



# FortiManager ServiceNow Integration App - User Guide

Version 2.0



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### Overview

Use the FortiManager Integration App to send configuration change requests to FortiManager to execute scripts and install configurations on FortiGate devices.

The FortiManager Integration App can get configuration change requests from the app GUI or any ServiceNow app through the app API. The API provides functionality for admins to further automate tasks involving FortiManager on ServiceNow.

The FortiManager Integration App is supported for desktop use in English and is available in the ServiceNow Store. See Downloading the Security Operations FortiManager Integration App on page 8.

### FortiManager guides

For information on using FortiManager, see the FortiManager guides in the Fortinet Document Library, especially the Administration Guide, the Release Notes, and Best Practices.

# Requirements

### **ServiceNow requirements**

You need a ServiceNow subscription to download and use ServiceNow apps, including the FortiManager Integration App.

### ServiceNow roles

The ServiceNow account must have the right roles to submit change requests. For information on ServiceNow roles, see the ServiceNow product documentation such as Base system roles.

You also need FortiManager Integration App roles to perform the following tasks:

Role	Description
x_forti_fmgintgv2.sys_prop_read	Can read the contents in System Properties.
x_forti_fmgintgv2.sys_prop_write	Can read and modify the contents in System Properties.
<pre>x_forti_fmgintgv2.fmg_script_read</pre>	Can read the list of change requests and related details.
x_forti_fmgintgv2.fmg_script_write	Can submit change requests and read the list of change requests and related details.

### FortiManager and FortiManager Integration App requirements

The FortiManager Integration App works with one FortiManager device at a time. However, it can work with multiple ADOMs on FortiManager. See Configuring the FortiManager Integration App on page 9 on selecting FortiManager ADOMs.

The FortiManager Integration App only executes scripts that are already defined in FortiManager.

- You can define CLI scripts to be executed on the FortiManager *Device Database*, *Policy Package or ADOM Database*, or *Remote FortiGate Directly (via CLI)*.
- In the FortiManager Integration App GUI, you can limit the script selection to scripts with specific prefixes.

Although FortiManager cannot currently run scripts with variables, the FortiManager Integration App can take variables in scripts and replace them with the desired values before execution. See Using FortiManager Integration App on page 10.

The FortiManager Integration App automatically detects the FortiManager workspace mode. If workspace mode is enabled, it must be set to normal. Workflow mode is not supported.

The FortiManager ADOM Mode must be set to Normal. Advanced mode is not supported.

For more information, see the FortiManager Administration Guide in the Fortinet Document Library.

# Setting Up FortiManager

Set up FortiManager to use the Security Operations FortiManager Integration App.

Task	Description
Create or select an account to use for integration with the FortiManager Integration App.	This account does not require a Super_User administrator profile and <i>Trusted Hosts</i> does not need to be turned on.  For more information, see the FortiManager Administration Guide in the Fortinet Document Library.
Set up JSON-RPC read-write permission for the account.	API calls from the app require the account to have JSON-RPC read-write permission.  Use CLI commands to set JSON-RPC permission:  config system admin user  edit servicenow_account  set rpc-permit read-write end
Install a trusted, signed SSL certificate and CA certificate for secure API communication.	ServiceNow requires a trusted, signed SSL certificate and CA certificate for communication with FortiManager.  For more information, see the <i>Certificates</i> section in the <i>FortiManager Administration Guide</i> .
If workspace mode is enabled, ensure it is set to normal.	Only normal workspace mode is supported. The app automatically detects the FortiManager workspace mode.  For more information, see the FortiManager Administration Guide in the Fortinet Document Library.
Ensure ADOM Mode is set to Normal.	In FortiManager > Advanced Settings, ADOM Mode must be set to Normal.  Advanced mode is not supported.

### **Using FortiManager scripts**

Create scripts in FortiManager to be used in FortiManager Integration App.

Use a FortiManager admin account to create or modify scripts.

The FortiManager Integration App clones the script and replaces any variables with the value provided in FortiManager Integration App GUI or API; and then submits the change request to FortiManager.

Variables in FortiManager scripts must meet the following requirements:

- Script variable names can only use upper case A-Z, lower case a-z, or underscore ( ).
- Script variables must use the format: \${variable name}.

For information on creating FortiManager scripts, see the FortiManager Administration Guide in the Fortinet Document Library.

# Downloading the Security Operations FortiManager Integration App

You need a ServiceNow subscription to download and use ServiceNow apps, including the FortiManager Integration App. For more information, see the online help in https://store.servicenow.com.

### To download the FortiManager Integration App:

- 1. Go to the ServiceNow store at https://store.servicenow.com.
- **2.** Search for the FortiManager Integration App.
- 3. Follow the onscreen instructions to download the FortiManager Integration App.

After downloading the FortiManager Integration App, add it to the Favorites menu for easy access.

# Configuring the FortiManager Integration App

The ServiceNow account must have sufficient permissions. The account must have  $x_forti_fmgintgv2.sys_prop_write$  role to create and submit change requests.

#### To configure the FortiManager Integration App:

- 1. Open the FortiManager Integration App and go to FortiManager System Properties.
- 2. Enter the information for connecting to the FortiManager API:

Domain	The FortiManager domain name without the protocol, for example, fortimanager.myorganization.com.		
Port Number	The port number to connect to FortiManager.		
Username and Password	The username and password of the FortiManager account used for integration with the FortiManager Integration App.		

3. Enter the information for connecting to the ServiceNow API:

Username and	The ServiceNow username and password.			
Password	This ServiceNow account must have the following roles:			
	• import_transformer			
	<ul><li>x_forti_fmgintgv2.fmg_script_write</li></ul>			

**4.** Enter the information for the app settings:

FortiManager ADOMs	Select the FortiManager ADOMs the app can access.			
FortiManager script prefix	You can limit the script selection in the app GUI to scripts with specific prefixes. If desired, enter the prefixes in this field.			
Options	If you want to delete the cloned scripts, select <i>Delete scripts from FortiManager</i> after execution.			

#### 5. Click Save.

A login success message shows you are connected and the bottom of the *Connection to FortiManager API* section displays the FortiManager *Version* and the *Workspace Mode* (if enabled).

# Using FortiManager Integration App

You can create change requests using the FortiManager Integration App GUI or the API.

To create change requests using the FortiManager Integration App API, see API Reference on page 15.

### Creating change requests in the FortiManager Integration App GUI

The account must have x forti fmgintgv2.fmg script write role to create and submit change requests.

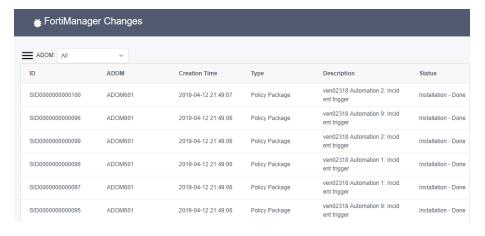
- 1. In FortiManager Integration App, go to FortiManager Changes.
- 2. Click the menu icon beside the ADOM name and select *New Change*.
- 3. Enter the Customized Script Description and click Next.
- 4. Select a FortiManager ADOM and click Next.
- **5.** Select a FortiManager Script and click Next.
- **6.** If necessary, enter the desired value for variables and click *Next*. You can see a preview of the script.
- 7. Select the FortiManager Devices and click Next.
- 8. To save the script as a draft, click Save. To run the script immediately, click Submit.

### Viewing change requests details in FortiManager Integration App

The account must have  $x_{forti_fmgintgv2}$ . fmg\_script\_read role to view the list of change requests and related details.

The FortiManager Changes page displays the list of change requests with summary information including their Status.

The *ID* number is the task ID in FortiManager System Settings > Task Monitor.

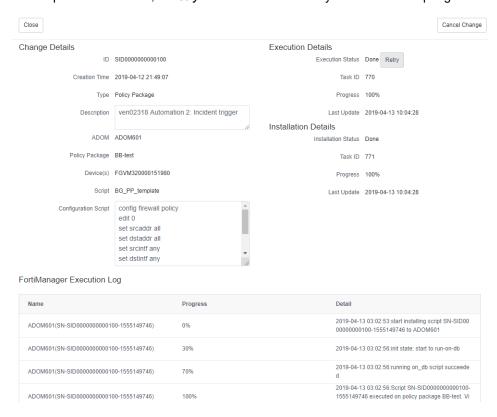


To view details, click the change request. The Change Details page shows the details of the script including the ADOM, Configuration Script, Execution Details, Installation Details, FortiManager Execution Log, FortiManager Installation Log, and other information.

- The FortiManager Execution Log section shows details of FortiManager script execution.
- The FortiManager Installation Log section shows details of FortiManager installing the configuration on FortiGate.

To cancel a change request before completion, click Cancel Change.

For scripts that timed out, a Retry button is available for you to run the script again.



# **Troubleshooting**

Error messages in the FortiManager Integration App GUI and in the ServiceNow *Application Logs* indicate the problem and usually includes recommendations to correct the issue.

### **Connection issues**

#### To troubleshoot connection issues between FortiManager and the FortiManager Integration App:

- **1.** In FortiManager, go to *System Settings > Admin > Administrators*.
  - a. Click the account used for integration with the FortiManager Integration App and check that settings are correct.
    - See Setting Up FortiManager on page 7.
- **2.** Check that you have set up JSON-RPC permission correctly. See Setting Up FortiManager on page 7.
- 3. Go to the FortiManager Integration App System Properties.
  - **a.** Check that the connection settings are correct, especially the domain name, port number, ADOMs, and API credentials.
    - See Configuring the FortiManager Integration App on page 9.
    - If connection settings are incorrect, the app displays an error message when you click Save.
  - **b.** Check that you are using a supported version.
- **4.** Check that the FortiManager is missing a certificate, or if the certificate is incomplete. ServiceNow requires a trusted certificate on FortiManager to establish a secured connection.
  - **a.** In ServiceNow, go to Application Log > Errors. The following error may indicate the certificate is incomplete: fileName:;line:0;errorMessage:org.apache.commons.httpclient.HttpException:SS LPeerUnverifiedException



- **b.** Use a third-party service such as *digicert* or *sslshopper* to identify the errors on the FortiManager side.
- **c.** In FortiManager, go to *System Settings > Certificates*, to fix the certificate errors, such as adding an intermediate CA certificate.

### Other issues

Issue	Possible solutions
Cannot update FortiManager System Properties	Check that your account has x_forti_fmgintg.fmg_ system_property_write permission.

Issue	Possible solutions
Cannot see FortiManager scripts in GUI selection menu	Check that the script prefix is set correctly.
Cannot see devices for a <i>Policy Package</i> script	Check that the devices are in the FortiManager Installation Targets for the selected Policy Package.

To view log message errors, go to ServiceNow, click *All applications* and search for *System Log*. Then select *Application Logs*.

In the App Log pane, check for errors. You can filter by keywords to search for messages.

### **Performance considerations**

The following values have been tested. Higher values might work but have not been tested.

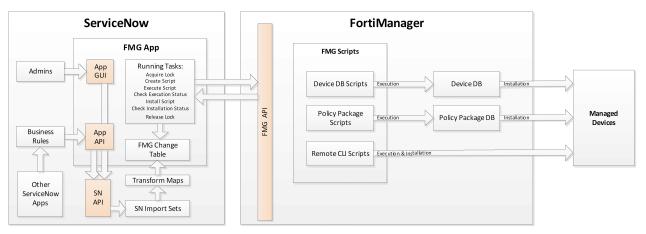
Maximum ADOMs	5
Maximum FortiGates per ADOM	100
Maximum policy packages per ADOM	20
Maximum installation targets per policy package	100
Maximum objects per ADOM	20 schedules, 100 services, 800 addresses, 80 interfaces

### Reference information

These sections include reference information on the FortiManager Integration App workflow and how to use FMGApiCli to integrate the FortiManager Integration App with other ServiceNow apps.

### **Integration Workflow**

The following diagram shows the end-to-end process from the time when a configuration change request is submitted on ServiceNow to the time when the configuration is installed on managed devices.



When a change request is submitted, it goes through steps to create and run a script on FortiManager and install the configuration on target FortiGates. These steps are scheduled tasks which run within the app.

When a change request completes a task successfully, it starts the next task until all tasks are completed. If a task fails at any point, the task retries within certain intervals for a maximum number of times as shown below:

Task	Interval (seconds)	Maximum attempts
LockADOM	6	Indefinite
CreateScript	6	18
ExecScript	6	18
DeleteScript	6	18
CheckExec	20	18
Install	6	18
CheckInstall	20	18

### **API Reference**

This section shows how to use FMGApiCli to integrate the FortiManager Integration App with other ServiceNow apps.

API calls to the app use the ServiceNow API credentials configured in *FortiManager System Properties*. No further authentication is done.



API calls are allowed from anywhere in the ServiceNow platform. Consider limiting access to ServiceNow scripts to users with authorization to create FortiManager change requests.

There are three APIs through FMGApiCli for inbound integration:

- CreateScript creates and executes scripts and configuration installations.
- CheckExec checks script execution status on FortiManager.
- CheckDeploy checks configuration installation status on FortiManager.

FMGApiCli provides a SendRestRequest function to send the "request object" to FortiManager Integration App.

This section shows the format to construct the "request object" and then use FMGApiCli.SendRestRequest (obj) to send the request. FortiManager Integration App returns a response to caller.

### **Using CreateScript**

### Request object

```
"method": "string",
    "params": [
            "url": "string",
            "adom": "string",
            "script": "string",
            "description": "string",
            "scriptVars": {
                 "variable 1": "string",
                 "variable 2": "string",
             "policy": [
                 "string",
            ],
            "devices": [
                 "string",
        }
    ]
}
```

### Request parameters

Name	Description					
method	Should be "	Should be "POST"				
params	url	Should be "CreateScript"				
	adom	The ADOM which the script template belongs to.				
	script	Name of script template in FortiManager GUI.				
	description	Description of this new change.				
	scriptVars	Optional: If a script template includes variables, specify the value of variables.				
	devices	Optional: If the type of script is <code>device_database</code> or <code>remote_device</code> , specify the name of devices.				
	Policy Optional: If the type of script is adom_database, specify the name of policies.					

### Response object

```
"id": "int",
    "result": [
        -{
             "data": {
                 "httpStatus": "int",
                 "bodyObj": {
                      "httpStatus": "int",
                      "bodyObj": {
                          "transform map": "string",
                          "table": "string",
                          "display name": "string",
                          "display_value": "string",
"record_link": "string",
                          "status": "string",
                          "sys_id": "string"
                      "status": {
                          "code": "int",
                          "message": "string"
                      }
                 }
             },
             "status": {
                 "code": "int",
                 "message": "OK"
             },
             "url": "string"
        }
   ]
}
```

### Response parameters

Name	Description				
ld	Reserved	erved field. Not currently used.			
result	data	Response f	from FortiManager web API.		
		httpStatus bodyObj	HTTP status of response from Import Set Web Service.		
			httpStatus	HTTP status of response from Import Set Web Service.	
			bodyObj	Response from	Import Set Web Service.
				transform	Import Set Table.
			Status	Table	ServiceNow table to store changes request.
				display_name	Field name of identity column in ServiceNow. In ServiceNow, this is called "number".
				display_value	Unique ID for tracking record in ServiceNow.
				record_link	Link to view the record in ServiceNow GUI.
				status	Operation of table.
				sys_id	System ID in ServiceNow.
				Status of respor	nse from Import Set Web Service.
				code	code
				message	message
	status Status of re  code  message	Status of response from FortiManager Integration App web API.			
		Status code			
		message	Message		
	url	FortiManager Integration App web API endpoint.			

### Sample CreateScript request

### Sample CreateScript response

```
{
    "id": "0",
    "result": [
        {
            "data": {
                "httpStatus": 200,
                "bodyObj": {
                    "httpStatus": 201,
                    "bodyObj": {
                        "transform map": "fmg script stage",
                         "table": "x_forti_fmgintgv2_fmg_script",
                         "display name": "number",
                         "display_value": "SID0000000000051",
                         "record link": "https://ven02319.service-
now.com/api/now/table/x forti fmgintgv2 fmg script/063c2848dbbc73003445710439
9619e0",
                         "status": "inserted",
                         "sys id": "063c2848dbbc730034457104399619e0"
                    },
                    "status": {
                         "code": 0,
                         "message": "OK"
                }
            },
            "status": {
                "code": 0,
                "message": "OK"
            "url": "https://ven02319.service-
now.com/api/x forti fmgintgv2/fmg/api"
        }
    1
}
```

#### FortiManager Changes page in GUI



### **Using CheckExec**

### Request object

### Request parameters

Name	Description		
method	Should be "POST"		
params	url	Should be "CheckExec"	
	number	The unique tracking string for ServiceNow table. It can be retrieved from the display_value variable from "Create Script" response.	

### Response object

```
{
    "id": "int",
    "result":
        {
            "data": {
                "httpStatus": "int",
                "bodyObj": {
                    "data": {
                        "adom": "string",
                        "number": "string",
                        "sys_updated_on": "string",
                        "exec_script_task_id": "string",
                        "exec_script_status": "string",
                        "exec script percent": "int"
                    },
                    "status": {
                        "code": "int",
                        "message": "string"
                    }
                }
            },
            "status": {
                "code": "int",
                "message": "string"
            "url": "string"
        }
   ]
}
```

### Response parameters

Name	Description					
ld	Reserved	field. Not currently used.				
result	data	Response from FortiManager web API.				
		httpStatus	HTTP status of response from Import Set Web Service.			
		bodyObj	data	Response from Import Set Web Service.		
				adom	ADOM which scripts belongs to.	
				number	Unique tracking ID in ServiceNow table.	
				sys_updated_on	Last update time.	
				exec_script_task_id	Tracking ID for execution task.	
				exec_script_status	Status of script execution.	
				exec_script_percent	Percentage of script execution.	
			Status	Status of response from Import Set Web Service.		
				code	code	
				message	message	
	status	Status of response from FortiManager Integration App web API.				
		code	Status code			
		message	Message			
	url	FortiManag	rtiManager Integration App web API endpoint.			

### Sample CheckExec request

```
var requestObj = {
    "method": "POST",
    "params": [{
        "url": "CheckExec",
        "number": " SID000000000051",
    }, ],
};

var fmgApiCli = new x_forti_fmgintgv2.FMGApiCli();
var responseObj = fmgApiCli.SendRestRequest(requestObj);
```

### Sample CheckExec response

```
"id": "0",
    "result": [
        {
            "data": {
                "httpStatus": 200,
                "bodyObj": {
                     "data": {
                         "adom": "ADOM601",
                        "number": "SID0000000000051",
                        "sys updated on": "2019-04-09 01:08:10",
                         "exec_script_task_id": "567",
                         "exec script status": "done",
                         "exec script percent": "100"
                    },
                     "status": {
                         "code": 0,
                         "message": "OK"
                }
            },
            "status": {
                "code": 0,
                "message": "OK"
            },
            "url": "https://ven02319.service-
now.com/api/x forti fmgintgv2/fmg/api"
       - }
    ]
```

#### FortiManager Changes Details page in GUI



### **Using CheckDeploy**

### Request object

### Request parameters

Name	Description		
method	Should be "POST"		
params	url	Should be "CheckDeploy"	
	number	The unique tracking string for ServiceNow table. It can be retrieved from the display_value variable from "Create Script" response.	

### Response object

```
{
    "id": "int",
    "result": [
        {
            "data": {
                "httpStatus": "int",
                "bodyObj": {
                    "data": {
                        "adom": "string",
                        "number": "string",
                        "sys_updated_on": "string",
                        "deploy task id": "string",
                        "deploy status": "string",
                        "deploy percent": "string"
                    },
                    "status": {
                        "code": "int",
                        "message": "string"
                }
            },
            "status": {
                "code": "int",
                "message": "string"
            "url": "string"
   ]
```

### Response parameters

Name	Description					
Id	Reserved	field. Not currently used.				
result	data	Response from FortiManager web API.				
		httpStatus	HTTP status of response from Import Set Web Service.			
		bodyObj	data	Response from Import Set Web Service.		
				adom	ADOM which scripts belongs to.	
				number	Tracking ID in ServiceNow table.	
				sys_updated_on	Last update time.	
				deploy_script_task_id	Tracking id for deployment task.	
				deploy_script_status	Status of script deployment.	
				deploy_script_percent	Percentage of script deployment.	
			Status	Status of response from Import Set Web Service.		
				code	code	
				message	message	
	status	Status of response from FortiManager Integration App web API.				
		code	Status code Message			
		message				
	url	FortiManag	ortiManager Integration App web API endpoint.			

### Sample CheckDeploy request

```
var requestObj = {
    "method": "POST",
    "params": [{
        "url": "CheckDeploy",
        "number": "SID000000000051",
    }, ],
};

var fmgApiCli = new x_forti_fmgintgv2.FMGApiCli();
var responseObj = fmgApiCli.SendRestRequest(requestObj);
```

### Sample CheckDeploy response

```
{
    "id": "0",
    "result": [
        {
            "data": {
                 "httpStatus": 200,
                 "bodyObj": {
                     "data": {
                         "adom": "ADOM601",
                         "number": "SID00000000000051",
                         "sys updated on": "2019-04-09 01:08:10",
                         "deploy task id": "568",
                         "deploy status": "error",
                         "deploy percent": "100"
                     },
                     "status": {
                         "code": 0,
                         "message": "OK"
                     }
                 }
            },
            "status": {
                 "code": 0,
                 "message": "OK"
            },
             "url": "https://ven02319.service-
now.com/api/x forti fmgintgv2/fmg/api"
       - }
    ]
}
```

#### FortiManager Changes Details page in GUI



# **Change Log**

Date	Change Description	
2019-05-27	Initial release.	
2020-05-20	Updated Troubleshooting on page 12 and Setting Up FortiManager on page 7.	





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