FortiGate Voice™

Version 4.0

Administration Guide

Preliminary Version: Fortinet Tech Docs is continuing to work on this document and will be releasing new versions with more information and corrections to errors over the next few weeks. Contact techdoc@fortinet.com if you have any comments about this document.

Visit http://support.fortinet.com to register your FortiGate Voice product. By registering you can receive product updates, technical support, and FortiGuard services.

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FortiGate Voice Administration Guide

Version 4.0

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Trademarks

Contents

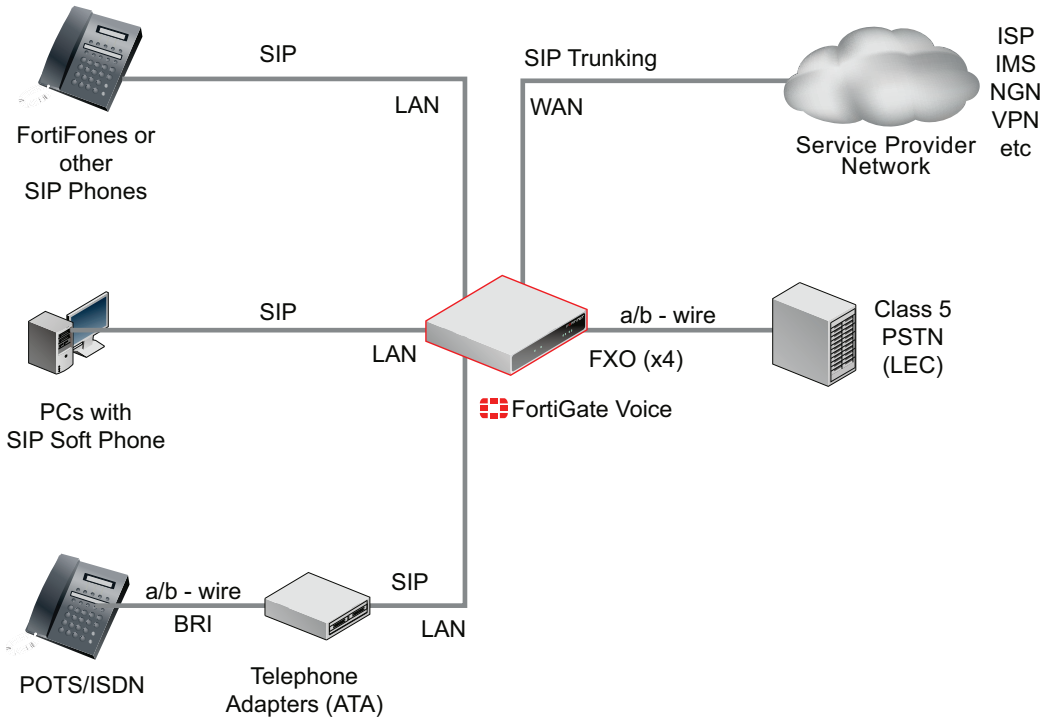
Introduction

The FortiGate Voice unit integrates FortiGate UTM functionality with VoIP phone PBX functionality. 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-80C PBX functionality includes:

- Four Foreign eXchange Office (FXO) interfaces for connected to up to 4 standard public switch telephone network (PSTN) phone lines
- 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 comprehensive 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 the VoIP, PBX, and PSTN web-based manager and CLI functionality of the FortiGate Voice-80C.

This chapter contains the following sections:

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.

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*.

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.

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, 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 1: Typographical conventions in Fortinet technical documentation

Convention	Example
Button, menu, text box, field, or check box label	From *Minimum log level*, select *Notification*.

CLI input*	`config system dns`
	`  set primary <address_ipv4>`
	`end`

CLI output	`FGT-602803030703 # get system settings`
	`comments  : (null)`
	`opmode  : nat`

Emphasis	HTTP connections are ***not*** secure and can be intercepted by a third party.
File content	`<HTML><HEAD><TITLE>Firewall Authentication</TITLE></HEAD>` `<BODY><H4>You must authenticate to use this service.</H4>`
Hyperlink	Visit the Fortinet Technical Support web site, https://support.fortinet.com.
Keyboard entry	Type a name for the remote VPN peer or client, such as `Central_Office_1`.
Navigation	Go to *VPN* > *IPSEC* > *Auto Key (IKE)*.
Publication	For details, see the *FortiGate Administration Guide*. **Note:** Links typically go to the most recent version. To access earlier releases, go to http://docs.fortinet.com/. This link appears at the bottom of each page of this document.
VDOM	The chapter or section contains VDOM configuration settings, see "VDOM configuration settings" on page 110.
Global	The chapter or section contains Global configuration settings, see "Global configuration settings" on page 112.

* For conventions used to represent command syntax, see "CLI command syntax" on page 9.

CLI command syntax

This guide uses the following conventions to describe 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.

For more information, see the *FortiGate CLI Reference*.

Table 2: Command syntax

Convention	Description

Square brackets `[ ]`	A non-required word or series of words. For example:
	`[verbose {1 | 2 | 3}]`
	indicates that you may either omit or type both the `verbose` word and its accompanying option, such as:
	`verbose 3`

Angle brackets `< >`	A word constrained by data type. To define acceptable input, the angled brackets contain a descriptive name followed by an underscore (_) and suffix that indicates the valid data type. For example: `<retries_int>` indicates that you should enter a number of retries, such as `5`. Data types include: • `<xxx_name>`: A name referring to another part of the configuration, such as `policy_A`. • `<xxx_index>`: An index number referring to another part of the configuration, such as `0` for the first static route. • `<xxx_pattern>`: A regular expression or word with wild cards that matches possible variations, such as `*@example.com` to match all email addresses ending in `@example.com`. • `<xxx_fqdn>`: A fully qualified domain name (FQDN), such as `mail.example.com`. • `<xxx_email>`: An email address, such as `admin@mail.example.com`. • `<xxx_ipv4>`: An IPv4 address, such as `192.168.1.99`. • `<xxx_ipv4range>`: An IPv4 address range. • `<xxx_v4mask>`: A dotted decimal IPv4 netmask, such as `255.255.255.0`. • `<xxx_ipv4mask>`: A dotted decimal IPv4 address and netmask separated by a space, such as `192.168.1.99 255.255.255.0`. • `<xxx_ipv4/mask>`: A dotted decimal IPv4 address and CIDR-notation netmask separated by a slash, such as such as `192.168.1.99/24`. • `<xxx_ipv6>`: An IPv6 address. • `<xxx_v6mask>`: A dotted decimal IPv6 netmask. • `<xxx_ipv6mask>`: A dotted decimal IPv6 address and netmask separated by a space. • `<xxx_str>`: A string of characters that is ***not*** another data type, such as `P@ssw0rd`. Strings containing spaces or special characters must be surrounded in quotes or use escape sequences • `<xxx_int>`: An integer number that is ***not*** another data type, such as `15` for the number of minutes.
Curly braces `{ }`	A word or series of words that is constrained to a set of options delimited by either vertical bars or spaces. You must enter at least one of the options, unless the set of options is surrounded by square brackets [ ].

Table 2: Command syntax

	Options delimited by vertical bars |	Mutually exclusive options. For example: `{enable | disable}` indicates that you must enter either `enable` or `disable`, 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`
		Note: To change the options, you must re-type the entire list. For example, to add `snmp` 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 Base article Registration Frequently Asked Questions.

Fortinet products End User License Agreement

See the *Fortinet products End User License Agreement*.

Customer service and technical support

Fortinet Technical Support provides services designed to make sure that you can install your Fortinet products quickly, configure them easily, and operate them 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 What does Fortinet Technical Support require in order to best assist the customer?

Training

Fortinet Training Services provides a variety of training programs to serve the needs of our customers and partners world-wide. Visit the Fortinet Training Services web site at http://campus.training.fortinet.com, or email training@fortinet.com.

Fortinet 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 Base.

Tools and Documentation CD

The documentation for your product is available on the Fortinet Tools and Documentation CD shipped with your product. The documents on this CD are current at shipping time. For the most 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

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 2 on page 14.

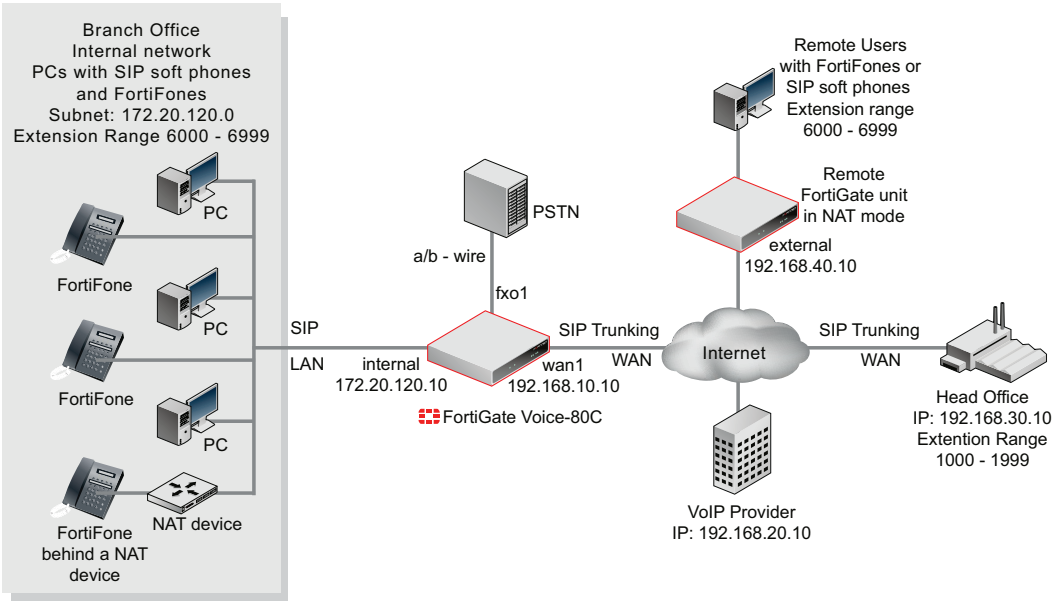
In this example the FortiGate Voice-80C unit provides:

- 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.
  - 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 1000-19999.

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 2: Example Branch Office network configuration



This section describes:

- General configuration steps
- Connecting the FortiGate Voice-80C unit
- Configuring basic FortiGate Voice-80C 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 for users behind a NAT device

General configuration steps

1 Connect the FortiGate Voice-80C unit to the Internet, the internal network and the PSTN.

2 Configure FortiGate Voice-80C 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-80C 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-80C as a DHCP server and DNS server for the branch office internal network. As a DHCP server the FortiGate Voice-80C 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-80C unit

The following procedure describes how to connect the FortiGate Voice-80C unit to the Internet, the branch office internal network, and the PSTN.

To connect the FortiGate Voice-80C unit

1 Use an Ethernet cable to connect the FortiGate Voice-80C 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-80C internal interface switch connectors.

   You can connect up to 8 PCs and FortiFones directly to the FortiGate Voice-80C 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-80C fxo1 port to the branch office PSTN phone line supplied by your local telephone service provider.

Configuring basic FortiGate Voice-80C network and UTM settings

The following procedures describe how to configure a FortiGate Voice-80C to provide basic Internet connectivity, network services, and UTM services for the branch office internal network. Network services include configuring the FortiGate Voice-80C to be the DHCP server and DNS server for the internal network.

As part of the FortiGate Voice-80C network interface configuration you must enable *SIP Traffic* on the internal and wan1 interfaces so that the FortiGate Voice-80C unit accepts SIP sessions received by these interfaces. No other special network configuration, firewall policies, or routing is required for the FortiGate Voice-80C to accept SIP sessions from configured extensions.

To configure basic network settings

1 Connect to the FortiGate Voice-80C web-based manager.
2 Go to *System* > *Network* > *Interface*.
3 Edit the *internal* interface and configure the following settings:

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

   Configure other network interface settings as required and select OK.

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

Addressing Mode	Manual
IP/Netmask	192.168.10.10/255.255.255.0
SIP Traffic	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-80C* internal interface as their DNS server IP address.

The procedure "To configure the FortiGate Voice-80C to be a DHCP server for the internal network" on page 16 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:

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

11 Select OK.

To configure the FortiGate Voice-80C 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-80C 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-80C 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.

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

Advanced	Select
DNS Server 1	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, antispam 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 10.

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.

Source Interface/Zone	internal
Source Address	all
Destination Interface/Zone	want
Destination Address	all
Schedule	always
Service	ANY
Action	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:

IP Address	172.20.120.20
Subnet Mask	255.255.255.0
Default Gateway	172.20.120.10
DNS Server	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-80C 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. 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-80C unit to one PSTN phone line. If you have more PSTN phone lines you can connect and configure more fxo interfaces.

1 Go to *System* > *Network* > *PSTN Interface* and edit the fxo1 interface.

2 Configure the following settings.

Pone 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.
Echo Cancelling	Normally you would select echo cancelling to improve voice quality.
Caller ID Options	Configure the following options to support caller id functions for calls from the internal network to the PSTN.
Catch Caller ID	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.

Caller ID Protocol	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.
Caller ID Indicator	Select the caller ID indicator required by the PSTN line. Contact your service provider for details.
Ring #	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.
Hang-up Options	Configure the following options to configure how the FortiGate Voice unit hangs up calls from the PSTN.
Hang up on Polarity Reversal	Select if the PSTN line uses polarity reversal to indicate a call has been hung up. Contact your service provider for details.
Hang up on Busy Tone	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.
Busy Tone Detection #	The number of busy tones that the FortiGate Voice receives before hanging up if *Hang up on Busy Tone* is selected.
Busy Tone Duration **Busy Tone Interval**	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.
Administrative Status	Set to *Up* 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 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* > *Config* > *System*.

2 Configure the following settings.

Extension Range	_6XXX Use the extension range to create a pattern that defines the valid extensions that can be added to the FortiGate Voice configuration. Extensions can include number or letters and you can define the number of characters that are required. In this extension range pattern: • _ indicates the extension range is a pattern. The _ is always required. • 6 indicates the extensions must start with the number 6. • XXX indicates the extensions must have three numerical digits following the 6.
Voicemail Access	*97 Phone users on the internal network can dial *97 to get their voicemail.
Max Voicemail Duration	60 seconds Limits a single voicemail message to 60 seconds.

3 Select Apply to save the changes.

4 Go to *PBX* > *Config* > *Voicemail Notification*.

5 Configure the following settings.

SMTP Server	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: *mail.example.com*. You can optionally create an email account on the email server for the FortiGate Voice unit.
Authentication	Select if the email server requires authentication.
User Name	Enter a valid username for an account on the email server.
Password	Enter the password for the account on the email sever.

6 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 a third-party VoIP provider to handle VoIP calls between the head office and the branch office.

1 Go to *PBX* > *Config* > *VoIP Provider*.

2 Configure the following settings.

Name	VoIP_Provider_1 A name for the VoIP provider. This can be any name.
Server	192.168.20.10 The VoIP provider's IP address.
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	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.

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

- The first rule requires branch office phones dial 9 to connect to phone numbers on the PSTN. This dial plan must also strip the first digit (the 9) from the dialed number.
- The second rule allows branch office phones to dial head office extensions directly. The dial plan rule sends calls starting with 1 to the VoIP provider where they are routed to the head office. This dial plan does not strip any digits because users dial the head office extension number directly without a prefix.

1 Go to *PBX* > *Call* > *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 the PSTN.

5 Configure the following settings.

Name	PSTN_Dial_Rule
Pattern	_9X. • _ indicates this a pattern • 9 indicates the number must start with a 9. • X indicates any number can be included • . indicates one or more numbers can be included
Strip	1 Remove the first digit from the number (in this case remove the leading 9).
Outgoing	Move *PSTN - fxo1* to the *Selected* list to send calls to the PSTN out the fxo1 interface.

6 Select OK.

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

8 Configure the following settings.

Name	Head_Office_Dial_Rule
Pattern	_1XXX • _ indicates this is a pattern • 1 indicates the number must start with a 1. • XXX indicates the number must have three numbers following the 1.
Strip	0 Do not remove any digits from the number.
Outgoing	Move *VoIP - VoIP_Provider_1* to the *Selected* list to send calls to the PSTN out the fxo1 interface.

9 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.

Extension	6001
Type	SIP Phone
First Name	The first name assigned to this extension. Usually a person's first name.
Last Name	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 *First Name* followed by the *Last Name*.
Email	The email address of the person assigned to this extension. The FortiGate Voice unit sends voicemail notifications for the extension to this email address.
Password	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 *Register Name* must consist of the extension *First Name* followed by the *Last Name* separated by one space. The FortiFone must also be configured with this *Password* and the IP address of the FortiGate Voice internal interface.
Dial Plan	Dial_Plan_1
Voicemail	Select
Voicemail Password	Enter the numeric password that the SIP user must enter to get voicemail. The password can contain numbers only.
Email Notification	Select
Email Attachment	Select to attach a recording of the user's voicemail message to the voicemail notification email.
Auto Delete	Select to automatically delete voicemail messages.
Maximum Message #	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.

1 Connect and power on the handset.

2 Connect to the handset web configuration interface.

3 Configure the handset *Network Settings* to set the *IP Type* to DHCP.

4 Configure the handset *Service Domain Settings* as follows:

Active	On
Display Name	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 *First Name* and *Last Name* added to the FortiGate Voice *Extension* configuration.
Line Number	6001
Register Name	The *Register Name* is used to authenticate the phone with the FortiGate Voice unit and must ben an exact match with a *First Name* and *Last Name* added to the FortiGate Voice *Extension* configuration. Separate the *First Name* and *Last Name* with a space. For example, in the FortiGate Voice Extension configuration if the *First Name* is *Example* and the *Last Name* is *User* then the *Register Name* must be *Example User*.
Register Password	The *Password* added to the FortiGate Voice Extension configuration. The Register Name and Register Password are used to authenticate the phone with the FortiGate Voice unit.
Domain Server	172.20.120.10 The IP address of the FortiGate Voice internal interface.
Proxy Server	172.20.120.10 The IP address of the FortiGate Voice internal interface.
Outbound Proxy	Leave this field blank.

5 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 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 22.

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 handset.
2. Connect to the handset web configuration interface.
3. Configure the handset *Network Settings* for the remote network.
4. Configure the handset *Service Domain Settings* as follows:

Active	On
Display Name	The name to be displayed on the phone.
Line Number	6010
Register Name	The *Register Name* is used to authenticate the phone with the FortiGate Voice unit and must ben an exact match with a *First Name* and *Last Name* added to the FortiGate Voice *Extension* configuration. Separate the *First Name* and *Last Name* with a space. For example, in the FortiGate Voice Extension configuration if the *First Name* is *Example* and the *Last Name* is *User* then the *Register Name* must be *Example User*.
Register Password	The *Password* added to the FortiGate Voice Extension configuration. The Register Name and Register Password are used to authenticate the phone with the FortiGate Voice unit.
Domain Server	192.168.10.10 The IP address of the FortiGate Voice wan1 interface.
Proxy Server	192.168.10.10 The IP address of the FortiGate Voice wan1 interface.
Outbound Proxy	Leave this field blank.

5. 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.
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 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 3.

   You can select any available key, but this example uses 3.
4. Set Action to *Go to Company Directory* and select OK.

Adding shortcut for checking voicemail

Use the following procedure to allow phone users to dial 7 to access their voicemail. 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 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* > *Config* > *System* 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.

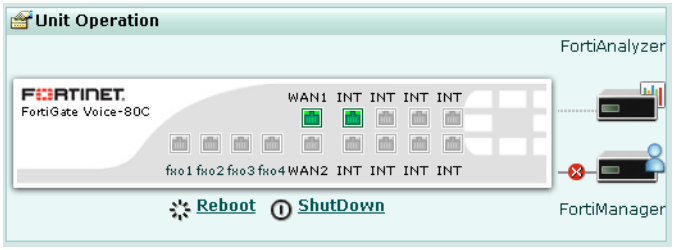
Dashboard widgets

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.

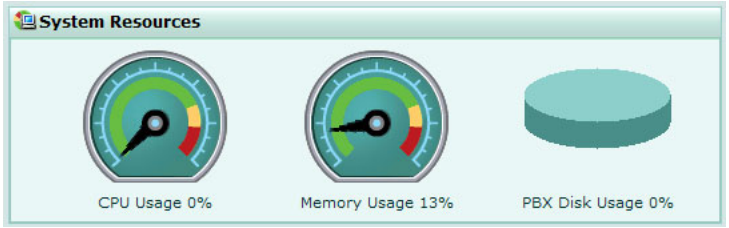
Figure 3: FortiGate Voice Unit operation widget



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 4: System Resources widget displaying the percentage of disk usage for PBX



Configuring VoIP interface settings

You can configure an interface to allow VoIP SIP traffic to flow through.

To configure VoIP interface settings

1 Go to *System* > *Network* > *Interface*.

2 Select the *Edit* icon in the row of the interface that you want to configure VoIP settings for.

3 Select the check box beside *SIP Traffic*.

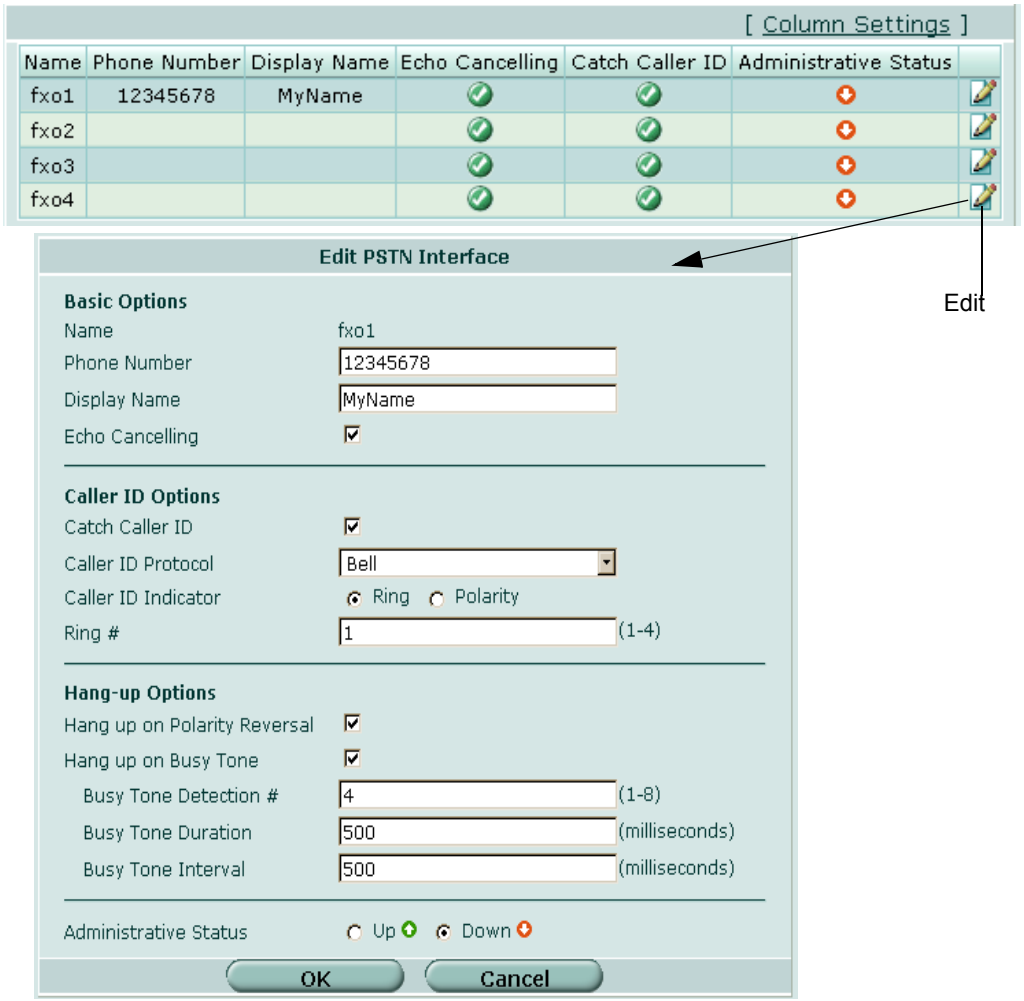
4 Select *OK*.

Configuring PSTN interfaces

There are four default PSTN interfaces to use for your PBX configuration. These interfaces are specific for PBX configurations.

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

Figure 5: 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.
Echo Cancelling	If enabled, a green checkmark appears. If Echo Cancelling is disabled, a gray X appears.
Catch Caller ID	If enabled, a green checkmark appears. If Catch Caller ID is disabled, a gray X appears.
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.

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 that will be associated with that interface.
Display Name	Enter the name that will display on the phone's LCD.
Echo Cancelling	Select to enable Echo Cancelling.
Caller ID Options	The options for caller ID on incoming calls.
Catch Caller ID	Select to enable catch caller ID.
Caller ID Protocol	Select from the drop-down list a caller ID protocol, such as V23.
Caller ID Indicator	Select either Ring or Polarity to indicate the caller ID.
Ring #	Enter a number for the number of rings before an incoming caller receives options to leave a message on the person's voicemail.
Hang-up Options	The options for when an incoming call is not delivered to
Hang up on Polarity Reversal	Select to have the phone hang up on polarity reversal.
Hang up on Busy Tone	Select to have the phone hang up if there is a busy tone.
Busy Tone Detection	Enter a number for the number of rings it takes before detecting a busy tone.
Busy Tone Duration	Enter a number in milliseconds for the duration of the busy tone.
Busy Tone Interval	Enter a number in milliseconds for the busy tone interval.
Administrative Status	Select to have the interface either up or down.

PBX configuration

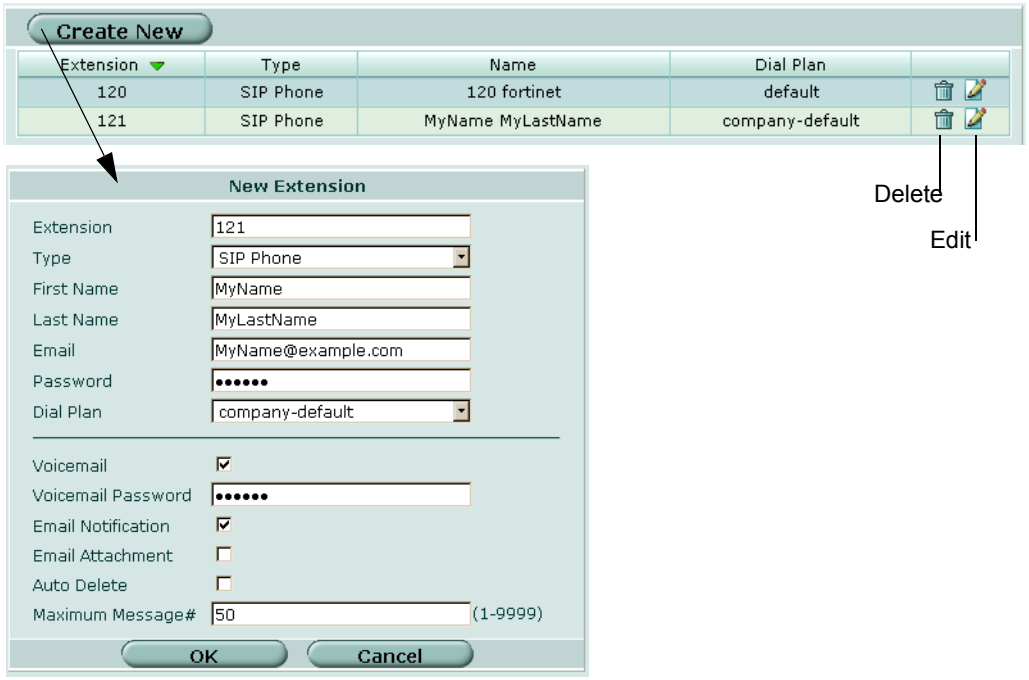
The following explains how to configure PBX settings for your network environment. These settings include voicemail notification settings, configuring a VoIP provider as well as system settings such as a voicemail access code and a maximum voicemail duration time limit.

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 6: Configuring extensions



General extension settings

Create New	Select to create an extension.
Extension	The extension number.
Type	The type of extension the number is, for example, SIP Phone.
Name	The name of the extension.
Dial Plan	The dial plan that will be used for that extension.
Delete icon	Select to delete an extension.
Edit icon	Select to change the extension's settings.

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.

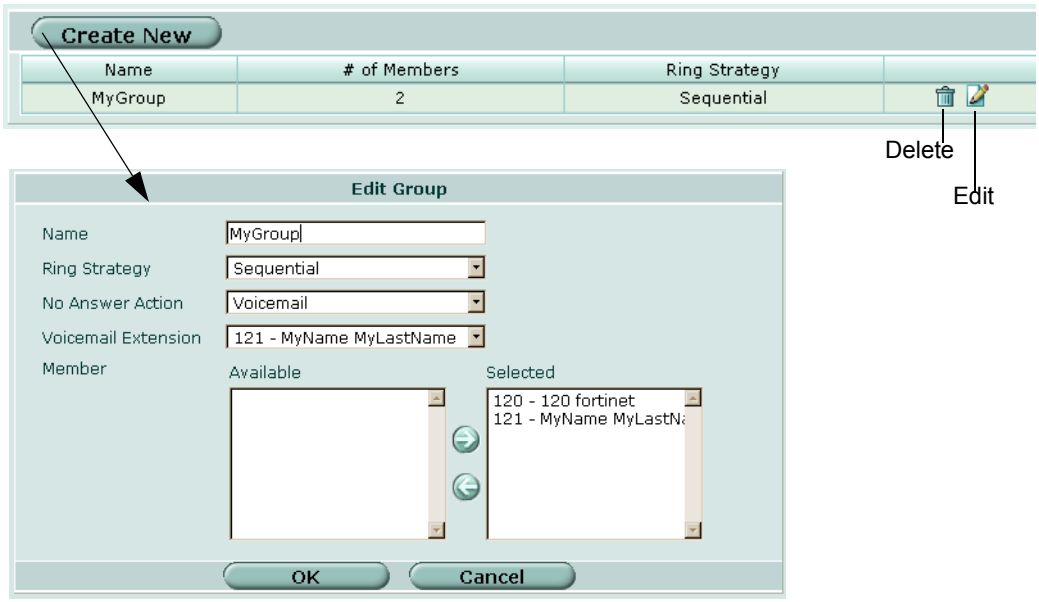
Auto Delete	Select to automatically delete the message.
Maximum Message	Enter a number for the maximum amount of messages that can be stored in the voicemail inbox before automatically deleting those messages.

Configuring extension groups

Extension 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.

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

Figure 7: Configuring extension groups



General extension group settings

Create New	Select to configure an extension group.
Name	The name of the extension group.
# of Members	The number of extensions associated with the extension group.
Ring Strategy	The type of ring strategy associated with the extension group.
Delete icon	Select to delete an extension group.
Edit icon	Select to change the extension group's settings.

Extension group configuration settings

Name	Enter a name for the extension group.
Ring Strategy	Select a type from the drop-down list. You can choose either Sequential or Ring All.
No Answer Action	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.

Voicemail Extension	Select the voicemail extension number from the drop-down list. This option appears only when Voicemail is selected in No Answer Action.
Member	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

You can configure a dial plan that includes dial plan rules in the PBX menu. A dial plan rule indicates an outgoing destination to send calls to. You can add multiple rules to one dial plan. Dial plans are used when configuring extensions that control how to handle outgoing calls from the extension.

To configure a dial plan

1. Go to *PBX* > *Call* > *Dial Plan*.
2. Select *Create New*.
3. Enter a name for the dial plan in the *Name* Field.
4. If you want, add a description of the dial plan in the *Comments* field.
5. Select *Create New*.

   When you select *Create New*, you will configure a new dial plan rule for the dial plan that you are currently configuring.
6. Enter a name for the dial plan rule in the *Name* field.
7. Enter a dial pattern in the *Pattern* field.

   A pattern always begins with an underscore _ and the pattern can include the following characters:

   - X matches numbers 0-9
   - Z matches numbers 1-9
   - N matches numbers 2-9
   - [15-7] matches single digits 1, 5, 6, and 7
   - . one or more digits
   - ! zero or more digits.

   The pattern _9X indicates that any number of digits 0-9 where the first digit is 9.
8. Enter the number of the digit to remove from the incoming number in the *Strip* field.
9. In *Outgoing*, select the PSTN interface and/or VoIP provider in the *Available* column list and then use the -> arrow to move to the *Selected* column.

   If you need to remove a PSTN interface or VoIP provider from the *Selected* list, select the PSTN interface or VoIP provider and use the <- arrow to move it back to the *Available* column list.
10. Select OK.
11. Repeat steps 5 to 9 to add multiple dial plan rules to the dial plan.

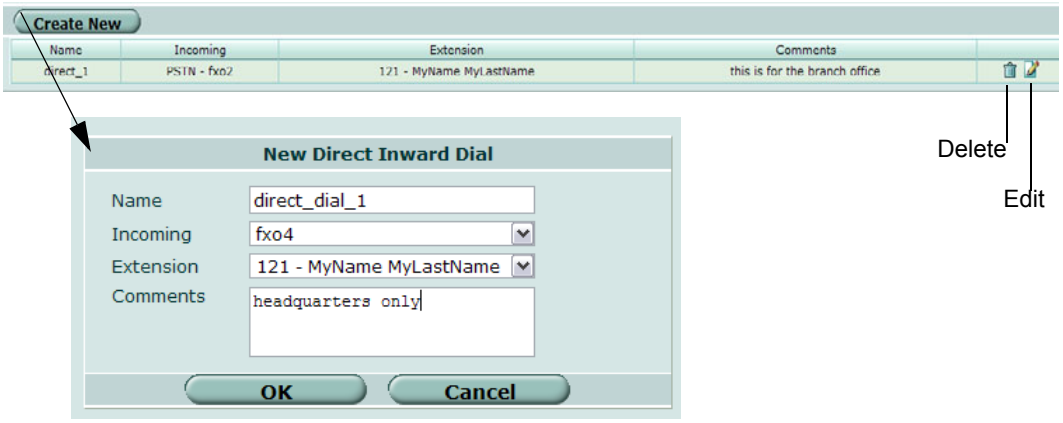
You can arrange the PSTN interfaces and VoIP providers in the *Selected* column using the up and down arrows that are beside the Selected column. You must select a PSTN interface or VoIP provider first and then use the arrows to arrange them in the list.

Configuring direct inward dialing

You can configure direct inward dialing (DID) for calls.

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

Figure 8: Direct inward dialing



General direct inward dialing settings

Name	The name of the direct inward dialing configuration.
Incoming	The incoming calls that will flow through the PSTN interface.
Extension	The extension that will be used.
Comments	A description about the direct inward dial configuration.
Delete icon	Select to delete a direct inward dialing configuration.
Edit icon	Select to change a direct inward dialing configuration's settings.

Direct inward dialing configuration settings

Name	Enter a name for the direct inward dialing configuration.
Incoming	Select a PSTN interface or VoIP 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.

Configuring voice menu options

You can edit the different menu items that each caller hears when they are trying to reach the number that they have dialed. There are ten voice menu options, from 0 to 9, with each number representing the number key on a phone's keypad.

To configure voice menu options

1. Go to *PBX* > *Call* > *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:

None	No action will be taken when a caller presses the number on the keypad.
Ring Group	An extension group that is to be used for that number.

Check Voicemail	Accesses voicemail messages from a voicemail inbox.
Go to Company Directory	Allows the caller to go directly to the company's phone directory.

4 If you selected Ring Group in step 3, select an extension group from the *Ring Group* list.

A ring group refers to an extension group. In the *Ring Group* list, you should see the extension groups you configured in "Configuring extension groups" on page 31.

5 Select *OK*.

Configuring PBX system options

PBX system options allow you to configure an extension range for your company's phone system, enter an access code for accessing voicemail messages, and a maximum voicemail duration setting.

In the web-based manager, you can only configure the voicemail access code and the maximum voicemail duration time. If you want to configure an extension range that is not the default range (_1XX), use the CLI. For more information, see "FortiGate Voice VoIP, PBX, and PSTN CLI Reference" on page 37.

To configure PBX system options

1 Go to *PBX* > *Config* > *System*.

2 In the *Voicemail Access* field, enter the access code number that you want employees to use when accessing their voicemail.

3 In *Max Voicemail Duration*, enter the limit of the voicemail length in seconds.

4 For example, to allow a voicemail length of two minutes, enter 120 seconds.

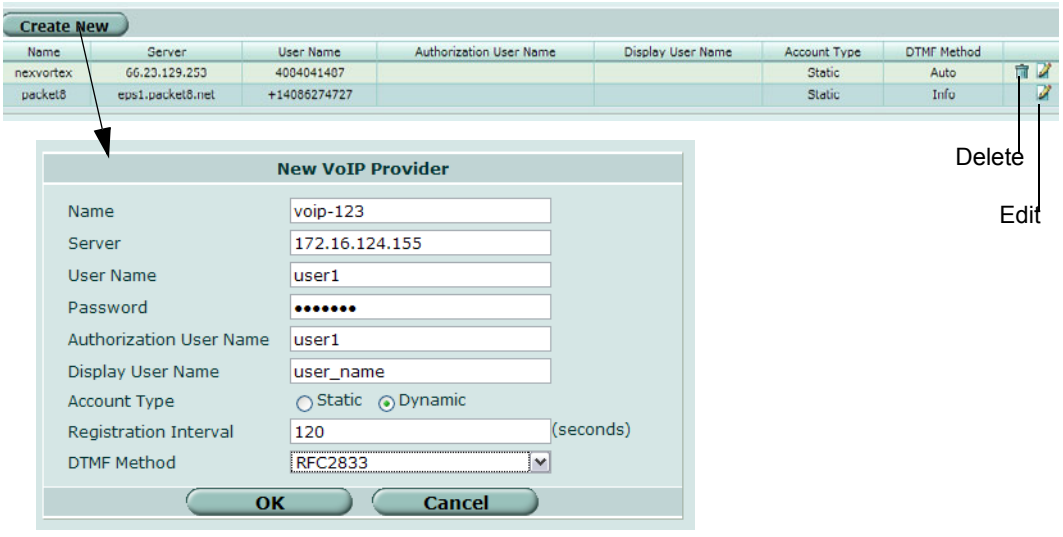
5 Select *Apply*.

Configuring VoIP providers

You can configure multiple VoIP providers for your PBX specifications.

To configure VoIP providers, go to *PBX* > *Config* > *VoIP Provider*, select *Create New*, configure the settings and then select *OK*.

Figure 9: VoIP Provider



General VoIP provider settings	
Name	The name of the VoIP provider.
Server	The server of the VoIP provider.
User Name	The user associated with the VoIP provider.
Authorization User Name	The authorized user for the VoIP provider.
Display User Name	The name that displays on the phone's LCD.
Account Type	The type of account for that VoIP provider.
DTMF Method	The type of DTMF method.
Delete icon	Select to delete a VoIP provider.
Edit icon	Select to change the settings of a VoIP provider.
VoIP provider configuration settings	
Name	Enter the name for the VoIP provider configuration.
Server	Enter the server of the VoIP provider.
User Name	Enter the name of the user.
Password	Enter the password for the user.
Authorization User Name	Enter the user name that is authorized for the VoIP provider.
Display User Name	Enter the user name that will display on the phone's LCD.
Account Type	Select either Static or Dynamic as the account type. When you select Dynamic, the Registration Interval is available for configuration.
Registration Interval	Enter a number in seconds for the interval. This appears when Account Type is set to Dynamic.
DTMF Method	Select a DTMF method from the drop-down list.

Configuring voicemail notifications

When an employee receives a voicemail message, you can configure an SMTP server that will send that voicemail message to the employee's email address.

To configure a voicemail notification

1. Go to *PBX* > *Config* > *Voicemail Notification*.
2. Enter the SMTP server information in the *SMTP Server* field.

   The SMTP server information can be either the SMTP server's IP address or its domain name.
3. If authentication is required, select the check box beside *Authentication*.
4. If you have selected *Authentication*, enter a user name and password in the *User Name* and *Password* fields.
5. Select *Apply*.

Monitoring calls

You can monitor incoming and outgoing calls from *PBX* > *Monitor*. From the Monitor tab, you can view each call and there duration. You can also filter the information that displays on the page, as well as refresh the information.

The calls on the page can also be arranged in descending or ascending order, using either the From, To, or Duration columns.

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*.

FortiGate Voice VoIP, PBX, and PSTN CLI Reference

This section describes FortiGate Voice VoIP, PBX, and PSTN configuration settings. For information about other FortiGate Voice CLI commands see the *FortiGate CLI Reference*.

This section describes:

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 callthrough {fxo1 | fxo2 | fxo3 | fx04 |
             <voip_providers>}
          set dest-pattern <pattern_str>
          set strip <digit_int>
        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
callthrough {fxo1 | fxo2 | fxo3 | fx04 | <voip_providers>}	Select one or more destinations that the dial plan rule sends outgoing calls to. fxo1, fxo2, fxo3, and fx04 are the 4 PSTN interfaces. <voip_providers> are the VoIP providers added to the FortiGate Voice. A dial plan rule can send calls to one or more destinations.	No default
dest-pattern <pattern_str>	Enter the dial pattern used to select this dial plan. Use the following characters to create the dial plan: A pattern always begins with an underscore _ and the pattern can include the following characters: • X matches numbers 0-9 • Z matches numbers 1-9 • N matches numbers 2-9 • [15-7] matches single digits 1, 5, 6, and 7 • . one or more digits • ! zero or more digits So the pattern _9X. means any number of digits 0 to 9 where the first digit is a 9. _6XXX means any 4-digit number that begins with a 6.	No default
strip <digit_int>	Enter the number of the digit to remove from the incoming number. 0 means do not strip any digits. 4 means strip the 4th digit. Usually you would strip a leading digit added to route the call to an external destination.	0

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 max-msg <max_messages_ allowed>
    set nat {no | yes}
    set secret <user_password>
    set type {conference | ivr | sip-phone}
    set vm-secret <user_password>
    set voicemail {enable | disable}
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
max-msg <max_messages_ allowed>	Enter the maximum number of voicemail messages that are allowed in a user's voicemail inbox.	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. • sip-phone to configure a SIP phone extension • 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. • conference to add a conference. Multiple users can call the conference bridge extension number enter the secret and have a conference call. A conference extension only requires an extension number and a secret.	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

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 max-voicemail <max_length_seconds>
  set muisc-on-hold {enable | disable}
  set voicemail-extension <access_number>
end
```

Variables	Description	Default
country-area <country_name>	Enter the name of the country in which the FortiGate Voice is installed.	USA
extension-pattern <extension_pattern>	Enter the pattern that must be used for all extensions added to the FortiGate Voice unit. If you want to change the extension pattern you have to delete all previously added extensions. A pattern always begins with an underscore _ and the pattern can include the following characters: • X matches numbers 0-9 • Z matches numbers 1-9 • N matches numbers 2-9 • [15-7] matches single digits 1, 5, 6, and 7 • . one or more digits • ! zero or more digits So the pattern _9X. means any number of digits 0 to 9 where the first digit is a 9. _6XXX means any 4-digit number that begins with a 6. The pattern _1XX means any 3-digit number that begins with a 1.	_1XX
max-voicemail <max_length_seconds>	Limit the length of voicemail messages. Set to 0 for no limit.	60
muisc-on-hold {enable | disable}	Enable to have music playing while the caller is on hold.	disable
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.

Syntax

```
config pbx ringgrp
  edit <ring_group_name>
    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.
member <acd_group_member>	Enter the ACD member for the group.	No default

Variables	Description	Default
no-answer-action {hangup | ivr | voicemail}	Enter the action that will be taken when none of the extensions in the ring group answers. • hangup hand up and end the call. • ivr return the caller to the attendant where they can try another extension. • voicemail the caller is directed to the voicemail system where they can leave a message.	No default
strategy {ring-all | sequential}	Control how the extensions in the group are called by the ring group. • ring-all calls all of the extensions in the group at the same time. • sequential calls the extensions in the group one at a time in the order in which they have been added to the group.	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 authenticate {enable | disable}
  set password <password_str>
  set port <smtp_server_port>
  set server <smtp_server_ip_ address>
  set username <username_str>
end
```

Variables	Description	Default
authenticate {enable | disable}	Select enable if the email server requires authentication. If you enable authentication you must also add a username and password.	disable
password <password_str>	Enter the password for the account on the email sever.	
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
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 | config press-1 | config press-2 | config
       press-3 | config press-4 | config press-5 | config press-
       6 | config press-7 | config press-8 | config press-9]
      set ring-group
      set type {directory | none | ring-group | voicemail}
    end
end
```

Variables	Description	Default
`comment <comment_string>`	Enter a description of the voice-menu settings, if applicable.	No default
`config [press-0 | config press-1 | config press-2 | config press-3 | config press-4 | config press-5 | config press-6 | config press-7 | config press-8 | config 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; `config press-1` variable would have the type `directory` selected in `type`.	No default
`ring-group`	Enter to include a specific ring-group if you have select `ring-group` in `type`. This variable appears only when `ring-group` is selected in `type`.	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 `config press-0` has directory as its type.	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 server <server_address>
    set user <user_name>
    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
server <server_address>	Enter the address for the server. The server's address can be either a domain name or an IP address.	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
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 preference type for the first Codec.	No default
codec1 {alaw | g729 |none | ulaw}	Enter the preference type for the second Codec.	No default
codec2 {alaw | g729 |none | ulaw}	Enter the preference type for the third Codec.	No default

config system pstn

Use this command to configure the PSTN interfaces.

Syntax

```
config system pstn
  edit <fxo_name>
    set cid-name <caller_name>
    set cid-name <caller_name>
    set echo-cancel {enable | disable}
    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>	Enter the caller ID name that will appear on the LCD panel as caller ID on the phone.	No default
echo-cancel {enable | disable}	Enable to support echo-cancelling for the port.	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
busy-tone-length <integer>	Enter a number that determines how logn 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 music-on-hold {delete | list | upload}
```

Variables	Description	Default
active-call <list>	Enter to view the active calls, in list format.	No default
music-on-hold {delete | list | upload}	Enter to either delete, list or upload music files.	No default

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
```

execute pbx-license

Use this command to enter a license key to be able to use the G729 codec for FortiGate Voice calls.

```
execute pbx-license <license_key>
```

diagnose pbx extension list

Use this diagnose command to view which extension was successfully configured, and which was not.

```
diagnose pbx extension list
```

The following is an example of what appears when the above diagnose command is entered. It shows which extensions were successfully configured and which were not.

```
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
```

diagnose pbx voip-provider list

Use this diagnose command to list the VoIP providers added to the FortiGate Voice unit configuration and display status information for each one.

```
diagnose pbx voip-provider list
```

The following is an example of what appears when the above diagnose command is entered on a FortiGate Voice unit configured with one VoIP provider named `Provider_1`.

```
diagnose pbx voip-provider list
Name        Host          Username     Account-Type    State
Provider_1  192.169.20.1  +5555555     Static           N/A
```

www.fortinet.com

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