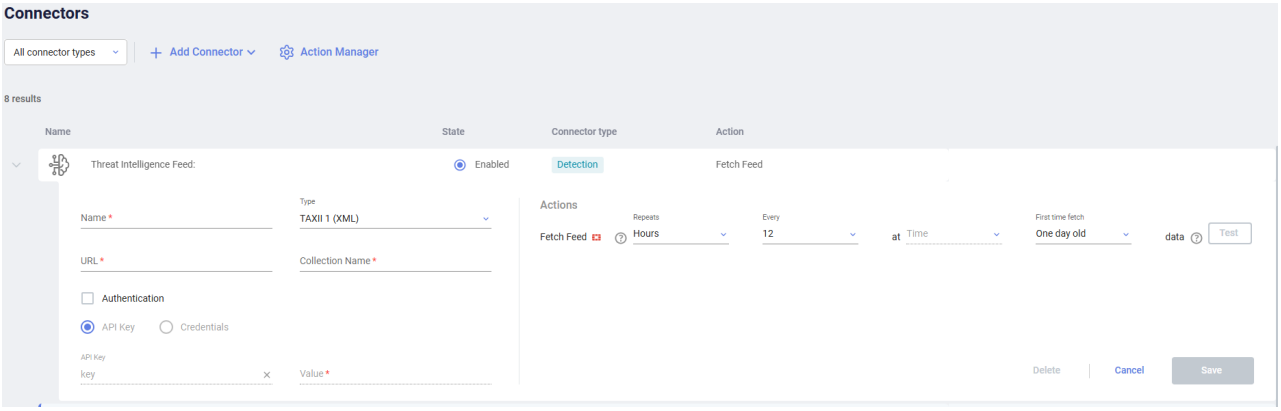
Threat Intelligence Feed integration

When a Threat Intelligence Feed connector is configured, FortiEDR creates a Threat Hunting query based on the data fetched from STIX/TAXII feed. The related query is updated upon each scheduled retrieval of collection data which covers the following indicators: hashes, file names, files size, paths, IPs, usernames, registry keys, URLs, and domain names. You can find the relevant queries under *Threat Hunting > Saved Queries*.

As one Threat Hunting query can include only 150 to 1000 conditions, depending on the indicator type, FortiEDR may create multiple query entries for the same collection.

To set up a Threat Intelligence Feed connector with FortiEDR:

1. Click the *Add Connector* button and select *Threat Intelligence Feed* in the *Connectors* dropdown list. The following displays:



2. In the *Details* section, fill in the following fields:

Field	Definition
Name	Specify a name of your choice which will be used to identify this Threat Intelligence Feed Collection.
Type	Select the syntax type of the original query, for example: *TAXII (JSON)* or *TAXII 1 (XML)*.
URL	Specify the IP or DNS address of the Threat Intelligence server.
Collection ID	Specify the collection name of the XML query or collection ID of the JSON query.
Authentication	Select this option to specify authentication details of your Threat Intelligence Feed. To use an API token, click the *API Key* radio button and copy the token value into the text box. To use API credentials, click the *Credentials* radio button and fill in the external system API username and password.
Enabled	Use this option to enable or disable FortiEDR integration with this Threat Intelligence Feed.

3. In the *Actions* section, specify the schedule for FortiEDR to retrieve the provided collection data, which covers the following indicators: hashes, file names, files size, paths, IPs, usernames, registry keys, URLs, and domain names.
4. Specify the age of collection data for the initial retrieval. For example, *One day old* means that only indicators that were added to the Collection during the last day will be retrieved for the initial retrieval.
5. Click the *Test* button to execute the action.

6. Click *Save*.
   The Threat Intelligence Feed connector is set up and relevant queries will be created in Saved Queries under Threat Hunting on page 131.

Action Manager

The *Action Manager* button is only available to users with Admin or IT permissions and have the *Custom script* option enabled. For more information about user roles and permissions, see Users on page 359.

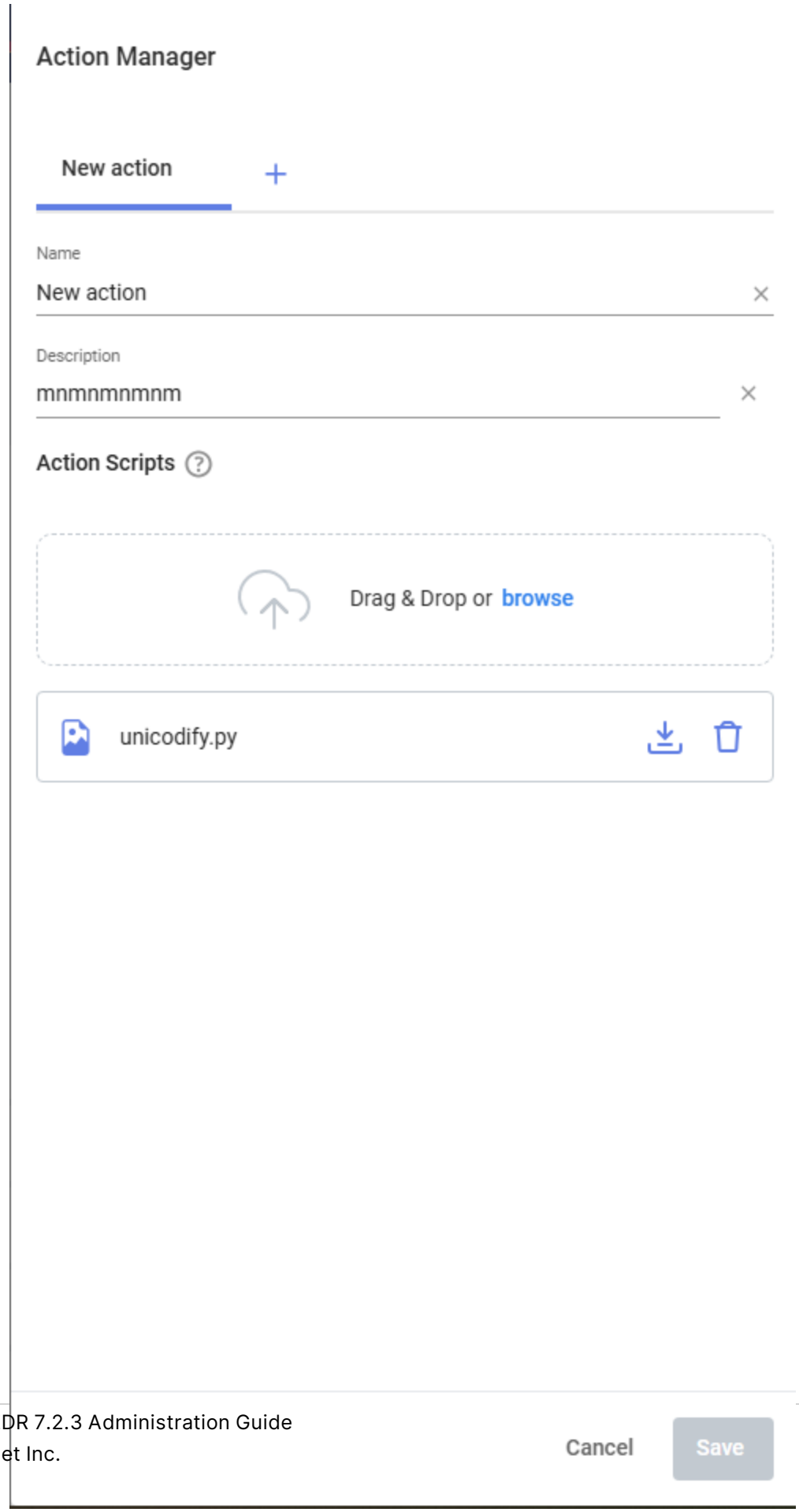
FortiEDR enables you to define connectors to external systems, so that FortiEDR will automatically trigger predefined actions when a security event is triggered in FortiEDR. You can define your own actions while defining a Custom integration connector, Firewall integration connector or NAC integration connector (as described above). Each action is comprised of a Python script (one or several ones) that calls an API from the third-party system in order to perform the relevant action.

The Action Manager enables you to upload and manage (add, modify and delete) these actions and the Python scripts that call third-party systems' APIs. Python 2.7 or later is supported.

To display the Action Manager:

1. Go to *Profiles* > *Integrations* > *Connectors*.

2. Click the *Action Manager* button. The following displays:

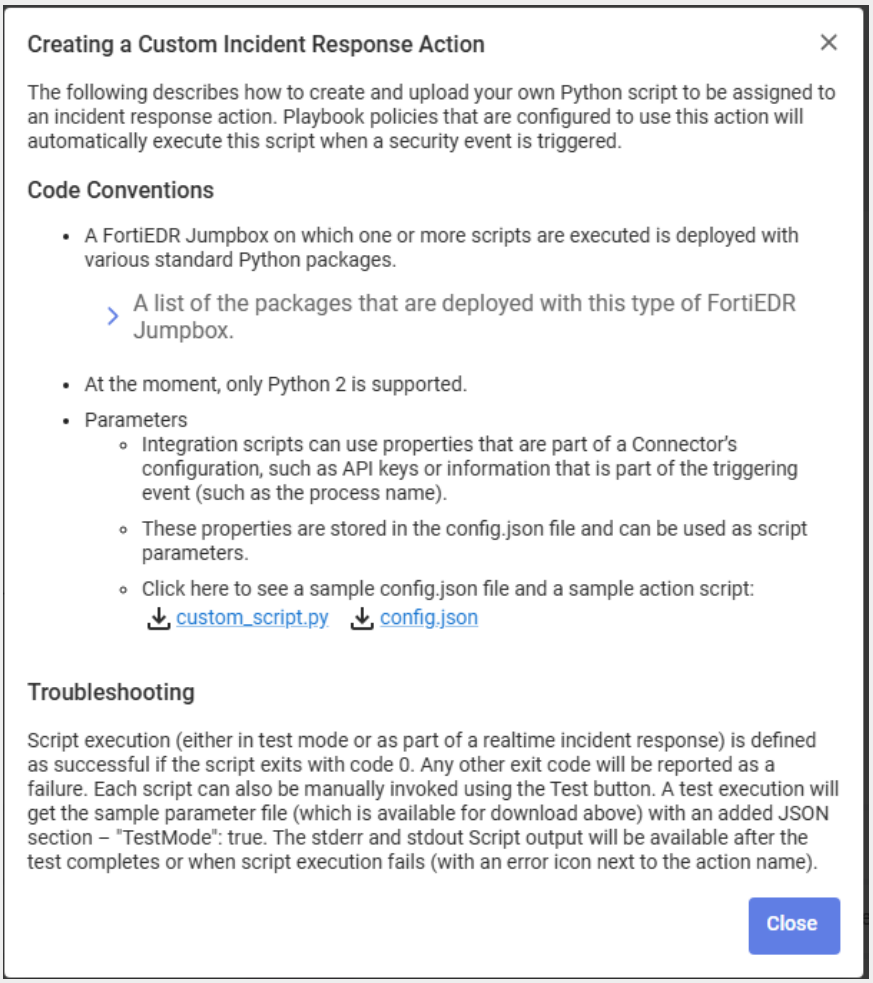

Action Manager
New action
Name
New action
Description
mnmnmnmnm
Action Scripts
Drag & Drop or browse
unicodify.py
Cancel
Save

To define a new action:

1. Click the *+ Add action* button.
2. Fill out the fields of this window as follows in order to define a new action to be triggered in response to an incident.

In order to trigger this action, a Playbook policy must be defined that triggers this action to execute the script when a security event is triggered. The definition of this new action here automatically adds this action as an option in a Playbook policy. This action however, is not selected by default in the Playbook policy. Therefore, you must go to the Playbook policy and select it in order for it to be triggered when a security event is triggered.

Field	Definition
Name	Enter any name for this action.
Description	Enter a description of this action.
Upload	Upload a Python script that calls an API from the third-party system in order to perform the relevant action. Python 2.7 or later is supported. This Python script must be created according to the coding conventions that can be displayed by clicking the icon next to the *Action Scripts* field. The following displays providing an explanation of these coding conventions and provides various links that you can click to see more detail and/or to download sample files.

Field	Definition
	

3. Click *Save*.

To modify the script of an action:

1. Go to *Profiles* > *Integrations* > *Connectors*.
2. Click the *Action Manager* button.
3. Select the action of the script to be modified.
4. In the *Action Scripts* area, hover over the name of the script in order to display various tools, as follows:

Tool	Description
	To download the action's current script. For example, so that you can edit it.
	To delete the action's selected script.

Tool	Description
	To upload a new Python script that calls an API from the third-party system in order to perform the relevant action. Python 2.7 or later is supported.

5. Click *Save*.

Playbooks

The FortiEDR Playbooks feature determines which automatic actions are triggered, based on the classification of a security event. Playbook policies enable administrators to preconfigure the action(s) to be automatically executed according to a security event's classification. Typically, Playbook policies only need be configured once, and can be modified thereafter, if needed. FortiEDR classifies each security event into one of five categories.

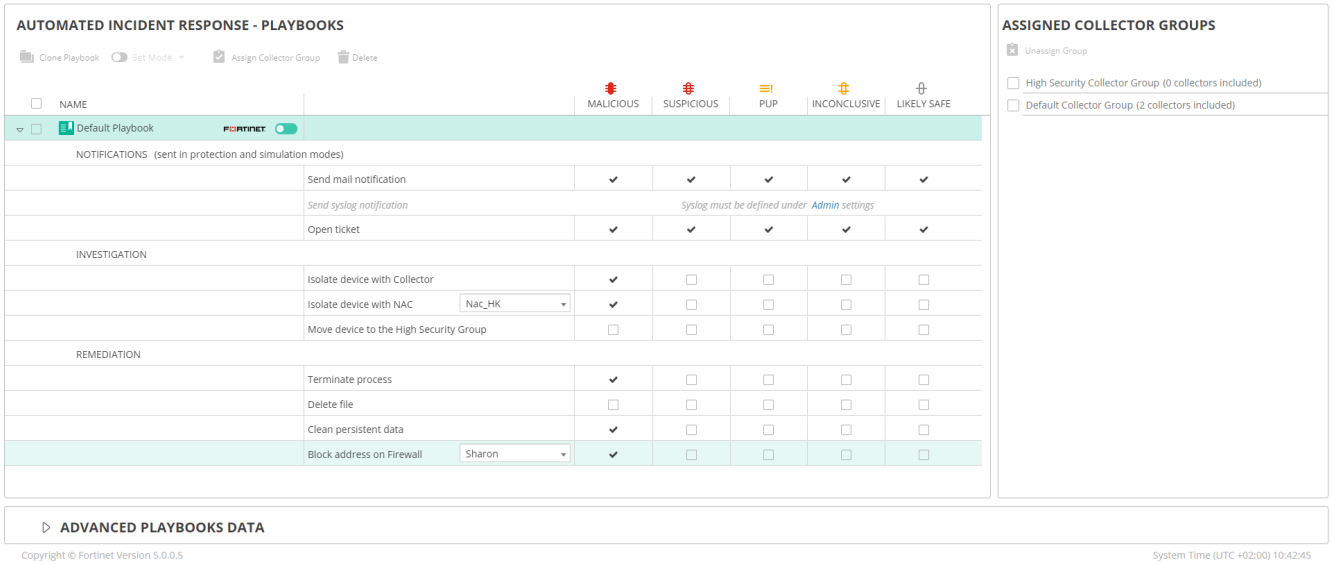
FortiEDR provides the following Playbook policy out of the box:

- **Default Playbook**: This Playbook policy specifies the default actions for the Collector Groups assigned to the policy. By default, all Collector Groups are assigned to this policy.

Automated Incident Response - Playbooks Page

The *AUTOMATED INCIDENT RESPONSE – PLAYBOOKS* page displays a row for each Playbook policy. To access this page, select *Profiles > Playbooks*.

Each Playbook policy row can be expanded to show the actions that it contains, as shown below:



You can drill down in a Playbook policy row to view the actions for that policy by clicking the icon.

- There are more options and actions than those shown above that can be added to a Playbook policy, such as the blocking of a malicious IP address. You may consult Fortinet Support about how to add them.
- Automatic Incident Response Playbook features can also be triggered by extended detection events when follow-up actions are configured for the Collector Group of a device on which the event triggered. This enables the system to follow up upon the detection of such an event and execute a sequence of actions, such as to block an address on a firewall or to isolate the device in which part of the event occurred.

Assigned Collector Groups

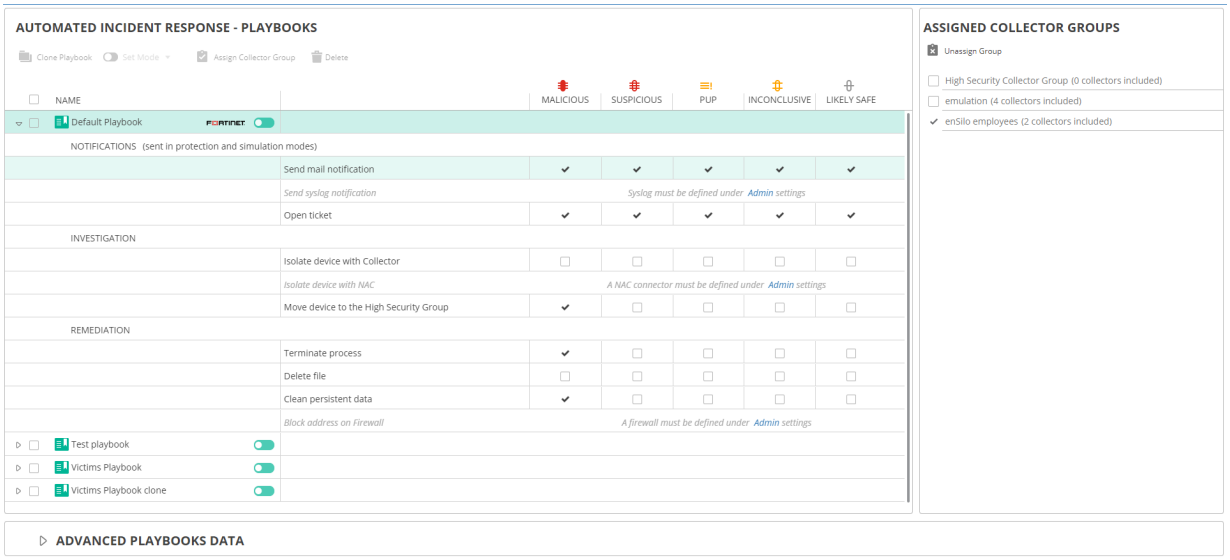
The Assigned Collector Groups pane on the right lists the various Collector Groups in the system. By default, all Collector Groups are assigned to the Default Playbook policy. You can reassign one or more Collector Groups to different Playbook policies, if preferred.

Note: When upgrading your FortiEDR system, all existing Collector Groups are automatically assigned to the Default Playbook policy.

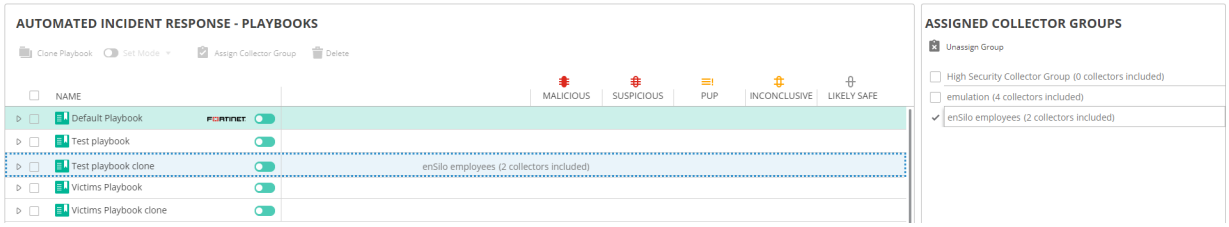
Cloning a Playbook Policy

Cloning a Playbook policy unassigns the policy from one Collector Group and then reassigns it to a different Collector Group. A Collector Group can only be assigned to one Playbook policy.

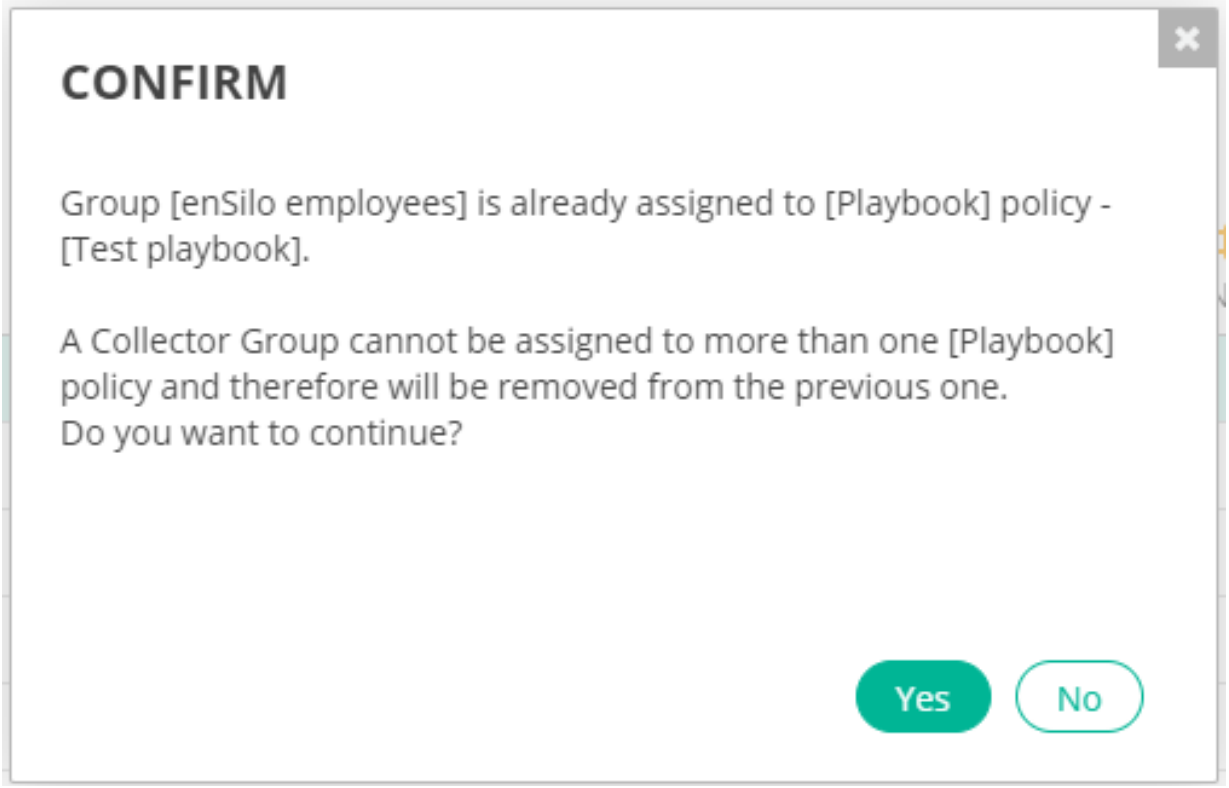
1. In the *AUTOMATED INCIDENT RESPONSE - PLAYBOOKS* page, select the Playbook policy row that you want to clone in the *Playbook Policies* list.
2. Do one of the following:
   a. Select the checkbox(es) of the Collector Group(s) in the *Assigned Collector Groups* pane that you want to assign to the cloned Playbook policy. Then, click the *Unassign Group* button in the *Assigned Collector Groups* pane.



b. Click *Collector Group* in the *Assigned Collector Groups* pane that you want to assign to the cloned Playbook policy. Then, drag the Collector Group onto the cloned Playbook policy in the *Playbook Policies* list, as shown below:



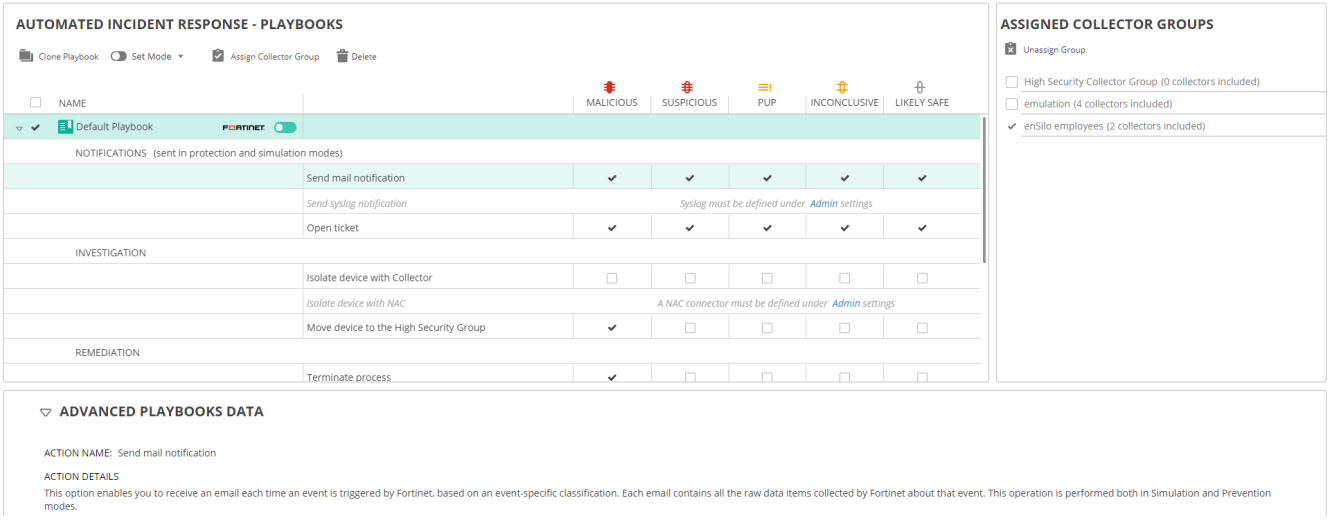
The following message displays.



Click *Yes*.

Advanced Playbooks Data

The *ADVANCED PLAYBOOKS DATA* area at the bottom of the *AUTOMATED INCIDENT RESPONSE – PLAYBOOKS* page displays more details about the action selected in the *Playbook Policy* list.



Playbook policy actions

Playbook policy actions are divided into the following types:

- Notifications on page 324
- Investigation on page 326
- Remediation on page 327
- Custom on page 329

Each of these categories contains different types of actions that can be performed when a security event is triggered.

Notifications

Notification actions send a notification when a relevant security event is triggered. These actions are implemented in both FortiEDR modes (Simulation and Prevention).

Notifications can be one of the following types:

- Emails
- Syslog
- Open Ticket

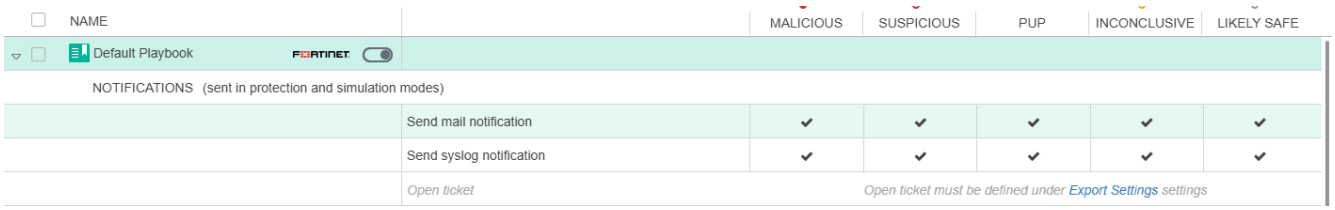
Notification actions must be enabled in order to be implemented by a Playbook policy. If notifications are disabled, they are not implemented by the Playbook policy, even if that policy is configured to send notifications. For more details see SMTP on page 330.

Each row under *Notifications* corresponds to a single type of notification (mail [email] notification, Syslog notification or Open Ticket notification). In the *Notifications* area, you configure each notification type to

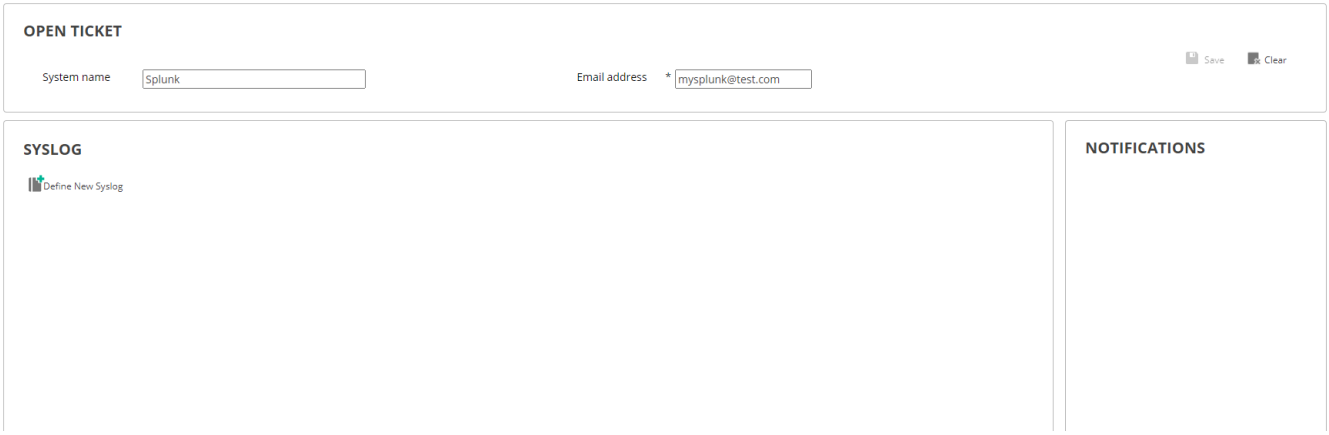
indicate whether or not it is to automatically send the relevant notification, once triggered by a security event.

The *Malicious*, *Suspicious*, *PUP*, *Inconclusive*, and *Likely Safe* columns correspond to the possible classifications (see Overview on page 91 and Incidents pane on page 86) for a security event. When a checkmark ✔ appears in one of these columns, it means that a notification of the specified type is sent when an event is triggered with that classification.

By default, the *Default Playbook* policy is set to Simulation mode, and only email notifications are automatically enabled, as shown below:



SMTP, Syslog and Open Ticket must already be configured in order to send their respective notifications. If their settings are not already configured, the relevant row in the Notifications list displays a message indicating that you must first configure it, with a link to the following configuration page when clicked:



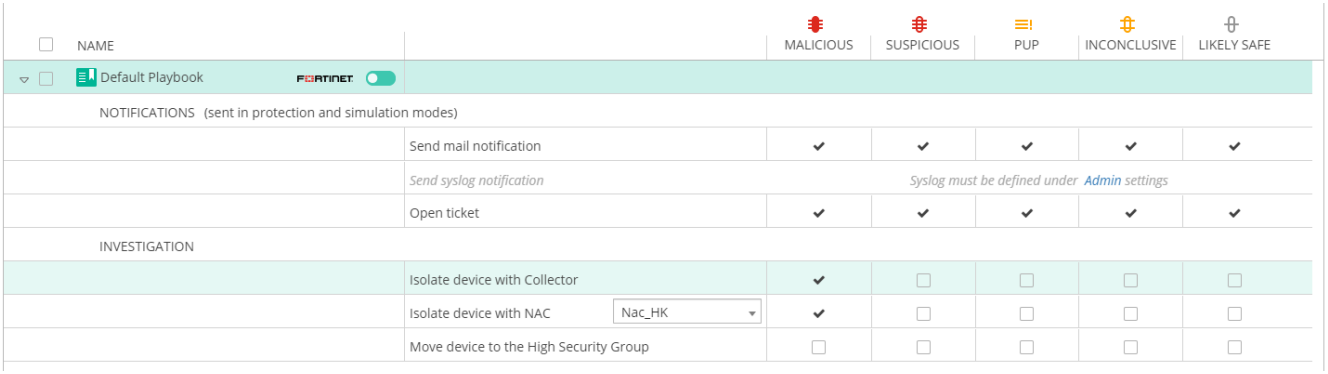
Notifications are sent based on the Core or FortiEDR Cloud Service (FCS) classification of the event, depending on whether the FCS classification happens within the timeout period and whether the FCS classification result differs from the one from the Core:

The default timeout period for FCS classification is 3 minutes. To change the default FCS timeout value for your dedicated environment, contact Fortinet Support.

- If the FCS classification is received within the timeout period, the notification is sent based on the FCS classification.
- If the FCS classification result is not received within the timeout period, a notification is sent by the end of the timeout based on the initial Core classification.
- If the FCS classification comes in after the timeout with a different result from the Core classification, an updated notification is sent based on the final classification by the FCS.

Investigation

Investigation actions enable you to isolate a device or assign it to a high-security Collector Group, in order to further investigate the relevant device's activity.



Investigation actions can be one of the following types:

- Isolate device with Collector on page 326
- Isolate device with NAC on page 326
- Move device to High Security Group on page 327

All investigation actions are performed based on FortiEDR Cloud Service (FCS) classification. If FCS is not running, FortiEDR performs investigation actions based on Core classification instead.

Isolate device with Collector

This action blocks the communication to/from the affected Collector. This action only applies for endpoint Collectors. For example, if the Playbook policy is configured to isolate the device for a malicious event, then whenever a maliciously classified security event is triggered from a device, then that device is isolated (blocked) from communicating with the outside world (for both sending and receiving). This means, for example, that applications that communicate with the outside world, such as Google Chrome, Firefox and so on, will be blocked for outgoing communications.

A checkmark ✔ in a classification column here means that the device is automatically isolated when a security event is triggered with that classification.

Isolate device with NAC

This action blocks the communication to/from the affected device by disabling this host on an external Network Access Control system. A NAC connector must already be configured in order to perform this action. For details about how to configure NAC connectors, see Network Access Control (NAC) integration on page 271.

In the dropdown menu next to the action, you can specify which NAC to use for disabling the host or select all of them.

Unlike devices that are isolated using the FortiEDR Collector for which there is an isolation indication on *Inventory* tab and un-isolation is available, devices that were isolated using an external system such as a NAC are not indicated as such on the FortiEDR Console and un-isolation is only possible on the external NAC system.

Move device to High Security Group

FortiEDR provides two default Collector Groups: the Default Collector Group and the High Security Collector Group. Both of these default Collector Groups are initially assigned to the Default Playbook policy, and cannot be deleted.

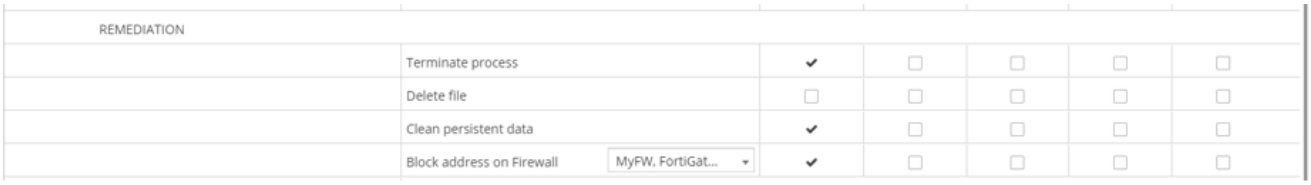
A checkmark ✔ in a classification column here means that the device is automatically moved (assigned) to the High Security Collector Group when a security event is triggered that has that classification. This feature is useful when you want to mark Collectors that triggered malicious events.

Move device to High security group	✔	✔	✔	✔	☐

Remediation

Remediation actions enable you to remediate a situation in the FortiEDR system, should malware be detected on a device.

All FortiEDR remediation actions are based on the final classification of a security event by the FortiEDR Cloud Service (FCS), which is a cloud-based, software only service that determines the exact classification of security events with a high degree of accuracy.



Remediation actions can be one of the following types:

- Terminate process on page 327
- Delete file on page 328
- Clean persistent data on page 328
- Block address on Firewall on page 328

Terminate process

This action terminates the affected process. It does not guarantee that the affected process will not attempt to execute again. This action can also be performed manually using the Forensics add-on, as described on Remediating a device upon malware detection on page 165

A checkmark ✔ in a classification column here means that the affected process is automatically terminated on the device when a security event is triggered that has that classification.

Delete file

This action ensures that the file does not attempt to exfiltrate data again, as the file is permanently removed from the device. This action can also be performed manually using the Forensics add-on, as described on Remediating a device upon malware detection on page 165

A checkmark ✔ in a classification column here means that the affected file is automatically removed on the device when a security event is triggered that has that classification.

Clean persistent data

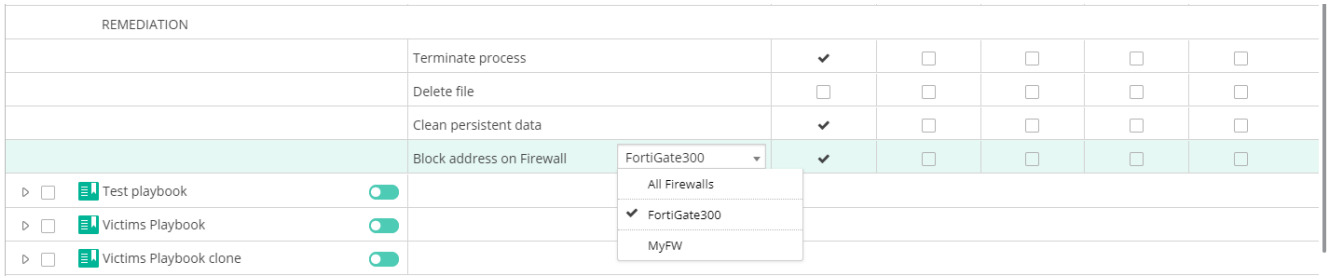
This action cleans the registry keys in Windows. This action can also be performed manually using the Forensics add-on, as described on Remediating a device upon malware detection on page 165.

A checkmark ✔ in a classification column here means that the affected registry key is automatically cleaned on the device when a security event is triggered that has that classification.

Block address on Firewall

This action ensures that connections to remote malicious addresses that are associated with the security event are blocked. A Firewall Connector must already be configured in order to perform this action. For details about how to configure firewall connectors, see Firewall Integration on Firewall integration on page 263.

In the dropdown menu next to the action, you can specify which firewalls are used to perform the blocking or select all of them, as shown below:

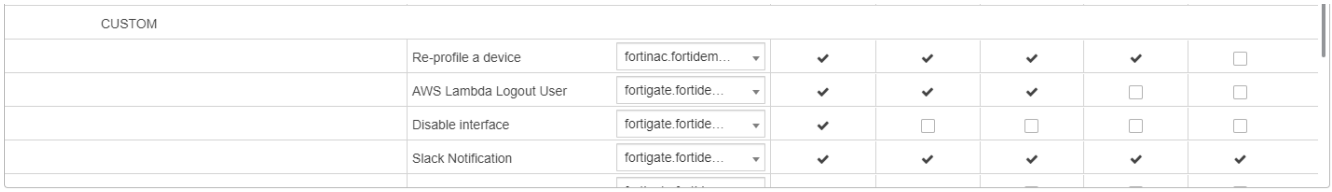


A checkmark ✔ in a Classification column means that communication with the affected destination is automatically blocked when a security event is triggered that has that classification.

The firewall must already be configured in order to add malicious destinations to blocked addresses. If its settings are not already configured, the relevant row in the Remediation list displays a message indicating that you must first configure it, with a link to the relevant place in the user interface to configure it.

Custom

Custom actions enable you to automatically trigger an incident response in a third-party system as the result of a security event detected by FortiEDR, according to the Custom Integration connector (and its actions) that you define.



The *CUSTOM* section of the *Playbook* page lists the actions that have been defined for Custom Integration Connectors, as described on Custom integration on page 291.

This list appears empty if no custom integration connector has been defined.

A checkmark ✔ in a classification column here means that the defined action is triggered in the third-party system when a security event is triggered that has that classification.

Other options in the Playbooks tab

You can perform the following operations using the toolbar at the top of the tab:

- *Clone Playbook*: Clones a Playbook policy, as described on Playbooks on page 321.
- *Set Mode*: Changes the mode of the Playbook policy. This process is similar to that for setting the mode for a standard security policy, which is described on Setting a security policy's Prevention or Simulation mode on page 205
- *Assign Collector Group*: Assigns a Playbook policy to a Collector Group. This process is similar to that for assigning a standard security policy to a Collector Group, which is described on Assigning a security policy to a Collector Group on page 209.
- *Delete*: Deletes a cloned Playbook policy. Default Playbook policies cannot be deleted.

The default Playbook policy (named Default Playbook) is mandatory and cannot be deleted.

Export settings

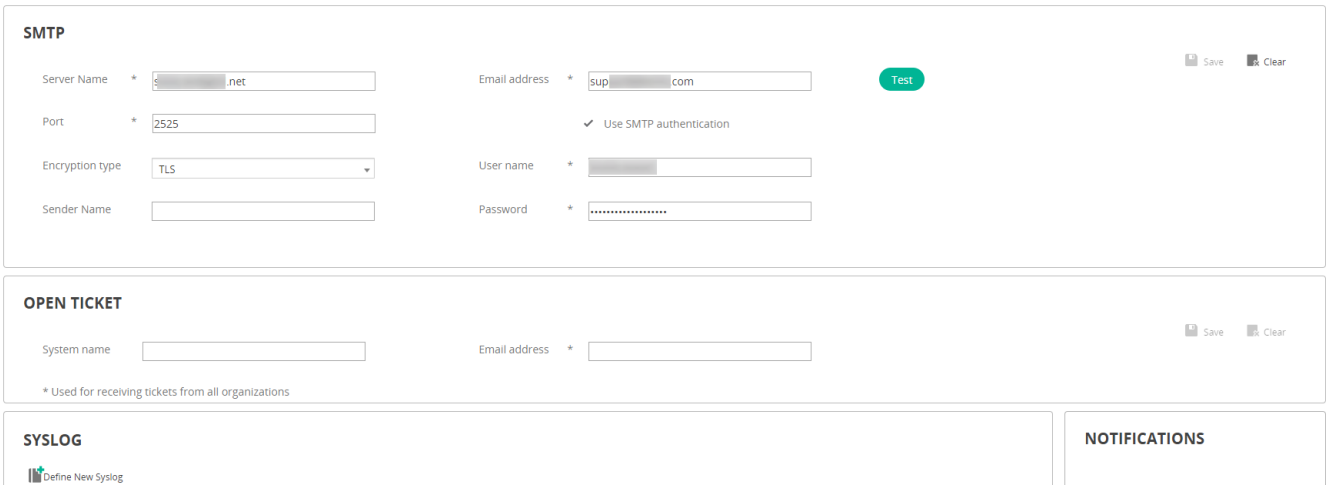
The *EXPORT SETTINGS* option provides access to the following options:

- SMTP on page 330

- Open Ticket on page 331
- Syslog on page 331

SMTP

The SMTP option enables you to configure the SMTP server to be used for sending emails. You can also check the connectivity to the SMTP server.



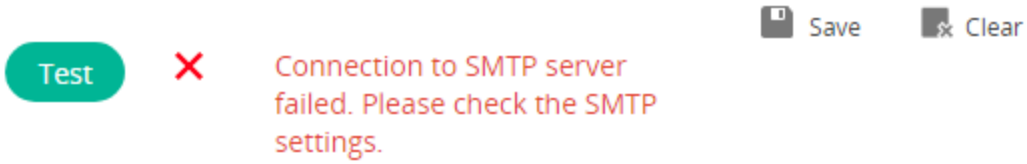
In a single-organization system, SMTP settings are only accessible in Hoster view (for administrators of all organization), or to the administrator of that organization.

To configure SMTP server settings:

1. In the SMTP area, enter standard SMTP settings and then click *Save*.

To test SMTP server connectivity:

1. In the SMTP area, click *Test*. An error message displays if there is no connectivity to the server.



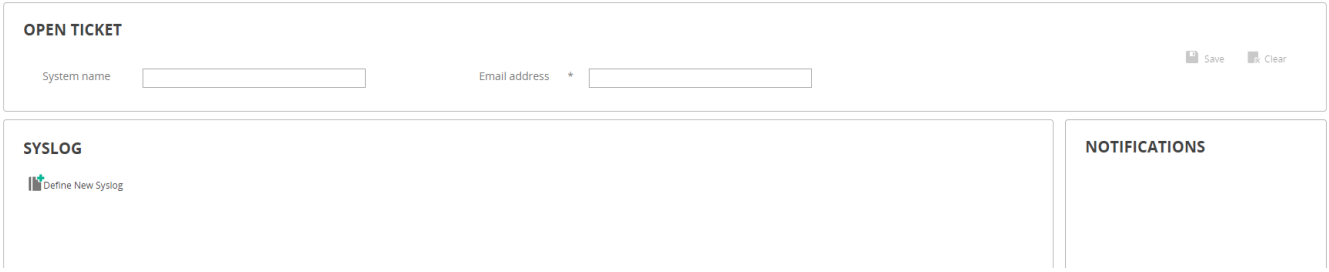
Open Ticket

The *Open Ticket* option enables you to send events to an event-management tool such as Jira or ServiceNow. Open Ticket automatically opens a ticket and attaches the relevant event to a ticket.

In order for the Open Ticket feature to work properly, you must set up an email feed in the event-management tool to be used.

Most event-management tools are supported. FortiEDR has tested and verified that Open Ticket works with the ServiceNow and Jira systems. For more details about setting up the email feed required for this feature, see Appendix A – Setting up an email feed for open ticket on page 461.

Security events are only sent to a ticketing system when they occur on devices that are part of Collector Groups that are assigned to a Playbook policy in which the *Open Ticket* option is checked.

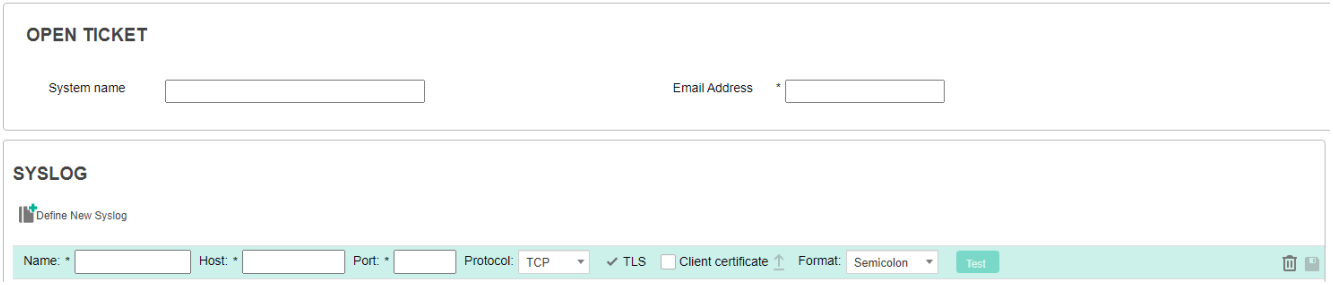


To configure Open Ticket settings:

1. In the *Open Ticket* area, in the *System name* field, enter the system name for the tool to be used for event management. This is a free-text field.
2. In the *Email address* field, enter the email address that is the destination to which all tickets are to be sent from FortiEDR. All tickets from all organizations are sent to this email.
3. Click *Save*.

Syslog

The *SYSLOG* option enables you to configure FortiEDR to automatically send FortiEDR events to one or more standard Security Information and Event Management (SIEM) solutions (such as FortiAnalyzer) via Syslog.



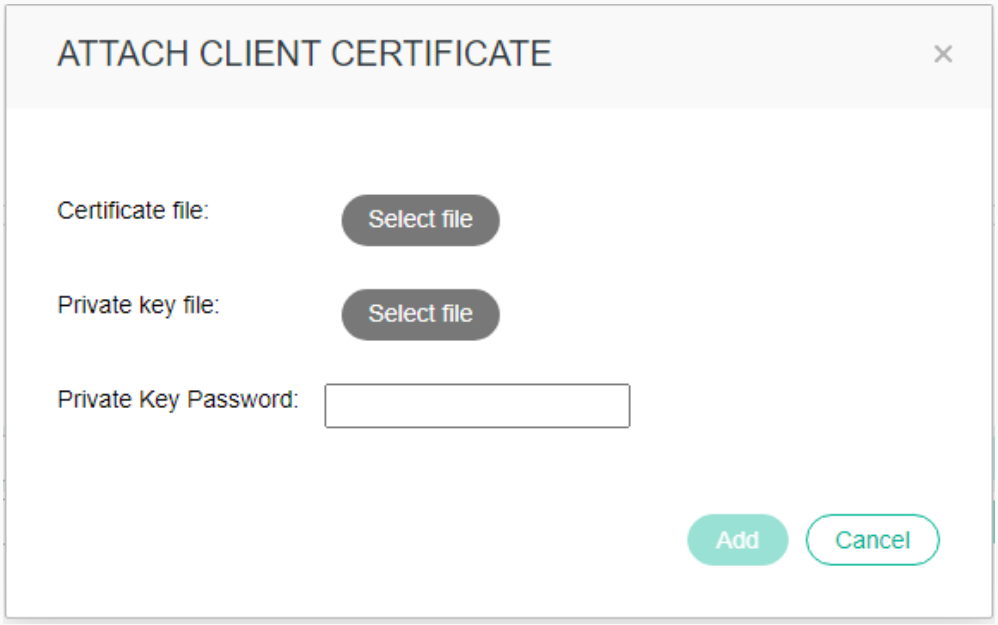
All Syslog messages in FortiEDR originate from the Central Manager. The source IP address for syslog messages is the IP of the Central Manager. The FortiEDR Central Manager server sends the raw data for security event aggregations. Each entry contains a raw data ID and an event ID. Variants belonging to the same security event aggregation share the same event ID, which enables the SIEM to combine them into one security event on the SIEM side, in order to remain aligned with the FortiEDR system.

Syslog messages are only sent for security events that occur on devices that are part of Collector Groups that are assigned to a Playbook policy in which the *Send Syslog Notification* option is checked.

To define a new Syslog destination:

1. Click the Define New Syslog button.
2. Specify the following attributes:

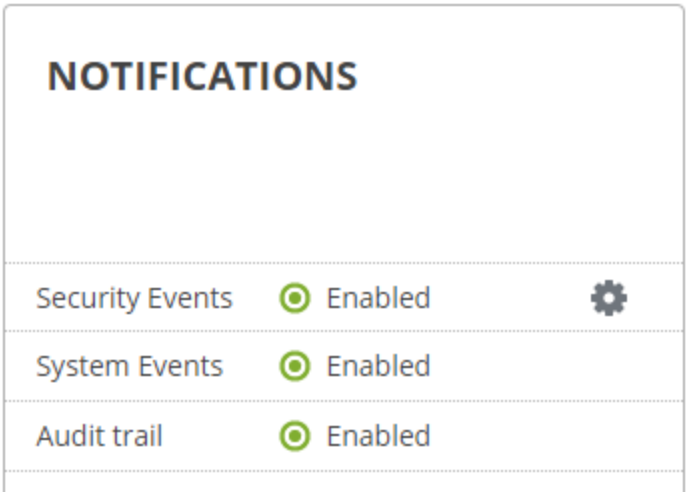
Attribute	Description
Syslog Name	Free-text field that identifies this destination in the FortiEDR.
Host	Host name of the Syslog server.
Port	Port of the Syslog server.
Protocol	Protocol of the Syslog server. You can select *TCP* or *UDP*.
TLS	When *TCP* is selected in *Protocol*, use this option to specify whether to enable TLS. If the Syslog server requires a client-side certificate, you must enable *TLS* before you can upload the certificate.
Client Certificate	If the Syslog server requires a client-side certificate, enable *TLS* and use this option to upload a certificate. For example, if your FortiAnalyzer server requires a client-side certificate, contact Fortinet Support to obtain appropriate client certificate files and upload them here.

Attribute	Description
	
Format	Select the type of the syslog server: • *Semicolon*—Select this option if the syslog server is not one the following three. FortiEDR then uses the default CSV syslog format. • *FAZ*—The syslog server is FortiAnalyzer. FortiAnalyzer Cloud is not supported. • *CEF*—The syslog server uses the CEF syslog format. • *LEEF*—The syslog server uses the LEEF syslog format. Refer to FortiEDR Syslog Message Reference for more details about syslog message fields for different formats.

3. Click the *Test* button to test the connection to the Syslog destination server.
4. Click the button to save the Syslog destination.

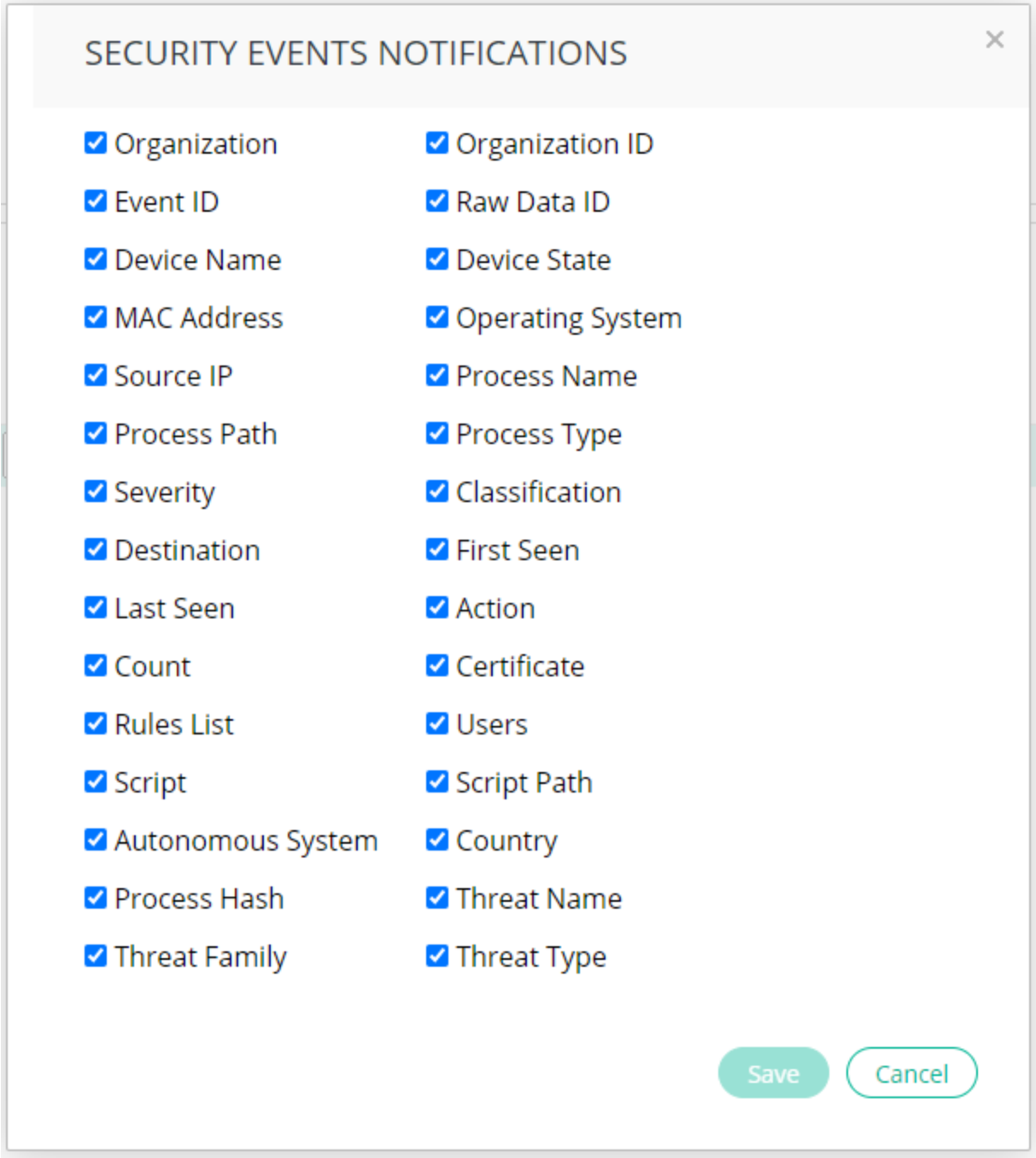
To select which syslog messages to send:

1. Select a syslog destination row.
2. Use the sliders in the *NOTIFICATIONS* pane on the right to enable or disable the destination per event type (system events, security events or audit trail) as shown below:



To select which fields will be included in the syslog messages:

Click the button on the right of the event type and check the checkbox of the fields that you want to be sent to your Syslog.



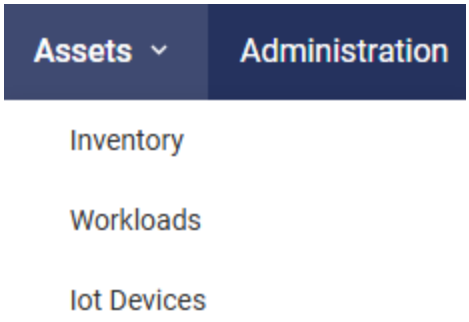
You can also define a Syslog destination via REST API, including the upload of a certificate using Rest API during the process. By default, all available syslog fields and all notifications options, including security, system, and audit events, are enabled. For more details, refer to the FortiEDR RESTful API Guide. You must log in to the Fortinet Developer Network to access the guide.

Warning: If syslog is configured for both Hoster view and an organization, two syslog events will be sent.

For more information on syslog messages, such as message types and fields, see FortiEDR Syslog Message Reference.

Assets

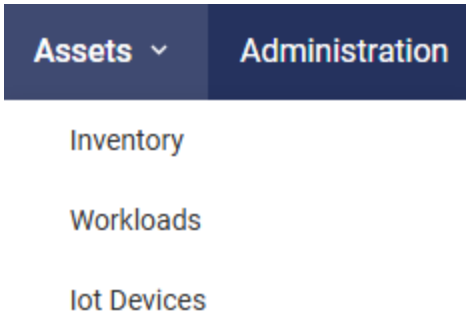
The *Assets* tab displays separate pages for *Inventory on page 337* and *IoT devices on page 351*.

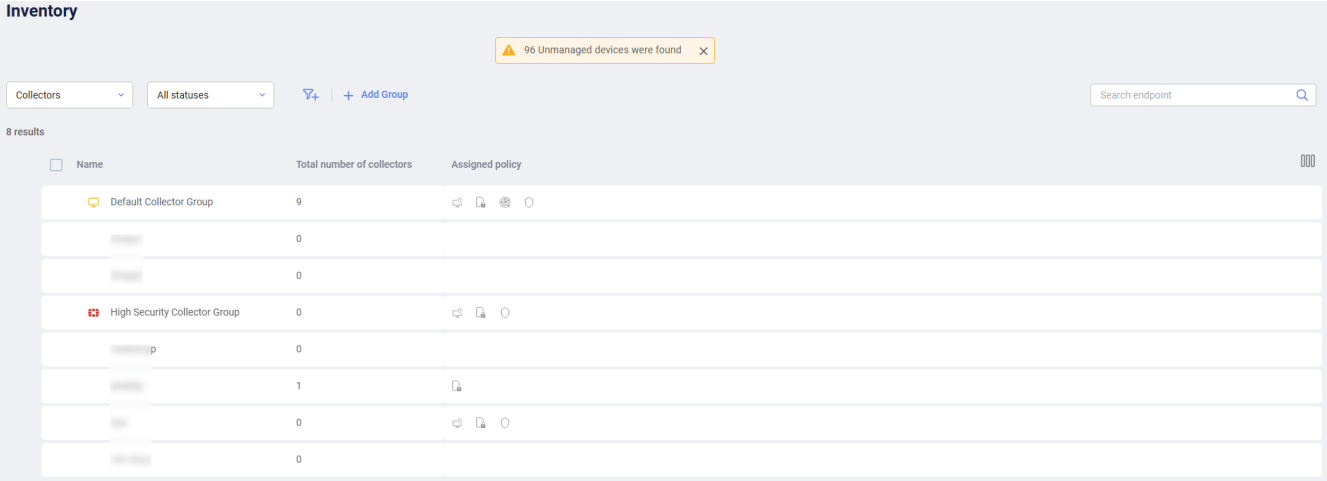


Inventory

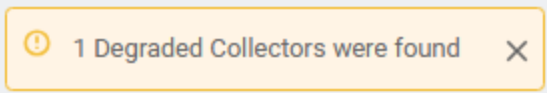
The *Inventory* page displays a list of the previously defined Collector Groups, which can be expanded to show the FortiEDR Collectors that each contains. Additional Collector Groups can be defined by you, as described on Defining a new Collector Group on page 344. FortiEDR Collectors automatically register with the system after installation. By default, each FortiEDR Collector is added to the Collector Group called *All*. You can move any Collector to another Collector Group, as described on Assigning Collectors to a Collector Group on page 345.

To access this page, click the down arrow next to *Assets* and then select *Inventory*, as shown below.

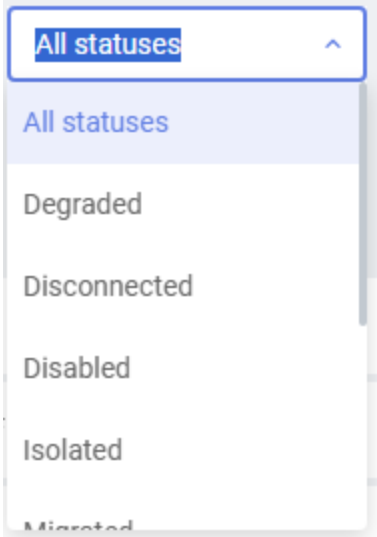




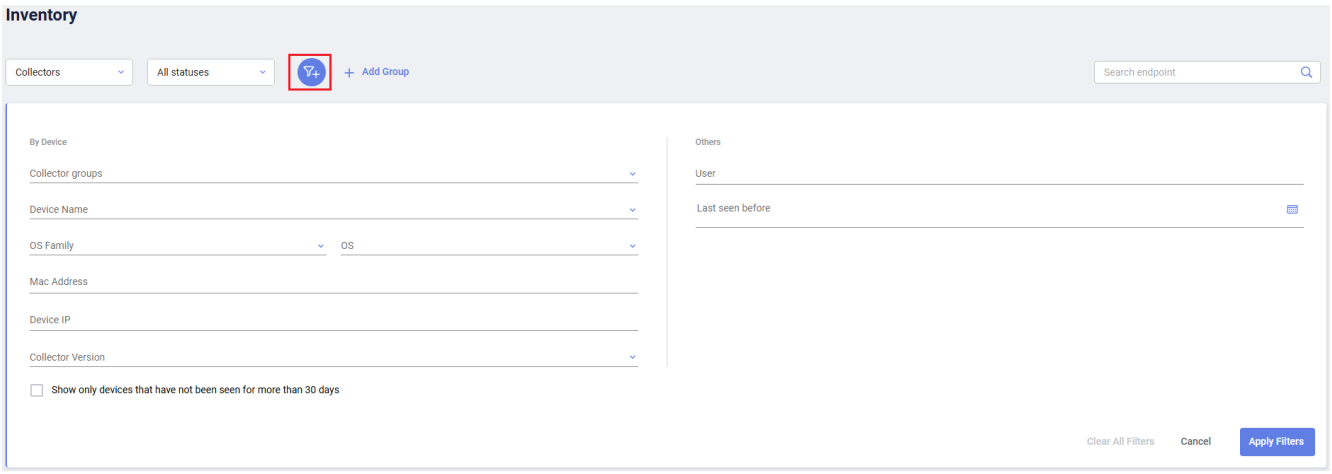
If there are Collectors in the Degraded state, the following indication appears at the right top corner, which you can click to filter the view to only show the Collectors in the Degraded state.



You can select to display all Collectors that are in one of the specific states (*New*, *Running*, *Disabled*, *Degraded*, *Disconnected*, *Isolated*, *Selected*, *Pending Reboot*, *Migrated*, *Pending Migration*, or *Unmanaged*) using the dropdown menu at the top left of the window, as shown below:

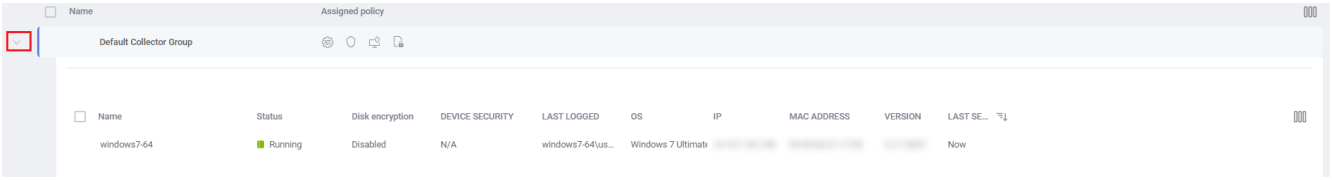


You can also use the *Filter* ( ) button to further narrow down the list of Collectors to display by various criteria. The *Show only devices that have not been seen for more than 30 days* option allows you to display devices that have not been connected for more than 30 consecutive days, which are not counted for licensing purposes. Such devices are in the *Disconnected (Expired)* status.



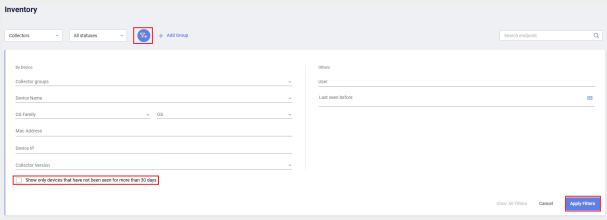
The default Collector Group is a group to which new Collectors are automatically added.

Click the *Expand* icon to expand the list and display the FortiEDR Collectors that the Collector Group contains.



The following information is provided for each Collector. Some columns are hidden by default. You can toggle them on using the *Choose Columns* button (Choose Columns) at the top right corner of the page.

Information Field	Description
Checkbox	Check this checkbox to select the Collector. You can then use one of the buttons at the top left of the window, such as the *Delete* button.
Collector Group Name	Name of the Collector Group to which the Collector is assigned.
Device Name	Device name taken from the communicating device on which a FortiEDR Collector is installed.
OS	Operating system of the communicating device on which the FortiEDR Collector is installed.
IP	IP address of the communicating device on which the FortiEDR Collector is installed.
Version	Version of the FortiEDR Collectors installed on the communicating device.
State	Current state of the FortiEDR Collector. Hovering over the STATE value pops up the last time the STATE was changed. Possible value for STATE are as follows:

<table>
<tr><th>Information Field</th><th>Description</th></tr>
<tr><td></td><td>
<table>
<tr><th>State</th><th>Description</th></tr>
<tr><td>Running</td><td>The FortiEDR Collector is up and all is well.</td></tr>
<tr><td>Disconnected</td><td>The device is offline, powered down or is not connected to the FortiEDR Aggregator.</td></tr>
<tr><td>Disconnected (Expired)</td><td>The device has not been connected for more than 30 consecutive days. Collectors in this state are not counted for licensing purposes.
To see the list of Collectors in this state, click the Filter () button, select the Show only devices that have not been seen for more than 30 days option, and click Apply Filters:
  </td></tr>
<tr><td>Pending Reboot</td><td>After the FortiEDR Collector is installed, you may want some devices to be rebooted before the FortiEDR Collector can start running. This status means that the FortiEDR Collector is ready to run after this device is rebooted. The reboot is performed in the usual manner on the device itself.</td></tr>
<tr><td>Disabled</td><td>The FortiEDR Collector was disabled in the FortiEDR Central Manager. This feature is not yet available in version 1.2.</td></tr>
<tr><td>Degraded</td><td>The FortiEDR Collector is prevented from performing to its full capacity (for example, due to lack of resources on the device on which it is installed or compatibility issues).</td></tr>
</table>
</td></tr>
<tr><td>Last Seen</td><td>Counts the number of days passed from the last time this Collector communicated with the Core.</td></tr>
<tr><td>Last Logged</td><td>Specifies the last user that logged into the device on which the Collector is installed. It shows the domain of the computer/username. If this device has not been logged into, then this column is blank. In addition, if the Collector is not V3.0.0.0 or above, then this column is empty and the events from this Collector will not contain the user from which the security event was triggered.</td></tr>
</table>

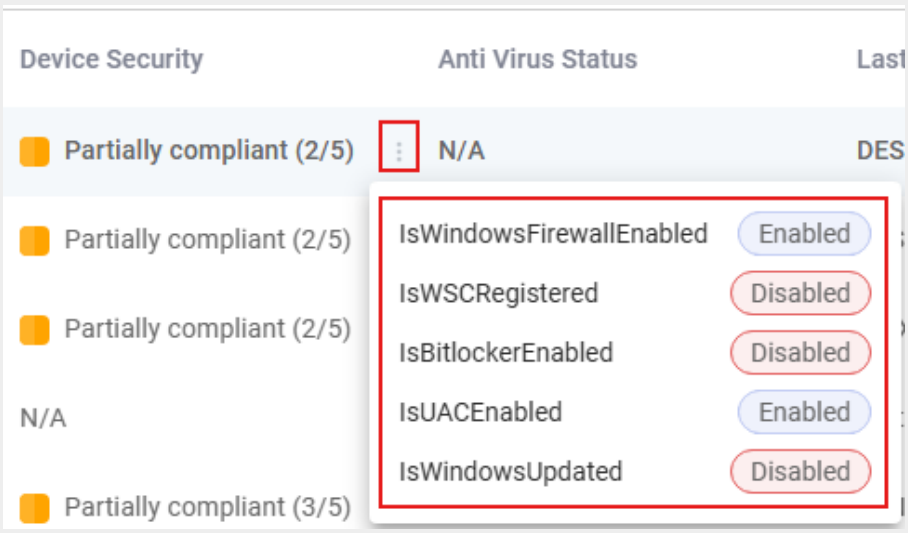
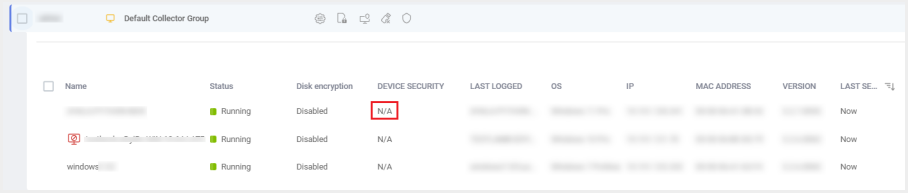
<table>
<tr><th>Information Field</th><th>Description</th></tr>
<tr><td>MAC Address</td><td>Physical address of the device. If a device has multiple MAC addresses, three dots (...) display. You can hover over the MAC Address to display the value (or values, in case of multiple MAC addresses) in a tooltip.</td></tr>
<tr><td>Device Security</td><td>Security posture indicator of Windows and macOS endpoints based on the following OS-level configurations:

 The device security compliance status is informational and has no impact on FortiEDR protection effectiveness. Endpoints are always protected by FortiEDR, regardless of the compliance status.

Windows
• Host Firewall—Host firewall is enabled to control incoming and outgoing network traffic to protect the endpoint against unwanted connections.
• Security Centre—FortiEDR is registered as anti-virus and threat protection agents in Administration > Settings > Windows Security Center on page 409.
• Disk Encryption—Disk encryption is enforced on the endpoint using BitLocker (TPM required).
• User Account Control (UAC)—Windows User Account Control is enabled to protect the operating system from unauthorized changes.
• Windows updates—The latest Windows update has been installed.

macOS
• Host Firewall—Host firewall is enabled to control incoming and outgoing network traffic to protect the endpoint against unwanted connections.
• Disk Encryption—Disk encryption is enforced on the Mac using FileVault.
• Gatekeeper Status—Gatekeeper is enabled to ensure that only trusted software runs on the Mac.
• System Integrity Protection (SIP) Status—System Integrity Protection is enabled to help protect the Mac from malicious software.

To view compliance details of each criteria, click the ellipsis to the right of the indicator:</td></tr>
</table>

Information Field	Description
	 Endpoints that are not in connected state show *N/A*. 

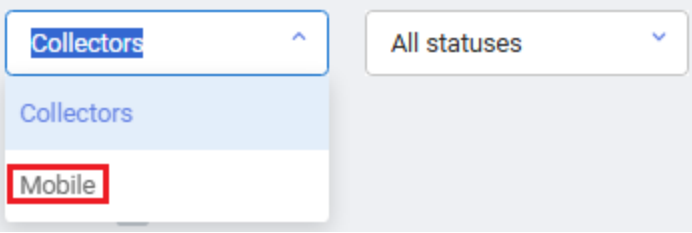
Uninstalling a Collector

Use the *Uninstall* button to uninstall a Collector from a device. Use caution when using this option, as a Collector cannot be reinstalled after removal using the FortiEDR user interface. Therefore, it is recommended to disable a Collector using the *Enable/Disable* option rather than uninstalling it.

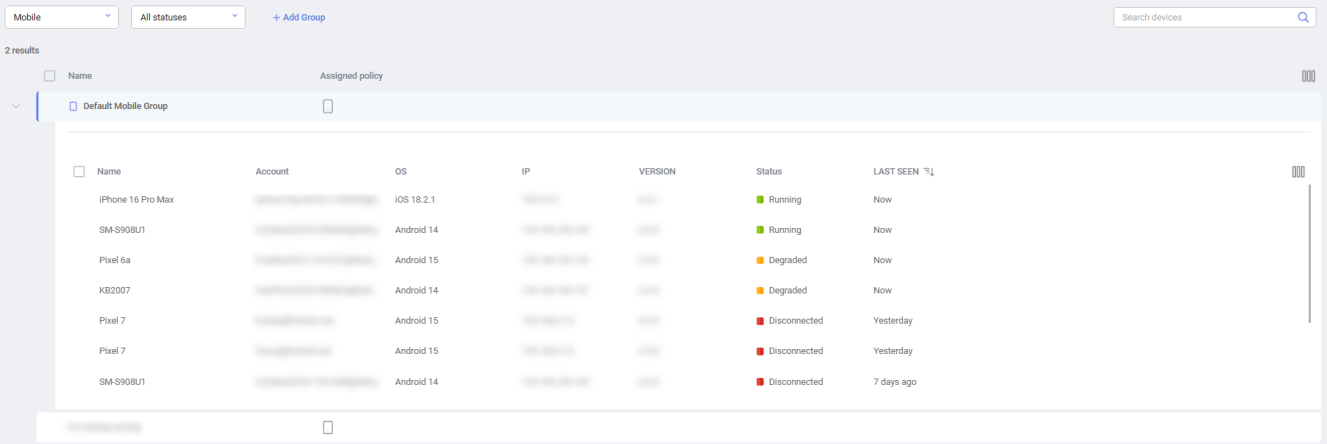
Mobile

To access the mobile Collectors page, use the following filter at the top left of the *Assets* > *Inventory* page.

The *Mobile* option is available only if mobile is enabled in the organization setting. See Step 2 – Defining or importing an organization on page 432.



The *Mobile* page displays a list of the previously defined mobile Collector Groups, which can be expanded to show the FortiEDR mobile Collectors that each contains.



Additional mobile Collector Groups can be defined by you, as described in Defining a new Collector Group on page 344. FortiEDR mobile Collectors automatically register with the system after installation. By default, each FortiEDR mobile Collector is added to the *Default Mobile Group*. You can move any mobile Collector to another Collector Group, as described in Assigning Collectors to a Collector Group on page 345.

The following information is provided for each Collector:

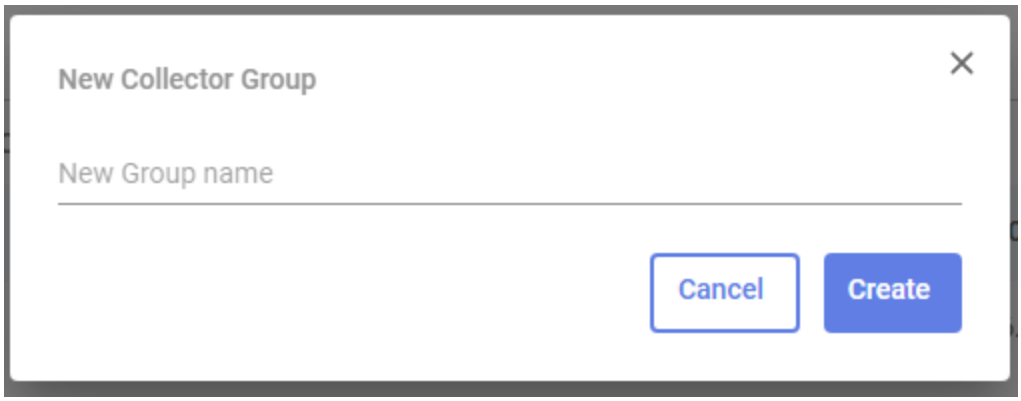
Information Field	Description
Checkbox	Check this checkbox to select the mobile Collector. You can then use one of the buttons at the top left of the window, such as the *Delete* button.
Collector Group Name	Name of the mobile Collector Group to which the mobile Collector is assigned.
Device Name	Device name taken from the communicating device on which a FortiEDR mobile Collector is installed.
OS	Operating system of the communicating device on which the FortiEDR mobile Collector is installed.
IP	IP address of the communicating device on which the FortiEDR mobile Collector is installed.
Version	Version of the FortiEDR mobile Collector installed on the communicating device.

<table>
<tr><th>Information Field</th><th>Description</th></tr>
<tr><td>State</td><td>Current state of the FortiEDR mobile Collector. Hovering over the STATE value pops up the last time the STATE was changed. Possible value for STATE are as follows:
<table>
<tr><th>State</th><th>Description</th></tr>
<tr><td>Running</td><td>The FortiEDR mobile Collector is up and all is well.</td></tr>
<tr><td>Disconnected</td><td>The device is offline, powered down or is not connected to the FortiEDR Aggregator.</td></tr>
<tr><td>Disconnected (Expired)</td><td></td></tr>
<tr><td>Pending Reboot</td><td>After the FortiEDR mobile Collector is installed, you may want some devices to be rebooted before the FortiEDR mobile Collector can start running. This status means that the FortiEDR Collector is ready to run after this device is rebooted. The reboot is performed in the usual manner on the device itself.</td></tr>
<tr><td>Disabled</td><td>The FortiEDR mobile Collector was disabled in the FortiEDR Central Manager.</td></tr>
<tr><td>Degraded</td><td>The FortiEDR mobile Collector is prevented from performing to its full capacity (for example, due to lack of resources on the device on which it is installed or compatibility issues).</td></tr>
</table></td></tr>
<tr><td>Last Seen</td><td>Counts the number of days passed from the last time this mobile Collector communicated with the Core.</td></tr>
</table>

Defining a new Collector Group

Creating multiple Collector Groups enables you to assign different FortiEDR policies to different FortiEDR Collectors, which means to different end user groups. In addition, it enables data segmentation in FortiEDR and reports according to user groups. For example, you may want to assign a more permissive policy to the CEO of your organization.

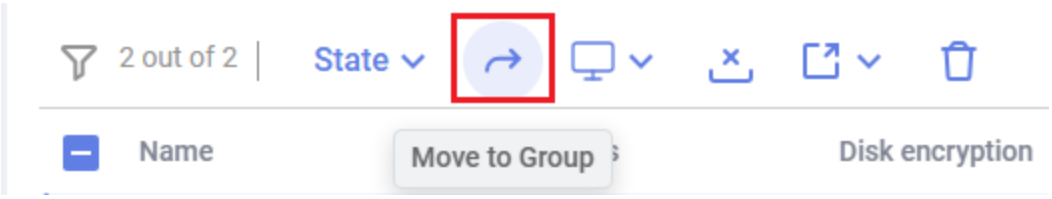
1. Click the *Add Group* button. The following window displays:



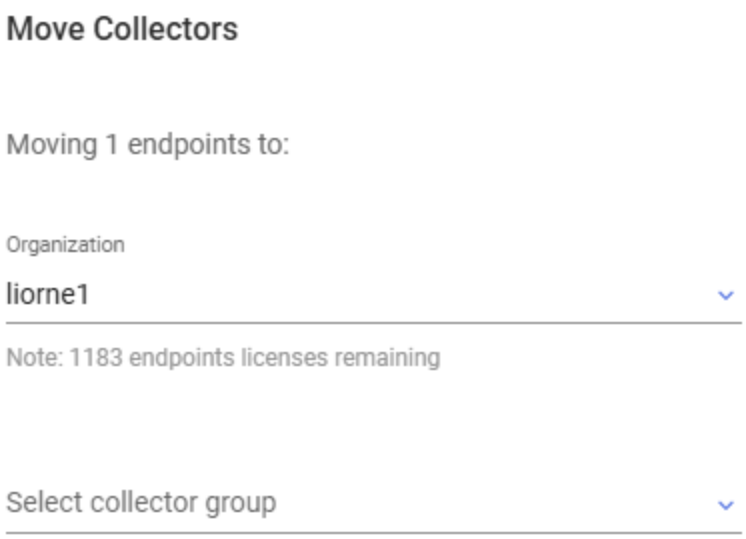
2. Enter any name for this group and click *Create*.

Assigning Collectors to a Collector Group

1. In the *Inventory* page, select the checkboxes of the FortiEDR Collectors to be moved to a different group.
2. Select the *Move to Group* button.



The following window displays with the name of the current Collector Group selected:



3. Select the Collector Group to which to move the selected Collectors. FortiEDR shows how many Collectors each group contains.
4. Click the *Move* button.

Deleting a Collector Group/Collector

Deleting a Collector Group simply means that you are deleting a logical grouping of Collectors. These Collectors then become available to be selected in the default Collector Group. The Collector Group assigned as the default Collector Group cannot be deleted.

Deleting a Collector only deletes it from the FortiEDR Central Manager's console. If the FortiEDR Collector is not uninstalled on the device, it will automatically reappear in the FortiEDR Central Manager's COLLECTOR list.

To delete a Collector Group/Collector:

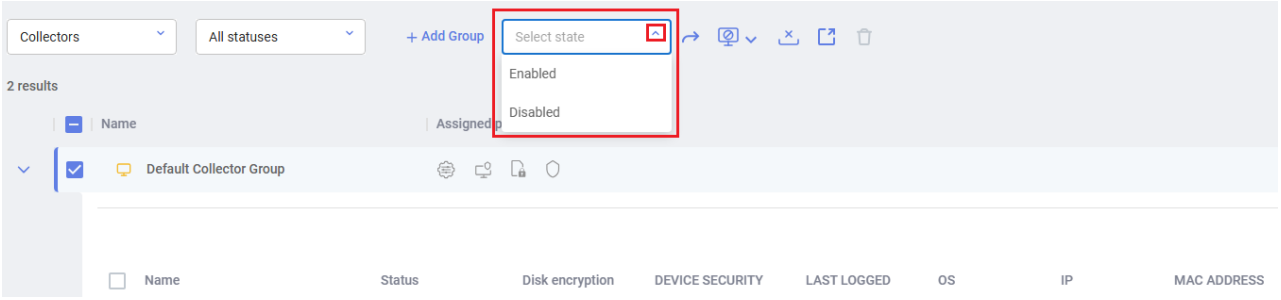
1. Select the Collector Group's/Collector's checkbox.
2. Click the *Delete* button.

Enabling/disabling a Collector

You can enable or disable one or more Collectors simultaneously.

To enable one or more Collectors simultaneously:

1. In the *Inventory* page, select the checkboxes of the FortiEDR Collectors to be enabled. All selected Collectors must be in a Disabled ( ) state.
2. Click the down arrow in the *Select state* dropdown and select *Enabled*.



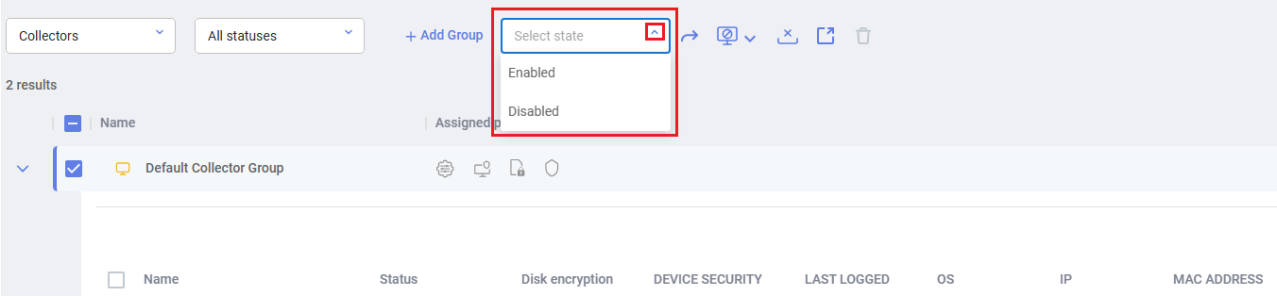
The *Select state* dropdown is available only if one or more Collectors are selected.

3. Click *Enable*.

To disable one or more Collectors simultaneously:

1. In the *COLLECTORS* page, select the checkboxes of the FortiEDR Collectors to be disabled. All selected Collectors must be in a *Running* ( ) state.

2. Click the down arrow in the *Select state* dropdown and select *Disabled*.



The *Select state* dropdown is available only if one or more Collectors are selected.

3. Click *Disable*.

Device isolation

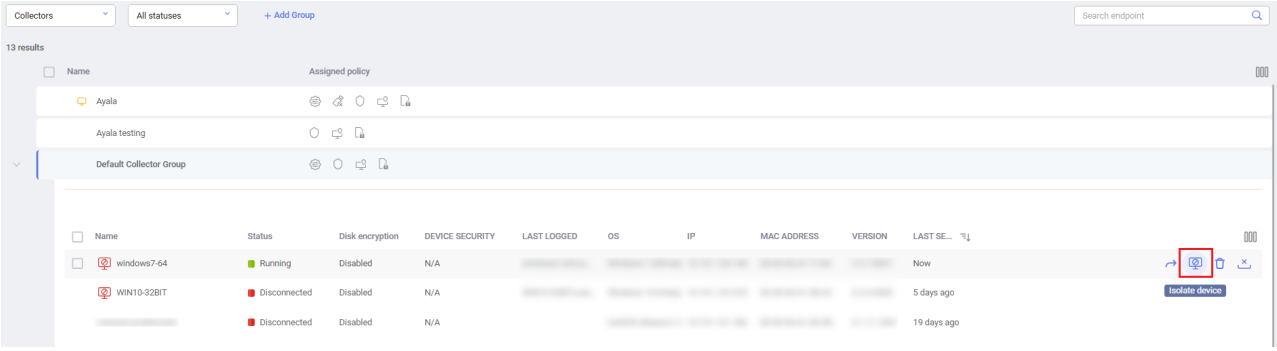
An isolated device is one that is blocked from communicating with the outside world (for both sending and receiving). A device can be isolated manually from the *Assets* > *Inventory* page or the Investigation View on page 92.

Isolation mode takes effect upon any attempt to establish a network session after isolation mode has been initiated. Connections that were established before device isolation was initiated remain intact. The same applies for Communication Control denial configuration changes. Note that both Isolation mode and Communication Control denial do not apply on incoming RDP connections and ICMP connections.

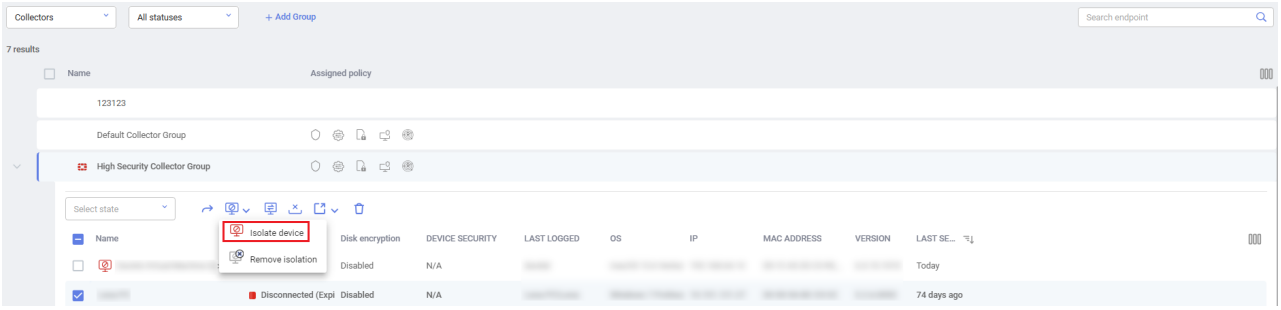
For more details about device isolation, see Investigation on page 326.

To isolate a device from the *Assets* > *Inventory* page:

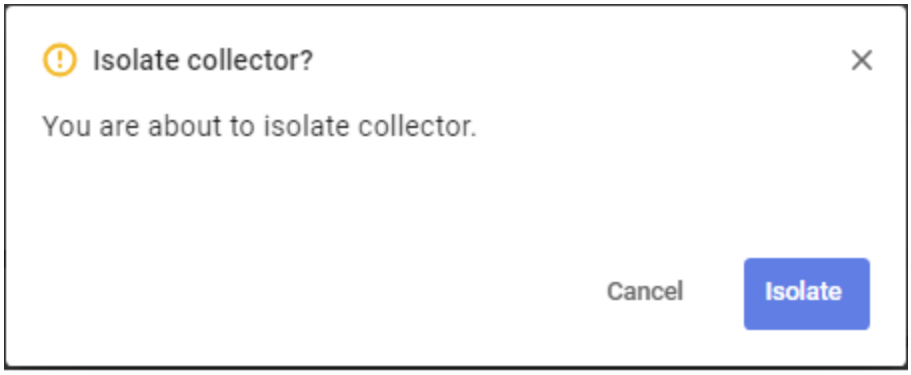
1. In the *Inventory* page, hover your mouse to the right of the row of the FortiEDR Collector that you want to isolate and click the *Isolate device* button.



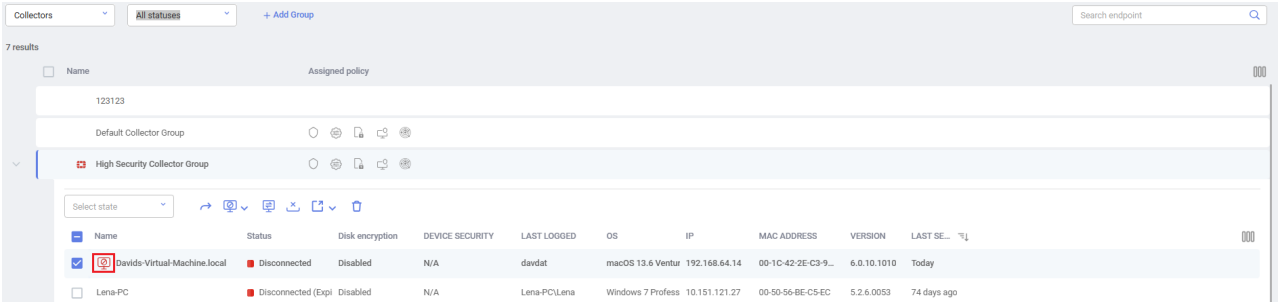
Alternatively, select the Collector and click *Isolate* device button.



2. Click *Isolate*.

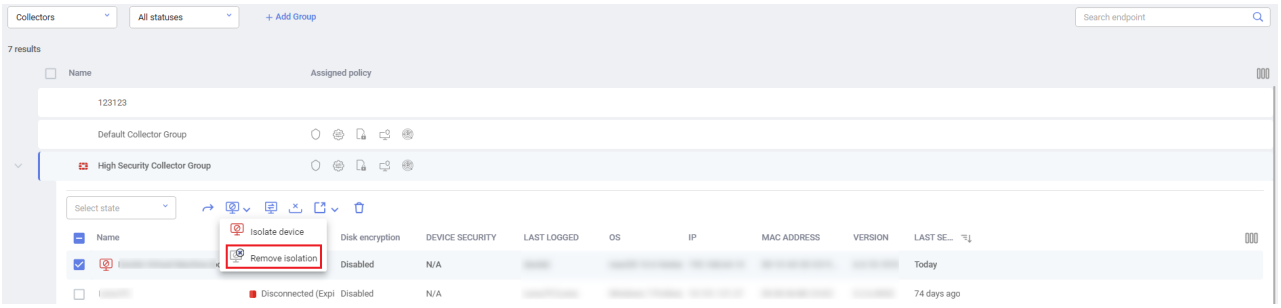


The *Isolate* icon appears next to the relevant Collector to indicate that the Collector has been isolated, as shown below:

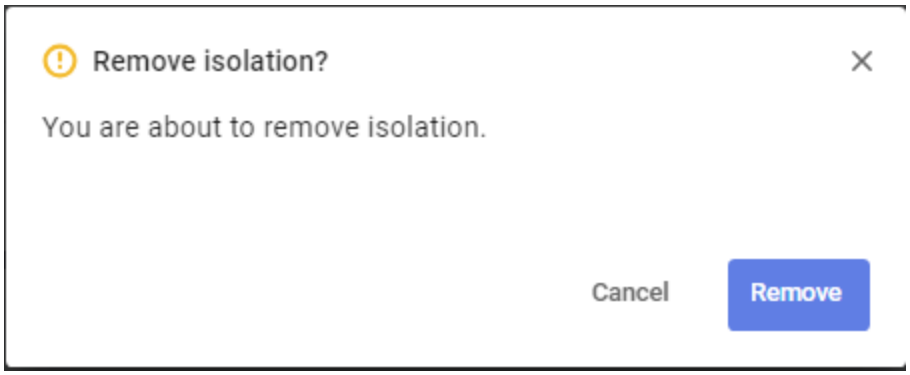


To remove isolation from a device from the *Inventory > Collectors* page:

1. In the *COLLECTORS* page, select the checkbox(es) of the FortiEDR Collector(s) whose isolation you want to remove.
2. Click the down arrow on the *Isolate* button and select *Remove isolation*, as shown below.

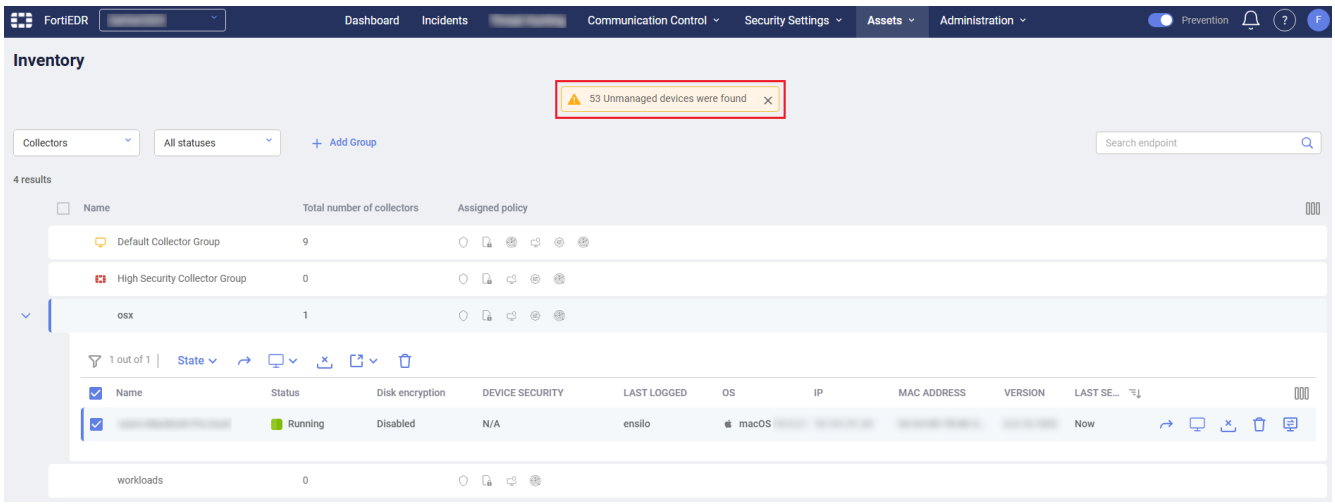


3. Click *Remove*.

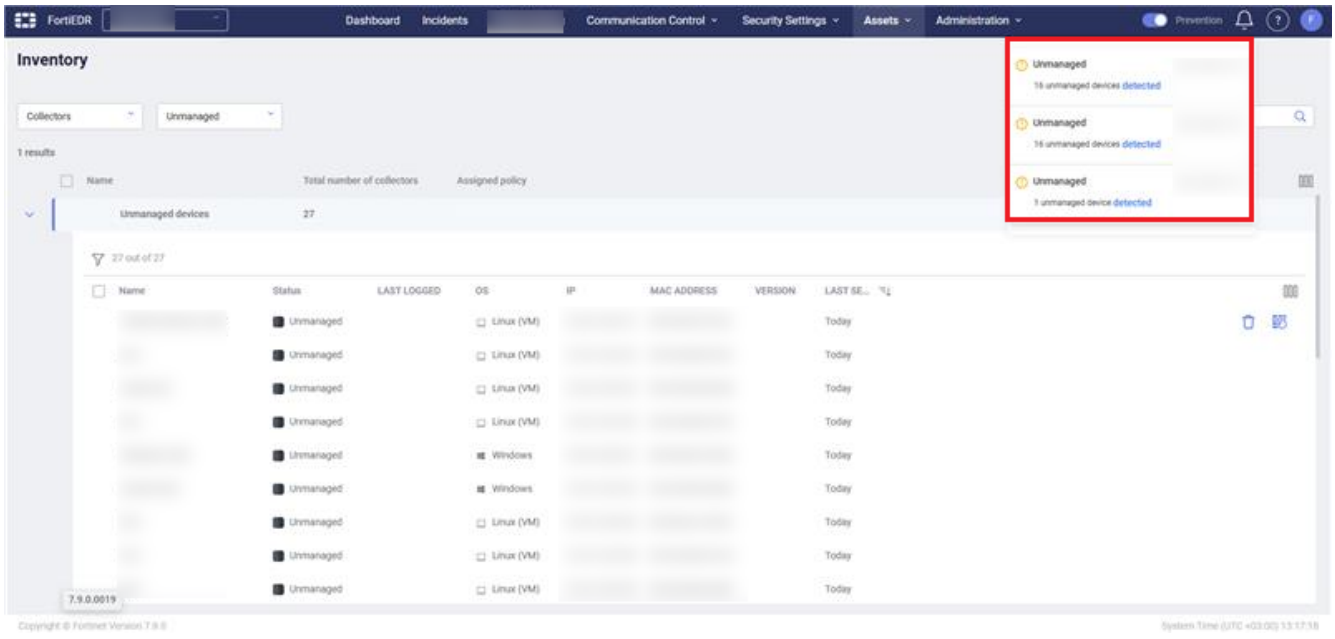


Unmanaged devices

The *Inventory* page also indicates the number of unmanaged devices found in the system at the top of the page, meaning those non-IoT devices on which no Collector is installed.

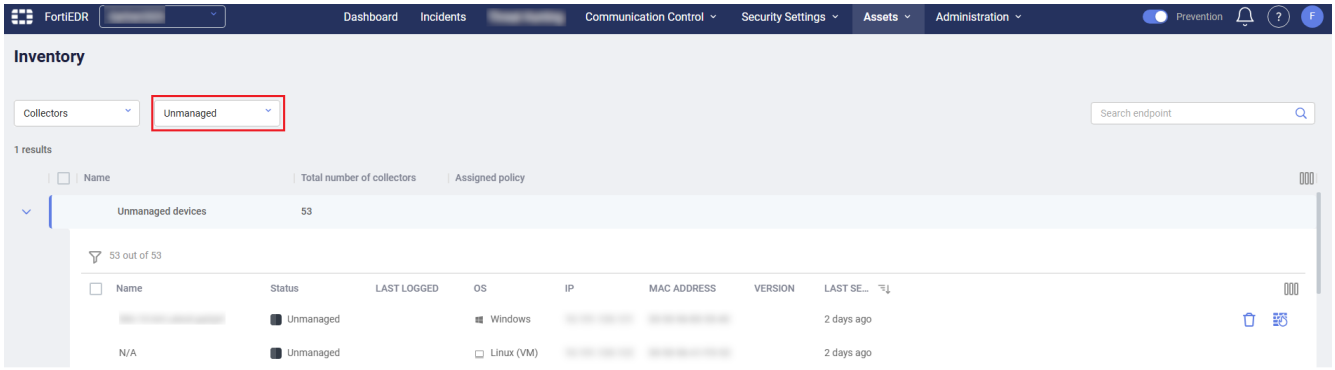


When new unmanaged devices are detected, FortiEDR sends real-time notifications with a link that redirects to the unmanaged devices view.



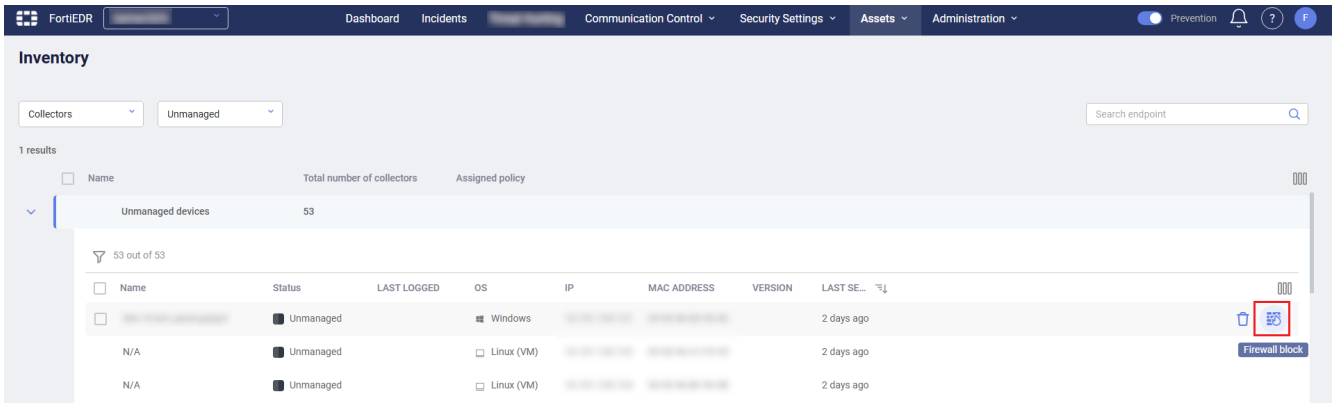
Unmanaged devices are not protected in the system. Therefore, it is recommended that you either install a Collector on each such device or remove it from your network.

To view the list of unmanaged devices, ensure you have enabled IoT Device Discovery on page 407 at least once after deploying Collectors and then select *Unmanaged* in the filter at the top left of the page.



None of the action buttons for managed Collectors are available for unmanaged devices, as there is no Collector installed on these devices.

You can activate the firewall playbook to block address on firewall for unmanaged devices. The block action triggers an integration using the firewall connector to block the device.

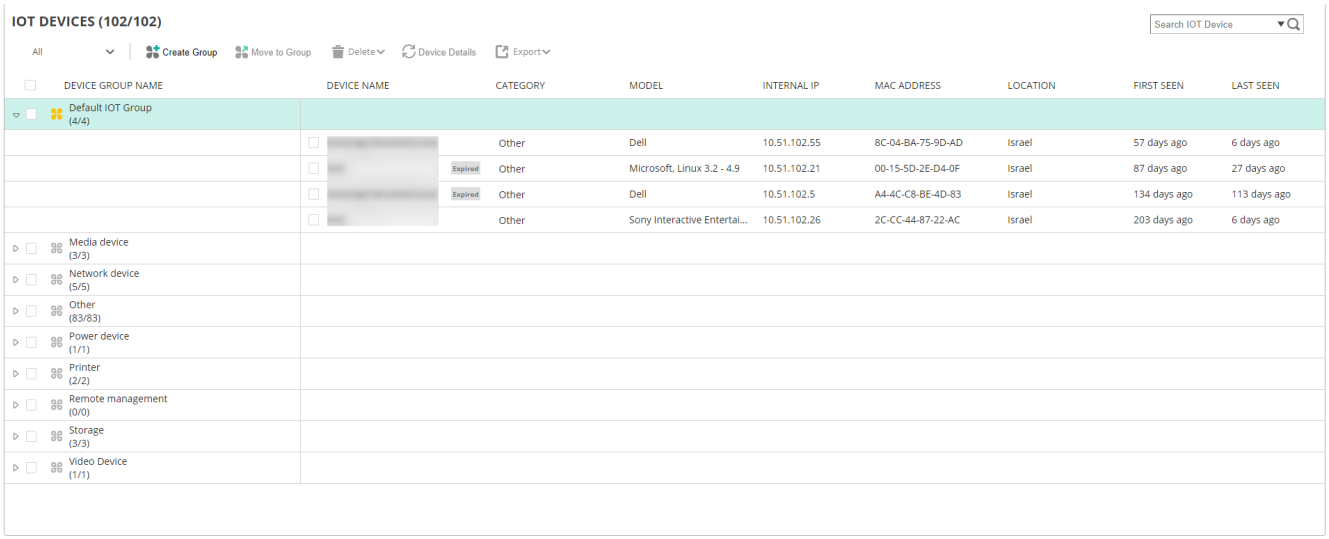


IoT devices

The *IOT DEVICES* page lists the non-workstation devices, such as printers, cameras and so on, that are part of your network. To access this page, click the down arrow next to *INVENTORY* and then select *IoT*.

This option is only available to users who have purchased the *Discover and Protect* or the *Discover, Protect and Response* license.

FortiEDR provides you with visibility to any device in your network, including those on which FortiEDR components are not installed. IoTs are proactively discovered from existing FortiEDR Collectors. For more details, see IoT Device Discovery on page 407.

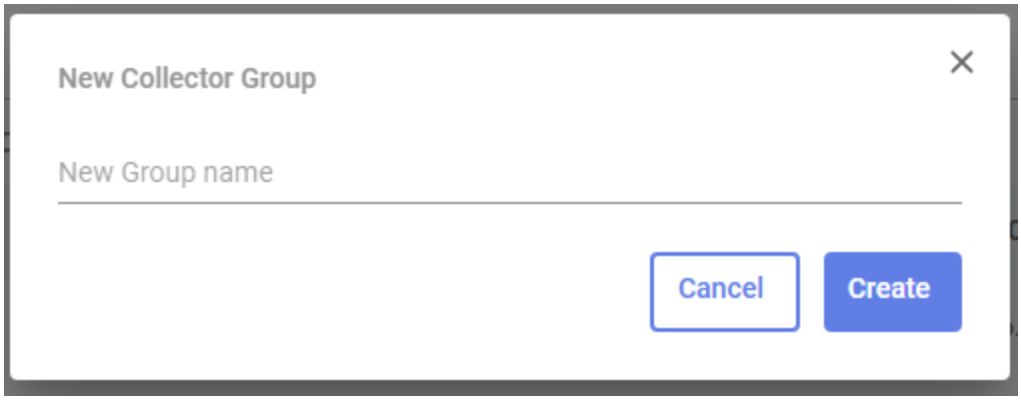


This page provides all the collected information about each discovered device, including its name, Category (device type), model number, internal IP address, MAC address, the physical location where the device was detected (based on its external IP address) and when it was first and last seen. FortiEDR presents all the information it collected for each device. Information that was not available for a device is marked as N/A in that device's row in the table. The *New* indication indicates that the device was discovered within the last three days. The *Expired* indication indicates that the device has not been seen for more than one week.

The default IoT Group to which new IoT devices are automatically added is marked with a yellow group icon . You can change to a different default IoT Group by clicking the group icon of another IoT Group. Alternatively, you can use Category-based grouping, where each new IoT device is automatically added to the group that represents its Category (for example, network devices, cameras, printers and so on).

Defining a new IoT group

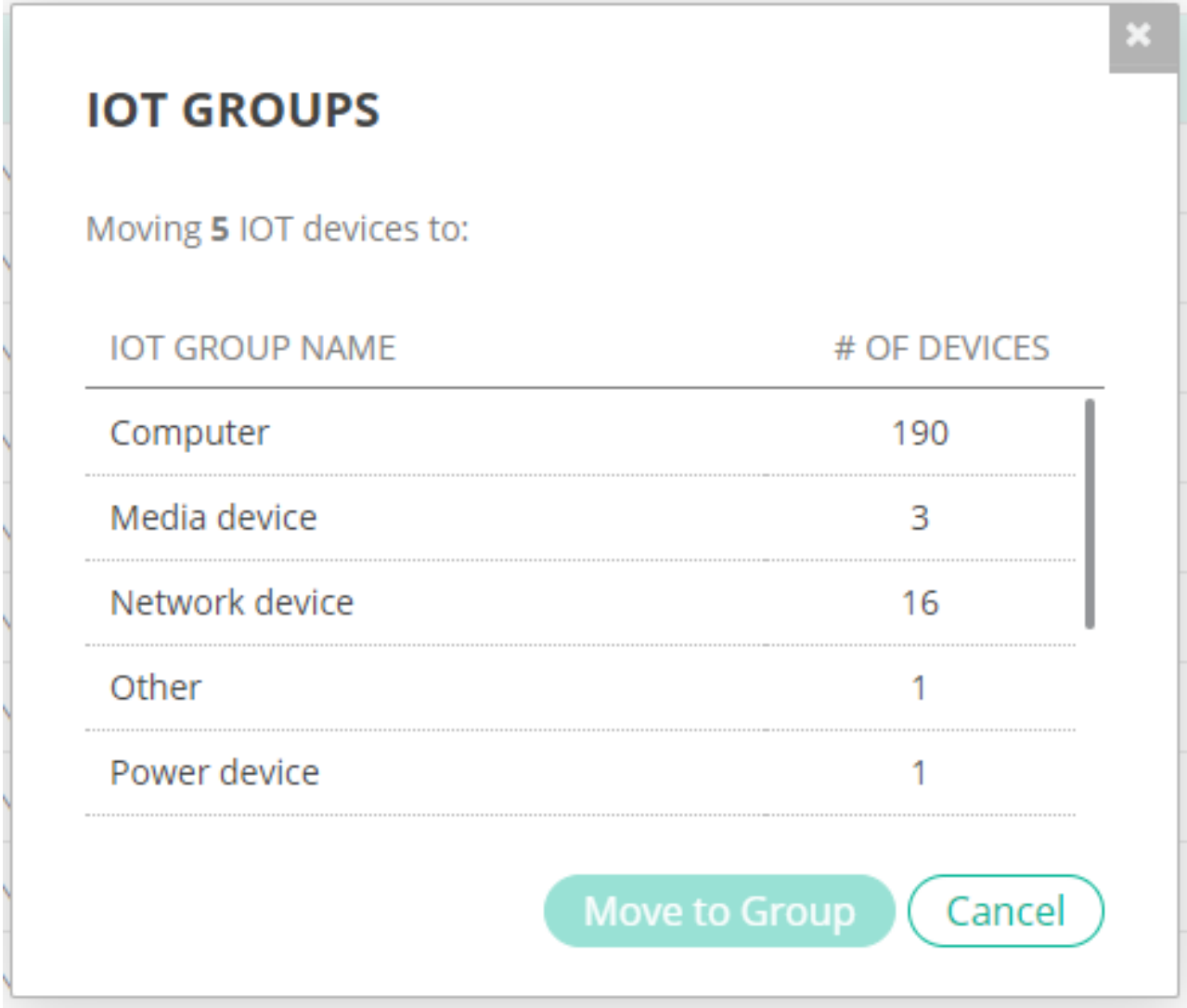
1. Click the *Create group* button. The following window displays:



2. Enter any name for this group.
3. Click *Create new group*.

Assigning devices to an IoT group

1. In the *IOT DEVICES* page, select the checkboxes of the IoT devices to be moved to a different group.
2. Select the *Move to group* button. The following window displays showing the names of the current IoT Groups and how many devices each contains:



3. Select the IoT Group to which to move the selected devices.
4. Click *Move to Group*.

Deleting an IoT device/IoT group

Deleting an IoT Group simply means that you are deleting a logical grouping of IoT devices. These devices then become available to be selected in the default IoT Group. The IoT Group assigned as the default IoT Group cannot be deleted.

Deleting an IoT device deletes it from the FortiEDR Central Manager's console. However, if the device is still connected to your network, it will re-appear following the next network scan.

To delete an IoT device/IoT group:

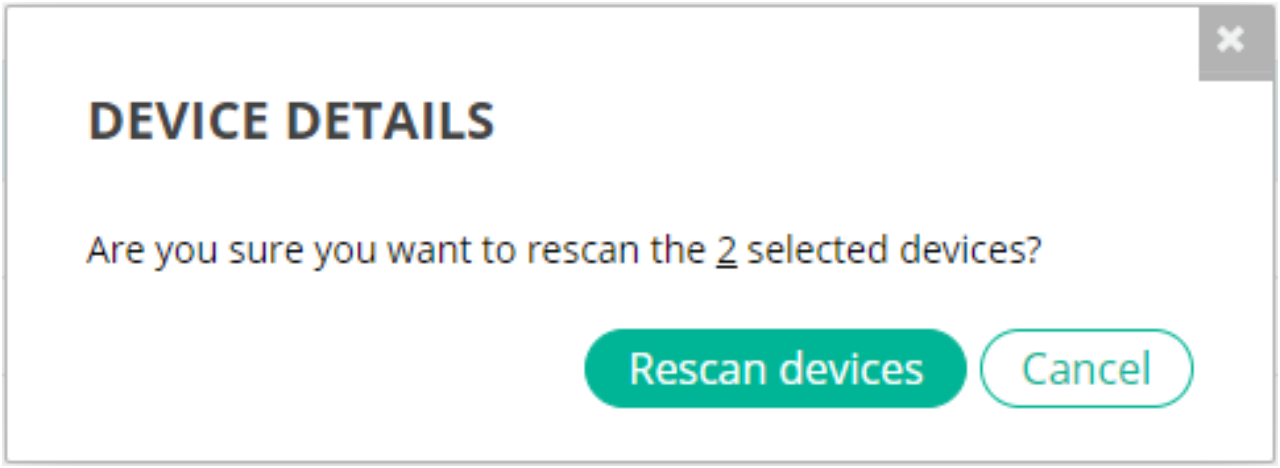
1. Select the IoT group's/IoT device's checkbox.
2. Click *Delete*.

Refreshing IoT device data

You can run a scan for a specific IoT device to recollect data for that device.

To rescan an IoT device(s):

1. Select the IoT device's checkbox for the device(s) that you want to scan and then click the *Device Details* button. A confirmation window displays.



2. Click *Rescan devices*.

Exporting IoT information

To export the list of IoT devices:

1. Click the *Export* button.
2. Select *Excel*.

To export details for an IoT device:

1. Check the checkbox of the device of interest.
2. Select *Device Info* under the *Export* button.

You can only export details for one device at a time. This report exports all collected data for the IoT device of interest, including additional data beyond what is presented in the user interface.

Exporting logs

The Export Logs feature enables you to retrieve technical information from the FortiEDR devices deployed in the organization, such as from Collectors, Cores, Aggregators and the Management server. The retrievable technical content describes the activities of each FortiEDR device. Typically, the technical content contains logs and statistical information. The retrieved technical content is password-protected. The password is enCrypted.

Logs only need to be retrieved when Fortinet technical support requests that you provide them. There is no need for you to analyze the data contained in the FortiEDR logs. You can retrieve logs for the following:

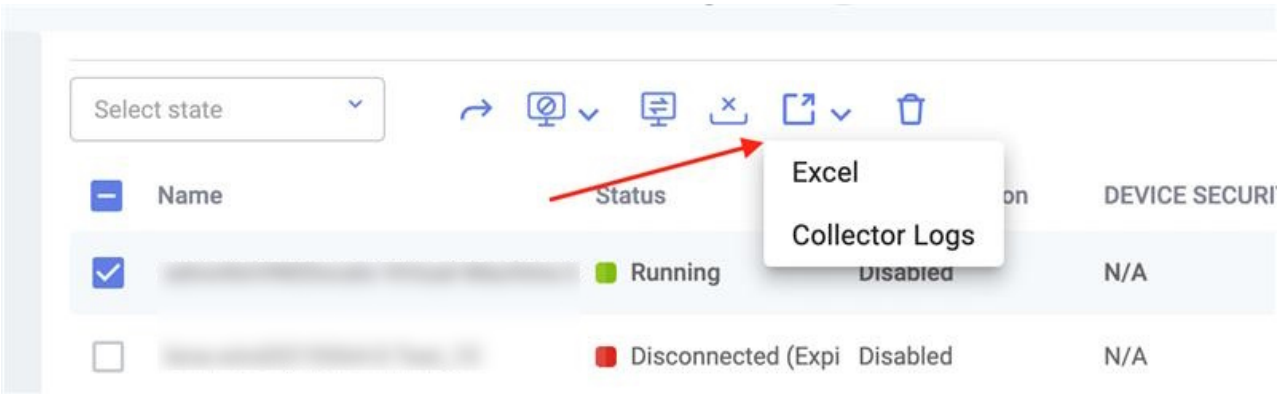
- Exporting logs for Collectors on page 355
- Exporting logs for Cores on page 356
- Exporting logs for Aggregators on page 357

To retrieve threat hunting logs, see Exporting threat hunting logs on page 171.

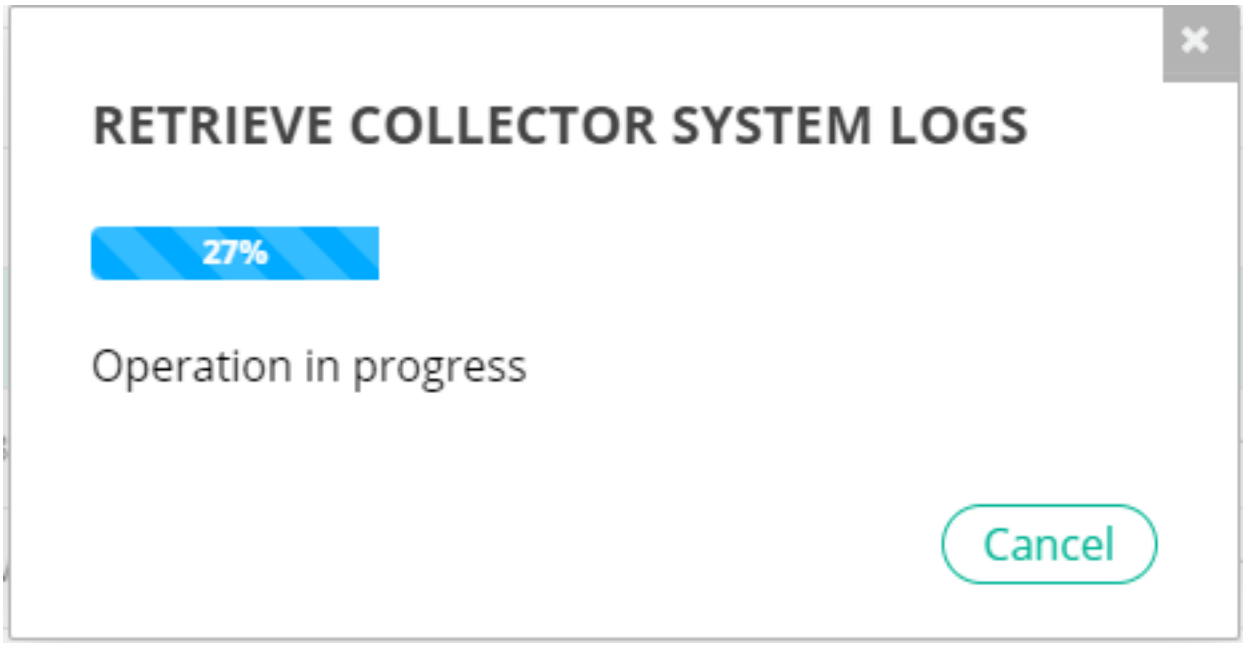
Exporting logs for Collectors

You can export logs for Collectors that are in *Running* status.

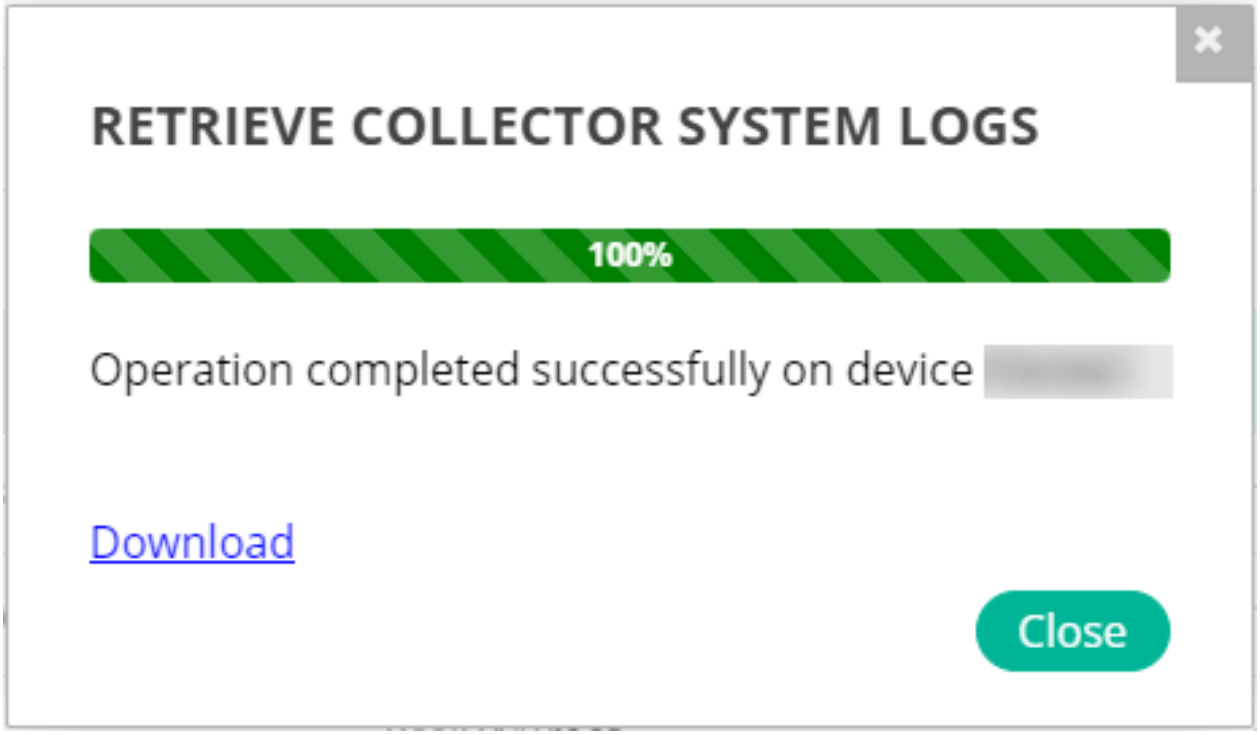
To export Collector logs:

1. In the *Collectors* page, select the checkbox of the FortiEDR Collector for which you want to export logs and click the down arrow on the *Export* dropdown menu and select *Collector Logs*.
   Note you can only export the logs for one Collector at a time and the Collector has to be in *Running* status.
2. 

3. A progress window displays, showing the status of the Collector log retrieval process:



After the retrieval process completes, the following window displays:

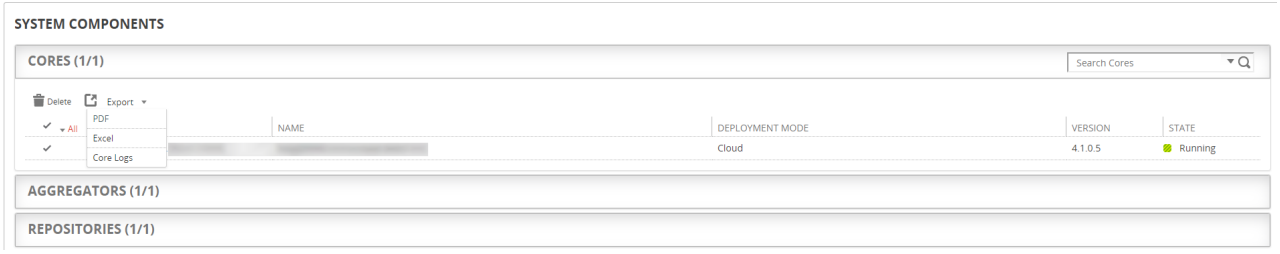


4. Click *Download* to automatically send the retrieved logs to Fortinet technical support.

Exporting logs for Cores

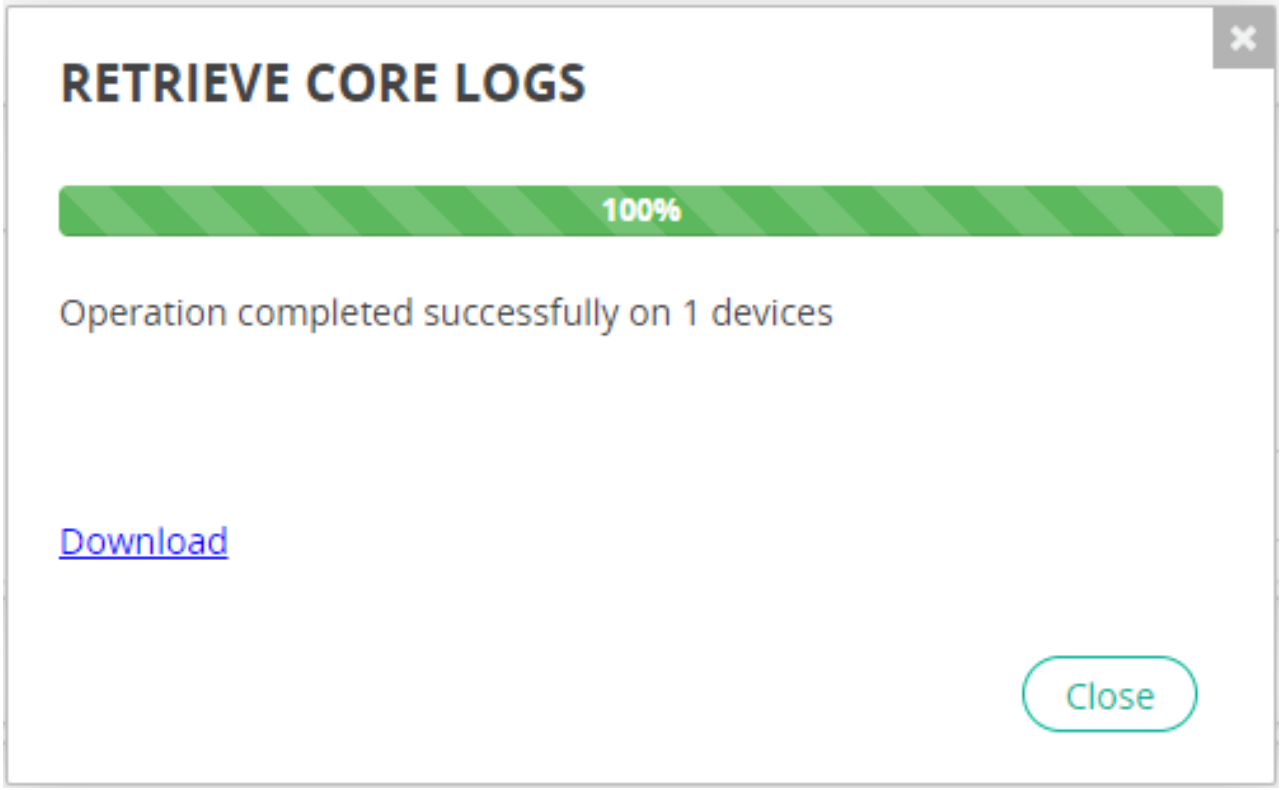
1. In the *SYSTEM COMPONENTS* page, select the checkboxes of the FortiEDR Cores for which you want to export logs.

2. Click the down arrow on the *Export* dropdown menu and select *Core Logs*.



A progress window displays, showing the status of the log retrieval process:

After the retrieval process completes, the following window displays:

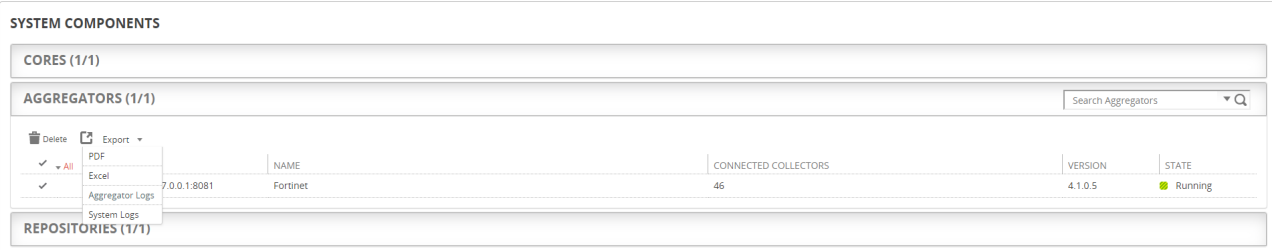


3. Click *Download* to automatically send the retrieved logs to Fortinet technical support.

Exporting logs for Aggregators

1. In the *SYSTEM COMPONENTS* page, select the checkboxes of the FortiEDR Aggregator for which you want to export logs.

2. Click the down arrow on the *Export* dropdown menu and select one of the following options:



   a. *Aggregator Logs*: Exports the log for the selected Aggregator(s).
   b. *System Logs*: Exports the logs of the central Manager.
      A progress window displays.
      After the retrieval process completes, a window displays.
      Click *Download* to automatically send the retrieved logs to Fortinet technical support.

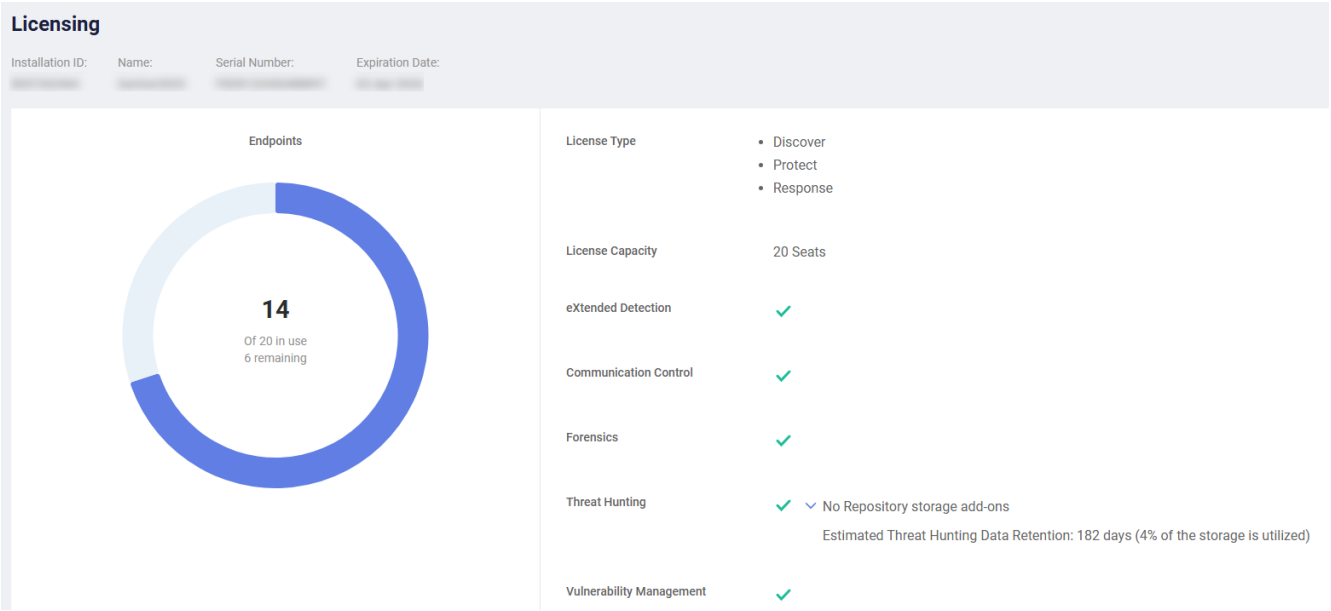
Administration

This chapter describes the FortiEDR Administration options, which are fully available to users with Admin permissions, partially available to users with IT or Senior Analyst permissions, and read-only for users with read-only permissions.

Licensing

Selecting *LICENSING* in the *ADMINISTRATION* tab displays all the entitlements provided by your license.

This window also shows your Serial Number, which is your FortiEDR unique identifier with Fortinet.



The tab bar at the top of the window may display a white circle(s) with a number inside the circle to indicate that new security events have not been read by the user. For Administration, the number represents the number of unread system events.

Users

The USERS option specifies who is allowed to use the FortiEDR Central Manager console. During installation of the FortiEDR Central Manager, you must specify the user name and password of the first FortiEDR Central

Manager console user. This is the only user who can log in to the FortiEDR Central Manager console for the first time.

To add a user:

1. Click the *Add User* button (+ Add User).
2. Fill in the displayed window.

3. Define this user's password. Make sure to remember it and notify the user about this password.
4. Select the user's role. The system comes with the following predefined user roles:

Role	Description
Admin	Highest-level super user that can perform all operations in the FortiEDR Central Manager console for the organization.
Senior Analyst	Analysts supervisor who can define security policies in addition to all the actions that can be performed by an Analyst. Similar to admin users but without system configuration privileges under the *ADMINISTRATION* tab. A senior analyst can view information and perform actions, such as marking security events as handled, changing policies and defining exceptions, but cannot access the system configuration options under the *ADMINISTRATION* tab.
Analyst	SOC/MDR service analyst who can perform actions as required in the day-to-day activities of handling events. Similar to senior analyst users but without access to security configuration. An analyst can view information and perform actions, such as marking security events as handled, but cannot access the *ADMINISTRATION* tab or define/change policies.
IT	IT staff who can define settings related to the FortiEDR integration with the customer ecosystem. This role has system configuration access only. They can deploy and upgrade system components and perform system integration with external systems using the *ADMINISTRATION* tab but do not have access to other areas, such as security configuration, alert monitoring, or Forensics options.
Read-Only	Basic role with read-only access to all functions except system configuration.

For Multi-tenancy (organizations) on page 428 systems, you can also configure the user with role-specific access to all organizations.

5. Select any advanced options as needed. Some options are available to users with specific permissions only.

Option	Description
Rest API	Specifies whether to allow the user to access the FortiEDR Central Manager through API calls. For more information about APIs, see the FortiEDR RESTful API Guide. You must log in to the Fortinet Developer Network to access the guide.
Custom script	Specifies whether to allow the user to upload and manage (add, modify and delete) Python scripts that call third-party system APIs (see Integrations on page 261). Those scripts will then be automatically triggered by FortiEDR as incident responses. This option is only available to users with Admin and IT permissions.
FortiEDR Connect	Specifies whether to allow the user to use FortiEDR Connect capabilities which provide direct access to FortiEDR-protected devices running on Windows through a remote Shell connection, as described in FortiEDR Connect on page 109. This option is only available to users with Admin, Analyst, and Senior Analyst permissions. This option takes effect only when the *Allow FortiEDR Connect - remote shell connection* checkbox is selected under *Administration > Settings*, which means the FortiEDR Connect functionality is enabled at the organization level.

6. If the *Require 2FA* option is disabled in *Password Policy*, you can enable 2FA for this particular user by configuring the 2FA prompt frequency to be *Always*, *Daily*, or *Weekly*. See Two-factor authentication on page 361 for more information.

This option is available only if *Require 2FA* is disabled in *Password Policy*.

7. Click *Apply* (the checkmark) to save the user.

Two-factor authentication

You can require two-factor authentication for all FortiEDR users or specific users, which means those users must provide additional proof in addition to his or her user name and password when logging in to FortiEDR. To verify the user's identity, FortiEDR supports two-factor authentication using FortiToken or any third-party authentication application, such as Google Authenticator, Microsoft Authenticator, Okta, or Duo.

- To enforce two-factor authentication on all users, check the *Require 2FA* checkbox when setting up the password policy.
- To require two-factor authentication on specific users, disable the *Require 2FA* checkbox in *Password Policy* and check the enable the *2FA* option for that user, as described in Users on page 359.

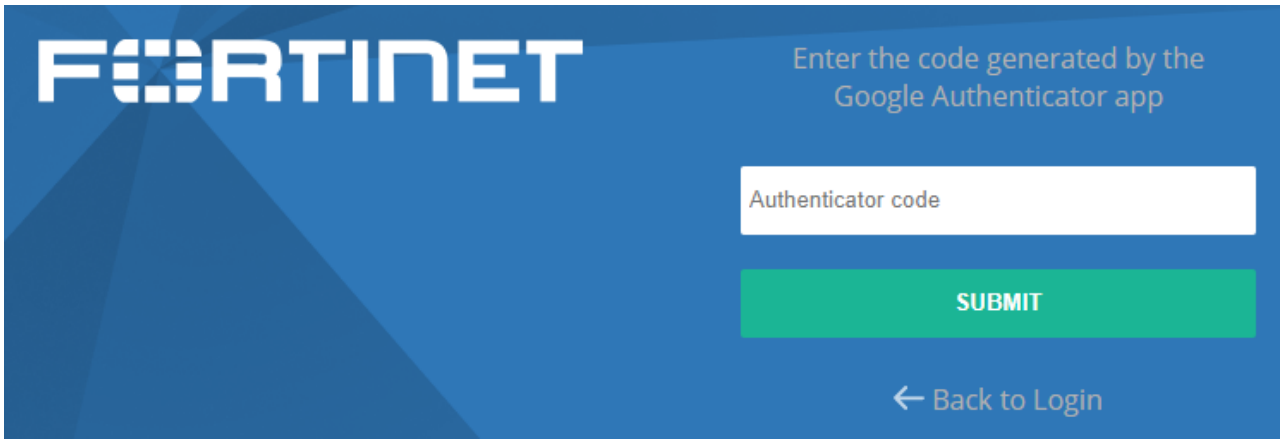
The following is an example of how a user logs in using two-factor authentication with Google Authenticator:

1. When prompted with the following window during your first login, enter the user name and password and click *LOGIN*.

2. On your mobile device, click the *Google Authenticator* icon to launch Google Authenticator. A QR code displays in the FortiEDR window, as shown below:

3. Scan the QR code using your mobile device. A FortiEDR token appears on the mobile device, as shown below. Note that this token (code) changes every 30 seconds.

4. In the FortiEDR login window, click the *INSERT AUTHENTICATOR CODE* button. The following window displays:



5. Enter the authentication token (code) you received in step 3, and then click *SUBMIT*. Be sure to enter the latest code, as the code changes every 30 seconds.
   Depending on the 2FA prompt frequency you set up for the user(s), FortiEDR verifies the user's identity for each login or on a daily or weekly basis by asking for a new token, when the user has to repeat steps 1 through 5 to re-authenticate. To set a different cycle on a standalone environment, please contact Fortinet Support.

Resetting a user password

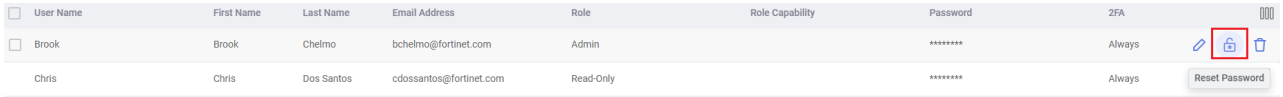
You can set a new password for a user in the following cases:

- A user forgets his or her password and cannot log in.
- A user password is compromised and poses a security risk.
- A user account gets locked after five or more consecutive failed login attempts due to an incorrect password.

If a user who must use two-factor authentication cannot access the FortiEDR application because of a lost or replaced mobile device, that user must repeat the procedure in Two-factor authentication on page 361 in order to log in. Before performing this procedure, you must first reset that user's password to accept a new two-factor authentication token.

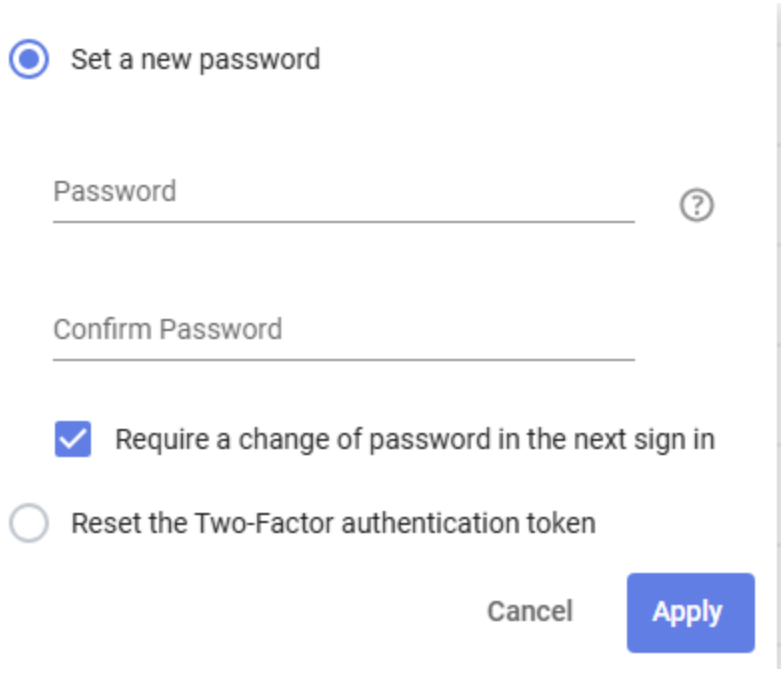
To reset a user password:

1. In the *ADMINISTRATION* tab, click the *USERS* link. The user list displays.
2. Place your cursor on the row of the user whose password you want to reset and click the *Reset Password* button.



   If the user account is locked, the button is in red.

3. In the *Reset Password* window that appears:



Do one of the following:

- Click the *Set a new password* radio button and define a new password for the user. Make sure the password follows the password policy. You can also require the user to change the password during the next login.
- For a user that must use two-factor authentication, click the *Reset the Two-Factor authentication token* radio button to force user identity verification using two-factor authentication during that user's next login. This means that the user must complete the procedure in Two-factor authentication on page 361 in order to log in.

4. Click *Apply*.

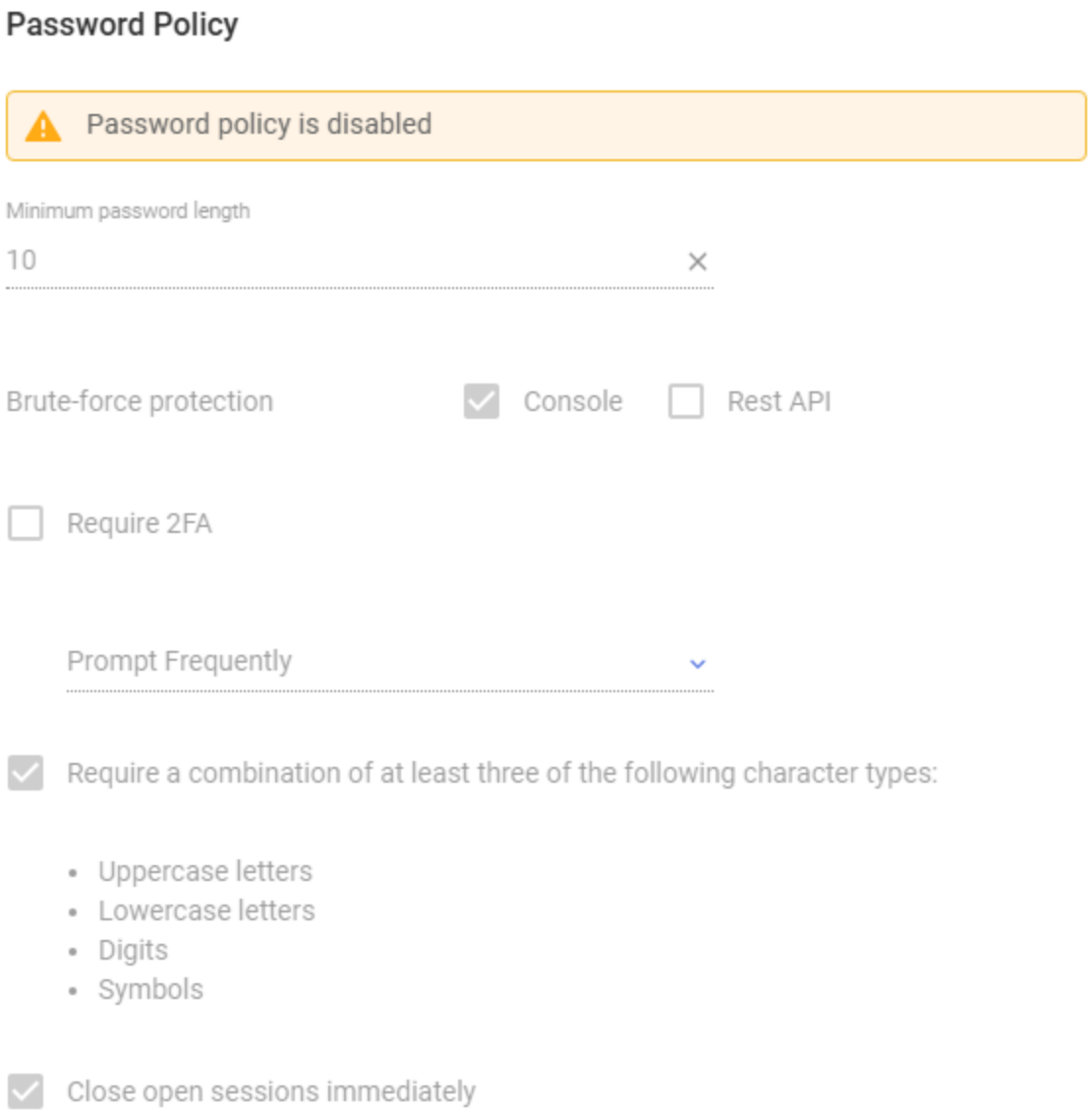
Now you can ask the user to log in using the new password.

Defining a password policy

To enhance security and better secure the access to the FortiEDR system, you can define a password policy to enforce some basic rules that apply to all user passwords, including the default password you create for each user and existing users that are created before the password policy is defined. All existing users with a password that does not comply with the new password policy will be prompted to change the password at their next login.

To define a password policy:

1. Click the *Password Policy* button (Password Policy).
2. Fill in the displayed window. The requirements you define will be applied to all new and existing users.



Option	Description
Minimum password length	Specify the minimum number of characters the password must include.
Brute-force protection	Specify whether to block user login after five failed login attempts in the Manager console or Rest API. Blocked users will not be able to log in before an administrator resets the password in the *Administration > Users* tab.

Option	Description
Require 2FA	Require all users to use Two-factor authentication on page 361. You can further configure the 2FA prompt frequency to be one of the following: • *Always*—The user has to re-authenticate for each login. • *Daily*—The user has to re-authenticate every 24 hours. • *Weekly*—The user has to re-authenticate every 7 days. This option enforces 2FA on all users. To require only specific users to use 2FA, leave this option empty and enable the 2FA option for specific users, as described in Users on page 359.
Require a combination of at least three of the following character types	Require all passwords to include at least three of the following character types: • Uppercase letters • Lowercase letters • Digits • Symbols
Close open sessions immediately	Force close any open sessions from users that do not comply with the password policy.

3. Click *Save*.

After you save the password policy, all new users must follow the password policy. Existing users with a password that does not comply with the new password policy will be prompted to change the password at their next login.

LDAP authentication

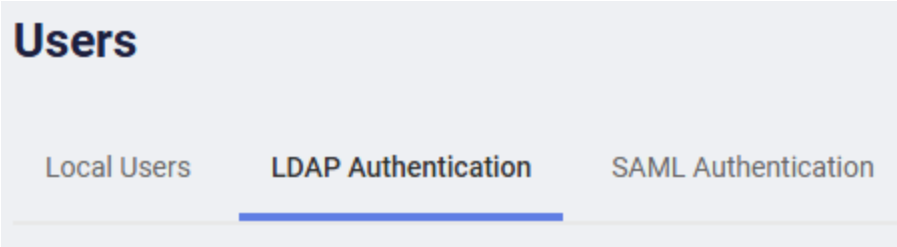
Lightweight Directory Access Protocol (LDAP) authentication is an open, industry-standard application protocol for accessing and maintaining distributed directory information services over an IP network. LDAP provides a central place to store usernames and passwords. This enables many different applications and services to connect to an LDAP server to validate users. This has a major benefit that allows a central place to update and change user passwords.

When LDAP authentication is enabled in FortiEDR, whenever a user attempts to log in to FortiEDR, the system looks for that user name and password in the central directory, instead of within the FortiEDR directory. If the user is not found on the LDAP server, the system checks whether the user is defined locally (under *Administration* > *Users* > *Local Users*).

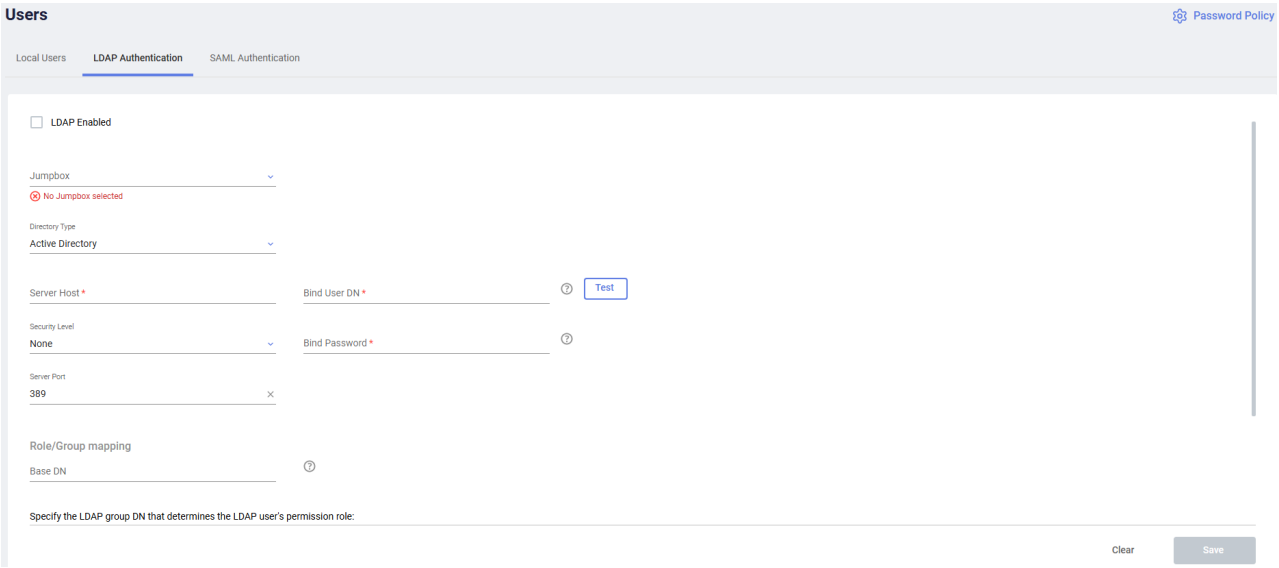
Before you start firewall configuration, make sure that your FortiEDR deployment includes an on-premise Core that has connectivity to the LDAP server. Details about how to install a FortiEDR on-premise Core can be found in Setting up the FortiEDR Core on page 524.

To set up LDAP authentication in FortiEDR:

1. For multi-tenancy environments, in the *Organization* dropdown list at the top left, verify the selected organization is the one that you want to grant the LDAP users access to. To grant the LDAP users access to all organizations, select *Hoster View*.
2. In the Organization dropdown list at the top left, select the organization that you want to grant the user access or select Hoster View if you want to grant the user access to all organizations.
3. Select Admin in the Role list for the group when you configure LDAP or SAML users.
4. Click the *LDAP AUTHENTICATION* tab.

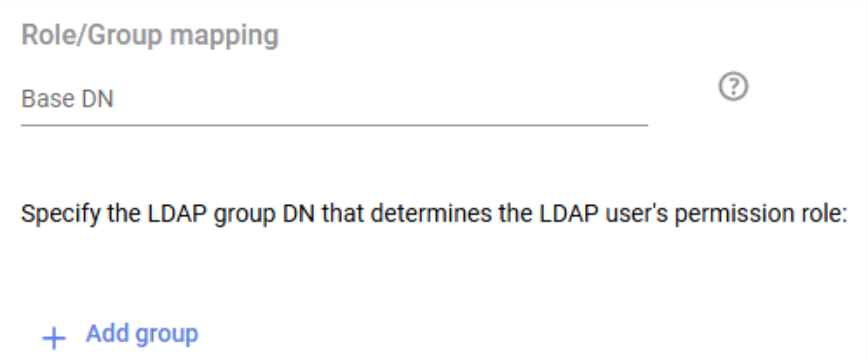
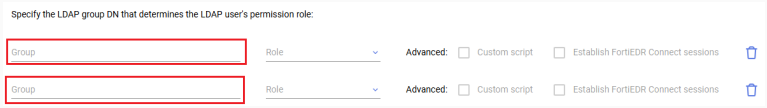
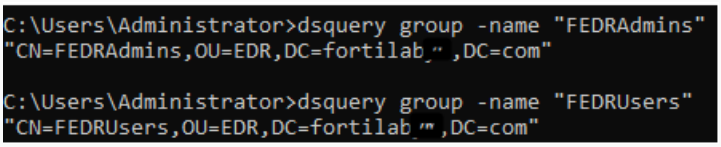


The following page displays:



5. Fill in the following fields:

Field	Definition
LDAP Enabled	Check this checkbox to enable LDAP authentication in FortiEDR.
Jumpbox	Select the FortiEDR Core to communicate with the LDAP server. Only FortiEDR Cores on page 416 configured with Jumpbox functionality appear in the list. If no such core exists in the system, the list is empty and FortiEDR displays a warning message.
Directory Type	Specify the type of central directory in use. FortiEDR supports Active Directory and OpenLDAP. The default is *Active Directory*.
Server Host	Specify the IP address of your LDAP server.

Field	Definition
Security Level	Specify the protocol to be used for the secured connection: *TLS*, *SSL*, or *None*.
Server Port	This value is dependent on the security protocol that was selected.
Bind User DN/Bind Password	Specify the user and password for the authentication of FortiEDR in the Central Directory.
Role/Group mapping	Specify the base DN and define group/role mapping and permissions of the group:  1. In *Base DN*, specify the location in the Central Directory hierarchy where the Groups that are used for permission mapping can be found. For example, the DN for the root of the domain should always work, but results in low performance. 2. Click *Add group*. 3. Define group/role mapping and permissions of the group: a. In the *Group* field, specify the LDAP group DN as defined in your central directory (Active Directory or OpenLDAP).  To check the LDAP group DN, run `dsquery group -name "Group_Name"` on the Active Directory server.  b. Under *Role*, select a role from the list. See Users on page 359 for more information about the roles. c. Under *Advanced*, enable any additional privileges for the group. Some options are role-dependent. 4. Click *Add group* and repeat step 2 for each role you want to map to a group or multiple groups. **For example**:

Field	Definition
	To give the user John Admin permissions in FortiEDR (for both the FortiEDR application and the custom script), assign John to a FortiEDRUsers group that is defined in your Central Directory: 1. Under *Group*, specify the LDAP group DN of the FortiEDRUsers group. 2. Select *Admin* under *Role*. 3. Check the *Custom script* checkbox under *Advanced*. During authentication, FortiEDR determines the relevant role for the user John by checking that the Central Directory exists and that the password used in the FortiEDR login page matches the password in the Central Directory. If both exist and are correct, FortiEDR then checks the FortiEDRUsers group to which John is assigned and matches the user role permissions.

6. If users must use two-factor authentication to log in, check the *Require two-factor authentication for LDAP logins* checkbox. For more details about two-factor login, see the Two-factor Authentication section in Two-factor authentication on page 361.

Click the *Reset 2FA Token* button to reset the two-factor authentication token for a specific user. This process works in the same way as described in Resetting a user password on page 363.

7. Click *Save*.

Users in Active Directory must not have a backslash (\) in the user name, in order for the name be supported by the FortiEDR Console. In some cases in Active Directory, a backslash is added when there is a space between a user's first and last names. For example, `CN=Yell\,`.

SAML authentication

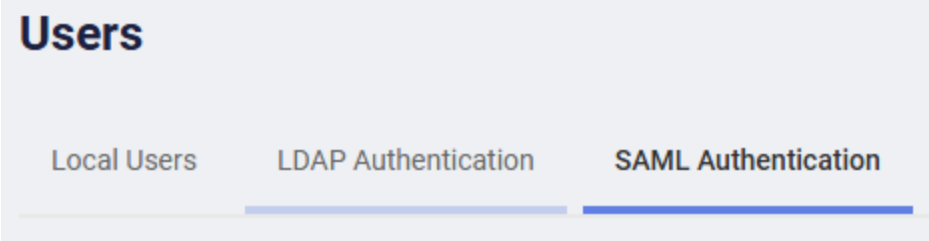
Security Assertion Markup Language (SAML) is an XML-based open standard for exchanging authentication and authorization data between parties, particularly between an identity provider (IdP) and a service provider (SP).

FortiEDR can act as an SP to authenticate users with a third-party IdP, enabling transparent user sign-in to the FortiEDR Central Manager Console.

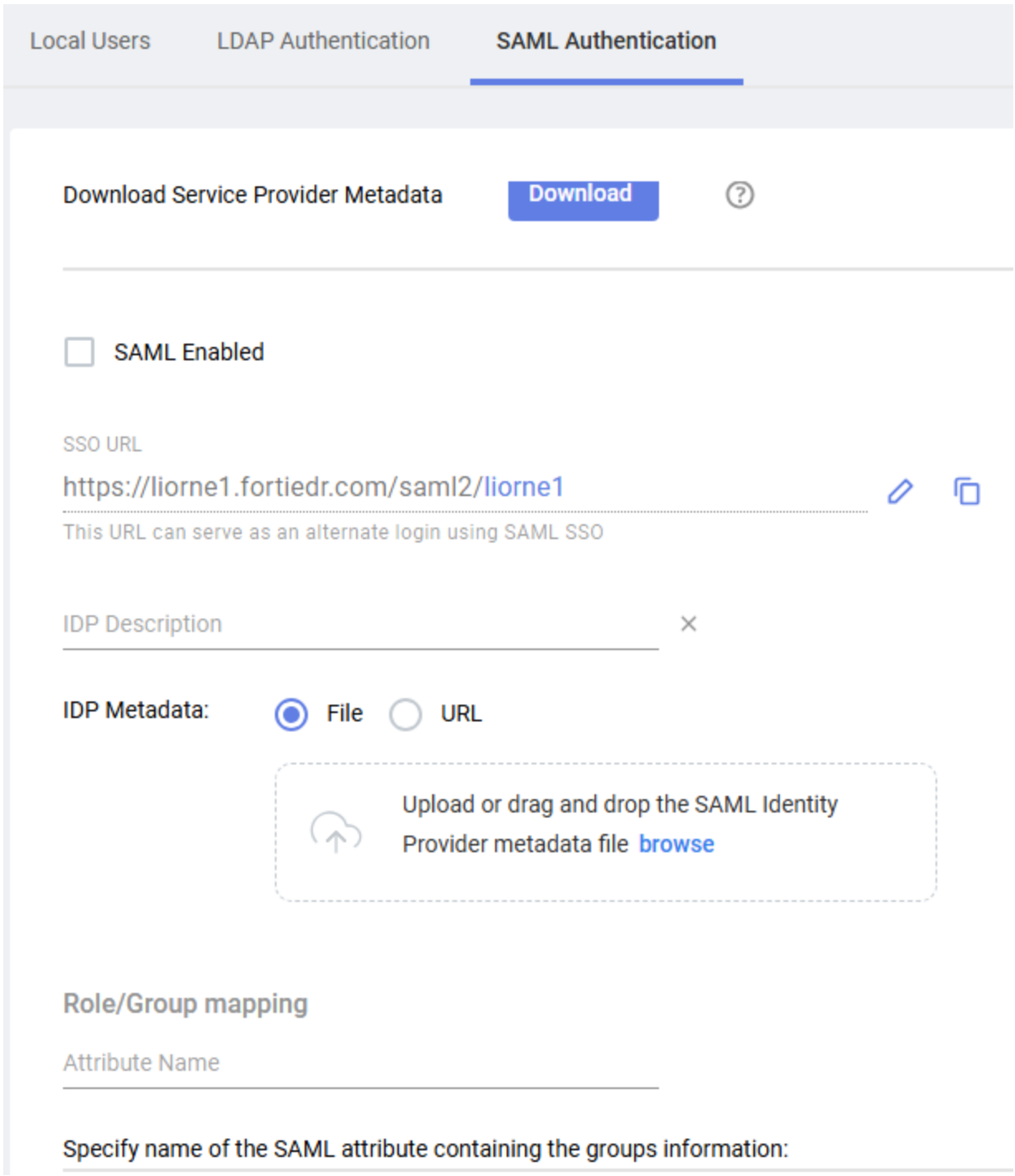
To set up SAML authentication in FortiEDR:

1. For multi-tenancy environments, in the *Organization* dropdown list at the top left, verify the selected organization is the one that you want to grant the SAML users access to. To grant the SAML users access to all organizations, select *Hoster View*.

2. In the *Administration* > *Users* page, go to the *SAML Authentication* tab.



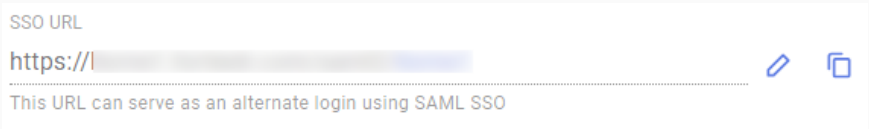
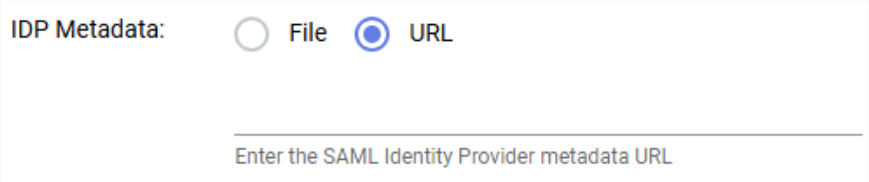
The following window displays:

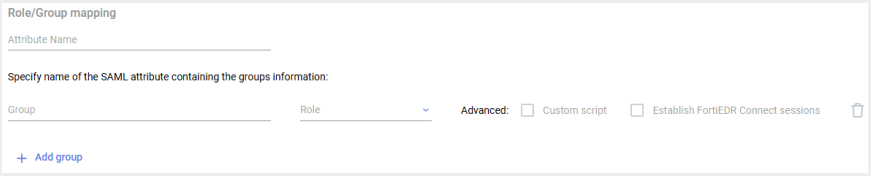
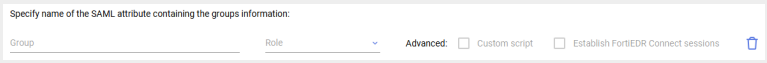


3. Click the *Download* button to download and save SP data from FortiEDR, which is used by your IdP server during SAML authentication. Then, upload this FortiEDR data as is to your IdP server using a standard method.
   If your IdP requires manual configuration, you can extract the following fields from the XML file that you downloaded and use them for manual configuration:

Field	Description
Entity ID	Located under the `md:EntityDescriptor` tag, in the `entityID` attribute.
Logout Address Value	Located under the `md:SingleLogoutService` tag, in the `Location` attribute.
Login Address Value	Located under the `md:AssertionConsumerService` tag, in the `Location` attribute.
Certificate Value (Public)	Located under the `ds:X509Certificate` tag.

4. Fill in the following fields:

Field	Definition
SAML Enabled	Check this checkbox to enable SAML authentication in FortiEDR.
SSO URL	Specify the URL to be used by users to log in to FortiEDR. If necessary, you can edit the suffix of this URL (shown in green) by clicking the *Edit* button and then modifying it as needed. You can also copy the URL to the clipboard using the *Copy* button (for example, in order to email the FortiEDR SAML login page to your users).  Make sure that the suffix does not include any spaces and is comprised of only letters, numbers and underscores.
IDP Description	Specify a free-text description. For example, you may want to specify the IdP server that you are using here.
IDP Metadata	Upload the IdP metadata to FortiEDR. You can either upload an XML file or a URL. To upload a file, click the *File* radio button and then click the *Select File* button to navigate to and select the applicable *.XML file. To upload a URL, click the *URL* radio button and then specify the requisite URL. 
Role/Group mapping	Specify the attribute name and define group/role mapping and permissions of the group:

Field	Definition
	 1. In *Attribute Name*, specify the name of the attribute to be read by FortiEDR, in order to determine the permissions and role to be assigned to that user in FortiEDR. This attribute must be included as part of the response from the identify provider server to FortiEDR when a user attempts to log in to FortiEDR. 2. Click *Add group*. 3. Define group/role mapping and permissions of the group:  a. In the *Group* field, specify an attribute value to be granted FortiEDR permissions. b. Under *Role*, select a role from the list. See Users on page 359 for more information about the roles. c. Under *Advanced*, enable any additional privileges for the group. Some options are role-dependent. 4. Click *Add group* and repeat step 2 for each role you want to map to an attribute value. If more than a single role is mapped to the user, FortiEDR expects to get multiple roles as a list of values and not in bulk in the SAML assertion that is sent by IdP.

5. Click *Save*.

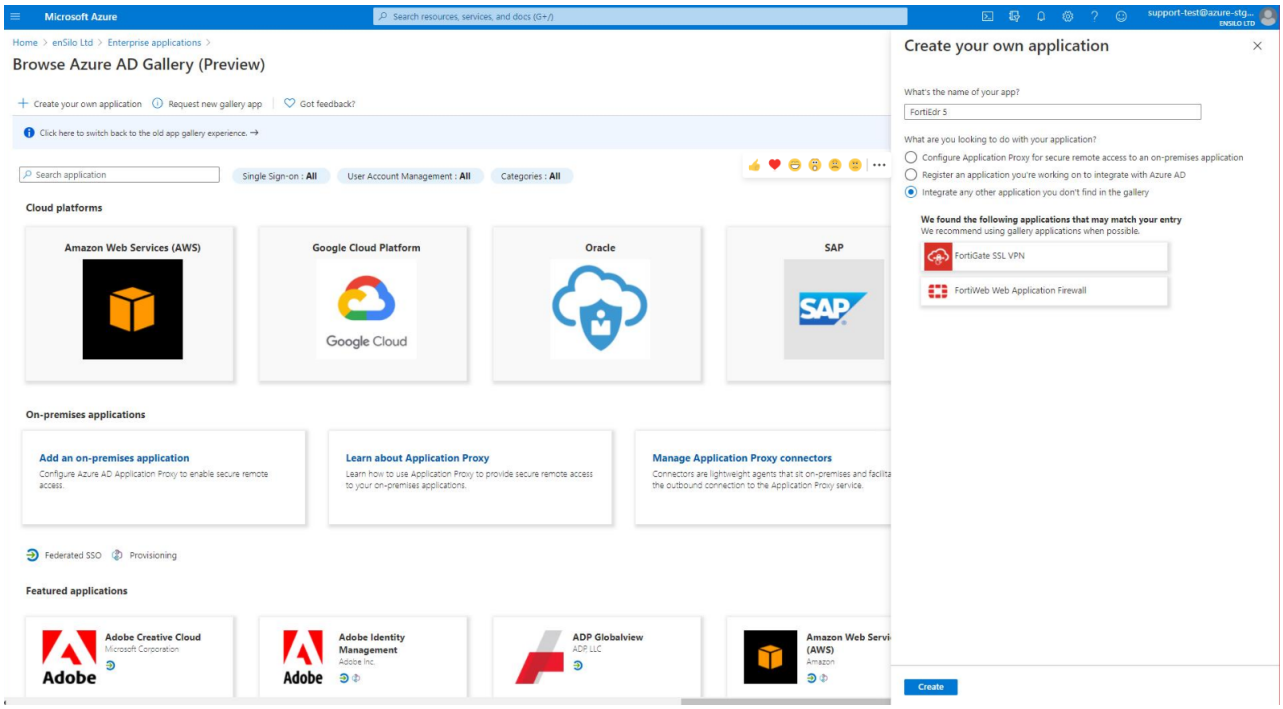
The examples below describe how the Azure, Okta or FortiAuthenticator SSO services can be used as an IdP that provides authorization and authentication for users attempting to access the FortiEDR Central Manager console. It demonstrates how to exchange metadata between the two entities, how to define group attributes and how to associate them with SAML users so that user permissions are dictated by the Group/Roles mapping in FortiEDR SAML configuration.

SAML IdP configuration with Azure

Azure may require a license to support SAML integration with their Enterprise Application. Contact Microsoft's support for further information.

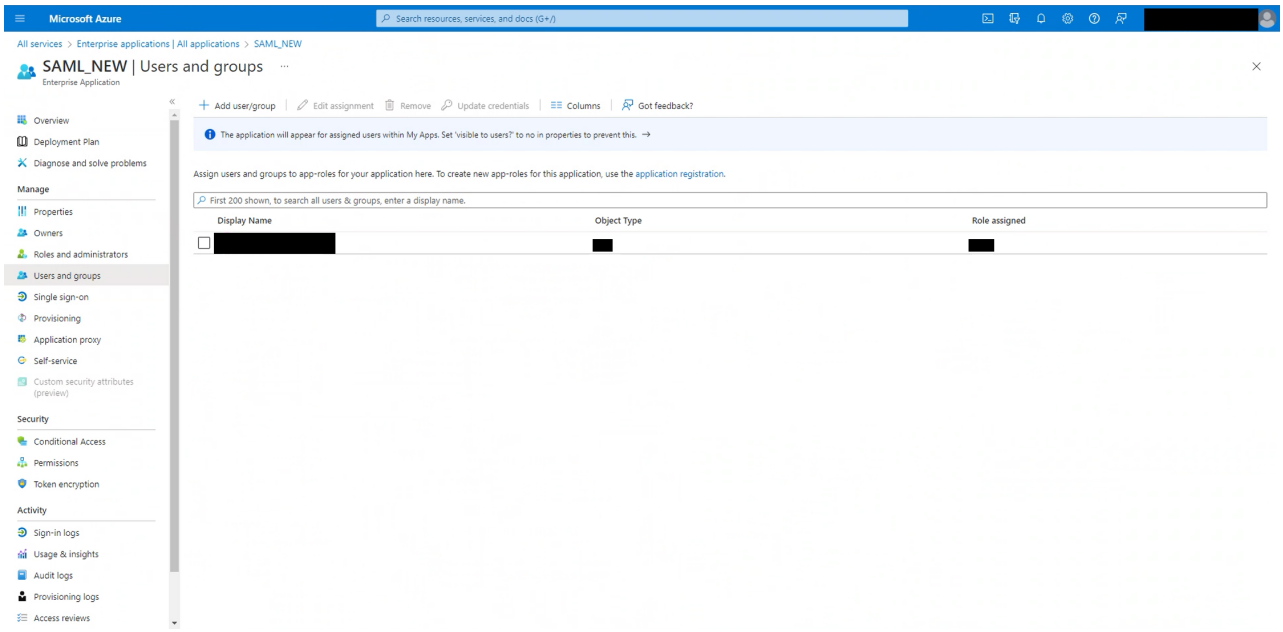
To configure general SAML IdP portal settings:

1. Before you start configuring SAML on Azure, download and save SP data from the FortiEDR SAML configuration page (`fortiEDR.sp.metedata.id.1.xml`), as described in SAML authentication on page 369.
2. Sign in to the Azure Dashboard.
3. In the Azure services, select and navigate to the Azure Active Directory.
4. From the left menu, select *Enterprise applications*.
5. Click *New Application* and then *Create your own application*.
6. In the window that appears, leave the default and click *Create*.

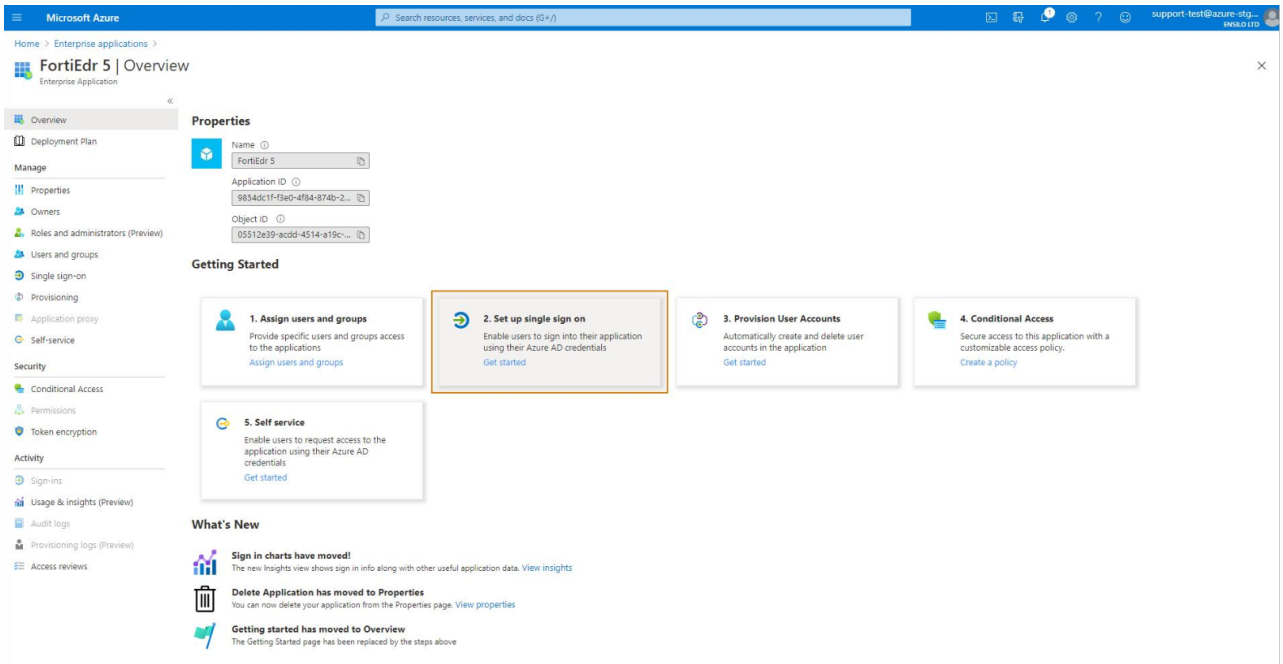


7. Click *Assign users and groups* to configure the users and groups to grant access to the FortiEDR application.
8. Select *Users and groups* and then *+ Add user/group* to create a new user group.

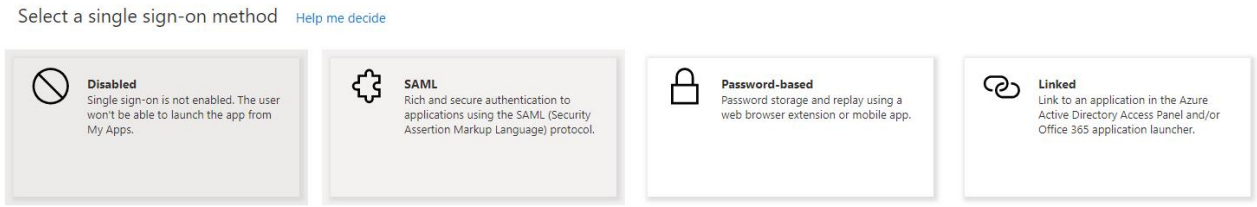
9. Add users to the group so that they will be eligible to authenticate with FortiEDR Manager.



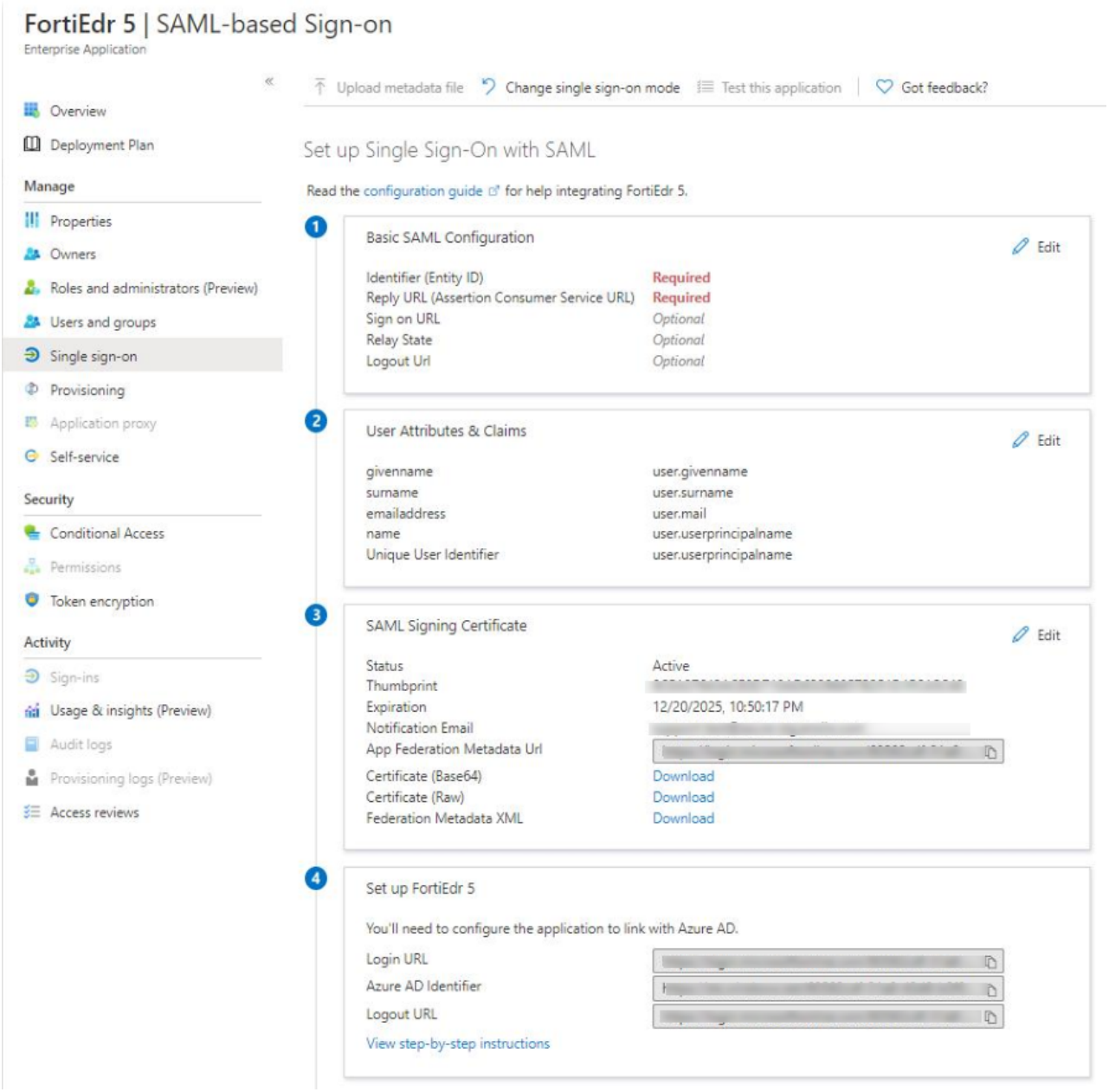
10. Go to the groups properties and note down the object Id which will be used in later steps.
11. Click *Set up single sign on*.



12. When prompted to select a single sign-on method, select *SAML*.

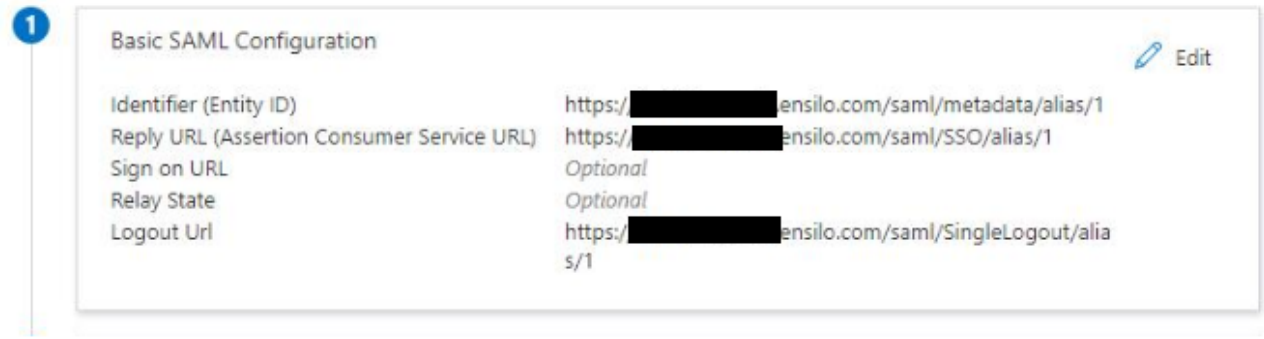


13. Click *Edit* in the *Basic SAML Configuration* box.



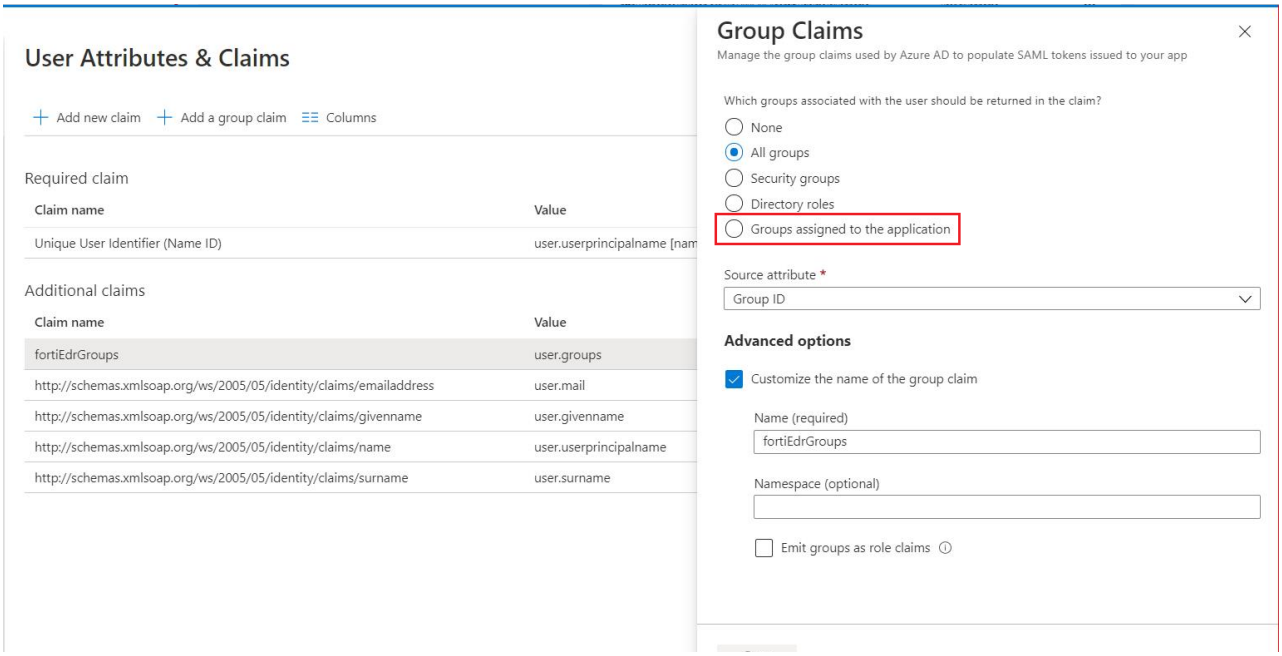
14. Click *Upload metadata file* and browse to select the FortiEDR SP metadata file (`fortiEDR.sp.metedata.id.1.xml`) that was downloaded from FortiEDR SAML configuration page during SAML authentication on page 369. Alternatively, you can manually copy the entityID and the Reply URL values from FortiEDR metadata file and paste them to the relevant input text boxes.

15. Click *Save*. The required SAML configuration fields displays populated with details, as shown below:



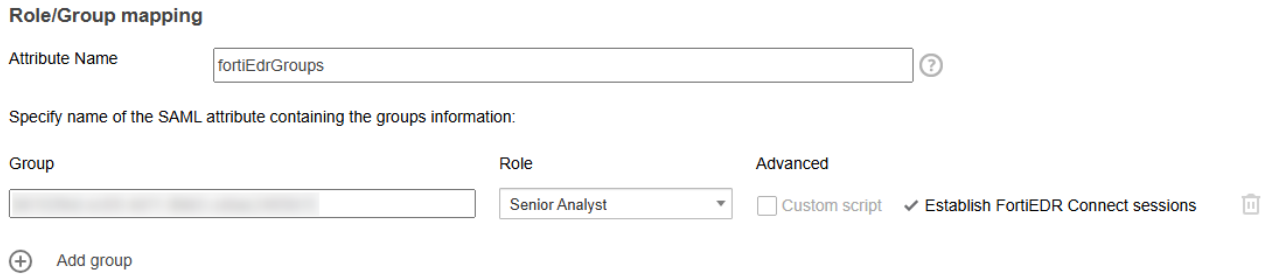
16. Click *Edit* in the *Attributes & Claims* box.
17. In the *Attributes & Claims* window, click *Add a group claim*.
18. In the *Group Claims* window, select *Groups assigned to the application* to include groups assigned to the FortiEDR application in the token.

    These specific groups should be specified in the Role/Group mapping on the SAML configuration page of the FortiEDR console in order to determine the permissions of the signed in user.

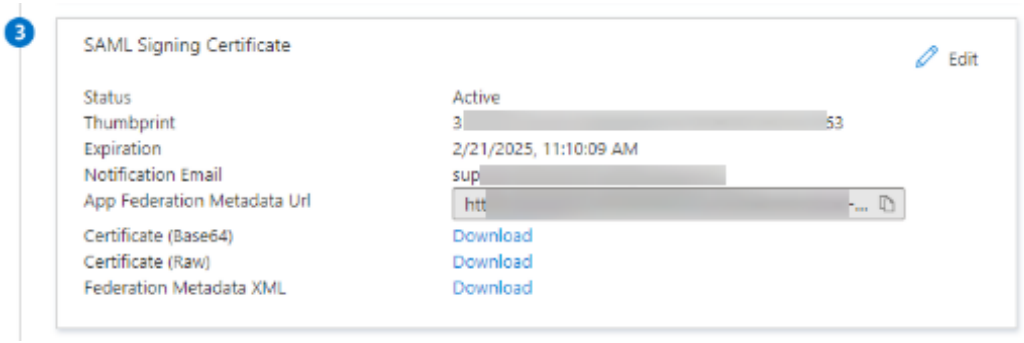


FortiEDR does not currently support consuming group overage (group.links) claim resolution or nested group resolution.

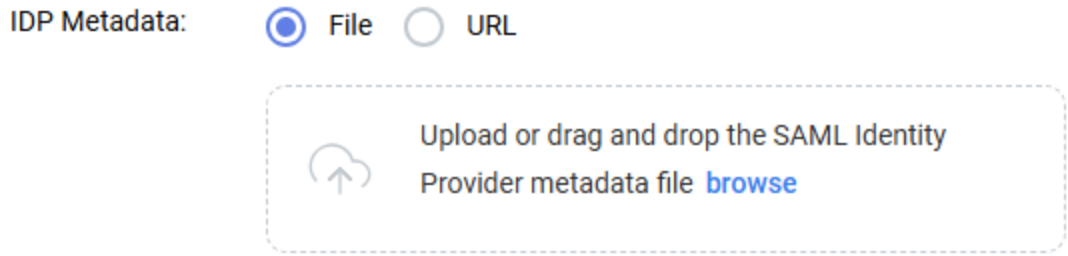
19. Select the *Customize the name of the group claim* checkbox.
    Note down the Azure "name of the group claim", which you will need to specify as *Attribute Name* when configuring SAML in FortiEDR later.
20. In the FortiEDR Central Manager console, in the *Attribute Name* field, enter the attribute name that was specified on the SAML configuration page of the FortiEDR console during SAML authentication on page 369. In our example, it is *fortiEdrGroups*, as shown below. The *Group* should be the *Azure Group object Id* noted earlier in step 10.



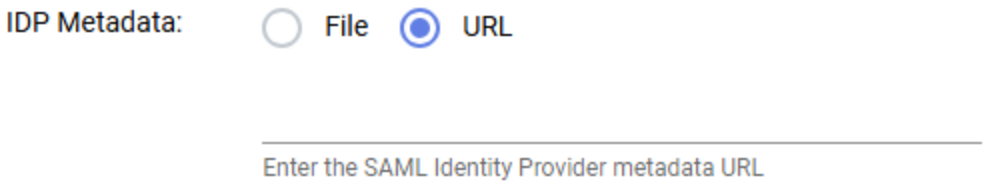
21. Click *Save*.
22. Download the Federation Metadata XML file from the *SAML Signing Certificate* section on Azure, as shown below:



23. Inspect the SAML assertion using SAML Tracer or Azure Token View to verify claim emission.
24. Select and upload the XML file into the FortiEDR Central Manager, as follows:



Alternatively, you can use the App Federation Metadata URL from Azure, select the *URL* radio button in the IDP Metadata configuration on the FortiEDR console and paste it to the same location:

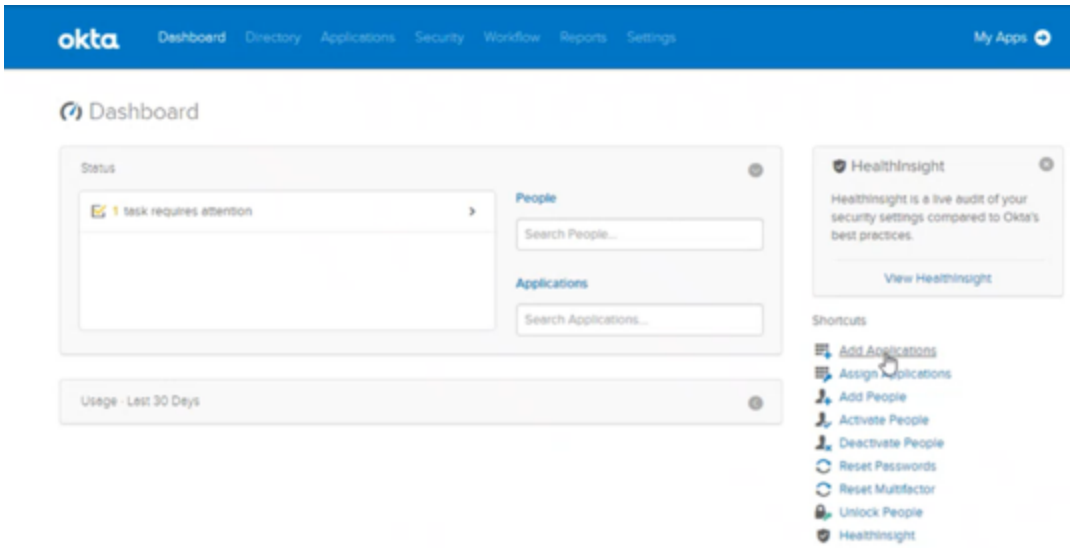


Azure can now be used as an IdP that awards authorization and authentication to users trying to access the FortiEDR Central Manager console. When logging into the FortiEDR console via an SSO URL that is specified under the SAML settings page, an Azure user is awarded access rights to the FortiEDR Central Manager according to the User Groups to which that user was added in Azure.

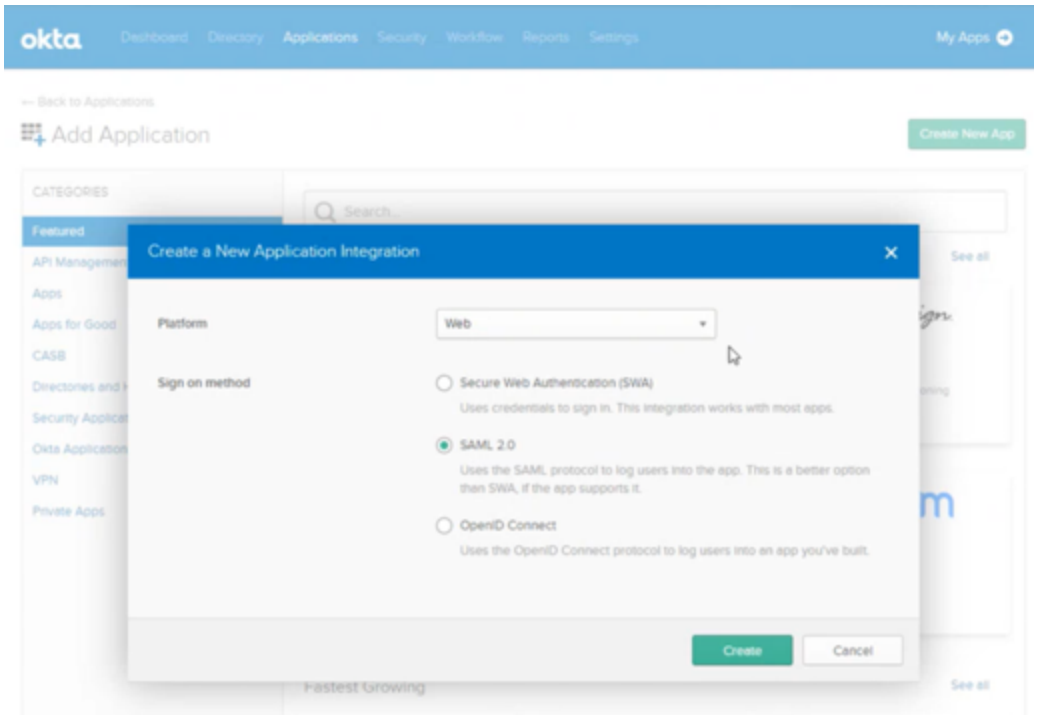
SAML IdP configuration with Okta

To configure general SAML IdP portal settings:

1. Before starting to configure SAML on Okta, you must download and save SP data from the FortiEDR SAML configuration page (`fortiEDR.sp.metedata.id.1.xml`), as described in SAML authentication on page 369
2. Sign in to the Okta Admin dashboard. The following displays:

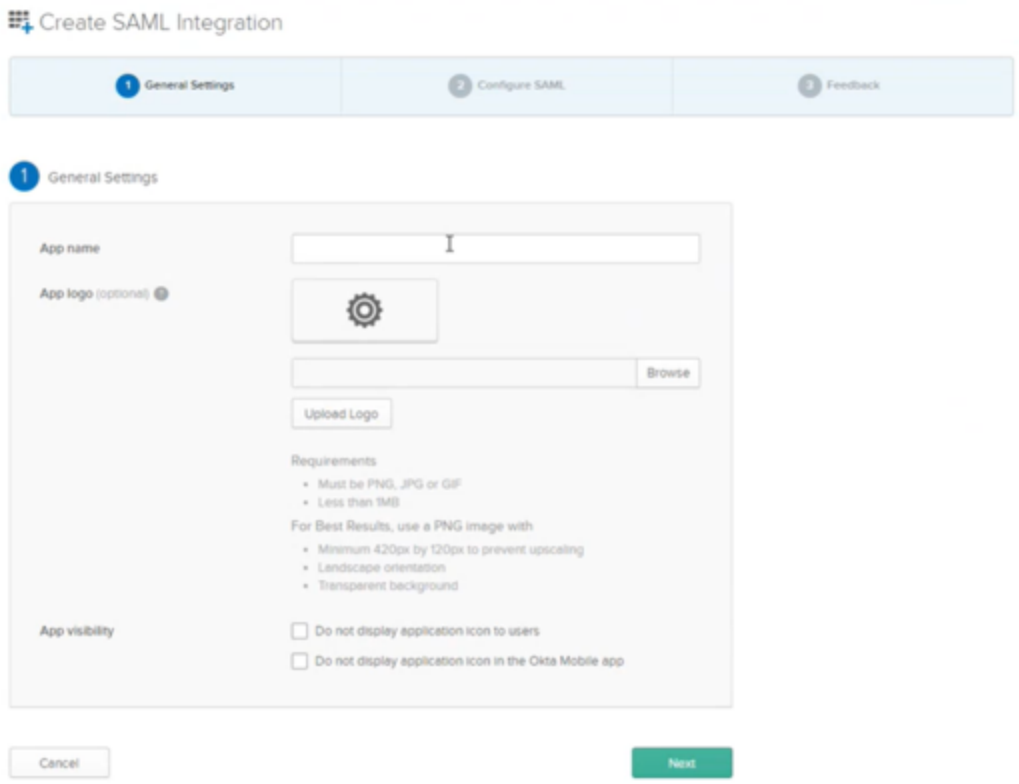


3. In your Okta org, click *Applications* and then *Add Applications*.
4. Click *Create New App* . The following displays:

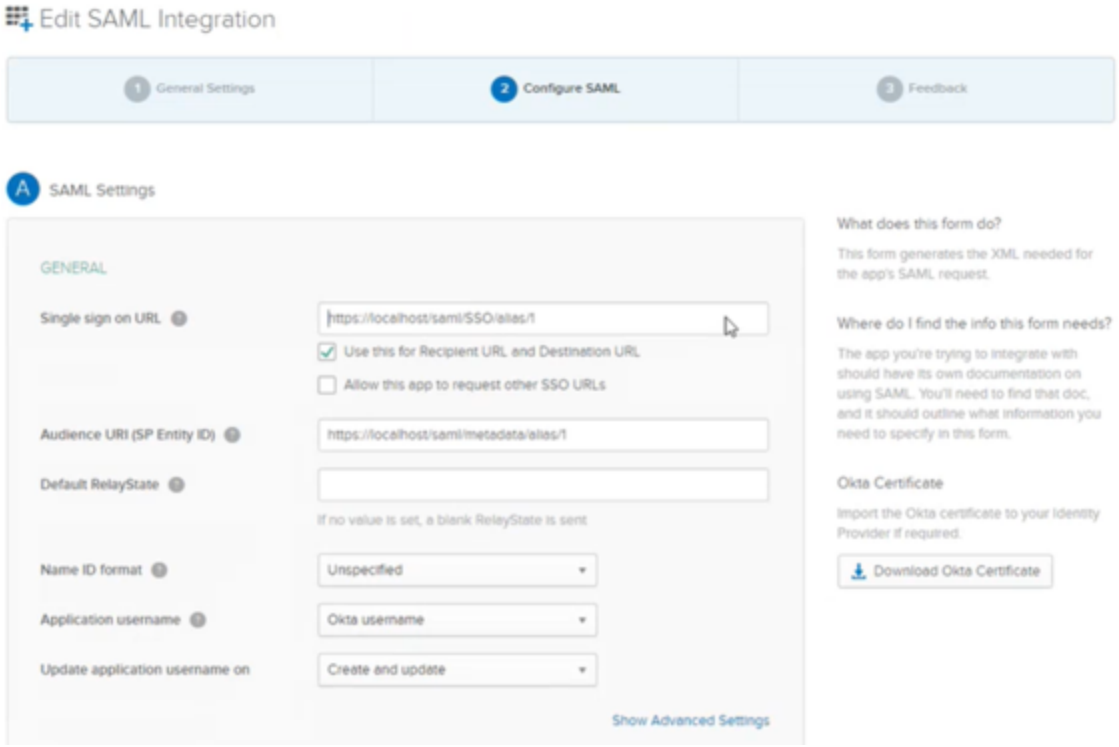


5. In the *Platform* field, select *Web*.

6. In the *Sign on method* field, select *SAML 2.0*.
7. Click *Create*.
8. In the *General Settings* page, select a name for the application. For example, FortiEDRConsole. Optionally, you can also add the FortiEDR logo here.



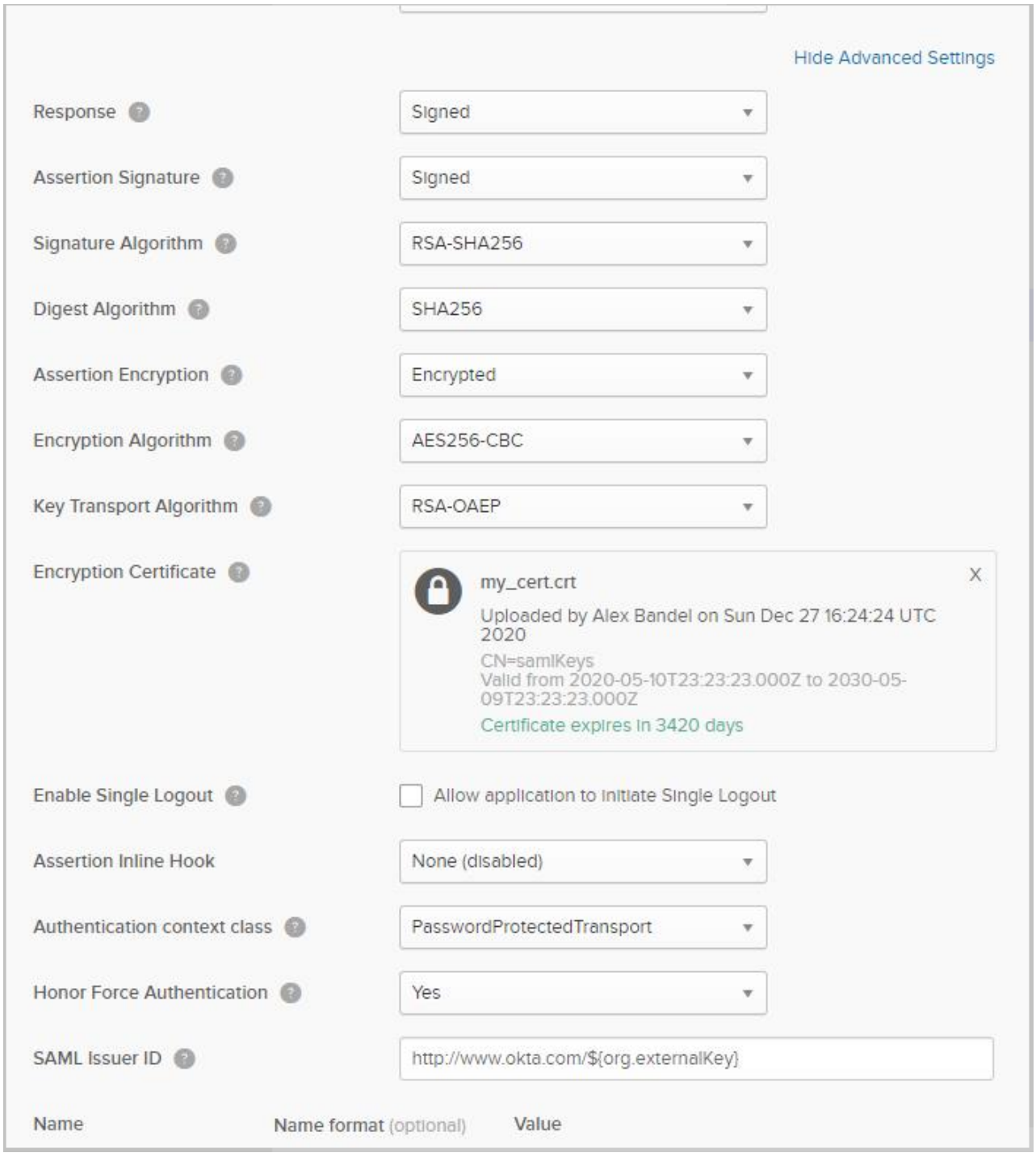
9. Click *Next*. The Configure SAML page displays:



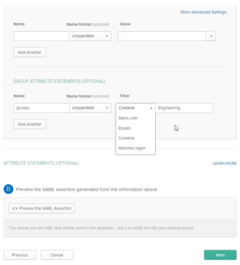
10. Copy the following values that are taken from the FortiEDR SP metadata file (`fortiEDR.sp.metedata.id.1.xml`) that was downloaded from FortiEDR SAML configuration page, as described in SAML authentication on page 369.
    - *Single sign on URL*: Under the `md:AssertionConsumerService` tag, in the *Location* attribute (For example, `https://myexample.fortiedr.com/saml/SSO/alias/1`).
    - *Audience URI (SP entity ID)*: Under the `md:EntityDescriptor` tag, in the `entityID` attribute (For example, `https://myexample.fortiedr.com/saml/metadata/alias/1`).
11. In *Advanced Settings*, in the *Assertion Encryption* field, select *Encrypted*.
12. Use Notepad or another text editor to copy the entire attribute `<ds:X509Certificate>XXX </ds:X509Certificate>` from the FortiEDR SP metadata file (`fortiEDR.sp.metedata.id.1.xml`) that was downloaded from FortiEDR SAML configuration page. Then, save this attribute as a `.crt` file to be used as a certificate.

13. Upload this `.crt` file to the Encryption Certificate box on Okta, as shown below:

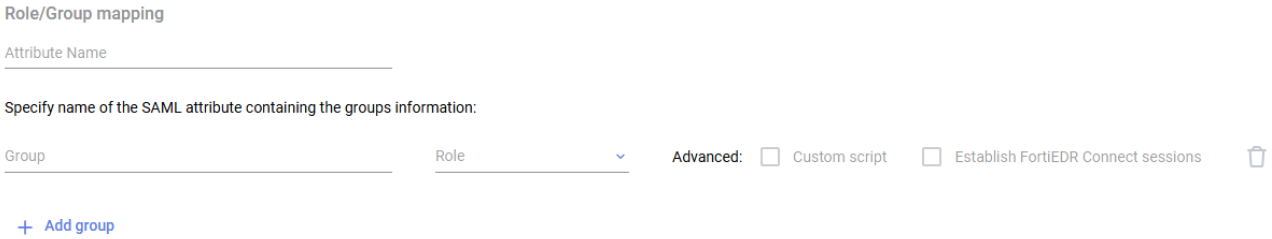
14. Leave the default values in the rest of the settings. For example, as shown below:



15. Groups will be used in the assertion so that FortiEDR roles will be assigned according to the current groups in the Okta directory. For example, to assign the *Okta Engineering* group to have Admin roles on FortiEDR, add it to Okta as follows:



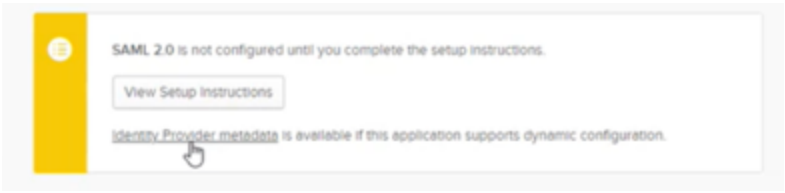
The mapping of this group to the FortiEDR Admin role is then performed in the SAML settings page of the FortiEDR Central Manager console as follows:



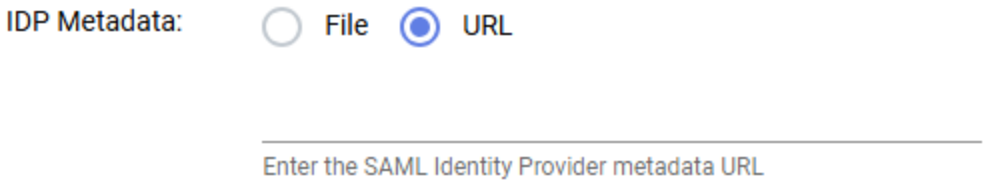
16. Previewing the assertion should appear similar to the following example:

```
<?xml version="1.0" encoding="UTF-8"?>
<saml2:Assertion xmlns:saml2="urn:oasis:names:tc:SAML:2.0:assertion" Version="2.0" IssueInstant="2020-12-27T12:13:33.838Z" ID="id808250676414641616301208l0">
    <saml2:Issuer Format="urn:oasis:names:tc:SAML:2.0:nameid-format:entity">http://www.okta.com/Issuer</saml2:Issuer>
  - <saml2:Subject>
        <saml2:NameID Format="urn:oasis:names:tc:SAML:1.1:nameid-format:unspecified">userName</saml2:NameID>
      - <saml2:SubjectConfirmation Method="urn:oasis:names:tc:SAML:2.0:cm:bearer">
            <saml2:SubjectConfirmationData Recipient="https://sw.console.ensilo.com/saml/SSO/alias/1" NotOnOrAfter="2020-12-27T12:18:33.871Z"/>
        </saml2:SubjectConfirmation>
    </saml2:Subject>
  - <saml2:Conditions NotOnOrAfter="2020-12-27T12:18:33.871Z" NotBefore="2020-12-27T12:08:33.871Z">
      - <saml2:AudienceRestriction>
            <saml2:Audience>https://sw.console.ensilo.com/saml/metadata/alias/1</saml2:Audience>
        </saml2:AudienceRestriction>
    </saml2:Conditions>
  - <saml2:AuthnStatement AuthnInstant="2020-12-27T12:13:33.838Z">
      - <saml2:AuthnContext>
            <saml2:AuthnContextClassRef>urn:oasis:names:tc:SAML:2.0:ac:classes:PasswordProtectedTransport</saml2:AuthnContextClassRef>
        </saml2:AuthnContext>
    </saml2:AuthnStatement>
  - <saml2:AttributeStatement>
      - <saml2:Attribute NameFormat="urn:oasis:names:tc:SAML:2.0:attrname-format:unspecified" Name="groups">
            <saml2:AttributeValue xsi:type="xs:string" xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance" xmlns:xs="http://www.w3.org/2001/XMLSchema">GroupName Match Contains "Engineering" (ignores case) </saml2:AttributeValue>
        </saml2:Attribute>
    </saml2:AttributeStatement>
</saml2:Assertion>
```

17. Click *Next* and then click *Finish*.
18. When you configure SAML SSO on the FortiEDR console, use the URL for *Identity Provide Metadata* from the application Sign On settings in Okta, as shown below:



19. Paste it into the FortiEDR Central Manager as follows:



Okta can now be used as an IdP that awards authorization and authentication to users trying to access the FortiEDR Central Manager console. When logging into FortiEDR console via the SSO URL that is specified under the SAML settings page, an Okta user is awarded access rights to the FortiEDR Central Manager according to the User Groups to which that user was added in Okta.

SAML IdP Configuration with FortiAuthenticator

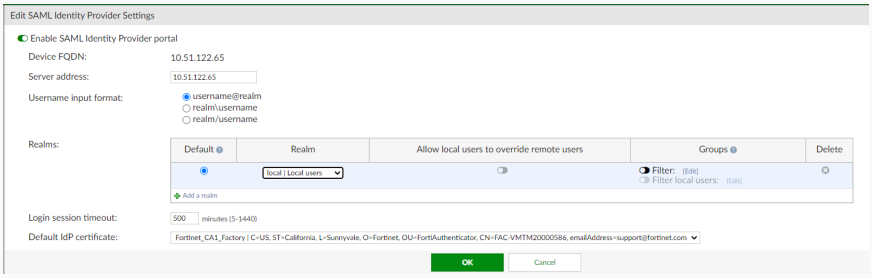
FortiAuthenticator configuration is comprised of the following steps:

1. Setting up FortiAuthenticator as an IdP on page 385
2. Setting up user group management on page 385 (if not configured already)
3. Setting up service provider for FortiEDR on page 387

Setting up FortiAuthenticator as an IdP

To configure general SAML IdP portal settings:

1. Go to *Authentication > SAML IdP > General* and select *Enable SAML Identity Provider portal*.
2. Configure the following settings:

Setting	Definition
Device FQDN	To configure this setting, you must enter a Device FQDN in the System Information widget in the Dashboard.
Server address	Enter the IP address or FQDN of the FortiAuthenticator device.
Username input format	Select one of the provided options. In our example, we used *username@realm*.
Realms	Select *Add a realm* to add the default local realm to which the users will be associated.
Login session timeout	Set the user's login session timeout limit to between 5 – 1440 minutes (one day). In our example, we used `500 minutes`.
Default IdP certificate	Select a default certificate the IdP uses to sign SAML assertions from the dropdown menu. 

3. Click *OK* to apply these changes.

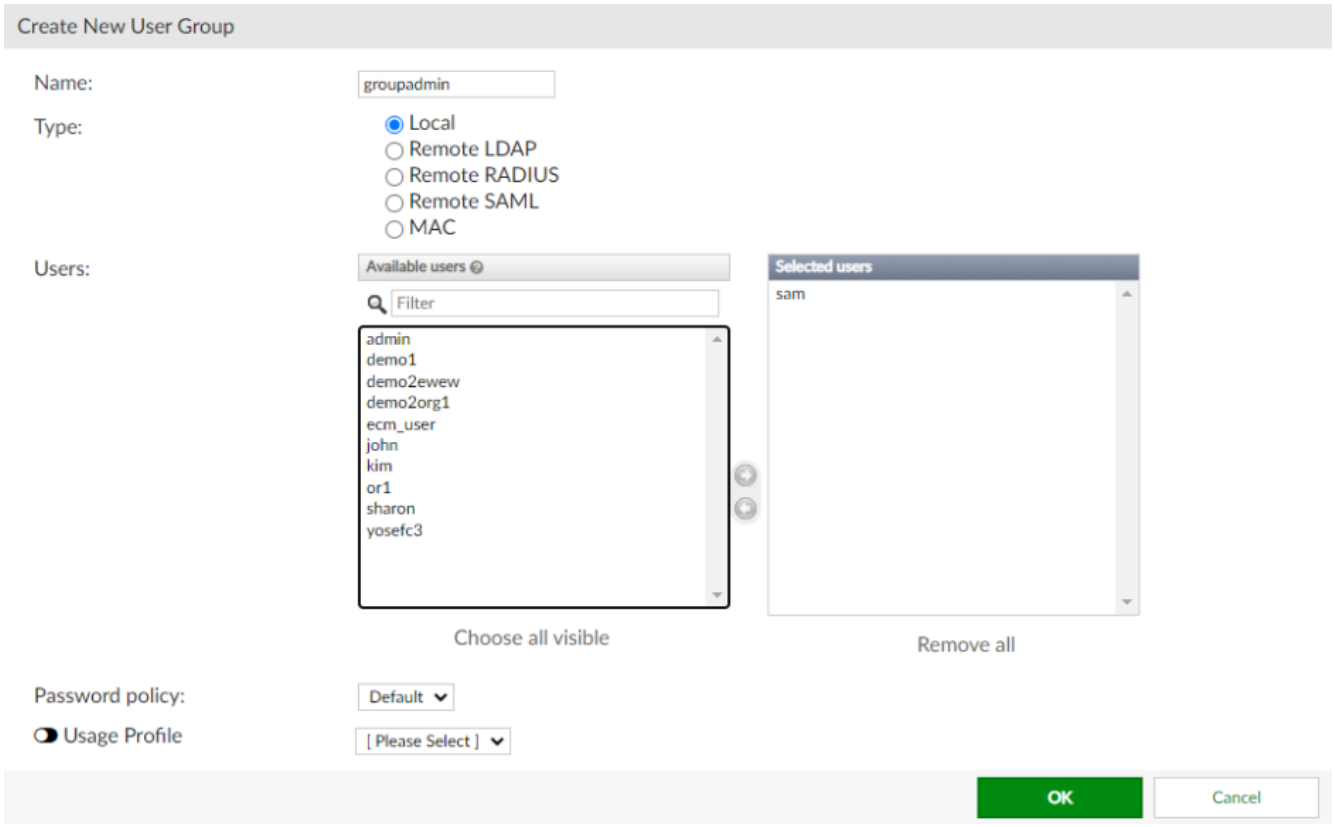
Setting up user group management

To configure on FortiAuthenticator the assertion attribute that will be used to map users' permissions to access FortiEDR:

1. Go to *Authentication > User Management > User Groups*.
2. Select *Create New*.

3. Specify a name for the group to be used for setting User access permissions for FortiEDR. In our example, we used groupuser.
4. In the *Users* section, select all the FortiAuthenticator users to be assigned with User permission to the FortiEDR Central Manager Console in order to add them to this User Group.
5. Click *OK* to save the configuration.
6. Repeat steps 1 – 5 above to create a group for each role and select the users to be assigned to that group with the corresponding permissions to the FortiEDR Central Manager Console.

In our example, we created a group named *groupadmin* and assigned this user the same Admin permissions to the FortiEDR Central Manager Console, as shown below:

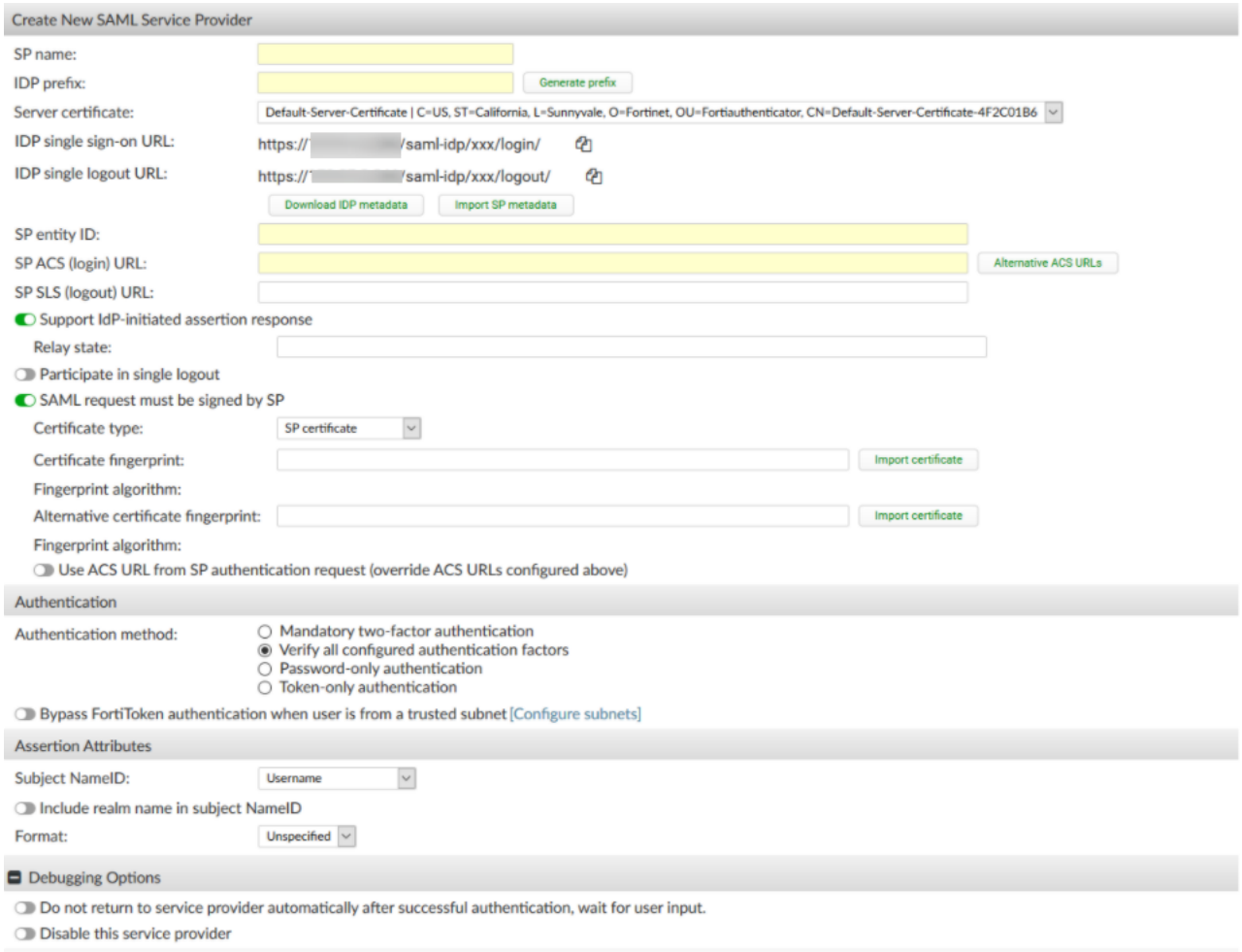


New or existing FortiAuthenticator users can also be configured into groups on the Local Users create and edit page.

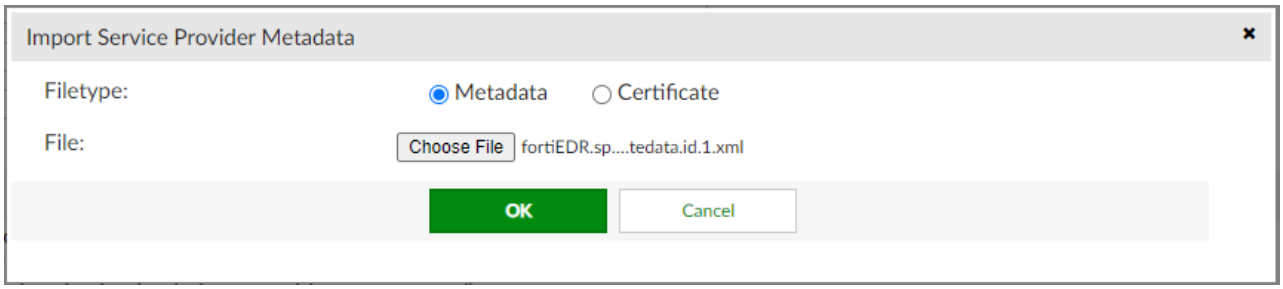
Setting up service provider for FortiEDR

To configure FortiEDR as a SAML service provider on FortiAuthenticator:

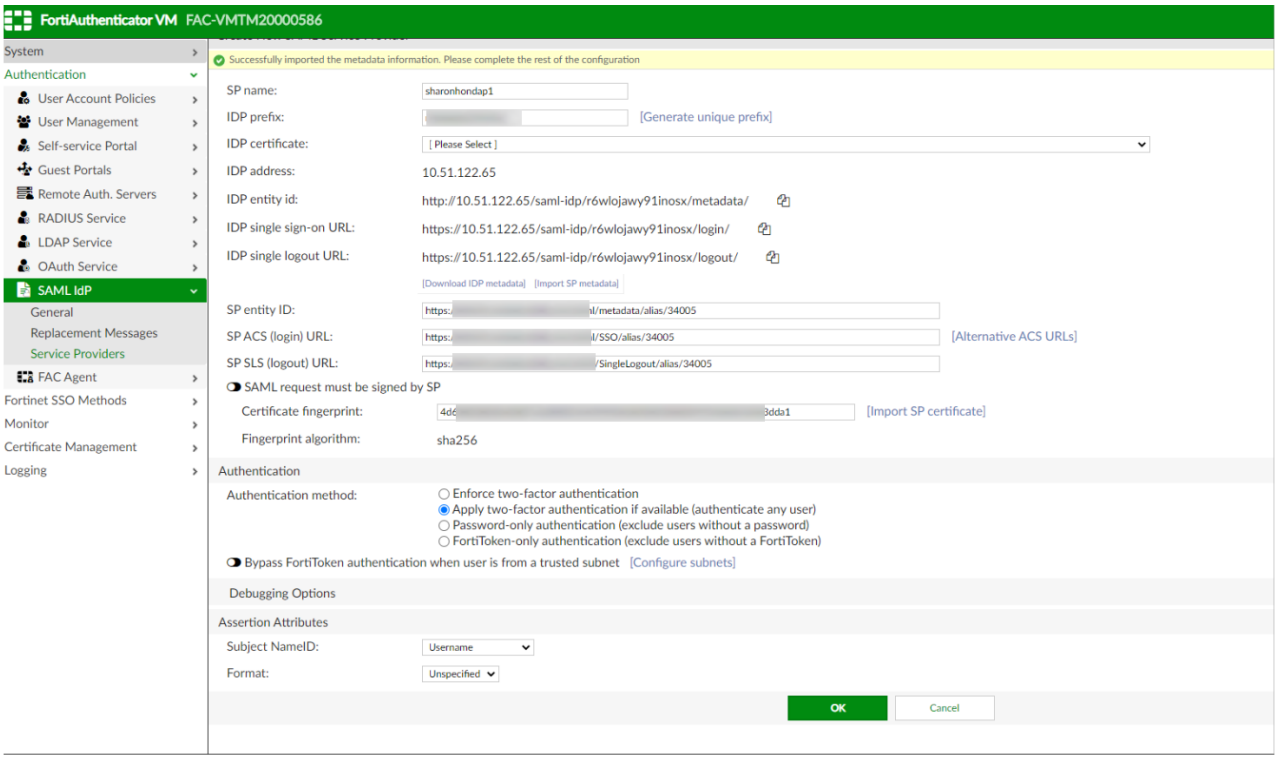
1. Go to *Authentication > SAML IdP > Service Providers*.
2. Select *Create New*.



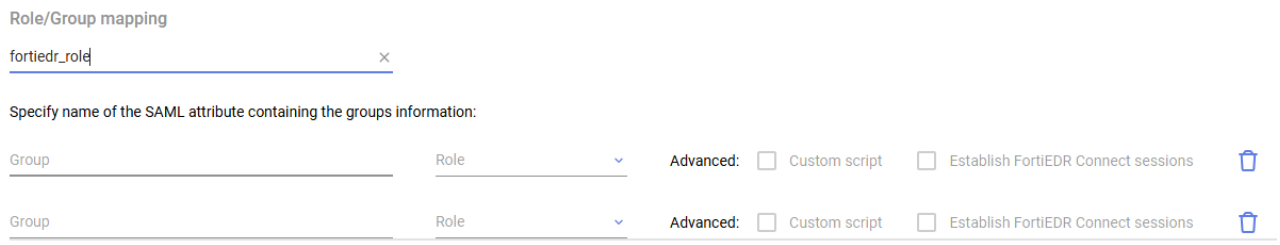
3. Fill in the following fields:
   - *SP name*: Enter a name for the FortiEDR SP.
   - *IDP prefix*: Select *Generate prefix* in order to generate a random 16-digit alphanumeric string or alternatively enter a prefix for the IDP that is appended to the end of the IDP URLs.
4. Click *Download IDP metadata* to save the FortiAuthenticator IDP data file to be used for uploading into FortiEDR. Refer to step 3 in SAML authentication on page 369 for more information.
5. Click *Import SP metadata* and select the SP data file that was downloaded from FortiEDR. Refer to step 2 in SAML authentication on page 369 for more information.



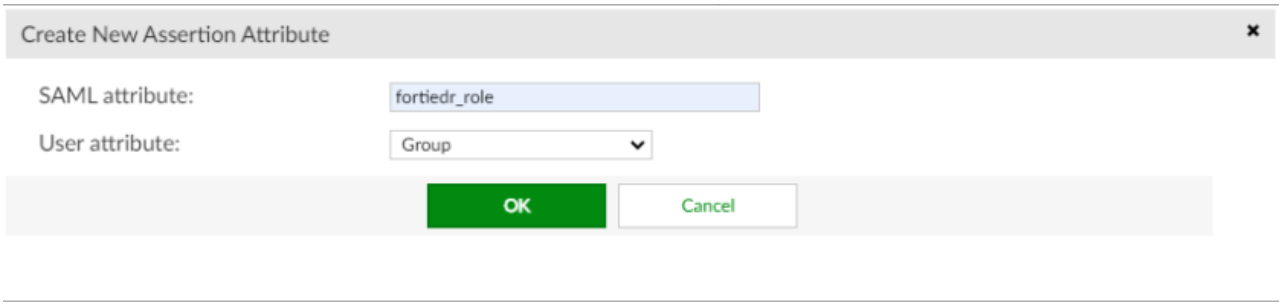
6. All other service provider configuration fields are auto-filled after the SP data file import:



7. Click *OK* to apply the changes.
8. Go to *Authentication > SAML IdP > Service Providers* and double-click to open the Service Provider that you created in the previous step.
9. In the *SAML Attribute* section, click *Create New*.
10. In the popup window, enter the attribute name that was configured in the FortiEDR SAML Authentication settings and select *FortiAuthenticator Group* as the User Attribute.
    In our example, we use `fortiedr_role` as an attribute name, as shown below:



And therefore the configuration on FortiAuthenticator appears as follows:



11. Click *OK* to save the changes.

FortiAuthenticator can now be used as the IdP, which provides authorization and authentication for users trying to access the FortiEDR Central Manager Console. When logging into the FortiEDR Console via the SSO url that is specified in the SAML settings page, a FortiAuthenticator user is awarded access permissions to the FortiEDR Central Manager according to the User Groups into which he/she was added.

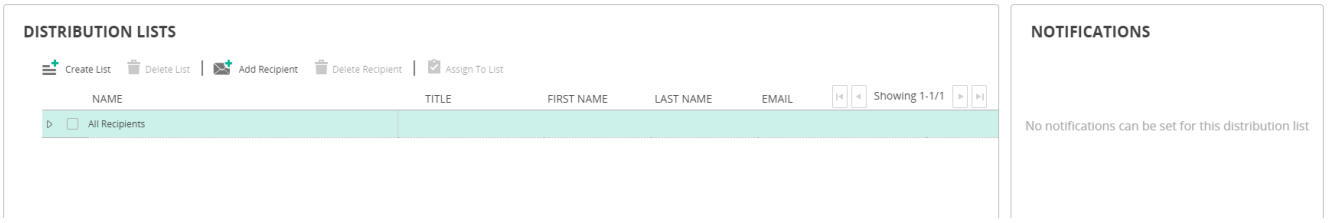
Distribution lists

The *DISTRIBUTION LISTS* option enables you to specify recipients who will receive an email each time a security event is triggered by FortiEDR.

You must configure SMTP before using the *Distribution List* option. For more details, see SMTP on page 330.

Emails are only sent for security events that occur on devices that are part of Collector Groups that are assigned to a Playbook policy in which the *Send Email Notification* option is checked.

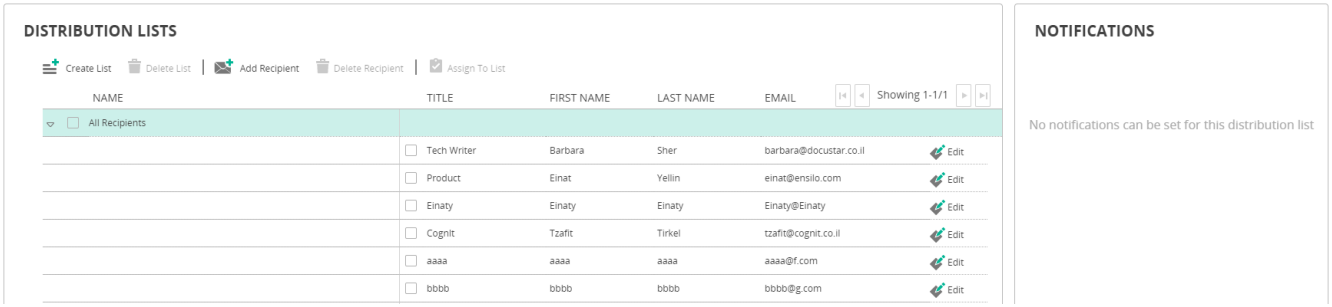
Each email contains all the variants collected by FortiEDR about that security event. The system is provided with a Distribution List called All Recipients that contains all FortiEDR Central Manager users. All other recipients that are added to the system are also automatically added to the *All Recipients* list.



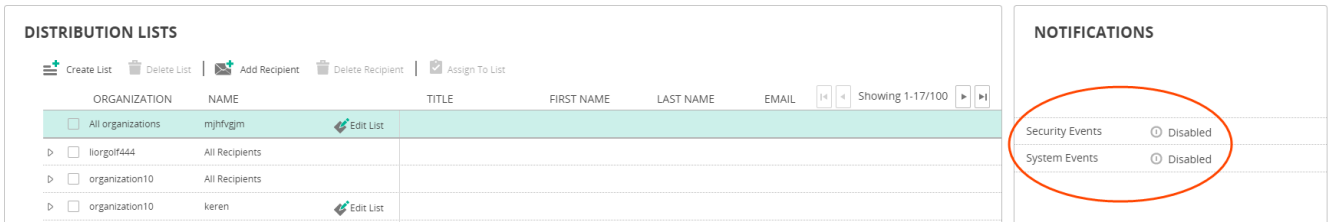
This window displays a row for each Distribution List. Click the *Expand* button ( ) in a row to view the recipients assigned to that list.

Use the *Create List* button (Create List) to create a new distribution list.

Use the *Add Recipient* button (Add Recipient) to add a recipient or user to a distribution list.



Select a distribution list row and then use the *Enabled/Disabled* option in the *NOTIFICATIONS* pane on the right to enable or disable the list per event type (system events or security events).



Settings

The *Administration* > *Settings* page provides access to the following configuration options:

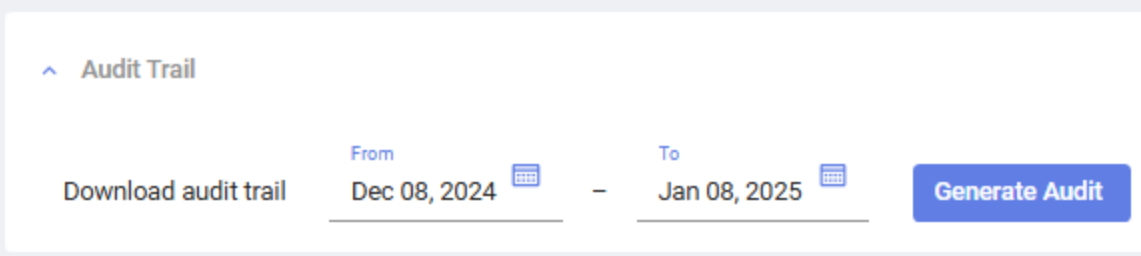
Some options are only available to specific roles. For more information about user roles and permissions, see Users on page 359.

- Audit Trail on page 391
- Deployment URL on page 393
- Component Authentication on page 393
- File Scan on page 395
- End Users Notifications on page 396
- Personal Data Handling on page 401
- IoT Device Discovery on page 407
- Windows Security Center on page 409
- Application Control Manager on page 410
- FortiEDR Connect on page 410
- Reputation Service on page 411
- Time Zone on page 411

Audit Trail

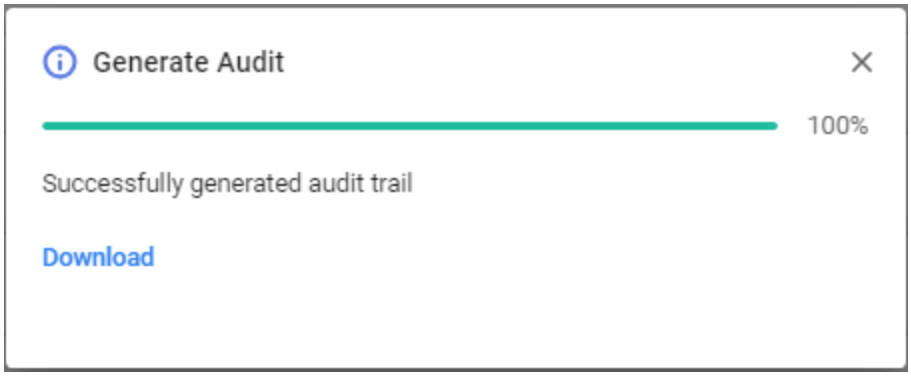
FortiEDR's audit mechanism records every user action in the FortiEDR system. System actions are not recorded. You can download the audit trail (up to 30 days) to a CSV file for further analysis.

Each time a new audit trail is created, it can be sent through the Syslog.

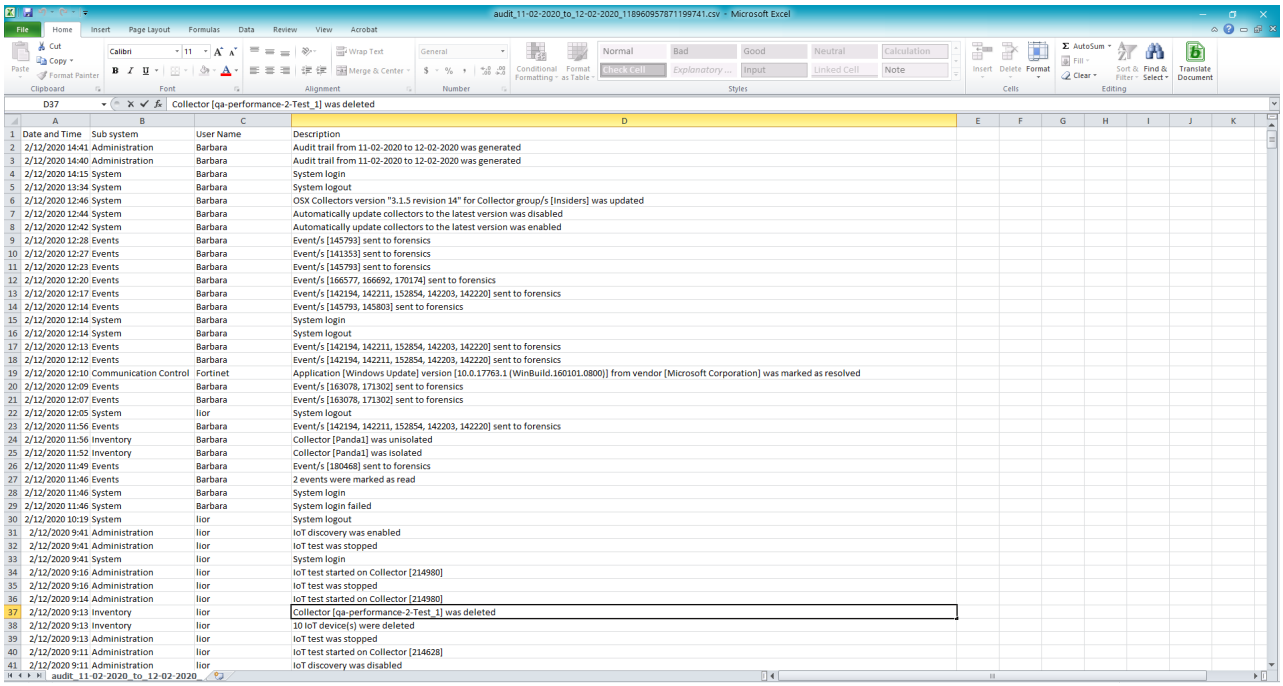


To generate the audit trail:

1. Navigate to the *Administration* > *Settings* page.
2. Expand the *Audit Trail* section and specify the *From* and *To* dates in the respective fields.
3. Click the *Generate Audit* button. A progress window displays:



4. Click the *Download* link to download the audit trail to a CSV file or spreadsheet, such as the example shown below, displays:



Date and Time	Sub system	User Name	Description
2/12/2020 14:41	Administration	Barbara	Audit trail from 11-02-2020 to 12-02-2020 was generated
2/12/2020 14:40	Administration	Barbara	Audit trail from 11-02-2020 to 12-02-2020 was generated
2/12/2020 14:15	System	Barbara	System login
2/12/2020 13:34	System	Barbara	System logout
2/12/2020 12:46	System	Barbara	OSX Collectors version "3.1.5 revision 14" for Collector group/s [Insiders] was updated
2/12/2020 12:44	System	Barbara	Automatically update collectors to the latest version was disabled
2/12/2020 12:42	System	Barbara	Automatically update collectors to the latest version was enabled
2/12/2020 12:28	Events	Barbara	Event/s [145793] sent to forensics
2/12/2020 12:27	Events	Barbara	Event/s [141353] sent to forensics
2/12/2020 12:23	Events	Barbara	Event/s [145793] sent to forensics
2/12/2020 12:20	Events	Barbara	Event/s [166577, 166692, 170174] sent to forensics
2/12/2020 12:17	Events	Barbara	Event/s [142194, 142211, 152854, 142203, 142220] sent to forensics
2/12/2020 12:14	Events	Barbara	Event/s [145793, 145803] sent to forensics
2/12/2020 12:14	System	Barbara	System login
2/12/2020 12:14	System	Barbara	System logout
2/12/2020 12:13	Events	Barbara	Event/s [142194, 142211, 152854, 142203, 142220] sent to forensics
2/12/2020 12:12	Events	Barbara	Event/s [142194, 142211, 152854, 142203, 142220] sent to forensics
2/12/2020 12:10	Communication Control	Fortinet	Application [Windows Update] version [10.0.17763.1 (WinBuild.160101.0800)] from vendor [Microsoft Corporation] was marked as resolved
2/12/2020 12:09	Events	Barbara	Event/s [163078, 171302] sent to forensics
2/12/2020 12:07	Events	Barbara	Event/s [163078, 171302] sent to forensics
2/12/2020 12:05	System	lior	System logout
2/12/2020 11:56	Events	Barbara	Event/s [142194, 142211, 152854, 142203, 142220] sent to forensics
2/12/2020 11:56	Inventory	Barbara	Collector [Panda1] was unisolated
2/12/2020 11:52	Inventory	Barbara	Collector [Panda1] was isolated
2/12/2020 11:49	Events	Barbara	Event/s [180468] sent to forensics
2/12/2020 11:46	Events	Barbara	2 events were marked as read
2/12/2020 11:46	System	Barbara	System login
2/12/2020 11:46	System	Barbara	System login failed
2/12/2020 10:19	System	lior	System logout
2/12/2020 9:41	Administration	lior	IoT discovery was enabled
2/12/2020 9:41	Administration	lior	IoT test was stopped
2/12/2020 9:41	System	lior	System login
2/12/2020 9:16	Administration	lior	IoT test started on Collector [214980]
2/12/2020 9:16	Administration	lior	IoT test was stopped
2/12/2020 9:14	Administration	lior	IoT test started on Collector [214980]
2/12/2020 9:13	Inventory	lior	Collector [qa-performance-2-Test_1] was deleted
2/12/2020 9:13	Inventory	lior	10 IoT device(s) were deleted
2/12/2020 9:13	Administration	lior	IoT test was stopped
2/12/2020 9:11	Administration	lior	IoT test started on Collector [214628]
2/12/2020 9:11	Administration	lior	IoT discovery was disabled

Each row in the audit trail file contains the following columns of information:

Field	Definition
Date and Time	Displays the date and time in the format *yyyy-mm-dd hh:mm:ss*.
Sub system	Displays the change type, such as System, Configuration, Administration, Forensics, Events, Inventory, Communication Control or Health.
User Name	Displays the name of the user.
Description	Displays the action and/or a description.

The following actions can be audited:

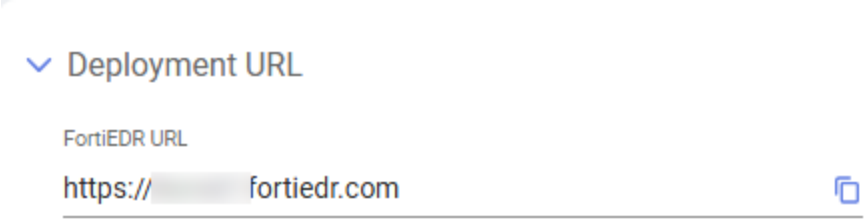
- Policy actions
- Forensic actions
- Administrative actions
- Events
- Inventory actions
- System health changes

If an employee's/user's data was removed from FortiEDR for GDPR compliance, then the affected record for that person still displays in the audit trail but shows *GDPR_ANONYMIZE* instead of actual user data. For example, as shown below:

6/20/2018 15:57	Administration	admin	GDPR report was generated
6/20/2018 15:57	System	GDPR_ANONYMIZE	System login
6/20/2018 15:57	Administration	admin	GDPR Deletion

Deployment URL

This section displays the URL of the environment that you can copy. The URL is read-only and includes the domain information that you will need in order to use FortiEDR APIs.



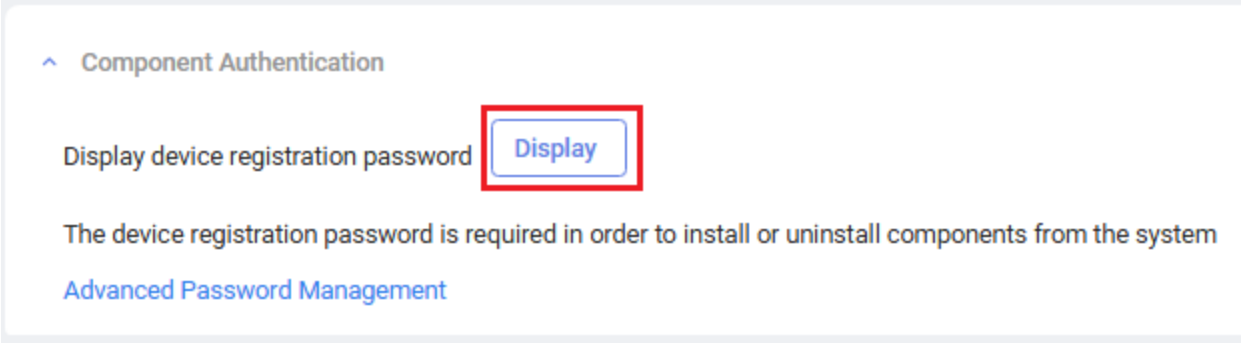
Component Authentication

In order to install, upgrade or uninstall a Collector, you must supply the registration password. The registration password is the same for all Collectors in the FortiEDR system. This password is defined when you configure the FortiEDR Central Manager Server and console.

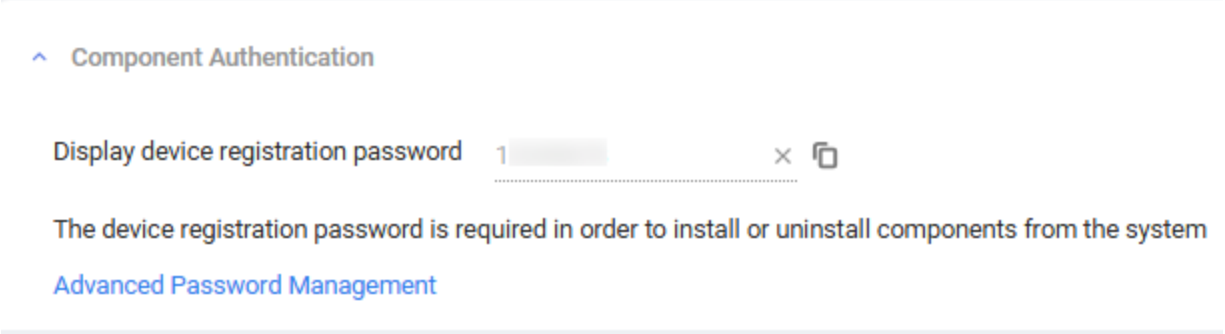
The *Component Authentication* section provides options to retrieve a lost registration password or revoke a compromised registration password.

If you forget the registration password, retrieve it by following the steps below:

1. Navigate to the *Administration > Settings* page.
2. Expand the *Component Authentication* section and click the *Display* button.

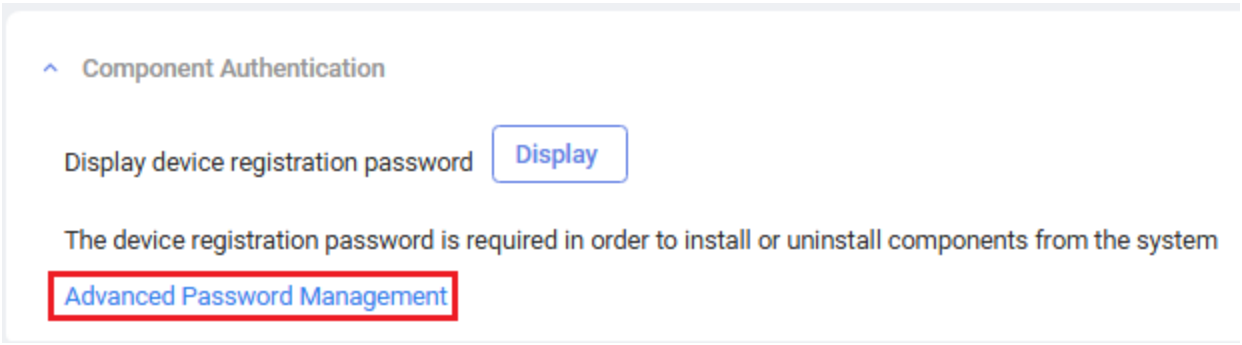


The password is shown temporarily for you to view to copy.

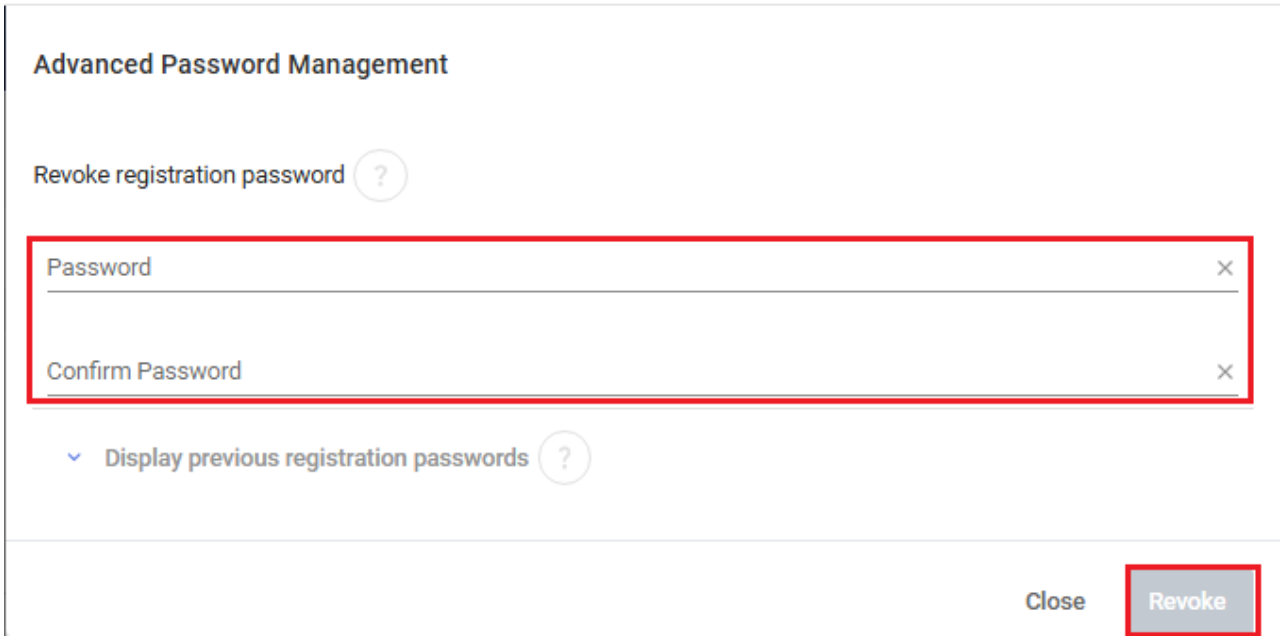


To revoke a compromised registration password:

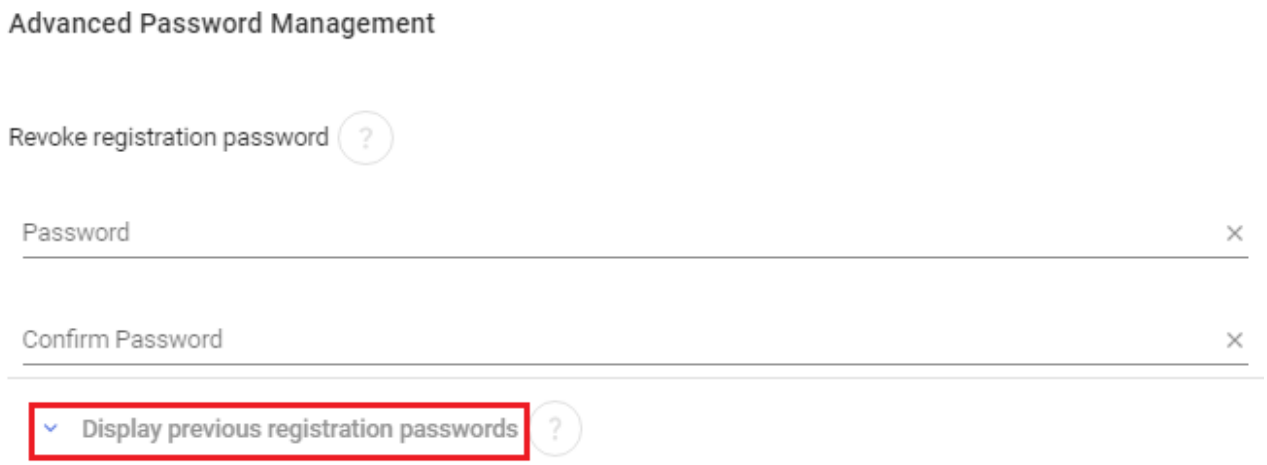
1. Navigate to the *Administration* > *Settings* page.
2. Expand the *Component Authentication* section and click *Advanced Password Management*.



3. Enter the new password, confirm it, and click *Revoke*.



After you revoke an existing registration password with a new one, the new password is required for subsequent connections with connected or new Collectors. However, you still need the revoked password for reconnection or uninstallation of disconnected Collectors. You can see a list of revoked passwords under *Display Previous Registration Passwords* with information of revoked time and number of Collectors still using that password.



You can revoke the registration password four times maximum, after which the *Revoke* button is disabled and you must delete an old password in order to create a new one.

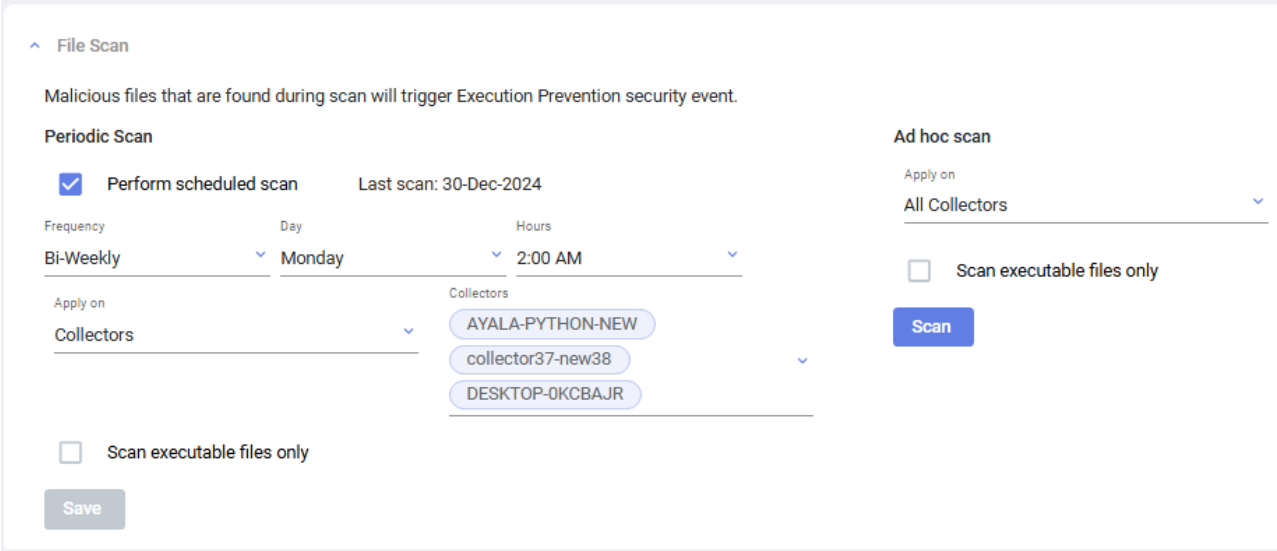
Fortinet recommends that you generate a new custom Collector after revoking a compromised registration password.

File Scan

FortiEDR can perform periodic scans of the files in the system on a scheduled or on-demand basis, based on its execution prevention policy. During a periodic scan, only the files on the hard drive are scanned and no memory scan is performed. For a periodic scan, each file on the hard drive is scanned. If a malicious file is identified during a scan, a security event is triggered.

To schedule a periodic scan:

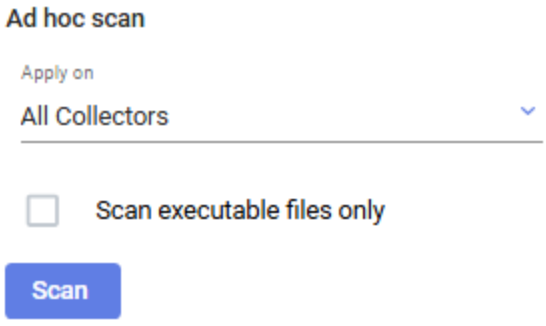
1. Navigate to the *Administration* > *Settings* page.
2. In the *File Scan* area, check the *Perform scheduled scan* checkbox. This checkbox must be checked to perform the scan according to the designated schedule.



3. In the *Frequency* dropdown list, select how frequently to execute the scan. Options are *Weekly*, *Bi-Weekly* (every two weeks), or *Monthly*.
4. In the *Day* dropdown list, select the day of the week to execute the scan.
5. In the *Hours* dropdown list, select the hour of the day to execute the scan.
6. Use the radio button to select on which devices the scheduled scan should be performed. When selecting Collector Groups or Collectors, you should specify which Groups or Collectors should be included in the scan. Devices that are not listed here are not scanned.
7. Click the *Save* button. The scan is performed as scheduled.

To perform an on-demand file scan:

1. Navigate to the *Administration* > *Settings* page.
2. In the *Ad hoc scan* area, select which devices to scan by specifying one or more Collectors or Collector Groups, or selecting the *All Collectors* option to scan all devices with installed Collectors.

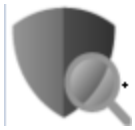


3. Check the *Scan executable files only* checkbox to only scan executable files. This option enables a quicker scan, but neglects documents, scripts and other potentially malicious files.
4. Click *Scan*. The scan is performed immediately.

End Users Notifications

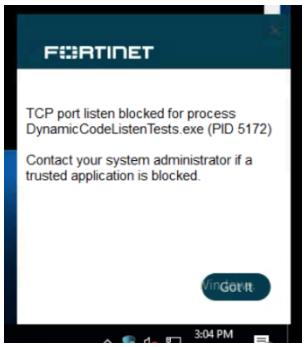
Each device protected by FortiEDR can display an icon in the system tray to indicate its state.

The FortiEDR icon indicates the current state of the device, as follows:

- Protection On
-  Protection Off/Disabled
- Degraded
- Isolated

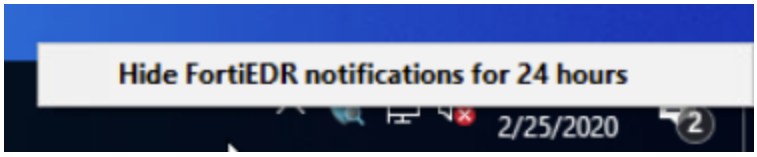
Terminating a FortiEDR process ends this process and stops the display of the FortiEDR icon in the system tray, but does not stop FortiEDR protection.

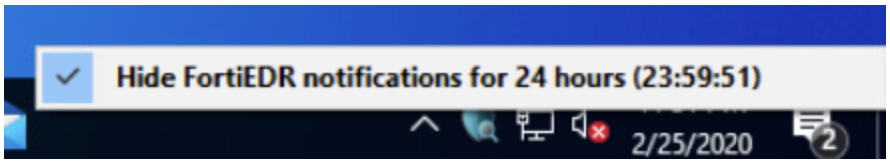
When the FortiEDR icon is configured to display on FortiEDR-protected devices, a popup message displays whenever something is blocked on a protected device (based on the blocking policy set for that device). File modifications (due to suspected ransomware), the exfiltration of external connections and execution prevention actions can be blocked. For example, the following shows that a TCP port listening action was blocked for the `DynamicCodeListenTests.exe` process.



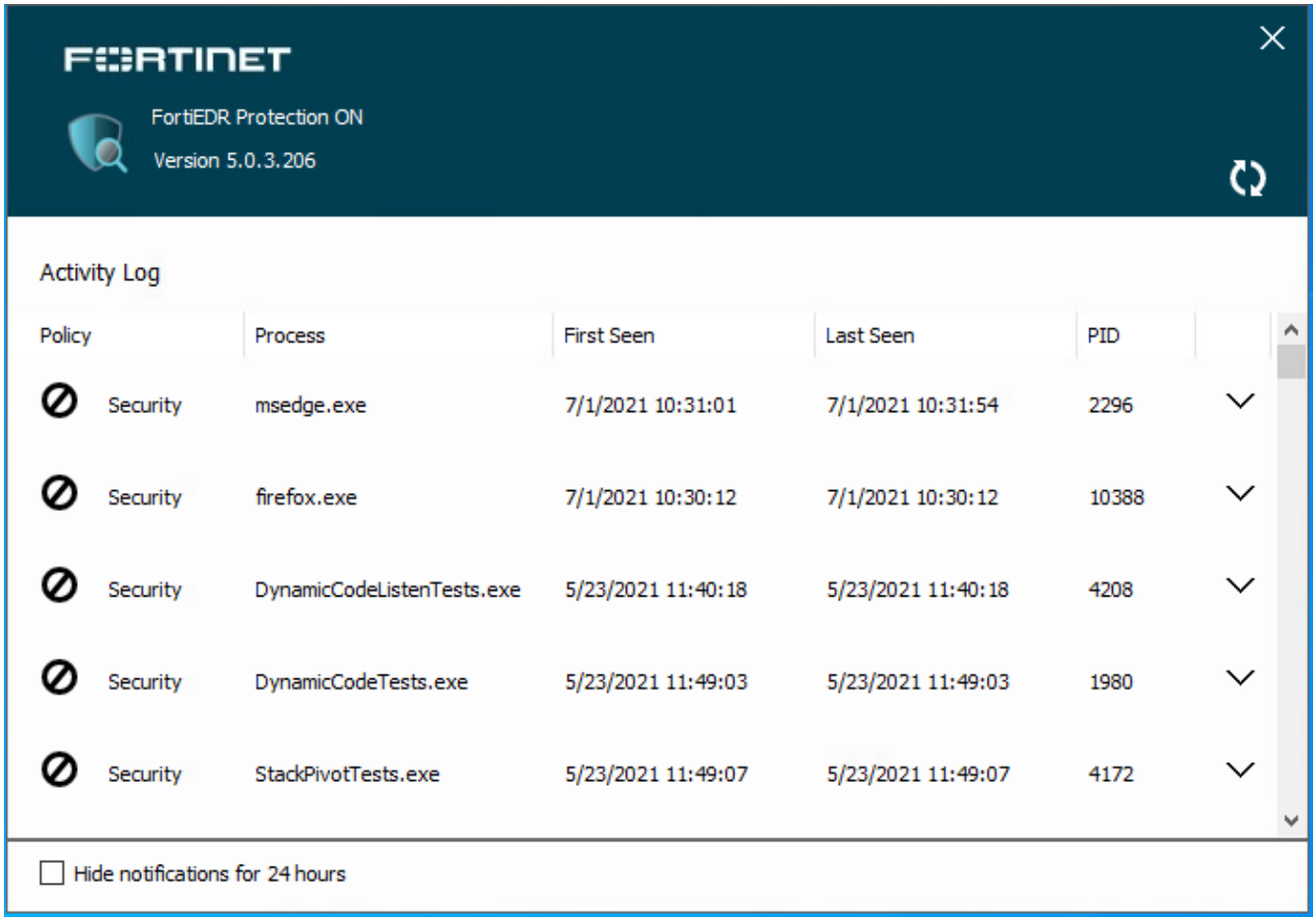
This notification is displayed only once for the same process. If the same process is blocked multiple times, only a single FortiEDR pop up is displayed.

You can choose to show or hide end-user notifications (pop-ups) for the next 24 hours. To do so, right-click the FortiEDR icon in the system tray and then check the checkbox to hide notifications or leave the checkbox unchecked to display notifications.

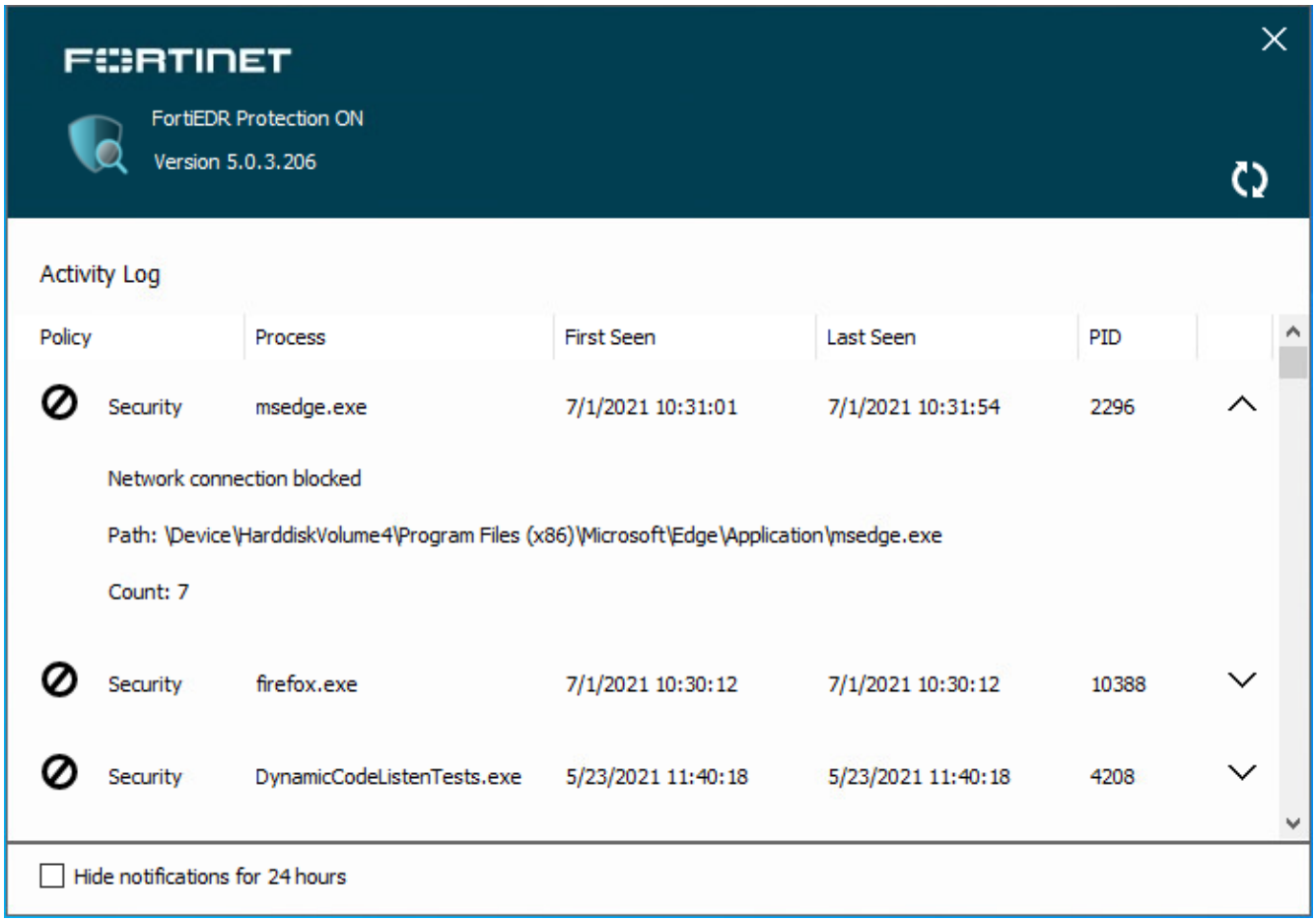




You can double-click the FortiEDR icon in the system tray to review recent blocking activity on the device as shown below. Each row includes a single event (that can be composed of multiple occurrences) and displays the process name, the first and last occurrences times, the process ID, and the type of blocking: either security or communication control.



Expanding the arrow on the right of each event reveals more details per event including the process path and the number of occurrences of the same blocking event:

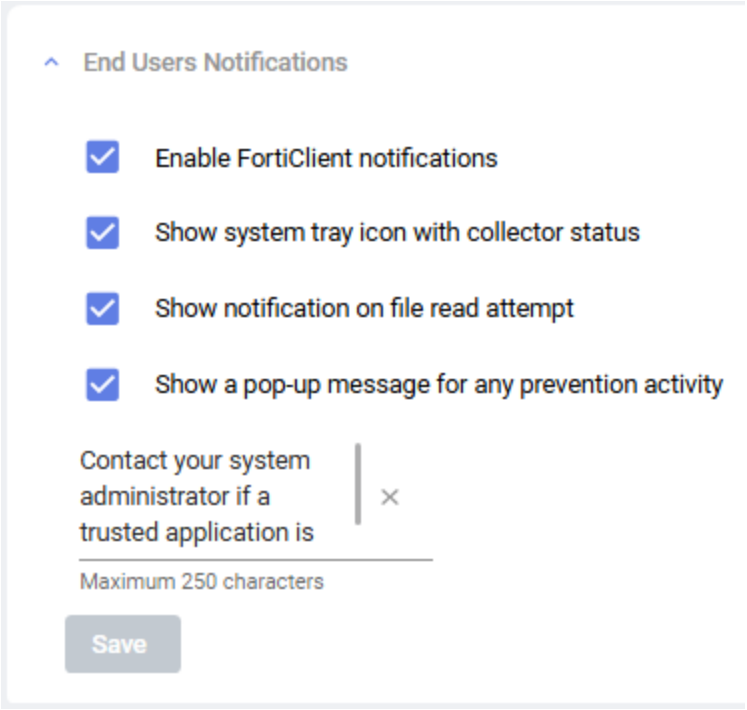


FortiEDR icon configuration

The behavior of the FortiEDR icon in the system tray must be configured in the *Administration* > *Settings* page.

To configure FortiEDR icon behavior:

1. Navigate to the *Administration* > *Settings* page.
2. In the *End Users Notifications* area, configure the following settings:



Setting	Definition
Enable FortiClient notifications	Check this checkbox to display notifications sourced from FortiClient. This option is specific to FortiEndpoint deployments. See the FortiEndpoint Administration Guide for more details.
Show system tray icon with collector status	Check this checkbox to display the FortiEDR icon on each FortiEDR-protected device or leave the checkbox unchecked to hide the icon on each protected device. Your selection here is applied on all protected devices. The default is checked.
Show notification on file read attempt	Check this checkbox to enable notifications for file read attempts.
Show a pop-up message for any prevention activity	Check this checkbox to enable the display of pop-up messages (end-user notifications) on FortiEDR-protected devices. Pop-up messages display whenever a process was prevented. By default, the name of the activity of the blocked process is displayed in the pop-up message. The default is checked.

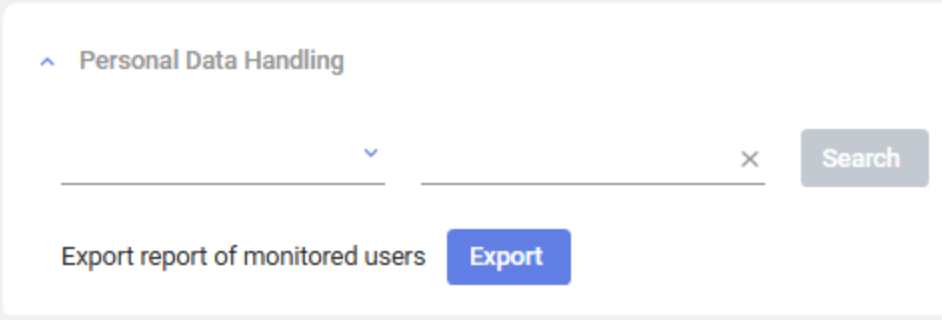
In the text box below the checkboxes, you can customize the text that is displayed in the pop-up message. Enter the text you want to display in the text box.

3. Click the *Save* button.

Personal Data Handling

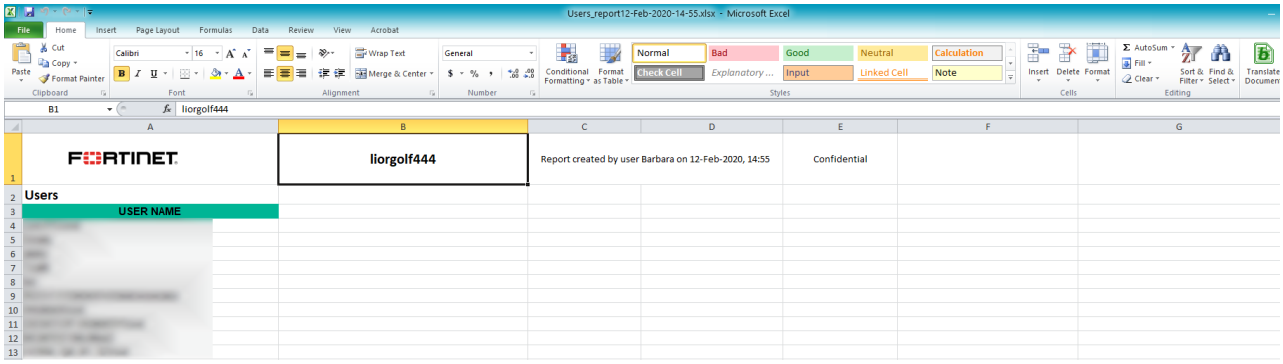
The FortiEDR system fully complies with the General Data Protection Regulation (GDPR) standard. The GDPR is a regulation in European Union (EU) law regarding data protection and privacy for all individuals within the EU and the European Economic Area (EEA). It also addresses the export of personal data outside the EU and EEA areas. The goal of the GDPR is primarily to give control to citizens and residents over their personal data and to simplify the regulatory environment for international business by unifying the regulation within the EU.

In FortiEDR, the GDPR feature is implemented in the *Personal Data Handling* section of the *Administration > Settings* page.



Use this section for the following GDPR compliance purposes:

- Remove all relevant data for an employee of a company that is using the FortiEDR system or a FortiEDR user from the FortiEDR system, once he/she no longer has access to or uses the FortiEDR system. The data includes the employee's/user's device name, IP address, MAC address, and user name.
- Notify your users, should the FortiEDR system be hacked. To export the list of monitored users in the FortiEDR system, use the *Export report of monitored users* button. See example report below:

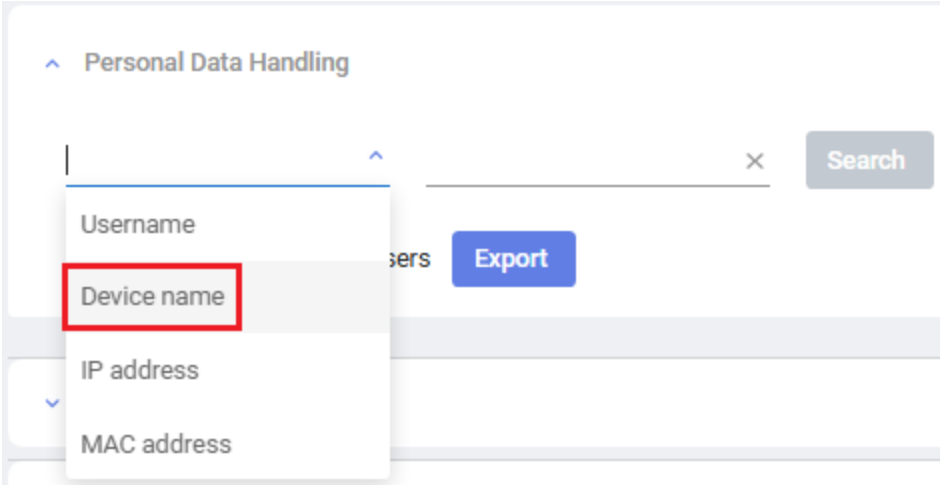


To remove employee/user data from the FortiEDR system for GDPR compliance:

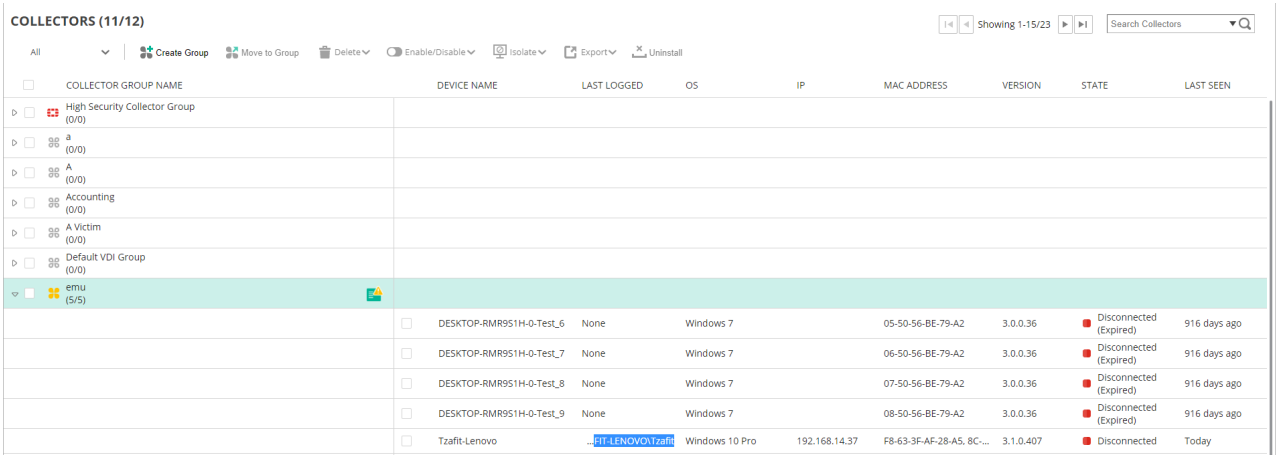
1. Uninstall the Collector from the employee's/user's computer. This step is important, so that no further data is collected from that Collector. For more details about uninstalling, see Uninstalling FortiEDR Collectors on page 70.
2. Navigate to the *Administration > Settings* page.
3. Expand the *Personal Data Handling* section, specify the device name, IP address, MAC address, or user name of the employee/user to be removed from FortiEDR.

You must remove all device name, IP address, MAC address, and user name data from FortiEDR in order to fully comply with the GDPR standard. This is an iterative process that must be performed four times in order to remove the device name, IP address, MAC address, and user name of the employee/user successively, one after another. You can remove this data in any order that you prefer. This example starts by removing all Device name data for the employee/user.

4. In the *Search by* dropdown list, select *Device name*. This field determines which criterion to search for in the FortiEDR system (device name, IP address, MAC address or user name).
5. In the adjacent field, enter the device name for the employee/user whose data you want to remove.

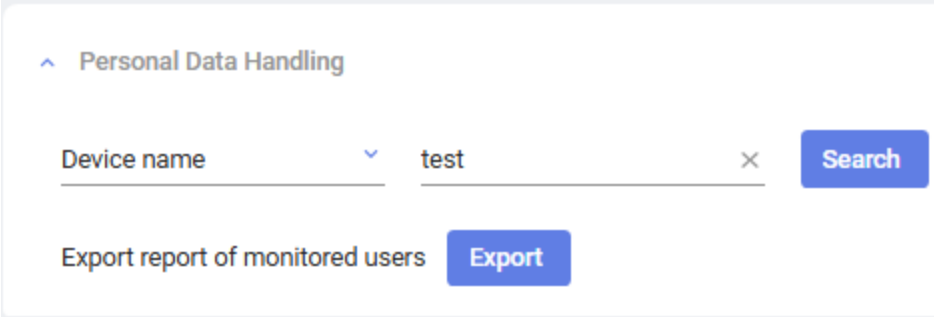


You can copy/paste this information into the adjacent field after locating it elsewhere in the FortiEDR user interface. For example, you can locate the relevant device name in the Last Logged column in the Collectors list in the Inventory window, such as shown below, and then copy that value into the relevant field in the *Personal Data Handling* area. Similarly, you can also readily locate the MAC address and IP address using the Collectors list in the *Inventory* window.

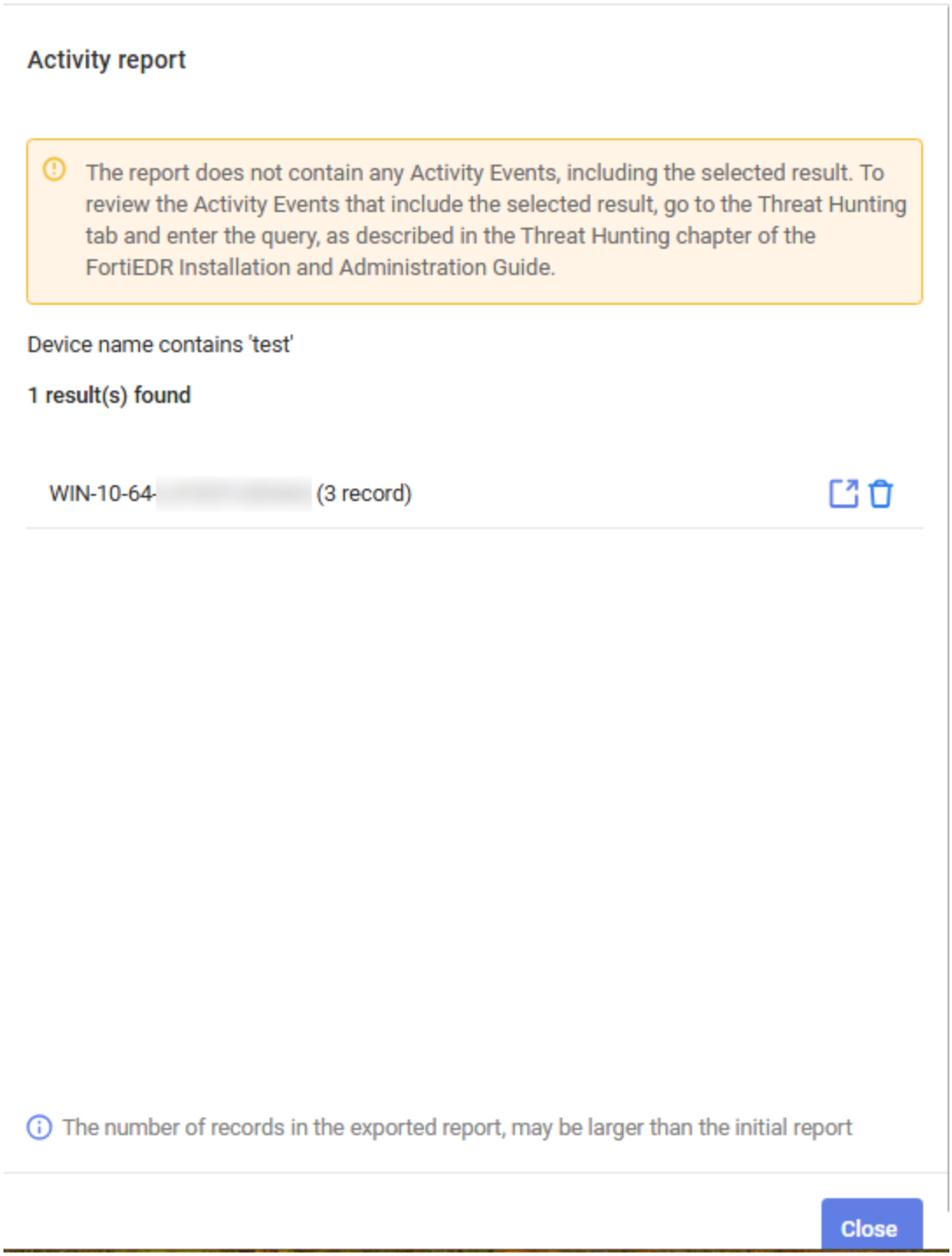


If you prefer, you can use another method of your choice to identify the device name.

6. After entering the details for the device name, click *Search* to search for all occurrences of the device name in the FortiEDR system.



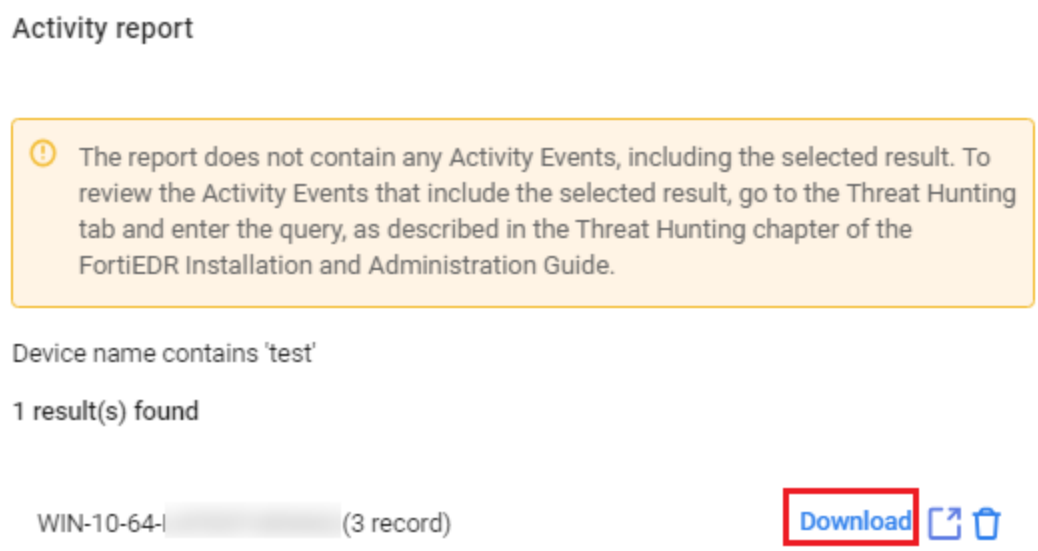
The following displays, listing all matching results.



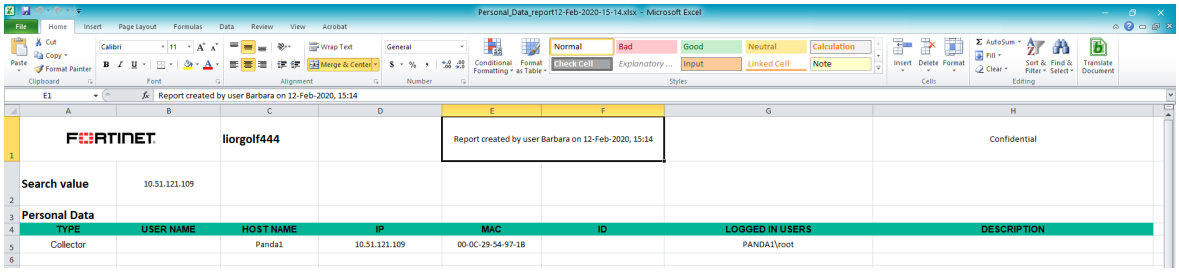
Threat hunting activity event data is not included in the search result but will be deleted. To see the activity data that will be deleted, use the Search option of the Threat Hunting feature, as described in Threat Hunting on page 131.

7. Select an entry in the search result list and do one of the following:

- To verify the data or to keep a record of the data:
  i. Click the *Export* ( ) icon to export the data to a report.
  ii. When the report is ready, click the *Download* link to download the Excel report.

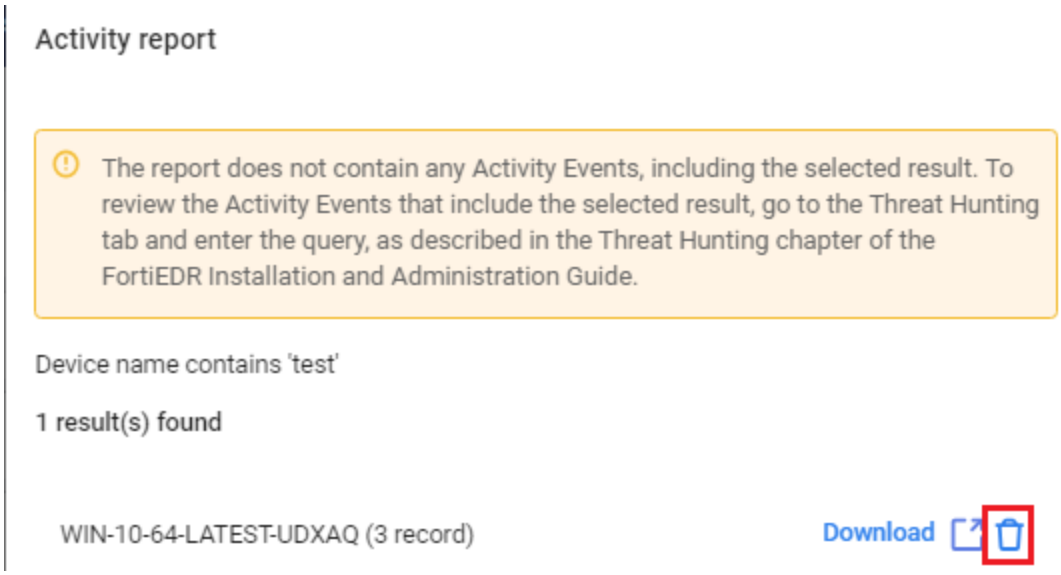


See example report below:

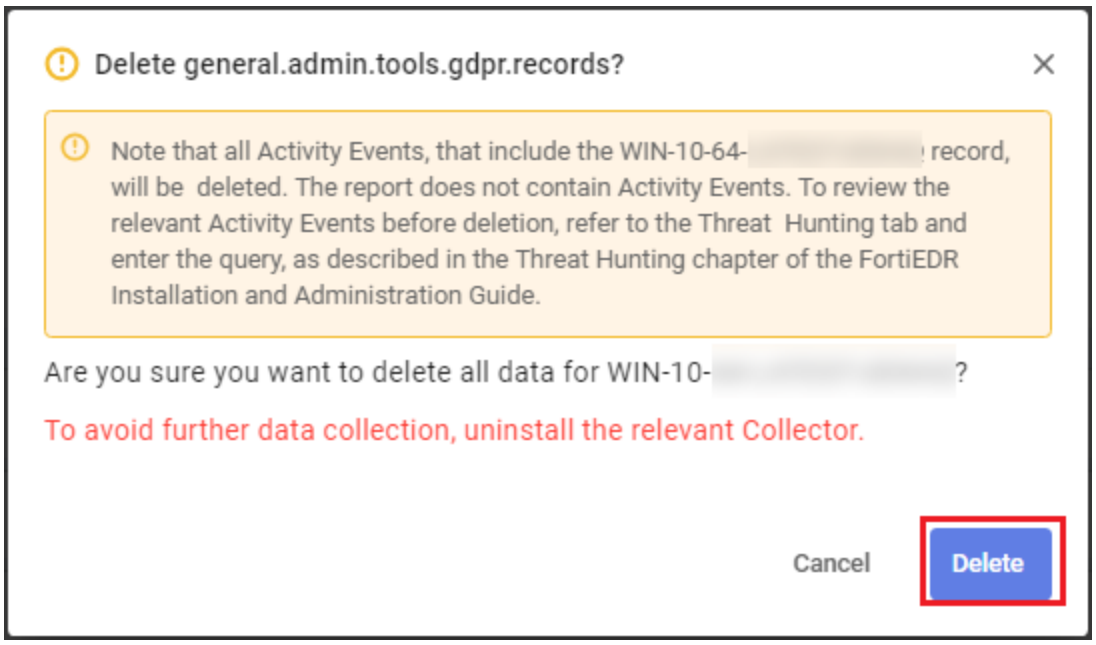


GDPR compliance requires that all traces of the employee's/user's data be permanently removed, including this report.

- To remove all the data for the employee/user, click the *Delete* () icon.



  i. Click *Delete* to remove all device name data for the employee/user from FortiEDR.



  The data is deleted from FortiEDR in real time, from everywhere that it appears in the FortiEDR system (for example, from the *Inventory*, *Incidents* tab, Audit Trail and so on).

8. Click *Continue* to proceed with removing the other required data for the employee/user (IP address, MAC address and user name).
9. Repeat steps 4–8 to remove the relevant IP address from FortiEDR. Be sure to select *IP Address* in step 4.
10. Repeat steps 4–8 to remove the relevant MAC address from FortiEDR. Be sure to select *MAC Address* in step 4.
11. Repeat steps 4–8 to remove the relevant user name data from FortiEDR. Be sure to select *User Name* in step 4.
12. Delete any reports that might include data about this user as required by GDPR.

13. If the employee/user has multiple computers on which Collectors are installed, repeat the steps above for each of his/her computers.

IoT Device Discovery

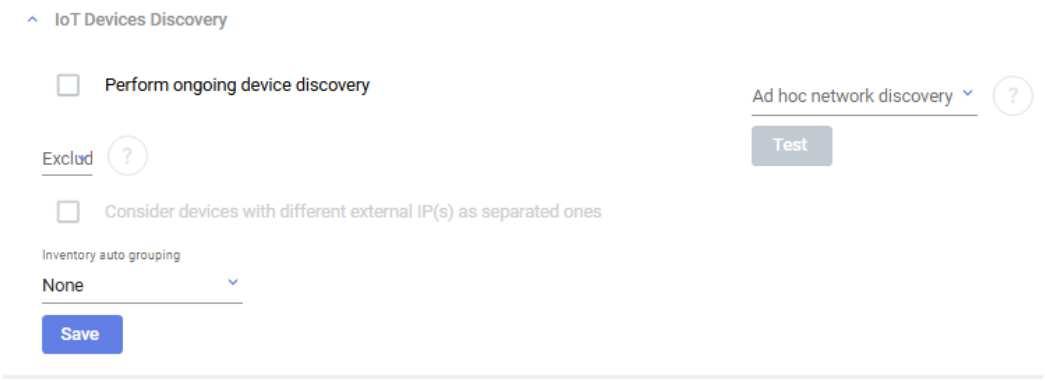
IoT device discovery enables you to continuously perform discovery to identify newly connected non-workstation devices in the system, such as printers, cameras, media devices and so on. During the discovery process, each relevant Collector in the system periodically probes all its nearby neighboring devices. Most nearby devices will respond to these requests by pinging the originating Collector device and providing information about itself, such as its device/host name (for example, ABC PC, Camera123), IP address and so on.

Such discovered devices can be seen in the *IOT DEVICES* page, as described in IoT devices on page 351.

The following default configuration applies to IoT scans by the FortiEDR Collectors:

- For operational reasons, Collectors that are running on servers or Collectors that are reported to be in one of the following states: degraded, disabled or isolated. Collectors do not take part in the IoT probing process.
- In order to refrain from scans on home or other non-enterprise networks, only subnets in which there is a minimal number of Windows Collectors are scanned in order to find Connected IoT devices.
- Extremely large subnets are excluded from scans.

If needed, in order to tune the scans to be more comprehensive and more granular, contact Fortinet Support who will change the default configuration.



To enable IoT device discovery, check the *Perform ongoing device discovery* checkbox. Note that when doing so, all relevant Collectors in the system perform sniffing in order to identify new connected devices in the system. When performing this discovery process, FortiEDR uses only the most powerful Collectors in each sub-network to perform sniffing, and excludes weaker Collectors for this process (disabled and degraded Collectors). This means that FortiEDR collects all the required information in the most efficient manner possible.

You can exclude specific Collector Groups from this discovery process. To do so, select the relevant Collector Group(s) in the *Exclude Collector Groups* dropdown list.

By default and when your organization has more than a single external IP address, FortiEDR ignores the external IP address of the IoT device while identifying and matching them. You can choose to list devices

that use different external IP addresses separately by unchecking the checkbox next to the *Consider devices with different external IP(s) as separated ones* option. However, in this case the same device might be listed more than once in the *IoT inventory* page.

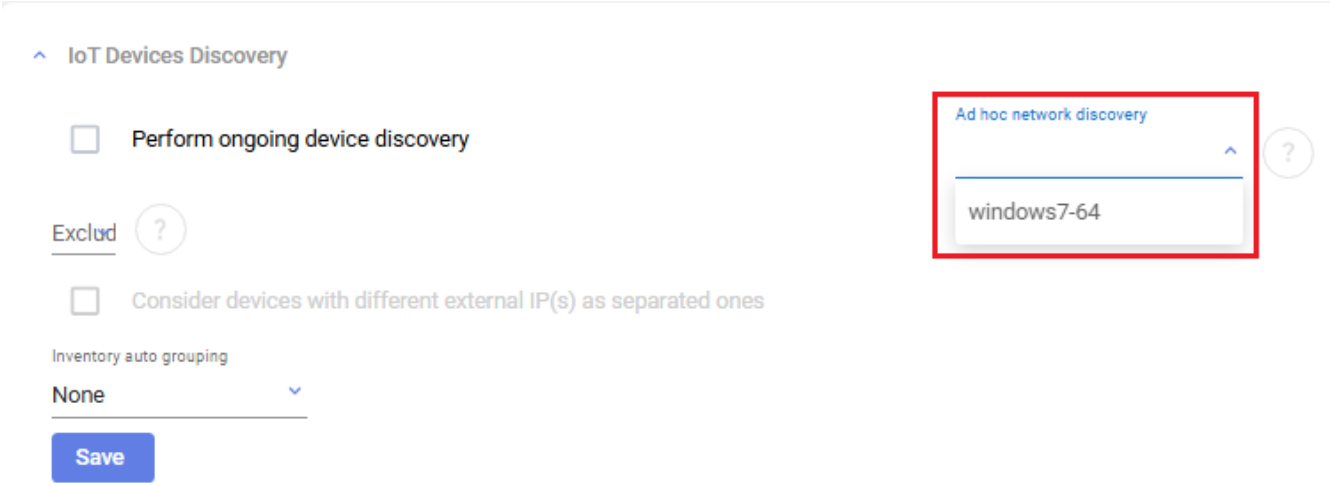
The Inventory *Auto Grouping* option enables you to group discovered devices by device type. For example, cameras, network devices, media devices, printers and so on. Select the *Category* option in the dropdown list to group discovered devices by device type or *None*. When you select *Category*, devices are auto-grouped in the *IOT DEVICES* page, as shown on IoT devices on page 351.

Click *Save* to save the configuration.

We recommend testing IoT the device discovery process to ensure that it works as expected across all your organizations before enabling the on-going periodic network scan. Testing can only be performed when IoT device discovery is not enabled, meaning the *Perform ongoing device discovery* checkbox is not checked. Select the Collector to use to test the IoT device discovery process in the *Ad Hoc Network Discovery* dropdown list and then click the *Test* button, as shown below.

You can search in the *Ad Hoc Network Discovery* dropdown list. For example, searching for "a" results in all collectors with letter "a" in their name being displayed in the list. An exception is when the search results list includes more than 100 entries, only exact matches will be displayed. If no exact match is found, the list will be empty.

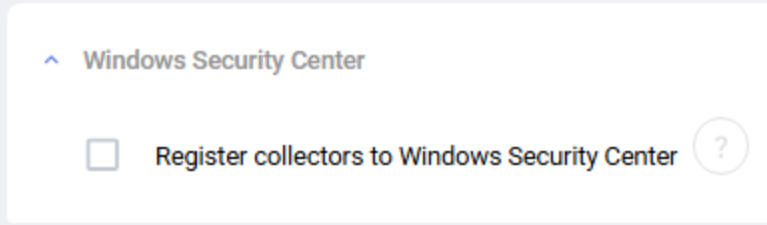
If searching for a single letter or a broad term does not return the expected results, we recommend entering at least three or more specific characters in the search box to narrow down the list and ensure the correct collectors are displayed.



The selected Collector sniffs the network once to identify new connected devices. After the test discovery process begins, you can stop it at any time by clicking the *Stop* button. In all cases, the scan will be stopped within a predefined time period (usually 30 minutes).

Windows Security Center

FortiEDR is fully integrated with Windows Security Center and has been certified by Microsoft as an anti-virus and threat protection application. You can choose whether to register FortiEDR Collectors as anti-virus and threat protection agents in Windows Security Center. The default is no registration. The registration status has no impact on FortiEDR protection.



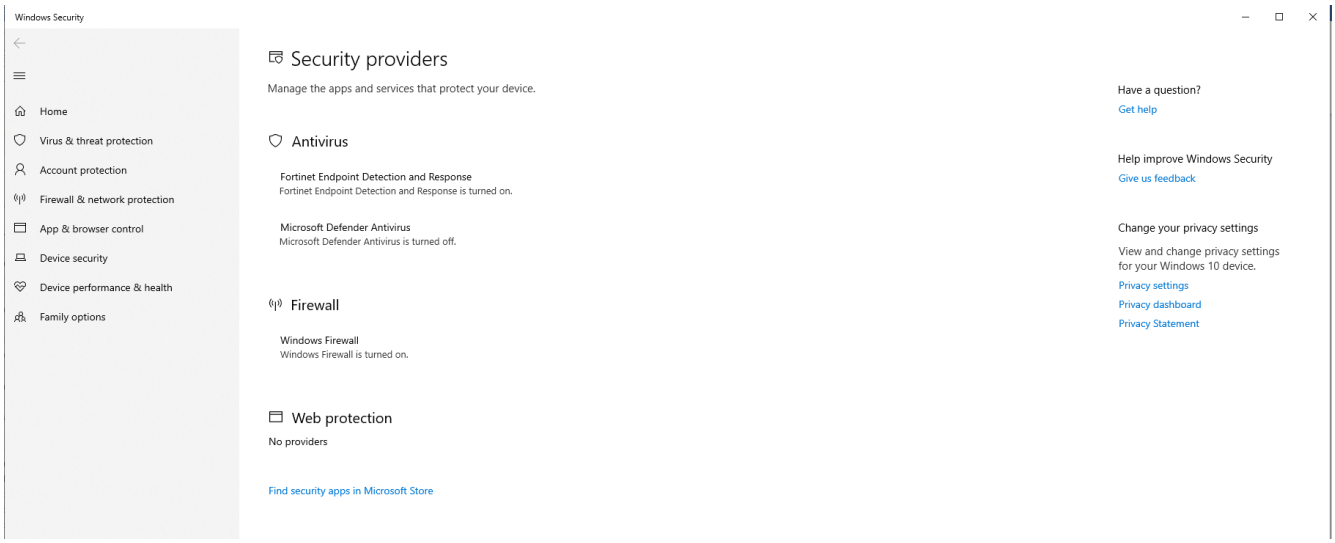
When multiple AV products are installed, refer to the following guidelines for configuring this option:

- To consolidate all SOC activities to FortiEDR, you must register FortiEDR Collectors with Windows Security Center.
- To maximize protection from multiple AV products without the need of SOC activity consolidation in FortiEDR, do not register FortiEDR Collectors with Windows Security Center as the registration may prevent other AV products from installing or functioning properly.

To register FortiEDR Collectors with Windows Security Center:

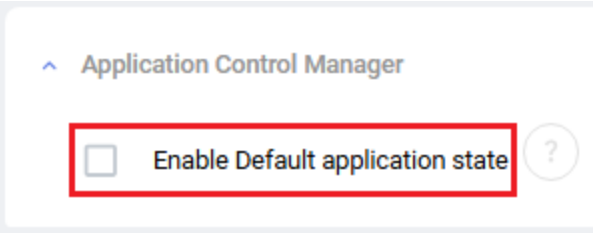
In the *Administration* > *Settings* page, expand the *Windows Security Center* section and check the *Register collectors to Windows Security Center* checkbox.

When registered, FortiEDR will be listed under *Windows Security* (as shown below) and all SOC activities will be consolidated to FortiEDR if multiple AV products are installed.



Application Control Manager

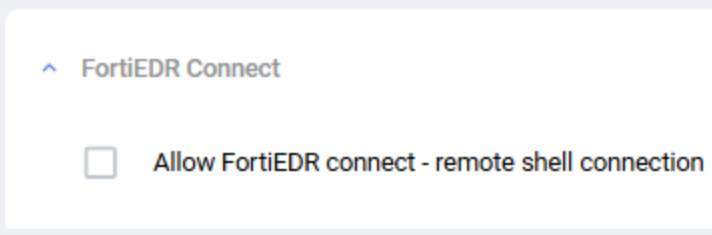
Under *Security Settings* > *Application Control on page 234*, the default block state of new applications is disabled, which means new applications are not blocked by default. To change the default block state of new applications so that they are blocked by default, check the *Enable Default application state* option under *Administration* > *Settings* > *Application Control Manager*.



FortiEDR Connect

The FortiEDR Connect feature opens a console that provides direct access to FortiEDR-protected devices (endpoints) that are running a Windows operating system through a remote Shell connection, as described in FortiEDR Connect on page 109. This enables you to respond to incidents immediately and to perform in-depth investigation by running commands on the device, running scripts on the device, collecting and downloading forensic data from the device, remediating threats and so on.

Select the *Allow FortiEDR connect - remote shell connection* checkbox to enable the FortiEDR Connect functionality for the organization. Otherwise, the *Connect to Device* button is deactivated for all users of the organization.

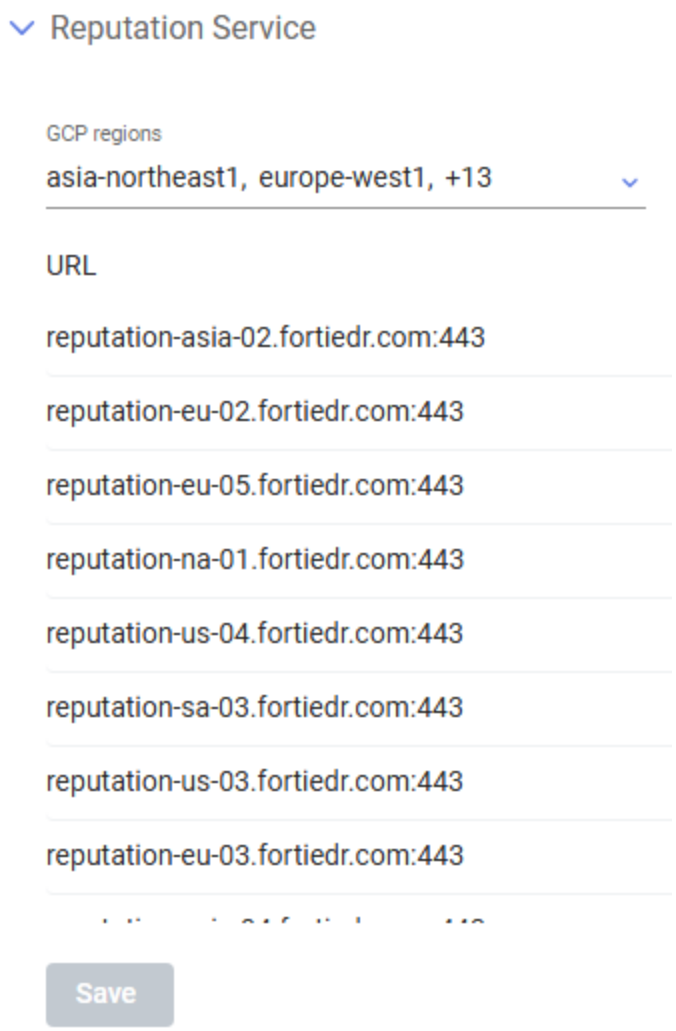


To further allow a user access to the FortiEDR Connect functionality, select the *Establish FortiEDR Connect sessions* checkbox in the user profile. Otherwise, the *Connect to Device* button is deactivated for the user. For more information about user roles and permissions, see Users on page 359.

The *Establish FortiEDR Connect sessions* checkbox is available for Admin, Analyst, and Senior Analyst users only.

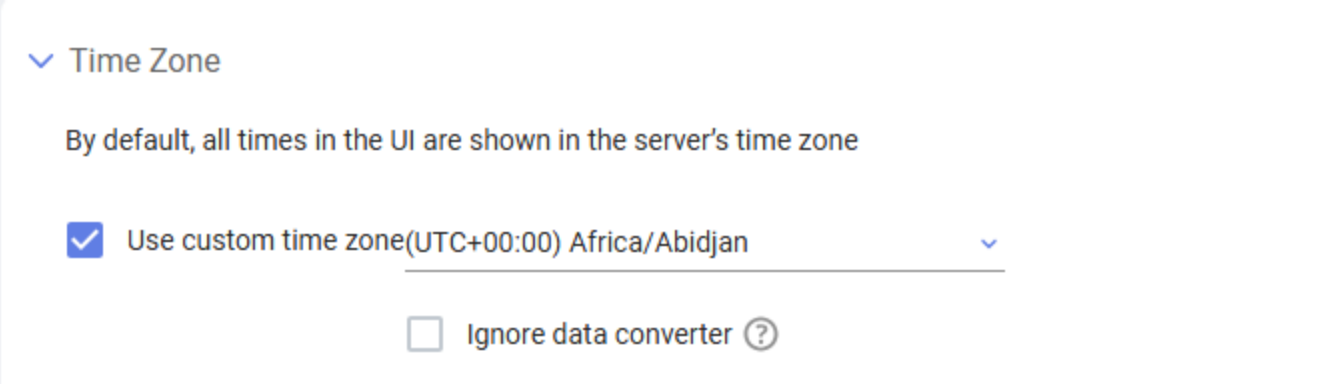
Reputation Service

This section displays a list of GCP regions where a reputation service instance is installed on and the relevant URLs of all selected regions. You can select any region you want to connect to. By default, all regions are selected. When a region is selected, the relevant reputation service URLs are displayed so that you can open them in your firewall.



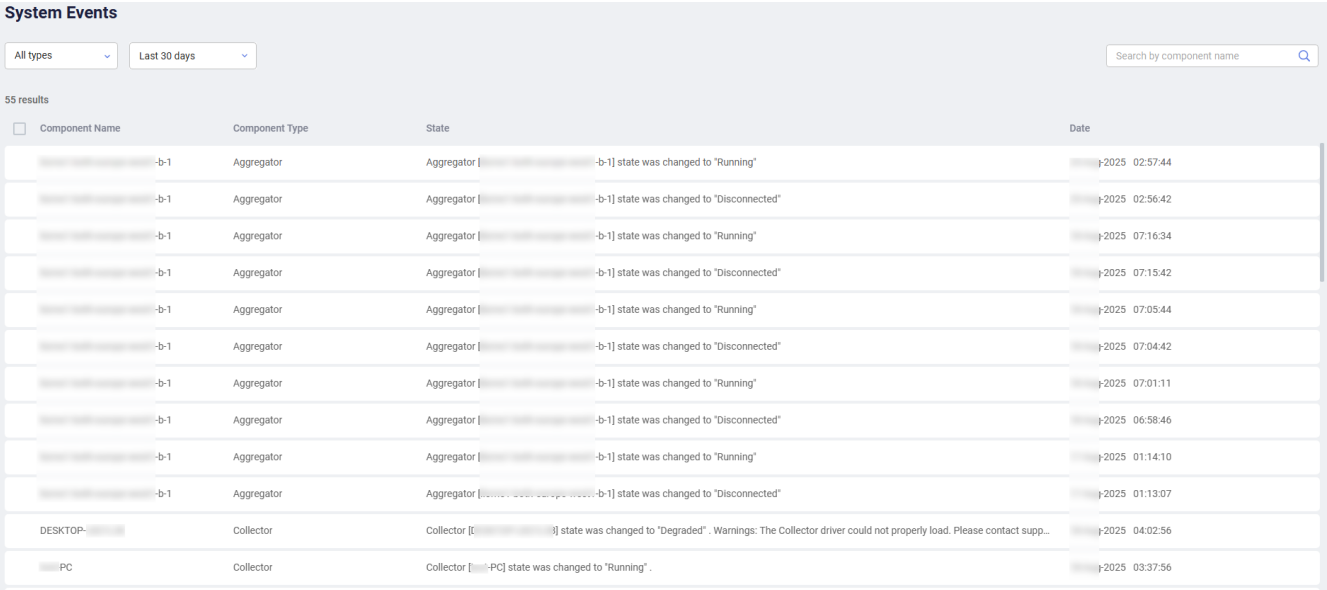
Time Zone

Configure the time zone for each organization. Use the *Ignore data converter* option to configure incident offsets. When the option is enabled, the converter data value according to the user's time zone will not be used in the following modules: Incidents, Inventory, System Events, and Audit Trail.

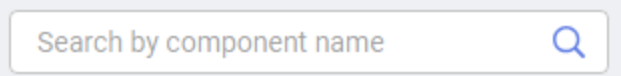


System events

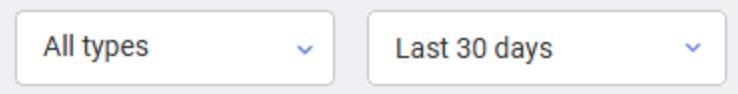
Selecting *SYSTEM EVENTS* in the *ADMINISTRATION* tab displays all the system events relevant to the FortiEDR system.



Use the search bar on the top right corner to filter system events by keywords.



Use the following filters to filter system events by component with a date range.



System events can also be retrieved using an API command. For more details, refer to the FortiEDR RESTful API Guide. You must log in to the Fortinet Developer Network to access the guide.

Each time a system event is triggered and created, the user receives an email notification for each of them if that system event is enabled for the user's Distribution lists on page 389. You can also configure Syslog on page 331 to send system events messages.

The following events are defined as system events in the system:

- Core state was changed to Disconnected (and another event when the Core state was returned to the Connected state immediately afterward)
- Core state was changed to Degraded (and another event when the Core state was returned to THE Connected state immediately afterward)
- Aggregator state was changed to Disconnected (and another event when the Aggregator state was returned to the Connected state immediately afterward)
- Aggregator state was changed to Degraded (and another event when the Aggregator state was returned to the Connected state immediately afterward)
- Threat Hunting Repository state was changed to Disconnected (and another event when the Repository state was returned to the Connected state immediately afterward).
- Threat Hunting Repository state was changed to Degraded (and another event when the Repository state was returned to the Connected state immediately afterward).
- Collector registered for the first time (only UI/API; is not sent by email/Syslog)
- Collector was uninstalled via the Central Manager console
- Collector state was changed to Disconnected Expired
- Collector state was changed to Degraded

  This event is disabled by default. To enable it, please contact Fortinet support to apply a configuration change on the backend.

- License will expire in 21/7 days/1 day
- License expired
- License capacity of workstations has reached 90/95/100%
- License capacity of servers has reached 90/95/100%
- System mode was changed from Prevention to Simulation or vice versa
- FortiEDR Cloud Service (FCS) connectivity is down

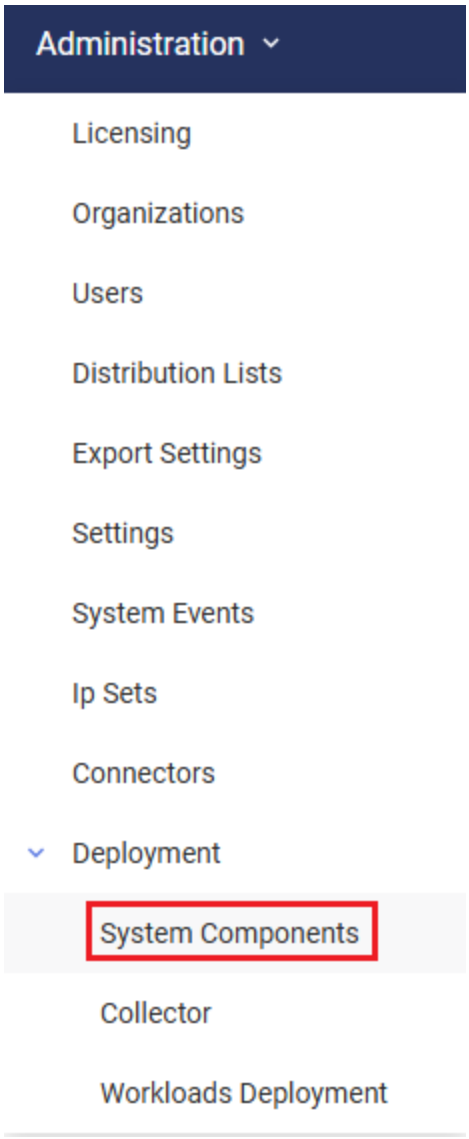
Deployment

The *Administration* > *Deployment* menu includes the following pages:

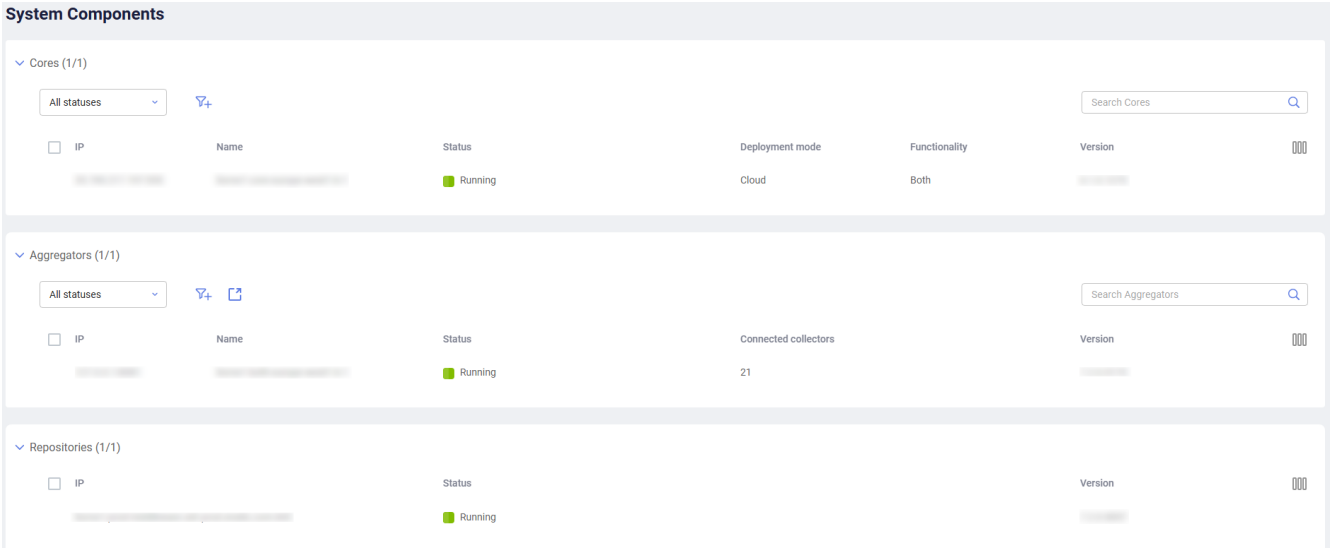
- System Components on page 414
- Collector on page 418

System Components

The *Administration* > *Deployment* > *System Components* page lists the FortiEDR Aggregators, Cores and Repositories.

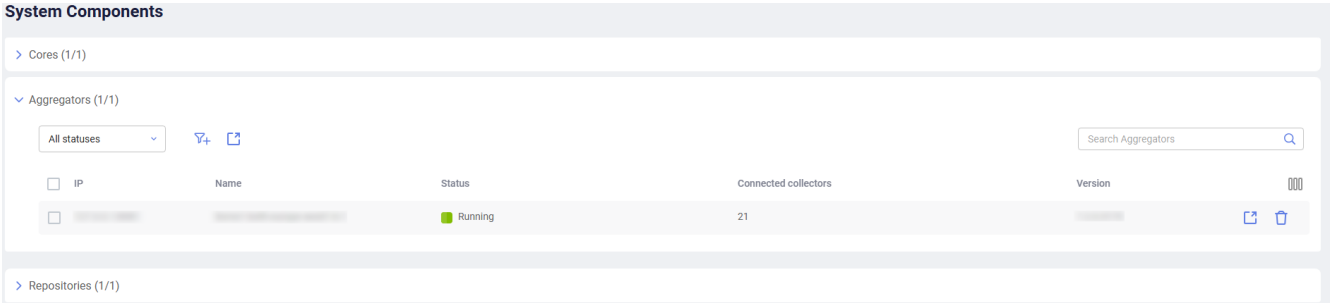


The following displays:



Aggregators

The *AGGREGATORS* area lists the FortiEDR Aggregators.

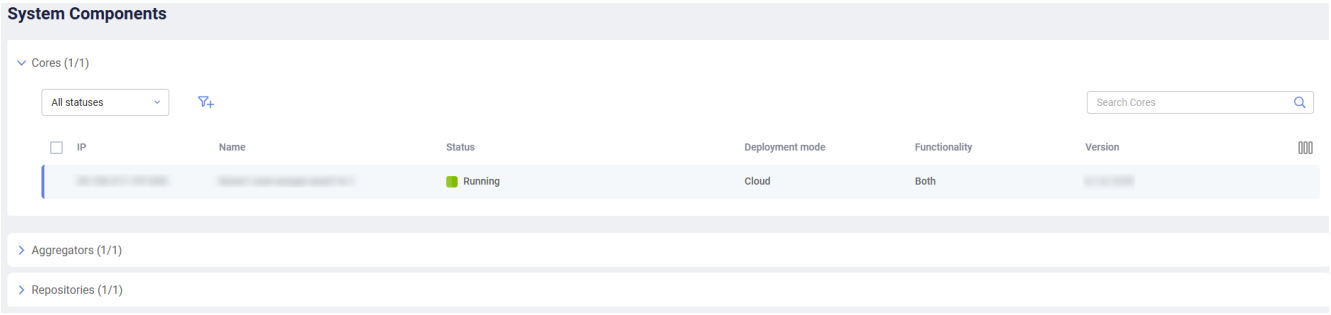


Click the *Expand* icon ( ) to expand the list. The following information is provided for each FortiEDR Aggregator:

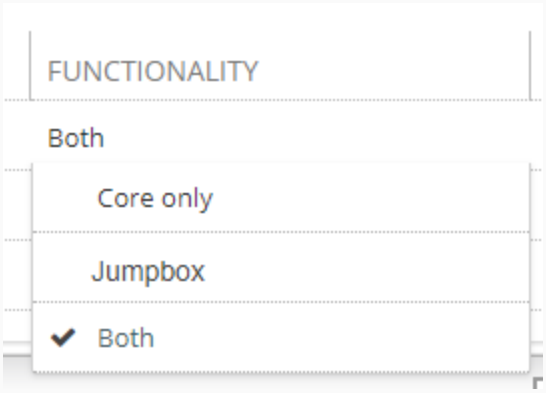
Information Field	Description
Checkbox	Check this checkbox to select the Aggregator. You can then use one of the buttons at the top left of the window, such as the *Delete* button.
IP	Specifies the IP address of the communicating device on which the FortiEDR Aggregator is installed.
Name	Specifies the Aggregator name entered during installation.
Connected Collectors	Specifies the number of FortiEDR Collectors that have been configured to operate with this Aggregator.
Version	Specifies the version of the Aggregator software.
State	Specifies the current state of the FortiEDR Aggregator.

Cores

The *CORES* area lists the FortiEDR Cores.



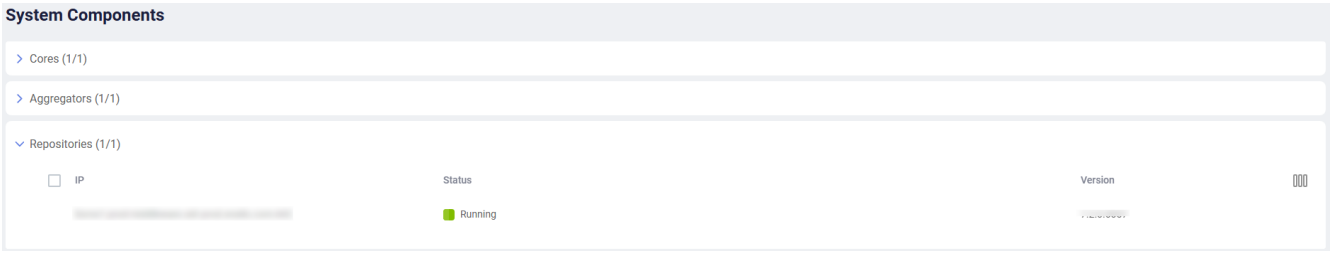
Click the *Expand* icon ( ) to expand the list. The following information is provided for each FortiEDR Core:

Information Field	Description
Checkbox	Check this checkbox to select the Core. You can then use one of the buttons at the top left of the window, such as the *Delete* button.
Organization	Specifies the name of the organization in a multi-organization FortiEDR environment. In a single-organization FortiEDR system, this column does not appear.
IP	Specifies the IP address of the communicating device on which the FortiEDR Core is installed.
Name	Specifies the FortiEDR Core name entered during installation.
Deployment Mode	Specifies whether the FortiEDR Core is physically deployed on your organization's premises (On-Premise) or in the cloud provided by Fortinet (Cloud). The following deployment options are available. • Cloud • On-premise
Functionality	Specifies the core's functionality and enables you to modify it by selecting one of the following options:  • *Core only* – Specifies that the system provides basic FortiEDR Core

Information Field	Description
	functionality: events processing, communication control handling, activity events proxy to the Repository and so on. • *Jumpbox* – Specifies that the FortiEDR Core is used by the Central Manager (the central web user interface) as a Jumpbox, while the Jumpbox connects to the LDAP, sandbox or to the products. No basic Core functionalities are provided. The *Jumpbox* option is unavailable for cloud Cores. To configure a cloud Core to function as Jumpbox, please contact Fortinet Support. • *Both* – Provides both *Core* and *Jumpbox* functionality, as described above. It is not mandatory to have a Core with Jumpbox functionality. However, removing Jumpbox functionality (by selecting the Core only option) may affect previously defined connectors, thus causing them to be nonfunctional. In this case, an appropriate message is displayed.
Version	Specifies the version of the FortiEDR Core.
State	Specifies the current state of the FortiEDR Core.

Repositories

The *REPOSITORIES* area shows details about the FortiEDR Threat Hunting Repository server.



Click the *Expand* icon ( ) to expand the list. The following information is provided for each FortiEDR Repository:

- *IP*: Specifies the IP and port address of the communicating device on which the FortiEDR Repository is installed.
- *STATE*: Specifies the current state of the FortiEDR Repository.

Collector

Perform the following tasks on the *Administration* > *Deployment* > *Collector* page:

- Updating the Collector version on page 418
- Loading a server certificate on page 421
- Requesting and obtaining a Collector installer on page 422
- Requesting and obtaining a mobile installer on page 425

Updating the Collector version

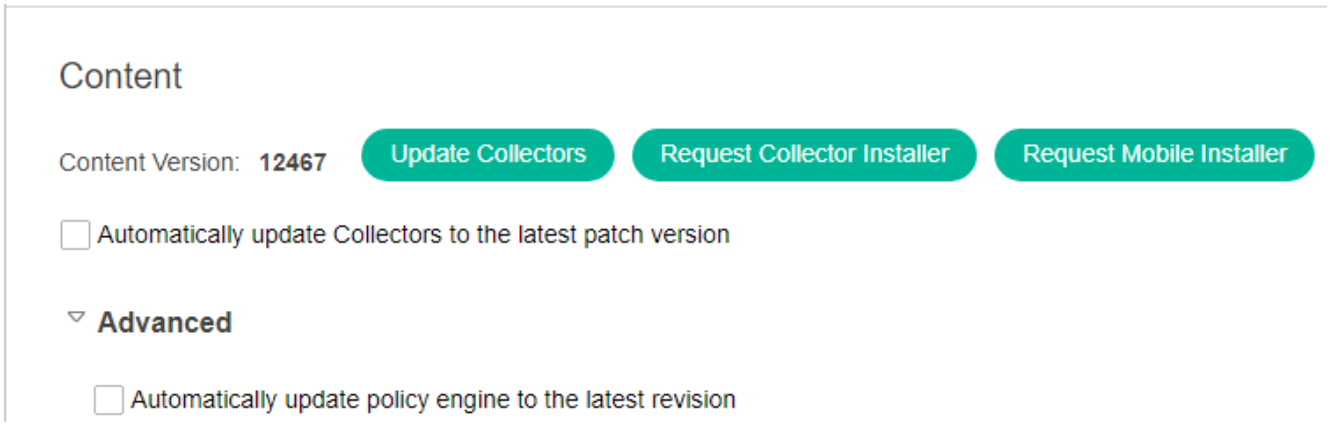
Use the Update Collector Version feature to update a FortiEDR Collector version, such as from 5.0.3 to 5.2.

This feature does not support upgrading a macOS Collector from 5.2 to 6.0, which can only be done via JAMF. See Installing FortiEDR on MacOS devices using Jamf PRO on page 58. Upgrading macOS Collector 6.0 to a later build using this option will work.

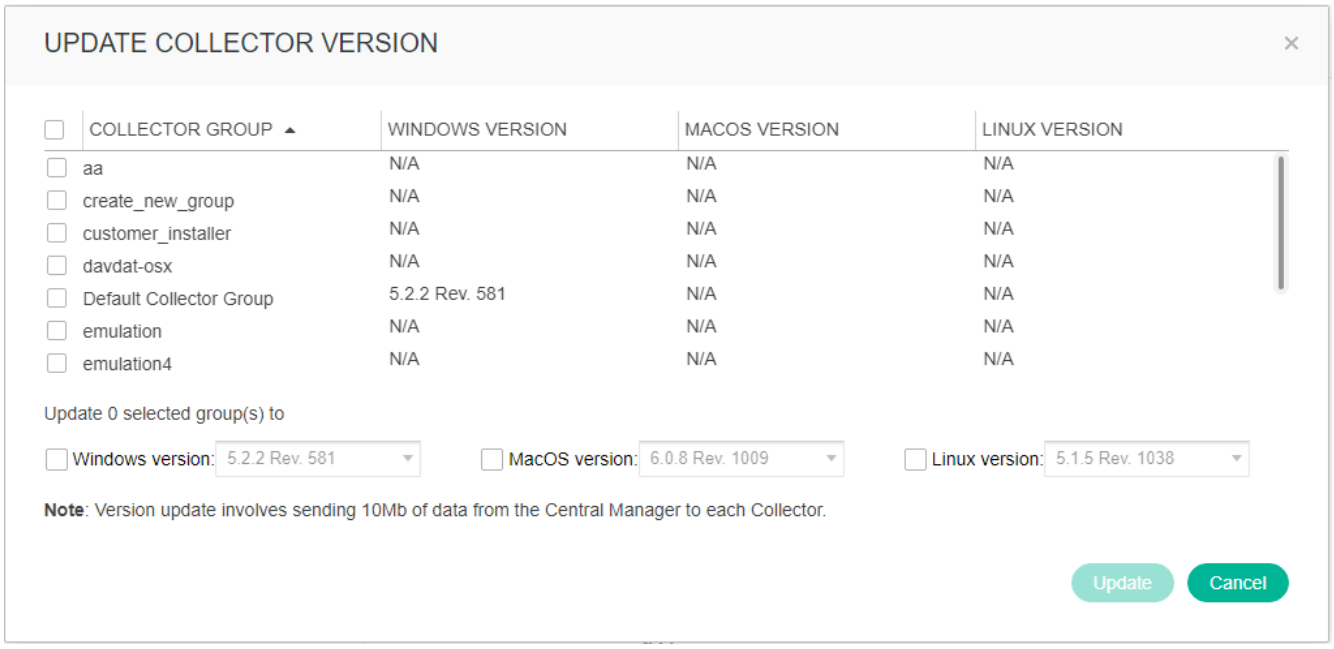
The Automatic Collector Updates feature updates the patch and revision for a given FortiEDR version upon the availability of a new Collector build. The patch and revision numbers are the third and fourth digits of the FortiEDR version number. For example, for FortiEDR version 3.1.*y*.*x*, *y* indicates the patch number and *x* indicates the revision number.

When the *Automatically update Collectors to the latest patch revision* checkbox is checked, whenever the content contains a new build (for example, 5.0.3.508 is a new build of 5.0.2.342), all Collectors are updated to that build. This means that all Collectors in all Collector Groups in all environments and operating systems are updated to the latest FortiEDR revision available (as provided by Fortinet using the Load Content feature). For more details about the Load Content feature, see Content Updates on page 559

In the *Advanced* section you can choose to disallow automatic updates of the Collector's policy logic library. When the checkbox is checked, the engine library is updated on the Collector whenever new engine becomes generally available. Automatic Policy engine library update keeps the core detection functionality within the Collector up to date and as it does not enforce any downtime or restart of the device is recommended.

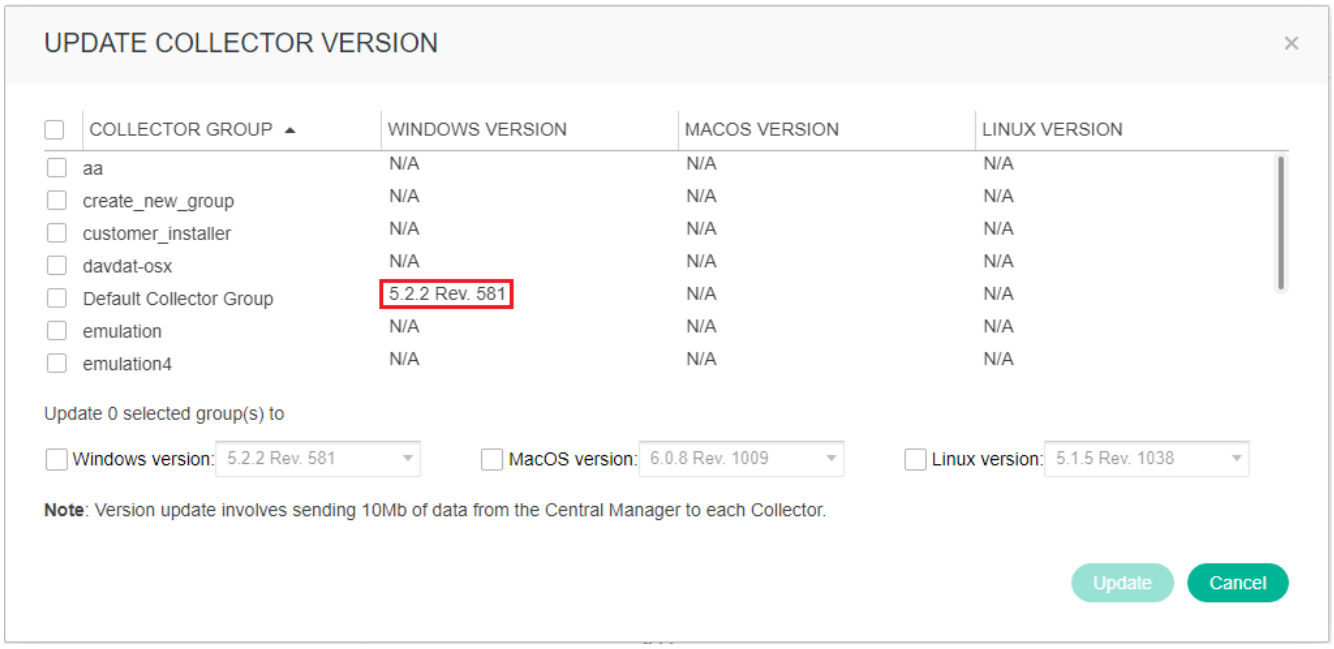


When you click the *Update Collectors* button in the Licensing window, the *Update Collector Version* window displays. This window lists all available Collector Groups. The *Windows Version*, *macOS Version*, and *Linux Version* columns indicate the current FortiEDR version for the Collectors in a Collector Group.



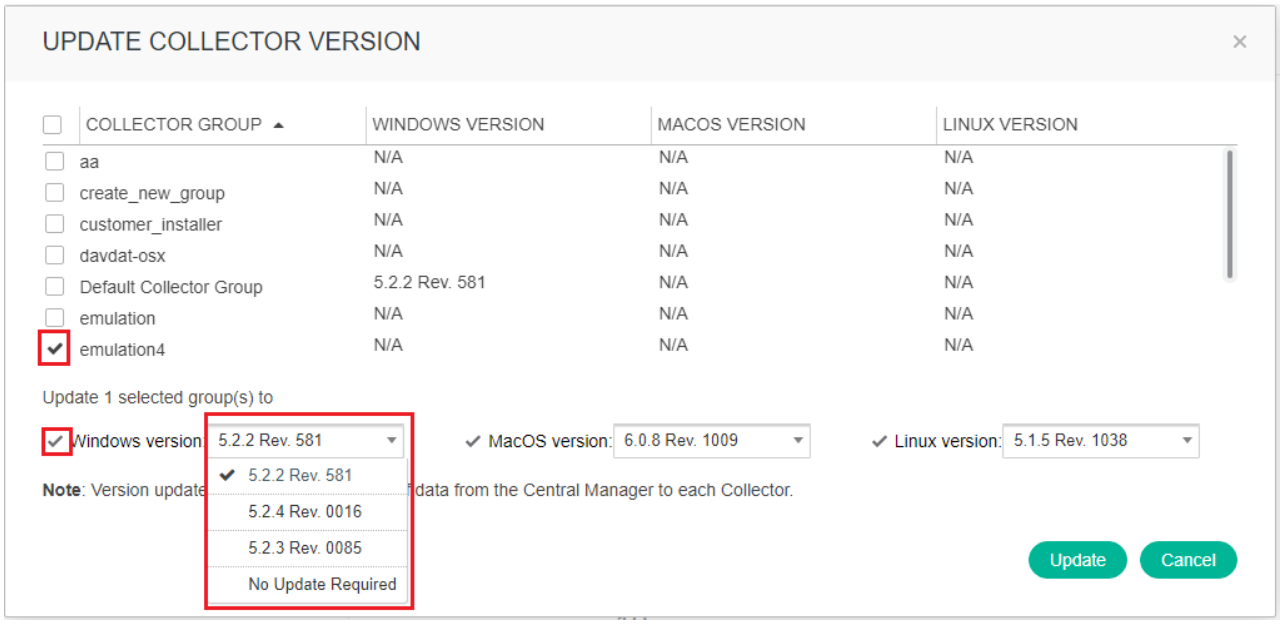
You can update the version for the Collectors in a Collector Group for each operating system.

If the *Automatically update Collectors to the latest patch version* checkbox is enabled on the *Administration > Deployment > Collector* page, then the *Update Collector Version* window does not display the revision number in the Windows Version, macOS Version and Linux Version columns, as the revision is automatically updated with the Automatic Updates feature.



To update the version for the Collectors in a Collector Group:

1. Check the checkbox of the Collector Group(s) whose Collectors you want to update. You can select more than one Collector Group.
2. Select the checkbox of the operating system(s) to update and in its adjacent dropdown list, select the FortiEDR version for the Collectors in the designated Collector Group. You can select more than one operating system.



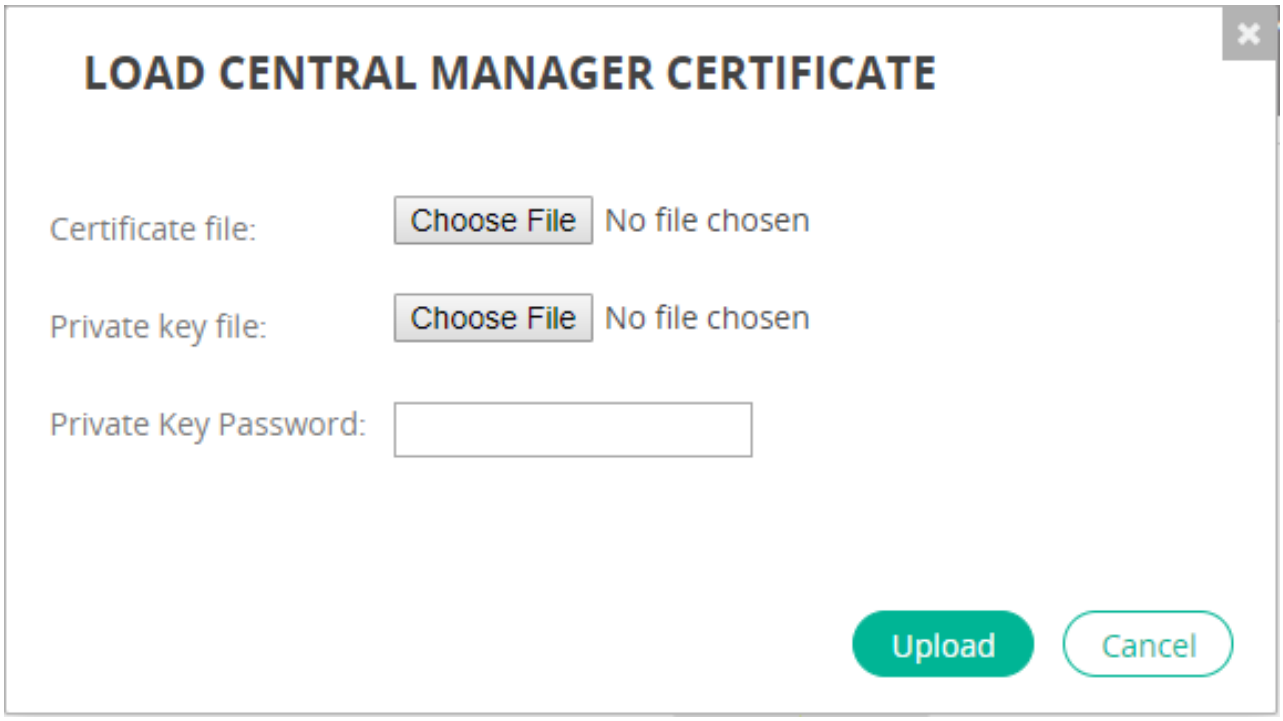
3. Click *Update*. FortiEDR gradually updates all the Collectors in the Collector Group(s) to the required version for the specified operating system(s), and displays the following window:

4. Click *Close*.

Loading a server certificate

To load a certificate:

1. Click *Central Manager Certificate* (Central Manager Certificate). The *Load Central Manager Certificate* dialog opens.



2. Click *Choose File* to upload the certificate file. Only PEM certificates (`.pem`) are supported.

> The certificate common name (CN) must match the FQDN of the FortiEDR machine. Otherwise, an error will occur.

3. Click *Choose File* to upload the private key file.
4. Enter the certificate password in the *Private Key Password* field.
5. Click *Upload*.
6. Configure the certificate as follows:
   - For cloud deployment, please contact Fortinet Support.
   - For on-premise deployment, add or edit the following entries in the `/opt/FortiEDR/webapp/application-customer.properties` file on the FortiEDR Manager VM:
     - `connector.ssl.externalAddress={`*`certificate domain/DNS name of machine`*`}`
     - `smtp.template.server.login={`*`certificate domain/DNS name of machine`*`}`

> The properties are case-sensitive and must be in lowercase. Space is not allowed.

7. Restart the FortiEDR Manager VM.

Requesting and obtaining a Collector installer

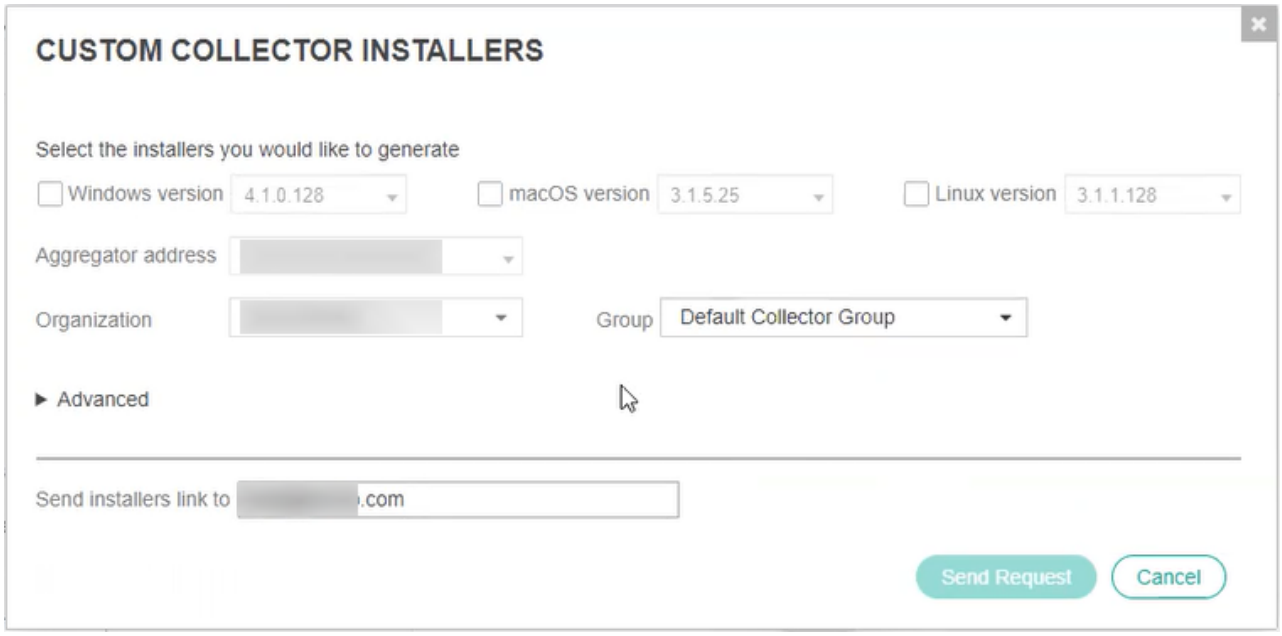
You can click the *Request Collector Installer* button (Request Collector Installer) to obtain a Collector installer file that can be used to install a Collector. This option enables you to request an installer for a particular operating system(s), such as Windows, MacOS, or Linux. This installer is similar to the standard wizard used to install a Collector, except that many of the fields in the wizard have already been filled in for you.

The requested Collector installer will then emailed to you. You can unzip it with 7-Zip using the registration password (available under *Administration > Settings > Component Authentication on page 393*) and install it by following the instructions in Installing FortiEDR Collectors on page 23, based on the operating system on which it is to be installed.

To minimize the risk of extraction failures and compatibility issues, we recommend using 7-Zip to extract the contents of the MSI package to ensure that all necessary files within the collector package are properly retrieved for further use or configuration. Using WinRAR or the Windows built-in extractor may cause errors or incomplete extractions.

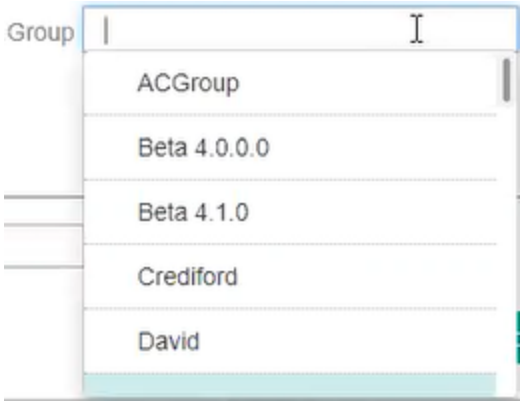
To configure custom installer settings to determine the type of installer to request :

1. On the *Administration > Deployment > Collector* page, click the *Request Collector Installer* button (Request Collector Installer). The following displays:

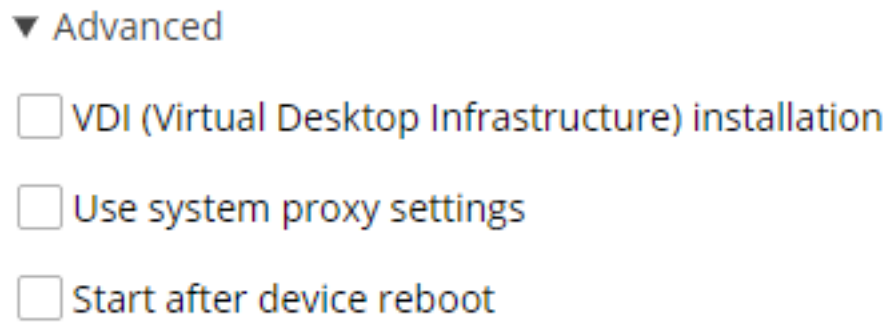


2. In the *Select the installer you would like to generate* area, select the checkbox of the installer(s) you want to request. Multiple installers can be requested at the same time.

3. In the adjacent dropdown list, select the installer version. When selecting installers for more than one operating system, you must specify the version for each of them. Specify the version in the same manner as described on Updating the Collector version on page 418
4. In the *Aggregator Address* dropdown list, select the aggregator to which this Collector is registered.
5. In a multi-tenant system, select the organization to which the installed Collector is registered in the *Organization* dropdown list.
6. In the *Group* dropdown list, select the Collector Group to which the installed Collector is assigned, or leave the field empty for the Collector to be assigned to the default Collector Group.



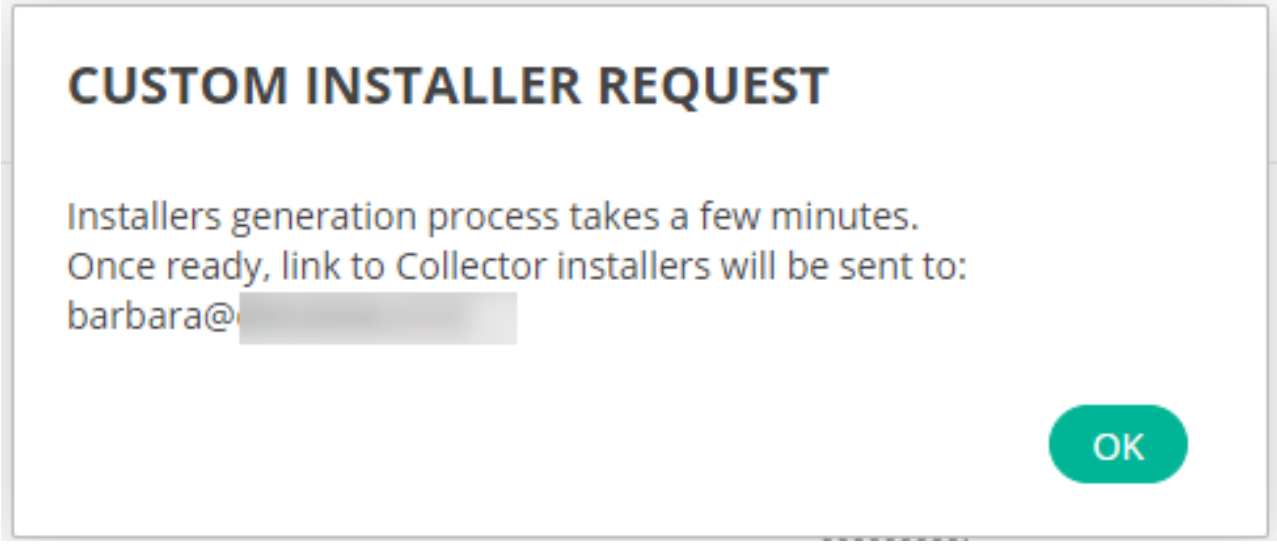
7. In the *Advanced* area, specify the following:



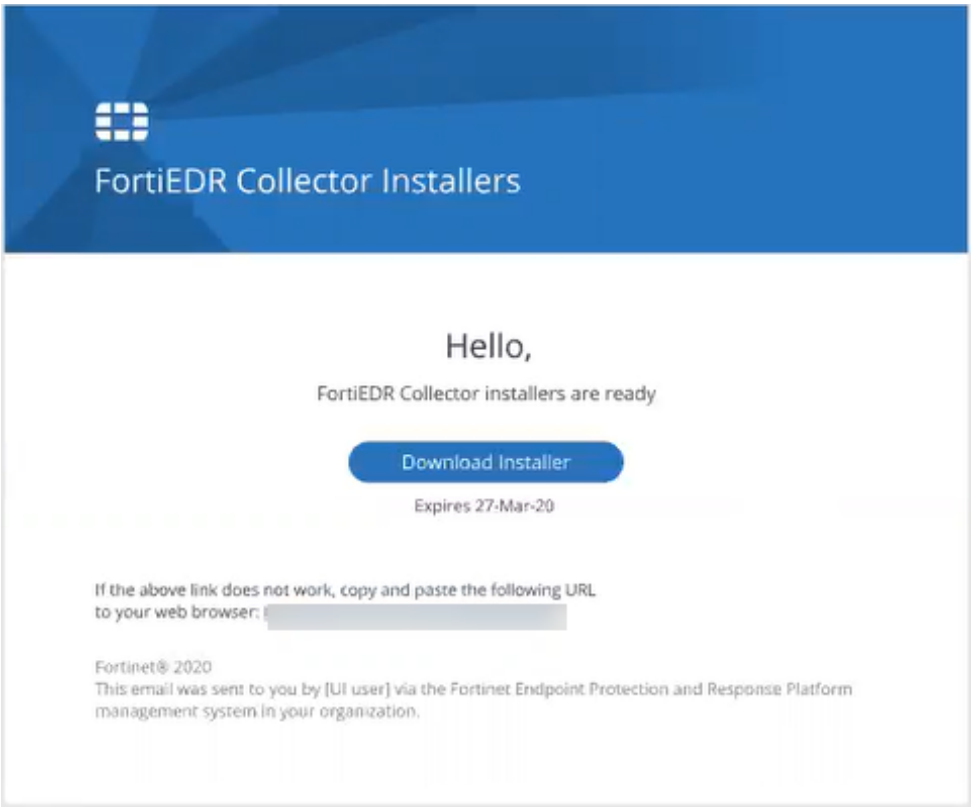
- *VDI (Virtual Desktop Infrastructure) Installation*: If you are installing the Collector on a VDI environment, check this checkbox. For more details, you may refer to the Working with FortiEDR on VDI Environments section on page 54.
- *Use System Proxy Settings*: If you use a web proxy to filter requests in this device's network, then check the *Use System Proxy Settings* checkbox. Note that Windows must be configured to use a proxy and tunneling must be allowed from the Collector to the Aggregator on port 8081 and from the Collector to the Core on port 555. (Run as Administrator: netsh winhttp set proxy <proxy IP >).
- *Start After Device Reboot*: Check this checkbox in order to delay data collection until a device reboot is applied. This is only required in rare cases. Typically, this checkbox remains unchecked.

8. In the *Send Installers Link To* field, specify the email address to which the installer is to be sent.

9. Click the *Send Request* (Send Request) button. A confirmation message displays.



10. Click *OK*. After the installer is generated by FortiEDR, it is emailed to the specified email address. Note that the link to download installers is only available for several hours. Be sure to download the installers within the required time period so that the link does not expire.



Note that in the presence of an email filtering system and/or a mail transfer agent that modifies the URL content, the installer download URL might include space(s) or %20s in it, that are added by the system/agent. In these cases, browsing directly to the URL will fail with a *signature* error message from the installer storage. In such cases, the URL should be amended to drop the redundant space/%20 before it can be used.

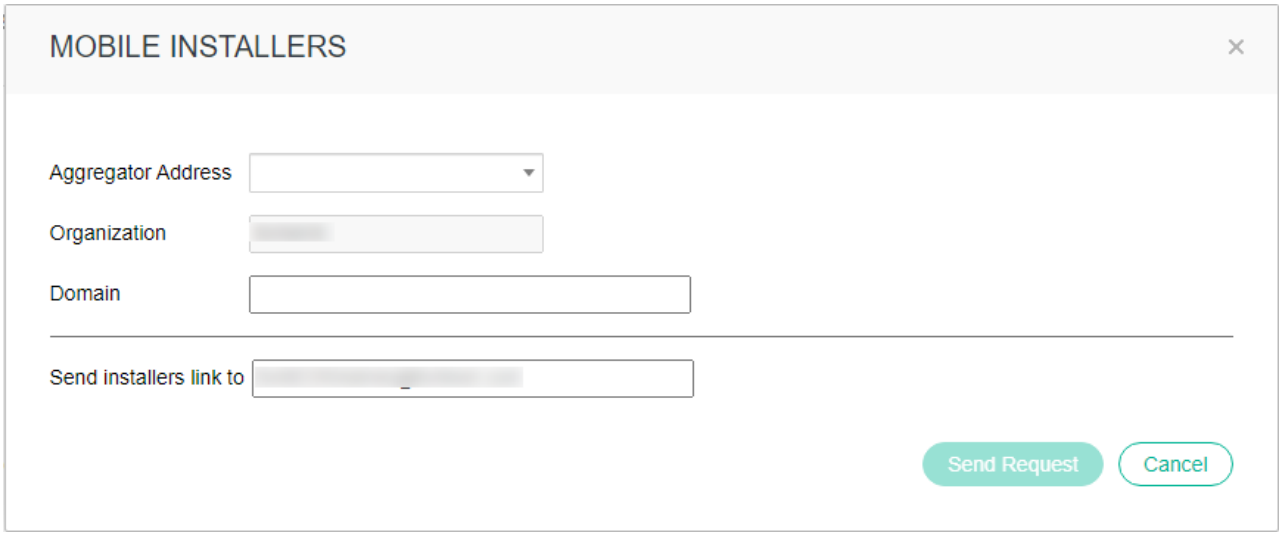
Requesting and obtaining a mobile installer

On the *Administration* > *Deployment* > *Collector* page, you can click the *Request Mobile Installer* button (Request Mobile Installer) to obtain a mobile Collector installer file that can be used to install on Android and iOS endpoints. The requested installer is then emailed to you. After you receive the installer file from FortiEDR, simply scan the QR code provided in the email using the mobile endpoint and follow the instructions attached in the email to install the mobile Collector.

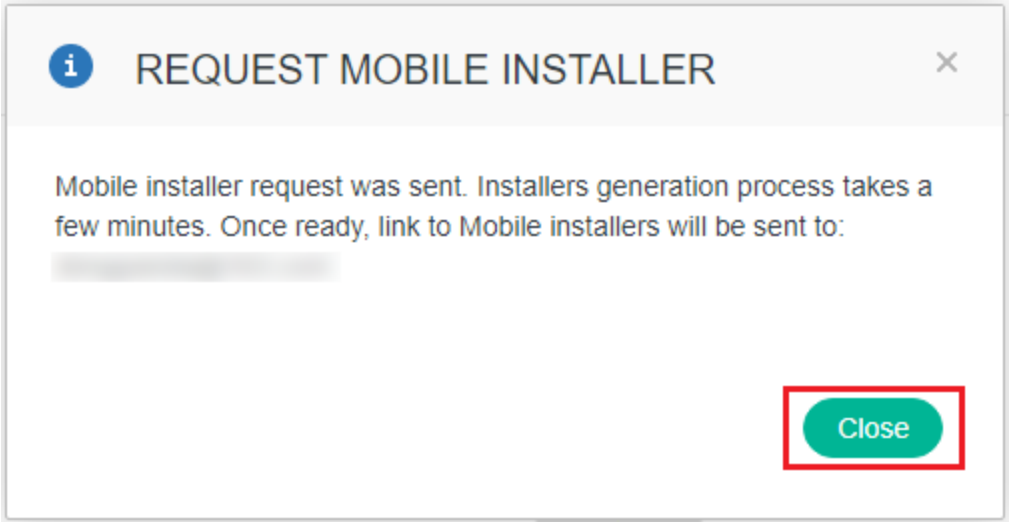
The *Request Mobile Installer* option is available only if mobile is enabled in the organization setting. See Step 2 – Defining or importing an organization on page 432.

To request a mobile installer:

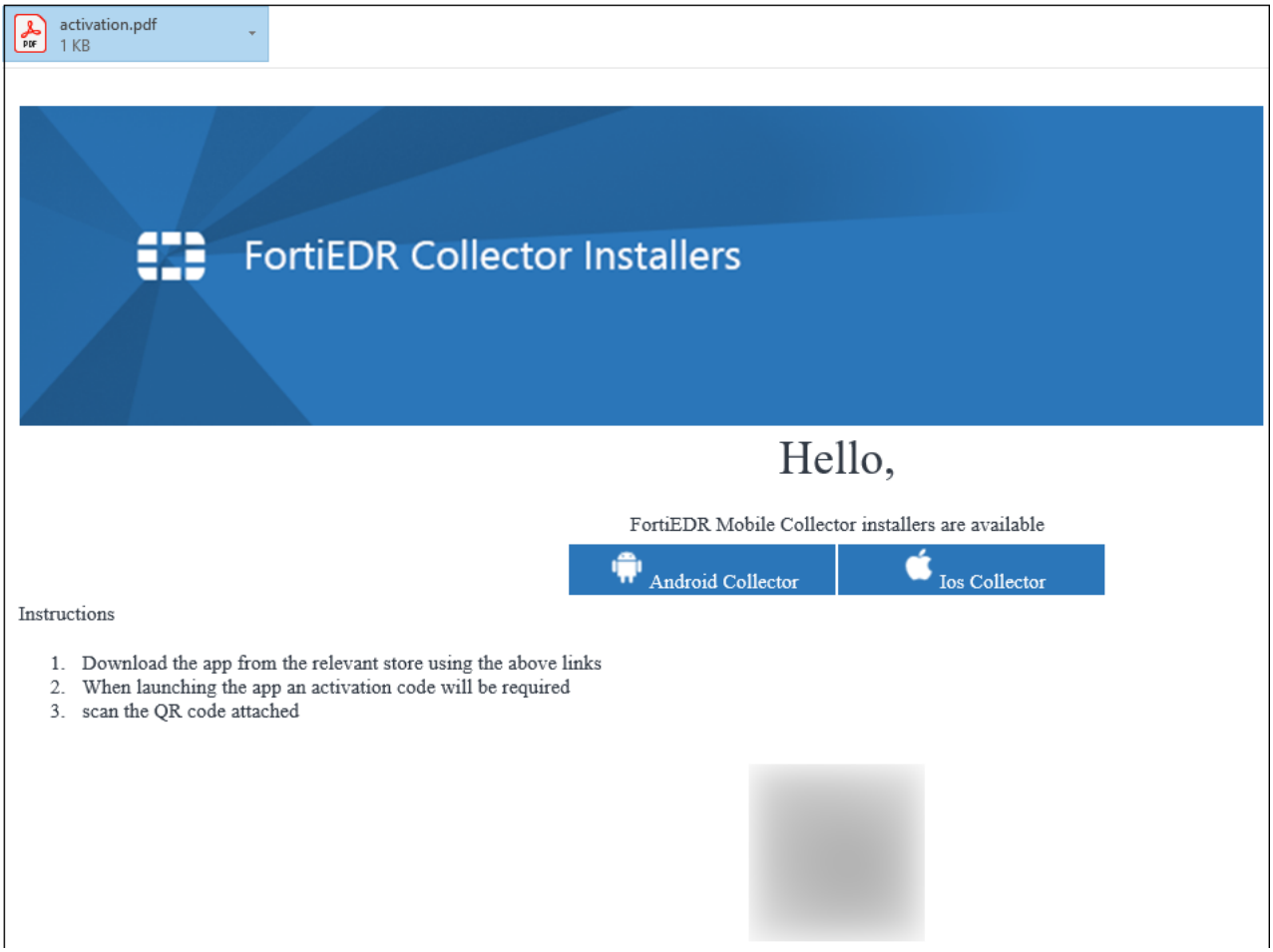
1. For multi-tenant systems, verify the correct organization (to which the mobile Collector will be registered) is selected at the top-left corner.
2. On the *Administration* > *Deployment* > *Collector* page, click *Request Mobile Installer* (Request Mobile Installer). The following displays:



3. In the *Aggregator Address* dropdown list, select the aggregator to which this Collector is registered.
4. Confirm the organization for the Collector to register with, if applicable.
   To change the organization, you must exit the window and change it at the top-left corner of the Central Manager console.
5. Specify the domain, which will be used for validation during account activation (see the FortiEDR Android and iOS User Guide).
   For example, if the domain is set to `fortinet.com`, the user must specify a valid username with a matching Fortinet email address. Account activation will fail if the username fails the domain validation.
6. Specify the email of the recipient of the mobile Collector.
7. Click *Send Request*. The Android and iOS collector installers and instructions will be sent via email.
8. Click *Close* in the *REQUEST MOBILE INSTALLER* window.



9. In the *Send Installers Link To* field, specify the email address to which the installer is to be sent.
10. Verify that the mobile Collector installers have been received in the specified email.
11. Follow the instructions to install the mobile Collector on desired Android or iOS devices.



12. After the mobile Collector is installed, activate it using the registration code attached in the email.

(Android only) After activation, the Collector automatically scans all files (including APKs) and applications on the mobile device for potential vulnerabilities. You can also trigger a scan anytime or schedule periodic scanning based on your needs (see File Scan on page 395). When a malicious application or file is detected, executed, or installed, the Collector sends a notification and prevents the execution or installation based on the policy setting. You can then view the details of the activity in the Incidents menu of the FortiEDR Central Manager console.

Multi-tenancy (organizations)

This chapter describes the operations that can be performed by an Administrator in a FortiEDR multi-organization system.

This chapter is only relevant for administrators in a multi-organization system. If you do not have Administrator rights, there is no need to read this chapter.

What is a multi-organization environment in FortiEDR?

Beginning with 3.0, the FortiEDR system can be set up as a single-organization or multi-organization environment. When set up as a single-organization system, the FortiEDR system and all its operations and infrastructure serve a single tenant, called an ***organization*** in the FortiEDR system, and work as described in all the previous chapters of this guide.

Prior to 3.0, the FortiEDR system only supported a single tenant (organization).

In a multi-organization FortiEDR system, someone with Administrator rights can perform operations and handle data for all organizations in the system. For example, think of a multi-organization environment like a hotel chain, which has a parent company along with hotels in various cities. In this scenario, the ABC Hotel corporate entity represents the *main organization*, and each ABC Hotel branch location represents a separate, discrete organization. For example, ABC Hotel Los Angeles, ABC Hotel New York, ABC Hotel Boston and so on.

FortiEDR uses *organizations* to distinguish between tenants in a multi-tenant environment. Each organization uses the same FortiEDR user interface and shares the same FortiEDR database.

Multi-organization and user roles

FortiEDR uses a series of predefined roles to control access to organizational data, as follows:

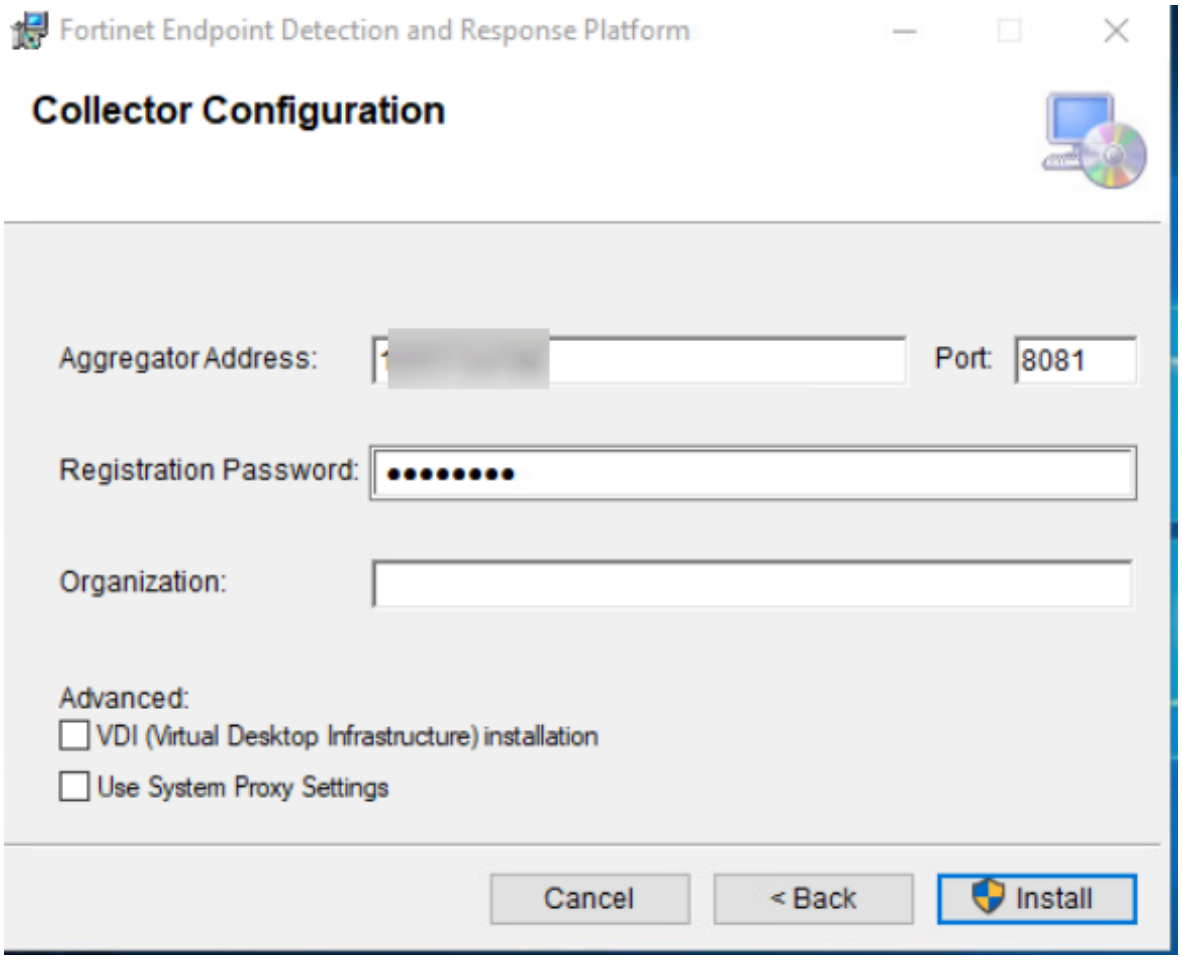
Role	Description
Admin	Highest-level super user that can access all data and perform all operations in the FortiEDR Central Manager console for one specific organization or all organizations, as defined in the user settings.

Role	Description
	In a FortiEDR multi-organization system, the system comes with one predefined Administrator user. More than one user with the Admin role is permitted. There must always be at least one Administrator in the system. Prior to 3.0, the FortiEDR system only supported a single tenant (organization).
Senior Analyst	Analysts supervisor who can define security policies in addition to all the actions that can be performed by an Analyst. Similar to admin users but without administration privileges. A senior analyst can view all information and perform actions, such as marking security events as handled, changing policies and defining exceptions, but cannot access the Administration on page 359 tab.
Analyst	SOC/MDR service analyst who can perform actions as required in the day-to-day activities of handling events. Similar to senior analyst users but without access to security configuration. An analyst can view all information and perform actions, such as marking security events as handled, but cannot access the *ADMINISTRATION* tab or define/change policies.
IT	IT staff who can define settings related to the FortiEDR integration with the customer ecosystem. This role has system configuration access only. They can deploy and upgrade system components and perform system integration with external systems using the *ADMINISTRATION* tab but do not have access to any security configuration, alert monitoring, or Forensics options.
Read-Only	Basic role with read-only access to all non-administrative functions.

Component registration in a multi-organization environment

Collector registration

Each organization has its own registration password. The Collector installer specifies the Collector organization name. If the *Organization* field is left empty during installation, the Collector is added to the default Hoster account, as shown below:



After registration, the Collector receives the organization ID. You can rename the organization if preferred.

To specify the organization when installing from a command line, run the following command:

```
msiexec…\qn ORG=<organization name> AGG=
```

For more details about Collector installation, see Installing FortiEDR Collectors on page 23.

Core registration

Most Cores are shared between organizations. It is possible to install a Core that belongs only to your organization by installing it on-premises. In this case, you must specify the organization during the Core installation process.

Collectors that do not belong to an organization cannot see that organization's organization-specific Core.

For more details about Core installation, see Setting up the FortiEDR Core on page 524.

Workflow

The following general workflow applies for Administrators when working in a FortiEDR multi-organization system:

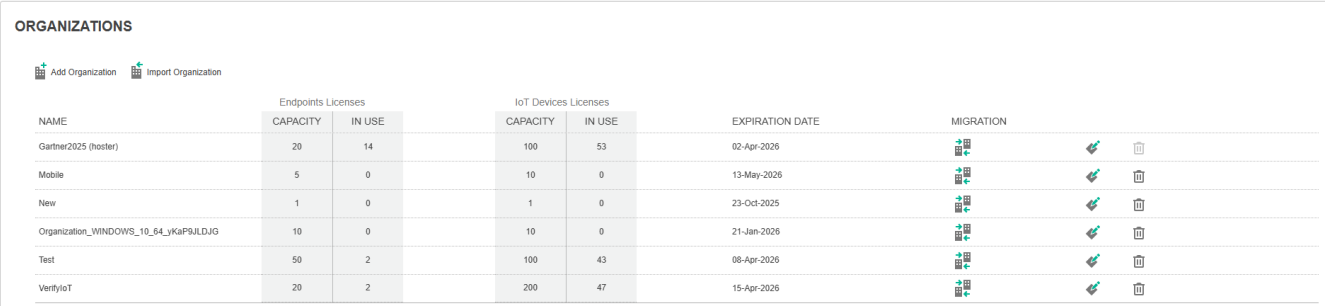
Step 1 – Logging in to a multi-organization system

For a FortiEDR multi-organization system, a user must also specify the organization when logging in to the system.

A user must be defined for an organization in order to log in to that organization. When logging in, the user must specify the organization name in the *Organization Name* dropdown list unless he/she is an administrator with privileges to all organizations, in which case he/she is logged in to the main organization by default without the need to specify an organization.

Step 2 – Defining or importing an organization

The *ORGANIZATIONS* page lists all the organizations defined in the FortiEDR system.



The *Default (hoster)* organization is predefined in the system. This organization represents the main organization in the system, such as the ABC Hotel chain described before. The *Default (hoster)* main organization cannot be deleted.

The default organization can be accessed by an Administrator with permissions to the default organization or to all organizations.

In a single-organization system, the Default (hoster) organization is the only organization. To set up a multi-organization system, see Moving from a single-organization to multi-organization structure in FortiEDR on page 436 in FortiEDR.

The *Organizations* window contains the following information:

Field	Definition
Name	Specifies the name of the organization.
Endpoint Licenses Capacity	For the organization, specifies the number of endpoint licenses (which includes workstations and servers) allocated to the organization.
Endpoint Licenses in Use	Specifies the number of endpoint licenses (which includes workstations and servers) in use (installed).
IoT Devices Capacity	For the organization, specifies the maximum number of IoT devices that can be detected in the organization.
IoT Devices in Use	Specifies the number of IoT devices detected in the organization.
Expiration Date	Specifies the expiration date of licenses for the organization.

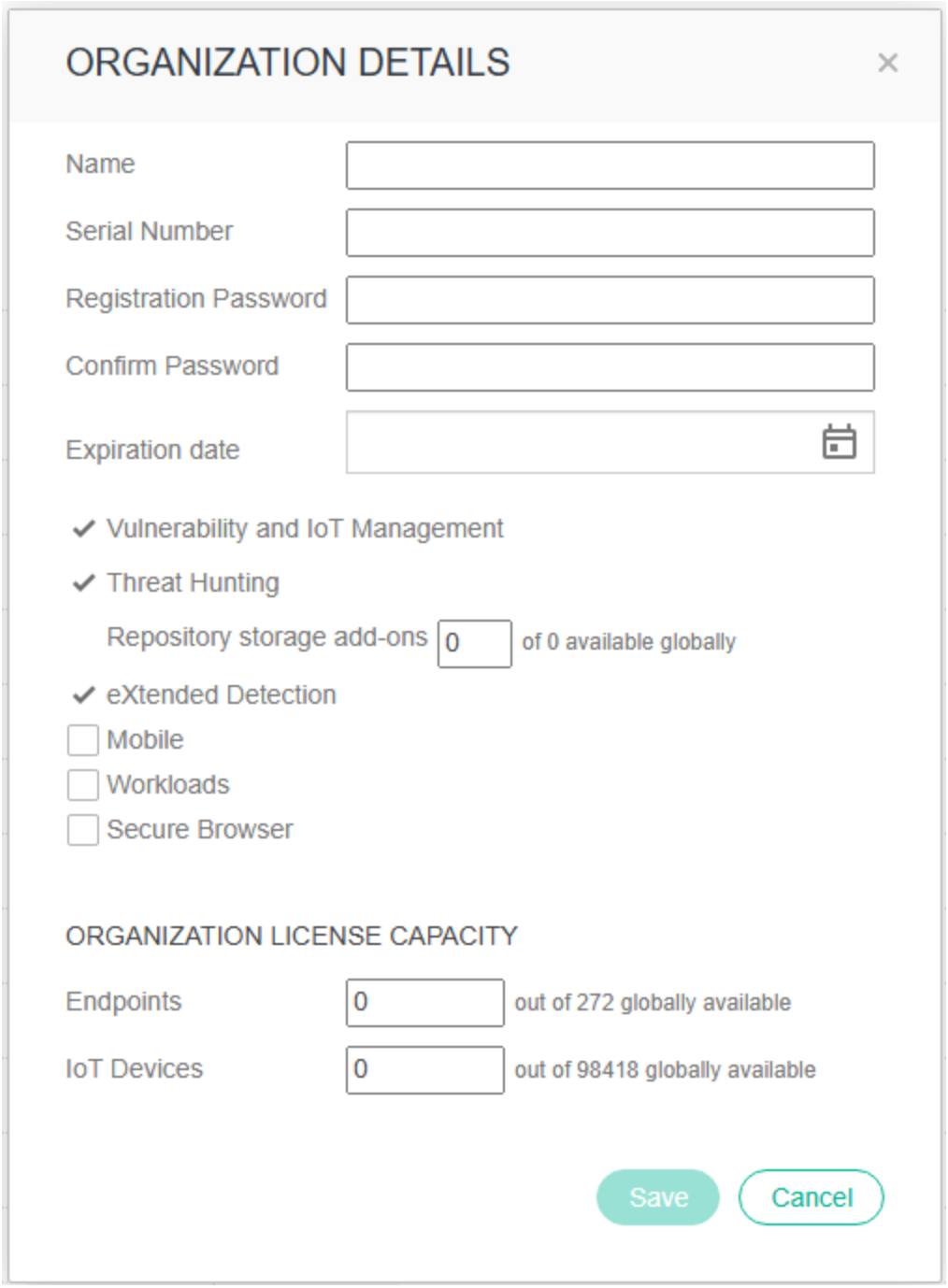
Click the *Edit* button in an organization row to edit the properties of that organization.

You can delete an organization as long as it does not have any workstations or servers in use. Click the *Delete* button in an organization row to delete that organization.

Click the *Migrate Organization* button in an organization row to migrate that organization. For more details, see Migrating an organization on page 438.

To define an organization:

1. Click the *ADMINISTRATION* tab and then click *ORGANIZATIONS* in the left pane. The *ORGANIZATIONS* page displays.
2. Click the *Add Organization* button. The following window displays:

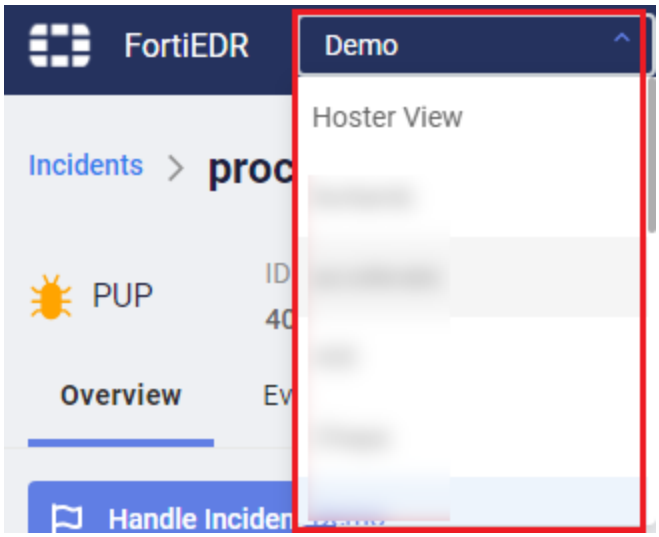


3. Fill in all fields in this window. All fields are mandatory.

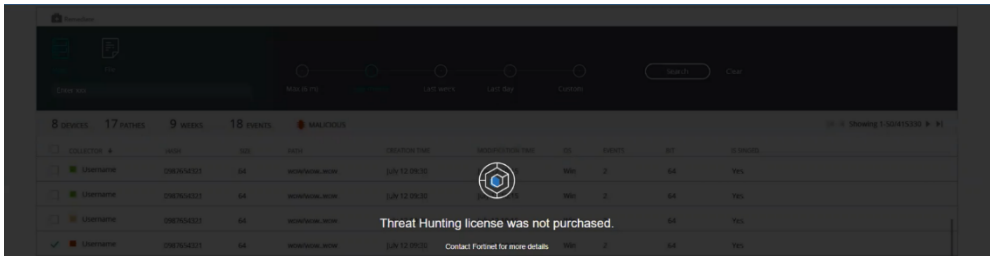
Field	Definition
Name	Define the name of the organization. Supported characters in the organization name: 0123456789:=@ABCDEFGHIJKLMNOPQRSTUVWXYZ_ abcdefghijklmnopqrstuvwxyz. Spaces are also allowed. For example, you can specify the organization name of a hotel branch as `ABC_ Hotel@Los Angeles`.
Serial Number	Your FortiEDR unique identifier with Fortinet, which can be found at the top of the *Administration > Licensing* tab.
Registration Password	Specifies the registration password for the organization. Each organization can have a different registration password. You set the value for this password. Supported special characters in the password: !, #, %, &, +, -, ., /, :, <, =, >, ?, @, [, \,], ^, _, `, {, |, }, (,), ~, and , You can display the registration password for an organization by selecting *Administration> Settings> Component Authentication > Display*. If third-party software attempts to stop the FortiEDR Collector service, the system prompts for the registration password. This is the same password used when installing the Collector. If an incorrect password is supplied at the prompt, the message `Access Denied` displays on the Collector device. In this case, the FortiEDR Collector service is not stopped. For more details about the required password to supply in this situation, refer to Component Authentication on page 393.
Expiration Date	Specifies when this license expires. Notifications are sent to you beforehand. Each organization can have its own expiration date. If the Default (hoster) organization expiration date is earlier than that for the organization, then the expiration date for the Default (hoster)organization applies. Whenever there is an expiration date conflict, the earlier date always applies.
Vulnerability and IoT Management	Check this checkbox for the organization to have access to these features. This option is only available on setups that have purchased a Discover and Protect license or Discover, Protect and Response license.

Field	Definition
	The various license types in FortiEDR enable access to different FortiEDR features. The Administrator can configure the various organizations in a multi-tenant environment to each have access to different features in the product. For example, Organization A may have access to the Threat Hunting feature and Organization B may not.
Threat Hunting	Check this checkbox to provide the organization access to threat hunting. This option is only available on setups that have purchased a *Discover, Protect and Response* or *Protect and Response* license. • *Repository storage add-ons*: Specifies the number of repository add ons, out of the total number of add on purchases, to enable this organization to use.
eXtended Detection	Check this checkbox to give the organization access to this feature. This option is only available on setups that have purchased an eXtended Detection add on. See Licensing on page 359 for details on how to check the license type.
Mobile	Check this checkbox to enable mobile-related features. See Mobile on page 342.
Secure Browser	Check this checkbox to enable secure browser-related features. See Secure Browser Collector 6.1.1.1281 or later on page 244.
Endpoint / IoT Devices License Capacity	Specifies the number of license seats for the organization, meaning the number of Collectors that can be installed in this organization. Before allocating licenses to an organization, you may need to verify the number of available licenses that can be distributed. All currently unallocated licenses are available for allocation to an organization. You cannot enter a number that is greater than the number of licenses available for allocation. The License Capacity field in the Licenses window shows the total number of license seats for the entire FortiEDR system, which are divided into endpoints (which includes workstations and servers) and IoT devices. The Default (hoster) organization initially receives the total allocation of licenses. The Administrator is responsible for allocating these licenses among organizations. In a single-organization FortiEDR system, licenses do not need to be allocated between organizations, as there is only one organization.

4. Click the *Save* button. Note that it may take a minute or so to create the organization.
After creating the organization, the organization appears as a new row in the *Organization* dropdown list.



If a user attempts to use a feature that is not available with their license, a warning message displays. For example, as shown below.



Moving from a single-organization to multi-organization structure in FortiEDR

In a single-organization system, the Default (hoster) organization is the only organization.

To create a multi-organization (multi-tenant) system, an Administrator simply needs to add one or more organizations to a single-organization system. When there are multiple organizations in the system, you can select the organization of interest in the *Organization* dropdown menu that appears at the top left of the window, as described below.

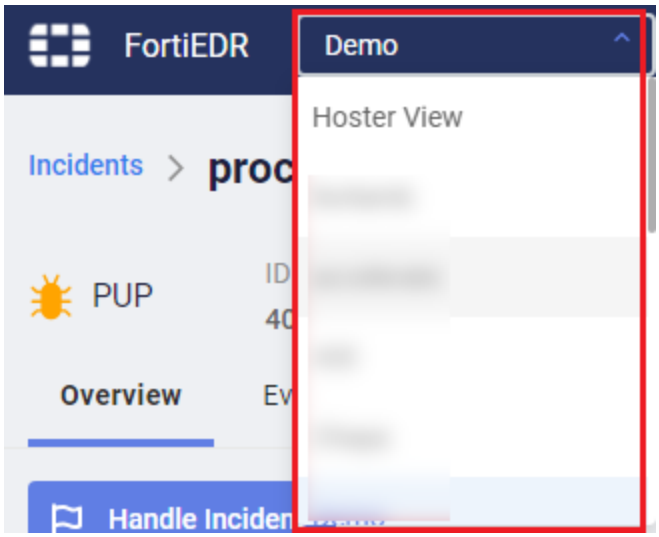
Step 3 - Navigating between organizations

In a multi-organization system, all types of information are now organized per organization.

Administrators can view information in the FortiEDR system for a specific organization or for all organizations together. To do so, use one of the following methods:

a. Select the *Hoster view* in the *Organization* dropdown menu at the top left of the window to display information for all organizations together. For more details about Hoster view, see Hoster view on page 447.

b. Select the organization of interest in the *Organization* dropdown list.



In Hoster view, each row in the *Organizations* pane represents a different organization. Note that after you select an organization, the entire user interface only shows information for that organization.

If that multiple web browser tabs or windows are opened on the same device and each of them navigates to a different organization on the FortiEDR Central Manager Console, they all show the data of the same organization, which is the last organization that was selected in the *Organization* dropdown list. In this case, the dropdown may look as if it points to Organization A however the data would be of Organization B.

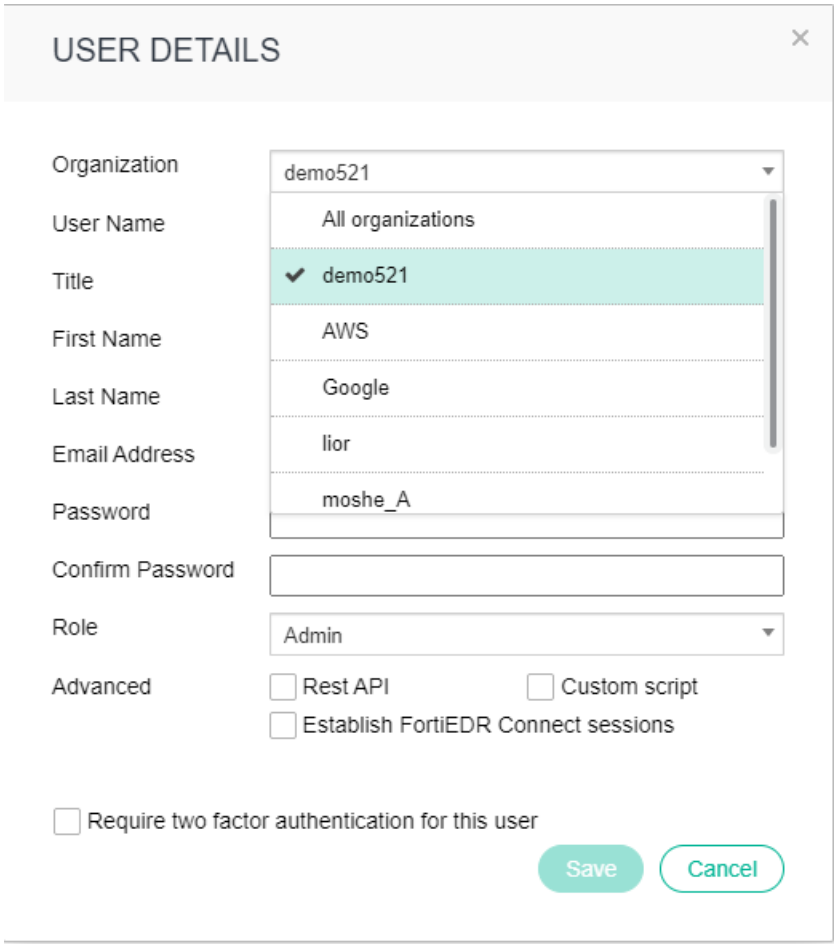
Step 4 – Defining an Administrator for an organization

Administrators can create one or more Administrators for an organization or for all organizations. You should define at least one Administrator for each organization.

To define an Administrator for an organization:

1. In Hoster view, click the *ADMINISTRATION* tab and then click *USERS* in the left pane.
2. Click the *Add User* button.

3. Select the organization in the *Organization* field, as shown below.



4. Fill in the displayed window, as described in Users on page 359.
5. Click *Save*.

Step 5 – Performing operations in the FortiEDR system

Administrators can perform all of the operations described from Profiles on page 201 to Threat Hunting on page 131 in this guide using the user interface of the FortiEDR Central Manager for all organizations in the system.

Administrators can monitor the system per organization or using Hoster view, which shows data for all organizations together.

Migrating an organization

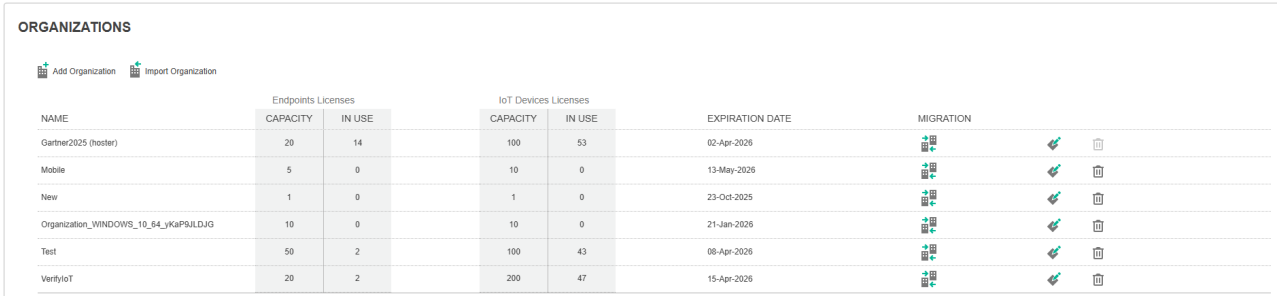
FortiEDR's Consolidation feature enables you to copy all the data and definitions within an organization from one environment to another environment. This feature copies an organization from one environment (`source setup/environment`) to another (`destination setup/environment`). The copy operation adds to the content in the destination environment, and does not replace the target's existing content.

This feature is only available to Administrators.

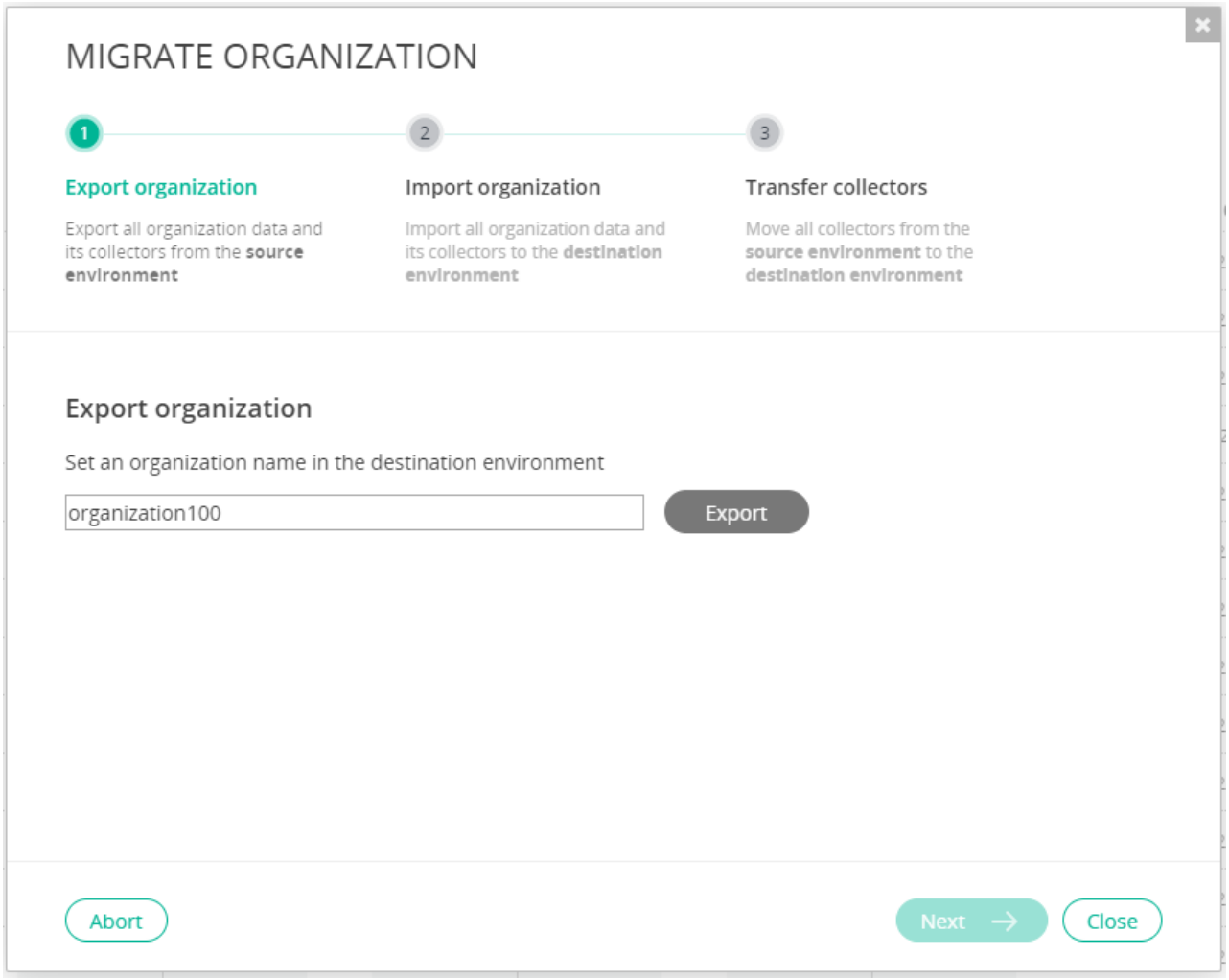
Organization migration involves three steps, which are described in detail in the procedure below.

To migrate an organization:

1. Click the *ADMINISTRATION* tab and then click *ORGANIZATIONS* in the left pane. The *Organizations* window displays.



2. Click the *Migrate organization* button in the row of the source organization that you want to copy to another environment. The following window displays:



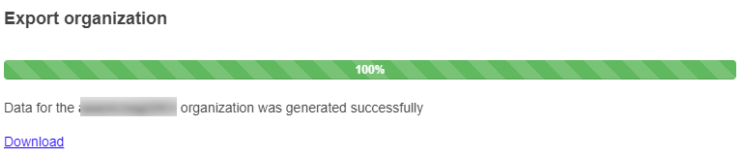
From this window, you perform three steps to migrate the organization to another environment:

a. Export the Organization: This step exports all the data of the selected organization to a zip file.

b. This step imports all the organization's data using the zip file exported in step 1. Note that this step is performed on the destination environment.

c. This step moves all the Collectors of the selected organization from the source environment to the destination environment.

3. In the *Export organization* field, specify the name of the organization to appear for this data in the destination environment. Make sure that you assign an organization name that does not already exist in the destination environment.
4. Click the *Export* button. All the data and definitions for the organization are exported to a zip file. The zip file is named as follows: `<source organization name>_<environment name>_FortiEDR_<timestamp>_Export.zip`. For example, `ad_localhost.localdomain_enSilo_Feb.05.2019_Export.zip`.
After the export completes, a *Download* link displays in the window:



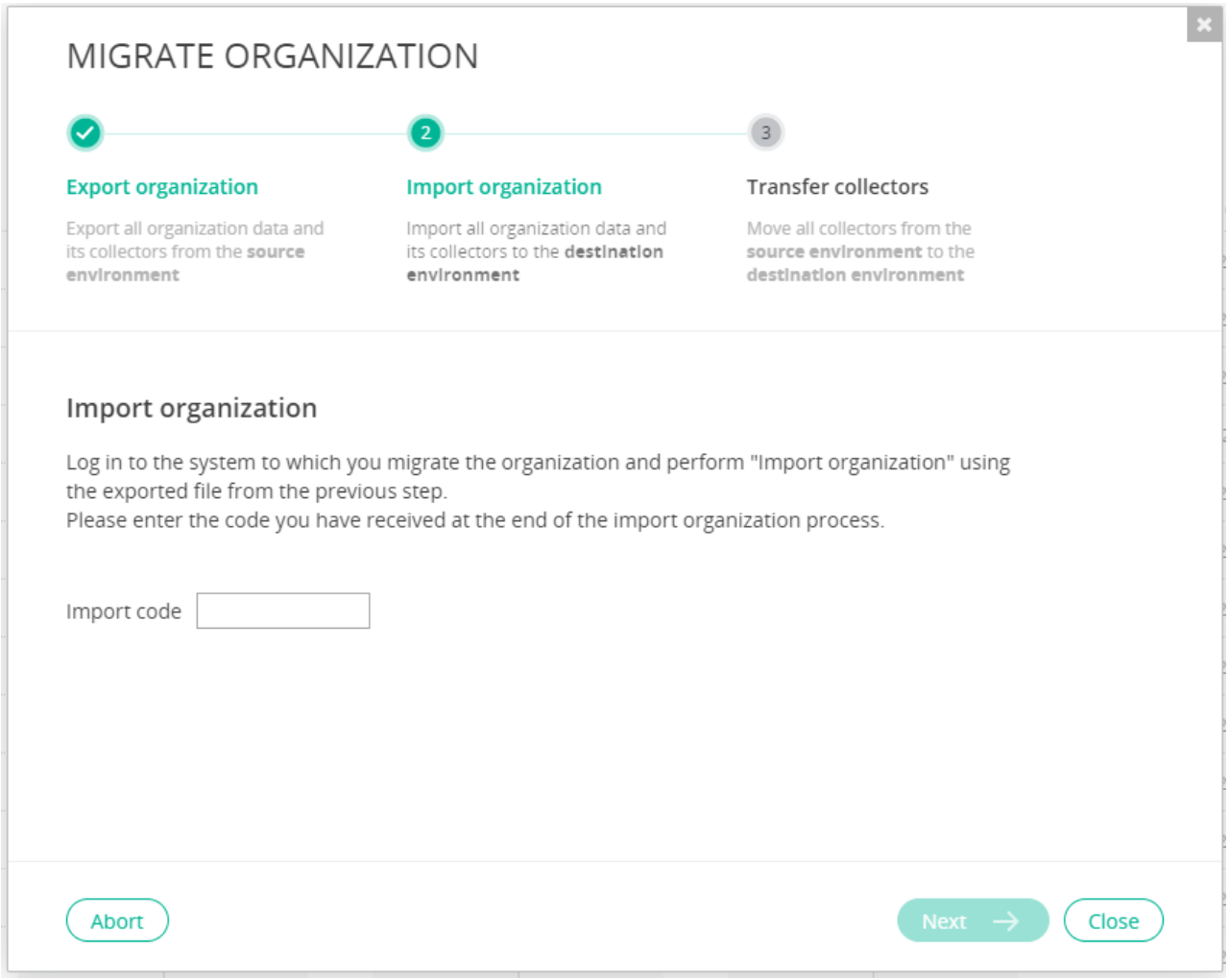
You can cancel the migration process at any time by clicking the *Abort* button.

5. Click the *Download* link to download the exported zip file.

Click the *Close* button if you want to close this window and continue the migration process at a later time. This action saves the relevant organizational data. You can later continue this migration process by using the *Continue Migration* Cont. button.

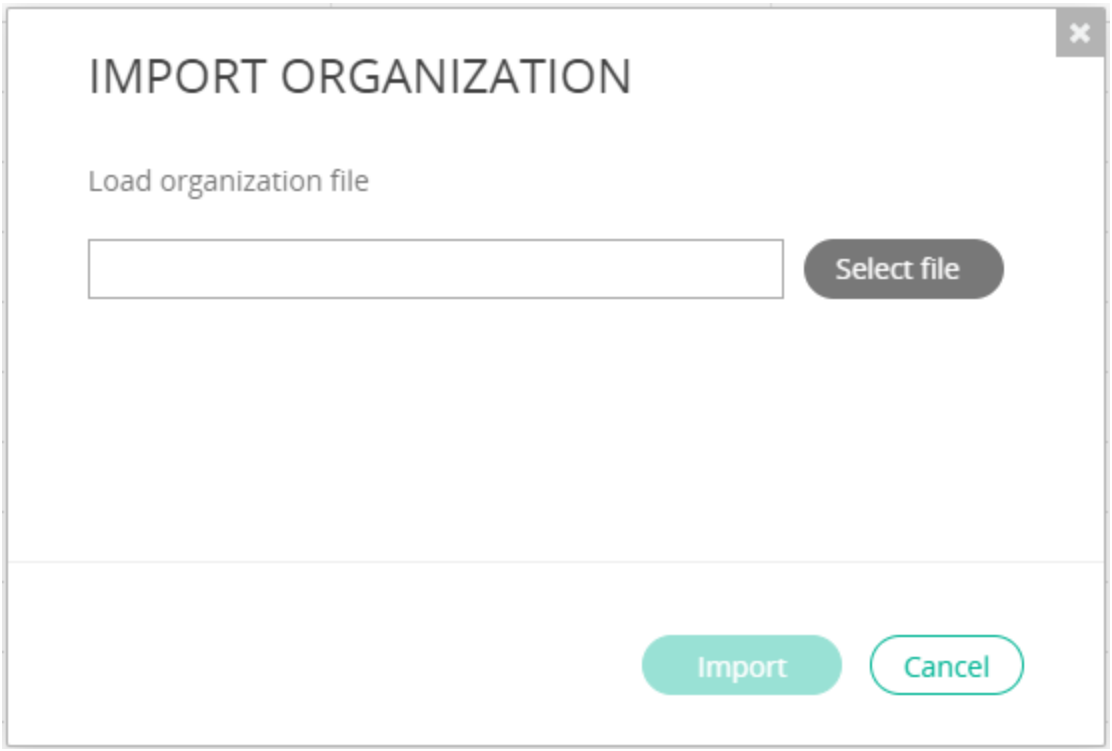
If you click the *Close* button before downloading the exported zip file, a warning displays. In this case, you must perform the migration process again from the beginning.

6. Click *Next*. The following window displays:



7. Log in to the destination environment.
8. Click the *ADMINISTRATION* tab and then click *ORGANIZATIONS* in the left pane.

9. In the *ORGANIZATIONS* page, click the *Import Organization* button. The following window displays:



10. Select the exported zip file to load and then click *Import*. This step copies all the data and environment definitions of the exported organization.

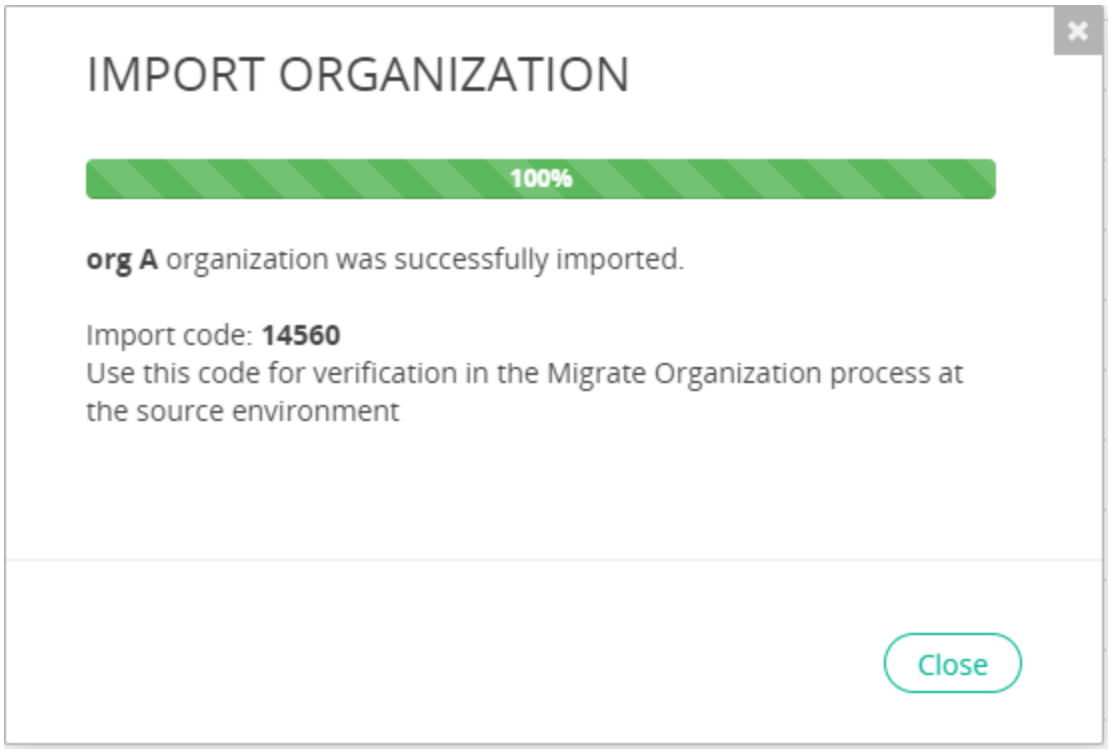
You cannot import an exported organization that has a name that already exists in the destination environment.

To import an organization, the FortiEDR platform version must be the same in both the source and destination environments.

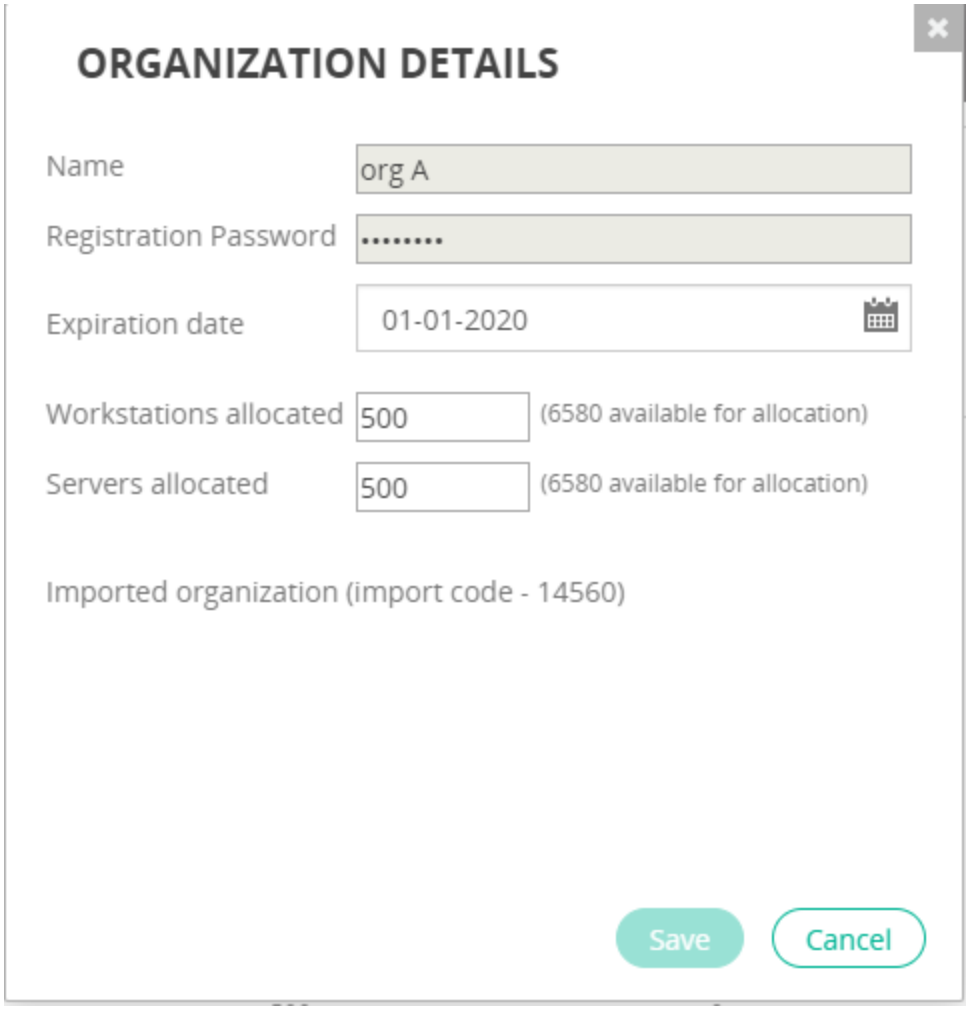
The content version must be the same in both the source and destination environments. You can see the Content Version at the bottom of the Licensing on page 359 window.

You must have sufficient workstation and server licenses in the destination environment.

At the end of the import process, the *Import Organization* window displays a code. Write down this code, as it will be entered later as part of the migration process.


IMPORT ORGANIZATION
100%
org A organization was successfully imported.
Import code: 14560
Use this code for verification in the Migrate Organization process at the source environment
Close

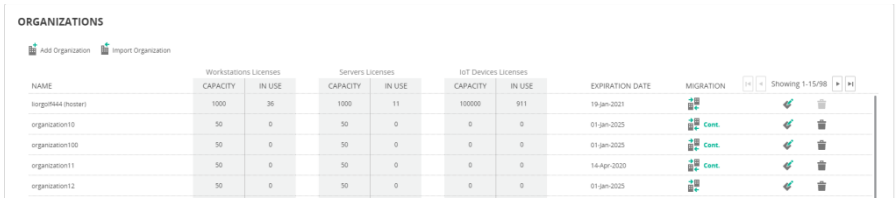
The *Import code* also displays in the *Organization Details* window, which you can display at any time by clicking the *Edit* button in an organization row in the *Organizations* window.



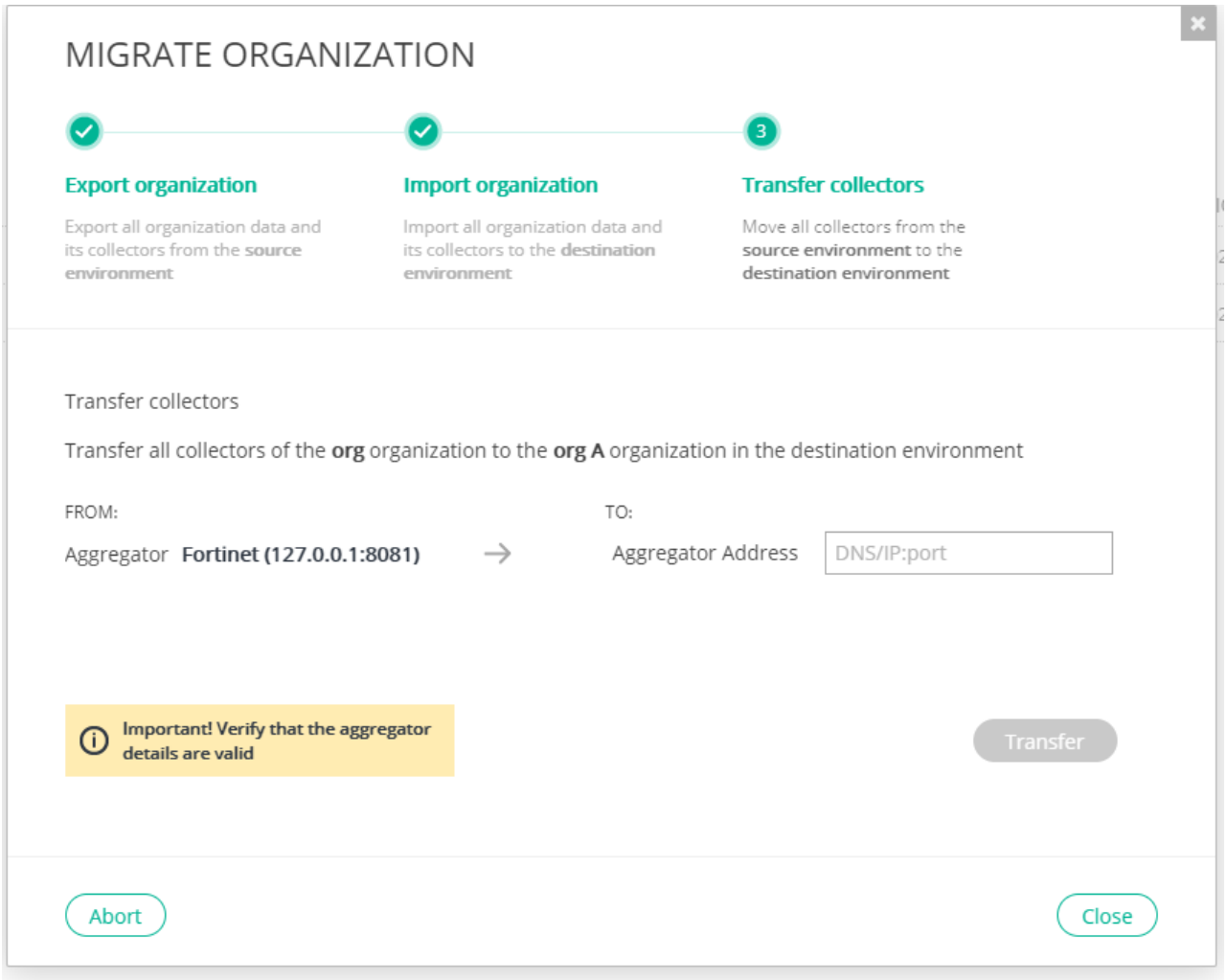
Note that the name of the organization cannot be changed in this window, and is read-only.

11. In step 2 of the *Migrate Organization* window, enter or copy the import code into the *Import code* field.

If you previously closed the *Migrate Organization* window, then click the *Continue Migration* Cont. button in the source organization row in the *ORGANIZATIONS* page.

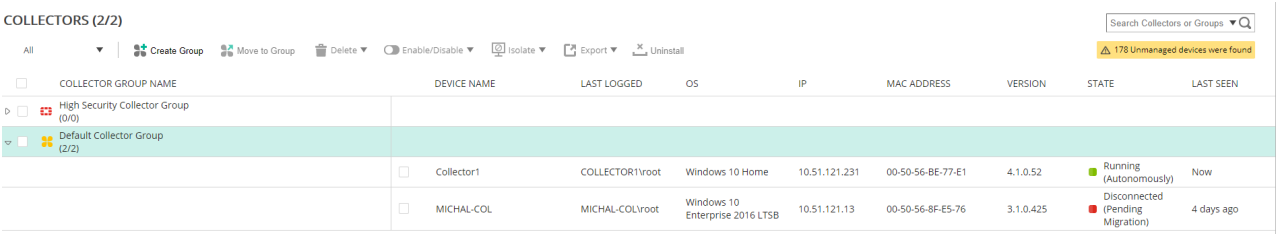


12. Click *Next*. The following window displays:

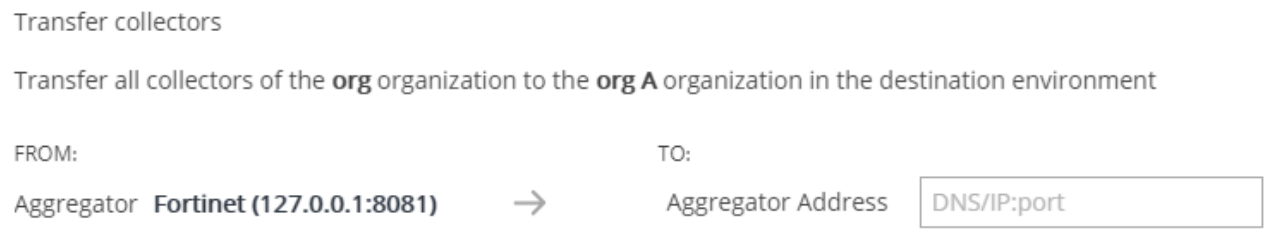


In this window, you move the Collectors from the source environment to the destination environment. The Collectors cannot be registered to both environments at the same time.

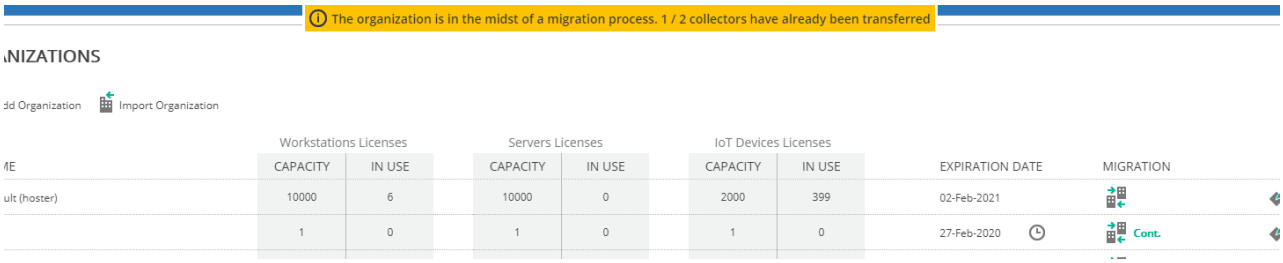
Note that until this step is completed, the Collectors are still registered to the organization in the source environment and their status and security events are displayed there. In the destination environment, Collectors are displayed with the *Pending Migration* state, as shown in the *Inventory* window. This state indicates that the Collector has not yet been transferred from the source environment to this environment. Collectors in the *Pending Migration* state are still registered to the source environment.



13. Specify the *Aggregator Address* in the *To* field. Each Collector is connected to one Aggregator. In this field, you specify the IP address or DNS name and the port of the Aggregator that will service the Collectors in the destination environment.



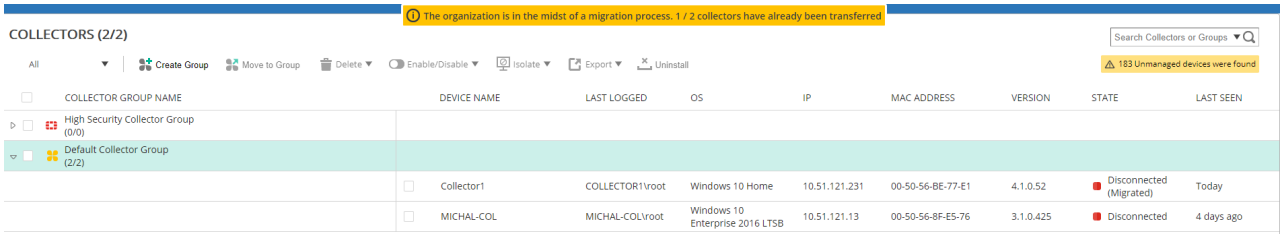
14. Click the *Transfer* button. The Collectors are transferred from the organization in the source environment to the organization in the destination environment. A progress indicator counter displays as the Collectors are transferred.



The progress indicator counter continues to display until the organization is deleted in the source environment, which is recommended after all Collectors have been transferred from the source environment to the destination environment. See step 16 below.

If you click the *Abort* button at this step, any Collectors already transferred from the source environment to the destination environment remain in the destination environment.

After a Collector has been transferred from the source environment to the destination environment, its state is *Migrated* in the source environment, and is *Running* (functional) in the destination environment.



Collector protection remains in effect throughout the entire migration process.

15. (Optional) Click the *Stop Transfer* button to pause the Collector transfer process. You can resume the transfer process by clicking the *Transfer* button again.

If a user enters the source organization while a migration process is in progress for it, a warning displays. Any changes made by this user will not be migrated or included in the destination organization. Any changes made to an organization while it is being migrated are ultimately lost.

16. After all the Collectors were successfully migrated from the organization on the source environment to the organization on the destination environment, delete the source organization. To do so, select the *Administration* tab and then click *Organizations* in the left pane. In the *Organizations* window, click the *Delete* button in the row of the source organization to be removed.

Collector protection and functionality remain throughout the entire migration process.

Hoster view

When you select *Hoster* view in the *Organization* dropdown list, all windows in the user interface are affected. In general, this view shows aggregated data for all organizations.

However, some data is only available in Hoster view, such as the following:

- *Export Settings*: In a multi-organization system, SMTP-related information is only displayed in Hoster view.
- *Administration* > *Settings*: The *Session Time Out* setting is available only in Hoster view.

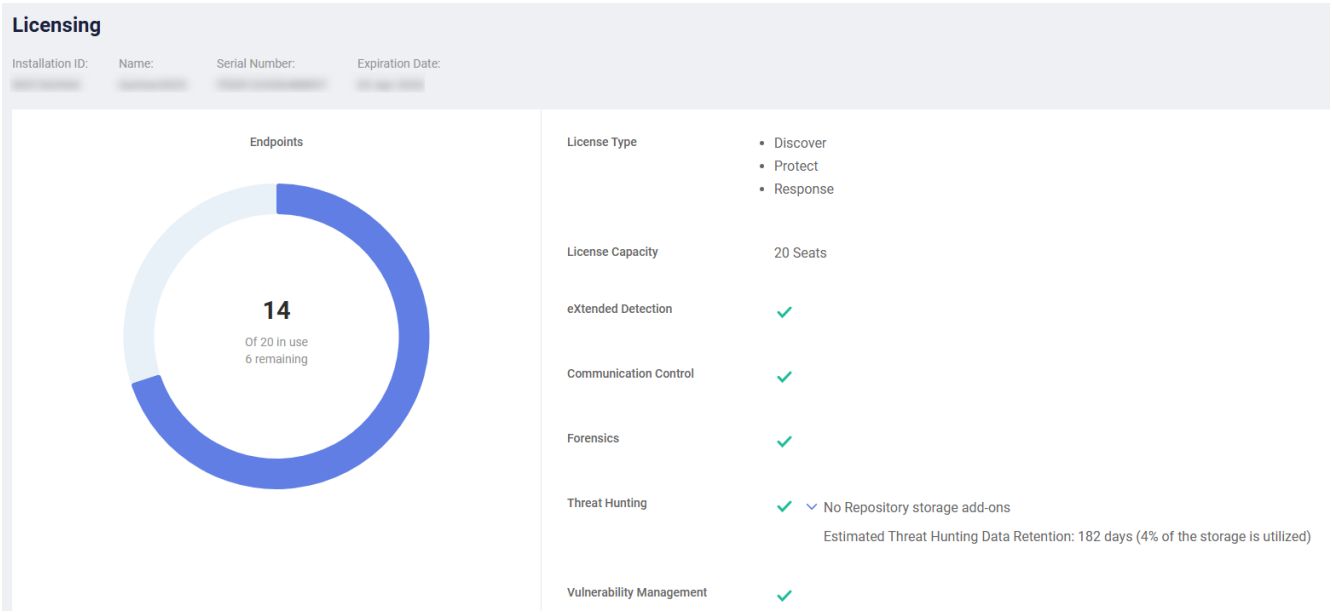
In addition, there are some special cases where you cannot view administration data in Hoster view, and can only view data for a specific organization, such as the following:

- Component Authentication
- Automatic Updates
- End User Notifications
- Periodic Scan

Many of the windows that display aggregated data for all organizations have some special features when displaying data in Hoster view. In general, in Hoster view, these windows have an additional column or field, and require that you specify the organization in order to add the item. Several examples are provided below. The examples below are not all-inclusive.

Licensing

When in Hoster view, the *Licensing* window shows aggregated information for all organizations.

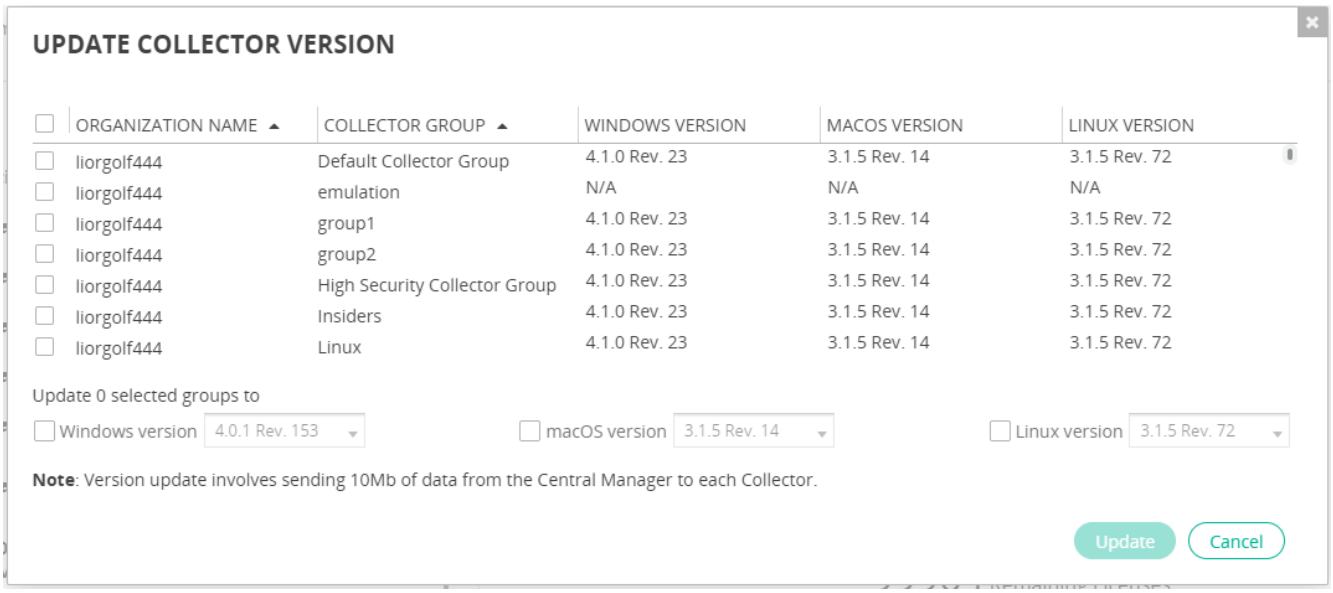


For example, the Workstations and Servers diagrams indicate the number of allocated and available licenses for all workstations and servers, respectively, in the entire FortiEDR system. The *Licenses in Use* numbers represent the number of Collectors that have been installed out of the total permitted to be installed.

The *Load Content* option loads content to all organizations. Once loaded, the new configuration applies to all organizations, including new Collector installers. However, Collectors are not being updated yet.

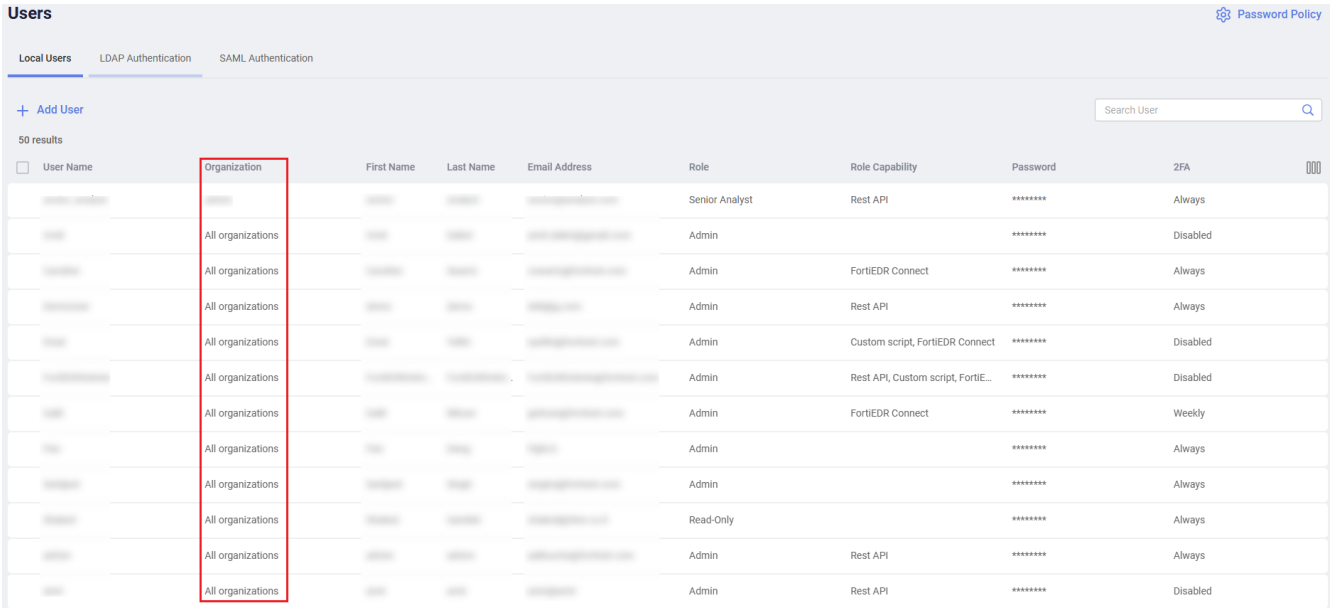
When in this view, you cannot load content to a specific organization.

When you click the *Update Collectors* button in the *Licensing* window, the *Update Collector Version* window displays, and includes an *Organization Name* column. Use the checkboxes in this column to update the organization for a Collector Group. All other functionality in this window works in the standard manner.

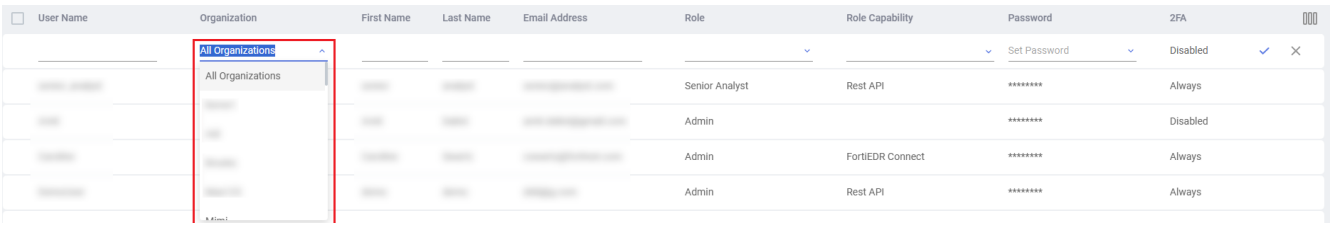


Users

In Hoster view, this window includes an *Organization* column.



When you click the *Add User* button from this window, you must specify the *Organization* field . You can assign the user to one specific organization or *All organizations*.



Settings

In Hoster view, the *Administration* > *Settings* page only includes the Audit Trail on page 391 and *Session Time Out* sections.

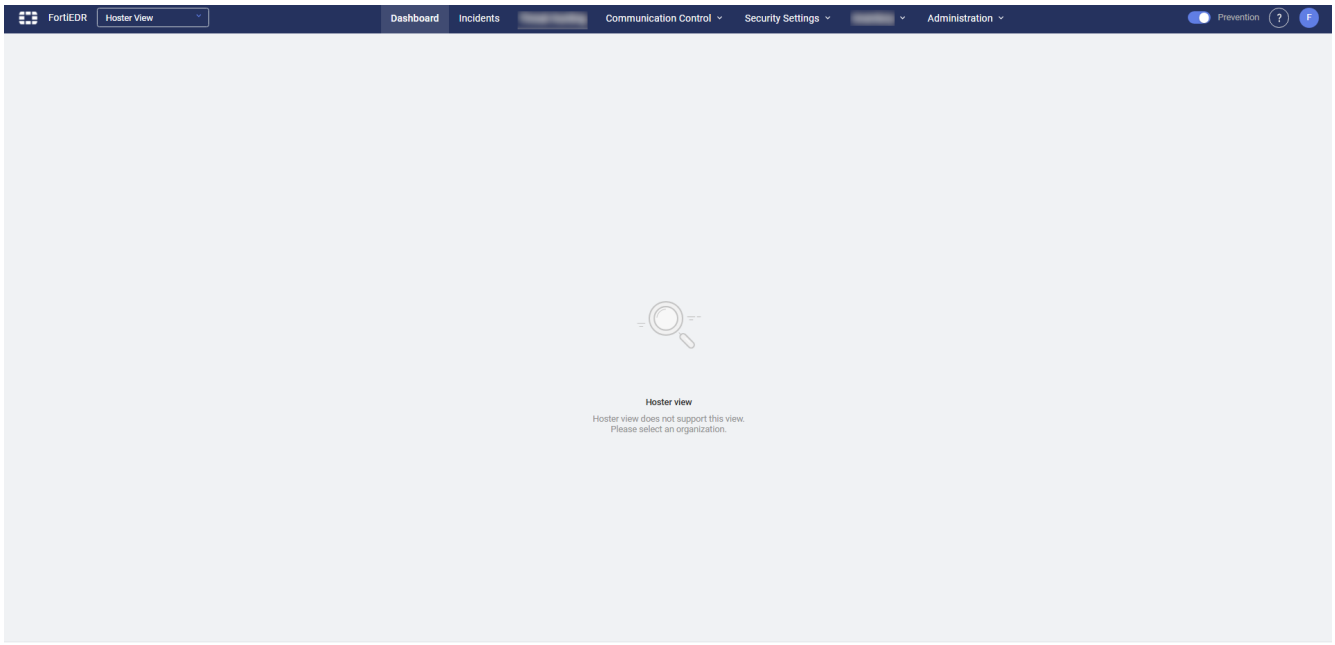
The *Session Time Out* section is specific to hoster view and can be used to configure the idle session timeout period, which is the duration (in minutes) before a session expires and users are prompted for credentials. The session timeout setting applies to all FortiEDR Console tabs except *Dashboard*. The default is 15 minutes. The acceptable value range is 1 - 1440.

The following sections are unavailable in the *Administration* > *Settings* page in Hoster view:

- Component Authentication on page 393
- File Scan on page 395
- End Users Notifications on page 396
- Personal Data Handling on page 401
- IoT Device Discovery on page 407
- Windows Security Center on page 409
- Application Control Manager on page 410
- FortiEDR Connect on page 410

Dashboard

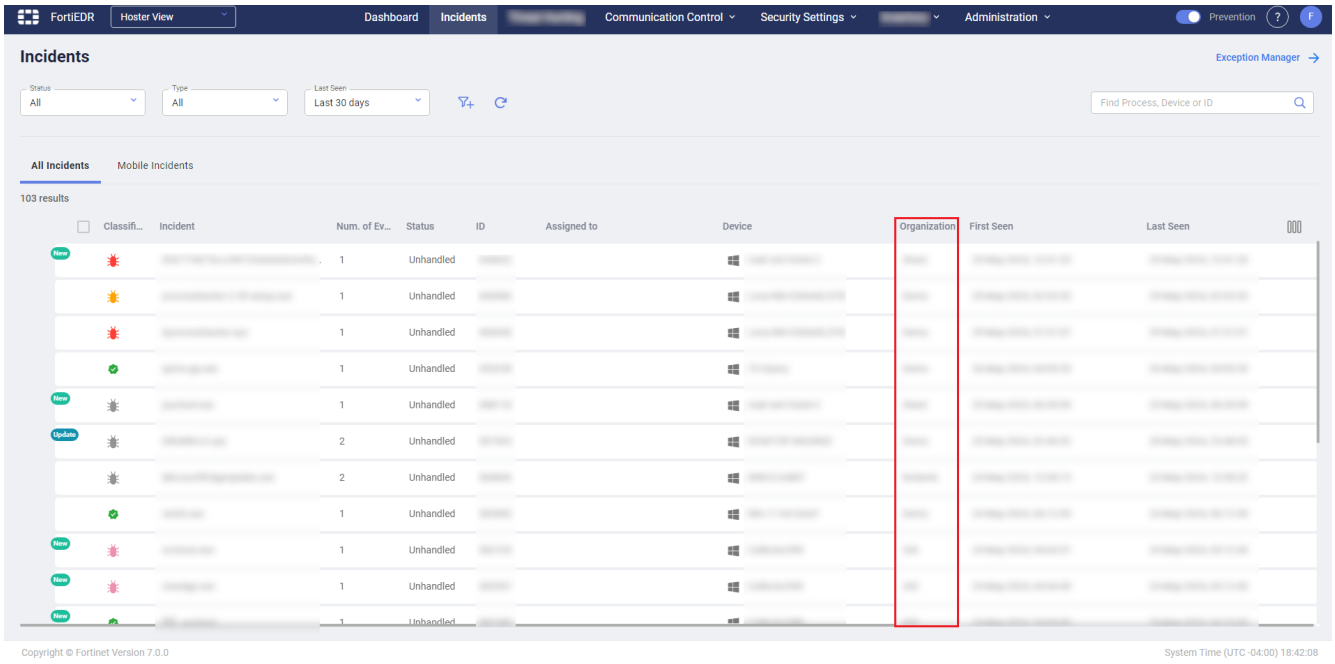
In Hoster view, some information does not display in the Dashboard. The information that does display is aggregated for all organizations, such as Collectors, System Components, Repositories and so on, as shown below.



To view Dashboard information for a specific organization, you must select the organization of interest in the *Organization* dropdown list at the top left corner.

Incidents

In Hoster view, the *Incidents* tab displays the security events from all organizations. The *Organization* column indicates the organization in which the security event occurred.



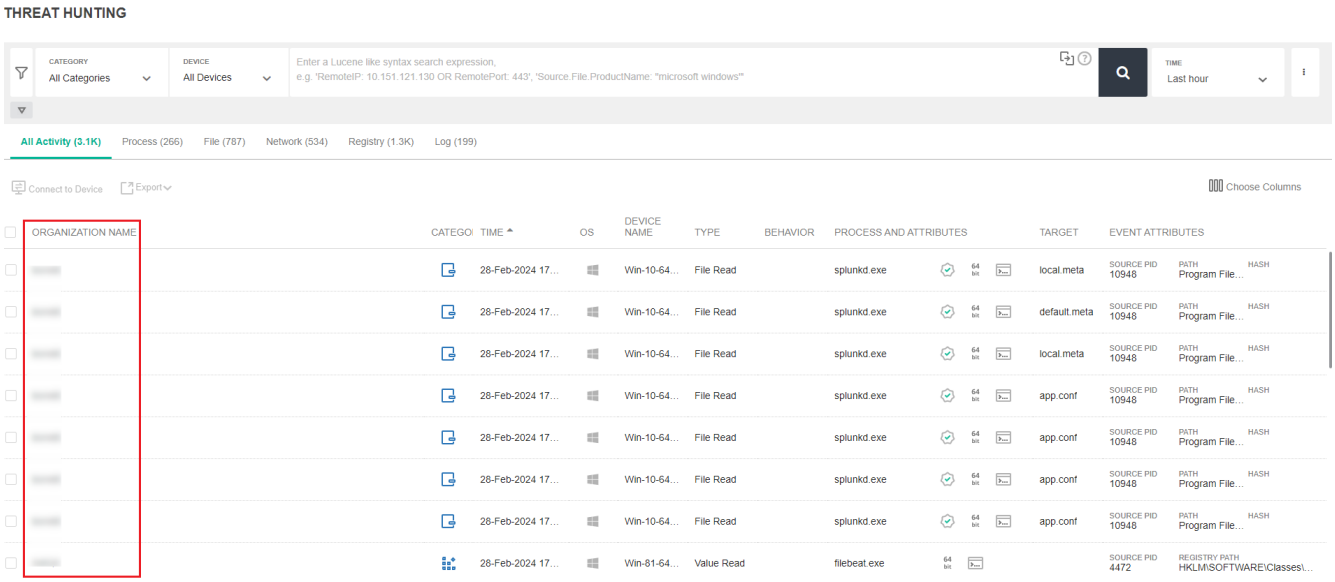
The same security event can occur in multiple organizations. In this case, it is displayed in separate rows per organization.

The various options in the toolbar can be applied on multiple organizations simultaneously. For example, you can handle security events from different organizations at once using the *Handle Incident* button and you can export security events from different organizations using the *Export* button.

You can also use the *Handle Incident* button to handle security events from multiple organizations.

Threat Hunting

In Hoster view, this window includes an *Organization* column.



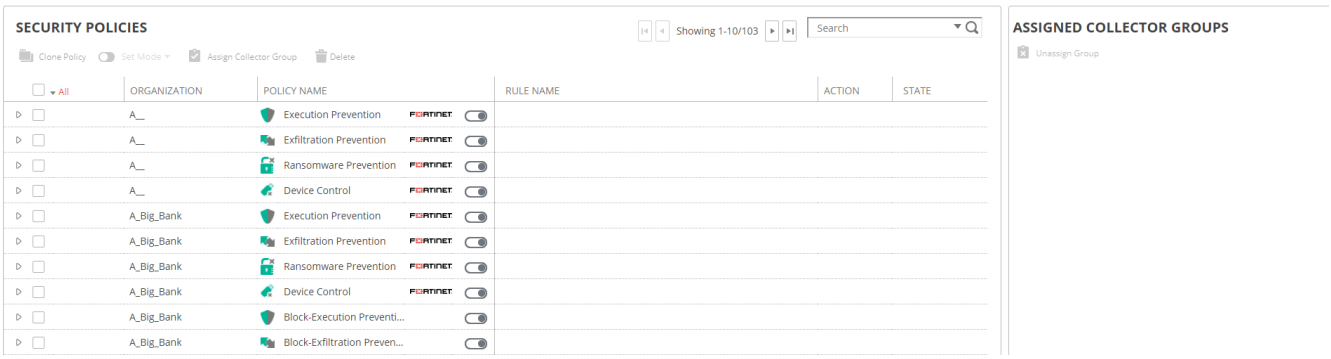
Communication Control

The *Communication Control* window is not available in Hoster view.

Security settings

SECURITY POLICIES page

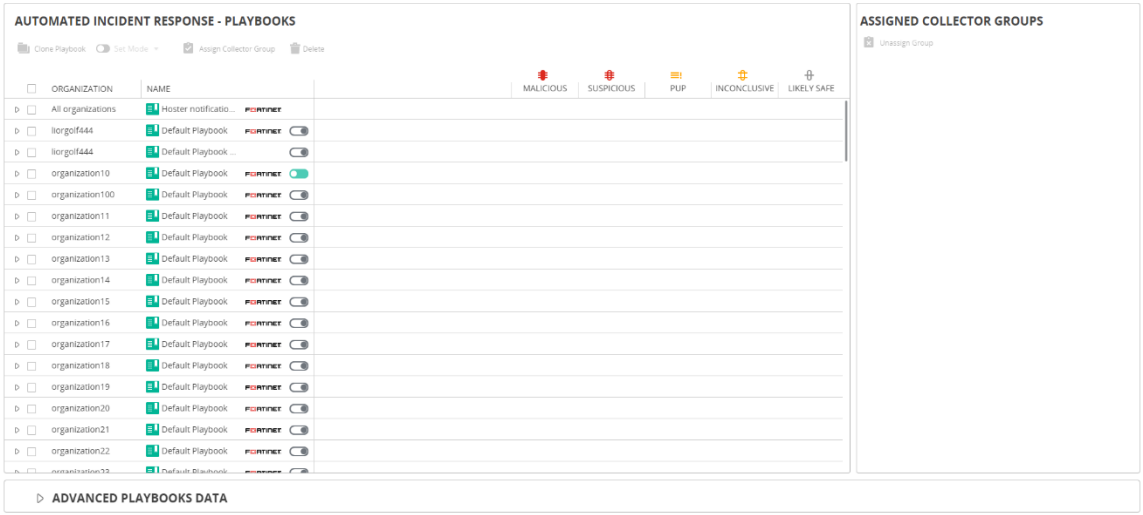
In Hoster view, the *SECURITY POLICIES* page displays all policies from all organizations.



FortiEDR's multi-organization feature enables you to clone a security policy from one organization to another. To do so, you must be in Hoster view. When not in Hoster view, you can only clone a policy within the same organization.

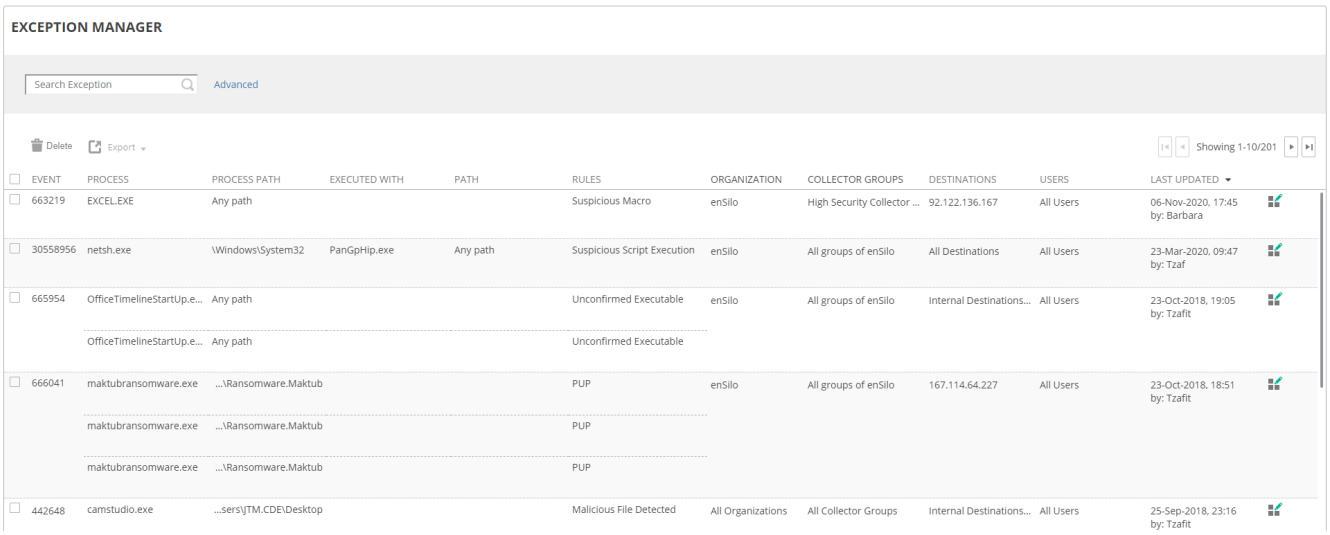
AUTOMATED INCIDENT RESPONSE - PLAYBOOKS page

In Hoster view, you can view all the notifications for the entire organization, based on the actions defined in the Hoster Notifications Playbook. This Playbook policy is only available in Hoster view.

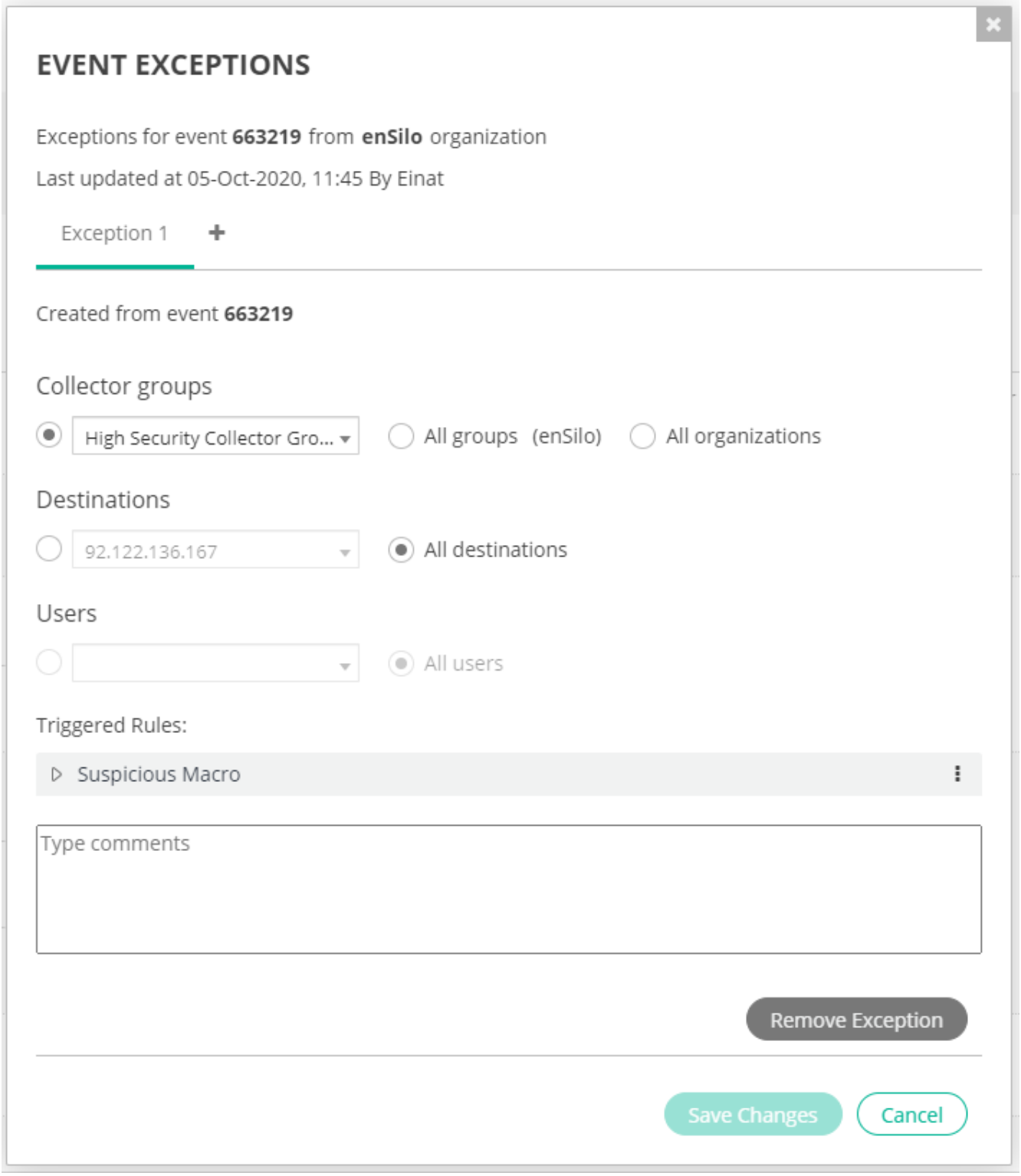


Exception Manager

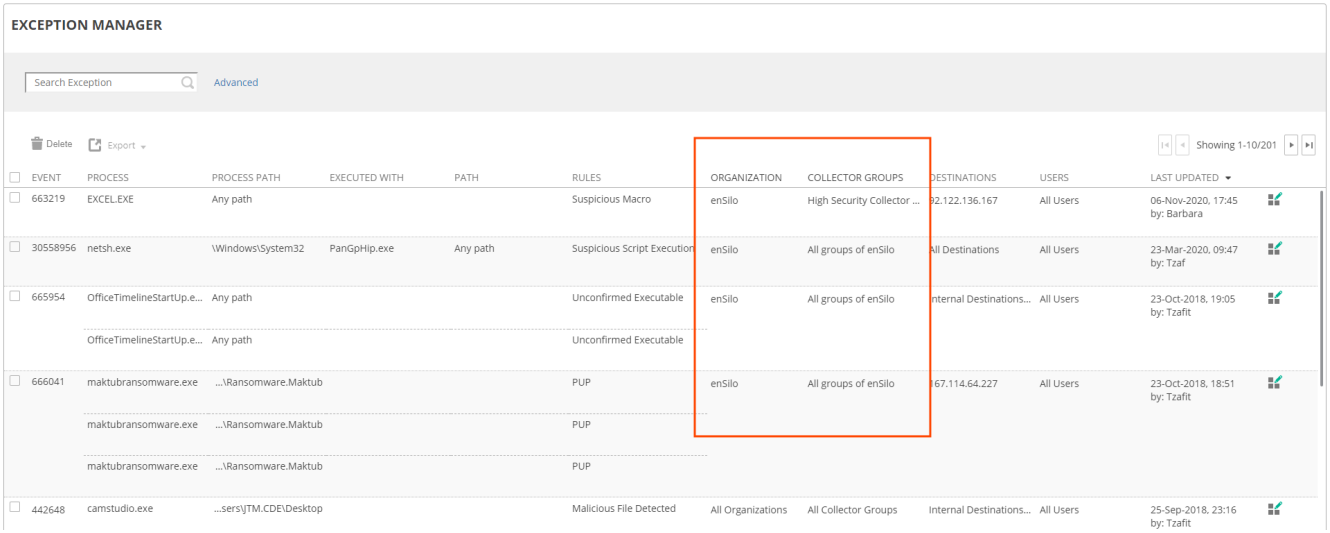
In Hoster view, the *Exception Manager* page displays all exceptions from all organizations.



When creating an exception in Hoster view, the organization in which the security event occurred is also shown in the *Exception Creation* window, as well as the event ID.



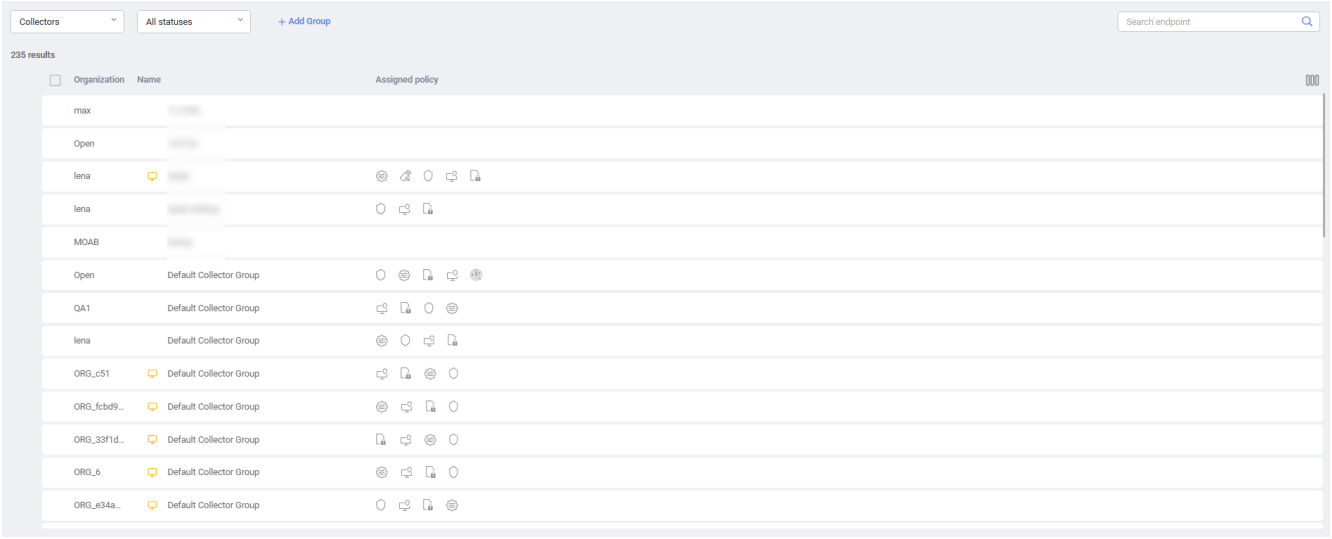
The *Exception Manager* page also shows the organization to which the exception applies. In addition, the *Collector Groups* column indicates the Collector Groups to which the exception applies.



Assets

Inventory page

In Hoster view, the *Assets* > *Inventory* page shows all the Collectors from all organizations.



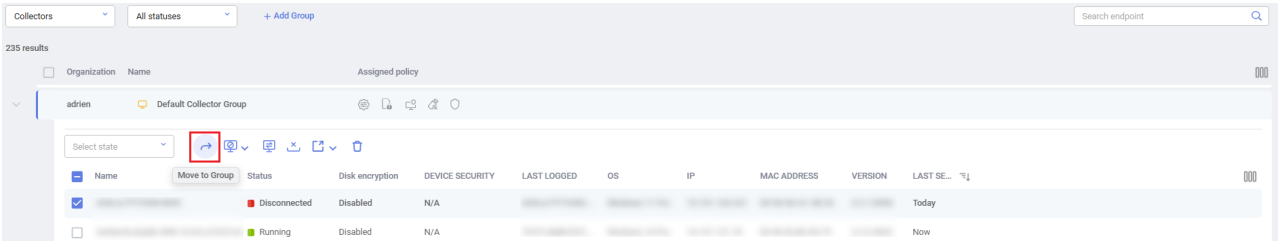
When in Hoster view, you can move Collectors between organizations using this window.

Only Collectors from 3.0 and above can be in the non-default organization. All older Collectors can only be installed in the default organization.

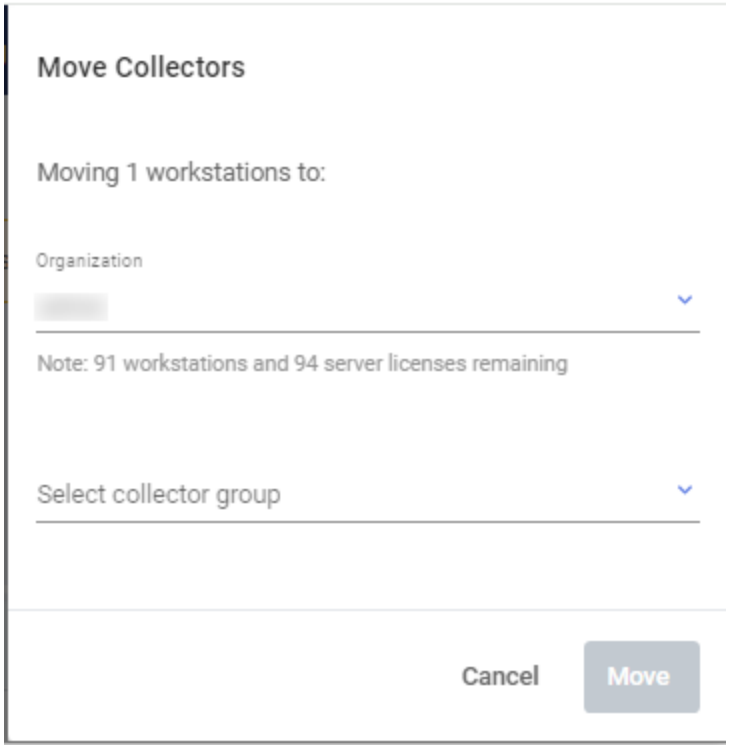
Only Collectors from 3.0 and above can be moved between organizations.

To move a Collector between organizations in Hoster view:

1. Check the checkbox of the Collector Group or check the checkbox(es) of one or more Collectors.



2. Click the *Move to group* button. The following window displays:



3. In the *Organization* field, select the organization to which to move the Collector(s).
4. Click *Move*.

Troubleshooting

This chapter describes how to troubleshoot various problems that you may encounter in the FortiEDR system.

For debugging and troubleshooting, Fortinet Support may request that you provide the logs for the FortiEDR devices deployed in your organization (Collectors, Cores, Aggregators). You may refer to Exporting logs on page 355 for details about how to do so.

If your system includes the Forensics add-on, you can use the Retrieve Memory function to retrieve memory related to a specific stack on a specific Collector. For more details, you may refer to Retrieving memory on page 100.

A FortiEDR Collector does not display in the INVENTORY tab

After a FortiEDR Collector is first launched, it registers with the FortiEDR Central Manager and is displayed in the *INVENTORY* tab. If it does not appear to have registered, then perform the following:

1. Check that the device on which the FortiEDR Collector is installed is powered on and has an Internet connection.
2. Validate that ports 8081 and 555 are available and that no other third-party product is blocking these ports.

No events on the FortiEDR Central Manager console

If no events are displayed in the FortiEDR Central manager console, then perform the following.

Validate that there is network connectivity between all the system components.

To do so, we recommend:

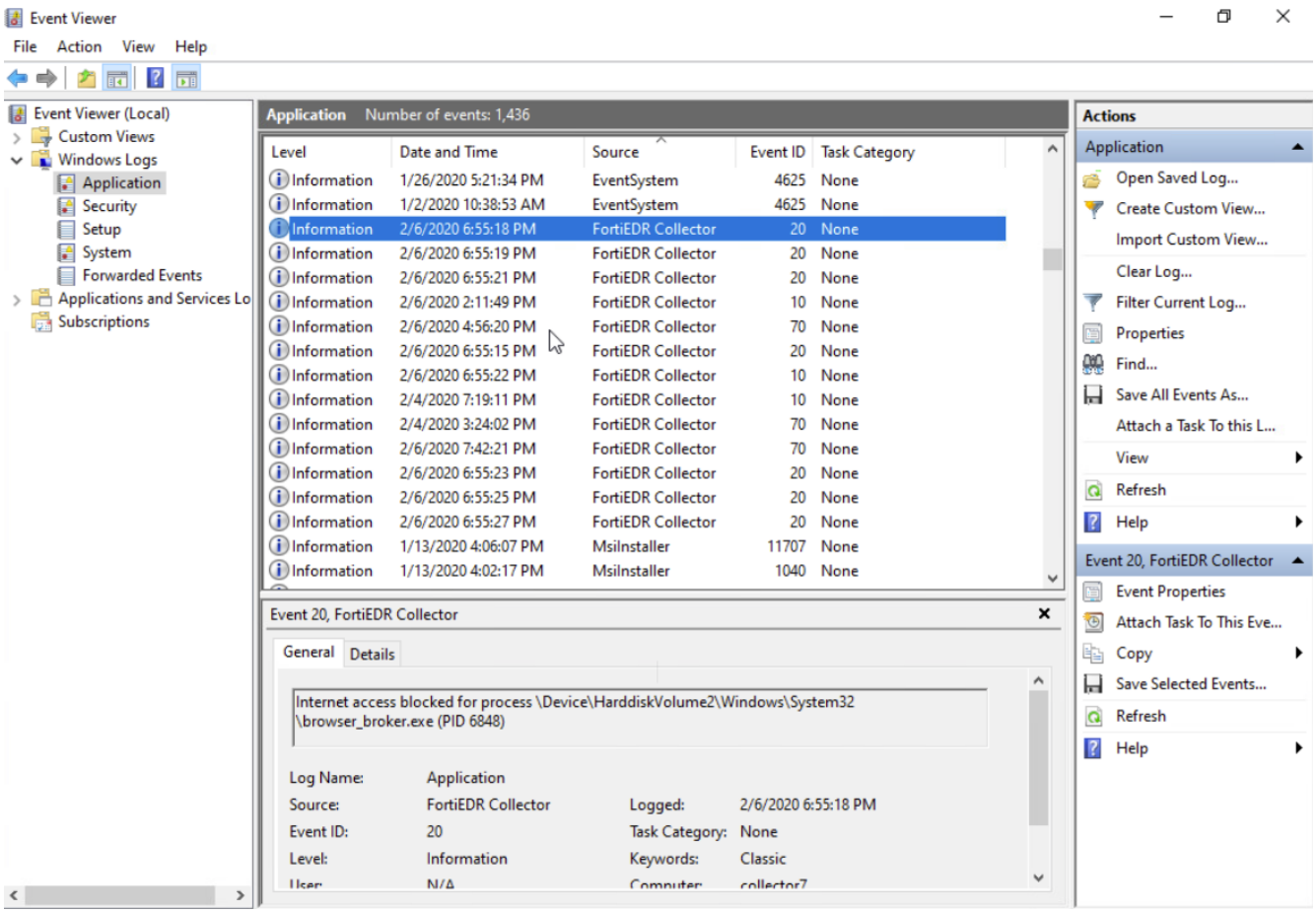
- Running Telnet on the FortiEDR Collector and connecting to the FortiEDR Core IP via port 555.
- Running Telnet on the FortiEDR Core and attempting to connect to the FortiEDR Aggregator IP on port 8081.

Make sure that Telnet is enabled on Windows.

User cannot communicate externally or files modification activity is blocked

Microsoft Windows-based devices

The Windows Event Viewer records whenever a FortiEDR Collector blocks communication from a device or file modification related to ransomware activity. This information is recorded in the Windows Event Viewer log located in the following location: *Event Viewer > Windows Logs > Application*.



macOS-based devices

The mconsole records whenever a FortiEDR Collector blocks communication from a device or file modification related to ransomware activity. This information is recorded in the macOS console log located in the following location: *Applications > Utilities > Console > All Messages*, as shown below:

```
Feb 26 20:06:50 Mac70 fortiEDRCollector[3654]: Fortinet Endpoint Detection and Response: Connection blocked for process /System/Library/PrivateFrameworks/
IMFoundation.framework/XPCServices/IMRemoteURLConnectionAgent.xpc/Contents/MacOS/IMRemoteURLConnectionAgent (pid:3813)
Feb 26 20:06:51 --- last message repeated 2 times ---
Feb 26 20:06:51 Mac70 fortiEDRCollector[3654]: Fortinet Endpoint Detection and Response: Connection blocked for process /System/Library/PrivateFrameworks/
IMFoundation.framework/XPCServices/IMRemoteURLConnectionAgent.xpc/Contents/MacOS/IMRemoteURLConnectionAgent (pid:3814)
```

Threat Hunting tab does not show expected activity events

If the Threat Hunting tab does not show expected activity events after installation, perform the following troubleshooting steps:

1. Check which Collectors group the triggering device belongs to.
2. Check the Threat Hunting Collection profile assigned to this group and make sure the profile includes the activity events you are searching for in the Threat Hunting tab.
3. If the profile includes the activity events but the Threat Hunting tab still does not show them, check the installation status of the Threat Hunting repository by running the `kubectl get pods -n edr2-onprem` command in the Threat Hunting repository console.
4. Verify the status is *Running* for all entries. See example below. Otherwise, reinstall the Threat Hunting repository.

```
master1 [~]# kubectl get pods -n edr2-onprem
NAME                                          READY   STATUS    RESTARTS   AGE
edr2-onprem-edr-streamer-c4d4dc9f4-25scq      1/1     Running   0          54m
edr2-onprem-edr-streamer-c4d4dc9f4-vmw2r      1/1     Running   4          56m
edr2-onprem-edr-streamer-sink-5d79bd87c4-2r56m   1/1     Running   0          54m
edr2-onprem-edr-streamer-sink-5d79bd87c4-66plb   1/1     Running   0          54m
edr2-onprem-entity-operator-56855b7b8d-qrm2m  3/3     Running   18         6d14h
edr2-onprem-kafka-0                           2/2     Running   9          6d14h
edr2-onprem-kafka-exporter-bc648bcb5-v6vt9    1/1     Running   12         6d14h
edr2-onprem-middleware-5df46877b6-wglx6       1/1     Running   0          57m
edr2-onprem-od-kibana-8567c97c88-m9glx        1/1     Running   3          6d14h
edr2-onprem-od-master-0                       1/1     Running   3          6d14h
edr2-onprem-od-opendistrowarm-data-0          1/1     Running   3          6d14h
edr2-onprem-zookeeper-0                       1/1     Running   5          6d14h
svclb-edr2-onprem-middleware-xtf5m            1/1     Running   3          6d14h
```

Collector is slow or hangs

If an endpoint is slow or hangs, check the Collector logs. It might be caused by collision with another AV product that FortiEDR is running in parallel with. You can fix the collision by excluding AV exceptions in both FortiEDR and the other AV product.

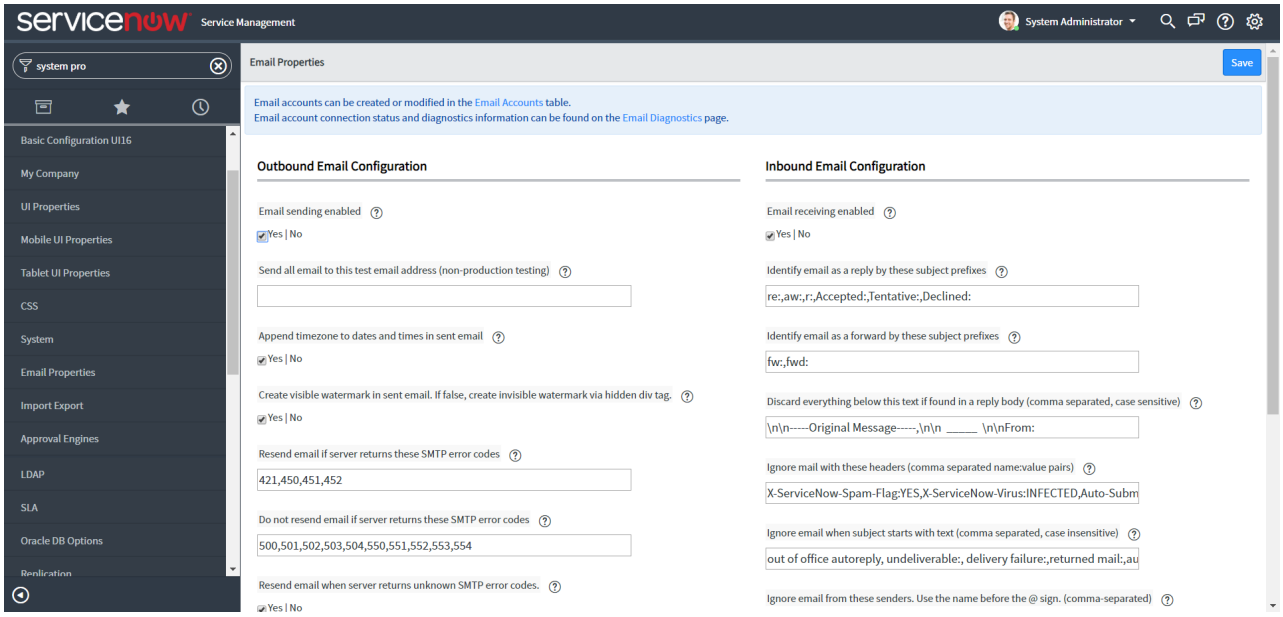
Appendix A – Setting up an email feed for open ticket

The Open Ticket feature enables you to send events to an event-management tool such as Jira or ServiceNow.

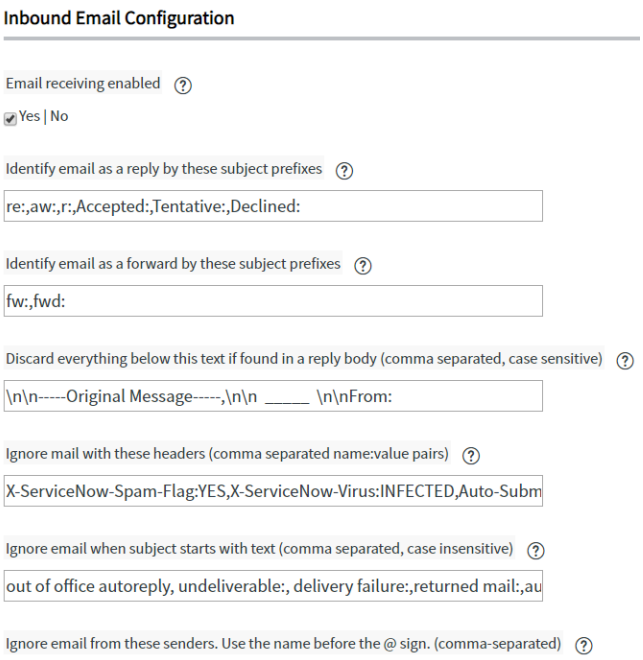
In order for the Open Ticket feature to work properly, you must set up a receiving email feed in the event-management tool to be used. This appendix provides an example that describes how to set up the required email feed in ServiceNow.

To set up an email feed in ServiceNow:

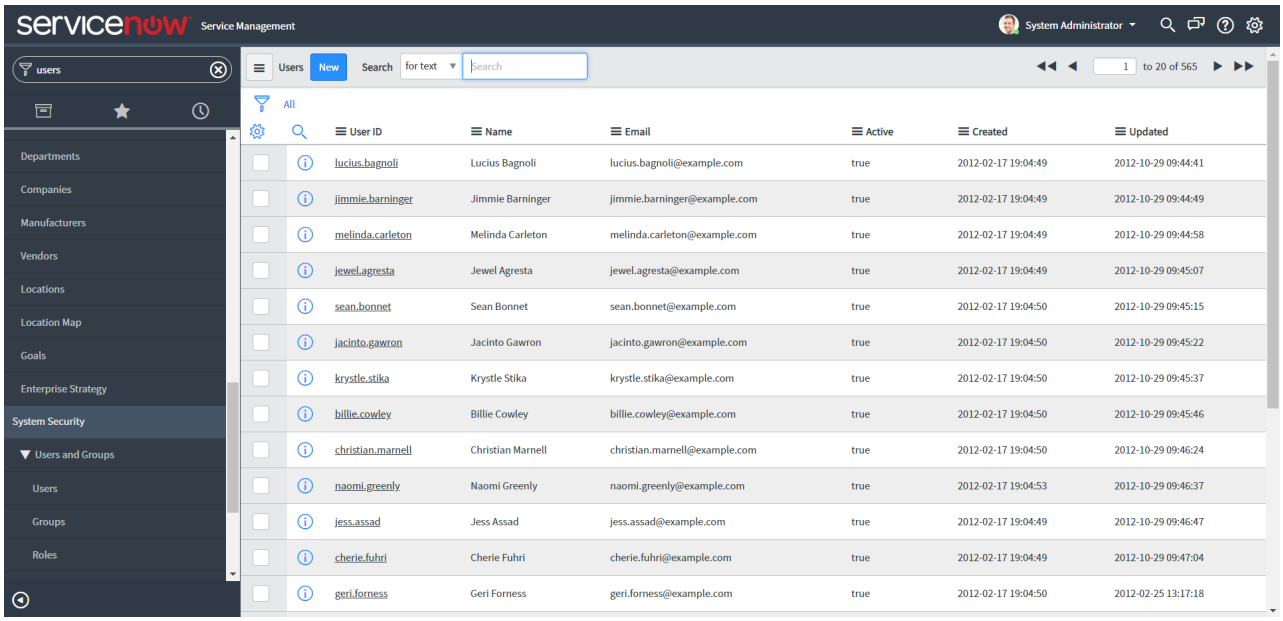
1. Launch ServiceNow.
2. In the window that opens, select *System Properties* > *Email Properties*. The following window displays:



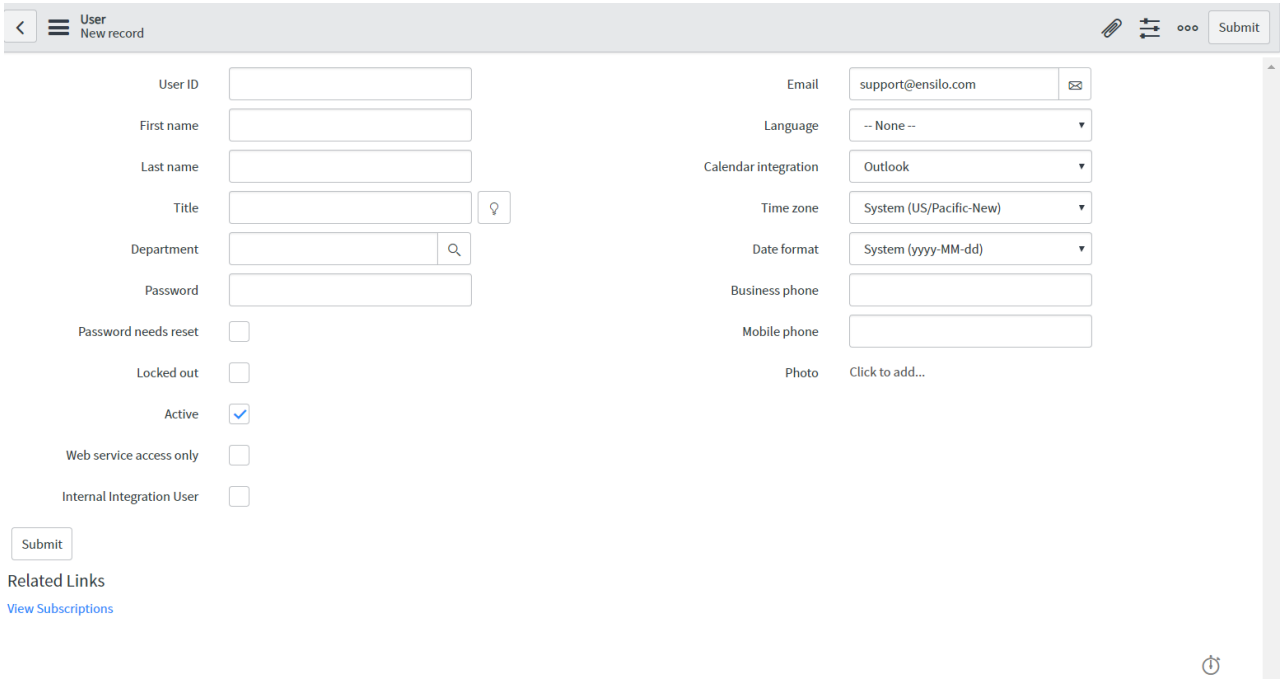
3. In the *Inbound Email Configuration* area, check the *Email receiving enabled* checkbox.



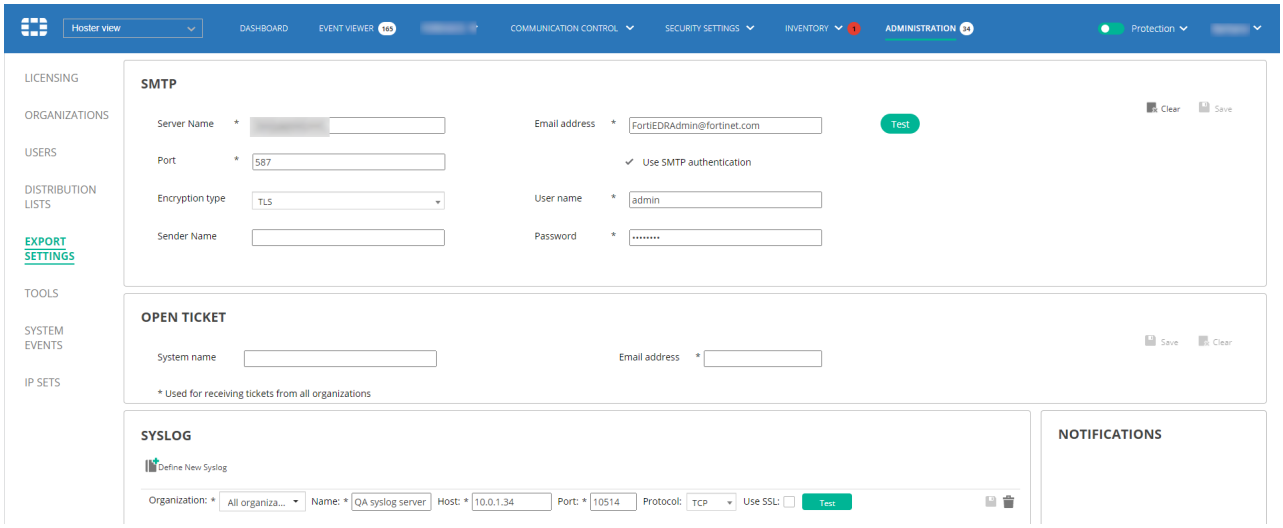
4. In the left pane, select *System Security > Users and Groups > Users*. The following window displays:



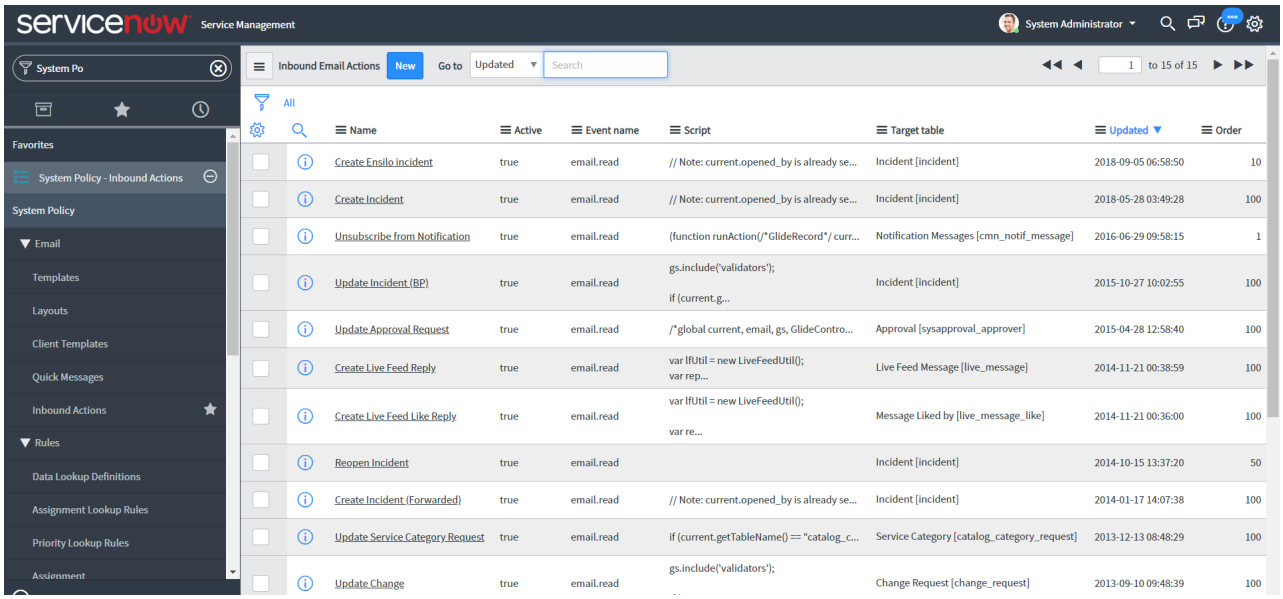
5. Click the *New* button to create a new user. The following window displays:



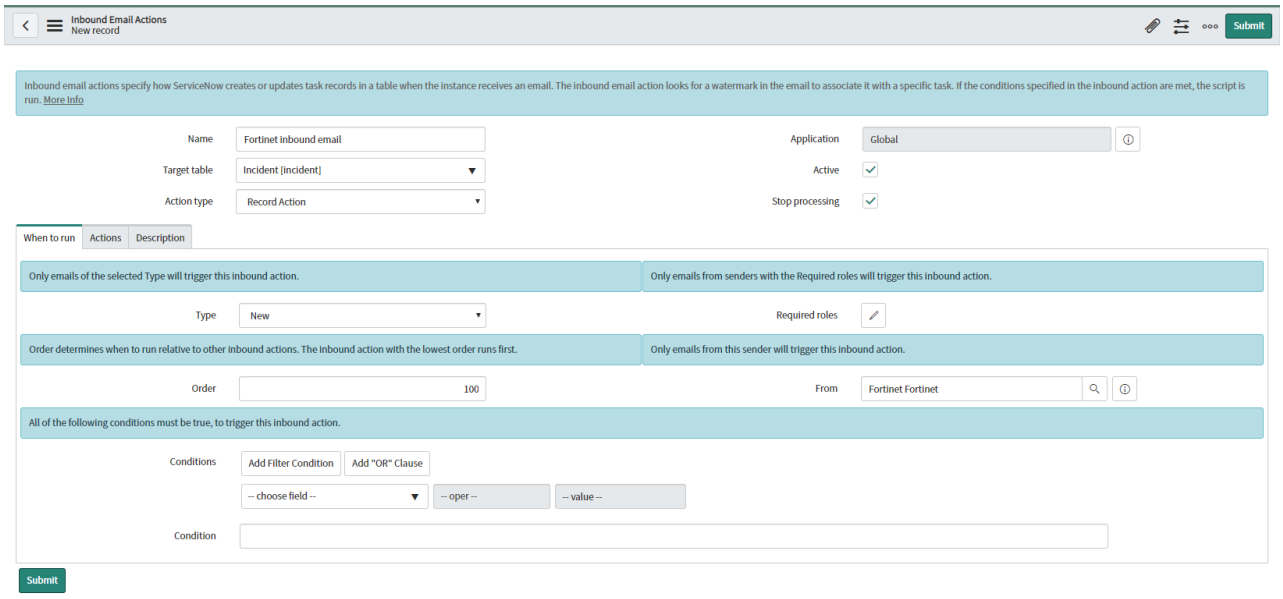
6. In the *Email* field, enter the email address of the FortiEDR messaging system. This email address is specified in the *Email Address* field of the FortiEDR Open Ticket settings, which can be accessed by selecting *Profiles* > *Export Settings* in the FortiEDR user interface, as shown below:



7. In the left pane, select *System Policy > Email > Inbound Actions*. The following window displays:



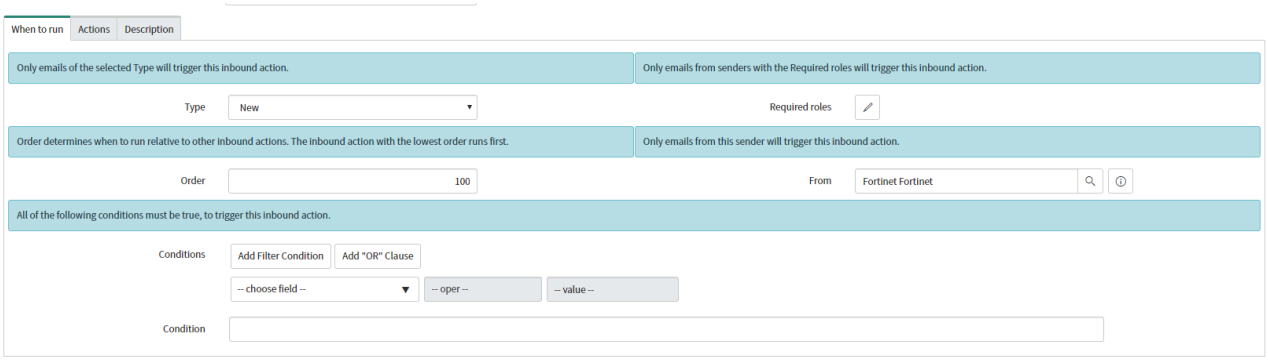
8. Click the *New* blue button to create new inbound email actions. The following window displays:



9. Fill in the following fields in this window:

Field	Definition
Name	Enter a free-text name for the inbound email feed. For example, `Fortinet inbound email`.
Target table	Select *Incident [incident]* in the dropdown list.
Action type	Select *Record Action* in the dropdown list.
Active	Check this checkbox to select it.
Stop Processing	Check this checkbox to select it.

10. In this window, select the *When to run* tab and then in the *From* field, select the FortiEDR user created in step 6.



11. Select the *Actions* tab and then paste the provided JavaScript (see below) into the email body. You can modify this script, as needed.

```
//  Note: current.opened_by is already set to the first UserID that matches the From: email address

current.caller_id = gs.getUserID();

current.comments = “received from: “ + email.origemail + “\n\n” + email.body_text;

current.short_description = email.subject;

current.category = “request”;

current.incident_state = 1;

current.notify = 2;

current.contact_type = “email”;


//set highest priority for emails from FortiEDR notification

if (email.origemail == "doNotReply@fortinet.com") {

    current.impact=1;


    current.urgency=1;

}


if (email.body.assign != undefined)

    current.assigned_to = email.body.assign;
```

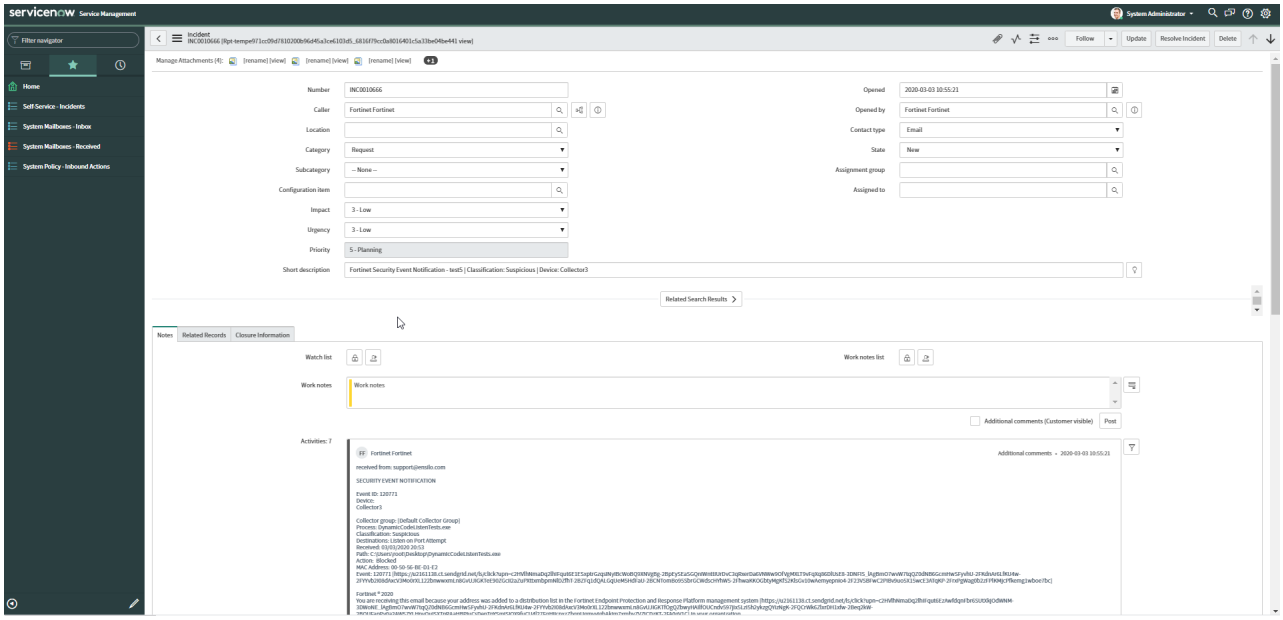
```
if (email.importance != undefined) {
    if (email.importance.toLowerCase() == "high")
        current.priority = 1;
}

if (email.body.priority != undefined)
    current.priority = email.body.priority;
//parsing fields from message body example
var severityStart = email.body_text.indexOf('Severity:') + 9;
var classificationStart = email.body_text.indexOf('Classification:') + 15;
var destinitionStart = email.body_text.indexOf('Destinations:');

var severity = email.body_text.slice(severityStart, classificationStart -15 );
var classification = email.body_text.slice(classificationStart, destinitionStart);
 current.insert();
```

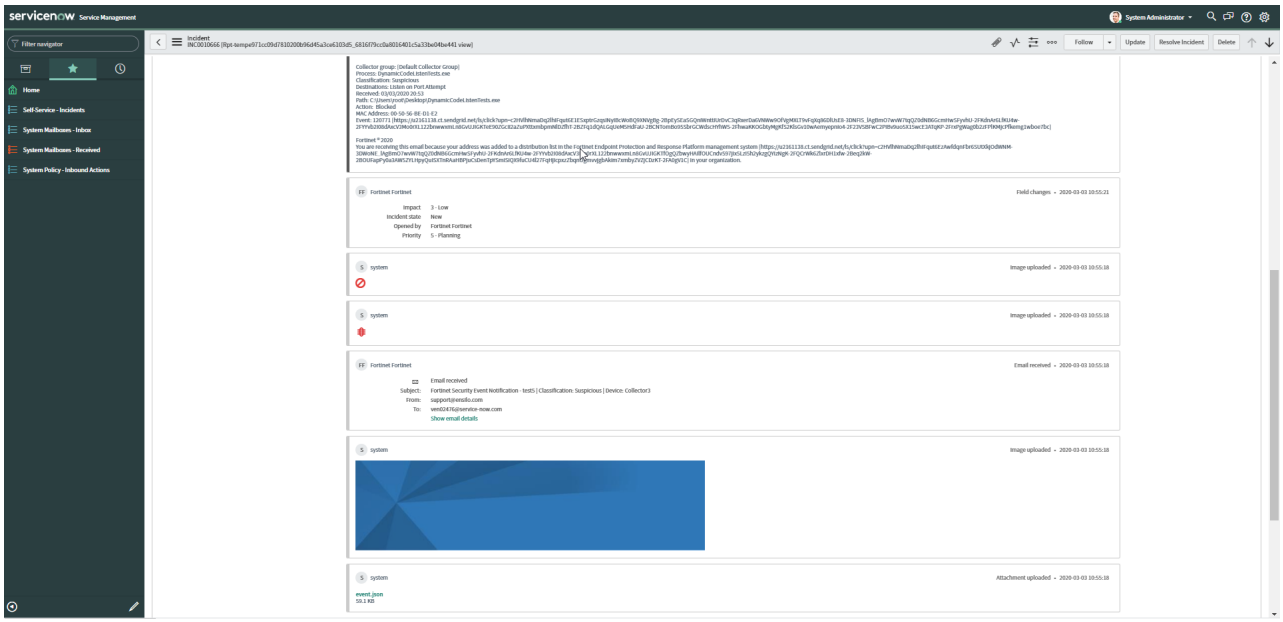
12. When pasting in the JavaScript, make sure that:
    - The emails address on line 11(see above) is the same as that specified in Email Address field of the FortiEDR Open Ticket settings (see step 6).
    - You set the *current.impact* and *current.urgency* fields on lines 12 and 14 to specify the impact and urgency values for ServiceNow.
      Various types of information can be extracted from the email sent by FortiEDR. For example, the text on line 33 in the JavaScript (see above) is an example of how to extract the classification value of this event from the email.
13. Click the *Submit* button in the ServiceNow window. This completes the email feed setup.
    When FortiEDR sends an email to ServiceNow, a JSON file is attached to it. This JSON file contains the raw data for the event. Once received, you should save this raw data to the ticket.
    The following shows a sample JSON file:

```
//parsing fields from attachment example
if (sys_email.hasAttachments()){
    var att = new GlideRecord("sys_attachment");
    att.addEncodedQuery("table_name=sys_email^table_sys_id=" + sys_email.getValue("sys_
id"));
```

```
    att.query();
    while (att.next()){
        if (att.file_name == "event.json" ) {
            var sa = new GlideSysAttachment();

            var binData = sa.getBytes(att);
            var strData = Packages.java.lang.String(binData);
            var parser = new JSONParser();
            var parsed = parser.parse(strData);
            current.comments =("EventId from JSON: " + parsed.EventId);
            }
    }
}
```

The following shows how an event appears when received in ServiceNow, after being sent from FortiEDR:




servicenow Service Management
System Administrator
Filter navigator
Home
Self-Service - Incidents
System Mailboxes - Inbox
System Mailboxes - Received
System Policy - Inbound Actions
Follow
Update
Resolve Incident
Delete
Fortinet Fortinet
Impact 3 - Low
Incident state New
Opened by Fortinet Fortinet
Priority 5 - Planning
system
Email received
Subject: Fortinet Security Event Notification - test5 | Classification: Suspicious | Device: Collector3
From: support@ensilo.com
To: ven02476@service-now.com
Show email details
event_json

Appendix B - Lucene syntax

The FortiEDR Threat Hunting free-text query is based on Lucene syntax. This syntax consists of terms and operators, as described below. For more details about the use of this query, see Threat Hunting on page 131.

You can convert JSON and XML syntax queries into Lucene syntax using the built-in *Convert Query* button in the *Free-text Query* filter.

Terms

A *free-text term* is a single word (for example NetworkService or CryptSvc) or a phrase surrounded by double quotes (for example, "NetworkService -p -s CryptSvc") that searches for all the words in a phrase (in the same order) regardless of the field in which the words appear.

A *Field: Value* term is a combination of a field and a value.

A list of available fields is provided in the query box, which is an automatically-complete dropdown list.

Examples

Where the Source command line contains the value NetworkService:

```
Source.CommandLine: NetworkService
```

Where the value of the remote IP is 10.151.121.130:

```
RemoteIP: 10.151.121.130
```

Operators

Operators enable you to customize the search and/or to create more complex queries.

Operators are case insensitive.

Operators	Definition
OR , ||	The query should match either one of the terms/values.
AND, &&	The query should match both of the terms/values.

Operators	Definition
NOT, !	The query should not match the term/value.
exists	The query should match when the field value is not null.
+ –	The term following this operator must be present.
•	The term following this operator must not be present.

Example

Where the Event includes either the RemoteIP field that contains 10.151.121.130 or the Remote Port field that contains 443

```
RemoteIP: 10.151.121.130 OR RemotePort: 443
```

Where the ProductName field contains both Microsoft and Windows

```
Source.Process.File.ProductName: (microsoft AND windows){}
```

Where the ProductName field contains Microsoft and does not include Windows

```
Source.File.ProductName: (microsoft -windows)
```

Where the Product Name field contains the exact phrase “Microsoft Windows”

```
Source.Process.File.ProductName: microsoft\ windows
```

Where the field Behavior has any non-null value

```
_exists_: Behavior
```

Where the field PID does not include the value 5292

```
Source.PID: (NOT 5292)
```

Where the Event does not include the value 5292 in any of the Event fields

```
NOT 5292
```

Wildcards

Wildcard searches can be run on individual terms using a **?** (question mark) to replace a single character, and an ***** (asterisk) to replace zero or more characters. For example: `Progr?m Fil*`.

If the value contains a space, escape it with a backslash. For example:

- `Source.Process.File.Path: Program\ Files*`
- `Source.Process.CompanyName: Microsoft\ Corporation`

Do not enclose wildcard search values with double quotes.

Wildcard queries may consume huge amounts of memory and perform poorly.

Ranges

Ranges can be specified for date, numeric or string fields. The inclusive ranges are specified with square brackets

[min TO max] and exclusive ranges with curly brackets {min TO max}.

Numbers 1..5

```
count:[1 TO 5]
```

Numbers from 10 upwards

```
count:[10 TO *]
```

Dates before 2012

```
date:{* TO 2012-01-01}
```

Ranges of IPs

```
RemoteIP: "140.100.100.0/24"
```

Reserved characters

Should you need to use any of the characters that function as operators in the query itself (and not as operators), then you should escape them with a leading backslash (\). For instance, to search for *c:\Windows*, write the query as *c\:\\Windows*.

Reserved characters are +,-, =, &&, ||, >, <, !, ( ), { }, [ ], ^, ", ~, *, ?, :, \ and /.

Appendix C – ON PREMISE DEPLOYMENTS

This chapter describes how to set up the FortiEDR backend components for on-premise deployments. Before you start, make sure that on-premise deployment is the most suitable option for you.

System requirements

The following tables lists the system requirements of each backend component. Make sure that all devices, workstations, virtual machines and servers on which a FortiEDR backend component will be installed comply with those requirements.

Component	Central Manager	Aggregator[1]	Threat Hunting Repository	Core[2]	Reputation Server
Processor	Intel or AMD x86 (64-bit)				
Number of CPUs	4	4	Varies by number of seats and period of required Threat Hunting data retention. Refer to the Threat Hunting Repository CPU, Physical Memory, and Disk Space Requirements on page 476 section for requirements for one month of data retention for the extensive profile.	• 4 for Core • 2 for Core running as a Jumpbox The following CPUs are unsupported: • E5-2440 • E5-2650 • E5-2660 • E5-2690 • E5-2699	4
Physical Memory	16 GB	16 GB		• 16 GB for Core • 8 GB for Core running as a Jumpbox	16 GB
Disk Space	150 GB, SSD	80 GB		• 250 GB SSD for Core • 50 GB (non-SSD) for Core running as a Jumpbox	120 GB

Component	Central Manager	Aggregator[1]	Threat Hunting Repository	Core[2]	Reputation Server
				For a Threat Hunting license, each 1000 additional Collectors above the first 1000 require an additional 45 GB of disk space.	
ISO Image OS	Ubuntu 22.04		ESXi 7.0	Ubuntu 22.04	

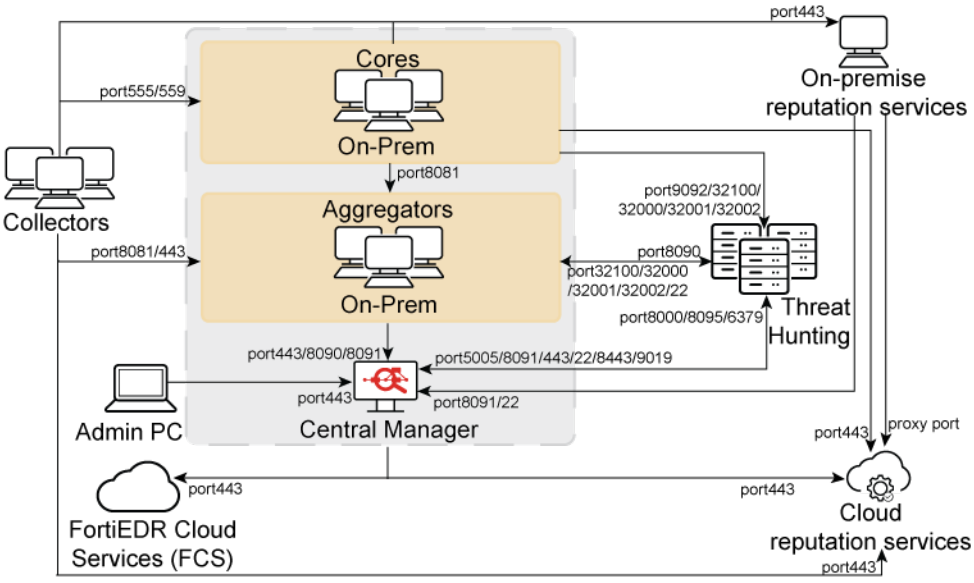
[1]If organizations will be defined and the number of Collectors exceeds 10000, set up an additional FortiEDR Aggregator VM on the top of the initial one.

[2]Refer to the following guidelines to determine the number of Cores you need to set up:

- Set up a separate Core for each Aggregator.
- For every additional 5000 Collectors, set up at least one additional Core. The number of additional Cores required depends on the amount of Threat Hunting events data, which relates to the Data Collection profile, number of servers, etc.
- You can set up a maximum of 50 Cores.

Network ports

Refer to the following image or table for the port information for communication between different components. Ensure that these ports or destination servers are not blocked by your firewall product (if one is deployed) and can be accessed by the corresponding component. You must also ensure that network ranges `10.42.x.x` and `10.43.x.x` are not used by any device.



Source	Destination	Port	Purpose
Collector	Aggregator	8081	Sending events, status, etc
		443	Sending events, status, etc, only when a custom port is used
	Core	555	Collector to Core communication without SSL
		(Core 5.2.2 or later) 559	Collector to Core communication with SSL enabled
	(Windows Collector 5.2.5.0052 or later) Reputation services (on-premise and/or cloud)	443	Sending requests for reputation data. When both on-premise and cloud reputation services are configured, FortiEDR Collectors prioritize the on-premise reputation server over the cloud. The cloud reputation services will be contacted only when the on-premise reputation server is unreachable.
Core	Aggregator	8081	Core registration
	Threat Hunting Repository	9092	Kafka topic
		32100, 32000, 32001, 32002	Kafka broker
	Reputation services (on-premise and/or cloud)	443	Sending requests for reputation data.
Aggregator	Central Manager and Threat Hunting Repository	8090	AV Signature updates
	Central Manager	8091	Aggregator communication
		443	Aggregator registration

Source	Destination	Port	Purpose
Central Manager	Threat Hunting Repository	8000	"FortiEDR Connect" related
		8095	Threat Hunting queries
		6379	Redis MS
	Syslog	**(Optional)** 6514	Syslog messages from Central Manager IP to syslog server via UDP/TCP/TCP SSL
	SMTP	**(Optional)** 587	SSLv3/TLS protocol to email server
	`rbq.cldsrv.ensilo.com`	5672	To RabbitMQ
	`cldsrv.ensilo.com`	443	Data sent to FCS (rest over RabbitMQ)

	`storage.googleapis.com`
	`oauth.googleapis.com`
	`oauth2.googleapis.com`
			Localization, scheduled queries, etc

	`fortiav.cloud.ensilo.com`		AV signatures updates
	Reputation service (cloud)	443	If proxy is not enabled, on-premise reputation service requests missing hashes from the cloud reputation service via the manager nginx.
Threat Hunting Repository	Central Manager	8091	Aggregator communication
		5005	"FortiEDR Connect" dedicated tunnel
		443	GUI access
		22	Communication with Central Manager during Threat Hunting Repository installation
		8443	Authentication service
		9019	Sink service
	Aggregator	22	Communication with Aggregator during Threat Hunting Repository installation
		32100, 32000, 32001, 32002	Secure browser connections to Kafka broker from Aggregator
Admin PC	Central Manager	443	FortiEDR console access

Source	Destination	Port	Purpose
Reputation services (on-premise)	Central Manager	8091	If proxy is not enabled, on-premise reputation service requests missing hashes from the cloud reputation service via the manager nginx.
		22	SSH application access
	Reputation service (cloud)	Proxy port	If proxy is enabled, on-premise reputation service requests missing hashes from the cloud reputation service via proxy.
Machines connecting to Grafana or Kibana	Threat Hunting Repository	3000	Grafana - monitoring
		5601	Kibana - logging
Machines accessing the Threat Hunting server via SSH	Central Manager	22	SSH access
	Aggregator		
	Threat Hunting Repository		

As a security best practice, it is recommended to update the firewall rules so that they only have a narrow opening. For example:

- Only open the TCP outbound port 555 to the Core IP address.
- Only open the TCP outbound port 8091 to the Central Manager IP address to be accessed by the Aggregator when the Aggregator is installed on premise while the Central Manager is in the cloud.

Threat Hunting Repository CPU, Physical Memory, and Disk Space Requirements

Number of Seats	Number of VMs (Nodes)	Number of CPUs per VM (Node)	Memory per VM (Node)	OS Disk per VM (Node)	Data Disk per VM (Node)
2000 or fewer	1	17	40 GB	100 GB, non-SSD	1500 GB SSD

Number of Seats	Number of VMs (Nodes)	Number of CPUs per VM (Node)	Memory per VM (Node)	OS Disk per VM (Node)	Data Disk per VM (Node)
4000		27	40 GB		2310 GB SSD
6000		37	41 GB		3410 GB SSD
8000		47	48 GB		4510 GB SSD
10000		57	55 GB	For Hyper-V VMs, the disk should be IDE with at least 30% of the physical disk space remaining free at all times. Do not use a Hyper-V checkpoint which consumes the entire disk size every few hours.	5610 GB SSD
12000		67	62 GB		6710 GB SSD
14000		77	69 GB		7810 GB SSD
15000	3	30	27 GB		3249 GB SSD
20000		40	35 GB		4318 GB SSD
25000		49	42 GB		5387 GB SSD
30000		58	47 GB		6456 GB SSD
For the Threat Hunting Repository specifications required for supporting more than 30000 Collectors, please contact Fortinet Support.					

Setting up FortiEDR components on-premise

Set up the system components top-down in the following order:

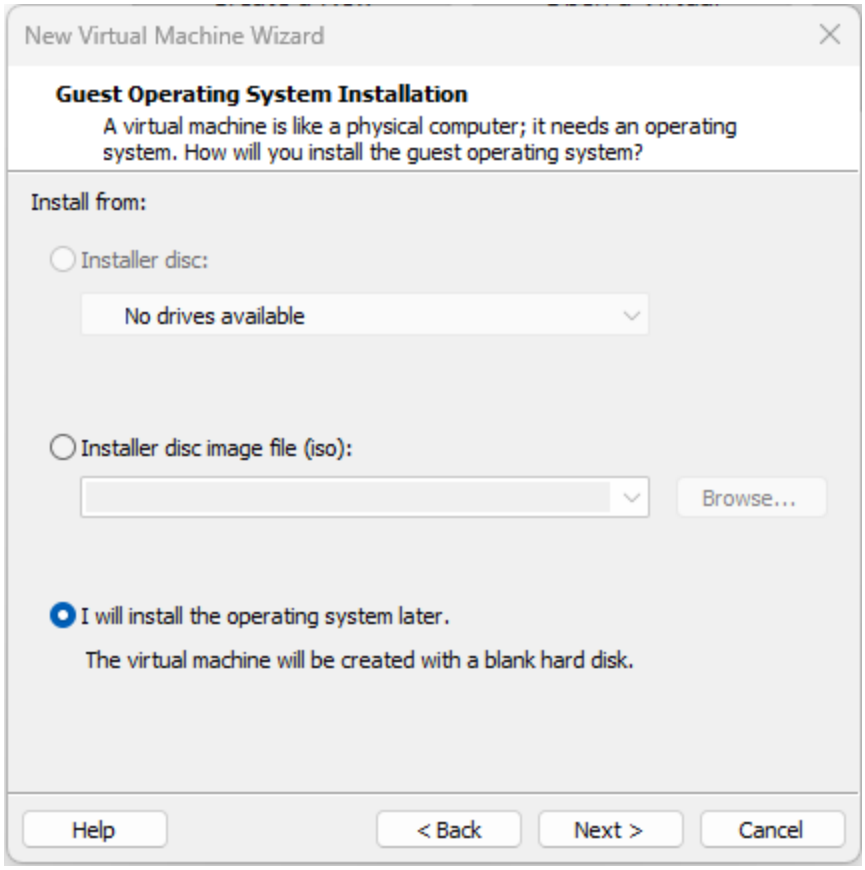
1. Setting up a VM to be the FortiEDR Central Manager on page 478
2. Setting up a VM to be the FortiEDR Aggregator on page 494
3. Setting up the FortiEDR Threat Hunting Repository on page 503
4. Setting up the FortiEDR reputation server on page 521
5. Setting up the FortiEDR Core on page 524
6. Installing FortiEDR Collectors on page 23

Setting up a VM to be the FortiEDR Central Manager

To set up a VM to be the FortiEDR Central Manager:

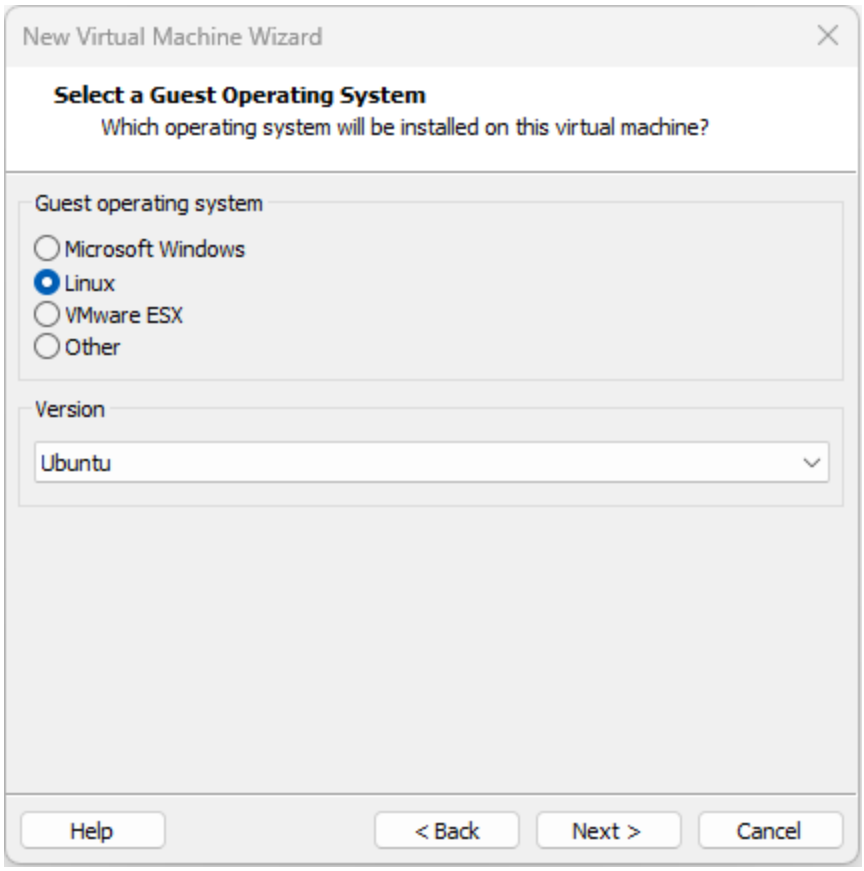
1. Create a new virtual server by selecting *File > New Virtual Machine*.
2. Select *Typical* option and select *Next*.

3. Select the *I will install the operating system later* option and click *Next*.

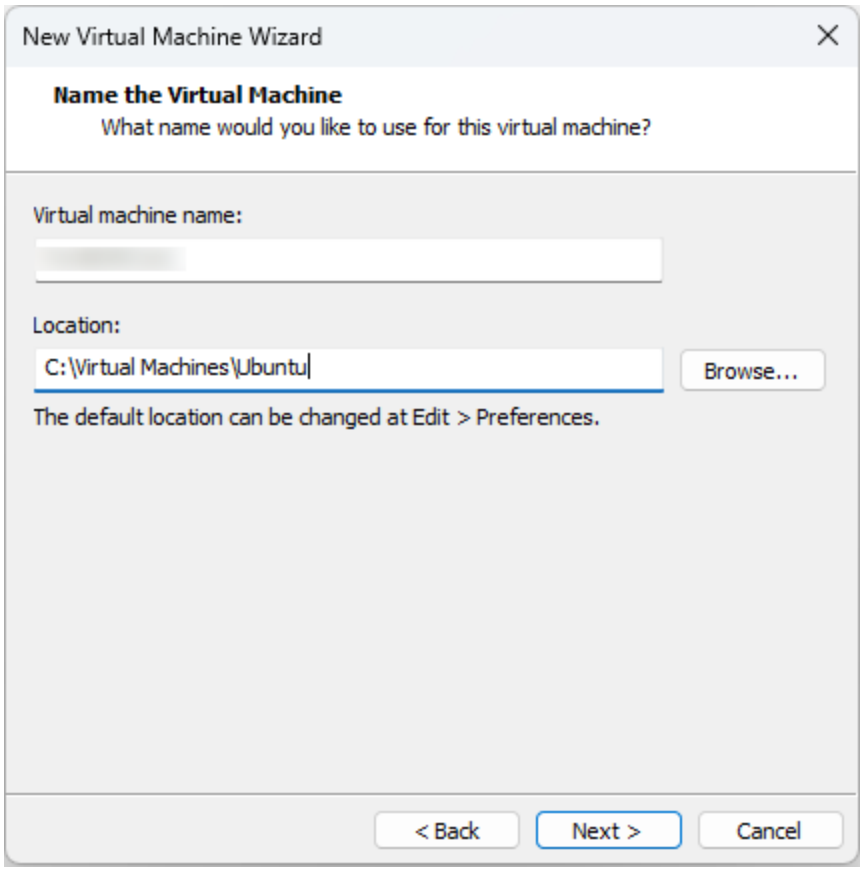


4. Select the *Linux* radio button. In the *Version* field, select *Ubuntu* and click *Next*.

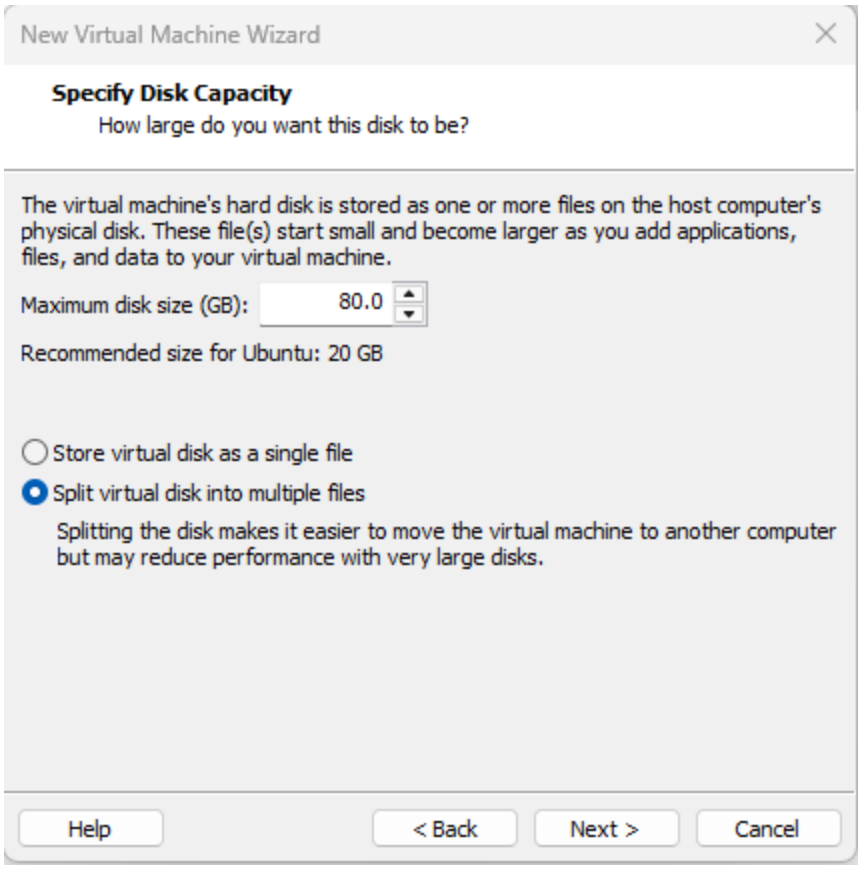
In some VMware environments where the *Linux* radio button is unavailable, select a generic Linux type, such as *General Linux* or *Other Linux (for vSphere/ESXi)*. Do not select a specific Linux distribution.



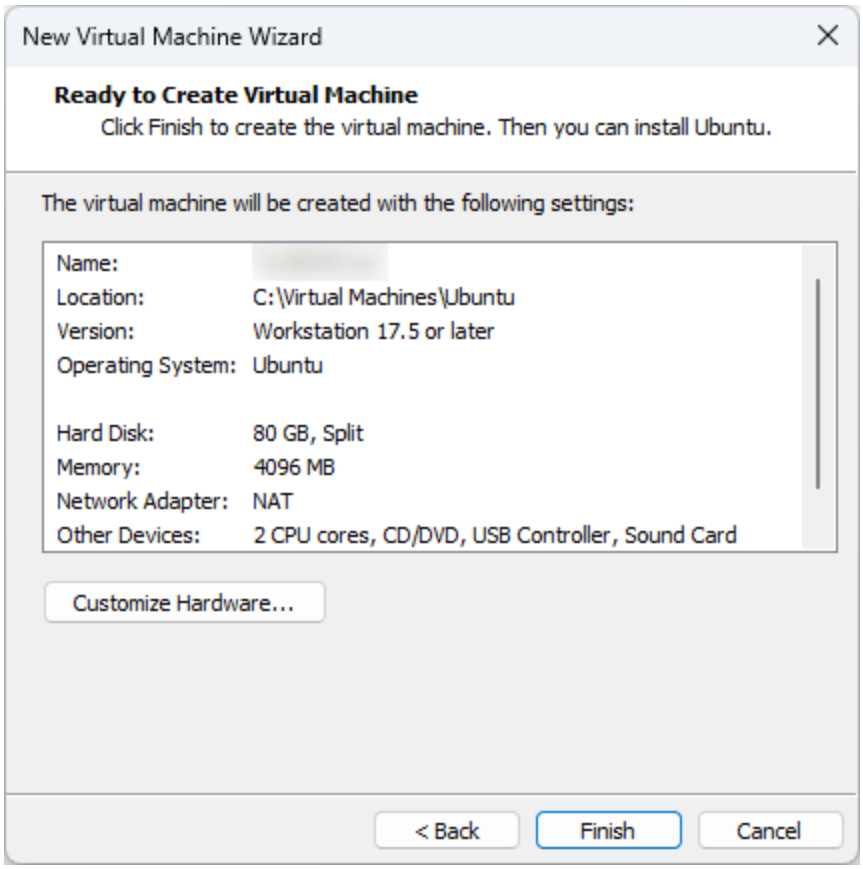
5. Specify a name for the virtual machine and the location in which to store the provided ISO file and click *Next*.



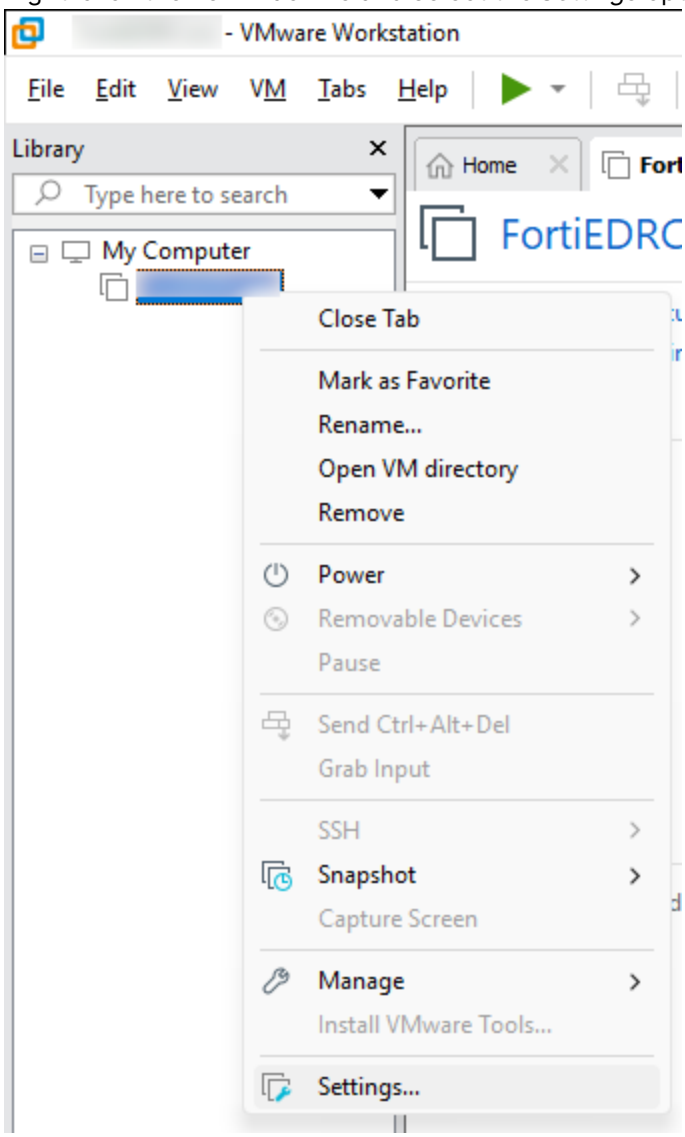
6. Change the *Maximum disk size* according to system requirements listed in Appendix C – ON PREMISE DEPLOYMENTS on page 472, leave the default option as *Split virtual disk into multiple files* and click *Next*.


New Virtual Machine Wizard
Specify Disk Capacity
How large do you want this disk to be?
The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.
Maximum disk size (GB):
80.0
Recommended size for Ubuntu: 20 GB
Store virtual disk as a single file
Split virtual disk into multiple files
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.
Help
< Back
Next >
Cancel

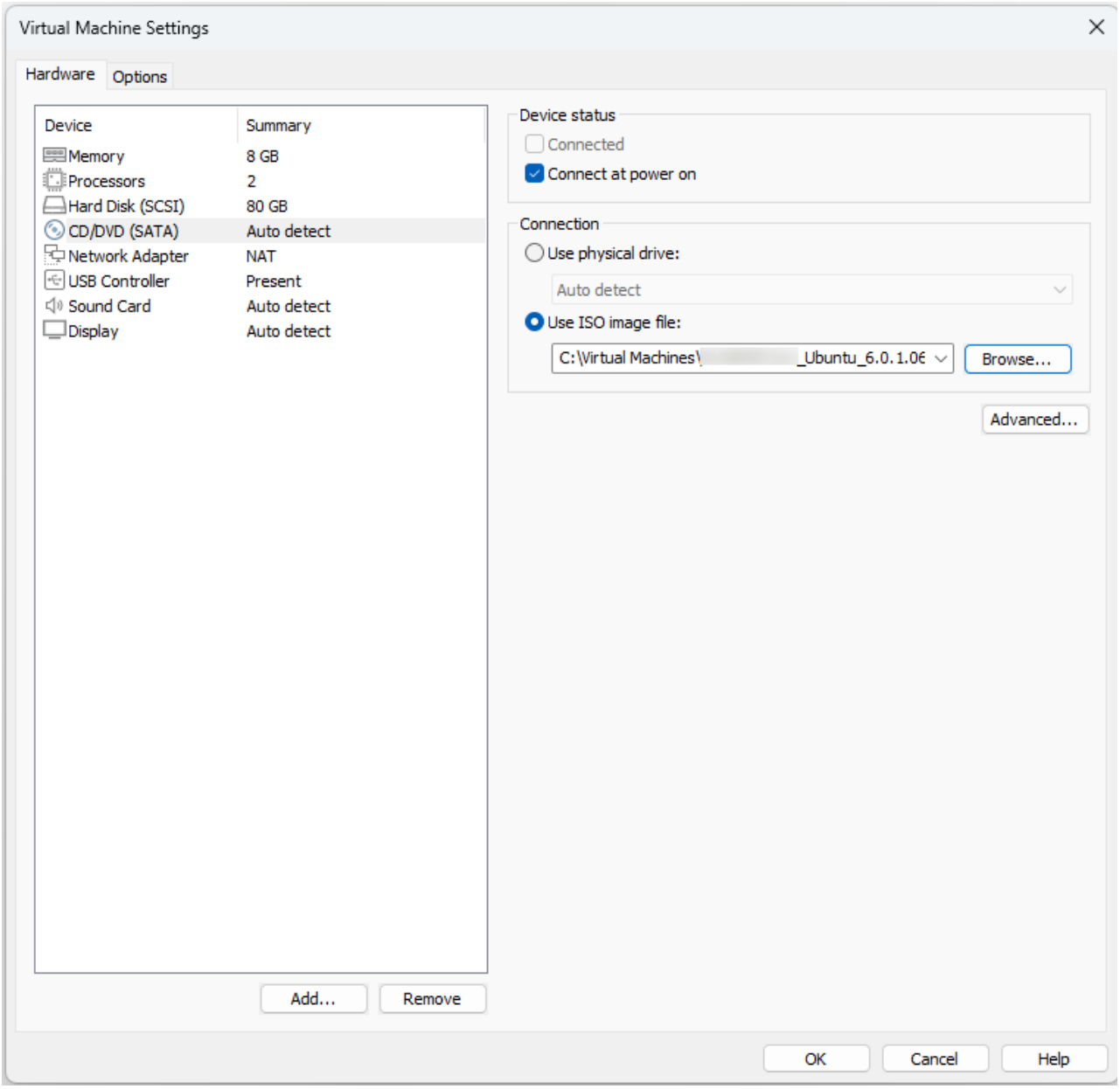
7. Click *Finish*.



8. Right-click the new machine and select the *Settings* option

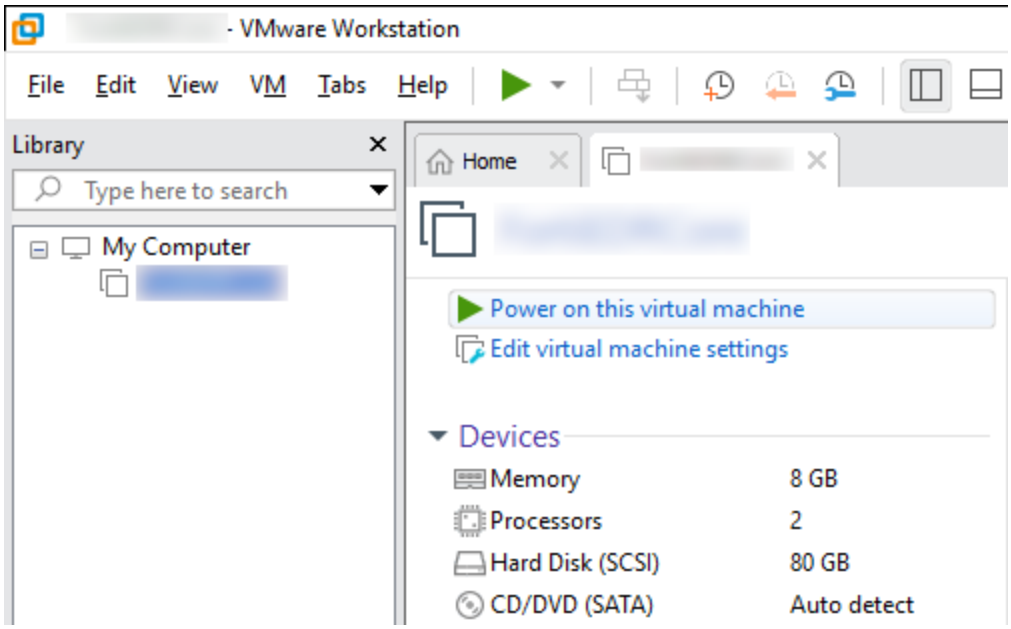


9. Select the *Memory* option and change the RAM according to the system requirements listed in Appendix C – ON PREMISE DEPLOYMENTS on page 472.



10. Select the *Processors* option and change the value according to the system requirements.
11. Select the *CD/DVD* option and then select the *Use ISO image file* option on the right.
12. Click the *Browse* button and select the ISO file provided by Fortinet for the FortiEDR Central Manager. Click *OK*.

13. Start the virtual machine.



The virtual machine automatically starts the installation process, which may take a few minutes.

14. Wait until a success message is displayed requesting that you reboot.
15. Reboot the virtual machine.
16. Log into the virtual machine in order to continue the installation process.
    `Login: root`
    Change the root password, by entering any password you want. Then re-type it. The password must be strong enough according to Linux standards.
17. In the VM CLI, enter `fortiedr config`.
18. At the prompt, enter your `hostname` and click *Next*. (Note: This can be any hostname)
19. At the prompt, select *manager* to configure the VM as the Central Manager, and click *Next*.
20. A list of network interfaces on this virtual machine displays. At the *Pick your primary interface* prompt, select the interface to be used as the primary network interface through which all FortiEDR Cores and FortiEDR Collectors will reach this server, and click *Next*.
21. At the *Do you want to use DHCP* prompt, select *No* to configure the IP of this virtual machine manually, and then click *Next*.
22. At the prompt, enter the IP address of the machine that you are installing. Use the following format: `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
23. At the prompt, enter the default gateway and click *Next*.
24. At the *Please set your DNS server* prompt, enter a valid IP address and click *Next*. Use the following format:
    `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
25. At the prompt, select *No* for debug mode.
26. At the *Please set the date* prompt, verify the date and click *Next*. The installer automatically presents the current date. You can change this date, if necessary.
27. At the *Please set your Time* prompt, set the time and click *Next*.
28. At the prompt, select the timezone and country in which the server is being installed.

29. At the *Do you want to enable web-proxy for the Manager?* prompt, if the Central Manager will communicate via a proxy when accessing the web (such as the FortiEDR Cloud Service (FCS)), select *Yes* and then enter the IP and port of the proxy. Otherwise, select *No*.
30. At the *Do you want to enable FCS?* prompt, select *Yes*.
31. Wait a few moments while the installation processes, until you see the Installation completed successfully message.
32. Configuring the FortiEDR Central Manager server and console on page 556.

Configuring the FortiEDR Central Manager server and console

After you install the FortiEDR Central Manager, you must configure the FortiEDR Central Manager Server and console before setting up other components, such as Aggregators, Cores, and Collectors. The configuration includes creating an Admin user, setting up device registration password, loading your license, and optional MITM configuration.

To configure the FortiEDR Central Manager Server and console:

1. Use any standard Internet browser to connect securely (via https://) to the IP address and port of the machine on which the FortiEDR Central Manager is installed, as follows:
   a. `https://<machine_IP_addess>/`
   b. Default port is 443
2. Define the first administrator user to be allowed to log into the FortiEDR Manager by filling in the *First Name*, *Last Name*, *Email Address*, and *Define administrator user name* fields.

3. Enter and confirm the password to be used by this administrator user.
4. In the *Device Registration Password* fields, enter and confirm the password to be used to install all FortiEDR Collectors, FortiEDR Aggregators and FortiEDR Cores. This same password must be used by all. The following special characters are supported in the password: !, #, %, &, +, -, ., /, :, <, =, >, ?, @, [, \,], ^, _, `, {, |, }, (,), ~, and ,

Write this password down in a good place. This password will be needed each time a FortiEDR component is installed. If you forgot your user interface password, contact Fortinet Support to retrieve it.

5. Click the *Login* button. The regular FortiEDR Central Manager Login page is then displayed, as shown below. The page that displays varies, depending on whether the FortiEDR system is set up as a single-organization or multi-organization system.

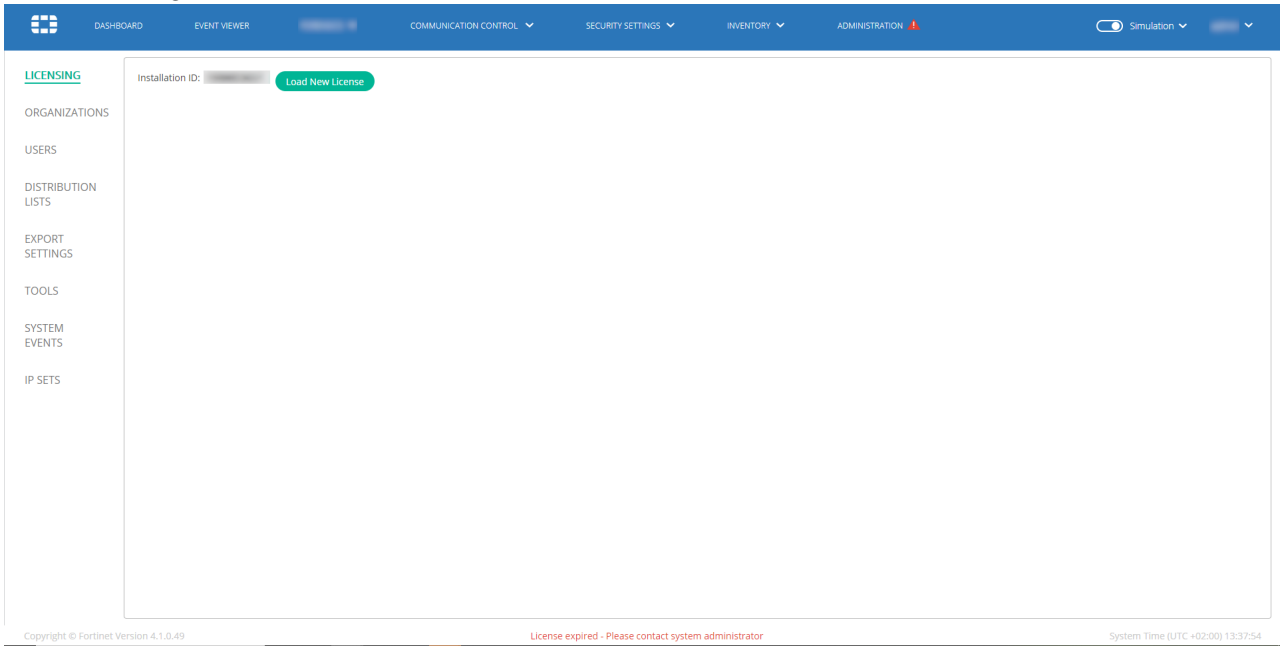
Login Page in a Single-organization System

Login Page in a Multi-organization System

The FortiEDR system can be set up as a single-organization or multi-organization system. In a multi-organization system, all users except an Administrator user must specify the organization in the Organization Name dropdown list. If a user is defined for an organization, then he/she can log in to that organization. Otherwise, he/she cannot.

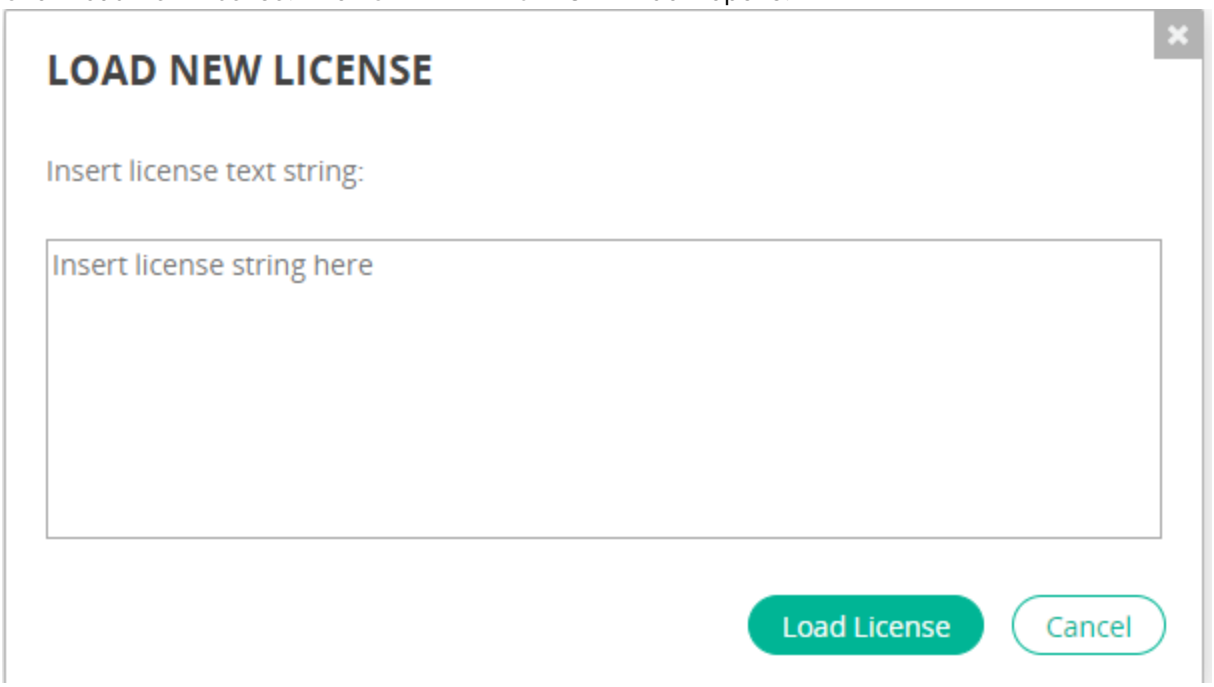
For more details about logging in to a multi-organization system, see Step 1 – Logging in to a multi-organization system on page 431.

6. Enter the administrator user name and password you have just defined and click *Login*. All fields are case sensitive. The following window displays automatically the first time you log into the FortiEDR Central Manager:

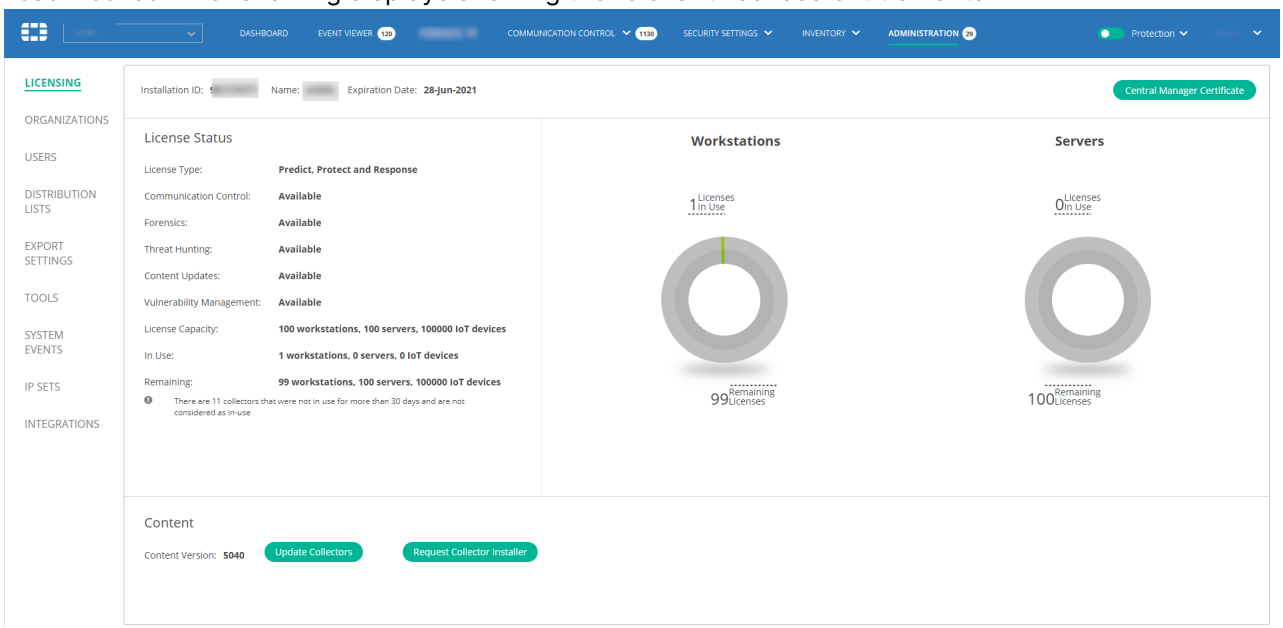


7. Send the displayed Installation ID to FortiEDRAdmin@fortinet.com by email in order to receive a license string from Fortinet.

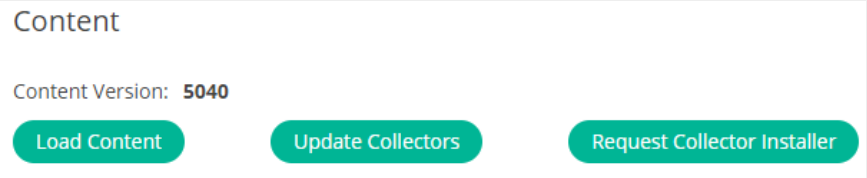
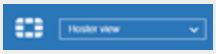
8. Click *Load New License*. The *LOAD NEW LICENSE* window opens.

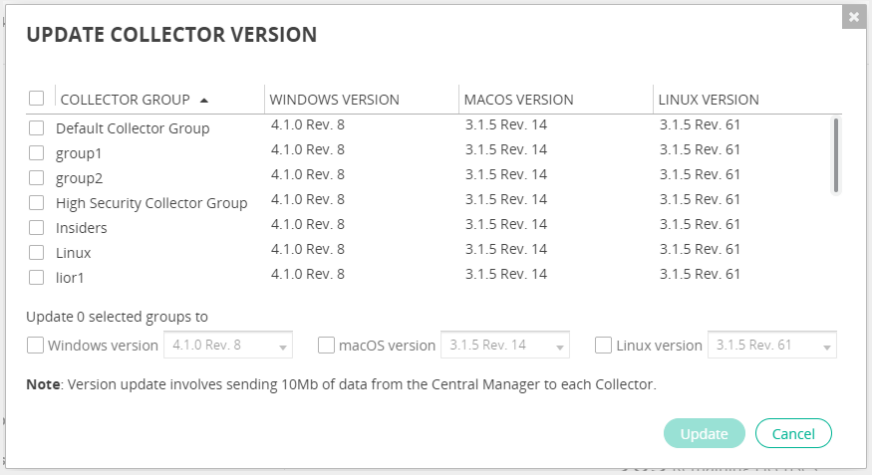


9. Copy/paste the license string that you received by email into the *LOAD NEW LICENSE* window and click *Load License*. The following displays showing the relevant licensed entitlements:



Field	Description
Installation ID	Specifies the unique identifier that is automatically generated upon installation of the ForitEDR Management server. You may be asked to provide this ID and the *Name* field when contacting Fortinet for support.

Field	Description
Name	Specifies the name of the organization in a multi-organization FortiEDR system. For more details, see Multi-tenancy (organizations) on page 428.
Expiration Date	Specifies when this license expires. Notifications will be sent to you beforehand.
License Type	Specifies whether the *Discover, Protect and Response* license, *Discover and Protect* license, or *Protect and Response* license was purchased. The license type defines the availability of the relevant add-ons.
Communication Control	Specifies the word *Available* if the Communication Control add-on is included in the license.
eXtended Detection	Specifies the word *Available*, when the *eXtended Detection* add-on is included in the license.
Forensics	Specifies the word *Available* if the Forensics add-on is included in the license.
Threat Hunting	Specifies the word *Available* if the Threat hunting add-on (described in Threat Hunting on page 131) is included in the license. It also specifies whether Repository add-ons have been purchased and how many have been.
Content Updates	Specifies the word *Available* if the *Content Updates* add-on is included in the license. This add-on enables you to automatically receive the latest FortiEDR policy rule and built-in exception updates. The system arrives with the latest content pre-installed. There is no need to install content during the initial installation. The *Load Content* button enables you to update content, as well as to update the Collector version on any existing Collector.  To load content updates on your FortiEDR system, click the *Load Content* button and then select the content file to load. In a multi-tenant environment, the *Load Content* button is available in Hoster View  . If the content file contains a Collector update, you can update all Collectors with the new version at that time, or choose to do so later. Click the *Update Collectors* button to update the version for all Collectors.

Field	Description
	
Vulnerability Management	Specifies the word *Available* if the Vulnerability Management add-on (described in Administration on page 359) is included in the license.
License Capacity	Specifies the number of available licenses for protection by FortiEDR Collectors (for workstations and servers). Only the number of FortiEDR Collectors allowed by the license can register with the FortiEDR Central Manager. Additional FortiEDR Collectors are not registered with the FortiEDR Central Manager. In addition, the number of IoT devices specified under the License Capacity determines whether or not IoT Discovery is available (zero number).
In Use	Specifies the number of FortiEDR licenses for workstations and servers that are currently in use. In addition, it specifies the number of IoT devices detected in the system thus far.
Remaining	Specifies the number of FortiEDR licenses for workstations and servers that are still available for use.

Regarding questions about the number of licenses purchased, please contact Fortinet Support.

10. **(Optional)** Configure the FortiEDR Central Manager to communicate with the Internet via a controlled MITM application (for example, FortiGate with SSL deep inspection enabled):
    a. Add the MITM CA certificate to the list of trusted certificates in the Central Manager Java application using the following API:

```
Method: POST
URL: /maintenance/upload-certificate
Body:
{
"alias": [custom_ca_name],
"certificateBlob": [CA certificate in pem format, encoded in base64]
}
```

Certificates signed by your custom MITM CA will not be trusted.

Example:

For the following certificate:

```
---BEGIN CERTIFICATE---
MIIDYzCCAkugAwIBAgIUXTs0sl6LZ3MNoiuy1+2QUOEqNqIwDQYJKoZIhvcNAQEL
BQAwUzELMAkGA1UEBhMCVVMxDjAMBgNVBAgMBVN0YXRlMQ0wCwYDVQQHDARDaXR5
MRUwEwYDVQQKDAxPcmdhbml6YXRpb24xDjAMBgNVBAMMBU15IENBMB4XDTI0MTAy
NzA4NDgxN1oXDTM0MTAyNTA4NDgxN1owUzELMAkGA1UEBhMCVVMxDjAMBgNVBAgM
BVN0YXRlMQ0wCwYDVQQHDARDaXR5MRUwEwYDVQQKDAxPcmdhbml6YXRpb24xDjAM
BgNVBAMMBU15IENBMIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEAua6l
NjX39F4T0MDozaENXHfnJ7qli/oK/M3SH6ZMFkOyAita31ri/JO2L2k7HS4qwHpJ
GGPnwsWEMsnwYJ8xuSi2Iz90KfRniDD5sgt/DFAjb+CRO4zbfERizO0qvQqCgqnU
24I2gCl31K7Frsky11B6db2s2I0LLpPVl7LMyaZ84yx4g1VFJSU1aYYXh8AU8oJa
ghW9LD6WFYMXjQIP0RQbUhqT0UK1CuEcl0ly/yVWmQ7edSyAV/YsIO7DpicPBuG9
fsLoY60tPhqj0pmfHcdMLDJoa03offAAhiqRDAQN5k5KnA6YcPxvDCoT88jTx823
8QQNd9gsVHr6uvLmpwIDAQABoy8wLTAMBgNVHRMEBTADAQH/MB0GA1UdDgQWBBQo
x7OwCDVpK1627HvgxMHNfAcp9TANBgkqhkiG9w0BAQsFAAOCAQEAL5u6LZQFLWVd
mQhkLWn9RuOR1vTnNHaARzURCH8k4VCfIliz93ruYXjJb/LWbJlMxR1nPjRbieI8
wAgUBfPV2cr4bXuP70W8Ftp/MYyw37G1sg1vzi9rvMl/h61I7aPn4JX9IRAaP+jO
7vT8hWP1DGf+TQKFBehHP5xJIEhCoWCESqPrOjF24YtDd4QYJWZm0IRtVIIVBnZ9
m6ZlHuRcZ3zLDpigtkyuLG3S/6BsQF0WOJQNQt90QU168026+7JlF7OSlH7EIl79
LaguuiA+PRXAN3ysNi4+/anp7Auy5ssIwjcZX7nAuPsUNGLUKH2LAELC0FxCZoO6
gC6bm+wRsg==
---END CERTIFICATE---
```

Encode the certificate in Base64 and use it in the API as follows:

```
{
```

```
"alias": "my_custom_MITM_ca",
```

```
"certificateBlob":
"LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSURZekNDQWt1Z0F3SUJBZ0lVWFRzMHNsNkxaM01Ob2l1eTErM
lFVT0VxTnFJd0RRWUpLb1pJaHZjTkFRRUwKQlFBd1V6RUxNQWtHQTFVRUJoTUNWVk14RGpBTUJnTlZCQWdNQlZOMFl
YUmxNUTB3Q3dZRFZRUUhEQVJEYVhSNQpNUlV3RXdZRFZRUUtEQXhQY21kaGJtbDZZWFJwYjI0eERqQU1CZ05WQkFNT
UJVMTVJRU5CTUI0WERUSTBNVEF5Ck56QTRORGd4TjFvWERUTTBNVEF5TlRBNE5EZ3hOMW93VXpFTE1Ba0dBMVVFQmh
NQ1ZWTXhEakFNQmdOVkJBZ00KQlZOMFlYUmxNUTB3Q3dZRFZRUUhEQVJEYVhSNU1SVXdFd1lEVlFRS0RBeFBjbWRoY
m1sNllYUnBiMjR4RGpBTQpCZ05WQkFNTUJVMTVJRU5CTUlJQklqQU5CZ2txaGtpRzl3MEJBUUVGQUFPQ0FROEFNSUl
CQ2dLQ0FRRUF1YTZsCk5qWDM5RjRUME1Eb3phRU5YSGZuSjdxbGkvb0svTTNTSDZaTUZrT3lBaXRhMzFyaS9KTzJMM
ms3SFM0cXdIcEoKR0dQbndzV0VNc253WUo4eHVTaTJJejkwS2ZSbmlERDVzZ3QvREZBamIrQ1JPNHpiZkVSaXpPMHF
2UXFDZ3FuVQoyNEkyZ0NsMzFLN0Zyc2t5MTFCNmRiMnMySTBMTHBQVmw3TE15YVo4NHl4NGcxVkZKU1UxYVlZWGg4Q
VU4b0phCmdoVzlMRDZXRllNWGpRSVAwUlFiVWhxVDBVSzFDdUVjbDBseS95VldtUTdlZFN5QVYvWXNJTzdEcGljUEJ
1RzkKZnNMb1k2MHRQaHFqMHBtZkhjZE1MREpvYTAzb2ZmQUFoaXFSREFRTjVrNUtuQTZZY1B4dkRDb1Q4OGpUeDgyM
wo4UVFOZDlnc1ZIcjZ1dkxtcHdJREFRQUJveTh3TFRBTUJnTlZIUk1FQlRBREFRSC9NQjBHQTFVZERnUVdCQlFvCng
3T3dDRFZwSzE2MjdIdmd4TUhOZkFjcDlUQU5CZ2txaGtpRzl3MEJBUXNGQUFPQ0FRRUFMNXU2TFpRRkxXVmQKbVFoa
0xXbjlSdU9SMXZUbk5IYUFSelVSQ0g4azRWQ2ZJbGl6OTNydVlYakpiL0xXYkpsTXhSMW5QalJiaWVJOAp3QWdVQmZ
QVjJjcjRiWHVQNzBXOEZ0cC9NWXl3MzdHMXNnMXZ6aTlydk1sL2g2MUk3YVBuNEpYOUlSQWFQK2pPCjd2VDhoV1AxR
EdmK1RRS0ZCZWhIUDV4SklFaENvV0NFU3FQck9qRjI0WXREZDRRWUpXWm0wSVJ0VklJVkJuWjkKbTZabEh1UmNaM3p
MRHBpZ3RreXVMRzNTLzZCc1FGMFdPSlFOUXQ5MFFVMTY4MDI2KzdKbEY3T1NsSDdFSWw3OQpMYWd1dWlBK1BSWEFOM
3lzTmk0Ky9hbnA3QXV5NXNzSXdqY1pYN25BdVBzVU5HTFVLSDJMQUVMQzBGeENab082CmdDNmJtK3dSc2c9PQotLS0
tLUVORCBDRVJUSUZJQ0FURS0tLS0t"
```

```
}
```

b. Add propery `ssl.truststore.enabled=true` to file `application-customer.properties`.

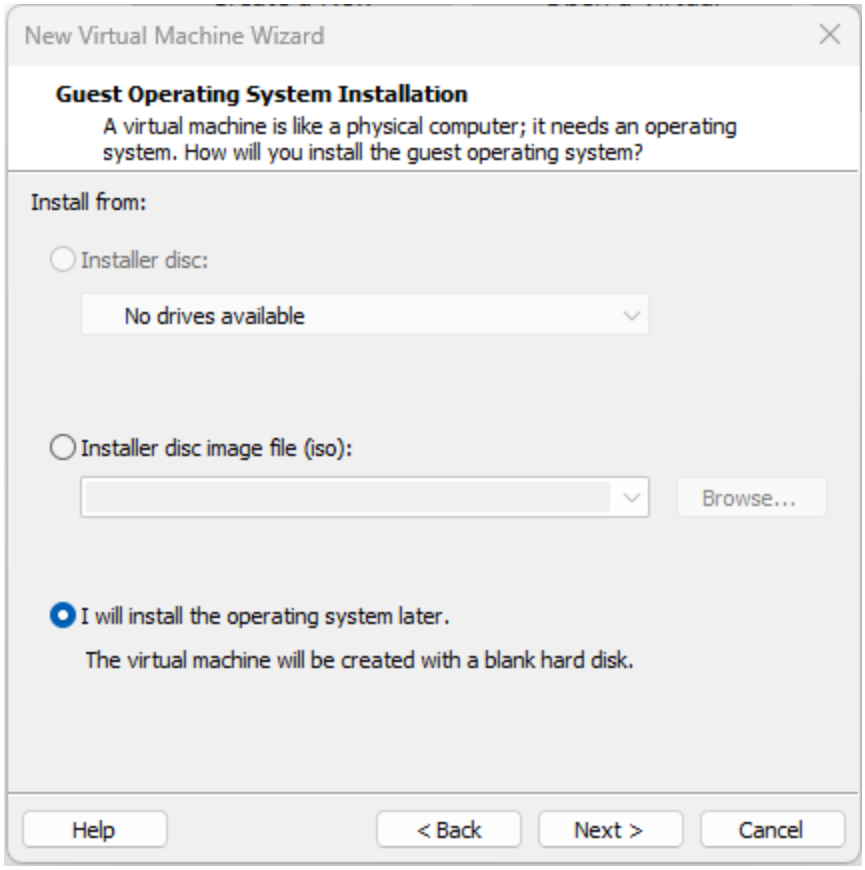
c. Restart the manager service using the following command: `exec command fortiedr manager restart`.

Setting up a VM to be the FortiEDR Aggregator

To set up a VM to be the FortiEDR Aggregator:

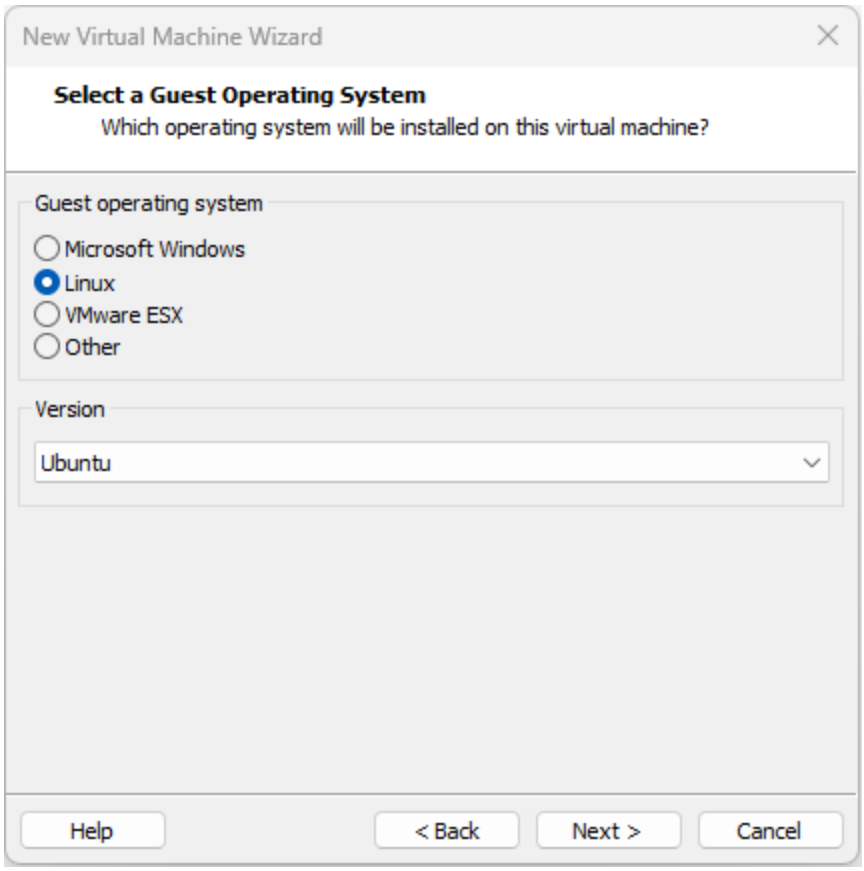
1. Create a new virtual server by selecting *File > New Virtual Machine*.
2. Select *Typical* option and select *Next*.

3. Select the *I will install the operating system later* option and click *Next*.

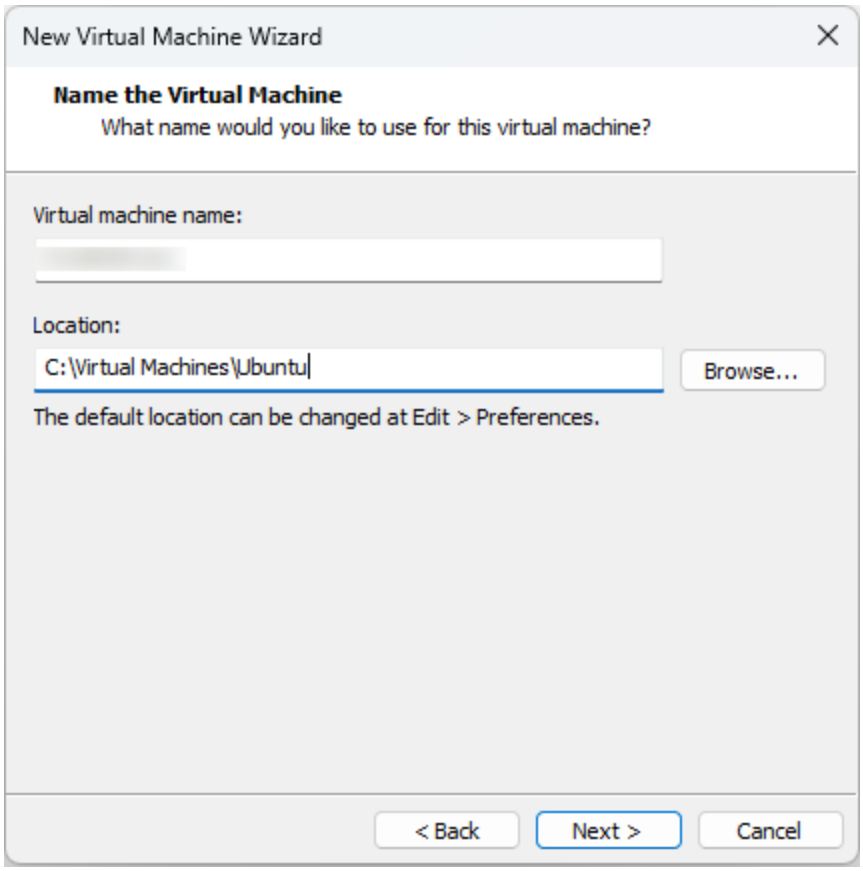


4. Select the *Linux* radio button. In the *Version* field, select *Ubuntu* and click *Next*.

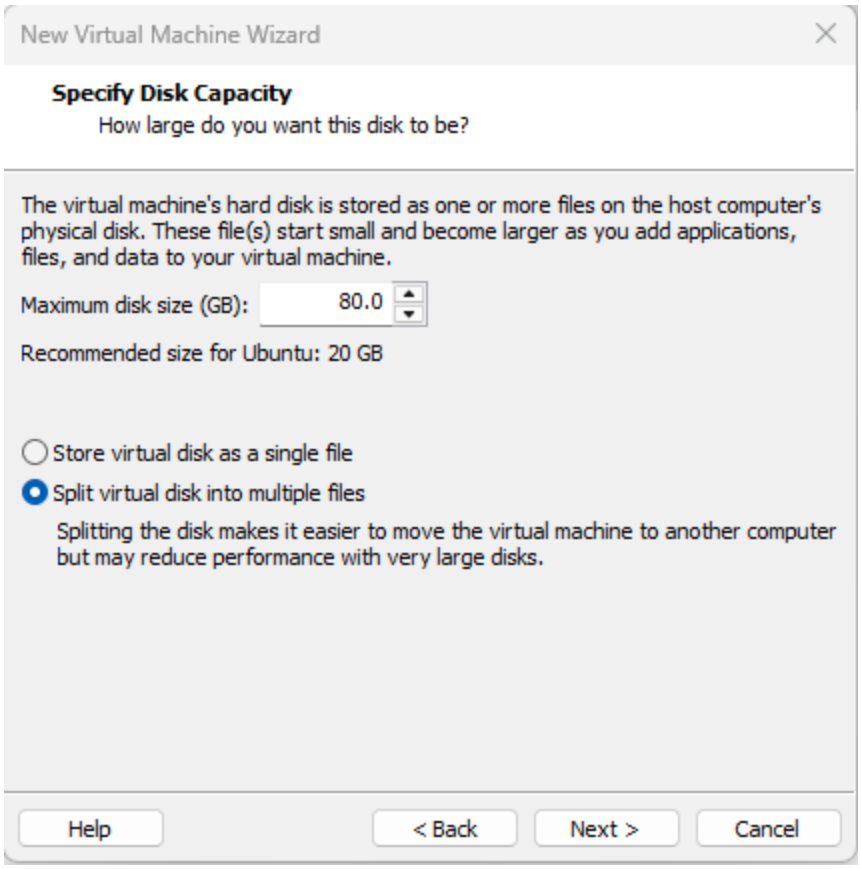
In some VMware environments where the *Linux* radio button is unavailable, select a generic Linux type, such as *General Linux* or *Other Linux (for vSphere/ESXi)*. Do not select a specific Linux distribution.



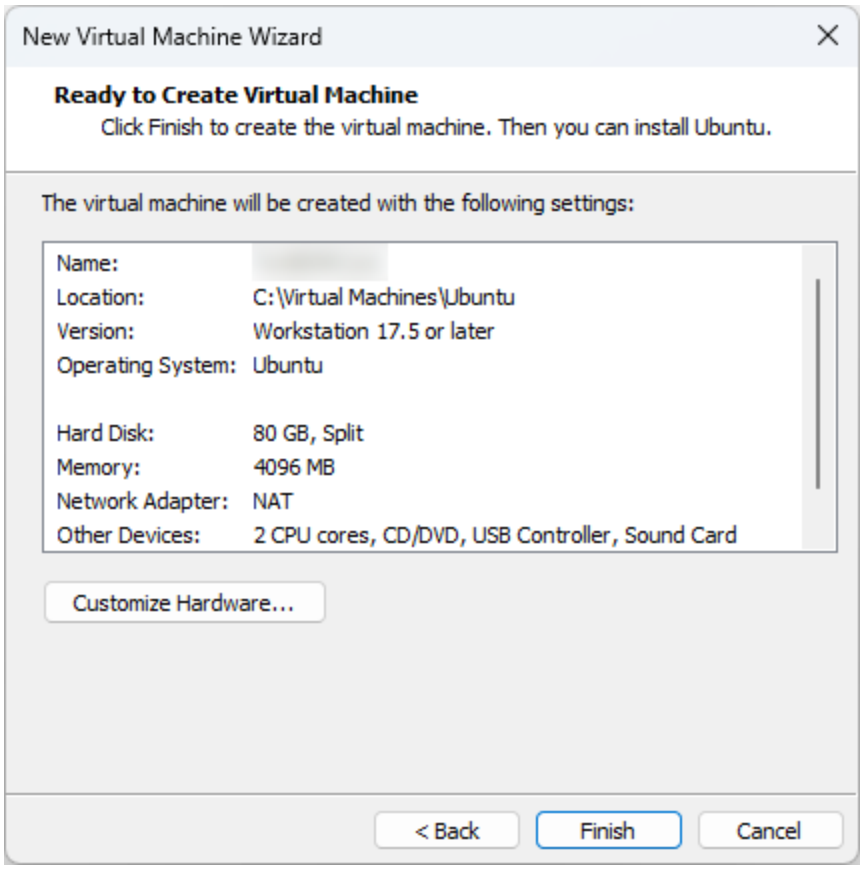
5. Specify a name for the virtual machine and the location in which to store the provided ISO file and click *Next*.



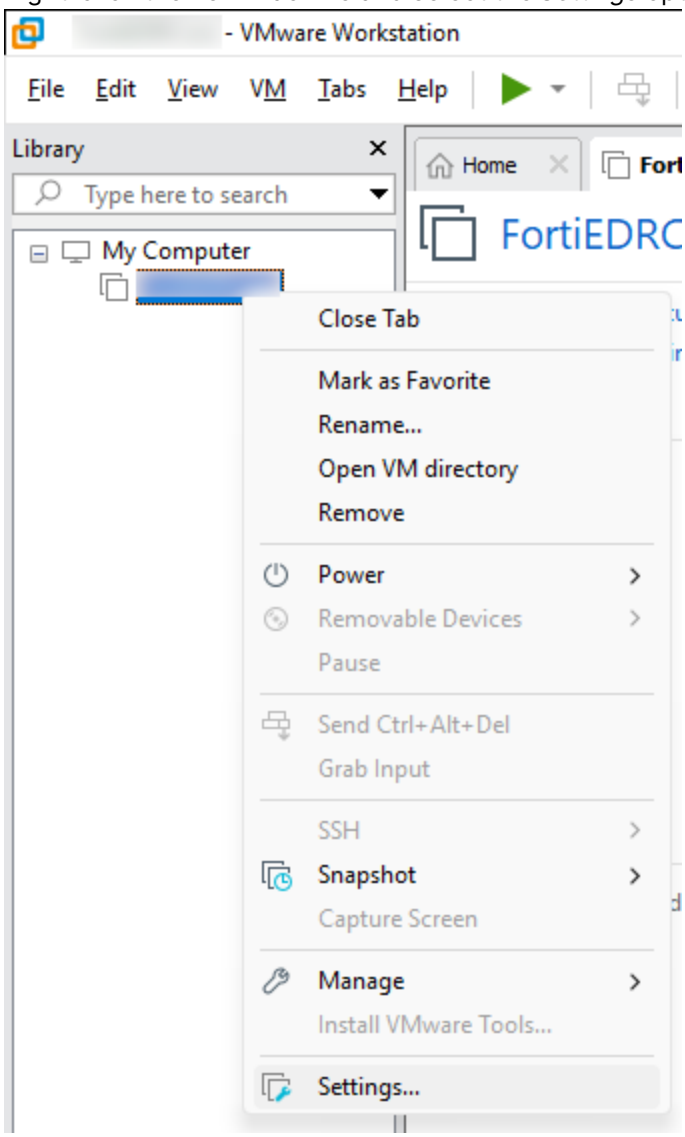
6. Change the *Maximum disk size* according to system requirements listed in Appendix C – ON PREMISE DEPLOYMENTS on page 472, leave the default option as *Split virtual disk into multiple files* and click *Next*.


New Virtual Machine Wizard
Specify Disk Capacity
How large do you want this disk to be?
The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.
Maximum disk size (GB):
80.0
Recommended size for Ubuntu: 20 GB
Store virtual disk as a single file
Split virtual disk into multiple files
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.
Help
< Back
Next >
Cancel

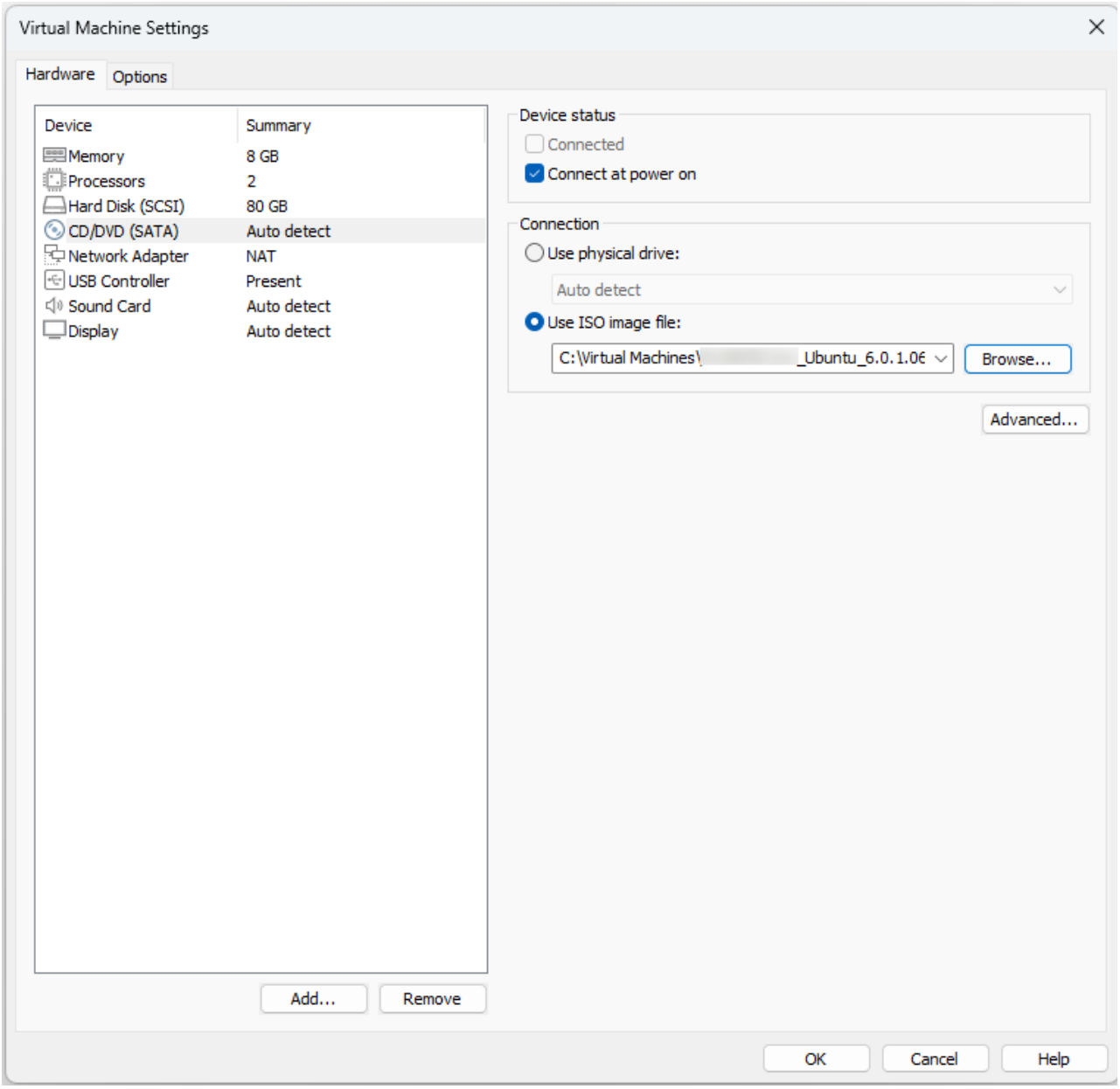
7. Click *Finish*.



8. Right-click the new machine and select the *Settings* option

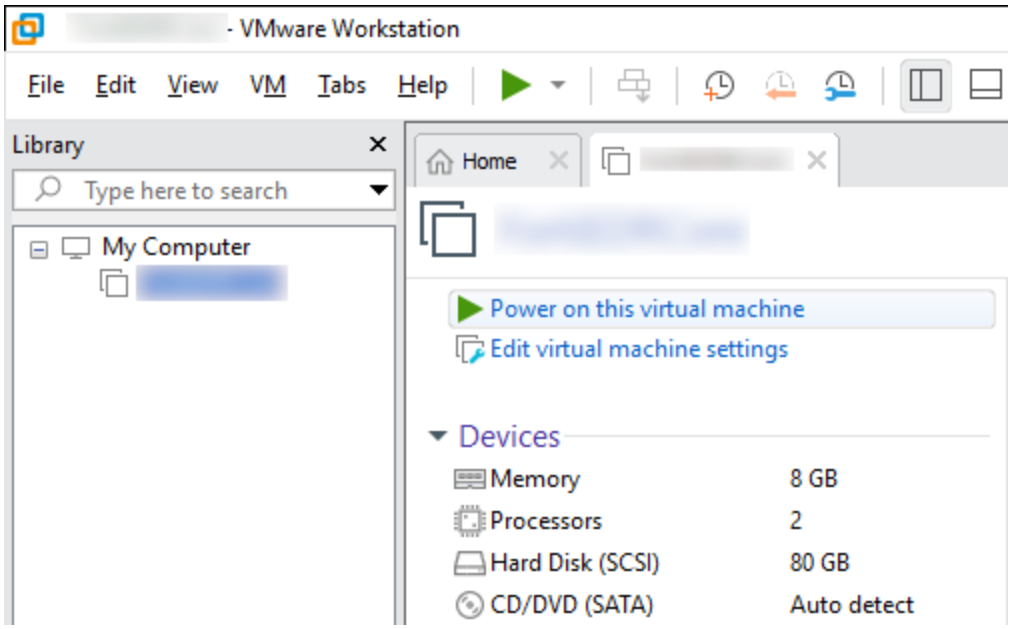


9. Select the *Memory* option and change the RAM according to the system requirements listed in Appendix C – ON PREMISE DEPLOYMENTS on page 472.



10. Select the *Processors* option and change the value according to the system requirements.
11. Select the *CD/DVD* option and then select the *Use ISO image file* option on the right.
12. Click the *Browse* button and select the ISO file provided by Fortinet for the FortiEDR Central Manager. Click *OK*.

13. Start the virtual machine.



The virtual machine automatically starts the installation process, which may take a few minutes.

14. Wait until a success message is displayed requesting that you reboot.
15. Reboot the virtual machine.
16. Log into the virtual machine in order to continue the installation process.
    `Login: root`
    Change the root password, by entering any password you want. Then re-type it. The password must be strong enough according to Linux standards.
17. In the VM CLI, enter `fortiedr config`.
18. At the prompt, enter your `hostname` and click *Next*. (Note: This can be any hostname)
19. At the prompt, select *aggregator* to configure the VM as the Aggregator, and click *Next*.
20. At the *Please enter the management IP address* prompt, enter the IP address to be used for communicating with the FortiEDR Central Manager and click *Next*.
21. At the *Please enter your registration password* prompt, enter the user and password used to register the FortiEDR Aggregator with the FortiEDR Central Manager, which you configured in step 30 in the previous section, and click *Next*.
22. At the *Do you want to use DHCP* prompt, select *No* to configure the IP of this virtual machine manually, and then click *Next*.
23. At the prompt, enter the IP address of the machine that you are installing. Use the following format: `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
24. At the prompt, enter the default gateway and click *Next*.
25. At the *Please set your DNS server* prompt, enter a valid IP address and click *Next*. Use the following format:
    `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
26. At the prompt, select *No* for debug mode.
27. At the *Please set the date* prompt, verify the date and click *Next*. The installer automatically presents the current date. You can change this date, if necessary.
28. At the *Please set your Time* prompt, set the time and click *Next*.
29. At the prompt, select the timezone and country in which the server is being installed.

30. Wait a few moments while the installation processes, until you see the Installation completed successfully message.
31. If organizations are defined and the number of Collectors exceeds 10000, set up additional Aggregators by repeating the previous steps for each additional Aggregator.
32. (Recommended) Define a DNS address for the Aggregator by following the steps below. Doing so avoids the need to reinstall all Collectors that are registered with the Aggregator IP when the Aggregator IP changes in some cases, such as when the Aggregator is migrated to a different data center.
    a. Define a DNS address for the Aggregator.
    b. Configure FortiEDR to disable the NAT IP and use the local IP of the Aggregator:
        i. Connnect to the FortiEDR Central Manager via `ssh`.
        ii. Open the `conf-customer.properties` configuration file using the following command: `vi/opt/FortiEDR/aggregator/conf-customer.properties`.
        iii. Comment out the `connection.dnsname = 10.10.80.201` line as follows: `#connection.dns-name = 10.10.80.201`.
        iv. Save the changes and restart the FortiEDR Aggregator service using the `fortiedr aggregator restart` command.
        v. Check the status of the Aggregator using the `fortiedr aggregator status` command.

Setting up the FortiEDR Threat Hunting Repository

The FortiEDR Threat Hunting feature (described in Threat Hunting on page 131) requires the set up of the Threat Hunting repository, which includes the following steps:

1. Creating a Virtual Machine on page 504
2. Installing an Operating System ISO on page 506
3. Installing a FortiEDR Repository software ISO on page 512
4. Configuring the Threat Hunting Repository Monitoring console on page 515
5. Backing up Threat Hunting Repository data on page 516
6. Activating the Threat Hunting Repository Monitoring console on page 517

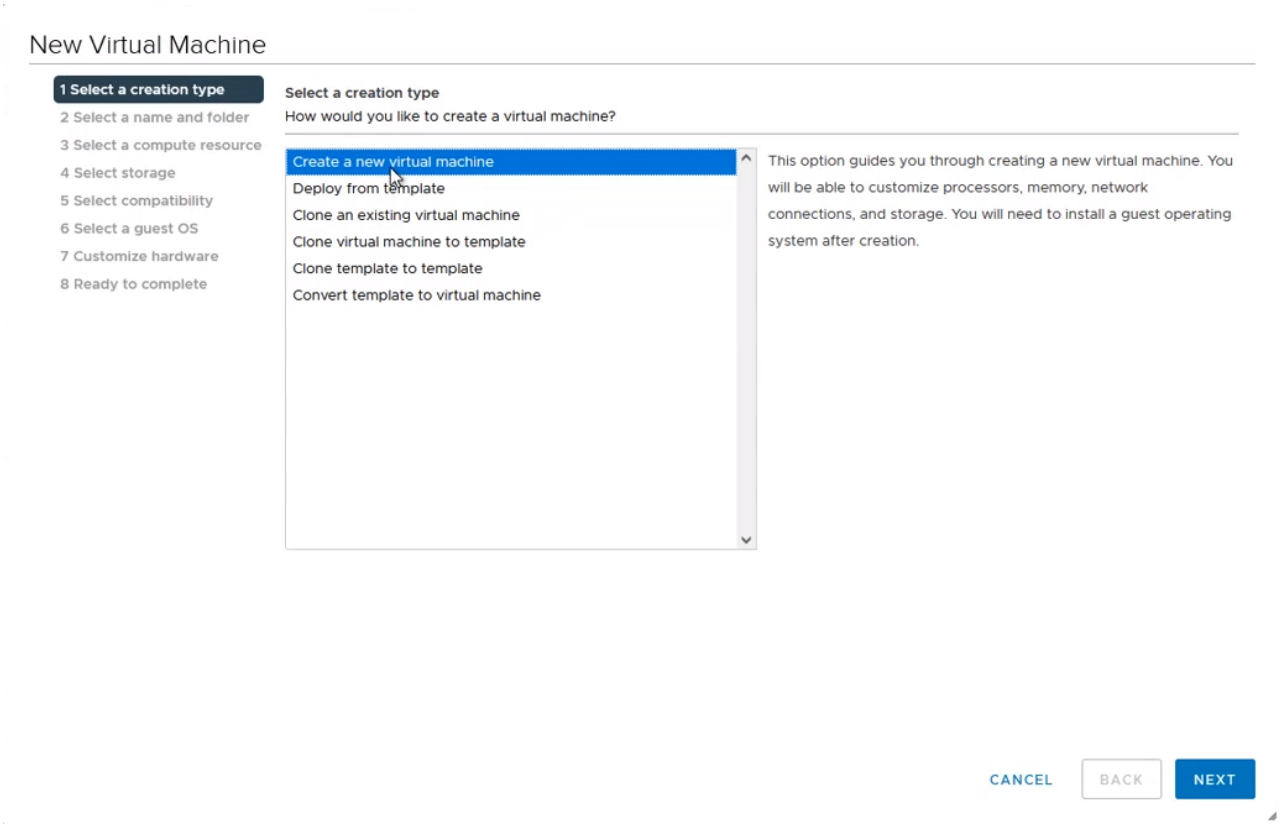
Prerequisites

- A license with access to the Threat Hunting feature.
- The FortiEDR Central Manager is installed.
- The system requirements listed in Appendix C – ON PREMISE DEPLOYMENTS on page 472 must be met.

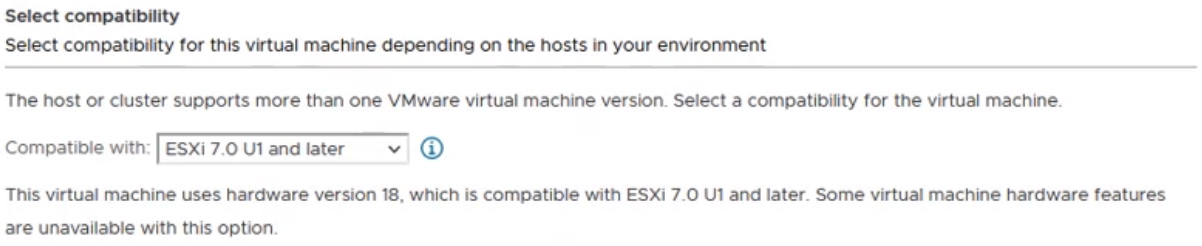
Creating a Virtual Machine

To create a virtual machine:

1. Create a new virtual server. For example, by selecting *File > New Virtual Machine...*, then selecting *Create a new virtual machine* and clicking *NEXT*.



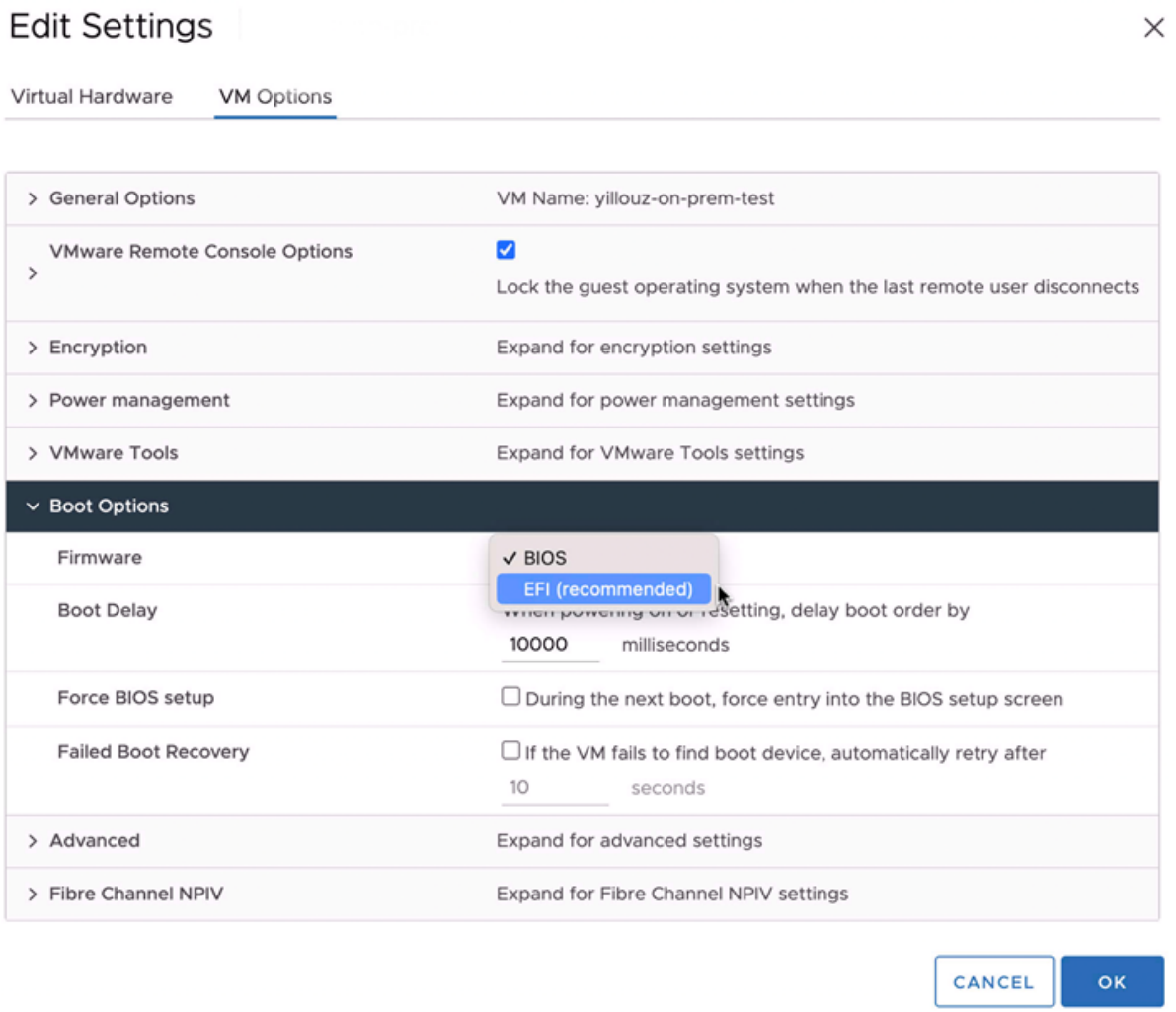
2. Enter the desired *virtual machine name*. For example, *FortiEDR-TH-Repository* and click *NEXT*.
3. Enter the virtual machine settings, as follows:
   a. In the *Select storage* step, select the storage where the virtual machine disk should be stored on and click *NEXT*.
   b. In the *Select Compatibility* step, select *ESXi 7.0 U1 and later* and click *NEXT*.



   c. At the *Select a guest OS* step:
      i. In the *Guest OS family* field, select *Linux*.
      ii. In the *Guest OS version* field, select *Other 4.x Linux (64-bit)*.

iii. Click *Next*. The following displays:

d. In the Virtual Machine *Boot Options*, select *BIOS* under *Firmware*, and click *OK*.



e. In the *Customize hardware* step, do the following:

a. Enter the values for *CPU*, *Memory*, and *New Hard disk* fields as specified in *Prerequisites*. It is highly recommended to use SSD for hard disk.

b. Add an OS disk in the *New Hard disk*:

a. Enter the OS disk size in GB, as specified in *Prerequisites*.

b. In the *Disk Provisioning* field, it is recommended to select *Thick Provision*.

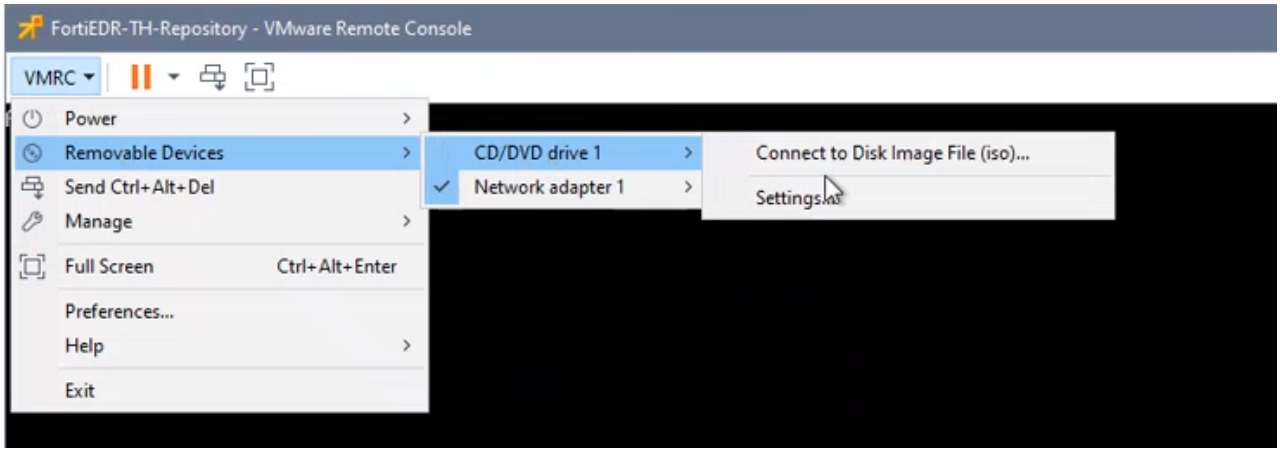
c. Add a DATA disk in the *New Hard disk*:
   a. Enter the DATA disk size in GB, as specified in *Prerequisites*.
   b. In the *Disk Provisioning* field, it is recommended to select *Thick Provision*.
   c. In case the previous disk hasn't been installed as SSD, define another SSD DATA disk of a size as specified in *Prerequisites*.
d. In the *New Network* field, choose *VMXNET3*.

4. Select *Finish* to complete the creation of the virtual machine.

Installing an Operating System ISO

To install an operating system ISO:

1. Select the newly created virtual machine and click **Launch Remote Console**.
2. In the *VMRC* menu, select *Removable Device > CD/DVE drive 1 > Connect to Disk Image File (iso)*....



3. Select the *FortiEDR_Repository_OSInstaller* ISO file and click *Open*. Make sure that the ISO remains mounted.

Another option instead of completing the two steps described above is to upload the ISO from the VMWare datastore (this is possible if the ISO has already been uploaded there).

4. Restart the Virtual Machine. The virtual machine starts and the following menu is displayed:

5. Select the *Install Node* option.
6. Configure the timezone of the VM using the following command:

```
sudo su -

export TIMEZONE=Area/Location
```

Replace *Area/Location* with the time zone value from the tz (timezone) database used by Linux and other Unix systems.

The default timezone UTC will be used if you skip this step. The timezone can only be set here once and cannot be changed after the installation.

7. Log in using the *rancher* user (without the password) and run the following commands in order to start the K8S node installation:

```
sudo su -

bash /k3os/system/install_k3os.sh
```

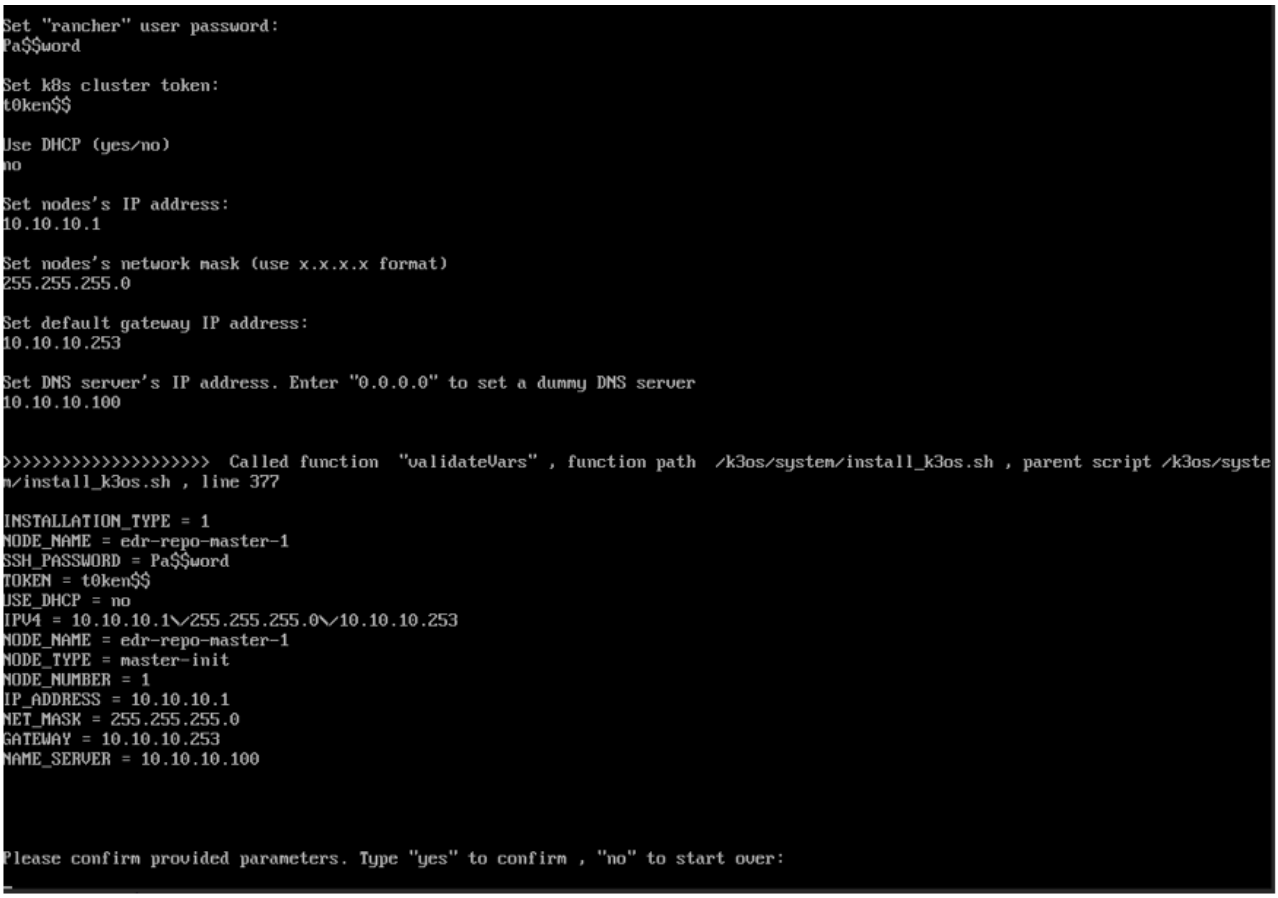
```
k3os-8350 [~]# bash /k3os/system/install_k3os.sh

Welcome to EDRv2 repository installation



Preparing data disk...

Creating data partition on /dev/sdb
Information: You may need to update /etc/fstab.

Information: You may need to update /etc/fstab.

mke2fs 1.45.6 (20-Mar-2020)
Creating filesystem with 26213888 4k blocks and 6553600 inodes
Filesystem UUID: 916d9e73-4260-4913-a9d9-e0cc8cffbf0e
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
        4096000, 7962624, 11239424, 20480000, 23887872

Allocating group tables: done
Writing inode tables: done
Creating journal (131072 blocks): done
Writing superblocks and filesystem accounting information: done


Choose installation type
1 - New installation
2 - Add a node to the existing cluster
```

8. When prompted with the following, enter the number depending on the virtual machine (node) you are installing:

```
1 - New installation
2 - Add a new master/node to the existing cluster
1
```

- Enter `1` if you are installing one single virtual machine (node) with fewer than 15000 seats or if you are installing the first virtual machine (node) of the three for 15000 to 30000 seats.
- Enter `2` if you are installing the second or third virtual machine (node) of the three for 15000 to 30000 seats.

9. Complete the *k3os* installation by providing the following parameters:



a. When prompted to enter the *SSH password*, enter the password to be used for the rancher user. A strong password must be entered.

b. At the *Use DHCP (yes/no)* prompt, enter *no*.

Using DHCP causes a malfunction of the FortiEDR Repository server so that it is in an *Offline* state after the installation. When prompted, enter the IP, Mask and Gateway details of the virtual machine.

c. At the *Do you want to change the default Pod network CIDR's* prompt, enter *yes* or *no* depending on your needs. The default Kubernetes internal Pod network is `10.42.0.0/16`.

  i. If you enter *yes*, provide the desired Pod network subnet in `x.x.0.0/16` format when prompted.

  ii. If you enter *no*, make sure the default Pod network CIDR does not overlap with your existing networks.

d. At the *Do you want to change the default Service network CIDR's* prompt, enter *yes* or *no* depending on your needs. The default Kubernetes internal Service network is `10.43.0.0/16`.

  i. If you enter *yes*, provide the desired Service network subnet in `x.x.0.0/16` format when prompted.

  ii. If you enter *no*, make sure the default Service network CIDR does not overlap with your existing networks.

e. When prompted to enter *node IP*, enter an IP depending on the virtual machine (node) you are installing:

- If you are installing one single virtual machine (node) with fewer than 15000 seats or if you are installing the first virtual machine (node) of the three for 15000 to 30000 seats, enter the virtual IP address.
- If you are installing the second or third virtual machine (node) of the three for 15000 to 30000 seats, enter the virtual IP address you defined for the first virtual machine (node).

f. When prompted to enter *subnet mask*, provide the virtual machine subnet mask.

g. When prompted to enter *DNS*, provide the DNS details.

h. When asked, read the settings provided and approve or reject them.

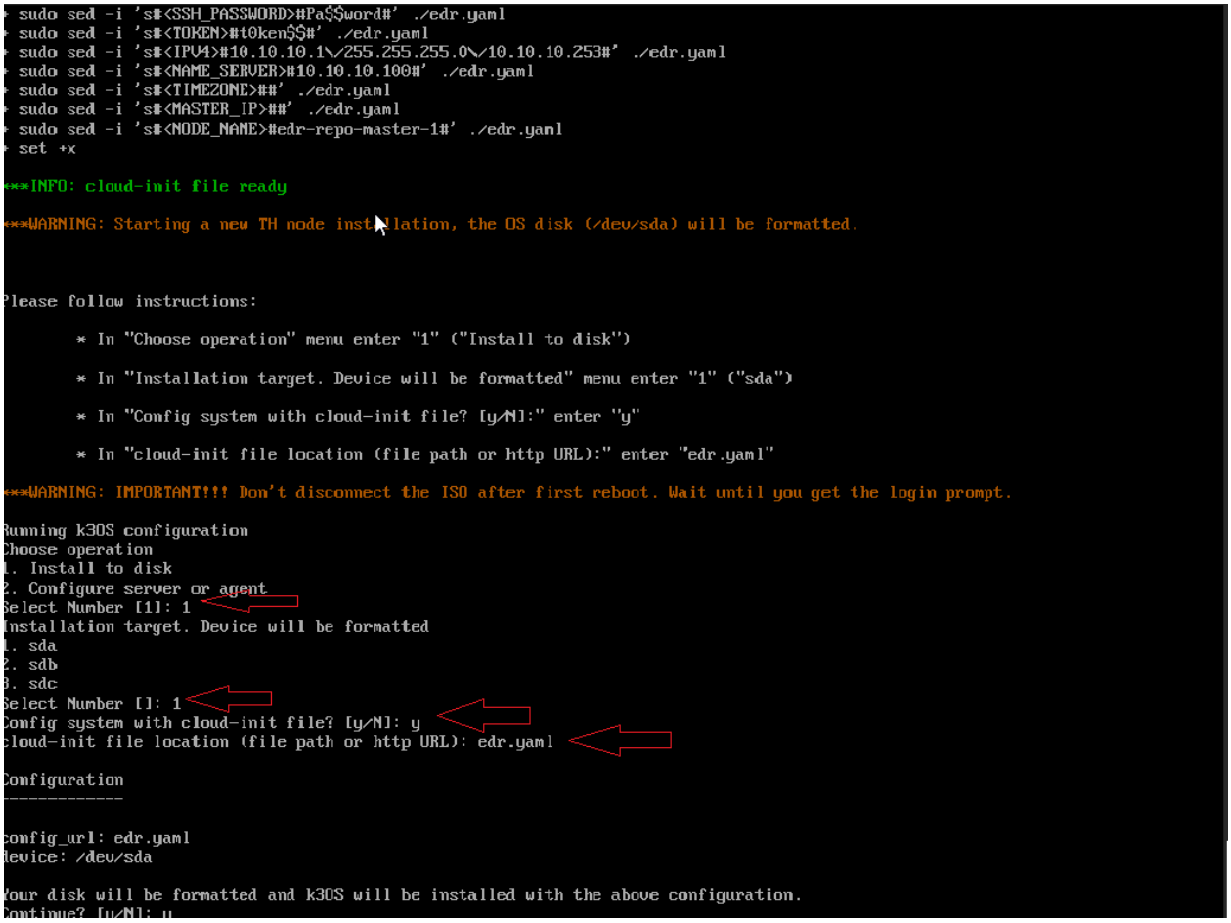
i. When prompted to select an operation, approve the default (*1. Install to disk*) by pressing `Enter`.

j. To select the *sda disk* as the *OS disk*, select *1*.

k. At the *Config system with cloud-init file* prompt, enter `y`.

l. When prompted to provide a *Cloud-init file location (file path or http URL)*, enter `edr.yaml`.

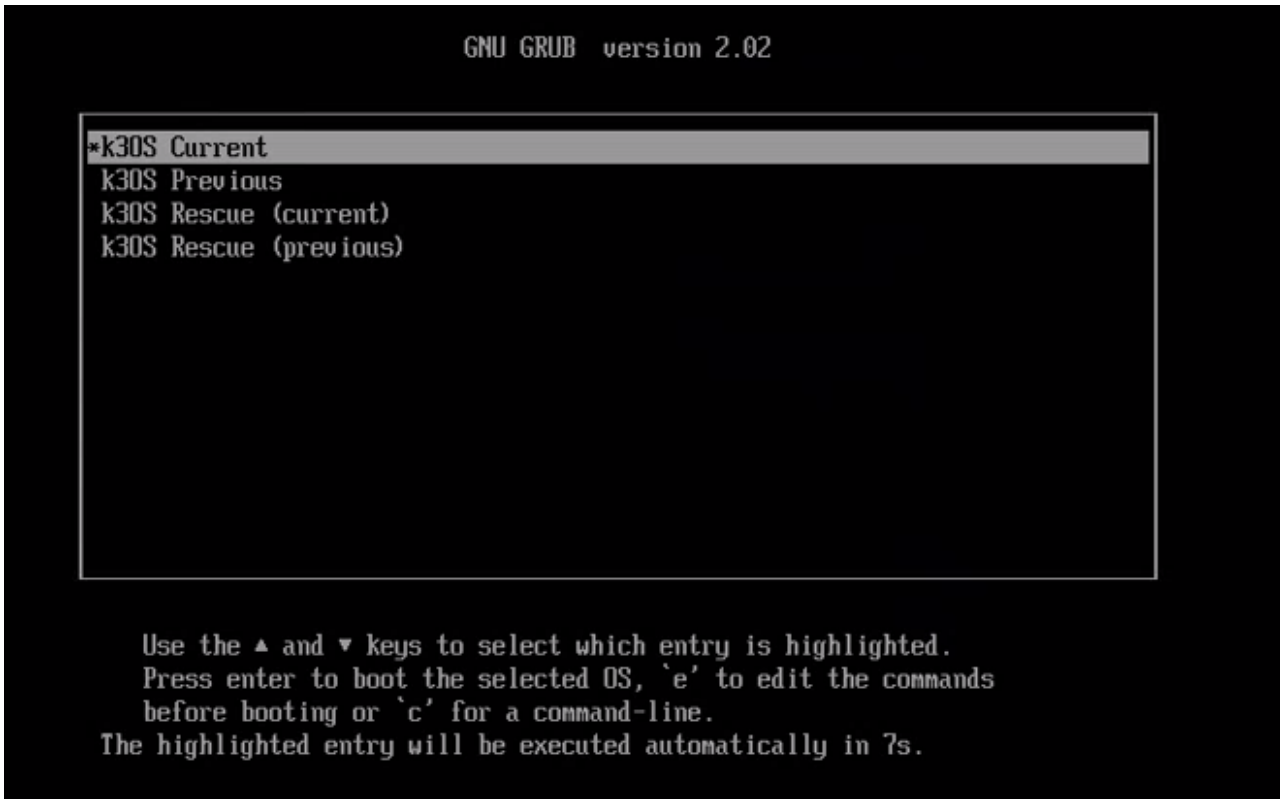
m. When prompted to continue, enter `y`.
The image below provides a preview of the parameters you entered for a master virtual machine (node).



10. Wait for the installation to complete which may take a while. The Virtual Machine restarts automatically after the installation.

11. If you have 15000 to 30000 seats, define two additional virtual machines (nodes) by repeating the steps in *Creating a virtual machine* and the previous steps in *Installing an Operating System ISO* for each node. Otherwise, skip to the next step.

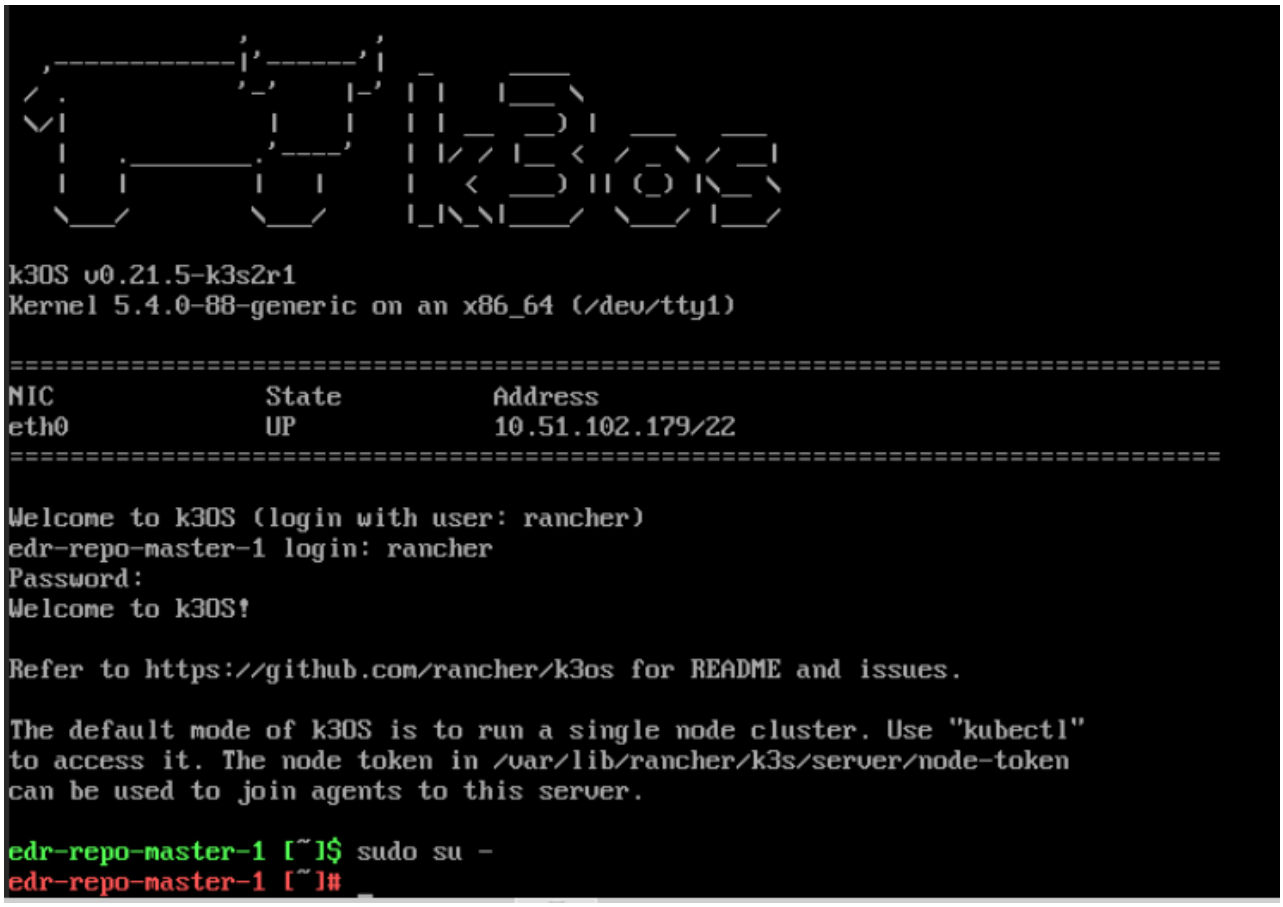
12. In the menu, select the default option *k30S Current* and press *Enter*.



The system will start. This might take a few minutes while OS data is copied to the Virtual Machine.

13. Log in with the `rancher` name and the password set previously.

14. Run the `sudo su -` command.

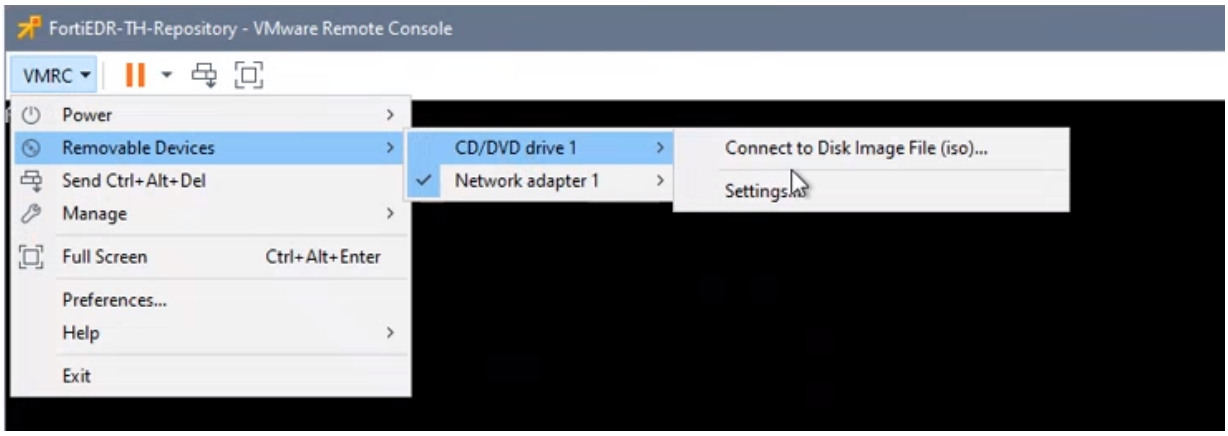


15. Verify the installation is successful by running the `kubectl get nodes` command and checking that the status of *edr-repo-master1* is *Ready*, as shown below. If you installed three nodes, verify that the status of the other two nodes are *Ready* as well.

Installing a FortiEDR Repository software ISO

To install the FortiEDR Repository Software ISO:

1. Launch the *FortiEDR_RepositoryInstaller* ISO file:
   a. From the *VMRC* menu, select *Removable Device > CD/DVD drive 1 > Connect to Disk Image File (iso)*....



b. Select the *FortiEDR_RepositoryInstaller* ISO file and click on *Open*. If the ISO has already been uploaded to the VMware datastore, you can also upload the ISO from there.

If mounting the new ISO appears to freeze the system, check if there is a prompt to disconnect the existing ISO. If yes, select *yes* to disconnect the existing ISO and then try mounting the new ISO again by repeating steps a and b.

2. Run the following command:

```
bash /k3os/system/install_edr2.sh
```

Select *init* (1) for a new installation.

```
mount: /mnt/iso: WARNING: device write-protected, mounted read-only.


Please select action:

1 - init ( install a fresh EDRv2 environment )

2 - update ( update existing EDRv2 environment )

3 - resize ( resize existing EDRv2 environment )
```

The node is being synchronized, which might take 10 to 15 minutes. If you installed three nodes, you will be prompted for the SSH password for each node.

```
***WARNING: The node 10.51.102.2 doesn't have a valid public key, updating the key now...
Warning: Permanently added '10.51.102.2' (ECDSA) to the list of known hosts.
rancher@10.51.102.2's password:
```

Existing virtual machine specifications (CPU and RAM) are being validated. If one is found to be lower than the minimum requirements for proper functioning of the FortiEDR Repository, the following warning appears:

```
ERROR: Current node's hardware spec doest fit minimun requirements:
       min CPU: 16 , currently installed 8
       min RAM: 24 , currently installed 16
```

Wait until the required container images are imported from ISO to the local image storage (might take few minutes).

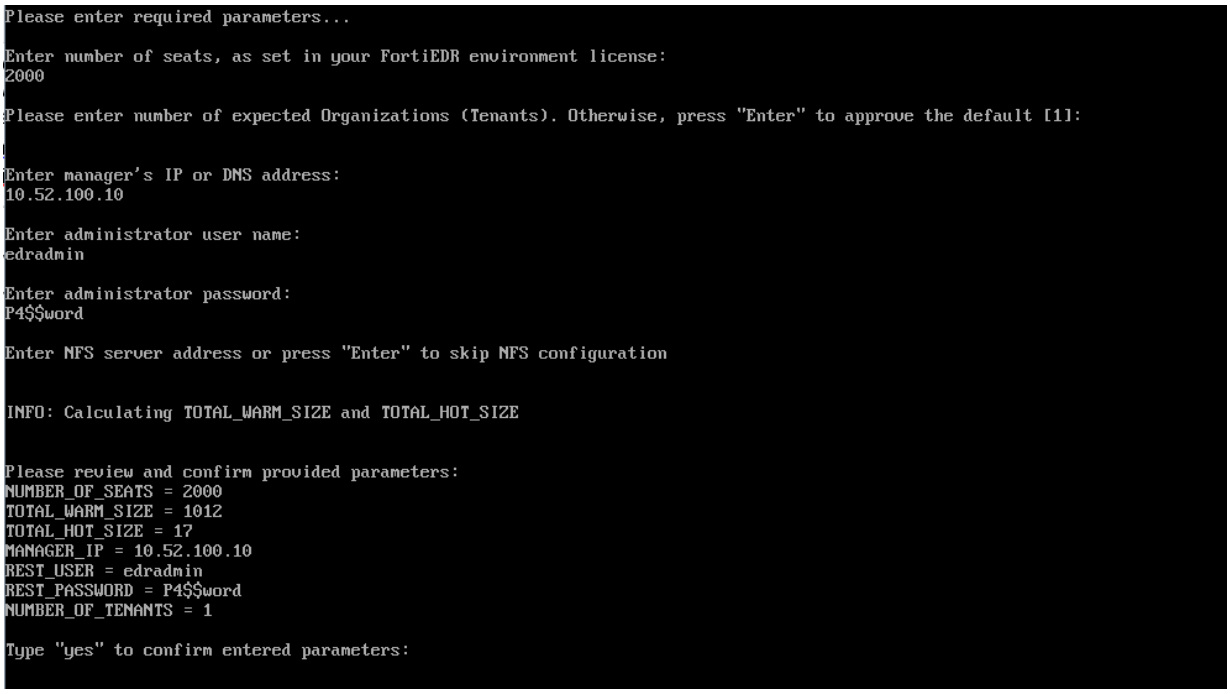
3. Complete the FortiEDR Repository software installation by providing the following parameters:
   - When prompted to enter the *number of seats*, enter the number of seats of your FortiEDR License (workstations and servers).
   - When prompted to specify whether the repository will be used by a *Managed Security Service Provider (MSSP)*, enter `yes` if you are going to define organizations, or `no` if you are not.

```
Please enter number of expected Organizations (Tenants).
1
Set MAX_ACCOUNT_COUNT=50

Enter manager's IP or DNS address:
10.51.102.99

Enter administrator user name:
admin

Enter administrator password:
********

Validating access to manager...
UP

***INFO: Manager is online

***INFO: Manager's version: 5.2.0.2229
```

   - If you entered `yes` in the previous question, provide the number of expected organizations (meaning Tenants).
   - When prompted for the FortiEDR Manager details, provide its IP and the credentials of one of the FortiEDR Console administrators that have Rest API permissions.

Make sure that the Threat Hunting repository does not block outbound traffic to port 443 on Central Manager.

   - Review the displayed configuration. Type *yes* to approve it or if the parameters are not correct, press *Enter* to restart the configuration process. The installation may take several minutes.



Configuring the Threat Hunting Repository Monitoring console

To configure and access the Threat Hunting Repository Monitoring console:

1. When prompted, provide the password to be used for the Threat Hunting Repository monitoring console (Grafana) login. Note that the password should be a combination of letters and digits.
2. When asked whether to enable SMTP alerts, enter yes if you want to receive alert emails triggered by the Threat Hunting Repository monitoring. Otherwise, enter no and skip to step 7.
3. When prompted, provide the following information of the SMTP server:
   a. Details of the SMTP server (IP or FQDN, and port)
   b. Email address to send the alerts
   c. Email sender address
   d. Username and password required for the SMTP server access

4. When prompted, review the provided details and confirm.

```
Set the password to the Threat Hunting Repository monitoring console (Grafana). The username is "admin"
********

Enable SMTP alerts (yes|no)
yes

Please enter SMTP server address (IP/FQDN):
10.51.100.1

PLease enter SMTP server port:
587

Please enter recipient address:
alerts@customer.com

Please enter sender address:
alerts@customer.com

Please enter SMTP user name:
alerts@customer.com

Please enter SMTP password:
*******

Please review and confirm provided parameters:
SMTP_SERVER = 10.51.100.1
SMTP_PORT = 587
RECIPIENT_ADDRESS = alerts@customer.com
SENDER_ADDRESS = alerts@customer.com
SMTP_USER = alerts@customer.com

Type "yes" to confirm entered parameters:
```

Backing up Threat Hunting Repository data

Fortinet recommends that you back up the data stored in the Threat Hunting Repository database by replicating it to a NFS server, which can be used in for disaster recovery.

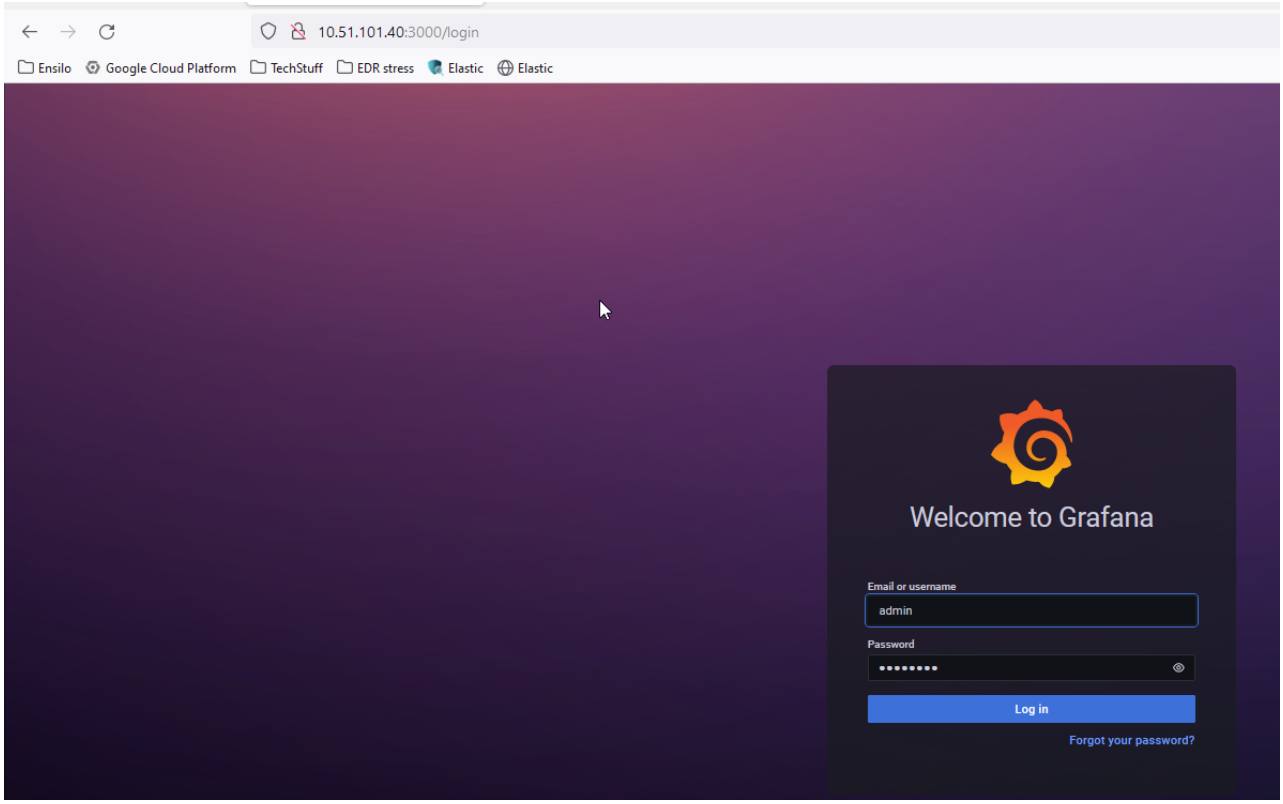
- The size of the NFS storage must be at least 55% of the total size of your Repository storage.
- The time to back up the data depends on the amount of data being copied over from the Repository database to the NFS server.
- When a piece of data is deleted from the Threat Hunting Repository storage due to retention, the backup copy of that piece of data, if exists, is deleted from the NFS server as well.

To enable backup of data, provide details about the backup storage in the CLI:

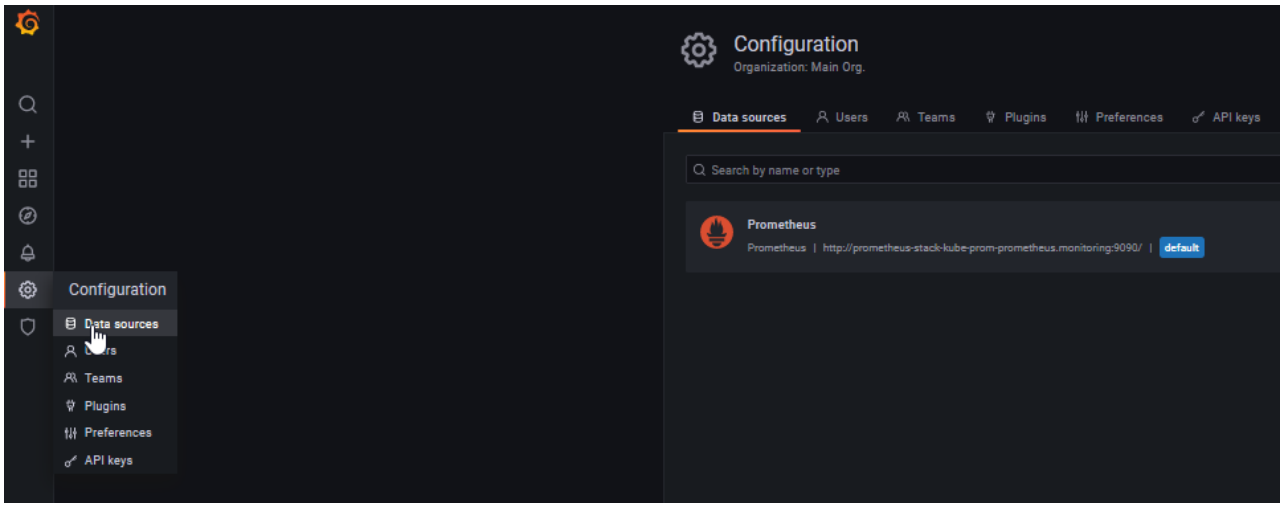
1. At the prompted question, enter yes.
2. When prompted, enter the NFS server address.
3. When prompted, enter the NFS share path to which the data will be replicated.

Activating the Threat Hunting Repository Monitoring console

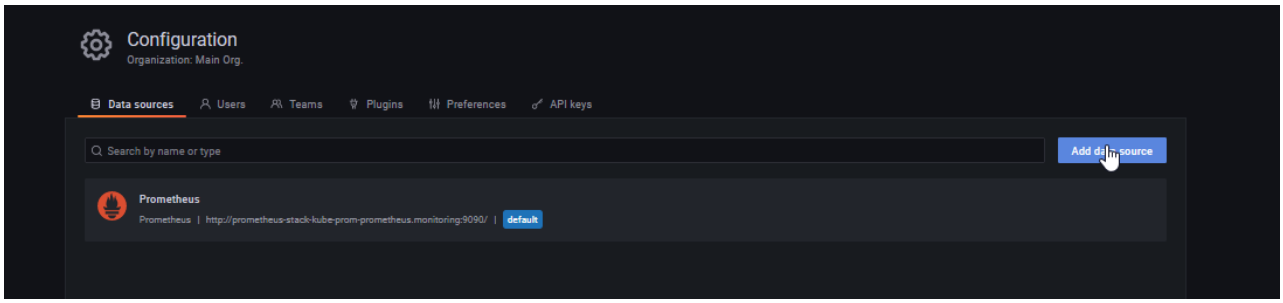
1. Visit `http://<TH IP>:3000`.



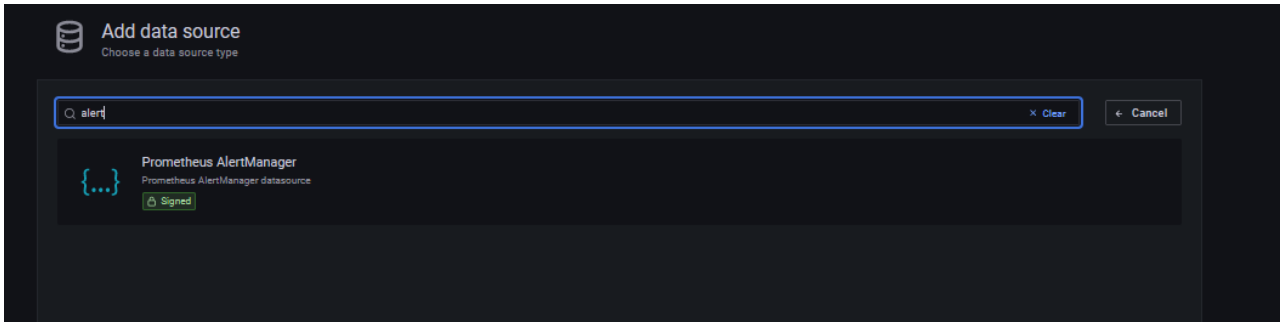
2. Enter the user and password that you provided during the initial installation setup.
3. Go to *Configuration* > *Data sources*.



4. Click *Add data source*.

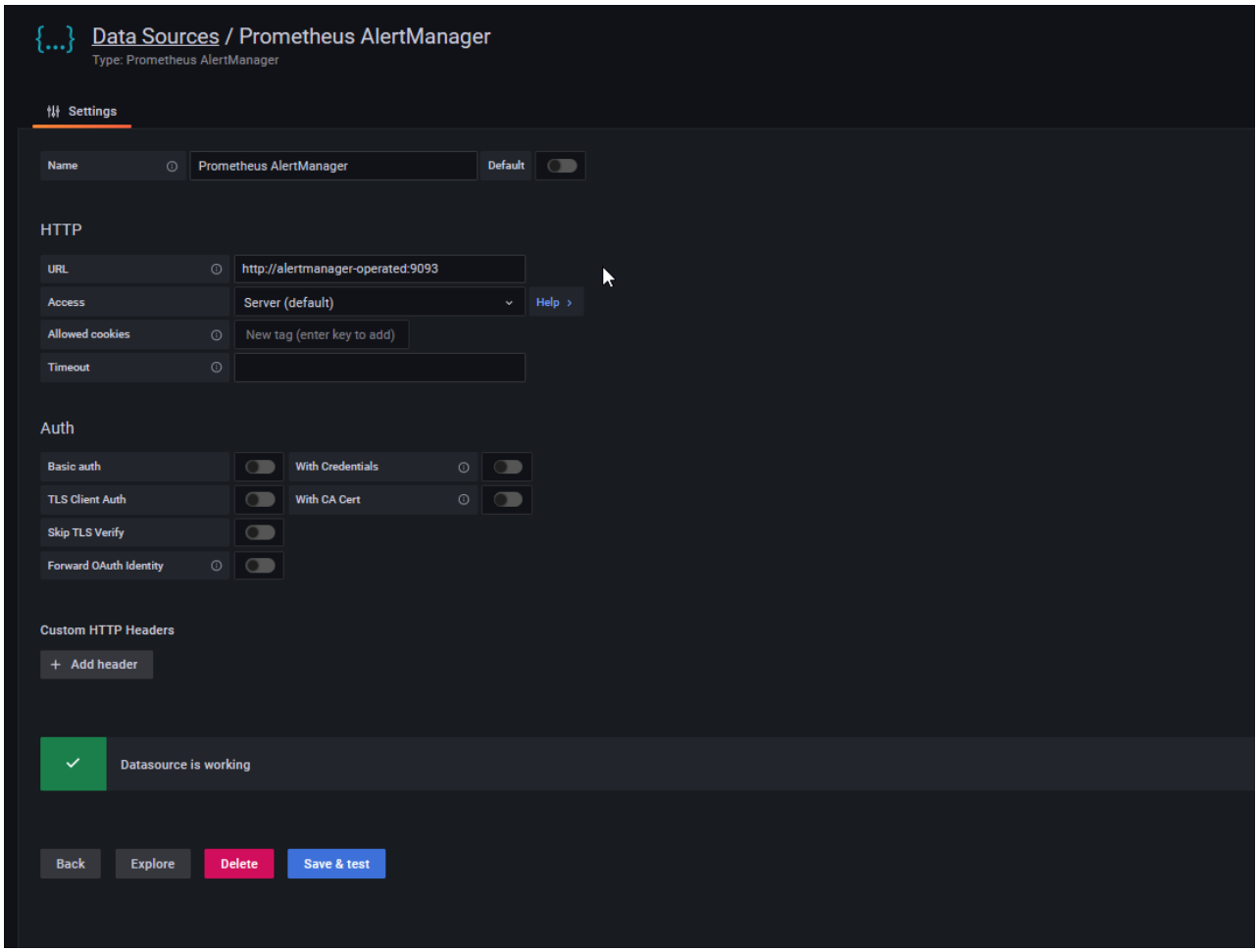


5. Select *Prometheus AlertManager*.

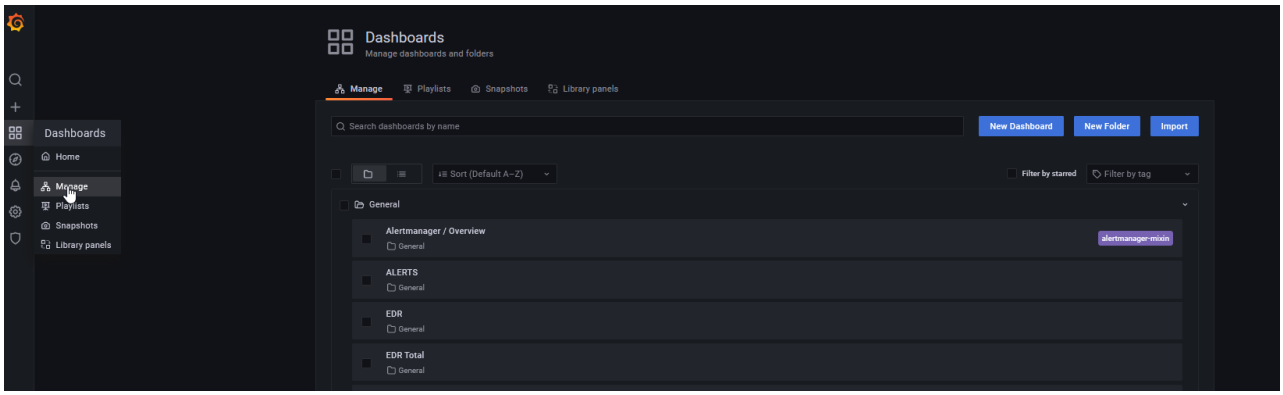


6. In the *URL* field, enter `http://alertmanager-operated:9093`.

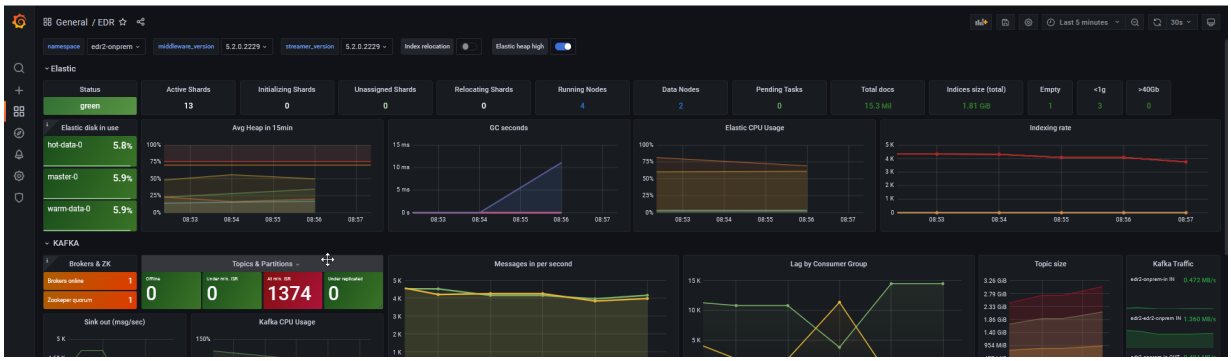
7. Click *Save & test*.



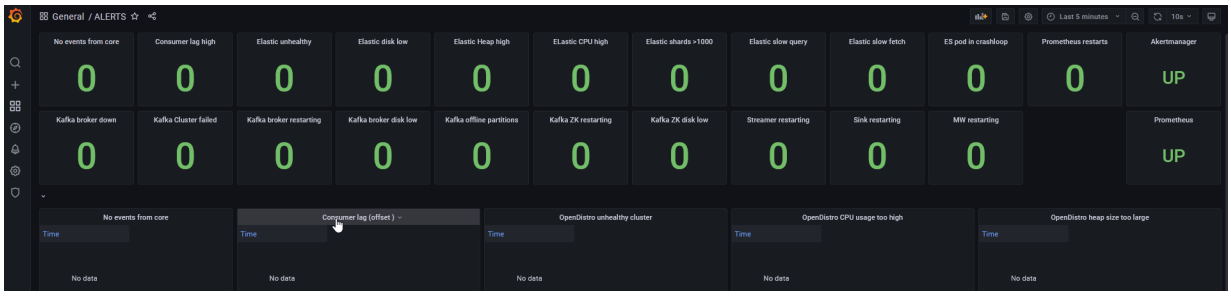
8. Under *Dashboards > Manage*:



- Open the *EDR* dashboard to view the current status of threat hunting.



- Open the *Alerts* dashboard to view alerts triggered by the Threat Hunting Repository monitoring system.



The following table lists all the alerts and the mitigation methods.

Alert	Mitigation
No events from core	Verify that all Cores are an running by using the FortiEDR Manager.

Alert	Mitigation
Consumer Lag (offset)	
OpenDistro Unhealthy Cluster	
OpenDistro CPU usage too high	
OpenDistro heap size too large	
OpenDistro too many shards per node	
OpenDistro slow search query	
OpenDistro slow search fetch	
OpenDistro disk usage	
ES pod in crashloop	
Kafka Offline Partitions	
Kafka broker is down	Contact Fortinet Support.
Kafka cluster failed	
Kafaka broker restart rate high	
Kafka broker disk low	
ZooKeeper disk low	
Streamer restart rate high	
StreamerSink restart rate high	
ZooKeeper restart too often	
Streamer MAX HPA	
Streamer unreached desired HPA	
Middleware restart rate high	

Setting up the FortiEDR reputation server

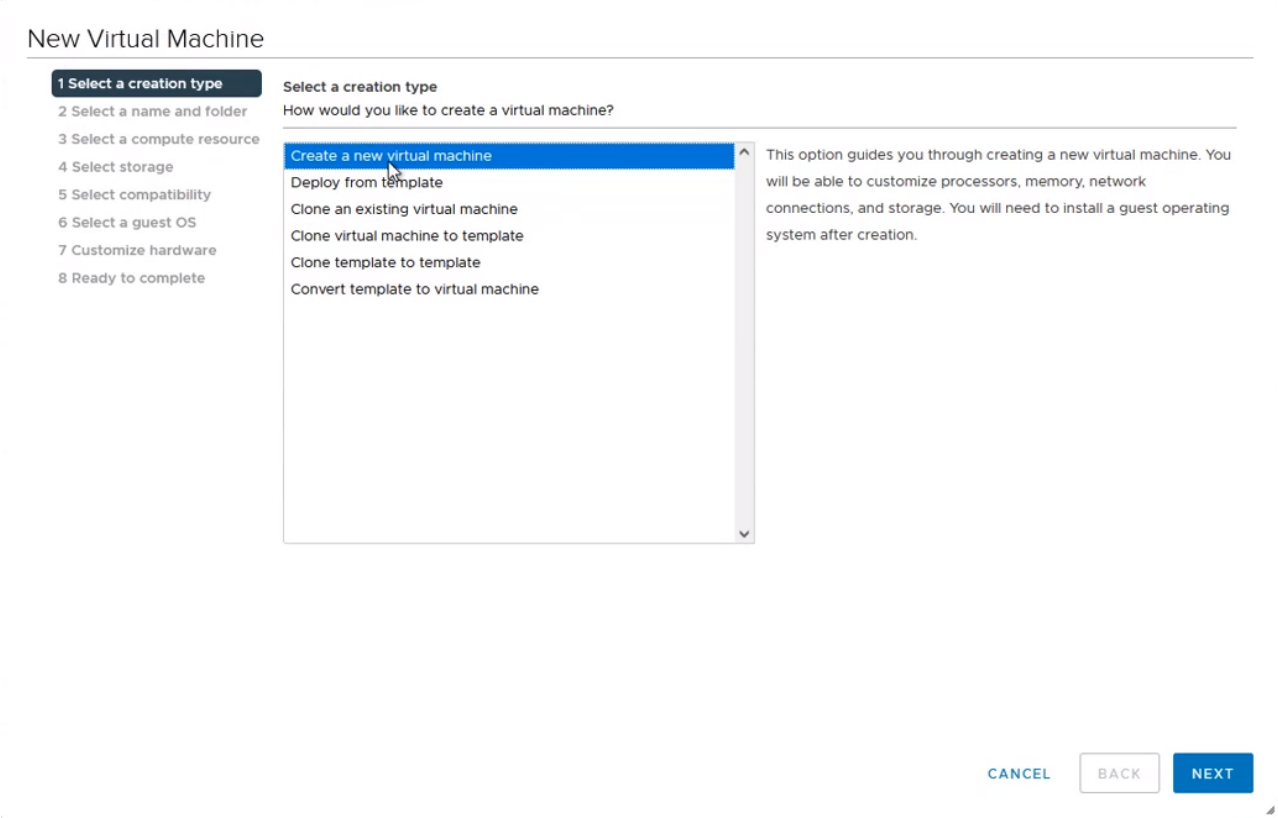
The installation of the reputation service includes the following steps:

1. Creating a Virtual Machine on page 522
2. Installing the reputation service on page 523
3. Configuring the reputation service on page 523

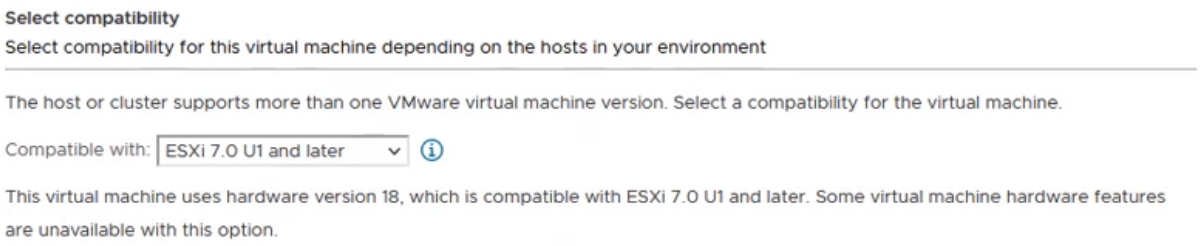
Creating a Virtual Machine

To create a virtual machine:

1. Create a new virtual server. For example, by selecting *File > New Virtual Machine...*, then selecting *Create a new virtual machine* and clicking *NEXT*.



2. Enter the desired *virtual machine name*. For example, *fortiedr-reputation-service* and click *NEXT*.
3. Enter the virtual machine settings, as follows:
   a. In the *Select a compute resource* step, select the resources as needed and click *NEXT*.
   b. In the *Select storage* step, select the storage where the virtual machine disk should be stored on and click *NEXT*.
   c. In the *Select Compatibility* step, select your ESXi version and click *NEXT*.



   d. At the *Select a guest OS* step, select *Linux* in the *Guest OS family* field and select *Ubuntu Linux (64-bit)* in the *Guest OS version* field.

e. In the *Customize hardware* step, select the minimum requirements as specified in system requirements in Appendix C – ON PREMISE DEPLOYMENTS on page 472 and attach a network interface.

4. Select *Finish* to complete the creation of the virtual machine.

Installing the reputation service

To install the FortiEDR reputation service:

1. Right-click the new VM and select *Open Remote Console*.
2. Select *Manage > Virtual Machine Settings*.
3. In the *Hardware* tab, select the *CD/DVD* option and then select the *Use ISO image file* option on the right.
4. Click the *Browse* button and select the ISO file provided by Fortinet for the FortiEDR Reputation Server. Click *OK*.

Another option instead of completing the two steps described above is to upload the ISO from the VMWare datastore (this is possible if the ISO has already been uploaded there).

5. Start the virtual machine and wait until installation is complete.
6. Log into the virtual machine in order to continue the installation process.
   `Login: root`
   Change the root password, by entering any password you want. Then re-type it. The password must be strong enough according to Linux standards.

Configuring the reputation service

To configure the FortiEDR reputation service:

1. In the VM CLI, enter `fortiedr config`.
2. At the device role prompt, click *Next*.
3. At the prompt, enter your `hostname` and click *Next*. (Note: This can be any hostname)
4. A list of network interfaces on this virtual machine displays. At the *Pick your primary interface* prompt, select the primary interface to reach the Central Manager server, and click *Next*.
5. At the *Do you want to use DHCP* prompt, select *No* to configure the IP of this virtual machine manually, and then click *Next*.
6. At the prompt, enter the IP address of the machine that you are installing. Use the following format: `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
7. At the prompt, enter the default gateway and click *Next*.
8. At the *Please set your DNS server* prompt, enter a valid IP address and click *Next*. Use the following format:
   `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
9. At the management prompt, enter the Central Manager IP address, which must be reachable from the reputation server.

10. Enter the credentials of an admin user with REST API permissions in the FortiEDR Central Manager. If no such user exists, you must first create one by following the steps in Users on page 359.
11. Enter the Central Manager SSH port (default is 22).
12. Enter the Central Manager SSH credentials, which are the root username and password you created when Setting up a VM to be the FortiEDR Central Manager on page 478.
13. At the *Do you want to enable web-proxy ?* prompt, if the service will communicate via a proxy when accessing the web (such as the FortiEDR Cloud Service (FCS)), select *Yes* and then enter the IP and port of the proxy. Otherwise, select *No*.
14. At the *Please set the date* prompt, verify the date and click *Next*. The installer automatically presents the current date. You can change this date, if necessary.
15. At the *Please set your Time* prompt, set the time and click *Next*.
16. At the prompt, select the timezone and country in which the server is being installed.
17. Wait a few moments while the installation processes, until you see the Installation completed successfully message.
18. Run `fortiedr status` to validate that the reputation service is running. Alternatively, go to *Administration* > *Settings* > *Reputation Service* and verify the reputation service is listed.

Setting up the FortiEDR Core

This topic includes the following sections:

- Prerequisites on page 524
- Installing the FortiEDR Core on page 525

Prerequisites

The workstation, virtual machine or server on which the FortiEDR Core will be installed, must meet the following requirements:

- Complies with the requirements described in the *System Requirements* section in Appendix C – ON PREMISE DEPLOYMENTS on page 472.
- Has connectivity to a Local Area Network (for wired users) or a Wireless Network (for wireless users). If there is no connectivity, consult your IT support person.
- Has connectivity to the FortiEDR Aggregator. You can check this by browsing to the Aggregator's IP address. For problems connecting, see Troubleshooting on page 458.
- Has connectivity to the FortiEDR Reputation Server at `reputation.cloud.ensilo.com`.
- If the FortiEDR Core is deployed on your organization's premises (on-premises) and you use a web proxy to filter requests, then before running the installer, set the system proxy to work with an HTTPS connection, as follows:
  - Edit the file `/etc/environment` to have a proxy address configuration, https_proxy or PAC address. For example: `https_proxy=https://192.168.0.2:443`
    (for PAC): `https_proxy=pac+http://192.168.200.100/sample.pac`, where the `sample.pac` file contains an HTTPS address of the proxy.

- If the definitions of the system proxy are placed somewhere other than `/etc/environment`, then:
  - Copy the definitions to the file `/etc/environment`. Note that this affects all processes on the Linux system.
  - Define a specific environment variable for the FortiEDR Linux Core with the name *nslo_https_proxy* at the file `/etc/environment`
    For example: `nslo_https_proxy=https://192.168.0.2:443`
    (for PAC): `nslo_https_proxy=pac+http://192.168.200.100/sample.pac`

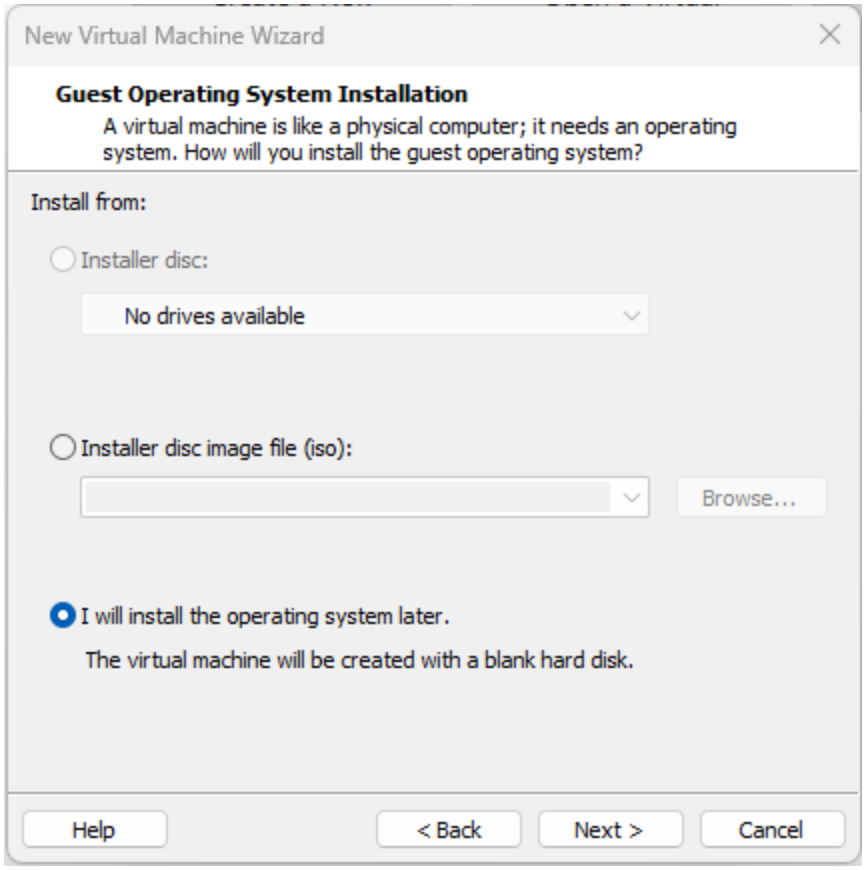
For more details about installing a Core in a multi-organization environment, see the *Core Registration* section in Component registration in a multi-organization environment on page 429.

Installing the FortiEDR Core

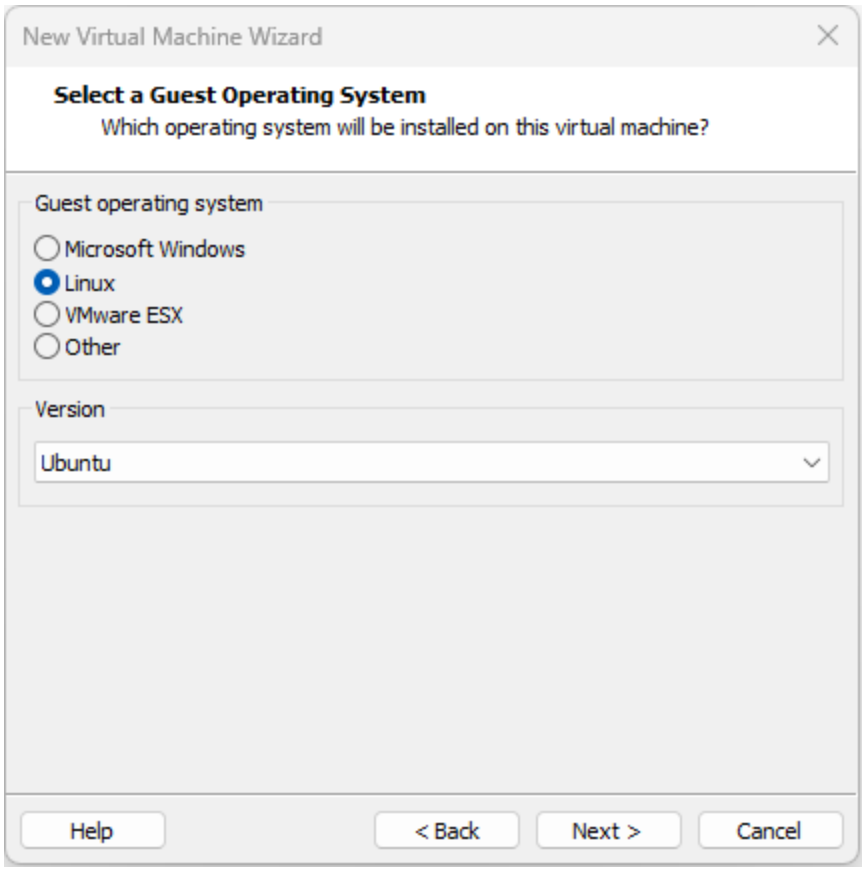
The following describes how to install the FortiEDR Core:

1. Create a new virtual server by selecting *File* > *New Virtual Machine*.
2. Select the *Typical* option and click *Next*.

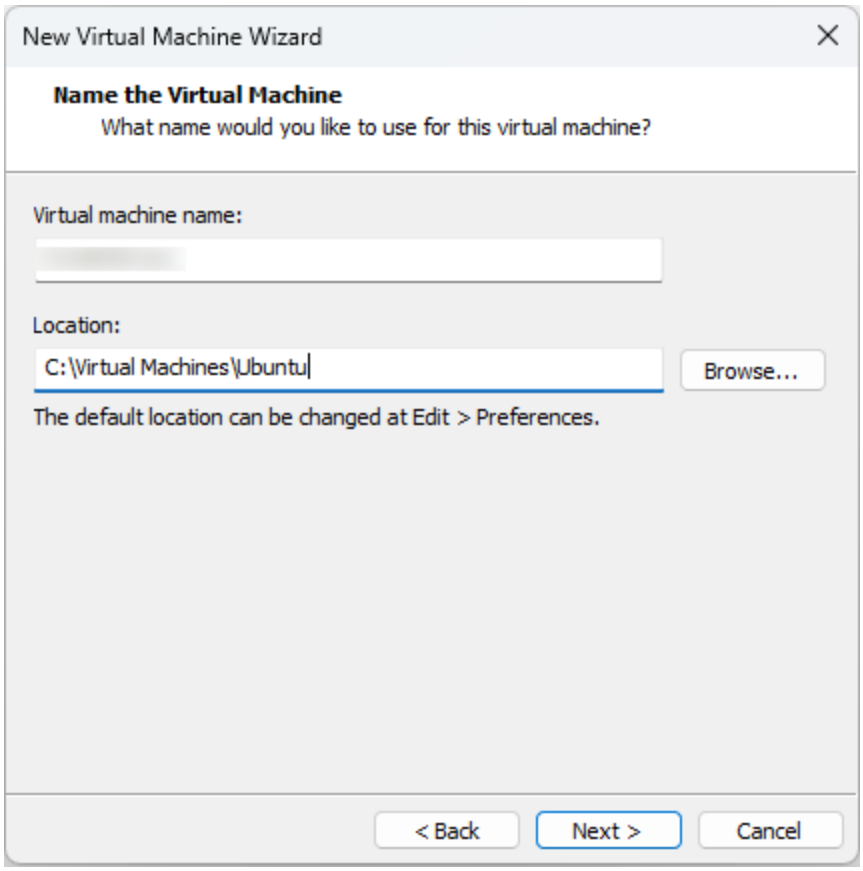
3. Select the *I will install the operating system later* option and click *Next*.



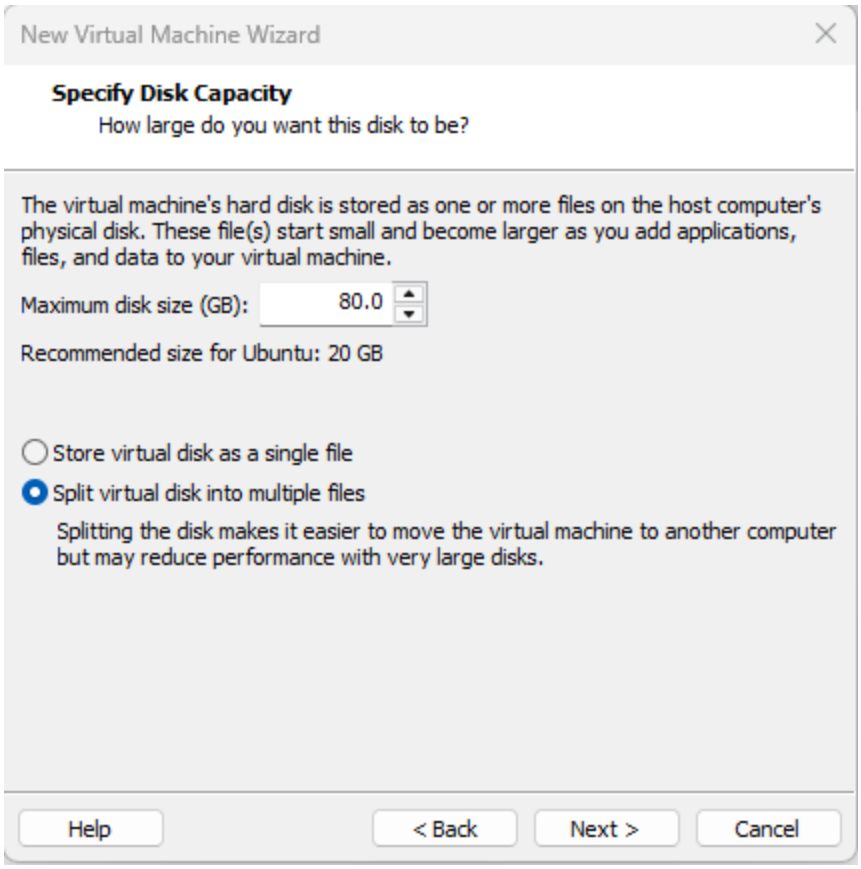
4. Select the *Linux* radio button. In the *Version* field, select *Ubuntu* and click *Next*. Alternatively, you can select a different generic Linux 64-bit in the *Version* field.



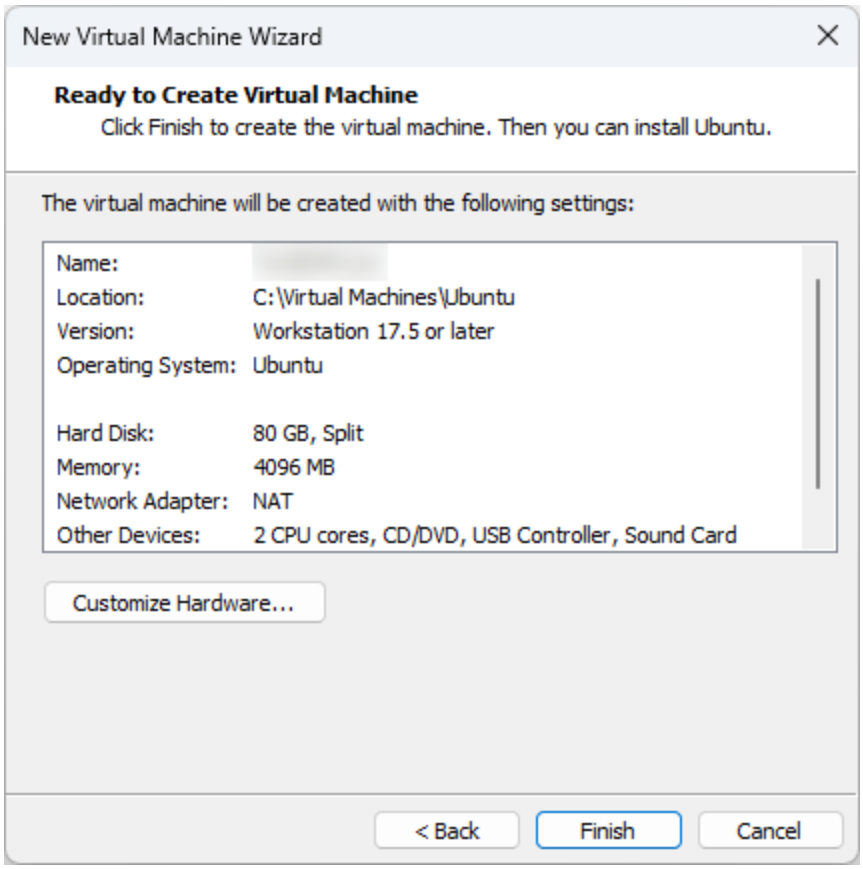
5. Specify a name for the virtual machine such as *FortiEDRCore* and the location in which to store the provided ISO file and click *Next*.



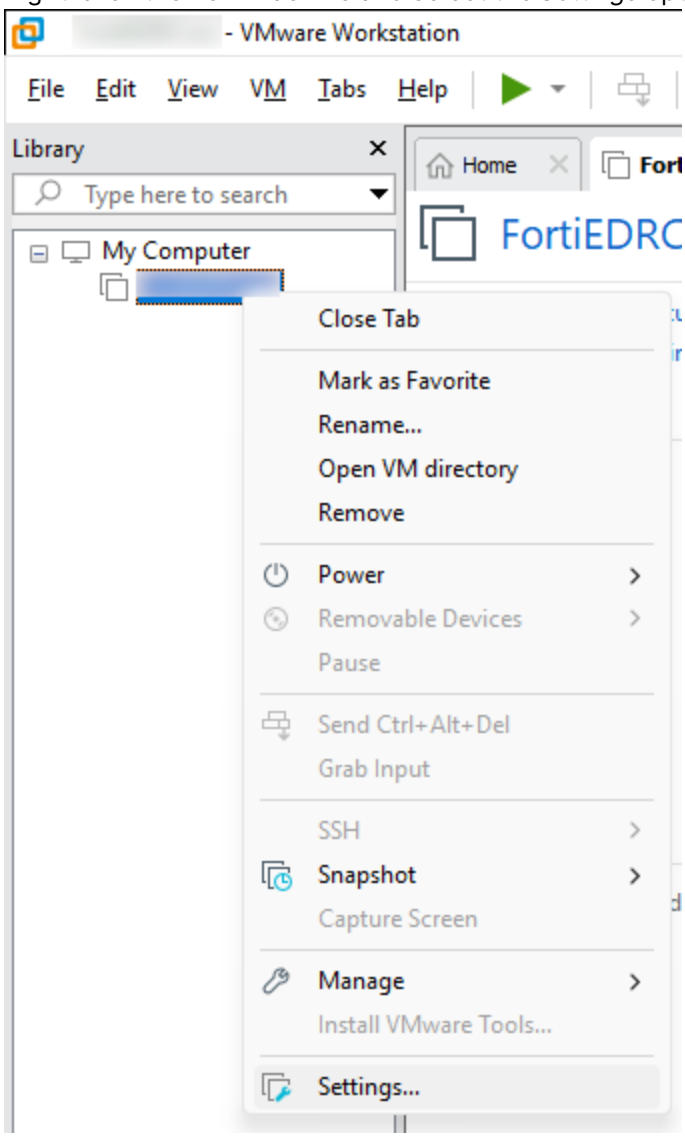
6. Change the *Maximum disk size* to `80` GB, leave the default option as *Split virtual disk into multiple files* and click *Next*.


New Virtual Machine Wizard
Specify Disk Capacity
How large do you want this disk to be?
The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.
Maximum disk size (GB):
80.0
Recommended size for Ubuntu: 20 GB
Store virtual disk as a single file
Split virtual disk into multiple files
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.
Help
< Back
Next >
Cancel

7. Click *Finish*.

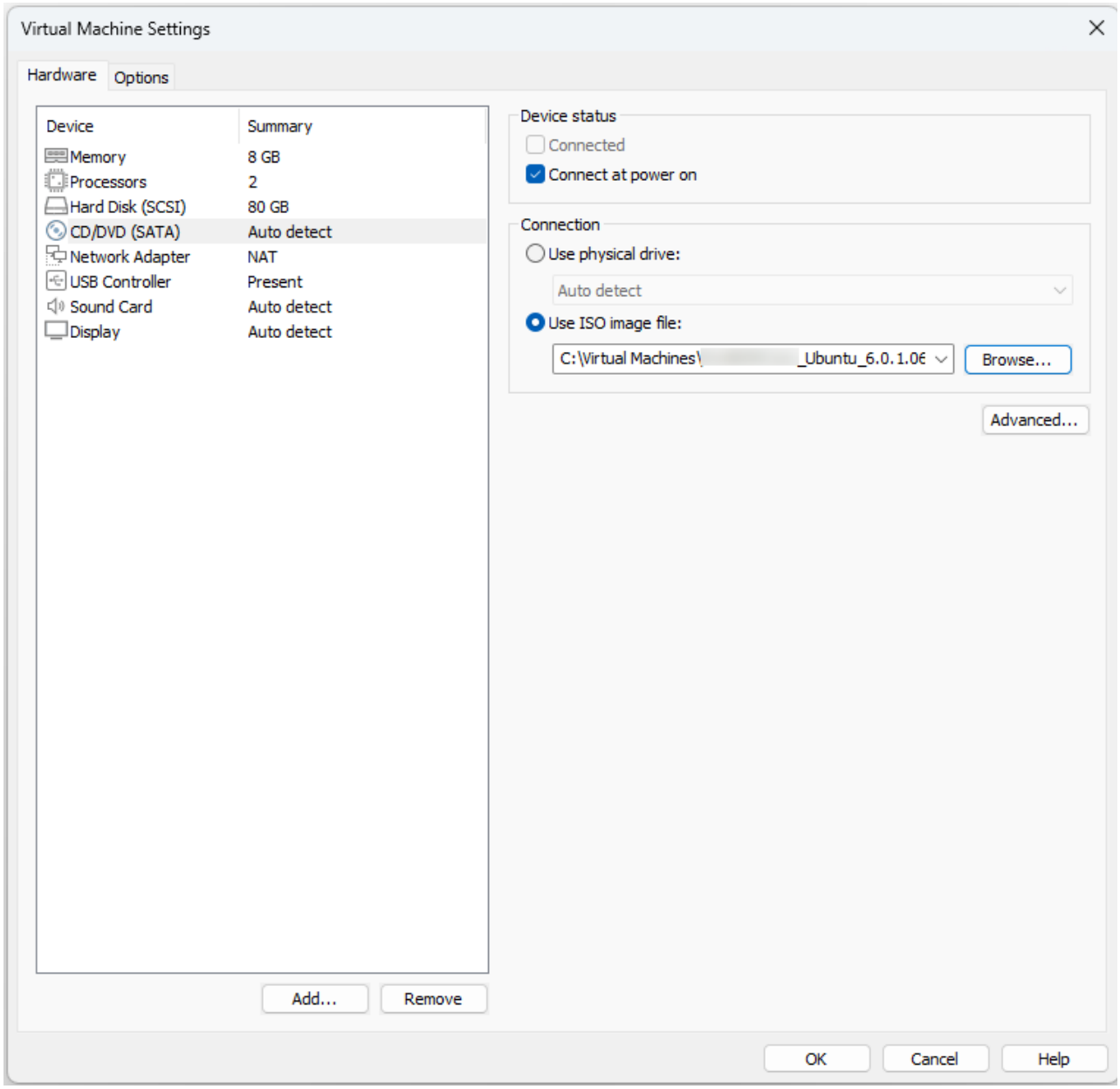


8. Right-click the new machine and select the *Settings* option.



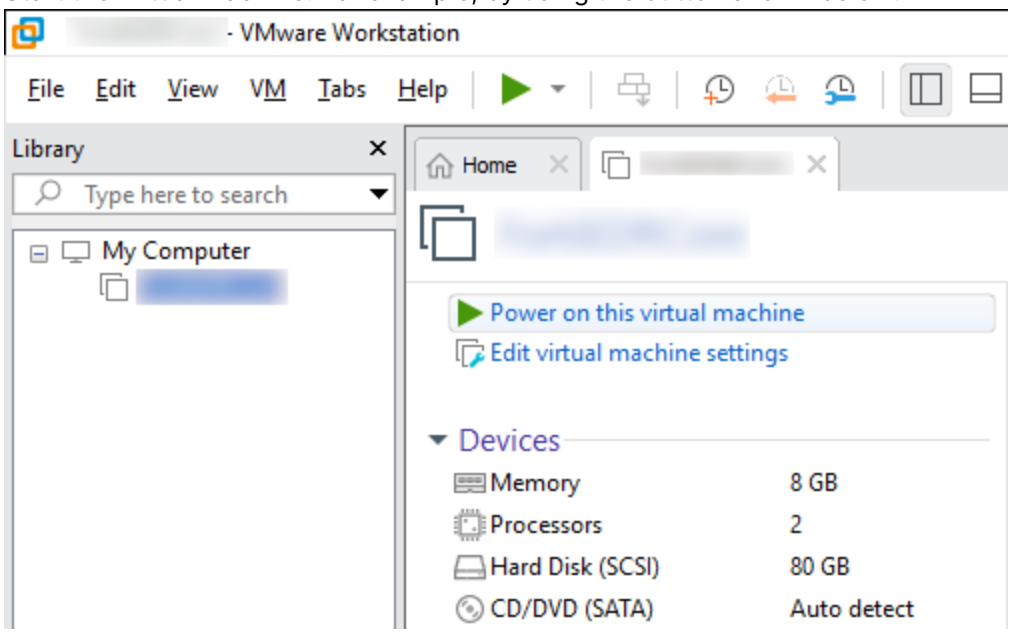
9. Select the *Memory* option and change the RAM to at least 8 GB.
10. Select the *Processors* option and change the value to a total of at least two CPU Cores.

11. Select the *CD/DVD* option and then select the *Use ISO image* file option on the right.



12. Click the *Browse* button and select the ISO file provided by Fortinet for the FortiEDR Core. Click *OK*.

13. Start the virtual machine. For example, by using the button shown below:



The virtual machine automatically starts the installation process, which may take a few minutes.

14. Wait until a success message is displayed requesting that you reboot.
15. Reboot the virtual machine.
16. Log into the virtual machine in order to continue the installation process.
    `Login: root`
    Change the root password, by entering any password you want and then retype it. The password must be strong enough according to Linux standards.
17. Enter `fortiedr config`.
18. At the prompt, select the role of the virtual machine. For this installation, select *CORE* and click *Next*.

After the installation of the Core, you can configure the functionality of the Core as *Core only*, *Jumpbox*, or *Both* in the *INVENTORY* > *System Components* tab of the Central Manager.

19. At the prompt, enter your hostname (any hostname) and click *Next*.
20. At the prompt, enter the Organization name if this Core is added to a multi-tenant environment and should work only with one organization. For a non-multi-tenant setup, leave the organization name empty. Click *Next*.
21. At the prompt, enter the registration password.

If this is a multi-tenant setup and this Core is to belong only to a specific organization, then the password should match the registration password that was provided upon creating that organization (listed under *ADMINISTRATION* > *ORGANIZATIONS* tab of the FortiEDR Central Manager).

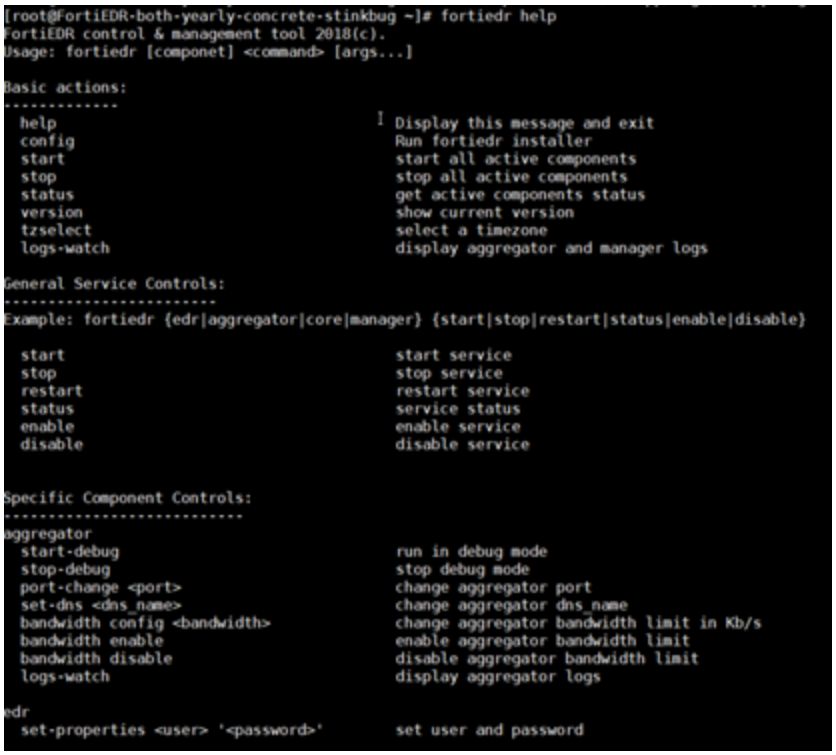
22. At the prompt, enter the Aggregator external IP address.
23. At the prompt, enter this Core machine's external IP address without the port.

24. A list of network interfaces on this virtual machine displays. At the *Pick your primary interface* prompt, select the interface to be used as the primary network interface through which all FortiEDR Cores and FortiEDR Collectors will reach this server, and then click *Next*.
25. At the *Do you want to use DHCP* prompt, do one of the following:
    a. Select *yes* to use DHCP and click *Next*. Proceed to step 29 below.
    b. Select *no* to configure the IP of this virtual machine manually, and then click *Next*. Perform steps 26 through 35 below.
26. At the prompt, enter the IP address of the machine that you are installing.
    Use the following format: `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
27. At the prompt, enter the default gateway and click *Next*.
28. At the *Please set your DNS server* prompt, enter a valid IP address and click *Next*.
    Use the following format: `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
29. At the prompt, select *no* for debug mode.
30. At the *Please set the date* prompt, verify the date and click *Next*. The installer automatically presents the current date. You can change this date, if necessary.
31. At the *Please set your Time* prompt, set the time and click *Next*.
32. At the prompt, select the timezone and country in which the server is being installed.
33. At the *Do you want to enable Web proxy* prompt, select one of the following:
    - *yes*—If you select *yes*, you must manually edit the `/etc/environment` file to configure the proxy address, which can be https_proxy (such as `https_proxy=https://192.168.0.2:443`) or PAC address (such as `https_proxy=pac+http://192.168.200.100/sample.pac`, where `sample.pac` is the file that contains an HTTPS address of the proxy.
    - *no* (default)
34. If you selected *yes* in the previous step, at the *Do you want to exclude proxy configuration for Aggregator communication?* prompt, if the Aggregator is also installed on-premise, select *yes* to ignore the proxy for Core and Aggregator communication. Otherwise, select *no*.
35. Wait a few moments while the installation processes, until you see the *Installation completed successfully* message.
36. To verify that core installation succeeded, use the `fortiedr status` and `fortiedr version` commands.
37. In the *Administration > Deployment > System Components* tab of the Central Manager, verify that the FortiEDR Core details are listed and configure the functionality of the Core as *Core only*, *Jumpbox*, or *Both*.

FortiEDR CLI commands

The following describes additional commands that you can perform in the FortiEDR Core, Repository Server, FortiEDR Central Manager, or FortiEDR Aggregator CLI.

At the prompt, type `fortiedr` or `fortiedr help` to display them.



Command	Description
Basic actions	
`help`	Display this message and exit.
`config`	Run FortiEDR installer.
`start`	Start all active components.
`stop`	Stop all active components.
`status`	Get active components status.
`version`	Show current version.
`tzselect`	Select a timezone.
`logs-watch`	Display Aggregator and Central Manager logs.
General service controls	
`start`	Start service.
`stop`	Stop service.
`restart`	Restart service.
`status`	Get service status.
`enable`	Enable service.

Command	Description
`disable`	Disable service.
Example: fortiedr {edr|aggregator|core|manager|activemq} {start|stop|restart|status|enable|disable}	
Specific component controls	
Aggregator	
`start-debug`	Run in debug mode.
`stop-debug`	Stop debug mode.
`port-change <port>`	Change Aggregator port.
`set-dns <dns_name>`	Change Aggregator DNS name.
`bandwidth config <bandwidth>`	Change aggregator bandwidth limit (in Kb/s).
`bandwidth enable`	Enable aggregator bandwidth limit.
`bandwidth disable`	Disable aggregator bandwidth limit.
`logs-watch`	Display Aggregator logs.
activemq	
`queue-stat <queue>`	Provides detailed metrics about the activemq queues (queue name is optional)
EDR	
`set-properties <user> '<password>'`	Set user and password.
`start-debug`	Run in debug mode.
`stop-debug`	Stop debug mode.
Central Manager	
`start-debug`	Run in debug mode.
`stop-debug`	Stop debug mode.
`load-content <password>`	Load dynamic content.
`load-extra-config <password>`	Load extra configuration.
`load-ssl-certificate <user> <password> <certificate-location> <privateKeyLocation> <privateKeyPassword>`	Load new SSL certificate.
`set-smtp-server <ip>`	Set SMTP server in `application-customer.properties`.
`reset-password <username>`	Reset web password for a specific user.
`disable-edr`	Disable FortiEDR in the Central Manager.
`enable-edr`	Enable FortiEDR in the Central Manager.

Command	Description
`set-edr-ip <ip>:<port>`	Set FortiEDR server IP address and port.
`set-edr-password <password>`	Set FortiEDR password.
`set-edr-user <user>`	Set FortiEDR user.
`logs-watch`	Display Central Manager logs.

Upgrading FortiEDR components

This section describes how to upgrade the components in the FortiEDR system.

Upgrading to a newer build number (major.minor.patch.build) can be done in any order. However, upgrading to newer major/minor versions (major.minor.patch.build) should be done top-down in the following order:

1. Upgrading the Central Manager on page 611
2. Upgrading the Aggregator on page 611
3. Upgrading the Threat Hunting Repository on page 612
4. Upgrading the Core on page 613
5. Upgrading the Collector on page 73

Upgrading the Central Manager

The required upgrade file is provided to you by Fortinet. Use it to perform the procedure below.

1. Copy the `FortiEDRInstaller_Ubuntu_7.2.3.xxxx.x` file to the Central Manager machine. You can place the file anywhere on the Linux machine. For example, `FortiEDRInstaller_Ubuntu_7.2.3.0097.x`.
2. Change the *chmod 755* permission and the *patch* name in order to enable you to run the upgrade, as shown below:
   ```
   [root@dan ~]# chmod 755 FortiEDRInstaller_Ubuntu_7.2.3.0097.x
   ```
3. Run the patch, as shown below:
   ```
   [root@dan ~]# ./FortiEDRInstaller_Ubuntu_7.2.3.0097.x
   ```
4. Wait for the upgrade to complete, as shown below:
   ```
   FortiEDR installation 7.2.3.0097.x finished successfully
   [root@dan ~]#
   ```

Upgrading the Aggregator

The required upgrade file is provided to you by Fortinet. Use it to perform the procedure below.

1. Copy the `FortiEDRInstaller_Ubuntu_7.2.3.xxxx.x` file to the Aggregator machine. You can place the file anywhere on the Linux machine. For example, `FortiEDRInstaller_Ubuntu_7.2.3.0097.x`.

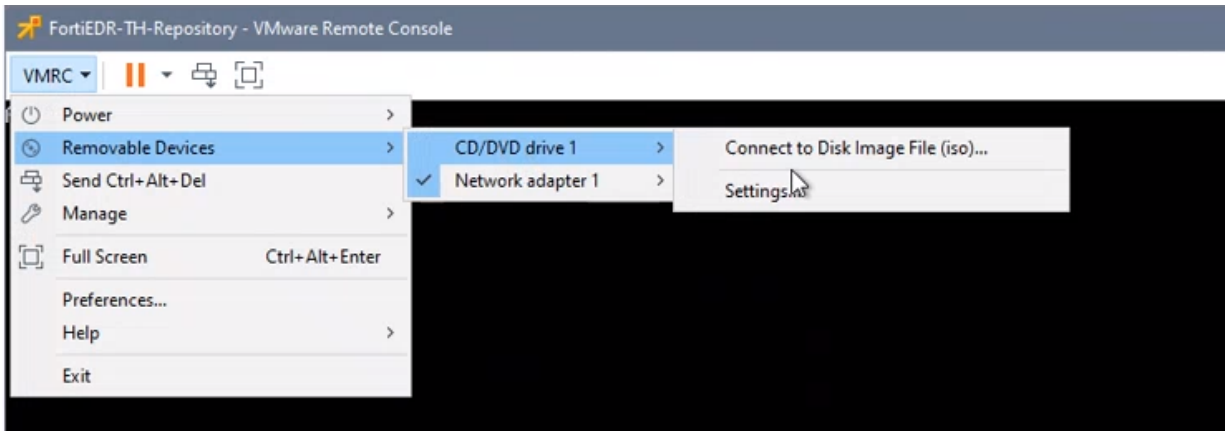
2. Change the *chmod 755* permission and the *patch* name in order to enable you to run the upgrade, as shown below:
   `[root@dan ~]# chmod 755 FortiEDRInstaller_Ubuntu_7.2.3.0097.x`
3. Run the patch, as shown below:
   `[root@dan ~]# ./FortiEDRInstaller_Ubuntu_7.2.3.0097.x`
4. Wait for the upgrade to complete, as shown below:
   `FortiEDR installation 7.2.3.0097.x finished successfully`
   `[root@dan ~]#`

Upgrading the Threat Hunting Repository

Before you begin, ensure the CPU and memory of the repository are at least 1.5 times of the defined Threat Hunting specifications in Appendix C – ON PREMISE DEPLOYMENTS on page 472. You can reduce the CPU and memory back to the specifications once the upgrade is completed.

To upgrade the Threat Hunting Repository:

1. Launch the *FortiEDR_RepositoryInstaller* ISO file of the new Threat Hunting Repository version:
   a. From the *VMRC* menu, select *Removable Device > CD/DVD drive 1 > Connect to Disk Image File (iso)*....



If an existing ISO is still connected, select *Removable Device > CD/DVD drive 1 > Disconnect [ISO path]* before connecting to the new ISO file.

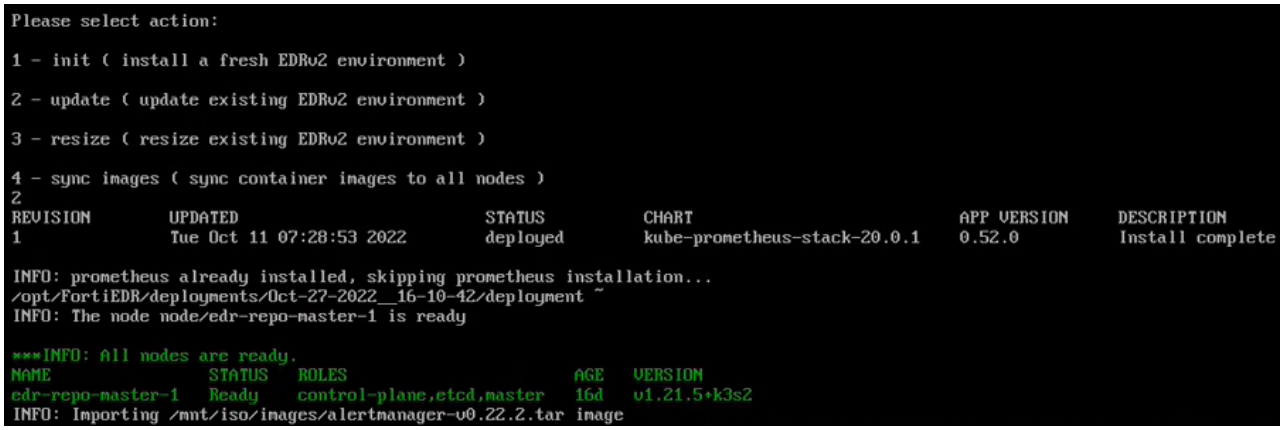
   b. Select the *FortiEDR_RepositoryInstaller* ISO file for the new version and click on *Open*.

Another option instead of the two steps described above is to upload the ISO from the VMWare datastore (this is possible if the ISO has already been uploaded there).

2. Start an SSH session to the repository machine, log in with user `rancher`, and run the following command:

```
sudo su -

bash /k3os/system/install_edr2.sh
```

Select *update* (2) to upgrade the Threat Hunting Repository.



The node is being updated, which might take 8 to 10 minutes.

3. Complete the FortiEDR Repository software upgrade by providing the following parameters:
   - When prompted for the FortiEDR Manager details, provide its IP and the credentials of one of the FortiEDR Console administrators with Rest API permissions. See Users on page 359.
   - When prompted for the primary DNS server address, provide the primary DNS server address for the Threat Hunting Repository.
   - When asked whether to set additional DNS servers, enter `yes` and provide an alternative DNS address for the Threat Hunting Repository if needed. Otherwise, enter `no` to proceed.

     Fortinet recommends that you set up one additional DNS server in case the primary DNS server fails.

   - Enter the password of the FortiEDR Console administrator with Rest API permissions. See Users on page 359.
   - When asked if you have a dedicated Aggregator VM, enter `yes` if you installed the Aggregator on a separate VM than the Central Manager, and you will then be prompted to provide the Aggregator details. Otherwise, enter `no` to proceed.
4. Wait for the configuration to complete.
5. Repeat step 1-4 on each additional Threat Hunting Repository nodes you may have.
6. Verify the upgrade is successful by opening the Central Manager and checking the version information under the *INVENTORY* > *System Components* > *REPOSITORIES* tab.

Upgrading the Core

1. Copy the `FortiEDRCoreInstaller_x.x.x.x.x` file to the Core machine. You can place the file anywhere on the Linux machine. For example, `FortiEDRCoreInstaller_6.0.1.x.y`.

2. Change the *chmod 755* permission and the *patch* name in order to enable you to run the upgrade, as shown below:
   ```
   [root@dan ~]# chmod 755 FortiEDRCoreInstaller_6.0.1.x.y
   ```
3. Run the patch, as shown below:
   ```
   [root@dan ~]# ./FortiEDRCoreInstaller_6.0.1.x.y
   ```
4. Wait for the upgrade to complete, as shown below:
   ```
   FortiEDR patch 6.0.1.x.y finished
   [root@dan ~]#
   ```

Appendix D – On-premise deployment for air-gapped environments

This chapter describes how to set up the FortiEDR backend components for on-premise deployments in air-gapped environments. Before you start, make sure that on-premise air-gapped deployment is the most suitable option for you.

System requirements

The following tables lists the system requirements of each backend component. Make sure that all devices, workstations, virtual machines and servers on which a FortiEDR backend component will be installed comply with those requirements.

Component	Central Manager	Aggregator [1]	Threat Hunting Repository	Core[2]	Reputation Server DB	Reputation Service
Processor	Intel or AMD x86 (64-bit)					
Number of CPUs	4	4	Varies by number of seats and period of required Threat Hunting data retention. Refer to the Threat Hunting Repository CPU, Physical Memory, and Disk Space Requirements on page 545 section for requirements for one month of data retention for the extensive profile.	• 4 for Core • 2 for Core running as a Jumpbox The following CPUs are unsupported: • E5-2440 • E5-2650 • E5-2660 • E5-2690 • E5-2699	4	8
Physical Memory	16 GB	16 GB		• 16 GB for Core • 8 GB for Core running as a Jumpbox	16 GB	32 GB
Disk Space	500 GB, SSD	80 GB		• 250 GB SSD for Core • 50 GB (non-	512 GB, SSD	120 GB, SSD

Component	Central Manager	Aggregator [1]	Threat Hunting Repository	Core[2]	Reputation Server DB	Reputation Service
				SSD) for Core running as a Jumpbox For a Threat Hunting license, each 1000 additional Collectors above the first 1000 require an additional 45 GB of disk space.		
ISO Image OS	Ubuntu 22.04		ESXi 7.0	Ubuntu 22.04		

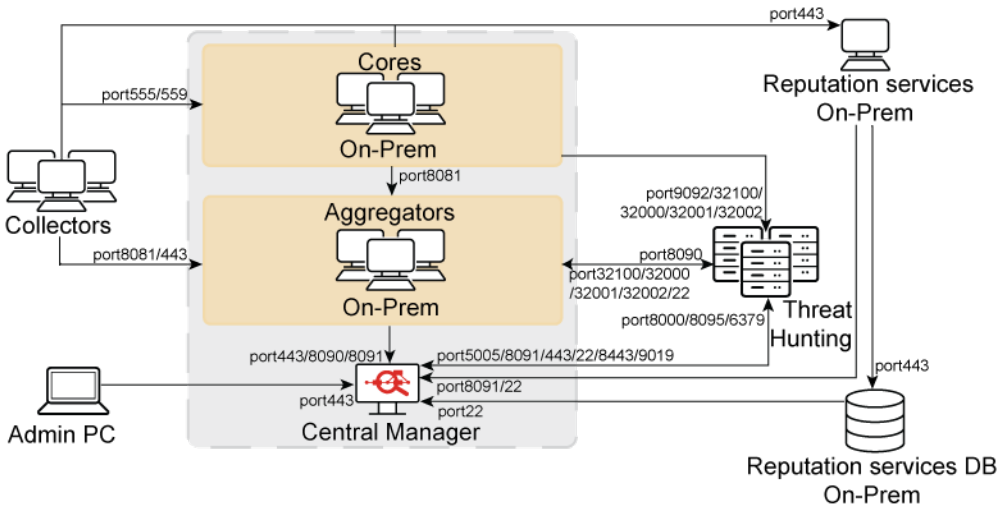
[1]If organizations will be defined and the number of Collectors exceeds 10000, set up an additional FortiEDR Aggregator VM on the top of the initial one.

[2]Refer to the following guidelines to determine the number of Cores you need to set up:

- Set up a separate Core for each Aggregator.
- For every additional 5000 Collectors, set up at least one additional Core. The number of additional Cores required depends on the amount of Threat Hunting events data, which relates to the Data Collection profile, number of servers, etc.
- You can set up a maximum of 50 Cores.

Network ports

Refer to the following image or table for the port information for communication between different components. Ensure that these ports or destination servers are not blocked by your firewall product (if one is deployed) and can be accessed by the corresponding component. You must also ensure that network ranges `10.42.x.x` and `10.43.x.x` are not used by any device.



Source	Destination	Port	Purpose
Collector	Aggregator	8081	Sending events, status, etc
		443	Sending events, status, etc, only when a custom port is used
	Core	555	Collector to Core communication without SSL
		(Core 5.2.2 or later) 559	Collector to Core communication with SSL enabled
	(Windows Collector 5.2.5.0052 or later) Reputation services (on-premise)	443	Sending requests for reputation data.
Core	Aggregator	8081	Core registration
	Threat Hunting Repository	9092	Kafka topic
		32100, 32000, 32001, 32002	Kafka broker
	Reputation services (on-premise)	443	Sending requests for reputation data.
Aggregator	Central Manager and Threat Hunting Repository	8090	AV Signature updates
	Central Manager	8091	Aggregator communication
		443	Aggregator registration

Source	Destination	Port	Purpose
Central Manager	Threat Hunting Repository	8000	“FortiEDR Connect” related
		8095	Threat Hunting queries
		6379	Redis MS
	Syslog	**(Optional)** 6514	Syslog messages from Central Manager IP to syslog server via UDP/TCP/TCP SSL
	SMTP	**(Optional)** 587	SSLv3/TLS protocol to email server
Threat Hunting Repository	Central Manager	8091	Aggregator communication
		5005	“FortiEDR Connect” dedicated tunnel
		443	GUI access
		22	Communication with Central Manager during Threat Hunting Repository installation
		8443	Authentication service
		9019	Sink service
	Aggregator	22	Communication with Aggregator during Threat Hunting Repository installation
		32100, 32000, 32001, 32002	Secure browser connections to Kafka broker from Aggregator
Admin PC	Central Manager	443	FortiEDR console access
Reputation services (on-premise)	Central Manager	8091	If proxy is not enabled, on-premise reputation service requests missing hashes from the cloud reputation service via the manager nginx.
		22	SSH application access
	Reputation services DB (on-premise)	443	Reputation queries
Reputation services DB (on-premise)	Central Manager	22	SSH access
Machines connecting to Grafana or Kibana	Threat Hunting Repository	3000	Grafana - monitoring
		5601	Kibana - logging

Source	Destination	Port	Purpose
Machines accessing the Threat Hunting server via SSH	Central Manager	22	SSH access
	Aggregator		
	Threat Hunting Repository		

As a security best practice, it is recommended to update the firewall rules so that they only have a narrow opening. For example:

- Only open the TCP outbound port 555 to the Core IP address.
- Only open the TCP outbound port 8091 to the Central Manager IP address to be accessed by the Aggregator when the Aggregator is installed on premise while the Central Manager is in the cloud.

Threat Hunting Repository CPU, Physical Memory, and Disk Space Requirements

Number of Seats	Number of VMs (Nodes)	Number of CPUs per VM (Node)	Memory per VM (Node)	OS Disk per VM (Node)	Data Disk per VM (Node)
2000 or fewer	1	17	40 GB	100 GB, non-SSD For Hyper-V VMs, the disk should be IDE with at least 30% of the physical disk space remaining free at all times. Do not use a Hyper-V checkpoint which consumes the entire disk size every few hours.	1500 GB SSD
4000		27	40 GB		2310 GB SSD
6000		37	41 GB		3410 GB SSD
8000		47	48 GB		4510 GB SSD
10000		57	55 GB		5610 GB SSD
12000		67	62 GB		6710 GB SSD
14000		77	69 GB		7810 GB SSD
15000	3	30	27 GB		3249 GB SSD
20000		40	35 GB		4318 GB SSD
25000		49	42 GB		5387 GB SSD

Number of Seats	Number of VMs (Nodes)	Number of CPUs per VM (Node)	Memory per VM (Node)	OS Disk per VM (Node)	Data Disk per VM (Node)
30000		58	47 GB		6456 GB SSD
For the Threat Hunting Repository specifications required for supporting more than 30000 Collectors, please contact Fortinet Support.					

Setting up FortiEDR components on-premise for air-gapped environments

Set up the system components top-down in the following order:

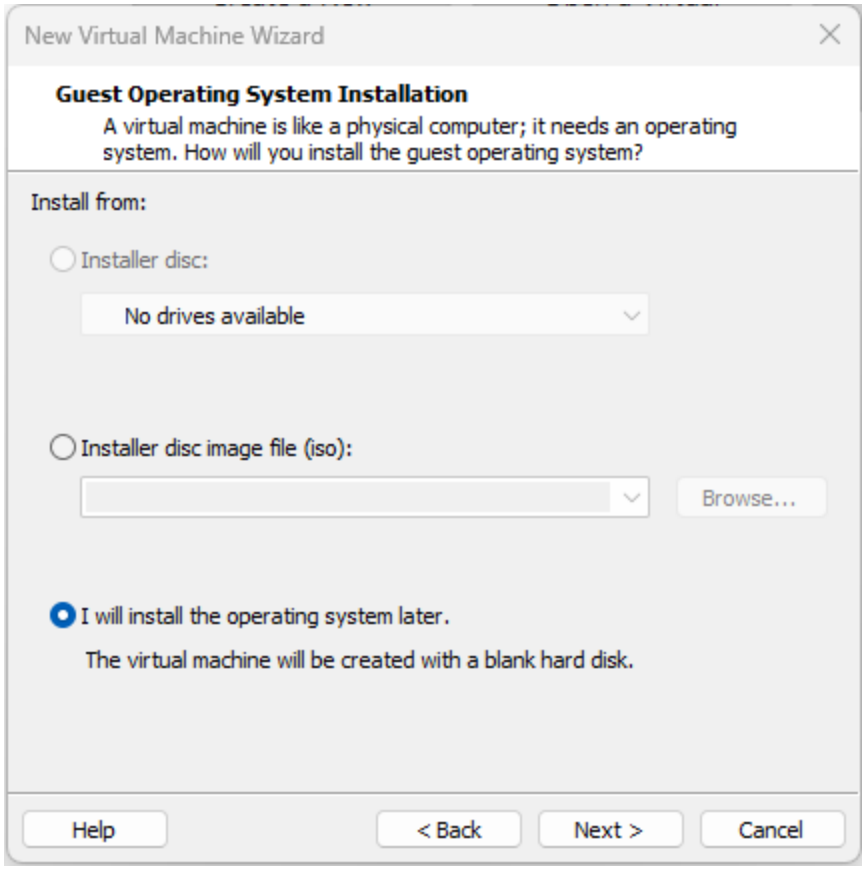
1. Setting up a VM to be the FortiEDR Central Manager on page 547
2. Setting up a VM to be the FortiEDR Aggregator on page 494
3. Setting up the FortiEDR Threat Hunting Repository on page 572
4. Setting up the FortiEDR reputation DB server on page 590
5. Setting up the FortiEDR reputation service on page 595
6. Setting up the FortiEDR Core on page 598
7. Installing FortiEDR Collectors on page 23

Setting up a VM to be the FortiEDR Central Manager

To set up a VM to be the FortiEDR Central Manager:

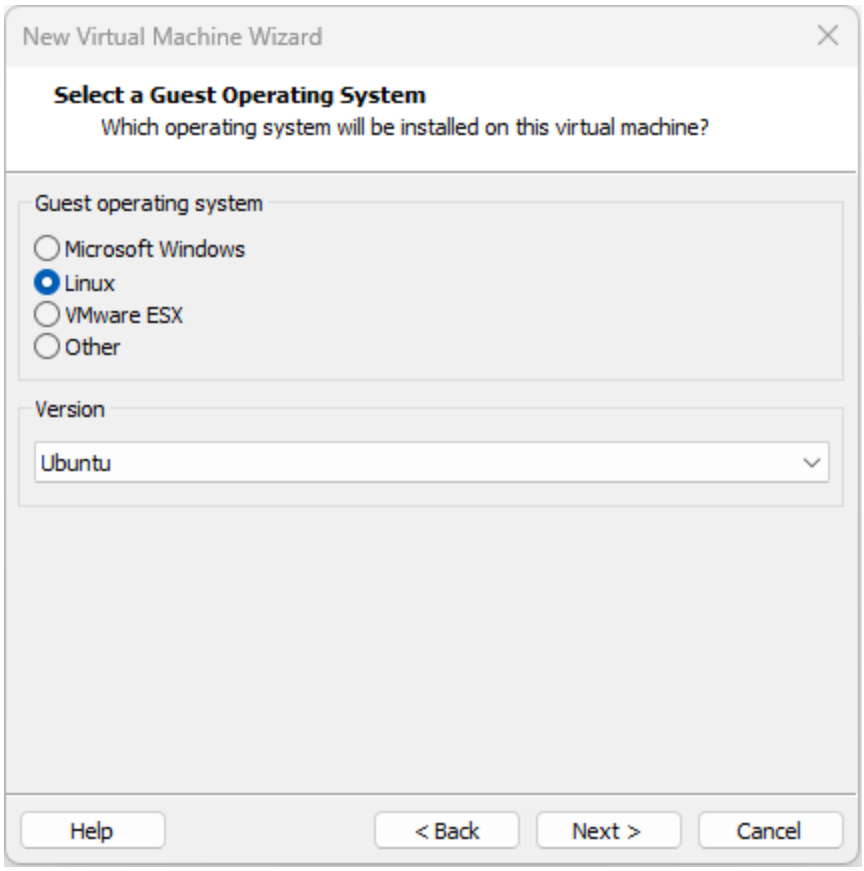
1. Create a new virtual server by selecting *File > New Virtual Machine*.
2. Select *Typical* option and select *Next*.

3. Select the *I will install the operating system later* option and click *Next*.

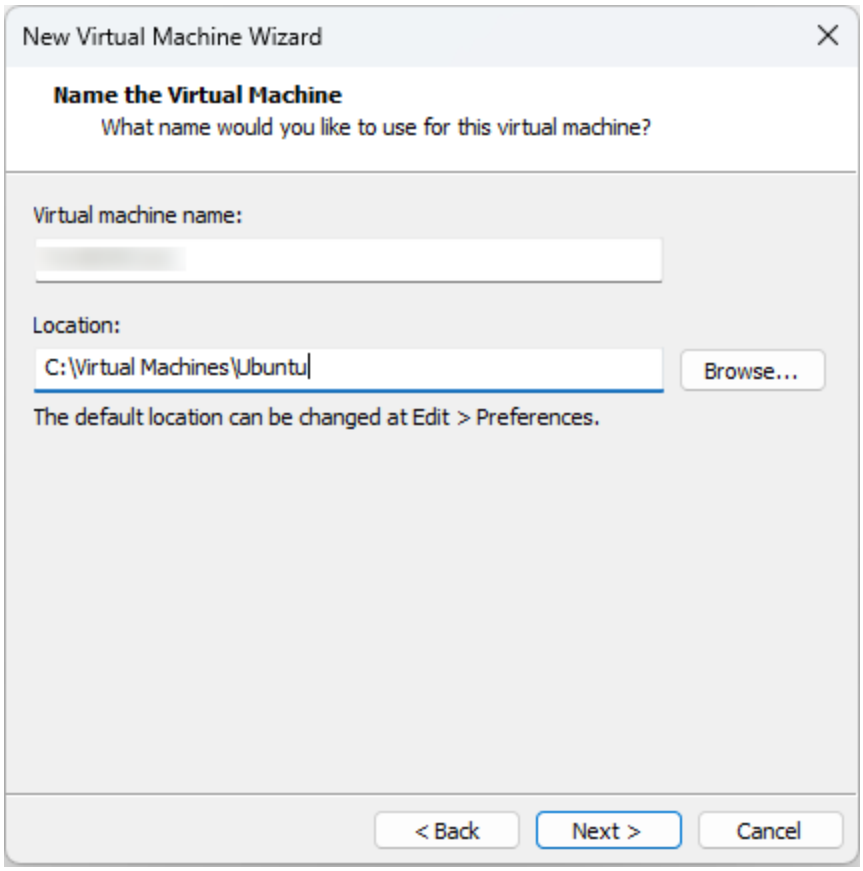


4. Select the *Linux* radio button. In the *Version* field, select *Ubuntu* and click *Next*.

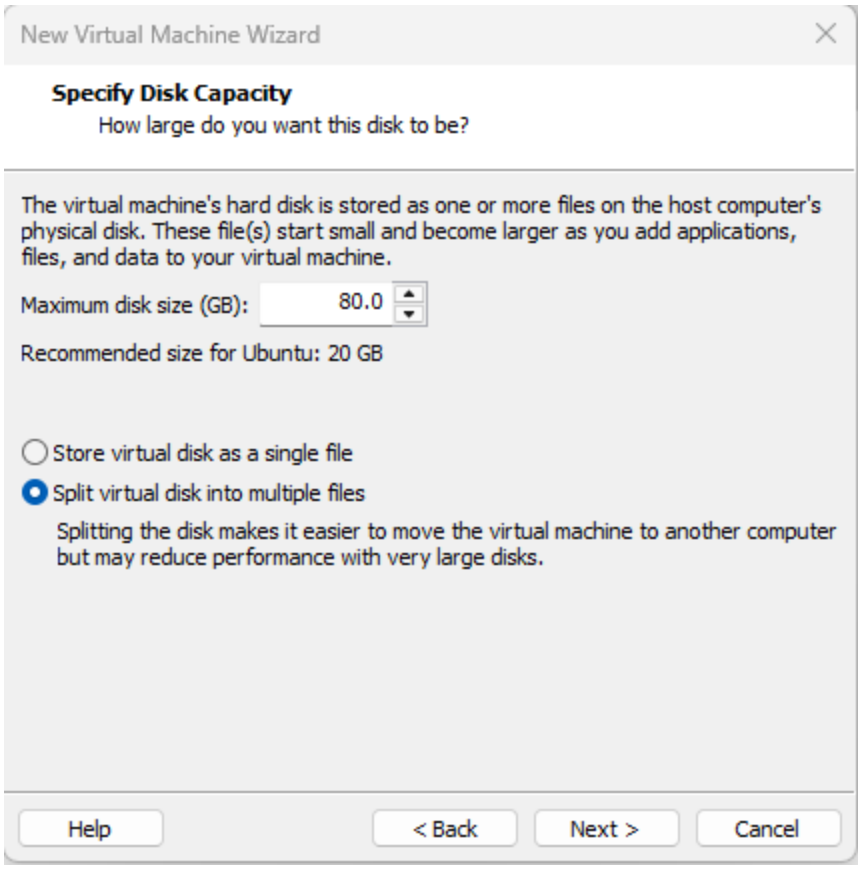
In some VMware environments where the *Linux* radio button is unavailable, select a generic Linux type, such as *General Linux* or *Other Linux (for vSphere/ESXi)*. Do not select a specific Linux distribution.



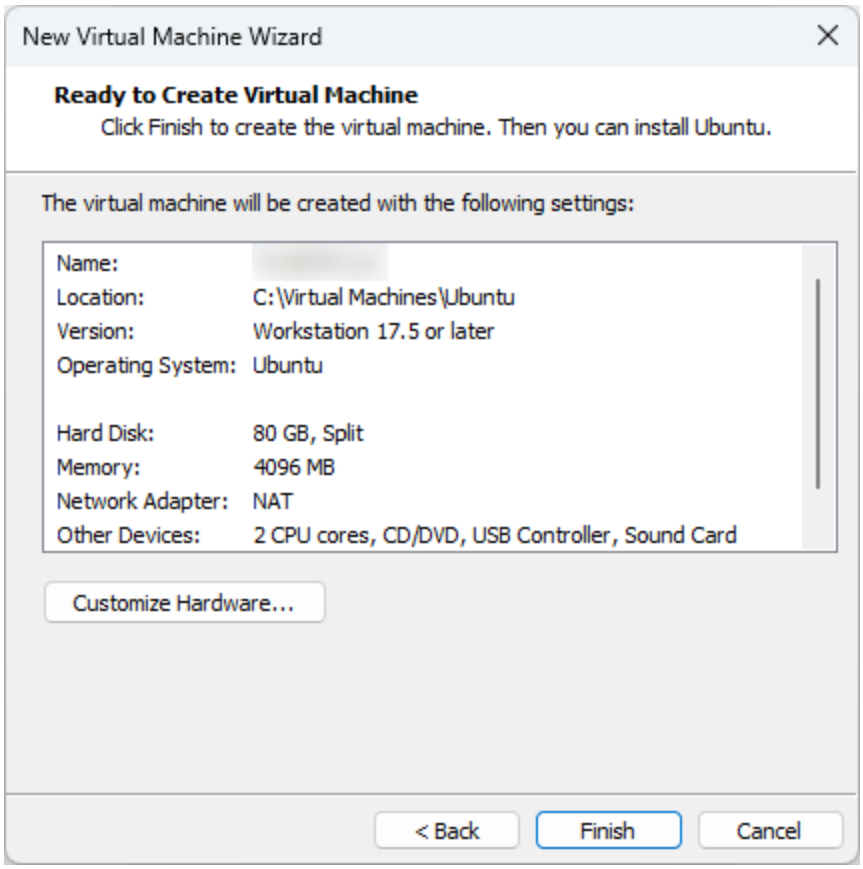
5. Specify a name for the virtual machine and the location in which to store the provided ISO file and click *Next*.



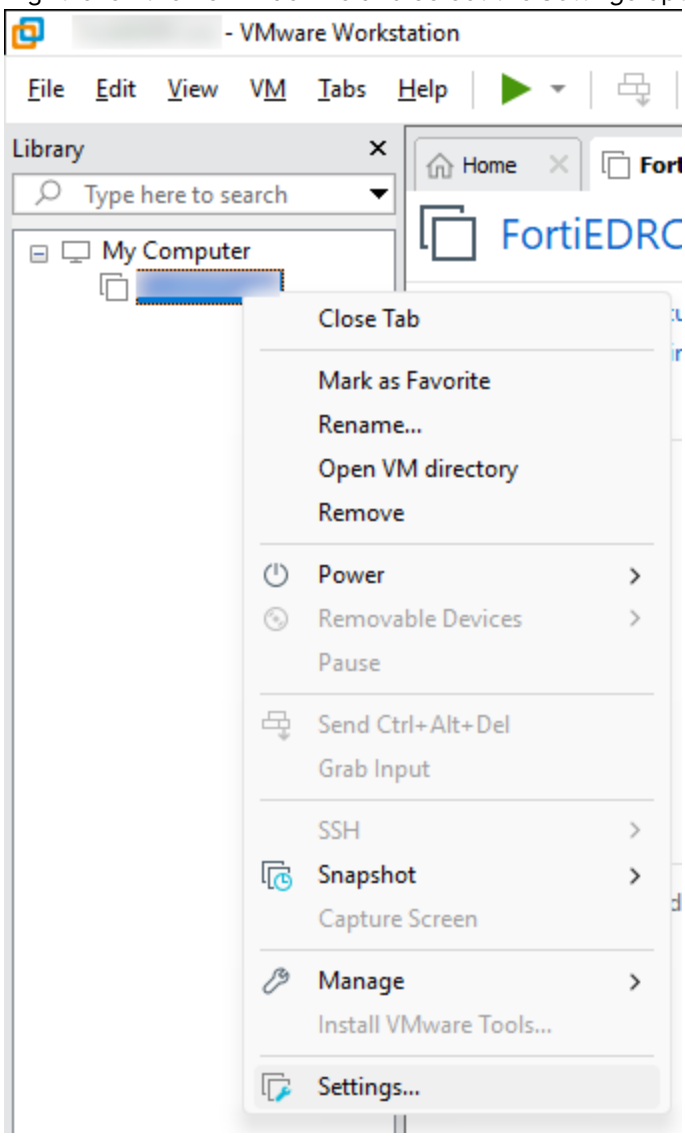
6. Change the *Maximum disk size* according to system requirements listed in Appendix D – On-premise deployment for air-gapped environments on page 541, leave the default option as *Split virtual disk into multiple files* and click *Next*.


New Virtual Machine Wizard
Specify Disk Capacity
How large do you want this disk to be?
The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.
Maximum disk size (GB):
80.0
Recommended size for Ubuntu: 20 GB
Store virtual disk as a single file
Split virtual disk into multiple files
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.
Help
< Back
Next >
Cancel

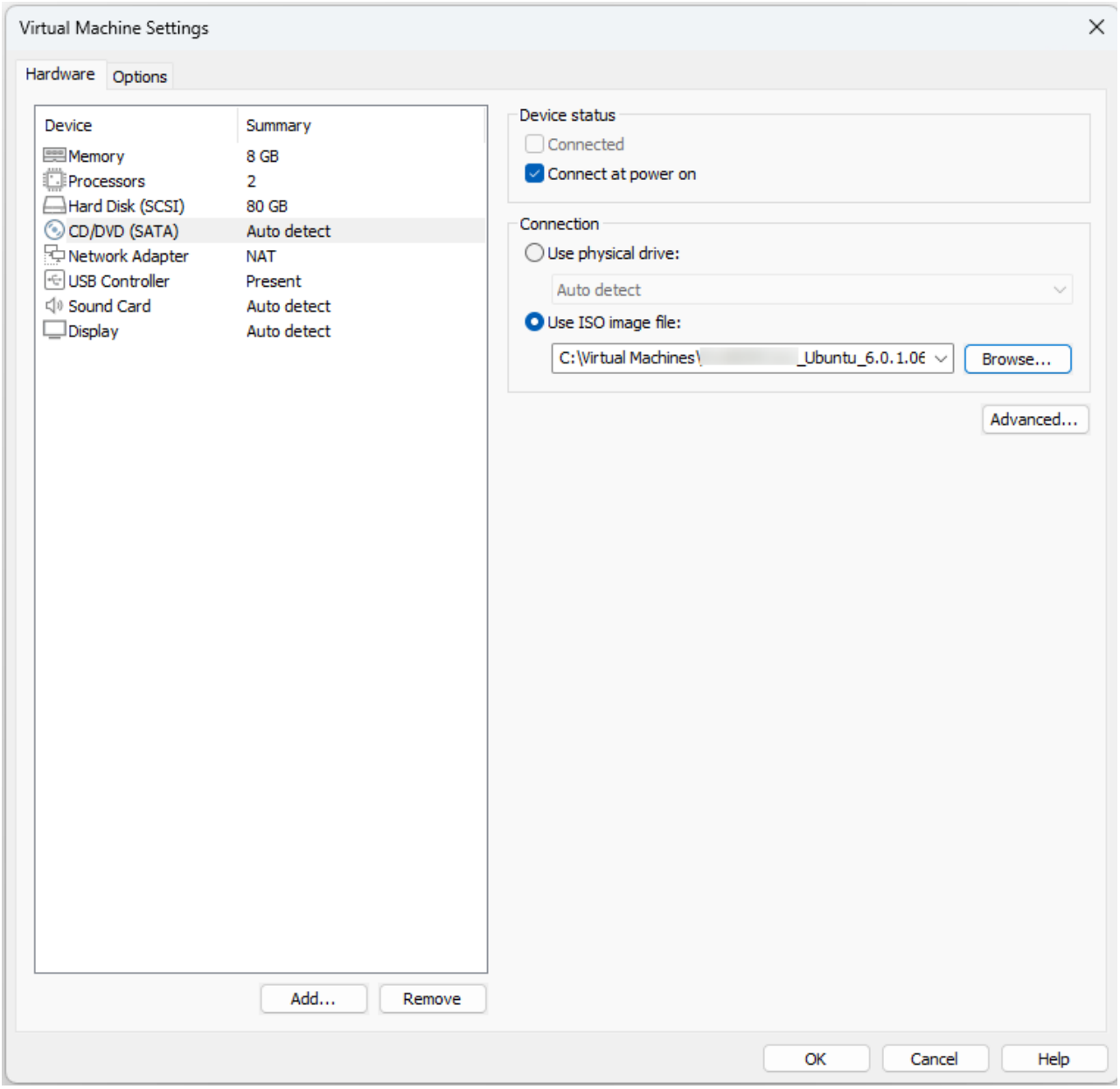
7. Click *Finish*.



8. Right-click the new machine and select the *Settings* option

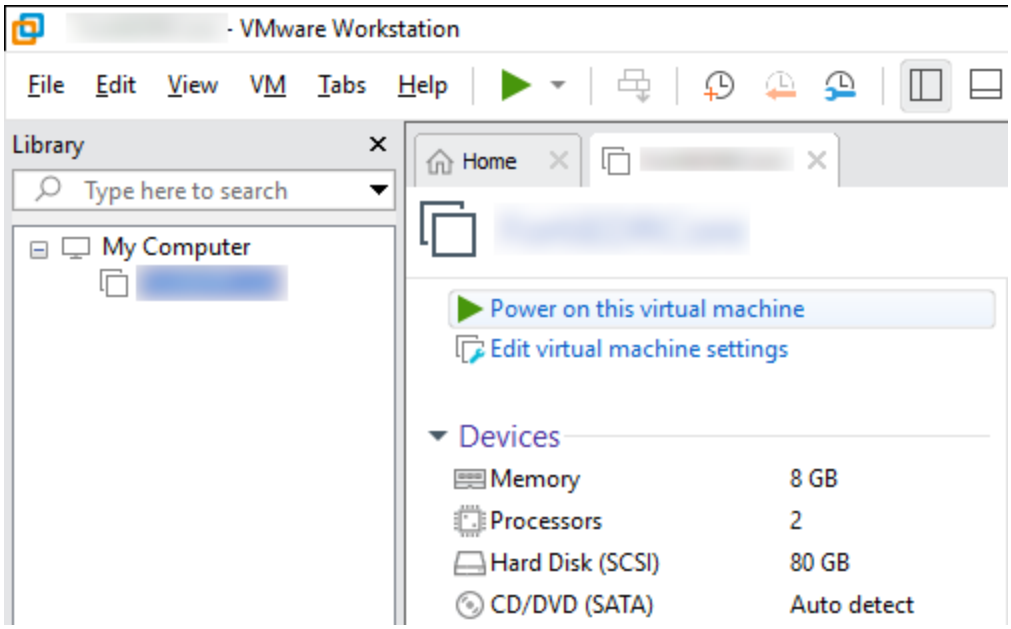


9. Select the *Memory* option and change the RAM according to the system requirements listed in Appendix D – On-premise deployment for air-gapped environments on page 541.



10. Select the *Processors* option and change the value according to the system requirements.
11. Select the *CD/DVD* option and then select the *Use ISO image file* option on the right.
12. Click the *Browse* button and select the ISO file provided by Fortinet for the FortiEDR Central Manager. Click *OK*.

13. Start the virtual machine.



The virtual machine automatically starts the installation process, which may take a few minutes.

14. Wait until a success message is displayed requesting that you reboot.
15. Reboot the virtual machine.
16. Log into the virtual machine in order to continue the installation process.
    `Login: root`
    Change the root password, by entering any password you want. Then re-type it. The password must be strong enough according to Linux standards.
17. In the VM CLI, enter `fortiedr config`.
18. At the prompt, enter your `hostname` and click *Next*. (Note: This can be any hostname)
19. At the prompt, select *manager* to configure the VM as the Central Manager, and click *Next*.
20. A list of network interfaces on this virtual machine displays. At the *Pick your primary interface* prompt, select the interface to be used as the primary network interface through which all FortiEDR Cores and FortiEDR Collectors will reach this server, and click *Next*.
21. At the *Do you want to use DHCP* prompt, select *No* to configure the IP of this virtual machine manually, and then click *Next*.
22. At the prompt, enter the IP address of the machine that you are installing. Use the following format: `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
23. At the prompt, enter the default gateway and click *Next*.
24. At the *Please set your DNS server* prompt, enter a valid IP address and click *Next*. Use the following format:
    `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
25. At the prompt, select *No* for debug mode.
26. At the *Please set the date* prompt, verify the date and click *Next*. The installer automatically presents the current date. You can change this date, if necessary.
27. At the *Please set your Time* prompt, set the time and click *Next*.
28. At the prompt, select the timezone and country in which the server is being installed.
29. At the *Do you want to enable web-proxy for the manager?* prompt, select *No*.
30. At the *Do you want to enable FCS?* prompt, select *no*.

31. At the *Is this an Air-Gapped environment?* prompt, select *yes*.
32. Wait a few moments while the installation processes, until you see the Installation completed successfully message.
33. Configuring the FortiEDR Central Manager server and console on page 556.

Configuring the FortiEDR Central Manager server and console

After you install the FortiEDR Central Manager, you must configure the FortiEDR Central Manager Server and console before setting up other components, such as Aggregators, Cores, and Collectors. The configuration includes creating an Admin user, setting up device registration password, loading your license, and optional MITM configuration.

To configure the FortiEDR Central Manager Server and console:

1. Use any standard Internet browser to connect securely (via https://) to the IP address and port of the machine on which the FortiEDR Central Manager is installed, as follows:
   a. `https://<machine_IP_addess>/`
   b. Default port is 443
2. Define the first administrator user to be allowed to log into the FortiEDR Manager by filling in the *First Name*, *Last Name*, *Email Address*, and *Define administrator user name* fields.

3. Enter and confirm the password to be used by this administrator user.
4. In the *Device Registration Password* fields, enter and confirm the password to be used to install all FortiEDR Collectors, FortiEDR Aggregators and FortiEDR Cores. This same password must be used by all. The following special characters are supported in the password: !, #, %, &, +, -, ., /, :, <, =, >, ?, @, [, \,], ^, _, `, {, |, }, (,), ~, and ,

Write this password down in a good place. This password will be needed each time a FortiEDR component is installed. If you forgot your user interface password, contact Fortinet Support to retrieve it.

5. Click the *Login* button. The regular FortiEDR Central Manager Login page is then displayed, as shown below. The page that displays varies, depending on whether the FortiEDR system is set up as a single-organization or multi-organization system.

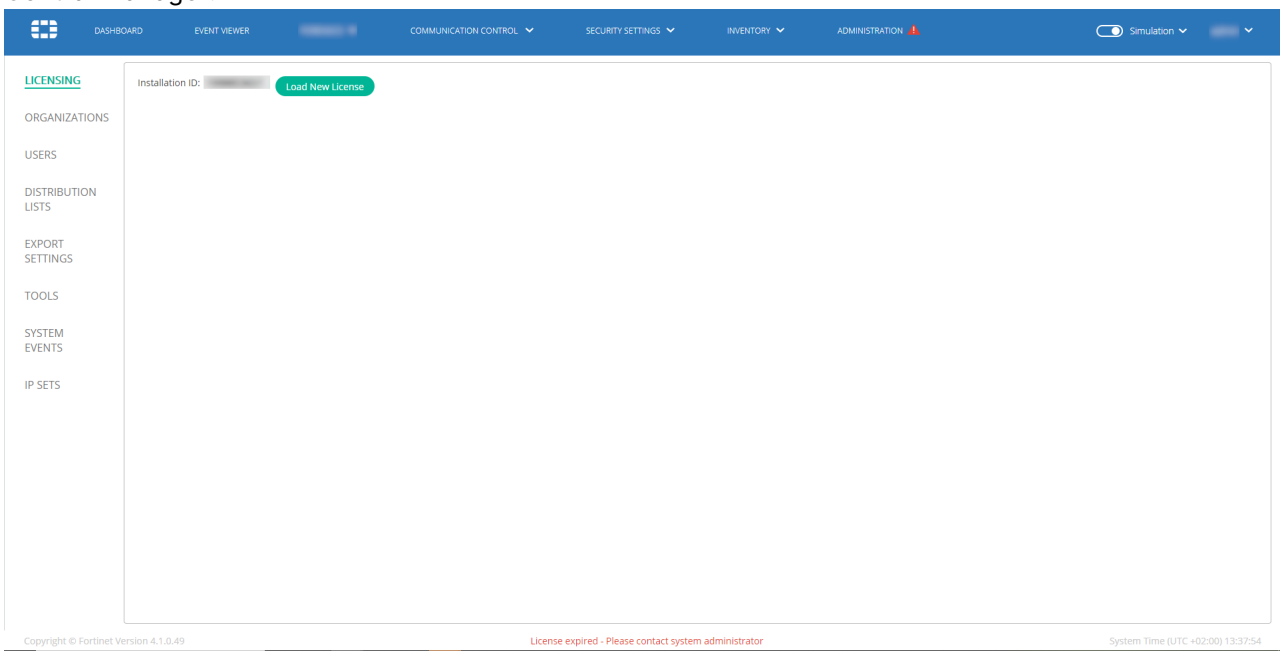
Login Page in a Single-organization System

Login Page in a Multi-organization System

The FortiEDR system can be set up as a single-organization or multi-organization system. In a multi-organization system, all users except an Administrator user must specify the organization in the Organization Name dropdown list. If a user is defined for an organization, then he/she can log in to that organization. Otherwise, he/she cannot.

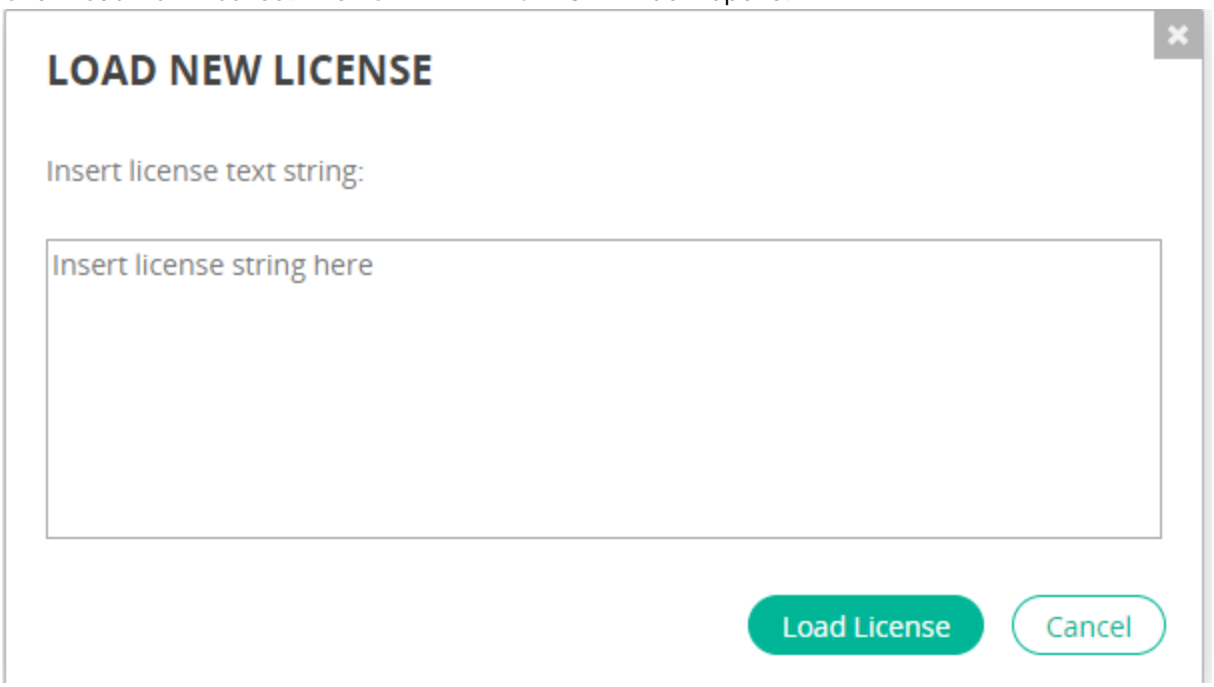
For more details about logging in to a multi-organization system, see Step 1 – Logging in to a multi-organization system on page 431.

6. Enter the administrator user name and password you have just defined and click *Login*. All fields are case sensitive. The following window displays automatically the first time you log into the FortiEDR Central Manager:

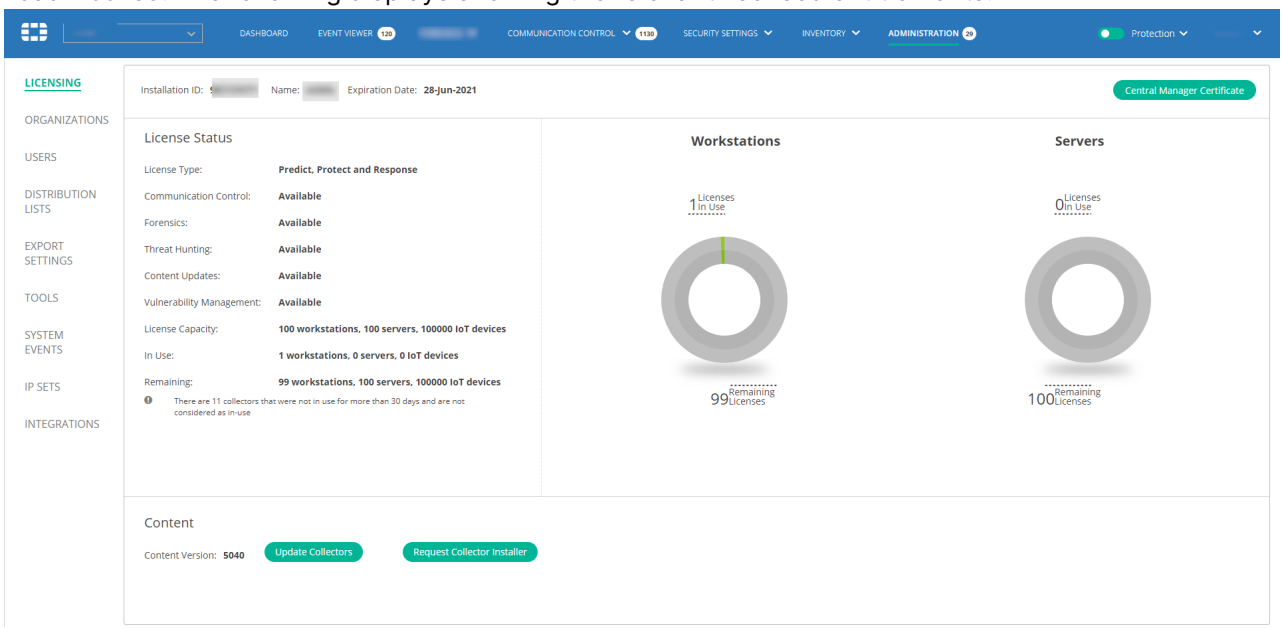


7. Send the displayed Installation ID to FortiEDRAdmin@fortinet.com by email in order to receive a license string from Fortinet.

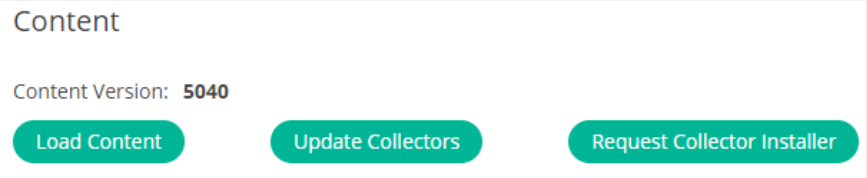
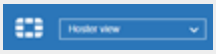
8. Click *Load New License*. The *LOAD NEW LICENSE* window opens.

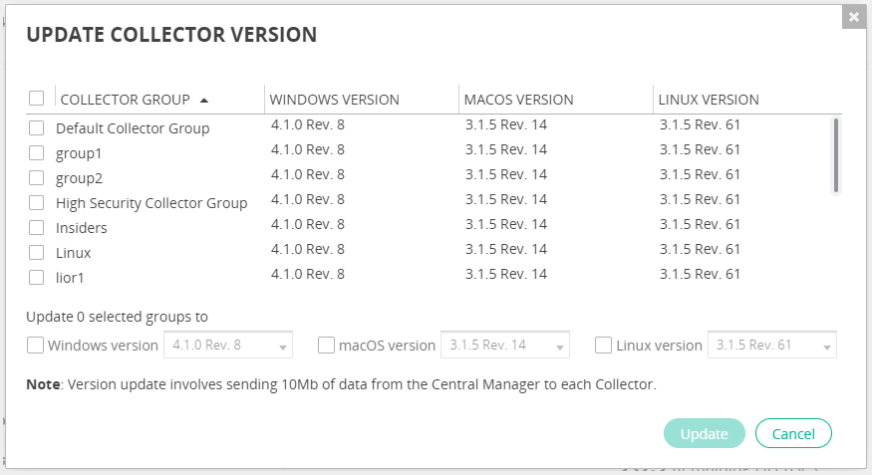


9. Copy/paste the license string that you received by email into the *LOAD NEW LICENSE* window and click *Load License*. The following displays showing the relevant licensed entitlements:



Field	Description
Installation ID	Specifies the unique identifier that is automatically generated upon installation of the ForitEDR Management server. You may be asked to provide this ID and the *Name* field when contacting Fortinet for support.

Field	Description
Name	Specifies the name of the organization in a multi-organization FortiEDR system. For more details, see Multi-tenancy (organizations) on page 428.
Expiration Date	Specifies when this license expires. Notifications will be sent to you beforehand.
License Type	Specifies whether the *Discover, Protect and Response* license, *Discover and Protect* license, or *Protect and Response* license was purchased. The license type defines the availability of the relevant add-ons.
Communication Control	Specifies the word *Available* if the Communication Control add-on is included in the license.
eXtended Detection	Specifies the word *Available*, when the *eXtended Detection* add-on is included in the license.
Forensics	Specifies the word *Available* if the Forensics add-on is included in the license.
Threat Hunting	Specifies the word *Available* if the Threat hunting add-on (described in Threat Hunting on page 131) is included in the license. It also specifies whether Repository add-ons have been purchased and how many have been.
Content Updates	Specifies the word *Available* if the *Content Updates* add-on is included in the license. This add-on enables you to automatically receive the latest FortiEDR policy rule and built-in exception updates. The system arrives with the latest content pre-installed. There is no need to install content during the initial installation. The *Load Content* button enables you to update content, as well as to update the Collector version on any existing Collector.  To load content updates on your FortiEDR system, click the *Load Content* button and then select the content file to load. In a multi-tenant environment, the *Load Content* button is available in Hoster View  . If the content file contains a Collector update, you can update all Collectors with the new version at that time, or choose to do so later. Click the *Update Collectors* button to update the version for all Collectors.

Field	Description
	
Vulnerability Management	Specifies the word *Available* if the Vulnerability Management add-on (described in Administration on page 359) is included in the license.
License Capacity	Specifies the number of available licenses for protection by FortiEDR Collectors (for workstations and servers). Only the number of FortiEDR Collectors allowed by the license can register with the FortiEDR Central Manager. Additional FortiEDR Collectors are not registered with the FortiEDR Central Manager. In addition, the number of IoT devices specified under the License Capacity determines whether or not IoT Discovery is available (zero number).
In Use	Specifies the number of FortiEDR licenses for workstations and servers that are currently in use. In addition, it specifies the number of IoT devices detected in the system thus far.
Remaining	Specifies the number of FortiEDR licenses for workstations and servers that are still available for use.

Regarding questions about the number of licenses purchased, please contact Fortinet Support.

10. **(Optional)** Configure the FortiEDR Central Manager to communicate with the Internet via a controlled MITM application (for example, FortiGate with SSL deep inspection enabled):
    a. Add the MITM CA certificate to the list of trusted certificates in the Central Manager Java application using the following API:

```
Method: POST
URL: /maintenance/upload-certificate
Body:
{
"alias": [custom_ca_name],
"certificateBlob": [CA certificate in pem format, encoded in base64]
}
```

Certificates signed by your custom MITM CA will not be trusted.

Example:

For the following certificate:

```
---BEGIN CERTIFICATE---
MIIDYzCCAkugAwIBAgIUXTs0sl6LZ3MNoiuy1+2QUOEqNqIwDQYJKoZIhvcNAQEL
BQAwUzELMAkGA1UEBhMCVVMxDjAMBgNVBAgMBVN0YXRlMQ0wCwYDVQQHDARDaXR5
MRUwEwYDVQQKDAxPcmdhbml6YXRpb24xDjAMBgNVBAMMBU15IENBMB4XDTI0MTAy
NzA4NDgxN1oXDTM0MTAyNTA4NDgxN1owUzELMAkGA1UEBhMCVVMxDjAMBgNVBAgM
BVN0YXRlMQ0wCwYDVQQHDARDaXR5MRUwEwYDVQQKDAxPcmdhbml6YXRpb24xDjAM
BgNVBAMMBU15IENBMIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEAua6l
NjX39F4T0MDozaENXHfnJ7qli/oK/M3SH6ZMFkOyAita31ri/JO2L2k7HS4qwHpJ
GGPnwsWEMsnwYJ8xuSi2Iz90KfRniDD5sgt/DFAjb+CRO4zbfERizO0qvQqCgqnU
24I2gCl31K7Frsky11B6db2s2I0LLpPVl7LMyaZ84yx4g1VFJSU1aYYXh8AU8oJa
ghW9LD6WFYMXjQIP0RQbUhqT0UK1CuEcl0ly/yVWmQ7edSyAV/YsIO7DpicPBuG9
fsLoY60tPhqj0pmfHcdMLDJoa03offAAhiqRDAQN5k5KnA6YcPxvDCoT88jTx823
8QQNd9gsVHr6uvLmpwIDAQABoy8wLTAMBgNVHRMEBTADAQH/MB0GA1UdDgQWBBQo
x7OwCDVpK1627HvgxMHNfAcp9TANBgkqhkiG9w0BAQsFAAOCAQEAL5u6LZQFLWVd
mQhkLWn9RuOR1vTnNHaARzURCH8k4VCfIliz93ruYXjJb/LWbJlMxR1nPjRbieI8
wAgUBfPV2cr4bXuP70W8Ftp/MYyw37G1sg1vzi9rvMl/h61I7aPn4JX9IRAaP+jO
7vT8hWP1DGf+TQKFBehHP5xJIEhCoWCESqPrOjF24YtDd4QYJWZm0IRtVIIVBnZ9
m6ZlHuRcZ3zLDpigtkyuLG3S/6BsQF0WOJQNQt90QU168026+7JlF7OSlH7EIl79
LaguuiA+PRXAN3ysNi4+/anp7Auy5ssIwjcZX7nAuPsUNGLUKH2LAELC0FxCZoO6
gC6bm+wRsg==
---END CERTIFICATE---
```

Encode the certificate in Base64 and use it in the API as follows:

```
{
```

```
"alias": "my_custom_MITM_ca",
```

```
"certificateBlob":
"LS0tLS1CRUdJTiBDRVJUSUZJQ0FURS0tLS0tCk1JSURZekNDQWt1Z0F3SUJBZ0lVWFRzMHNsNkxaM01Ob2l1eTErM
lFVT0VxTnFJd0RRWUpLb1pJaHZjTkFRRUwKQlFBd1V6RUxNQWtHQTFVRUJoTUNWVk14RGpBTUJnTlZCQWdNQlZOMFl
YUmxNUTB3Q3dZRFZRUUhEQVJEYVhSNQpNUlV3RXdZRFZRUUtEQXhQY21kaGJtbDZZWFJwYjI0eERqQU1CZ05WQkFNT
UJVMTVJRU5CTUI0WERUSTBNVEF5Ck56QTRORGd4TjFvWERUTTBNVEF5TlRBNE5EZ3hOMW93VXpFTE1Ba0dBMVVFQmh
NQ1ZWTXhEakFNQmdOVkJBZ00KQlZOMFlYUmxNUTB3Q3dZRFZRUUhEQVJEYVhSNU1SVXdFd1lEVlFRS0RBeFBjbWRoY
m1sNllYUnBiMjR4RGpBTQpCZ05WQkFNTUJVMTVJRU5CTUlJQklqQU5CZ2txaGtpRzl3MEJBUUVGQUFPQ0FROEFNSUl
CQ2dLQ0FRRUF1YTZsCk5qWDM5RjRUME1Eb3phRU5YSGZuSjdxbGkvb0svTTNTSDZaTUZrT3lBaXRhMzFyaS9KTzJMM
ms3SFM0cXdIcEoKR0dQbndzV0VNc253WUo4eHVTaTJJejkwS2ZSbmlERDVzZ3QvREZBamIrQ1JPNHpiZkVSaXpPMHF
2UXFDZ3FuVQoyNEkyZ0NsMzFLN0Zyc2t5MTFCNmRiMnMySTBMTHBQVmw3TE15YVo4NHl4NGcxVkZKU1UxYVlZWGg4Q
VU4b0phCmdoVzlMRDZXRllNWGpRSVAwUlFiVWhxVDBVSzFDdUVjbDBseS95VldtUTdlZFN5QVYvWXNJTzdEcGljUEJ
1RzkKZnNMb1k2MHRQaHFqMHBtZkhjZE1MREpvYTAzb2ZmQUFoaXFSREFRTjVrNUtuQTZZY1B4dkRDb1Q4OGpUeDgyM
wo4UVFOZDlnc1ZIcjZ1dkxtcHdJREFRQUJveTh3TFRBTUJnTlZIUk1FQlRBREFRSC9NQjBHQTFVZERnUVdCQlFvCng
3T3dDRFZwSzE2MjdIdmd4TUhOZkFjcDlUQU5CZ2txaGtpRzl3MEJBUXNGQUFPQ0FRRUFMNXU2TFpRRkxXVmQKbVFoa
0xXbjlSdU9SMXZUbk5IYUFSelVSQ0g4azRWQ2ZJbGl6OTNydVlYakpiL0xXYkpsTXhSMW5QalJiaWVJOAp3QWdVQmZ
QVjJjcjRiWHVQNzBXOEZ0cC9NWXl3MzdHMXNnMXZ6aTlydk1sL2g2MUk3YVBuNEpYOUlSQWFQK2pPCjd2VDhoV1AxR
EdmK1RRS0ZCZWhIUDV4SklFaENvV0NFU3FQck9qRjI0WXREZDRRWUpXWm0wSVJ0VklJVkJuWjkKbTZabEh1UmNaM3p
MRHBpZ3RreXVMRzNTLzZCc1FGMFdPSlFOUXQ5MFFVMTY4MDI2KzdKbEY3T1NsSDdFSWw3OQpMYWd1dWlBK1BSWEFOM
3lzTmk0Ky9hbnA3QXV5NXNzSXdqY1pYN25BdVBzVU5HTFVLSDJMQUVMQzBGeENab082CmdDNmJtK3dSc2c9PQotLS0
tLUVORCBDRVJUSUZJQ0FURS0tLS0t"
```

```
}
```

b. Add propery `ssl.truststore.enabled=true` to file `application-customer.properties`.

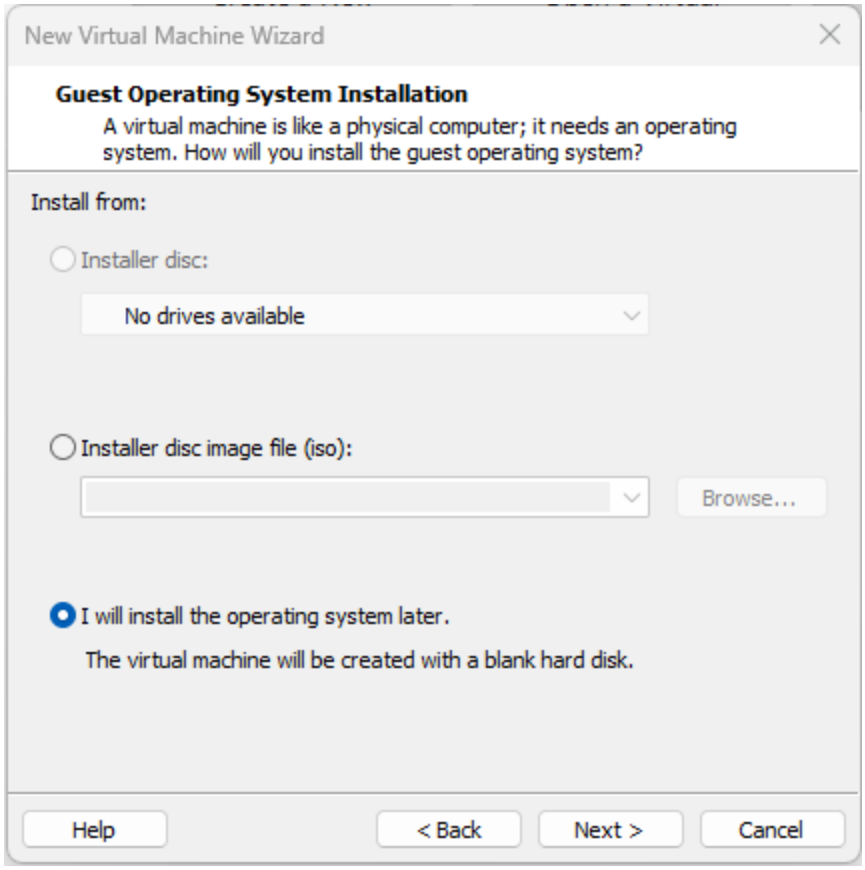
c. Restart the manager service using the following command: `exec command fortiedr manager restart`.

Setting up a VM to be the FortiEDR Aggregator

To set up a VM to be the FortiEDR Aggregator:

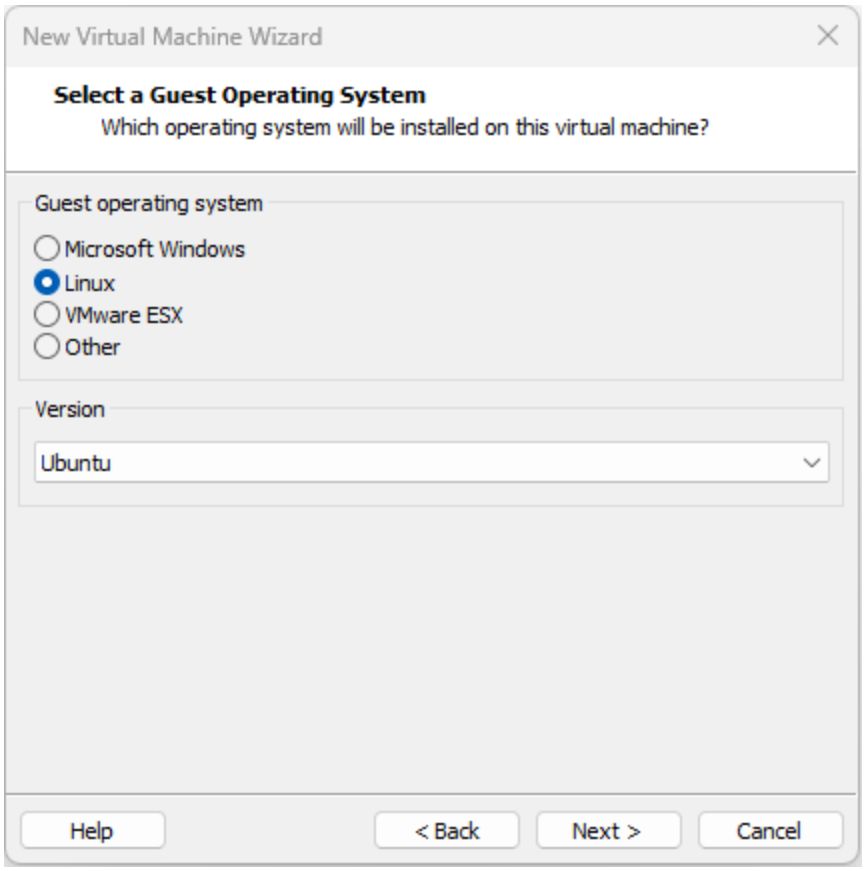
1. Create a new virtual server by selecting *File > New Virtual Machine*.
2. Select *Typical* option and select *Next*.

3. Select the *I will install the operating system later* option and click *Next*.

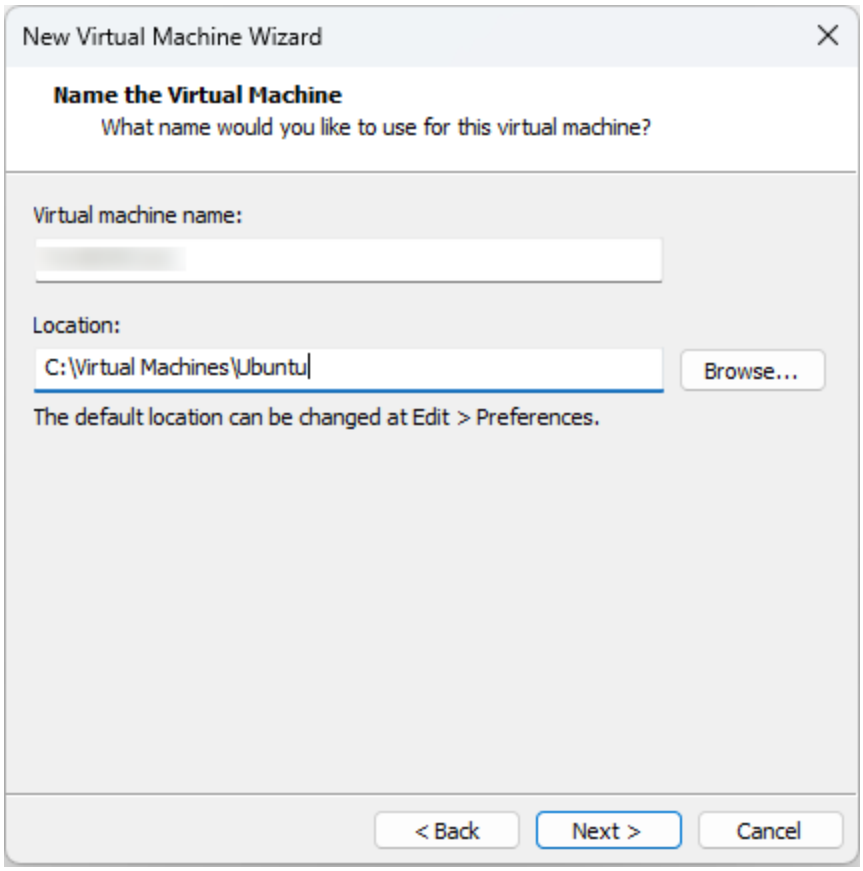


4. Select the *Linux* radio button. In the *Version* field, select *Ubuntu* and click *Next*.

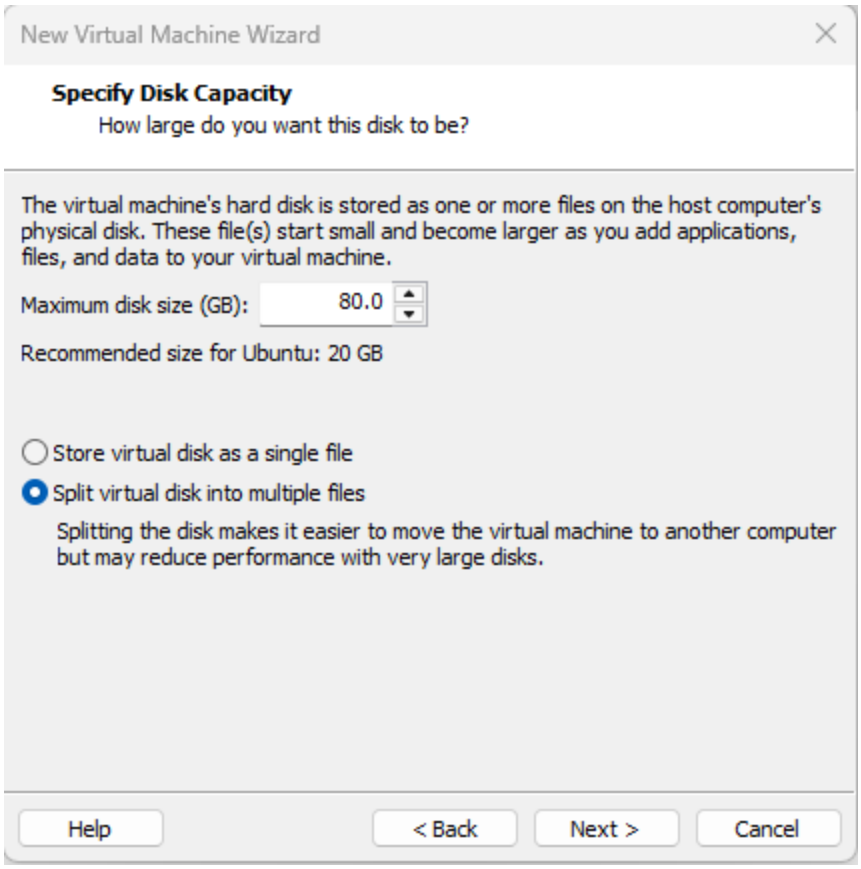
In some VMware environments where the *Linux* radio button is unavailable, select a generic Linux type, such as *General Linux* or *Other Linux (for vSphere/ESXi)*. Do not select a specific Linux distribution.



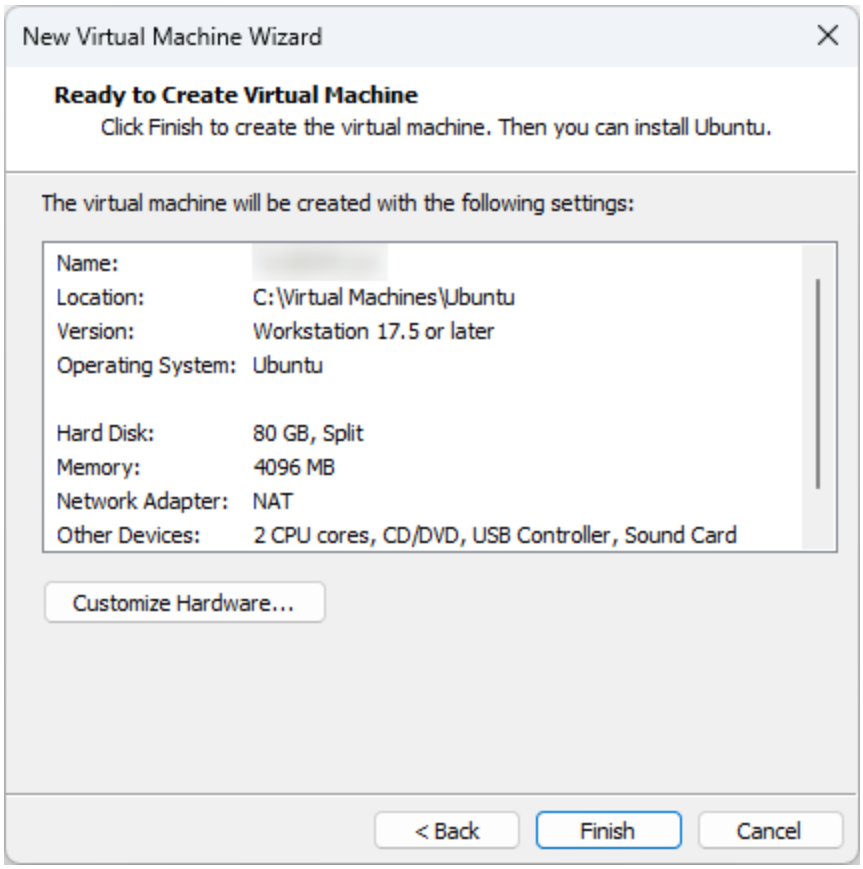
5. Specify a name for the virtual machine and the location in which to store the provided ISO file and click *Next*.



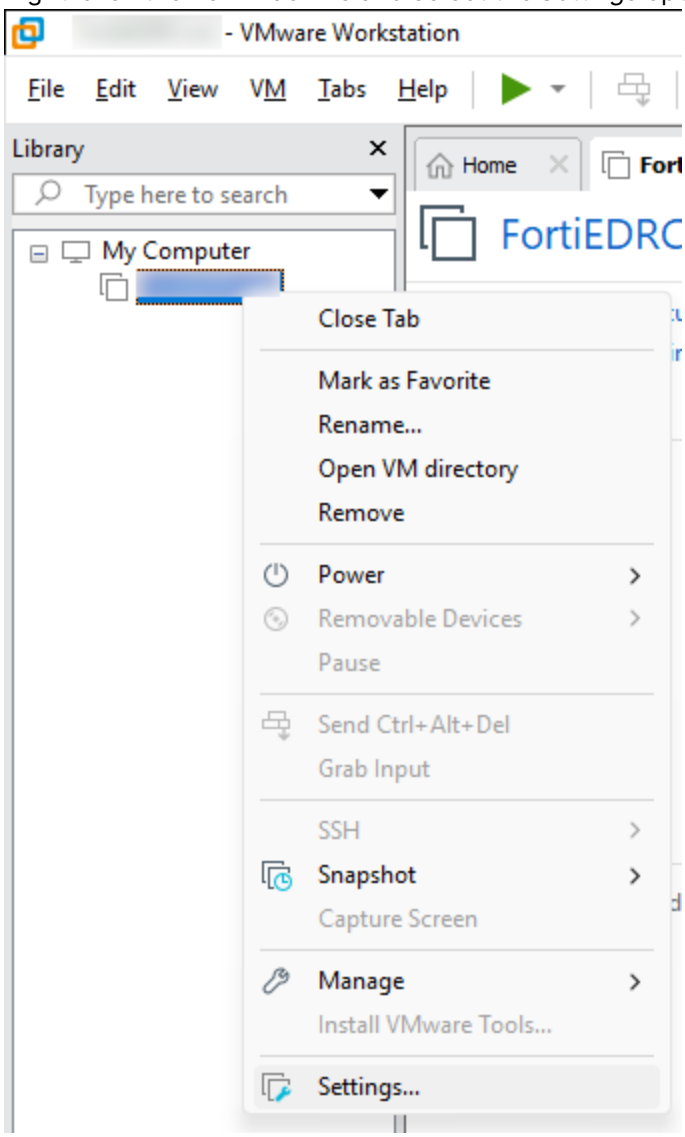
6. Change the *Maximum disk size* according to system requirements listed in Appendix D – On-premise deployment for air-gapped environments on page 541, leave the default option as *Split virtual disk into multiple files* and click *Next*.


New Virtual Machine Wizard
Specify Disk Capacity
How large do you want this disk to be?
The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.
Maximum disk size (GB):
80.0
Recommended size for Ubuntu: 20 GB
Store virtual disk as a single file
Split virtual disk into multiple files
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.
Help
< Back
Next >
Cancel

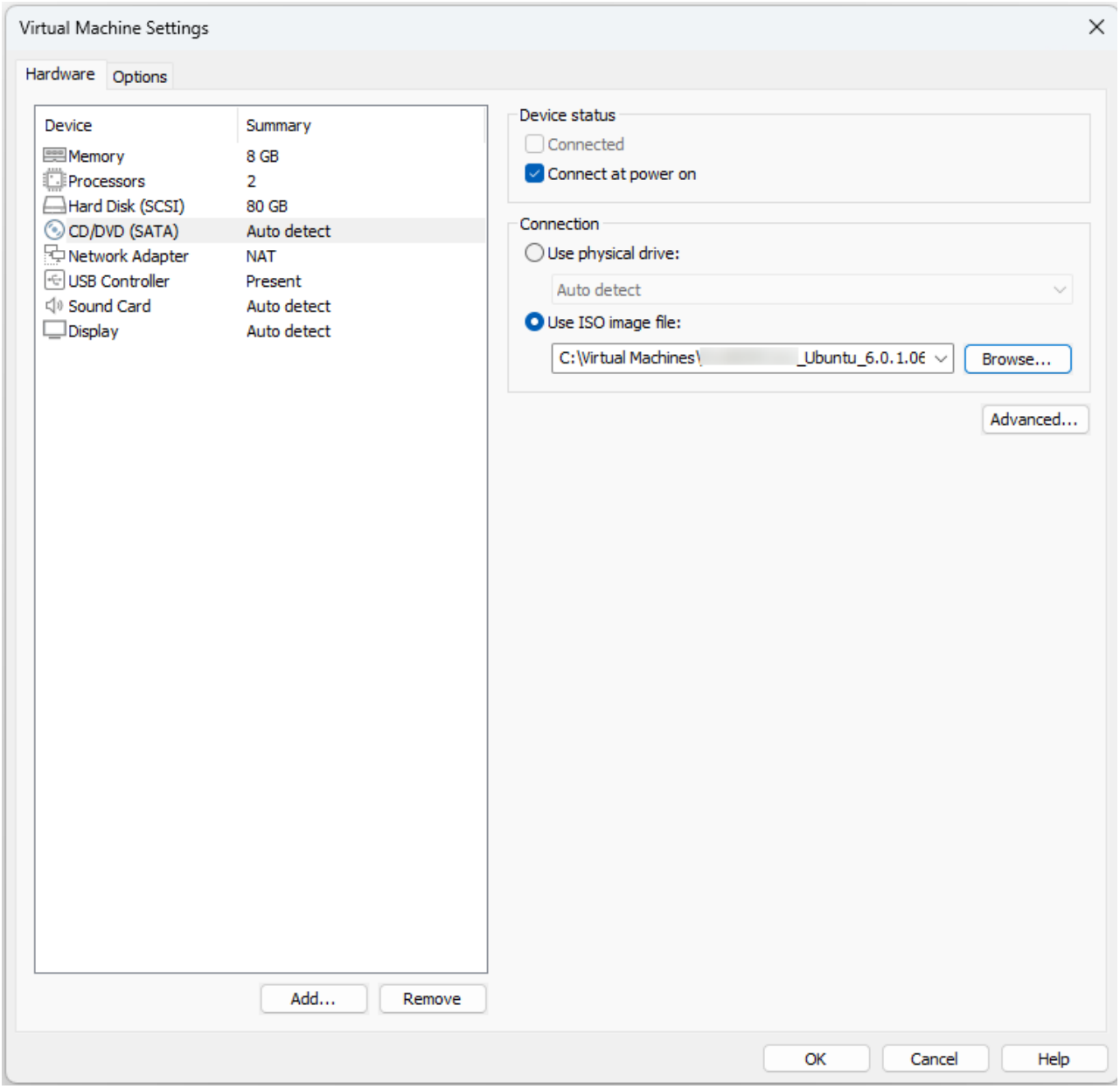
7. Click *Finish*.



8. Right-click the new machine and select the *Settings* option

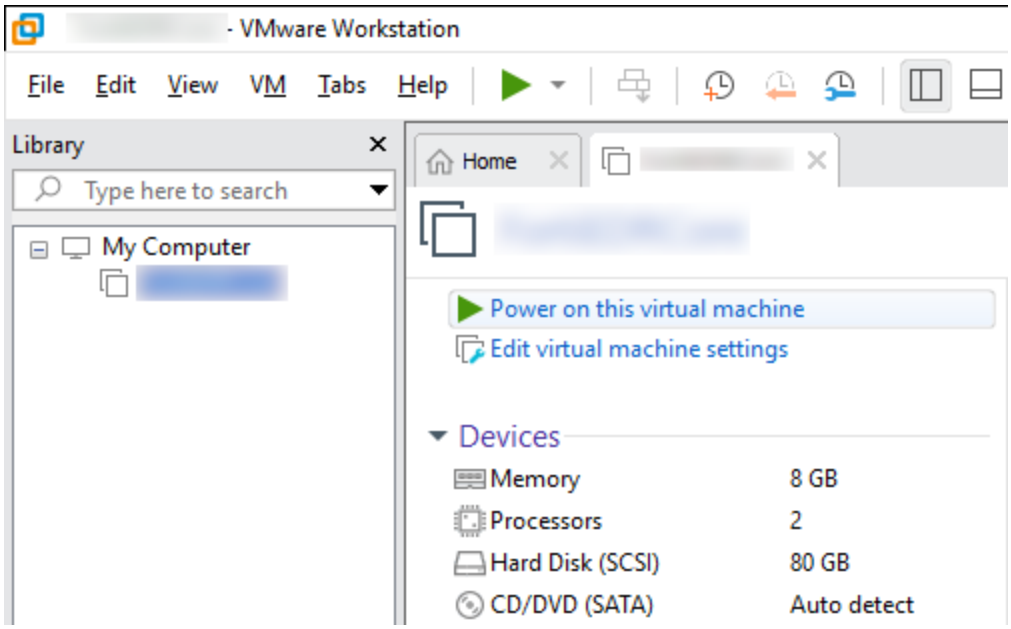


9. Select the *Memory* option and change the RAM according to the system requirements listed in Appendix D – On-premise deployment for air-gapped environments on page 541.



10. Select the *Processors* option and change the value according to the system requirements.
11. Select the *CD/DVD* option and then select the *Use ISO image file* option on the right.
12. Click the *Browse* button and select the ISO file provided by Fortinet for the FortiEDR Central Manager. Click *OK*.

13. Start the virtual machine.



The virtual machine automatically starts the installation process, which may take a few minutes.

14. Wait until a success message is displayed requesting that you reboot.
15. Reboot the virtual machine.
16. Log into the virtual machine in order to continue the installation process.
`Login: root`
Change the root password, by entering any password you want. Then re-type it. The password must be strong enough according to Linux standards.
17. In the VM CLI, enter `fortiedr config`.
18. At the prompt, enter your `hostname` and click *Next*. (Note: This can be any hostname)
19. At the prompt, select *aggregator* to configure the VM as the Aggregator, and click *Next*.
20. At the *Please enter the management IP address* prompt, enter the IP address to be used for communicating with the FortiEDR Central Manager and click *Next*.
21. At the *Please enter your registration password* prompt, enter the user and password used to register the FortiEDR Aggregator with the FortiEDR Central Manager, which you configured in step 30 in the previous section, and click *Next*.
22. At the *Do you want to use DHCP* prompt, select *No* to configure the IP of this virtual machine manually, and then click *Next*.
23. At the prompt, enter the IP address of the machine that you are installing. Use the following format: `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
24. At the prompt, enter the default gateway and click *Next*.
25. At the *Please set your DNS server* prompt, enter a valid IP address and click *Next*. Use the following format:
`xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
26. At the prompt, select *No* for debug mode.
27. At the *Please set the date* prompt, verify the date and click *Next*. The installer automatically presents the current date. You can change this date, if necessary.
28. At the *Please set your Time* prompt, set the time and click *Next*.
29. At the prompt, select the timezone and country in which the server is being installed.

30. Wait a few moments while the installation processes, until you see the Installation completed successfully message.
31. If organizations are defined and the number of Collectors exceeds 10000, set up additional Aggregators by repeating the previous steps for each additional Aggregator.
32. (Recommended) Define a DNS address for the Aggregator by following the steps below. Doing so avoids the need to reinstall all Collectors that are registered with the Aggregator IP when the Aggregator IP changes in some cases, such as when the Aggregator is migrated to a different data center.
    a. Define a DNS address for the Aggregator.
    b. Configure FortiEDR to disable the NAT IP and use the local IP of the Aggregator:
        i. Connnect to the FortiEDR Central Manager via `ssh`.
        ii. Open the `conf-customer.properties` configuration file using the following command: `vi/opt/FortiEDR/aggregator/conf-customer.properties`.
        iii. Comment out the `connection.dnsname = 10.10.80.201` line as follows: `#connection.dns-name = 10.10.80.201`.
        iv. Save the changes and restart the FortiEDR Aggregator service using the `fortiedr aggregator restart` command.
        v. Check the status of the Aggregator using the `fortiedr aggregator status` command.

Setting up the FortiEDR Threat Hunting Repository

The FortiEDR Threat Hunting feature (described in Threat Hunting on page 131) requires the set up of the Threat Hunting repository, which includes the following steps:

1. Creating a Virtual Machine on page 573
2. Installing an Operating System ISO on page 575
3. Installing a FortiEDR Repository software ISO on page 581
4. Configuring the Threat Hunting Repository Monitoring console on page 584
5. Backing up Threat Hunting Repository data on page 585
6. Activating the Threat Hunting Repository Monitoring console on page 586

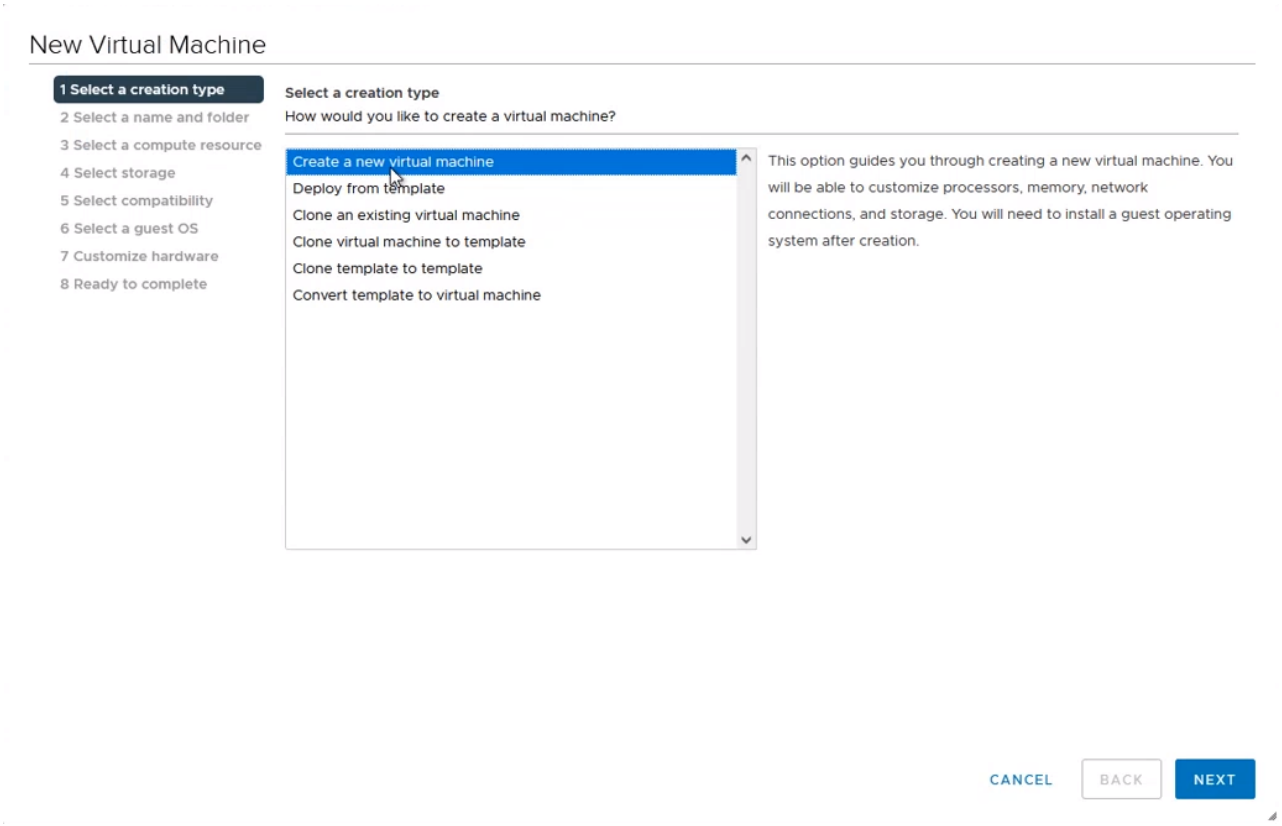
Prerequisites

- A license with access to the Threat Hunting feature.
- The FortiEDR Central Manager is installed.
- The system requirements listed in Appendix D – On-premise deployment for air-gapped environments on page 541 must be met.

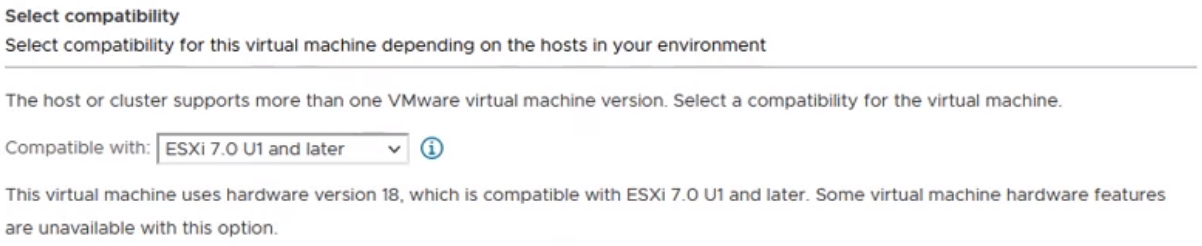
Creating a Virtual Machine

To create a virtual machine:

1. Create a new virtual server. For example, by selecting *File > New Virtual Machine...*, then selecting *Create a new virtual machine* and clicking *NEXT*.



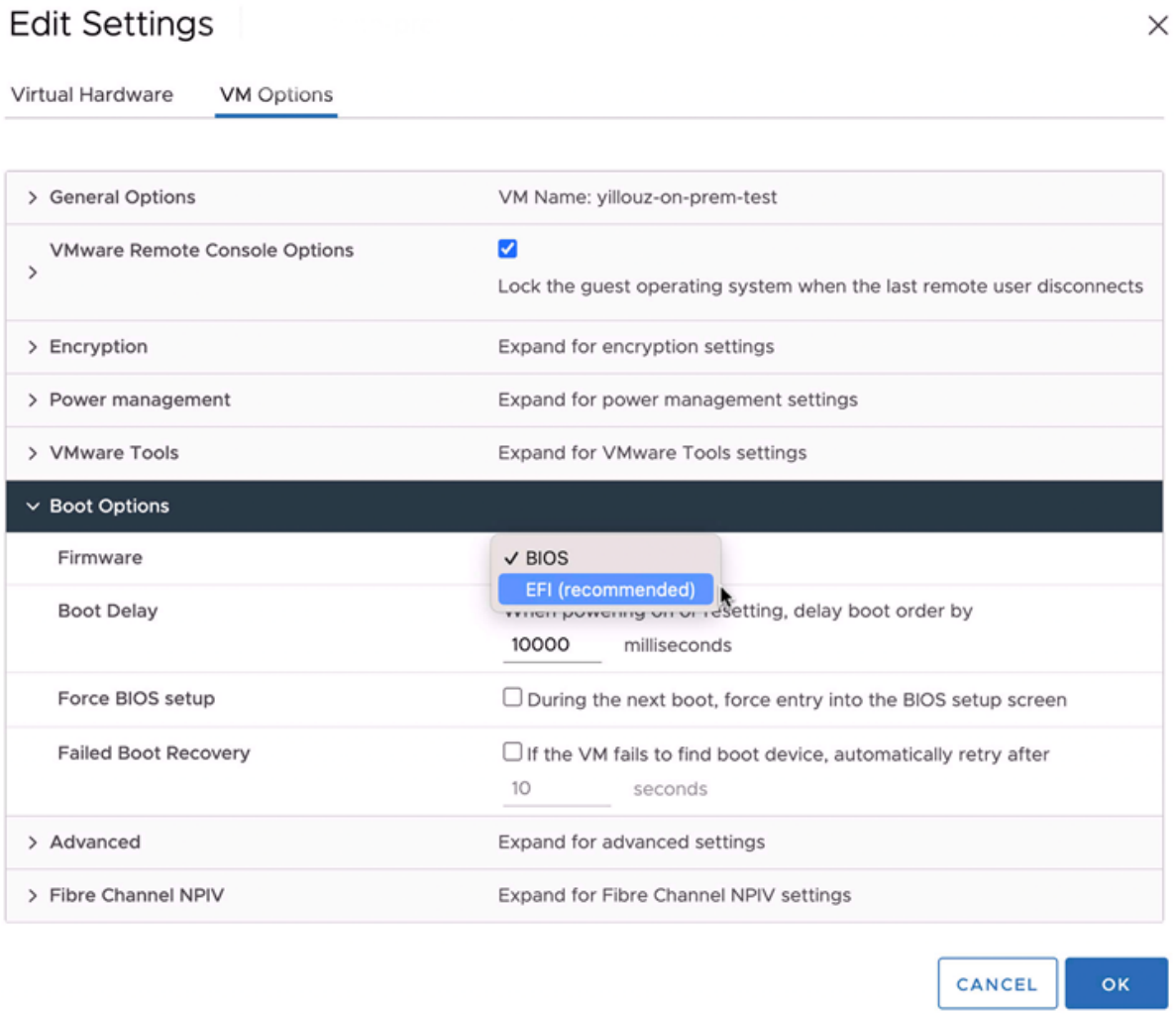
2. Enter the desired *virtual machine name*. For example, *FortiEDR-TH-Repository* and click *NEXT*.
3. Enter the virtual machine settings, as follows:
   a. In the *Select storage* step, select the storage where the virtual machine disk should be stored on and click *NEXT*.
   b. In the *Select Compatibility* step, select *ESXi 7.0 U1 and later* and click *NEXT*.



   c. At the *Select a guest OS* step:
      i. In the *Guest OS family* field, select *Linux*.
      ii. In the *Guest OS version* field, select *Other 4.x Linux (64-bit)*.

iii. Click *Next*. The following displays:

d. In the Virtual Machine *Boot Options*, select *BIOS* under *Firmware*, and click *OK*.



e. In the *Customize hardware* step, do the following:

a. Enter the values for *CPU*, *Memory*, and *New Hard disk* fields as specified in *Prerequisites*. It is highly recommended to use SSD for hard disk.

b. Add an OS disk in the *New Hard disk*:

a. Enter the OS disk size in GB, as specified in *Prerequisites*.

b. In the *Disk Provisioning* field, it is recommended to select *Thick Provision*.

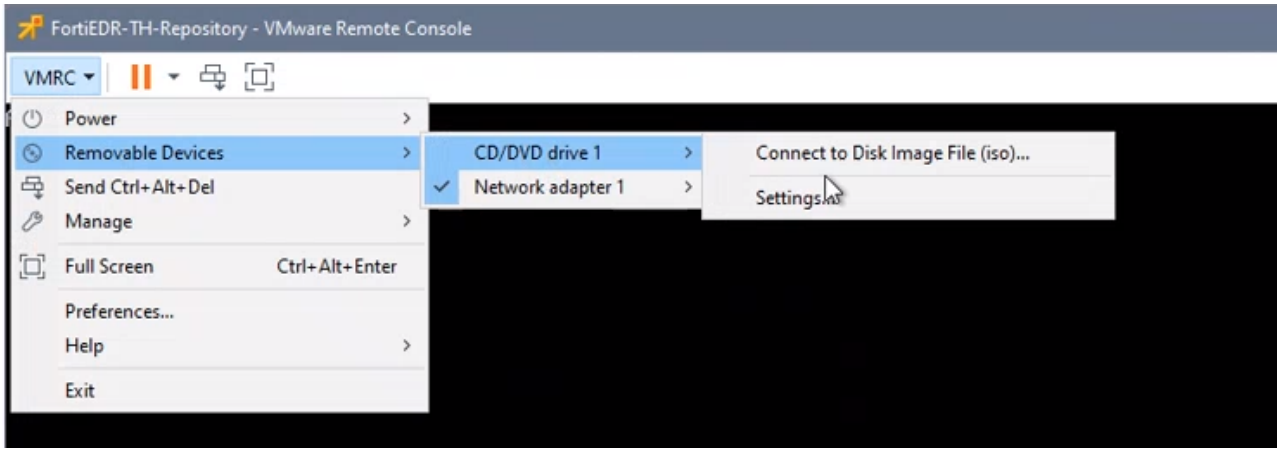
c. Add a DATA disk in the *New Hard disk*:
   a. Enter the DATA disk size in GB, as specified in *Prerequisites*.
   b. In the *Disk Provisioning* field, it is recommended to select *Thick Provision*.
   c. In case the previous disk hasn't been installed as SSD, define another SSD DATA disk of a size as specified in *Prerequisites*.
d. In the *New Network* field, choose *VMXNET3*.

4. Select *Finish* to complete the creation of the virtual machine.

Installing an Operating System ISO

To install an operating system ISO:

1. Select the newly created virtual machine and click **Launch Remote Console**.
2. In the *VMRC* menu, select *Removable Device > CD/DVE drive 1 > Connect to Disk Image File (iso)*....



3. Select the *FortiEDR_Repository_OSInstaller* ISO file and click *Open*. Make sure that the ISO remains mounted.

Another option instead of completing the two steps described above is to upload the ISO from the VMWare datastore (this is possible if the ISO has already been uploaded there).

4. Restart the Virtual Machine. The virtual machine starts and the following menu is displayed:

5. Select the *Install Node* option.
6. Configure the timezone of the VM using the following command:

```
sudo su -

export TIMEZONE=Area/Location
```

Replace *Area/Location* with the time zone value from the tz (timezone) database used by Linux and other Unix systems.

The default timezone UTC will be used if you skip this step. The timezone can only be set here once and cannot be changed after the installation.

7. Log in using the *rancher* user (without the password) and run the following commands in order to start the K8S node installation:

```
sudo su -

bash /k3os/system/install_k3os.sh
```

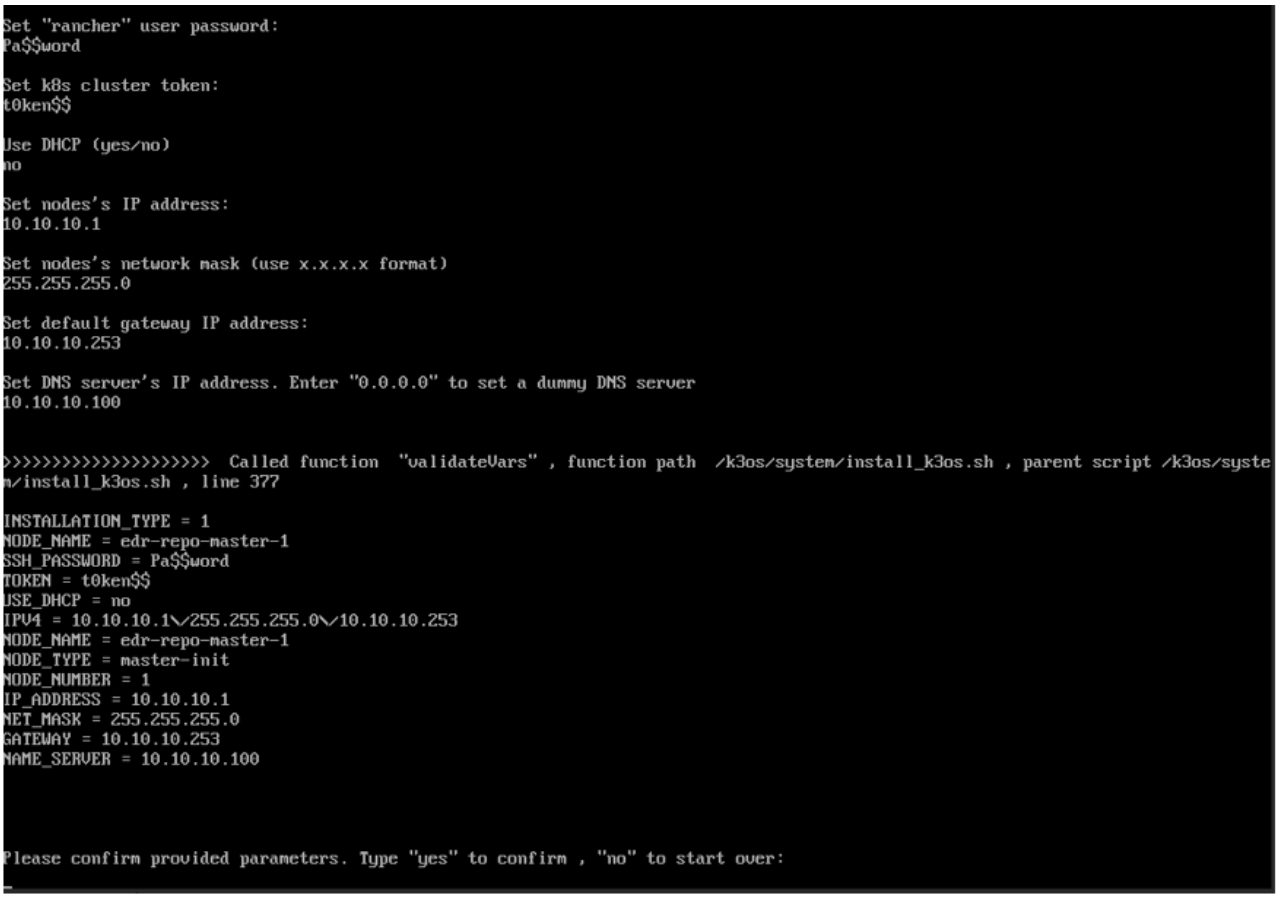
```
k3os-8350 [~]# bash /k3os/system/install_k3os.sh

Welcome to EDRv2 repository installation



Preparing data disk...

Creating data partition on /dev/sdb
Information: You may need to update /etc/fstab.

Information: You may need to update /etc/fstab.

mke2fs 1.45.6 (20-Mar-2020)
Creating filesystem with 26213888 4k blocks and 6553600 inodes
Filesystem UUID: 916d9e73-4260-4913-a9d9-e0cc8cffbf0e
Superblock backups stored on blocks:
        32768, 98304, 163840, 229376, 294912, 819200, 884736, 1605632, 2654208,
        4096000, 7962624, 11239424, 20480000, 23887872

Allocating group tables: done
Writing inode tables: done
Creating journal (131072 blocks): done
Writing superblocks and filesystem accounting information: done


Choose installation type
1 - New installation
2 - Add a node to the existing cluster
```

8. When prompted with the following, enter the number depending on the virtual machine (node) you are installing:

```
1 - New installation
2 - Add a new master/node to the existing cluster
1
```

- Enter 1 if you are installing one single virtual machine (node) with fewer than 15000 seats or if you are installing the first virtual machine (node) of the three for 15000 to 30000 seats.
- Enter 2 if you are installing the second or third virtual machine (node) of the three for 15000 to 30000 seats.

9. Complete the *k3os* installation by providing the following parameters:



   a. When prompted to enter the *SSH password*, enter the password to be used for the rancher user. A strong password must be entered.
   b. At the *Use DHCP (yes/no)* prompt, enter *no*.

Using DHCP causes a malfunction of the FortiEDR Repository server so that it is in an *Offline* state after the installation. When prompted, enter the IP, Mask and Gateway details of the virtual machine.

   c. At the *Do you want to change the default Pod network CIDR's* prompt, enter *yes* or *no* depending on your needs. The default Kubernetes internal Pod network is `10.42.0.0/16`.
      i. If you enter *yes*, provide the desired Pod network subnet in `x.x.0.0/16` format when prompted.
      ii. If you enter *no*, make sure the default Pod network CIDR does not overlap with your existing networks.
   d. At the *Do you want to change the default Service network CIDR's* prompt, enter *yes* or *no* depending on your needs. The default Kubernetes internal Service network is `10.43.0.0/16`.
      i. If you enter *yes*, provide the desired Service network subnet in `x.x.0.0/16` format when prompted.
      ii. If you enter *no*, make sure the default Service network CIDR does not overlap with your existing networks.
   e. When prompted to enter *node IP*, enter an IP depending on the virtual machine (node) you are installing:

- If you are installing one single virtual machine (node) with fewer than 15000 seats or if you are installing the first virtual machine (node) of the three for 15000 to 30000 seats, enter the virtual IP address.
- If you are installing the second or third virtual machine (node) of the three for 15000 to 30000 seats, enter the virtual IP address you defined for the first virtual machine (node).

f. When prompted to enter *subnet mask*, provide the virtual machine subnet mask.

g. When prompted to enter *DNS*, provide the DNS details.

h. When asked, read the settings provided and approve or reject them.

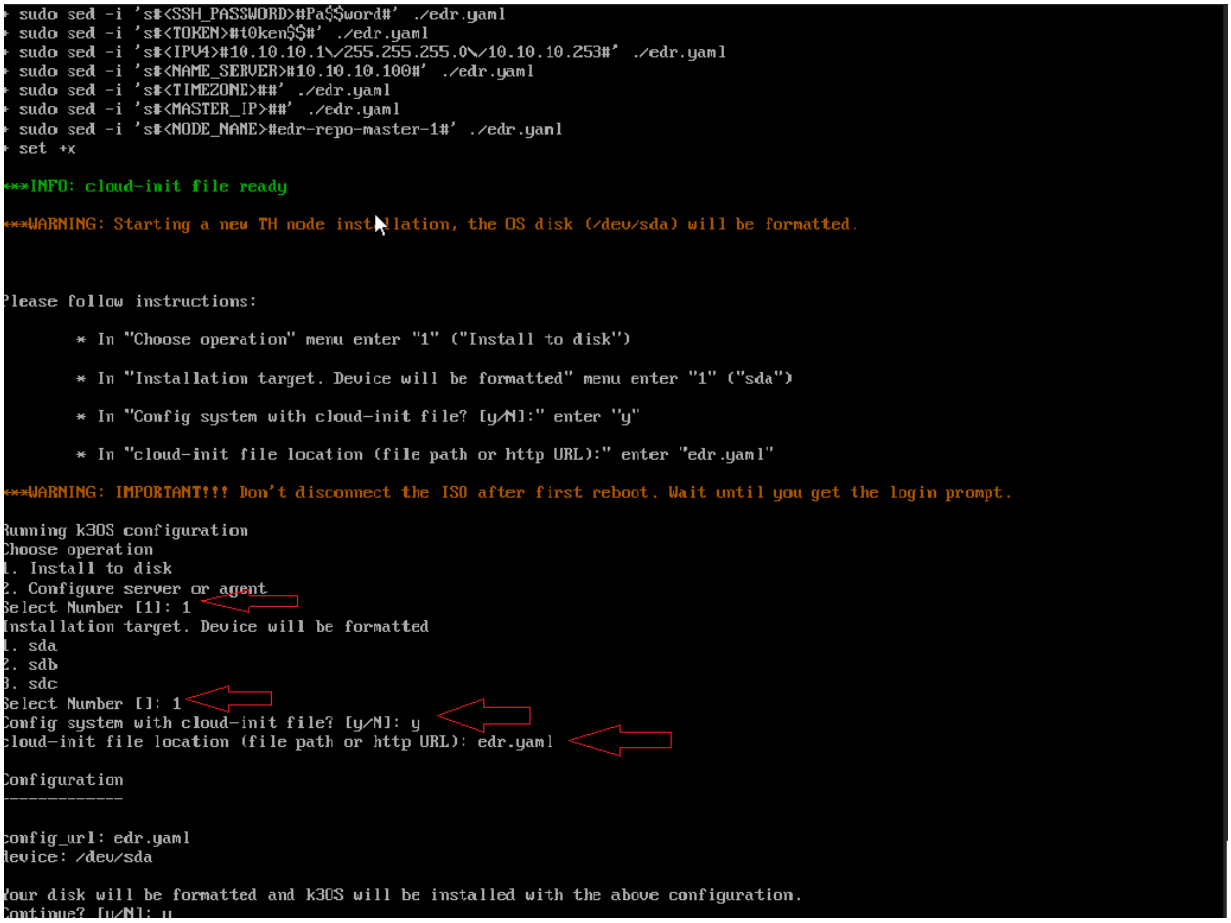
i. When prompted to select an operation, approve the default (*1. Install to disk*) by pressing `Enter`.

j. To select the *sda disk* as the *OS disk*, select *1*.

k. At the *Config system with cloud-init file* prompt, enter `y`.

l. When prompted to provide a *Cloud-init file location (file path or http URL)*, enter `edr.yaml`.

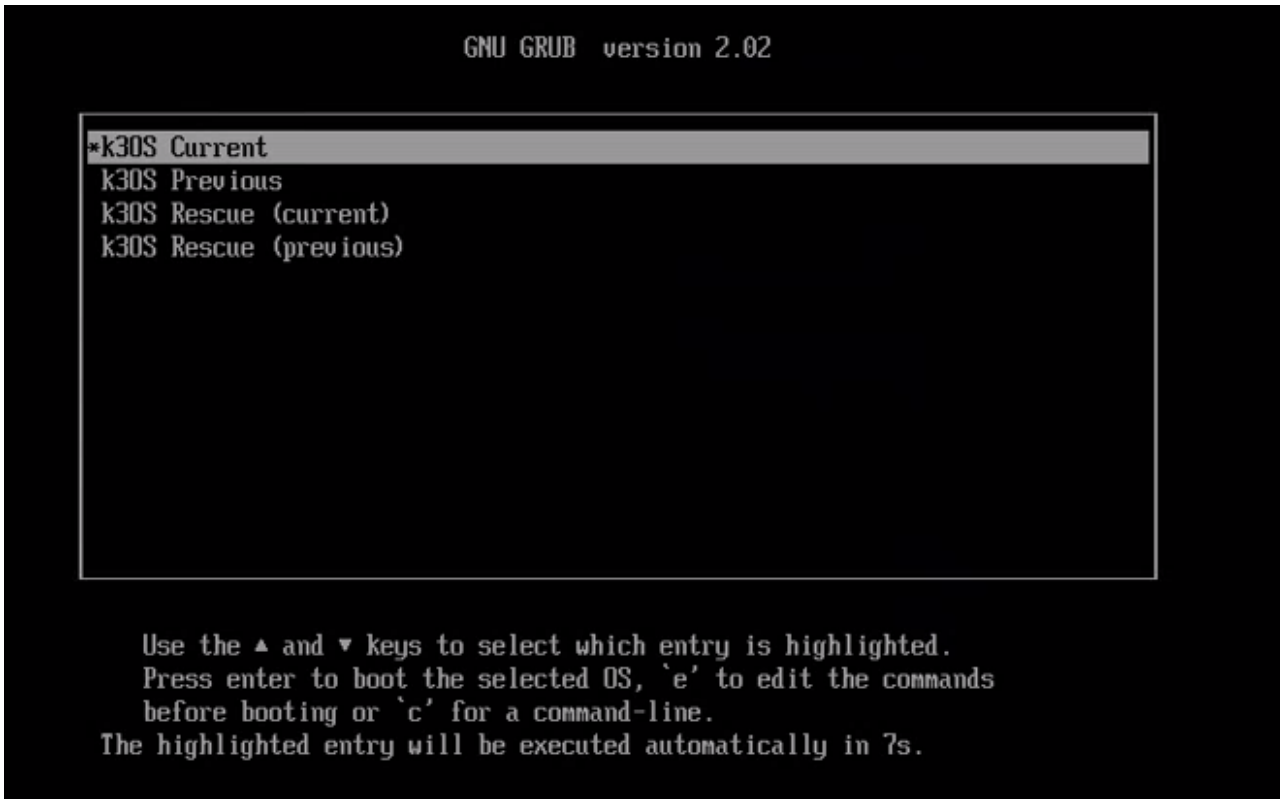
m. When prompted to continue, enter `y`.
The image below provides a preview of the parameters you entered for a master virtual machine (node).



10. Wait for the installation to complete which may take a while. The Virtual Machine restarts automatically after the installation.

11. If you have 15000 to 30000 seats, define two additional virtual machines (nodes) by repeating the steps in *Creating a virtual machine* and the previous steps in *Installing an Operating System ISO* for each node. Otherwise, skip to the next step.

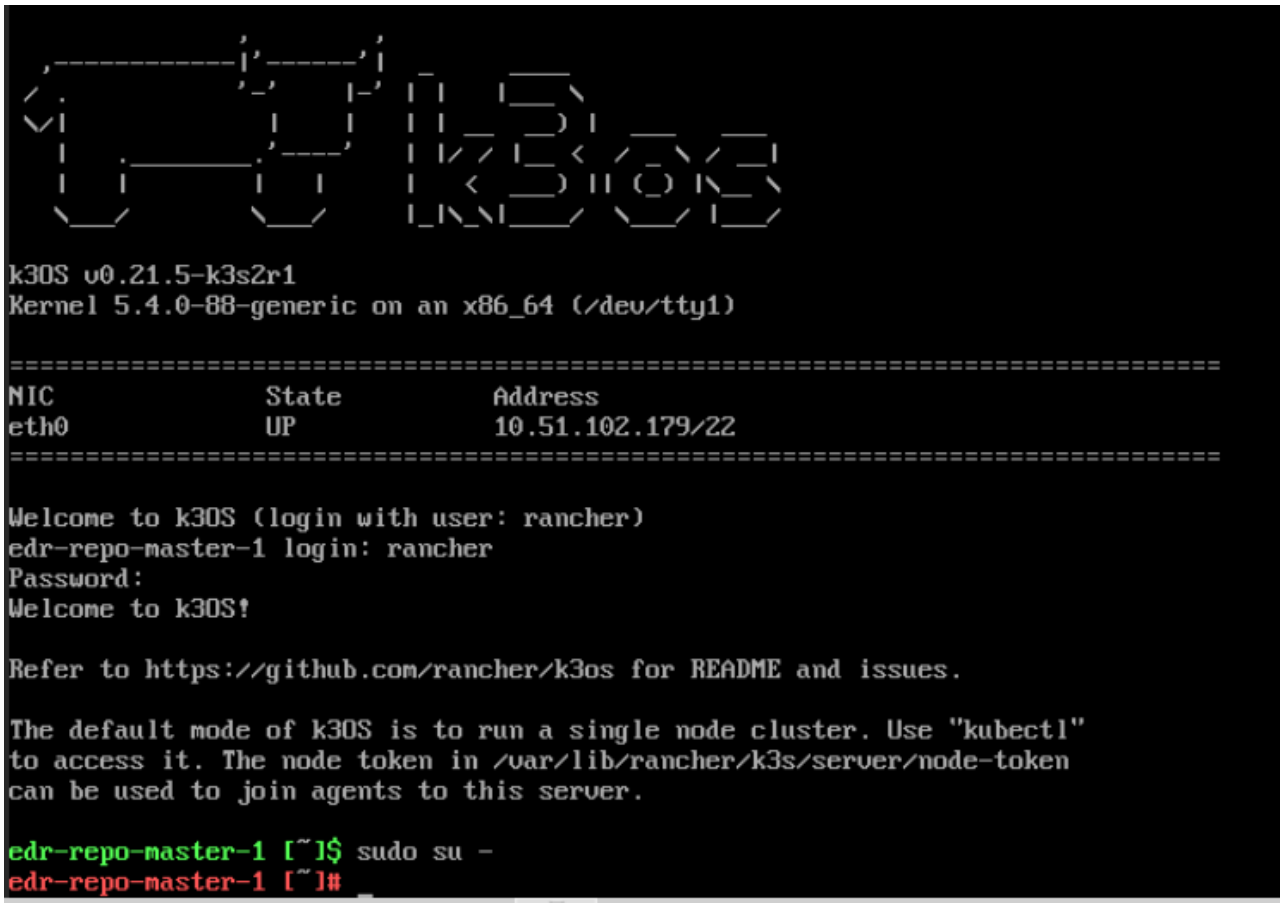
12. In the menu, select the default option *k30S Current* and press *Enter*.



The system will start. This might take a few minutes while OS data is copied to the Virtual Machine.

13. Log in with the `rancher` name and the password set previously.

14. Run the `sudo su -` command.

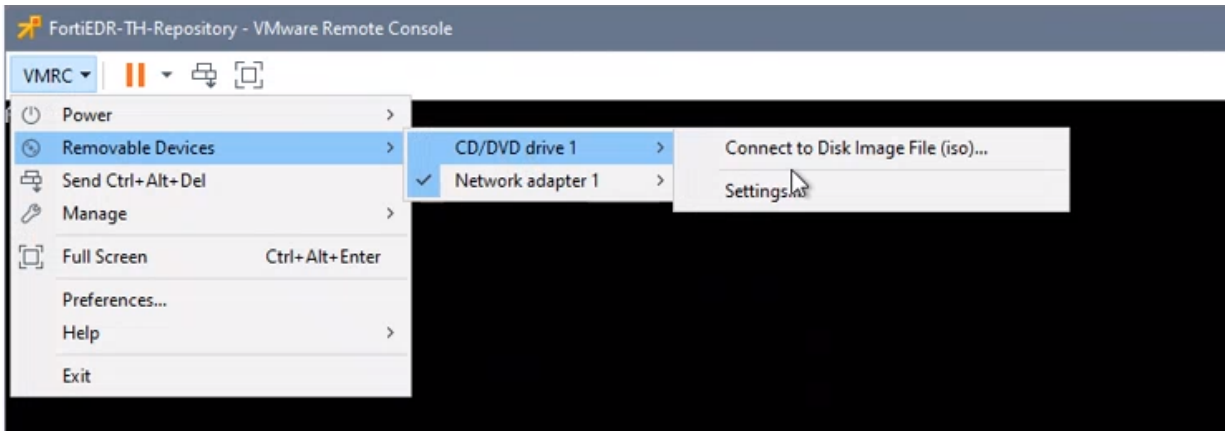


15. Verify the installation is successful by running the `kubectl get nodes` command and checking that the status of *edr-repo-master1* is *Ready*, as shown below. If you installed three nodes, verify that the status of the other two nodes are *Ready* as well.

Installing a FortiEDR Repository software ISO

To install the FortiEDR Repository Software ISO:

1. Launch the *FortiEDR_RepositoryInstaller* ISO file:
   a. From the *VMRC* menu, select *Removable Device > CD/DVD drive 1 > Connect to Disk Image File (iso)*....



b. Select the *FortiEDR_RepositoryInstaller* ISO file and click on *Open*. If the ISO has already been uploaded to the VMware datastore, you can also upload the ISO from there.

If mounting the new ISO appears to freeze the system, check if there is a prompt to disconnect the existing ISO. If yes, select *yes* to disconnect the existing ISO and then try mounting the new ISO again by repeating steps a and b.

2. Run the following command:

```
bash /k3os/system/install_edr2.sh
```

Select *init* (1) for a new installation.

```
mount: /mnt/iso: WARNING: device write-protected, mounted read-only.


Please select action:

1 - init ( install a fresh EDRv2 environment )

2 - update ( update existing EDRv2 environment )

3 - resize ( resize existing EDRv2 environment )
```

The node is being synchronized, which might take 10 to 15 minutes. If you installed three nodes, you will be prompted for the SSH password for each node.

```
***WARNING: The node 10.51.102.2 doesn't have a valid public key, updating the key now...
Warning: Permanently added '10.51.102.2' (ECDSA) to the list of known hosts.
rancher@10.51.102.2's password:
```

Existing virtual machine specifications (CPU and RAM) are being validated. If one is found to be lower than the minimum requirements for proper functioning of the FortiEDR Repository, the following warning appears:

```
ERROR: Current node's hardware spec doest fit minimun requirements:
       min CPU: 16 , currently installed 8
       min RAM: 24 , currently installed 16
```

Wait until the required container images are imported from ISO to the local image storage (might take few minutes).

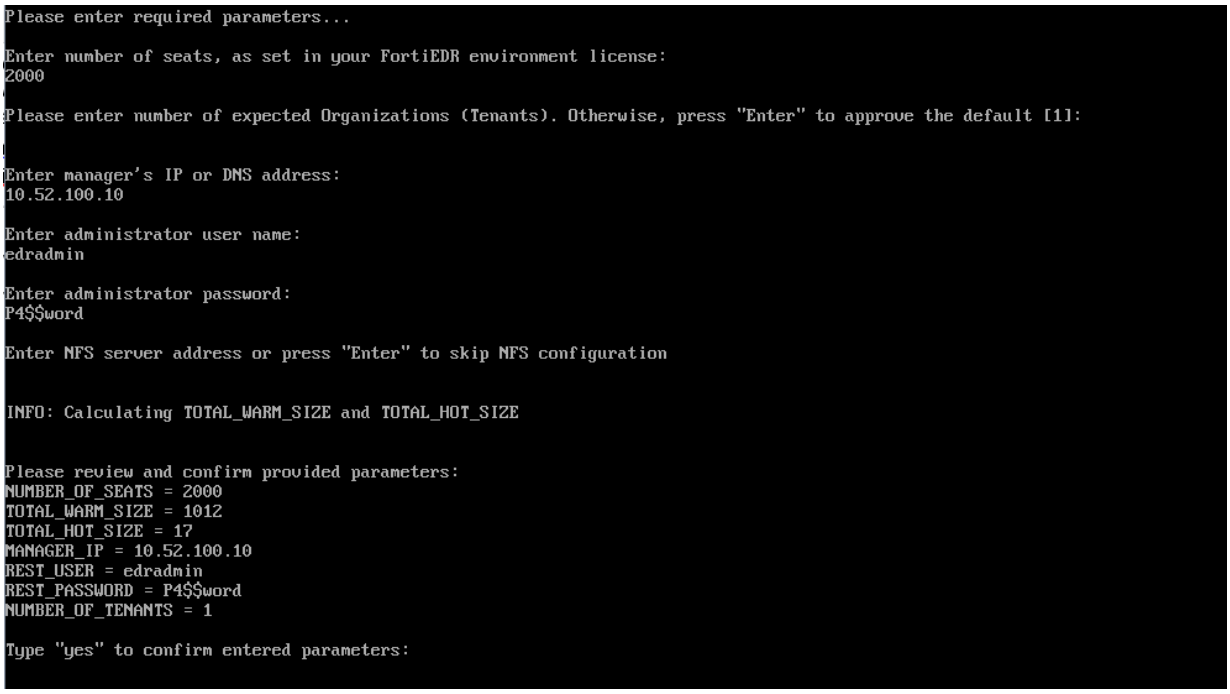
3. Complete the FortiEDR Repository software installation by providing the following parameters:
   - When prompted to enter the *number of seats*, enter the number of seats of your FortiEDR License (workstations and servers).
   - When prompted to specify whether the repository will be used by a *Managed Security Service Provider (MSSP)*, enter `yes` if you are going to define organizations, or `no` if you are not.

```
Please enter number of expected Organizations (Tenants).
1
Set MAX_ACCOUNT_COUNT=50

Enter manager's IP or DNS address:
10.51.102.99

Enter administrator user name:
admin

Enter administrator password:
********

Validating access to manager...
UP

***INFO: Manager is online

***INFO: Manager's version: 5.2.0.2229
```

   - If you entered `yes` in the previous question, provide the number of expected organizations (meaning Tenants).
   - When prompted for the FortiEDR Manager details, provide its IP and the credentials of one of the FortiEDR Console administrators that have Rest API permissions.

Make sure that the Threat Hunting repository does not block outbound traffic to port 443 on Central Manager.

   - Review the displayed configuration. Type *yes* to approve it or if the parameters are not correct, press *Enter* to restart the configuration process. The installation may take several minutes.



- At the *Is this an Air-Gapped environment?* prompt, enter *yes*.

Configuring the Threat Hunting Repository Monitoring console

To configure and access the Threat Hunting Repository Monitoring console:

1. When prompted, provide the password to be used for the Threat Hunting Repository monitoring console (Grafana) login. Note that the password should be a combination of letters and digits.
2. When asked whether to enable SMTP alerts, enter yes if you want to receive alert emails triggered by the Threat Hunting Repository monitoring. Otherwise, enter no and skip to step 7.
3. When prompted, provide the following information of the SMTP server:
   a. Details of the SMTP server (IP or FQDN, and port)
   b. Email address to send the alerts
   c. Email sender address
   d. Username and password required for the SMTP server access

4. When prompted, review the provided details and confirm.

```
Set the password to the Threat Hunting Repository monitoring console (Grafana). The username is "admin"
********

Enable SMTP alerts (yes|no)
yes

Please enter SMTP server address (IP/FQDN):
10.51.100.1

PLease enter SMTP server port:
587

Please enter recipient address:
alerts@customer.com

Please enter sender address:
alerts@customer.com

Please enter SMTP user name:
alerts@customer.com

Please enter SMTP password:
*******

Please review and confirm provided parameters:
SMTP_SERVER = 10.51.100.1
SMTP_PORT = 587
RECIPIENT_ADDRESS = alerts@customer.com
SENDER_ADDRESS = alerts@customer.com
SMTP_USER = alerts@customer.com

Type "yes" to confirm entered parameters:
```

Backing up Threat Hunting Repository data

Fortinet recommends that you back up the data stored in the Threat Hunting Repository database by replicating it to a NFS server, which can be used in for disaster recovery.

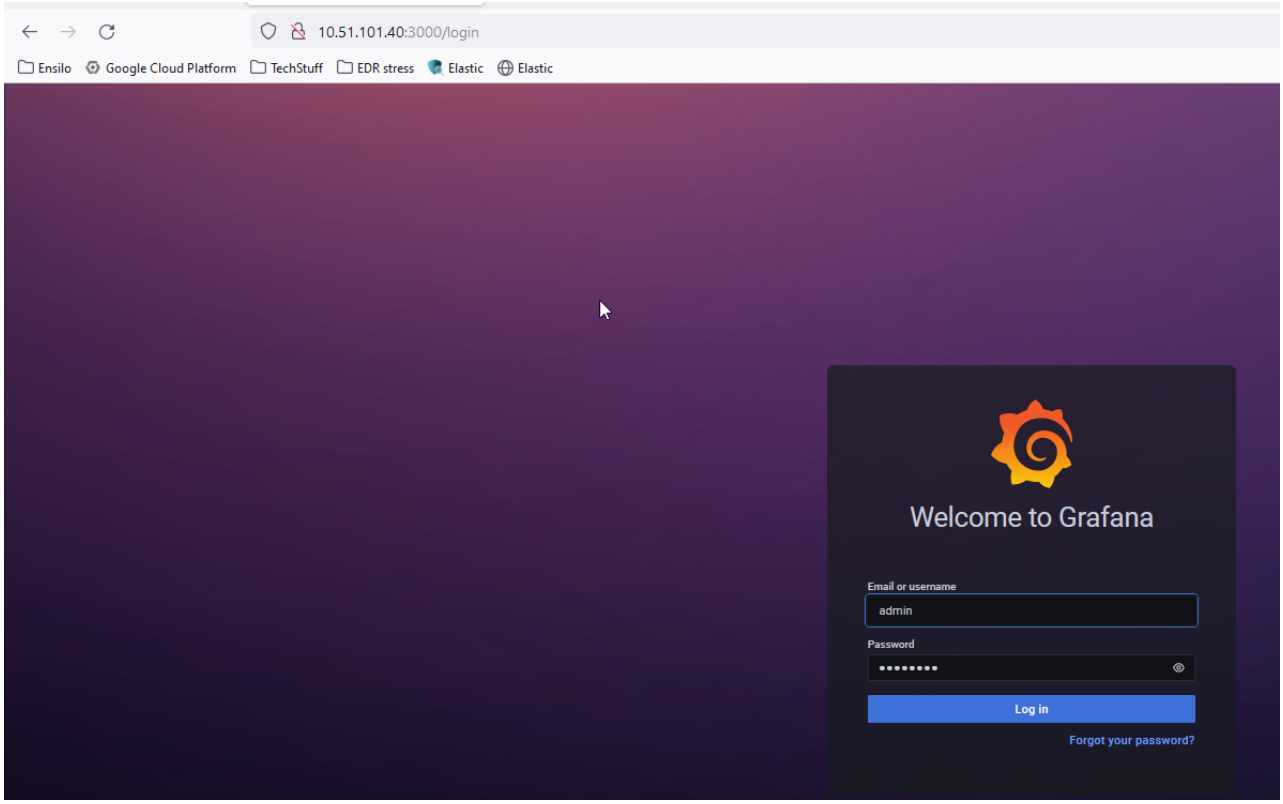
- The size of the NFS storage must be at least 55% of the total size of your Repository storage.
- The time to back up the data depends on the amount of data being copied over from the Repository database to the NFS server.
- When a piece of data is deleted from the Threat Hunting Repository storage due to retention, the backup copy of that piece of data, if exists, is deleted from the NFS server as well.

To enable backup of data, provide details about the backup storage in the CLI:

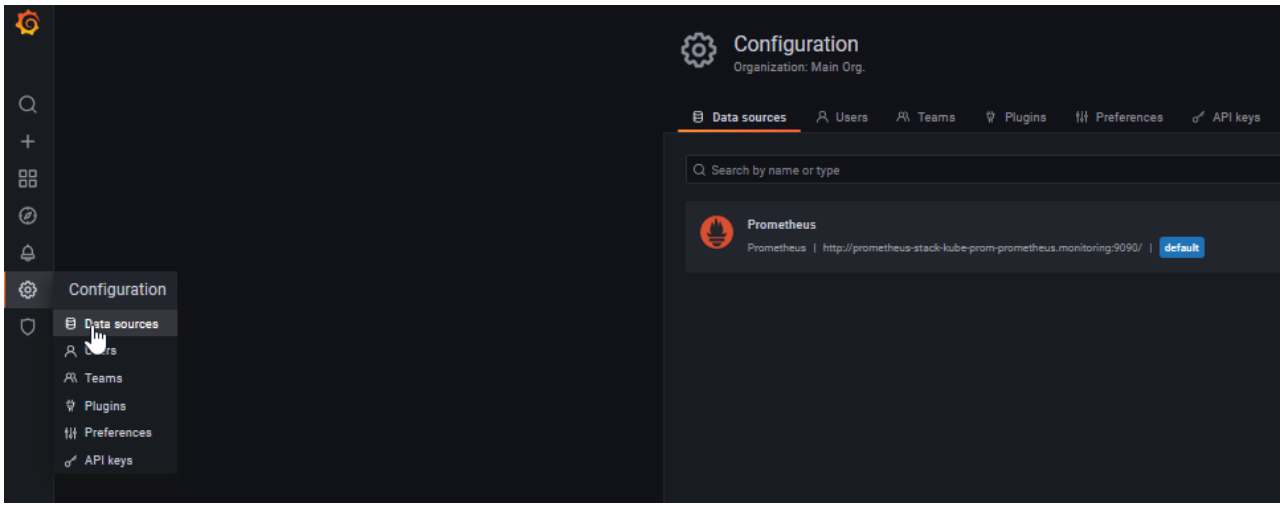
1. At the prompted question, enter yes.
2. When prompted, enter the NFS server address.
3. When prompted, enter the NFS share path to which the data will be replicated.

Activating the Threat Hunting Repository Monitoring console

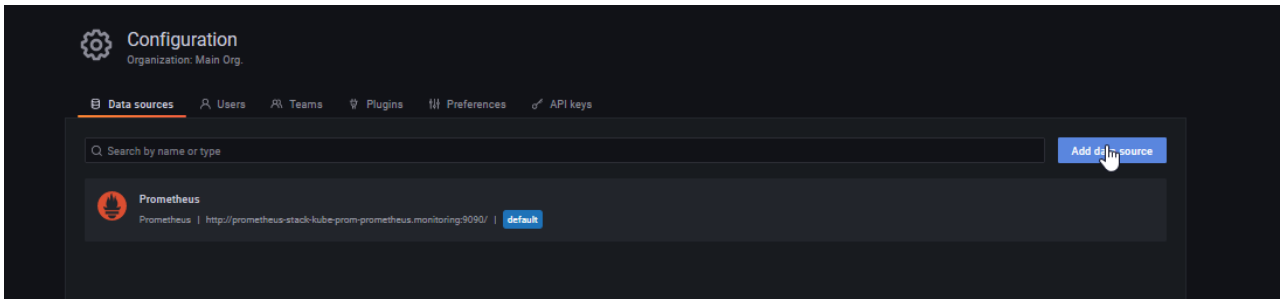
1. Visit `http://<TH IP>:3000`.



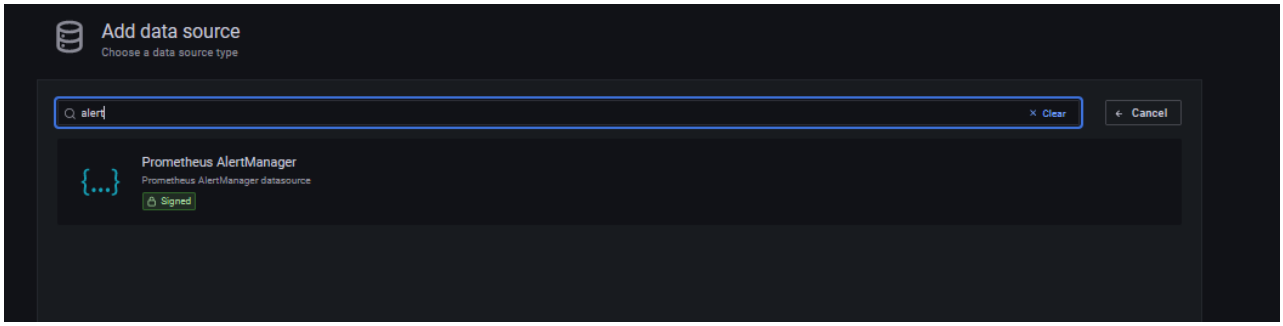
2. Enter the user and password that you provided during the initial installation setup.
3. Go to *Configuration* > *Data sources*.



4. Click *Add data source*.

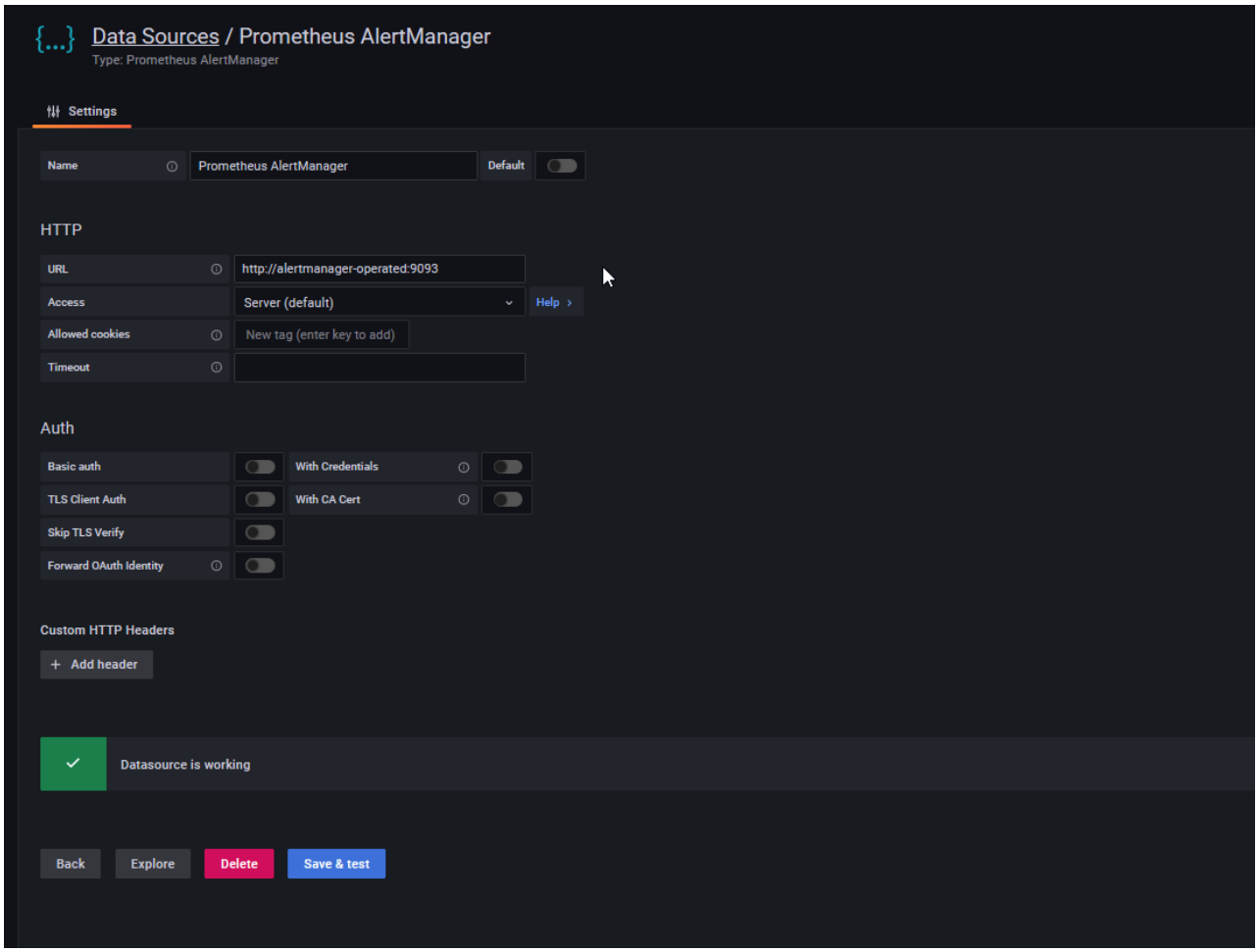


5. Select *Prometheus AlertManager*.

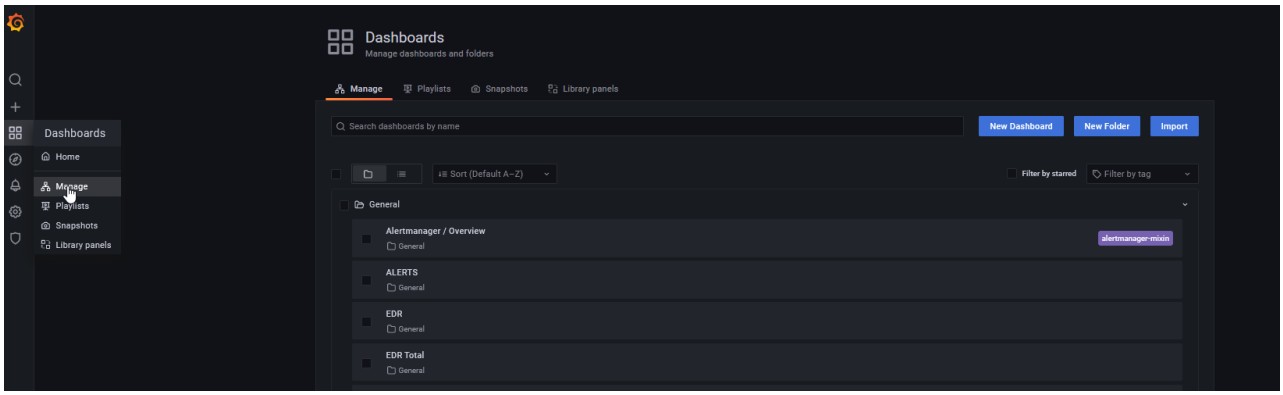


6. In the *URL* field, enter `http://alertmanager-operated:9093`.

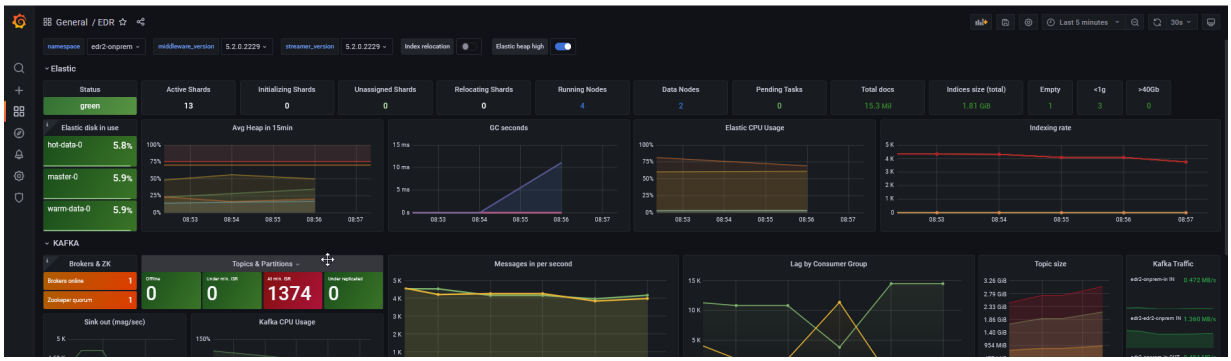
7. Click *Save & test*.



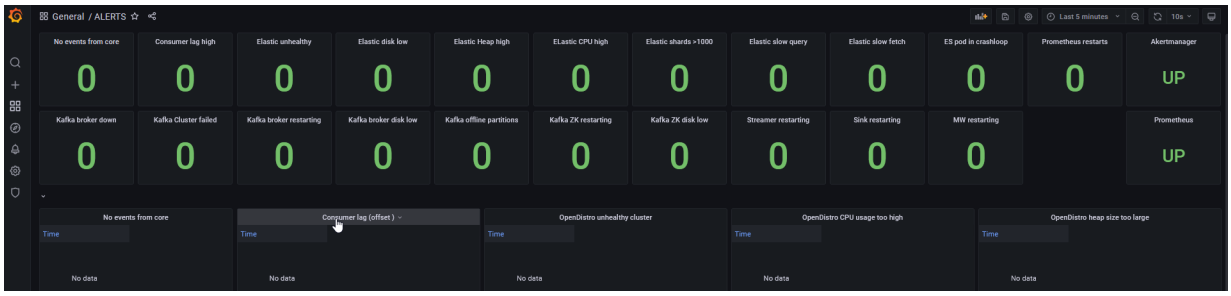
8. Under *Dashboards > Manage*:



- Open the *EDR* dashboard to view the current status of threat hunting.



- Open the *Alerts* dashboard to view alerts triggered by the Threat Hunting Repository monitoring system.



The following table lists all the alerts and the mitigation methods.

Alert	Mitigation
No events from core	Verify that all Cores are an running by using the FortiEDR Manager.

Alert	Mitigation
Consumer Lag (offset)	
OpenDistro Unhealthy Cluster	
OpenDistro CPU usage too high	
OpenDistro heap size too large	
OpenDistro too many shards per node	
OpenDistro slow search query	
OpenDistro slow search fetch	
OpenDistro disk usage	
ES pod in crashloop	
Kafka Offline Partitions	
Kafka broker is down	Contact Fortinet Support.
Kafka cluster failed	
Kafaka broker restart rate high	
Kafka broker disk low	
ZooKeeper disk low	
Streamer restart rate high	
StreamerSink restart rate high	
ZooKeeper restart too often	
Streamer MAX HPA	
Streamer unreached desired HPA	
Middleware restart rate high	

Setting up the FortiEDR reputation DB server

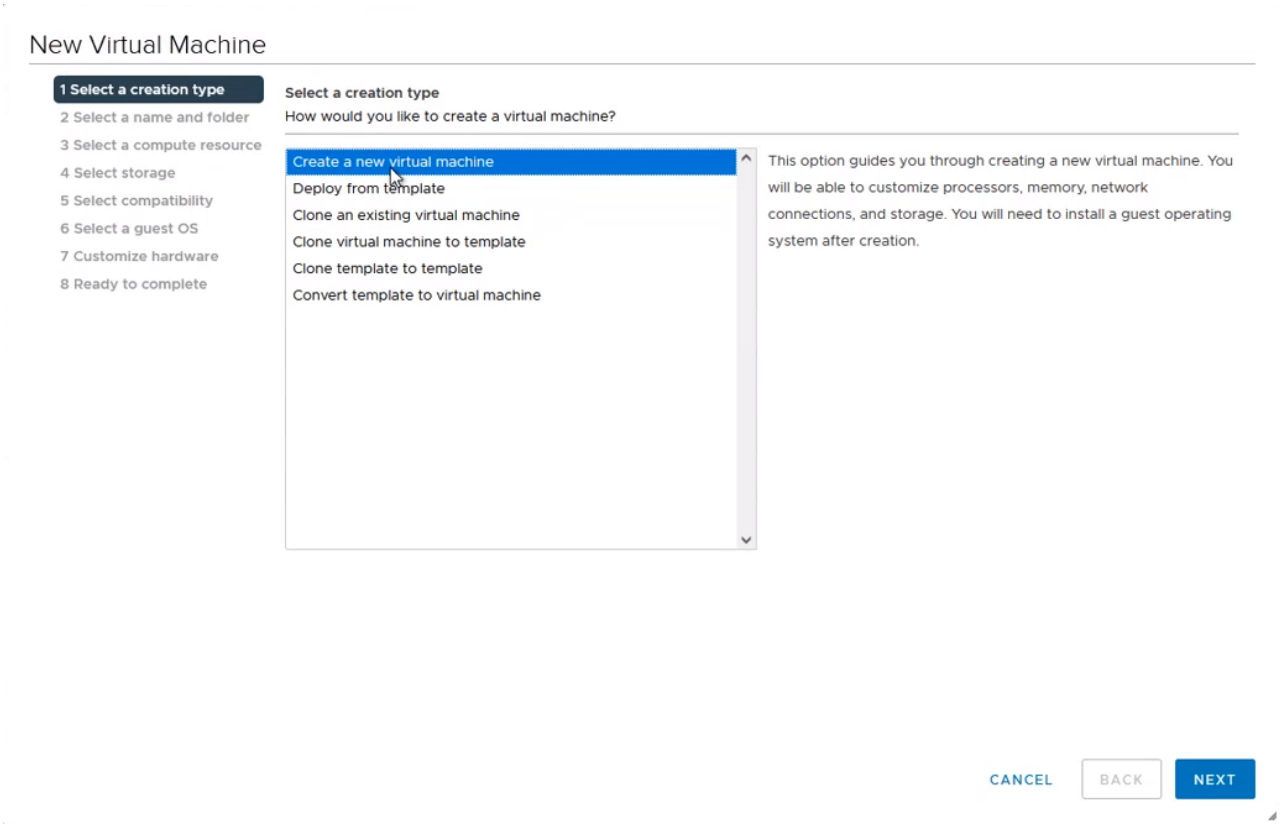
The installation of the reputation service includes the following steps:

1. Creating a Virtual Machine on page 591
2. Installing the reputation service on page 592
3. Configuring the reputation DB on page 592
4. Uploading reputation files on page 593

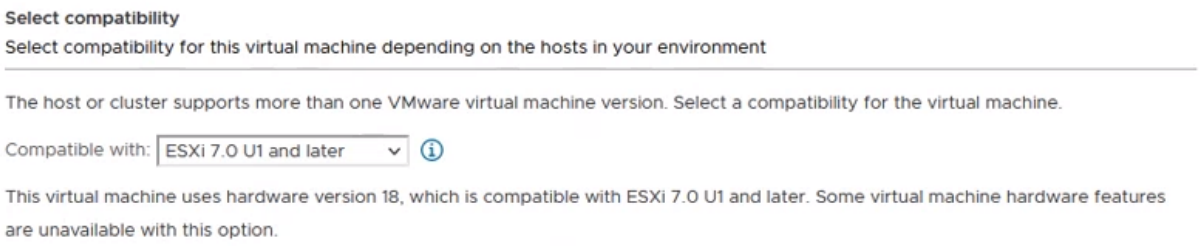
Creating a Virtual Machine

To create a virtual machine:

1. Create a new virtual server. For example, by selecting *File > New Virtual Machine...*, then selecting *Create a new virtual machine* and clicking *NEXT*.



2. Enter the desired *virtual machine name*. For example, *fortiedr-reputation-service* and click *NEXT*.
3. Enter the virtual machine settings, as follows:
   a. In the *Select a compute resource* step, select the resources as needed and click *NEXT*.
   b. In the *Select storage* step, select the storage where the virtual machine disk should be stored on and click *NEXT*.
   c. In the *Select Compatibility* step, select your ESXi version and click *NEXT*.



   d. At the *Select a guest OS* step, select *Linux* in the *Guest OS family* field and select *Ubuntu Linux (64-bit)* in the *Guest OS version* field.

e. In the *Customize hardware* step, select the minimum requirements as specified in system requirements in Appendix D – On-premise deployment for air-gapped environments on page 541 and attach a network interface.

4. Select *Finish* to complete the creation of the virtual machine.

Installing the reputation service

To install the FortiEDR reputation service:

1. Right-click the new VM and select *Open Remote Console*.
2. Select *Manage > Virtual Machine Settings*.
3. In the *Hardware* tab, select the *CD/DVD* option and then select the *Use ISO image file* option on the right.
4. Click the *Browse* button and select the ISO file provided by Fortinet for the FortiEDR Reputation Server. Click *OK*.

Another option instead of completing the two steps described above is to upload the ISO from the VMWare datastore (this is possible if the ISO has already been uploaded there).

5. Start the virtual machine and wait until installation is complete.
6. Log into the virtual machine in order to continue the installation process.
   `Login: root`
   Change the root password, by entering any password you want. Then re-type it. The password must be strong enough according to Linux standards.

Configuring the reputation DB

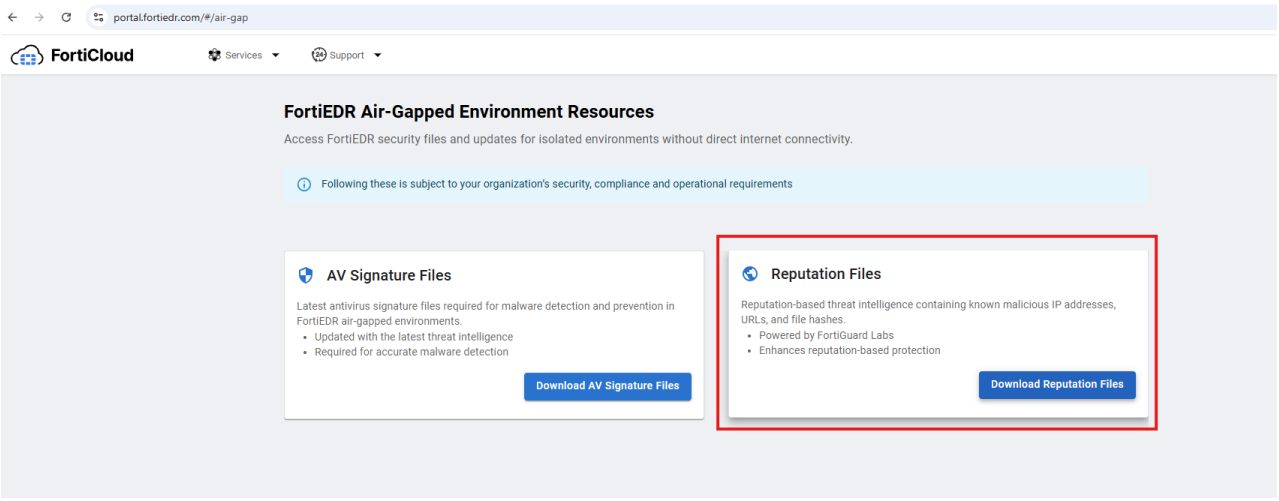
To configure the FortiEDR reputation service:

1. In the VM CLI, enter `fortiedr config`.
2. At the device role prompt, click *Next*.
3. At the prompt, enter your `hostname` and click *Next*. (Note: This can be any hostname)
4. A list of network interfaces on this virtual machine displays. At the *Pick your primary interface* prompt, select the primary network interface, and click *Next*.
5. At the *Do you want to use DHCP* prompt, select *No* to configure the IP of this virtual machine manually, and then click *Next*.
6. At the prompt, enter the IP address of the machine that you are installing. Use the following format: `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
7. At the prompt, enter the default gateway and click *Next*.
8. At the *Please set your DNS server* prompt, enter a valid IP address and click *Next*. Use the following format:
   `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
9. At the prompt, enter the default gateway and click *Next*.
10. At the management prompt, enter the Central Manager IP address, which must be reachable from the reputation server.

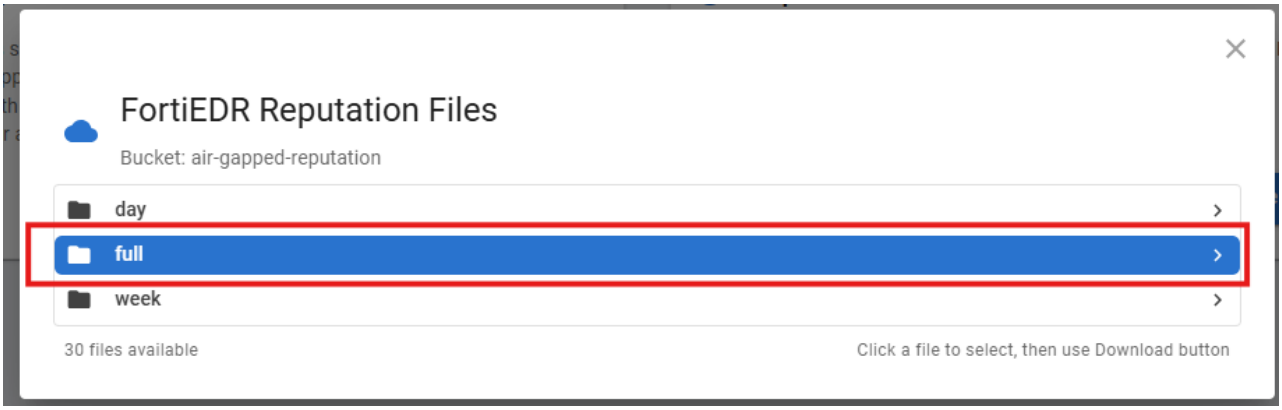
11. Enter the credentials of an admin user with REST API permissions in the FortiEDR Central Manager. If no such user exists, you must first create one by following the steps in Users on page 359.
12. At the *Do you want to enable web-proxy?* prompt, select *No*.
13. At the *Please set the date* prompt, verify the date and click *Next*. The installer automatically presents the current date. You can change this date, if necessary.
14. At the *Please set your Time* prompt, set the time and click *Next*.
15. At the prompt, select the timezone and country in which the server is being installed.
16. Wait a few moments while the installation processes, until you see the Installation completed successfully message.
17. Run `fortiedr status` to validate that the reputation service is running. Alternatively, go to *Administration* > *Settings* > *Reputation DB* and verify the reputation server DB is listed.

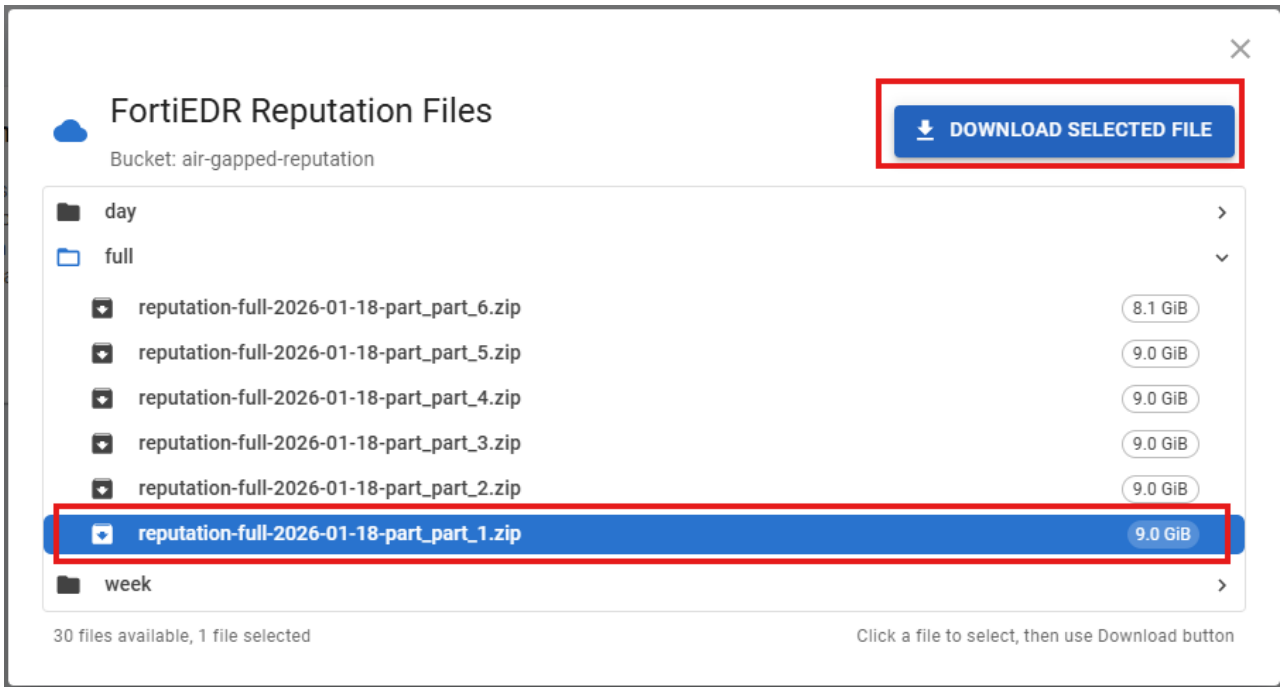
Uploading reputation files

1. In an Internet-connected system, log into the FortiCloud Portal and click *Download Reputation Files*.



2. Select *Full* and download all six parts of the file dump.





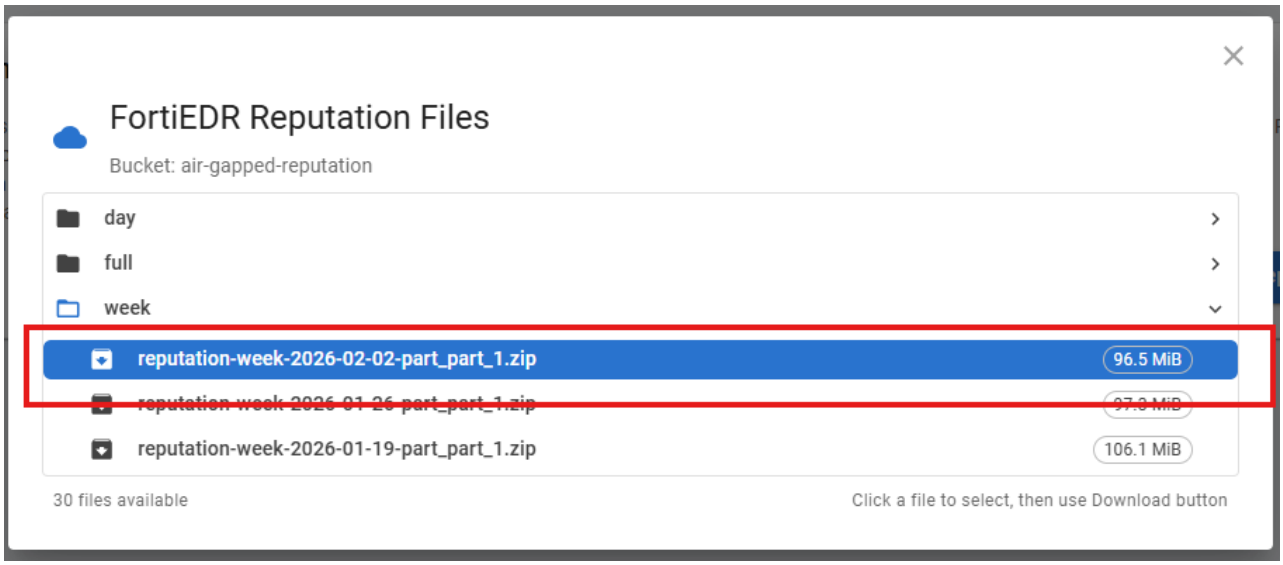
3. Transfer the files to the air-gapped (isolated) environment using approved removable media.
4. Upload all file parts to the reputation DB server in order using the following command:

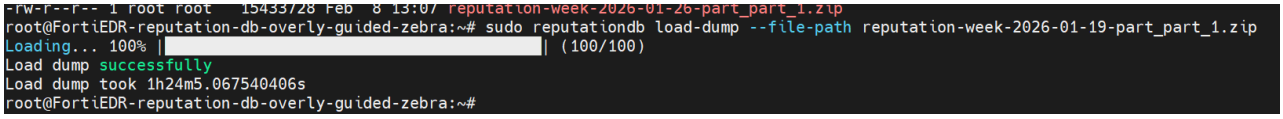
   ```
   sudo reputationdb load-dump --file-path {reputation file name zip}
   ```

   For example:

   ```
   root@FortiEDR-reputation-db-overly-guided-zebra:~#
   root@FortiEDR-reputation-db-overly-guided-zebra:~# sudo reputationdb load-dump --file-path  reputation-full-2026-01-18-part_part_1.zip
   Loading... 100% |████████████████████████████████████| (100/100)
   Load dump successfully
   Load dump took 43m57.553034479s
   root@FortiEDR-reputation-db-overly-guided-zebra:~# sudo reputationdb load-dump --file-path  reputation-full-2026-01-18-part_part_2.zip
   Loading... 100% |████████████████████████████████████| (100/100)
   Load dump successfully
   Load dump took 43m52.454349653s
   root@FortiEDR-reputation-db-overly-guided-zebra:~#
   ```

5. Follow the same procedure to upload all the weekly reputation dump files up to date when the system is installed.





6. Follow the same procedure to upload all the daily reputation dump files up to date when the system is installed.

The daily reputation dump files must be uploaded after the weekly reputation dump files are uploaded.

Setting up the FortiEDR reputation service

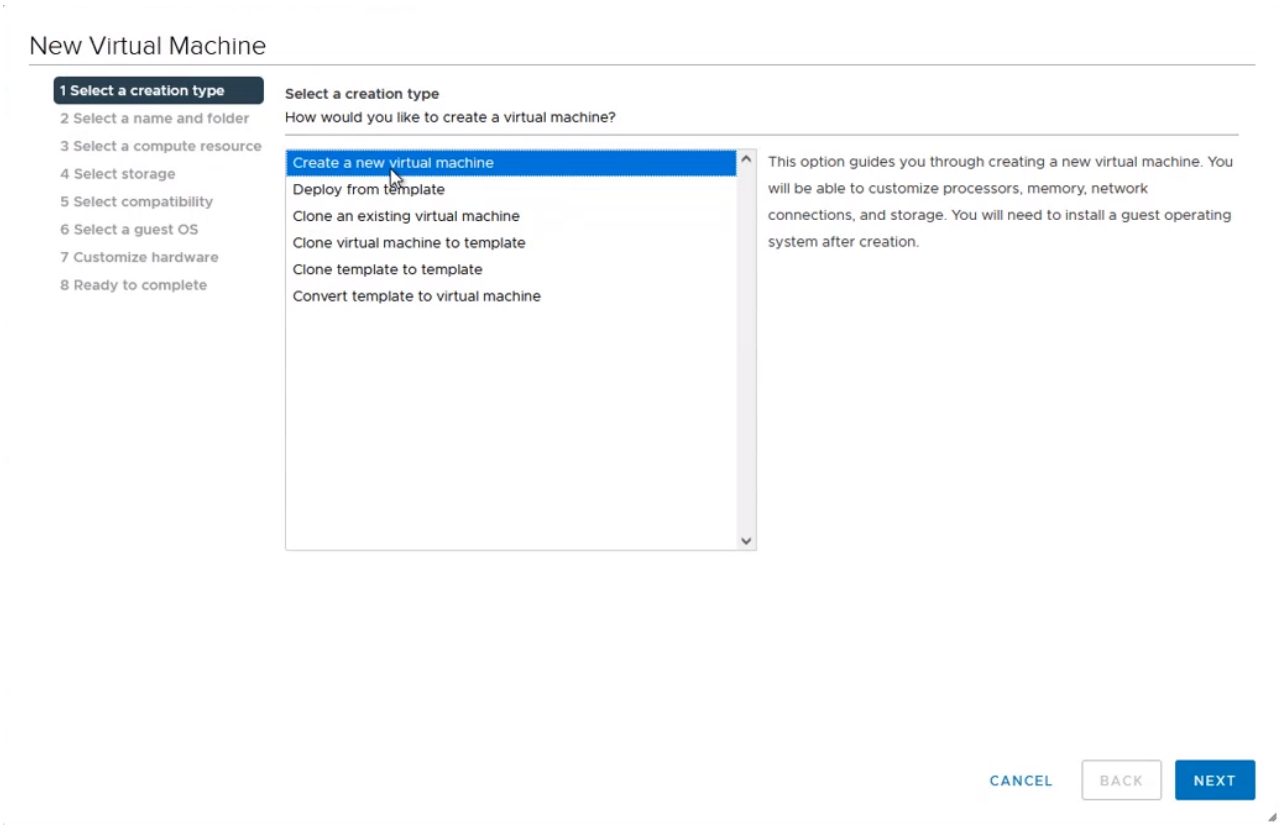
The installation of the reputation service includes the following steps:

1. Creating a Virtual Machine on page 595
2. Installing the reputation service on page 597
3. Configuring the reputation service on page 597

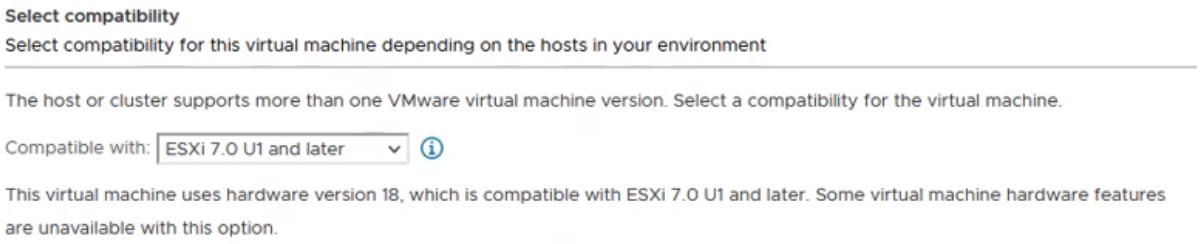
Creating a Virtual Machine

To create a virtual machine:

1. Create a new virtual server. For example, by selecting *File > New Virtual Machine...*, then selecting *Create a new virtual machine* and clicking *NEXT*.



2. Enter the desired *virtual machine name*. For example, *fortiedr-reputation-service* and click *NEXT*.
3. Enter the virtual machine settings, as follows:
   a. In the *Select a compute resource* step, select the resources as needed and click *NEXT*.
   b. In the *Select storage* step, select the storage where the virtual machine disk should be stored on and click *NEXT*.
   c. In the *Select Compatibility* step, select your ESXi version and click *NEXT*.



   d. At the *Select a guest OS* step, select *Linux* in the *Guest OS family* field and select *Ubuntu Linux (64-bit)* in the *Guest OS version* field.
   e. In the *Customize hardware* step, select the minimum requirements as specified in system requirements in Appendix D – On-premise deployment for air-gapped environments on page 541 and attach a network interface.
4. Select *Finish* to complete the creation of the virtual machine.

Installing the reputation service

To install the FortiEDR reputation service:

1. Right-click the new VM and select *Open Remote Console*.
2. Select *Manage* > *Virtual Machine Settings*.
3. In the *Hardware* tab, select the *CD/DVD* option and then select the *Use ISO image file* option on the right.
4. Click the *Browse* button and select the ISO file provided by Fortinet for the FortiEDR Reputation Server. Click *OK*.

Another option instead of completing the two steps described above is to upload the ISO from the VMWare datastore (this is possible if the ISO has already been uploaded there).

5. Start the virtual machine and wait until installation is complete.
6. Log into the virtual machine in order to continue the installation process.
   `Login: root`
   Change the root password, by entering any password you want. Then re-type it. The password must be strong enough according to Linux standards.

Configuring the reputation service

To configure the FortiEDR reputation service:

1. In the VM CLI, enter `fortiedr config`.
2. At the device role prompt, click *Next*.
3. At the prompt, enter your `hostname` and click *Next*. (Note: This can be any hostname)
4. A list of network interfaces on this virtual machine displays. At the *Pick your primary interface* prompt, select the primary interface to reach the Central Manager server, and click *Next*.
5. At the *Do you want to use DHCP* prompt, select *No* to configure the IP of this virtual machine manually, and then click *Next*.
6. At the prompt, enter the IP address of the machine that you are installing. Use the following format: `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
7. At the prompt, enter the default gateway and click *Next*.
8. At the *Please set your DNS server* prompt, enter a valid IP address and click *Next*. Use the following format:
   `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
9. At the management prompt, enter the Central Manager IP address, which must be reachable from the reputation server.
10. Enter the credentials of an admin user with REST API permissions in the FortiEDR Central Manager. If no such user exists, you must first create one by following the steps in Users on page 359.
11. Enter the Central Manager SSH port (default is 22).
12. Enter the Central Manager SSH credentials, which are the root username and password you created when Setting up a VM to be the FortiEDR Central Manager on page 547.
13. At the *Is this an Air-Gapped environment?* prompt, enter *yes*.

14. At the *Please enter the Reputation DB server Address* prompt, enter the IP of the reputation DB server.
15. At the *Do you want to enable web-proxy?* prompt, select *no*.
16. At the *Please set the date* prompt, verify the date and click *Next*. The installer automatically presents the current date. You can change this date, if necessary.
17. At the *Please set your Time* prompt, set the time and click *Next*.
18. At the prompt, select the timezone and country in which the server is being installed.
19. Wait a few moments while the installation processes, until you see the Installation completed successfully message.
20. Run `fortiedr status` to validate that the reputation service is running. Alternatively, go to *Administration* > *Settings* > *Reputation Service* and verify the reputation service is listed.
21. Manually upload and manage AV signatures under *Profiles* > *Security* > *Security Content Update* > *Content Manager*. See Security Content Update Collector 6.2 or later on page 227 for more details.

Setting up the FortiEDR Core

This topic includes the following sections:

- Prerequisites on page 598
- Installing the FortiEDR Core on page 599

Prerequisites

The workstation, virtual machine or server on which the FortiEDR Core will be installed, must meet the following requirements:

- Complies with the requirements described in the *System Requirements* section in Appendix D – On-premise deployment for air-gapped environments on page 541.
- Has connectivity to a Local Area Network (for wired users) or a Wireless Network (for wireless users). If there is no connectivity, consult your IT support person.
- Has connectivity to the FortiEDR Aggregator. You can check this by browsing to the Aggregator's IP address. For problems connecting, see Troubleshooting on page 458.
- Has connectivity to the FortiEDR Reputation Server at `reputation.cloud.ensilo.com`.
- If the FortiEDR Core is deployed on your organization's premises (on-premises) and you use a web proxy to filter requests, then before running the installer, set the system proxy to work with an HTTPS connection, as follows:
  - Edit the file `/etc/environment` to have a proxy address configuration, https_proxy or PAC address. For example: `https_proxy=https://192.168.0.2:443`

    (for PAC): `https_proxy=pac+http://192.168.200.100/sample.pac`, where the `sample.pac` file contains an HTTPS address of the proxy.
  - If the definitions of the system proxy are placed somewhere other than `/etc/environment`, then:
    - Copy the definitions to the file `/etc/environment`. Note that this affects all processes on the Linux system.

- Define a specific environment variable for the FortiEDR Linux Core with the name *nslo_https_proxy* at the file `/etc/environment`
  For example: `nslo_https_proxy=https://192.168.0.2:443`
  (for PAC): `nslo_https_proxy=pac+http://192.168.200.100/sample.pac`

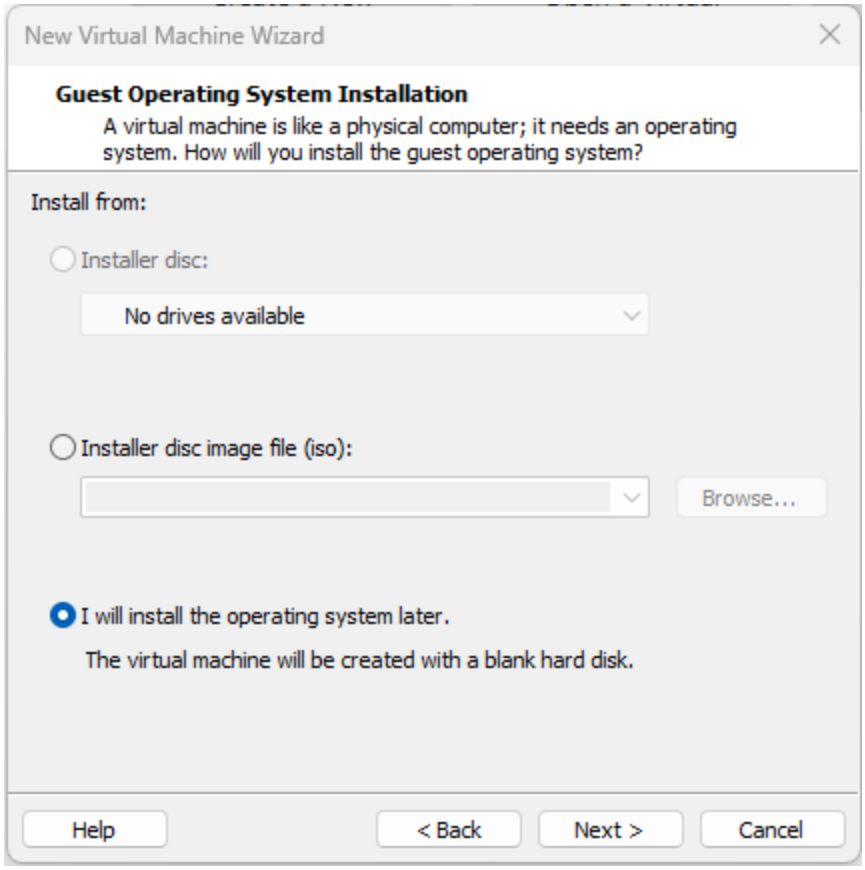
For more details about installing a Core in a multi-organization environment, see the *Core Registration* section in Component registration in a multi-organization environment on page 429.

Installing the FortiEDR Core

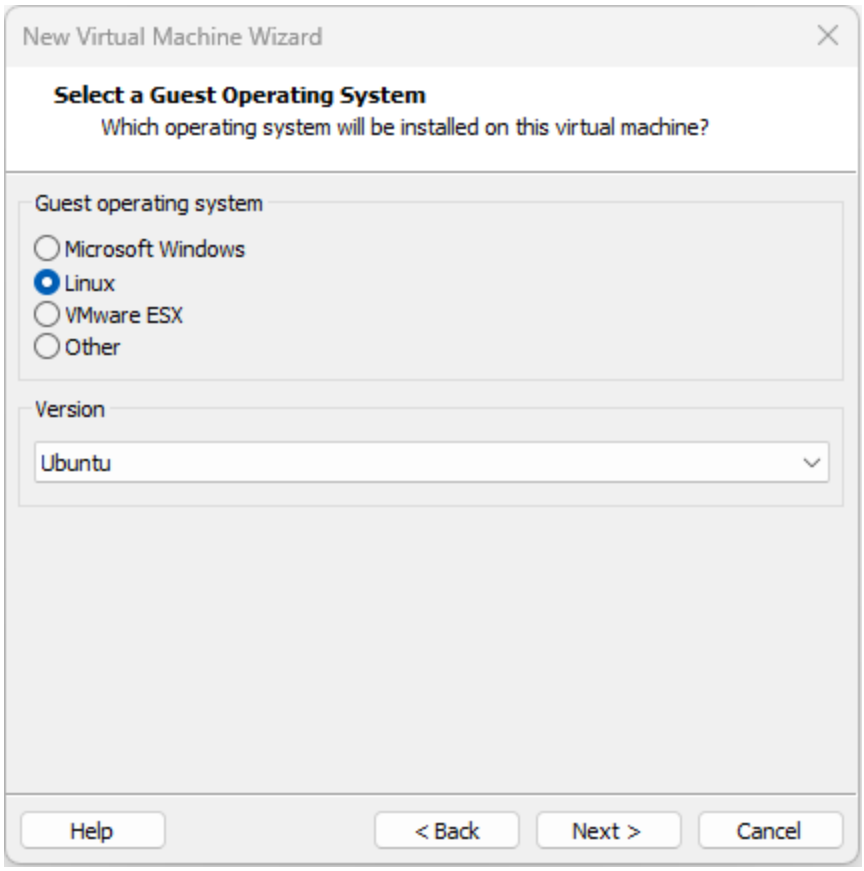
The following describes how to install the FortiEDR Core:

1. Create a new virtual server by selecting *File* > *New Virtual Machine*.
2. Select the *Typical* option and click *Next*.

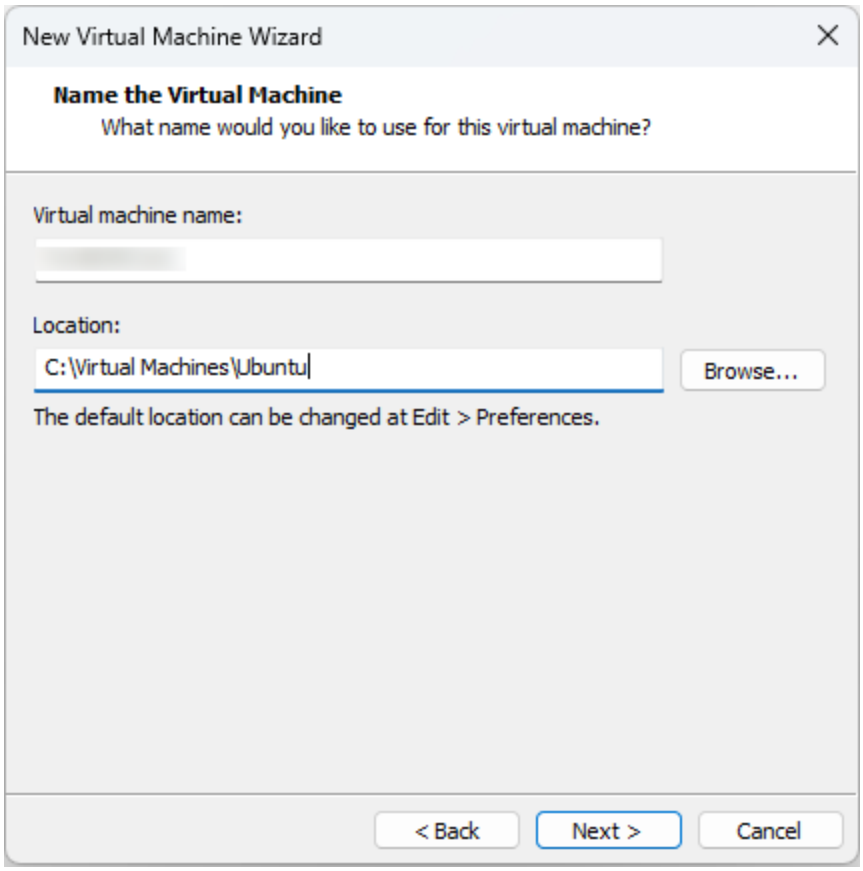
3. Select the *I will install the operating system later* option and click *Next*.



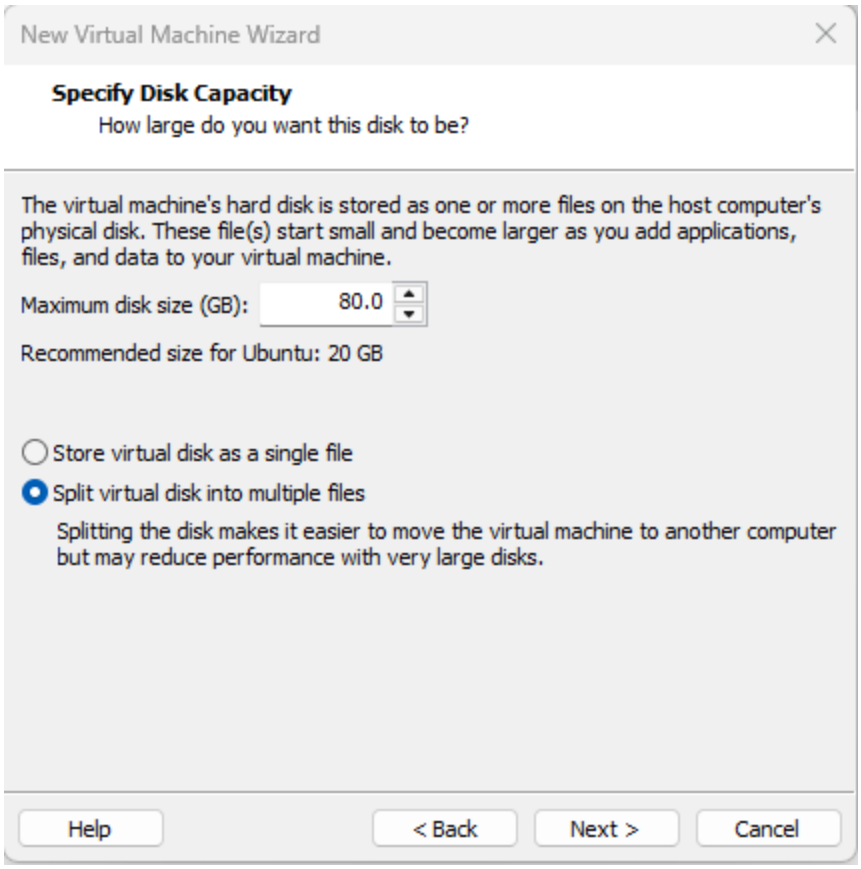
4. Select the *Linux* radio button. In the *Version* field, select *Ubuntu* and click *Next*. Alternatively, you can select a different generic Linux 64-bit in the *Version* field.



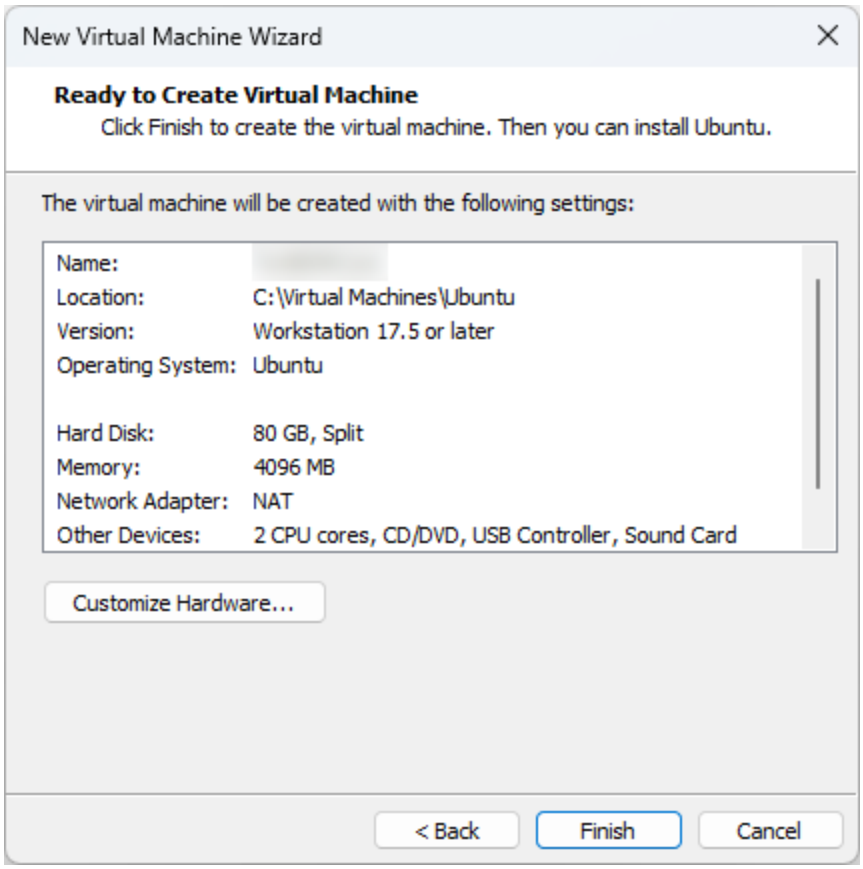
5. Specify a name for the virtual machine such as *FortiEDRCore* and the location in which to store the provided ISO file and click *Next*.



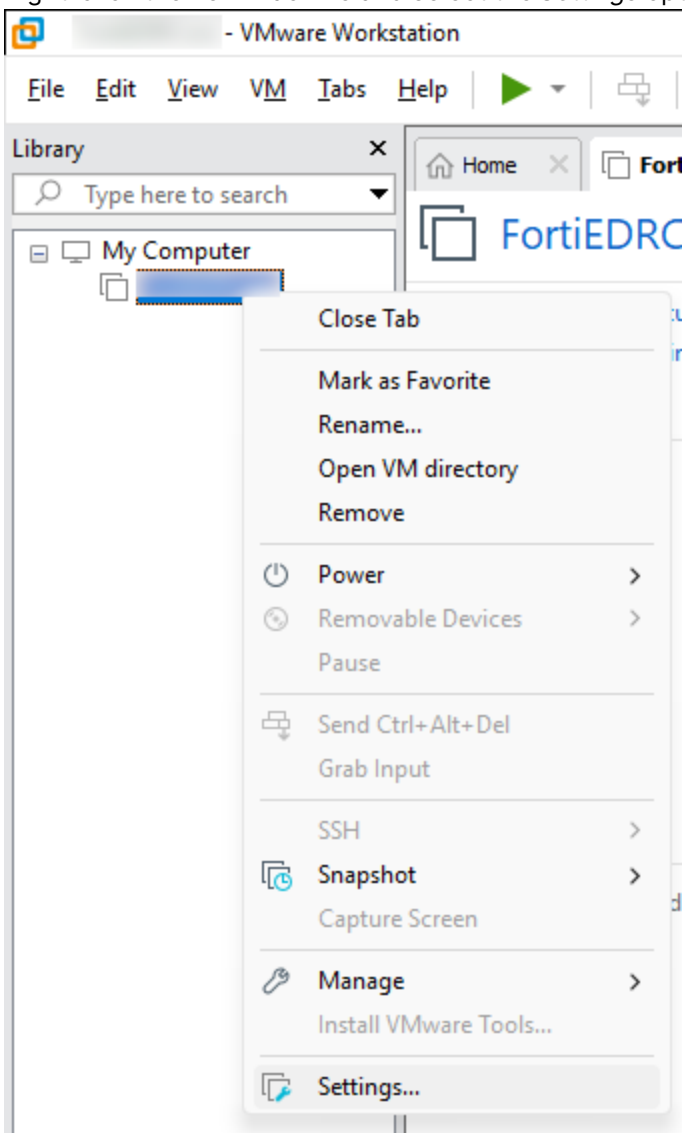
6. Change the *Maximum disk size* to `80` GB, leave the default option as *Split virtual disk into multiple files* and click *Next*.


New Virtual Machine Wizard
Specify Disk Capacity
How large do you want this disk to be?
The virtual machine's hard disk is stored as one or more files on the host computer's physical disk. These file(s) start small and become larger as you add applications, files, and data to your virtual machine.
Maximum disk size (GB):
80.0
Recommended size for Ubuntu: 20 GB
Store virtual disk as a single file
Split virtual disk into multiple files
Splitting the disk makes it easier to move the virtual machine to another computer but may reduce performance with very large disks.
Help
< Back
Next >
Cancel

7. Click *Finish*.

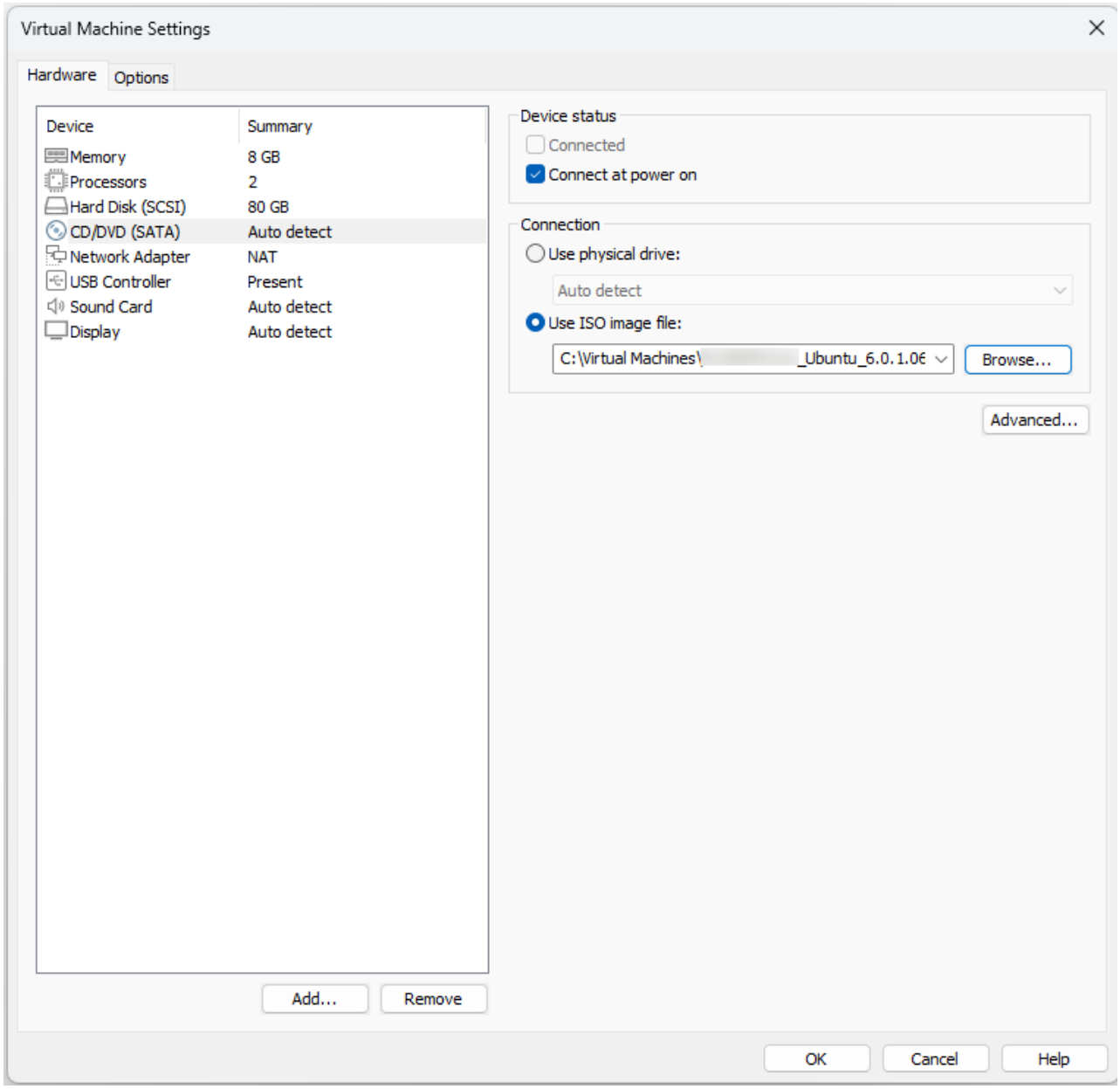


8. Right-click the new machine and select the *Settings* option.



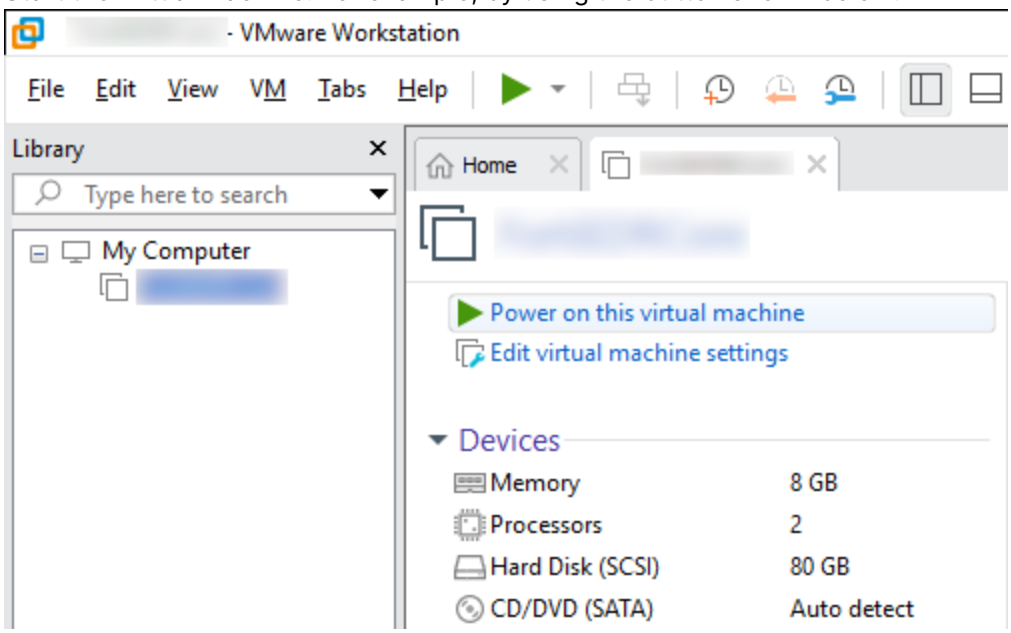
9. Select the *Memory* option and change the RAM to at least 8 GB.
10. Select the *Processors* option and change the value to a total of at least two CPU Cores.

11. Select the *CD/DVD* option and then select the *Use ISO image* file option on the right.



12. Click the *Browse* button and select the ISO file provided by Fortinet for the FortiEDR Core. Click *OK*.

13. Start the virtual machine. For example, by using the button shown below:



The virtual machine automatically starts the installation process, which may take a few minutes.

14. Wait until a success message is displayed requesting that you reboot.
15. Reboot the virtual machine.
16. Log into the virtual machine in order to continue the installation process.
`Login: root`
Change the root password, by entering any password you want and then retype it. The password must be strong enough according to Linux standards.
17. Enter `fortiedr config`.
18. At the prompt, select the role of the virtual machine. For this installation, select *CORE* and click *Next*.

After the installation of the Core, you can configure the functionality of the Core as *Core only*, *Jumpbox*, or *Both* in the *INVENTORY* > *System Components* tab of the Central Manager.

19. At the prompt, enter your hostname (any hostname) and click *Next*.
20. At the prompt, enter the Organization name if this Core is added to a multi-tenant environment and should work only with one organization. For a non-multi-tenant setup, leave the organization name empty. Click *Next*.
21. At the prompt, enter the registration password.

If this is a multi-tenant setup and this Core is to belong only to a specific organization, then the password should match the registration password that was provided upon creating that organization (listed under *ADMINISTRATION* > *ORGANIZATIONS* tab of the FortiEDR Central Manager).

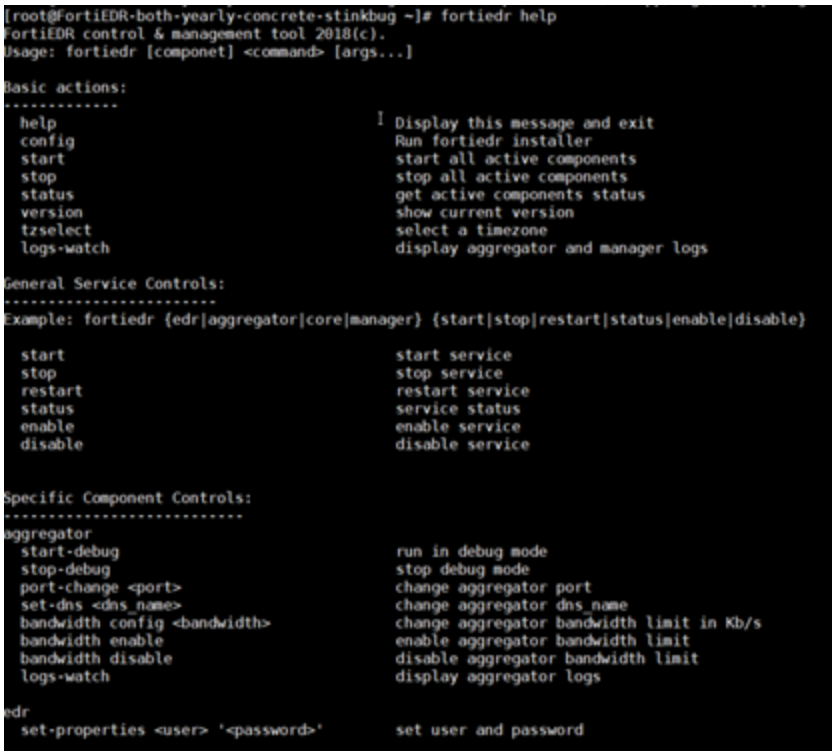
22. At the prompt, enter the Aggregator external IP address.
23. At the prompt, enter this Core machine's external IP address without the port.

24. A list of network interfaces on this virtual machine displays. At the *Pick your primary interface* prompt, select the interface to be used as the primary network interface through which all FortiEDR Cores and FortiEDR Collectors will reach this server, and then click *Next*.
25. At the *Do you want to use DHCP* prompt, do one of the following:
    a. Select *yes* to use DHCP and click *Next*. Proceed to step 29 below.
    b. Select *no* to configure the IP of this virtual machine manually, and then click *Next*. Perform steps 26 through 35 below.
26. At the prompt, enter the IP address of the machine that you are installing.
    Use the following format: `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
27. At the prompt, enter the default gateway and click *Next*.
28. At the *Please set your DNS server* prompt, enter a valid IP address and click *Next*.
    Use the following format: `xxx.xxx.xxx.xxx/yy`, where yy is the routing prefix of the subnet.
29. At the prompt, select *no* for debug mode.
30. At the *Please set the date* prompt, verify the date and click *Next*. The installer automatically presents the current date. You can change this date, if necessary.
31. At the *Please set your Time* prompt, set the time and click *Next*.
32. At the prompt, select the timezone and country in which the server is being installed.
33. At the *Do you want to enable Web proxy* prompt, select *no*.
34. Wait a few moments while the installation processes, until you see the *Installation completed successfully* message.
35. To verify that core installation succeeded, use the `fortiedr status` and `fortiedr version` commands.
36. In the *Administration > Deployment > System Components* tab of the Central Manager, verify that the FortiEDR Core details are listed and configure the functionality of the Core as *Core only*, *Jumpbox*, or *Both*.

FortiEDR CLI commands

The following describes additional commands that you can perform in the FortiEDR Core, Repository Server, FortiEDR Central Manager, or FortiEDR Aggregator CLI.

At the prompt, type `fortiedr` or `fortiedr help` to display them.



Command	Description
Basic actions	
`help`	Display this message and exit.
`config`	Run FortiEDR installer.
`start`	Start all active components.
`stop`	Stop all active components.
`status`	Get active components status.
`version`	Show current version.
`tzselect`	Select a timezone.
`logs-watch`	Display Aggregator and Central Manager logs.
General service controls	
`start`	Start service.
`stop`	Stop service.
`restart`	Restart service.
`status`	Get service status.
`enable`	Enable service.

Command	Description
`disable`	Disable service.
Example: fortiedr {edr|aggregator|core|manager|activemq} {start|stop|restart|status|enable|disable}	
Specific component controls	
Aggregator	
`start-debug`	Run in debug mode.
`stop-debug`	Stop debug mode.
`port-change <port>`	Change Aggregator port.
`set-dns <dns_name>`	Change Aggregator DNS name.
`bandwidth config <bandwidth>`	Change aggregator bandwidth limit (in Kb/s).
`bandwidth enable`	Enable aggregator bandwidth limit.
`bandwidth disable`	Disable aggregator bandwidth limit.
`logs-watch`	Display Aggregator logs.
activemq	
`queue-stat <queue>`	Provides detailed metrics about the activemq queues (queue name is optional)
EDR	
`set-properties <user> '<password>'`	Set user and password.
`start-debug`	Run in debug mode.
`stop-debug`	Stop debug mode.
Central Manager	
`start-debug`	Run in debug mode.
`stop-debug`	Stop debug mode.
`load-content <password>`	Load dynamic content.
`load-extra-config <password>`	Load extra configuration.
`load-ssl-certificate <user> <password> <certificate-location> <privateKeyLocation> <privateKeyPassword>`	Load new SSL certificate.
`set-smtp-server <ip>`	Set SMTP server in `application-customer.properties`.
`reset-password <username>`	Reset web password for a specific user.
`disable-edr`	Disable FortiEDR in the Central Manager.
`enable-edr`	Enable FortiEDR in the Central Manager.

Command	Description
`set-edr-ip <ip>:<port>`	Set FortiEDR server IP address and port.
`set-edr-password <password>`	Set FortiEDR password.
`set-edr-user <user>`	Set FortiEDR user.
`logs-watch`	Display Central Manager logs.

Upgrading FortiEDR components

This section describes how to upgrade the components in the FortiEDR system.

Upgrading to a newer build number (major.minor.patch.build) can be done in any order. However, upgrading to newer major/minor versions (major.minor.patch.build) should be done top-down in the following order:

1. Upgrading the Central Manager on page 611
2. Upgrading the Aggregator on page 611
3. Upgrading the Threat Hunting Repository on page 612
4. Upgrading the Core on page 613
5. Upgrading the Collector on page 73

Upgrading the Central Manager

The required upgrade file is provided to you by Fortinet. Use it to perform the procedure below.

1. Copy the `FortiEDRInstaller_Ubuntu_7.2.3.xxxx.x` file to the Central Manager machine. You can place the file anywhere on the Linux machine. For example, `FortiEDRInstaller_Ubuntu_7.2.3.0097.x`.
2. Change the *chmod 755* permission and the *patch* name in order to enable you to run the upgrade, as shown below:
   ```
   [root@dan ~]# chmod 755 FortiEDRInstaller_Ubuntu_7.2.3.0097.x
   ```
3. Run the patch, as shown below:
   ```
   [root@dan ~]# ./FortiEDRInstaller_Ubuntu_7.2.3.0097.x
   ```
4. Wait for the upgrade to complete, as shown below:
   ```
   FortiEDR installation 7.2.3.0097.x finished successfully
   [root@dan ~]#
   ```

Upgrading the Aggregator

The required upgrade file is provided to you by Fortinet. Use it to perform the procedure below.

1. Copy the `FortiEDRInstaller_Ubuntu_7.2.3.xxxx.x` file to the Aggregator machine. You can place the file anywhere on the Linux machine. For example, `FortiEDRInstaller_Ubuntu_7.2.3.0097.x`.

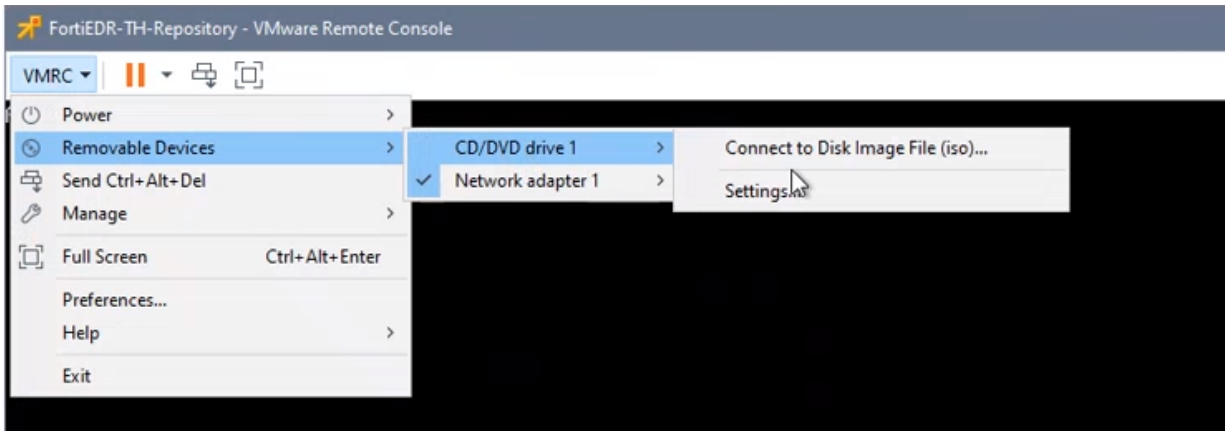
2. Change the *chmod 755* permission and the *patch* name in order to enable you to run the upgrade, as shown below:
   `[root@dan ~]# chmod 755 FortiEDRInstaller_Ubuntu_7.2.3.0097.x`
3. Run the patch, as shown below:
   `[root@dan ~]# ./FortiEDRInstaller_Ubuntu_7.2.3.0097.x`
4. Wait for the upgrade to complete, as shown below:
   `FortiEDR installation 7.2.3.0097.x finished successfully`
   `[root@dan ~]#`

Upgrading the Threat Hunting Repository

Before you begin, ensure the CPU and memory of the repository are at least 1.5 times of the defined Threat Hunting specifications in Appendix C – ON PREMISE DEPLOYMENTS on page 472. You can reduce the CPU and memory back to the specifications once the upgrade is completed.

To upgrade the Threat Hunting Repository:

1. Launch the *FortiEDR_RepositoryInstaller* ISO file of the new Threat Hunting Repository version:
   a. From the *VMRC* menu, select *Removable Device > CD/DVD drive 1 > Connect to Disk Image File (iso)*....



If an existing ISO is still connected, select *Removable Device > CD/DVD drive 1 > Disconnect [ISO path]* before connecting to the new ISO file.

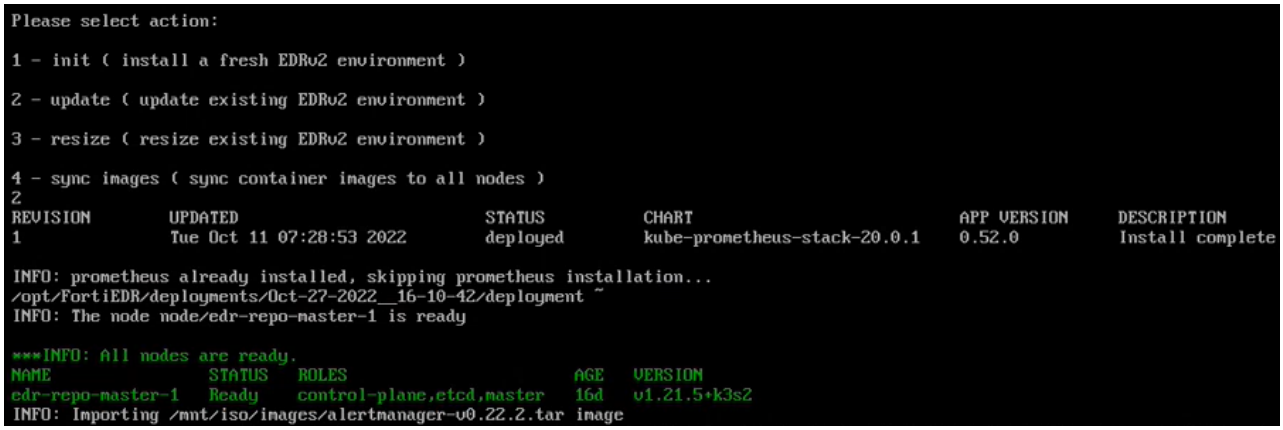
   b. Select the *FortiEDR_RepositoryInstaller* ISO file for the new version and click on *Open*.

Another option instead of the two steps described above is to upload the ISO from the VMWare datastore (this is possible if the ISO has already been uploaded there).

2. Start an SSH session to the repository machine, log in with user `rancher`, and run the following command:

```
sudo su -

bash /k3os/system/install_edr2.sh
```

Select *update* (2) to upgrade the Threat Hunting Repository.



The node is being updated, which might take 8 to 10 minutes.

3. Complete the FortiEDR Repository software upgrade by providing the following parameters:
   - When prompted for the FortiEDR Manager details, provide its IP and the credentials of one of the FortiEDR Console administrators with Rest API permissions. See Users on page 359.
   - When prompted for the primary DNS server address, provide the primary DNS server address for the Threat Hunting Repository.
   - When asked whether to set additional DNS servers, enter `yes` and provide an alternative DNS address for the Threat Hunting Repository if needed. Otherwise, enter `no` to proceed.

     Fortinet recommends that you set up one additional DNS server in case the primary DNS server fails.

   - Enter the password of the FortiEDR Console administrator with Rest API permissions. See Users on page 359.
   - When asked if you have a dedicated Aggregator VM, enter `yes` if you installed the Aggregator on a separate VM than the Central Manager, and you will then be prompted to provide the Aggregator details. Otherwise, enter `no` to proceed.
4. Wait for the configuration to complete.
5. Repeat step 1-4 on each additional Threat Hunting Repository nodes you may have.
6. Verify the upgrade is successful by opening the Central Manager and checking the version information under the *INVENTORY* > *System Components* > *REPOSITORIES* tab.

Upgrading the Core

1. Copy the `FortiEDRCoreInstaller_x.x.x.x.x` file to the Core machine. You can place the file anywhere on the Linux machine. For example, `FortiEDRCoreInstaller_6.0.1.x.y`.

2. Change the *chmod 755* permission and the *patch* name in order to enable you to run the upgrade, as shown below:
   ```
   [root@dan ~]# chmod 755 FortiEDRCoreInstaller_6.0.1.x.y
   ```
3. Run the patch, as shown below:
   ```
   [root@dan ~]# ./FortiEDRCoreInstaller_6.0.1.x.y
   ```
4. Wait for the upgrade to complete, as shown below:
   ```
   FortiEDR patch 6.0.1.x.y finished
   [root@dan ~]#
   ```

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