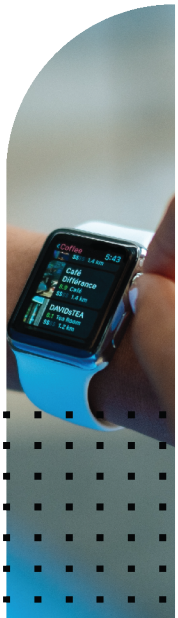
Cookbook

FortiVoice 6.4.4



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Change log

Date	Change description
2021-12-17	Initial release of the FortiVoice 6.4.4 Cookbook.
2022-01-17	Updated Configuring FortiFone softclient for mobile settings on FortiVoice on page 137

Introduction

The FortiVoice Cookbook is a collection of recipes about configuring and using FortiVoice features.

A recipe focuses on a task that you can perform using the FortiVoice web-based manager. A few tasks described in this document use the FortiVoice CLI or user portal, as required.

Auto dialer

The FortiVoice auto dialing system can assist your organization in reaching multiple contact quickly and efficiently.

This section includes the following recipe:

- Setting up and starting an auto dialer campaign on page 9

Setting up and starting an auto dialer campaign

An auto dialer campaign allows you to broadcast a recorded message to the dialed phone numbers.

For this recipe, perform the following tasks:

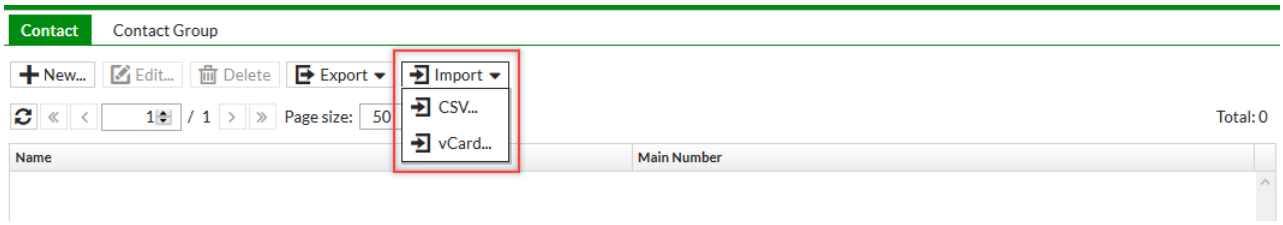
1. Enabling the auto dialer service on page 9
2. Adding contacts on page 9
3. Configuring an audio message on page 10
4. Configuring the auto dialer campaign on page 10
5. Starting an auto dialer campaign on page 10

Enabling the auto dialer service

1. Go to **Auto Dialer > Setting > Setting**.
2. Click **Enable service**.
3. Set **Maximum channel** to the maximum number of contacts that can be dialed at the same time.
4. Click **Apply**.

Adding contacts

1. Go to **Auto Dialer > Contact > Contact** and click **New**.
2. Enter the contact's **Name** and their **Main number**, and any other family, business, and emergency settings as required.
3. Click **Create**.
4. To **Import** (and **Export**) multiple contacts at once, select **CSV** or **vCard**.



Configuring an audio message

An audio message can either be uploaded or recorded.

To upload an audio message:

Make sure to upload an audio file that meets the following requirements:

- WAVE (.wav) format
- Moni, 16-bit PCM (8000 MHz)

1. Go to **Auto Dialer > Campaign > Audio** and click **New**.
2. Enter a **File name** for the audio message.
3. Click **Upload**.
4. Locate the audio file to upload and click **Open**.
5. Click **Create**.

To record a new phone message:

1. Click **Record** to record a new message by phone.
2. Set **Send record call** to your extension. Answer the call and record your message, then click **OK**. Follow the audio prompts to complete the recording.
3. If you want to retain a copy of the WAVE file after you complete the recording, click **Download**.
4. Click **Create**.

Configuring the auto dialer campaign

1. Go to **Auto Dialer > Campaign > Campaign** and click **New**.
2. Enter a **Name** and a **Caller ID** for the campaign to be displayed on called phones.
3. Set **Sound file** to the audio message from Configuring an audio message on page 10.
4. Set **Retry** to the number of times you want the auto dialer to retry calling the client if the call is missed.
5. Under **External Numbers**, click in the field and select the external phone numbers to add them to the campaign.
6. Under **Internal Numbers**, click in the field and select any internal extensions from your local network to be added to the campaign.
7. Click **Create**.

Starting an auto dialer campaign

To broadcast a recorded message to the dialed phone numbers, start an auto dialer campaign.

1. Go to **Auto Dialer > Campaign > Campaign** and click **New**.
2. In the campaign list, select a campaign that has a status other than *Completed*.
3. Click **Start**.
4. Select a start and end time.
5. Click **OK**.

Call center

This section includes the following recipes:

- Call center setup on page 11
- Skill-based routing on page 17

Call center setup

Callers may outnumber available agents, often forcing a caller to call back repeatedly to reach an available agent. Thankfully, FortiVoice queues multiple incoming calls and can prioritize them.

This recipe guides you through the process of creating a call queue to handle large volumes of incoming calls and then set up the appropriate department to handle the calls.

This recipe includes the following tasks:

- Creating a call queue on page 11
- Configuring extension departments on page 13
- Creating a department administrator profile and account on page 14

Creating a call queue

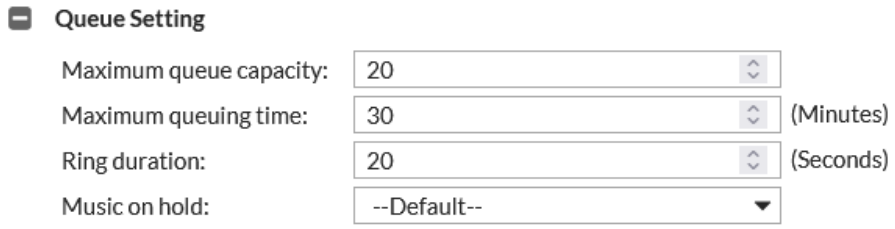
Call queues establish the order in which incoming calls are placed when an agent is unavailable.

1. Go to **Call Center > Call Queue > Call Queue** and click **New**.
2. Make sure to select **Enabled**.
3. Enter a **Queue ID** for the queue.
4. Enter an available extension **Number** for callers to dial and enter into a call queue following the extension number pattern.
5. Enter a **Display name**.
6. Enter a brief **Description**.
7. Leave **Department** set to **None**, as you will configure one and add it to the queue later. See Configuring extension departments on page 13.

Queue setting

1. Under **Queue Setting**, set **Maximum queue capacity** to the maximum number of callers the queue can handle.
2. Set a **Maximum queuing time** in minutes and **Ring duration** in seconds.

3. Select the **Music on hold** audio file you want for the call queue.



Call distribution

1. Under **Call distribution**, determine whether calls in the call queue will be subjected to **Skill Based Routing**, whereby calls are routed depending on the operator's skill. For more information, see Skill-based routing on page 17.
   Note that skill-based routing can be configured along with a distribution policy, in which case the distribution policy will only take effect when you have more than one agent with the same skill level in a queue.
2. Set **Distribution policy** to one of the following:
   - **Ring all**: Dials all available agents.
   - **Round Robin**: Dials all agents in order from top to bottom and then bottom to top.
   - **Sequential**: Dials each agent in a sequential manner.
   - **Random**: Dials an agent at random.
   - **Least Recent**: Dials the agent that least recently received a call.
   - **Fewest Calls**: Dials the agent that has completed the fewest calls in this queue.
   - **Weight Random**: Dials a random agent, but uses the agent's penalties as a weight.
   - **Priority Based**: Dials agents based on the agents' rated ability to handle calls in that call center.

Additional setting

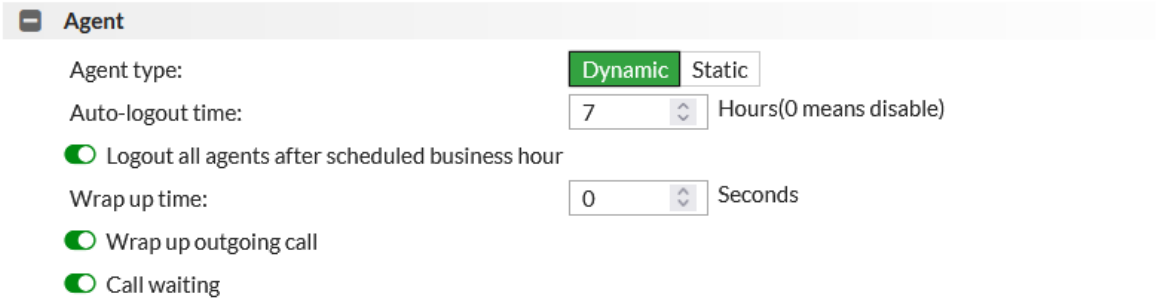
Under **Additional Setting**, you can configure a variety of options, including the following:

- **Distinctive Setting for Agent**: In some cases, one agent may need to handle calls from multiple queues, and needs to be able to distinguish between queues when they receive the calls. Use this setting to define an audio message that announces the queue name, and control how the caller's ID is displayed.
- **Business Schedule**: Determine when agents are available to answer calls.
- **Announcement to Caller**: Determine whether callers will be told where they are in a queue, and control how often those announcements are made.
- **Service Level**: Determine how often the FortiVoice unit checks to see whether the queue service level threshold is reached.
- **Alert**: Determine what events will trigger an alert, such as queue overflow and agent unavailability, and control how alert notifications will be sent to the appropriate contact.

- **Callback Setting**: Allow callers waiting in a queue to request a callback. The system can callback automatically when an agent becomes available or the agent can manually call the caller.
- **Survey Settings**: Define how the system collects customer feedback.
- **Call classifications**: Enter custom call label names, such as external, or company A, to classify calls and enable call center agents to easily generate reports against those classifications. When an agent finishes a call, they receive a pop-up window where they can choose and apply the classification.

Agent

1. Under **Agent**, set **Agent type** to either **Dynamic** or **Static**. Dynamic agents are required to log in to the queue, while static agents are always connected to the queue.
2. If you have selected the **Dynamic** agent type, set **Auto-logout time** to the duration of time agents have before they are logged out of the queue. Additionally, enable or disable **Logout all agents after scheduled business hour** for dynamic agents.
3. Set **Wrap up time** to the duration of time in seconds needed by agents to complete a queue call. Similarly, enable **Wrap up outgoing call** to apply the same time constraint for agents to make and finish any outgoing customer calls.
4. Enable **Call waiting** to display caller information on the agent's phone when a queue call comes in while the agent is already on the phone. The agent can choose to answer the call or not. If the agent does not answer the call, after the ring duration is due, the call is transferred to the next agent.



Call handling

1. Under **Call handling**, set **When no logged-in agent** to either **Queue Caller** or **Do Not Queue**. For example, if there are no agents available, you may set this option to **Do Not Queue**, in which case any incoming calls will be handled by your general call handling configuration, such as the auto attendant.
2. Optionally configure additional scheduled and non-scheduled business hour call handling options.
3. Click **Create**.

Configuring extension departments

After creating the call queue, you can configure an extension department with appropriate members, managers, and the call queue itself. The department can be helpful for management and reporting purposes.

1. Go to **Extension > Group > Department** and click **New**.
2. Enter a **Name** for the department.
3. Under **Call Center**, click in the field and select the **Member** extensions you want to be members of the department.

4. Similarly, select the **Manager** extensions you want to be managers of the department.
5. Select the newly created call **Queue**.
6. Click **Create**.

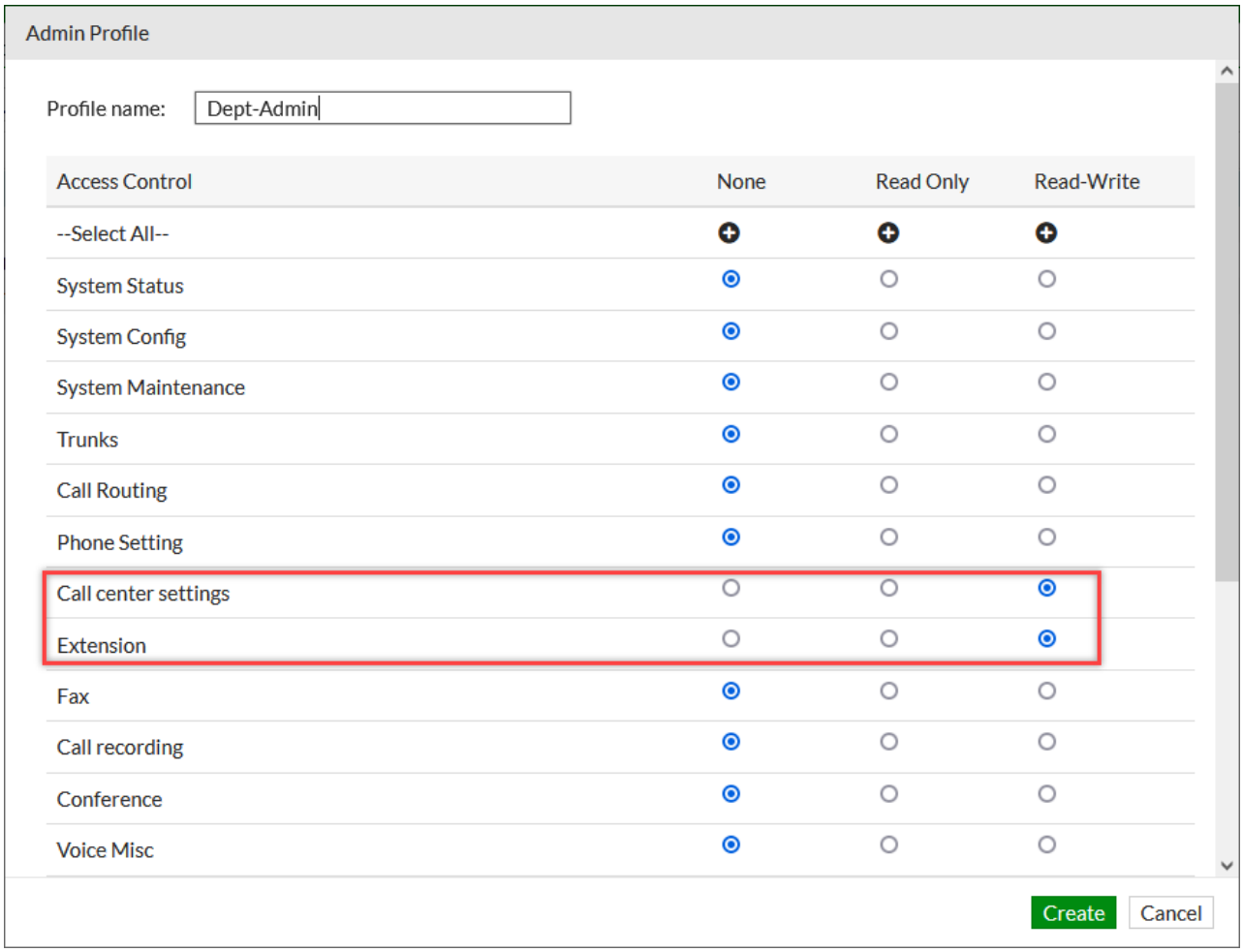
Creating a department administrator profile and account

After creating a department, you can also create a department FortiVoice administrator profile and account and decide which departments you want this administrator to manage.

To create an admin profile for the department FortiVoice administrator

1. Go to **System > Administrator > Admin Profile**.
2. Click **New**.
3. Enter a descriptive **Profile name**.
4. In the Access Control list, go to both **Call center settings** and **Extension** and enable the **Read-Write** privilege.

In the FortiVoice web-based manager, the department FortiVoice administrator can access the **Extension > Extension** and **Group** menus only regardless of the selected privileges in the Access Control list.

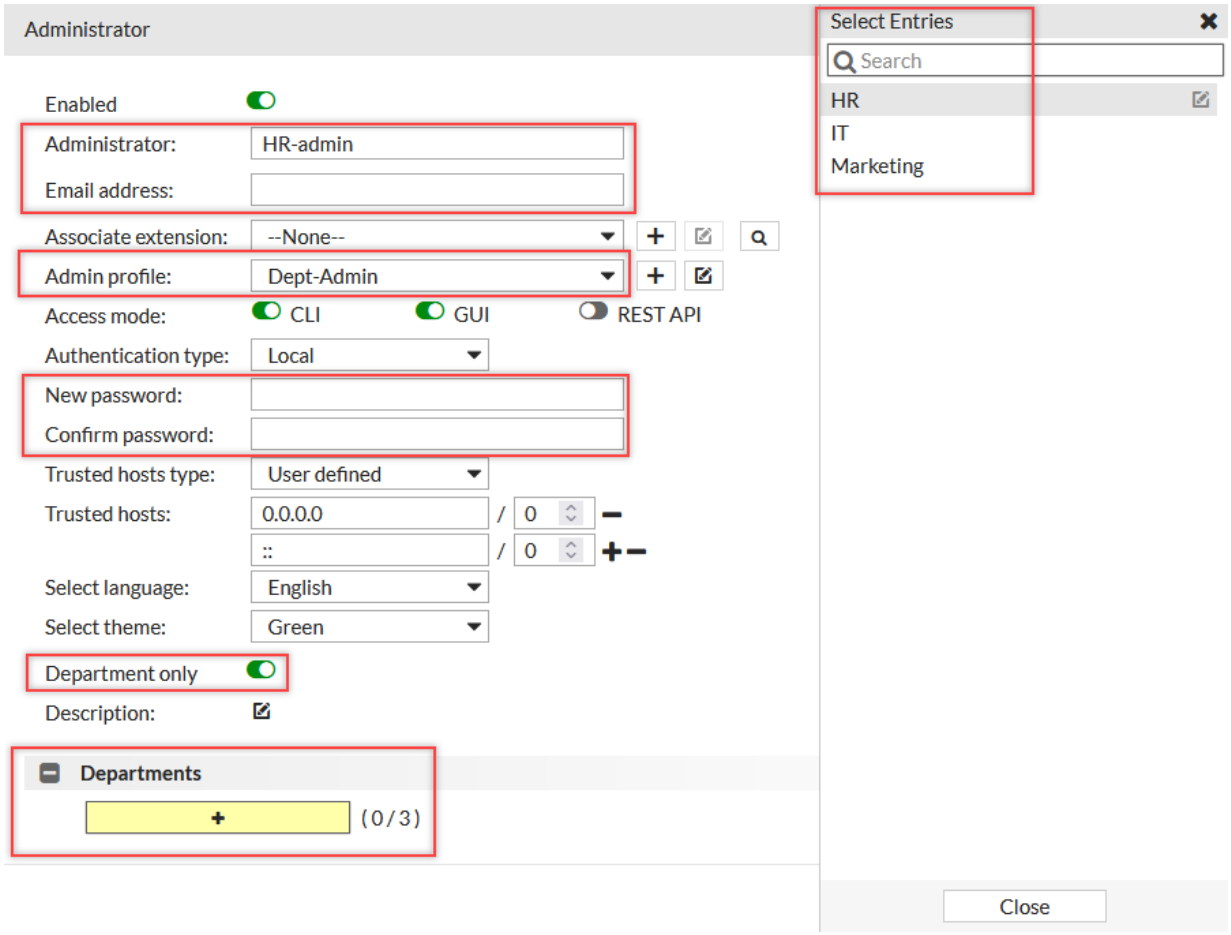


5. Click **Create**.

To create a department FortiVoice administrator account

1. Go to **System > Administrator > Administrator**.
2. Click **New**.
3. Fill in the fields, as necessary. Here are details for the mandatory ones:
   a. Enter a descriptive **Administrator** name for this account. The name can contain numbers (0-9), uppercase and lowercase letters (A-Z, a-z), hyphens (-), and underscores (_). Other special characters and spaces are not allowed.
   b. Select the **Admin profile**.
   c. Enter the administrator's **Email address**.
   d. Add a **New password** and **Confirm password**.
   e. Enable **Department only**.
   f. Expand the **Departments** section.

g. Click + and then select one or more departments for the administrator to manage.

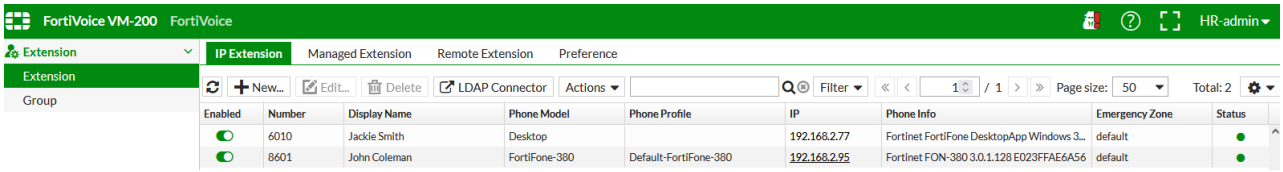


h. Click **Close**.

4. Click **Create**.

To log in to the department FortiVoice administrator account

1. Log in to the department FortiVoice administrator account using the name and password associated with the account.
2. FortiVoice displays the **Extension** and **Group** menus that the department FortiVoice administrator account can manage.
   Here is an example:



3. For more details about **Extension** and **Group** menus, see the Configuring extensions section in the FortiVoice Phone System Administration Guide.

Skill-based routing

When a customer dials an organization's support line they are commonly greeted with an automated attendant that transfers the customer's call to a specific department based on the number the customer selects.

This recipe guides you through the process of configuring FortiVoice to transfer customer calls to the most qualified agent.

Skill-based routing requires that you have completed the configuration of the call center, extension, and virtual number features.

This recipe includes the following tasks:

1. Creating skill sets on page 17
2. Configuring skill levels on page 17
3. Assigning a skill level to an extension on page 18
4. Configuring the call queue on page 19
5. Configuring call handling on page 20

Creating skill sets

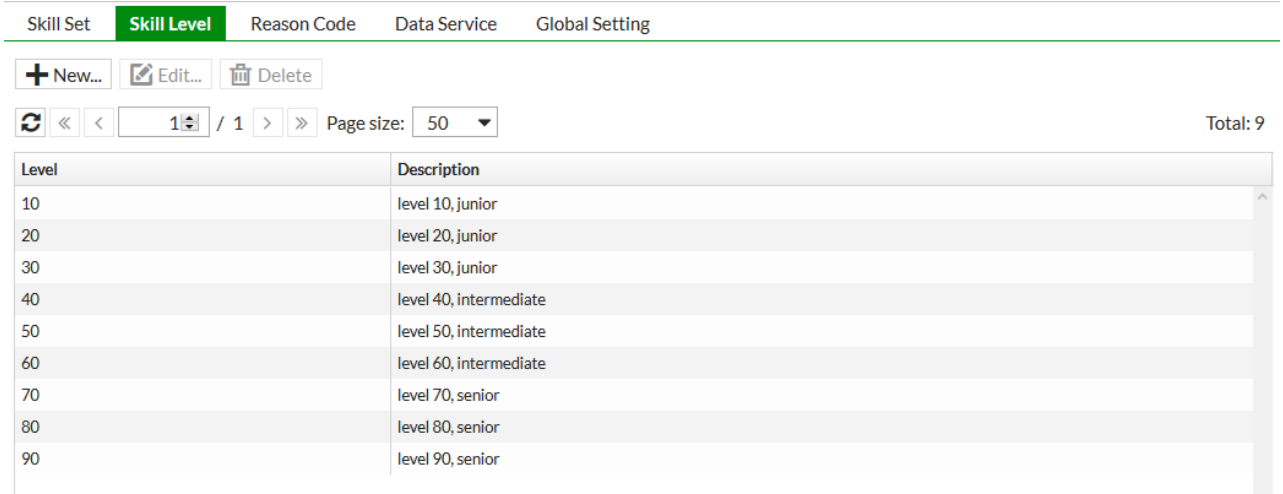
Establish varying skill sets for each department. For example, a skill set is created for the Sales department.

1. On FortiVoice, go to **Call Center > Configuration > Skill Set** and click **New**.
2. Enter a **Name** and **Description** for the Sales department, and click **Create**.

Configuring skill levels

After you have created the skill sets, define the individual skill levels.

1. Go to **Call Center > Configuration > Skill Level**. The FortiVoice already has a pre-defined list of skill levels, showing varying degrees of skill-progression from junior through intermediate to senior.
2. Either create your own levels by clicking **New**, edit, or use the default levels.
   For the purpose of this recipe, default levels will be used.

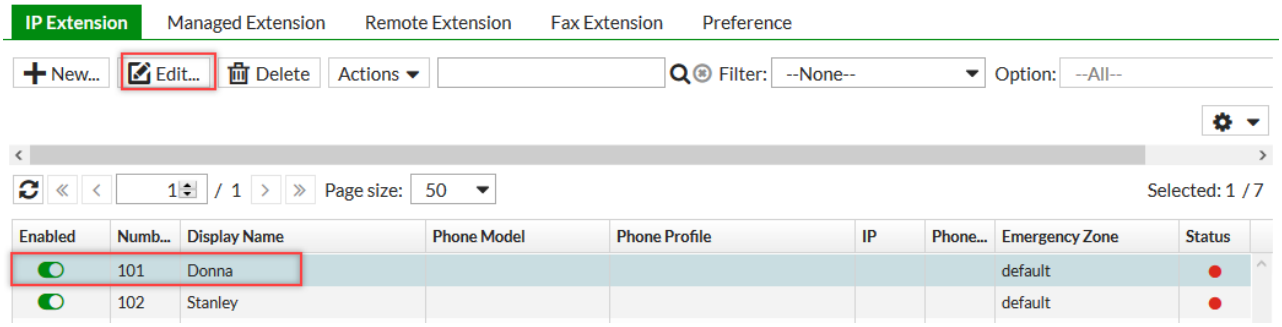


Level	Description
10	level 10, junior
20	level 20, junior
30	level 30, junior
40	level 40, intermediate
50	level 50, intermediate
60	level 60, intermediate
70	level 70, senior
80	level 80, senior
90	level 90, senior

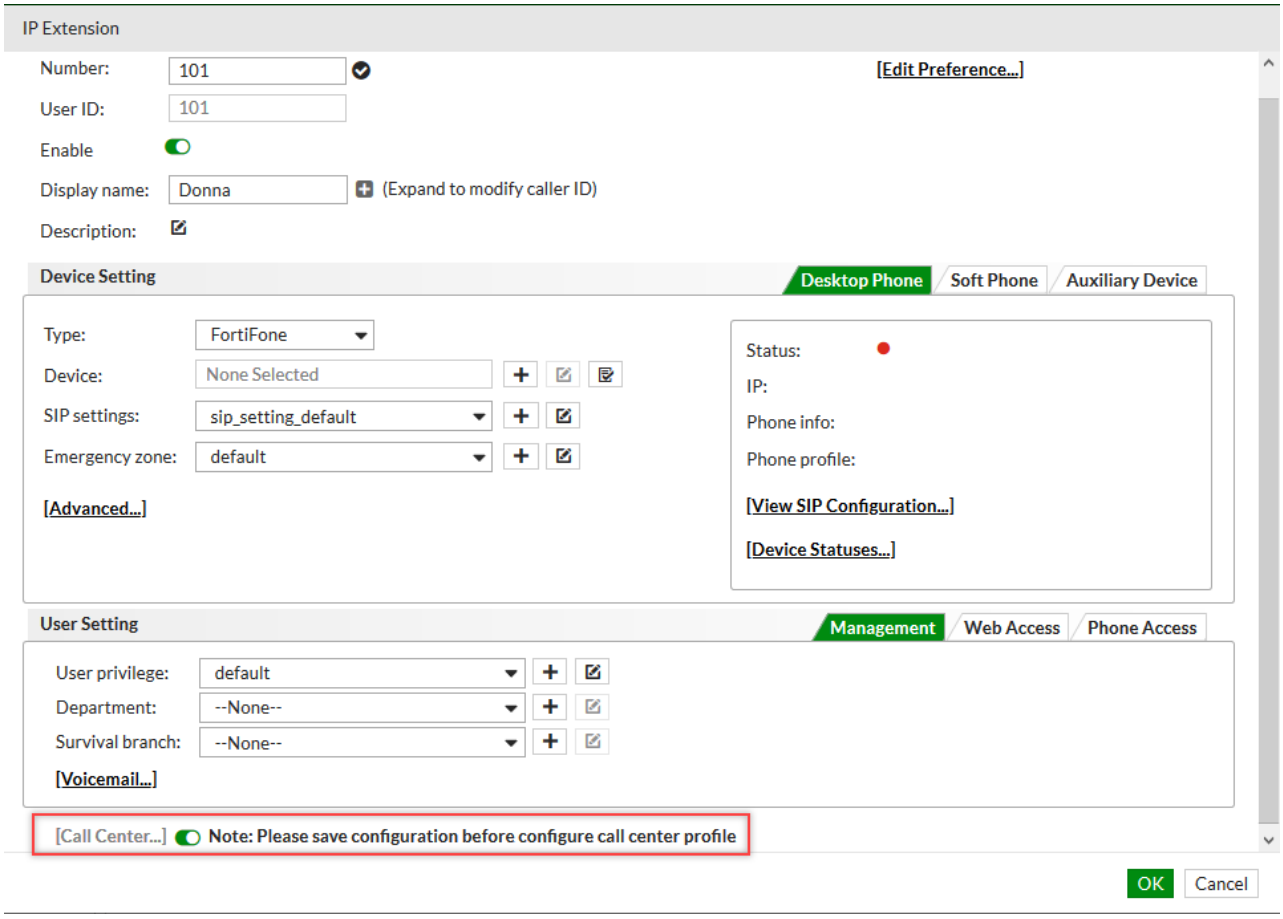
Assigning a skill level to an extension

Assign a skill level to each agent.

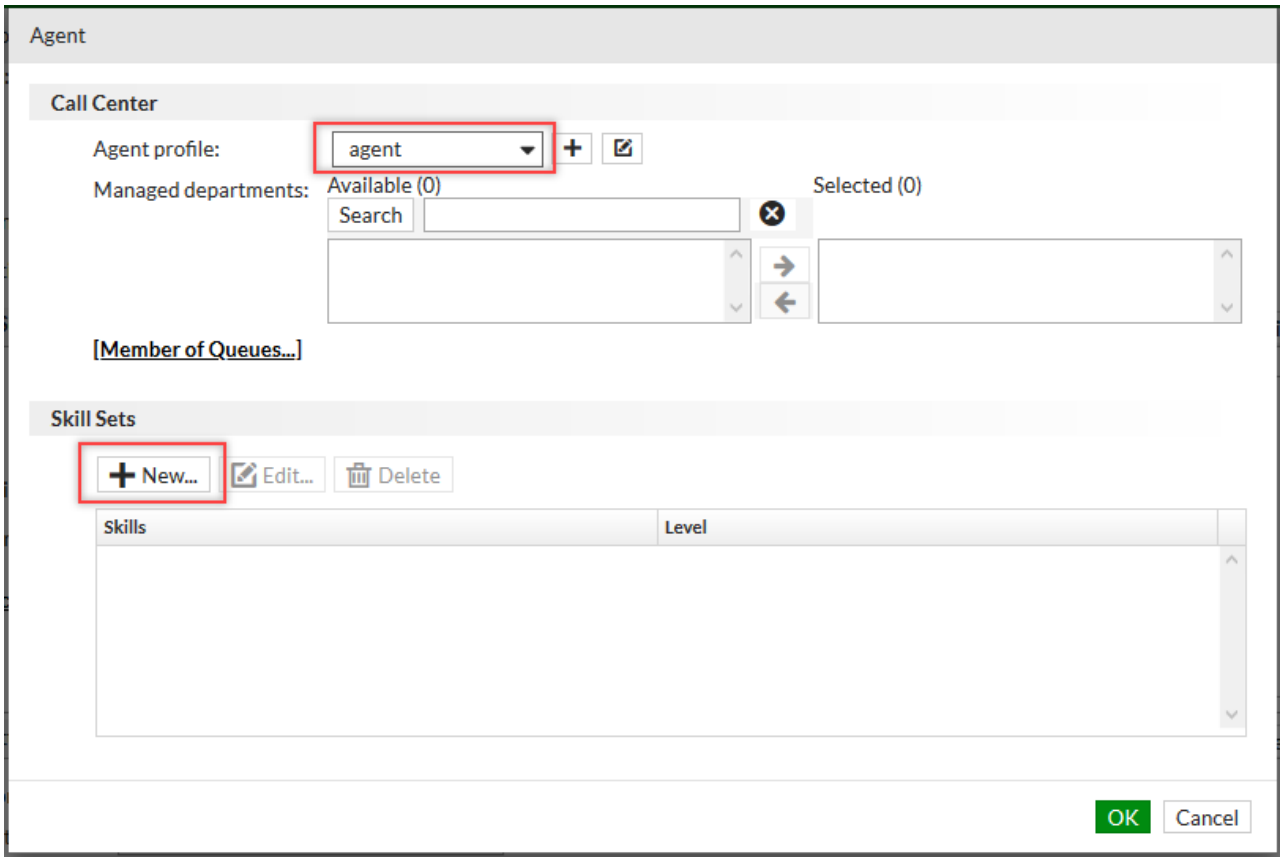
1. Go to **Extension > Extension > IP Extension**.
2. Select an agent's extension and click **Edit** (in the example, **Donna**).



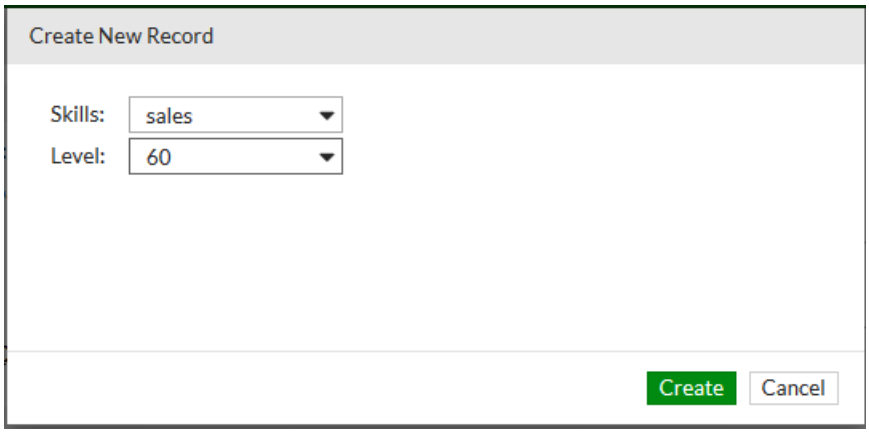
3. Enable **Call Center**. A prompt appears stating that you must save the configuration before configuring the call center profile of the extension.



4. Click **OK**, edit the profile again, and click **Call Center**.
5. Set **Agent profile** to **agent**.
6. Under **Skill Sets**, click **New**.



7. Set **Skills** to **Sales**, and set the **Level** accordingly. In this example, Donna is being assigned to the **Sales** skill set, and assigned a skill level of **60**; a strong intermediate level.
8. Click **Create**.

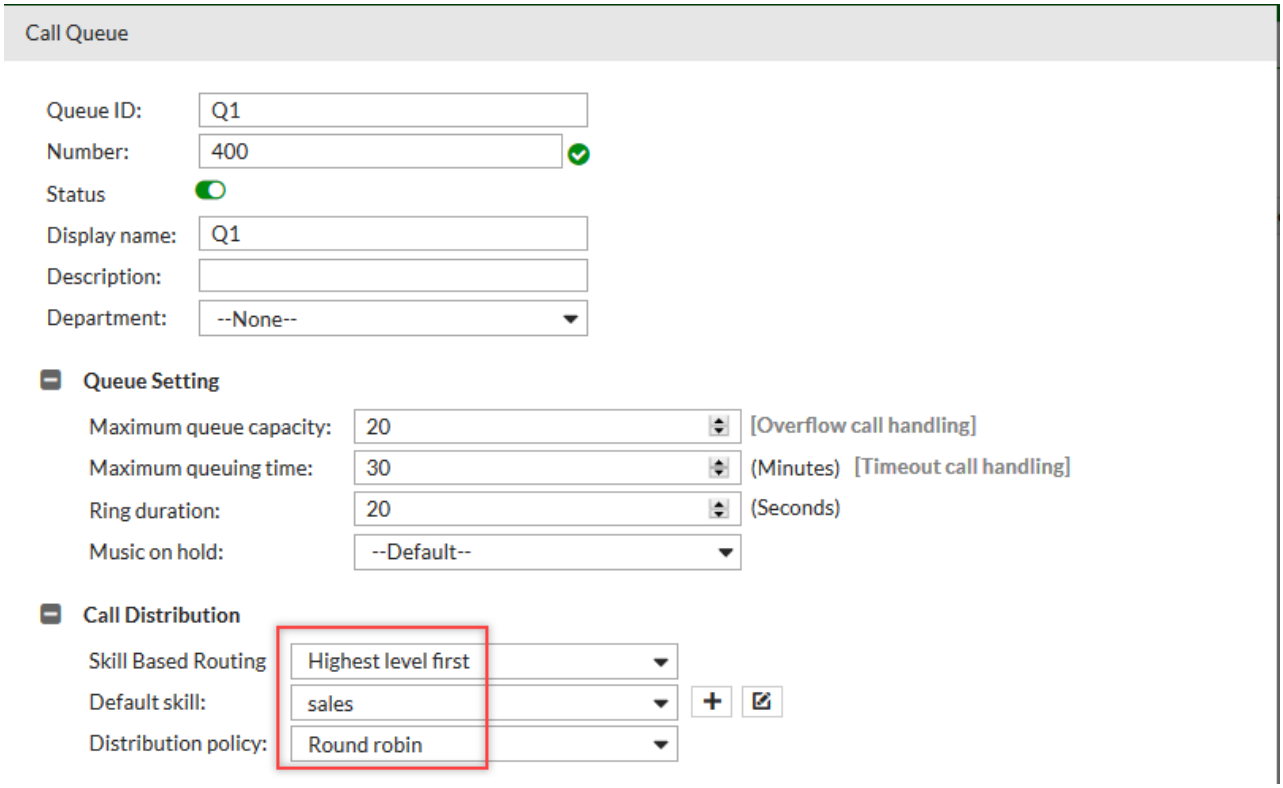


9. To complete the call center settings, click **OK**.
10. To finish configuring the agent IP extension, click **OK**.
11. Repeat the same steps for your other agents, assigning the appropriate skill level where applicable.

Configuring the call queue

Calls are routed to different call queues depending on the set skills.

1. Go to **Call Center > Call Queue > Call Queue** and click **New**.
2. Under **Call Distribution**, set **Skill Based Routing** to one of the following:
   - **Lowest Level First**: The call transfers to the agent with the lowest skill level score first and then moves up the ranks to the first available agent.
   - **Highest Level First**: The call transfers to the agent with the highest skill level score first and then moves down in rank to the first available agent.
3. Set **Default skill** to the defined skill set (Sales), meaning only agents from the Sales department will pick up calls from the queue.
4. Select a **Distribution policy** from the drop-down menu. In this example, **Round Robin** is selected, whereby all agents in the queue will be equally called from the top to the bottom of the list and so on.



5. Under **Agent**, click **Agent Members**.
6. Select all agents that you want to be assigned to the call queue and click **OK**.
7. Click **Create**.

Configuring call handling

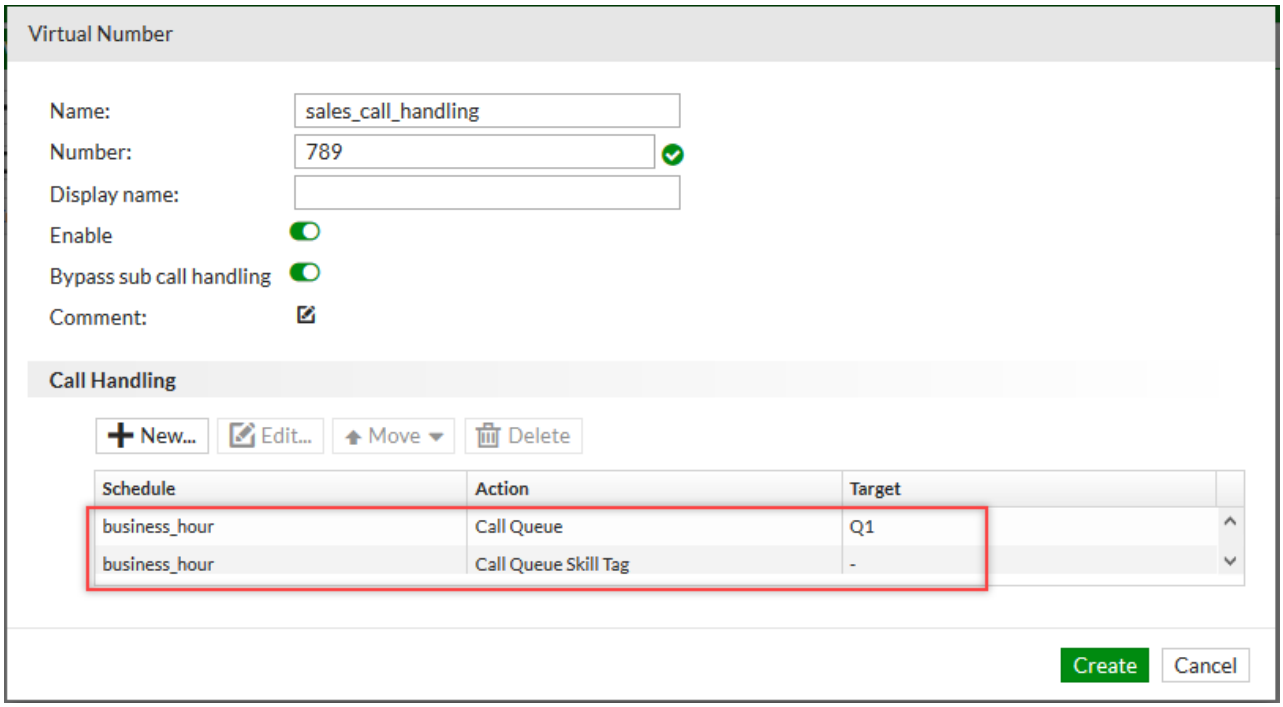
After establishing skill-based routing, configure call handling for virtual numbers. Skill-based call handling helps to associate (tag) an incoming call with a specific skill set to distributed a call among agents with that specific skill set.

You need to define two actions:

- An action to tag the call with a skill to process the call as a skill-based call.
- An action to route the call to the queue where the agents with configured skill levels are assigned the appropriate calls.

1. Go to **Extension > Virtual Number > Virtual Number** and click **New**.
2. Enter a **Name** and an unassigned **Number**.

3. Under **Call Handling**, click **New**.
4. Set an appropriate **Schedule**, and set **Action** to **Call Queue Skill Tag**.
5. Click **OK**.
6. Click **New** again.
7. Set the **Schedule**, and set **Action** to **Call Queue**.
8. Assign the newly created **Call queue** from the drop-down menu.
9. Click **OK**. Your virtual number call handling should look similar to the example below.
10. Click **Create**.



Call features

This section includes information about the following call features:

- Auto attendant on page 22
- Call parking on page 24
- Conference calls on page 30
- Call recording on page 28
- Faxes on page 38
- Importing and exporting speed dial numbers on page 41

Auto attendant

What if you need FortiVoice to answer calls and direct users to various departments within your office? An auto attendant can answer calls with a prerecorded message and then guide the user to the department they desire with a simple press of a button.

This recipe guides you through the process of configuring auto attendants, exploring the user options, and establishing how a caller navigates through the auto attendant.

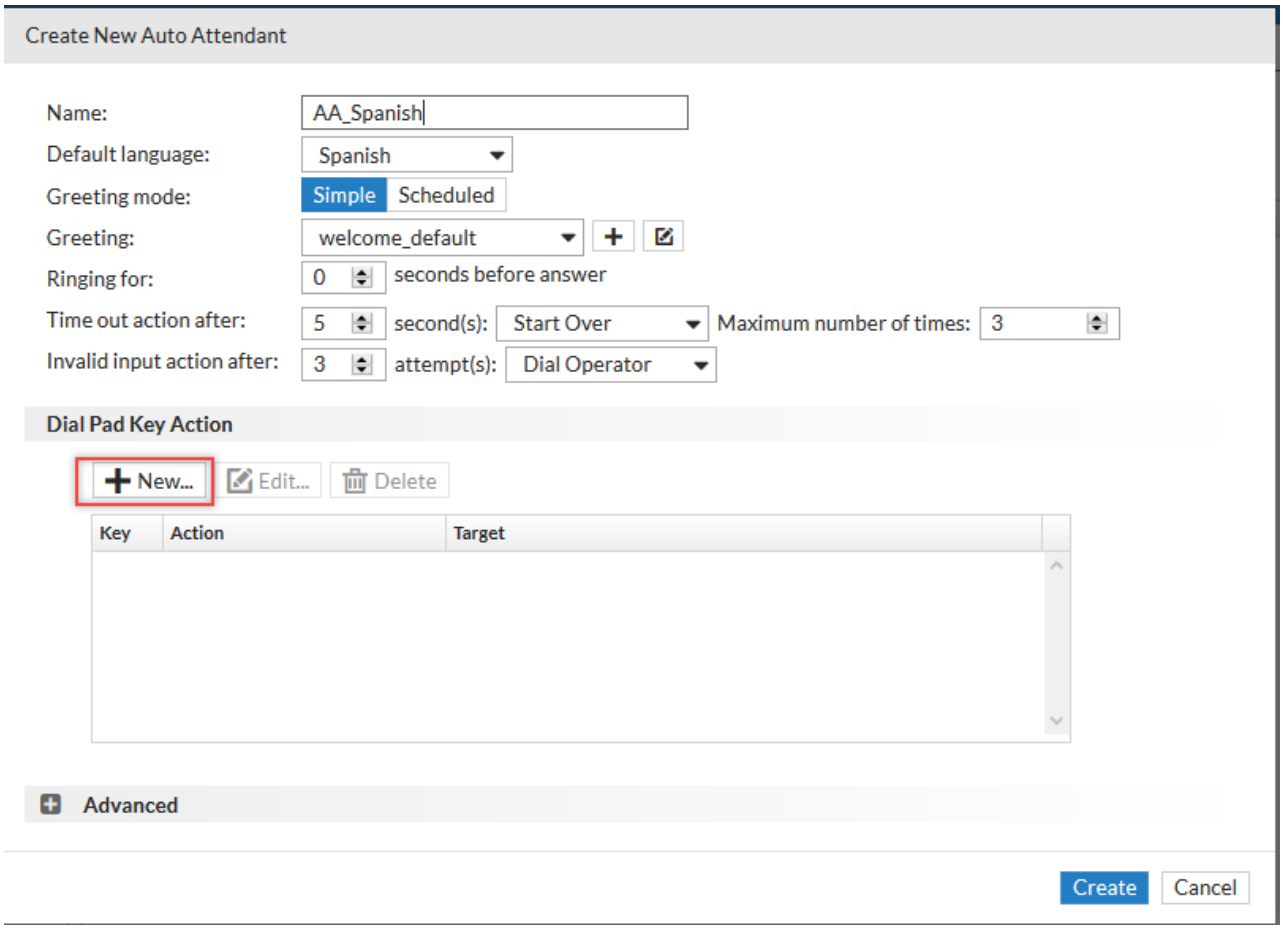
This recipe includes the following tasks:

- Configuring the auto attendant on page 22
- Configuring key actions on page 23
- Configuring advanced settings (optional) on page 24

Configuring the auto attendant

1. Go to **Call Feature > Auto Attendant > Auto Attendant** and click **New**.
2. Enter a **Name** and set the **Default language**.
3. Select a **Greeting mode**, and select the desired sound file for the **Greeting**.
4. Enter the amount of time that the phone will ring before being answered, and the time out and invalid input settings.

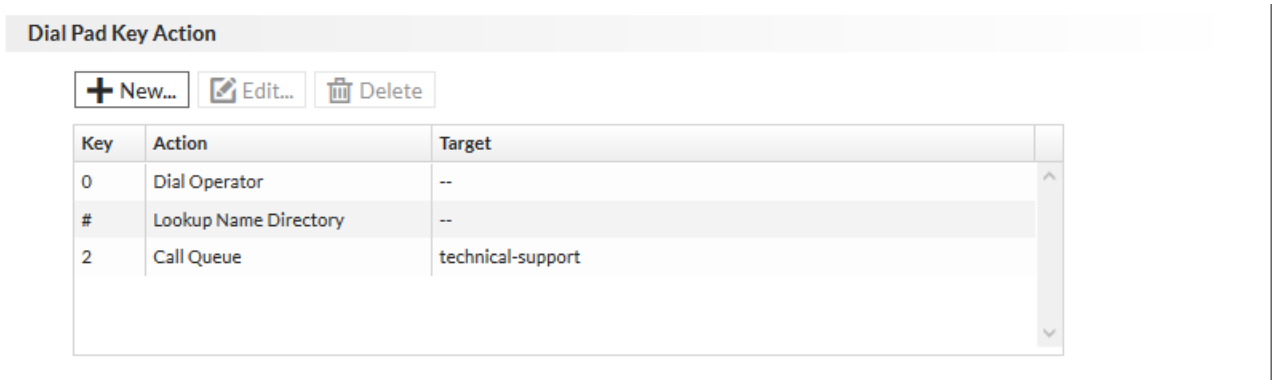
5. Before you click **Create**, configure the dial pad key action settings in Configuring key actions on page 23.



Configuring key actions

Configure the auto attendant keys for caller to use when navigating through the auto attendant hierarchy.

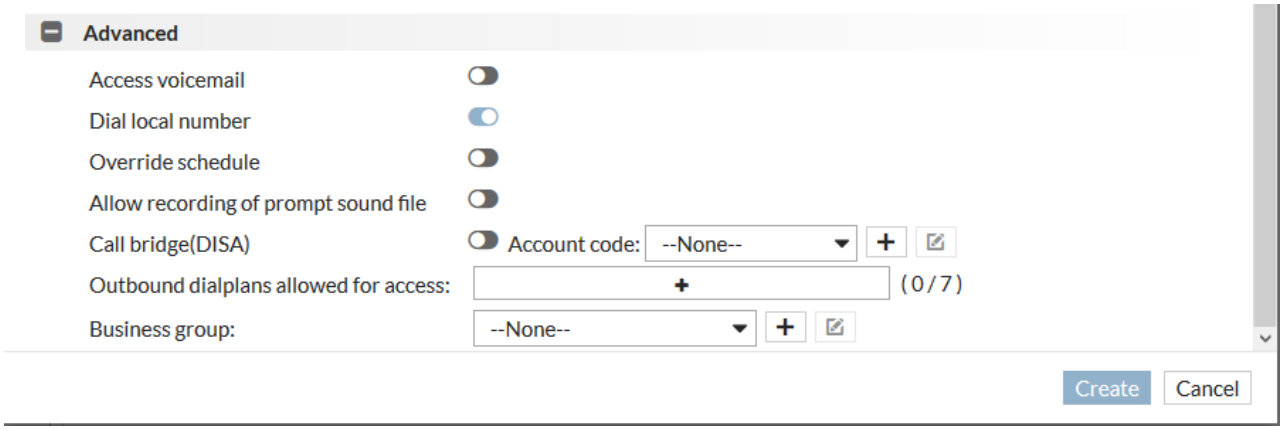
1. Under **Dial Pad Key Action**, click **New**.
2. Map keys with the appropriate **Language** and **Action**, and any additional settings according to the action selected. In this example, the **Dial Pad Key Action** section shows number 2 assigned to the technical support call queue.



Additional advanced settings can be optionally configured in Configuring advanced settings (optional) on page 24.

Configuring advanced settings (optional)

1. Expand the **Advanced** tab.
2. Enable **Access voicemail**, if required, to allow external callers to reach their voicemail boxes by dialing their voicemail prompt code. Dial local number should already be enabled by default, allowing external callers to dial local extensions.
3. Disable **Dial local number** if you do not want callers to be able to dial extensions directly. This forces users to use the Dial Pad Key Actions only – used in many call centers.
4. Enable **Override schedule**, if required, to allow an administrator with the privilege to dial a code followed by the administrator PIN to replace the original schedule with a system schedule.
5. Enable **Call bridge (DISA)**, if required, and select an account. This allows external users to dial into the FortiVoice device and use the FortiVoice service like a local extension.
6. If **Call bridge (DISA)** is enabled, select the outbound dial plan for users to make outbound calls using FortiVoice.
7. Click **Create**.



Call parking

Sometimes active calls at extensions are put on hold within the FortiVoice phone system for other extensions to pick up. This process is called *parking*. FortiVoice features the ability to easily park calls, unpark calls, and monitor parking slots on FortiFone devices with programmable keys. Monitored parking slots can easily unpark calls by simply pressing the programmable key. Calls can also be parked by using the call park feature code, which is useful for FortiFone devices without programmable keys.

The following recipe covers specific tips to program and use call parking on FortiVoice and FortiFone devices:

- Configuring call parking settings on page 24
- Configuring call parking on programmable phone keys on page 25
- Using call parking on page 27

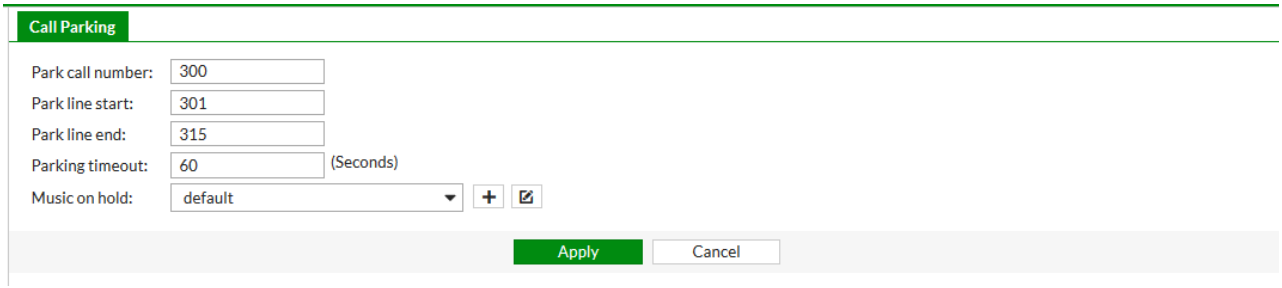
Configuring call parking settings

First, call parking must be configured on FortiVoice. It is recommended to keep the numbering scheme separate from the extension number scheme, keeping it unique to call parking. By default, the FortiVoice reserves 300 to 320 for call parking. This can be broken down as follows:

- **300**: Number reserved to park a call in the first available slot.
- **301-320**: Numbers reserved as call park slots.

For more information on how to use these number schemes, see Using call parking on page 27.

1. Go to **Call Feature > Call Parking > Call Parking**.
2. Set **Park call number** to the number used to park calls automatically to the first available call park slot.
3. Set **Park line start** and **Park line end** to define the total range of call park slots.
4. Set **Parking timeout** to the amount of time in seconds that the call will remain parked. After this timeout is reached, the parked call is returned to the extension that had parked it.
5. Select the desired hold music from the **Music on hold** drop-down menu, and click **Apply**.



Configuring call parking on programmable phone keys

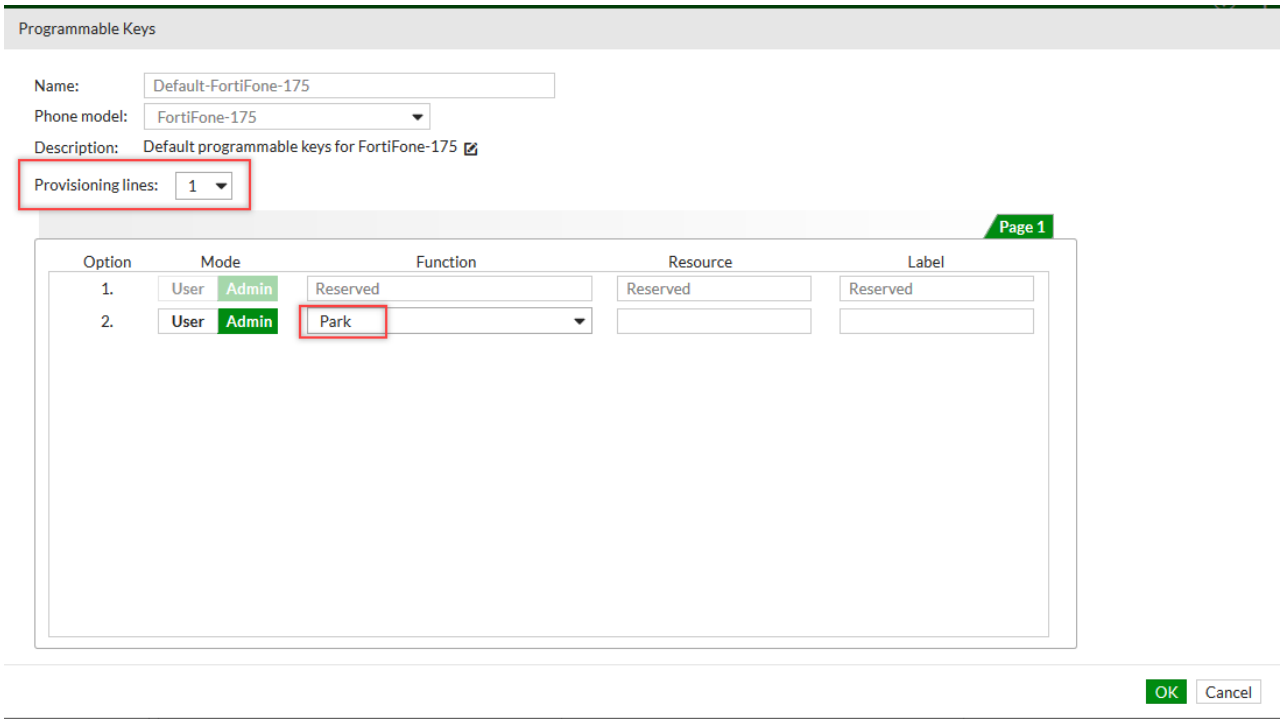
FortiFone devices that support programmable phone keys can be configured with one touch call parking. There are two types of call park programmable phone keys:

- **Park**: Places the call into the first available call park slot.
- **Park appearance**: Monitors the selected call park slots, informing the user if there is a call parked. It may also be used to park a call in the specified call park slot if it is not already in use.

Configuring automatic parking

1. Go to **Phone System > Profile > Programmable Keys**.
2. Select a FortiFone profile and click **Edit**.
3. In **Provisioning lines**, select **1**.
4. Under **Page 1**, set the **Function** for line 2 to **Park**.

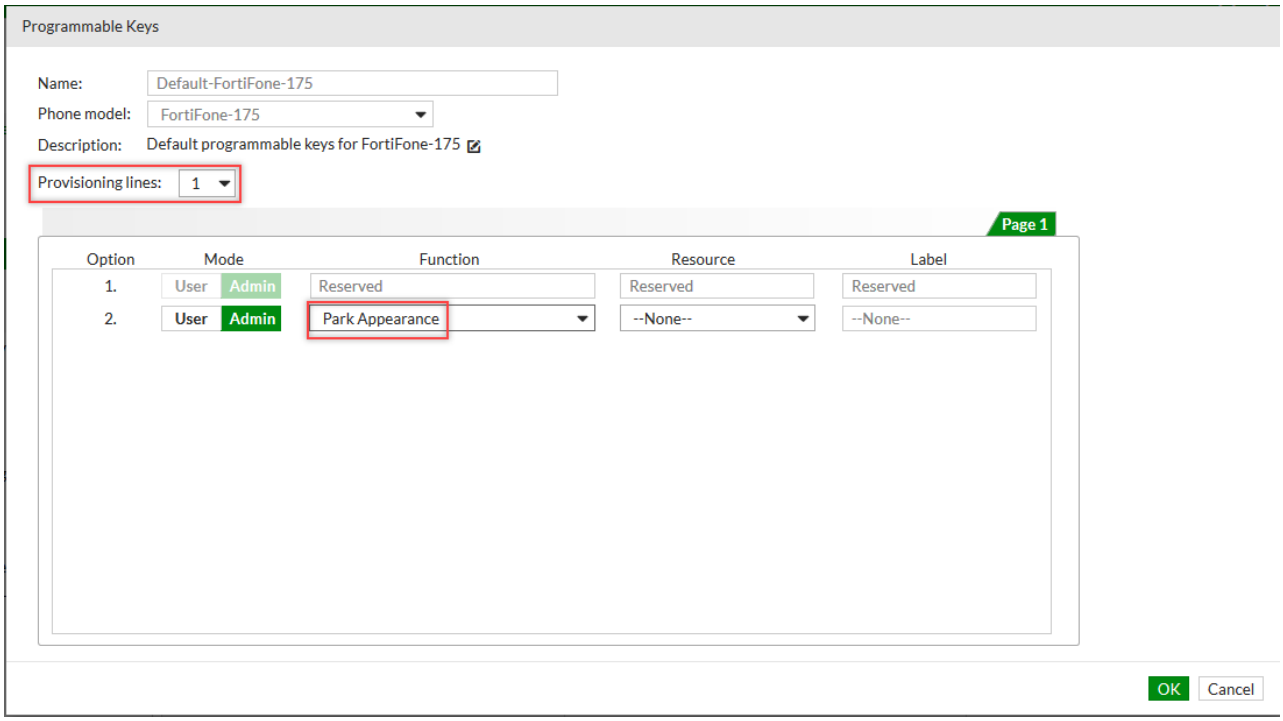
5. Click **OK**. For changes to take effect, the FortiFone device must reboot.



Configuring park appearance

1. Go to **Phone System > Profile > Programmable Keys**.
2. Select a FortiFone profile and click **Edit**.
3. In **Provisioning lines**, select **1**.
4. Under **Page 1**, set the **Function** for line 2 to **Park appearance**.
5. Set **Resource** to the call park slot you would like to monitor. The **Label** will automatically propagate.
6. Click **OK**. For changes to take effect, the FortiFone device must reboot. Repeat this for as many call park slots that

you would like to monitor.



Using call parking

You can park a call in the following ways:

- Call park feature code
- Programmable phone key with park
- Programmable phone key with park appearance

All FortiFone models support the feature code method.

Feature code

1. While on a call, dial ***40**.
   The call is now parked. The extension will be notified of the call park slot number.
2. To retrieve the parked call from any extension, dial the call park slot number.

Programmable key with park

1. While on a call, press the **Park** programmable phone key on the FortiFone device.
   FortiVoice will indicate the call park slot the call has been placed in (for example, 301).
2. To retrieve the parked call from any extension, dial the call park slot number.

Programmable key with park appearance

1. While on a call, press the **Park appearance** programmable phone key on the FortiFone device.
   The call is now parked.
2. To retrieve the parked call, press the **Park appearance** programmable phone key again or dial the call park slot number.

When using call park, keep in mind the following:

- The feature code and programmable phone key park methods will place the call in the first available call park slot.
- Programmable phone keys with park appearance will indicate if a call is parked. Press the key to retrieve the call.
- Programmable phone keys with park appearance may be used to park calls, only if the key is not already in use.

Call recording

FortiVoice allows you to monitor and supervise incoming and outgoing calls, but you can also record calls, allowing you to have a permanent record of particularly important phone calls.

For details about configuring call recordings and archiving recorded calls, see the FortiVoice Phone System Administration Guide.

This section included the following recipes:

- Recording a phone call on page 28
- Managing recorded calls on page 29

Recording a phone call

With FortiVoice, the following two types of phone call recordings are available:

- **Personal recording**: You can access your phone call recordings from the FortiVoice user portal.
- **System recording**: With the administrator privilege, you can access phone call recordings from the FortiVoice web-based manager.

Prerequisites

- **To allow an extension to perform a call recording**: Make sure to apply a user privilege with the personal recording or system recording option enabled, as applicable, to that extension. To enable recording options, the FortiVoice system administrator can go to **Phone System > Profile > User Privilege** and then **Monitor/Recording**.
- **To view codes**: Personal and system recording procedures in this section use the default feature codes for recording phone calls. To view or edit those codes, the FortiVoice system administrator can go to **Call Feature > Feature Code > Mid-Call/DTMF Code**.

Before recording a phone call, have the agreement of the person you are talking with or check your local laws regarding phone recording.

For a personal recording

1. During a phone call, start the personal recording by pressing *30.
2. To pause the personal recording, press *31. To resume the recording, press *30 again.
   The recording continues until you hang up.

For a system recording

1. During a phone call, start the system recording by pressing *35.
   - To pause the system recording, press *36.
   - To resume the system recording, press *37.
   - To cancel the system recording, press *38.

   The recording ends when you hang up.

Managing recorded calls

Prerequisites

- **To allow an extension to access a personal call recording from the FortiVoice user portal:** Make sure to apply a user privilege with the call recording option enabled to that extension. To enable the call recording option on the FortiVoice user portal, the FortiVoice system administrator can go to **Phone System > Profile > User Privilege** and then **User Portal**.

For a personal recording

1. Log in to the FortiVoice user portal.
2. Go to **Call Recording**.
3. Perform one of the following actions:
   - To listen to the recorded phone call, click .
   - To remove the recorded phone call, click **Delete**. To confirm the deletion, click **Yes**.
   - To send the recorded phone call to another extension, click **Forward**. Select the extension and click **OK**.

     When you download multiple recorded phone calls at the same time, they are saved in the TGZ file format. To decompress and extract the recorded phone calls from this file, use a third-party tool that supports the TGZ file format.

   - To save the recorded phone call (WAV file format), click **Download**. Select to save the file and click **OK**.

For a system recording

1. Log in to the FortiVoice web-based manager.
2. Select **Monitor > Storage > Recorded Call**.
3. Double-click a call record folder to open the archived call files.
4. Select a **Recording type**.
   - **Conference** refers to calls recorded by phone number that are conference call numbers. For information on configuring conference call recording, see Recording a conference call on page 37.
   - **System** refers to all other type of calls recorded.

5. Select a recorded call and perform one of the actions:
   - To listen to the recorded phone call, click **Play**.
   - To search specific recorded calls, click *Search,* then *New*, enter the search values, and click *Create*. When the search result status changes to **Done**, select the result and click **View Search Result**. All recorded calls are listed. You can double-click a call recording and select to play or download it.
   - To remove the recorded phone call, click **Delete**. To confirm the deletion, click **Delete**.

     When you download multiple recorded phone calls at the same time, they are saved in the TGZ file format. To decompress and extract the recorded phone calls from this file, use a third-party tool that supports the TGZ file format.

   - To save one or more recorded phone call (WAV file format), click **Download > Selected Files** or click **Download > All**. Select to save the file and click **OK**.

Conference calls

FortiVoice features conference calling, allowing multiple clients to join a live group discussion.

There are three kinds of conference call instances:

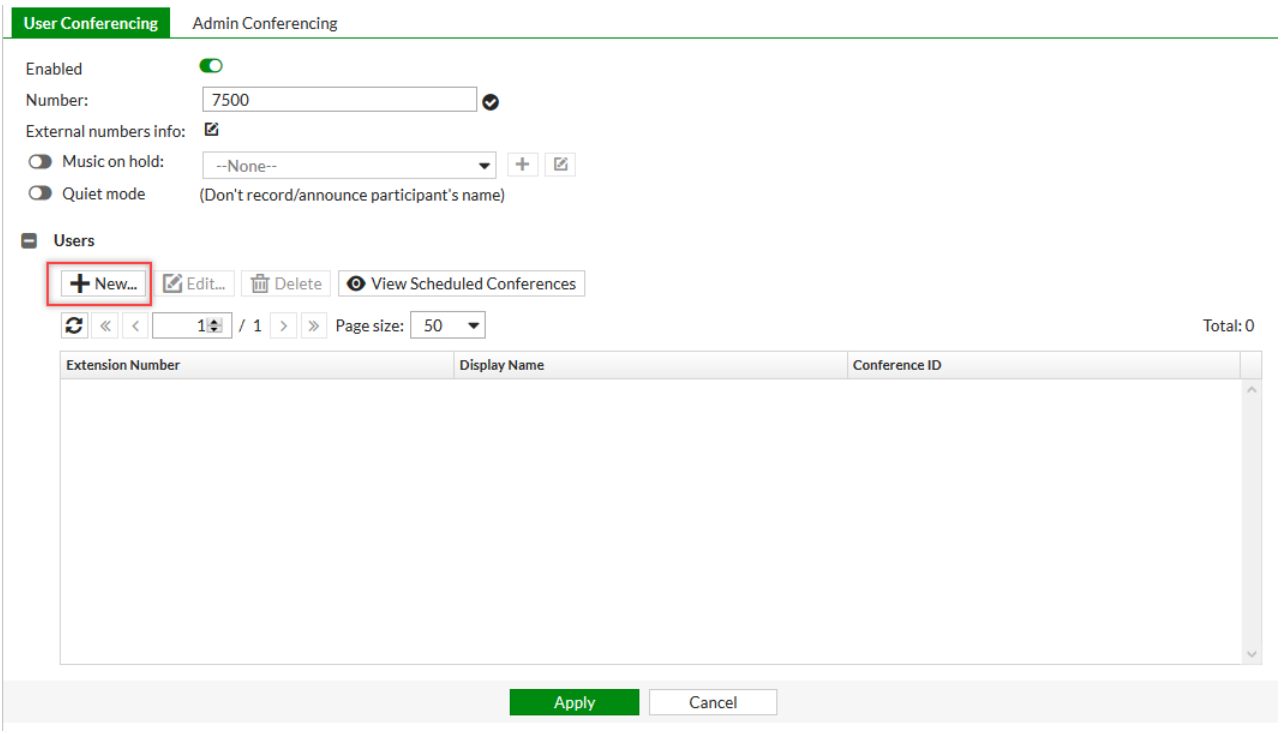
- **User Conferencing**: Administrators provide the ability for users to create and schedule conferences through the FortiVoice user portal. Users can add attendees to the conference in order to get an email invite with the information regarding the conference.
- **Static Conference**: Administrators create rooms for conference that can be used based upon schedule profile (office hours, anytime, and so on) or only available for a specific date and time. These conferences are the most restrictive. To avoid conflicts administrators would need to create multiple rooms.
- **Dynamic Conference**: Administrators create a room, and then can create unique conference events based upon time and dates required. These events will have unique conference IDs limiting conflicts in participants. Similar to user conferencing attendees can receive email invites with the call details for the conferences.

This section includes the following recipes:

- Configuring user conferencing on page 30
- Scheduling a user conference on page 31
- Viewing upcoming user conferences on page 34
- Configuring administrator conferencing on page 35
- Recording a conference call on page 37

Configuring user conferencing

1. Go to **Call Feature > Conferencing > User Conferencing** and click **Enabled**.
2. Set **Number** to the extension number that is mapped to the external number that callers can use to dial to join the conference call.
3. Under **Extensions**, click **New** to add extensions users who have the privilege to organize conference calls.

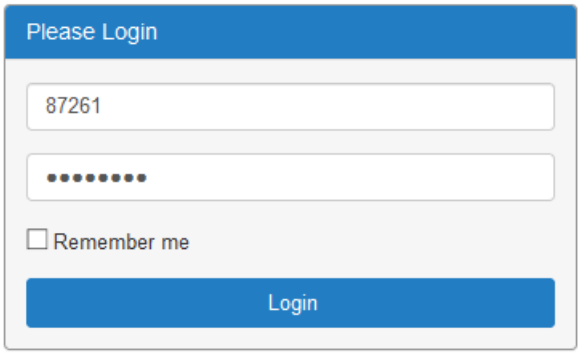


4. Select the **Extension** from the drop-down list.
5. For **Conference ID**, enter a code or generate one by clicking **Generate**.
6. Select **OK**, and select **Apply** to finish the **User Conferencing** configuration.

Scheduling a user conference

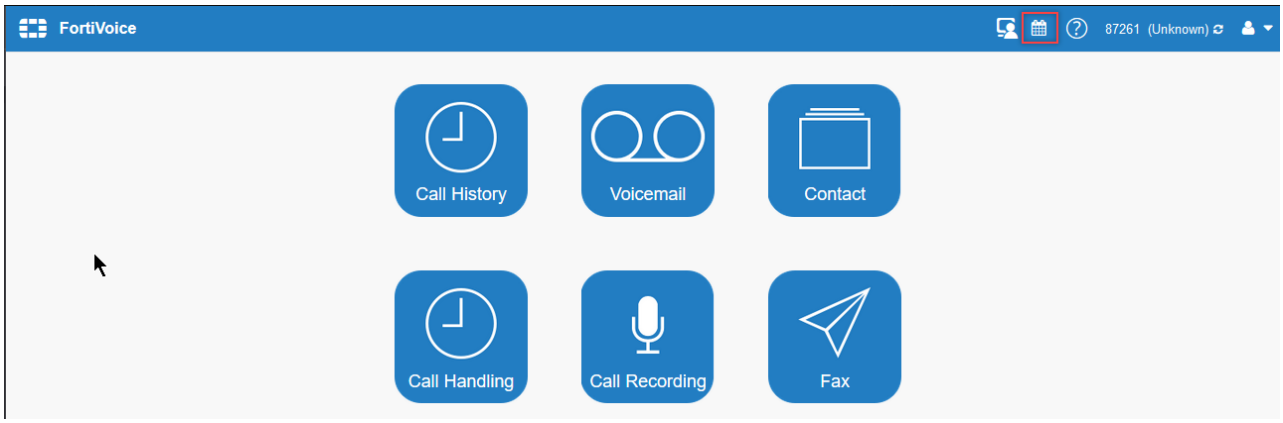
Access the FortiVoice user portal to schedule a user conference and invite attendees.

1. Open a web browser and go to `https://<IP_address_or_FQDN>/voice`.
   where <IP_address_or_FQDN> is the IP address or the FQDN of the FortiVoice phone system.
   If the FortiVoice system administrator has changed the access port, then you must also include the port, for example:
   `https://<IP_address_or_FQDN>:446/voice`
2. Log in as the user that has been added to the list of extensions.



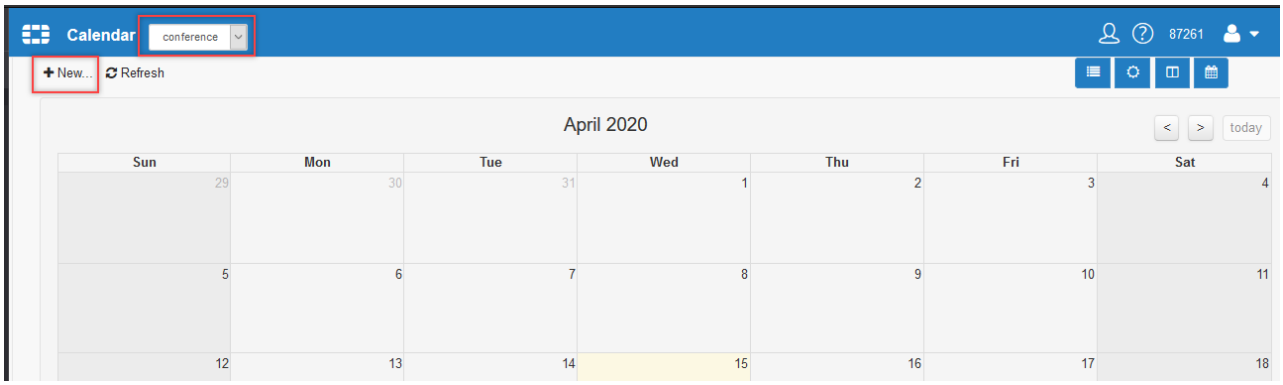
3. After you are logged in, click on the calendar.

The **Conference** option is available to extensions that have been added to the extension list that allows conference scheduling.

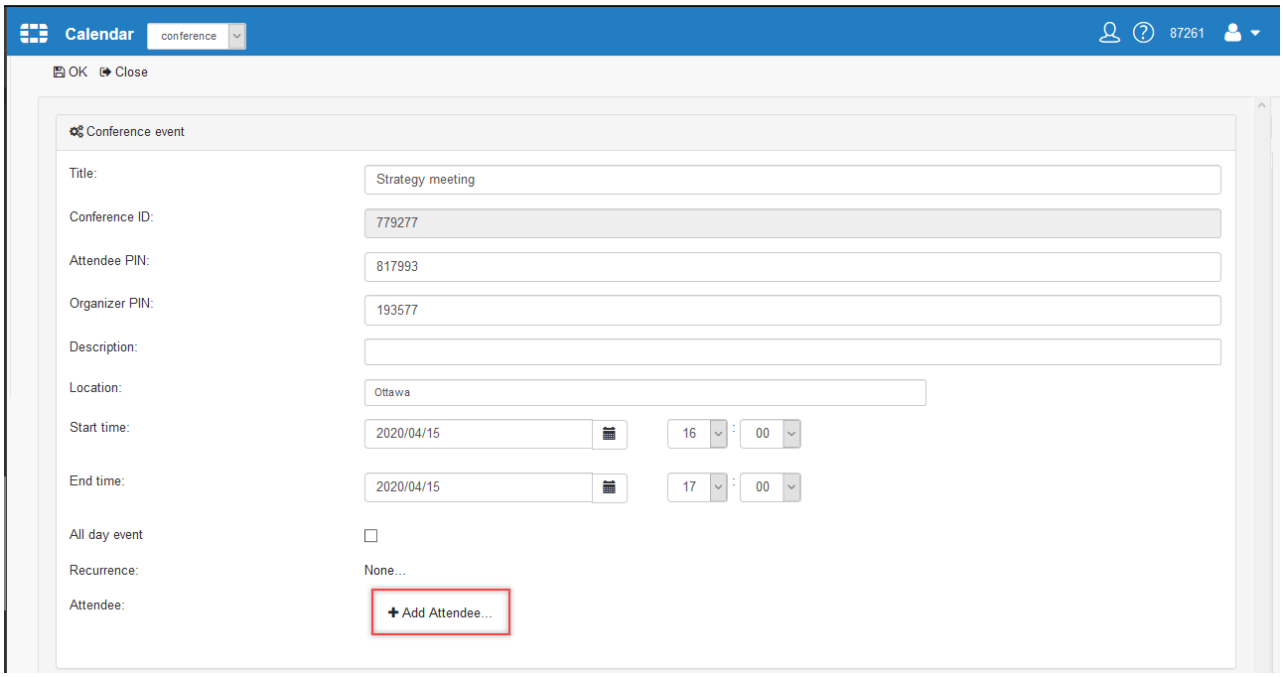


A new window opens to a calendar view, where the user can schedule upcoming conference calls.

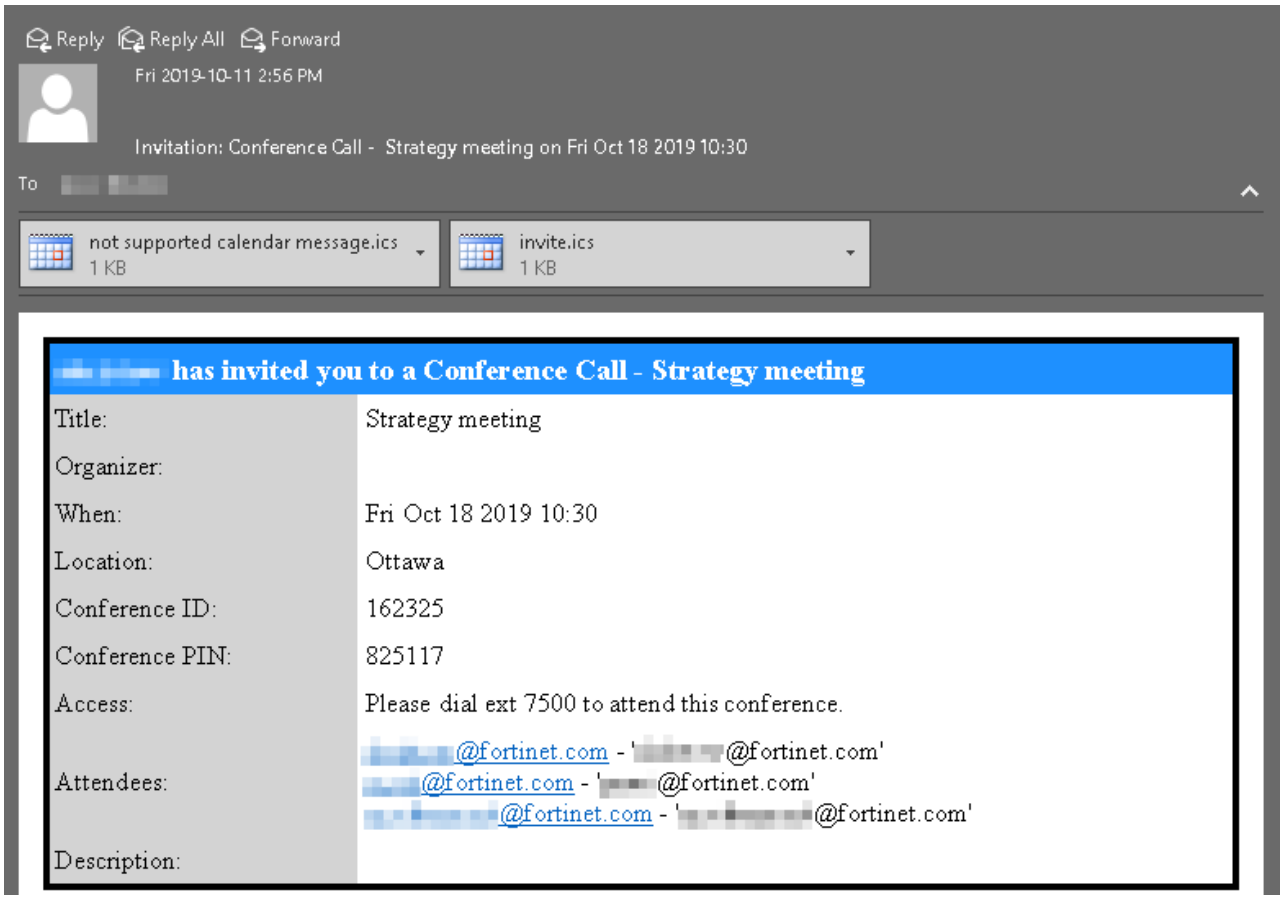
4. Select **Conference** and then click **New** or the date you wish to schedule the conference for.



5. Fill in details for this meeting.
6. Make note of the **Attendee PIN**. Attendees invited to the conference call will need this PIN.
7. Make note of the **Organizer PIN**. You will need this PIN to start the meeting.
8. In **Attendee**, click **Add Attendee**.



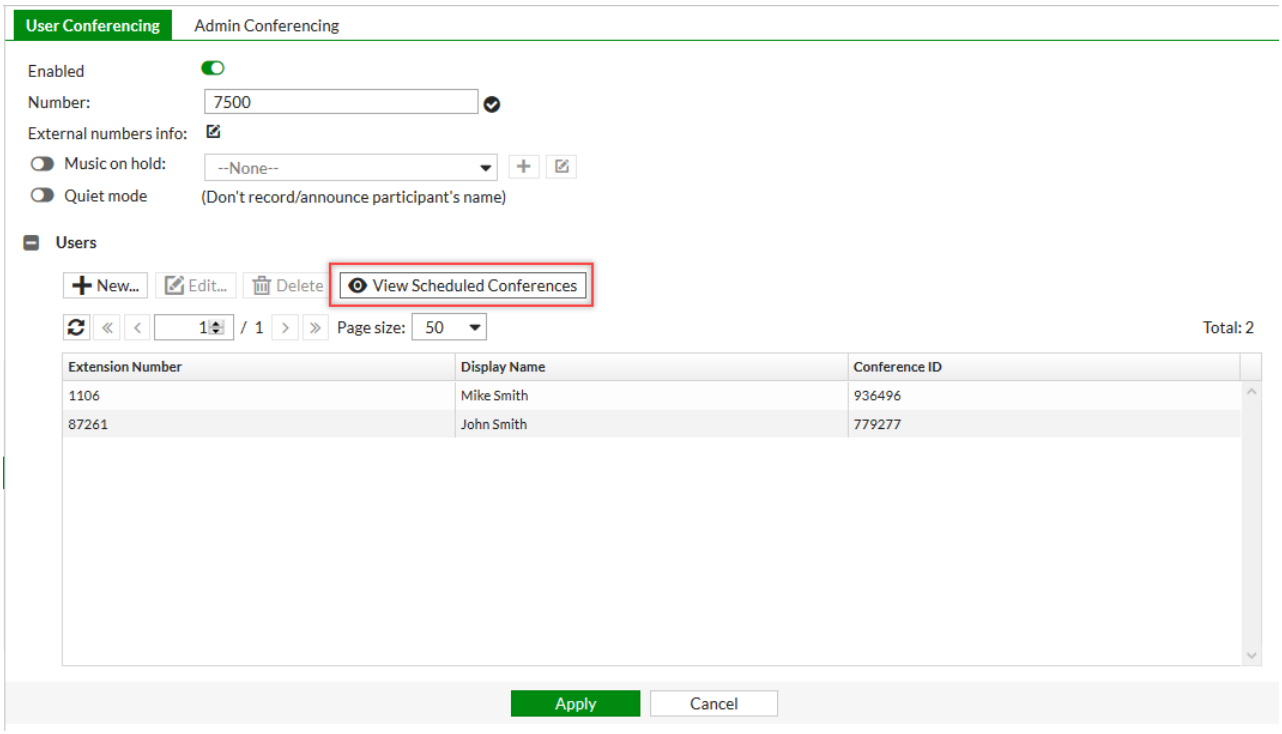
9. Enter the **Email** address of the attendee you wish to invite to the conference call, with an optional **Display name**. Click **Create**.
10. Add any additional attendees you wish to invite.
11. To finish the scheduling of the conference call, click **OK**.
    Upon clicking **OK**, all invited attendees will receive an email invitation to the conference call, with all the relevant information they need to attend the conference call.



Viewing upcoming user conferences

As an administrator, you can view upcoming conferences.

1. Go to **Call Feature > Conferencing > User Conferencing**.
2. Click **View Scheduled Conferences**.

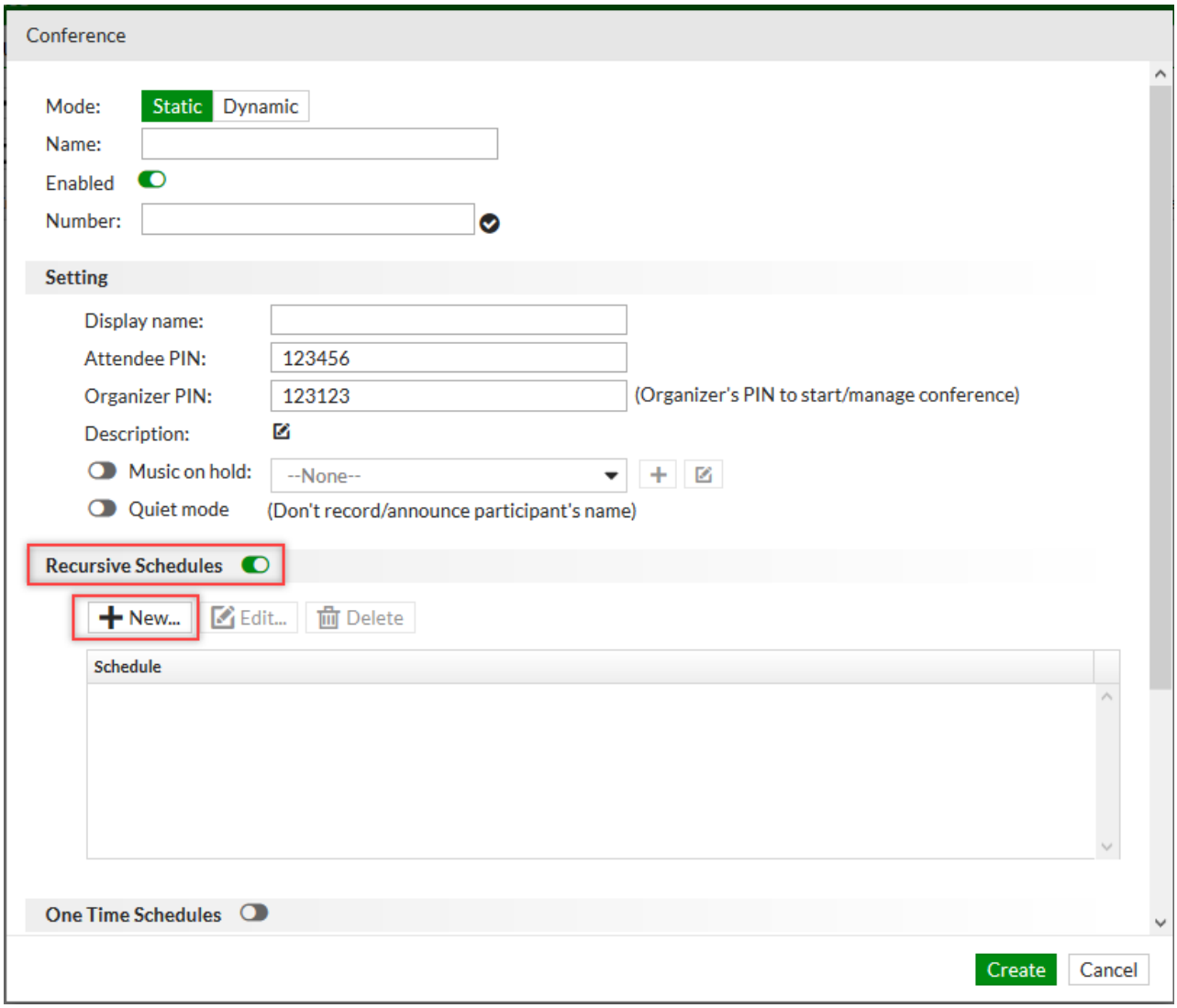


Configuring administrator conferencing

Both **Static** and **Dynamic** administrator conferences can be configured.

Configuring a static conference call

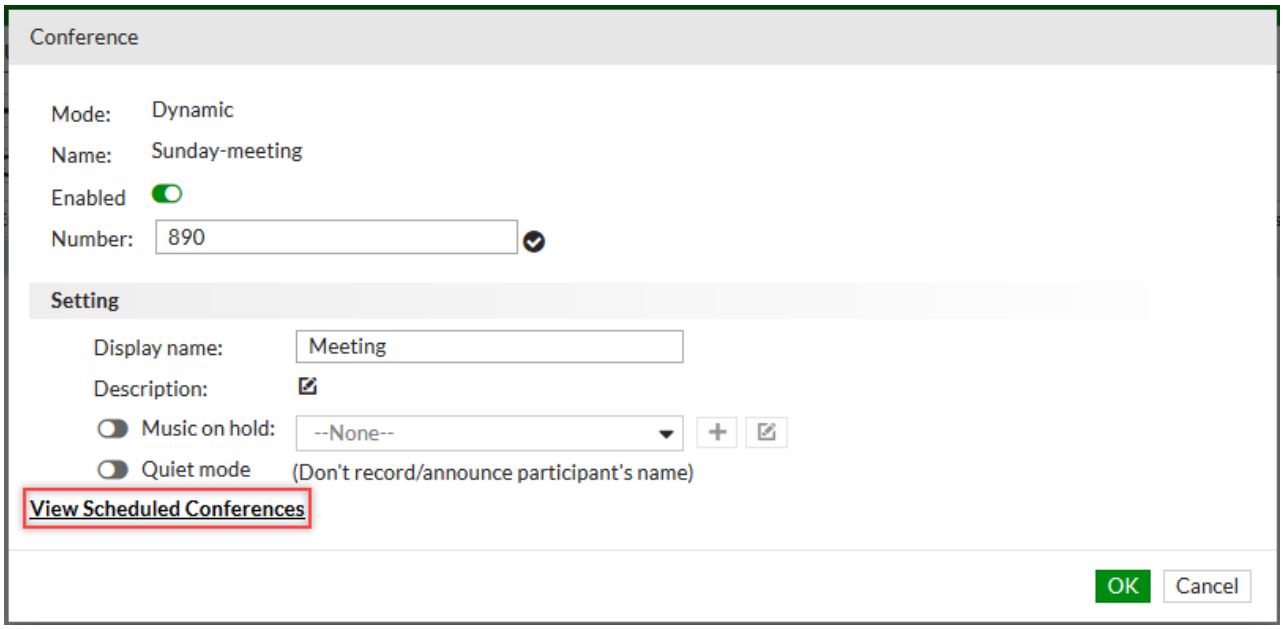
1. Go to **Call Feature > Conferencing > Admin Conferencing** and click **New**.
2. Set **Mode** to **Static**, enter a **Name**, and set to **Enabled** (if not already activated).
3. Enter an extension **Number** that callers can dial to join the conference call.
4. Under **Setting**, enter a **Display name** for the conference call, and an optional **Description**.
5. Enter a **User PIN**, which is the password users must enter to join the conference call.
   Callers need to dial the conference number and then enter their PIN.
6. Enter an **Admin PIN**, which is the password an administrator must use to begin the conference call.
7. To configure a recurring frequency for this static conference call, enable **Recursive Schedules** and click **New**.



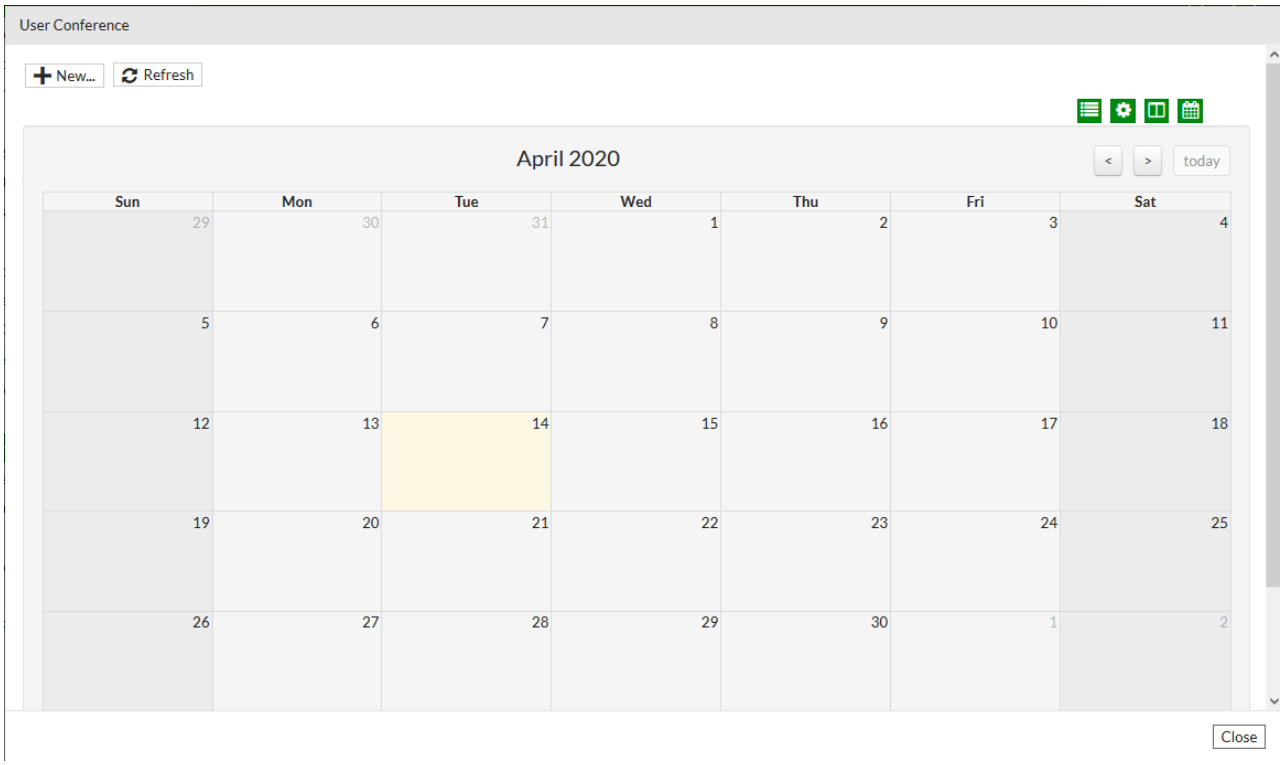
8. Assign an appropriate **Schedule** from the drop-down list, and enter a **Password**. Then click **Create**. This recursive schedule will make sure that users can only join the conference call during the scheduled time period by entering the configured password.
9. Alternatively, enable **One Time Schedules** and click **New** to schedule a single conference call.
10. Click **Create**.

Configuring a dynamic conference call

1. Go to **Call Feature > Conferencing > Admin Conferencing** and click **New**.
2. Set **Mode** to **Dynamic**, enter a **Name**, and set to **Enabled** (if not already activated).
3. Enter an extension **Number** that callers can dial to join the conference call.
4. Under **Setting**, enter a **Display name** for the conference call, and an optional **Description**.
5. Click **Create**.
6. Select your newly created conference call and click **Edit**.
7. Click **View Scheduled Conferences** to show the calendar view.



8. To schedule conference calls, click the desired date.



Recording a conference call

You can create a policy to record a conference call based on a phone number. With this policy, all conference calls using the phone number in the policy are recorded and will show up under **Monitor > Storage > Recorded Call.**

To configure a conference call recording

1. Go to **Call Feature** > **Call Recording** > **Policy**.
2. Click **New**.

GUI field		Description
Recording Policy		
	Name	Enter a name for this configuration.
	Enable	Select to activate this configuration.
	Description	Select **By Phone Number** to record conference calls based on a phone number.
	Caller number pattern	Leave this field empty and all calls to the conference will be recorded.
	Dialed number pattern	Enter the conference call number. The phone calls to this number will be recorded.
	Record ratio	Enter the file compression percentage for the recording. The larger the percentage, the better the sound quality.
	Retention duration	Enter the days for which you want to keep the recordings.
	File name format	Select the format of the downloaded recorded call files generated under this policy. The file format is useful when you filter downloaded recorded call files in **Monitor > Storage > Recorded Call**.

3. Click **Create**.

To search your recorded calls

1. Go to **Monitor > Storage > Recorded Call**.
2. Click **Search**, then **New**.
3. Under **Recording type**, select **Conference**.
4. Enter the search values, and click **Create**.
5. When the search result status changes to **Done**, select the result and click **View Search Result**.
   All recorded conference calls are listed. You can double-click a call recording and select to play or download it.

Faxes

FortiVoice can send and receive faxes to the FortiVoice user portal, email, and physical fax machines. This recipe guides you through the process of configuring the FortiVoice unit to receive and send faxes.

This section includes the following recipes:

- Configuring FortiVoice to receive faxes on page 39
- Configuring FortiVoice to send faxes on page 40

Configuring FortiVoice to receive faxes

1. Go to **Call Feature > Fax > eFax Account** and click **New**.
2. Under **Incoming Fax Setting**, make sure that **Enabled** is selected.
3. Enter a **Name** and an extension **Number**.
4. Enter a **Display name** for the extension.
5. Under **External Numbers**, click **New**.
6. Map the direct inward dialing (DID) numbers to the extension of the fax. Select the **Incoming trunk** used for dialing the DID numbers, and enter the **DID Numbers** that you want to map to an extension.
   All DID numbers assigned here will reach this extension for incoming faxes.
7. Click **Create**.
8. Under **Select Fax Monitors**, click in the field and assign the extensions that can monitor the faxes received on this fax extension in their FortiVoice user portal. From their FortiVoice user portal, users can choose to view, delete, resend, forward, or download the faxes. These users, who have email addresses linked to their extensions, will receive an email notification when a fax is received.
9. Set **Fax to Email** to the email addresses you want to receive the faxes sent to this fax extension. These email addresses will receive the faxes in a PDF file.
10. If required, under **Relay to Fax Machine**, assign the fax machines connected to the FortiVoice unit using T.38 adapters. Faxes will be relayed to the selected machines.
11. Under **Archive**, enable **Fax archive** to activate fax archiving and enter the **File name format** to archive, according to the formats available from the drop-down menu.
12. Click **Create**.

Fax archive settings

If you have enabled **Fax archive** in an **eFax Account**, you should specify rotation and destination settings to archive recorded calls.

1. Go to **Call Feature > Fax > Archive**.
2. Under **Rotation Setting**, set the **Fax rotation size** in MB and **Fax rotation time** in days. The FortiVoice unit starts generating a new archive file when either one of these parameters (size or time) is reached first.
3. Set **Archiving options when disk quota is full** to determine what the FortiVoice unit should do if it runs out of disk space. Click **Overwrite** to remove the oldest archived folder to make space for new archives, or click **Do Not Overwrite** to stop archiving.
4. Set a **Schedule** for archiving to take place. Archiving will not take place outside of the selected schedule.
5. Under **Destination Setting**, set **Destination** to either **Local** to use the hard drive of the FortiVoice unit or a NAS server, or **Remote** to use a remote FTP or SFTP storage server.
6. If **Destination** is set to **Remote**, configure the remote server options as necessary.
7. Click **Apply**.

Configuring FortiVoice to send faxes

1. Go to **Call Feature > Fax > Sending Rule** and click **New**.
2. Make sure that **Enabled** is selected.
3. Enter a **Name**.
4. Under **Dialed Number Match**, click **New**.
5. Enter a **Match Pattern** number. This is the extension number pattern in your dial plan that can match many different numbers for sending faxes.
   The following pattern matching syntax is supported, in order to match a wide range of potential numbers:

Syntax	Description
X	Matches any single digit from 0 to 9.
Z	Matches any single digit from 1 to 9.
N	Matches any single digit from 2 to 9.
[ ]	Matches any digits in the brackets. For a range of numbers, use a dash. Example: [15-7]. In this example, the pattern matches 1, 5, 6, and 7.
.	(period) Acts as a wildcard that matches any digit and allows for any number of digits to be dialed. Example of a pattern matching rule: XX. In this example, the system looks for a dialed number match that has three or more digits.
!	(exclamation point) Acts as a wildcard that matches any digit (including no digits) and allows for any number of digits to be dialed. Example of a pattern matching rule: XX! In this example, the system looks for a dialed number match that has two or more digits.

6. Enter any required **Modification** settings, such as stripping or appending prefixes or postfixes to the number pattern, and click **Create**.
7. Under **Call Handling**, click **New**.
8. Set the appropriate **Schedule**, **Action**, and **Outgoing trunk** and/or **Caller ID modification** for your dial plan requirements, to determine the call handling action for the numbers matching the configured number pattern.
9. Click **Create**, and **Create** again to finish configuring the **Sending Rule**.

General fax settings

1. Go to **Call Feature > Fax > Setting**.
2. Enter a **System station ID** and **System fax header** that shows on each fax sent from the FortiVoice unit.
3. Under **T.38 Fax**, determine whether the FortiVoice unit will resend a T.38 invite if the remote end is unresponsive, and whether the FortiVoice will fallback to G.711 mode if T.38 communication fails.
   A T.38 fax requires significantly less bandwidth, and helps mitigate packet loss.
4. T.38 uses UDP Transport Layer (UDPTL) as its transport protocol. Enter the start and end ports.

5. Under **Send Queue**, set **Max retry times** to the maximum number of times the FortiVoice unit will attempt to resend a fax if the fax is unable to be sent due to busy lines.
6. Set a **Retry interval** and **Wait time for an answer** to the duration of time in seconds that the FortiVoice unit will wait between retries and the wait time for a "go-ahead" signal from the fax receiving terminal.
7. Click **Apply**.

Importing and exporting speed dial numbers

You can import and export speed dial number lists for fast configuration and backup purposes.

To export a speed dial number list

1. Go to **Call Features > Speed Dial > Number**.
2. Click **Export**.
3. Select **Export** to save the speed dial list as a CSV file.
4. Select **Download sample** to learn how to prepare speed dial numbers to import into the FortiVoice unit.

To import a speed dial number list

1. Go to **Call Features > Speed Dial > Number**.
2. Click **Import**.
3. Browse for the number list file.

Extensions

This section includes the following topics:

- Auxiliary phone and secondary account on page 42
- Auto provisioning for FortiFone devices on different subnets on page 43
- Caller ID modification on page 46
- FortiVoice Click-to-dial configuration on Google Chrome on page 54
- Hot desking on page 58
- Local IP extensions on page 61
- Remote extension configuration on page 65
- Managing a large number of extensions on page 66

Auxiliary phone and secondary account

You can update an IP extension to enable and configure the following settings:

- **Auxiliary phone**: When you add an auxiliary phone to your extension, you have two phones with the same extension number. The phones will ring at the same time but you can only use one phone to answer the call. This function is useful when you want to access the same extension from two different locations.
- **Secondary account**: When you add a secondary account to your extension, you can set the secondary extension to ring at the same time as your existing extension. However, the secondary extension operates separately. For example, extension 100 sets extension 200 to be a secondary account. When a call comes in to extension 100, both extensions (100 and 200) will ring and you can answer one of them. In that same example, if a call comes into extension 200, only extension 200 will ring.

Adding an auxiliary phone

1. Go to **Extension > Extension > IP Extension**.
2. Double-click the extension that you want to add the auxiliary phone to.
3. In **Device Setting**, click the **Auxiliary Phone** tab.
4. Click **New**.
5. In **Device**, add a new phone or select an existing phone .
6. If you select an existing phone, make sure that it is not assigned.
7. Complete the configuration.
8. To complete the addition of the auxiliary phone, click **Create**.
9. To save the changes to IP extension, click **OK**.

Adding a secondary account

The secondary account setting is available when your extension is using a FortiFone phone, not a generic phone.

1. Enable the secondary account setting:
   a. Go to **System > Advanced > Auto Provisioning**.
   b. In **Other Setting**, enable **Secondary account**.
   c. Click **Apply**.
2. Add a secondary account to an extension:
   a. Go to **Extension > Extension > IP Extension**.
   b. Double-click the extension that you want to add the secondary account to.
   c. In **Device Setting**, click **Advanced**.
   d. Expand **Secondary account**.
   e. In **Account**, select the extension that you want to add as the secondary account.
   f. To save changes to the advanced settings, click **OK**.
   g. To save changes to the IP extension, click **OK**.

Auto provisioning for FortiFone devices on different subnets

When configuring FortiFone IP extensions on your FortiVoice system on a single LAN deployment, they will auto discover utilizing SIP PnP, in which a multicast is sent out on the network.

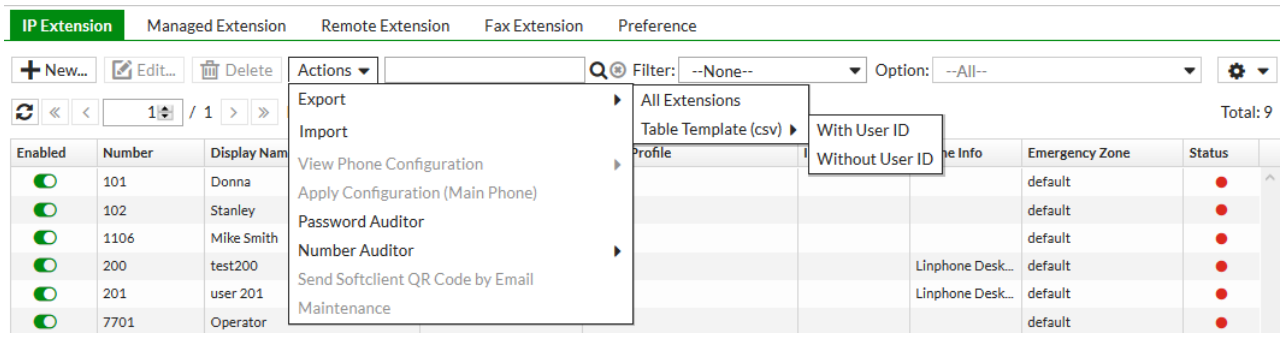
For FortiFone devices on networks that use a different subnet than FortiVoice, the multicast will not make it across the various subnets. In deployments using different subnets it is best to use HTTP or HTTPS with Option 66 configured on your DHCP server.

The HTTP and HTTPS protocols increase the reliability of the FortiFone devices being able to auto provision across the network. Option 66 set on the DHCP server creates an easy way to have all phones directed towards the FortiVoice in order to auto provision.

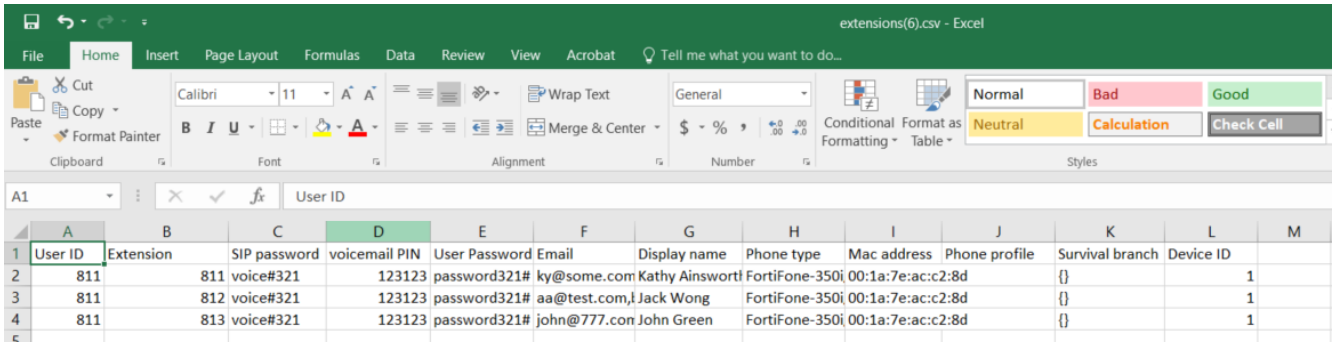
This recipe covers the best practices for a large deployment of FortiFone devices with the FortiVoice system.

Downloading and editing the CSV file

1. On FortiVoice, go to **Extension > Extension > IP Extension**.
2. Under the **Actions** drop-down, select **Export > Table Template (csv) > With User ID**.
   A sample file will be downloaded entitled **extensions.csv**.



3. Open the newly downloaded sample CSV file.
4. Replace the sample's content with the information for your extensions. Make sure to configure the following sections: **User ID**, **Extension**, **Display Name**, **Phone Type**, and **MAC Address**.



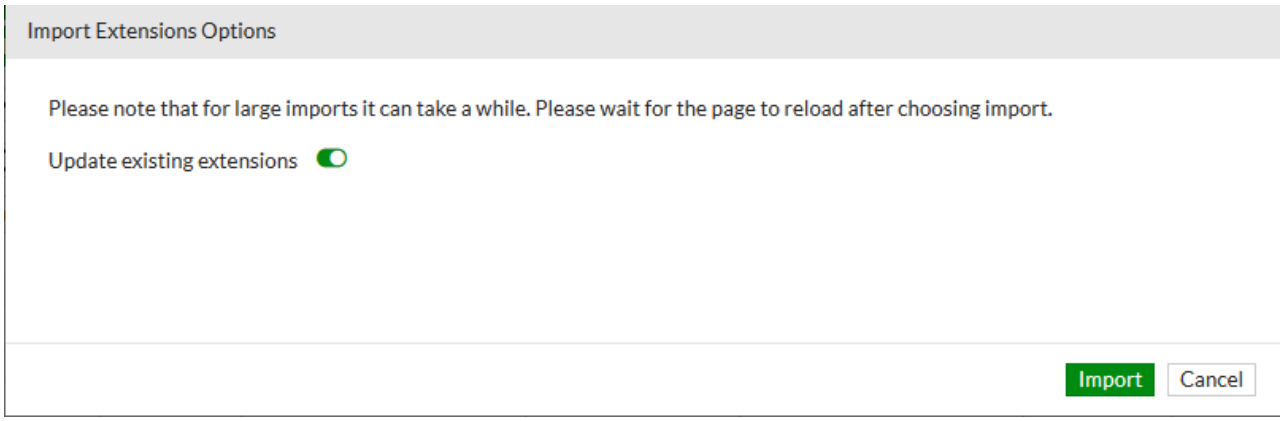
The **Phone Type** must be entered as “FortiFone-XXX”, where “XXX” is your model type (for example, **FortiFone-570**). To see a current list of FortiFone models, go to **Phone System > Profile > Phone**.

The **MAC Address** sections must be populated as “xx:xx:xx:xx:xx:xx”. After you import the CSV file, FortiVoice automatically formats the MAC address.

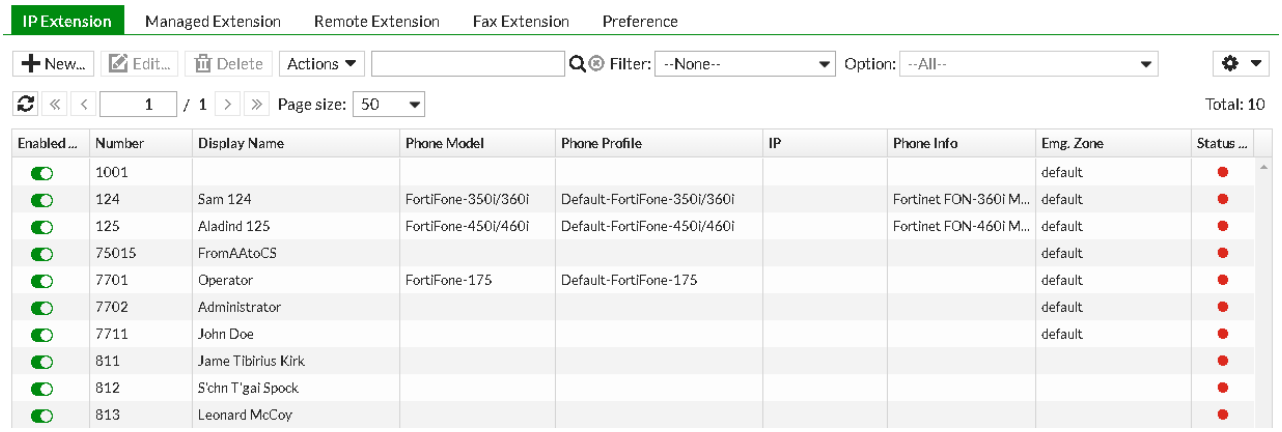
If a custom phone profile using the default settings is in use, the **Phone profile** section will also need to be configured.

Importing the CSV file

1. Go to **Extension > Extension > IP Extension**.
2. Under the **Actions** drop-down, select **Import**.
3. Navigate to and select the configured CSV file and select **OK**.
   A window will appear stating that large imports can take a while, with **Update existing extensions** enabled.
4. Select **Import**.



5. Review your list of pre-existing and newly imported extensions.

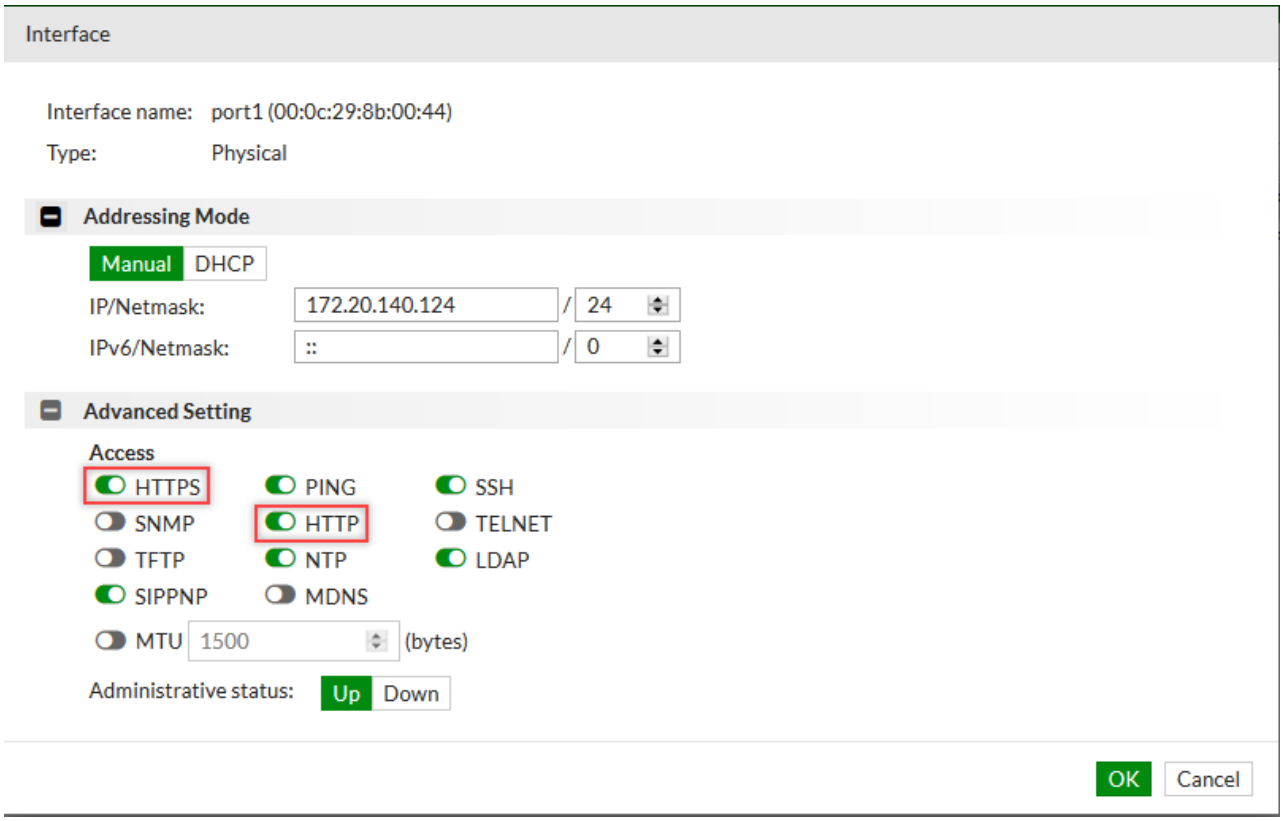


Enabled ...	Number	Display Name	Phone Model	Phone Profile	IP	Phone Info	Emg. Zone	Status ...
	1001						default	
	124	Sam 124	FortiFone-350i/360i	Default-FortiFone-350i/360i		Fortinet FON-360i M...	default	
	125	Aladind 125	FortiFone-450i/460i	Default-FortiFone-450i/460i		Fortinet FON-460i M...	default	
	75015	FromAAtoCS					default	
	7701	Operator	FortiFone-175	Default-FortiFone-175			default	
	7702	Administrator					default	
	7711	John Doe					default	
	811	Jame Tibirius Kirk						
	812	S'chn T'gai Spock						
	813	Leonard McCoy						

Configuring HTTP or HTTPS protocol support

For successful auto provisioning to occur across multiple subnets, the HTTP and HTTPS protocols must be enabled on the FortiVoice network interface.

1. Go to **System > Network > Network**.
2. Select the network interface in use (in this example, **port1**) and select **Edit**.
3. Expand **Advanced Setting**.
4. Under **Access**, make sure **HTTP** and/or **HTTPS** is enabled, then select **OK**.



5. Go to **System > Advanced > Auto Provisioning**.
6. Under **Auto Provisioning**, select **Enabled** (and optionally enable **Unassigned phone**).
7. Set **Provisioning protocol** to either **HTTPS** or **HTTP**, and select **Apply**.

DHCP server

1. On your DHCP server, set:
   a. Option 66 to the protocol in use
   b. IP address of FortiVoice
   c. Protocol port number
   d. Provisioning folder (for example, *http://192.168.1.99:80/provisioning/*, or *https://192.168.1.99:443/provisioning/*)
2. The protocol ports can be changed from their default values on FortiVoice by going to **System > Configuration > Option**. Make note of any changes made on FortiVoice.
3. After the DHCP settings are verified, connect the FortiFone devices to the network, or reboot them if already connected.

Caller ID modification

For outbound calls from the FortiVoice unit, you can customize the caller ID to be any name, number, or both. As there are multiple areas where you can modify the caller ID within the FortiVoice UI, there is a hierarchy to which the caller ID

modification takes precedence. This recipe details the caller ID modification hierarchy to help you decide how to configure your FortiVoice caller IDs.

The hierarchy of caller ID modification options is different for a normal call or an emergency call.

This section includes the following topics:

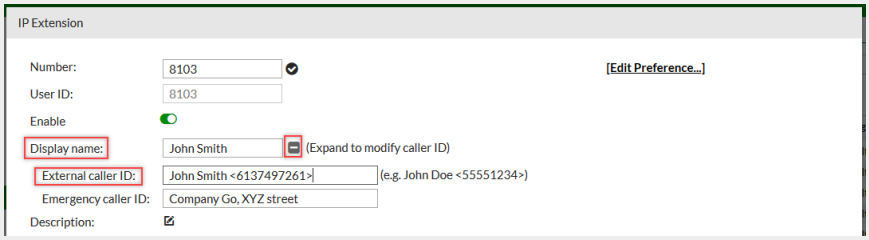
- Caller ID modification hierarchy for normal calls on page 47
- Caller ID modification hierarchy for emergency calls on page 50

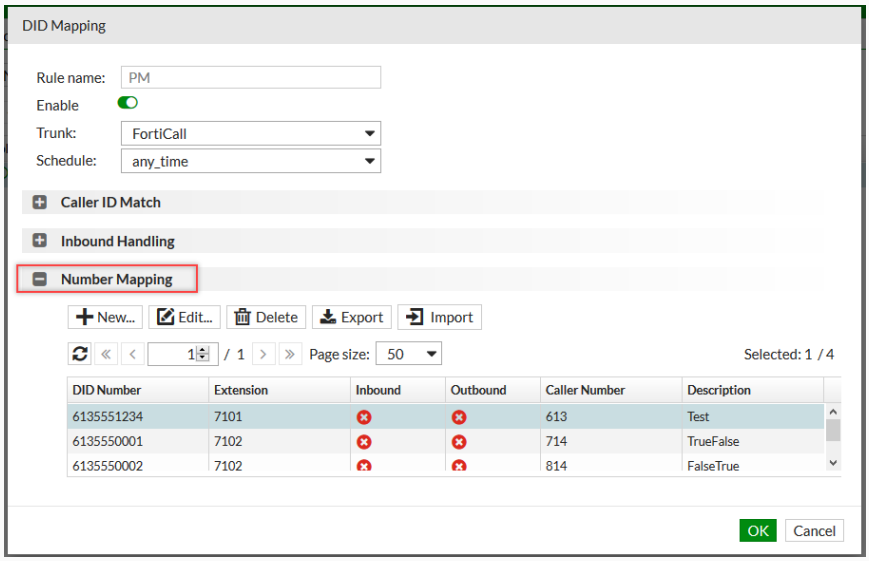
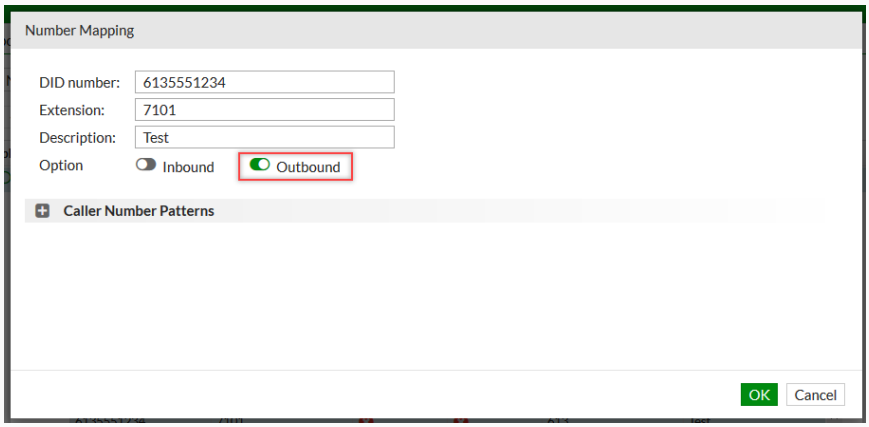
Caller ID modification hierarchy for normal calls

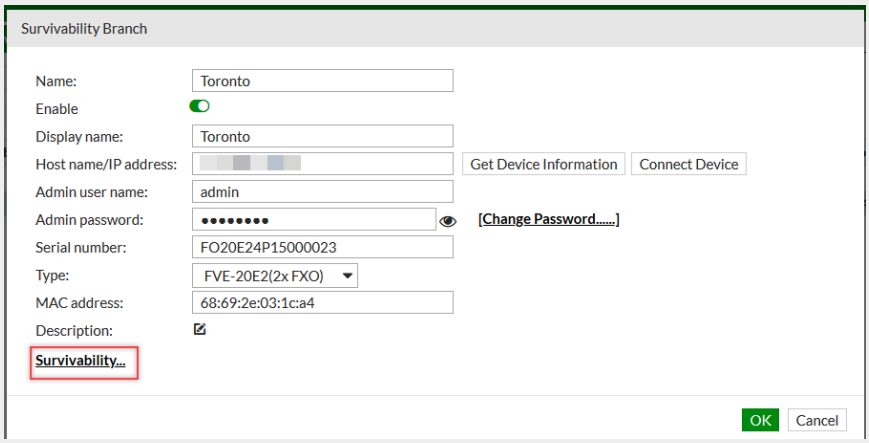
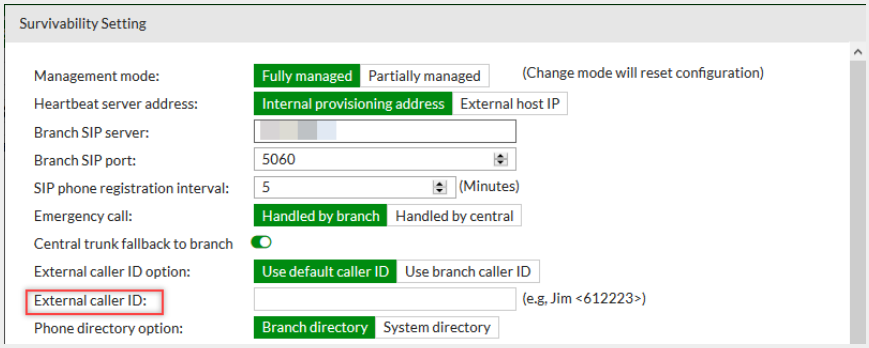
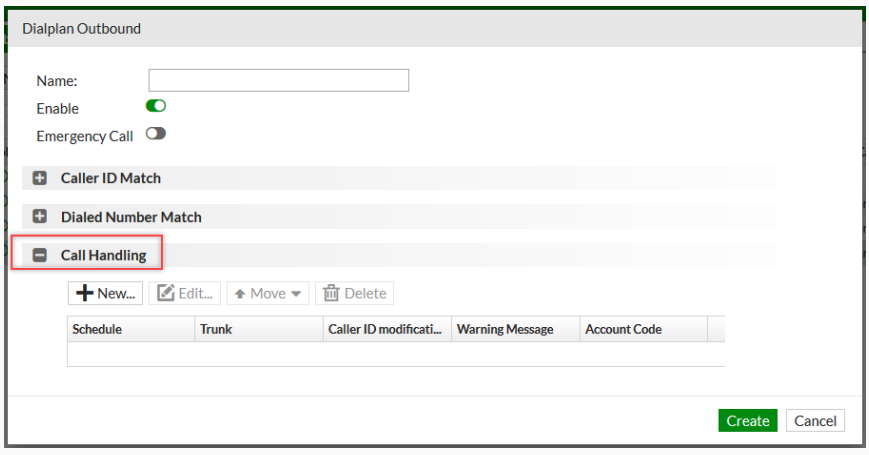
A normal call is any outbound call that is not an emergency call, as defined by the regional emergency number settings.

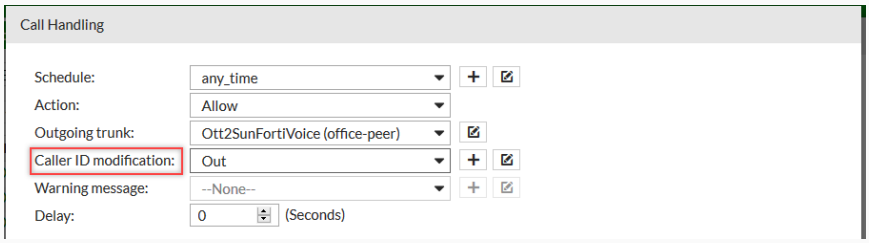
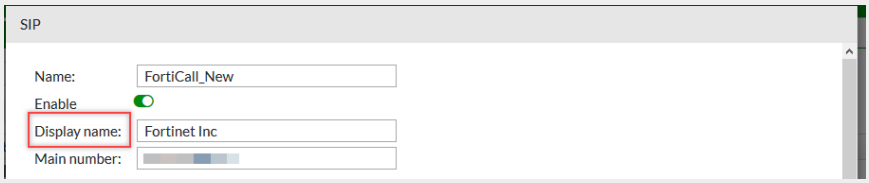
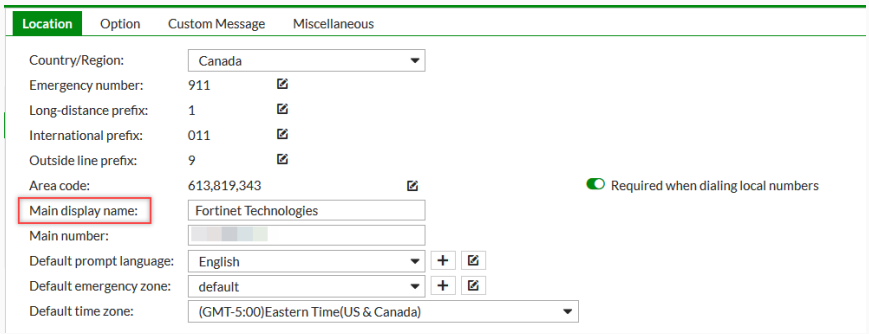
The following table displays the caller ID modification options available on normal calls from the highest priority (1) to the lowest priority (6).

For example, if you configure the caller ID settings using the direct inward dialing (DID) number mapping (priority 2) and the Caller ID modification (priority 4), the FortiVoice unit displays the caller ID configured using the DID number mapping because this setting has a higher priority.

Priority	Setting	Steps
1	External caller ID	1. Go to **Extension > Extension > IP Extension**. 2. Edit an extension or create a new one. 3. Go to **Display name** and click to expand. 4. In **External caller ID**, enter the caller ID such as a name and number (example, John Doe <55551234>). 5. Click **OK** or **Create**, as applicable. 
2	DID number mapping	1. Go to **Call Routing > Inbound > DID Mapping**. 2. Edit a rule or create a new one. 3. Under **Number Mapping**, create a new DID number mapping or edit an existing one.

Priority	Setting	Steps
		 4. In **Option**, select **Outbound**. 5. Click **OK** or **Create**, as applicable. 
3	External caller ID, survivability setting for local survivable gateway (LSG)	1. Go to **Managed System > Survivability > Survivability Branch**. 2. Edit an existing branch or create a new one. 3. Click **Survivability**.

Priority	Setting	Steps
		 4. In **External caller ID**, enter a caller ID such as a name and number (example, Jim <612223>). 5. Click **OK** or **Create**, as applicable. 
4	Caller ID modification	1. Go to **Call Routing > Outbound > Outbound**. 2. Edit an existing rule or create a new one. 3. In **Call Handling**, edit an existing rule or create a new one.  4. In **Caller ID modification**, select an existing profile or create a new one.

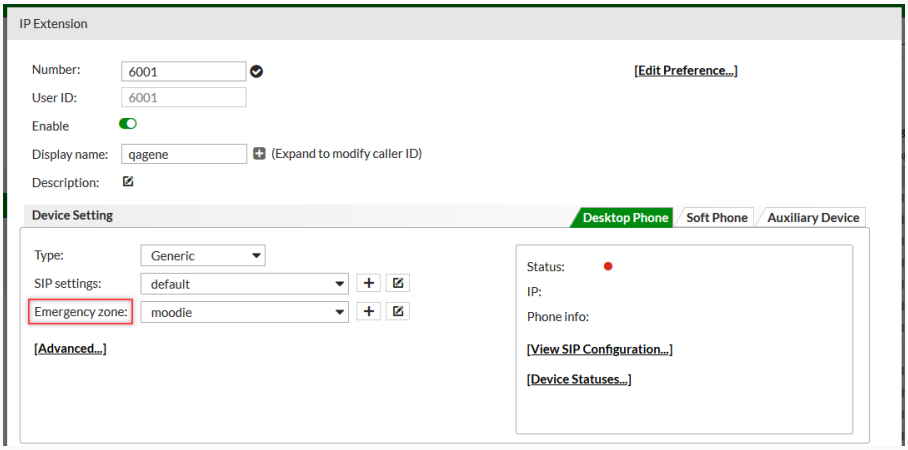
Priority	Setting	Steps
		5. Click **OK** or **Create**, as applicable. 
5	Trunk display name	1. Go to **Trunk > VoIP > SIP**. 2. Edit an existing trunk or create a new one. 3. In **Display name**, enter a name. 4. Click **OK** or **Create**, as applicable. 
6	Location main display name	1. Go to **Phone System > Setting > Location**. 2. In **Main display name**, enter the name displaying on the FortiVoice phone system unit. Your PSTN provider assigns this name. 3. Click **OK** or **Create**, as applicable. 

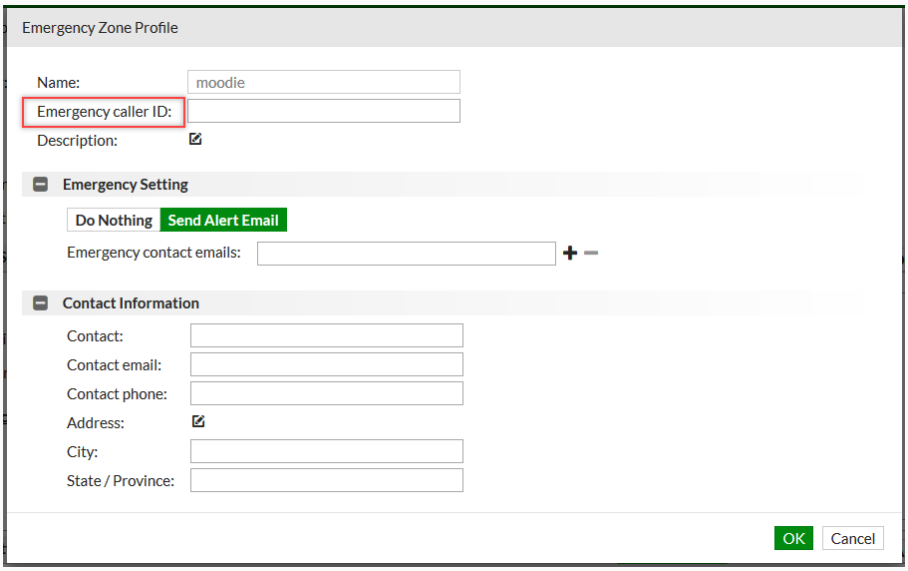
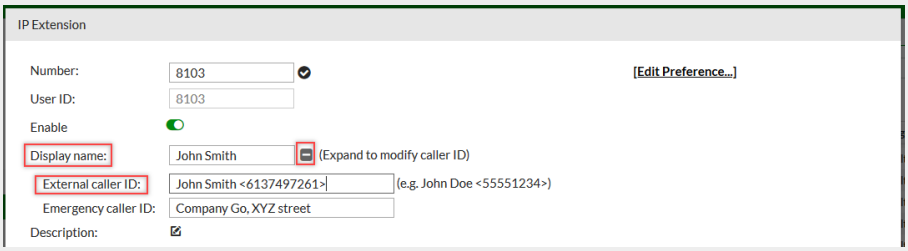
Caller ID modification hierarchy for emergency calls

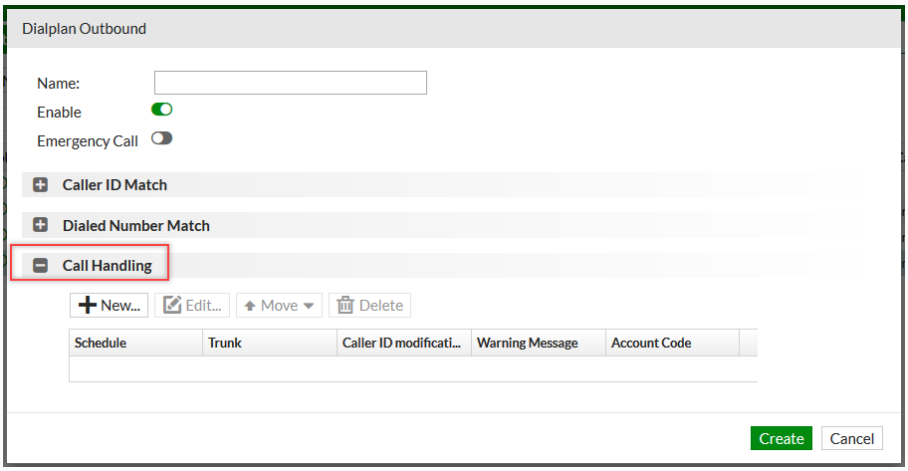
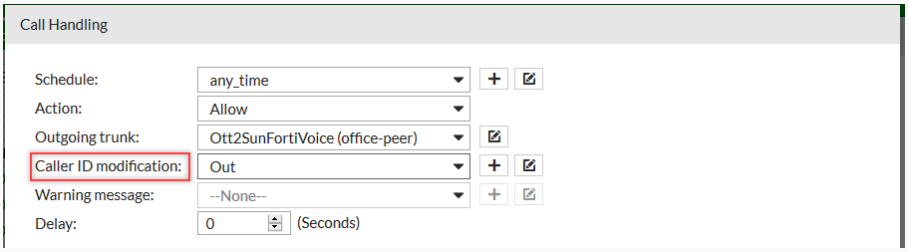
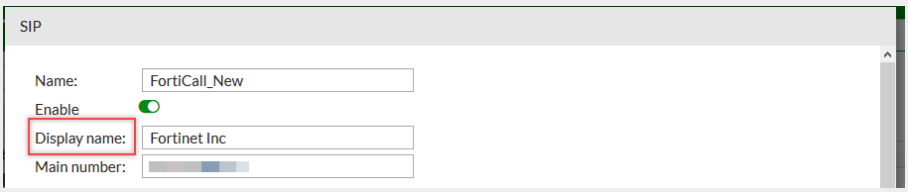
When you place an emergency call, the hierarchy for caller ID modification changes to alert emergency services about the correct location of the caller.

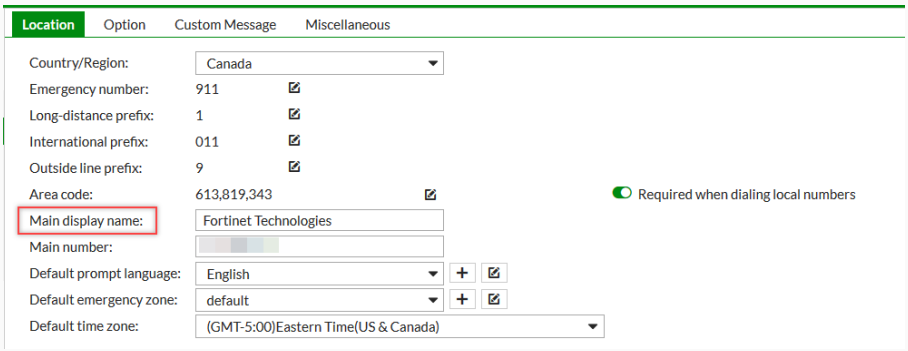
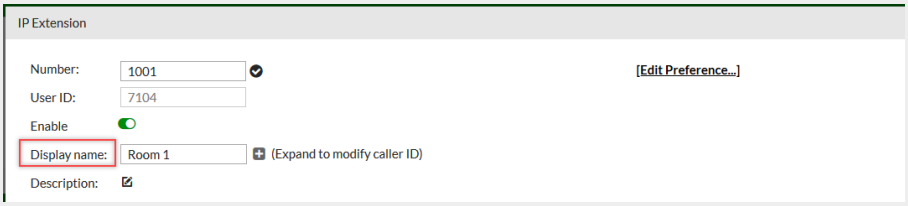
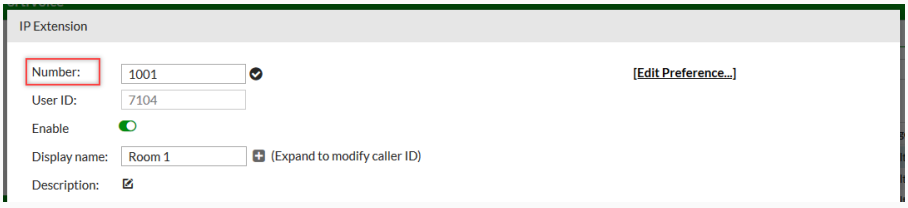
The following table displays the caller ID modification options available on emergency calls from the highest priority (1) to the lowest (8).

For example, if you configure the caller ID settings using the Extension emergency caller ID (priority 1) and the Extension external caller ID (priority 3), the FortiVoice unit displays the caller ID configured using the Extension emergency caller ID because this setting has a higher priority.

Priority	Setting	Steps
1	Extension emergency caller ID	1. Go to **Extension > Extension > IP Extension**. 2. Edit an extension or create a new one. 3. Go to **Display name** and click to expand. 4. In **Emergency caller ID**, enter the caller ID to display on the destination phone when you dial the emergency number. 5. Click **OK** or **Create**, as applicable.
2	Emergency zone caller ID (Extension setting)	1. Go to **Extension > Extension > IP Extension**. 2. Edit an extension or create a new one. 3. In **Emergency zone**, select a profile or create a new one.  4. In **Emergency caller ID** of the profile, enter the caller ID to display on the destination phone when you dial the emergency number. 5. Click **OK** or **Create**, as applicable.

Priority	Setting	Steps
		
3	Extension external caller ID	1. **Extension > Extension > IP Extension**. 2. Edit an extension or create a new one. 3. Go to **Display name** and click to expand. 4. In **External caller ID**, enter the caller ID such as a name and number (example, John Doe <5551234>). 5. Click **OK** or **Create**, as applicable. 
4	Caller ID modification	1. **Call Routing > Outbound > Outbound**. 2. Edit an existing rule or create a new one. 3. In **Call Handling**, edit an existing rule or create a new one.

Priority	Setting	Steps
		 4. In **Caller ID modification**, select an existing profile or create a new one. 5. Click **OK** or **Create**, as applicable. 
5	Trunk display name	1. Go to **Trunk > VoIP > SIP**. 2. Edit an existing trunk or create a new one. 3. In **Display name**, enter a name. 4. Click **OK** or **Create**, as applicable. 
6	Location main display name	1. Go to **Phone System > Setting > Location**. 2. In **Main display name**, enter a name. 3. Click **OK**.

Priority	Setting	Steps
		
7	Extension display name	1. Go to **Extension > Extension > IP Extension**. 2. Edit an extension or create a new one. 3. In **Display name**, enter the name to display on the destination phone calling this extension. 4. Click **OK** or **Create**, as applicable. 
8	Extension number	1. Go to **Extension > Extension > IP Extension**. 2. Edit an existing extension to change its extension number or create a new extension and enter an extension number. 3. Click **OK** or **Create**, as applicable. 

FortiVoice Click-to-dial configuration on Google Chrome

FortiVoice Click-to-dial is a Google Chrome extension that allows you to click on a phone number on a website and call them from your desk phone. This section details the steps required to install and set up the extension from the Chrome Web Store.

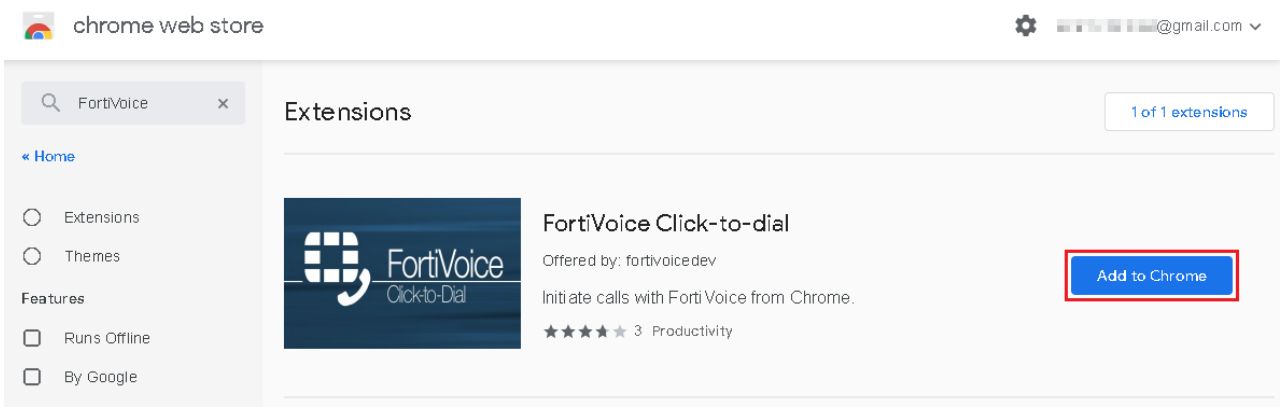
This section includes the following recipes:

- Installing FortiVoice Click-to-dial on page 55
- Configuring FortiVoice Click-to-dial on page 56

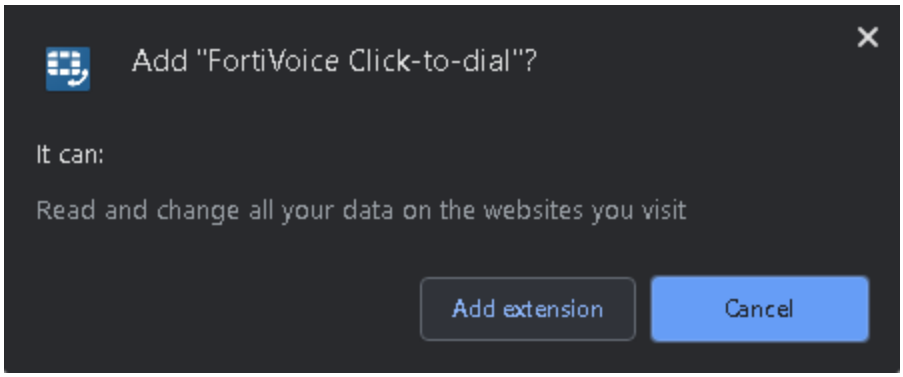
- Using FortiVoice Click-to-dial on page 57

Installing FortiVoice Click-to-dial

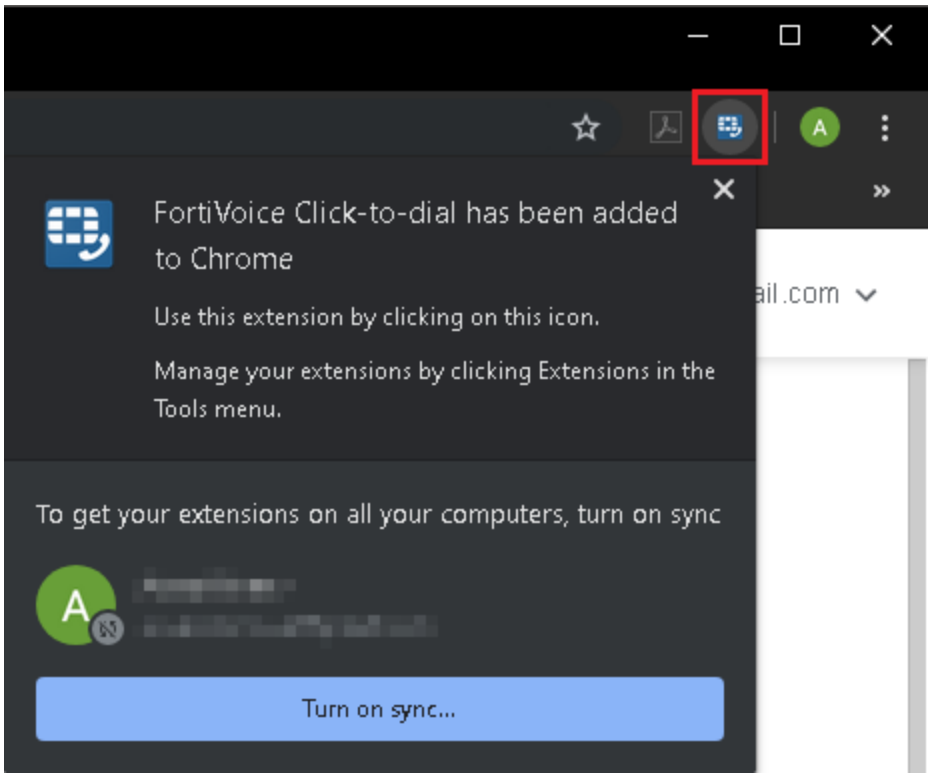
1. Start the Google Chrome web browser and go to the Chrome Web Store.
2. Search for **FortiVoice**.
   Google Chrome displays **FortiVoice Click-to-dial**.
3. Select **Add to Chrome**.



4. In the confirmation window select **Add extension**.

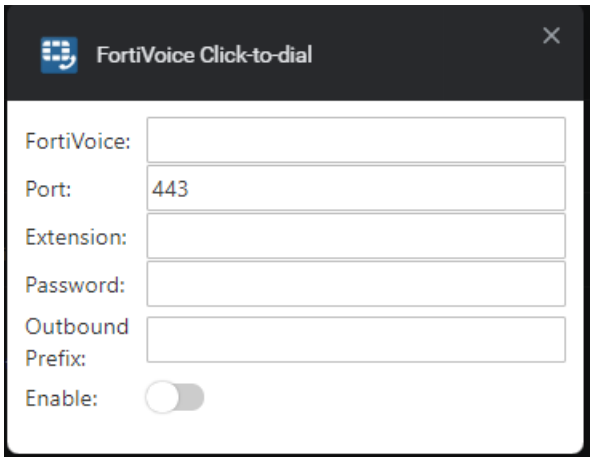


5. After the installation is complete, the FortiVoice Click-to-dial icon appears in the search bar.



Configuring FortiVoice Click-to-dial

1. Right-click on the Click-to-dial icon and select **Options**.
2. Complete the following fields:
   - **FortiVoice**: The IP address or FQDN of the FortiVoice device. If on the same network as the FortiVoice, enter the private IP address.
   - **Port**: The HTTPS port used by FortiVoice (443 by default).
   - **Extension**: The extension number of the user.
   - **Password**: The PIN code or password for that extension (the same as the voicemail PIN).
   - **Outbound Prefix**: (Optional) If required to dial an outbound code before the number, such as 9.
   - **Enable**: Turn on the extension.



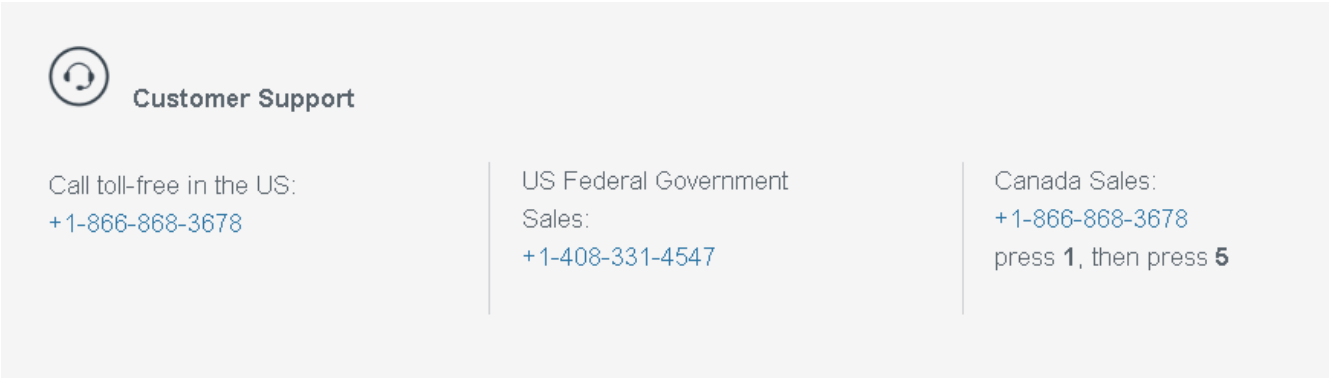
Note that the following errors can appear when you attempt to enable the extension:

- **Connection error**: Indicates that the **IP/FQDN** or **Port** is incorrect, or if the firewall is not routing the traffic correctly if attempting to use externally.
- **Invalid credentials**: Indicates that the wrong **Password** has been entered.

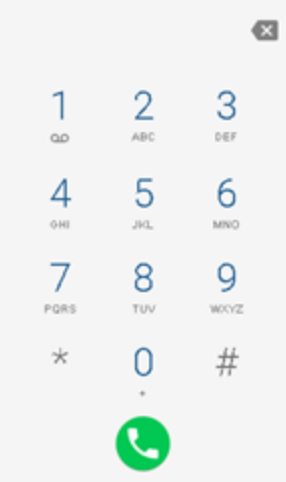
If the **Enable** toggle remains on, the configuration is correct.

Using FortiVoice Click-to-dial

After the configuration is complete, any web page that contains a phone number will be highlighted; click on the number to initiate the call from your extension.



Alternatively, you can select the Click-to-dial icon to open the phone dialer and manually enter the phone number.



Hot desking

Hot desking, also known as free seating, enables a user to log in to an unassigned phone and take total control of that phone by applying all of their own phone settings until logging out.

Hot desking is particularly useful in a call center or sales office environment where users need to be able to sit at any desk and use their phone extension.

The hot-desking configuration requires two phones:

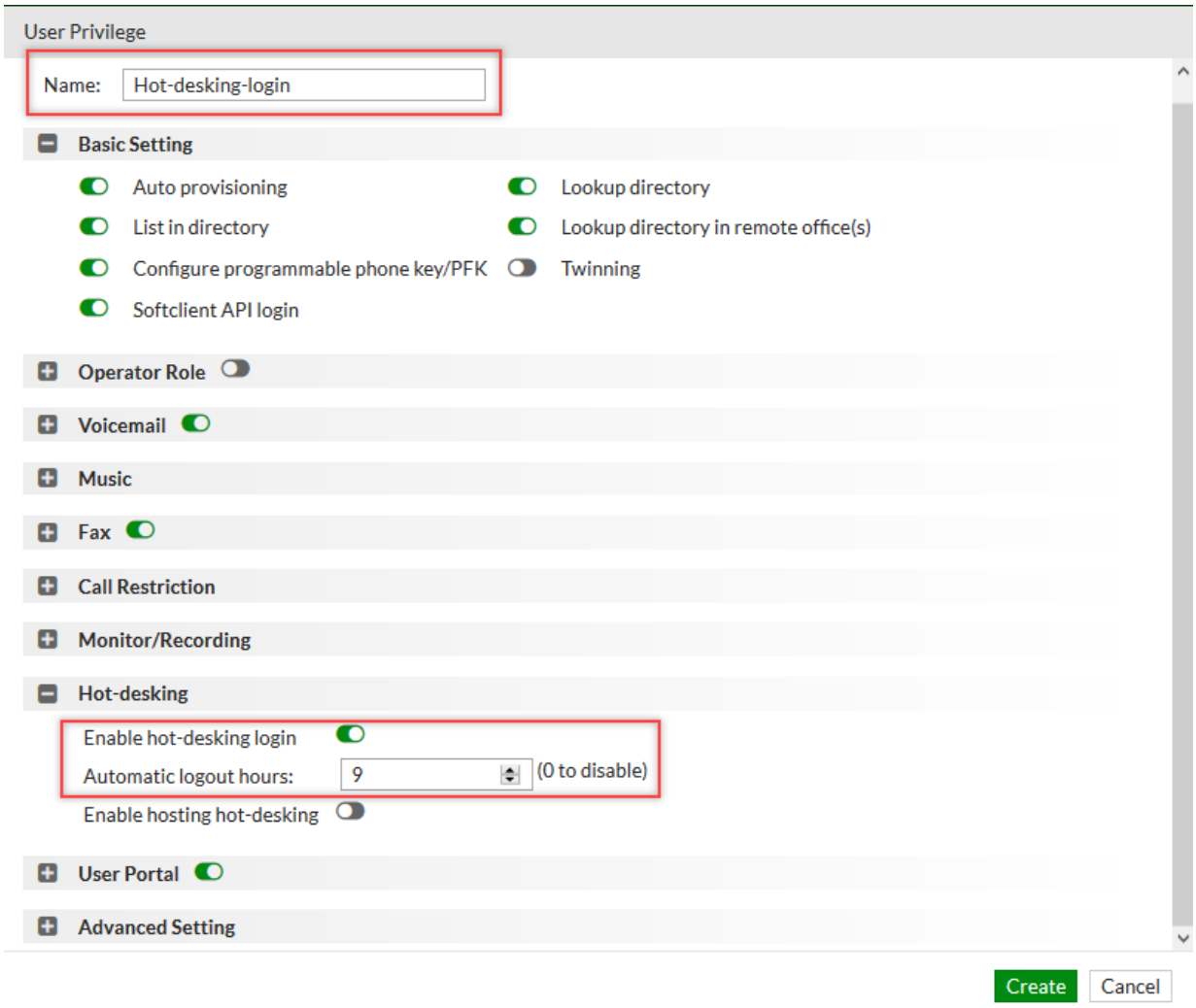
- Registered phone: This phone has an extension and is used to log in to a hot-desking host. This extension requires a user privilege with the hot-desking login enabled.
- Unassigned phone: This phone is the hot-desking host which users log in to. The unassigned phone has no extension and does not require a user privilege.

Configuring hot desking

1. Log in to the FortiVoice web-based manager.
2. Create a user privilege to enable hot-desking login:
   a. Go to **Phone System > Profile > User Privilege**.
   b. Click **New**.

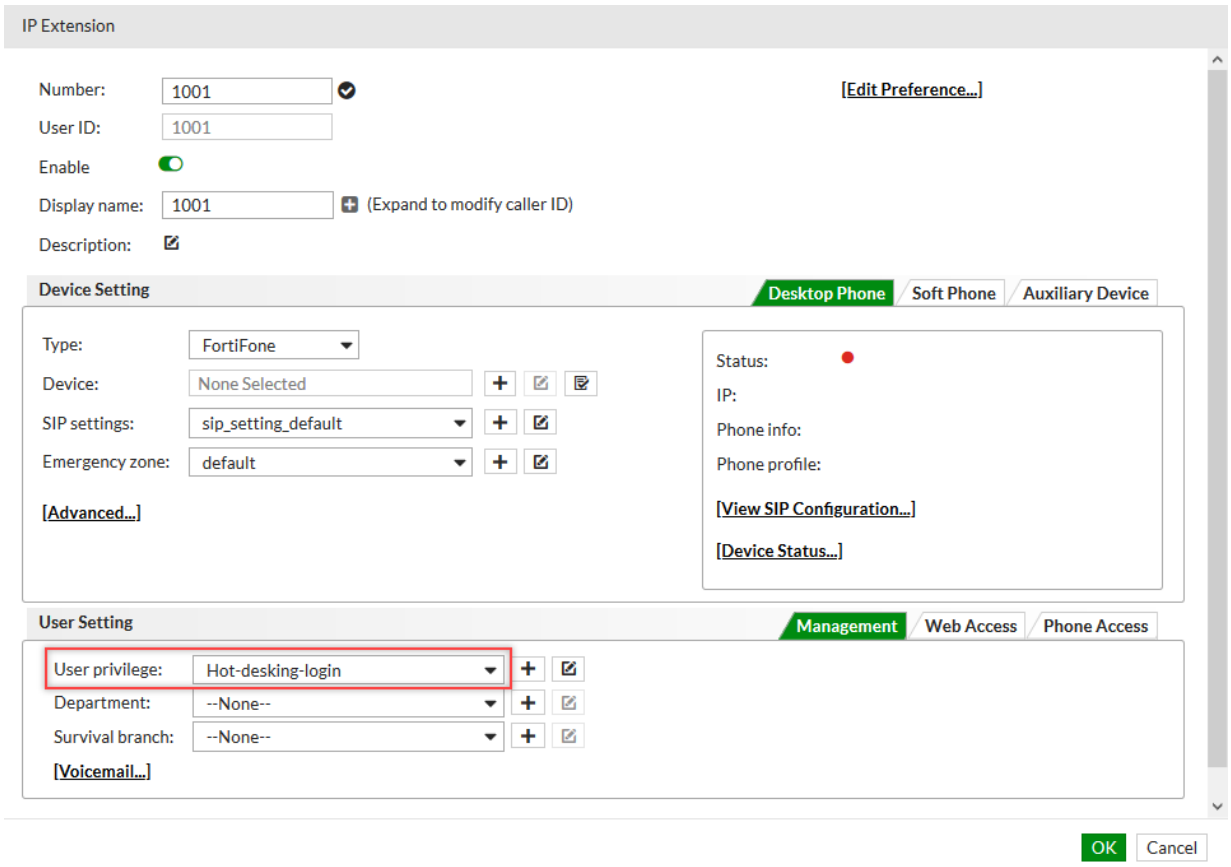
   The **Name** field does not support the following characters:
   - Space
   - Quotation mark
   - Backward slash

   c. In the **Name** field, add a name for this user privilege.
   d. Select **Enable hot-desking login** to allow phones associated with this user privilege to log in to other phones.
   e. In the **Automatic logout hours** field, enter the time in hours after which the phone automatically logs out of hot desking.



f. Click **Create**.

3. Associate the user privilege (example, Hot-desking-login) to the extension used for logging in to another phone:
   a. Go to **Extension > Extension > IP Extension**.
   b. Double-click on the row of the extension number (example, 1001) that wants to log in to other phones.
   c. From the **User privilege** drop-down list, select the user privilege (example, Hot-desking-login) that you created in step 2.



d. Click **OK**.

Using hot desking on FortiFone

1. On the FortiFone unit that you want to log in to, dial *11.
2. Enter your extension number (example, 1001#) and user PIN.
   Depending of the phone model, the FortiFone unit may reboot.
   The new extension and name display on the FortiFone screen.
3. To place a call, dial an extension (example, 3004).
   The screen of the receiving FortiFone unit displays the extension number (example, 1001).
4. To log out of the FortiFone unit, dial *12.
   Depending of the phone model, the FortiFone unit may reboot.

Viewing activity details of hot-desking extensions

1. Go to **Monitor > Extension & Device > Hot Desking**.
   When an extension is used for logging in or logging out of a hot-desking host, FortiVoice populates the table. The table includes one row for each extension, not multiple rows. If the table is empty, then none of the extensions have used hot desking.

2. For the extension that is logged in to a phone or has logged out, you can view the following hot-desking details:
   - **Status**: The status of the hot-desking extension as logged in or logged out.
   - **Number**: The number of the hot-desking extension.
   - **Display Name**: The name displayed on the phone that is hosting hot desking.
   - **Host Device**: The MAC address of the unassigned phone. This is the phone that a hot-desking user logs into. When the status of the hot-desking extension is "Logged out", then the host device is blank.
   - **Last Login**: The last login performed on the hosting phone.
   - **Expiry**: The expiry time (in the yyyy-mm-dd hh:mm:ss format) of the hot-desking login. The value is set in the **Automatic logout hours** field of the user privilege for the hot-desking login. When the status of the hot-desking extension is "Logged out", the expiry time is all zeros.

Local IP extensions

FortiVoice allows you to configure IP phone extensions, edit analog extensions, and determine extension preferences.

This recipe shows how to configure an internal IP extension, a phone connected on the same LAN as the system. An external IP extension is a phone connected outside the LAN.

This section includes the following recipes:

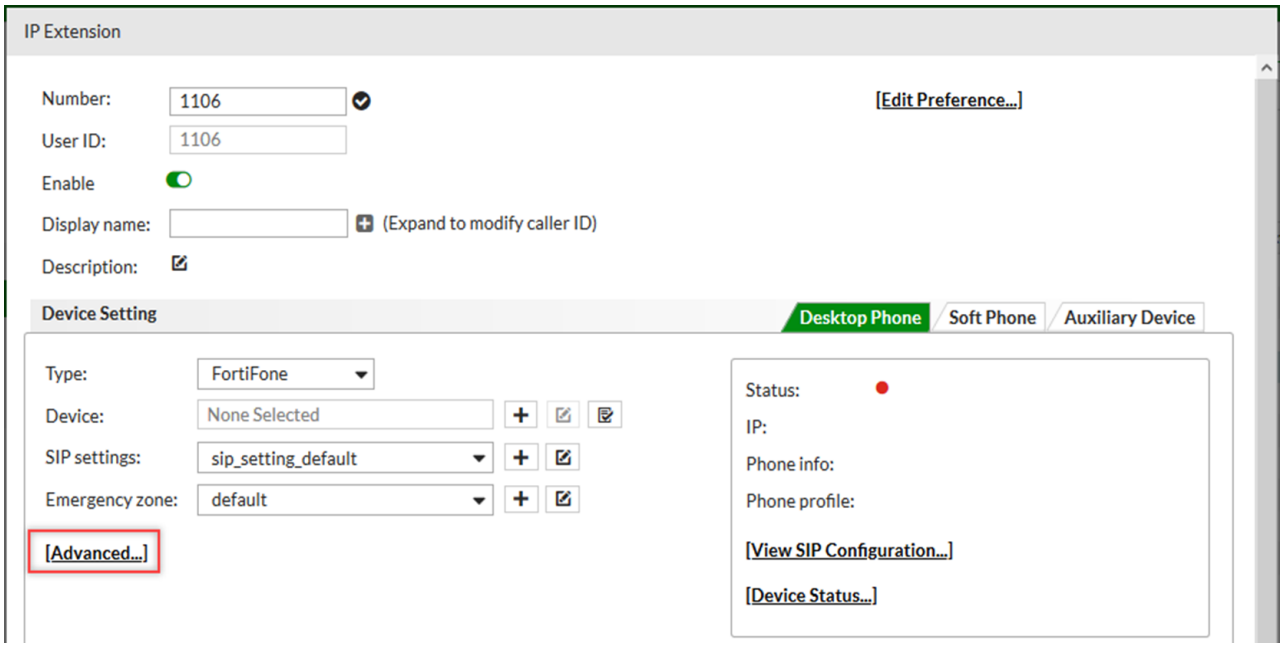
- Configuring extension settings on page 61
- Configuring notification options on page 65

Configuring extension settings

1. Go to **Extension > Extension > IP Extension** and click **New** (or select and **Edit** an existing extension).
2. Enter an extension **Number**. A green check mark will appear to indicate that the number entered is **Available**. FortiVoice auto-populates the **User ID** field.
3. Enter a **Display name** for the user. This is the name that appears on the phone screen when receiving a call from this extension.

Configuring device settings

1. In the **Device Setting** section, you can determine whether the IP extension is assigned as either a **Desktop Phone**, **Soft Phone**, or an **Auxiliary Device**. For this example, stay on the **Desktop Phone** tab, and set the **Type** to **FortiFone** from the drop-down menu.
2. For **Device**, click **New**, where you can enter the extension's device **MAC address**, **Phone model**, and assign a **Phone profile**.
3. Assign an appropriate SIP profile from the **SIP settings** drop-down, and assign an **Emergency zone**.
4. Then click **Advanced** to open the desktop phone advanced settings.



5. Enter or **Generate** a **SIP password**, and set **Location** to **Internal**.
   Note that IP extensions that are designated as **Internal** are those extensions that do not traverse through NAT to connect to the FortiVoice unit. Select **External** if the extension does require NAT.
6. Optionally, enable message waiting indication (**MWI**), **Auto answer**, and **Direct call**. Then click **Create**.

Configuring user settings

1. In the **User Setting** section, under the **Management** tab, assign a **User privilege**, the **Department** the extension belongs to, and a **Survival branch** profile.
   See Configuring voicemail on page 63 for information on configuring the **Voicemail** settings.
2. Under the **Web Access** tab, set **Authentication type** to **Local** and enter or **Generate** a **User password**.
3. A warning may appear indicating that the system password policy is disabled. If this is the case, click **Password policy is disabled** to enable **Password/PIN Policy**, and configure the minimum requirements for passwords as appropriate.
4. Under the **Phone Access** tab, enter or **Generate** a **Voicemail PIN** and **Personal code**. These are used by the extension user to access their voicemail and the FortiVoice user portal, and to make restricted calls, respectively.

Configuring voicemail

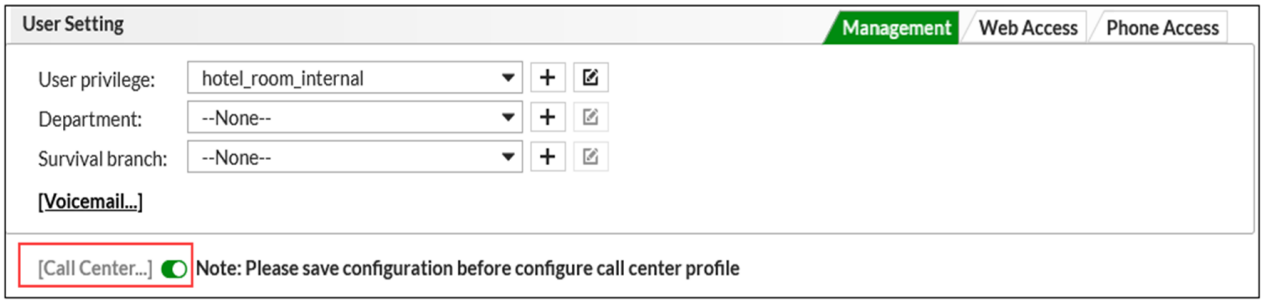
1. In the **User Setting** section, under the **Management** tab, click **Voicemail**.

2. Set **Main Voicemail** to the extension's own voicemail or that of another extension as the voicemail of this extension. Typically, you will use the default voicemail.
3. To allow other users or groups to receive a notification when the extension receives a voicemail, perform the following steps:
   a. For **Users (s)** and/or **Groups(s)**, click **+**.
   b. Select one or more entries.
   c. Click **Close**.
4. Click **OK**.

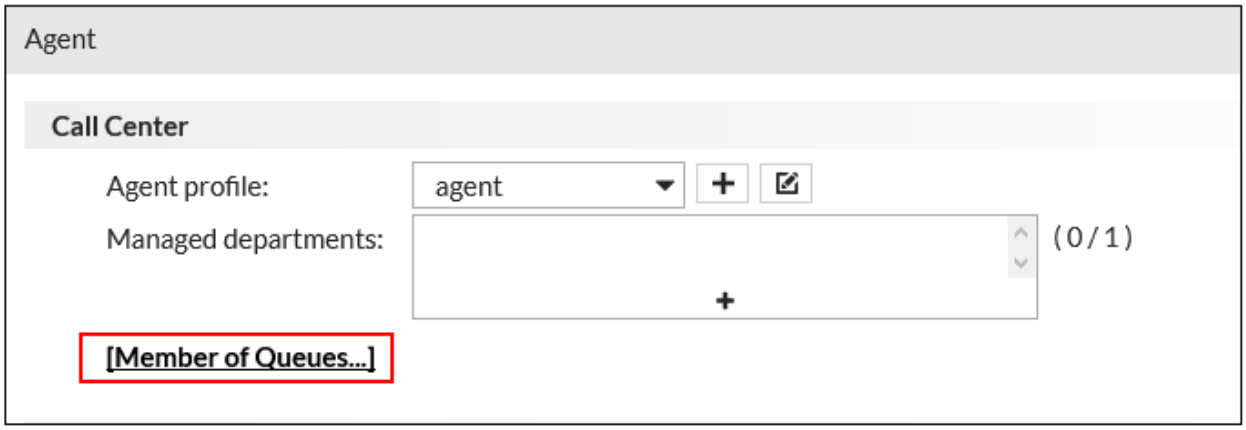
Configuring call center

If you have purchased a call center license and uploaded that license on FortiVoice, then you can enable the call center option.

1. When you have completed the configuration of the various IP extension settings, scroll to the bottom of the IP Extension dialog and enable **Call Center**. Call center profiles can only be configured after the IP extension configuration has been saved.
2. Click **Create**.



3. Select the newly created IP extension from the list and click **Edit**.
4. Scroll to the bottom of the IP Extension dialog and and click **Call Center**.
5. Under **Call Center**, assign an **Agent profile** from the drop-down menu. For example, you can designate the extension as either a call center **agent** or **manager**.
6. An agent, or especially a manager, may need to monitor call queues in certain departments. Click the **Managed departments** table and assign those departments you wish to be monitored.
7. Click **Member of Queues**.



8. Set **Main/Outgoing queue** to the primary queue for collecting the outgoing calls from all queues by this agent.
9. From the **Queues** table, assign the queues you want the extension to be a member of.
10. Click **OK** when finished.
11. Under **Skill Sets**, click **New**.
12. Assign the appropriate skill and skill level for the agent from the drop-down menu. For more information on agent skill and skill-based routing, see Skill-based routing on page 17.

13. Click **Create**, and **OK** to complete configuring the **Call Center**, and **OK** again to complete configuring the **IP Extension**.

Configuring notification options

You can set up the options to receive an email when you receive a voicemail or fax and miss a phone call.

1. Go to **Extension > Extension > IP Extension**.
2. Double-click on an extension.
3. Click **Edit Preference**.
4. In **Notification Options**, update the **Voicemail** and **Fax** settings, as applicable.
5. If you want to be notified when you miss an incoming phone call, enable **Missed call**.
6. Enter the **email address** to send the notification to.
7. Click **OK**.

Remote extension configuration

Callers can connect to remote extensions through auto attendants or through call cascade transfers. A remote extension reaches an external phone by automatically selecting a line from a trunk and dialing the phone number. For example, a remote extension could reach an employee's cell phone or home phone, or a phone at a branch office.

This recipe guides you through the process of configuring a remote extension. It is assumed that an auto attendant is already established.

Remote extensions are designed to operate with most major telephone service providers. Unfortunately, phone numbers and mobile phones roaming internationally may not support remote extensions.

This section includes the following topics:

- Adding a remote extension on page 66
- Testing a remote extension on page 66

Adding a remote extension

1. Go to **Extension > Extension > Remote Extension** and click **New**.
2. Set **Number** to the local extension number from which calls are transferred to a remote extension.
3. Enter the **Remote number**. Calls to the local extension are transferred to this remote number.
4. Click **Enable**.
5. Enter a **Display name**, and expand to modify the caller ID.
6. Under **User Setting**, in the **Management** tab, apply a **User privilege** rule and a **Department**, if required.
7. Click **Voicemail** to assign a voice mailbox, and optionally allow other users and/or groups to access the same voice mailbox. For example, you may want others to access the mailbox when you are away.
8. In the **Web Access** tab, select the appropriate **Authentication type**.
9. Enter the **User password**, for local authentication extensions.
10. In the **Phone Access** tab, set **Voicemail PIN** to the PIN for the user to access voicemail.
11. Click **Create**.

Testing a remote extension

1. Call the auto attendant associated with the FortiVoice unit, which dials the local extension.
2. When the extension's user is not available to answer the call, the call is transferred to the configured remote extension. For example, the user's cell phone number.
3. The user will receive the call through their remote extension.

Managing a large number of extensions

The FortiVoice unit provides many ways to manage a large number of extensions efficiently.

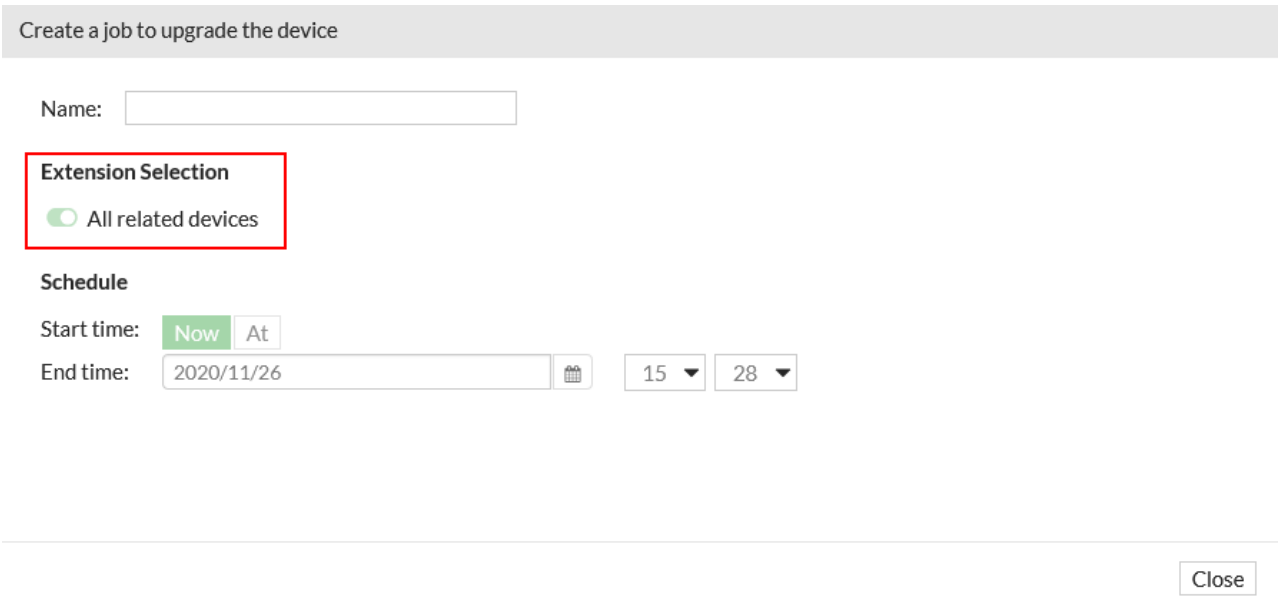
This section groups all of the FortiVoice features that offer global extension management functions, including:

- Maintaining phones on page 66
- Managing extensions on page 67

Maintaining phones

You can update phone configurations and upgrade phone firmwares for all or selected devices.

1. Go to **System > Maintenance > Phone Maintenance Job**.
2. Click **New** and select to do a configuration update or firmware upgrade.
3. Configure the maintenance job.
4. For **Extension Selection**, enable **All related devices** if you want to update the phone configuration or upgrade the phone firmware for all devices.
   If you want to update phone configurations or upgrade phone firmwares for selected devices, then disable **All related devices**.



Managing extensions

You can select to edit a group of extensions at the same time, save a copy of the extension list or download as a sample list, or upload a copy of the extension list saved elsewhere.

This section includes:

- Allocating FortiFone softclient licenses to extensions on page 67
- Editing extension management settings on page 68
- Editing extension caller IDs on page 69
- Editing extension authentication information on page 70
- Editing extension main device settings on page 71
- Editing extension preferences on page 72
- Editing extension notifications on page 73
- Exporting an extension list on page 74
- Importing an extension list on page 74

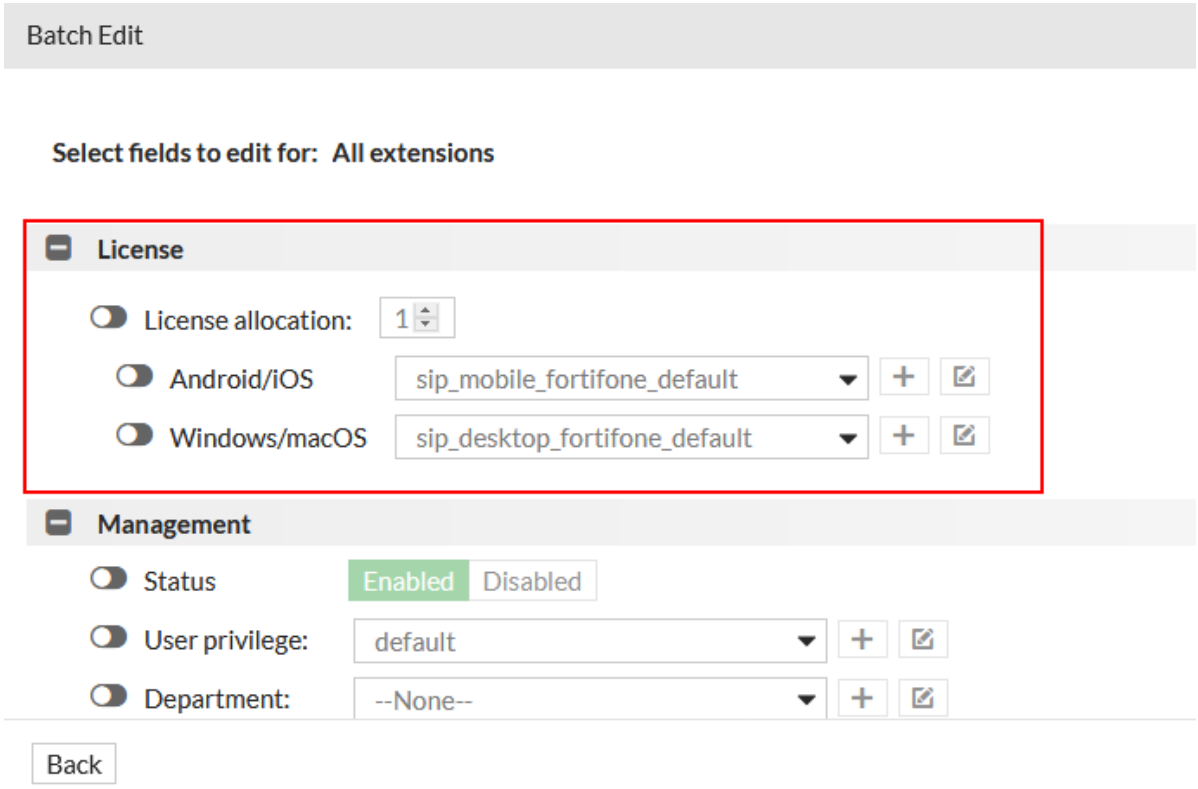
If you only edited some of the extension settings in the list above and want to activate the extensions to put them into service, on the **Batch Edit** page, go to **Management** and select **Status > Enabled**. If you select **Status > Disabled**, all extensions will be deactivated and will not be in service. If you leave **Status** deselected, the extensions' current status will not change.

Allocating FortiFone softclient licenses to extensions

If you want to allocate the same number of FortiFone softclient licenses to all or some of the extensions, do the following:

1. Go to **Extension > Extension > IP Extension**.
2. Under **Actions**, click **Batch Edit**.

3. Search or filter the extensions you want to edit, if required. If nothing is done, all extensions are selected by default.
4. Click **Next**.
5. On the **Batch Edit** page, go to **License** and do the following:
   - **License allocation**: Enable and select up to 5 FortiFone softclient licenses for use on the extensions.
   - **Android/iOS**: Enable if the softclient is on an Android phone or iPhone and select a SIP profile for it.
   - **Windows/macOS**: Enable if the softclient is on a Windows or Mac device and select a SIP profile for it.



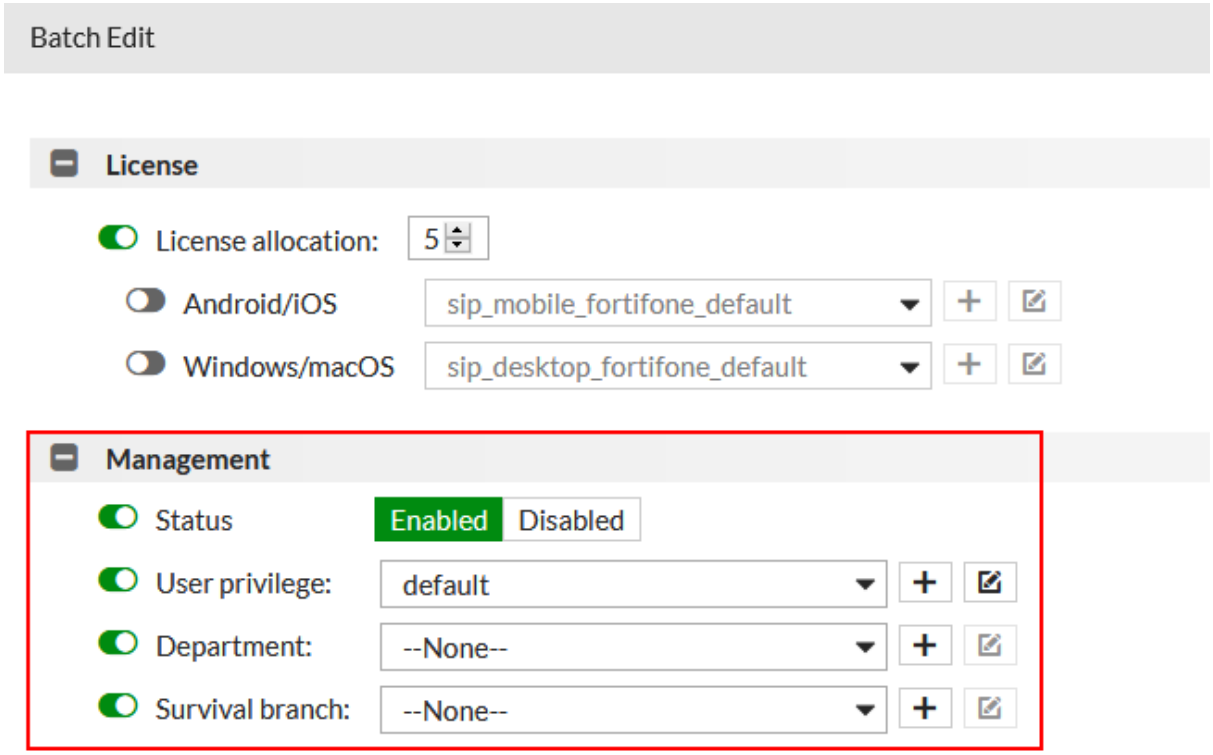
6. Click **Next** to review the edited license allocation values to be applied to the extensions.
7. Click **Apply**.

Editing extension management settings

If you want to edit the extension management settings, do the following:

1. Go to **Extension > Extension > IP Extension**.
2. Under **Actions**, click **Batch Edit**.
3. Search or filter the extensions you want to edit, if required. If nothing is done, all extensions are selected by default.
4. Click **Next**.
5. On the **Batch Edit** page, go to **Management** and do the following:
   - **Status**: If you want to activate the extensions to put them into service, select **Status > Enabled**. If you select **Status > Disabled**, all extensions will be deactivated and will not be in service. If you leave **Status** deselected, the extensions' current status will not change.
   - **User privilege**: Enable and select the services for the extensions.
   - **Department**: Enable and select the department that the extensions belong to.

- **Survival branch**: Select the local survival branch FortiVoice unit for the extensions if the extensions are in a local survivability network.



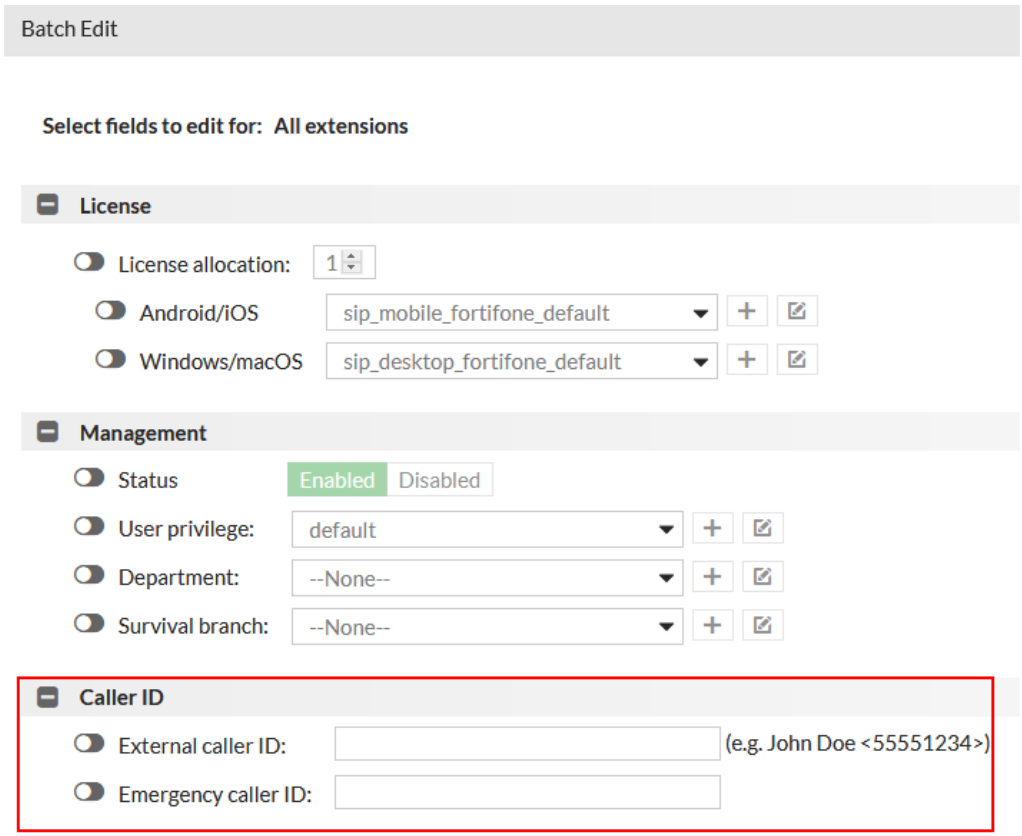
6. Click **Next** to review the edited values to be applied to the extensions.
7. Click **Apply**.

Editing extension caller IDs

If you do not enter the caller IDs, your organization's main number will be used. If you add both IDs, the emergency ID will only be used when making emergency calls. All other calls will use the external caller ID.

If you want to edit extension caller IDs, do the following:

1. Go to **Extension > Extension > IP Extension**.
2. Under **Actions**, click **Batch Edit**.
3. Search or filter the extensions you want to edit, if required. If nothing is done, all extensions are selected by default.
4. Click **Next**.
5. On the **Batch Edit** page, go to **Caller ID** and do the following:
   - **External caller ID**: Enter the ID that displays on a called phone when you make a call. Use the name<phone_number> format, such as HR<222134>.
   - **Emergency caller ID**: Enter the emergency caller ID. Use the name <phone_number> format, such as HR<222134>.



6. Click **Next** to review the edited caller ID values to be applied to the extensions.
7. Click **Apply**.

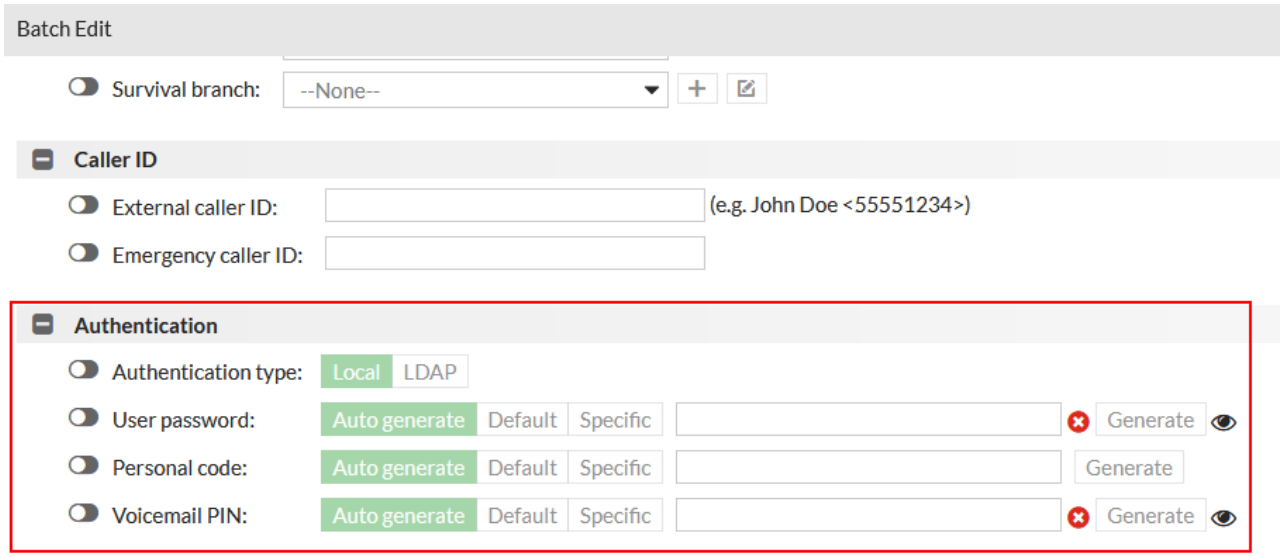
Editing extension authentication information

If you want to edit the extension authentication information, do the following:

1. Go to **Extension > Extension > IP Extension**.
2. Under **Actions**, click **Batch Edit**.
3. Search or filter the extensions you want to edit, if required. If nothing is done, all extensions are selected by default.
4. Click **Next**.
5. On the **Batch Edit** page, go to **Authentication** and do the following:
   - **Authentication type**: Select the extensions' authentication type: **Local** or **LDAP**.
   - **LDAP profile**: If you select **LDAP** for **Authentication type**, select an LDAP profile to apply to the extensions.
   - **User password**: Enter the password for user portal access. You can let the system generate a password, use the system default password (Extension#321), or select **Specific** to manually enter a password.
   - **Personal code**: Enter the extension account code that can be used to restrict calls. This code is needed to make some restricted calls. You can let the system generate a code, use the system default code (voice#321), or select **Specific** to manually enter a code.
   - **Voicemail PIN**: Enter the password for the extension user to access voicemail. You can let the system generate a PIN, use the system default PIN (123123), or select **Specific** to manually enter a PIN. Selection of using personal password or voicemail PIN to access user portal is set when configuring phone system capacity.

If you selected **Auto generate** for **User password**, **Personal code**, and **Voicemail PIN** and want to view them, after applying the edited settings, go to **Extension > Extension > IP Extension** and double-click an extension number that is included in the batch-editing to open the **IP Extension** page:

- To view the **User password**, go to **User Setting > Web Access** and click the eye icon after **User password**. You may click **Generate** to get a new password or enter one manually if required.
- To view the **Personal code**, go to **Device Setting > Phone > Advanced** and click the eye icon after **SIP password**. You may click **Generate** to get a new code or enter one manually if required.
- To view the **Voicemail PIN**, go to **User Setting > Phone Access** and click the eye icon after **Voicemail PIN**. You may click **Generate** to get a new PIN or enter one manually if required.



6. Click **Next** to review the edited authentication values to be applied to the extensions.
7. Click **Apply**.

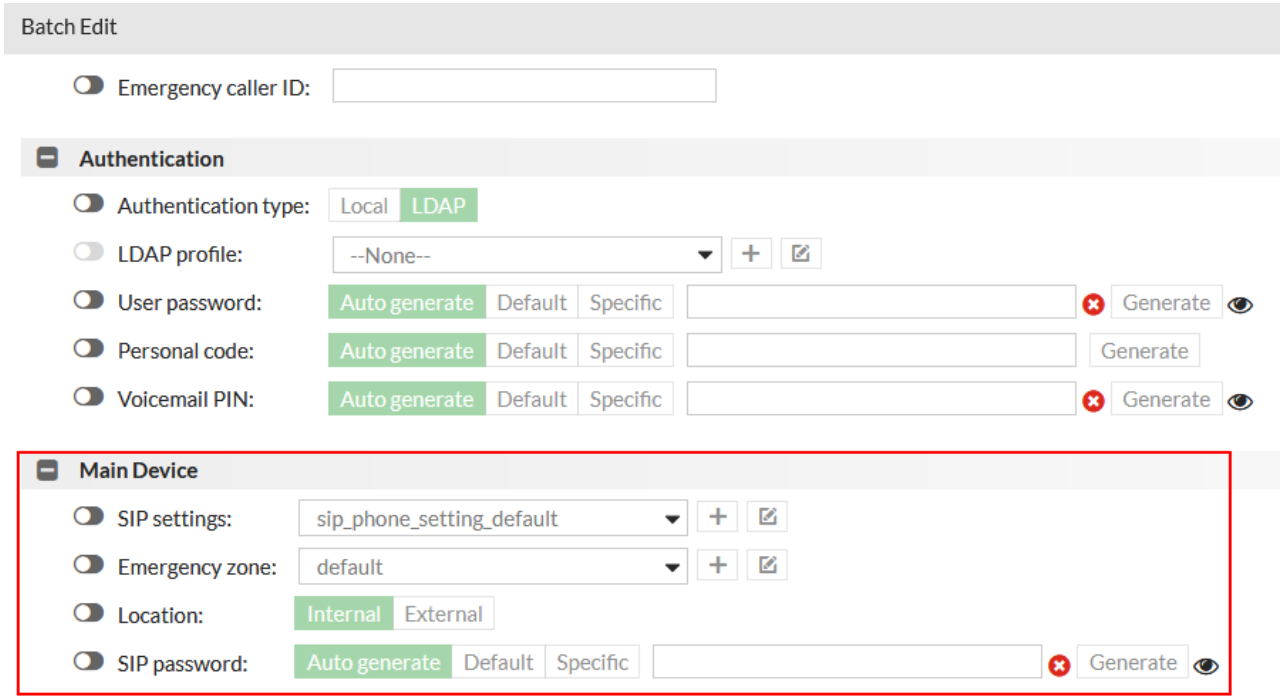
Editing extension main device settings

Main extension SIP devices include desktop phones and soft phones.

If you want to edit the extension main device settings, do the following:

1. Go to **Extension > Extension > IP Extension**.
2. Under **Actions**, click **Batch Edit**.
3. Search or filter the extensions you want to edit, if required. If nothing is done, all extensions are selected by default.
4. Click **Next**.
5. On the **Batch Edit** page, go to **Main Device** and do the following:
   - **SIP settings**: Select the SIP profile for the extensions.
   - **Emergency zone**: Select the emergency zone profile for the extensions.
   - **Location**: Select **Internal** if the extension devices do not traverse through Network Address Translation (NAT) to connect to the FortiVoice unit, and **External** if the devices do. These are system defined locations.

- **SIP password**: Enter the password used for configuring your SIP phones from the phones or the Web. You can let the system generate a password, use the system default password (voice#321), or select **Specific** to manually enter a password.

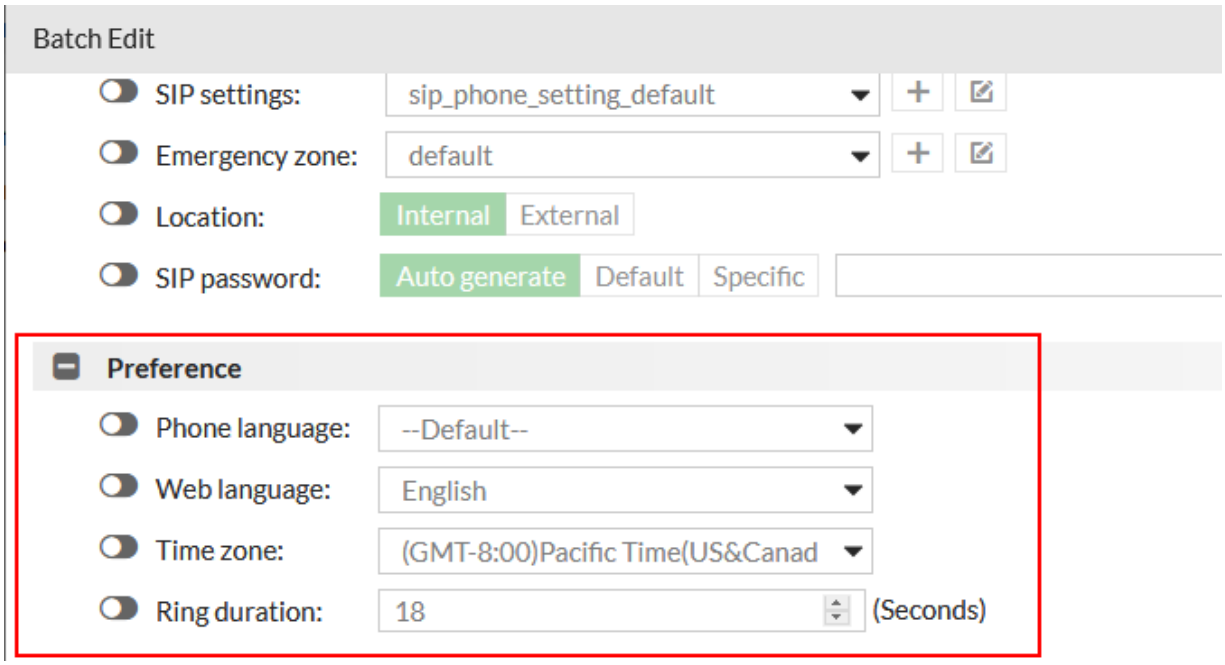


6. Click **Next** to review the edited device values to be applied to the extensions.
7. Click **Apply**.

Editing extension preferences

If you want to edit the extension preferences, do the following:

1. Go to **Extension > Extension > IP Extension**.
2. Under **Actions**, click **Batch Edit**.
3. Search or filter the extensions you want to edit, if required. If nothing is done, all extensions are selected by default.
4. Click **Next**.
5. On the **Batch Edit** page, go to **Preference** and do the following:
   - **Phone language**: Select the prompt language for the extensions. The default is English.
   - **Web language**: Select the language for the FortiVoice user portal.
   - **Time zone**: Select the time zone for the FortiVoice user portal.
   - **Ring duration**: Enter the phone ringing duration in seconds before an incoming call goes to voicemail.



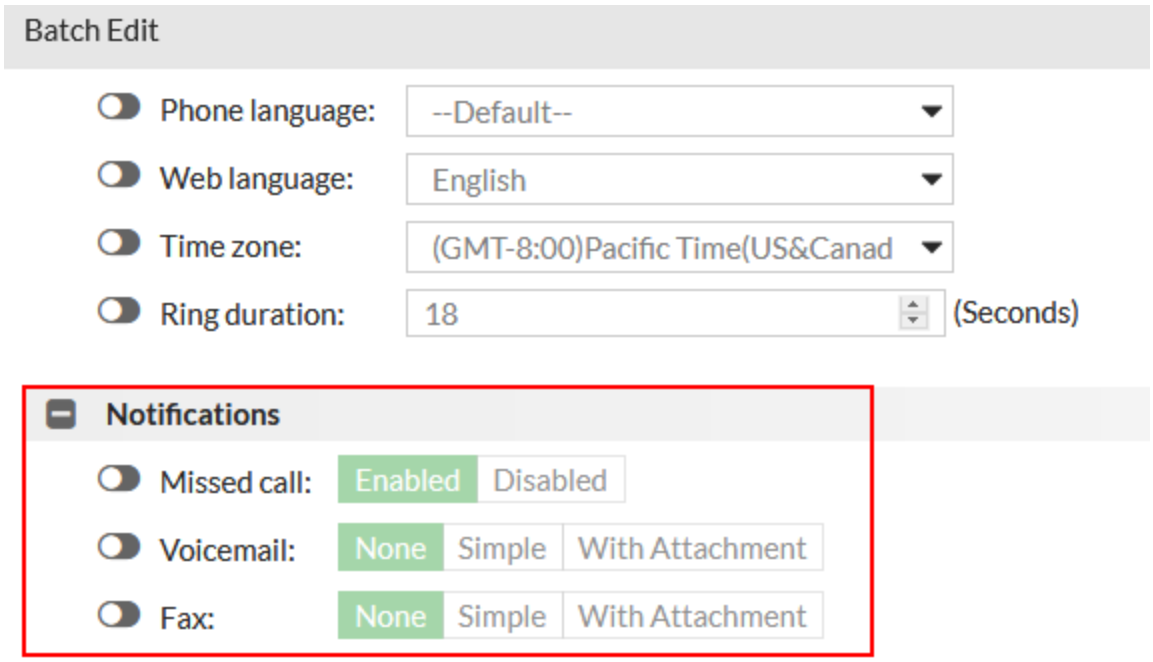
6. Click **Next** to review the edited preference values to be applied to the extensions.
7. Click **Apply**.

Editing extension notifications

If you want to edit the extension notifications, do the following:

1. Go to **Extension > Extension > IP Extension**.
2. Under **Actions**, click **Batch Edit**.
3. Search or filter the extensions you want to edit, if required. If nothing is done, all extensions are selected by default.
4. Click **Next**.
5. On the **Batch Edit** page, go to **Notifications** and do the following:
   - **Missed call**: Select **Enabled** if you want to receive an email notification when an incoming call is missed.
   - **Voicemail**: Select the type of email notification when a voicemail is left on the extensions:
     - **None**: Do not send any notification.
     - **Simple**: Send an email notification.
     - **With attachment**: Send an email notification with the voicemail attached.
   - **Fax**: Select the type of email notification when a fax is sent to the extensions:
     - **None**: Do not send any notification.
     - **Simple**: Send an email notification.
     - **With attachment**: Send an email notification with the fax attached.

Each extension notification email address is set when configuring extension preferences. This email address cannot be edited globally.

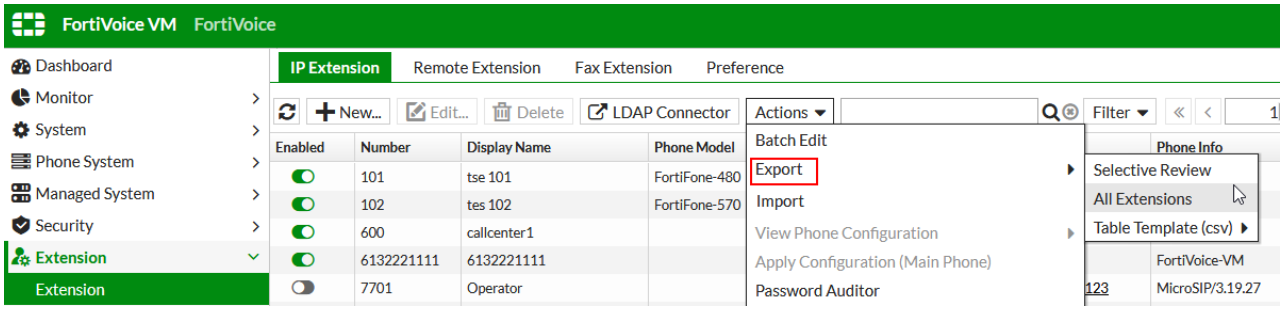


6. Click **Next** to review the edited notification values to be applied to the extensions.
7. Click **Apply**.

Exporting an extension list

If you want to back up an extension list, do the following:

1. Go to **Extension > Extension > IP Extension**.
2. Under **Actions**, click **Export**.

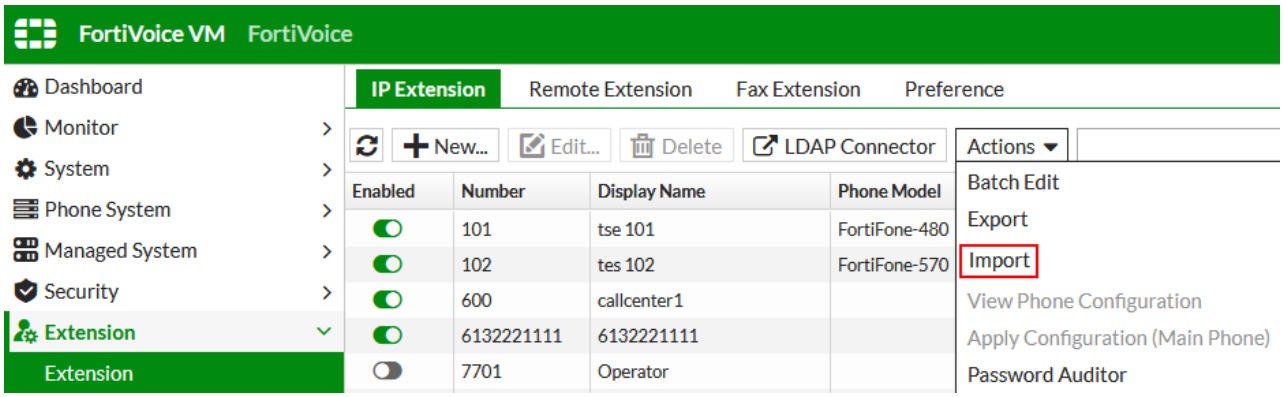


3. Select an option:
   - Search or filter the extensions you want to export.
   - Export all extensions in CSV format.
   - Download all extensions as a sample list with or without user ID in CSV format.

Importing an extension list

If you want to upload an extension list, do the following:

1. Go to **Extension > Extension > IP Extension**.
2. Under **Actions**, click **Import**.



3. Browse for the extension list file.

High availability

With FortiVoice high availability (HA), you set up redundancy between two FortiVoice units in case of a system failure. FortiVoice HA uses an active-passive mode which means that you have a primary (active) unit and a secondary (passive) unit. These two units make up an HA group. The secondary unit is not used until a failure occurs on the primary unit and triggers the secondary unit to assume the responsibilities of the primary unit.

FortiVoice HA units use a heartbeat link to communicate. This heartbeat link lets the secondary unit know that the primary unit is up and running, and allows the primary unit to copy configuration and data information to the secondary unit whenever the primary configuration changes. If a failure occurs on the primary unit, the loss of the heartbeat triggers the secondary unit to take over as the primary and be a copy of that primary unit.

This section includes the following recipes:

- Planning high availability on page 76
- Configuring high availability on FortiVoice units on page 77
- Configuring service-based failover on page 79
- Synchronizing configuration and data in a FortiVoice HA group on page 80
- Installing licenses on a FortiVoice HA group on page 80
- Enabling high availability activity logging on page 81
- Displaying the high availability status on page 81
- Upgrading the firmware in an HA group on page 82

Planning high availability

For FortiVoice HA, apply the following planning guidelines:

- Make sure that both FortiVoice units in the HA group are the same model and have the same firmware version. If you are using VM instances, you require two VM licenses.
- For *both* primary and secondary FortiVoice units:
  - Connect port 1 to the network switch.
  - Connect port 2 or a secondary port (3, 4, or 5, depending on the model) to the network switch. This port takes on the role of the primary heartbeat interface.
- Plan which interface ports to use for your voice traffic and heartbeat links:
  - Decide which port you want to use for your voice traffic, for example port 1.
  - Make sure to assign the secondary heartbeat status to port 1.
  - Make sure to assign the primary heartbeat status to port 2 (3, 4, or 5, depending on the model).
- FortiVoice HA uses a secondary IP address on the interface ports. This secondary IP address is called a virtual IP address. You configure the primary and secondary units to use this virtual IP address but only the acting primary unit will use it to communicate. Any network traffic that is to be forwarded to the FortiVoice unit can be forwarded to this virtual IP address. If a failover occurs, the secondary unit assumes the role of primary and starts to use the virtual IP address. Your system is then able to continue operating as normal without having to change your port forwarding. For example, the primary unit has an IP address of 192.168.1.200 and the secondary unit has an IP address of 192.168.1.202. The virtual IP address is 192.168.1.210. Both primary and secondary units share this virtual IP address which is also used to receive all port forwarding to the FortiVoice unit.

- Take note of the IP address of each interface port on both FortiVoice units. You will need this information to set up the heartbeat link.

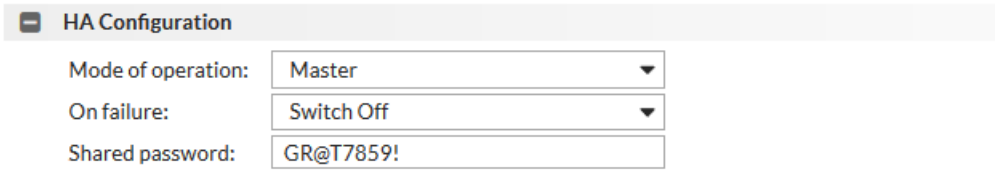
When you are ready to configure HA, go to Configuring high availability on FortiVoice units on page 77.

If a failover occurs and you are using FortiVoice 200F8 or FortiVoice 300E-T, remember to swap the physical FXO and PRI connections to the secondary unit.

Configuring high availability on FortiVoice units

Perform this procedure on both primary and secondary FortiVoice units.

1. Go to **System > High Availability > Configuration**.
2. In **HA configuration**, configure the following settings:
   a. Set **Mode of operation**.
   If the FortiVoice unit is the primary unit, set the **Mode of operation** to **Master**.
   If the FortiVoice unit is the secondary unit, set the **Mode of operation** to **Slave**.
   b. Set the **On failure** behavior to one of the following choices:
      i. **Switch Off**: As part of the HA group, the failed unit will not become a primary unit again until you manually restore the configured operating mode on the **Status** tab.
      ii. **Wait for Recovery then Restore Original Role**: After the unit recovers from failure, it will go back to its programmed **Mode of operation**. For example, if unit 1 (primary) encounters a failure and unit 2 (secondary) effectively becomes the primary, then when unit 1 recovers from failure, unit 1 will be restored as the primary and unit 2 will return to operating as the secondary unit.
      iii. **Wait for Recovery then Restore Slave Role**: After the unit recovers from failure, this unit will operate in secondary mode. For example, if unit 1 (primary) encounters a failure and unit 2 (secondary) effectively becomes the primary, then when unit 1 recovers from failure, it will then assume the secondary mode and unit 2 will continue to operate in primary mode.
   c. Set **Shared password**. Make sure to use the same password for both primary and secondary units.
   Example of HA Configuration settings for primary unit



3. In **Advanced Options**, configure the following port and heartbeat settings:
   a. The **HA base port** is used for the heartbeat signal as well as data and configuration synchronization. The default and recommended port is 20000.
   b. The **Heartbeat lost threshold** setting is the amount of time that must pass with no heartbeat link between the primary and secondary units before the system triggers a failover. The heartbeat signal is sent once per second to ensure that the unit is responding. To prevent a premature failover due to the system being under a heavy load, it is recommended to set this setting at 3 seconds or higher.
   c. As an added fail-safe, you can enable **Remote services as heartbeat**. After you enable this setting, you can configure the HTTP and SIP UDP settings in the **Service Monitor** section to act as an additional HA heartbeat

(details are included in Configuring service-based failover on page 79). If both primary and secondary heartbeat links fail but the remote service detects that the primary unit is still available, no failover will occur. Note that this feature is only an additional heartbeat and does not provide any synchronization of files from primary to secondary units. Therefore, Fortinet does not recommend relying on remote services alone. Configure at least one HA heartbeat on an interface port.

d. With **Call recording sync**, you enable or disable the synchronization of recorded calls from the primary to the secondary units. This setting is optional because there can be many recorded calls on the system that can take up quite a bit of memory. Copying these files during synchronization can take a long time and use up network bandwidth.

e. Click **Apply**.

4. In **Interface**, you configure the port behavior. When setting up the ports, make sure that you mirror the primary unit settings on the secondary unit, except for the **Peer IP address** and **Peer IPv6 address** settings.

Make sure to apply the following settings:

- Set port 1 with the secondary heartbeat status.
- Set port 2 (or 3 or 4) with the primary heartbeat status.

Select a port and click **Edit**.

a. **Port monitor enabled**: When you enable this setting, the unit performs an internal port check to make sure that this port is responsive. If the port becomes unresponsive, the system triggers a failover. This setting has its timing intervals configured by using the **Service monitor, Interface monitor** section which you can set later in Configuring service-based failover on page 79.

b. **Heartbeat status**: Configure the heartbeat link and system synchronization. The following three choices are available:

   i. **Disable**: There is no heartbeat link or synchronization on this port.

   ii. **Primary**: Make sure to set port 2 (or 3 or 4) as primary. This port provides a heartbeat link and system synchronization from the primary to the secondary.

   iii. **Secondary**: Make sure to set port 1 as secondary. A secondary heartbeat link is used as a backup in case the primary one fails. A failover does not occur unless both primary and secondary heartbeat links are down.

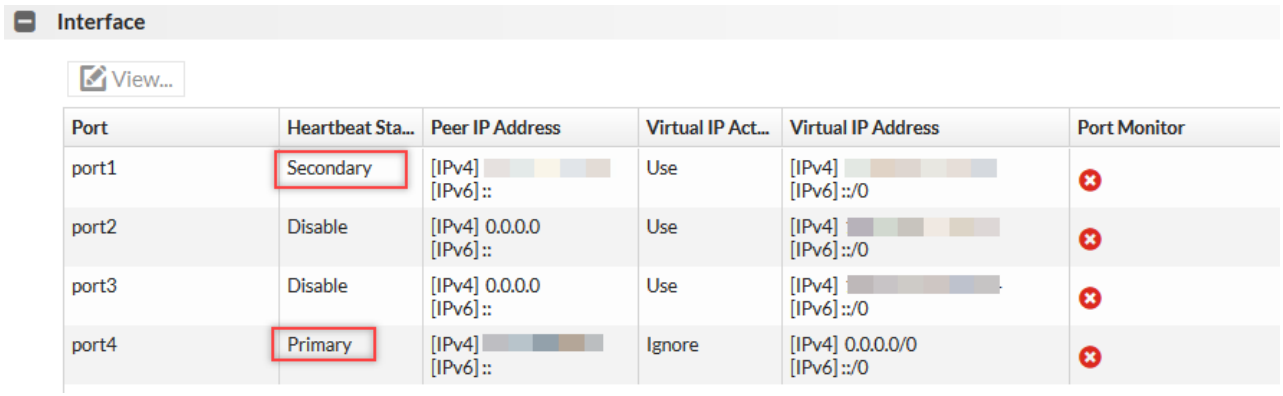
c. **Peer IP address** and **Peer IPv6 address**: Specify the IP address of the port at the opposite side for the heartbeat link to communicate on. For example, if you are configuring the primary unit, then enter the IP address for port 2 of the secondary unit here. If you are configuring the secondary unit, then enter the IP address of port 2 of the primary unit here.

d. **Virtual IP action**: When configuring the virtual IP address, set the **Virtual IP action** to **Use**.

e. **Virtual IP address** and **IPv6 address**: Make sure that the primary and secondary units share the same virtual IP address on each port. Also, make sure that all port forwarding for voice traffic on your router is forwarded to the virtual IP address.

f. Click **OK**.

Example of Interface settings



5. **Service Monitor** offers another way of detecting whether or not there is a system failure. For configuration details, see Configuring service-based failover on page 79.
6. When you have completed the configuration on both FortiVoice units in the HA group, go to Synchronizing configuration and data in a FortiVoice HA group on page 80.

Configuring service-based failover

The **Service Monitor** section offers another way of detecting whether or not there is a system failure.

The system uses **Remote HTTP** and **SIP UDP** settings as a heartbeat link to confirm that the secondary unit can connect to the primary unit using HTTP or SIP. If the secondary unit cannot connect to the primary unit, then the system triggers a failover and the secondary unit becomes the primary. In addition to enabling the **Remote HTTP** and **SIP UDP** settings here, make sure that you have enabled **Remote services as heartbeat** in the **Advanced Options** section of Configuring high availability on FortiVoice units on page 77.

The **Interface monitor** and **Local hard drives** settings are locally monitored. If the system detects a failure on one of its interface ports or hard drives, then the system triggers a failover. To enable which ports the unit will monitor for failure, select **Port monitor enabled** in the **Interface** section of Configuring high availability on FortiVoice units on page 77.

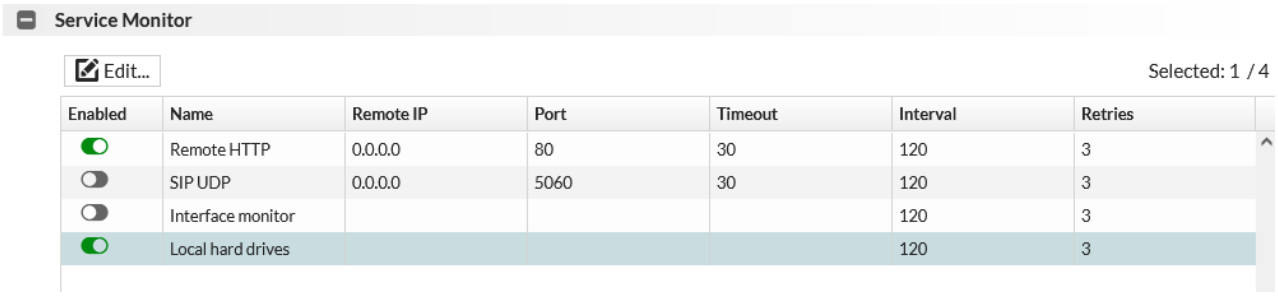
Perform the following steps on both the primary FortiVoice unit and secondary FortiVoice unit.

1. Go to **System > High Availability > Configuration**.
2. In **Service Monitor**, click one of the following services:
   - **Remote HTTP**
   - **SIP UDP**
   - **Interface monitor**
   - **Local hard drives**
3. Click **Edit**.
4. For **Remote HTTP** and **SIP UDP**, click **Enable**, and configure the following settings:
   - **Remote IP**: Enter the peer IP address.
   - **Port**: Enter the port number of the peer service.
   - **Timeout**: Enter the timeout period (in seconds) for one connection test.
   - **Interval**: Enter the frequency (in seconds) of the tests.
   - **Retries**: Enter the number of consecutive tests that are allowed before the primary unit is deemed unresponsive and a failover occurs.

   For **Interface monitor** and **Local hard drives**, configure the following settings:

- **Enabled**: Select to enable local hard drive monitoring.
  For interface monitoring, select **Port monitor enabled** in the **Interface** section of Configuring high availability on FortiVoice units on page 77.
- **Interval**: Enter the frequency (in seconds) of the test.
- **Retries**: Enter the number of consecutive tests that are allowed before the local interface or local hard drive is deemed unresponsive and a failover occurs.

5. Click **OK**.
   Example of Service Monitor settings



6. Go to Synchronizing configuration and data in a FortiVoice HA group on page 80.

Synchronizing configuration and data in a FortiVoice HA group

Use this procedure to synchronize configuration and data from the primary FortiVoice unit to the secondary FortiVoice unit.

The synchronization does not copy the following data:

- Host name
- Static routes
- Interface configuration
- Main HA configuration
- HA service monitoring settings
- System appearance

Procedure steps

1. Go to **System > High Availability > Status**.
2. Click the link **Click HERE to Start a Configuration/Data Sync**.
3. To confirm, click **OK**.

Installing licenses on a FortiVoice HA group

For the Call Center, Hotel Management, FortiFone softclient, and third-party phone features, the primary and secondary FortiVoice units share the license file that includes the serial number of both units. However, you must install the license file separately on both primary and secondary FortiVoice units.

Prerequisite

Download the license (.lic) file from your Fortinet Support account and know where you save the file on your computer. For more details, see Licensing on page 93.

Install the license on the primary FortiVoice unit

1. Log in to the primary FortiVoice unit.
2. Go to **Dashboard > Status**.
3. In the **License Information** widget, click **Update License**.
4. Locate the license file that you previously downloaded to your computer and click **Open**.
5. To confirm the upload, click **Yes**.

Install the license on the secondary FortiVoice unit

1. Log in to the secondary FortiVoice unit.
2. Go to **System > High Availability > Status**.
3. Check the **Effective Operation Mode** and wait until it displays **out of sync**.
   You can install the license file on the secondary unit only when the file is out of synchronization with the license file on the primary unit.
4. When the **Effective Operation Mode** on the secondary unit displays **out of sync**, then go to **Dashboard > Status**.
5. In the **License Information** widget, click **Update License**.
6. Locate the license file that you previously downloaded to your computer and click **Open**.
7. To confirm the upload, click **Yes**.
8. After successfully uploading the license file, go to **System > High Availability > Status**.
9. Click the link **Click HERE to restart the HA system**.

Enabling high availability activity logging

Use this procedure to enable the high availability (HA) activity logging. This logging is disabled by default.

1. Go to **Log & Report > Log Setting > Local**.
2. Under **Logging Policy Configuration**, expand **System** and enable **HA**.
3. Click **Apply**.

Displaying the high availability status

Use this procedure to display the high availability (HA) status of a FortiVoice unit.

1. Go to **System > High Availability > Status**.
2. You can review the following settings:
   - **Refresh** section lets you set a timer for how often you want this page to check for a status update automatically. To manually refresh this page, click **Refresh**.
   - **Mode Status** lets you know what the configured mode is and the mode that it is currently using.
     - **Configured Operating Mode** is the mode that you have programmed the unit to act as with the **Configuration** tab (either as primary or secondary).

- **Effective Operating Mode** can display one of the following modes:
  - **Master** shows that the unit is acting as the primary.
  - **Slave** shows that the unit is acting as the secondary.
  - **Failed** shows that the service or network interface monitoring has detected a failure and the diagnostic connection is currently determining whether the problem has been corrected or a failover is required.
  - **Off** is a mode used by both units. For a primary unit, this mode indicates that the service or interface monitoring has detected a failure, taken the primary unit offline, and triggered a failover. For a secondary unit, this mode indicates that the synchronization has failed once; a subsequent failure will trigger a failover.
- **Daemon status** is only available on the secondary unit. The following updates are available:
  - **Monitor** shows when the secondary unit will check the primary unit to make sure that it is still active. If the system detects any errors, this section will show how many errors were detected.
  - **Configuration** shows the last time the configuration was updated from the primary unit to the secondary unit.
  - **Data** shows the last time the data was synchronized between the primary and secondary units. The **Configuration** and **Data** section may display different times. This is normal. Synchronizing data can take longer to complete.
  - **Database** shows the database status such as Checking Status, Stopped, Running (in sync), and Syncing Data.
- **Actions**
  - **Click HERE to Start a Configuration/Data Sync**: For details about this action, see Synchronizing configuration and data in a FortiVoice HA group on page 80.
  - **Click HERE to Restore Configured Operating Mode**: If a failover is triggered and the issue has been resolved, you can click this link to tell the unit that it can resume the mode it was originally configured to be.
  - **Click HERE to Switch to SLAVE Mode**: This action is available on the primary unit only. If you want to change the mode of operation of the primary unit to secondary, click the link.
  - **Click HERE to Switch to MASTER Mode**: This action is available on the secondary unit only. If you want to change the mode of operation of the secondary unit to primary, click the link.

Upgrading the firmware in an HA group

This recipe describes the required tasks to perform a firmware upgrade of the FortiVoice solution that includes FortiVoice units in an active-passive HA group and the following products, as applicable:

- FortiVoice local survivable gateway (LSG)
- FortiVoice foreign exchange subscriber (FXS) gateway - FortiVoice Gateway GS16

In a firmware upgrade of an active-passive HA group, the following behaviors apply:

- When you perform a firmware upgrade on the secondary FortiVoice unit, the normal call processing is uninterrupted.
- When you perform a firmware upgrade on the primary FortiVoice unit, the normal call processing is temporarily interrupted.
- Before starting the firmware installation, the primary unit signals the secondary unit that a firmware upgrade is taking place. This signaling causes the HA daemon of the secondary unit to pause its monitoring of the primary unit for a short period. When the firmware installation is complete, the primary unit signals the secondary unit to resume

its HA heartbeat monitoring. If the secondary unit does not receive this signal after a few minutes, then the secondary unit resumes its HA heartbeat monitoring anyway. If the primary unit fails during the firmware installation, the HA group fails over to the secondary unit which then becomes the new primary unit.

Workflow

To upgrade the firmware in an HA group, perform the tasks described in the following workflow:

Upgrade task sequence	Description	Procedure
Task 1	Make sure to use a supported upgrade path specified in the FortiVoice Phone System Release Notes.	
Task 2	Download firmware image files from the Fortinet Support website.	Downloading firmware image files on page 83
Task 3	Back up the configuration of the primary and secondary FortiVoice units.	Backing up the configuration on page 84
Task 4	Upload firmware image files to the FortiVoice primary unit.	Uploading firmware image files on page 84
Task 5	Upgrade the FortiVoice FXS gateway located at the branch office.	Upgrading the FortiVoice FXS gateway on page 85
Task 6	Upgrade the FortiVoice LSG firmware located at the branch office.	Upgrading the FortiVoice LSG firmware on page 86
Task 7	Upgrade the firmware on the secondary and primary FortiVoice units located at the main office.	Upgrading the FortiVoice firmware in an HA group on page 86

Downloading firmware image files

Use this procedure to access the Fortinet Support website and download the firmware image files for the products that you want to upgrade in your FortiVoice solution.

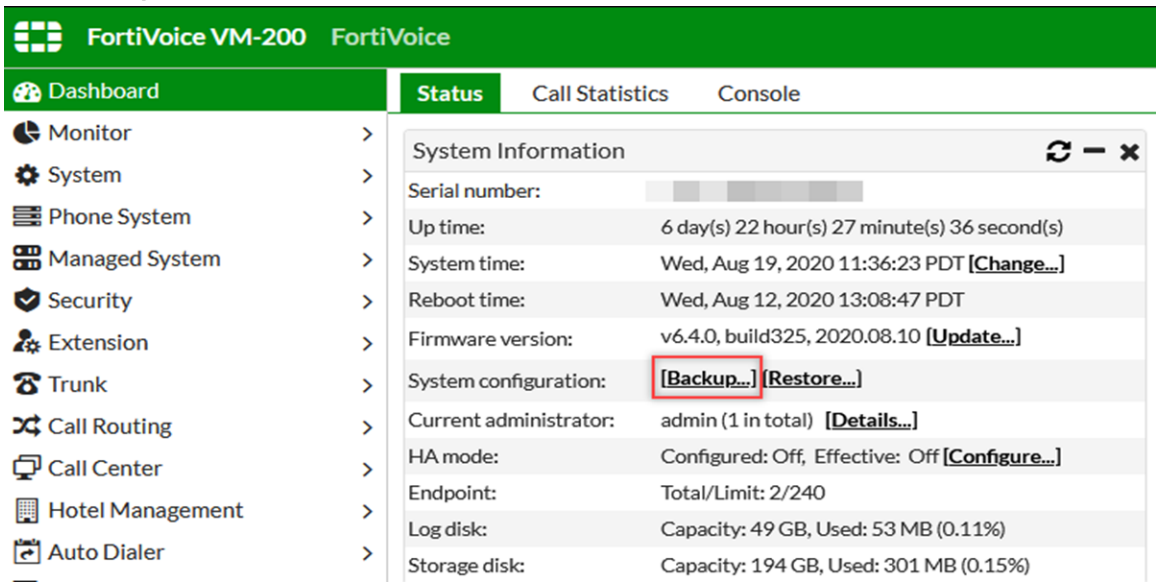
1. Go to Fortinet Support website.
2. Log in to your existing account or register for an account.
3. Select **Download > Firmware Images**.
4. In **Select Product**, select **FortiVoiceEnterprise**.
5. In the **Download** tab, click the **v6.00** folder and navigate to the **6.4** folder.
6. Locate the firmware image files that you need to download for the FortiVoice units, FortiVoice LSG, and FortiVoice Gateway GS16, as applicable.
7. To download the firmware image file, go to the end of the row and click the **HTTPS** link.
8. Click **OK**.
9. Take note of where you save the firmware image files on your computer.

Backing up the configuration

Use this procedure to backup the configuration of *both* the primary and secondary FortiVoice units.

If your deployment includes a FortiVoice FXS gateway or FortiVoice LSG unit, or both, a configuration backup of those units is not necessary because the primary FortiVoice unit already has this configuration.

1. Log in to the web-based manager of the primary FortiVoice unit.
2. Go to **Dashboard > Status**.
3. In the **System Information** widget, go to the **System configuration** row.
4. Click **Backup**.



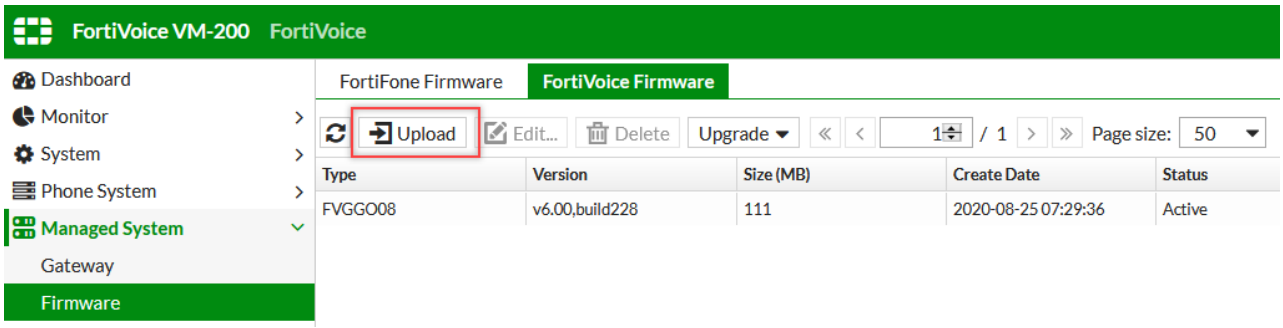
5. To save the file on your management computer, click **OK**.
6. Take note of the location where you save the file. Backup files let you revert to your previous configuration, if the new configuration does not function correctly.
7. Log in to the web-based manager of the secondary FortiVoice unit.
8. Repeat steps 2 to 6.

Uploading firmware image files

Use this procedure to upload the firmware image files to the primary and secondary FortiVoice units. You have already downloaded the firmware image files from the Fortinet Support website.

1. Log in to the web-based manager of the primary FortiVoice unit.
2. Go to **Managed System > Firmware > FortiVoice Firmware**.

3. Click **Upload**.



4. Click **Select**.
5. Select the file to upload and click **Open**.
6. When the upload is complete, click **OK**.
7. To upload another firmware image file, repeat steps 3 to 6.
8. Log in to the web-based manager of the secondary FortiVoice unit.
9. Repeat steps 2 to 7.

Upgrading the FortiVoice FXS gateway

1. Log in to the web-based manager of the primary FortiVoice unit.
2. Go to **Managed System > Firmware > FortiVoice Firmware**.
3. In the list, click the firmware file that you want to use to upgrade the FortiVoice FXS gateway units.
4. To perform the upgrade now:
   a. Select **Upgrade > Now**.

   A warning appears with information about the firmware type and version, and the following message: All devices with the same type will be upgraded.

   b. To continue with the upgrade, click **OK**.
5. To schedule the upgrade:
   a. Select **Upgrade > Custom Time**.

   A warning appears with information about the firmware type and version, and the following message: All devices with the same type will be upgraded.

   b. To continue with the upgrade, click **OK**.
   c. Select a date and time, and click **OK**.
6. Verify that the FortiVoice FXS gateway firmware is successfully installed:
   a. Go to **Managed System > Gateway > FXS Gateway**.
   b. Locate the row for the upgraded FortiVoice FXS gateway.
   c. In the **Version** column, make sure that the FortiVoice FXS gateway firmware version is the one that you upgraded to.

Upgrading the FortiVoice LSG firmware

1. Log in to the web-based manager of the primary FortiVoice unit.
2. Go to **Managed System > Firmware > FortiVoice Firmware**.
3. In the list, click once on the firmware that you want to use to upgrade the FortiVoice LSG units.
4. To perform the upgrade now:
   a. Select **Upgrade > Now**.

   A warning appears with information about the firmware type and version, and the following message: All devices with the same type will be upgraded.

   b. To continue with the upgrade, click **OK**.
5. To schedule the upgrade:
   a. Select **Upgrade > Custom Time**.

   A warning appears with information about the firmware type and version, and the following message: All devices with the same type will be upgraded.

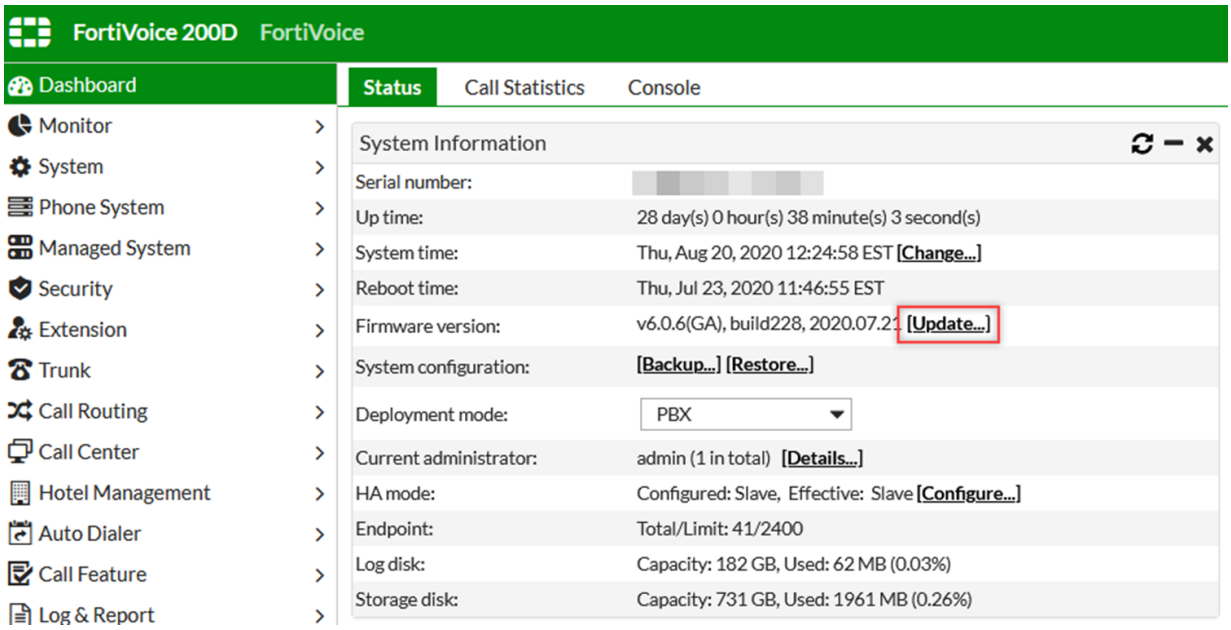
   b. To continue with the upgrade, click **OK**.
   c. Select a date and time, and click **OK**.
6. Verify that the FortiVoice LSG firmware is successfully installed:
   a. Go to **Managed System > Survivability > Survivability Branch**.
   b. Locate the row for the upgraded FortiVoice LSG unit.
   c. In the **Version** column, make sure that the FortiVoice LSG firmware version is the one that you upgraded to.

Upgrading the FortiVoice firmware in an HA group

Make sure to upgrade the firmware on the secondary unit *before* upgrading the firmware on the primary unit.

1. Upgrade the firmware on the secondary FortiVoice unit:
   a. Log in to the web-based manager of the secondary FortiVoice unit.
   b. Go to **Dashboard > Status**.
   c. In the **System Information** widget, go to the **Firmware version** row.

d. Click **Update**.



e. Locate the firmware file and then upload that file.
Your web browser uploads the firmware file to the unit.

f. To confirm the upgrade, click **Yes**.
The unit installs the firmware and restarts.

g. To make sure that the FortiVoice web-based manager reloads correctly and displays all changes, clear the cache of your web browser and restart it.

2. Verify that the firmware is successfully installed on the secondary FortiVoice unit:
   a. Go to **Dashboard > Status**.
   b. In the **System Information** widget, go to the **Firmware version** row.
   c. Make sure that the FortiVoice firmware version is the one that you upgraded to.

Fortinet recommends that you upgrade the primary unit during your maintenance window without manually forcing a failover.

Manually forcing a failover to the secondary unit before upgrading the primary unit would cause some unnecessary data synchronization.

3. Upgrade the firmware on the primary FortiVoice unit:
   a. Log in to the web-based manager of the primary FortiVoice unit.
   b. Go to **Dashboard > Status**.
   c. In the **System Information** widget, go to the **Firmware version** row.
   d. Click **Update**.
   e. Locate the firmware file and then upload that file.
   Your web browser uploads the firmware file to the unit.
   f. To confirm the upgrade, click **Yes**.
   The unit installs the firmware and restarts.
   g. To make sure that the FortiVoice web-based manager reloads correctly and displays all changes, clear the cache of your web browser and restart it.

4. Verify that the firmware is successfully installed on the primary FortiVoice unit:
   a. Go to **Dashboard > Status**.
   b. In the **System Information** widget, go to the **Firmware version** row.
   c. Make sure that the FortiVoice firmware version is the one that you upgraded to.
5. Verify the traffic flow on the primary FortiVoice unit.

Hotel management

All property management systems (PMS) that support the Mitel protocol work seamlessly with FortiVoice. However, in the hospitality industry, there are many PMSs using their own proprietary implementation that do not support the Mitel protocol.

Thankfully, FortiVoice supports the Comtrol's Lodging Link solution, which works as a middle-ware that translates commands between a third-party PMS and a guest service system such as FortiVoice.

The following recipe guides you through the process of configuring FortiVoice to work with a PMS by using the FortiVoice comtrol interface.

After configuring FortiVoice, configure and connect your own PMS to FortiVoice. For more details, see your PMS manual.

FortiVoice requires a hotel management license for this configuration.

This section includes the following recipes:

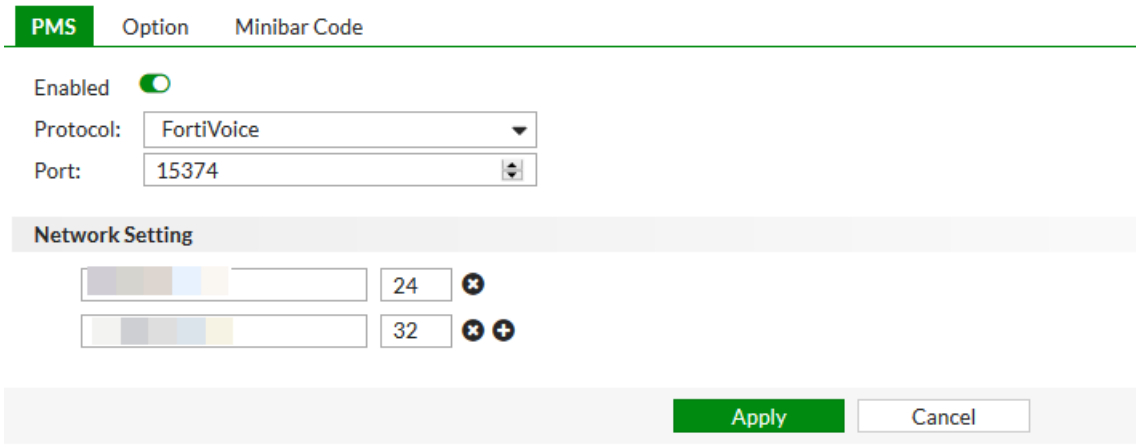
- Configuring PMS settings on page 89
- Configuring hotel management options on page 90
- Defining minibar codes on page 91
- Configuring room status on page 91

Configuring PMS settings

Configure PMS settings to allow FortiVoice to connect to your PMS.

1. Go to **Hotel Management > Setting > PMS**.
2. Click **Enabled**.
3. Set **Protocol** to **FortiVoice**, and enter the port number used to connect to the PMS (by default, 15374).
4. Under **Network Setting**, enter the IP address and netmask of the PMS.
   If you have multiple property management systems, you can enter multiple trusted hosts.

5. Click **Apply**.

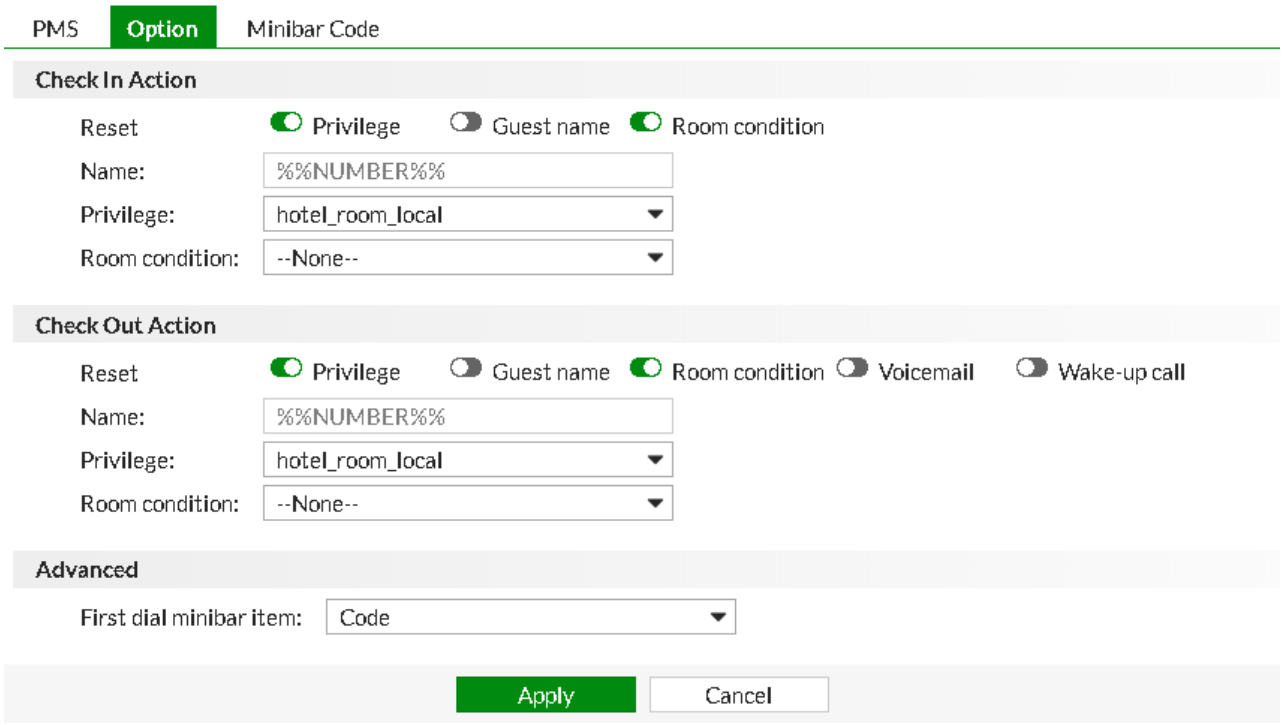


Configuring hotel management options

You can select the appropriate guest information to make a room check-in or check-out ready.

1. Go to **Hotel Management > Setting > Option**.
2. Under **Check In Action**, select the appropriate guest information to make a room check-in ready:
   - **Privilege**: Enable phone call restrictions and user privileges for the room extension.
   - **Guest name**: Display either the room number or guest name on the extension in the room. This is configured in the **Name** field as %%NUMBER%% to display the room number or %%NAME%% to display the guest name.
   - **Room condition**: Clear any condition set for the room.
3. Under **Check Out Action**, select the appropriate guest information to make a room check-out ready. In addition to the options available for check-in, check-out options also include the following:
   - **Voicemail**: Clear all voicemails for the room extension.
   - **Wake-up call**: Clear all wake-up call setups for the room extension.
4. Under **Advanced**, set **First dial minibar item** to either **Code** or **Number**, to determine how guests place an order from the front desk. For example, if **Code** is selected, and the guest wants two waters (code 1), the guest would enter **1*2**. If **Number** is selected, and the guest wants the same order, they would instead enter **2*1**.

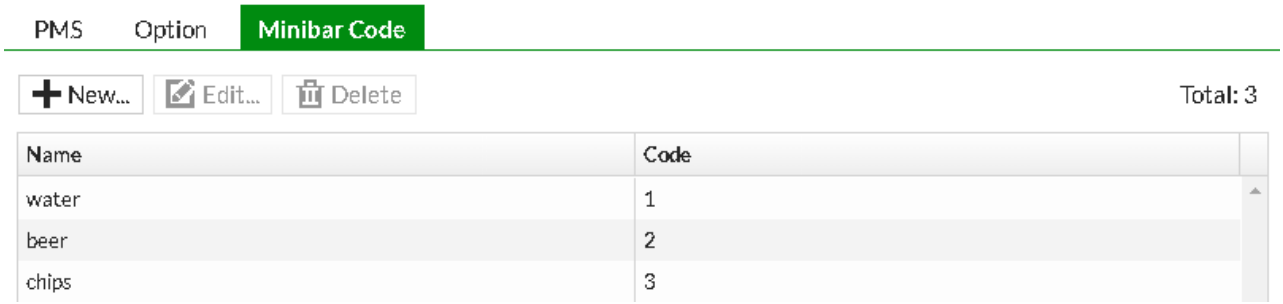
5. Click **Apply**.



Defining minibar codes

In the previous step, an example was given of the guest entering a number code of 1 for water. The **Minibar Code** tab is where codes are associated with minibar items. Codes assigned to minibar items must be configured to allow guests to place minibar orders using the key pad.

1. Go to **Hotel Management > Setting > Minibar Code** and click **New**.
2. To create the water code used in the previous step, set **Name** to **water** and **Code** to **1**, and click **OK**.
3. Create other minibar codes for other minibar items as necessary.

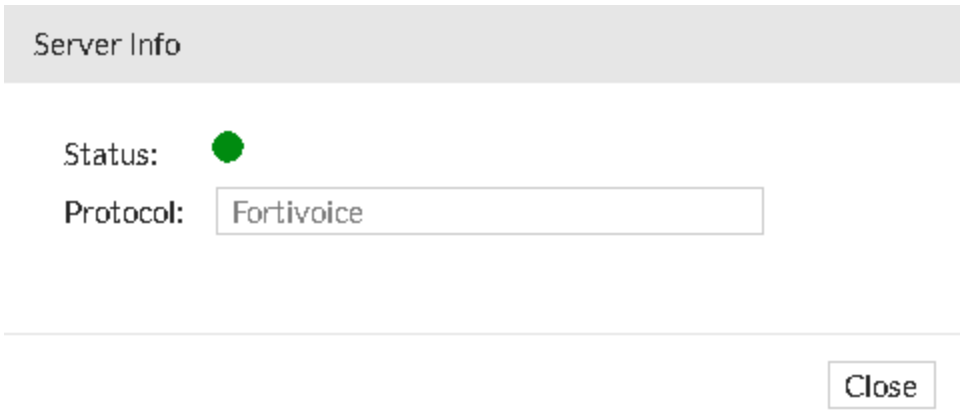


In this example, water, beer, and chips have been assigned codes 1, 2, and 3 respectively. If the guest wants two waters, two beers, and one order of chips, and assuming **First dial minibar item** under **Hotel Management > Setting > Option** is set to **Code**, the guest would enter **1*2*2*2*3*1**.

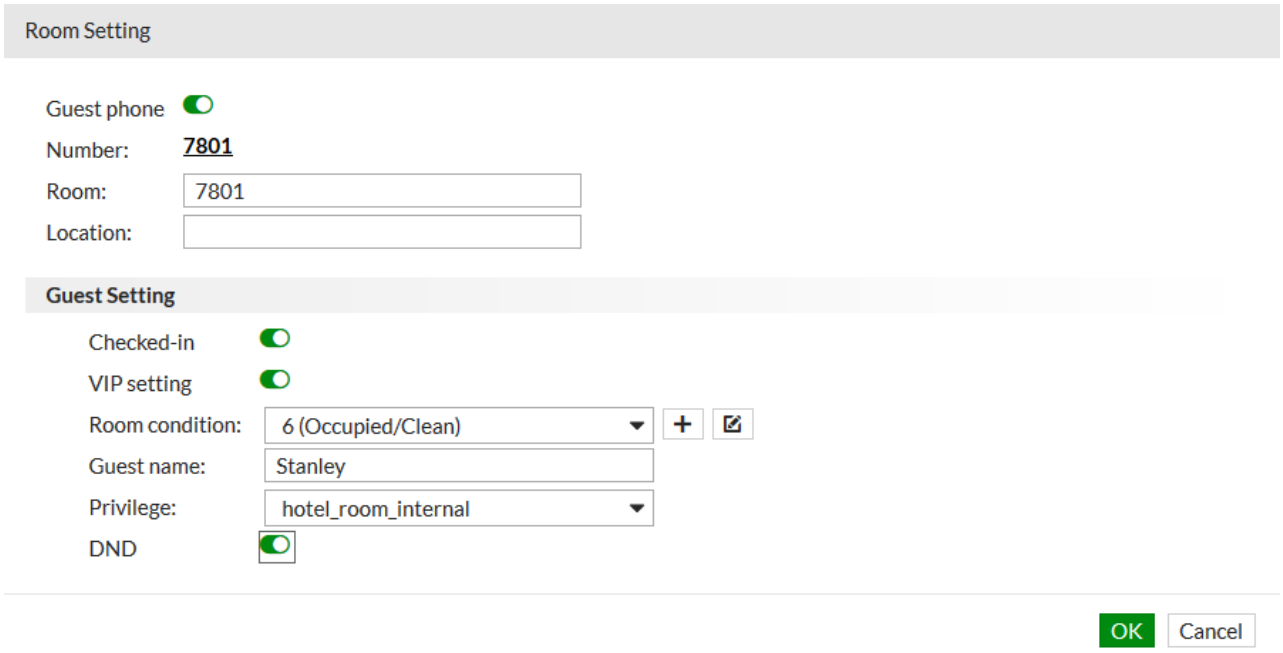
Configuring room status

After connecting the PMS and the FortiVoice phone system, you can configure the hotel room statuses.

1. Go to **Hotel Management > Room Status > Room Status** and click **Server Info**.
   A green dot indicates that the FortiVoice device is connected with the PMS.



2. Select the **Room** you wish to edit and click **Edit**.
3. Enable **Guest phone** to make the room a guest room. **Guest Setting** will appear.
4. If the guest is checked-out, set the appropriate **Room condition** from the drop-down menu. If the guest is checked-in, enable **Checked-in**, set the appropriate **Room condition**, **Guest name**, and **Privilege** option.
5. Additionally, enable **VIP setting** if the guest should receive special treatment, and enable **DND** if the guest does not want to be disturbed.



Licensing

This section includes the following recipes:

- Purchasing a FortiVoice product license on page 93
- Registering a FortiVoice product and downloading the license file on page 93
- Uploading the license file to FortiVoice on page 94

Purchasing a FortiVoice product license

To place an order to purchase a license for a Fortinet FortiVoice product, you can contact a local Fortinet partner or contact evac@fortinet.com.

After placing an order, Fortinet sends a license registration code to the email address used in the order form. Use this code to register your Fortinet FortiVoice product with Fortinet Support (see Registering a FortiVoice product and downloading the license file on page 93).

Registering a FortiVoice product and downloading the license file

Prerequisites

Make sure that you have the license registration code for the product that you want to register (see Purchasing a FortiVoice product license on page 93).

Procedure steps

1. Log in to your FortiCloud account or register for an account.
2. To start the registration process, click **Register Product**.
3. In **Registration Code**, enter your product serial number, service contract registration code or license certificate number.
4. In **End User Type**, choose the type of user as either government or non-government.
5. To continue the product registration, click **Next**.
6. Provide registration details and click **Next**.
7. Read and accept the terms and conditions of the product registration agreement, and click **Next**.
8. On the Verification page, review and accept the product entitlement, and click **Confirm**.
9. When the registration is complete, download the license file file (.lic) to your computer:
   a. Go to **Products > Product List**.
   b. Click the **Serial Number** for your product.
   c. In **Product Information**, go to **License File** and click **License File Download**.
   d. Take note of the location where you save the license file.

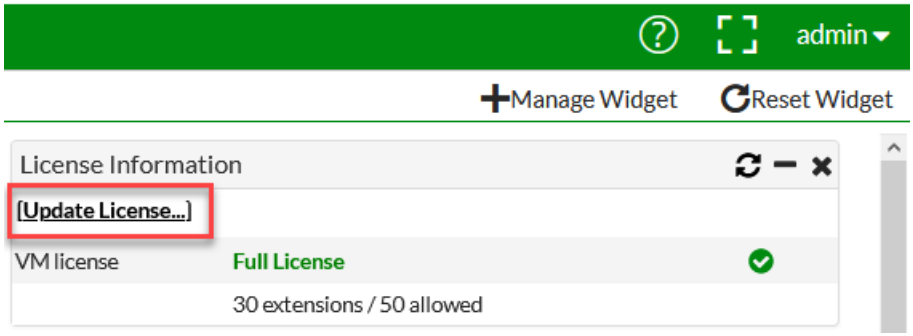
Uploading the license file to FortiVoice

Prerequisite

You know where the license file is stored on your computer. For more details, see Registering a FortiVoice product and downloading the license file on page 93.

Procedure steps

1. Go to **Dashboard > Status**.
2. In the **License Information** widget, click **Update License**.



3. In the File Upload dialog box, locate the license (.lic) file, select the file, and click **Open**.
4. To confirm the upload, click **Yes**.

Managed system

This section contains information about configuring system management settings including gateways, survivability, and FortiVoice and FortiFone firmware.

This section includes the following topics:

- Gateway management on page 95
- FortiVoice units as survivable branches on page 95
- FortiFone firmware upgrades on page 95

Gateway management

FortiVoice can manage the following three types of gateways:

- **FortiVoice foreign exchange office (FXO) gateway** - This gateway works in conjunction with the FortiVoice phone system, an IP private branch exchange (IP PBX), to expand resources and support additional analog phone lines. With the FortiVoice FXO gateway, you connect your analog phone lines to your FortiVoice phone system. For details about deploying an FXO gateway, see the FortiVoice FXO Gateway Deployment Guide.
- **FortiVoice foreign exchange subscriber (FXS) gateway** - This gateway works in conjunction with the FortiVoice phone system to expand resources and support additional analog phone extensions. With the FXS gateway, you can connect your traditional analog phones and fax machines to a FortiVoice phone system. For details about deploying an FXS gateway, see the FortiVoice FXS Gateway Deployment Guide.
- **FortiVoice primary rate interface (PRI) gateway** - This gateway works in conjunction with your FortiVoice phone system to expand resources and support additional phone lines. With a PRI gateway, you connect your legacy telephony infrastructure composed of PRI (T1 or E1) digital lines to a FortiVoice phone system. For details about deploying a PRI gateway, see the FortiVoice PRI Gateway Deployment Guide.

FortiVoice units as survivable branches

In a centralized multi-site network deployment, a FortiVoice local survivability solution provides resiliency with survivability branches. A survivability branch is a FortiVoice local survivable gateway (LSG) unit with local extensions. A FortiVoice LSG unit is located in a branch office. A FortiVoice phone system in a main office manages one or more FortiVoice LSG units (survivability branches).

Local survivability provides centralized management and branch office resiliency.

For details about deploying a FortiVoice LSG unit, see the FortiVoice Local Survivable Gateway Deployment Guide.

FortiFone firmware upgrades

This recipe guides you through the process of upgrading the FortiFone firmware..

This section includes the following tasks:

- Reviewing the current FortiFone firmware on page 96
- Uploading the FortiFone firmware to FortiVoice on page 96
- Performing the FortiFone firmware upgrade on page 97
- Confirming the FortiFone firmware upgrade on page 97

Reviewing the current FortiFone firmware

Before updating the FortiFone firmware, you can review the firmware currently installed on all FortiFone devices connected to the network.

1. From the FortiVoice UI, navigate to **Managed System > Firmware > FortiFone Firmware** and click **Statistics**. The **Firmware Upgrade Status** window opens listing the phone model and firmware version details of phones currently connected to the network. The **Phone Count** column provides the number of phones in each particular grouping.
2. When you are finished reviewing the status of the phones, click **Close**.

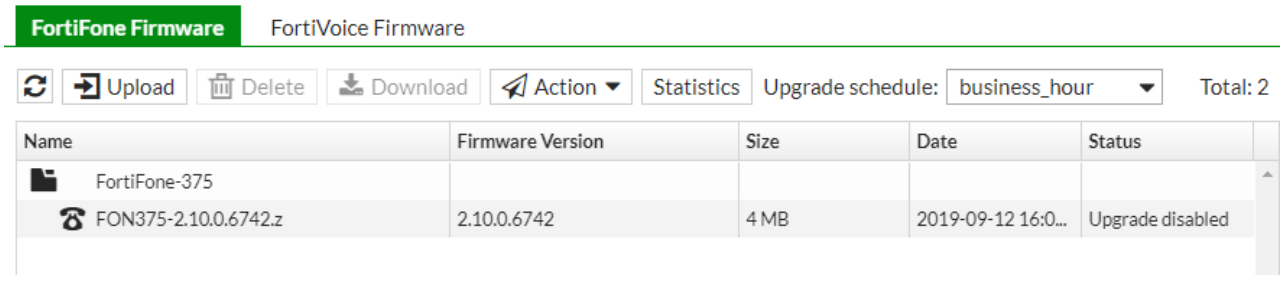
Uploading the FortiFone firmware to FortiVoice

Before you begin

- Verify that the network connectivity is available between the target FortiFone devices and the FortiVoice unit.
- Download the latest FortiFone firmware files from the Fortinet Support website.

Procedure steps

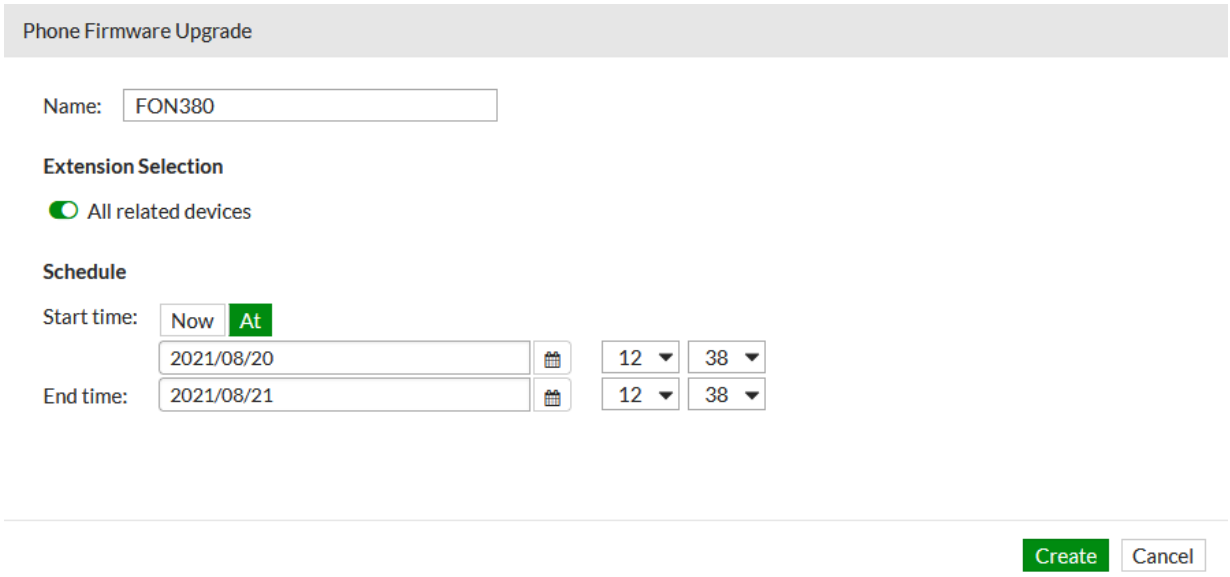
1. Go to **Managed System > Firmware**.
2. From the **FortiFone Firmware** tab, click **Upload**.
   The **FortiFone Firmware Upload** window opens.
3. For **Phone model**, select the phone type that will be the target of the firmware upgrade.
4. For **Firmware file**, click **Select**. Select the firmware file for the selected FortiFone model and click **Open**.
   The firmware file uploads to FortiVoice.
5. In the **Comments** field, provide a comment if necessary.
6. For FortiFone-380, 480, and 580, there is a **Forced** option. If necessary, enable this option to force a new build onto the phone regardless of the firmware version already on the phone.
7. Click **OK**.
   The uploaded firmware file appears in the list of **FortiFone Firmware** files.



Performing the FortiFone firmware upgrade

You can perform an immediate or scheduled FortiFone firmware upgrade.

1. Go to **Managed System > Firmware**.
2. In the **FortiFone Firmware** tab, select an uploaded firmware file from the list.
3. Go to **Action > Activate**.
4. Enter a **Name** for this firmware schedule.
5. If you want to upgrade the firmware on all devices, leave **All related devices** enabled.
6. To perform an immediate upgrade:
   a. Click **Now**.
   b. Click **Create**.
   FortiVoice starts the phone firmware upgrade.
7. To perform the upgrade at a scheduled date and time:
   a. In **Schedule**, click **At**.
   b. In **Start time**, select a date and time.
   c. In **End time**, select a date and time.



   d. To save changes, click **Create**.
   The firmware upgrade is scheduled to run.

Confirming the FortiFone firmware upgrade

Confirm that the firmware has been successfully installed on targeted FortiFone devices.

1. Go to **Managed System > Firmware**.
2. From the **FortiFone Firmware** tab, click **Statistics**.
   The Firmware Upgrade Status window opens. Review the firmware version of applicable phone models to confirm that the new firmware is installed.
3. If necessary, click **Refresh** to view updates.
4. Click **Close**.

Phone system

This section includes information about configuring the following system features:

- Emergency numbers on page 98
- LDAP authentication configuration for extension users on page 105
- Schedules – best practices on page 108

Emergency numbers

This recipe guides you through the process of establishing an emergency contact number on FortiVoice for your company or organization.

An emergency call, such as 911 in North America, is first routed to a Public Safety Answering Point (PSAP). The PSAP will look up the Automatic Number Identification (ANI), or calling number, from the Automatic Location Information Database (ALI database) to determine the caller's physical address. The PSTN service provider updates the ALI database when a customer subscribes to its trunk service. A record in the ALI database is a mapping between a phone number (or trunk) and its physical address.

For each emergency call, the PBX is responsible for setting the correct ANI for the PSAP.

This recipe includes the following topics:

- Configuring the emergency number on page 98
- Configuring an outbound dialplan for emergency calls on page 100
- Configuring an emergency zone profile on page 102
- Configuring the emergency caller ID on page 104

Configuring the emergency number

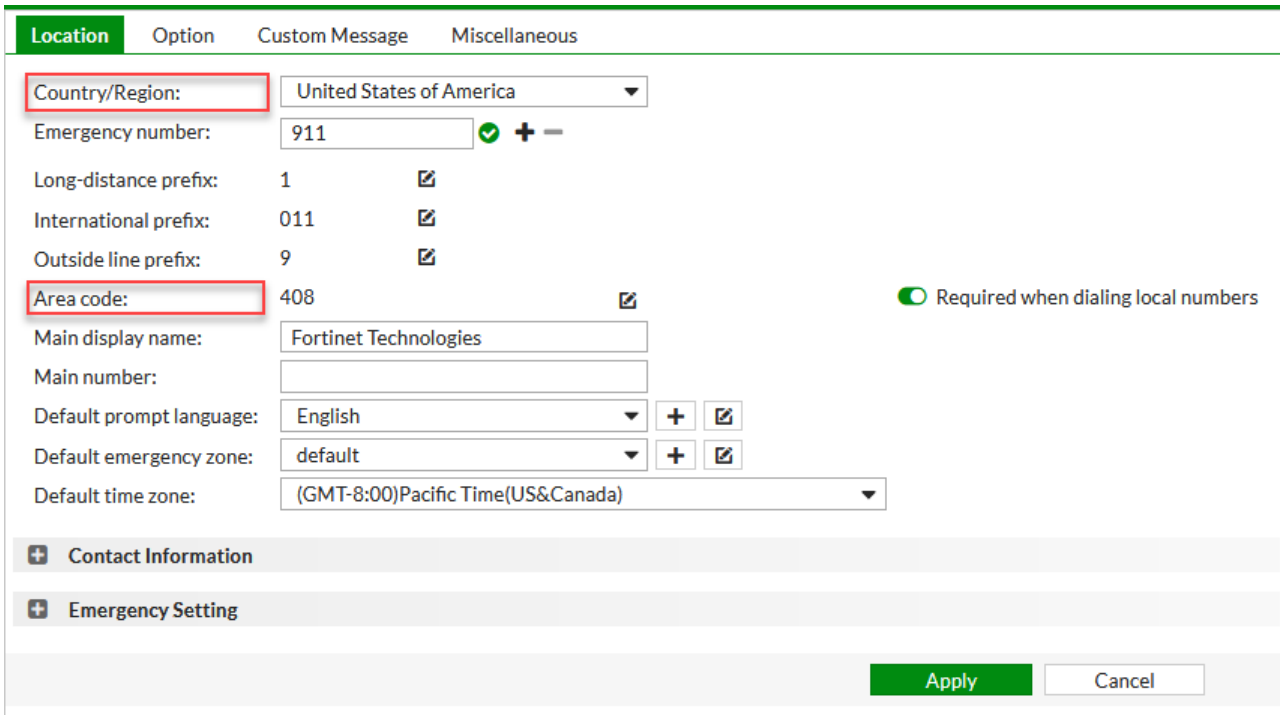
Configure the emergency number and contact details on FortiVoice for your company or organization.

1. Go to **Phone System > Setting > Location**.
2. Select the appropriate **Country/Region** (in this example, **United States of America**).
3. Select a **Country/Region**. With this selection, the following fields automatically update. You can edit any of them, if required.
   - **Emergency number**
   - **Long-distance prefix**
   - **International prefix**

     Take note of the **Outside line prefix**. Internal callers need to append this prefix to the configured emergency number (in this example, **9 911**).

   - **Outside line prefix**

4. Check with your PSTN service provider and update the **Area code**.
5. Configure the remaining settings, as required.



6. Expand **Contact Information** and enter contact details to associate with the emergency number.

7. Expand **Emergency Setting**, select **Send Alert Email** and enter **Emergency contact emails** as necessary. The email addresses specified here will receive an alert email any time an emergency call is made, including the location of the caller and the time of the call.

8. To save changes, click **Apply**.

Email example:

An emergency number has been called,

Emergency Caller: "John Doe" <1002>
Dialed Number: <911>
Called On: Mon, 11 Dec 2017 15:50:59 -0500
Duration: 40 (seconds)
Via Trunk: PRI

Extra information
Address: 899 Kifer Road
City: Sunnyvale
Province: CA 94086
Contact email: abc@xyz.com

Contact phone: 4085551234

Configuring an outbound dialplan for emergency calls

Configure an outbound dialplan to set up how to route emergency calls.

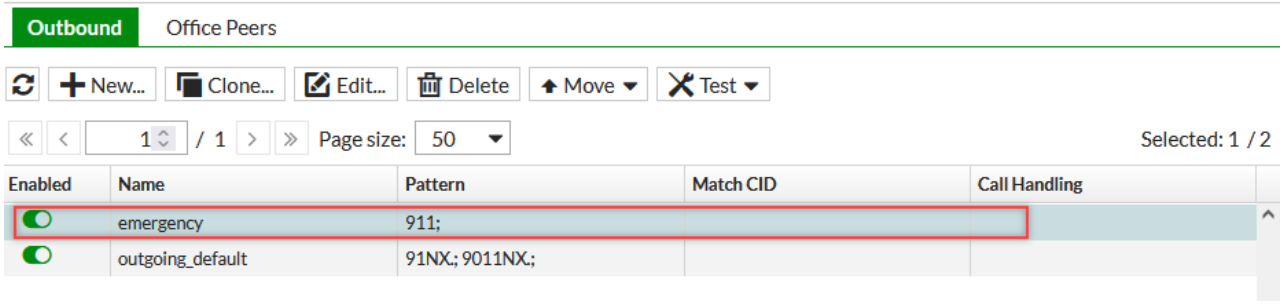
Before you begin

Configure one or more trunks that you want a 911 call to use:

a. Go to **Trunk > VoIP > SIP**.
b. Update the fields. If you needs more details, see the Setting up VoIP trunks section in the FortiVoice Phone System Administration Guide.

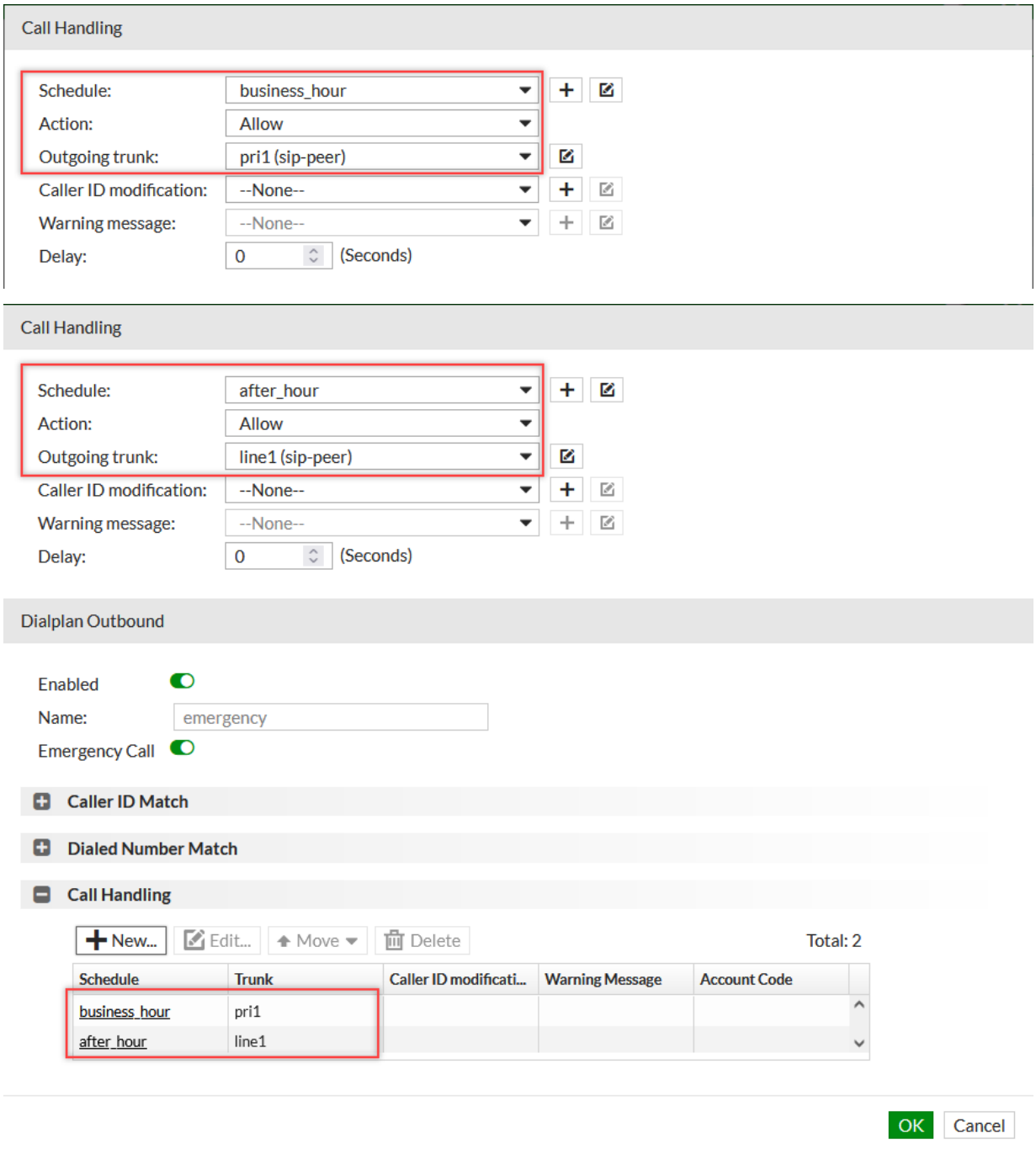
Procedure steps

1. Go to **Call Routing > Outbound > Outbound**.
   There is a default emergency dial plan available. This dialplan ensures that the FortiVoice unit bypasses privilege checks and grants the highest priority to all emergency calls.
2. To edit the emergency dial plan, double-click the **emergency** row.

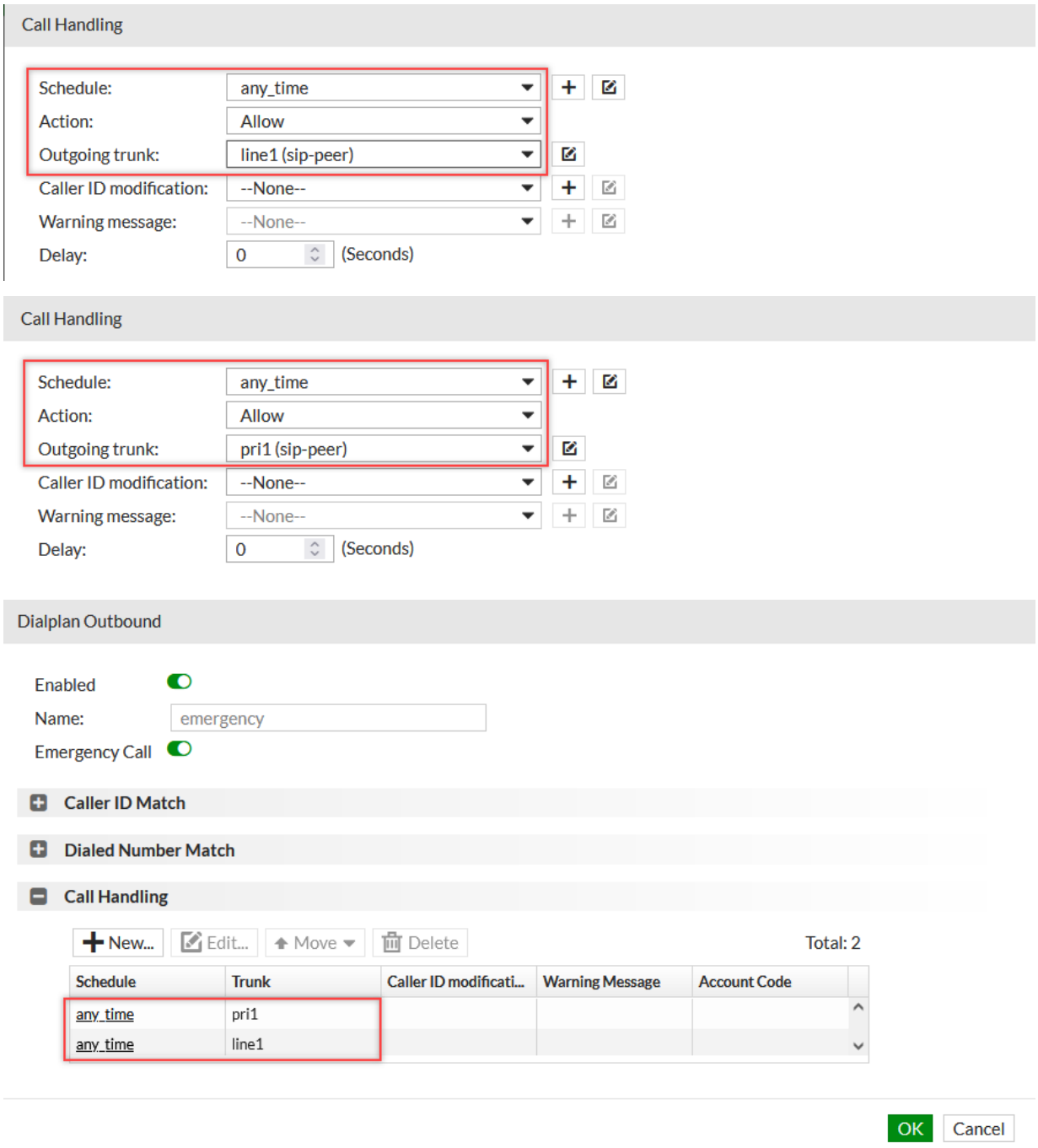


3. Make sure that **Emergency Call** is enabled.
4. Leave **Caller ID Match** and **Dialed Number Match** unchanged, as you do not want to impose any kind of restrictions to who can make an emergency call.
5. Under **Call Handling**, click **New**.

6. You can select and schedule the type of trunk that you want a 911 call to use. To assist you with the call handling configuration, here are two examples (using pri1 and line1 trunks):
   a. **Example 1**: Create two call handling schedules. During business hours, set the dialplan to use the pri1 trunk and off-business hours, use the line1 trunk.



   b. **Example 2**: Create two call handling schedules. Both pri1 and line1 trunks can be used anytime. If for some reason, the pri1 trunk is unavailable, then the 911 call can use the line1 trunk.



Configuring an emergency zone profile

Configure an emergency zone profile to assign the same emergency settings (including the caller ID) to multiple user extensions located in one office building.

If an office location has a few extension users only or an extension user is at a remote location (such as working from home), then assign an emergency caller ID instead of using an emergency zone (see Configuring the emergency caller ID on page 104).

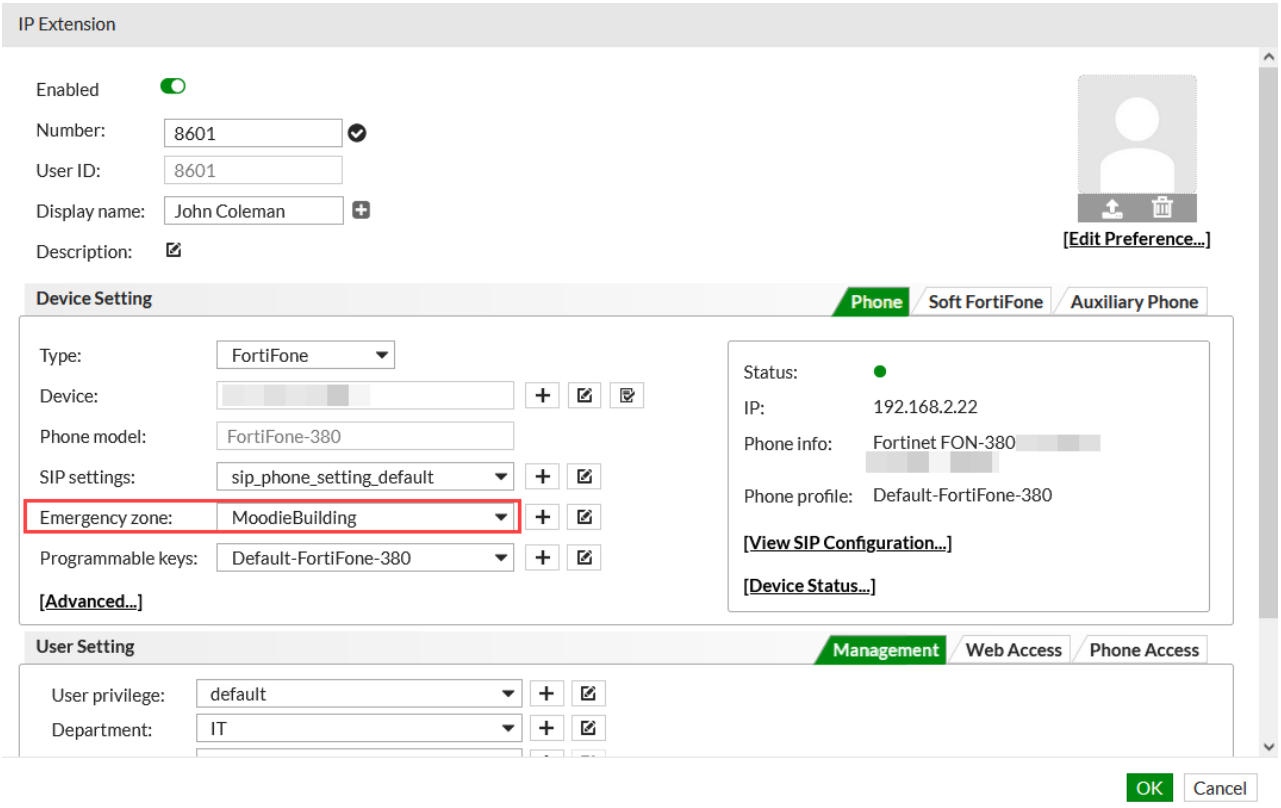
To configure an emergency zone profile

1. Go to **Phone System > Profile > Emergency Zone**.
2. Click **New**.
3. Enter a **Name** for this profile.
4. Enter the **Emergency caller ID** to display on the destination phone when the extension user dials the emergency number.
5. Optionally, enter a **Description** for this profile.
6. Update the **Emergency Setting** section:
   a. **Do Nothing**: If you do not want FortiVoice to send an alert email when an emergency call is made, select this option.
   b. **Send an alert email**: If you want FortiVoice to send an alert email when an emergency call is made, select this option and enter one or more **Emergency contact emails**. To add more addresses, click **+**.
   c. Enter an **Emergency barge number**. This is the extension number of an authorized user. When an ongoing emergency call is in progress, the phone of the authorized user also rings. This user can listen to the call and talk, if necessary.
   d. Select an **Emergency message group number**. Extension users of this emergency zone profile dial this number to make an emergency call and FortiVoice will notify all users in the group.
7. Under **Contact Information**, enter the contact details to associate with this profile.
8. Click **Create**.

To assign an emergency zone profile to an extension

1. Go to **Extension > Extension > IP Extension**.
2. Double-click the extension that you want to edit.

3. Under **Device Setting**, select the **Emergency zone**.



4. Click **OK**.

To assign an emergency zone profile to multiple extensions

For details about performing a batch edit to assign an emergency zone profile to multiple extensions, see Editing extension main device settings on page 71.

Configuring the emergency caller ID

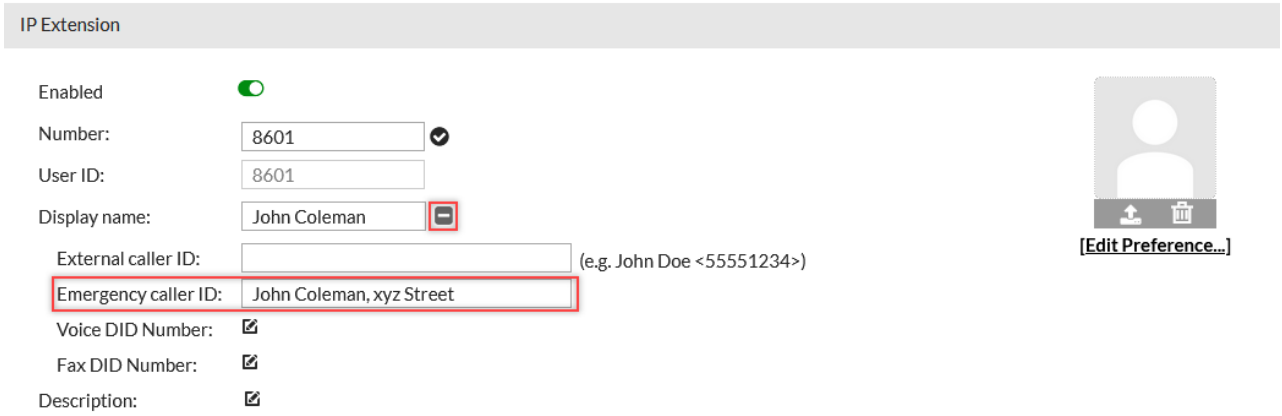
If an office location has a few extension users only or an extension user is at a remote location (such as working from home), then assign an emergency caller ID instead of using an emergency zone.

When the extension user makes a 911 call, the destination phone displays the emergency caller ID.

For more details about the caller ID hierarchy, see Caller ID modification hierarchy for emergency calls on page 50.

1. Go to **Extension > Extension > IP Extension**.
2. Edit an extension or create a new one.
3. Go to **Display name** and click to expand.
4. In **Emergency caller ID**, enter the caller ID to display on the destination phone when the extension user dials the emergency number.

5. Click **OK** or **Create**, as applicable.



LDAP authentication configuration for extension users

The FortiVoice unit works with an LDAP server (such as MS Active Directory or OpenLDAP) to authenticate extension users accessing the unit. This recipe guides you through the process of configuring LDAP authentication on the FortiVoice unit for extension users.

This recipe includes the following tasks:

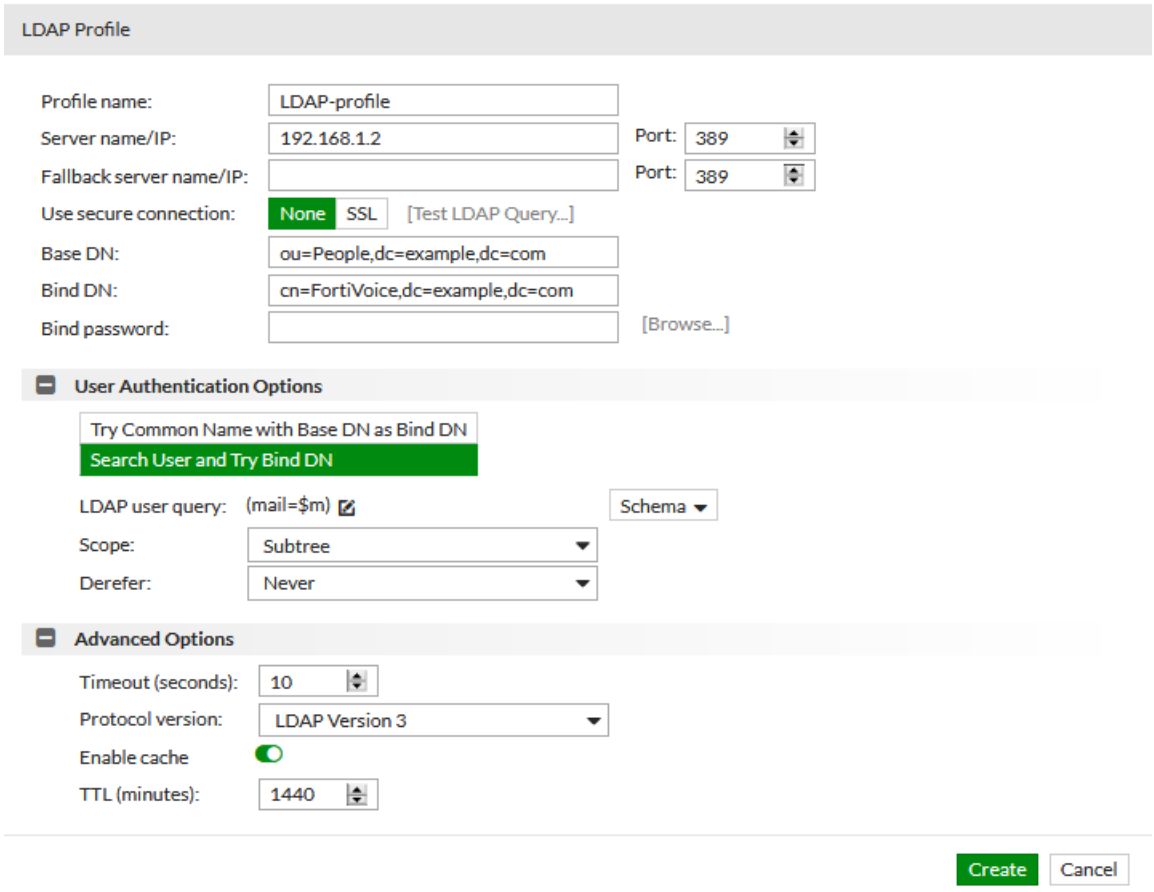
- Creating an LDAP profile on page 105
- Configuring an LDAP connector on page 107
- Applying the LDAP profile to an extension on page 108

Creating an LDAP profile

1. Go to **Phone System > LDAP > LDAP Profile** and click **New**.
2. Enter a **Profile name**.
3. Set **Server name/IP** to the FQDN or IP address of the LDAP server.
4. Set **Port** to the port that the LDAP server will use to communicate with the FortiVoice unit.
   The default port number varies by your selection in **Use secure connection**. Port 389 is typically used for non-secure connections and port 636 is typically used for SSL-secured connections.
5. Optionally, set enter a **Fallback server name /IP** and **Port**. Enter the fully qualified domain name (FQDN) or IP address of an alternate LDAP server that the FortiVoice unit can query if the primary LDAP server is unreachable.
   The default port number varies by your selection in **Use secure connection**. Port 389 is typically used for non-secure connections and port 636 is typically used for SSL-secured connections.
6. Set **Use secure connection** to **None** or **SSL**.
7. Set **Base DN** to the distinguished name (DN) of the LDAP directory tree within which the FortiVoice unit will search for user objects, such as `ou=People,dc=example,dc=com`.
8. Set the **Bind DN** of an LDAP user account who has permissions to query the base DN, such as `cn=FortiVoice,dc=example,dc=com`.
   This field may be optional if your LDAP server does not require the FortiVoice unit to authenticate when performing queries.
9. Enter the **Bind password** of the Bind DN, if applicable.

10. Under **User Authentication Options**, enable one of the following:
    - **Try Common Name with Base DN as Bind DN**: Enable to form the user's bind DN by prepending a common name to the base DN. Also enter the name of the user objects' common name attribute, such as `cn` or `uid` into the field.
    - **Search User and Try Bind DN**: Select to form the user's bind DN by using the DN retrieved for that user.
      - To automatically populate the **LDAP user query** field, select a **Schema** other than **User Defined**.
      - In **Scope**, select which level of depth to query.
      - In **Derefer**, select the method to use, if any, when dereferencing attributes whose values are references.

    For more information about configuring the LDAP query filter and schema required for this option, see the Configuring authentication options section in the FortiVoice Phone System Administration Guide.
11. Under **Advanced Options**, enter a **Timeout** in seconds that the FortiVoice unit will wait for query responses from the LDAP server.
12. Set **Protocol version** to the protocol used by the LDAP server.
13. To cache LDAP query results, click **Enable cache**.
14. Set **TTL** to the number of minutes that the FortiVoice unit will cache query results. After the TTL has elapsed, cached results expire, and any subsequent request for that information causes the FortiVoice unit to query the LDAP server, refreshing the cache.
    If caching is enabled, but queries are not being cached, review the value entered for **TTL**. Setting a **TTL** of **0** effectively disables caching.
15. Click **Create** or **OK**.



Configuring an LDAP connector

If your LDAP server has contact or extension information, you can configure an LDAP connector to retrieve this information and add it to the contact and extension lists on the FortiVoice unit.

Prerequisite

Before starting to configure an LDAP connector, make sure to complete the steps in Creating an LDAP profile on page 105.

Procedure steps

1. Go to **Phone System > LDAP > LDAP Connector.**
2. Click **New > Extension Connector** or **Contact Connector**.
3. Enter a **Name** for the LDAP connector.
4. Select an **LDAP profile**. This action auto-populates the fields.
5. Select a **Schema** that defines the rules to govern the types of data that the LDAP server can hold. This option appears after you select the LDAP profile. If you select **Active directory** or **Open LDAP**, the fields under **Search Criteria** and **Mapping** are populated. However, you can change them as needed.
6. In the **Search Criteria** section, you can use the auto-populated search attributes or enter your own search attributes for the data that you want the FortiVoice unit to retrieve from the LDAP server:
   - **Search base**: Enter or browse for the location in the LDAP directory tree where the search for contacts or extensions begins.
   - **Search filter**: Enter the complete query filters.
   - **Scope**: Select the LDAP search scope indicating the set of entries at or below the Base DN that may be considered potential matches for a SearchRequest.
   - **Max results**: Enter the maximum number of contacts or extensions that you want to allow the LDAP connector to get. If you leave the value as 0, then the search will include an unlimited number of contacts or extensions, as applicable.
7. The **Mapping** section enables the FortiVoice unit to convert the data retrieved from the LDAP server in to the FortiVoice extension or contact list, as applicable. If you want to choose an attribute from your LDAP server, click the **Retrieve LDAP attribute** icon ( ) beside each field.
8. In the **More** section, you can use the auto-populated attribute data or enter the attributes used by your LDAP server. If you want to choose an attribute from your LDAP server, click the **Retrieve LDAP attribute** icon ( ) beside each field.
   - **Time zone**: This field is visible when you create an extension connector, not a contact connector.
     - **Add entry**: Use this option to configure the new time zone attribute retrieved from the LDAP server.
       - **Fixed**: Select the time zone from the list. This value does not update when the FortiVoice unit synchronizes with the LDAP server.
       - **Sync**: The current time zone value will be updated when the FortiVoice unit synchronizes with the LDAP server.
     - **Update entry**: Use this option to configure the existing time zone attribute on your FortiVoice unit.
       - **Skip**: The current time zone is ignored and will not be updated when the FortiVoice unit synchronizes with the LDAP server.
       - **Sync**: The current time zone value will be updated when the FortiVoice unit synchronizes with the LDAP server.
   - **Voicemail PIN**: This field is visible when you create an extension connector, not a contact connector.
     - **Add entry**:Use this option to configure the new voicemail attribute retrieved from the LDAP server.
       - **Fixed**: Enter a voicemail PIN. This value will not be updated when the FortiVoice unit synchronizes with the LDAP server.

- **Sync**: The voicemail PIN will be updated when the FortiVoice unit synchronizes with the LDAP server.
- **Generate**: Select to let the system generate a voicemail PIN. This value will not be updated when the FortiVoice unit synchronizes with the LDAP server.

- **Update entry**: Use this option to configure the existing voicemail PIN attribute on your FortiVoice unit.
  - **Skip**: The current voicemail PIN is ignored and will not be updated when the FortiVoice unit synchronizes with the LDAP server.
  - **Sync**: The current voicemail PIN value will be updated when the FortiVoice unit synchronizes with the LDAP server.

9. In **Schedule**, you can specify when you want the FortiVoice unit and your LDAP server to synchronize.
10. Click **Create**.
11. To view the contact list of the LDAP contact connector, go to **Phone System > LDAP > LDAP Contact**.
12. To view the extension list of the LDAP extension connector:
    a. Go to **Extension > Extension > IP Extension**.
    b. Select **Filter > Source > LDAP**.

Applying the LDAP profile to an extension

You can configure an extension with LDAP as the authentication type used to access the user portal and softclient for mobile or desktop devices.

Prerequisite

Before applying the LDAP profile to an extension, make sure to complete the steps in Creating an LDAP profile on page 105.

Procedure steps

1. Go to **Extension > Extension > IP Extension** and click **New**, or edit an existing extension.
2. Under **User Setting**, in the **Web Access** tab, set **Authentication type** to **LDAP**.
3. Select an **LDAP profile** to apply to this extension.
4. During the creation of the LDAP profile, you selected an user authentication option. The choice you made dictates how to fill in the **Authentication ID** field:
   - If you selected **Try Common Name with Base DN as Bind DN**, then update the **Authentication ID** field to match the common name attribute (example, uid) that you entered in the **Common name ID** field of the LDAP profile. Example: jdoe.
   - If you selected **Search User and Try Bind DN**, then leave the **Authentication ID** field empty.
5. Click **Create** or **OK**.

Schedules – best practices

Each schedule you create can be used within the call handling of the FortiVoice to direct calls during various times of the day, such as your business hours, after hours and holidays. Schedules can easily be edited to change hours, include specific days with modified hours, or even add new holidays.

Schedules are used for handling calls in the following features:

- Inbound call handling
- Outbound call handling

- Extension call handling
- Ring groups call handling
- Virtual number call handling

As schedules for these features are all added in the same way, this best practice covers an efficient way to create three schedules and how to edit them that works for most businesses.

This section includes the following recipes:

- Creating schedules on page 109
- Configuring call handling with schedules on page 116

Creating schedules

FortiVoice has two methods for creating a schedule, **Calendar** and **Standard**, both of which are used to create the schedules outlined within this recipe. FortiVoice contains three example schedules (**business_hours**, **after_hours**, and **holiday**) and a schedule called **any_time** which can be used to handle calls for any time that is not configured within a separate schedule. As a best practice, the following is recommended:

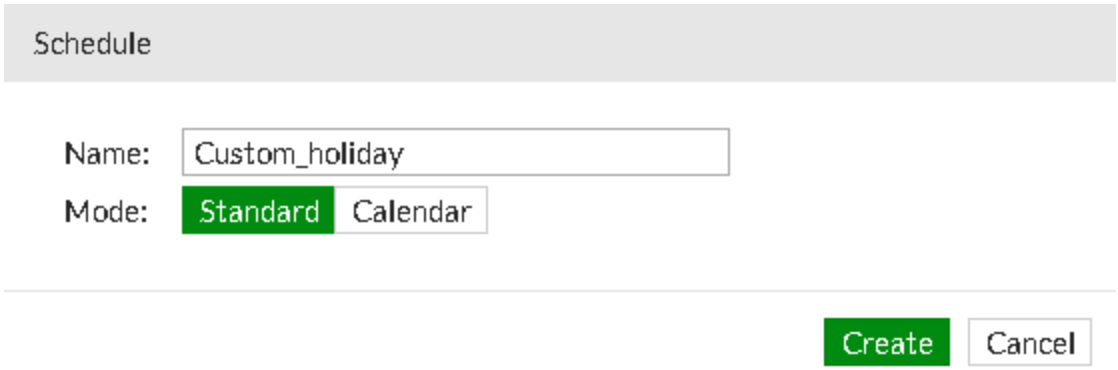
- Create a **Standard** schedule to handle your holidays.
- Create a **Calendar** based schedule for your business hours.
- Use the **any_time** schedule to handle time outside of business hours.

A holiday schedule should use the **Standard** based schedule, which allows for the quick addition of holidays. The holiday schedule will run for the entire day so no time ranges are required.

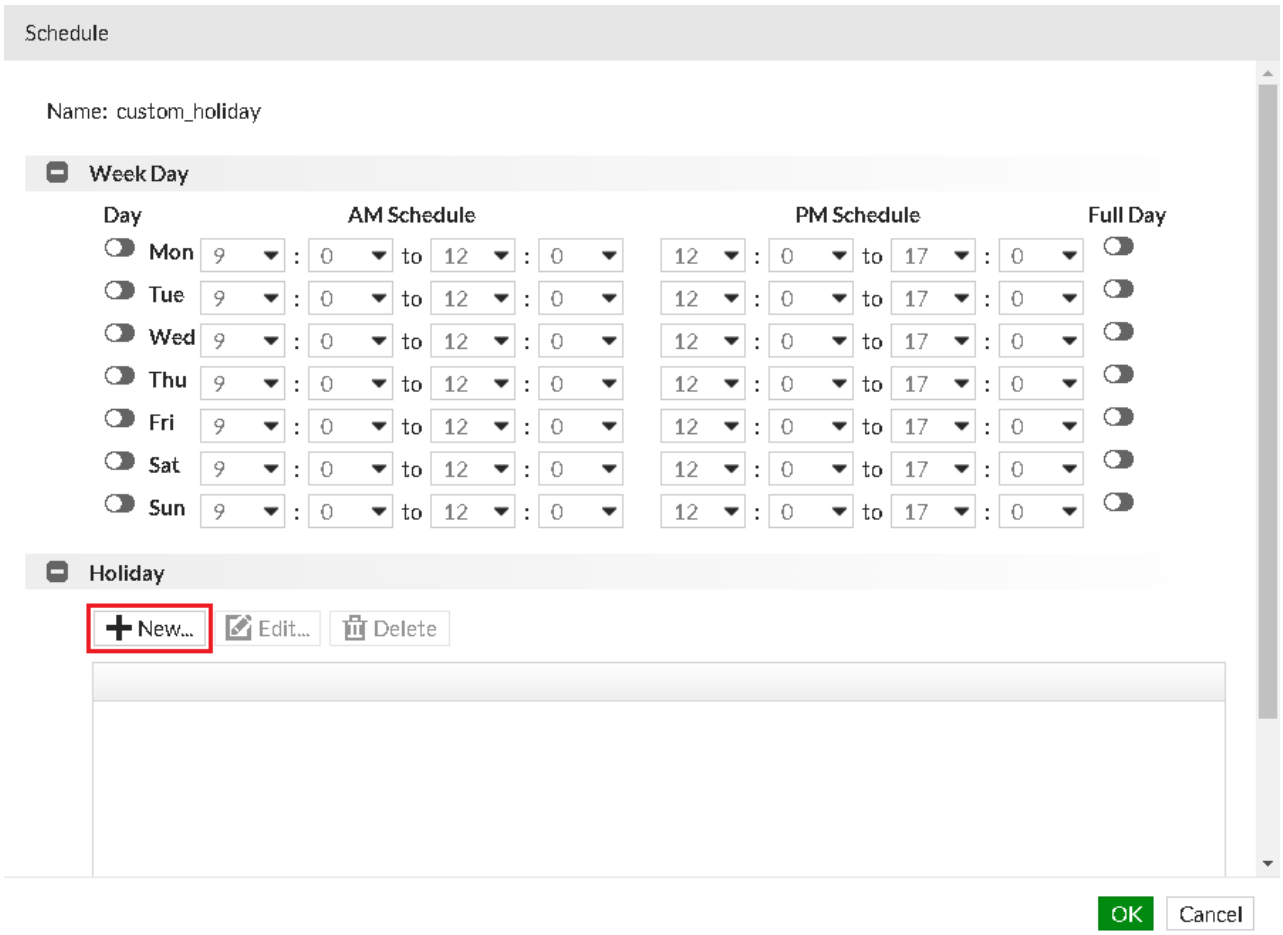
By default, FortiVoice uses a schedule called **any_time** to handle hours that have not already been configured within a schedule. For example, if you have a business hours schedule for 10 AM to 6 PM but no other schedule created, the hours outside that schedule (6 PM to 9 AM the next day) will be handled by the **any_time** schedule.

To add holiday dates in a Standard based schedule:

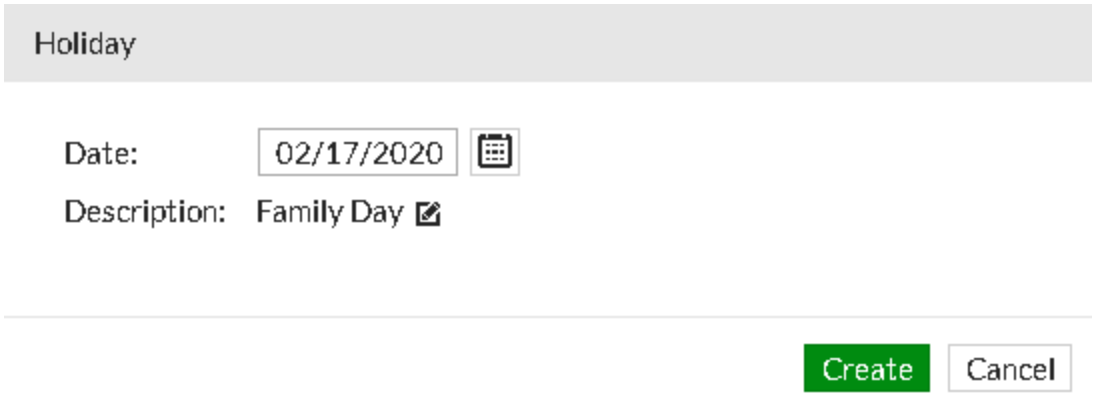
1. Go to **Phone System > Profile > Schedule** and click **New**.
2. Enter a **Name** (in this example, **Custom_holiday**), set **Mode** to **Standard**, and click **Create**.



3. After creating the schedule, select it the list and click **Edit**.
4. Expand **Holiday** and click **New**.

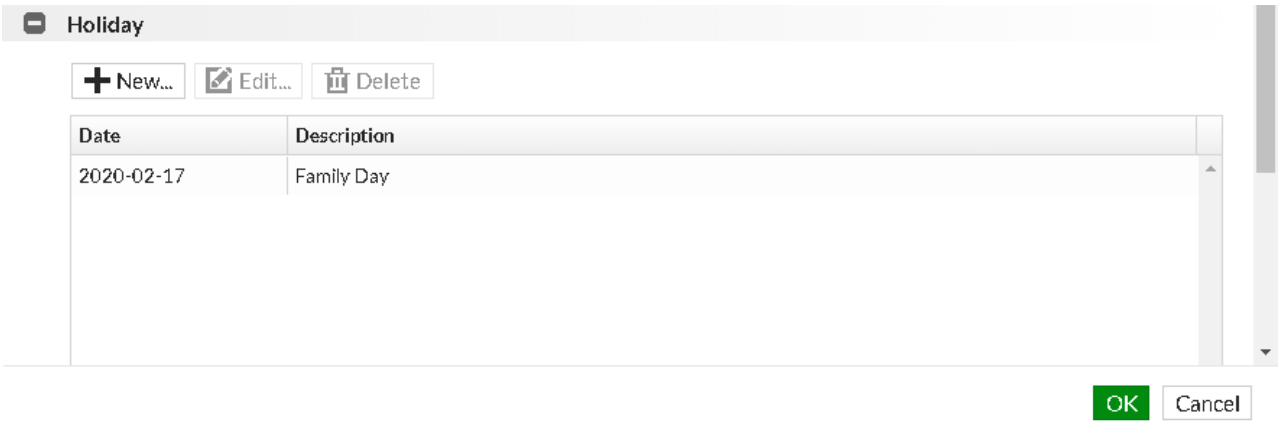


5. Select the **Date** and enter a **Description**, and click **Create**.



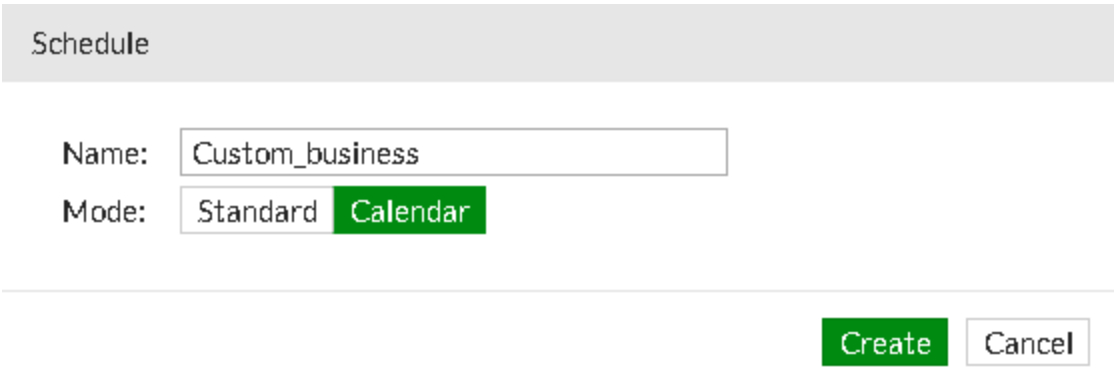
The new holiday is added to the list.

6. Click **OK**.

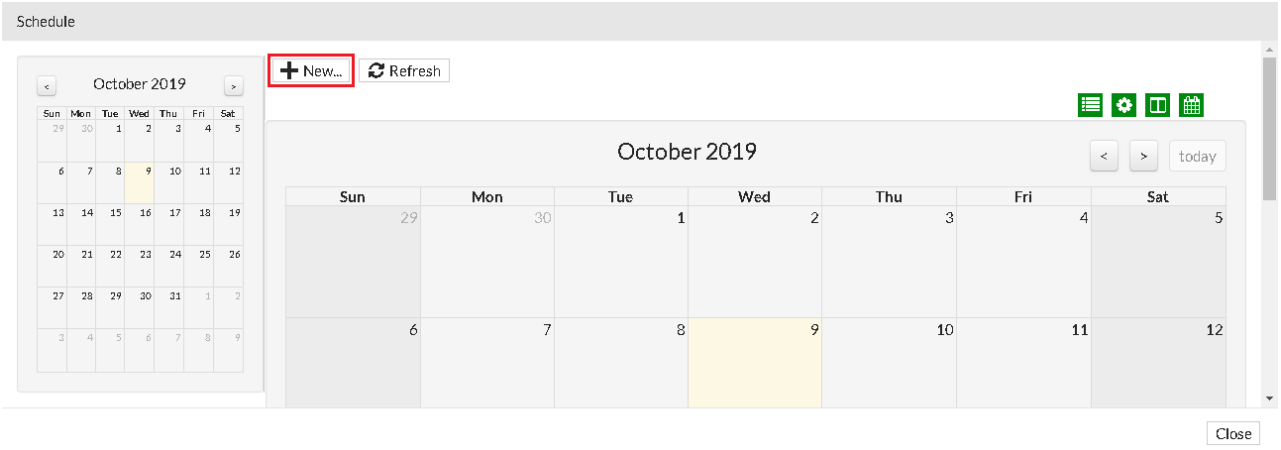


To create a Calendar based schedule for your business hours:

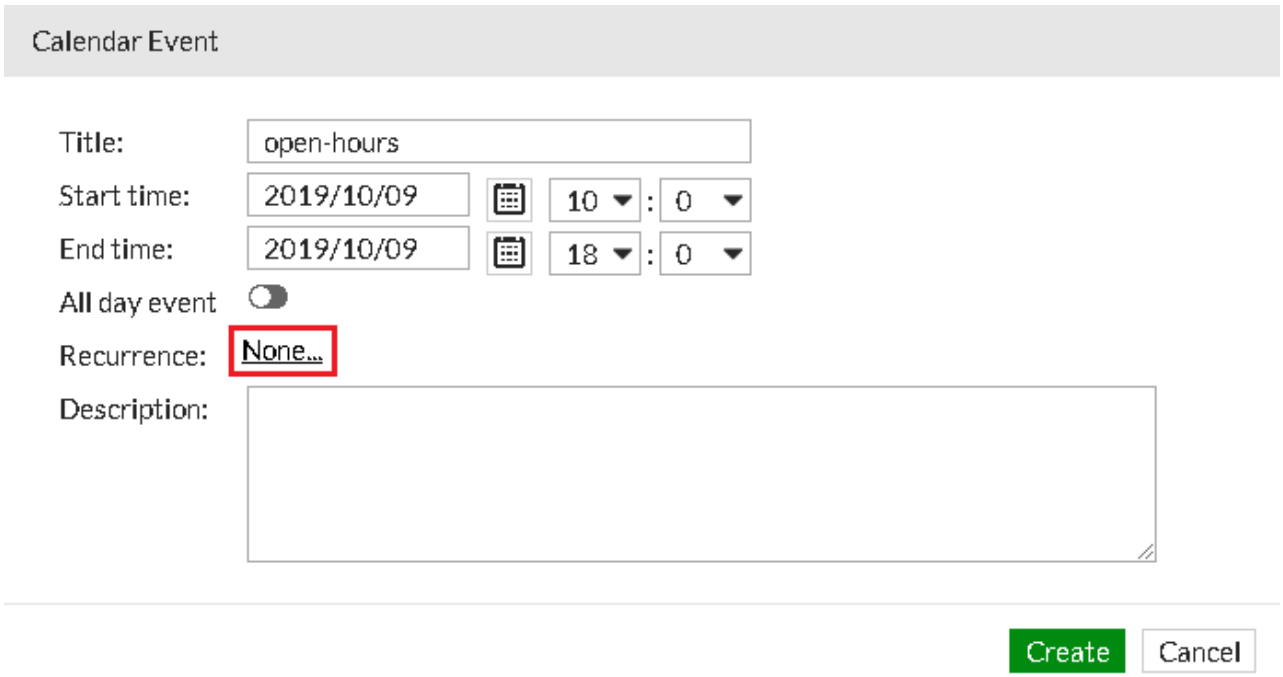
1. Go to **Phone System > Profile > Schedule** and click **New**.
2. Enter a **Name** (in this example, **Custom_business**), set **Mode** to **Calendar**, and click **Create**.



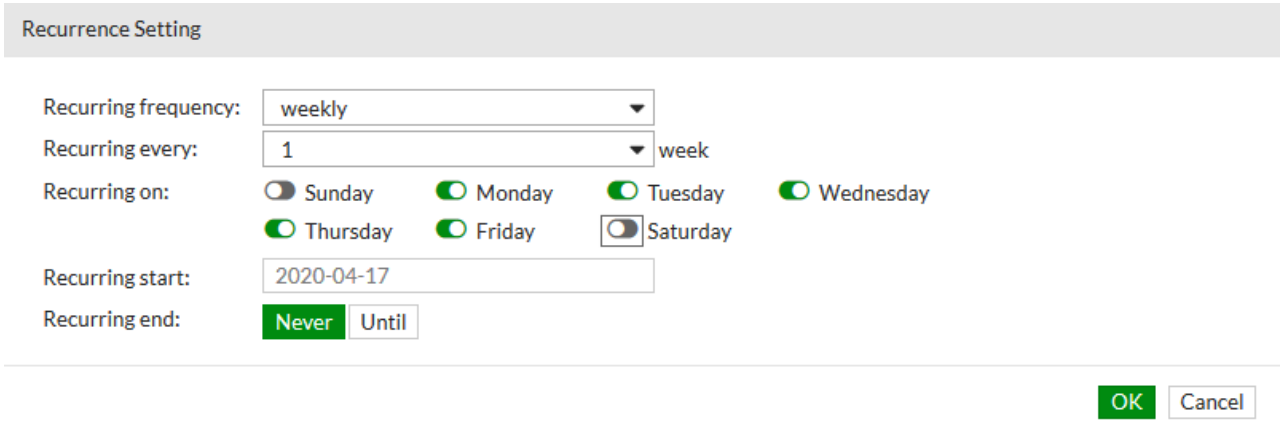
3. After creating the schedule, select it from the list and click **Edit**.
4. You will be presented with the calendar view. Click **New**.



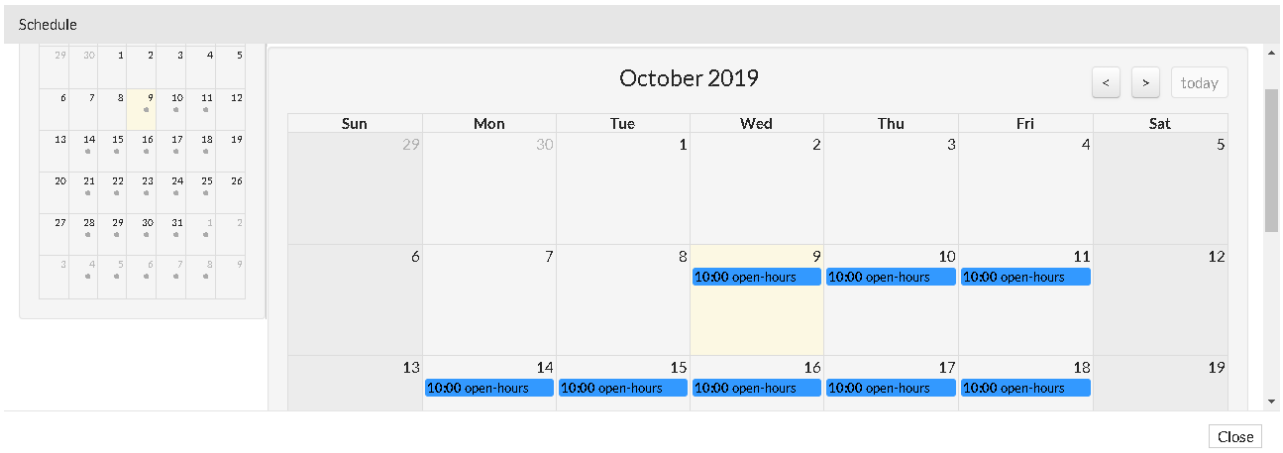
5. Enter a **Title**, a **Start time**, and an **End time**. These are your business operation hours (in this example, 10 AM to 6 PM). Then click **None** next to **Recurrence** to configure a recurrent frequency.



6. Set the following **Recurrence Setting**. In this example, an indefinite weekday-only schedule that occurs every week.
7. Click **OK**, and then **Create**.



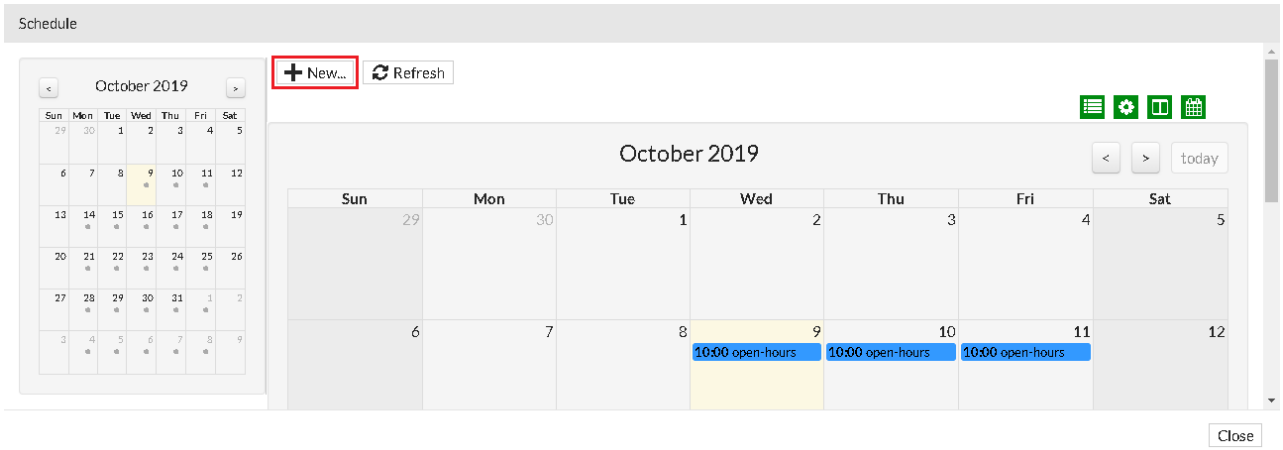
The calendar view shows the business hours schedule automatically populated for each day that was selected.



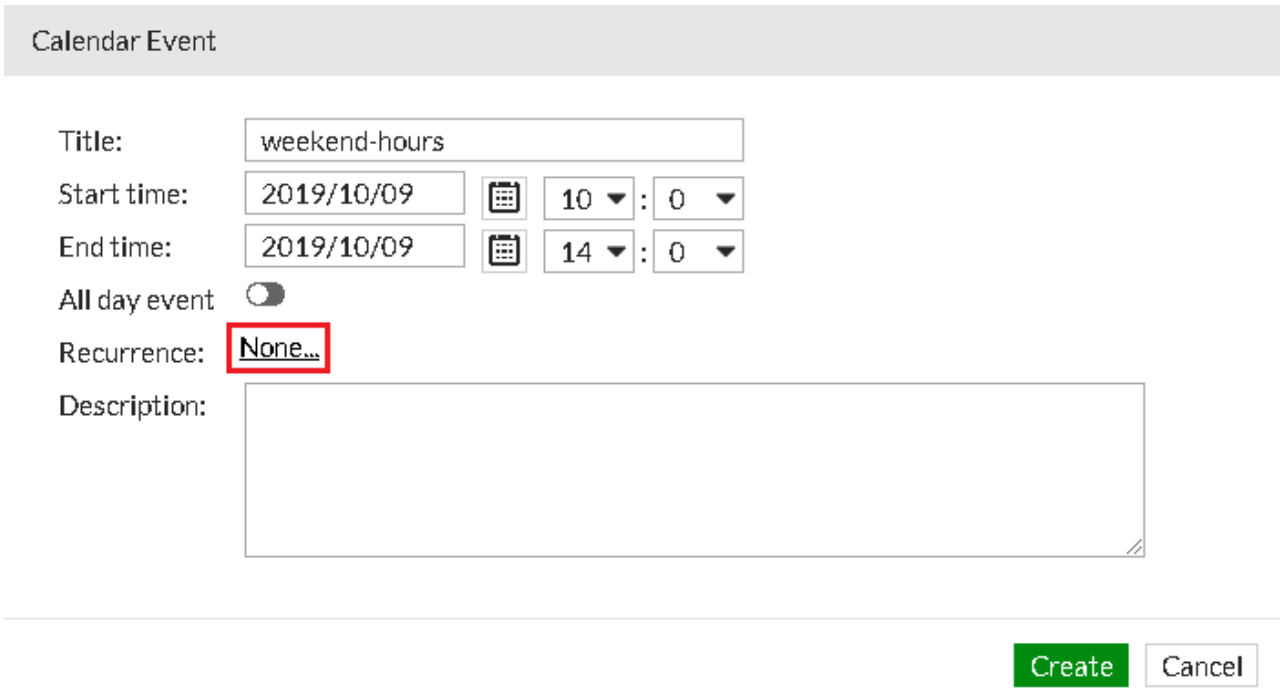
To define different hours for the weekend:

In this example, weekends will be defined as reduced-hour workdays.

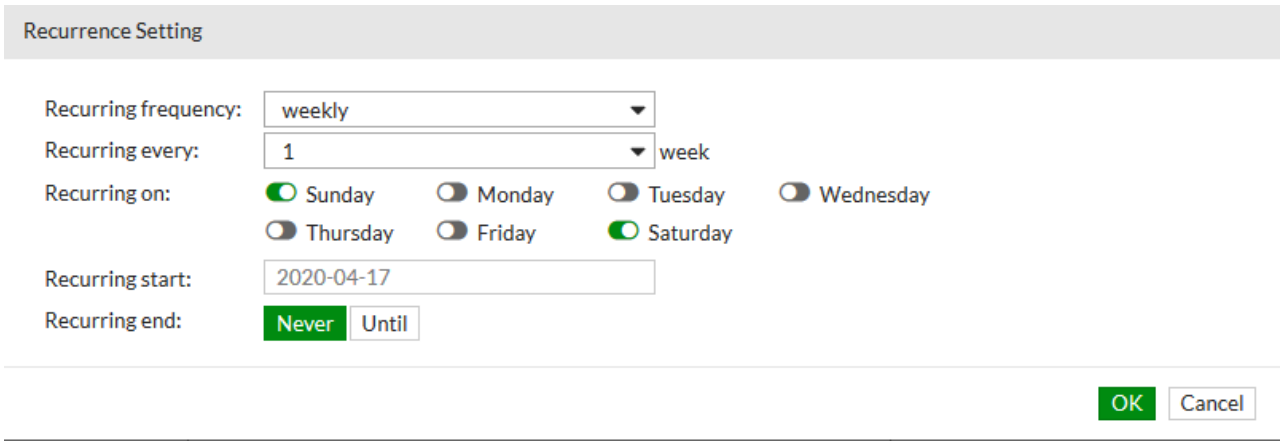
1. Within your existing business calendar, click **New**.



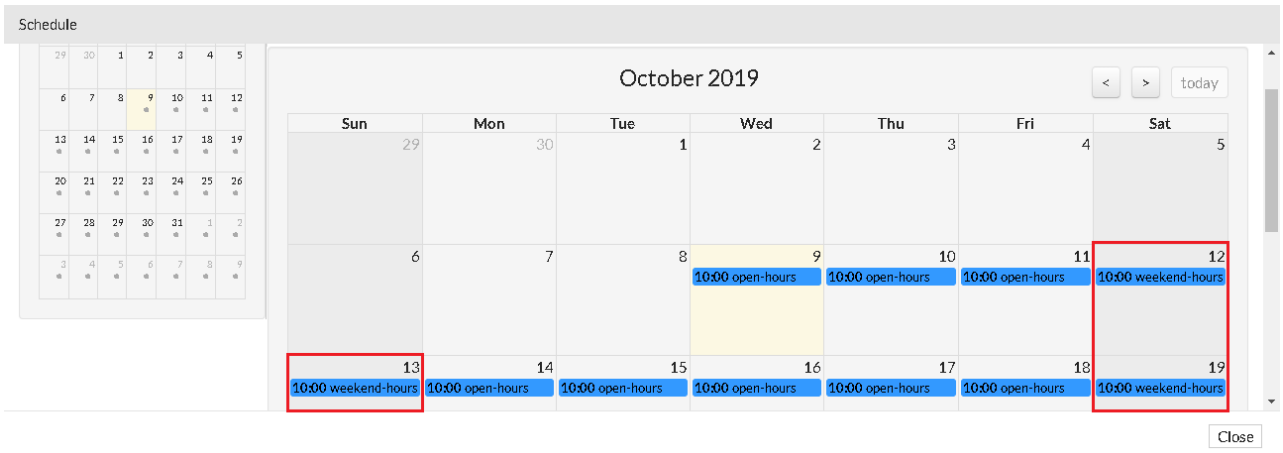
2. Enter a **Title**, a **Start time**, and an **End time**. This is your reduced operation hours (in this example, 10 AM to 2 PM). Note that the date shown here is today/the day you are creating this schedule, and happens to be a weekday. Leave this as it is. Then click **None** next to **Recurrence** to configure a recurrent frequency.



3. Set the following **Recurrence Setting**. In this example, an indefinite weekend-only schedule that occurs every week. Note that **Recurring start** is greyed-out, and is again set to today. This does not matter, as only the days specified in the **Recurring on** fields will be affected by this schedule.
Click **OK**, and then **Create**.



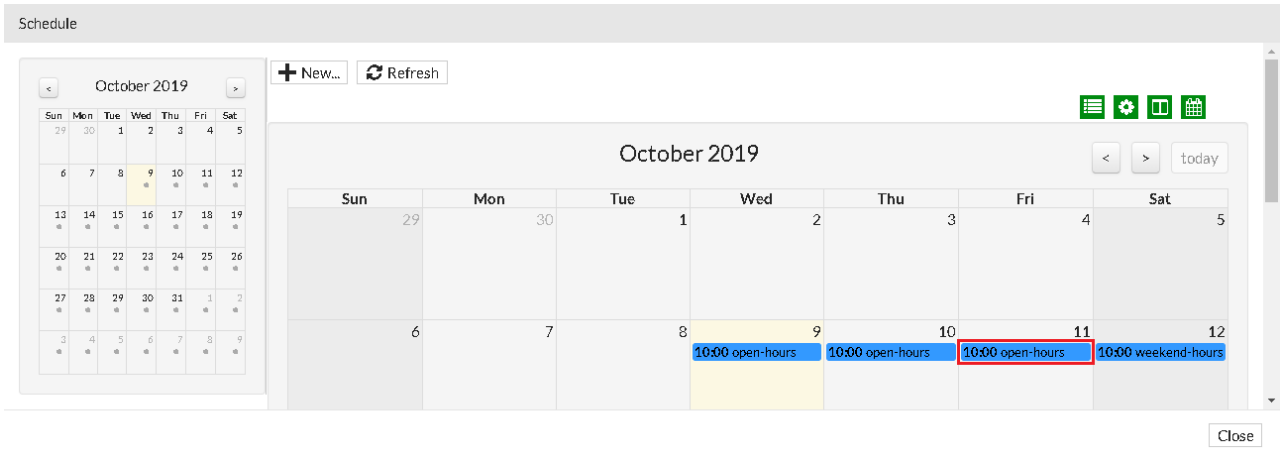
The calendar view shows the newly created weekend hours automatically populated alongside the regular business hours.



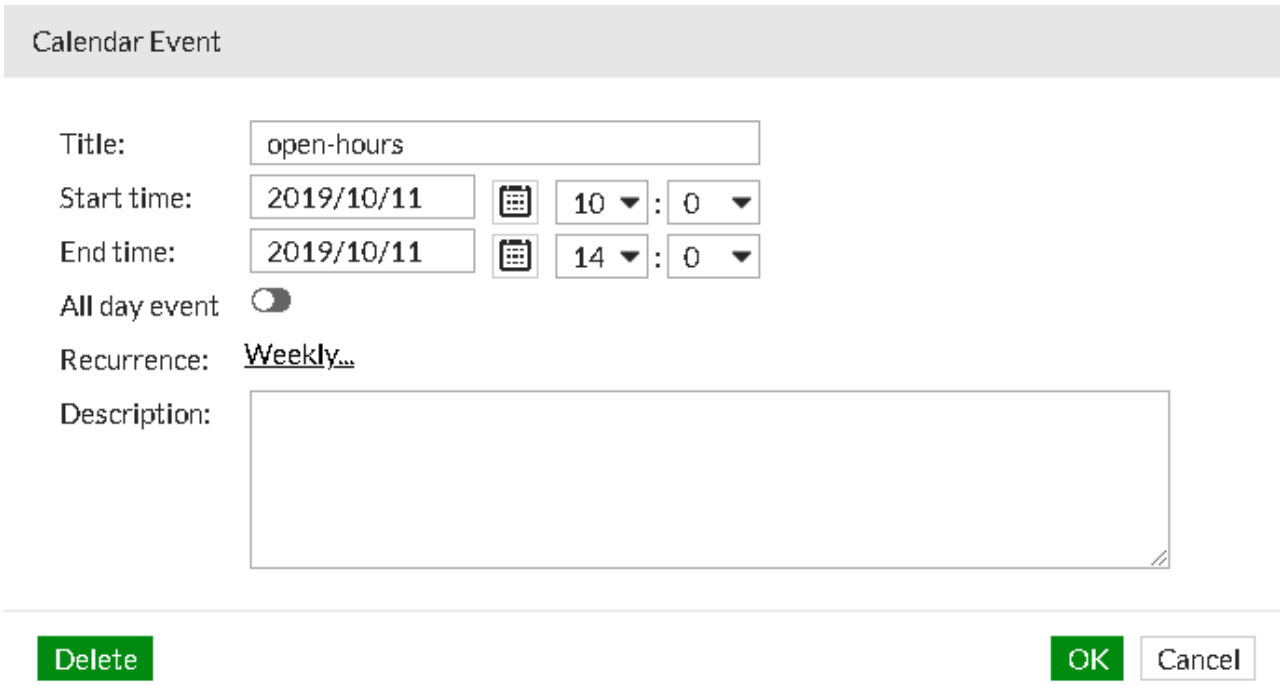
To define unique hours for a specific date:

The benefit to using calendar-based schedules is that they are perpetual schedules that can be easily edited. For example, you may want to edit your business hours for one specific date.

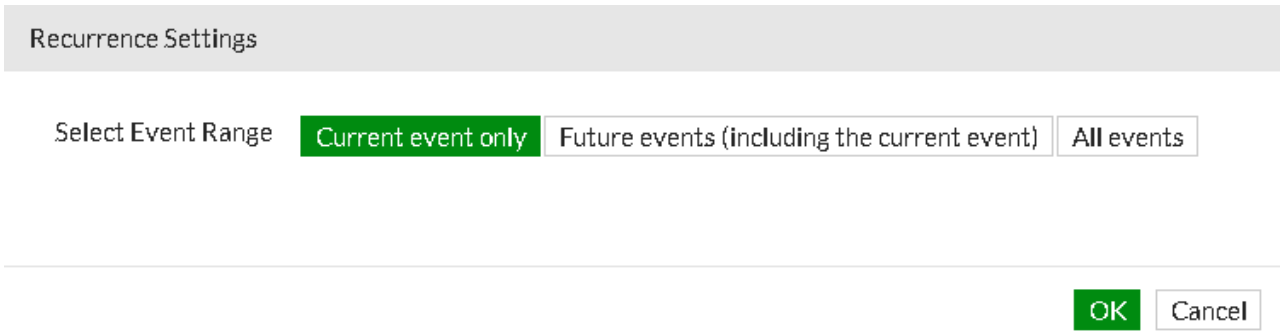
1. Go to **Phone System > Profile > Schedule** and edit your existing calendar-based business schedule.
2. Click the calendar event on the date that you would like to edit (for example, this coming Friday, October 11th). Be sure to click the event itself and not the area surrounding the event, otherwise a new event will be created instead.



3. Change the hours as necessary, and click **OK**. In this example, the **End time** has been reduced from 6 PM to 2 PM.



4. Before the new time can take effect, set **Select Event Range** to **Current event only**, meaning that only this specific day will be affected. Click **OK**.



Configuring call handling with schedules

When you have schedules ready to use, they can be added to the call handling of any of the FortiVoice features. As the configuration for adding a schedule is the same for all features, one call handling example will be used for inbound calls.

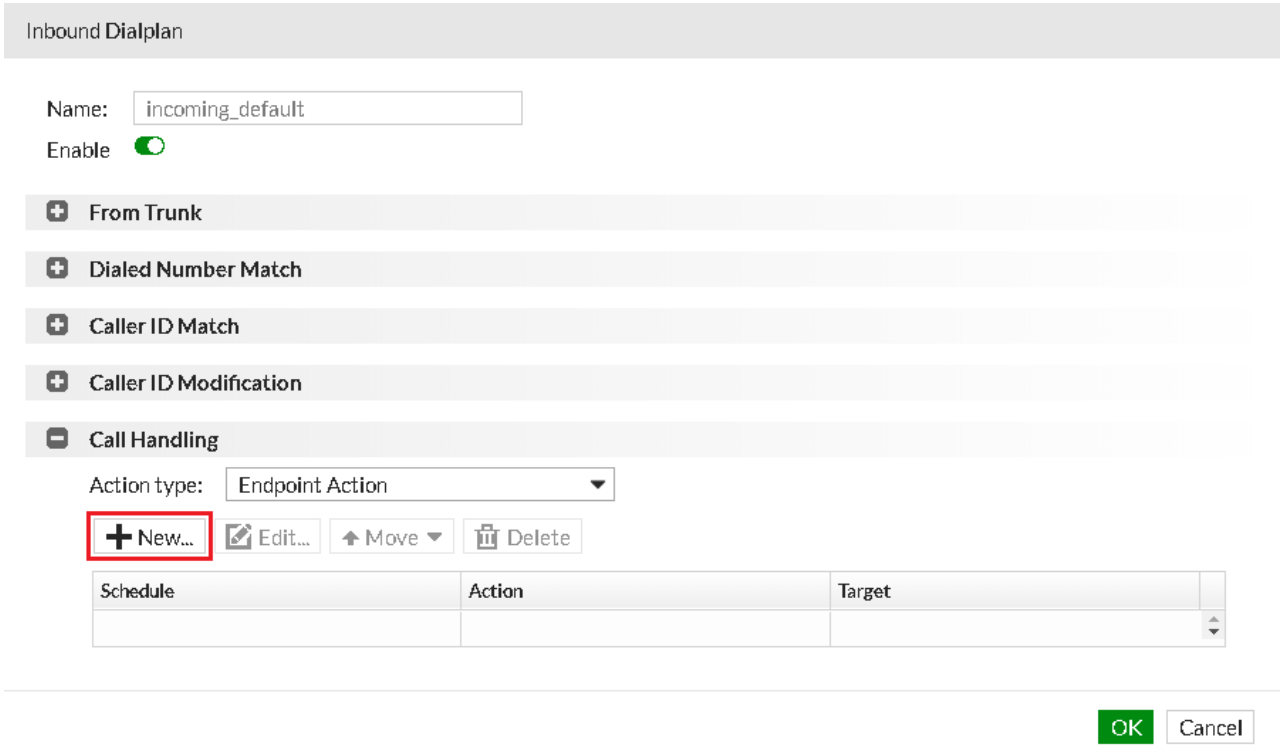
In this example the schedules will be put in a specific order as the FortiVoice checks schedules in the list from first to last. The order of the schedules will be:

- **Custom_holiday**: Checked first to see if the calls are coming in during a scheduled holiday.
- **Custom_business**: Checked second to ensure the call is coming in during scheduled business hours.
- **Any_time**: Checked last to handle any calls that fall outside of the business hours.

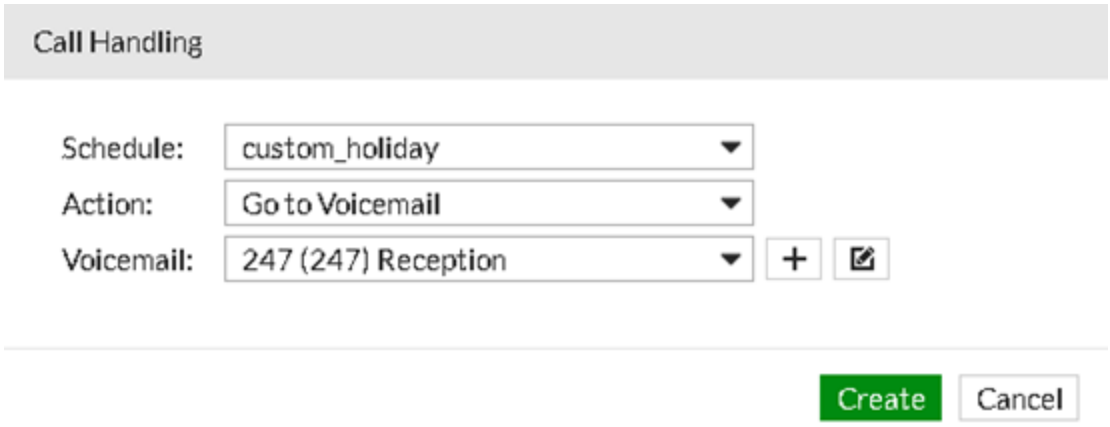
To configure inbound call handling with a schedule:

1. Go to **Call Routing > Inbound > Inbound**.
2. Select your inbound call routing rule and click **Edit**.

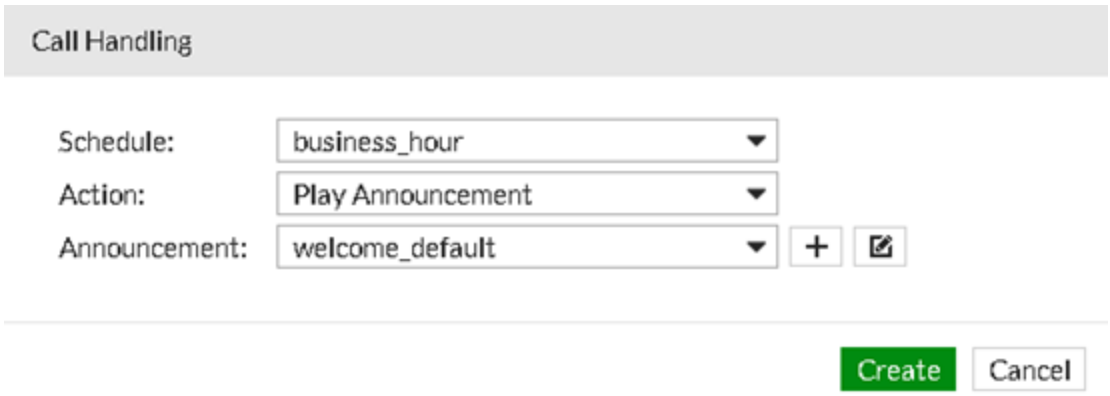
3. Under **Call Handling** click **New**.



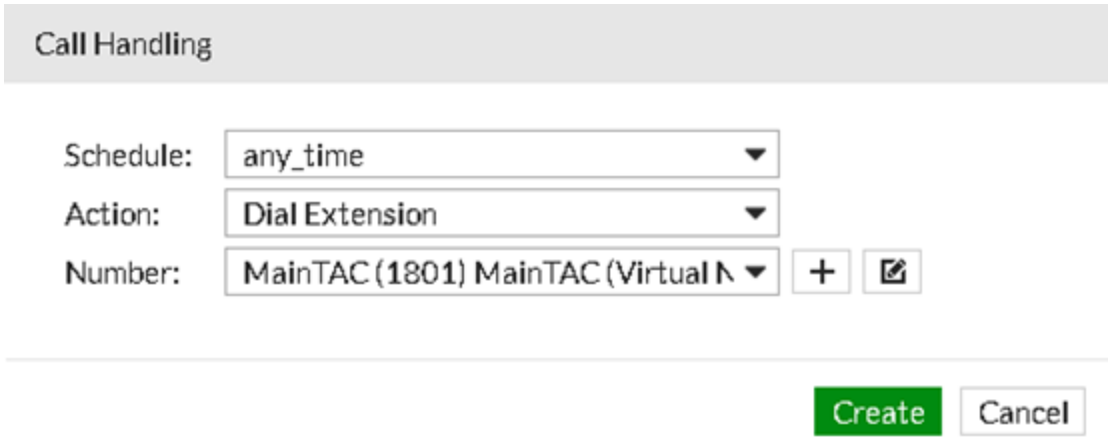
4. Set **Schedule** to the holiday schedule, and set an appropriate **Action** to perform on holidays. Click **Create**.



5. Click **New** to create a second **Call Handling** action.
6. Set **Schedule** to the business schedule, and set an appropriate **Action** to perform during business hours. Click **Create**.



7. Click **New** to create a third **Call Handling** action.
8. Set **Schedule** to the default any_time schedule, and set an appropriate **Action** to perform outside of business hours. Click **Create**.



9. Click **OK** to finish the inbound dial plan configuration.

Security

This section contains information about establishing and maintaining a secure phone system.

When developing a secure network topology for your FortiVoice phone system, make sure to:

- Include a FortiGate next-generation firewall.
- Verify that your FortiVoice phone system has the latest software to take advantage of the latest features and enhancements that are available to you. For details about installing the latest firmware, see the Installing firmware section in the FortiVoice Phone System Administration Guide.

This section includes the following recipes:

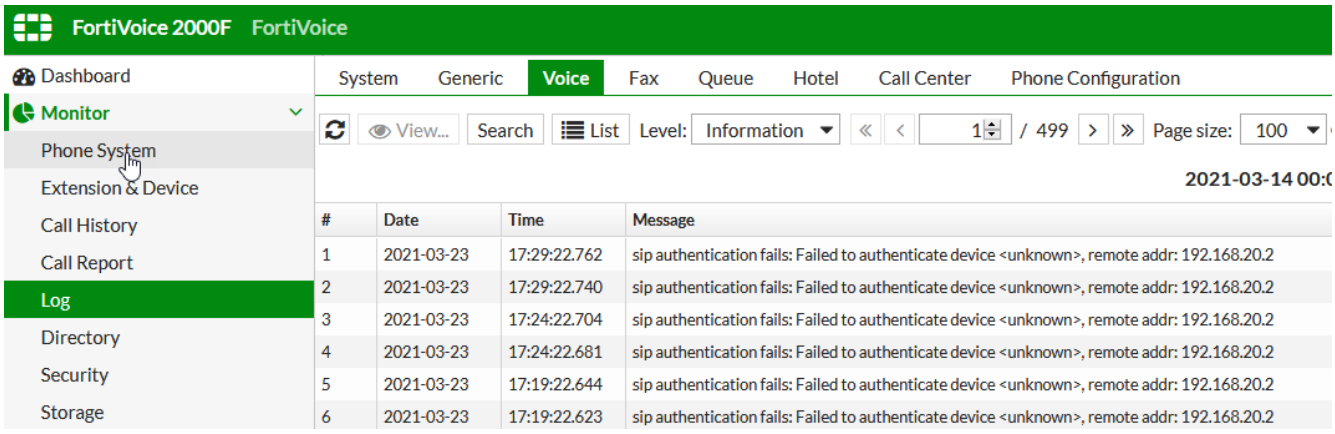
- Detecting the security risks on page 119
- Changing the default external access ports on page 121
- Changing the default passwords on page 122
- Disabling recommended features on page 126
- Configuring additional settings on page 127
- Monitoring and reporting on page 132

Detecting the security risks

This section describes how to detect the security risks and take actions to secure the FortiVoice phone system.

Monitor > Log > Voice provides the window to investigate the security risks. It displays the phone call activities between your FortiVoice unit and other PBXes. The "**sip authentication fails**" messages shows the IP addresses that have failed to obtain the authentication from your FortiVoice unit and some of these IP addresses might be security risks. Depending on the configured threshold, the FortiVoice unit will block the IP addresses if their number of attempted logins have reached the set threshold. Meanwhile, the alert email is sent out. See Setting the authentication failure parameters on page 120.

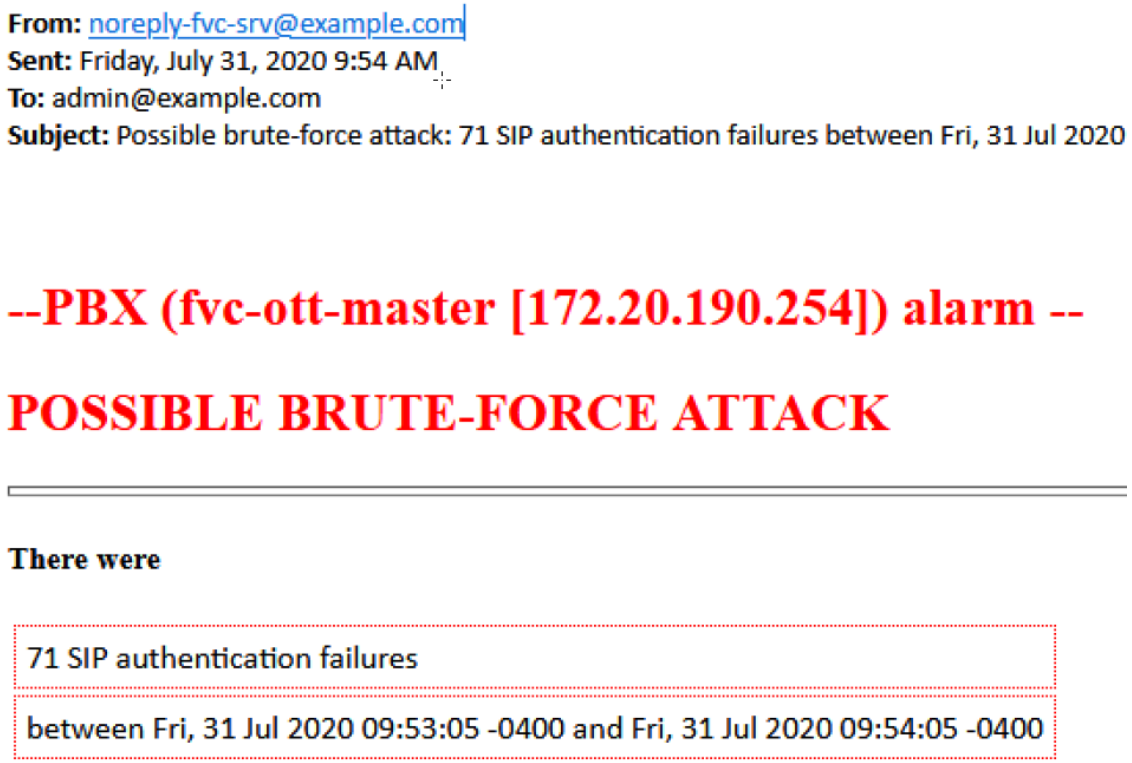
Voice log example:



To send alert emails, enter the email address in **Log & Report > Alert > Configuration** and enable the **Massive SIP authentication failure** option in **Log & Report > Alert > Category.**

You may take actions after receiving an alert email. See Reviewing blocked SIP device IP addresses on page 121.

Alert email example:



Setting the authentication failure parameters

You can use the CLI to set the authentication failure parameters.

```
config security sip-authentication-failure
   set threshold
   set interval
   set max-notification
end
```

CLI command	Description
config security sip-authentication-failure	Use this command to configure SIP authentication failure parameters.
set threshold	Set the threshold for blocking IP addresses from logging in to the FortiVoice Phone System and sending an alert email. The default is 50 attempted logins per minute.
set interval	Set the time interval to check the phone call activities. The default is 60 seconds.
set max-notification	Set the maximum notification emails to send after the threshold is reached. The default is 100.

Reviewing blocked SIP device IP addresses

The FortiVoice unit automatically blocks IP addresses of the SIP devices that initiate the attacks against any extensions based on the thresholds and parameters set.

For blocked IP addresses, you may select an IP address to delete it, add it to the exempt list if it is wrongly blocked, and view its blocked history.

For auto exempt IP addresses, you may select an IP address to delete it if you find it suspicious.

To view the blocked IP addresses, go to **Monitor > Security > Blocked IP.**

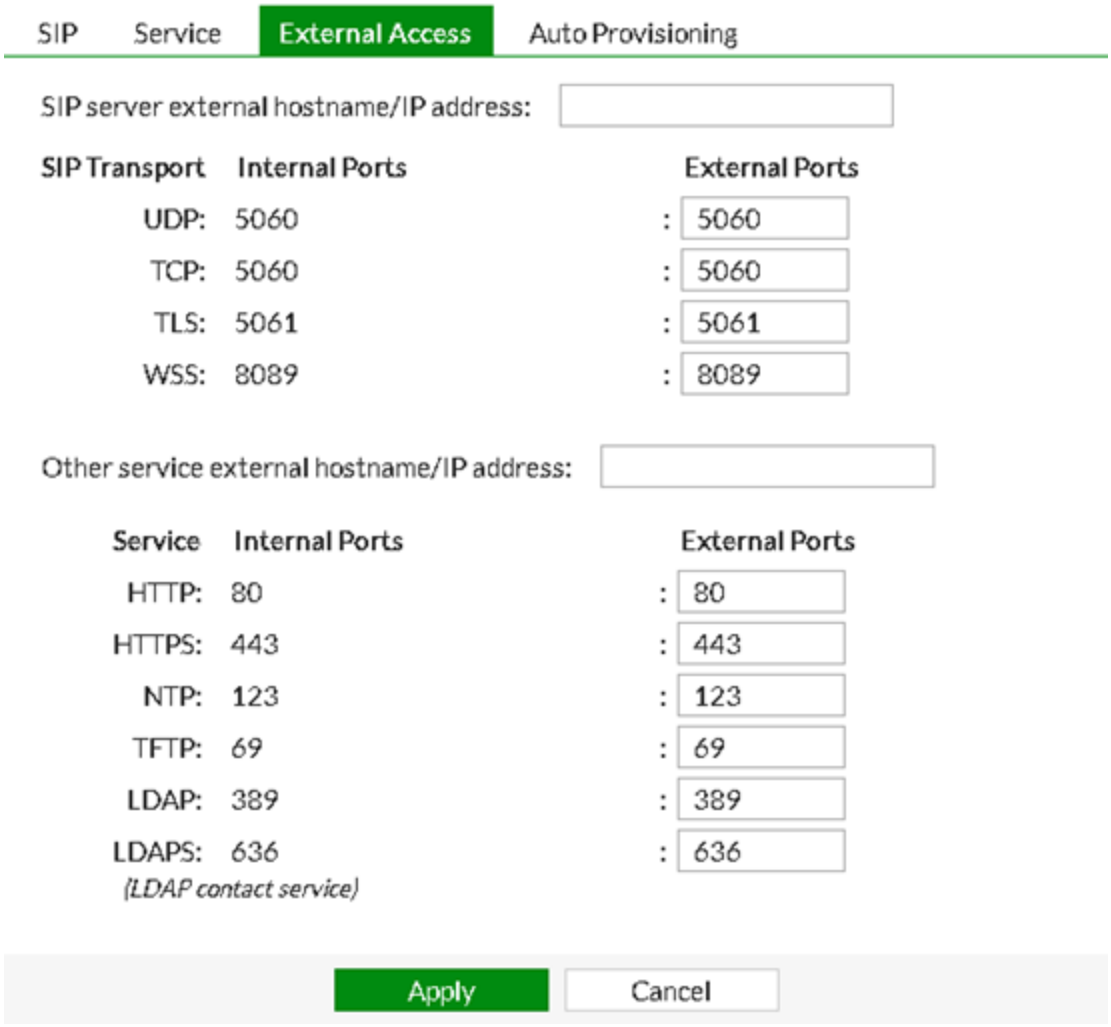
To view the exempted IP addresses, go to **Monitor > Security > Auto Exempt IP.**

Changing the default external access ports

SIP communication commonly uses TCP or UDP port 5060 and/or 5061. Port 5060 is used for nonencrypted SIP signaling sessions and port 5061 is typically used for SIP sessions encrypted with Transport Layer Security (TLS).

Avoid changing any of the protocol ports to four digit numbers, such as 5065 or 5070, as those are used by other brands and are commonly scanned port numbers.

1. Go to **System > Advanced > External Access**.
2. You have the option to change the following SIP transport protocol ports:
   - **UDP**: This is the default signaling port used for external extensions, VoIP trunking, and office peers. Choose a five digit number.
   - **TCP**: This is the default signaling port used for the FortiFone softclient. Choose a five digit number.
   - **TLS**: This is the default port for SIP sessions encrypted with Transport Layer Security (TLS). Choose a five digit number.
   - **WSS**: WebSocket Secure is used to support the FortiFone desktop application. Choose a five digit number.
3. Additionally, you can configure the service external ports. Click **Apply** when finished.



Changing the default passwords

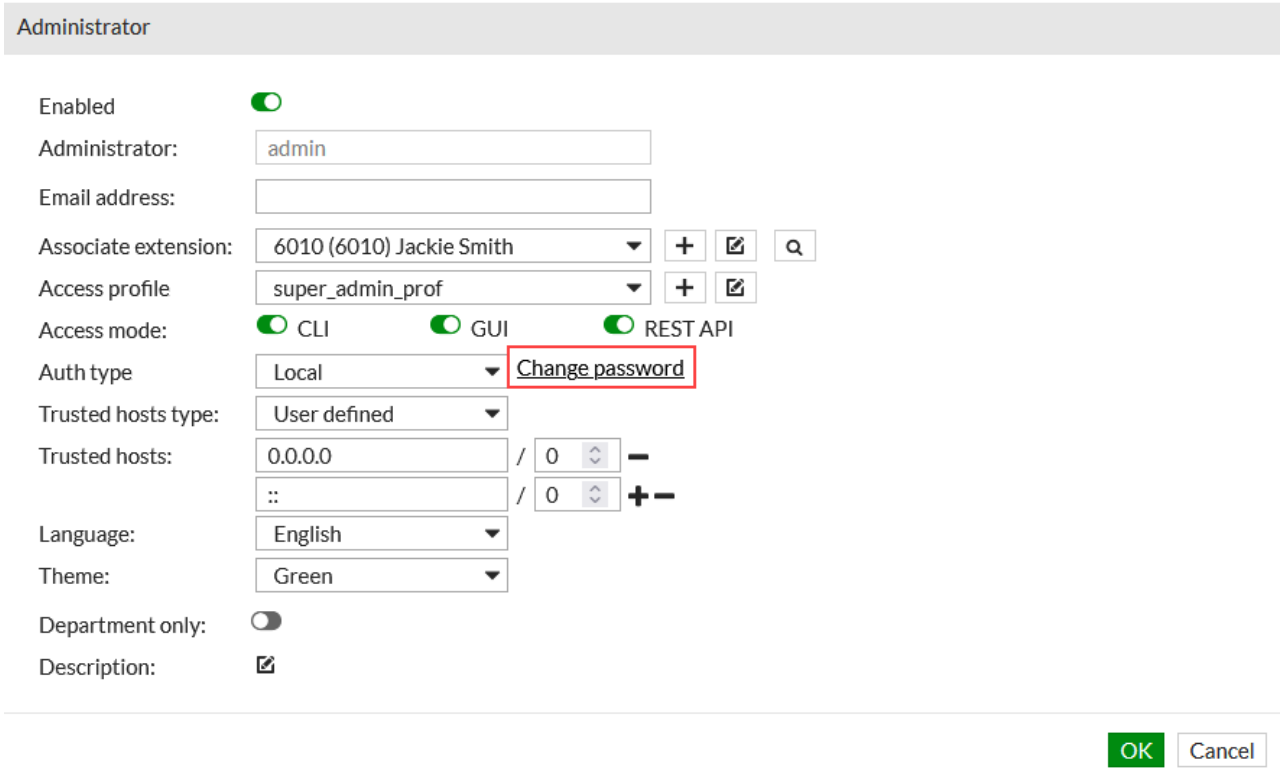
Many of the default passwords are too simple and are therefore more susceptible to compromise. It is recommended to take the time to change the default passwords to more secure passwords.

Administrator password

Establish a more secure administrator password on the system.

1. Go to **System > Administrator > Administrator**.
2. Select the **admin** account and click **Edit**.

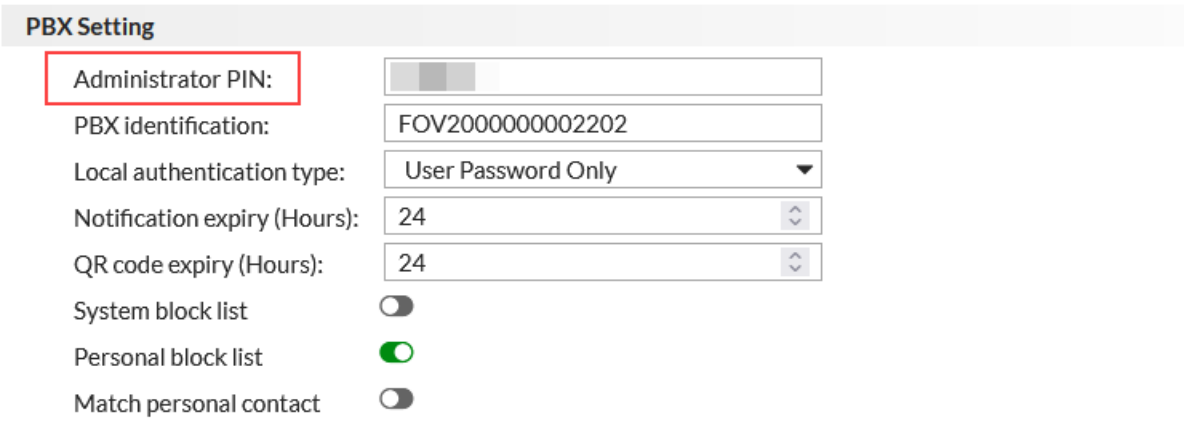
3. Click **Change Password**, enter and confirm a new password, and click **OK**.



Administrator PIN

The administrator PIN allows the owner of the PIN to change extension assignments and modes from any phone or auto attendant.

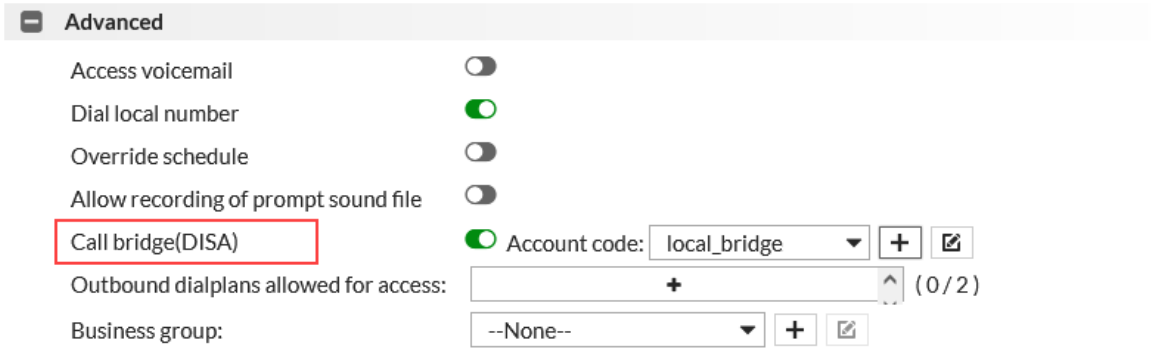
1. Go to **Phone System > Setting > Miscellaneous**.
2. Under **PBX Setting**, enter a new **Administrator PIN**, and click **Apply**.



Call Bridge (DISA) account code

The Call Bridge Direct Inward System Access (DISA) feature allows callers to make outgoing calls from the auto attendant. If enabled, configure this feature to use an account code.

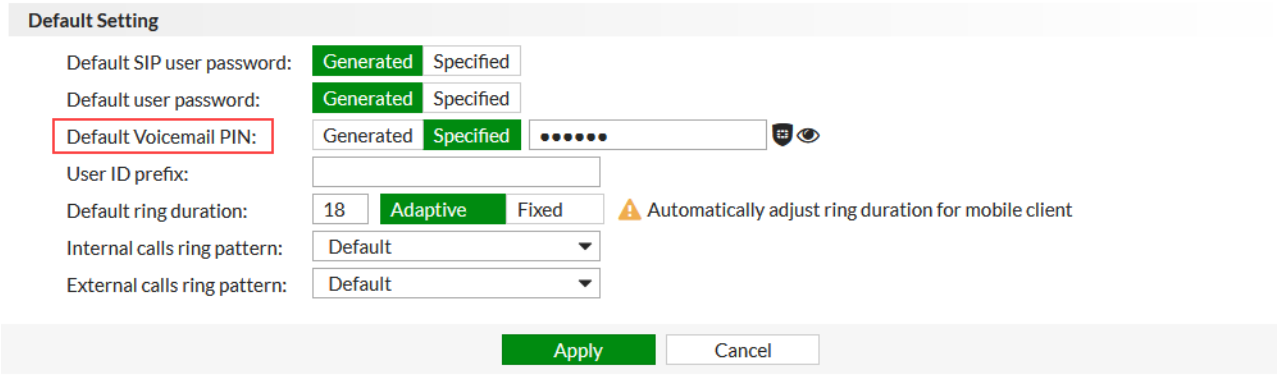
1. Go to **Call Feature > Auto Attendant > Auto Attendant**.
2. Select an auto attendant and click **Edit**.
3. Under **Advanced**, enable **Call bridge (DISA)** and select the appropriate **Account code**, or create a new one.
4. Click **OK**.



User voicemail PIN

The default user voicemail PIN is **123123**. It is highly recommended to change this default PIN.

1. Go to **Phone System > Setting > Option**.
2. Under **Default Setting**, enter a new **Default Voicemail PIN**. Select either **Specified** and enter your own PIN or **Generated** to generate a random PIN, and click **Apply**.

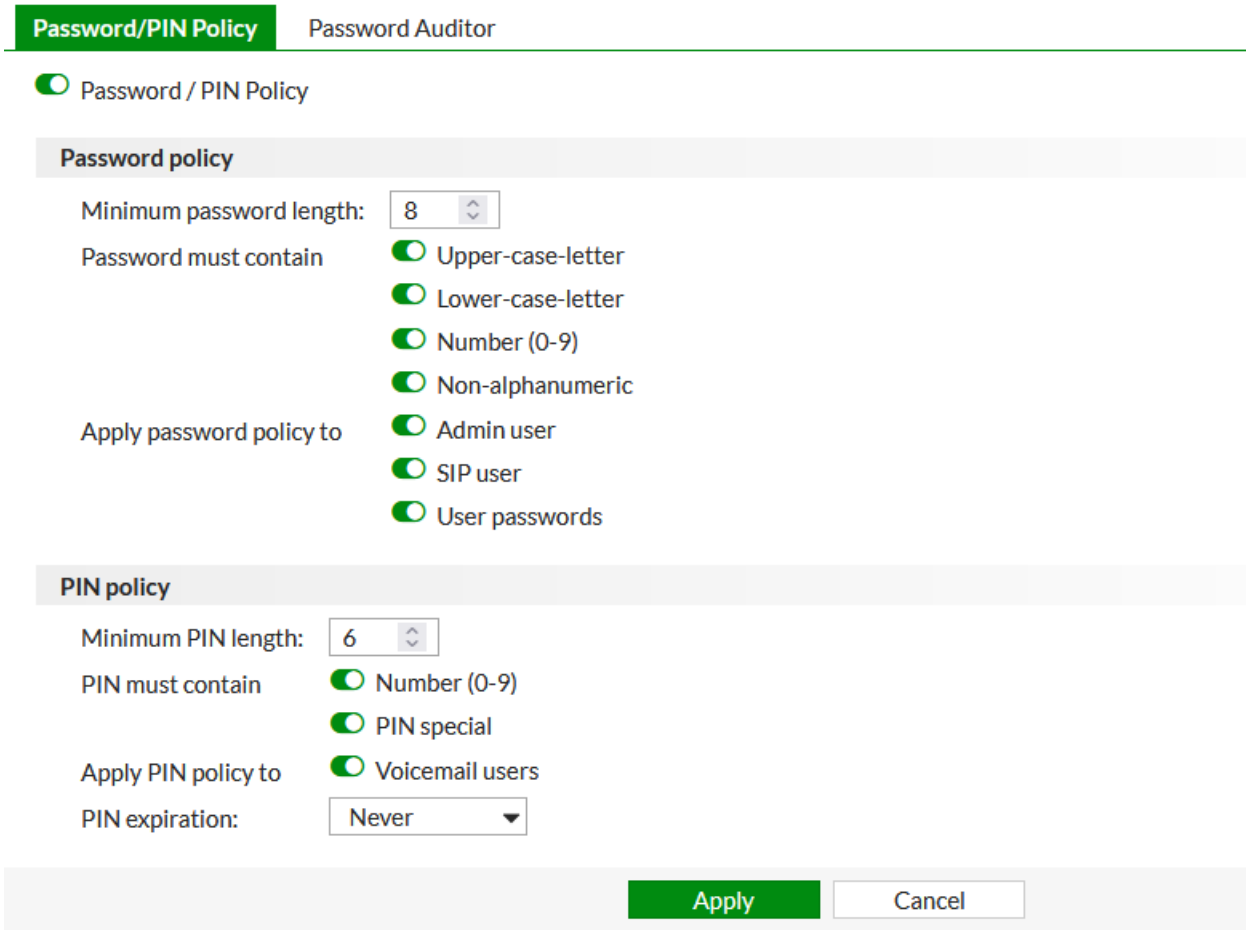


Password and PIN policy

Set a secure password policy that requires upper and lower case characters and alpha numerical characters for administrator passwords and SIP passwords.

1. Go to **Security > Password Policy > Password/PIN Policy**.
2. Enable **Password/PIN Policy** and configure the settings as required. Make sure to apply the password policy to the appropriate users.

3. Enabling **PIN special** allows the use of the * and # special characters.
4. Click **Apply**.



Office peers

Authentication can be configured for inbound and outbound calls on office peer trunks.

1. Go to **Trunk > Office Peer > Office Peer**.
2. Select an existing office peer or create a new one.
3. Under **Peer Configuration**, expand **Authentication** and select one of the following options from the drop-down menu:
   - **Symmetric**: Both PBX devices will use the following information to form the office peer trunk and authenticate each other. The defined **User name** and **Password** must be the same on both PBX devices forming the office peer trunk.
   - **Asymmetric**: Used to authenticate incoming and outgoing calls. Enter the **Inbound user name**, **Outbound user name**, and **Password**. These settings must be the same on both PBX devices forming the office peer trunk.

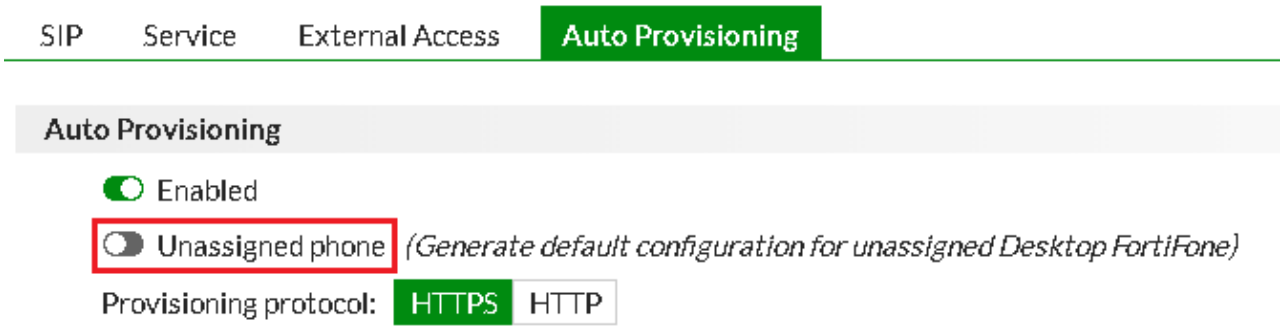
Disabling recommended features

Many features are enabled by default to assist with the initial setup. After setup, however, we recommend disabling any features that you feel are unnecessary.

Default configuration generation

After the initial setup, disable the **Unassigned phone** option. When you disable this feature, FortiVoice does not automatically create a default configuration file when it receives a request from an unassigned phone.

1. Go to **System > Advanced > Auto Provisioning**.
2. Under **Auto Provisioning**, disable **Unassigned phone**. Automatic default configurations for unassigned phones will no longer be generated.
3. Click **Apply**.



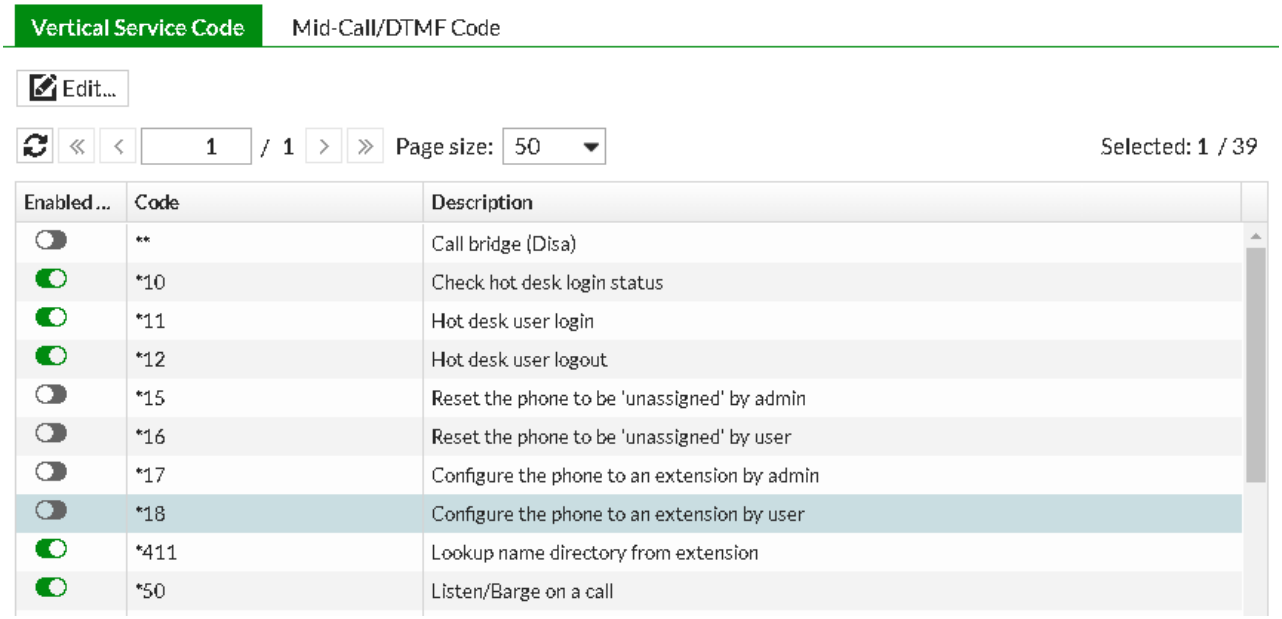
TFTP service

Go to **System > Advanced > Service**, disable **TFTP** since it is not a secure protocal.

Vertical service codes

Disable any service codes that you do not use.

1. Go to **Call Feature > Feature Code > Vertical Service Code**.
2. Disable the codes that you will not be requiring, such as the following:
   - ****: Call bridge (DISA).
   - ***15**: Reset the phone to be "unassigned" by admin.
   - ***16**: Reset the phone to be "unassigned" by user.
   - ***17**: Configure the phone to an extension by admin.
   - ***18**: Configure the phone to an extension by user.



Configuring additional settings

In order to provide another level of protection beyond external abuse, there are a number of settings that you can enable to protect the FortiVoice phone system from internal abuse.

This recipe includes the following settings:

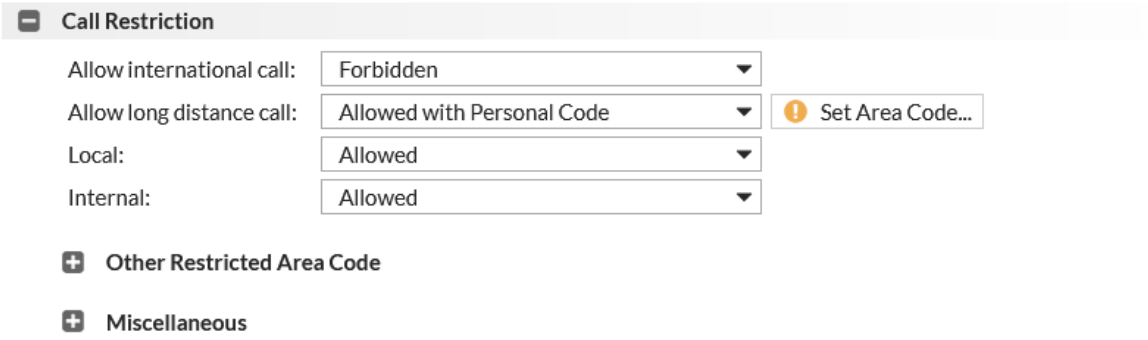
- Call restrictions and common phones on page 127
- Interface access on page 128
- Guest provision protocol on page 129
- Prohibited prefixes on page 129
- Trusted hosts for administrators on page 130
- Trusted hosts for extensions on page 130
- Unused administrators on page 131
- Unused extensions on page 131
- Verify SIP user agent on page 131
- Blocking numbers on page 132
- Unassigned phones on page 132

Call restrictions and common phones

Restrictions can be put in place based on call types, such as blocking international or toll calls.

1. Go to **Security > User Privilege > User Privilege**.
2. Select a user privilege and click **Edit**.

3. Expand **Call Restriction** and configure the settings accordingly.



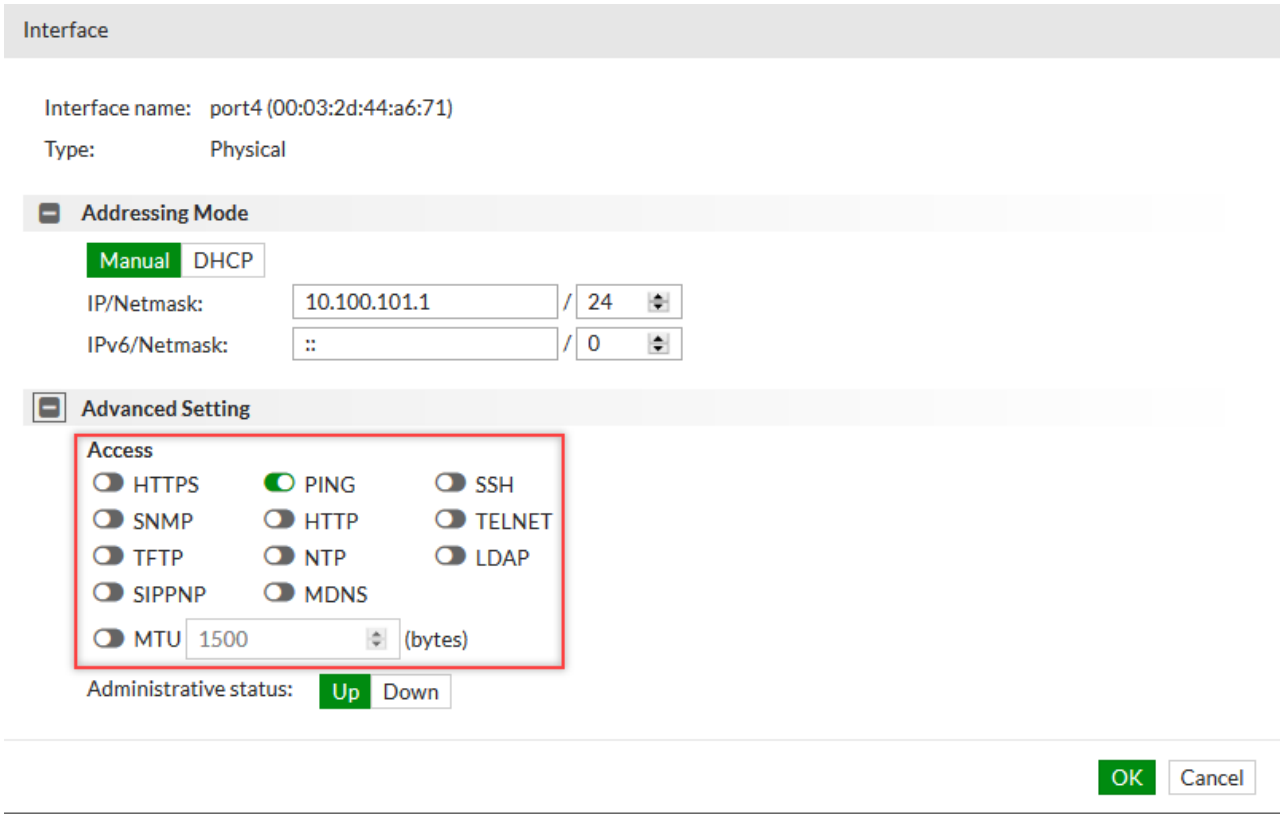
Extensions that are placed in common areas, such as store floors and kitchens, should have the highest restriction levels, which include a PIN code to make calls.

4. Set the appropriate call restriction to **Allowed with Account Code**, **Allowed with Personal Code**, or **Allowed with Account and Personal Code**.

Interface access

Any access methods that are not being used on the FortiVoice device should be disabled.

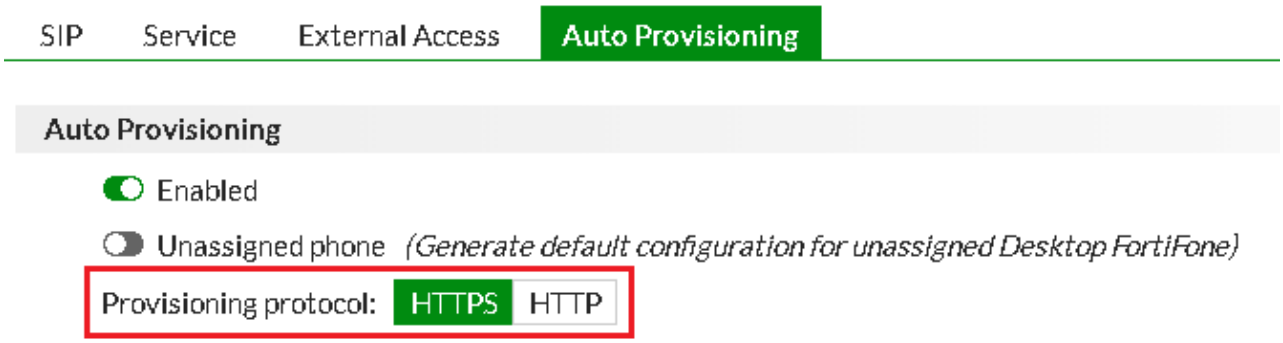
1. Go to **System > Network > Network**.
2. Select an interface and click **Edit**.
3. Under **Advanced Setting**, disable any unused **Access** protocols.



Guest provision protocol

Using HTTPS to provision FortiFone devices with FortiVoice is recommended.

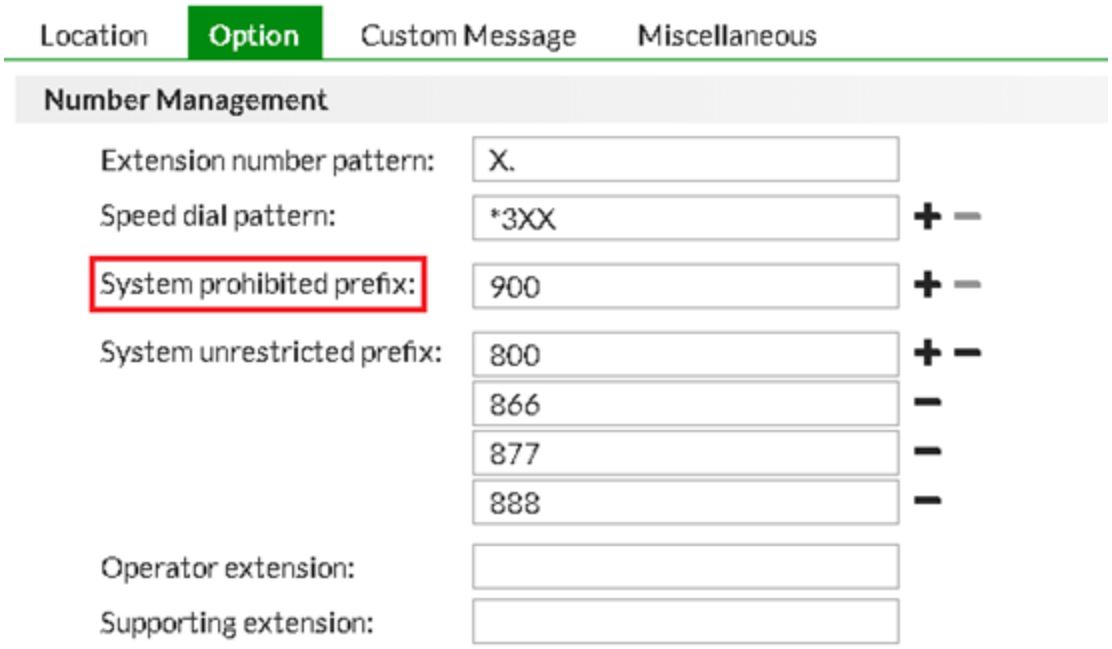
1. Go to **System > Advanced > Auto Provisioning**.
2. Under **Auto Provisioning**, set **Provisioning protocol** to **HTTPS**.



Prohibited prefixes

You may want to outright block certain phone number prefixes, such as 900 (blocked by default) which is commonly used for premium-rate calls, or phone calls with area codes originating from certain regions.

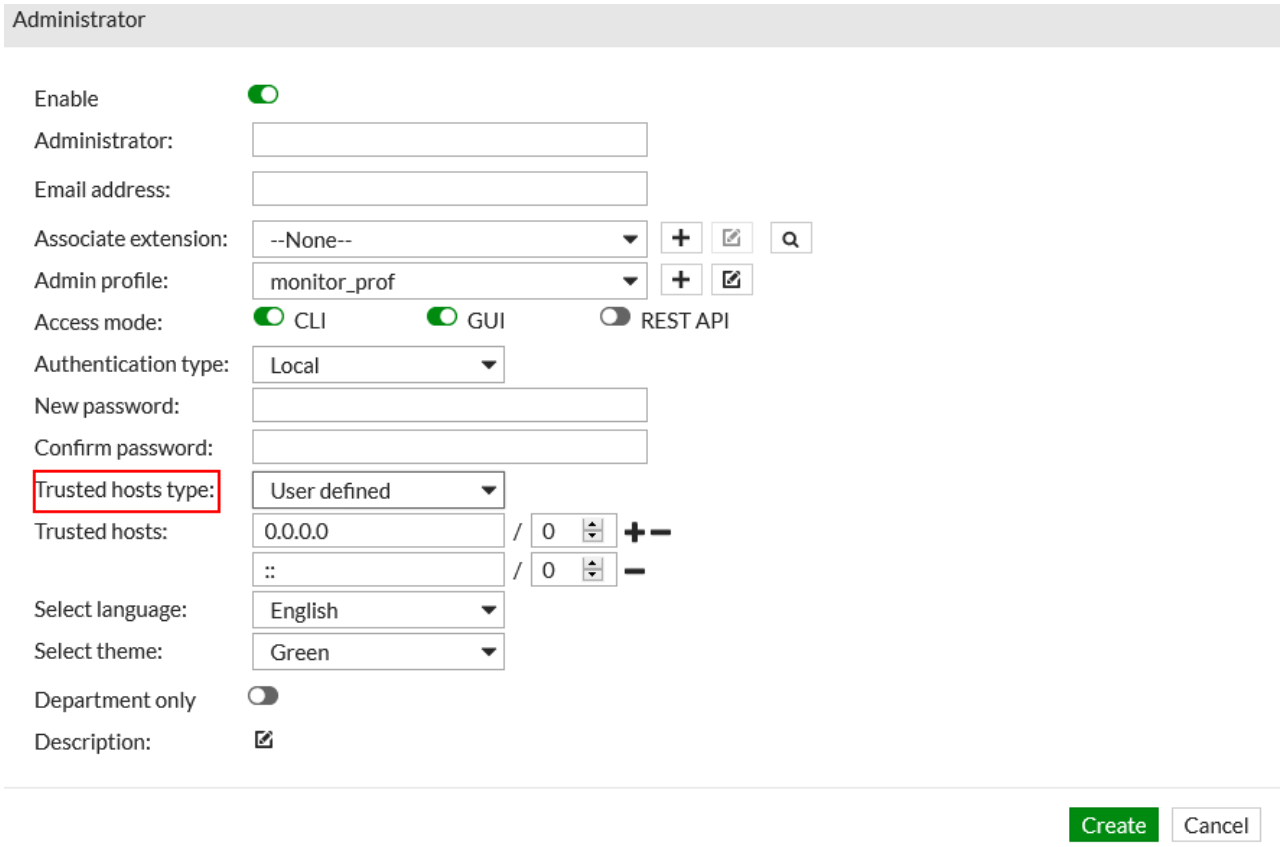
1. Go to **Phone System > Setting > Option**.
2. Under **Number Management**, add all undesirable prefixes to the **System prohibited prefix** section.



Trusted hosts for administrators

Certain IP subnets can be designated as allowed or trusted for administrators to log into FortiVoice. This configuration can allow local networks to access the system but restrict remote access to the system and restrict remote access to the system.

1. Go to **System > Administrator > Administrator**.
2. Select the administrator and click **Edit**.
3. Set **Trusted hosts type** to the local trusted IP subnet (define as many as required) or RFC 1918 predefine.

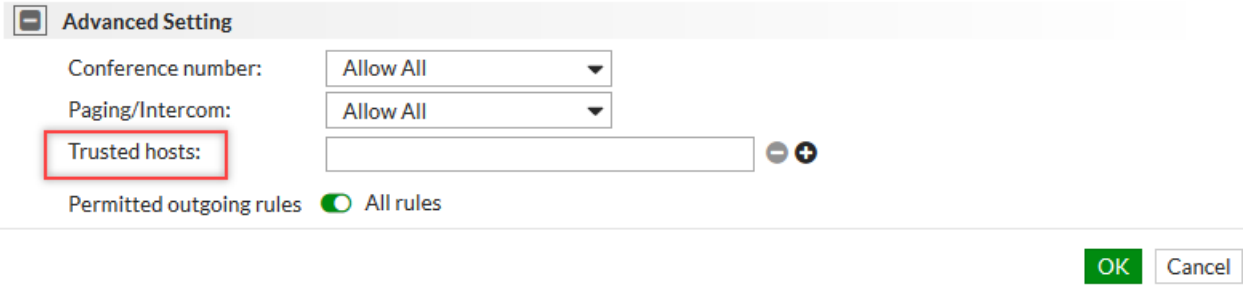


Trusted hosts for extensions

Certain IP subnets can also be designated as trusted for extensions to register to FortiVoice. This configuration can allow local networks to access the system but restrict remote access to the system and restrict remote access to the system.

1. Go to **Phone System > Profile > User Privilege**.
2. Select a user privilege and click **Edit**.

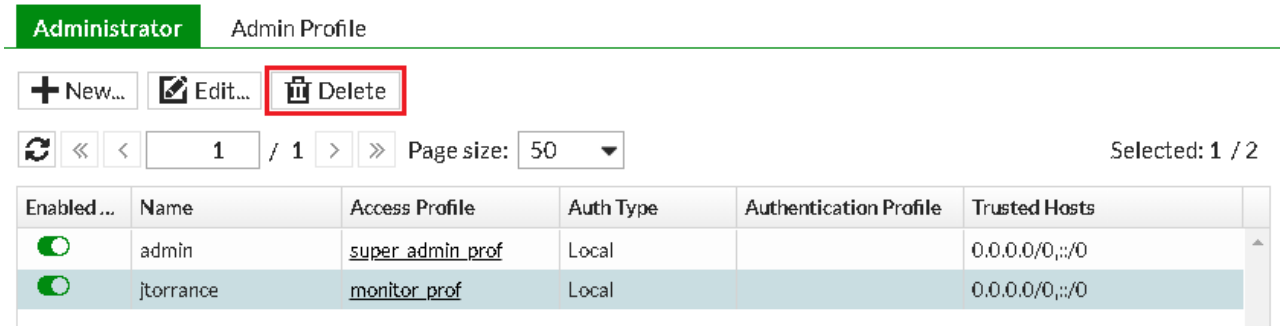
3. Expand **Advanced Setting**, and set **Trusted hosts** to the local trusted IP subnet (define as many as required).



Unused administrators

Remove administrator profiles that are not in use.

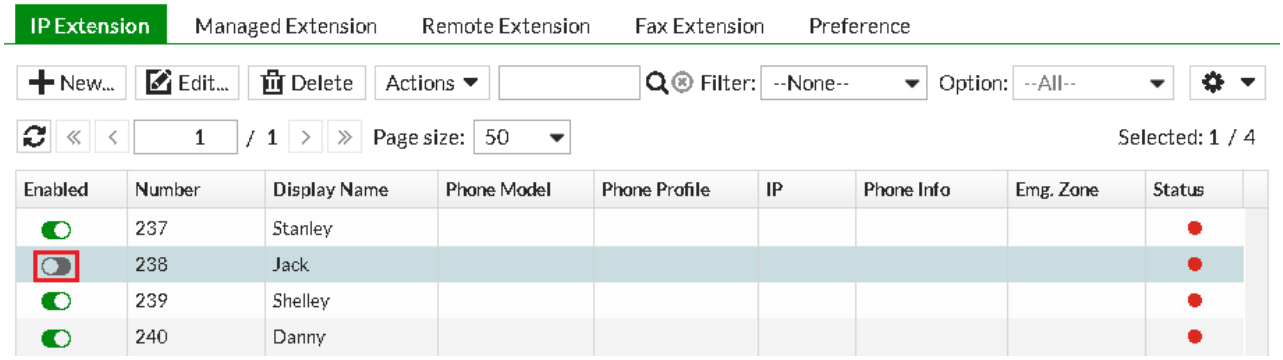
1. Go to **System > Administrator > Administrator**.
2. Select the administrators that are not active and click **Delete**.



Unused extensions

To avoid the unintentional use of unused extensions, remove those extensions.

1. Go to **Extension > Extension > IP Extension**.
2. Disable the extensions that are not active.



Verify SIP user agent

Restrict phone registration so only phone requests that match the system configured phone type are allowed.

1. Go to **Dashboard > Console** and click inside the window to connect to the CLI console.
2. Enter the following commands:

```
config system sip-setting
   set verify-user-agent enable
end
```

Blocking numbers

If you find any extension has been suffering from attacks by other devices, you may block it to stop the attacks.

1. Go to **Security > Blocked Number**.
2. Click **New**.
3. Enter the extension you want to block.
4. Click **Create**.
5. To unblock a number, select it in the list and click **Delete**.

Unassigned phones

If you find the number of phones that are auto discovered but have not been assigned extensions are abnormally high, it may mean the FortiVoice unit is under MAC address flooding attack and its performance will be compromised. You can remove the phones.

1. Go to **Dashboard > Status**.
2. At the bottom of **System Information**, find **Phones not assigned**.
3. Click the **Remove all not assigned phones** icon to delete the phones as required.

Monitoring and reporting

There are many tools within FortiVoice to help manage your security settings and help protect your system.

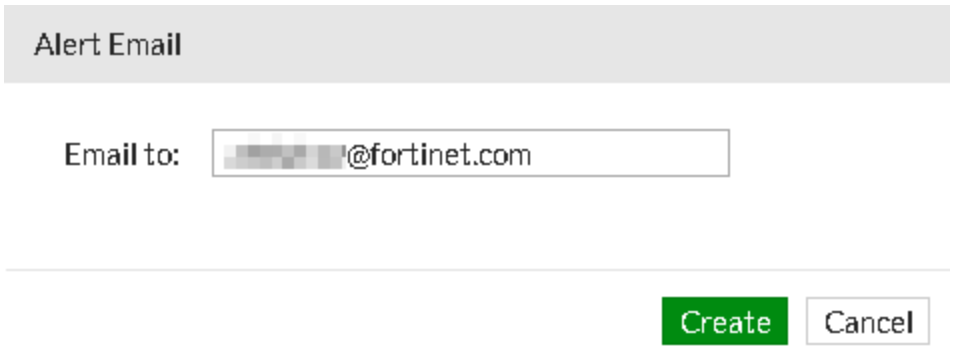
This section includes the following topics:

- Administrator alerts on page 132
- Call detail reports on page 133
- SIP password auditor on page 134
- Intrusion detection on page 134

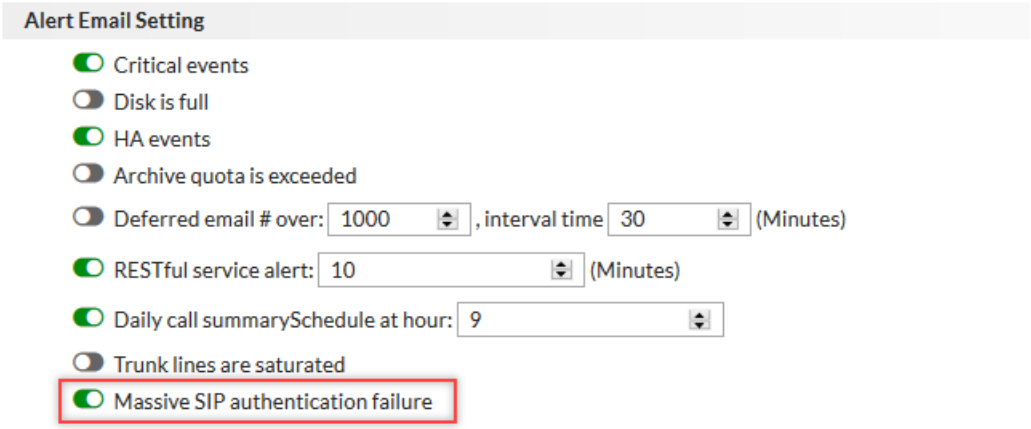
Administrator alerts

Administrators can be notified by email of system alerts when FortiVoice detects suspicious activity, such as a SIP attack.

1. Go to **Log & Report > Alert > Configuration** and click **New**.
2. Enter the administrator's email address and click **Create**.



3. Go to **Log & Report > Alert > Category**.
4. Under **Alert Email Setting**, enable **Massive SIP authentication failure**, and click **Apply**.

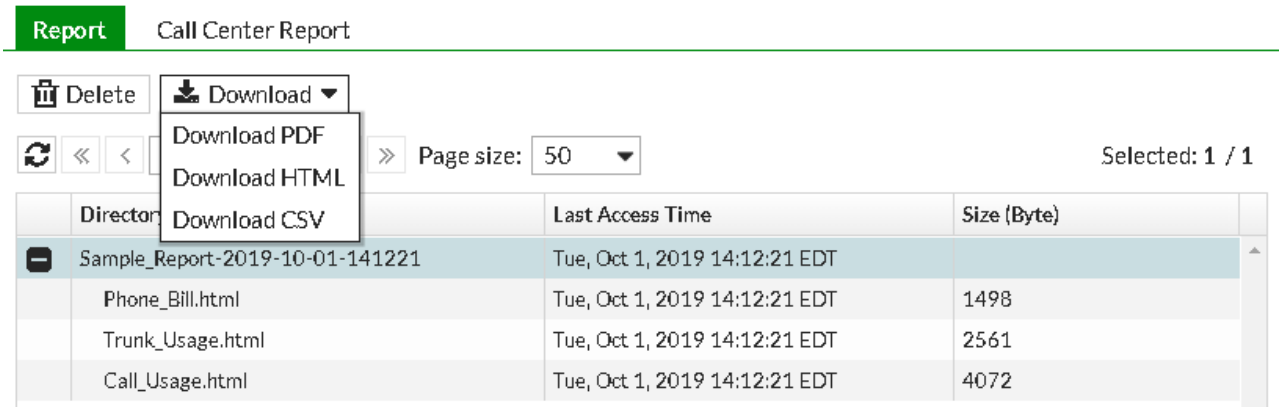


Call detail reports

Reports can be generated and downloaded for greater call inspection, such as for looking into details concerning blocked or denied calls.

1. Go to **Log & Report > Call Report > Call Report**.
2. Select the appropriate call report and click **Generate**.
3. A dialog window appears letting you know that the report has been started. Click **OK**.
4. Click **View Report**, where you are redirected to **Monitor > Call Report > Report**.
5. Expand the report generated to view the various components of the report. Select the whole report and click

Download and either **Download PDF**, **Download HTML**, or **Download CSV**.



SIP password auditor

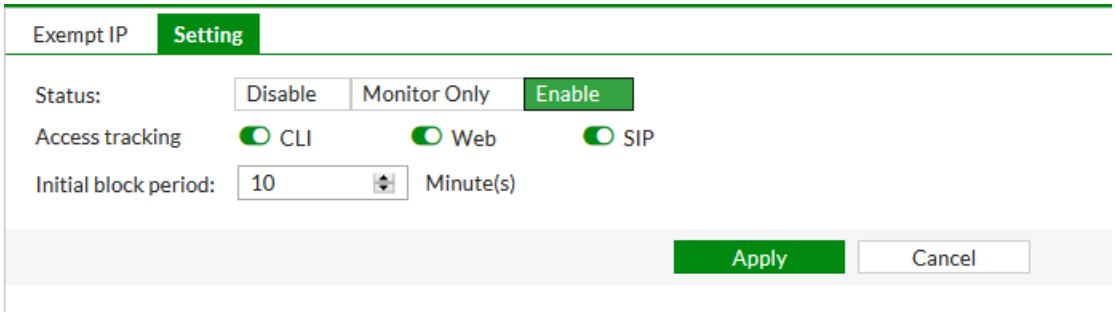
Frequently review the SIP password audits to make sure that SIP passwords for extensions are secure. Make sure that **Password/PIN Policy** is enabled under **Security > Password Policy > Password/PIN Policy**, and that the password policy is applied to SIP users.

1. Go to **Security > Password Policy > Password Auditor**.
2. Review the list of extensions to see whether their password and PIN strengths meet the password policy requirements.

Intrusion detection

Intrusion detection lets you manually add IPs to be exempted from being blocked, remove system added exempt IPs if you find them suspicious, and configure intrusion detection settings.

1. Go to **Security > Intrusion Detection > Setting** and set **Status** to **Enable**.



Softclient

With the FortiFone softclient, you stay connected to the office, never missing an important call. You transform your mobile device into an extension connected to the FortiVoice phone system. The Fortinet business communications solution enables you to manage calls, check voicemail messages, and quickly view the company directory.

This section includes the following configuration topics:

- Deployment of FortiFone softclient for mobile on page 135
- Deployment of FortiFone softclient for desktop on page 157

Deployment procedures use FortiGate as an example firewall. If your deployment does not use FortiGate, then follow the instructions provided by the firewall manufacturer.

Deployment of FortiFone softclient for mobile

Topics in this section apply to the FortiFone softclient for mobile, not for desktop.

With the FortiFone softclient for mobile, you stay connected to the office, never missing an important call. You transform your mobile device into an extension connected to the FortiVoice phone system. Fortinet's business communications solution enables you to manage calls, check voicemail messages and quickly view the company directory.

In a typical deployment scenario, the FortiVoice phone system is located behind an internet facing firewall. If a customer has deployed a FortiFone softclient, this softclient is usually behind another firewall when the customer's cell phone is using the data service of a cellular network or the Wi-Fi of a home network. Signaling and two-way audio through a firewall requires the network address translation (NAT) traversal for the session initiation protocol (SIP). When the deployment is using either SIP over the transmission control protocol (TCP) or the user datagram protocol (UDP), the SIP application layer gateway (ALG) with hosted NAT traversal enabled on FortiGate can translate the internal IP address of a session description protocol (SDP) payload properly to allow media flow. If the deployment is using SIP over transport layer security (TLS), the SIP traffic is encrypted end-to-end. With this encryption, FortiGate is unable to translate the internal IP address in the SDP payload, which then causes a one-way audio or no audio at all. Fortunately, FortiGate supports SSL inspection and is able to decrypt the encrypted SIP traffic and translate the SDP address to resolve the NAT-traversal issue.

This section describes how to configure the FortiVoice phone system and FortiGate to use the FortiFone softclient as a remote SIP client, and install and configure the FortiFone softclient.

Protocols

The communication between the FortiFone softclient and FortiVoice uses the following protocols and server:

- HTTPS for softclient login, auto-provisioning, download of contacts, call logs, and voicemails
- SIP for signaling
- RTP or secure RTP (SRTP) for audio
- Android and iOS push server for outbound calls

Call flows

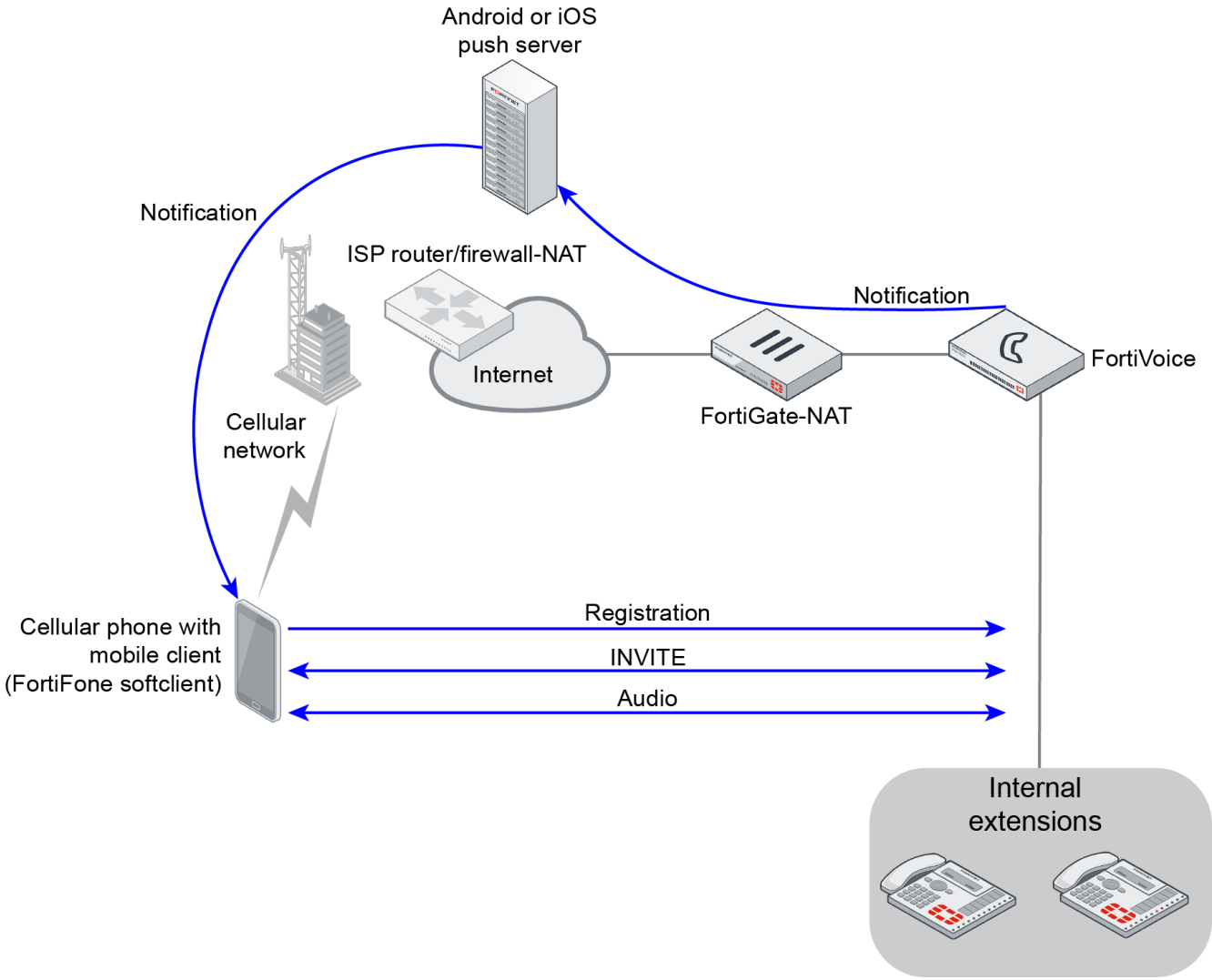
The inbound call flow includes the following steps:

1. A caller dials an extension to connect to the FortiFone softclient.
2. FortiVoice sends the push request to the Android or iOS push server which relays the request to the mobile client (cellular phone).
3. If the mobile client is in sleep mode, the request wakes up the mobile client.
4. The FortiFone softclient registers with FortiVoice and then receives the inbound call.
5. After the signaling is complete, FortiVoice sends the audio to the mobile client using RTP or SRTP.

The outbound call flow includes the following steps:

1. The user initiates an outbound call using the mobile client.
2. The FortiFone softclient sends a SIP invite directly to FortiVoice.
3. After the signaling is complete, FortiVoice sends the audio to the destination phone using RTP or SRTP.

Topology



Configuring FortiFone softclient for mobile settings on FortiVoice

Perform the following procedures to configure FortiFone softclient for mobile settings on the FortiVoice phone system:

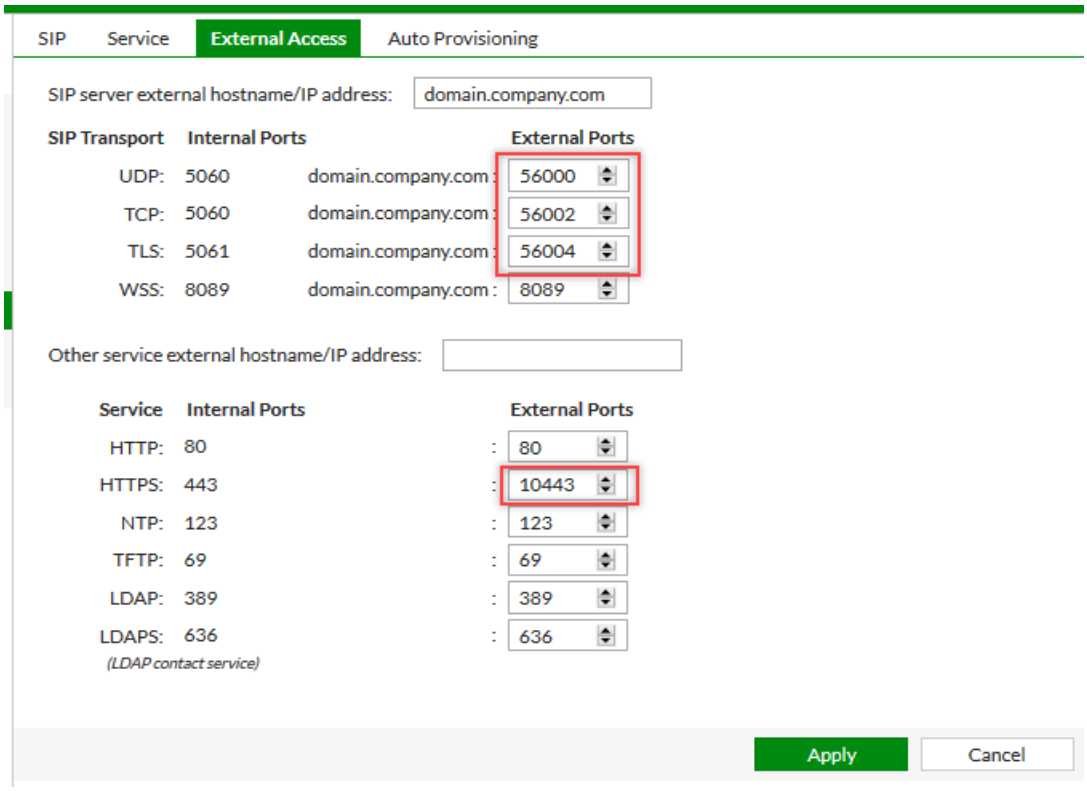
Prior to starting the configuration, make sure to complete the recipes in Licensing on page 93.

Unless otherwise specified, steps in this FortiFone softclient section apply to SIP over TCP, UDP, and TLS.

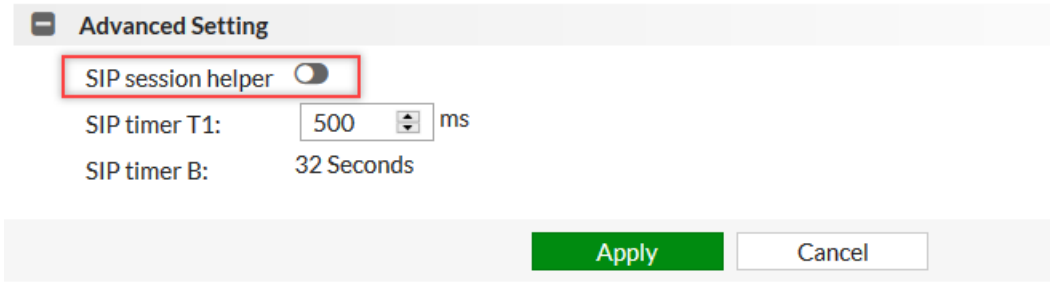
- Configure external access settings on page 138
- Configure a SIP profile on page 139
- Assign the FortiFone softclient to a FortiVoice extension on page 140
- Export the FortiVoice server certificate for SIP over TLS on page 141

Configure external access settings

1. On FortiVoice, go to **System > Advanced > External Access**.
2. Set **SIP server external hostname/IP address** to the IP address or FQDN of the FortiVoice device and configure the following external access ports.



3. Go to **System > Advanced > SIP**.
4. Under **Advanced Setting**, make sure that **SIP session helper** is disabled.

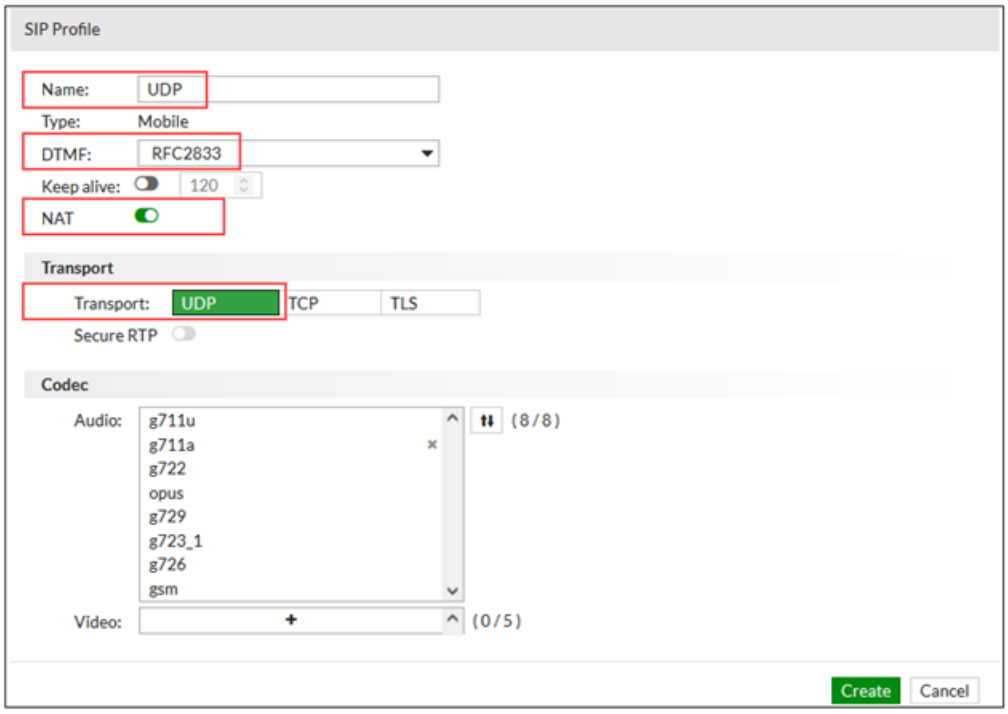


Configure a SIP profile

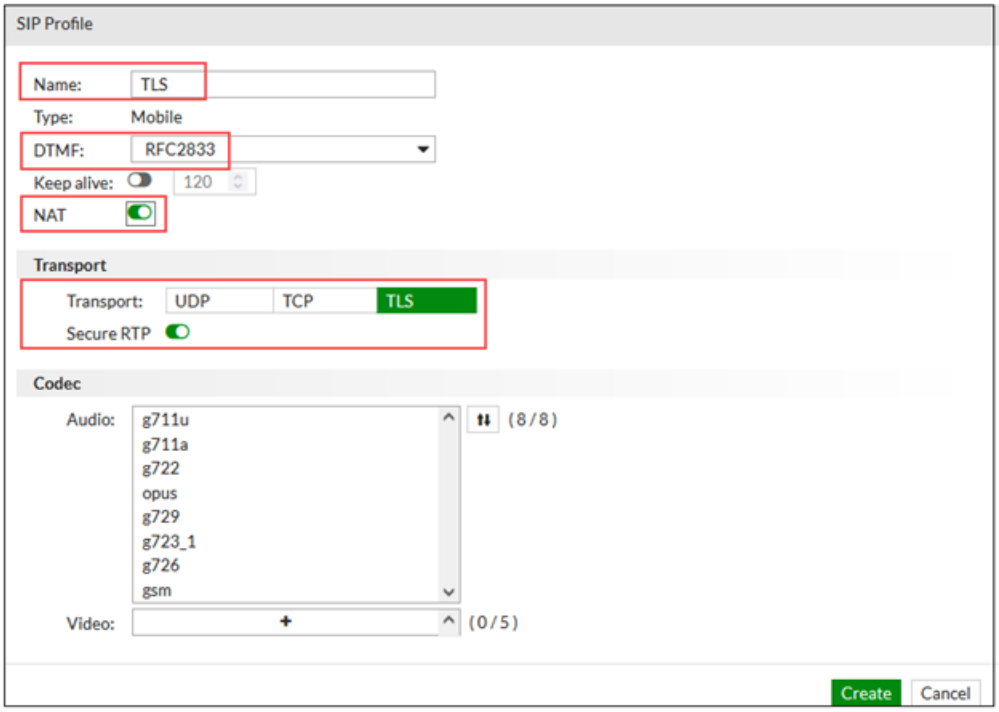
FortiVoice includes a default SIP profile (sip_mobile_fortifone_default). If your deployment uses SIP over TCP, then you can use this default profile, and skip this procedure.

If your deployment requires SIP over UDP or TLS, then you can create a new SIP profile.

1. On FortiVoice, go to **Phone System > Profile > SIP**.
2. Click **New > Mobile**.
3. In **Name**, enter a name for this SIP profile.
4. Select a **DTMF** setting.
5. Enable **NAT**.
6. In **Transport**, select the protocol. If you select **TLS**, then enable **Secure RTP**.
7. Click **Create**.
   Example for configuring a SIP profile for UDP:



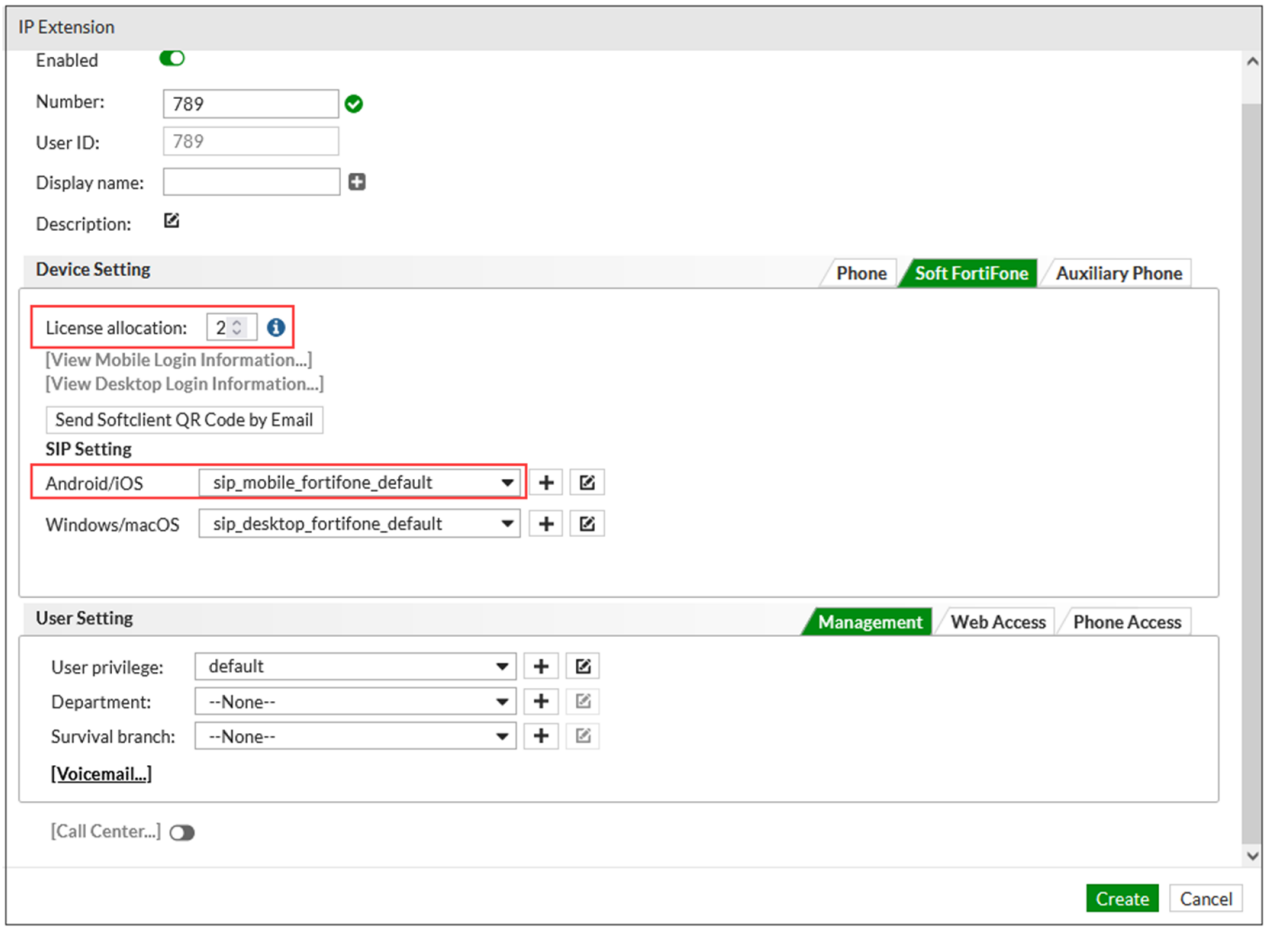
Example for configuring a SIP profile for TLS:



Assign the FortiFone softclient to a FortiVoice extension

1. On FortiVoice, go to **Extension > Extension > IP Extension** and click **New**.
2. Enter a **Number**.
3. Under **Device Setting**, click the **Soft FortiPhone** tab.

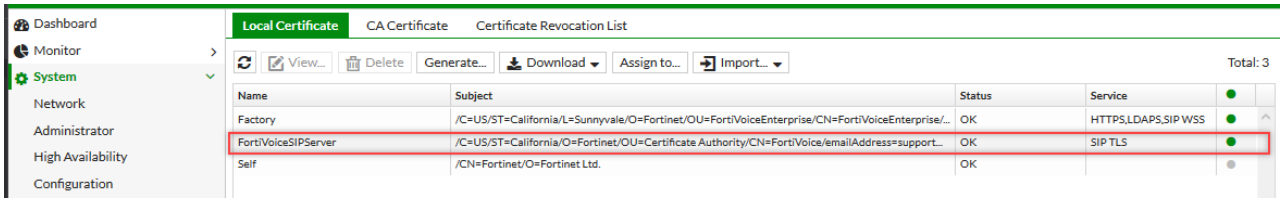
4. In **License allocation**, specify the value to configure.
5. In **Android/iOS**, leave the default profile (sip_mobile_fortifone_default) or select the profile that you configured in Configure a SIP profile on page 139.



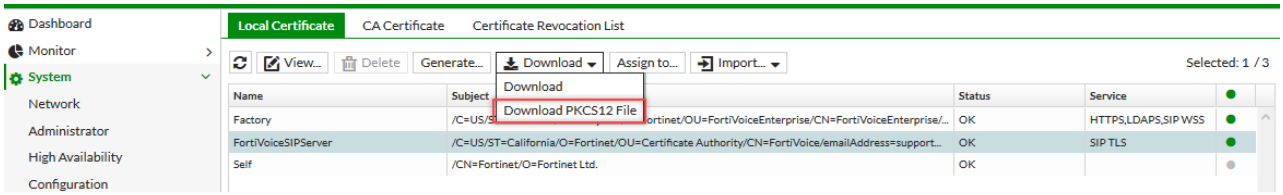
6. Click **Create**.
7. If your deployment uses SIP over TLS, go to Export the FortiVoice server certificate for SIP over TLS on page 141.
   If your deployment uses SIP over TCP or UDP, go to Configuring FortiGate for SIP over TCP or UDP on page 150.

Export the FortiVoice server certificate for SIP over TLS

1. On FortiVoice, go to **System > Certificate > Local Certificate**.
2. In the list, select **FortiVoiceSIPServer**. This is the default certificate for the SIP service. If you are using a custom certificate, select that one instead of the default.



3. Click **Download** and select **Download PKCS12 File**.



   The PKCS12 Certificate Download dialog opens.
4. In **Password** and **Confirm password**, enter a password to encrypt the key.
5. To download the file, click **OK**.
6. To save the file locally, click **OK**.
7. Take note of the location where you save the file.
8. Go to Configuring FortiGate for SIP over TLS on page 142.

Configuring FortiGate for SIP over TLS

After Configuring FortiFone softclient for mobile settings on FortiVoice on page 137, perform the following procedures to configure a FortiGate device for SIP over TLS:

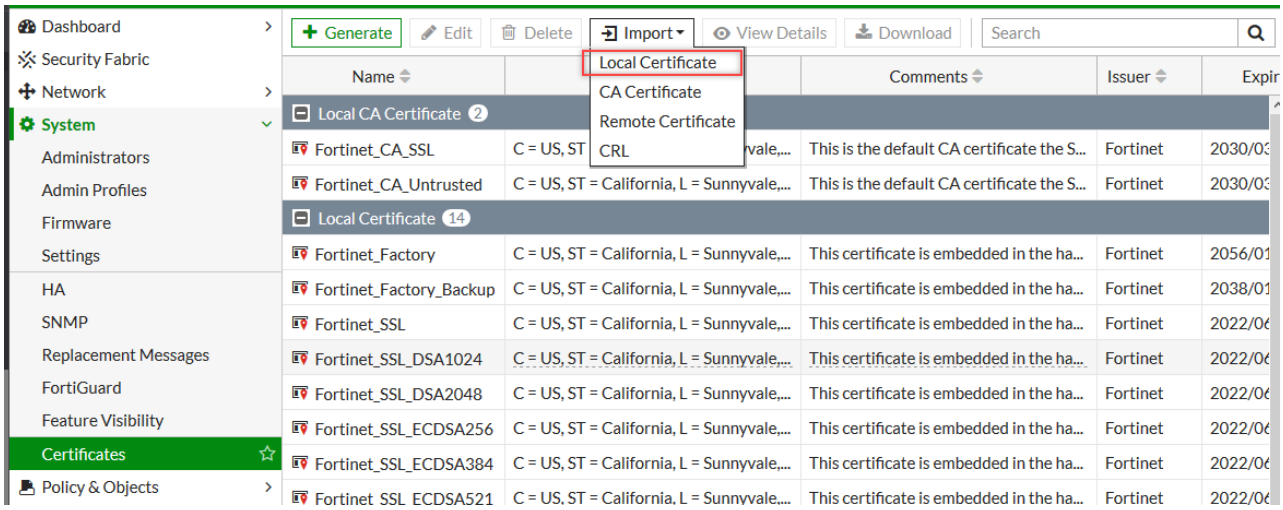
- Import the downloaded FortiVoice server certificate for SIP over TLS on page 142
- Configure system settings for SIP over TLS on page 144
- Create virtual IP addresses for SIP over TLS on page 144
- Configure VoIP profile and NAT traversal settings for SIP over TLS on page 147
- Create an inbound firewall policy for SIP over TLS on page 148
- Create an outbound firewall policy for FortiVoice to access the Android or iOS push server on page 149

If your FortiVoice deployment is using SIP over TCP or UDP instead, go to Configuring FortiGate for SIP over TCP or UDP on page 150.

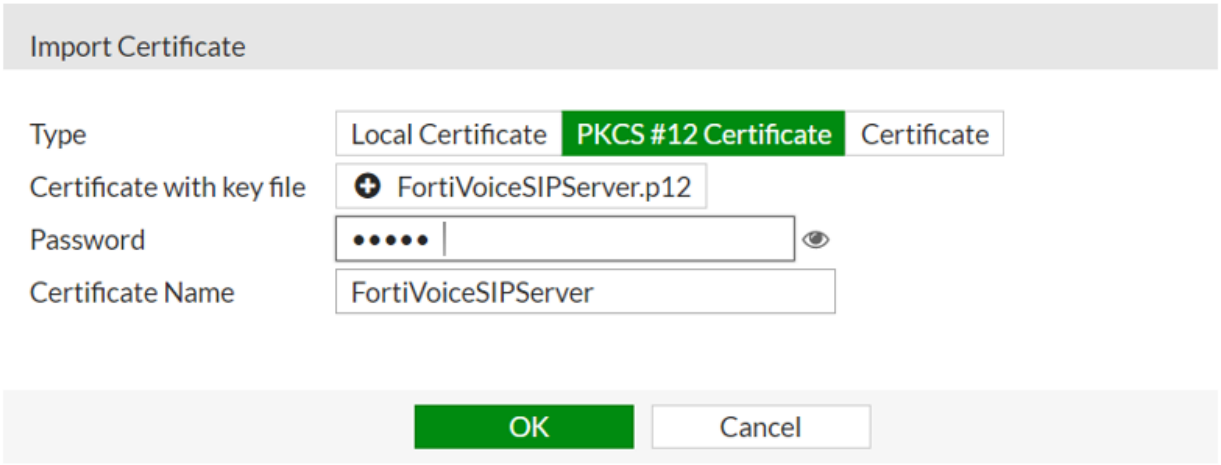
Import the downloaded FortiVoice server certificate for SIP over TLS

Perform the following steps to import the downloaded FortiVoice server certificate. The downloaded certificate is from Export the FortiVoice server certificate for SIP over TLS on page 141.

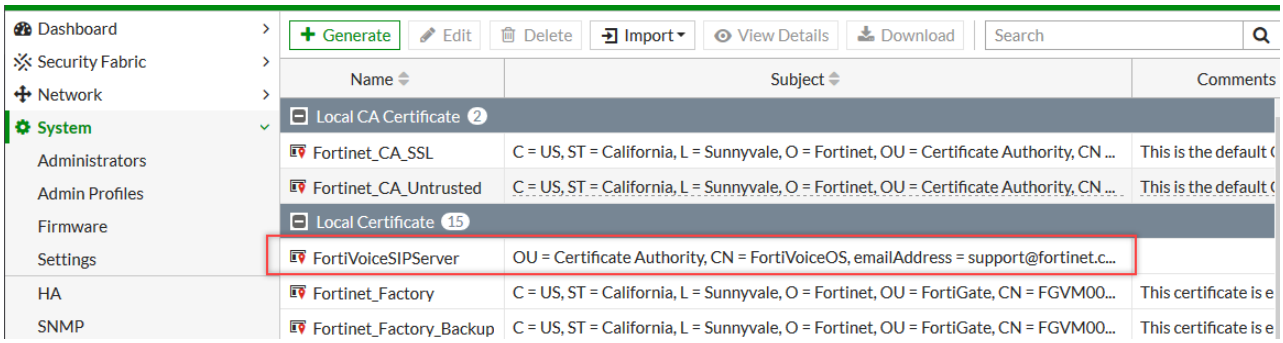
1. On FortiGate, go to **System > Certificates**.
2. Click **Import** and select **Local Certificate**.



3. Update the following fields in the Import Certificate dialog:
   a. In **Type**, click **PKCS #12 Certificate**.
   b. In **Certificate with key file**, click **Upload**.
   c. Locate the FortiVoice server certificate. This is the file from Export the FortiVoice server certificate for SIP over TLS on page 141.
   d. Click **Open**.
   e. In **Password**, enter the password associated with the FortiVoice server certificate.
   f. Click **OK**.

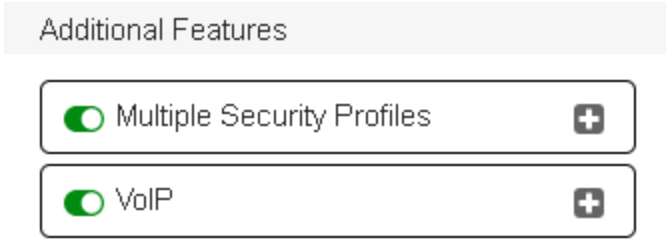


4. Verify that the list of certificates now includes the newly imported FortiVoice server certificate.



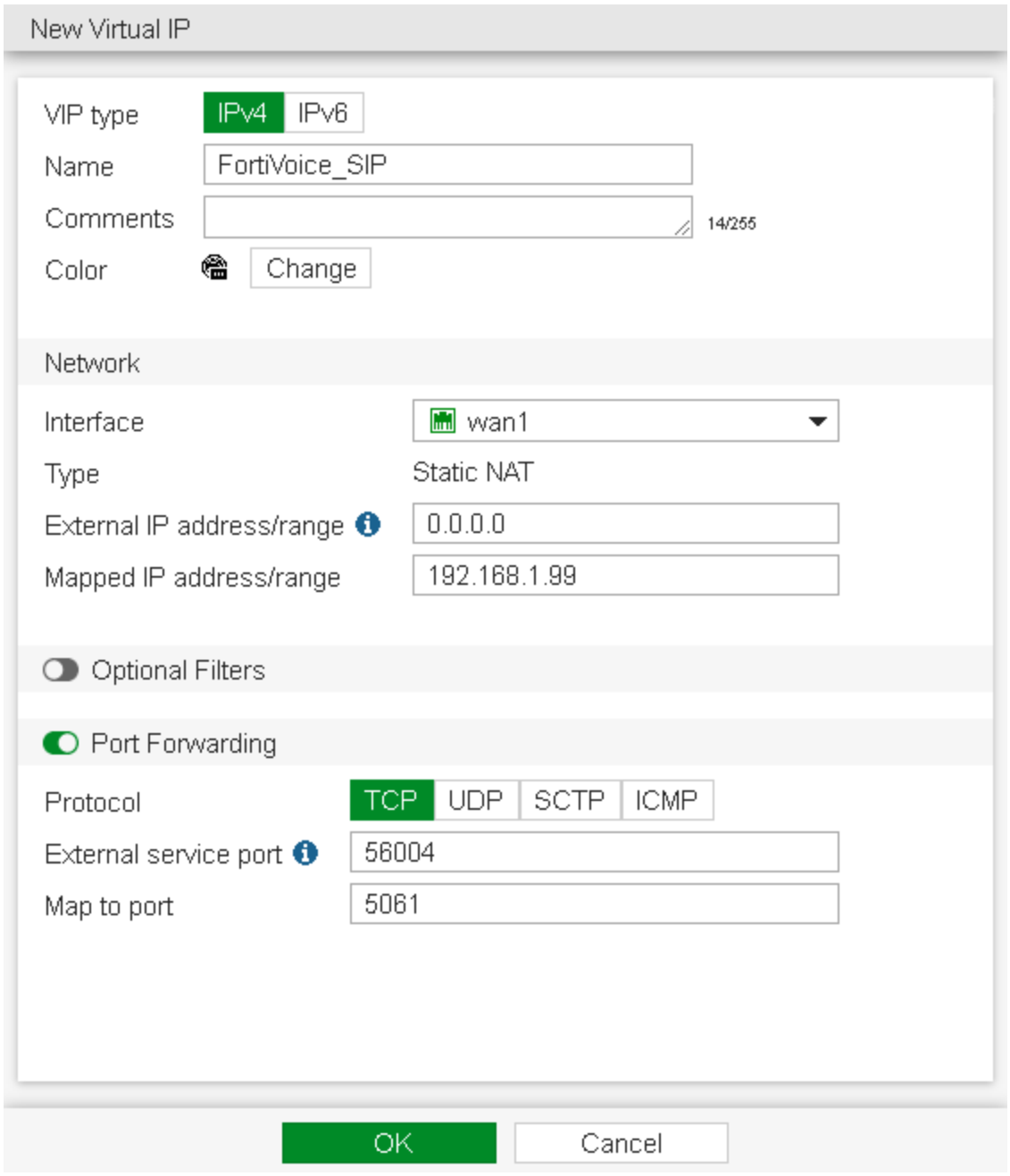
Configure system settings for SIP over TLS

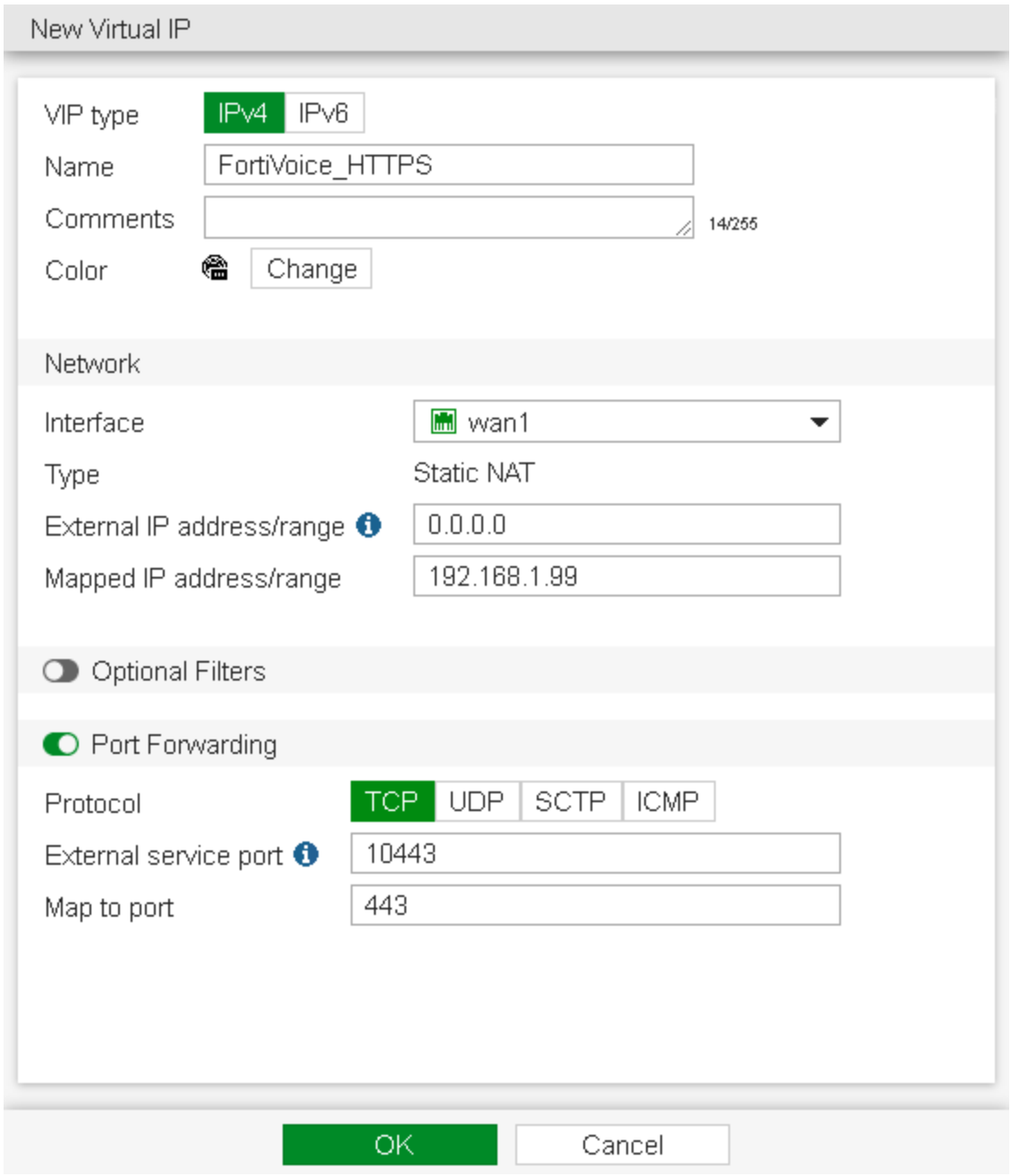
1. On FortiGate, go to **System > Feature Visibility**.
2. Under **Additional Features**, enable **Multiple Security Profiles** and **VoIP**.
3. Click **Apply**.



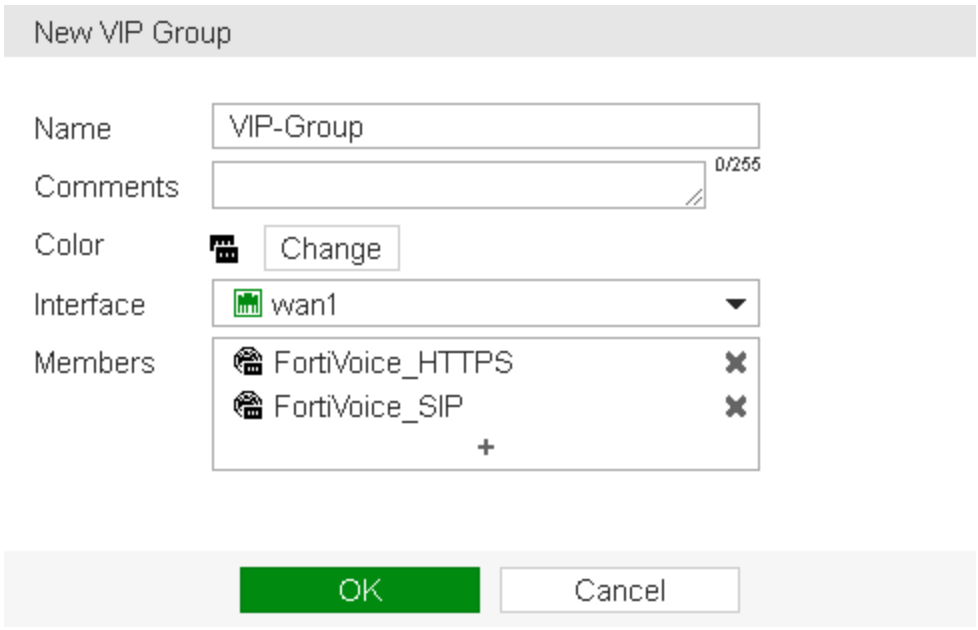
Create virtual IP addresses for SIP over TLS

1. On FortiGate, go to **Policy & Objects > Virtual IPs**.
2. Click **Create New** and select **Virtual IP**.
3. Create virtual IPs for the following services that map to the IP address of the FortiVoice:
   - External SIP TLS port of FortiVoice
   - External HTTPS port of FortiVoice. The HTTPS port is used for the softclient login, call logs, and contacts download from the FortiVoice phone system.


New Virtual IP
VIP type
IPv4
IPv6
Name
FortiVoice_SIP
Comments
14/255
Color
Change
Network
Interface
wan1
Type
Static NAT
External IP address/range
0.0.0.0
Mapped IP address/range
192.168.1.99
Optional Filters
Port Forwarding
Protocol
TCP
UDP
SCTP
ICMP
External service port
56004
Map to port
5061
OK
Cancel



4. To create a virtual IP group, click **Create New** and select **Virtual IP Group**.
5. Add the two newly created virtual IPs.



Configure VoIP profile and NAT traversal settings for SIP over TLS

1. On FortiGate, open the **CLI Console** from the GUI banner.
2. Create a VoIP protection profile and enable hosted NAT traversal (HNT) and restricted HNT source address. If the FortiVoice softclient is behind a non-SIP-aware firewall, HNT addresses the SDP local address problem. Enable SSL full inspection and refer to the imported FortiVoice server certificate for example, FortiVoiceSIPServer.
   This VoIP protection policy with hosted NAT traversal enabled will be added to the inbound firewall policy to prevent potential one way audio issues caused by NAT.

VoIP profile command example for SIP over TLS

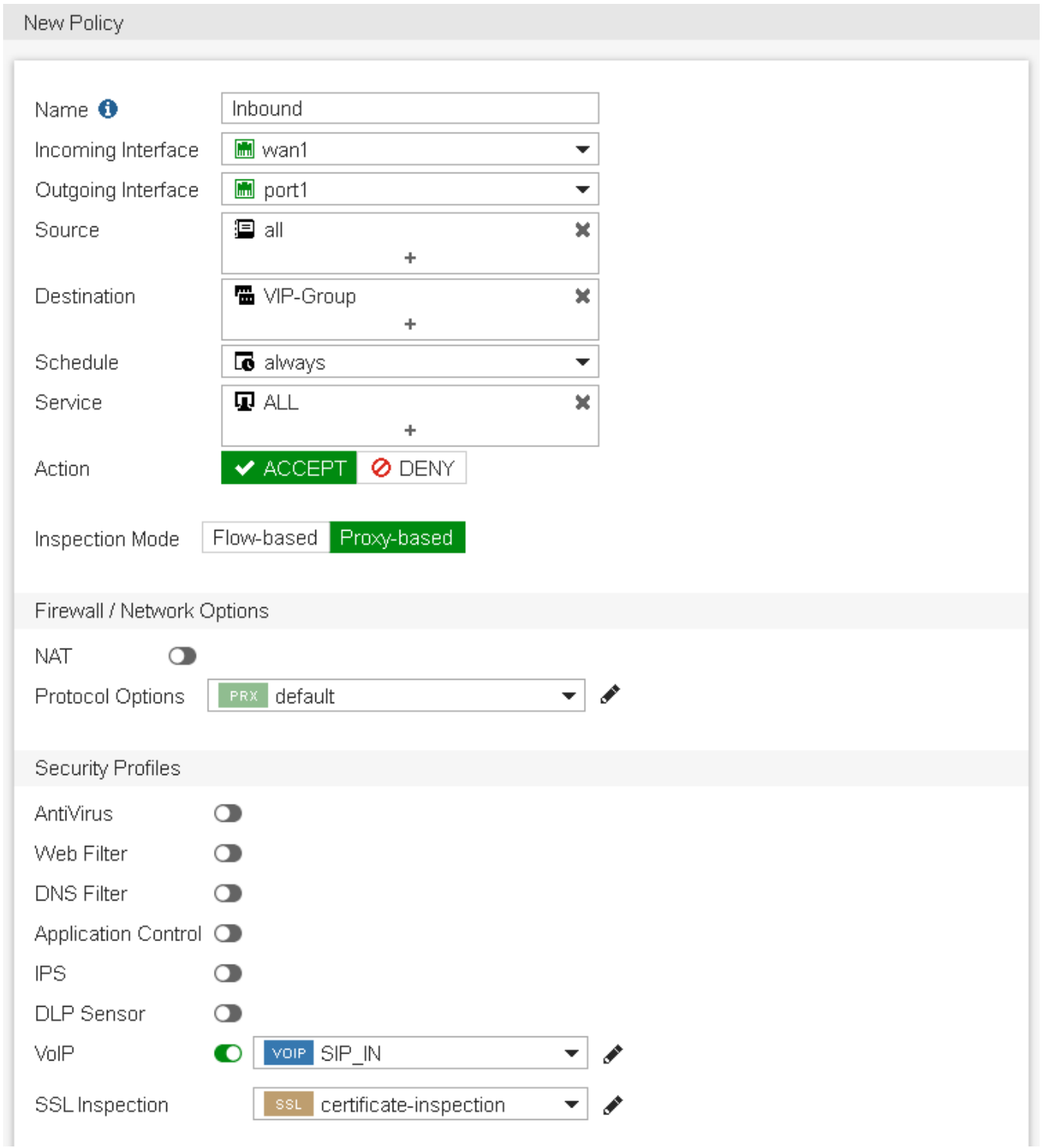
```
config voip profile
   edit "SIP_IN"
      config sip
         set hosted-nat-traversal enable
         set ssl-mode full
         set ssl-server-certificate "FortiVoiceSIPServer"
      end
   next
end
```

3. For SIP over TLS, the recommendation is to use the default SSL port for SIP (TCP 5061). Enter the following commands:
   ```
   config system settings
      set sip-tcp-port 5061
   end
   ```
4. Edit the FortiGate interface connecting to the internet and set it to external. The SIP application layer gateway (ALG) with hosted NAT traversal requires an external port to work. Enter the following commands:
   ```
   config system interface
      edit wan1
         set external enable
   ```

```
    next
end
```

Create an inbound firewall policy for SIP over TLS

1. On FortiGate, go to **Policy & Objects > Firewall Policy** and click **Create New**.
2. Set **Incoming Interface** to the internet-facing interface.
3. Set **Outgoing Interface** to the internal/LAN interface.
4. Set **Source** to **all**.
5. Set **Destination** to the virtual IP group created in Create virtual IP addresses for SIP over TLS on page 144.
6. Set **Schedule** to **always**.
7. Set **Service** to **ALL**.
8. Disable **NAT**.
9. Enable **VoIP** and select the VoIP profile created in Configure VoIP profile and NAT traversal settings for SIP over TLS on page 147.



Create an outbound firewall policy for FortiVoice to access the Android or iOS push server

FortiVoice requires outbound access to the Android and iOS push servers.

If FortiGate has an outbound firewall policy that allows FortiVoice to access everything on the internet, then you do not need to create an additional firewall policy. You have completed the FortiGate configuration for SIP over TLS. Go to Installing and configuring the FortiFone softclient for mobile on page 157.

If FortiGate does not have an outbound firewall policy that allows FortiVoice to access everything on the internet, perform the steps to create the FQDN addresses and the specific outbound firewall policies to allow FortiVoice to access the Android and iOS push servers.

To create FQDN addresses for Android and iOS push servers

1. On FortiGate, go to **Policy & Objects > Addresses** and click **Create New**.
2. In **Name**, enter a name for the Android push server address.
3. In **Type**, select **FQDN**.
4. In **FQDN**, enter **fcm.googleapis.com**.
5. Click **OK**.
6. Click **Create New**.
7. In **Name**, enter a name for the iOS push server address.
8. In **Type**, select **FQDN**.
9. In **FQDN**, enter **gateway.push.apple.com**.
10. Click **OK**.

To use the Android and iOS push server addresses in an outbound firewall policy

1. On FortiGate, go to **Policy & Objects > Firewall Policy** and click **Create New**.
2. In **Incoming interface**, enter the port connected to FortiVoice.
3. In **Outgoing interface**, enter the WAN port.
4. In **Source**, select **all**.
5. In **Destination**, select the FQDN addresses that you created for the Android and iOS push servers.
6. Configure the rest of the policy, as needed.
7. Click **OK**.
   You have completed the configuration of FortiGate for SIP over TLS.
8. Go to Installing and configuring the FortiFone softclient for mobile on page 157.

Configuring FortiGate for SIP over TCP or UDP

After Configuring FortiFone softclient for mobile settings on FortiVoice on page 137, perform the following procedures to configure a FortiGate device for SIP over TCP or UDP:

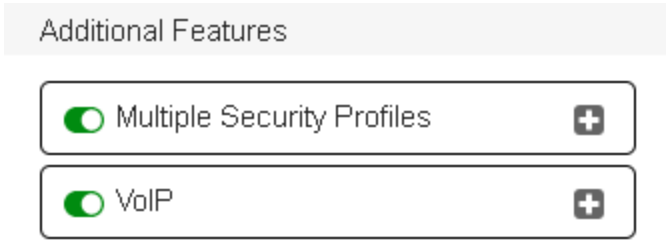
- Configure system settings for SIP over TCP or UDP on page 150
- Create virtual IP addresses for SIP over TCP or UDP on page 151
- Configure VoIP profile and NAT traversal settings for SIP over TCP or UDP on page 154
- Create an inbound firewall policy for SIP over TCP or UDP on page 155
- Create an outbound firewall policy for FortiVoice to access the Android or iOS push server on page 156

If your FortiVoice deployment is using SIP over TLS instead, go to Configuring FortiGate for SIP over TLS on page 142.

Configure system settings for SIP over TCP or UDP

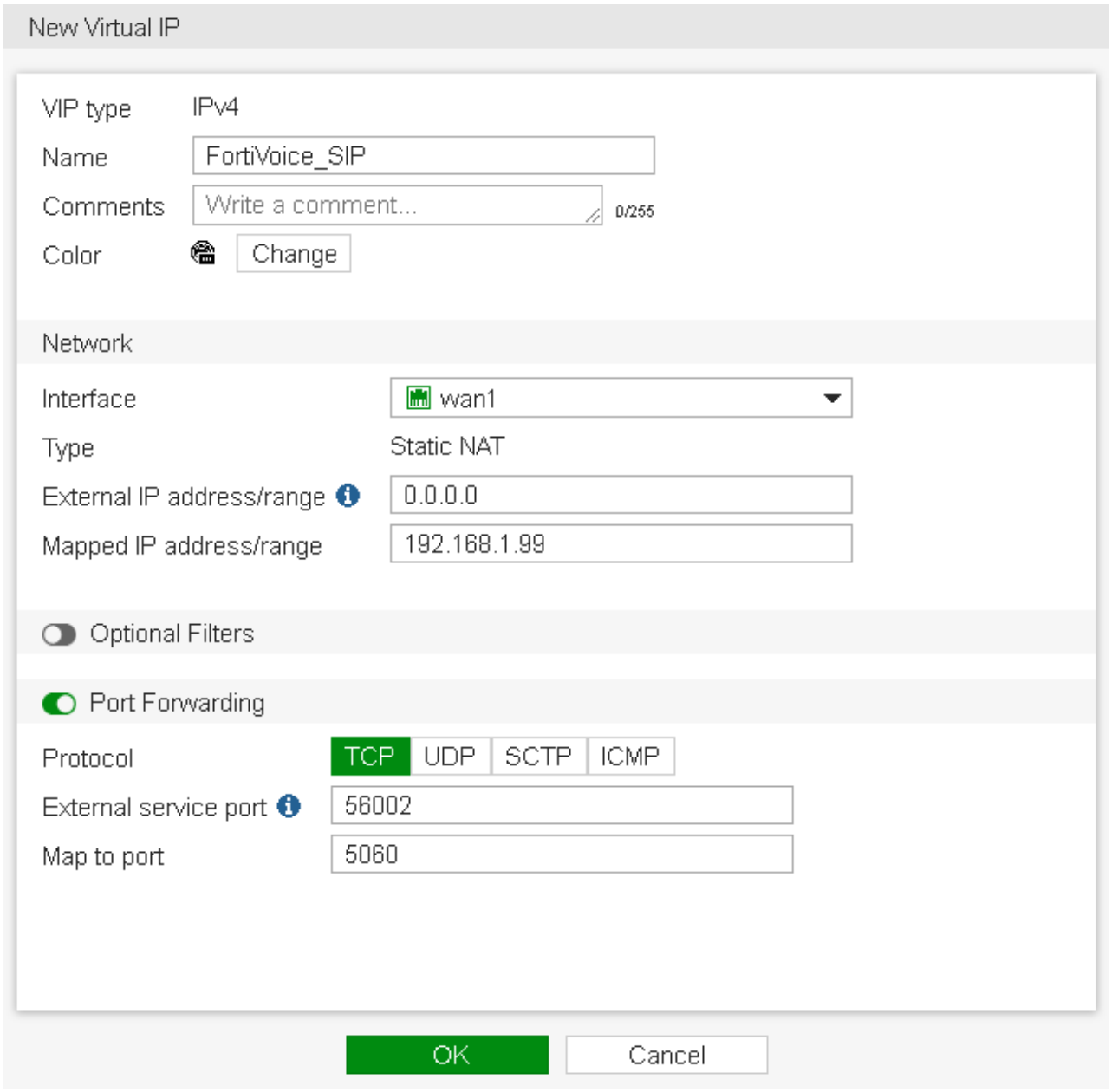
1. On FortiGate, go to **System > Feature Visibility**.
2. Under **Additional Features**, enable **Multiple Security Profiles** and **VoIP**.

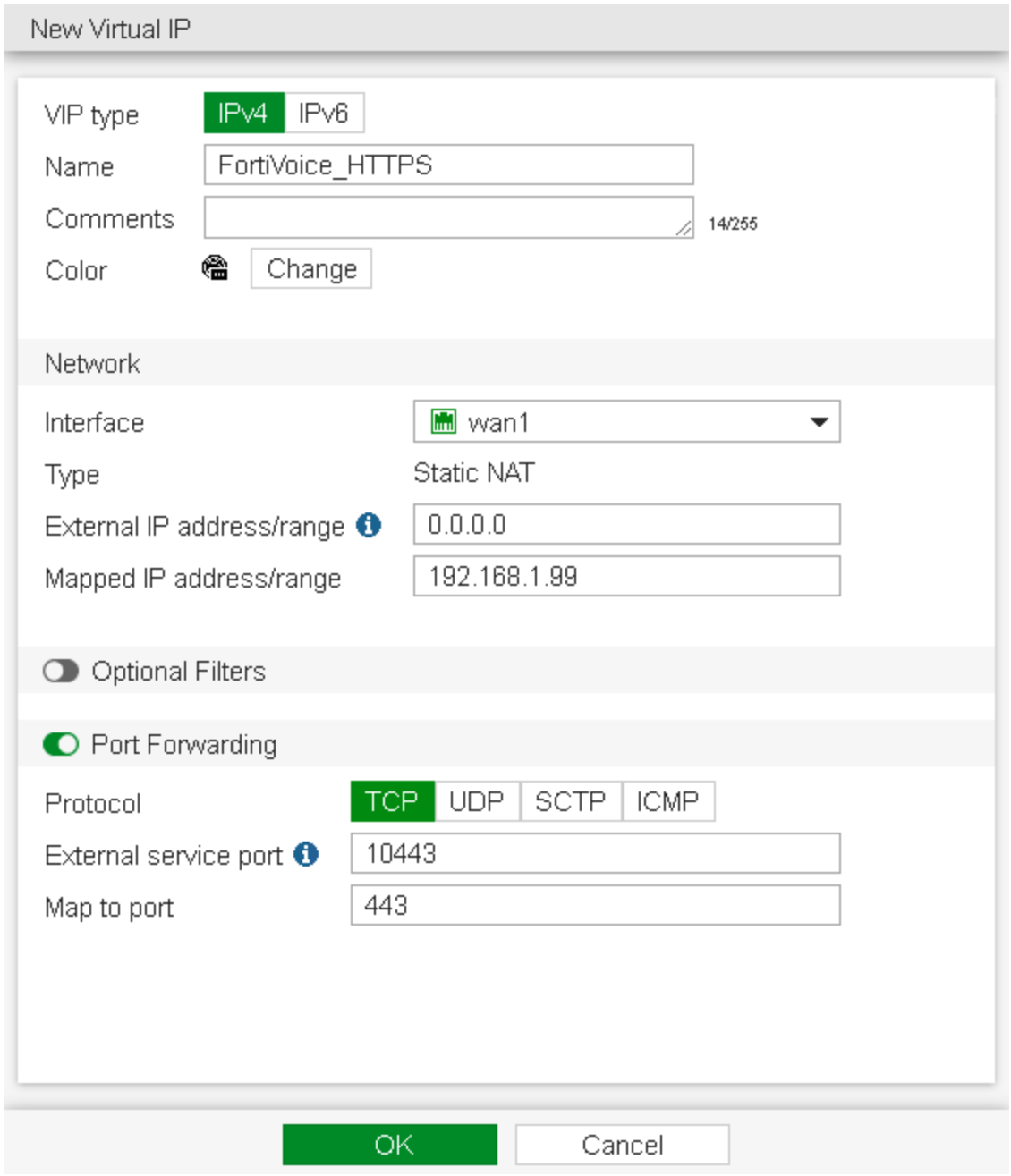
3. Click **Apply**.



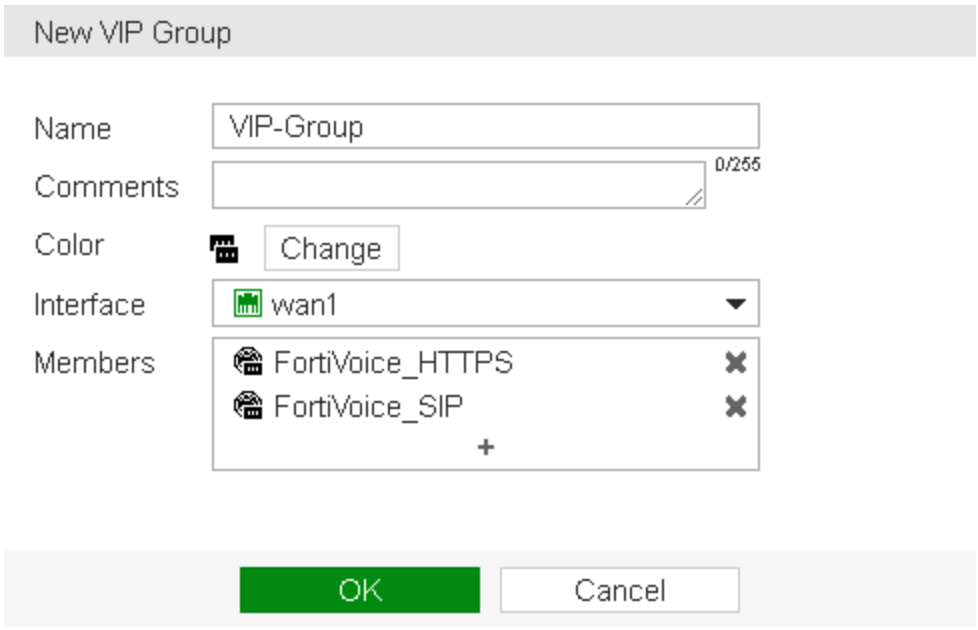
Create virtual IP addresses for SIP over TCP or UDP

1. On FortiGate, go to **Policy & Objects > Virtual IPs**.
2. Click **Create New** and select **Virtual IP**.
3. Create virtual IPs for the following services that map to the IP address of the FortiVoice:
   - External SIP TCP port of FortiVoice. If the **sip_mobile_default** profile has been modified to use UDP instead, configure the VIP for the external SIP UDP port.
   - External HTTPS port of FortiVoice. The HTTPS port is used for the softclient login, call logs, and contacts download from the FortiVoice phone system.


New Virtual IP
VIP type
IPv4
Name
FortiVoice_SIP
Comments
Write a comment...
0/255
Color
Change
Network
Interface
wan1
Type
Static NAT
External IP address/range
0.0.0.0
Mapped IP address/range
192.168.1.99
Optional Filters
Port Forwarding
Protocol
TCP
UDP
SCTP
ICMP
External service port
56002
Map to port
5060
OK
Cancel



4. To create a virtual IP group, click **Create New** and select **Virtual IP Group**.
5. Add the two newly created virtual IPs.



Configure VoIP profile and NAT traversal settings for SIP over TCP or UDP

1. On FortiGate, open the **CLI Console** from the GUI banner.
2. Create a VoIP protection profile and enable hosted NAT traversal (HNT) and restricted HNT source address. If the FortiVoice softclient is behind a non-SIP-aware firewall, HNT addresses the SDP local address problem.
   This VoIP protection profile will be added to the inbound firewall policy to prevent potential one-way audio issues caused by NAT.

   VoIP profile command example for SIP over TCP or UDP

   ```
   config voip profile
      edit "SIP_IN"
         config sip
            set hosted-nat-traversal enable
         end
      next
   end
   ```
3. If you are using a non-standard external port, update the system settings by entering the following commands. Both command examples use port 5566.

   External port setting example for TCP

   ```
   config system settings
      set sip-tcp-port 5566
   end
   ```

   External port setting example for UDP

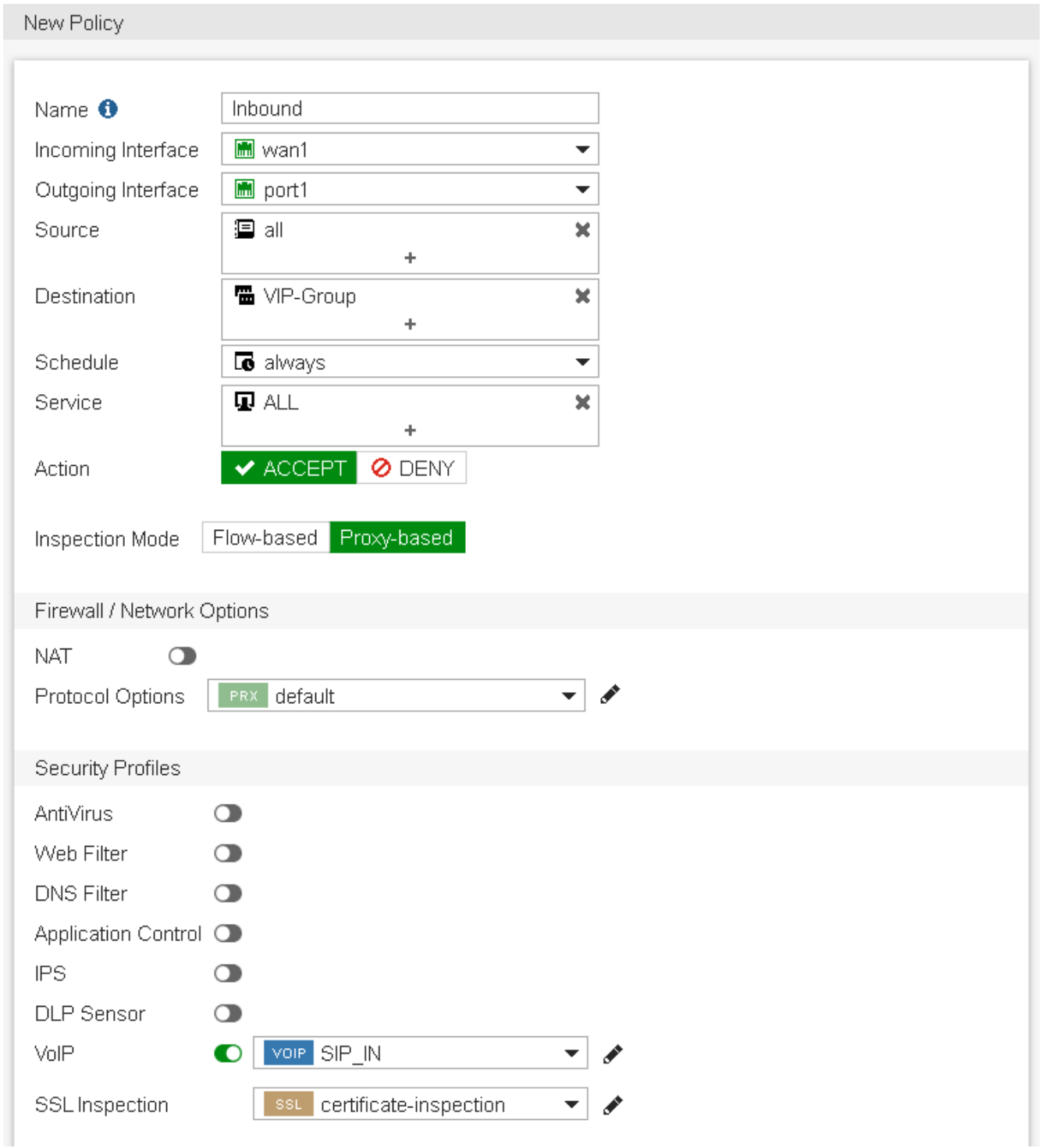
   ```
   config system settings
      set sip-udp-port 5566
   end
   ```
4. Set the internet facing interface as external. HNT requires an external port to work. The command example uses port2 as the internet facing interface.

   ```
   config system interface
      edit "wan1"
         set external enable
      next
   ```

```
end
```

Create an inbound firewall policy for SIP over TCP or UDP

1. On FortiGate, go to **Policy & Objects > Firewall Policy**.
2. Click **Create New**.
3. Set **Incoming Interface** to the internet-facing interface and **Outgoing Interface** to the internal/LAN interface.
4. Set **Source** to **all**.
5. Set **Destination** to the virtual IP group created in Create virtual IP addresses for SIP over TCP or UDP on page 151.
6. Set **Schedule** to **always**.
7. Set **Service** to **ALL**.
8. Disable **NAT**.
9. Enable **VoIP** and select the VoIP profile created in Configure VoIP profile and NAT traversal settings for SIP over TCP or UDP on page 154.



Create an outbound firewall policy for FortiVoice to access the Android or iOS push server

FortiVoice requires outbound access to the Android and iOS push servers.

If FortiGate has an outbound firewall policy that allows FortiVoice to access everything on the internet, then you do not need to create an additional firewall policy. You have completed the FortiGate configuration for SIP over TLS. Go to Installing and configuring the FortiFone softclient for mobile on page 157.

If FortiGate does not have an outbound firewall policy that allows FortiVoice to access everything on the internet, perform the steps to create the FQDN addresses and the specific outbound firewall policies to allow FortiVoice to access the Android and iOS push servers.

To create FQDN addresses for Android and iOS push servers

1. On FortiGate, go to **Policy & Objects > Addresses** and click **Create New**.
2. In **Name**, enter a name for the Android push server address.
3. In **Type**, select **FQDN**.
4. In **FQDN**, enter **fcm.googleapis.com**.
5. Click **OK**.
6. Click **Create New**.
7. In **Name**, enter a name for the iOS push server address.
8. In **Type**, select **FQDN**.
9. In **FQDN**, enter **gateway.push.apple.com**.
10. Click **OK**.

To use the Android and iOS push server addresses in an outbound firewall policy

1. On FortiGate, go to **Policy & Objects > Firewall Policy** and click **Create New**.
2. In **Incoming interface**, enter the port connected to FortiVoice.
3. In **Outgoing interface**, enter the WAN port.
4. In **Source**, select **all**.
5. In **Destination**, select the FQDN addresses that you created for the Android and iOS push servers.
6. Configure the rest of the policy, as needed.
7. Click **OK**.
   You have completed the configuration of FortiGate for SIP over TCP or UDP.
8. Go to Installing and configuring the FortiFone softclient for mobile on page 157.

Installing and configuring the FortiFone softclient for mobile

For details about installing, configuring, and using the FortiFone softclient for mobile, see one of the following user guides, as applicable:

- FortiFone Softclient for Android User Guide
- FortiFone Softclient for iOS User Guide

Deployment of FortiFone softclient for desktop

The FortiFone softclient for desktop is a secure application designed to transform your computer into an extension on the FortiVoice phone system. Through the intuitive interface, you can conveniently take control of your calls without shifting focus away from your screen. Using the FortiFone softclient for desktop in conjunction with a desk phone allows you to manage calls, check voicemail, and quickly view the company directory.

This section describes how to configure the FortiVoice phone system to use the FortiFone softclient for desktop, and install and configure the FortiFone softclient.

Protocols

The communication between the FortiFone softclient for desktop and the FortiVoice phone system uses the following protocols:

- WSS (TCP) for signaling
- DTLS (UDP) for audio

Call flows

The inbound call flow includes the following steps:

1. The FortiFone softclient for desktop logs in and registers with FortiVoice.
2. A caller dials an extension to connect to the FortiFone softclient for desktop.
3. FortiVoice sends an Invite message to the FortiFone softclient for desktop to initiate the call.
4. When the user of the FortiFone softclient for desktop accepts the call, the signaling will be complete and FortiVoice transmits the audio using DTLS.

The outbound call flow includes the following steps:

1. The user initiates an outbound call using the FortiFone softclient for desktop.
2. The FortiFone softclient for desktop sends an Invite message to FortiVoice. FortiVoice attempts to make the outbound call.
3. After the signaling is complete and the call is established, the audio is transmitted between FortiVoice and the FortiFone softclient for desktop using DTLS.

Workflow

For a deployment with FortiFone softclient for desktop, perform the following tasks:

1. Configuring FortiFone softclient for desktop settings on FortiVoice on page 158
2. Configuring the ICE support on page 161
3. Create virtual IP addresses on FortiGate on page 162
4. Configuring a FortiGate firewall policy for port forwarding on page 165
5. Installing and configuring the FortiFone softclient for desktop on page 167

Configuring FortiFone softclient for desktop settings on FortiVoice

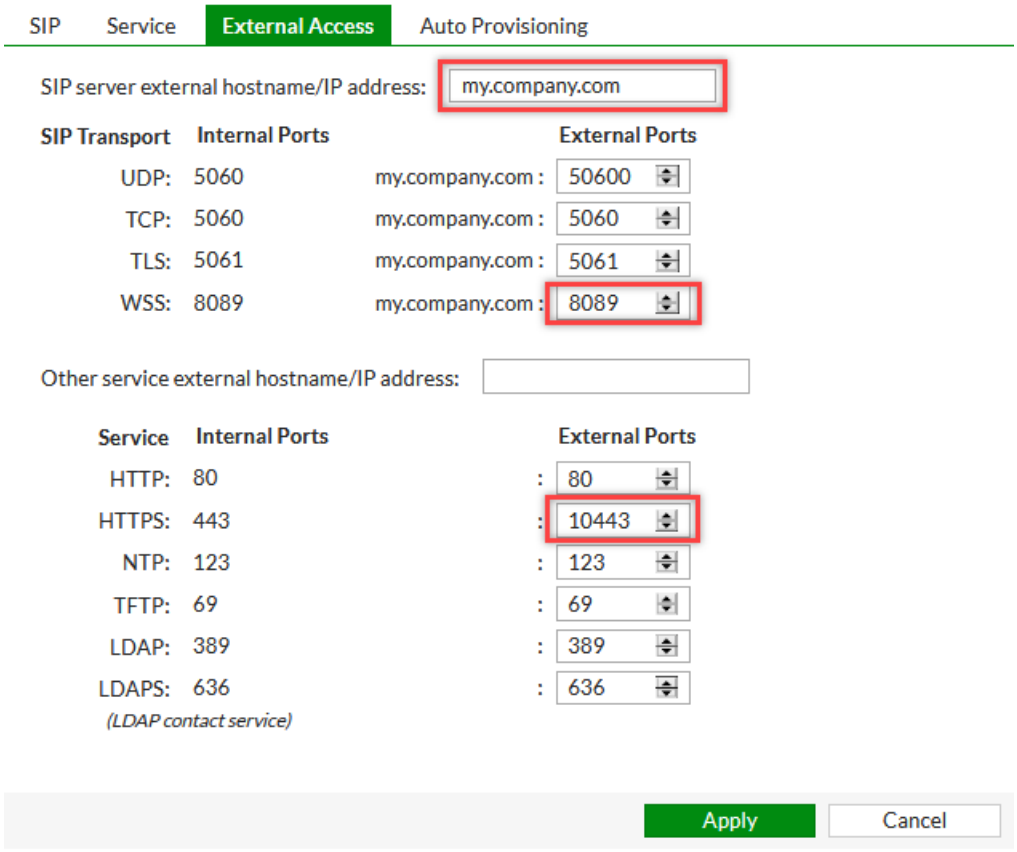
Perform the following procedures to configure FortiFone softclient for desktop settings on the FortiVoice phone system:

Prior to starting the configuration, make sure to complete the recipes in Licensing on page 93 to purchase, register, and upload a softclient license.

- Configure external access settings on page 159
- Configure a SIP profile on page 159
- Assign the FortiFone softclient for desktop to a FortiVoice extension on page 160

Configure external access settings

1. On FortiVoice, go to **System > Advanced > External Access**.
2. Set **SIP server external hostname/IP address** to the IP address or FQDN of the FortiVoice device.
3. Configure the WSS and HTTPS external access ports.



4. Click **Apply**.

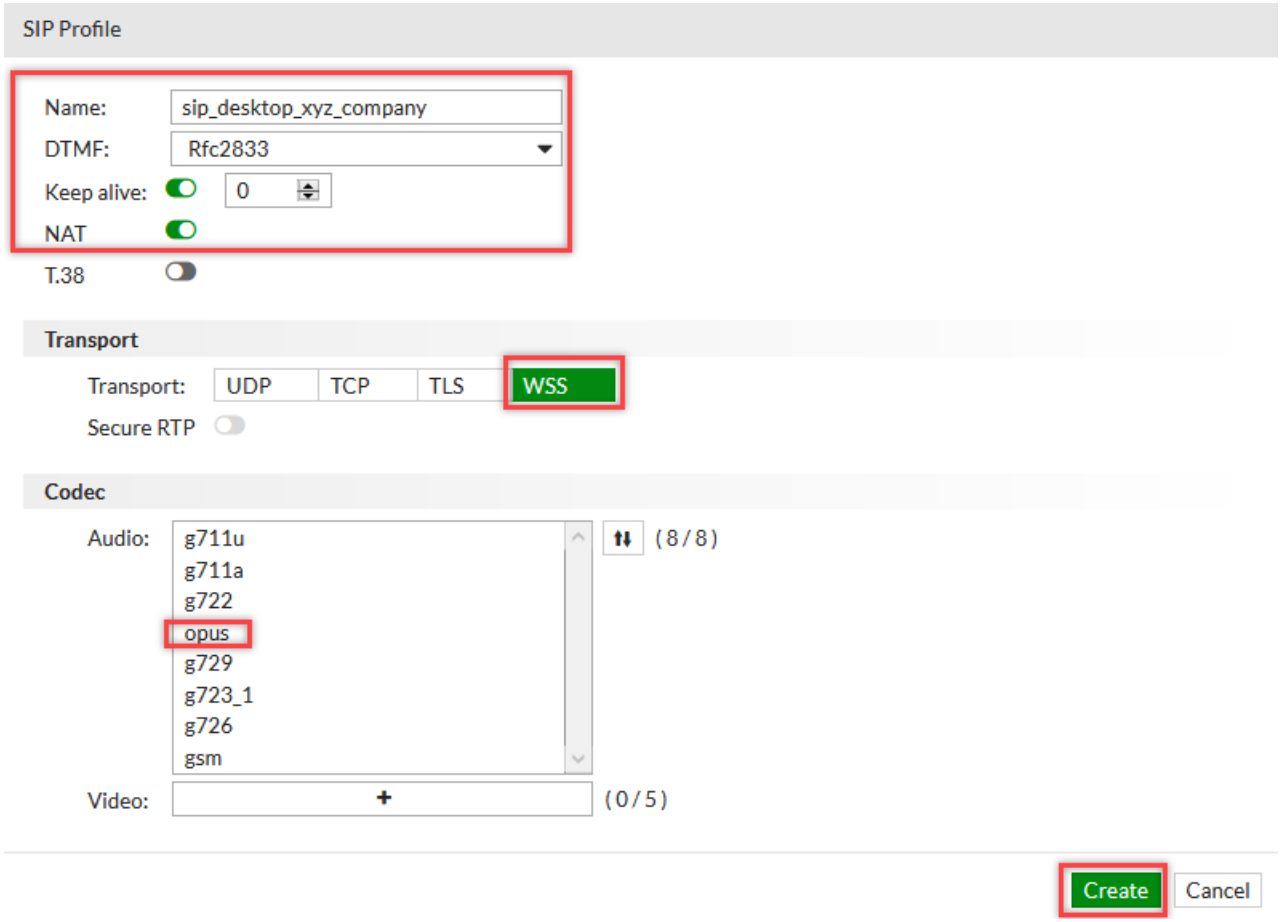
Configure a SIP profile

Fortinet recommends that you use the default SIP profile (sip_desktop_default).

However, if you want to create your own SIP profile, then perform the following steps to set the parameters for your deployment:

1. On FortiVoice, go to **Phone System > Profile > SIP**.
2. Click **New > Desktop**.
3. In **Name**, enter a name for this SIP profile.
4. In **DTMF**, select **RFC2833**.
5. In **Keep alive**, select 0.

6. Enable **NAT**.
7. In **Codec**, make sure that **opus** is in the list.

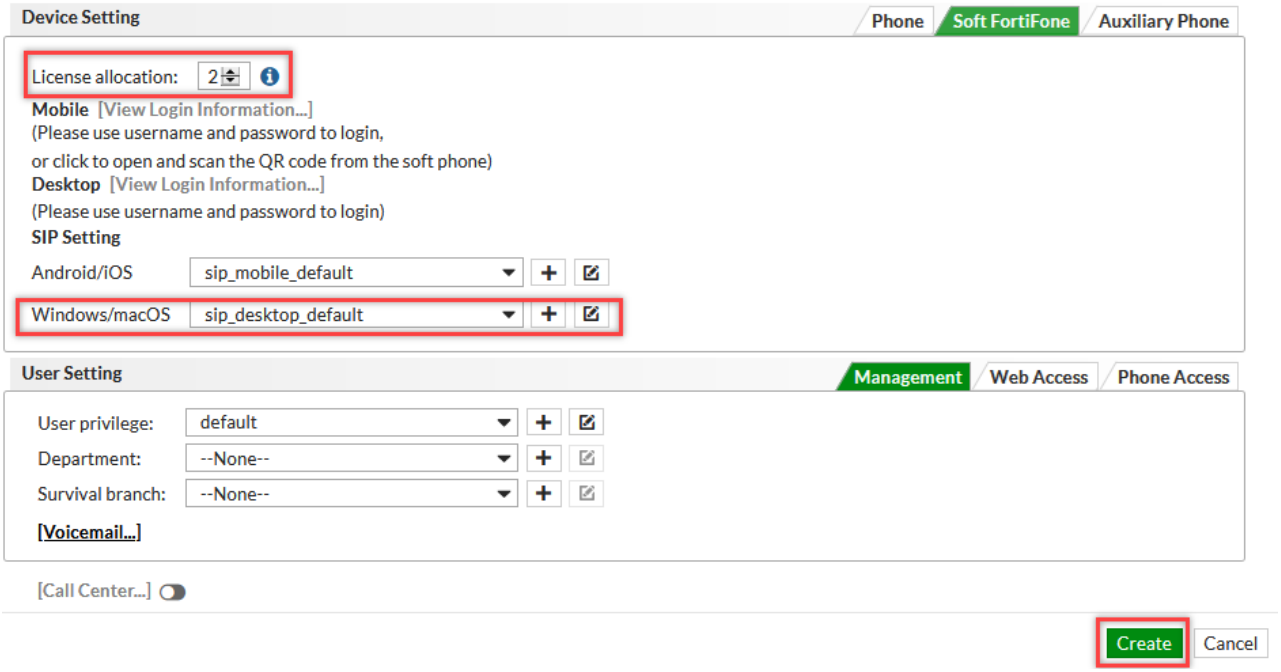


8. Click **Create**.

Assign the FortiFone softclient for desktop to a FortiVoice extension

1. On FortiVoice, go to **Extension > Extension > IP Extension** and click **New**.
2. Enter a **Number** for the extension.
3. Under **Device Setting**, click the **Soft FortiFone** tab.

4. In **License allocation**, specify the value to configure. In this example, the value is 2. One license allocation is for the desktop (Windows/macOS) and the other is for the mobile (Android/iOS) that you can deploy later.
   After you complete the installation of the FortiFone softclient, the **Soft FortiFone** tab lists the device. From this tab, you can also revoke a license occupied by an inactive or unused device, if applicable.
5. In **Windows/macOS**, keep the default profile or select the profile that you configured in Configure a SIP profile on page 159.



6. Click **Create**.

Configuring the ICE support

When the FortiFone softclient is located behind a Network Address Translator (NAT) or FortiFone softclients are on different networks (without internetwork routing), configure the interactive connectivity establishment (ICE) support to allow the FortiVoice phone system to establish a valid audio path with the FortiFone softclient.

To configure the ICE support, you have the following two options:

- **Static mapping**: Uses the internal and external IP addresses of the FortiVoice phone system.
- **STUN server**: Uses the IP address of a Session Traversal Utilities for NAT (STUN) server.

Decide which option you want to configure for ICE support.

To configure the static mapping for ICE support

1. To connect to the FortiVoice CLI, go to **Dashboard > Console** and click inside the window.
2. Enter the following commands and replace xxx.xxx.xxx.xxx with the internal and external FortiVoice IP addresses used in your deployment:

```
config system sip-setting
set ice-support static-mapping
   config ice-ip-mapping
      edit 1
         set status enable
         set internal-ipaddr xxx.xxx.xxx.xxx
```

```
            set external-ipaddr xxx.xxx.xxx.xxx
        next
    end
```

3. Reload the configuration by entering the following command:
   ```
   execute reload voiced
   ```

To configure the STUN server for ICE support

1. To connect to the FortiVoice CLI, go to **Dashboard > Console** and click inside the window.
2. Enter the following commands and replace xxx.xxx.xxx.xxx with the IP address or host name of a Fortinet or third-party STUN server:
   ```
   config system sip-setting
      set ice-support stun-server
      set stun-server xxx.xxx.xxx.xxx
   end
   ```
3. Reload the configuration by entering the following command:
   ```
   execute reload voiced
   ```

Create virtual IP addresses on FortiGate

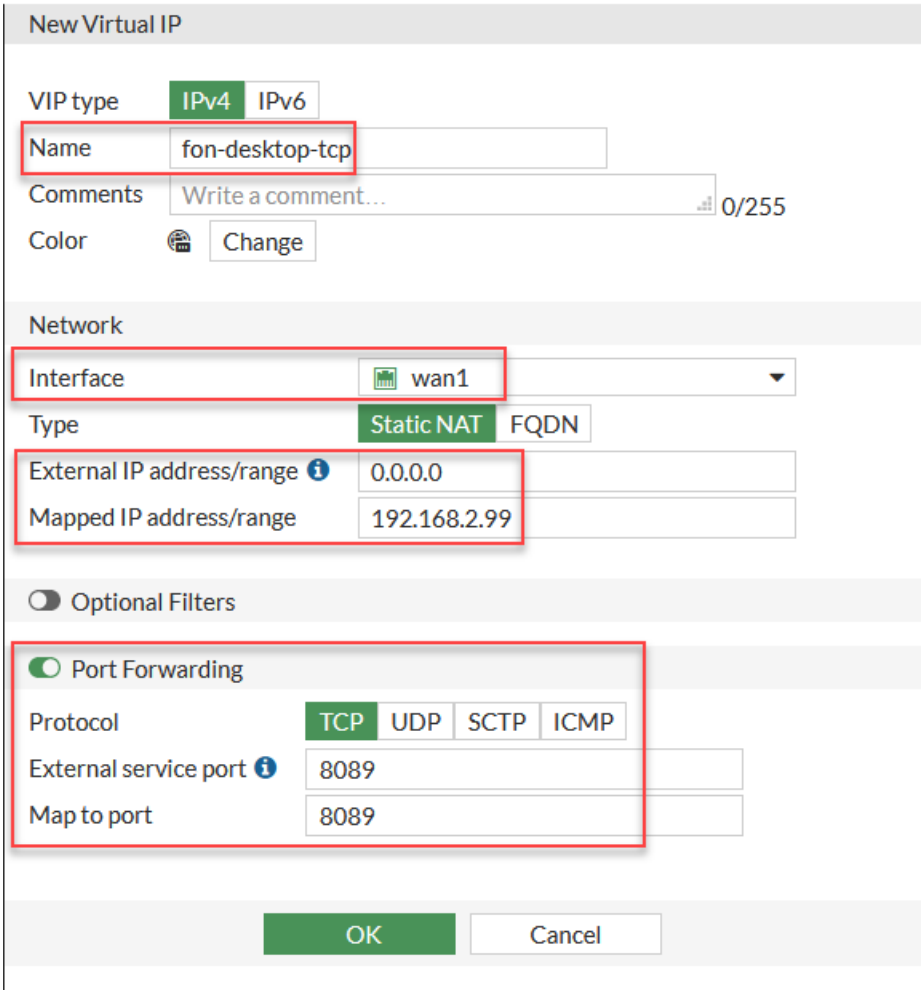
Create virtual IP addresses to be used for the following port forwarding:

- WSS port
- RTP port
- HTTPS port

To create a virtual IP address for the WSS port (using the TCP protocol)

1. On FortiGate, go to **Policy & Objects > Virtual IPs**.
2. Click **Create New > Virtual IP**.
3. Enter a **Name** to identify this virtual IP address.
4. Configure the settings.
   Here are example settings:
   - **Interface**: wan1
   - **External IP address/range**: 0.0.0.0
   - **Mapped IP address/range**: IP address of the FortiVoice unit
   - Enable **Port Forwarding**.
     - **Protocol**: TCP
     - **External port service**: 8089

- **Map to port**: 8089

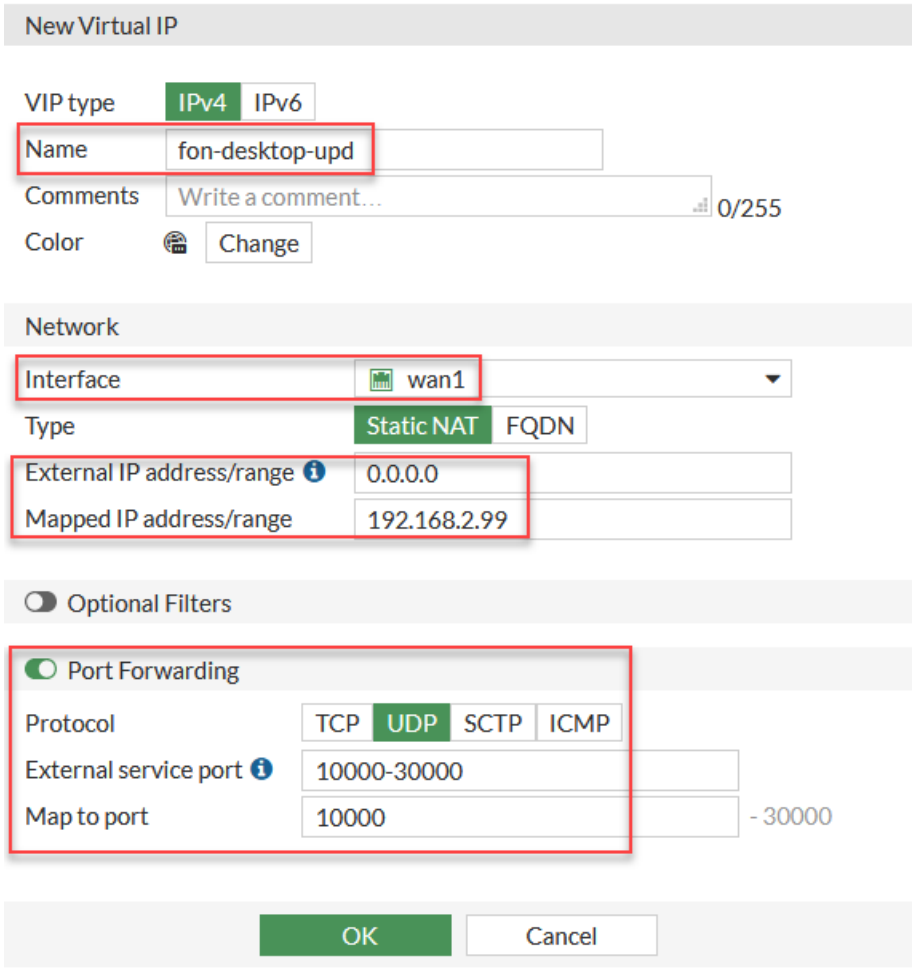


5. To save the changes, click **OK**.

To create a virtual IP address for the RTP port (encrypted using DTLS and running over UDP)

7. Click **Create New > Virtual IP**.
8. Enter a **Name** to identify this virtual IP address.
9. Configure the settings.
   Here are example settings:
   - **Interface**: wan1
   - **External IP address/range**: 0.0.0.0
   - **Mapped IP address/range**: IP address of the FortiVoice unit
   - Enable **Port Forwarding**.
     - **Protocol**: UDP
     - **External port service**: 10000 - 30000
       - **Note**: For the range of the **External port service**, make sure to use the same values as the **RTP Setting** available in **System > Advanced > SIP**.

- **Map to port**: 10000



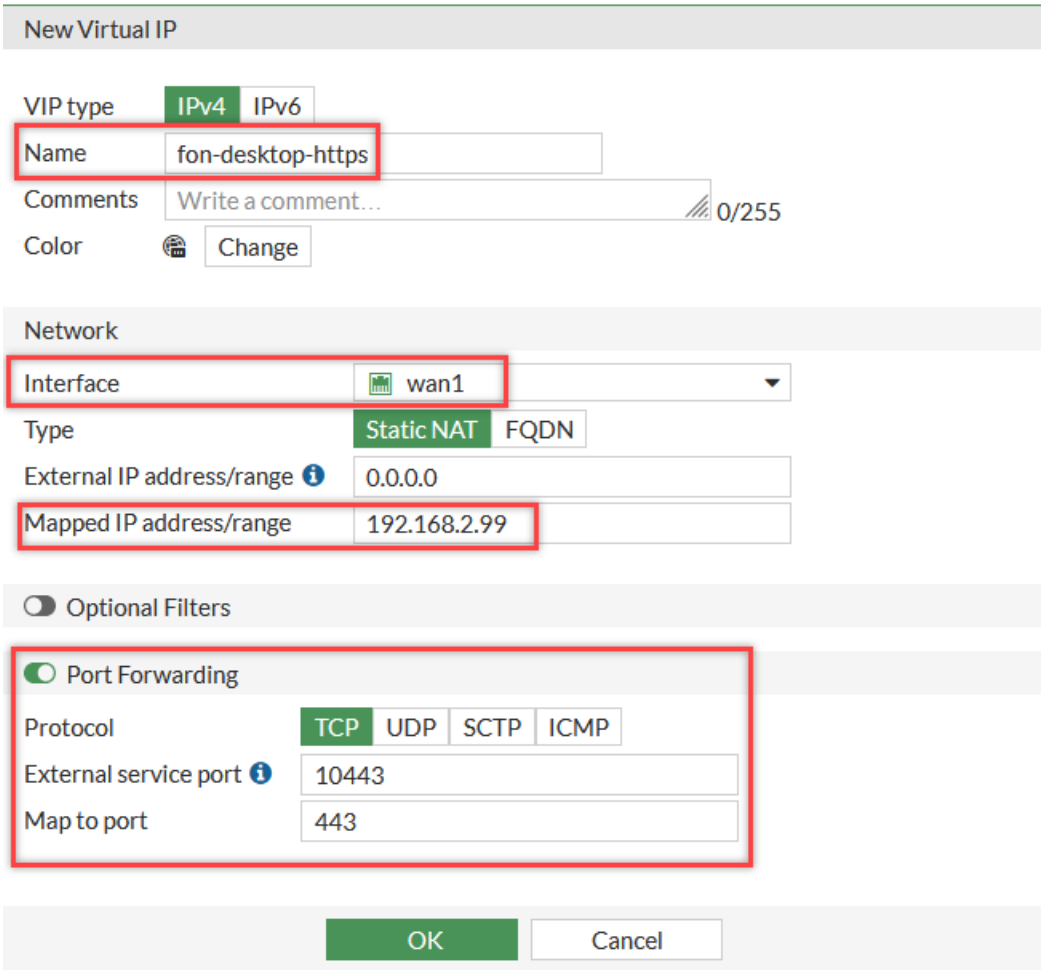
10. To save the changes, click **OK**.

To create a virtual IP address for the HTTPS port

The HTTPS port is used for logging in and downloading call detail records and voicemail messages.

11. Click **Create New > Virtual IP**.
12. Enter a **Name** to identify this virtual IP address.
13. Configure the settings.
    Here are example settings:
    - **Interface**: wan1
    - **External IP address/range**: 0.0.0.0
    - **Mapped IP address/range**: IP address of the FortiVoice unit
    - Enable **Port Forwarding**.
      - **Protocol**: TCP
      - **External port service**: 10443

- **Map to port**: 443



14. To save the changes, click **OK**.

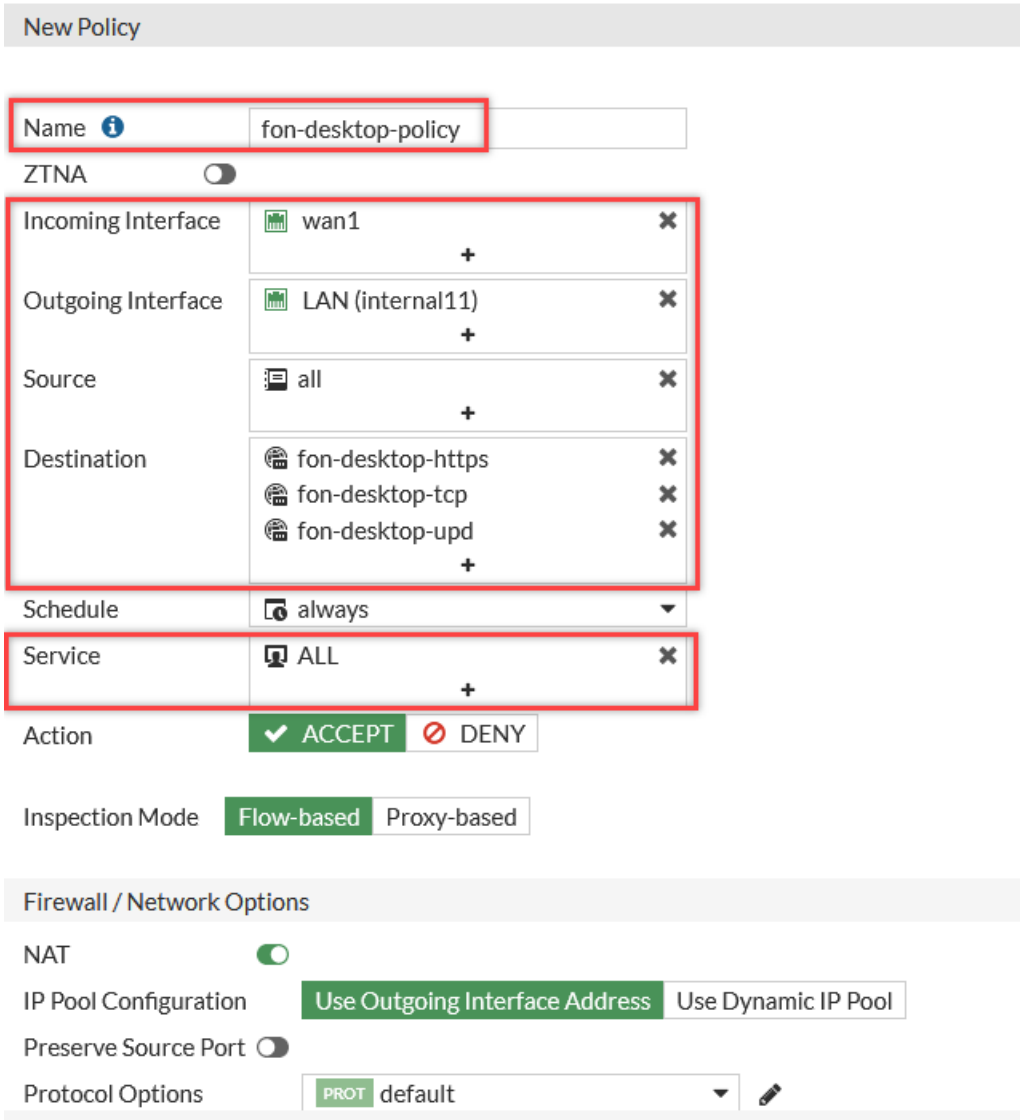
Configuring a FortiGate firewall policy for port forwarding

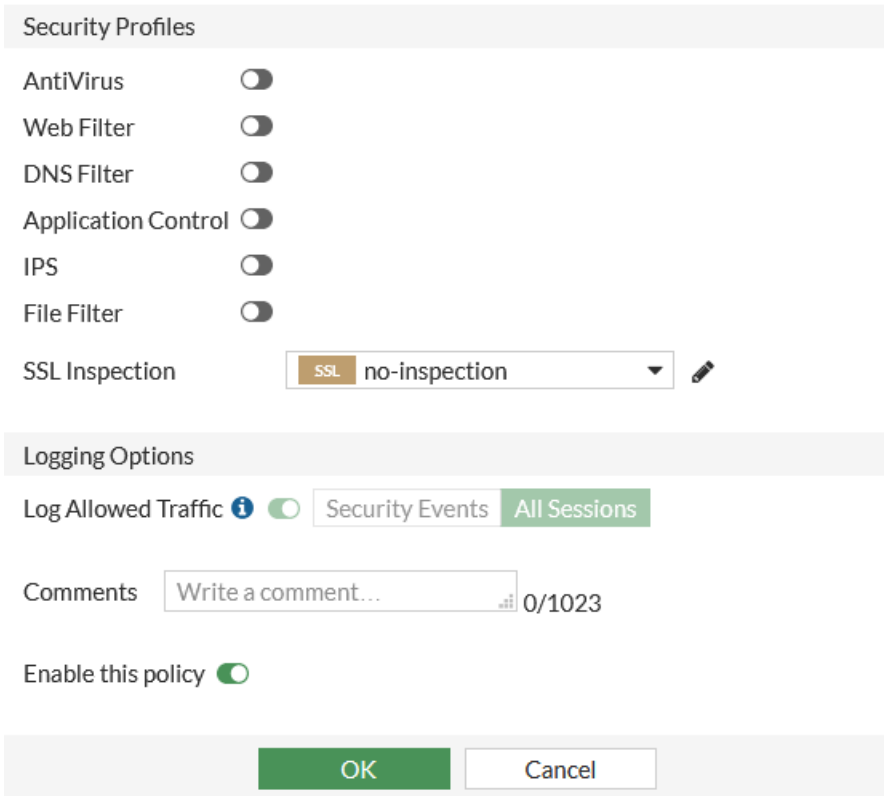
On FortiGate, configure a firewall policy to manage the port forwarding for the FortiFone softclient for desktop on the FortiVoice phone system.

Procedure steps

1. On FortiGate, go to **Policy & Objects > Firewall Policy**.
2. Click **Create New**.
3. Add a **Name** to identify this policy.
4. For a basic setup example, you can configure the following settings:
   - **Incoming interface**: wan1
   - **Outgoing interface**: LAN
   - **Source**: All
   - **Destination**: Select the virtual IP addresses that you created in Create virtual IP addresses on FortiGate on page 162.

- **Service**: All


New Policy
Name
fon-desktop-policy
ZTNA
Incoming Interface
wan1
Outgoing Interface
LAN (internal11)
Source
all
Destination
fon-desktop-https
fon-desktop-tcp
fon-desktop-upd
Schedule
always
Service
ALL
Action
ACCEPT
DENY
Inspection Mode
Flow-based
Proxy-based
Firewall / Network Options
NAT
IP Pool Configuration
Use Outgoing Interface Address
Use Dynamic IP Pool
Preserve Source Port
Protocol Options
PROT
default



5. To save the new firewall policy, click **OK**.

Installing and configuring the FortiFone softclient for desktop

For details about installing, configuring, and using the FortiFone softclient for desktop, see the FortiFone Softclient for Desktop User Guide.

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