



# FortiGate Voice™

Version 4.0 MR1

Administration Guide

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## **FortiGate Voice Administration Guide**

Version 4.0 MR1

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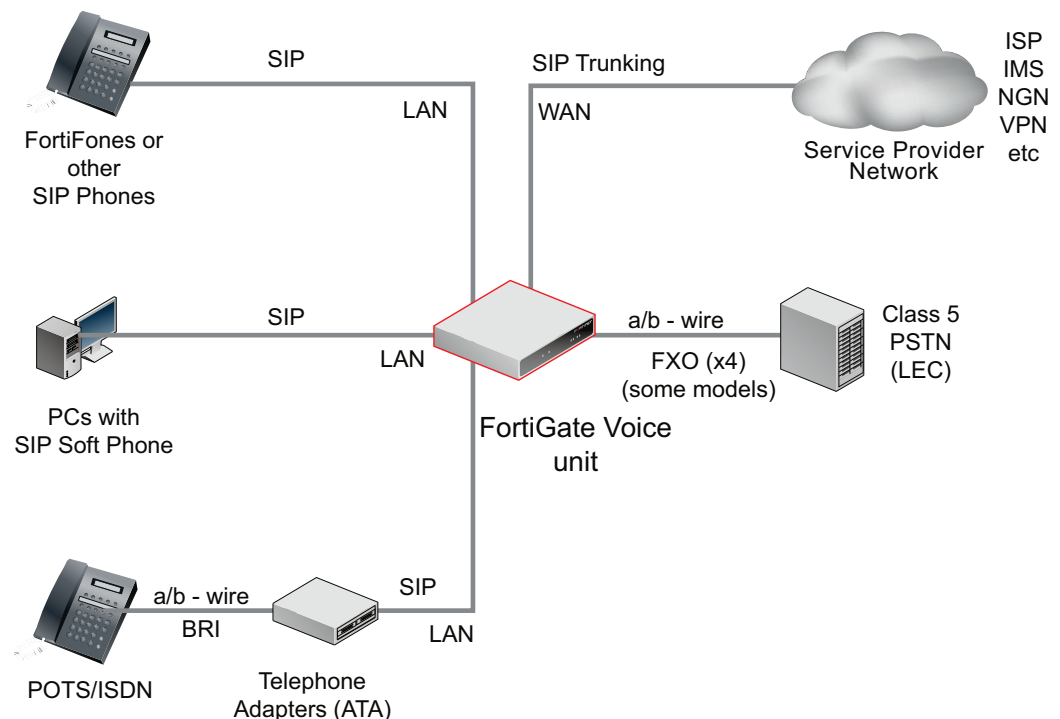
# Introduction

FortiGate Voice units integrate FortiGate UTM functionality with VoIP phone PBX functionality. Some FortiGate Voice models also support connections to the public switched telephone network (PSTN). A small office or an enterprise branch office can use a FortiGate Voice unit to provide routing, Ethernet switching, Internet connectivity, UTM security, VoIP gateway, and VoIP PBX features for the office.

FortiGate Voice PBX functionality includes:

- Four Foreign eXchange Office (FXO) interfaces for connected to up to 4 standard public switch telephone network (PSTN) phone lines (some FortiGate Voice models)
- Flexible number dial plans
- Standard VoIP PBX feature set
- Integrated dial-back up modem and optional 3G wireless cards
- Voicemail
- Message notification
- Unified messaging
- Music on hold
- Automatic Call Distribution (ACD)
- Basic conferencing
- Statistics and logging

**Figure 1: FortiGate Voice Network connections**



This document includes a configuration example that describes how to configure a FortiGate Voice-80C to provide VoIP, networking, and UTM services for a branch office network. Also included is a configuration reference to FortiGate Voice VoIP, PBX, and PSTN web-based manager and CLI functionality.

This chapter contains the following sections:

- [Fortinet products](#)
- [Before you begin](#)
- [How this guide is organized](#)
- [Document conventions](#)
- [Registering your Fortinet product](#)
- [Fortinet products End User License Agreement](#)
- [Training](#)
- [Documentation](#)
- [Customer service and technical support](#)

## Fortinet products

Fortinet's portfolio of security gateways and complementary products offers a powerful blend of ASIC-accelerated performance, integrated multi-threat protection, and constantly updated, in-depth threat intelligence. This unique combination delivers network, content, and application security for enterprises of all sizes, managed service providers, and telecommunications carriers, while providing a flexible, scalable path for expansion. For more information on the Fortinet product family, go to [www.fortinet.com/products](http://www.fortinet.com/products).

## Before you begin

This document is intended for administrators, not end users.

This [FortiGate Voice Administration Guide](#) is a supplement to the [FortiGate Administration Guide](#) that provides detailed information about the PBX, and PSTN configuration for system administrators of a FortiGate Voice unit. It is assumed that you have already successfully installed a FortiGate unit by following the instructions in the [FortiGate Voice-80C QuickStart Guide](#). PSTN interfaces are supported on some FortiGate Voice models.

At this stage:

- You have administrative access to the web-based manager and/or CLI.
- The FortiGate Voice unit is integrated into your network.
- The operation mode has been configured.
- The system time, DNS settings, administrator password, and network interfaces have been configured.
- Firmware, FortiGuard Antivirus and FortiGuard Antispam updates are completed.

Once that basic installation is complete, you can use this document.

## How this guide is organized

This section of the guide provides a brief provides a chapter-by-chapter summary of this guide.

The most recent version of this document is available from the [FortiGate](#) page of the [Fortinet Technical Documentation](#) web site.

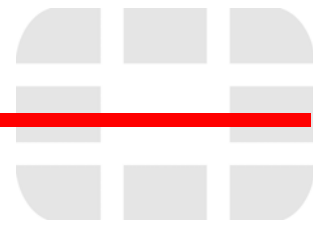
You can also learn more about the FortiGate Voice product from the same FortiGate page, as well as from the [Fortinet Knowledge Base](#).

This administration guide contains the following chapters:

- [Example FortiGate Voice branch office configuration](#) provides a configuration example that describes how to configure a FortiGate Voice-80C unit to operate in NAT/Route mode and provide basic UTM and SIP services for an example branch office network.
- [FortiGate Voice web-based manager configuration reference](#) describes FortiGate Voice web-based manager configuration settings.
- [FortiGate Voice VoIP, PBX, and PSTN CLI Reference](#) describes upgrading and managing firmware versions. You should review this section before upgrading your FortiGate firmware because it contains important information about how to properly back up your current configuration settings and what to do if the upgrade is unsuccessful.







## Document conventions

Fortinet technical documentation uses the conventions described below.

### IP addresses

To avoid publication of public IP addresses that belong to Fortinet or any other organization, the IP addresses used in Fortinet technical documentation are fictional and follow the documentation guidelines specific to Fortinet. The addresses used are from the private IP address ranges defined in RFC 1918: Address Allocation for Private Internets, available at <http://ietf.org/rfc/rfc1918.txt?number-1918>.

Most of the examples in this document use the following IP addressing:

- IP addresses are made up of A.B.C.D
- A - can be one of 192, 172, or 10 - the non-public addresses covered in RFC 1918.
- B - 168, or the branch / device / virtual device number.
  - Branch number can be 0xx, 1xx, 2xx - 0 is Head office, 1 is remote, 2 is other.
  - Device or virtual device - allows multiple FortiGate units in this address space (VDOMs).
  - Devices can be from x01 to x99.
- C - interface - FortiGate units can have up to 40 interfaces, potentially more than one on the same subnet
  - 001 - 099- physical address ports, and non -virtual interfaces
  - 100-255 - VLANs, tunnels, aggregate links, redundant links, vdom-links, etc.
- D - usage based addresses, this part is determined by what device is doing
  - The following gives 16 reserved, 140 users, and 100 servers in the subnet.
  - 001 - 009 - reserved for networking hardware, like routers, gateways, etc.
  - 010 - 099 - DHCP range - users
  - 100 - 109 - FortiGate devices - typically only use 100
  - 110 - 199 - servers in general (see later for details)
  - 200 - 249 - static range - users
  - 250 - 255 - reserved (255 is broadcast, 000 not used)
  - The D segment servers can be farther broken down into:
    - 110 - 119 - Email servers
    - 120 - 129 - Web servers
    - 130 - 139 - Syslog servers
    - 140 - 149 - Authentication (RADIUS, LDAP, TACACS+, FSAE, etc)
    - 150 - 159 - VoIP / SIP servers / managers
    - 160 - 169 - FortiAnalyzers
    - 170 - 179 - FortiManagers
    - 180 - 189 - Other Fortinet products (FortiScan, FortiDB, etc.)
    - 190 - 199 - Other non-Fortinet servers (NAS, SQL, DNS, DDNS, etc.)
    - Fortinet products, non-FortiGate, are found from 160 - 189.

The following table shows some examples of how to choose an IP number for a device based on the information given. For internal and dmz, it is assumed in this case there is only one interface being used.

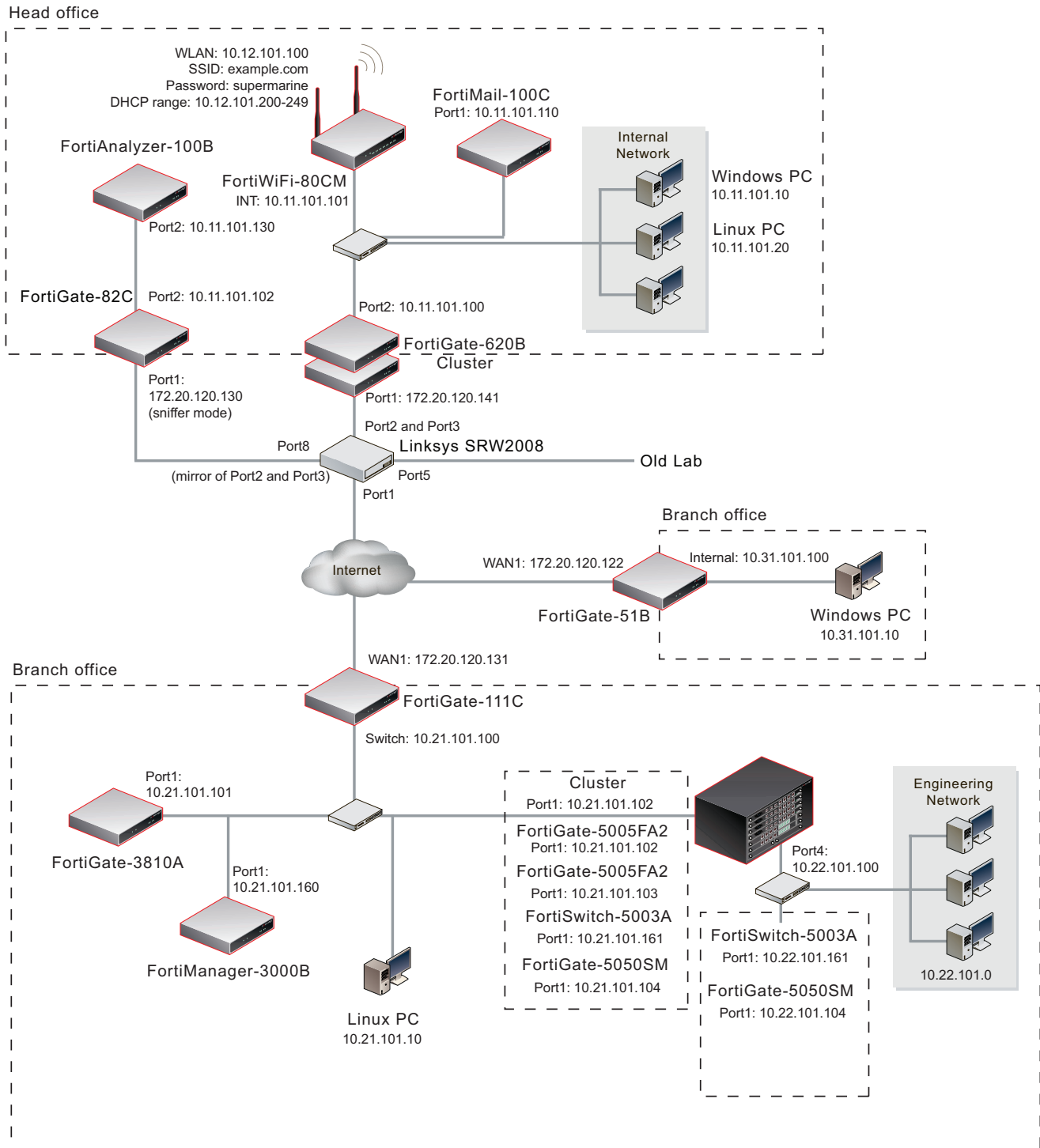
**Table 1: Examples of the IP numbering**

<b>Location and device</b>	<b>Internal</b>	<b>Dmz</b>	<b>External</b>
<b>Head Office, one FortiGate</b>	10.011.101.100	10.011.201.100	172.20.120.191
<b>Head Office, second FortiGate</b>	10.012.101.100	10.012.201.100	172.20.120.192
<b>Branch Office, one FortiGate</b>	10.021.101.100	10.021.201.100	172.20.120.193
<b>Office 7, one FortiGate with 9 VDOMs</b>	10.079.101.100	10.079.101.100	172.20.120.194
<b>Office 3, one FortiGate, web server</b>	n/a	10.031.201.110	n/a
<b>Bob in accounting on the corporate user network (dhcp) at Head Office, one FortiGate</b>	10.0.11.101.200	n/a	n/a
<b>Router outside the FortiGate</b>	n/a	n/a	172.20.120.195

## Example Network configuration

The network configuration shown in [Figure 2](#) or variations on it is used for many of the examples in this document. In this example, the 172.20.120.0 network is equivalent to the Internet. The network consists of a head office and two branch offices.

**Figure 2: Example network configuration**



## Cautions, Notes and Tips

Fortinet technical documentation uses the following guidance and styles for cautions, notes and tips.



**Caution:** Warns you about commands or procedures that could have unexpected or undesirable results including loss of data or damage to equipment.



**Note:** Presents useful information, but usually focused on an alternative, optional method, such as a shortcut, to perform a step.



**Tip:** Highlights useful additional information, often tailored to your workplace activity.

## Typographical conventions

Fortinet documentation uses the following typographical conventions:

**Table 2: Typographical conventions in Fortinet technical documentation**

Convention	Example
<b>Button, menu, text box, field, or check box label</b>	From <i>Minimum log level</i> , select <i>Notification</i> .
<b>CLI input</b>	<pre>config system dns   set primary &lt;address_ipv4&gt; end</pre>
<b>CLI output</b>	<pre>FGT-602803030703 # get system settings comments          : (null) opmode            : nat</pre>
<b>Emphasis</b>	HTTP connections are <b>not</b> secure and can be intercepted by a third party.
<b>File content</b>	<pre>&lt;HTML&gt;&lt;HEAD&gt;&lt;TITLE&gt;Firewall Authentication&lt;/TITLE&gt;&lt;/HEAD&gt; &lt;BODY&gt;&lt;H4&gt;You must authenticate to use this service.&lt;/H4&gt;</pre>
<b>Hyperlink</b>	Visit the Fortinet Technical Support web site, <a href="https://support.fortinet.com">https://support.fortinet.com</a> .
<b>Keyboard entry</b>	Type a name for the remote VPN peer or client, such as <code>Central_Office_1</code> .
<b>Navigation</b>	Go to <code>VPN &gt; IPSEC &gt; Auto Key (IKE)</code> .
<b>Publication</b>	For details, see the <a href="#">FortiOS Handbook</a> .

## CLI command syntax conventions

This guide uses the following conventions to describe the syntax to use when entering commands in the Command Line Interface (CLI).

Brackets, braces, and pipes are used to denote valid permutations of the syntax. Constraint notations, such as `<address_ipv4>`, indicate which data types or string patterns are acceptable value input.

Table 3: Command syntax notation

Convention	Description
<b>Square brackets</b> [ ]	<p>A non-required word or series of words. For example: [verbose {1   2   3}]</p> <p>indicates that you may either omit or type both the <code>verbose</code> word and its accompanying option, such as: <code>verbose 3</code></p>
<b>Angle brackets</b> < >	<p>A word constrained by data type.</p> <p>To define acceptable input, the angled brackets contain a descriptive name followed by an underscore ( <code>_</code> ) and suffix that indicates the valid data type. For example: &lt;retries_int&gt;</p> <p>indicates that you should enter a number of retries, such as 5.</p> <p>Data types include:</p> <ul style="list-style-type: none"> <li>• &lt;xxx_name&gt;: A name referring to another part of the configuration, such as <code>policy_A</code>.</li> <li>• &lt;xxx_index&gt;: An index number referring to another part of the configuration, such as 0 for the first static route.</li> <li>• &lt;xxx_pattern&gt;: A regular expression or word with wild cards that matches possible variations, such as <code>*@example.com</code> to match all email addresses ending in <code>@example.com</code>.</li> <li>• &lt;xxx_fqdn&gt;: A fully qualified domain name (FQDN), such as <code>mail.example.com</code>.</li> <li>• &lt;xxx_email&gt;: An email address, such as <code>admin@mail.example.com</code>.</li> <li>• &lt;xxx_url&gt;: A uniform resource locator (URL) and its associated protocol and host name prefix, which together form a uniform resource identifier (URI), such as <code>http://www.fortinet./com/</code>.</li> <li>• &lt;xxx_ipv4&gt;: An IPv4 address, such as <code>192.168.1.99</code>.</li> <li>• &lt;xxx_v4mask&gt;: A dotted decimal IPv4 netmask, such as <code>255.255.255.0</code>.</li> <li>• &lt;xxx_ipv4mask&gt;: A dotted decimal IPv4 address and netmask separated by a space, such as <code>192.168.1.99 255.255.255.0</code>.</li> <li>• &lt;xxx_ipv4/mask&gt;: A dotted decimal IPv4 address and CIDR-notation netmask separated by a slash, such as <code>192.168.1.99/24</code>.</li> <li>• &lt;xxx_ipv6&gt;: A colon ( <code>:</code> )-delimited hexadecimal IPv6 address, such as <code>3f2e:6a8b:78a3:0d82:1725:6a2f:0370:6234</code>.</li> <li>• &lt;xxx_v6mask&gt;: An IPv6 netmask, such as <code>/96</code>.</li> <li>• &lt;xxx_ipv6mask&gt;: An IPv6 address and netmask separated by a space.</li> <li>• &lt;xxx_str&gt;: A string of characters that is <b>not</b> another data type, such as <code>P@ssw0rd</code>. Strings containing spaces or special characters must be surrounded in quotes or use escape sequences.</li> <li>• &lt;xxx_int&gt;: An integer number that is <b>not</b> another data type, such as 15 for the number of minutes.</li> </ul>
<b>Curly braces</b> { }	<p>A word or series of words that is constrained to a set of options delimited by either vertical bars or spaces.</p> <p>You must enter at least one of the options, unless the set of options is surrounded by square brackets [ ].</p>

Table 3: Command syntax notation (Continued)

Convention	Description
Options delimited by vertical bars	Mutually exclusive options. For example: {enable   disable} indicates that you must enter either <code>enable</code> or <code>disable</code> , but must not enter both.
Options delimited by spaces	Non-mutually exclusive options. For example: {http https ping snmp ssh telnet} indicates that you may enter all or a subset of those options, in any order, in a space-delimited list, such as: ping https ssh <b>Note:</b> To change the options, you must re-type the entire list. For example, to add <code>snmp</code> to the previous example, you would type: ping https snmp ssh If the option adds to or subtracts from the existing list of options, instead of replacing it, or if the list is comma-delimited, the exception will be noted.

## Registering your Fortinet product

Before you begin configuring and customizing features, take a moment to register your Fortinet product at the Fortinet Technical Support web site, <https://support.fortinet.com>.

Many Fortinet customer services, such as firmware updates, technical support, and FortiGuard Antivirus and other FortiGuard services, require product registration.

For more information, see the Fortinet Knowledge Center article [Registration Frequently Asked Questions](#).

## Fortinet products End User License Agreement

See the [Fortinet products End User License Agreement](#).

## Training

Fortinet Training Services provides courses that orient you quickly to your new equipment, and certifications to verify your knowledge level. Fortinet provides a variety of training programs to serve the needs of our customers and partners world-wide.

To learn about the training services that Fortinet provides, visit the Fortinet Training Services web site at <http://campus.training.fortinet.com>, or email [training@fortinet.com](mailto:training@fortinet.com).

## Documentation

The Fortinet Technical Documentation web site, <http://docs.fortinet.com>, provides the most up-to-date versions of Fortinet publications, as well as additional technical documentation such as technical notes.

In addition to the Fortinet Technical Documentation web site, you can find Fortinet technical documentation on the Fortinet Tools and Documentation CD, and on the Fortinet Knowledge Center.

## Fortinet Tools and Documentation CD

Many Fortinet publications are available on the Fortinet Tools and Documentation CD shipped with your Fortinet product. The documents on this CD are current at shipping time. For current versions of Fortinet documentation, visit the Fortinet Technical Documentation web site, <http://docs.fortinet.com>.

## Fortinet Knowledge Base

The Fortinet Knowledge Base provides additional Fortinet technical documentation, such as troubleshooting and how-to-articles, examples, FAQs, technical notes, a glossary, and more. Visit the Fortinet Knowledge Base at <http://kb.fortinet.com>.

## Comments on Fortinet technical documentation

Please send information about any errors or omissions in this or any Fortinet technical document to [techdoc@fortinet.com](mailto:techdoc@fortinet.com).

## Customer service and technical support

Fortinet Technical Support provides services designed to make sure that your Fortinet products install quickly, configure easily, and operate reliably in your network.

To learn about the technical support services that Fortinet provides, visit the Fortinet Technical Support web site at <https://support.fortinet.com>.

You can dramatically improve the time that it takes to resolve your technical support ticket by providing your configuration file, a network diagram, and other specific information. For a list of required information, see the Fortinet Knowledge Base article [FortiGate Troubleshooting Guide - Technical Support Requirements](#).



# Example FortiGate Voice branch office configuration

This section describes how to configure a FortiGate Voice-80C unit to operate in NAT/Route mode and provide basic UTM and SIP services for the example branch office network shown in [Figure 3 on page 18](#). The non-PSTN parts of this example configuration also apply to FortiGate Voice models that do not include PSTN interfaces.

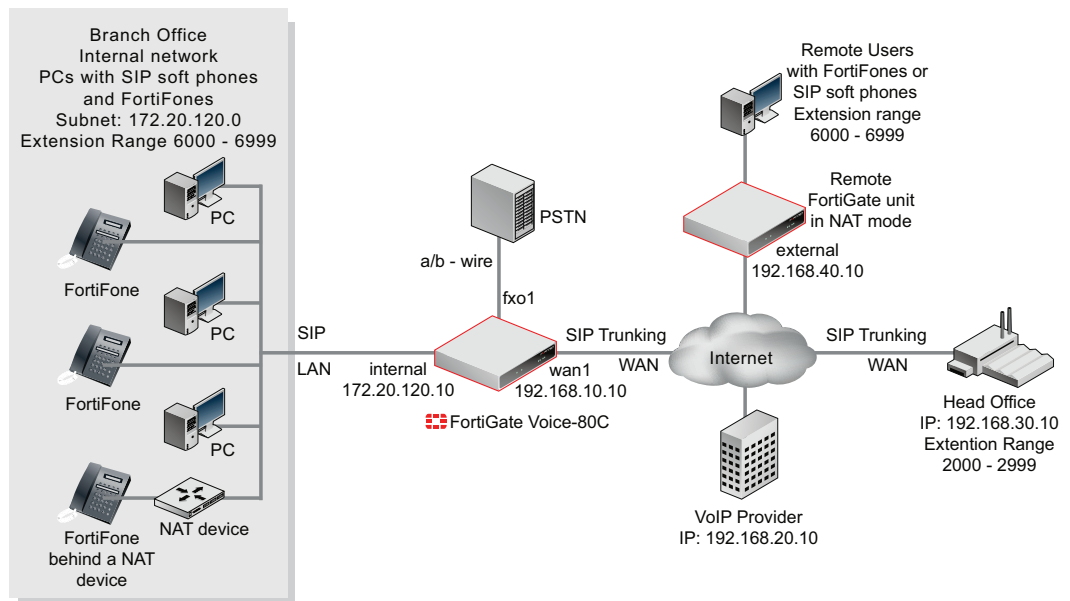
In this example the FortiGate Voice-80C unit provides:

- Internet connectivity, networking, and UTM features for the PCs on the branch office internal network.
- An single line a/b wire connection between the FortiGate Voice-80C fxo1 interface and a public switched telephone network (PSTN) line so that branch office phones can call the PSTN or receive calls from the PSTN.
- VoIP PBX services for FortiFones and SIP soft phones connected to the branch office internal network. PBX features include:
  - Extensions to the FortiFones and SIP soft phones in the internal network. The branch office phones use numeric extensions beginning with the number 6 and including three more digits. Example valid extensions are 6123, 6456, and 6899.
  - Extensions for phones behind NAT devices on the internal network.
  - Extensions for phones behind NAT devices on a remote network.
  - To collect voicemail the branch office phones dial \*97.
  - SIP trunking to a VoIP provider for calling the head office.
  - To call a phone number on the PSTN, the branch office phones dial 9 followed by the phone number. PSTN support will also include:
    - Dialing 911 for emergencies
    - Support for dialing international calls
    - Support for dialing toll free calls
    - Support for long distance calls
  - The FortiGate Voice unit sends email notifications to users when they receive voicemail.
  - To call the head office, the branch office phones dial a head office extension directly. The head office extension range is 2000-2999.

This configuration example describes configuring the FortiGate Voice-80C unit to support these services and where required also provides configuration steps for other devices such as the FortiFones and the remote FortiGate unit operating in NAT mode.

Details about the PSTN connection requirements, SIP trunking for the VoIP provider and the Head Office SIP configuration are not described.

Figure 3: Example Branch Office network configuration



This section describes:

- [General configuration steps](#)
- [Connecting the FortiGate Voice unit](#)
- [Configuring basic FortiGate Voice network and UTM settings](#)
- [Configuring network settings for the devices on the Internal network](#)
- [Configuring the FortiGate Voice PSTN and PBX settings](#)
- [Configuring the FortiFones on the internal network](#)
- [Adding extensions and configuring FortiFones for users behind a NAT device](#)

## General configuration steps

- 1 Connect the FortiGate Voice unit to the Internet, the internal network and the PSTN.
- 2 Configure FortiGate Voice unit network and UTM settings.

The network configuration includes enabling the *SIP Traffic* option on the internal and wan1 interfaces. You must enable SIP traffic on these interfaces to accept and process SIP calls. No other special network configuration, firewall policies, or routing is required for the FortiGate Voice to accept and process SIP calls.



**Note:** You do not have to add SIP firewall policies to enable SIP traffic for the FortiGate Voice unit to function as a PBX. Also, with PBX functionality enabled, you cannot apply FortiGate SIP application control features to SIP traffic received by FortiGate Voice interfaces for which you have enabled the *SIP Traffic* option.

This example also describes how to configure the FortiGate Voice as a DHCP server and DNS server for the branch office internal network. As a DHCP server the FortiGate Voice can supply network configuration settings for the PCs and FortiFones on the internal network.

- 3 Configure network settings for the PCs on the Internal network.
- 4 Configuring the FortiGate Voice PSTN and PBX settings.

- 5 Configure the FortiFones on the internal network.
- 6 Configuring the FortiGate Voice unit to SIP phone users behind a remote NAT device.

## Connecting the FortiGate Voice unit

The following procedure describes how to connect the FortiGate Voice unit to the Internet, the branch office internal network, and the PSTN (supported by some FortiGate Voice models).

### To connect the FortiGate Voice unit

- 1 Use an Ethernet cable to connect the FortiGate Voice wan1 interface to the device that connects the branch office to the Internet.  
  
The device could be a cable or DSL modem or other device depending on how the Branch Office connects to the Internet.
- 2 Use Ethernet cables to connect the PCs and FortiFones on the internal network to the FortiGate Voice internal interface switch connectors.  
  
You can connect up to 8 PCs and FortiFones directly to the FortiGate Voice Internal interface switch connectors. To connect more devices, add Ethernet switches to your network as required.
- 3 Use an RJ-45 telephone cable to connect the FortiGate Voice fxo1 port to the branch office PSTN phone line supplied by your local telephone service provider.

## Configuring basic FortiGate Voice network and UTM settings

The following procedures describe how to configure a FortiGate Voice to provide basic Internet connectivity, network services, and UTM services for the branch office internal network. Network services include configuring the FortiGate Voice to be the DHCP server and DNS server for the internal network.

As part of the FortiGate Voice network interface configuration you must enable *SIP Traffic* on the internal and wan1 interfaces so that the FortiGate Voice unit accepts SIP sessions received by these interfaces. No other special network configuration, firewall policies, or routing is required for the FortiGate Voice to accept SIP sessions from configured extensions.

### To configure basic network settings

- 1 Connect to the FortiGate Voice web-based manager.
- 2 Go to *System > Network > Interface*.
- 3 Edit the *internal* interface and configure the following settings:

<b>Addressing Mode</b>	Manual
<b>IP/Netmask</b>	172.20.120.10/255.255.255.0
<b>SIP Traffic</b>	Select Enable

Configure other network interface settings as required and select OK.

- 4 Edit the *wan1* interface and configure the following settings:

<b>Addressing Mode</b>	Manual
<b>IP/Netmask</b>	192.168.10.10/255.255.255.0
<b>SIP Traffic</b>	Select Enable

Configure other network interface settings as required and select OK.



**Note:** You can also set the *Addressing mode* to *DHCP* or *PPPoE* for the wan1 interface depending on the requirements of your ISP. In the example the wan1 interface has a static IP address.

- 5 Go to *System > Network > Options*.
- 6 Add the IP addresses of the primary and secondary DNS servers used by the branch office provided by your ISP.
- 7 Selected *internal* for *Enable DNS forwarding from* so that users on the internal network can use the *FortiGate Voice* internal interface as their DNS server IP address.  
The procedure “[To configure the FortiGate Voice to be a DHCP server for the internal network](#)” on page 20 describes how to configure the FortiGate DHCP server to configure PCs on the internal network to use the FortiGate Voice internal interface as a DNS server.
- 8 Select Apply.
- 9 Go to *Router > Static > Static Route*.
- 10 Edit the default static route and configure the following settings:

<b>Destination IP/Mask</b>	0.0.0.0/0.0.0.0
<b>Device</b>	wan1
<b>Gateway</b>	Enter the IP address of the default gateway provided by your ISP.
<b>Distance</b>	10

- 11 Select OK.

### To configure the FortiGate Voice to be a DHCP server for the internal network

Use this procedure to add a new DHCP server for the internal network or to change the configuration of the default FortiGateVoice DHCP server. The DHCP server will give PCs on the Internal network IP addresses in the range 172.20.120.110 to 172.20.120.210 and set their default gateway and DNS server to the IP address of the FortiGate Voice internal interface.

- 1 Go to *System > DHCP > Service* and select the expand arrow for the *internal* interface.
- 2 Select the *Add DHCP Server* icon for the *internal* interface.  
If a DHCP server has already been added for the internal interface, select the Edit icon to change its configuration.
- 3 Configure the following settings.

<b>Name</b>	Add a name for the DHCP server if you are adding a new one.
<b>Enable</b>	Select
<b>Type</b>	Regular
<b>IP Range</b>	172.20.120.110 - 172.20.120.210
<b>Network Mask</b>	255.255.255.0
<b>Default Gateway</b>	172.20.120.10

<b>Advanced</b>	Select
<b>DNS Server 1</b>	172.20.120.10

- 4 Change other settings if required and select OK.

**To configure FortiGuard services for the FortiGate Voice unit**

Use the following procedure to configure the FortiGate Voice unit to connect to the FortiGuard Distribution Network (FDN) to update the antivirus, antispyware and IPS attack definitions. Before you can begin receiving updates, you must register the FortiGate Voice unit from the Fortinet Support web site. For more information, see [“Registering your Fortinet product” on page 15](#).

- 1 Go to *System > Maintenance > FortiGuard*.
- 2 Select the expand arrow for *AntiVirus and IPS Options* to expand the options.
- 3 Select *Update Now* to update the FortiGuard services and definitions.

If the connection to the FDN is successful, the web-based manager displays a message similar to the following:

```
Your update request has been sent. Your database will be updated
in a few minutes. Please check your update page for the status
of the update.
```

After a few minutes, if an update is available, the FortiGuard page lists new version information for the FortiGate services and definitions. The system dashboard license information widget also displays new dates and version numbers for the FortiGuard definitions. Messages are recorded to the event log indicating whether the update was successful or not.

**To configure basic Internet access and UTM features**

This procedure describes how to add a firewall policy that allows users on the internal network to connect to the Internet. The firewall policy includes the scan protection profile to apply UTM features, in this case virus scanning, to this traffic. This configuration is not required for VoIP support. It just provides users on the internal network with UTM-protected access to the Internet.

- 1 Go to *Firewall > Policy* and select *Create New* to add a new firewall policy.
- 2 Configure the following settings.

<b>Source Interface/Zone</b>	internal
<b>Source Address</b>	all
<b>Destination Interface/Zone</b>	want
<b>Destination Address</b>	all
<b>Schedule</b>	always
<b>Service</b>	ANY
<b>Action</b>	ACCEPT

- 3 Select *Protection Profile* and select the *scan* protection profile to apply UTM virus scanning to the traffic accepted by the firewall policy.
- 4 Select OK to save the firewall policy.

## Configuring network settings for the devices on the Internal network

You can configure the PCs and other devices on the internal network to get their network configuration automatically using DHCP. If required you can also configure devices on the internal network with static IP addresses on the 172.20.120.0 subnet but outside the range awarded by the FortiGate Voice DHCP server. Example static TCP/IP configuration:

<b>IP Address</b>	172.20.120.20
<b>Subnet Mask</b>	255.255.255.0
<b>Default Gateway</b>	172.20.120.10
<b>DNS Server</b>	172.20.120.10

You can also use the same network configuration for the SIP phones on the internal network.

## Configuring the FortiGate Voice PSTN and PBX settings

The procedures in this section describe how to configure the FortiGate Voice unit as the PBX for SIP phones on the branch office internal network. These procedures describe how to configure many of the FortiGate Voice PSTN and PBX features. PSTN features are supported on some FortiGate Voice models. The following procedures are included:

- [To configure the fxo1 PSTN interface](#)
- [To configure basic PBX system and voicemail notification settings](#)
- [To add a VoIP provider](#)
- [To add a dial plan for dialing the PSTN and the main office](#)
- [To add the extensions that are on the branch office internal network](#)

### To configure the fxo1 PSTN interface

This procedure describes how to configure the FortiGate Voice fxo1 PSTN interface to connect the FortiGate Voice unit to one PSTN phone line. If you have more PSTN phone lines you can connect and configure more fxo interfaces. Skip this procedure if your FortiGate Voice unit does not include PSTN interfaces.

- 1 Go to *System > Network > PSTN Interface* and edit the fxo1 interface.
- 2 Configure the following settings.

<b>Phone Number</b>	Enter the phone number of the PSTN phone line as provided by your phone service provider. The phone number is used for caller ID for calls from the FortiGate Voice unit to the PSTN. It can be any number, but is usually the actual phone number of the PSTN line connected to the fxo1 interface. Area code and country codes are optional.
<b>Display Name</b>	This name is used for caller ID for calls from the FortiGate Voice unit to the PSTN. It can be any name, such as a company name, that identifies the branch office.
<b>Caller ID Options</b>	Configure the following options to support caller ID functions for calls from the internal network to the PSTN.
<b>Catch Caller ID</b>	Select to enable the FortiGate Voice unit to receive caller ID information from calls originating on the PSTN and send the caller ID information to the extension that answers the call.

<b>Caller ID Protocol</b>	Select the caller ID protocol required by PSTN line that the fxo interface is connected to. Contact your service provider for the name of the protocol to use.
<b>Caller ID Indicator</b>	Select the caller ID indicator required by the PSTN line. Contact your service provider for details.
<b>Ring #</b>	Set the number of rings to wait before receiving caller ID information. In most cases, enter 1 to send caller ID information between the first and second ring. Contact your service provider for details.
<b>Hang-up Options</b>	Configure the following options to configure how the FortiGate Voice unit hangs up calls from the PSTN.
<b>Hang up on Polarity Reversal</b>	Select if the PSTN line uses polarity reversal to indicate a call has been hung up. Contact your service provider for details.
<b>Hang up on Busy Tone</b>	Select if you want the FortiGate Voice unit to hang up automatically when it receives a busy tone when attempting to dial a number on the PSTN.
<b>Busy Tone Detection #</b>	The number of busy tones that the FortiGate Voice receives before hanging up if <i>Hang up on Busy Tone</i> is selected.
<b>Busy Tone Duration</b>	Tune the FortiGate Voice unit to accurately detect busy tones on this PSTN line. You can change the default settings if busy tones are not accurately detected.
<b>Busy Tone Interval</b>	
<b>Administrative Status</b>	Set to <i>Up</i> if the fxo interface is connected to the PSTN and you want to be able to receive and send calls on this PSTN interface.

3 Select OK.

**To configure basic PBX system and voicemail notification settings**

Use the following procedure to configure PBX system settings and voicemail notification email settings that affect the overall performance of the PBX service and all of the users of it. Usually you would configure these settings once and rarely thereafter.

- 1 Go to *PBX > Calling Rules > Setting*.
- 2 Configure the following settings.

<b>Extension Range</b>	6XXX The example extension range means that every extension added to the FortiGate Voice unit must have an extension that begins with the number 6 and includes three more numbers.
<b>Country Code</b>	Enter the international country calling code for the country or region in which you are installing the FortiGate Voice unit.
<b>Local Area Code</b>	Enter the local area code for the country or region in which you are installing the FortiGate Voice unit.
<b>Voicemail Access</b>	*97 Phone users on the internal network can dial *97 to get their voicemail.
<b>Outgoing Prefix</b>	9 Phone users must dial 9 to get an outside line. The outgoing prefix should not be the same as the first number of the extension range.
<b>Max Voicemail Duration</b>	60 seconds Limits a single voicemail message to 60 seconds.

3 Configure the voicemail notification email settings.



<b>SMTP Server</b>	The name or IP address of an email server that the FortiGate Voice unit can send email notifications to when PBX users receive a voicemail. For example: <i>mail.example.com</i> . You can optionally create an email account on the email server for the FortiGate Voice unit.
<b>Authentication</b>	Select if the email server requires authentication.
<b>User Name</b>	Enter a valid username for an account on the email server.
<b>Password</b>	Enter the password for the account on the email sever.

- 4 Select Apply to save the changes.

### To add a VoIP provider

Use the following procedure to add the information required by the FortiGate Voice unit to use a VoIP provider for routing SIP calls on the main office. In the example, the organization uses a third-party VoIP provider to handle VoIP calls between the head office and the branch office.

- 1 Go to *PBX > Service Providers > SIP Trunk*.
- 2 Configure the following settings.

<b>Name</b>	VoIP_Provider_1 A name for the VoIP provider. This can be any name.
<b>Domain</b>	192.168.20.10 The VoIP provider's IP address. This could also be the VoIP providers domain name (for example, voip.example.com).
<b>User Name</b>	Enter a valid user name for an account on the VoIP provider's server. This could also be a phone number including area code, depending on the requirements of the VoIP provider.
<b>Password</b>	Enter the password for the account on the VoIP provider's SIP sever.
<b>Authorization User Name</b>	Enter a valid authorization user name for an account on the VoIP provider's server if required by the VoIP provider.
<b>Display User Name</b>	Enter a valid display user name for an account on the VoIP provider's server if required by the VoIP provider.
<b>Account Type</b>	Select Static or Dynamic depending on the account with the VoIP provider.
<b>Registration Interval</b>	If this is a dynamic account with the VoIP provider, enter the registration interval as required by the VoIP provider. After each registration interval the FortiGate Voice renews the registration of the account with the VoIP provider.
<b>DTMF Method</b>	Auto Auto means the VoIP provider's server and the FortiGate Voice unit will negotiate to select a DTMF method. You could also select a specific DTMF method if required.

- 3 Select OK to add the VoIP provider.

### To add a dial plan for dialing the PSTN and the main office

Dial plans are used to route calls made from an extension to an external phone system. The external phone system can be the PSTN or a VoIP provider. To route calls to an external phone system you add dial plan rules that include a dial pattern and list of outgoing destinations. When the FortiGate Voice unit receives a call from an extension and the number dialed matches a pattern in a dial plan rule, the FortiGate Voice unit routes the call to the outgoing destination added to the dial plan.



In addition to PSTN and head office support the dial plan must also support Emergency, international, toll free and long distance dialing.

Use the following steps to add a dial plan with the following dial plan rules:

- Allows the branch office to call the PSTN
  - Dialing 911 for emergencies
  - Dialing 9 followed by a country code for international calls
  - Dialing 9 followed by 18 for toll free calls
  - Dialing 9 followed by 1 for long distance calls
  - Dialing 9 for all other PSTN calls
- Allows the branch office to dial head office extensions directly. The dial plan rule sends calls starting with 2 to the VoIP provider where they are routed to the head office. This dial plan does not include any other settings because users dial the head office extension number directly without a prefix.

- 1 Go to *PBX > Calling Rules > Dial Plan* and select *Create New*.
- 2 Add a name for the new dial plan, for example, *Dial\_Plan\_1*.
- 3 Select OK.
- 4 Select *Create New* to add the dial plan rule for dialing 911 for emergencies.

<b>Name</b>	Emergency
<b>Use Default Outgoing Prefix ("9")</b>	Not selected
<b>Phone number Begin with</b>	911
<b>Action</b>	Allow
<b>Outgoing Selected</b>	PSTN - fxo1

- 5 Select *Create New* to add the dial plan rule for dialing 9 followed by a country code for international calls.

<b>Name</b>	International
<b>Use Default Outgoing Prefix ("9")</b>	Selected
<b>Phone number Begin with</b>	o11
<b>Action</b>	Block

- 6 Select *Create New* to add the dial plan rule for dialing 9 followed by 18 for toll free calls.

<b>Name</b>	Toll_Free
<b>Use Default Outgoing Prefix ("9")</b>	Selected
<b>Phone number Begin with</b>	18
<b>Action</b>	Allow
<b>Outgoing Selected</b>	PSTN - fxo1

- 7 Select *Create New* to add the dial plan rule for dialing 9 followed by 1 for long distance calls.

<b>Name</b>	Long_Distance
<b>Use Default Outgoing Prefix ("9")</b>	Selected
<b>Phone number Begin with</b>	1
<b>Action</b>	Allow
<b>Outgoing Selected</b>	PSTN - fxo2

- 8 Select *Create New* to add the dial plan rule for dialing 9 for all other PSTN calls.

<b>Name</b>	Other_PSTN_Numbers
<b>Use Default Outgoing Prefix ("9")</b>	Selected
<b>Action</b>	Allow
<b>Outgoing Selected</b>	Move <i>PSTN - fxo1</i> to the <i>Selected</i> list to send calls to the PSTN out the fxo1 interface.

- 9 Select *Create New* to add the dial plan rule for dialing the Head Office.

<b>Name</b>	Head_Office_Dial_Rule
<b>Use Default Outgoing Prefix ("9")</b>	Deselect.
<b>Phone number Begin with</b>	2 Indicates that outgoing calls to the Head Office must start with a 2.
<b>Action</b>	Allow
<b>Outgoing</b>	Move <i>VoIP - VoIP_Provider_1</i> to the <i>Selected</i> list to send calls to the PSTN out the fxo1 interface.

- 10 Select OK.

### To add the extensions that are on the branch office internal network

Use the following steps to add extensions to the FortiGate Voice unit for the IP phones that are to be connected to the internal network. You add identifying information to each extension entry. The IP phone must be configured with identifying information that matches an entry in the extension list in order to get an extension from the FortiGate Voice unit. Extension numbers are independent of the IP address of the IP phone.

- 1 Go to *PBX > Extension > Extension* and select *Create New*.
- 2 Configure the following settings to add extension 6001.

<b>Extension</b>	6001
<b>Type</b>	SIP Phone
<b>First Name</b>	The first name assigned to this extension. Usually a person's first name.
<b>Last Name</b>	The last name assigned to this extension. Usually a person's last name. When this extension calls another phone the caller ID displayed on the called phone consists of the extension <i>First Name</i> followed by the <i>Last Name</i> .
<b>Email</b>	The email address of the person assigned to this extension. The FortiGate Voice unit sends voicemail notifications for the extension to this email address.

<b>Password</b>	The SIP phone user password for the phone assigned to this extension. For a FortiFone on the internal network to be able to register with the FortiGate Voice unit to get this extension, the FortiFone <i>Register Name</i> must consist of the extension <i>First Name</i> followed by the <i>Last Name</i> separated by one space. The FortiFone must also be configured with this <i>Password</i> and the IP address of the FortiGate Voice internal interface.
<b>Dial Plan</b>	Dial_Plan_1
<b>Voicemail</b>	Select
<b>Voicemail Password</b>	Enter the numeric password that the SIP user must enter to get voicemail. The password can contain numbers only.
<b>Email Notification</b>	Select
<b>Email Attachment</b>	Select to attach a recording of the user's voicemail message to the voicemail notification email.
<b>Auto Delete</b>	Select to automatically delete voicemail messages.
<b>Maximum Message #</b>	50 The FortiGate Voice unit keeps up to 50 voicemail messages for this extension.

- 3 Select OK to add the extension.
- 4 Repeat to add more extensions.

## Configuring the FortiFones on the internal network

This section contains high-level instructions for installing and configuring FortiFones for the example configuration. For more detailed information see the FortiFone documentation.

### To configure FortiFones on the internal network

The following steps describe how to configure a FortiFone on the internal network with extension number 6001. This procedure would also apply to configuring a FortiFone for most networks. See the documentation supplied with the FortiFone for details.

- 1 Connect and power on the FortiFone handset.
- 2 Connect to the handset web configuration interface.  
The default web configuration interface address is `http://192.168.0.1`. To connect to this address from a PC, your PC should have an IP address on the 192.168.0.0 subnet, for example: 192.168.0.10/255.255.255.0.  
The default Username is root. No password is required.
- 3 Go to *Network > LAN Settings* and set the *IP Type* to DHCP Client and select Submit.
- 4 Select Save & Reboot to save the IP addressing change.
- 5 Log into the FortiFone using the IP address it acquired from the DHCP server.
- 6 Go to *SIP Settings > Service Domain* and add the following configuration information:

<b>Active</b>	On
<b>Display Name</b>	The name to be displayed on the phone. This name is only displayed on this phone. When this phone calls another phone the name displayed is the <i>First Name</i> and <i>Last Name</i> added to the FortiGate Voice <i>Extension</i> configuration.

- |                          |   |
|--------------------------|---|
| <b>User Name</b>         | 6001<br>This is actually the Line Number or Extension Number and must match the Extension Number added to the FortiGate Voice Extension configuration for this phone.   |
| <b>Register Name</b>     | 6001<br>The Register Name is used to authenticate the FortiFone and must match the Extension Number added to the FortiGate Voice Extension configuration for this phone. Both the User Name and Register Name are required. |
| <b>Register Password</b> | The <i>Password</i> added to the FortiGate Voice Extension configuration for this phone. The Register Name and Register Password are used to authenticate the phone with the FortiGate Voice unit.                          |
| <b>Domain Server</b>     | Leave this field blank.<br>Not required since the configuration uses the FortiGate Voice unit as a SIP proxy. This field is only used to add the phone to a SIP service domain.   |
| <b>Proxy Server</b>      | 172.20.120.10<br>The IP address of the FortiGate Voice internal interface.  |
| <b>Outbound Proxy</b>    | Leave this field blank.   |
- 7 Select Submit.
  - 8 Select Save & Reboot to save the service domain information.
  - 9 If the FortiFone can successfully connect to and register with the FortiGate Voice unit the *Status* of the FortiFone changes to *Registered*.  
If *Status* does not change to *Registered* you should verify the *Register Name* or re-enter the *Password*. You should also confirm that the *Domain Server* and *Proxy Server* IP addresses are correct.

## Adding extensions and configuring FortiFones for users behind a NAT device

When adding an extension for any SIP phone with a NAT device between the phone and the FortiGate Voice unit you must enable NAT in the FortiGate Voice extension configuration for the phone. You can enable NAT only from the CLI. This applies whether the phone is on a remote network behind a NAT device or behind a NAT device on the internal network.

### To add an extension for a SIP phone behind a NAT device

The following procedure describes adding the extension from the FortiGate Voice CLI because you must use the CLI to enable NAT. You could add the extension from the web-based manager and then edit the extension from the CLI to enable NAT.

The following configuration is the same whether the phone is behind a NAT device on the internal network or on a remote network,

- 1 Connect to the FortiGate CLI.
- 2 Enter the following command to add extension 6010.  
The command includes setting `nat` to `yes` to enable NAT.

```
config pbx extension
  edit 6010
    set first-name <first_name_str>
    set last-name <last_name_str>
    set email <email_str>
```

```
set secret <password_str>
set dialplan Dial_Plan_1
set vm-secret <voicemail_password_str>
set email-notify enable
set attach enable
set nat yes
end
```

### To configure FortiFones behind a NAT device on the internal network

The configuration for FortiFones behind a NAT device on the internal network is the same as for FortiFones directly on the Internal network. See “To configure FortiFones on the internal network” on page 27.

You may have to configure the NAT device to allow SIP sessions between the FortiFone and the FortiGate Voice unit.

### To configure FortiFones behind a NAT device on a remote network

The following steps describe how to configure a FortiFone on the remote network with extension number 6010.

- 1 Connect and power on the FortiFone handset.
- 2 Connect to the handset web configuration interface.  
The default web configuration interface address is `http://192.168.0.1`. To connect to this address from a PC, your PC should have an IP address on the 192.168.0.0 subnet, for example: 192.168.0.10/255.255.255.0.  
The default Username is root. No password is required.
- 3 Go to *Network > LAN Settings* and set the *IP Type* to DHCP Client and select Submit.
- 4 Select Save & Reboot to save the IP addressing change.
- 5 Log into the FortiFone using the IP address it acquired from the DHCP server.
- 6 Go to *SIP Settings > Service Domain* and add the following configuration information:

<b>Active</b>	On
<b>Display Name</b>	The name to be displayed on the phone. This name is only displayed on this phone. When this phone calls another phone the name displayed is the <i>First Name</i> and <i>Last Name</i> added to the FortiGate Voice <i>Extension</i> configuration.
<b>User Name</b>	6010 This is actually the Line Number or Extension Number and must match the Extension Number added to the FortiGate Voice Extension configuration for this phone.
<b>Register Name</b>	6010 The Register Name is used to authenticate the FortiFone and must match the Extension Number added to the FortiGate Voice Extension configuration for this phone. Both the User Name and Register Name are required.
<b>Register Password</b>	The <i>Password</i> added to the FortiGate Voice Extension configuration for this phone. The Register Name and Register Password are used to authenticate the phone with the FortiGate Voice unit.
<b>Domain Server</b>	Leave this field blank. Not required since the configuration uses the FortiGate Voice unit as a SIP proxy. This field is only used to add the phone to a SIP service domain.

<b>Proxy Server</b>	172.20.120.10 The IP address of the FortiGate Voice internal interface.
<b>Outbound Proxy</b>	Leave this field blank.

- 7 If the FortiFone can successfully connect to and register with the FortiGate Voice unit the *Status* of the FortiFone changes to *Registered*.

If *Status* does not change to *Registered* you should verify the *Register Name* or re-enter the *Password*. You should also confirm that the *Domain Server* and *Proxy Server* IP addresses are correct.

#### To configure the remote FortiGate unit in NAT mode

The remote FortiGate unit in NAT mode must be configured to allow SIP sessions between the remote users on the remote network and the FortiGate Voice external interface. To do this you need to:

- Add an internal to external firewall policy that allows SIP sessions so that the remote users can start SIP sessions with the FortiGate Voice unit
- Add a virtual IP and an external to internal firewall policy that allows SIP sessions from the FortiGate Voice wan1 interface to connect to the phones in the remote network

For higher security, you could configure IPsec tunneling between the branch office network and the remote network and send SIP traffic over the IPsec tunnel.

## FortiGate Voice IVR configuration

By default, when callers call into the FortiGate Voice PBX from a remote system such as the PSTN the call is picked up by the PBX system which plays a default message asking the caller to dial the extension number that they want to reach or to dial 0 for assistance. If the caller dials 0 they can use the number keys on their phone to spell out the *First Name* or *Last Name* of an extension to connect with that extension.

You can use the following procedure to add a custom welcome message.

#### To add a custom welcome message

- 1 Log into the FortiGate Voice web-based manager.
- 2 Go to *PBX > Extension > Extension* and select *Create New*.
- 3 Enter an *Extension*.
- 4 Set *Type* to IVR Recorder.
- 5 Enter a *Password*.  
The password should include numbers only.
- 6 Select OK.
- 7 From a SIP phone that is registered with the FortiGate Voice unit, dial the Extension added in step 3.
- 8 Follow the prompts to record a new welcome message.

## Providing access to the company directory

Use the following procedure to allow phone users to dial 3 to access the FortiGate Voice PBX directory. Phone users can use the directory to call an extension by using the number keys on their phone to spell out the *First Name* or *Last Name* of an extension to connect with that extension.

**To provide access to the company directory from any extension**

- 1 Log into the FortiGate Voice web-based manager.
- 2 Go to *PBX > Calling Rules > Voice Menu*.
- 3 Select the Edit icon for Key 3.  
You can select any available key, but this example uses 3.
- 4 Set Action to *Go to Company Directory* and select OK.

## Adding a shortcut for checking voicemail

Use the following procedure to allow phone users to dial 7 to access their voicemail.

**To provide access to the company directory form any extension**

- 1 Log into the FortiGate Voice web-based manager.
- 2 Go to *PBX > Call > Voice Menu*.
- 3 Select the Edit icon for Key 7.  
You can select any available key, but this example uses 7.
- 4 Set Action to *Check Voicemail* and select OK.

### Checking voicemail

Once users connect to their voicemail using the *Voicemail Access* number configured from *PBX > Calling Rules > Setting* or by pressing the configured voicemail key they can follow the prompts to listen to, store, and delete messages. Users can also change their voicemail password.





# FortiGate Voice web-based manager configuration reference

This section describes FortiGate Voice web-based manager configuration settings. For information about other FortiGate Voice web-based manager settings, see the [FortiGate Administration Guide](#) or the FortiGate Voice online help.

This section describes:

- [Dashboard widgets](#)
- [Configuring VoIP interface settings](#)
- [Configuring PSTN interfaces](#)
- [PBX configuration](#)
- [Logging of PBX activities](#)

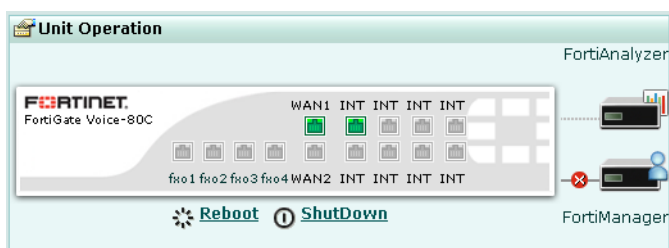
## Dashboard widgets

There are two specific Dashboard widgets that contain valuable information at a glance about the operation of your FortiGate Voice unit and PBX disk usage. The following explain these widgets, the Unit Operation widget, and the System Resources widget.

### Unit operation dashboard widget

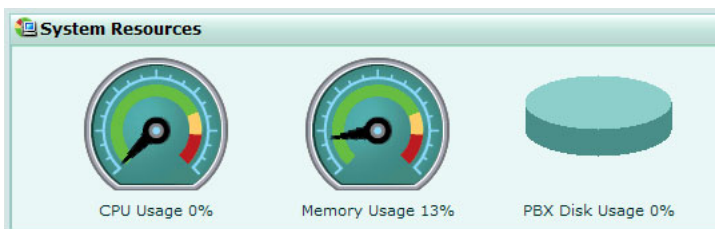
Go to *System > Status* and view the *Unit Operation* widget to see the status of the FortiGate Voice unit and its Ethernet and fxo interfaces. The fxo interfaces appear if your FortiGate Voice unit includes PSTN interfaces.

**Figure 4: FortiGate Voice-80C Unit operation widget**



### System resources dashboard widget

Go to *System > Status* and view the *System Resources* widget to see the status of the amount of disk space left for the storage of PBX activities and events.

**Figure 5: System Resources widget displaying PBX disk usage**

## Configuring VoIP interface settings

You can configure an interface to accept SIP traffic for the FortiGate Voice PBX.

### To configure VoIP interface settings

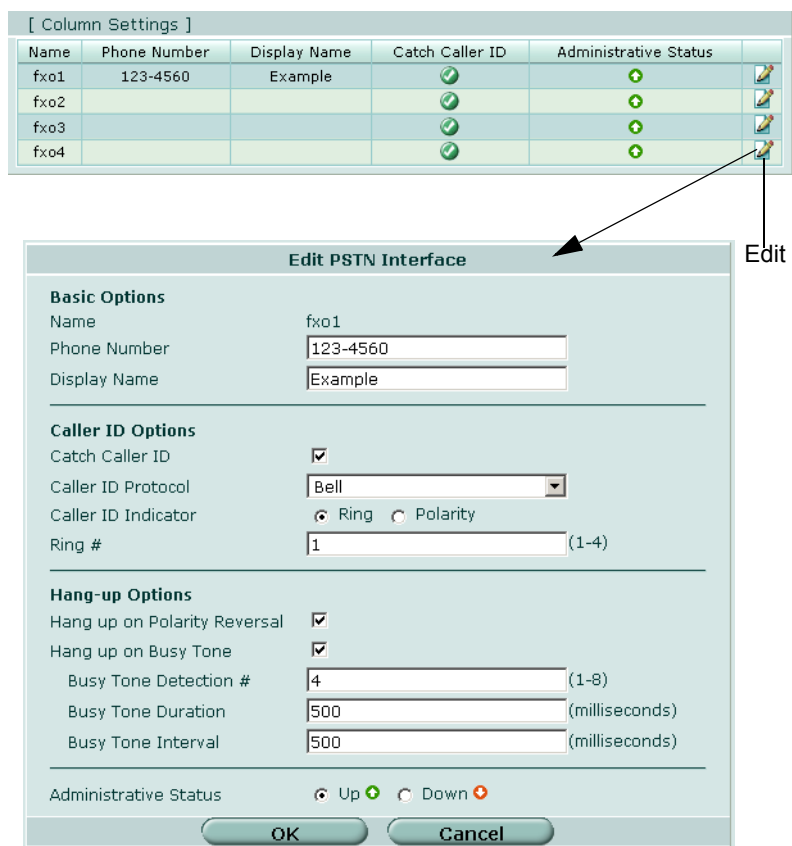
- 1 Go to *System > Network > Interface*.
- 2 Select the interface that you want to configure VoIP settings for.
- 3 Select the *SIP Traffic* check box to enable SIP traffic.
- 4 Select *OK*.

## Configuring PSTN interfaces

Some FortiGate Voice models include public switched telephone network (PSTN) interfaces that you can use to connect the FortiGate Voice PBX to your local public telephone network. Using these interfaces you can route calls from your FortiGate Voice network to the public telephone network. The PSTN interfaces are named *fxo1*, *fxo2*, and so on.

To configure the PSTN interfaces, go to *System > Network > PSTN Interface*, configure settings for the *fxo* interface and then select *OK*.

Figure 6: Configuring PSTN interfaces



**General PSTN interface settings**

- Column Settings** Select to add or remove columns. This changes what information appears.
- Name** The name of the PSTN interface.
- Phone Number** The phone number that is associated with that PSTN interface.
- Display Name** The name that displays on the phone’s LCD.
- Administrative Status** Status of the PSTN interface. A red down arrow indicates that the interface is down; a green up arrow indicates that the interface is up.
- Catch Caller ID** If enabled, a green checkmark appears. If Catch Caller ID is disabled, a gray X appears.

**PSTN interface configuration settings**

- Basic Options** The basic options for the interface.
  - Name** The name of the PSTN interface.
  - Phone Number** Enter the phone number of the PSTN phone line as provided by your phone service provider.  
The phone number is used for caller ID for calls from the FortiGate Voice unit to the PSTN. It can be any number, but is usually the actual phone number of the PSTN line connected to the fxo1 interface. Area code and country codes are optional.
  - Display Name** This name is used for caller ID for calls from the FortiGate Voice unit to the PSTN. It can be any name, such as a company name, that identifies the branch office.
- Caller ID Options** Configure the following options to support caller ID functions for calls from the internal network to the PSTN.

<b>Catch Caller ID</b>	Select to enable the FortiGate Voice unit to receive caller ID information from calls originating on the PSTN and send the caller ID information to the extension that answers the call.
<b>Caller ID Protocol</b>	Select the caller ID protocol required by PSTN line that the fxo interface is connected to. Contact your service provider for the name of the protocol to use.
<b>Caller ID Indicator</b>	Select the caller ID indicator required by the PSTN line. Contact your service provider for details.
<b>Ring #</b>	Set the number of rings to wait before receiving caller ID information. In most cases, enter 1 to send caller ID information between the first and second ring. Contact your service provider for details.
<b>Hang-up Options</b>	Configure the following options to configure how the FortiGate Voice unit hangs up calls from the PSTN.
<b>Hang up on Polarity Reversal</b>	Select if the PSTN line uses polarity reversal to indicate a call has been hung up. Contact your service provider for details.
<b>Hang up on Busy Tone</b>	Select if you want the FortiGate Voice unit to hang up automatically when it receives a busy tone when attempting to dial a number on the PSTN.
<b>Busy Tone Detection</b>	The number of busy tones that the FortiGate Voice receives before hanging up if <i>Hang up on Busy Tone</i> is selected.
<b>Busy Tone Duration</b> <b>Busy Tone Interval</b>	Tune the FortiGate Voice unit to accurately detect busy tones on this PSTN line. You can change the default settings if busy tones are not accurately detected.
<b>Administrative Status</b>	Set to <i>Up</i> if the fxo interface is connected to the PSTN and you want to be able to receive and send calls on this PSTN interface.

## PBX configuration

The following explains how to configure PBX settings for your network environment. These settings include voicemail notification settings, configuring a VoIP provider as well as system settings such as a voicemail access code and a maximum voicemail duration time limit.

This section describes:

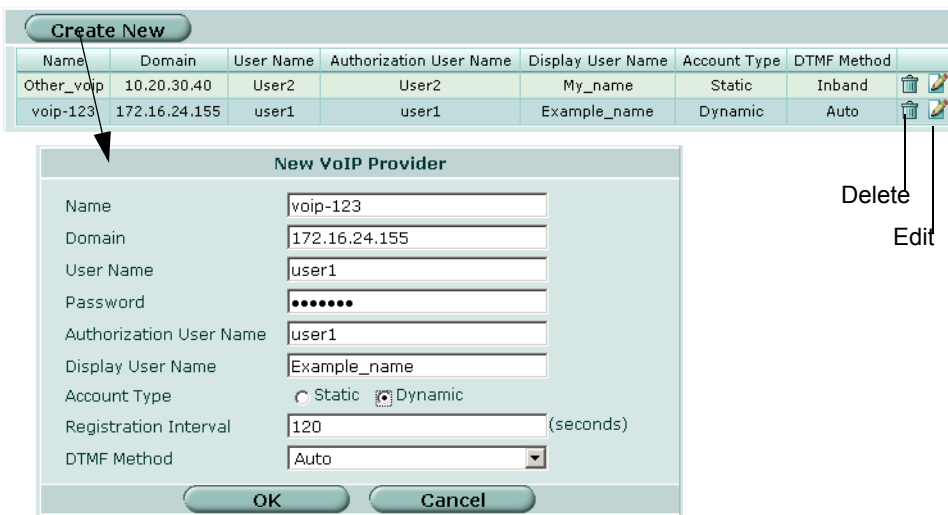
- [Configuring service providers](#)
- [Configuring extensions](#)
- [Configuring extension groups \(ring groups\)](#)
- [Configuring dial plans](#)
- [Configuring voice menu options](#)
- [Configuring direct inward dialing](#)
- [Configuring PBX settings](#)
- [Monitoring calls](#)
- [Monitoring SIP Trunk status](#)
- [Monitoring the status of PBX extensions](#)

### Configuring service providers

You can configure multiple VoIP providers for your PBX configuration.

To configure VoIP providers, go to *PBX > Service Providers > SIP Trunk*, select *Create New*, configure the settings and then select *OK*.

Figure 7: VoIP Provider



- Name** Enter the name for the VoIP provider configuration. This can be any name.
- Domain** The VoIP provider’s domain name or IP address. For example, 172.20.120.11 or voip.example.com.
- User Name** Enter a valid user name for an account on the VoIP provider’s server. This could also be a phone number including area code, depending on the requirements of the VoIP provider.
- Password** Enter the password for the account on the VoIP provider’s SIP sever.
- Authorization User Name** Enter a valid authorization user name for an account on the VoIP provider’s server if required by the VoIP provider.
- Display User Name** Enter a valid display user name for an account on the VoIP provider’s server if required by the VoIP provider.
- Account Type** Select Static or Dynamic depending on the account with the VoIP provider.
- Registration Interval** If this is a dynamic account with the VoIP provider, enter the registration interval as required by the VoIP provider. After each registration interval the FortiGate Voice renews the registration of the account with the VoIP provider.
- DTMF Method** Select the DTMF method used by the VoIP provider. Options are RFC2833, Inband, Info, and Auto.  
Auto means the VoIP provider’s server and the FortiGate Voice unit will negotiate to select a DTMF method. You could also select a specific DTMF method if required.

**Configuring extensions**

Extensions provide specific information for how to handle actions for that extension. You can choose the type of extension, such as SIP Phone, IVR, or Conference.  
 To configure extensions, go to *PBX > Extension > Extension*, select *Create New*, enter the information and then select *OK*.

Figure 8: Configuring extensions

Extension	Type	Name	Dial Plan	
120	SIP Phone	120 fortinet	default	Delete Edit
121	SIP Phone	MyName MyLastName	company-default	Delete Edit

**Create New**

**New Extension**

Extension: 121

Type: SIP Phone

First Name: MyName

Last Name: MyLastName

Email: MyName@example.com

Password: .....

Dial Plan: company-default

Voicemail:

Voicemail Password: .....

Email Notification:

Email Attachment:

Auto Delete:

Maximum Message#: 50 (1-9999)

OK Cancel

### General extension settings

- Create New** Select to create an extension.
- Extension** The extension number.
- Type** The type of extension the number is. Type can be:
- SIP Phone to configure a SIP phone extension
  - IVR Recorder to configure the extension to call to leave a message for the phone system operator. For IVR recorder you can add an extension number and a password. From any PBX extension you can call this extension and enter the password to get messages left by callers and to program the IVR system and record a new voice mail message for the system
  - Conference to configure a conference bridge. For the Conference extension you can add an extension number and a password. PBX users can call this extension number and enter the password to join a conference call.
- Name** The name of the extension.
- Dial Plan** The dial plan that will be used for that extension.

### Extension configuration settings

- Extension** Enter the extension number.
- Type** Select the type of extension. You can choose from SIP Phone, IVR, or Conference.
- First Name** Enter the first name of the person that will be using this extension.
- Last Name** Enter the surname of the person that will be using this extension.
- Email** Enter the email address of the person that will be using this extension.
- Password** Enter the password of that accesses the email address.
- Dial Plan** Select the dial plan that will be used with this extension from the drop-down list.
- Voicemail** Select if you want to have voicemail available for this extension.

- Voicemail Password** Enter a voicemail password for accessing the voicemail.
- Email Notification** Select to have an email sent to the email address given in the Email field so that the person is notified when a voicemail message is in their voicemail message inbox.
- Email Attachment** Select to attach the actual voicemail message to the notification email.
- Auto Delete** Select to automatically delete the message.
- Maximum Message #** Enter a number for the maximum number of messages that can be stored in the extension's voicemail inbox before automatically deleting those messages.

### Configuring extension groups (ring groups)

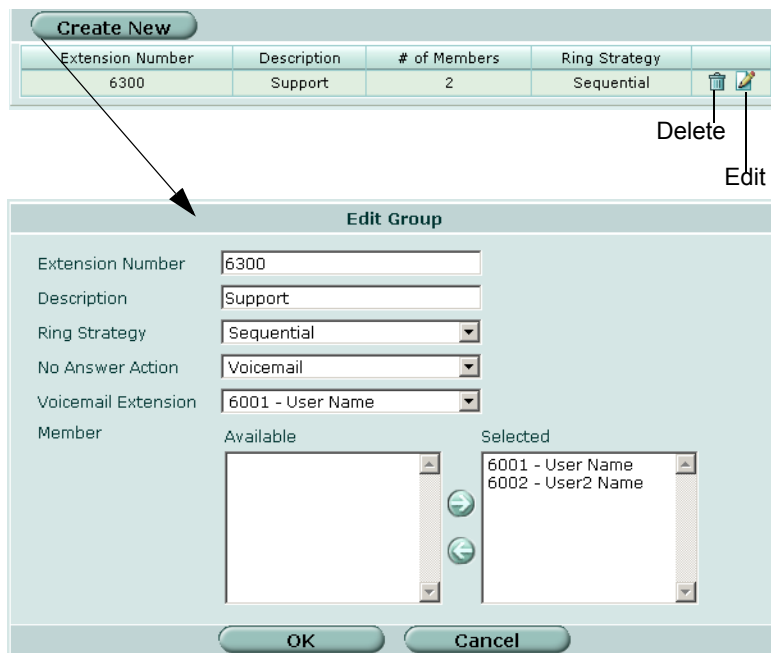
Extension groups (also called ring groups) are a group of extensions that can be called using one number. The extension group can be used to call all the extensions in the group at the same time or to call the extensions one at a time until someone answers.



**Note:** The order in which the members are added to the ring group does not match the order in which the FortiGate Voice unit calls them.

To configure an extension group, go to *PBX > Extension > Group*, select *Create New*, enter the information, and then select *OK*.

**Figure 9: Configuring extension groups**



- Extension Number** The number to call to reach extension group. This number must be a valid extension number for the FortiGate Voice configuration.
- Description** A description of the extension group.
- # of Members** The number of extensions in the extension group.
- Ring Strategy** Select a type from the drop-down list. You can choose either Sequential or Ring All.

<b>No Answer Action</b>	Select the action to take when there is no answer for the incoming caller. You can select Voicemail, which routes the caller to voicemail, IVR, or Hangup. If you select Voicemail, the Voicemail Extension list appears and you need to select the voicemail extension number.
<b>Voicemail Extension</b>	Select the voicemail extension number from the drop-down list. This option appears only when Voicemail is selected in No Answer Action.
<b>Member</b>	Select an extension in the Available column and then use the -> arrow to move it to the Selected column. To remove an extension from the Selected column, select the extension and use the <- arrow to move it back to the Available column.

## Configuring dial plans

Dial plans route calls made from a FortiGate Voice extension to an external phone system. The external phone system can be one or more PSTN lines if your FortiGate Voice unit includes PSTN interfaces, or a VoIP service provider. To route calls to an external phone system you add dial plan rules that define the extra digits that extension users must dial to call out of the PBX. The rules also control how the FortiGate Voice unit handles these calls including whether to block or allow the call, the destinations the calls are routed to and whether to add digits to the beginning of the dialed number (called prepending).

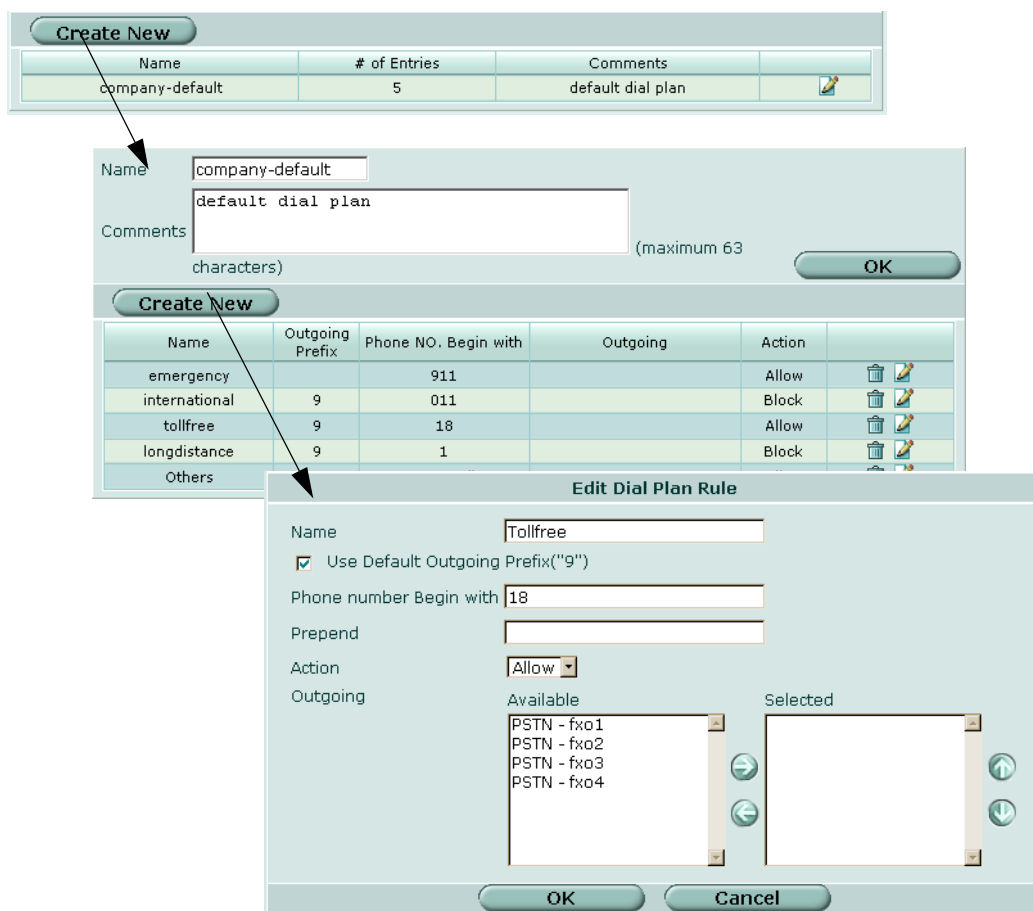
For example, if PBX users should be able to dial 911 for emergencies you should include a dial plan rule that sends all calls that begin with 911 to an external phone system. This rule should also override the default outgoing prefix so that users can dial 911 without having to dial 9 first.

You can also use dial plan rules to block some calls. For example, if you want to block extensions from making international calls you can add dial plan rule that blocks calls that start with the default outgoing prefix followed by 011.

When the FortiGate Voice unit receives a call from an extension that does not match the FortiGate Voice unit's extension range, the call is processed according to the dial plan added to the extension. (If the extension does not have a dial plan the call is blocked). To process the call, the FortiGate Voice unit selects the dial plan rule that best matches the dialed numbers and processes the call using the settings in the dial plan rule. For example, the emergency dial plan rule could route calls out a local PSTN line (if your FortiGate Voice unit includes them) or to a remote VoIP provider.



Figure 10: Configuring a dial plan



Go to PBX > Calling Rules > Dial Plan to add a dial plan.

**General dial plan list settings**

**Create New** Select to configure a dial plan. You can add multiple dial plans and assign them to different extensions. For example, you might want to have a dial plan that allows long distance calls and a dial plan that does not.

**Name** The name of the dial plan.

**# of Entries** The number of entries in each dial plan.

**Comments** An optional description of the dial plan.

**Dial plan rule configuration settings**

**Name** Enter a descriptive name for the dial plan rule.

**Use Default Outgoing Prefix("9")** Select this checkbox if the dial plan rule should use the default outgoing prefix (usually 9).

**Outgoing Prefix** If you clear the Use Default Outgoing Prefix checkbox you can enter a different outgoing prefix for this dial plan.

**Phone number Begin with** Enter the leading digits of the phone number that this dial plan rule should match with. For example, a dial plan rule for toll free numbers in North America should begin with 18. The FortiGate Voice uses a best match to match a dialed number with a dial plan. So each dial plan should have a different Phone number Begin with setting. But you should plan your dial plan to make sure that unexpected matches do not occur.

- Prepend** Add digits that should be prepended or added to the beginning of the dialed number before the call is forwarded to its destination. You can prepend digits at the beginning of a call of special dialing is required to reach and external phone system.
- Action** Set the action to Allow if this dial plan rule should allow a call. Set the action to Block if the dial plan should block a call. For example, if you want to block international calls you could set the Phone Number begin with to 011 and set the action to block.
- Outgoing** In the *Available* column, select one or more PSTN interfaces (if your FortiGate Voice unit includes them) and/or VoIP service providers that the calls matching this dial plan should be routed to and use the arrow to move to them to the *Selected* column.  
 If you need to remove a PSTN interface or VoIP provider from the *Selected* list, select the item and use the arrow to move it back to the *Available* column list.  
 The FortiGate Voice unit uses the PSTN interfaces and VoIP providers in the *Selected* list in the order in which they are arranged in the list. You can arrange the PSTN interfaces and VoIP providers in the *Selected* column using the up and down arrows beside the Selected column. Select a PSTN interface or VoIP provider and then use the arrows to arrange them in the list.

### Example dial plan

This simplified example dial plan includes 5 dial plan rules that:

- Routes emergency calls (dialing 911) to the fxo1 PSTN interface
- Blocks international calls (the phone number begins with 011)
- Routes Toll Free calls (beginning with 18) to the fxo1 PSTN interface
- Routes non-international long distance calls (beginning with 1) to the fxo2 PSTN interface
- Routes all other external calls to the fxo3 and fxo3 PSTN interfaces

In this example, all outgoing calls are routed to the PSTN and not to other VoIP service providers.

**Table 4: Rule 1: emergency calls using 911**

<b>Name</b>	Emergency
<b>Use Default Outgoing Prefix ("9")</b>	Not selected
<b>Phone number Begin with</b>	911
<b>Action</b>	Allow
<b>Outgoing Selected</b>	PSTN - fxo1

**Table 5: Rule 2: international calls beginning with 011**

<b>Name</b>	International
<b>Use Default Outgoing Prefix ("9")</b>	Selected
<b>Phone number Begin with</b>	o11
<b>Action</b>	Block

**Table 6: Rule 3: Toll free calls starting with 18**

<b>Name</b>	Toll_Free
<b>Use Default Outgoing Prefix ("9")</b>	Selected

**Table 6: Rule 3: Toll free calls starting with 18**

<b>Phone number Begin with</b>	18
<b>Action</b>	Allow
<b>Outgoing Selected</b>	PSTN - fxo1

**Table 7: Rule 4: Long Distance calls starting with 1**

<b>Name</b>	Long_Distance
<b>Use Default Outgoing Prefix ("9")</b>	Selected
<b>Phone number Begin with</b>	1
<b>Action</b>	Allow
<b>Outgoing Selected</b>	PSTN - fxo2

**Table 8: Rule 5: Other outgoing calls**

<b>Name</b>	Other_PSTN_Numbers
<b>Use Default Outgoing Prefix ("9")</b>	Selected
<b>Phone number Begin with</b>	
<b>Action</b>	Allow
<b>Outgoing Selected</b>	PSTN - fxo2, PSTN - fxo2

## Configuring voice menu options

Configure voice menu options to provide PBX users with shortcuts to PBX functions such as accessing their voice mail, finding numbers in the company directory, or dialing a ring group.

To access voice menu functions PBX users dial a single number on their phones and wait a few seconds for the PBX to respond. For example, you can use voice menu options to allow PBX users to simply dial 3 to access their voice mail.

### To configure voice menu options

- 1 Go to *PBX > Calling Rules > Voice Menu*.
- 2 In the row of the key that you want to configure voice menu options for, select the *Edit* icon.
- 3 In the *Action* drop-down list, select one of the following:
 

<b>None</b>	No action will be taken when a caller dial this number.
<b>Ring Group</b>	The PBX user calls a ring group. Select the ring group to call. A ring group is also called an extension group. To add ring groups, see <a href="#">"Configuring extension groups (ring groups)" on page 39</a> .
<b>Check Voicemail</b>	Provides direct access to the PBX user's voice mail inbox.
<b>Go to Company Directory</b>	Provides direct access to the PBX company phone directory.
- 4 Select *OK*.

## Configuring direct inward dialing

You can configure direct inward dialing (DID) for calls. DID allows the FortiGate Voice unit to direct calls from external callers directly to PBX extensions. For example, you could set up DID so that external users call 555-1234 and DID directs the call to extension 1234. Using the FortiGate Voice unit direct inward dial settings you associate an incoming PSTN interface (if supported by your FortiGate Voice unit) or VoIP service provider with a PBX extension. When an incoming call is received from one of these sources, if the last digits of the dialed number match the selected extension number the FortiGate Voice unit directs the call directly to the extension. For this to work you must obtain an external phone number with the last digits matching the selected extension.

To configure direct inward dialing, go to *PBX > Calling Rules > Direct Inward Dial*, enter the information, and then select *OK*.

**Figure 11: Direct inward dialing**



### General direct inward dialing settings

- Name** The name of the direct inward dialing configuration.
- Incoming** The incoming calls that received from the PSTN interface (if supported by your FortiGate Voice unit) or from a VoIP service provider.
- Extension** The extension that will be used.
- Comments** A description about the direct inward dial configuration.

### Direct inward dialing configuration settings

- Name** Enter a name for the direct inward dialing configuration.
- Incoming** Select a PSTN interface or VoIP service provider from the drop-down list.
- Extension** Select an extension from the drop-down list.
- Comments** Enter a description, if applicable, for the direct inward dialing configuration.

From the CLI you can use the `cid-number` option of the `config pbx did` command to specify the number called from an external line that is re-directed to the selected extension. Use this option if the extension number cannot be matched with the external number. In the following example, DID sends calls received on the `fxo1` PSTN interface that end with 5555 to extension 1234.

```
config pbx did
edit did_example
set external-line fxo1
set cid-number 5555
set extension 1234
```

end  
end

## Configuring PBX settings

Configure PBX system settings that affect the overall performance of the PBX service and all of the users of it. Settings include the extension pattern for the PBX, the outgoing dial prefix and the email server to use for sending voicemail notification email messages. Usually you would configure these settings once and rarely thereafter.

To configure PBX settings group, go to *PBX > Calling Rules > Setting*, make configuration changes as required and then select Apply.

Figure 12: Configuring PBX settings

PBX Settings	
<b>PBX Global Setting</b>	
Extension Range	6XXX
Country Code	1
Local Area Code	408
Voicemail Access	*97
Outgoing Prefix	9
Max Voicemail Duration	<input type="checkbox"/> No Limit
	60 (seconds)
<b>Voicemail Notification Email Setting</b>	
SMTP Server	mail.example.com
Authentication	<input checked="" type="checkbox"/>
User Name	Voice_Admin
Password	*****
<input type="button" value="Apply"/>	

### PBX Global Settings

**Extension Range** Enter a pattern that defines the valid extensions that can be added to the FortiGate Voice configuration. The pattern can include numbers that must be in every extension and upper case Xs to indicate the number of digits. The extension range can only contain numbers and the letter X.

- If you add numbers to the extension range, all extensions added to this FortiGate Voice unit must include the same numbers in the same location in the extension number. For example, if you include a 6 as the first digit, all extensions added this FortiGate Voice unit must begin with the number 6.
- The Xs indicate the number of digits in addition to the required number that each extension must have. For example, 6XXX indicates the extensions must start with the number 6 and be followed by any three numbers.

Usually you would add one or two numbers to the start of the extension range to identify the extensions for this PBX and follow this with enough Xs to be able to add the required number of extensions.

The extension range should not begin with the same number as the outgoing prefix.

**Country Code** Enter the international country calling code for the country or region in which you are installing the FortiGate Voice unit.

**Local Area Code** Enter the local area code for the country or region in which you are installing the FortiGate Voice unit.

<b>Voicemail Access</b>	Enter the exact pattern that PBX users dial to get their voicemail. For example, for users to dial *99 to get their voice mail, enter *99.
<b>Outgoing Prefix</b>	The number that PBX users must dial to get an outside line. For example, if users should dial 9 to get an outside line, add 9 to this field. The outgoing prefix should not be the same as the first number of the extension range.
<b>Max Voicemail Duration</b>	Select <i>No Limit</i> if you don't want to limit the voice mail duration. Otherwise enter a maximum time in seconds for voice mail recordings.
<b>Voicemail Notification Email Settings</b>	
<b>SMTP server</b>	Enter the email server IP address or domain name. The FortiGate Voice unit uses this email server for sending voicemail notification emails to PBX users.
<b>Authentication</b>	Select if the email server requires authentication. If you enable authentication you must also add a username and password.
<b>User Name</b>	Enter a valid username for an account on the email server.
<b>Password</b>	Enter the password for the account on the email sever.

## Monitoring calls

You can monitor incoming and outgoing calls from *PBX > Monitor > Active Call*.

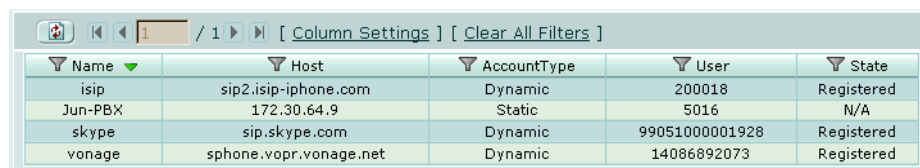
You can view information for all active calls including the originator of the call (From) the destination of the call (To), how long the call has been active (Duration), the codec used for transmitting voice packets, and the status of the call.

## Monitoring SIP Trunk status

You can monitor status of the external SIP trunks or VoIP service providers that you have added to the FortiGate Voice configuration. To monitor SIP trunk or VoIP service provider status go to *PBX > Monitor > SIP Trunk Status*.

For each service provider you can see the name of the service provider, the host name of the SIP server that the FortiGate Voice unit connects to, the account type, the username for the account, and the state of the relationship between the FortiGate Voice unit and the service provide. If status is Registered the FortiGate Voice unit is able to connect to and register with the service provider.

**Figure 13: Monitoring VoIP provider status**



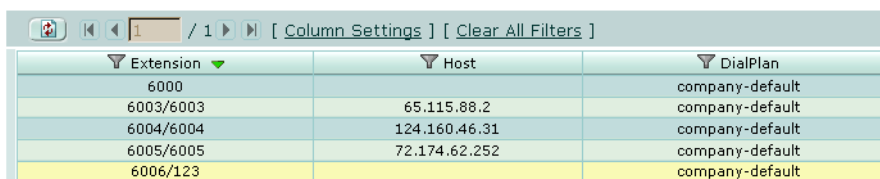
Name	Host	AccountType	User	State
isip	sip2.isip-iphone.com	Dynamic	200018	Registered
Jun-PBX	172.30.64.9	Static	5016	N/A
skype	sip.skype.com	Dynamic	99051000001928	Registered
vonage	sphone.vopr.vonage.net	Dynamic	14086892073	Registered

## Monitoring the status of PBX extensions

You can monitor the status of the extensions added to the FortiGate Voice configuration. Status information includes the extension number and the Host name or IP address of the extension as registered with the FortiGate Voice unit. To monitor extension status go to *PBX > Monitor > Extension Status*.

If the information displayed about an extension includes a host name or IP address the extension is operating and can send or receive calls with the FortiGate Voice unit. If no host name or IP address is displayed the extension cannot communicate with the FortiGate Voice unit. For example, the extension could be shut down or not able to connect to the FortiGate Voice because of network issues or configuration problems with the configuration of the extension phone or softphone.

Figure 14: Monitoring extension status



Extension	Host	DialPlan
6000		company-default
6003/6003	65.115.88.2	company-default
6004/6004	124.160.46.31	company-default
6005/6005	72.174.62.252	company-default
6006/123		company-default

## Logging of PBX activities

After configuring PBX settings, you can configure logging of PBX activities and events. If you are new to logging, see [Logging and Reporting in FortiOS 4.0 User Guide](#) before proceeding.

### To configure logging of PBX settings

- 1 Go to *Log&Report > Log Config > Event Log*.
- 2 Select the check box beside *Enable* to make the other event log options available.
- 3 Select the check box beside *PBX event*.

### Viewing log messages

You can view the PBX activities and events from *Log&Report > Log Access*. The log messages can be filtered so that you are viewing specific information, or you can display them in Raw format. Raw format is the format of what a log message actually appears in the log file.

To view PBX log messages, go to *Log&Report > Log Access* and then select the tab associated with the logging device you chose to store logs on. For example, you want to view PBX log messages from the FortiAnalyzer unit that they are on, so you select *Log&Report > Log Access > FortiAnalyzer*.

For more information about log messages, see the [FortiGate Log Message Reference](#) and also the [Logging and Reporting in FortiOS 4.0 User Guide](#).

#### Example PBX log messages

The following log message indicates that the phone with FortiGate Voice extension number 6005 called 914036085000 and the call was routed to the skype-088adb08 service provider. The call was answered and lasted for 1869 seconds.

```
2010-03-12 12:53:27 log_id=0162043782 type=event subtype=pbx pri=information
fwver=040000 vd=root action=PBX-call clid="6005", src="6005"
dst="914036085000"channel="SIP/6005-088a7c08" dstchannel="SIP/skype-088adb08"
duration=1869 start="Fri Mar 12 12:22:18 2010 " end="Fri Mar 12 12:53:27 2010 "
disposition="ANSWERED"msg="call from 6005=>914036085000, ANSWERED, for 1869
seconds"
```

The following log message indicates that the phone with FortiGate Voice extension number 6012 with caller ID Example Caller called extension 6036. And that the call was answered and lasted for 23 seconds.

```
2010-03-12 01:12:42 log_id=0162043782 type=event subtype=pbx pri=information
fwver=040000 vd=root action=PBX-call clid=""Example Caller" <6012>", src="6012"
dst="6036"channel="SIP/6012-084a9aa0" dstchannel="SIP/6036-08464150" duration=23
start="Fri Mar 12 01:12:19 2010 " end="Fri Mar 12 01:12:42 2010 "
disposition="ANSWERED"msg="call from 6012=>6036, ANSWERED, for 23 seconds"
```





# FortiGate Voice VoIP, PBX, and PSTN CLI Reference

This section describes FortiGate Voice VoIP, PBX, and PSTN configuration settings. PSTN interfaces are not available on all FortiGate Voice models. For information about other FortiGate Voice CLI commands see the [FortiGate CLI Reference](#).

This section describes:

- [config pbx dialplan](#)
- [config pbx did](#)
- [config pbx extension](#)
- [config pbx global](#)
- [config pbx ringgrp](#)
- [config pbx smtp](#)
- [config pbx voice-menu](#)
- [config pbx voip-provider](#)
- [config system pstn](#)
- [config system interface](#)
- [execute pbx](#)
- [diagnose pbx restart](#)

## config pbx dialplan

Use this command to add a dial plan and add rules to the dial plan. A dial plan rule indicates an outgoing destination to send calls to. You can add multiple rules to a dial plan. You add dial plans to extensions to control how to handle outgoing calls from the extension.

### Syntax

```
config pbx dialplan
  edit <pbx_dialplan_name>
    set comments <comment_string>
    config rule
      edit <rule_name_str>
        set action {allow | block}
        set callthrough {fx01 | fx02 | fx03 | fx04 |
          <voip_providers>}
        set outgoing-prefix <pattern_str>
        set phone-no-beginwith <patern_str>
        set prepend <pattern_str>
        set use-global-outgoing-prefix {no | yes}
      end
    end
end
```

Variables	Description	Default
edit <pbx_dialplan_name>	Enter the name for the dial plan. If you entering an existing dial plan, select Tab to get to the dial plan that you want to edit.	No default
comments <comment_string>	Optionally enter a description of the dial plan.	No default
config rule	Configure a new dial plan rule.	No default
edit <rule_name_str>	Enter the name of the dial plan rule to configure.	No default
action {allow   block}	Set the action to <code>allow</code> if this dial plan rule should allow a call. Set the action to <code>block</code> if the dial plan should block a call. For example, if you want to block international calls you could set the Phone Number begin with to 011 and set the action to block.	No default
callthrough {fxo1   fxo2   fxo3   fx04   <voip_providers>}	Select one or more destinations that the dial plan rule sends outgoing calls to. <code>fxo1</code> , <code>fxo2</code> , <code>fxo3</code> , and <code>fx04</code> are the 4 PSTN interfaces. <code>&lt;voip_providers&gt;</code> are the VoIP providers added to the FortiGate Voice. A dial plan rule can send calls to one or more destinations.	No default
outgoing-prefix <pattern_str>	If you set <code>use-global-outgoing-prefix</code> to <code>no</code> you can enter a different outgoing prefix for this dial plan.	null
phone-no-beginwith <patern_str>	Enter the leading digits of the phone number that this dial plan rule should match with. For example, a dial plan rule for toll free numbers in North America should begin with 18. The FortiGate Voice uses a best match to match a dialed number with a dial plan. So each dial plan should have a different Phone number Begin with setting. But you should plan your dial plan to make sure that unexpected matches do not occur.	null
prepend <pattern_str>	Add digits that should be prepended or added to the beginning of the dialed number before the call is forwarded to its destination. You can prepend digits at the beginning of a call of special dialing is required to reach and external phone system.	null
use-global-outgoing-prefix {no   yes}	Select <code>yes</code> if the dial plan rule should use the default outgoing prefix (usually 9). Select <code>no</code> to add a different outgoing-prefix.	yes

## config pbx did

Use this command to configure Direct Inward Dialing (DID). DID allows calls from external phone systems to dial directly to extensions added to the FortiGate Voice unit.

### Syntax

```
config pbx did
  edit <pbx_did_name>
    set external-line {fxo1 | fxo2 | fxo3 | fx04 |
      <voip_providers>}
    set cid-number <phone_number>
    set extension <extension_number>
    set comment <comment_string>
  end
```

Variables	Description	Default
edit <pbx_did_name>	Enter the name for the Direct Inward Dial.	No default
external-line {fxo1   fxo2   fxo3   fx04   <voip_providers>}	Select one external system that can dial directly to an extension. fxo1, fxo2, fxo3, and fx04 are the 4 PSTN interfaces. <voip_providers> are the VoIP providers added to the FortiGate Voice.	No default
cid-number <phone_number>	Enter the phone number dialed by a caller on the external system.	No default
extension <extension_number>	Enter the FortiGate Voice extension number the call is directed to.	No default
comment <comment_string>	Enter a description, if applicable, about the direct inward dial configuration.	No default

## config pbx extension

Use this command to add SIP phone extensions to the FortiGate Voice unit.

### Syntax

```
config pbx extension
  edit <extension_number>
    set attach {enable | disable}
    set auto-delete {enable | disable}
    set dialplan <dialplan_name>
    set email <user_email>
    set email-notify <user_email_address>
    set first-name <first_name>
    set last-name <surname_name>
    set nat {no | yes}
    set secret <user_password>
    set type {conference | ivr | sip-phone}
    set vm-secret <user_password>
    set voicemail {enable | disable}
    set max-msg <max_messages_allowed>
  end
```

Variables	Description	Default
edit <extension_number>	Enter the extension number. The extension number has to match the config pbx global extension pattern.	No default
attach {enable   disable}	Enable the voicemail message as an attachment in an email.	No default
auto-delete {enable   disable}	Enable to automatically delete voice mail.	No default
dialplan <dialplan_name>	Enter the dial plan that you want to use for the extension.	No default
email <user_email>	Enter the user's email address.	No default
email-notify <user_email_address>	Enter the email address of the user that will be used when notifying them that they have a voicemail message.	No default

Variables	Description	Default
first-name <first_name>	Enter the person's first name.	No default
last-name <surname_name>	Enter the surname of the person.	No default
nat {no   yes}	Enter to indicate that the phone is behind a NAT device.	No default
secret <user_password>	Enter the user's password for voicemail.	No default
type {conference   ivr   sip-phone}	Enter the type of extension to configure. <ul style="list-style-type: none"> <li>• sip-phone to configure a SIP phone extension</li> <li>• ivr to add an interactive voice response (IVR) configuration. Use this setting to customize the welcome message when a external caller calls the system. Create the IVR and then call the extension number to customize the welcome message. An ivr extension only requires an extension number and a secret.</li> <li>• conference to add a conference bridge. Multiple users can call the conference bridge extension number enter the secret and have a conference call. A conference bridge only requires an extension number and a secret.</li> </ul>	sip-phone
vm-secret <user_password>	Enter the user's password for accessing their voicemail inbox.	No default
voicemail {enable   disable}	Enable the extension to have voicemail.	No default
max-msg <max_messages_ allowed>	Enter the maximum number of voicemail messages that are allowed in a user's voicemail inbox.	No default

## config pbx global

Use this command to configure voicemail settings such as using music while the incoming caller is put on hold, as well as the country and the extension pattern of the user.

### Syntax

```
config pbx global
  set country-area <country_name>
  set extension-pattern <extension_pattern>
  set local-area-code <code_string>
  set max-voicemail <max_length_seconds>
  set outgoing-prefix <pattern_str>
  set ring-timeout <time_int>
  set rtp-hold-timeout <time_int>
  set rtp-timeout <time_int>
  set voicemail-extension <access_number>
end
```

Variables	Description	Default
country-area <country_name>	Enter the name of the country in which the FortiGate Voice unit is installed.	USA
extension-pattern <extension_pattern>	<p>Enter a pattern that defines the valid extensions that can be added to the FortiGate Voice configuration. The pattern can include numbers that must be in every extension and upper case xs to indicate the number of digits. The extension range can only contain numbers and the letter X.</p> <ul style="list-style-type: none"> <li>If you add numbers to the extension range, all extensions added to this FortiGate Voice unit must include the same numbers in the same location in the extension number. For example, if you include a 6 as the first digit, all extensions added this FortiGate Voice unit must begin with the number 6.</li> <li>The xs indicate the number of digits in addition to the required number that each extension must have. For example, 6XXX indicates the extensions must start with the number 6 and be followed by any three numbers.</li> </ul> <p>Usually you would add one or two numbers to the start of the extension range to identify the extensions for this PBX and follow this with enough Xs to be able to add the required number of extensions.</p> <p>The extension range should not begin with the same number as the outgoing prefix.</p>	null
local-area-code <code_string>	Enter the local area code for the country or region in which you are installing the FortiGate Voice unit.	408
max-voicemail <max_length_seconds>	Limit the length of voicemail messages in seconds. Set to 0 for no limit.	60
outgoing-prefix <pattern_str>	The number that PBX users must dial to get an outside line. For example, if users should dial 9 to get an outside line, add 9 to this field. The outgoing prefix should not be the same as the first number of the extension range.	9
ring-timeout <time_int>	The number of seconds that an extension should be allowed to ring before going to voicemail.	20
rtp-hold-timeout <time_int>	The amount of time in seconds that the extension will wait on hold for RTP packets before hanging up the call. 0 means no time limit.	0
rtp-timeout <time_int>	The amount of time in seconds during an active call that the extension will wait for RTP packets before hanging up the call. 0 means no time limit.	60
voicemail-extension <access_number>	Enter the voicemail extension number that a user will use to access their voicemail inbox.	No default

## config pbx ringgrp

Use this command to add and configure the extension groups. An extension group here is referred to a ring group and is a group of extensions that can be called using one number. You can configure the ring group to call all of the extensions in the group at the same time or to call the extensions one at a time until someone answers.



**Note:** The order in which the members are added to the ring group does not match the order in which the FortiGate Voice unit calls them.

## Syntax

```

config pbx ringgrp
  edit <ring_group_name>
    set description <description_str>
    set member <acd_group_member>
    set no-answer-action {hangup | ivr | voicemail}
    set strategy {ring-all | sequential}
    set voicemail-of-extension <extension_number>
  end

```

Variables	Description	Default
edit <ring_group_name>	Enter the name for the group.	No default.
description <description_str>	A description of the extension group.	
member <acd_group_member>	Enter the ACD member for the group.	No default
no-answer-action {hangup   ivr   voicemail}	Enter the action that will be taken when none of the extensions in the ring group answers. <ul style="list-style-type: none"> <li>hangup hand up and end the call.</li> <li>ivr return the caller to the attendant where they can try another extension.</li> <li>voicemail the caller is directed to the voicemail system where they can leave a message.</li> </ul>	No default
strategy {ring-all   sequential}	Control how the extensions in the group are called by the ring group. <ul style="list-style-type: none"> <li>ring-all calls all of the extensions in the group at the same time.</li> <li>sequential calls the extensions in the group one at a time in the order in which they have been added to the group.</li> </ul>	No default
voicemail-of-extension <extension_number>	Enter the extension number to use for voicemail if no one answers the call and no-answer-action is set to voicemail.	No default

## config pbx smtp

Use this command to configure the FortiGate Voice unit to send voicemail notification email messages. Using this command you configure the email server that the FortiGate Voice unit sends email notifications to.

## Syntax

```

config pbx smtp
  set port <smtp_server_port>
  set server <smtp_server_ip_address>
  set authenticate {enable | disable}
  set password <password_str>
  set username <username_str>
end

```

Variables	Description	Default
port <smtp_server_port>	Enter the port number that the email server uses for SMTP.	25
server <smtp_server_ip_address>	Enter the email server IP address or domain name.	No default
authenticate {enable   disable}	Select <code>enable</code> if the email server requires authentication. If you enable authentication you must also add a <code>username</code> and <code>password</code> .	disable
password <password_str>	Enter the password for the account on the email sever.	
username <username_str>	Enter a valid username for an account on the email server.	No default

## config pbx voice-menu

Use this command to configure the menu that callers will access when they call. The variable `config press-<number>` configures the settings for the type of ring group and the type of group associated with that number.

### Syntax

```
config pbx voice-menu
  set comment <comment_string>
  config [press-0 | press-1 | press-2 | press-3 | press-4 |
    press-5 | press-6 | press-7 | press-8 | press-9]
    set type {directory | none | ring-group | voicemail}
    set ring-group
  end
end
```

Variables	Description	Default
comment <comment_string>	Enter a description of the voice-menu settings, if applicable.	No default
config [press-0   press-1   press-2   press-3   press-4   press-5   press-6   press-7   press-8   press-9]	Use this command when configuring what action each number on the phone's keypad will take. For example, you want the personnel directory to come up every time someone presses 1; <code>config press-1</code> variable would have the type <code>directory</code> selected in <code>type</code> .	No default
type {directory   none   ring-group   voicemail}	Enter the type of action that is associated with the specific number on the phone's keypad. For example, the office phone directory is heard when a caller presses 0 because <code>config press-0</code> has <code>directory</code> as its type.	No default
ring-group	Enter to include a specific ring-group if you have select <code>ring-group</code> in <code>type</code> . This variable appears only when <code>ring-group</code> is selected in <code>type</code> .	No default

## config pbx voip-provider

Use this command to configure the VoIP provider for the PBX.

### Syntax

```

config pbx voip-provider
  edit <provider_name>
    set user <user_name>
    set domain {<VoIP_provider_address_ipv4> |
      <VoIP_provider_domain>}
    set secret <password>
    set authuser <authuser>
    set display-name <display_name>
    set reigstration-interval <refresh_interval>
    set account-type {static | dynamic}
    set port <port_provider>
    set dtmf-method {auto | inband | info | rfc2833}
    set codec {alaw | g729 |none | ulaw}
    set codec1 {alaw | g729 |none | ulaw}
    set codec2 {alaw | g729 |none | ulaw}
  end
  
```

Variables	Description	Default
edit <provider_name>	Enter the VoIP provider's name.	No default
user <user_name>	Enter the user name for the provider. You can enter the phone number registered with this provider instead.	No default
secret <password>	Enter the password associated with the provider.	No default
domain {<VoIP_provider_address_ipv4>   <VoIP_provider_domain>}	The VoIP provider's domain name or IP address. For example, 172.20.120.11 or voip.example.com.	No default
authuser <authuser>	Enter the authentication user for the account.	No default
display-name <display_name>	Enter the name that will be used as the caller ID name if the provider supports this feature.	No default
reigstration-interval <refresh_interval>	Enter a number for the refresh interval.	No default
account-type {static   dynamic}	Enter to define the type of account.	No default.
port <port_provider>	Enter the port that the provider will be using.	No default
dtmf-method {auto   inband   info   rfc2833}	Enter the DTMF method that will be used.	No default
codec {alaw   g729  none   ulaw}	Enter the most preferred Codec for the VoIP provider.	ulaw
codec1 {alaw   g729  none   ulaw}	Enter the second most preferred Codec for the VoIP provider.	none
codec2 {alaw   g729  none   ulaw}	Enter the third most preferred Codec for the VoIP provider.	none



## config system pstn

Use this command to configure the PSTN interfaces. PSTN interfaces are available on some FortiGate Voice models.

### Syntax

```
config system pstn
  edit <fxo_name>
    set cid-name <caller_name>
    set cid-number <caller_name>
    set status {enable | disable}
    set user-callerid {enable | disable}
    set cid-signalling {bell | dtmf | v23 | v23-jp}
    set cid-start {polarity | ring}
    set send-callerid-after <integer>
    set hangup-on-polarity-reversal
    set hangup-on-zero-voltage
    set hangup-on-busy-tone
    set busycount <integer>
    set busy-tone-length <integer>
    set busy-quiet-length <integer>
    set codec {alaw | ulaw}
  end
```

Variables	Description	Default
edit <fxo_name>	Enter the name of the FXO.	No default
cid-name <caller_name>	This name is used for caller ID for calls from the FortiGate Voice unit to the PSTN. It can be any name, such as a company name, that identifies the branch office.	No default
cid-number <caller_name>	Enter the phone number of the PSTN phone line as provided by your phone service provider.	No default
status {enable   disable}	Enable the status of the port.	No default
user-callerid {enable   disable}	Enable to catch the caller ID.	No default
cid-signalling {bell   dtmf   v23   v23-jp}	Enter the caller ID protocol. The protocol v23-jp is the v23 protocol for Japan.	No default
cid-start {polarity   ring}	Enter to start transmitting the caller ID.	No default
send-callerid-after <integer>	Enter a number for the number of rings after that the caller ID began to transmit.	No default
hangup-on-polarity-reversal	Enter to have the phone hang up when there is polarity reversal.	No default
hangup-on-zero-voltage	Enter to have the phone hang up when there is zero voltage.	No default
hangup-on-busy-tone	Enter to have the phone hang up when a busy tone is detected.	No default
busycount <integer>	Enter a number for the accurate number of busy tones that are detected.	No default

Variables	Description	Default
busy-tone-length <integer>	Enter a number that determines how long the busy tone is on.	No default
busy-quiet-length <integer>	Enter a number that determines how long the busy tone is off.	No default
codec {alaw   ulaw}	Enter the Codec preference type based on the country.	No default

## config system interface

Use this command to allow traffic for the VoIP protocol, SIP, to flow on a specific interface.

### Syntax

```
config system interface
  edit <interface_name>
    set voip {enable | disable}
  end
```

Variables	Description	Default
edit <interface_name>	Enter the interface that you want to allow SIP traffic on.	No default
voip {enable   disable}	Enable the VoIP SIP protocol for allowing SIP traffic on the interface.	disable

## execute pbx

Use this command to view active channels and to delete, list or upload music files for when music is playing while a caller is on hold.

### Syntax

```
execute pbx active-call <list>
execute pbx extension <list>
execute pbx music-on-hold {delete | list | upload}
execute pbx prompt upload ftp <file.tgz>
  <ftp_server_address>[:port] [<username>] [password]
execute pbx prompt upload tftp <file.tgz>
  <ftp_server_address>[:port] [<username>] [password]
execute pbx prompt upload usb <file.tgz>
  <ftp_server_address>[:port] [<username>] [password]
execute pbx restore-default-prompts
execute pbx sip-trunk list
```

Variables	Description
active-call <list>	Enter to display a list of the active calls being processed by the FortiGate Voice unit.
extension <list>	Enter to display the status of all extensions with SIP phones that have connected to the FortiGate Voice unit.

Variables	Description
music-on-hold {delete   list   upload}	Enter to either delete, list or upload music on hold files. You can upload music on hold files using FTP, TFTP, or from a USB drive plugged into the FortiGate Voice unit.
prompt upload ftp <file.tgz> <ftp_server_address> [:port] [<username>] [password>]	Upload new pbx voice prompt files using FTP. The voice prompt files should be added to a tar file and zipped. This file would usually have the extension tgz. You must include the filename, FTP server address (domain name of IPv4 address) and if required the username and password for the server.
prompt upload tftp <file.tgz> <ftp_server_address> [:port] [<username>] [password>]	Upload new pbx voice prompt files using TFTP. The voice prompt files should be added to a tar file and zipped. This file would usually have the extension tgz. You must include the filename and TFTP server IP address.
prompt upload usb <file.tgz> <ftp_server_address> [:port] [<username>] [password>]	Upload new pbx voice prompt files from a USB drive plugged into the FortiGate Voice unit. The voice prompt files should be added to a tar file and zipped. This file would usually have the extension tgz. You must include the filename.
restore-default-prompts	Restore default English voicemail and other PBX system prompts. Use this command if you have changed the default prompts and want to restore the default settings.
sip-trunk list	Enter to display the status of all SIP trunks that have been added to the FortiGate Voice configuration.

### Example command output

Enter the following command to view active calls:

```
execute pbx active-call
```

```
Call-From    Call-To    Duration
6016         6006      00:00:46
```

Enter the following command to display the status of all extensions

```
execute pbx extension list
```

```
Extension  Host                Dialplan
6052      Unregister          company-default
6051      Unregister          company-default
6050      Unregister          company-default
6022      Unregister          company-default
6021/6021 172.30.63.34       company-default
6020      Unregister          company-default
```

Enter the following command to display the status of all SIP trunks

```
execute pbx sip-trunk list
```

```
Name          Host                Username          Account-Type     State
Provider_1    192.169.20.1       +55555555        Static           N/A
```

## diagnose pbx restart

Use this diagnose command to restart the FortiGate Voice PBX daemon.

```
diagnose pbx restart
```

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