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FORTINET FORTIGATE FORTIGATE-1000A FIREWALL INSTALL MANUAL

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FortiGate-1000A/AFA2
FortiOS 3.0 MR6

FORTINET®

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FortiGate-1000A/AFA2 Install Guide
FortiOS 3.0 MR6
31 January 2008
01-30006-0461-20080131

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Regulatory compliance

FCC Class A Part 15 CSA/CUS

.

Caution: Risk of Explosion if Battery is replaced by an Incorrect Type. Dispose of Used Batteries According to the Instructions.

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Introduction

Welcome and thank you for selecting Fortinet products for your real-time network protection.

The FortiGate Unified Threat Management System improves network security, reduces network misuse and abuse, and helps you use communications resources more efficiently without compromising the performance of your network. The FortiGate Unified Threat Management System are ICSA-certified for firewall, IPSec, and antivirus services.

The FortiGate Unified Threat Management Systemis a dedicated, easily managed security device that delivers a full suite of capabilities, which include:

- application-level services such as virus protection and content filtering
- network-level services such as firewall, intrusion detection, VPN and traffic shaping

The FortiGate Unified Threat Management System uses Fortinet's Dynamic Threat Prevention System (DTPS™) technology, which leverages breakthroughs in chip design, networking, security and content analysis. The unique ASIC-based architecture analyzes content and behavior in real-time, enabling key applications to be deployed right at the network edge where they are most effective at protecting your networks.

Register your FortiGate unit

Register the FortiGate unit by visiting http://support.fortinet.com and select Product Registration.

To register, enter your contact information and the serial numbers of the FortiGate units that you or your organization have purchased. You can register multiple FortiGate units in a single session without re-entering your contact information.

By registering your FortiGate unit, you will receive updates to threat detection and prevention databases (Antivirus, Intrusion Detection, etc.) and will also ensure your access to technical support.

For more information, see the Fortinet Knowledge Centre article "Registration Frequently Asked Questions" (http://kc.forticare.com/default.asp?id=2071).

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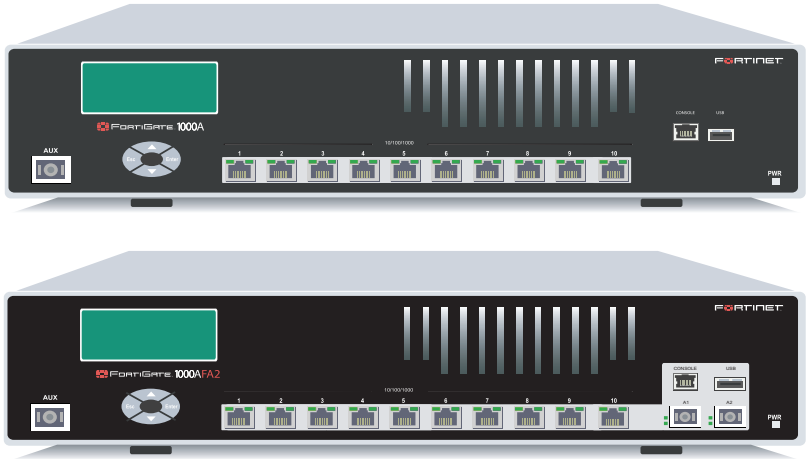
About the FortiGate-1000A/AFA2

The FortiGate-1000A/AFA2 Security System is a high performance solution that delivers gigabit throughput with exceptional reliability for the most demanding large enterprise. The FortiGate-1000AFA2 optionally provides 2 additional fiber interfaces featuring FortiAccel ASIC technology enhancing small packet performance. The FortiGate-1000A/AFA2 deploys easily in existing networks and can be used for antivirus and content filtering only or can be deployed as a complete network protection solution. High Availability (HA) operation and redundant hot-swappable power supplies ensure non-stop operation in mission-critical applications.

The FortiGate-1000A offers 10 tri-speed 10/100/1000 Base-TX interfaces.

The FortiGate-1000AFA2 offers 10 tri-speed ports + two Small Form-factor Pluggable(SFP) FortiAccel ASIC accelerated ports which use hardware acceleration for line rate performance of all packet sizes ideal for applications such as VOIP.

Figure 1: FortiGate-1000A and FortiGate-1000AFA2



About this document

This document explains how to install and configure your FortiGate unit onto your network. This document also includes how to install and upgrade new firmware versions on your FortiGate unit.

This document contains the following chapters:

- Installing – Describes setting up and powering on a FortiGate unit.
- Configuring – Provides an overview of the operating modes of the FortiGate unit and how to integrate the FortiGate unit into your network.
- Advanced configuration – Describes additional configuration you can perform on the FortiGate unit to enhance network protection, including antivirus, antispam, firewall configuration and logging.
- FortiGate Firmware – Describes how to install, update, restore and test firmware for the FortiGate device.

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Document conventions

The following document conventions are used in this guide:

- In the examples, private IP addresses are used for both private and public IP addresses.
- Notes and Cautions are used to provide important information:

Note: Highlights useful additional information.

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

Typographic conventions

FortiGate documentation uses the following typographical conventions:

Convention	Example
Keyboard input	In the Gateway Name field, type a name for the remote VPN peer or client (for example, `Central_Office_1`).

Code examples	`config sys global`
	`set ips-open enable`
	`end`

CLI command syntax	`config firewall policy`
	`edit id_integer`
	`set http_retry_count <retry_integer>`
	`set natip <address_ipv4mask>`
	`end`

Document names	*FortiGate Administration Guide*
Menu commands	Go to **VPN > IPSEC > Phase 1** and select Create New.
Program output	`Welcome!`
Variables	`<address_ipv4>`

Further Reading

The most up-to-date publications and previous releases of Fortinet product documentation are available from the Fortinet Technical Documentation web site at http://docs.forticare.com.

The following FortiGate product documentation is available:

- *FortiGate QuickStart Guide*

  Provides basic information about connecting and installing a FortiGate unit.
- *FortiGate Administration Guide*

  Provides basic information about how to configure a FortiGate unit, including how to define FortiGate protection profiles and firewall policies; how to apply intrusion prevention, antivirus protection, web content filtering, and spam filtering; and how to configure a VPN.

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- *FortiGate online help*

  Provides a context-sensitive and searchable version of the *Administration Guide* in HTML format. You can access online help from the web-based manager as you work.
- *FortiGate CLI Reference*

  Describes how to use the FortiGate CLI and contains a reference to all FortiGate CLI commands.
- *FortiGate Log Message Reference*

  Available exclusively from the Fortinet Knowledge Center, the FortiGate Log Message Reference describes the structure of FortiGate log messages and provides information about the log messages that are generated by FortiGate units.
- *FortiGate High Availability User Guide*

  Contains in-depth information about the high availability feature and the clustering protocol.
- *FortiGate IPS User Guide*

  Describes how to configure the FortiGate Intrusion Prevention System settings and how the FortiGate IPS deals with some common attacks.
- *FortiGate IPSec VPN User Guide*

  Provides step-by-step instructions for configuring IPSec VPNs using the web-based manager.
- *FortiGate SSL VPN User Guide*

  Compares FortiGate IPSec VPN and FortiGate SSL VPN technology, and describes how to configure web-only mode and tunnel-mode SSL VPN access for remote users through the web-based manager.
- *FortiGate PPTP VPN User Guide*

  Explains how to configure a PPTP VPN using the web-based manager.
- *FortiGate Certificate Management User Guide*

  Contains procedures for managing digital certificates including generating certificate requests, installing signed certificates, importing CA root certificates and certificate revocation lists, and backing up and restoring installed certificates and private keys.
- *FortiGate VLANs and VDOMs User Guide*
- Describes how to configure VLANs and VDOMS in both NAT/Route and Transparent mode. Includes detailed examples.

Fortinet Knowledge Center

The Knowledge Center contains troubleshooting and how-to articles, FAQs, technical notes, and more. Visit the Fortinet Knowledge Center at http://kc.forticare.com.

Comments on Fortinet technical documentation

Please send information about any errors or omissions in this document, or any Fortinet technical documentation, to techdoc@fortinet.com.

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Customer service and technical support

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

Please visit the Fortinet Technical Support web site at http://support.fortinet.com to learn about the technical support services that Fortinet provides.

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Installing

This chapter describes installing your FortiGate unit in your server room, environmental specifications and how to mount the FortiGate in a rack if applicable.

This chapter contains the following topics:

- Environmental specifications
- Cautions and warnings
- Plugging in the FortiGate
- Plugging in the FortiGate
- Turning off the FortiGate unit

Environmental specifications

- Operating temperature: 32 to 104°F (0 to 40°C)

  If you install the FortiGate unit in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient temperature. Therefore, make sure to install the equipment in an environment compatible with the manufacturer's maximum rated ambient temperature.
- Storage temperature: -13 to 158°F (-25 to 70°C)
- Humidity: 5 to 90% non-condensing
- Air flow - For rack installation, make sure that the amount of air flow required for safe operation of the equipment is not compromised.
- For free-standing installation, make sure that the appliance has at least 1.5 in. (3.75 cm) of clearance on each side to allow for adequate air flow and cooling.

This device complies with part FCC Class A, Part 15, UL/CUL, C Tick, CE and VCCI. Operation is subject to the following two conditions:

- This device may not cause harmful interference, and
- This device must accept any interference received, including interference that may cause undesired operation.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.

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- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

The equipment compliance with FCC radiation exposure limit set forth for uncontrolled Environment.

Cautions and warnings

Review the following cautions before installing your FortiGate unit.

Grounding

- Ensure the FortiGate unit is connected and properly grounded to a lightning and surge protector. WAN or LAN connections that enter the premises from outside the building should be connected to an Ethernet CAT5 (10/100 Mb/s) surge protector.
- Shielded Twisted Pair (STP) Ethernet cables should be used whenever possible rather than Unshielded Twisted Pair (UTP).
- Do not connect or disconnect cables during lightning activity to avoid damage to the FortiGate unit or personal injury.

Rack mount instructions

Elevated Operating Ambient - If installed in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient. Therefore, consideration should be given to installing the equipment in an environment compatible with the maximum ambient temperature (Tma) specified by the manufacturer.

Reduced Air Flow - Installation of the equipment in a rack should be such that the amount of air flow required for safe operation of the equipment is not compromised.

Mechanical Loading - Mounting of the equipment in the rack should be such that a hazardous condition is not achieved due to uneven mechanical loading.

Circuit Overloading - Consideration should be given to the connection of the equipment to the supply circuit and the effect that overloading of the circuits might have on overcurrent protection and supply wiring. Appropriate consideration of equipment nameplate ratings should be used when addressing this concern.

Reliable Earthing - Reliable earthing of rack-mounted equipment should be maintained.

Particular attention should be given to supply connections other than direct connections to the branch circuit (e.g. use of power strips).

Mounting

If required to fit into a rack unit, remove the rubber feet from the bottom of the FortiGate unit.

The FortiGate unit can be placed on any flat surface, or mounted in a standard 19-inch rack unit.

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When placing the FortiGate unit on any flat, stable surface, ensure the unit has at least 1.5 inches (3.75 cm) of clearance on each side to ensure adequate airflow for cooling.

For rack mounting, use the mounting brackets and screws included with the FortiGate unit.

Note: Fortinet recommends purchasing side rail mounts or similar rack mount aids separately to ensure the FortiGate unit is attached safely to the rack.

Caution: Depending on the size of your FortiGate unit, avoid personal injury, you may require two or more people to install the unit in the rack.

To install the FortiGate unit into a rack

1. Attach the mounting brackets to the side to the unit so that the brackets are on the front portion of the FortiGate unit. Ensure that the screws are tight and not loose.

   The following photos illustrate how the brackets should be mounted. Note that the screw configuration may vary depending on your FortiGate unit.

   Figure 1: Installed mounting brackets

2. Position the FortiGate unit in the rack to allow for sufficient air flow.
3. Line up the mounting bracket holes to the holes on the rack, ensuring the FortiGate unit is level.
4. Finger tighten the screws to attach the FortiGate unit to the rack.
5. Once you verify the spacing of the FortiGate unit and that it is level, tighten the screws with a screwdriver. Ensure that the screws are tight and not loose.

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The following photos illustrate how the mounting brackets and FortiGate unit should be attached to the rack.

Figure 2: Mounting in a rack

Plugging in the FortiGate

The FortiGate unit does not have an on/off switch.

To power on the FortiGate unit

1. Connect the power cables to the power connections on the back of the FortiGate unit.
2. Connect the power cables to power outlets.

   Each power cable should be connected to a different power source. If one power source fails, the other may still be operative.

   After a few seconds, SYSTEM STARTING appears on the LCD. The main menu setting appears on the LCD when the system is running.

   The FortiGate unit starts and the Power and Status LEDs light up. The Status LEDs flash while the FortiGate unit starts up, and remain lit when the system is running.

Note: If only one power supply is connected, an audible alarm sounds to indicate a failed power supply. Press the red alarm cancel button on the rear panel next to the power supply to stop the alarm.

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Connecting to the network

Using the supplied Ethernet cable, connect one end of the cable to your router or modem, whatever the connection is to the Internet. Connect the other end to the FortiGate unit. Connect to either the External, WAN port, or port 1. Connect additional cable to the Internal port or port 2 and your internal hub or switch.

Turning off the FortiGate unit

Always shut down the FortiGate operating system properly before turning off the power switch to avoid potential hardware problems.

To power off the FortiGate unit

1. From the web-based manager, go to **System > Status**.
2. In the Unit Operation display, select Shutdown, or from the CLI enter:

   ```
   execute shutdown
   ```

3. Disconnect the power cables from the power supply.

Note: Disconnect both power supply cords before servicing.

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Configuring

This section provides an overview of the operating modes of the FortiGate unit, NAT/Route and Transparent, and how to configure the FortiGate unit for each mode. There are two ways you can configure the FortiGate unit, using the web-based manager or the command line interface (CLI). This section will step through using both methods. Use whichever you are most comfortable with.

This section includes the following topics:

- NAT vs. Transparent mode
- Connecting to the FortiGate unit
- Verify the configuration
- Backing up the configuration
- Additional configuration

NAT vs. Transparent mode

The FortiGate unit can run in two different modes, depending on your network infrastructure and requirements. You have a choice between NAT/Route mode and Transparent mode. Both include the same robust network security features such as antispam, antivirus, VPN and firewall policies.

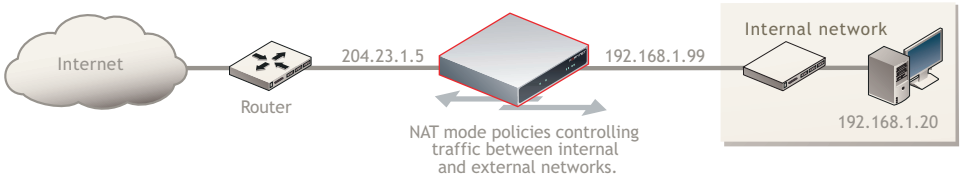
NAT mode

In NAT/Route mode, the FortiGate unit is visible to the network. Like a router, all its interfaces are on different subnets.

In NAT mode, each port is on a different subnet, enabling you to have a single IP address available to the public Internet. The FortiGate unit performs network address translation before it sends and receives the packet to the destination network.

In Route mode, there is no address translation.

Figure 1: FortiGate unit in NAT mode



You typically use NAT/Route mode when the FortiGate unit is operating as a gateway between private and public networks. In this configuration, you would create NAT mode firewall policies to control traffic flowing between the internal, private network and the external, public network, usually the Internet.

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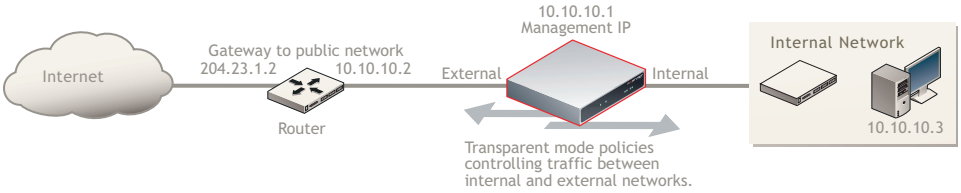
Transparent mode

In Transparent mode, the FortiGate unit is invisible to the network. Similar to a network bridge, all FortiGate interfaces must be on the same subnet. You only have to configure a management IP address to make configuration changes. The management IP address is also used for antivirus and attack definition updates.

Figure 2: FortiGate unit in Transparent mode



You typically use the FortiGate unit in Transparent mode on a private network behind an existing firewall or behind a router. The FortiGate unit performs firewall functions, IPSec VPN, virus scanning, IPS web filtering, and Spam filtering.

Connecting to the FortiGate unit

To configure, maintain and administer the FortiGate unit, you need to connect to it. There are two methods for these tasks:

- using the web-based manger, a GUI interface using a current web browser such as FireFox or Internet Explorer.
- using the command line interface (CLI), a command line interface similar to DOS or UNIX commands using an SSH terminal or Telnet terminal.

Connecting to the web-based manager

To connect to the web-based manager, you require:

- a computer with an Ethernet connection
- Microsoft Internet Explorer version 6.0 or higher or any recent version of the most popular web browser
- an Ethernet cable.

To connect to the web-based manager

1. Set the IP address of the management computer to the static IP address 192.168.1.2 with a netmask of 255.255.255.0.
2. Using the Ethernet cable, connect the internal interface of the FortiGate unit to the computer Ethernet connection.
3. Start your browser and enter the address https://192.168.1.99. (remember to include the “s” in https://).

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To support a secure HTTPS authentication method, the FortiGate unit ships with a self-signed security certificate, which is offered to remote clients whenever they initiate a HTTPS connection to the FortiGate unit. When you connect, the FortiGate unit displays two security warnings in a browser.

The first warning prompts you to accept and optionally install the FortiGate unit's self-signed security certificate. If you do not accept the certificate, the FortiGate unit refuses the connection. If you accept the certificate, the FortiGate login page appears. The credentials entered are encrypted before they are sent to the FortiGate unit. If you choose to accept the certificate permanently, the warning is not displayed again.

Just before the FortiGate login page is displayed, a second warning informs you that the FortiGate certificate distinguished name differs from the original request. This warning occurs because the FortiGate unit redirects the connection. This is an informational message. Select OK to continue logging in.

4 Type `admin` in the Name field and select Login.

Connecting to the CLI

To connect to the FortiGate CLI you require:

- a computer with an available communications port
- a serial cable, either a RJ-45 to DB-9 or null modem cable, whichever was included in your FortiGate package
- terminal emulation software such as HyperTerminal for Microsoft Windows

Note: The following procedure uses Microsoft Windows HypterTerminal software. You can apply these steps to any terminal emulation program.

To connect to the CLI

1 Connect the serial cable to the communications port of your computer and to the FortiGate console port.

2 Start HyperTerminal, enter a name for the connection and select OK.

3 Configure HyperTerminal to connect directly to the communications port on your computer and select OK.

4 Select the following port settings and select OK:

Bits per second	9600
Data bits	8
Parity	None
Stop bits	1
Flow control	None

5 Press Enter to connect to the FortiGate CLI.

6 When the login prompt appears, type `admin` and press Enter twice.

Type ? to list available commands. For information about how to use the CLI, see the *FortiGate CLI Reference*.

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Configuring NAT mode

Configuring NAT mode involves defining interface addresses and default routes, and simple firewall policies. You can use the web-based manager or the CLI to configure the FortiGate unit in NAT/Route mode.

Using the web-based manager

After connecting to the web-based manager, you can use the following procedures to complete the basic configuration of the FortiGate unit. Ensure you read the section "Connecting to the web-based manager" on page 18 before beginning.

Configure the interfaces

When shipped, the FortiGate unit has a default address of 192.168.1.99 and a netmask of 255.255.255.0. for either the Port 1 or Internal interface. You need to configure this and other ports for use on your network.

To configure interfaces

1. Go to **System > Network > Interface**.
2. Select the edit icon for an interface.
3. Set the Addressing Mode for the interface.
   - For Manual addressing, enter the IP address and netmask for the interface.
   - For DHCP addressing, select DHCP and complete the following:

Distance	Enter the administrative distance, between 1 and 255 for the default gateway retrieved from the DHCP server. The administrative distance specifies the relative priority of a route when there are multiple routes to the same destination. A lower administrative distance indicates a more preferred route.
Retrieve default gateway from server	Enable to retrieve a default gateway IP address from the DHCP server. The default gateway is added to the static routing table.
Override internal DNS	Enable to use the DNS addresses retrieved from the DHCP server instead of the DNS server IP addresses on the DNS page on **System > Network > Options**. On FortiGate-100 units and lower, you should also enable Obtain DNS server address automatically in **System > Network > Options**.

   - For PPPoE addressing, select PPPoE, and complete the following:

Username	Enter the username for the PPPoE server. This may have been provided by your ISP.
Password	Enter the password for the PPPoE server for the above user name.
Unnumbered	Specify the IP address for the interface. If your ISP has assigned you a block of IP addresses, use one of these IP addresses. Alternatively, you can use, or borrow, the IP address of a configured interface on the router. You may need to do this to minimize the number of unique IP addresses within your network. If you are borrowing an IP address remember the interface must be enabled, or up to function correctly.
Initial Disc Timeout	Initial discovery timeout in seconds. The time to wait before starting to retry a PPPoE discovery. To disable the discovery timeout, set the value to 0.

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Initial PADT Timeout	Initial PPPoE Active Discovery Terminate (PADT) timeout in seconds. Use this timeout to shut down the PPPoE session if it is idle for this number of seconds. Your ISP must support PADT. To disable the PADT timeout, set the value to 0.
Distance	Enter the administrative distance, between 1 and 255 for the default gateway retrieved from the DHCP server. The administrative distance specifies the relative priority of a route when there are multiple routes to the same destination. A lower administrative distance indicates a more preferred route.
Retrieve default gateway from server	Enable to retrieve a default gateway IP address from the DHCP server. The default gateway is added to the static routing table.
Override internal DNS	Enable to use the DNS addresses retrieved from the DHCP server instead of the DNS server IP addresses on the DNS page on **System > Network > Options**. On FortiGate-100 units and lower, you should also enable Obtain DNS server address automatically in **System > Network > Options**.

4 Select OK.

5 Repeat this procedure for each interface as required.

Note: If you change the IP address of the interface you are connecting to, you must connect through a web browser again using the new address. Browse to https:// followed by the new IP address of the interface. If the new IP address of the interface is on a different subnet, you may have to change the IP address of your computer to the same subnet.

Configure a DNS server

A DNS server is a service that converts symbolic node names to IP addresses. A domain name server (DNS server) implements the protocol. In simple terms, it acts as a phone book for the Internet. A DNS server matches domain names with the computer IP address. This enables you to use readable locations, such as fortinet.com when browsing the Internet.

DNS server IP addresses are typically provided by your internet service provider.

To configure DNS server settings

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

2 Enter the IP address of the primary DNS server.

3 Enter the IP address of the secondary DNS server.

4 Select Apply.

Adding a default route and gateway

A route provides the FortiGate unit with the information it needs to forward a packet to a particular destination. A static route causes packets to be forwarded to a destination other than the default gateway. You define static routes manually. Static routes control traffic exiting the FortiGate unit-you can specify through which interface the packet will leave and to which device the packet should be routed.

In the factory default configuration, entry number 1 in the Static Route list is associated with a destination address of 0.0.0.0/0.0.0.0, which means any/all destinations. This route is called the "static default route". If no other routes are present in the routing table and a packet needs to be forwarded beyond the FortiGate unit, the factory configured static default route causes the FortiGate unit to forward the packet to the default gateway.

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For an initial configuration, you must edit the factory configured static default route to specify a different default gateway for the FortiGate unit. This will enable the flow of data through the FortiGate unit.

For details on adding additional static routes, see the *FortiGate Administration Guide*.

To modify the default gateway

1. Go to **Router > Static**.
2. Select Edit for the default route
3. In the Gateway field, type the IP address of the next-hop router where outbound traffic is directed.
4. If the FortiGate unit reaches the next-hop router through a different interface (compared to the interface that is currently selected in the Device field), select the name of the interface from the Device field.
5. Select OK.

Adding firewall policies

Firewall policies enable traffic to flow through the FortiGate interfaces. Firewall policies define how the FortiGate unit processes the packets in a communication session. You can configure the firewall policies to allow only specific traffic, users and specific times when traffic is allowed.

For the initial installation, a single firewall policy that enables all traffic through will enable you to verify your configuration is working. On lower-end units such a default firewall policy is already in place. For the higher end FortiGate units, you will need to add a firewall policy.

The following steps add two policies that allows all traffic through the FortiGate unit, to enable you to continue testing the configuration on the network.

To add an outgoing traffic firewall policy

1. Go to **Firewall > Policy**.
2. Select Create New.
3. Set the following and select OK.

Source Interface	Select the port connected to the network.
Source Address	All
Destination Interface	Select the port connected to the Internet.
Destination Address	All
Schedule	always
Service	Any
Action	Accept

To add an incoming traffic firewall policy

1. Go to **Firewall > Policy**.
2. Select Create New.

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3 Set the following and select OK.

Source Interface	Select the port connected to the Internet.
Source Address	All
Destination Interface	Select the port connected to the network.
Destination Address	All
Schedule	always
Service	Any
Action	Accept

Firewall policy configuration is the same in NAT/Route mode and Transparent mode.

Note that these policies allow all traffic through. No protection profiles have been applied. Ensure you create additional firewall policies to accommodate your network requirements.

For details, see the *FortiGate Administration Guide*.

Using the CLI

After connecting to the CLI, you can use the following procedures to complete the basic configuration of the FortiGate unit. Ensure you read the section "Connecting to the CLI" on page 19 before beginning.

Configure the interfaces

When shipped, the FortiGate unit has a default address of 192.168.1.99 and a netmask of 255.255.255.0. for either the Port 1 or Internal interface. You need to configure this and other ports for use on your network.

To set an interface to use a static address

```
config system interface
    edit <interface_name>
        set mode static
        set ip <address_ip> <netmask>
  end
```

To set an interface to use DHCP addressing

```
config system interface
    edit external
        set mode dhcp
        set distance <integer>
        set defaultgw {enable | disable}
        set dns-server-override {enable | disable}
  end
```


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To set an interface to use PPPoE addressing

```
config system interface
     edit external
         set mode pppoe
         set username <name_str>
         set password <psswrd>
         set ipunnumbered <ip_address>
         set disc-retry-timeout <integer_seconds>
         set padt-retry-timeout <integer_seconds>
         set distance <integer>
         set defaultgw {enable | disable}
         set dns-server-override {enable | disable}
   end
```

The CLI lists the IP address, netmask, and other settings for each of the FortiGate interfaces.

Note: If you change the IP address of the interface you are connecting to, you must connect through a web browser again using the new address. Browse to https:// followed by the new IP address of the interface. If the new IP address of the interface is on a different subnet, you may have to change the IP address of your computer to the same subnet.

Configure a DNS server

A DNS server is a service that converts symbolic node names to IP addresses. A domain name server (DNS server) implements the protocol. In simple terms, it acts as a phone book for the Internet. A DNS server matches domain names with the computer IP address. This enables you to use readable locations, such as fortinet.com when browsing the Internet.

DNS server IP addresses are typically provided by your internet service provider.

To configure DNS server settings

```
config system dns
     set autosvr {enable | disable}
     set primary <address_ip>
     set secondary <address_ip>
   end
```

Note if you set the `autosvr` to `enable`, you do not have to configure the primary or secondary DNS server IP addresses.

Adding a default route and gateway

A route provides the FortiGate unit with the information it needs to forward a packet to a particular destination. A static route causes packets to be forwarded to a destination other than the default gateway. You define static routes manually. Static routes control traffic exiting the FortiGate unit-you can specify through which interface the packet will leave and to which device the packet should be routed.

In the factory default configuration, entry number 1 in the Static Route list is associated with a destination address of 0.0.0.0/0.0.0.0, which means any/all destinations. This route is called the "static default route". If no other routes are present in the routing table and a packet needs to be forwarded beyond the FortiGate unit, the factory configured static default route causes the FortiGate unit to forward the packet to the default gateway.

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For an initial configuration, you must edit the factory configured static default route to specify a different default gateway for the FortiGate unit. This will enable the flow of data through the FortiGate unit.

For details on adding additional static routes, see the *FortiGate Administration Guide*.

To modify the default gateway

```
config router static
     edit <seq_num>
         set gateway <gateway_IP>
         set device <interface>
   end
```

Adding firewall policies

Firewall policies enable traffic to flow through the FortiGate interfaces. Firewall policies to define the FortiGate unit process the packets in a communication session. You can configure the firewall policies to allow only specific traffic, users and specific times when traffic is allowed.

For the initial installation, a single firewall policy that enables all traffic through will enable you to verify your configuration is working. On lower-end units such a default firewall policy is already in place. For the higher end FortiGate units, you will need to add a firewall policy.

The following steps add two policies that allows all traffic through the FortiGate unit, to enable you to continue testing the configuration on the network.

To add an outgoing traffic firewall policy

```
config firewall profile
     edit <seq_num>
         set srcintf <source_interface>
         set srcaddr <source_IP>
         set dstintf <destination_interface>
         set dstaddr <destination_IP>
         set schedule always
         set service ANY
         set action accept
   end
```

To create an incoming traffic firewall policy, use the same commands with the addresses reversed.

Note that these policies allow all traffic through. No protection profiles have been applied. Ensure you create additional firewall policies to accommodate your network requirements.

Configuring Transparent mode

Configuring Transparent mode involves switching to Transparent mode, configuring the management IP address, default routes, and simple firewall policies. You can use the web-based manager or the CLI to configure the FortiGate unit in Transparent mode.

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Using the web-based manager

After connecting to the web-based manager, you can use the following procedures to complete the basic configuration of the FortiGate unit. Ensure you read the section "Connecting to the web-based manager" on page 18 before beginning.

Switching to Transparent mode

The FortiGate unit comes preset to NAT mode. You need to switch to Transparent mode.

To switch to Transparent mode

1. Go to **System > Status**.
2. Select Change beside the Operation Mode.
3. Select Transparent.
4. Enter the Management IP/Netmask address and the Default Gateway address.

   The default gateway IP address is required to tell the FortiGate unit where to send network traffic to other networks.
5. Select Apply.

Configure a DNS server

A DNS server is a service that converts symbolic node names to IP addresses. A domain name server (DNS server) implements the protocol. In simple terms, it acts as a phone book for the Internet. A DNS server matches domain names with the computer IP address. This enables you to use readable locations, such as fortinet.com when browsing the Internet.

DNS server IP addresses are typically provided by your internet service provider.

To configure DNS server settings

1. Go to **System > Network > Options**.
2. Enter the IP address of the primary DNS server.
3. Enter the IP address of the secondary DNS server.

   Select Apply.

Adding firewall policies

Firewall policies enable traffic to flow through the FortiGate interfaces. Firewall policies define the FortiGate unit process the packets in a communication session. You can configure the firewall policies to allow only specific traffic, users and specific times when traffic is allowed.

For the initial installation, a single firewall policy that enables all traffic through will enable you to verify your configuration is working. On lower-end units such a default firewall policy is already in place. For the higher end FortiGate units, you will need to add a firewall policy.

The following steps add two policies that allows all traffic through the FortiGate unit, to enable you to continue testing the configuration on the network.

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To add an outgoing traffic firewall policy

1. Go to **Firewall > Policy**.
2. Select Create New.
3. Set the following and select OK.

Source Interface	Select the port connected to the network.
Source Address	All
Destination Interface	Select the port connected to the Internet.
Destination Address	All
Schedule	always
Service	Any
Action	Accept

To add an incoming traffic firewall policy

1. Go to **Firewall > Policy**.
2. Select Create New.
3. Set the following and select OK.

Source Interface	Select the port connected to the Internet.
Source Address	All
Destination Interface	Select the port connected to the network.
Destination Address	All
Schedule	always
Service	Any
Action	Accept

Firewall policy configuration is the same in NAT/Route mode and Transparent mode.

Note that these policies allow all traffic through. No protection profiles have been applied. Ensure you create additional firewall policies to accommodate your network requirements.

Using the CLI

After connecting to the CLI, you can use the following procedures to complete the basic configuration of the FortiGate unit. Ensure you read the section "Connecting to the CLI" on page 19 before beginning.

Switching to Transparent mode

The FortiGate unit comes preset to NAT mode. You need to switch to Transparent mode.

To switch to Transparent mode

```
config system settings
      set opmode transparent
      set manageip <address_ip> <netmask>
      set gateway <address_gateway>
   end
```


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Configure a DNS server

A DNS server is a service that converts symbolic node names to IP addresses. A domain name server (DNS server) implements the protocol. In simple terms, it acts as a phone book for the Internet. A DNS server matches domain names with the computer IP address. This enables you to use readable locations, such as fortinet.com when browsing the Internet.

DNS server IP addresses are typically provided by your internet service provider.

To configure DNS server settings

```
config system dns
    set autosvr {enable | disable}
    set primary <address_ip>
    set secondary <address_ip>
  end
```

Note if you set the `autosvr` to `enable`, you do not have to configure the primary or secondary DNS server IP addresses.

Adding firewall policies

Firewall policies enable traffic to flow through the FortiGate interfaces. Firewall policies define the FortiGate unit process the packets in a communication session. You can configure the firewall policies to allow only specific traffic, users and specific times when traffic is allowed.

For the initial installation, a single firewall policy that enables all traffic through will enable you to verify your configuration is working. On lower-end units such a default firewall policy is already in place. For the higher end FortiGate units, you will need to add a firewall policy.

The following steps add two policies that allows all traffic through the FortiGate unit, to enable you to continue testing the configuration on the network.

To add an outgoing traffic firewall policy

```
config firewall profile
    edit <seq_num>
        set srcintf <source_interface>
        set srcaddr <source_IP>
        set dstintf <destination_interface>
        set dstaddr <destination_IP>
        set schedule always
        set service ANY
        set action accept
  end
```

To create an incoming traffic firewall policy, use the same commands with the addresses reversed.

Note that these policies allow all traffic through. No protection profiles have been applied. Ensure you create additional firewall policies to accommodate your network requirements.

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Verify the configuration

Your FortiGate unit is now configured and connected to the network. To verify the FortiGate unit is connected and configured correctly, use your web browser to browse a web site, or use your email client to send and receive email.

If you cannot browse to the web site or retrieve/send email from your account, review the previous steps to ensure all information was entered correctly and try again.

Remember, to verify the firewall policies. The firewall policies control the flow of information through the FortiGate unit. If they are not set up correctly, or are too restrictive, it can prohibit network traffic.

Backing up the configuration

Once you have determined your FortiGate is configured and working correctly, it is extremely important that you back up your configuration. By backing up the configuration, you ensure that if you need to reset the FortiGate unit for whatever reason, you will be able to quickly return it to operation with minimal effort.

To back up the FortiGate configuration

1. Go to **System > Maintenance > Backup & Restore**.
2. Select to back up to your PC or to a USB key.

   The USB Disk option will be grayed out if the FortiGate unit supports USB disks but none are connected.
3. Select Encrypt the backup file.

   Encryption must be enabled on the backup file to backup VPN certificates.
4. Enter a password and enter it again to confirm it. You will need this password to restore the file.
5. Select Backup.
6. The web browser will prompt you for a location to save the configuration file. The configuration file will have a .conf extension.

   It is a good practice to backup the FortiGate configuration after any modification to any of the FortiGate settings. Alternatively, before performing an upgrade to the firmware, ensure you backup the configuration before upgrading. Should anything happen during the upgrade that changes the configuration, you can easily restore the saved configuration.

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Restoring a configuration

Should you need to restore the configuration file, use the following steps.

To restore the FortiGate configuration

1. Go to **System > Maintenance > Backup & Restore**.
2. Select to upload the restore file from your PC or a USB key.

   The USB Disk option will be grayed out if the FortiGate unit supports USB disks but none are connected.
3. Enter the path and file name of the configuration file, or select Browse to locate the file.
4. Enter a password if required.
5. Select Restore.

   The FortiGate unit will load the configuration file and restart. Once the restart has completed, verify that the configuration has been restored.

Additional configuration

With the FortiGate connected and allowing traffic to pass-through, there are a few other configuration. While not mandatory, they will help in ensuring better control with the firewall.

Set the time and date

For effective scheduling and logging, the FortiGate system date and time must be accurate. You can either manually set the system date and time or configure the FortiGate unit to automatically keep its time correct by synchronizing with a Network Time Protocol (NTP) server.

To set the date and time

1. Go to **System > Status**.
2. Under **System Information > System Time**, select Change.
3. Select your Time Zone.
4. Optionally, select Automatically adjust clock for daylight saving changes.
5. Select Set Time and set the FortiGate system date and time.
6. If you want to synchronize the time with an NTP server, enable the option.
7. Select OK.

Note: If you choose the option Automatically adjust clock for daylight saving changes, the system time must be manually adjusted after daylight savings time ends.

Set the Administrator password

The default administrator password is no password. You will want to apply a password to prevent anybody logging into the FortiGate and changing configuration options.

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To change the administrator password

1. Go to **System > Admin > Administrators**.
2. Select Change Password and enter a new password.
3. Select OK.

   Alternatively, you can also add new administrator users by selecting Create New, however, you cannot remove the admin administrator. Applying a password for this account is recommended.

Configure FortiGuard

Configure the FortiGate unit to connect to the FortiGuard Distribution Network (FDN) to update the antivirus, antispam and IPS attack definitions.

The FDN is a world wide network of FortiGuard Distribution Servers (FDS). When the FortiGate unit connects to the FDN, it connects to the nearest FDS. To do this, all FortiGate units are programmed with a list of FDS addresses sorted by nearest time zone according to the time zone configured for the FortiGate unit.

Before you can begin receiving updates, you must register your FortiGate unit from the Fortinet web page. For information about registering your FortiGate unit, see "Register your FortiGate unit" on page 5.

Updating antivirus and IPS signatures

After you have registered your FortiGate unit, you can update antivirus and IPS signatures. The FortiGuard Center enables you to receive push updates, allow push update to a specific IP address, and schedule updates for daily, weekly, or hourly intervals.

To update antivirus definitions and IPS signatures

1. Go to **System > Maintenance > FortiGuard**.
2. Select the blue arrow for AntiVirus and IPS Options to expand the options.
3. Select Update Now to update the antivirus 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 System FortiGuard Center page lists new version information for antivirus definitions. The System Status page also displays new dates and version numbers for the antivirus definitions. Messages are recorded to the event log indicating whether the update was successful or not.

Note: Updating antivirus definitions can cause a very short disruption in traffic currently being scanned while the FortiGate unit applies the new signature database. Schedule updates when traffic is light, for example overnight, to minimize any disruption.

For details on further FortiGuard configuration, see the *FortiGate Administration Guide*.

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Advanced configuration

The FortiGate unit and the FortiOS operating system provide a wide range of features that enable you to control network and internet traffic and protect your network. This chapter describes some of these options and how to configure them.

This chapter includes

- Protection profiles
- Firewall policies
- Antivirus options
- AntiSpam options
- Web filtering
- Logging

Protection profiles

A protection profile is a group of settings you can adjust to suit your requirements for network protection. Since protection profiles apply different protection settings to traffic controlled by firewall policies, you can tailor the settings to the type of traffic each policy handles.

Use protection profiles to configure:

- antivirus protection
- web filtering
- web category filtering
- spam filtering
- content archiving
- instant messaging filtering and access control
- P2P access and bandwidth control
- logging options for policies and configurations within the policies
- rate limiting for VoIP protocols.

Using protection profiles, you can customize types and levels of protection for different firewall policies.

For example, while traffic between internal and external addresses might need strict protection, traffic between trusted internal addresses might need moderate protection. You can configure policies for different traffic services to use the same or different protection profiles.

The FortiGate unit is preconfigured with four default protection profiles. In many cases you can use these default protection profiles, or use them as a starting point in creating your own.

Table 1: Default protection profiles

Strict	Applies maximum protection to HTTP, FTP, IMAP, POP3, and SMTP traffic. The strict protection profile may not be useful under normal circumstances but it is available when maximum protection is required.
Scan	Apply virus scanning to HTTP, FTP, IMAP, POP3, and SMTP traffic.

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Web Apply virus scanning and web content blocking to HTTP traffic.

Unfiltered Apply no scanning, blocking or IPS. Use the unfiltered content profile if no content protection for content traffic is required. Add this protection profile to firewall policies for connections between highly trusted or highly secure networks where content does not need to be protected.

The best way to begin creating your own protection profile is to open a predefined profile. This way you can see how a profile is set up, and then modify it suit your requirements. You access Protection profile options by going to **Firewall > Protection Profile**, and selecting Edit for one of the predefined profiles.

Protection profiles are used by the firewall policies to determine how network and Internet traffic is controlled, scanned and when necessary, rejected. The Protection Profiles can be considered the rules of the firewall policy. Because of this, you should take some time to review the various options to consider what you want the firewall policies to do. If, after setting the protection profile and firewall policies, traffic is not flowing or flowing too much, verify your profile settings.

The number of options and configuration for the protection profile is too vast for this document. For details on each protection profile feature and setting, see the *FortiGate Administration Guide* or the FortiGate Online Help.

Firewall policies

Firewall policies are instructions the FortiGate unit uses to decide what to do with a connection request. When the firewall receives a connection request, it analyzes it to extract its source address, destination address, and port number.

For the connection through the FortiGate unit to be successful, the source address, destination address, and service of the connection must match a firewall policy. The policy directs the firewall action for the connection. The action can be to allow the connection, deny the connection, require authentication before the connection is allowed, or process the packet as an IPSec VPN connection.

You can configure each firewall policy to route connections or apply network address translation (NAT) to translate source and destination IP addresses and ports. You also add protection profiles to firewall policies to apply different protection settings for the traffic controlled by firewall policies.

The FortiGate unit matches firewall policies by searching from the top of the firewall policy list and moving down until it finds the first match, then performs the required address translation, blocking and so on described by the protection profile, then passes on the packet information. This is important, because once the FortiGate unit finds a match to a policy, it will not continue down the list. You need to arrange policies in the policy list from more specific to more general.

For example, if you have two policies, one that blocks specific URLs or IP addresses, and another general policy that lets traffic through. If you put the general policy at the top, the FortiGate unit will act on the general policy, figuring the policy has been matched and potentially let the URLs or IPs you wanted blocked through.

Note: No traffic will flow through a FortiGate unit until at least one firewall policy is added.

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Configuring firewall policies

To add or edit a firewall policy go to **Firewall > Policy** and select Edit on an existing policy, or select Create New to add a policy.

The **source and destination Interface/Zone** match the firewall policy with the source and destination of a communication session. The Address Name matches the source and destination address of the communication session.

Schedule defines when the firewall policy is enabled. While most policies are always on, you can configure a firewall policy so that it is only on at specific times of the day. For example, you may want to block news and entertainment sites most of the day, except during lunch or after work, enabling your employees to only view those sites during non-working times.

Service matches the firewall policy with the service used by a communication session. This enables you to configure a policy for general web surfing and a different policy specifically for other traffic such as SMTP mail or FTP uploads and downloads.

Action defines how the FortiGate unit processes traffic. Specify an action to accept or deny traffic or configure a firewall encryption policy.

- Add ACCEPT policies that accept communication sessions. Using an accept policy, you can apply FortiGate features such as virus scanning and authentication to the communication session accepted by the policy.
- Add DENY policies to deny communication sessions.
- Add IPSec encryption policies to enable IPSec tunnel mode VPN traffic and SSL VPN encryption policies to enable SSL VPN traffic. Firewall encryption policies determine which types of IP traffic will be permitted during an IPSec or SSL VPN session.

Select **Protection Profile** to include apply a protection profile to the firewall policy for scanning of traffic passing through the FortiGate unit.

For details on the firewall policies features and settings, see the *FortiGate Administration Guide* or the FortiGate Online Help.

Antivirus options

The FortiGate unit's antivirus configuration prevents malicious files from entering and infecting your network environment.

The FortiGate unit uses a number of processes to scan files to ensure unwanted files and potential attackers do not get through. The FortiGate unit scans using these antivirus options:

- File pattern - The FortiGate will check the file against the file pattern setting you have configured. You can set which file names or file types the FortiGate unit looks for in the incoming traffic.
- Virus scan - The virus definitions are kept up to date through the FortiNet Distribution Network. The list is updated on a regular basis so you do not have to wait for a firmware upgrade. Note that you must register the FortiGate unit to and purchase FortiGuard services to use virus scanning through the FDN.

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- Grayware - These are unsolicited commercial software programs that are installed on computers, often without the user's consent or knowledge. Grayware programs are generally considered an annoyance, but these programs can cause system performance problems or be used for malicious ends. The FortiGate unit scans for known grayware executable programs in each enabled category.
- Heuristics - The FortiGate heuristic antivirus engine performs tests on the file to detect virus-like behavior or known virus indicators. In this way, heuristic scanning may detect new viruses, but may also produce some false positive results.

The antivirus elements work in sequence to give you an efficient method of scanning incoming files. The first three elements have specific functions, the fourth, the heuristics, is to cover any new previously unknown virus threats. The four elements work together to offer your network unparalleled antivirus protection. To ensure that your system is providing the most protection available, all virus definitions and signatures are up dated regularly through the FortiGuard antivirus services.

To configure the file patterns that the FortiGate scans, go to **AntiVirus > File Filter**.

To enable grayware blocking, go to **AntiVirus > Config > Grayware**.

Antivirus settings are turned on in the protection profile. In the protection profile you can enable antivirus options for specific services and which services will use the file patterns as a part of the antivirus process.

To configure antivirus protection profile settings, go to **Firewall > Protection Profile**. Select edit for a profile and select the Anti-Virus options.

For details on the antivirus features and settings, see the *FortiGate Administration Guide* or the FortiGate Online Help.

AntiSpam options

The FortiGate unit's antispam feature detects unsolicited commercial email by identifying spam email messages and spam transmissions from known or suspected spam servers.

This feature requires a FortiGuard subscription and a registered FortiGate unit. When the FortiGate unit receives an email message, it verifies with the FortiGuard server whether it is a valid email or a spam message. FortiGuard Antispam is one of the features designed to manage spam. FortiGuard is an antispam system from Fortinet that includes an IP address black list, a URL black list, and spam filtering tools. The FortiGuard Center accepts submission of spam email messages as well as well as reports of false positives.

Depending on how you configure the FortiGate unit, the FortiGate unit will either tag the message with text so you can easily identify the spam, or delete the message before it reaches the recipient.

The FortiGate unit also enables you to create your own spam filters using banned words and black/white lists.

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Banned word lists are specific words that may be typically found in email. The FortiGate unit searches for words or patterns in email messages. If matches are found, values assigned to the words are totalled. If the defined threshold value is exceeded, the message is marked as spam. If no match is found, the email message is passed along to the next filter.

You configure banned words by going to **Antispam > Banned Word**.

While FortiGuard services maintain a large list of known spammers, it is not perfect. In some cases, some mail tagged as spam is an individual you want to receive mail from, while email that is not caught by the spam filters or users you don't want to receive email from gets through to your inbox.

White lists and black lists enable you to maintain a list of email addresses that you want (white list) or don't want (black list) to receive email from. You can add or remove addresses from lists as required. The FortiGate unit uses both an IP address list and an email address list to filter incoming email, if enabled in the protection profile.

When performing an IP address list check, the FortiGate unit compares the IP address of the message's sender to the IP address list in sequence. If a match is found, the action associated with the IP address is taken. If no match is found, the message is passed to the next enabled spam filter.

When performing an email list check, the FortiGate unit compares the email address of the message's sender to the email address list in sequence. If a match is found, the action associated with the email address is taken. If no match is found, the message is passed to the next enabled antispam filter.

To configure black/white lists, go to **AntiSpam > Black/White List**.

You enable antispam options for each mail service (POP3, IMAP and SMTP) in the protection profile. To configure antispam protection profile settings, go to **Firewall > Protection Profile**. Select edit for a profile and select the Spam Filtering options.

For details on the antispam features and settings, see the *FortiGate Administration Guide* or the FortiGate Online Help.

Web filtering

Web filtering is a method of controlling what web sites are viewable by users. There are three main sections to web filtering: the Web Filter Content Block, the URL Filter, and the FortiGuard Web filter. Each interact with each other in such a way as to provide maximum control and protection for the Internet users.

Web filtering options are enabled and configured in the protection profile settings by going to **Firewall > Protection Profile**. Select edit for a profile and selecting either the FortiGuard Web Filtering options or the Web Filtering options. You need to register your FortiGate unit and purchase FortiGuard services to use FortiGuard Web Filtering.

Content blocking enables you to specify file types and words that the FortiGate unit should block when encountered. With web content block enabled, every requested web page is checked against the content block list. The score value of each pattern appearing on the page is added, and if the total is greater than the threshold value set in the protection profile, the page is blocked.

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To configure content blocking, go to **Web Filter > Content Block**.

URL filter enables you to control additional web sites that you can block or allow. This enables you greater control over certain URLs or sub-URLs. The FortiGate unit allows or blocks web pages matching any specified URLs or patterns and displays a replacement message instead.

To configure URL filters, go to **Web Filter > URL Filter**.

FortiGuard web filtering is a managed web filtering solution provided by Fortinet. FortiGuard web filtering sorts hundreds of millions of web pages into a wide range of categories users can allow, block, or monitor. FortiGuard web filtering includes over 60 million individual ratings of web sites applying to hundreds of millions of pages. Pages are sorted and rated into 56 categories users can allow, block, or monitor. Categories may be added to, or updated, as the Internet evolves. You need to have a FortiGuard subscription to take advantage of FortiGuard web filtering.

The FortiGate unit also enables you to override the FortiGuard filtering designation, and you can add your own. To customize your FortiGuard web filtering, go to **Web Filter > FortiGuard - Web Filter**.

For details and configuration options for the web filtering features and settings, see the *FortiGate Administration Guide* or the FortiGate Online Help.

Logging

Logging is an indirect method of protecting your network. The FortiGate unit's robust logging features enable you to see the attacks, spam and virus activity is occurring on your network. Using this information, you can then take the corrective action necessary to resolve any problems before they become major problems.

With alert email, you can configure the FortiGate unit to send alert messages, when specific events occur with specific frequency. By logging to a FortiAnalyzer unit, you can run over 300 reports on various network traffic.

To configure logging, go to **Log&Report > Log Setting**.

For details and configuration options for the logging features and settings, see the *FortiGate Administration Guide* or the FortiGate Online Help.

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FortiGate Firmware

Fortinet periodically updates the FortiGate firmware to include new features and address issues. After you have registered your FortiGate unit, you can download FortiGate firmware updates is available for download at the support web site, http://support.fortinet.com.

You can also use the instructions in this chapter to downgrade, or revert, to a previous version. The FortiGate unit includes a number of firmware installation options that enables you to test new firmware without disrupting the existing installation, and load it from different locations as required.

Only FortiGate admin user and administrators whose access profiles contain system read and write privileges can change the FortiGate firmware.

This section includes the following topics:

- Downloading firmware
- Using the web-based manager
- Using the CLI
- Installing firmware from a system reboot using the CLI
- Testing new firmware before installing

Downloading firmware

Firmware images for all FortiGate units is available on the Fortinet Customer Support web site. You must register your FortiGate unit to access firmware images. Register the FortiGate unit by visiting http://support.fortinet.com and select Product Registration.

To download firmware

1. Log into the site using your user name and password.
2. Go to **Firmware Images > FortiGate**.
3. Select the most recent FortiOS version, and MR release and patch release.
4. Locate the firmware for your FortiGate unit, right-click the link and select the Download option for your browser.

Note: Always review the *Release Notes* for a new firmware release before installing. The *Release Notes* can include information that is not available in the regular documentation.

Using the web-based manager

Upgrading the firmware

Installing firmware replaces your current antivirus and attack definitions, along with the definitions included with the firmware release you are installing. After you install new firmware, make sure that antivirus and attack definitions are up to date. For details, see the *FortiGate Administration Guide*.

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To upgrade the firmware

1. Download the firmware image file to your management computer.
2. Log into the web-based manager as the admin administrative user.
3. Go to **System > Status**.
4. Under **System Information > Firmware Version**, select Update.
5. Type the path and filename of the firmware image file, or select Browse and locate the file.
6. Select OK.

   The FortiGate unit uploads the firmware image file, upgrades to the new firmware version, restarts, and displays the FortiGate login. This process takes a few minutes.

Reverting to a previous version

The following procedures revert the FortiGate unit to its factory default configuration and deletes IPS custom signatures, web content lists, email filtering lists, and changes to replacement messages.

Before beginning this procedures, it is recommended that you back up the FortiGate unit configuration.

If you are reverting to a previous FortiOS version, you might not be able to restore the previous configuration from the backup configuration file.

Note: Installing firmware replaces the current antivirus and attack definitions, along with the definitions included with the firmware release you are installing. After you install new firmware, make sure that antivirus and attack definitions are up to date. For details, see the *FortiGate Administration Guide.*

Note: To use this procedure, you must log in using the admin administrator account, or an administrator account that has system configuration read and write privileges.

To revert to a previous firmware version

1. Copy the firmware image file to the management computer.
2. Log into the FortiGate web-based manager.
3. Go to **System > Status**.
4. Under **System Information > Firmware Version**, select Update.
5. Type the path and filename of the firmware image file, or select Browse and locate the file.
6. Select OK.

   The FortiGate unit uploads the firmware image file, reverts to the old firmware version, resets the configuration, restarts, and displays the FortiGate login. This process takes a few minutes.
7. Log into the web-based manager.
8. Restore your configuration.

   For information about restoring your configuration see "Restoring a configuration" on page 30.

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Backup and Restore from a USB key

Use a USB key to either backup a configuration file or restore a configuration file. You should always make sure a USB key is properly install before proceeding since the FortiGate unit must recognize that the key is installed in its USB port.

Note: You can only save VPN certificates if you encrypt the file. Make sure the configuration encryption is enabled so you can save the VPN certificates with the configuration file. An encrypted file is ineffective if selected for the USB Auto-Install feature.

To backup configuration

1. Go to **System > Maintenance > Backup and Restore**.
2. Select USB Disk from the backup configuration to list.
3. Enter a file name for the configuration file.
4. Select Backup.

To restore configuration

1. Go to **System > Maintenance > Backup and Restore**.
2. Select USB Disk from the restore configuration from list.
3. Select a backup configuration file from the list.
4. Select Restore.

Using the USB Auto-Install

The USB Auto-Install feature automatically updates the FortiGate configuration file and image file on a system reboot. Also, this feature provides you with an additional backup if you are unable to save your system settings before shutting down or rebooting your FortiGate unit.

Note: You need an unencrypted configuration file for this feature. Also the default files, image.out and system.conf, must be in the root directory of the USB key.

Note: Make sure at least FortiOS v3.0MR1 is installed on the FortiGate unit before installing.

To configure the USB Auto-Install

1. Go to **System > Maintenance > Backup and Restore**.
2. Select the blue arrow to expand the Advanced options.
3. Select the following:
   - On system restart, automatically update FortiGate configuration file if default file name is available on the USB disk.
   - On system restart, automatically update FortiGate firmware image if default image is available on the USB disk.
4. Enter the configuration and image file names or use the default configuration filename (system.conf) and default image name (image.out).
5. The default configuration filename should show in the Default configuration file name field.
6. Select Apply.

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Using the CLI

Installing firmware replaces your current antivirus and attack definitions, along with the definitions included with the firmware release you are installing. After you install new firmware, make sure that antivirus and attack definitions are up to date. You can also use the CLI command `execute update-now` to update the antivirus and attack definitions. For details, see the *FortiGate Administration Guide*.

Before you begin, ensure you have a TFTP server running and accessible to the FortiGate unit.

To upgrade the firmware using the CLI

1. Make sure the TFTP server is running.
2. Copy the new firmware image file to the root directory of the TFTP server.
3. Log into the CLI.
4. Make sure the FortiGate unit can connect to the TFTP server.

   You can use the following command to ping the computer running the TFTP server. For example, if the IP address of the TFTP server is 192.168.1.168:

   ```
   execute ping 192.168.1.168
   ```

5. Enter the following command to copy the firmware image from the TFTP server to the FortiGate unit:

   ```
   execute restore image <name_str> <tftp_ip4>
   ```

   Where `<name_str>` is the name of the firmware image file and `<tftp_ip4>` is the IP address of the TFTP server. For example, if the firmware image file name is `image.out` and the IP address of the TFTP server is 192.168.1.168, enter:

   ```
   execute restore image image.out 192.168.1.168
   ```

   The FortiGate unit responds with the message:

   ```
   This operation will replace the current firmware version!
   Do you want to continue? (y/n)
   ```

6. Type `y`.

   The FortiGate unit uploads the firmware image file, upgrades to the new firmware version, and restarts. This process takes a few minutes.

7. Reconnect to the CLI.
8. Update antivirus and attack definitions, by entering:

   ```
   execute update-now
   ```


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Reverting to a previous version

This procedure reverts the FortiGate unit to its factory default configuration and deletes IPS custom signatures, web content lists, email filtering lists, and changes to replacement messages.

Before beginning this procedure, it is recommended that you:

- back up the FortiGate unit system configuration using the command `execute backup config`
- back up the IPS custom signatures using the command `execute backup ipsuserdefsig`
- back up web content and email filtering lists

If you are reverting to a previous FortiOS version (for example, reverting from FortiOS v3.0 to FortiOS v2.80), you might not be able to restore the previous configuration from the backup configuration file.

Note: Installing firmware replaces your current antivirus and attack definitions, along with the definitions included with the firmware release you are installing. After you install new firmware, make sure that antivirus and attack definitions are up to date. You can also use the CLI command `execute update-now` to update the antivirus and attack definitions.

Note: To use this procedure, you must log in using the admin administrator account, or an administrator account that has system configuration read and write privileges.

To use the following procedure, you must have a TFTP server the FortiGate unit can connect to.

To revert to a previous firmware version using the CLI

1. Make sure the TFTP server is running
2. Copy the firmware image file to the root directory of the TFTP server.
3. Log into the FortiGate CLI.
4. Make sure the FortiGate unit can connect to the TFTP server.

   You can use the following command to ping the computer running the TFTP server. For example, if the TFTP server's IP address is 192.168.1.168:

   ```
   execute ping 192.168.1.168
   ```

5. Enter the following command to copy the firmware image from the TFTP server to the FortiGate unit:

   ```
   execute restore image <name_str> <tftp_ipv4>
   ```

   Where `<name_str>` is the name of the firmware image file and `<tftp_ip4>` is the IP address of the TFTP server. For example, if the firmware image file name is `imagev28.out` and the IP address of the TFTP server is 192.168.1.168, enter:

   ```
   execute restore image image28.out 192.168.1.168
   ```

   The ForitGate unit responds with this message:

   ```
   This operation will replace the current firmware version!
   Do you want to continue? (y/n)
   ```

6. Type `y`.

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The FortiGate unit uploads the firmware image file. After the file uploads, a message similar to the following appears:

```
Get image from tftp server OK.
Check image OK.
This operation will downgrade the current firmware version!
Do you want to continue? (y/n)
```

7 Type `y`.

The FortiGate unit reverts to the old firmware version, resets the configuration to factory defaults, and restarts. This process takes a few minutes.

8 Reconnect to the CLI.

9 To restore your previous configuration, if needed, use the command:

```
execute restore config <name_str> <tftp_ip4>
```

10 Update antivirus and attack definitions using the command:

```
execute update-now.
```

Installing firmware from a system reboot using the CLI

This procedure installs a firmware image and resets the FortiGate unit to default settings. You can use this procedure to upgrade to a new firmware version, revert to an older firmware version, or re-install the current firmware.

To use this procedure, you must connect to the CLI using the FortiGate console port and a RJ-45 to DB-9, or null modem cable.

This procedure reverts the FortiGate unit to its factory default configuration.

For this procedure you install a TFTP server that you can connect to from the FortiGate internal interface. The TFTP server should be on the same subnet as the internal interface.

Before beginning this procedure, it is recommended that you back up the FortiGate unit configuration.

If you are reverting to a previous FortiOS version, you might not be able to restore the previous configuration from the backup configuration file.

Note: Installing firmware replaces your current antivirus and attack definitions, along with the definitions included with the firmware release you are installing. After you install new firmware, make sure that antivirus and attack definitions are up to date. For details, see the *FortiGate Administration Guide*.

To install firmware from a system reboot

1 Connect to the CLI using the RJ-45 to DB-9 or null modem cable.

2 Make sure the TFTP server is running.

3 Copy the new firmware image file to the root directory of the TFTP server.

4 Make sure the internal interface is connected to the same network as the TFTP server.

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5 To confirm the FortiGate unit can connect to the TFTP server, use the following command to ping the computer running the TFTP server. For example, if the IP address of the TFTP server is 192.168.1.168:

```
execute ping 192.168.1.168
```

6 Enter the following command to restart the FortiGate unit.

```
execute reboot
```

The FortiGate unit responds with the following message:

```
This operation will reboot the system!
Do you want to continue? (y/n)
```

7 Type `y`.

As the FortiGate unit starts, a series of system startup messages appears. When the following messages appears:

```
Press any key to display configuration menu..........
```

Immediately press any key to interrupt the system startup.

Note: You have only 3 seconds to press any key. If you do not press a key soon enough, the FortiGate unit reboots and you must log in and repeat the `execute reboot` command.

If you successfully interrupt the startup process, the following messages appears:

```
[G]: Get firmware image from TFTP server.
[F]: Format boot device.
[Q]: Quit menu and continue to boot with default
firmware.
[H]: Display this list of options.

Enter G, F, Q, or H:
```

8 Type G to get to the new firmware image form the TFTP server.

The following message appears:

```
Enter TFTP server address [192.168.1.168]:
```

9 Type the address of the TFTP server and press Enter:

The following message appears:

```
Enter Local Address [192.168.1.188]:
```

10 Type an IP address the FortiGate unit can use to connect to the TFTP server. The IP address can be any IP address that is valid for the network the interface is connected to. Make sure you do not enter the IP address of another device on this network.

The following message appears:

```
Enter File Name [image.out]:
```

11 Enter the firmware image filename and press Enter.

The TFTP server uploads the firmware image file to the FortiGate unit and a message similar to the following appears:

```
Save as Default firmware/Backup firmware/Run image without
saving: [D/B/R]
```


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12 Type `D`.

The FortiGate unit installs the new firmware image and restarts. The installation might take a few minutes to complete.

Restoring the previous configuration

Change the internal interface address, if required. You can do this from the CLI using the following command:

```
config system interface
    edit <interface>
        set ip <address_ip4mask>
        set allowaccess {ping|https|ssh|telnet|http}
    end
```

After changing the interface address, you can access the FortiGate unit from the web-based manager and restore the configuration.

Backup and Restore from a USB key

Use a USB key to either backup a configuration file or restore a configuration file. You should always make sure a USB key is properly install before proceeding since the FortiGate unit must recognize that the key is installed in its USB port.

Note: You can only save VPN certificates if you encrypt the file. Make sure the configuration encryption is enabled so you can save the VPN certificates with the configuration file. An encrypted file is ineffective if selected for the USB Auto-Install feature.

To backup configuration using the CLI

1 Log into the CLI.

2 Enter the following command to backup the configuration files:

```
exec backup config usb <filename>
```

3 Enter the following command to check the configuration files are on the key:

```
exec usb-disk list
```

To restore configuration using the CLI

1 Log into the CLI.

2 Enter the following command to restore the configuration files:

```
exec restore image usb <filename>
```

The FortiGate unit responds with the following message:

```
This operation will replace the current firmware version!
Do you want to continue? (y/n)
```

3 Type `y`.

Using the USB Auto-Install

The USB Auto-Install feature automatically updates the FortiGate configuration file and image file on a system reboot. Also, this feature provides you with an additional backup if you are unable to save your system settings before shutting down or rebooting your FortiGate unit.

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Note: You need an unencrypted configuration file for this feature. Also the default files, image.out and system.conf, must be in the root directory of the USB key.

Note: Make sure at least FortiOS v3.0MR1 is installed on the FortiGate unit before installing.

To configure the USB Auto-Install using the CLI

1. Log into the CLI.
2. Enter the following command:

```
config system auto-install
  set default-config-file <filename>
  set auto-intall-config {enable | disable}
  set default-image-file <filename>
  set auto-install-image {enable | disable}
end
```

3. Enter the following command to see the new firmware installation settings:

```
get system status
```

Additional CLI Commands for a USB key

Use the following CLI commands when you want to delete a file from the FortiUSB key, list what files are on the key, including formatting the key or renaming a file:

- `exec usb-disk list`
- `exec usb-disk delete <filename>`
- `exec usb-disk format`
- `exec usb-disk rename <old_filename1> <old_filename2>`

Note: If you are trying to delete a configuration file from the CLI command interface, and the filename contains spaces, you will need quotations around the filename before you can delete the file from the FortiUSB key.

Testing new firmware before installing

You can test a new firmware image by installing the firmware image from a system reboot and saving it to system memory. After completing this procedure, the FortiGate unit operates using the new firmware image with the current configuration. This new firmware image is not permanently installed. The next time the FortiGate unit restarts, it operates with the originally installed firmware image using the current configuration. If the new firmware image operates successfully, you can install it permanently using the procedure "Upgrading the firmware" on page 39.

To use this procedure, you must connect to the CLI using the FortiGate console port and a RJ-45 to DB-9 or null modem cable. This procedure temporarily installs a new firmware image using your current configuration.

For this procedure you install a TFTP server that you can connect to from the FortiGate internal interface. The TFTP server should be on the same subnet as the internal interface.

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To test the new firmware image

1. Connect to the CLI using a RJ-45 to DB-9 or null modem cable.
2. Make sure the TFTP server is running.
3. Copy the new firmware image file to the root directory of the TFTP server.
4. Make sure the internal interface is connected to the same integer as the TFTP server.

   You can use the following command to ping the computer running the TFTP server. For example, if the TFTP server's IP address is 192.168.1.168:

   ```
   execute ping 192.168.1.168
   ```

5. Enter the following command to restart the FortiGate unit:

   ```
   execute reboot
   ```

6. As the FortiGate unit reboots, press any key to interrupt the system startup. As the FortiGate unit starts, a series of system startup messages appears.
   When the following messages appears:

   ```
   Press any key to display configuration menu....
   ```

7. Immediately press any key to interrupt the system startup.

Note: You have only 3 seconds to press any key. If you do not press a key soon enough, the FortiGate unit reboots and you must login and repeat the `execute reboot` command.

If you successfully interrupt the startup process, the following messages appears:

```
[G]: Get firmware image from TFTP server.
[F]: Format boot device.
[Q]: Quit menu and continue to boot with default
firmware.
[H]: Display this list of options.

Enter G, F, Q, or H:
```

8. Type G to get the new firmware image from the TFTP server.

   The following message appears:

   ```
   Enter TFTP server address [192.168.1.168]:
   ```

9. Type the address of the TFTP server and press Enter:

   The following message appears:

   ```
   Enter Local Address [192.168.1.188]:
   ```

10. Type an IP address of the FortiGate unit to connect to the TFTP server.

    The IP address must be on the same network as the TFTP server, but make sure you do not use the IP address of another device on the network.

    The following message appears:

    ```
    Enter File Name [image.out]:
    ```


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11 Enter the firmware image file name and press Enter.

The TFTP server uploads the firmware image file to the FortiGate unit and the following appears.

```
Save as Default firmware/Backup firmware/Run image without
saving: [D/B/R]
```

12 Type `R`.

The FortiGate image is installed to system memory and the FortiGate unit starts running the new firmware image, but with its current configuration.

You can test the new firmware image as required. When done testing, you can reboot the FortiGate unit, and the FortiGate unit will resume using the firmware that was running before you installed the test firmware.

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