



FortiCarrier™

Version 4.0

FortiCarrier 2U Install Guide

FortiGate FortiCarrier 2U Install Guide

Version 4.0

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FCC Class A/Class B 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 network protection.

FortiCarrier™ ASIC-accelerated multi-threat security systems improve network security, reduce network misuse and abuse, and help you use communications resources more efficiently without compromising the performance of your network. FortiCarrierFortiCarrier Systems are ICSA-certified for Antivirus, Firewall, IPSec, SSL-TLS, IPS, Intrusion detection, and AntiSpyware services.

FortiCarrier Systems are dedicated, easily managed security devices that deliver a full suite of capabilities including:

- Application-level services such as virus protection, intrusion protection, spam filtering, web content filtering, IM, P2P, and VoIP filtering
- Network-level services such as firewall, intrusion detection, IPSec and SSL VPN, and traffic shaping
- Management services such as user authentication, logging, reporting with FortiAnalyzer, administration profiles, secure web and CLI administrative access, and SNMP.

The FortiCarrier security system uses Fortinet's Dynamic Threat Prevention System (DTPS™) technology, which leverages breakthroughs in chip design, networking, security and content analysis. The unique ASIC-accelerated 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.

This chapter contains the following topics:

- [Registering your Fortinet product](#)
- [Customer service and technical support](#)
- [Fortinet documentation](#)
- [Conventions](#)

Registering your Fortinet product

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

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

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

Customer service and technical support

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

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

You can dramatically improve the time that it takes to resolve your technical support ticket by providing your configuration file, a network diagram, and other specific information. For a list of required information, see the Fortinet Knowledge Center article [What does Fortinet Technical Support require in order to best assist the customer?](#)

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 Center.

Fortinet Tools and Documentation CD

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

Fortinet Knowledge Center

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

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>.

CLI constraints

CLI constraints, such as `<address_ipv4>`, indicate which data types or string patterns are acceptable input for a given parameter or variable value. CLI constraint conventions are described in the CLI Reference document for each product.

Notes, Tips and Cautions

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



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



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



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

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 <i>Minimum log level</i> , select <i>Notification</i> .
CLI input	<pre>config system dns set primary <address_ipv4> end</pre>
CLI output	<pre>FGT-602803030703 # get system settings comments : (null) opmode : nat</pre>
Emphasis	HTTP connections are <i>not</i> secure and can be intercepted by a third party.
File content	<pre><HTML><HEAD><TITLE>Firewall Authentication</TITLE></HEAD> <BODY><H4>You must authenticate to use this service.</H4></pre>
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 <code>Central_Office_1</code> .
Navigation	Go to <code>VPN > IPSEC > Auto Key (IKE)</code> .
Publication	For details, see the <i>FortiCarrier Administration Guide</i> .

Installing

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

This chapter contains the following topics:

- [Environmental specifications](#)
- [Cautions and warnings](#)
- [Plugging in the FortiCarrier](#)
- [Plugging in the FortiCarrier](#)
- [Turning off the FortiCarrier unit](#)

Environmental specifications

Before you begin, review the environmental specifications to ensure proper operation of the FortiCarrier unit.

- Operating temperature: 32 to 104°F (0 to 40°C)
If you install the FortiCarrier 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 or Class B, 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.
- 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 FortiCarrier unit.



Caution: Risk of Explosion if battery is replaced by an incorrect type. Dispose of used batteries according to the instructions



Caution: To reduce the risk of fire, use only No. 26 AWG or larger UL Listed or CSA Certified Telecommunication Line Cord.

Grounding

- Ensure the FortiCarrier 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 FortiCarrier 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 (T_{ma}) 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 FortiCarrier unit.

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

When placing the FortiCarrier 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 FortiCarrier unit.



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



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

To install the FortiCarrier 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 FortiCarrier 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 FortiCarrier unit.

Figure 1: Installed mounting brackets



- 2 Position the FortiCarrier 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 FortiCarrier unit is level.
- 4 Finger tighten the screws to attach the FortiCarrier unit to the rack.
- 5 Once you verify the spacing of the FortiCarrier unit and that it is level, tighten the screws with a screwdriver. Ensure that the screws are tight and not loose.

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

Figure 2: Mounting in a rack



Plugging in the FortiCarrier

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

To power on the FortiCarrier unit

- 1 Connect the power cables to the power connections on the back of the FortiCarrier 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.

The FortiCarrier unit starts and the Power and Status (if available) LEDs light up. The Status LED (if available) flash while the FortiCarrier 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.

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 FortiCarrier 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 FortiCarrier unit

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

To power off the FortiCarrier 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.

Configuring

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

This section includes the following topics:

- [NAT vs. transparent mode](#)
- [Connecting to the FortiCarrier unit](#)
- [Verifying the configuration](#)
- [Backing up the configuration](#)
- [Restoring a configuration](#)
- [Additional configuration](#)

NAT vs. transparent mode

The FortiCarrier unit can run in two different modes, depending on your network infrastructure and requirements. You can choose between NAT/Route mode and transparent mode. Both include the same robust network security features such as antispy, antivirus, VPN and firewall policies.

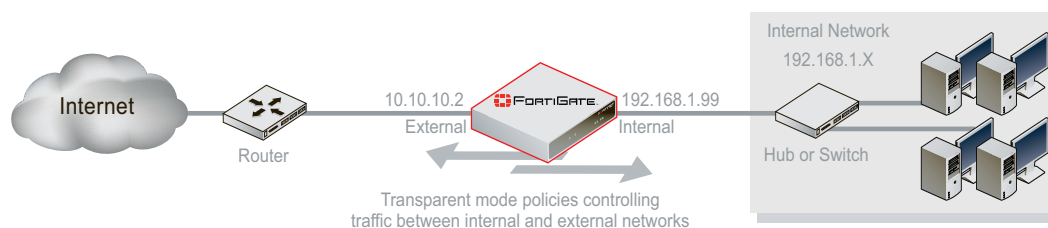
NAT mode

In NAT/Route mode, the FortiCarrier 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 FortiCarrier unit performs network address translation before sending the packet to the destination network or receiving a packet from the destination network.

In Route mode, there is no address translation.

Figure 3: FortiCarrier unit in NAT mode



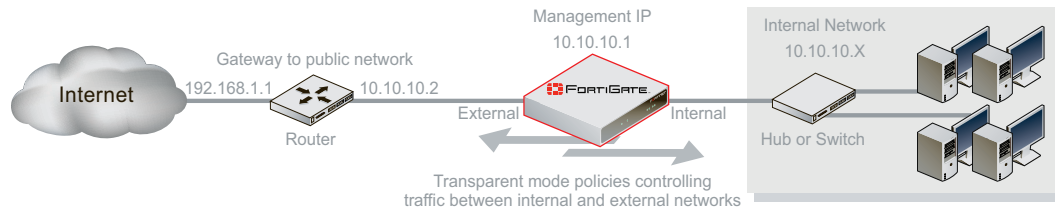
You typically use NAT/Route mode when the FortiCarrier unit is operating as a gateway between private and public networks. In this configuration, you would create NAT mode firewall policies to control traffic flowing between the internal, private network and the external, public network, usually the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

In this guide, unless otherwise stated, references to NAT mode apply to both NAT and Route mode.

Transparent mode

In transparent mode, the FortiCarrier 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 4: FortiCarrier unit in transparent mode



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

Connecting to the FortiCarrier unit

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

- using the web-based manager: a GUI interface that you connect to 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 that you connect to 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 a common 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 FortiCarrier 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://`).

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

The first warning prompts you to accept and optionally install the FortiCarrier unit's self-signed security certificate. If you do not accept the certificate, the FortiCarrier 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 FortiCarrier 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 FortiCarrier 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 an 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 HyperTerminal 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 then 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 [FortiCarrier CLI Reference](#).

Configuring NAT mode

When configuring NAT mode, you need to define interface addresses and default routes, and simple firewall policies. You can use the web-based manager or the CLI to configure the FortiCarrier unit in NAT/Route mode.

Configure the interfaces

When shipped, the FortiCarrier 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.



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.

To configure interface for manual addressing - web-based manager

- 1 Go to *System > Network > Interface*.
- 2 Select the *Edit* icon for an interface.
- 3 Enter the *IP address* and *netmask* for the interface.

To configure an interface for manual addressing - CLI

```
config system interface
    edit <interface_name>
        set mode static
        set ip <interface_ipv4mask>
    end
```

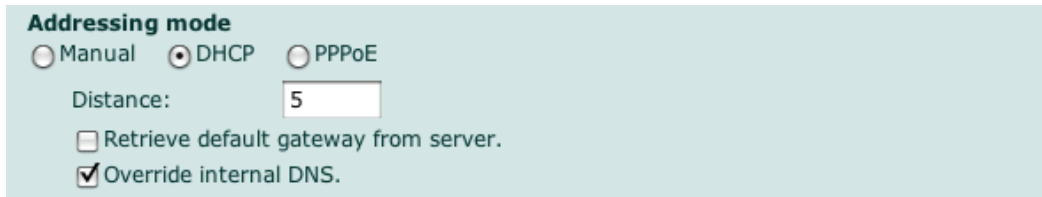
To configure DHCP addressing - web-based manager

- 1 Go to *System > Network > Interface*.
- 2 Select the *Edit* icon for an interface.
- 3 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 <i>System > Network > Options</i> . You should also enable Obtain DNS server address automatically in <i>System > Network > Options</i> .

- 4 Select *OK*.

Figure 5: Configuring DHCP addressing



Addressing mode

Manual DHCP PPPoE

Distance:

Retrieve default gateway from server.

Override internal DNS.

To configure DHCP addressing - CLI

```

config system interface
  edit external
    set mode dhcp
    set distance <integer>
    set defaultgw enable
  end

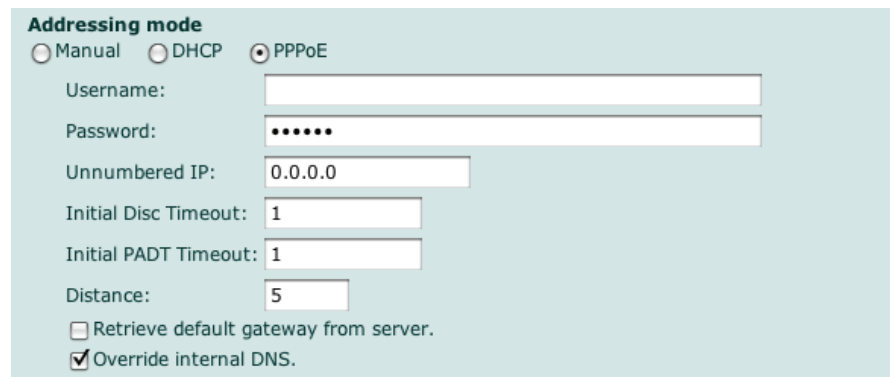
```

To configure DHCP addressing - web-based manager

- 1 Go to *System > Network > Interface*.
- 2 Select the *Edit* icon for an interface.
- 3 Select *PPPoE*, and complete the following:

Username	Enter the username for the PPPoE server. This may have been provided by your Internet Service Provider.
Password	Enter the password for the PPPoE server for the above user name.
Unnumbered IP	Specify the IP address for the interface. If your Internet Service Provider 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, and Ethernet connected.
Initial Disc Timeout	Initial discovery timeout in seconds. The amount of time to wait before starting to retry a PPPoE discovery. To disable the discovery timeout, set the value to 0.
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 Internet Service Provider 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 <i>System > Network > Options</i> . On FortiCarrier-100 units and lower, you should also enable Obtain DNS server address automatically in <i>System > Network > Options</i> .

- 4 Select *OK*.

Figure 6: Configuring PPPoE addressing


Addressing mode

Manual
 DHCP
 PPPoE

Username:

Password:

Unnumbered IP:

Initial Disc Timeout:

Initial PADT Timeout:

Distance:

Retrieve default gateway from server.
 Override internal DNS.

To configure PPPoE addressing - CLI

```

config system interface
  edit external
    set mode pppoe
    set username <pppoe_username>
    set password <pppoe_password>
    set ipunnumbered <unnumbered_ipv4>
    set disc-retry-timeout <pppoe_retry>
    set padt-retry-timeout <pppoe_retry>
    set distance <integer>
    set defaultgw enable
  end

```

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 - web-based manager

- 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*.

Figure 7: Configure a DNS server

The screenshot shows the 'Networking Options' configuration page. Under the 'DNS Settings' section, the 'Primary DNS Server' is set to 192.168.110.9, the 'Secondary DNS Server' is set to 1.1.1.1, and the 'Local Domain Name' field is empty. Under the 'Dead Gateway Detection' section, the 'Detection Interval' is set to 5 seconds and the 'Fail-over Detection' is set to 5 lost consecutive pings. An 'Apply' button is located at the bottom of the configuration area.

To configure DNS server settings - CLI

```

config system dns
    set primary <dns_ipv4>
    set secondary <dns_ipv4>
end

```

Add a default route and gateway

A route provides the FortiCarrier 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 FortiCarrier 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 FortiCarrier unit, the factory configured static default route causes the FortiCarrier unit to forward the packet to the default gateway.

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

For details on adding additional static routes, see the [FortiCarrier Administration Guide](#).

To modify the default gateway - web-based manager

- 1 Go to *Router > Static*.
- 2 Select the *Edit* icon 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 FortiCarrier 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*.

Figure 8: Configure the default gateway

Edit Static Route	
Destination IP/Mask	0.0.0.0/0.0.0.0
Device	internal
Gateway	172.20.120.2
Distance	10 (1-255)
<input type="button" value="OK"/> <input type="button" value="Cancel"/>	

To modify the default gateway - CLI

```

config router static
    edit <sequence_num>
        set gateway <gateway_address_ipv4>
        set device <interface_name>
    end

```

Add firewall policies

Firewall policies enable traffic to flow through the FortiCarrier interfaces. Firewall policies define how the FortiCarrier 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 to flow 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 high-end FortiCarrier units, you need to add a firewall policy.

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

To add an outgoing traffic firewall policy - web-based manager

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

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

Figure 9: Creating an outgoing firewall policy

Source Interface/Zone	internal	
Source Address	all	Multiple
Destination Interface/Zone	wan1	
Destination Address	all	Multiple
Schedule	always	
Service	ANY	Multiple
Action	ACCEPT	

To add an outgoing traffic firewall policy - CLI

```

config firewall policy
  edit <index_int>
    set srcintf <name_str>
    set srcaddr <name_str>
    set dstintf <name_str>
    set dstaddr <name_str>
    set schedule always
    set service ANY
    set action accept
  end
    
```

To add an incoming traffic firewall policy - web-based manager

- 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

Figure 10: Creating an incoming firewall policy

Source Interface/Zone	wan1	
Source Address	all	Multiple
Destination Interface/Zone	internal	
Destination Address	all	Multiple
Schedule	always	
Service	ANY	Multiple
Action	ACCEPT	

To add an incoming traffic firewall policy - CLI

```
config firewall policy
  edit <index_int>
    set srcintf <name_str>
    set srcaddr <name_str>
    set dstintf <name_str>
    set dstaddr <name_str>
    set schedule always
    set service ANY
    set action accept
  end
```

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

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

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 [FortiCarrier Administration Guide](#).

Configuring transparent mode

When configuring transparent mode, you need to switch to transparent mode and configure the management IP address, default routes, and simple firewall policies. You can use the web-based manager or the CLI to configure the FortiCarrier unit in transparent mode.

Switching to transparent mode

The FortiCarrier unit comes preset to NAT mode. You need to switch to transparent mode.

To switch to transparent mode - web-based manager

- 1 Go to *System > Status*.
- 2 Under *System Information*, 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 FortiCarrier unit where to send network traffic to other networks.

- 5 Select *Apply*.

Figure 11: Switching to transparent mode

Mode	
Operation Mode	Transparent
Management IP/Netmask	0.0.0.0/0.0.0.0
Default Gateway	0.0.0.0
Apply	

To switch to transparent mode

```
config system settings
    set opmode transparent
    set manageip <manage_ipv4>
    set gateway <gw_ipv4>
end
```

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 - web-based manager

- 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*.

Figure 12: Configure a DNS server

Networking Options	
DNS Settings	
Primary DNS Server	192.168.110.9
Secondary DNS Server	1.1.1.1
Local Domain Name	
Dead Gateway Detection	
Detection Interval	5 (seconds)
Fail-over Detection	5 (lost consecutive pings)
Apply	

To configure DNS server settings - CLI

```
config system dns
    set primary <dns_ipv4>
    set secondary <dns_ipv4>
end
```

Add firewall policies

Firewall policies enable traffic to flow through the FortiCarrier interfaces. Firewall policies define the FortiCarrier 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 FortiCarrier units, you will need to add a firewall policy.

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

To add an outgoing traffic firewall policy - web-based manager

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

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

Figure 13: Creating an outgoing firewall policy

Source Interface/Zone	internal	
Source Address	all	Multiple
Destination Interface/Zone	wan1	
Destination Address	all	Multiple
Schedule	always	
Service	ANY	Multiple
Action	ACCEPT	

To add an outgoing traffic firewall policy - CLI

```
config firewall policy
  edit <index_int>
    set srcintf <name_str>
    set srcaddr <name_str>
    set dstintf <name_str>
    set dstaddr <name_str>
    set schedule always
    set service ANY
    set action accept
  end
```

To add an incoming traffic firewall policy - web-based manager

- 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

Figure 14: Creating an incoming firewall policy

Source Interface/Zone	wan1	
Source Address	all	Multiple
Destination Interface/Zone	internal	
Destination Address	all	Multiple
Schedule	always	
Service	ANY	Multiple
Action	ACCEPT	

To add an incoming traffic firewall policy - CLI

```
config firewall policy
  edit <index_int>
    set srcintf <name_str>
    set srcaddr <name_str>
    set dstintf <name_str>
    set dstaddr <name_str>
    set schedule always
    set service ANY
    set action accept
  end
```

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

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

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

Verifying the configuration

Your FortiCarrier unit is now configured and connected to the network. To verify that the FortiCarrier 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 FortiCarrier unit. If the policies are not set up correctly, or are too restrictive, they can prohibit network traffic.

Backing up the configuration

Once you have determined your FortiCarrier unit 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 unit for whatever reason, you will be able to quickly return it to operation with minimal effort.

To back up the FortiCarrier configuration - web-based manager

- 1 Go to *System > Maintenance > Backup & Restore*.
- 2 Select to back up to your *Local PC* or to a *USB key*.
The *USB Disk* option will be grayed out if the FortiCarrier unit supports USB disks but none are connected.
- 3 Select *Encrypt configuration file*.
Encryption must be enabled on the backup file to back up 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.

Figure 15: Backing up the FortiCarrier configuration
To back up the FortiCarrier configuration - CLI

```
execute backup configmanagement-station <comment>
```

or

```
execute backup configusb <backup_filename> [<backup_password>]
```

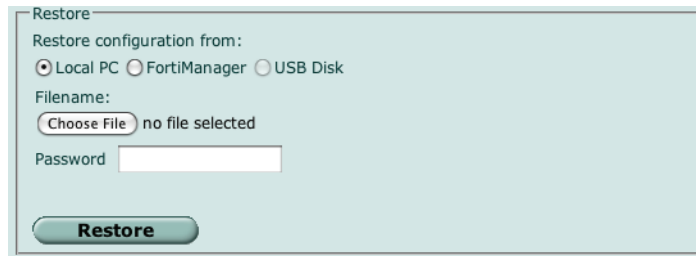
It is a good practice to backup the FortiCarrier configuration after any modification to any of the FortiCarrier settings. Alternatively, before performing an upgrade to the firmware, ensure you back up the configuration before upgrading. Should anything happen during the upgrade that changes the configuration,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

Restoring a configuration

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

To restore the FortiCarrier configuration - web-based manager

- 1 Go to *System > Maintenance > Backup & Restore*.
- 2 Select to upload the configuration file to be restored from your *Local PC* or a *USB key*.
The *USB Disk* option will be grayed out if the FortiCarrier 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*.

Figure 16: Restoring a FortiCarrier configuration**To back up the FortiCarrier configuration - CLI**

```
execute restore configmanagement-station normal 0  
or
```

```
execute restore configusb <filename> [<password>]
```

The FortiCarrier unit will load the configuration file and restart. Once the restart has completed, verify that the configuration has been restored. For information on verifying the configuration, see [“Verifying the configuration” on page 27](#).

Additional configuration

Once the FortiGate unit is connected and traffic can pass through, several more configuration options are available. While not mandatory, they will help to ensure better control with the firewall.

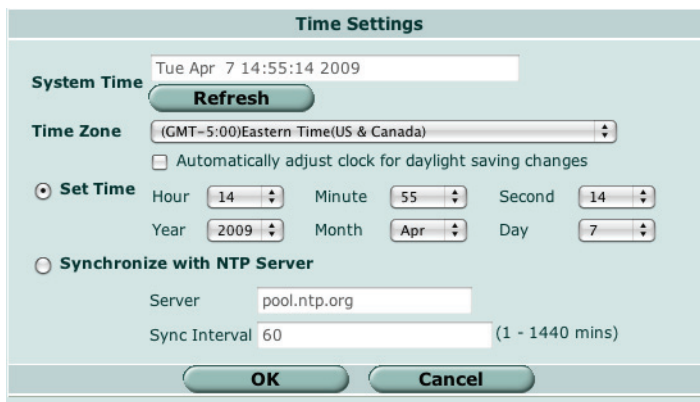
Setting the time and date

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 FortiCarrier unit to automatically keep its time correct by synchronizing with a Network Time Protocol (NTP) server.

To set the date and time - web-based manager

- 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*.

Figure 17: Setting the time and date



Set the time and date - CLI

```
execute date [<date_str>]
execute time [<time_str>]
```



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

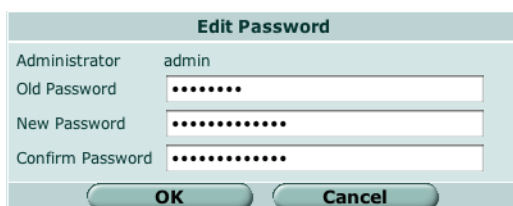
Set the Administrator password

The FortiCarrier unit ships with a default empty password. You will want to apply a password to prevent anybody logging into the FortiCarrier unit and changing configuration options.

To change the administrator password - web-based manager

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

Figure 18: Changing the Admin password



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.

Set the admin password - CLI

```
config system admin
  edit admin
    set password <admin_password>
```

Configuring FortiGuard

You need to configure the FortiCarrier unit to connect to the FortiGuard Distribution Network (FDN) to update the antivirus, antispy and IPS attack definitions.

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

Before you can begin receiving updates, you must register your FortiCarrier unit from the Fortinet web page. For more information, see [“Registering your Fortinet product” on page 5](#).

Updating antivirus and IPS signatures

After you have registered your FortiCarrier 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 expand 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 or not the update was successful or not.



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

For more information on FortiGuard configuration, see the [FortiCarrier Administration Guide](#).

Advanced configuration

The FortiCarrier unit and the FortiOS operating system provide a wide range of advanced features that enable you to control network and internet traffic and protect your network. This chapter describes some of these options and where to configure them, after you have completed basic configuration.

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 needs 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:

- protocol recognition
- antivirus protection
- web filtering
- web category filtering
- application control
- data leak prevention
- 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 may need strict protection, traffic between trusted internal addresses may need moderate protection. You can configure policies for different traffic services to use the same or different protection profiles.

The FortiCarrier unit is pre configured with four default protection profiles. In many cases you can use these default protection profiles, use them just as they are or as a starting point to create your own.

Table 2: 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	Applies virus scanning to HTTP, FTP, IMAP, POP3, and SMTP traffic.
Web	Applies virus scanning and web content blocking to HTTP traffic.
Unfiltered	Applies 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 to 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 settings for the protection profile is too vast for this document. For details on each protection profile feature and setting, see the [FortiCarrier Administration Guide](#) or the [FortiCarrier Online Help](#).

Carrier features

FortiCarrier provides a number of firewall features unique for carrier-based solutions, that go beyond the standard firewall application. FortiCarrier includes:

MMS content processing

FortiCarrier MMS protection profiles scan MMS messages for viruses, block content in MMS messages, scan MMS messages for spam, and perform other functions.

Carrier end points

Carrier end points are used by FortiOS Carrier to identify originators of communication sessions. A carrier end point is any information that a service provider uses to identify a customer and the device that the customer is using to connect to a service provider network. For example, if the customer is using a mobile phone, the carrier end point could be the phone's MSISDN number. Carrier end points are useful for identifying customers when other identifying information such as IP addresses are not reliable.

FortiCarrier uses carrier end points in MMS filters and IP filters to perform a number of different actions with communication sessions that can be identified as originating from those carrier end points.

GTP Support

GTP does not provide any authentication, data integrity, or confidentiality protection. FortiCarrier units provide full protection over the three GPRS interfaces: Gn, Gi, and Gp.

SIP Support

The FortiGate unit SIP pre-defined service tracks and scans SIP calls. The FortiGate unit can make all necessary adjustments, to both the firewall state and call data, to ensure a seamless call is established through the FortiGate unit regardless of its operation mode, NAT, route, or transparent. You can use protection profiles to control the SIP protocol and SIP call activity. A statistical summary of SIP protocol activity is also available and makes managing SIP use easy.

Firewall policies

Firewall policies are the instructions the FortiCarrier 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 FortiCarrier 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 FortiCarrier unit matches firewall policies by searching from the top of the firewall policy list and moving down until it finds the first match it, then implements the required address translation, blocking and other rules defined by the protection profile, and then passes on the packet information. This list order is important, because once the FortiCarrier 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, you may 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 FortiCarrier unit will act on the general policy, having calculated that the policy has been matched, and then stop. The second policy will be ignored and the FortiCarrier unit will let the URLs or IPs you wanted blocked get through.

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 Interface/Zone* 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 view those sites only 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 FortiCarrier 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 FortiCarrier 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 FortiCarrier unit.

For details on the firewall policies features and settings, see the [FortiCarrier Administration Guide](#) or the [FortiCarrier Online Help](#).

Antivirus options

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

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

- **File pattern** - The FortiCarrier will check the file against the file pattern setting you have configured. You can set which file names or file types the FortiCarrier 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 FortiCarrier unit to and purchase FortiGuard services to use virus scanning through the FDN.
- **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 FortiCarrier unit scans for known grayware executable programs in each enabled category.
- **Heuristics** - The FortiCarrier 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 FortiCarrier scans, go to *UTM > AntiVirus > File Filter*.

To enable grayware blocking, go to *UTM > AntiVirus > 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 [FortiCarrier Administration Guide](#) or the [FortiCarrier Online Help](#).

AntiSpam options

The FortiCarrier 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 FortiCarrier unit. When the FortiCarrier 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 reports of false positives.

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

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

Banned word lists are specific words that may be typically found in email. The FortiCarrier 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 *UTM > 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 FortiCarrier 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 FortiCarrier 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 FortiCarrier 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 *UTM > AntiSpam > E-mail Address*.

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 [FortiCarrier Administration Guide](#) or the [FortiCarrier 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 FortiCarrier unit and purchase FortiGuard services to use FortiGuard Web Filtering.

Content blocking enables you to specify file types and words that the FortiCarrier 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.

To configure content blocking, go to *UTM > 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 FortiCarrier unit allows or blocks web pages matching any specified URLs or patterns and displays a replacement message instead.

To configure URL filters, go to *UTM > 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.

For details and configuration options for the web filtering features and settings, see the [FortiCarrier Administration Guide](#) or the [FortiCarrier Online Help](#).

Data leak prevention

FortiCarrier data leak prevention enables you to stop sensitive data, such as credit card information or social security numbers, from leaving your network. You can define sensitive data patterns and data matching. These patterns will be blocked and/or logged when passing through the FortiCarrier unit. The data leak prevention system is configured by creating individual rules, combining the rules into a data leak prevention sensor which you can then apply to a protection profile.

While its primary use is to prevent sensitive data from leaving your network, you can also use the data leak prevention to prevent unwanted data from entering your network.

To configure a data leak prevention sensor and pattern, go to *UTM > Data Leak Prevention* and select *Rule* and *Sensor*.

For details and configuration options for data leak prevention, see the [FortiCarrier Administration Guide](#) or the [FortiCarrier Online Help](#).

Application control

Application control is a feature that enables your FortiCarrier unit to detect and take action against network traffic depending on the application generating the traffic. Based on intrusion protection protocol detectors, application control is a more user-friendly way to use intrusion protection features to log and manage the behavior of application traffic passing through the FortiCarrier unit. Application control uses IPS protocol decoders that can analyze network traffic to detect application traffic even if the traffic uses non-standard ports or protocols.

The FortiCarrier unit can recognize the network traffic generated by more than 70 applications. You can create application control lists that specify what action will be taken with the traffic of the applications you need to manage.

To configure application control, go to *UTM > Application Control > Control List*.

For details and configuration options for application control see the [FortiCarrier Administration Guide](#) or the [FortiCarrier Online Help](#).

Logging

Logging is an indirect method of protecting your network. The FortiCarrier 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 FortiCarrier unit to send alert messages, when specific events occur with specific frequency. By logging to a FortiAnalyzer unit, you can run over 400 reports on various network traffic.

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

For details and configuration options for the logging features and settings, see the [FortiCarrier Administration Guide](#) or the [FortiCarrier Online Help](#).

FortiCarrier Firmware

Fortinet periodically updates the FortiCarrier firmware to include new features and address issues. After you have registered your FortiCarrier unit, you can download 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 FortiCarrier 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.

In addition to firmware images, Fortinet issues patch releases--maintenance release builds that resolve important issues. Fortinet strongly recommends reviewing the release notes for the patch release, as well as testing and reviewing the patch release before upgrading the firmware. Follow the steps below:

- download and review the release notes for the patch release
- download the patch release
- back up the current configuration
- install the patch release using the procedure “[Testing new firmware before installing](#)” on page 49
- test the patch release until you are satisfied that it applies to your configuration.

Installing a patch release without reviewing release notes or testing the firmware may result in changes to settings or unexpected issues.

Only FortiCarrier admin user and administrators whose access profiles contain system read and write privileges can change the FortiCarrier 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 FortiCarrier units is available on the Fortinet Customer Support web site. You must register your FortiCarrier unit to access firmware images. Register the FortiCarrier 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.
- 4 Locate the firmware for your FortiCarrier 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 [FortiCarrier Administration Guide](#).

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

Reverting to a previous version

The following procedures revert the FortiCarrier unit to its factory default configuration and deletes any configuration settings.

Before beginning this procedures, ensure you back up the FortiCarrier 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 more information, see the [FortiCarrier 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 FortiCarrier 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 FortiCarrier unit uploads the firmware image file, reverts to the old firmware version, resets the configuration, restarts, and displays the FortiCarrier 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 28](#).

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 FortiCarrier 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 FortiCarrier 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 FortiCarrier unit before installing.

To configure the USB Auto-Install

- 1 Go to *System > Maintenance > Backup and Restore*.
- 2 Select the Expand 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*.

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 more information, see the *FortiCarrier Administration Guide*.

Before you begin, ensure you have a TFTP server running and accessible to the FortiCarrier 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 FortiCarrier 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 FortiCarrier unit:

```
execute restore image tftp <filename> <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 `image.out` and the IP address of the TFTP server is 192.168.1.168, enter:

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

The FortiCarrier unit responds with the message:

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

- 6 Type `y`.
The FortiCarrier 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
```

Reverting to a previous version

This procedure reverts the FortiCarrier 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 FortiCarrier 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 FortiCarrier 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 FortiCarrier CLI.
- 4 Make sure the FortiCarrier 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 FortiCarrier unit:

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

Where `<name_str>` is the name of the firmware image file and `<tftp_ipv4>` 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 tftp image28.out 192.168.1.168
```

The FortiGate unit responds with this message:

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

- 6 Type `y`.

The FortiCarrier 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 FortiCarrier 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 FortiCarrier 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 FortiCarrier console port and a RJ-45 to DB-9, or null modem cable.

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

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

Before beginning this procedure, ensure you back up the FortiCarrier 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 [FortiCarrier 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.
- 5 To confirm the FortiCarrier 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 FortiCarrier unit.

```
execute reboot
```

The FortiCarrier unit responds with the following message:

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

7 Type `y`.

As the FortiCarrier 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 FortiCarrier 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.
[B]: Boot with backup firmware and set as default
[C]: Configuration and information
[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 FortiCarrier 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 FortiCarrier unit and a message similar to the following appears:

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

12 Type `D`.

The FortiCarrier 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 FortiCarrier 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 FortiCarrier 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 FortiCarrier 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 FortiCarrier 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 FortiCarrier 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 FortiCarrier unit operates using the new firmware image with the current configuration. This new firmware image is not permanently installed. The next time the FortiCarrier 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 42](#).

To use this procedure, you must connect to the CLI using the FortiCarrier 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 FortiCarrier internal interface. The TFTP server should be on the same subnet as the internal interface.

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 FortiCarrier unit:

```
execute reboot
```

- 6 As the FortiCarrier unit reboots, press any key to interrupt the system startup. As the FortiCarrier 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 FortiCarrier 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.
[B]: Boot with backup firmware and set as default
[C]: Configuration and information
[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 FortiCarrier 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]:
```

- 11 Enter the firmware image file name and press Enter.

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

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

- 12 Type R.

The FortiCarrier image is installed to system memory and the FortiCarrier 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 FortiCarrier unit, and the FortiCarrier unit will resume using the firmware that was running before you installed the test firmware.

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