Platform Guide: 7000 Series

MAN-0450-02

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Legal Notices

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Export Regulation Notice

This product may include cryptographic software. Under the Export Administration Act, the United States government may consider it a criminal offense to export this product from the United States.

RF Interference Warning

This is a Class A product. In a domestic environment this product may cause radio interference, in which case the user may be required to take adequate measures.

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This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This unit generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

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This Class A digital apparatus complies with Canadian ICES-003.

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The 7000 Series Platform

About 7000 Series models

The BIG-IP® 7000 Series platform is a powerful system that is capable of managing traffic for any size of enterprise. This platform series includes models that support either hard disk drives (HDDs) or solid-state drives (SSDs).

F5 offers three performance levels of SSL offload in the 7000 Series: the 7000s, 7200v, and 7200v-SSL. The 7200v-SSL platform features high performance SSL hardware that frees up servers from the task of encrypting and decrypting data.

The 7000 Series platform is available with a FIPS-certified hardware security module (HSM) as a factory-installed option (7200v-FIPS).

Note: FIPS is not supported in vCMP guests.

Please see the data sheet at `https://f5.com/products/platforms` for more information.

About the platform

Before you install this platform, review information about the controls and ports located on both the front and back of the platform.

On the front of the platform, you can reset the unit using the LCD control buttons and view the indicator LEDs for disk drive access. You can also use the front-panel LEDs to assess the condition of the platform. On the back, you can power off the unit.

Figure 1: Front view of the 7000 platform

1. Disk drive bay 1
2. Disk drive bay 2
3. Management 10/100/1000 port
4. USB ports
5. Console serial port
6. Serial (hard-wired) failover port
7. 10/100/1000 interfaces
8. 1G/10G optical ports

9. Indicator LEDs
10. LCD display
11. LCD control buttons

The back of the platform includes two AC power supplies and the fan tray.

Figure 2: Back view of the platform

1. Fan tray
2. Power input panel 1 (power switch and power receptacle)
3. Power input panel 2 (power switch and power receptacle)
4. Chassis ground lug

Hardware included with the platform

This platform should include all of the hardware components listed here.

Quantity	Hardware
2	Power cables (black), AC power only
	Note: *The power cables included with this unit are for exclusive use with this unit and should not be used with other electrical appliances.*
2	DC terminal block plug, DC power option only
1	RJ45 to RJ45 failover cable, CAT 5 crossover (blue)
1	RJ45 to DB9 console port cable (beige)
1	RJ45F to RJ45M rolled adapter (beige)
1	Quick-install rail kit (left and right rails)
2	Front-mount brackets (left and right)
10	M4 screws
4	#10-32 pan head screws
1	Front bezel
2	SFP+ transceiver modules

Peripheral hardware requirements

For each platform, you might need to provide additional peripheral hardware. If you plan to remotely administer the system, it would be helpful to have a workstation already connected to the same subnet as the management interface.

Type of hardware	Description
Network hubs, switches, or connectors to connect to the platform network interfaces	You must provide networking devices that are compatible with the network interface cards that are installed in the platform. You can use either 10/100/1000/10000-Gigabit or 40-Gigabit Ethernet switches.
External USB CD/DVD drive or USB flash drive	You can use any USB-certified CD/DVD mass storage device or a USB flash drive for installing upgrades and for system recovery. *Note: External CD/DVD drives must be externally powered.*
Serial console	You can remotely manage the platform by connecting to a serial console terminal server through the console port. *Important: In the event that network access is impaired or not yet configured, the serial console might be the only way to access the unit. You should perform all installations and upgrades using the serial console, as these procedures require reboots, in which network connectivity is lost temporarily.*
Management workstation on the same IP network as the platform	You can use the default platform configuration if you have a management workstation set up.

LCD panel

The LCD panel provides the ability to manage the unit without attaching a console or network cable.

Figure 3: The LCD panel and control buttons

About the LCD menus

There are three menus on the LCD panel. You can configure the display options to meet your needs.

Options menu

You can use the Options menu to adjust the display properties of the LCD panel.

Option	Description
Heartbeat	Enables (checked) or disables (unchecked) the heartbeat panel on the LCD. This heartbeat does not affect the failover mechanism of the system.
Backlight	Specifies an LCD screen backlighting option. Select from these options: • ON enables the backlight. • GRAY enables the software to specify when the backlight is illuminated. • OFF disables the backlight.
Contrast	Sets the contrast of the LCD.
On Brightness	Adjusts LCD backlight brightness.
Off Brightness	Controls the brightness of the LCD when the backlight is off.

System menu

You can use the System menu to view options for rebooting, halting, and netbooting the hardware. This menu also provides options for configuring the management interface.

Option	Description
DHCP	Controls the use of DHCP. Select from these options: • disabled (default) • enabled
Management	Changes the management interface information. Select from these options: • Address Type indicates whether to use an IPv4 or IPv6 address. • Mgmt IP sets the management interface IP address. You can use an IPv4 or IPv6 address. • Prefix Length sets the length of the routing prefix for the IPv4 or IPv6 management IP address. • Mgmt Gateway sets the default route for the management interface. This route is necessary if you plan to manage the unit from a different subnetwork. • Commit saves your changes.
Serial Speed	Changes the baud rate of the management serial port. Select from these options: • 9600 • 19200 (default) • 57600 • 115200
Reboot	Reboots the unit.
Halt	Halts the unit.
Netboot	Boots the unit over an IP network. Select this option if you are installing software from a PXE server.

Screens menu

You can use the Screens menu to specify the information that is displayed on the default screens.

Option	Description
DateScreen	Displays the date and time.
InfoScreen	Displays the information screen.
RaidScreen	Displays the RAID status screen.
	Note: *Not available on solid-state drive (SSD) platforms.*
VersionScreen	Displays product version information.

Using the LCD panel

Put the LCD panel into Menu mode to manage the platform using the LCD menus and control buttons.

Press the X button to activate Menu mode for the LCD.

The Left Arrow, Right Arrow, Up Arrow, and Down Arrow buttons are functional only when the LCD is in Menu mode.

Pausing on a screen

Normally, the screens cycle on the LCD panel at a constant rate, but you can pause on a specific screen.

Push the Check button to toggle the LCD screen between Hold and Rotate modes.

In Hold mode, a single screen is displayed. The Rotate mode changes the screen displayed on the LCD every four seconds.

Powering on the unit

Use the LCD control buttons to power on the unit.

Press the Check button to power on a unit that is shut down.

Halting the unit

Use the LCD control buttons to halt the unit. You should halt the unit before you power it down or reboot it using the LCD menu options.

1. Press the X button, then use the arrow keys to navigate to the System menu.
2. Press the Check button.
3. Navigate to the Halt menu.
4. Press the Check button.
5. Press the Check button again at the confirmation screen.

Wait 60 seconds before powering the machine off or rebooting it.

Putting the unit in standby mode

Use the LCD control buttons to put the unit into standby mode.

Hold the X button for four seconds to put the unit in standby mode and power off the host subsystem.

F5® recommends that you halt the system before you power off the system in this manner.

Resetting the unit

Use the LCD control buttons to reset the unit.

Hold the Check button for four seconds to reset the unit.

You should only use this option after you halt the unit.

Clearing alerts

Use the LCD control buttons to clear alerts from the LCD screen.

Press the Check button to clear any alerts on the LCD screen.

You must clear any alerts on the screen before you can use the LCD panel.

Indicator LEDs

The behavior of each LED indicates the status of the system.

Status LED

The status LED indicate the operating state of the system.

State	Description
off/none	System is halted and powered down.
green solid	System is running in normal mode. Also indicates that the system is in an Active state of a device group.
yellow solid	System is running in an impaired mode. The condition is not considered to be significant enough to be considered an alarm condition. Also indicates that the system is the Standby member of a device group.
yellow blinking (with traffic)	The system is not under host computer control. This might be due to the host being halted or in EUD mode, or due to a software or hardware problem that interferes with the host's control of the LED.

Alarm LED

The alarm LED indicate system alarm conditions and the severity of the alarm condition.

There are five levels of messages.

Note: The alarm LED might continue to display until alerts are cleared using the LCD panel.

State	Description
off/none	Informational or no alarm conditions present. System is operating properly.
yellow solid	Warning (0). System may not be operating properly, but the condition is not severe or potentially damaging.
yellow blinking	Error (1). System is not operating properly, but the condition is not severe or potentially damaging.
red solid	Alert (2) or Critical (3). System is not operating properly, and the condition is potentially damaging.
red blinking	Emergency (4). System is not operating, and the condition is potentially damaging.

Power supply LEDs

The power supply LEDs indicate the operating state of the power supplies.

Power 1 state	Power 2 state	Description
green solid	green solid	Power supply is present and operating properly. Also indicates when the system in is power standby mode.
yellow solid	yellow solid	Power supply is present, but not operating properly.
off/none	off/none	No power supply present.

Indicator LED behavior

The indicator LEDs behave in a specific manner to indicate system or component status.

Behavior	Description
off (none)	LED is not lit and does not display any color.
solid	LED is lit and does not blink.
blinking	LED turns on and off at a regular frequency.
intermittent	LED turns on and off with an irregular frequency and might sometimes appear solid.

Defining custom alerts

The `/etc/alertd/alert.conf` and the `/config/user_alert.conf` files on the BIG-IP® system define alerts that cause the indicators to change. The `/etc/alertd/alert.conf` file defines standard system alerts, and the `/config/user_alert.conf` file defines custom settings. You should edit only the `/config/user_alert.conf` file.

1. Open a command prompt on the system.
2. Change to the /config directory.

   cd /config

3. Using a text editor, such as vi or Pico, open the /config/user_alert.conf file.
4. Edit the file, as needed.
   For example, add these lines to the end of the file to create a custom alert in which the front panel LEDs indicate when a node is down:

```
alert BIGIP_MCPD_MCPDERR_POOL_MEMBER_MON_DOWN "Pool member (.*?):(.*?) monitor
 status down."
{
  snmptrap OID=".1.3.6.1.4.1.3375.2.4.0.10";
  lcdwarn description="Node down" priority="1"
}
alert BIGIP_MCPD_MCPDERR_NODE_ADDRESS_MON_DOWN "Node (.*?) monitor status
down." {
  snmptrap OID=".1.3.6.1.4.1.3375.2.4.0.12";
  lcdwarn description="Node address down" priority="1"
}
alert BIGIP_MCPD_MCPDERR_POOL_MEMBER_MON_UP "Pool member (.*?):(.*?) monitor
 status up."
{
  snmptrap OID=".1.3.6.1.4.1.3375.2.4.0.11"
}
alert BIGIP_MCPD_MCPDERR_NODE_ADDRESS_MON_UP "Node (.*?) monitor status up."

{
  snmptrap OID=".1.3.6.1.4.1.3375.2.4.0.13"
}
```

5. Save the file and exit the text editor.

Platform interfaces

Every platform includes multiple interfaces. The exact number of interfaces that are on the system depends on the platform type.

Each interface on the platform has a set of properties that you can configure, such as enabling or disabling the interface, setting the requested media type and duplex mode, and configuring flow control.

About managing interfaces

You can use the Traffic Management Shell (tmsh) or the BIG-IP® Configuration utility to manage platform interfaces.

Viewing the status of a specific interface using tmsh

You can use tmsh to view the status of a specific interface on a platform.

1. Open the Traffic Management Shell (tmsh).
   tmsh

2. Change to the network module.

`net`

The system prompt updates with the module name: `user@bigip01(Active)(/Common)(tmos.net)#`

3. Display the current status of a specific interface.

`show interface <interface_key>`

This is an example of the output that you might see when you run this command on interface 1.1:

```
----------------------------------------------------------------
Net::Interface
Name  Status  Bits  Bits  Pkts  Pkts  Drops  Errs      Media
              In    Out   In    Out
----------------------------------------------------------------
1.1       up  5.9T     0  7.3G     0  7.3G      0  10000SR-FD
```

Viewing the status of all interfaces using tmsh

You can use `tmsh` to view the status of all interfaces on the platform.

1. Open the Traffic Management Shell (`tmsh`).

`tmsh`

2. Change to the network module.

`net`

The system prompt updates with the module name: `user@bigip01(Active)(/Common)(tmos.net)#`

3. Display the current status of all interfaces.

`show interface`

This is an example of the output that you might see when you run this command:

```
-------------------------------------------------------------------
Net::Interface
Name  Status    Bits  Bits   Pkts  Pkts  Drops  Errs       Media
                In    Out    In    Out
-------------------------------------------------------------------
1.1       up    5.9T     0   7.3G     0  7.3G      0  10000SR-FD
1.2     miss       0     0      0     0     0      0        none
1.3     miss       0     0      0     0     0      0        none
1.4     miss       0     0      0     0     0      0        none
1.5     miss       0     0      0     0     0      0        none
1.6     miss       0     0      0     0     0      0        none
1.7     miss       0     0      0     0     0      0        none
1.8     miss       0     0      0     0     0      0        none
1.9     miss       0     0      0     0     0      0        none
1.10    miss       0     0      0     0     0      0        none
1.11    miss       0     0      0     0     0      0        none
1.12    miss       0     0      0     0     0      0        none
1.13    miss       0     0      0     0     0      0        none
1.14    miss       0     0      0     0     0      0        none
1.15    miss       0     0      0     0     0      0        none
1.16    miss       0     0      0     0     0      0        none
1.17  uninit       0     0      0     0     0      0        none
1.18  uninit       0     0      0     0     0      0        none
1.19  uninit       0     0      0     0     0      0        none
1.20  uninit       0     0      0     0     0      0        none
1.21  uninit       0     0      0     0     0      0        none
1.22  uninit       0     0      0     0     0      0        none
1.23  uninit       0     0      0     0     0      0        none
1.24  uninit       0     0      0     0     0      0        none
```

```
2.1    uninit      0       0       0       0       0       0         none
2.2    uninit      0       0       0       0       0       0         none
2.3    uninit      0       0       0       0       0       0         none
2.4    uninit      0       0       0       0       0       0         none
2.5      miss      0       0       0       0       0       0         none
2.6      miss      0       0       0       0       0       0         none
mgmt       up  182.1G    6.8G   41.2M    6.0M       0       0     1000T-FD
```

Viewing the status of all interfaces using the Configuration utility

You can use the BIG-IP® Configuration utility to view the status of all interfaces on the platform.

1. On the Main tab, click **Network** > **Interfaces** > **Interface List**.
   This displays the list of available interfaces.
2. On the menu bar, click **Statistics**.
   The Statistics screen for all interfaces opens.

About interface media type and duplex mode

All interfaces on the system default to auto-negotiate speed and full duplex settings. We recommend that you also configure any network equipment that you plan to use with the system to auto-negotiate speed and duplex settings. If you connect the system to network devices with forced speed and duplex settings, you must force the speed and duplex settings of the system to match the settings of the other network device.

Important: If the system is attempting to auto-negotiate interface settings with an interface that has the speed and duplex settings forced (that is, auto-negotiation is disabled), you will experience severe performance degradation. This applies to 10GbE and 40GbE interfaces.

By default, the media type on interfaces is set to automatically detect speed and duplex settings, but you can specify a media type as well. Use the following syntax to set the media type:

```
tmsh modify net interface <interface_key> media <media_type> | auto
```

If the media type does not accept the duplex mode setting, a message appears. If media type is set to `auto`, or if the interface does not accept the duplex mode setting, the duplex setting is not saved to the `/config/bigip_base.conf` file.

Important: Auto-MDI/MDIX functionality is retained when you manually configure an interface to use specific speed and duplex settings. You can use either a straight-through cable or a crossover cable when media settings are forced, and you will be able to successfully link to either DTE or DCE devices.

Valid media types

This table lists the valid media types for the `tmsh interface` command.

Note: This platform might not support all of the media type options that are available in the Traffic Management Shell (`tmsh`).

10BaseT half	100BaseTX full
10BaseT full	1000BaseLX full
10GBaseER full	1000BaseCX full

10GBaseLR full	1000BaseT half
10GBaseSR full	1000BaseT full
10GBaseT full	1000BaseSX full
10SFP+Cu full	auto
40GBaseSR4 full	none
40GBaseLR4 full	no-phy
100BaseTX half	

Viewing valid media types for an interface

You can use `tmsh` to view the valid media types for an interface.

Note: This platform might not support all of the media type options that are available in `tmsh`.

1. Open the Traffic Management Shell (`tmsh`).
   ```
   tmsh
   ```
2. Change to the network module.
   ```
   net
   ```
   The system prompt updates with the module name: `user@bigip01(Active)(/Common)(tmos.net)#`
3. Display the valid media types for a specific interface.
   ```
   list interface <interface_key> media-capabilities
   ```

   Important: In all Gigabit Ethernet modes, the only valid duplex mode is full duplex.

This is an example of the output that you might see when you run this command on interface 1.3:

```
net interface 1.3 {
    media-capabilities {
        none
        auto
        10T-FD
        10T-HD
        100TX-FD
        100TX-HD
        1000T-FD
        1000T-HD
    }
}
```

Network interface LED behavior

The appearance and behavior of the network interface LEDs on the platform indicate network traffic activity, interface speed, and interface duplexity.

RJ45 Copper interface LED behavior

The appearance and behavior of the RJ45 network interface LEDs indicate network traffic activity, interface speed, and interface duplexity.

Link	Speed LED	Activity LED
No Link/Idle	Not lit	Not lit
10Mbit/s, half duplex	Yellow blinking (with traffic)	Yellow blinking (with traffic)
10Mbit/s, full duplex	Yellow blinking (with traffic)	Green blinking (with traffic)
100Mbit/s, half duplex	Yellow solid	Yellow blinking (with traffic)
100Mbit/s, full duplex	Yellow solid	Green blinking (with traffic)
1Gbit/s, half duplex	Green solid	Yellow blinking (with traffic)
1Gbit/s, full duplex	Green solid	Green blinking (with traffic)

SFP+ port LED behavior

The appearance and behavior of the SFP+ optical interface LEDs indicate network traffic activity, interface speed, and interface duplexity.

Link	Speed LED	Activity LED
No link/Idle	Not lit	Not lit
1 Gbit/s, full duplex	Yellow solid	Green blinking (with traffic)
10 Gbit/s, full duplex	Green solid	Green blinking (with traffic)
40 Gbit/s, full duplex	Green solid	Green blinking (with traffic)

Note: *Applies only to bundled 10GbE interfaces.*

Transceiver module specifications

For current specification information for optical transceivers that are supported by this platform, see *F5*® *Platforms: Accessories*.

Cable pinout specifications

For current pinout information for this platform, see *F5*® *Platforms: Accessories*.

Always-On Management

The Always-On Management (AOM) subsystem enables you to manage the system remotely using serial console or SSH, even if the host is powered down. The AOM Command Menu operates independently of the Traffic Management Operating System® (TMOS®).

You can use the command menu to reset the unit if TMOS has locked up, or get access to TMOS directly, so that you can configure it from the command-line interface.

Note: *The available functionality and options in AOM vary depending on the platform type.*

AOM Command Menu options

The AOM Command Menu provides the AOM options for the platform. You can access the AOM Command Menu using either a serial console or SSH.

Note: The availability of menu options varies depending on the platform type.

Letter	Option	Description
B	Set console baud rate	Configures the baud speed for connecting to AOM using the serial console. Select from these options: • 9600 • 19200 (default) • 38400 • 57600 • 115200
I	Display platform information	Displays information about the AOM firmware and bootloader, chassis serial and part numbers, blade serial number, MAC address, and power status for the active console.
P	Power on/off host subsystem	Powers the host subsystem on or off.
R	Reset host subsystem	Resets the host subsystem with a hardware reset. *Important: F5 Networks does not recommend using this option under typical circumstances. It does not allow for graceful shutdown of the system.*
N	Configure AOM network	Runs the AOM network configuration utility. This utility enables you to reconfigure the IP address, netmask, and default gateway used by AOM. If you use this option while connected using SSH, your session will be disconnected as a part of the network configuration operation. *Note: This option is not available when you are connected using SSH.*
S	Configure SSH Server	Sets a session idle timeout (in seconds) for the AOM SSH server. Available values are 0 (no timeout; default value), or between 30 and 86400 (one day).
A	Reset AOM	Resets the AOM subsystem. In this case, the system is reset with a hardware reset. *Important: We do not recommend using this option under normal circumstances. It does not allow for graceful shutdown of the system.*
H	Host Console Capture Buffer	Buffers the last 4K bytes of console output from the host and saves it to a non-volatile storage location. *Important: This option is hidden and disabled by default. It is intended to be used as a diagnostic tool by F5 technical support. When this option is enabled, then disabled, the buffer is cleared.*
E	Display error report	Displays a list of latched events/errors or out-of-range sensors.

Letter	Option	Description
Q	Quit menu and return to console	Exits the AOM Command Menu and returns to terminal emulation mode.

Accessing the AOM Command Menu from the serial console

You can access the AOM Command Menu using the front panel serial console.

1. Connect to the system using the serial console.
2. Open the AOM Command Menu.
   ```
   Esc (
   ```

Configuring the management network

You can assign a management IP address, netmask, and gateway to access AOM either manually or with DHCP.

1. Connect to the system using the serial console.
2. Open the AOM Command Menu.
   ```
   Esc (
   ```
3. Type n to open the AOM management network configurator.
4. Assign a management IP address, netmask, and gateway:
   - To use DHCP to assign the addresses, type y when prompted about using DHCP.
   - To manually assign the addresses, type n when prompted about using DHCP. At the prompts, type values for IP address (required), netmask (required), and gateway (optional).

   A confirmation message displays the configured management IP address, netmask, and gateway.
5. (Optional) Type i to verify the assigned addresses.

Accessing the AOM Command Menu using SSH

Before you access the AOM Command Menu using SSH, you must assign a management IP address, netmask, and gateway for AOM. You can assign the addresses manually or with DHCP.

You can access the AOM Command Menu remotely using SSH from a management workstation that is connected to the same subnet as the platform's management (MGMT) interface.

Note: On this platform, AOM allows only one SSH connection at a time.

1. Open an SSH session, where `<ip addr>` is the IP address that you configured for AOM.
   ```
   ssh root@<ip addr>
   ```
2. Type the root password.
3. Open the AOM Command Menu.
   ```
   Esc (
   ```

Setting an SSH idle session timeout

You can specify a timeout value (in seconds) for idle AOM SSH sessions. You can access the AOM Command Menu using either a serial console or SSH.

1. Connect to the system using the serial console.
2. Open the AOM Command Menu.
   `Esc (`
3. Type `s` to configure a timeout value for idle SSH sessions.
4. Type a timeout value.
   The default value is 0 (no timeout). Available values are 0, or between 30 and 86400 (one day).

Disabling network configuration

You can connect to the system's serial console to disable SSH access to AOM over the network. This does not affect console access to AOM.

1. Connect to the system using the serial console.
2. Open the AOM Command Menu.
   `Esc (`
3. Type `n` to open the AOM management network configurator.
4. Type `n` when prompted about using DHCP.
5. Type `0.0.0.0` at the IP address prompt.
   A confirmation message displays the configured management IP address, netmask, and gateway.
6. (Optional) Type `i` to verify that network configuration is disabled.

About the host console capture buffer

When enabled, the host console capture buffer (H) option in the AOM Command Menu buffers the last 4K bytes of console output from the host and saves it to a non-volatile storage location.

Important: This option is intended to be used as a diagnostic tool by F5® Technical Support.

Enabling the host console capture buffer

1. Connect to the system using the serial console or by opening an SSH session to the AOM management IP address.
2. Open the AOM Command Menu.
   `Esc (`
3. Enable the host console capture buffer (H) option.
   `Esc h`
4. When prompted to confirm, type `y`.

   This message displays: `Host console capture buffer enabled.`

   The host console capture buffer (H) option now displays in the AOM Command Menu.

Showing the host console capture buffer

1. Connect to the system using the serial console or by opening an SSH session to the AOM management IP address.
2. Open the AOM Command Menu.
   `Esc (`
3. Type `h` to select the host console capture buffer option.
   This message displays: `The host console capture buffer is actively capturing.`
4. Type `s` to show the contents of the buffer.

Disabling the host console capture buffer

When you no longer require use of the host console capture buffer, you can disable it.

1. Connect to the system using the serial console or by opening an SSH session to the AOM management IP address.
2. Open the AOM Command Menu.
   `Esc (`
3. Type `h` to select the host console capture buffer option.
   This message displays: `The host console capture buffer is actively capturing.`
4. Type `d` to disable the host console capture buffer.
5. When prompted to confirm, type `y`.

   This message displays: `Host console capture buffer disabled.`

   The buffer is cleared, and the host console capture buffer (H) option no longer displays in the AOM Command Menu.

Platform Installation

About installing the platform

After you have reviewed the hardware requirements and become familiar with the 7000 Series platform, you can install the unit.

Important: Before you install this platform, review the environmental guidelines to make sure that you are installing and using the platform into a compatible rack and in the appropriate environment.

About general recommendations for rack mounting

Although not required, a 1U space between units makes it easier for you to remove the unit from the rack in the event that the unit requires service. A 1U space between units also provides additional cable routing options.

Leaving at least 100 mm of space from the front panel of the unit to the rack front or rack door provides enough room for you to route the cables without excessive bending or insulation damage.

A shelf or similar device is required to support the unit if only one person is installing the unit.

Note: Before you install this platform, review the environmental guidelines to make sure that you are installing and using the platform in the appropriate environment.

Warning: Due to the weight of the platform, at least two people are required to install this chassis into a rack. Failing to use two people can result in severe personal injury or equipment damage.

Important: This product is sensitive to electrostatic discharge (ESD). F5® Networks recommends that you use proper ESD grounding procedures and equipment when you install or maintain the unit.

Unpacking the platform

The platform ships in a custom-designed package that protects the product during shipment. Due to the weight of the platform, there is a specific procedure that you must follow to ensure that you remove the platform from its packaging safely and securely.

Warning: To ensure your safety and to prevent damage to the chassis, at least two people are required to remove this chassis from the shipping box.

1. If you have not already done so, open the top of the shipping box.

2. Remove the mounting options box from the accessory tray.

3. Remove the accessory tray from the shipping box.

The accessory tray includes compartments that contain the bezel box, and accessory boxes for the AC power cords or DC connectors, cables, and optical transceivers.

4. Remove the upper foam inserts.

5. Remove the plastic wrapping sheeting from the platform, and then remove the platform from the shipping box.

6. Place the platform on a flat surface until you are ready to install the platform into a rack.

Determining which rack mounting kit to use

The 7000 Series platform comes with two types of rack mounting kits: sliding quick-install rail-mounting and stationary front-mounting. An advantage of installing the quick-install kit is that you can then slide the unit in and out of the rack as needed.

The tasks required to install the platform might differ depending on the type of rack mount you decide to use or which type of cabinet unit you are installing into (single two-post cabinet or four-post cabinet).

About the front-mount/rail lock brackets

You must use the front-mount/rail lock brackets (left and right) if you are installing into either a two-post or four-post rack and in two installation configurations:

- Stationary front-mounting
- Sliding quick-install rail-mounting
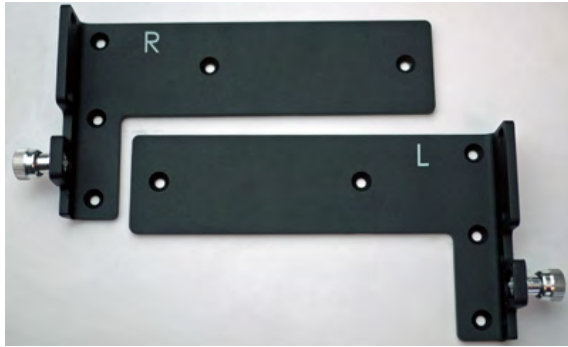
Figure 4: The front-mount brackets

Note: *The front-mount/rail lock brackets are used in both the stationary front-mount and sliding quick-install rail-mount installation methods.*

About the quick-install rail kit

Use the quick-install rail kit if you want to be able to slide the unit in or out of the rack for maintenance activities. The kit includes two rails (left and right) and eight #8-32 thumb screws. The rails snap into place in the rack, and no tools are required to install a platform using this kit.

The rails are optimized for installation into square hole cabinets, but they can be installed in other cabinet styles, such as round hole cabinets, using the screws provided. The rails are easily converted to mount to either cabinet style.

Figure 5: Quick-install rail kit

For information about installing the platform using the quick-install rail kit, see the instruction guide provided by the manufacturer, which is included with the kit hardware.

After installing the platform, secure it to the rack with the rail lock brackets that are provided. Attach the front bezel to the unit by grasping the bezel using the indentations located on either side and applying a gentle forward, slightly upward force to the left side. This helps ensure that the left side is mounted flush to the unit.

Installing using the front-mount/rail lock brackets

This platform includes front-mount/rail lock brackets, which you can use to either attach the unit directly to the rack or secure a rail-kit mounted unit to the rack.

The rail lock thumb screw is integrated with the front-mount/rail lock bracket. Use the thumb screw to secure the unit to the rack when using the quick-install rail kit.

1. Align the countersink holes on the bracket to the threaded holes on the side of the unit.
2. Mount the bracket to the unit using the M4 flat head countersink screws (five per side).

    The screws must be torqued to 16-18 inch-pounds.

Note: The brackets are marked with L for left side and R for right side.

---

3. Repeat steps 1 and 2 for the other bracket.
4. If you are installing the unit into the rack using the quick-install rail kit:
    a) Install the rails into the rack.

        For more information, see the instruction guide provided by the manufacturer, which is included with the kit hardware.
    b) Use the captive screw that is attached to the bracket to secure the brackets to the rack on each side of the unit.

        Use 18 to 20 inch-pounds (2.0 to 2.3 Newton-meters) of torque on these screws.

5. If you are front-mounting the unit directly into the rack, without using the rail kit, secure the brackets to the rack using the four #10-32 pan head screws provided with the platform.

The unit must be securely fastened to the rack to provide adequate stability and to prevent the unit from falling out of the rack.

Note: The thumb screw is not used for the two-post rack mount.

6. Attach the front bezel to the unit by grasping the bezel on either side using the indentations provided and applying a gentle forward, slightly upward force to the left side. This helps ensure that the left side is mounted flush to the unit.

Note: Failure to use the indentations could result in pinched fingers.

If the rack you have does not provide adequate support for the unit, you might need a shelf kit. F5 recommends using a shelf kit created by the rack manufacturer, if available.

About grounding the platform

You should ground the platform after you install it in a rack. The chassis ground lug is located on the back of the platform.

Do not secure multiple bonding or grounding connectors with the same bolt. The grounding connectors do not need to be removed to perform service or installation procedures. You can connect other bonding or grounding conductors to a grounding connector provided a reliable bond between the connector and the equipment is not disturbed during installation, service, or maintenance of the platform.

Important: *All grounding cable terminal lugs must meet appropriate safety standards.*

Note: *The platform must be grounded to a common bonding network (CBN).*

Figure 6: Chassis ground lug

Connecting the ground lug to the ground terminal

After the unit is installed in the rack and before you provide power to the system, you need to connect the grounding hardware.

1. Attach a grounding terminal lug to 12 AWG copper ground wire.
2. Install the #8-32 Keps nuts on the ground terminal lugs.

   Use 60 to 70 inch-pounds (6.8 to 8.0 Newton-meters) of torque on these Keps nuts.
3. Connect the ground wire to a common bonding network (CBN).

Connecting the cables and other hardware

After you have installed the unit into the rack, connect the cables and other hardware.

Important: *In the event that network access is impaired or not yet configured, the serial console might be the only way to access the unit. You should perform all installations and upgrades using the serial console, as these procedures require reboots, in which network connectivity is lost temporarily.*

1. Connect an Ethernet cable to the MGMT port if you are using the default network configured on the management interface.

Note: *For EMI compliance, shielded cables are required for the MGMT port, and the shield must be grounded at both ends.*

2. Connect to a serial console server. Depending on which BIG-IP® system you have, you can use either the supplied RJ45 to DB9 console port cable or the RJ45F to RJ45M rolled serial adapter to connect the BIG-IP system to a serial console.

- Connect the RJ45 to DB9 console port cable to the CONSOLE port on the BIG-IP system.

    Note: *The default baud rate is 19200,n,8,1.*

- Connect the RJ45F to RJ45M rolled serial adapter to the console port if you are connecting the system to a serial console server with a standard CAT5 cable, and then connect the CAT5 cable to the adapter. The adapter provides the appropriate pinout connection to your equipment.

Figure 7: The RJ45F to RJ45M rolled serial (pass-through) adapter

3. For AC-powered systems, connect the power cable to the power input panel, and then connect it to the power source. For DC-powered systems, wire the DC power terminal block and connect the power supply to a DC power source.

4. Connect the serial failover cable to the FAILOVER port on each unit if you plan to set up device service clustering (DSC™) with hard-wired failover capacity.

For more information about configuring failover, see *BIG-IP® Device Service Clustering: Administration*.

5. If you have not already done so, power on the unit.

You can now assign a management IP address to the system, and then license and provision the software.

Optionally, you should run the latest version of the qkview utility. This utility collects configuration and diagnostic information about your system into a single file that you can provide to F5 Technical Support to aid in troubleshooting. For more information, see
`http://support.f5.com/kb/en-us/solutions/public/12000/800/sol12878.html`.

Configuring a management IP address using the LCD panel

You can use the LCD panel to configure the management IP address. The management IP address enables you to access the BIG-IP® Configuration utility to configure other aspects of the product, such as the product license, VLANs, and trunks. The options are located in the System menu.

Note: *When using the LCD panel to configure the unit, be sure to use the Commit option to save all settings.*

1. Press the X button to activate Menu mode for the LCD.

2. Press the Check button to select **System**.

3. To configure the management IP address using DHCP:
    a) Press the Check button to select **DHCP**.
    b) Press the Check button to select **enabled**.

4. To configure the management IP address manually:
    a) Press the Check button to select **Management**.
    b) Press the Check button to select **Address Type**, and then press the Check button again to select either **IPv4** or **IPv6**.
    c) Use the arrow keys to select **Mgmt IP** and press the Check button.
    d) Use the arrow keys to configure the management IP address.
    e) Use the arrow keys to select **Prefix Length** and press the Check button.
    f) Use the arrow keys to configure the length of the routing prefix for the IPv4 or IPv6 management IP address.
    g) Use the arrow keys to select **Mgmt Gateway** and press the Check button.
    h) Use the arrow keys to configure the default route for the management interface.

5. Use the arrow keys to select **Commit** and press the Check button.

Licensing the platform

Once the management IP address is configured for the platform, you can use the BIG-IP® Configuration utility to license the appropriate BIG-IP software.

1. Using a Web browser, navigate to the management IP address that you assigned to the platform.

   Use this format where *<mgmt_ip_address>* is the management IP address you assigned:

   ```
   https://<mgmt_ip_address>
   ```

2. Type admin as the user name and admin as the password.

   If this is the first time you have accessed the Configuration utility, the first screen you see is the License screen.

3. Follow the instructions in the Configuration utility to license the platform.

Platform Maintenance

About maintaining the platform

The 7000 Series platform contains several components that you can replace individually without exchanging the entire system. This platform contains these replaceable components:

- AC power supply
- DC power supply
- Fan tray
- Hard drive

About AC power supplies

BIG-IP® platforms can support up to two AC power supplies. Some platforms come with only one power supply by default. You can hot swap power supplies without powering down the system if there are two installed and one remains installed and operational during the replacement process.

Figure 8: The 400W AC power supply

The platform supports power redundancy, which ensures that the system is unaffected if a single power supply fails in a system containing more than one power supply.

Caution: *Running without power supplies installed in all available bays in the platform can affect cooling and electromagnetic interference (EMI). If you need to run the unit with fewer power supplies, you must install a blank supply bracket into any empty power supply bays. The blank supply bracket is required to maintain proper airflow in the system. If you do not have a blank supply bracket, leave all supplies installed and unplug any unused power supplies.*

Caution: *As a safety precaution, the socket outlet must be installed near the equipment and be easily accessible.*

Caution: *Do not mix power supply models. If two power supplies are installed in the same system, use only power supplies of the same model.*

Important: *You should use only one power supply type (AC or DC) in a platform. AC and DC interoperability is not supported.*

Important: *This product is sensitive to electrostatic discharge (ESD). F5® Networks recommends that you use proper ESD grounding procedures and equipment when you install or maintain the unit.*

Note: *Depending on the model and revision of the power supply, you might need either a Phillips or a slotted screwdriver to replace the power supply.*

Installing an AC power supply

In the event of a power supply failure, you can replace an AC power supply without powering down the system, provided that there is at least one power supply operating during the replacement process.

1. Disconnect the AC power cord from the power supply.
2. Loosen the power supply screw by turning it counterclockwise with an appropriate screwdriver, if necessary.

   Note: *The screw is captive and cannot be removed from the assembly.*

3. Remove the power supply from the system by pulling straight toward you.
4. Slide the power supply into the empty slot.

   Ensure that the power supply is fully seated in the chassis.

5. Tighten the screw into place.

   The power supply is connected to the system when you tighten the screw completely.

6. Attach the power cord to the new power supply.

   If the system does not boot after you apply power to the power supply, press the Check button on the LCD panel to begin booting the system.

About DC power supplies

BIG-IP® platforms can support up to two DC power supplies. Some platforms come with only one power supply by default. You can hot swap power supplies without powering down the system if there are two installed and one remains installed and operational during the replacement process. The DC power supply does not have an on/off switch. You can control the power from the rack switch or the DC power source.

The DC power supply includes a DC terminal block that connects the power supply to the DC power source.

The platform supports power redundancy, which ensures that the system is unaffected if a single power supply fails in a system containing more than one power supply.

Figure 9: The 300W DC power supply and terminal block

Caution: *Before installing a DC power supply, be sure that the DC power source for the rack is powered off.*

Caution: *Running without power supplies installed in all available bays in the platform can affect cooling and electromagnetic interference (EMI). If you need to run the unit with fewer power supplies, you must install a blank supply bracket into any empty power supply bays. The blank supply bracket is required to maintain proper airflow in the system. If you do not have a blank supply bracket, leave all supplies installed and unplug any unused power supplies.*

Caution: *Before you begin to work with one of these platforms, refer to the DC-powered equipment environmental warnings for this platform and review any safety requirements for the facilities where the DC-powered platforms will be installed.*

Caution: *Do not mix power supply models. If two power supplies are installed in the same system, use only power supplies of the same model.*

Important: *You should use only one power supply type (AC or DC) in a platform. AC and DC interoperability is not supported.*

Important: *This product is sensitive to electrostatic discharge (ESD). F5® Networks recommends that you use proper ESD grounding procedures and equipment when you install or maintain the unit.*

Important: *The platform must be installed in a RESTRICTED ACCESS LOCATION, such as a central office or customer premises environment.*

Note: *Copper cables used for grounding must meet appropriate safety standards.*

Note: *Bare conductors should be coated with an appropriate antioxidant before being crimped. Make sure to clean all unplated connectors, braided strap, and bus bars to a bright finish prior to coating them with the antioxidant.*

Note: *The platform must be grounded to a common bonding network (CBN).*

Note: *The battery return terminals on the platform are in an isolated DC return (DC-I) configuration.*

Installing a DC power supply

You will need these tools to install the DC power supply:

- Wire stripping tool
- Small slotted screwdriver
- Two 14-16 AWG copper wires long enough to reach from the platform to the DC power source

In the event of a power supply failure, you can replace a DC power supply in the system.

1. Review the DC power supply label and determine the correct wire size for your installation.
2. Use the wire stripping tool to remove 3/8 inch (0.95 cm) of insulation.

Important: *Be sure to remove the appropriate amount of insulation from each wire. If you remove too much insulation, exposed wire protruding from the terminal block can create an electrical hazard. If you do not remove enough insulation, the wire might not make proper contact with the terminal.*

---

3. Using a small slotted screwdriver, press the spring-loaded mechanism above the openings in the terminal block to open the terminal connectors and then insert each exposed wire into the appropriate opening.

   a) Connect the chassis ground wire to the middle terminal in the terminal block.

      This step might be optional with some DC power sources.

   b) Connect the negative DC power wire to the 3 terminal on the terminal block.
   c) Connect the positive DC wire to the 1 terminal on the terminal block.
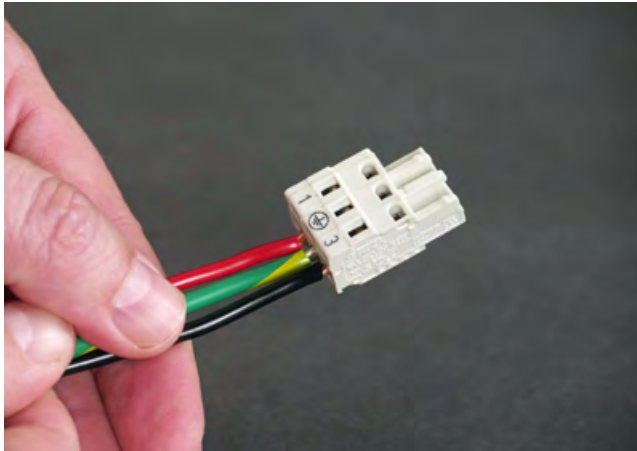
4. Make sure that the power from the DC power source is off.
5. Ensure that the terminal block is not connected to the power supply before adding it to the unit.
6. Remove the AC power supply, if it is installed.
7. Slide the DC power supply into the power supply slot.

8. Tighten the screw completely, using 4 to 5 inch-pounds (0.45 to 0.56 Newton-meters) of torque on the screw.

9. Connect the terminal block into the DC power supply.

10. Power on the DC power source.

If the system does not boot after you power on the DC power source, press the Check button on the LCD to begin booting the system.

About the fan tray

The BIG-IP® 7000 Series platform has a removable fan tray that is designed to maintain airflow throughout the chassis. You can change or replace the fan tray as part of the routine maintenance of the unit, or in the event of a fan failure. The fans in the fan tray run constantly while the unit is powered on. Over time, the fans can wear out, requiring you to replace the fan tray.

Figure 10: The fan tray

Important: *This product is sensitive to electrostatic discharge (ESD). F5® Networks recommends that you use proper ESD grounding procedures and equipment when you install or maintain the unit.*

Replacing the fan tray

You do not need special tools to replace the fan tray. You also do not need to power down the unit when replacing the fan tray; however, F5® Networks highly recommends that you do not leave the unit operating without a fan tray for longer than 30 seconds.

Caution: *Operating the unit without a fan tray for more than 30 seconds might cause permanent damage.*

---

1. Stand at the back of the platform and locate the thumb screws on the fan tray.
2. Loosen the fan tray screws by turning them counterclockwise with a Phillips screwdriver, if necessary.

Note: *The screws that hold the fan tray in place are captive and cannot be removed from the assembly.*

---

3. Remove the fan tray from the system by grabbing both handles (one with each finger) and pulling straight toward you.

4. Install the fan tray into the system opening and push inward until it stops.

Note: Guide pins on the fan tray align it into place during the final stage of the engagement.

5. Tighten the screws into place, using 4 to 5 inch-pounds (0.45 to 0.56 Newton-meters) of torque on the screws.

The fan tray is connected to the system when you tighten the screws completely. When seated, the fan tray automatically powers up and begins circulating air through the chassis.

About the hard disk drives

The BIG-IP® 7000 Series platform includes two hot swappable hard disk drives (HDDs) and supports hard disk drive mirroring using RAID. You can change or replace the drives as part of routine maintenance of the unit or in the event of a drive failure.

Figure 11: Orientation of the 7000 Series platform hard drive bays

1. Hard disk drive bay 1
2. Hard disk drive bay 2

Identifying a faulty hard disk drive

To access the hard disk drives (HDDs), you must first remove the bezel from the unit.

Before you remove the HDD from the system, you should first identify the faulty drive.

1. Open the Traffic Management Shell (`tmsh`).

   `tmsh`

2. View the status of the drives.

   `show sys raid`

   A disk summary similar to this example displays:

```
--------------------
Sys::Raid::Array: MD1
--------------------
Size (MB)  931.5K

----------------------------------------------------------
Sys::Raid::ArrayMembers
Bay ID  Serial Number    Name  Array Member  Array Status
----------------------------------------------------------
1       WD-WXG1C52Y5088  HD2   yes           failed
2       WD-WXP1C52U8160  HD1   yes           ok

-----------------------------------------------------------
Sys::Raid::Bay
Bay  Shelf  Name  Serial Number    Array Member  Array Status
-----------------------------------------------------------
1    1      HD2   WD-WXG1C52Y5088  yes           failed
2    1      HD1   WD-WXP1C52U8160  yes           ok

----------------------------------------------------------------------
Sys::Raid::Disk
Name  Serial Number    Array   Array Status  Model
                       Member
----------------------------------------------------------------------
HD1   WD-WXP1C52U8160  yes     ok            ATA    WDC WD1000CHTZ-0
HD2   WD-WXG1C52Y5088  yes     failed        ATA    WDC WD1000CHTZ-0
```

3. Make note of the bay number and serial number for the faulty HDD.

   Note: You can also locate the last seven digits of the serial number on the front of the drive. The serial number is printed in its entirety on the labels, on top of the drive.

4. Before you physically remove the HDD from the system, remove the faulty drive from the array.

   The faulty drive is HD2 in the example.

   `modify sys raid array MD1 remove HD2`

5. (Optional) To ensure that you remove the correct drive, you can make the LED blink for the failed drive.

   The faulty drive is in bay 1 in the example.

   `modify sys raid bay 1 flash-led`

   Note: If the faulty drive is not responsive, it might not blink the LED.

   Note: The LED on the drive assembly continues to blink until the failed drive is removed. When the new drive assembly is inserted, the LED blinks until the new drive assembly is added to the array and begins the replication process.

Next, you can physically remove the HDD and replace it with the new one that you received from F5 Networks. You do not have to power down the system before you remove the drive.

Replacing a hard disk drive tray

After you have identified and removed the faulty hard disk drive (HDD) from the platform, you can install the replacement drive that you received from F5®.

1. Remove the front bezel from the unit, if it is still installed.
2. Verify the location of the faulty HDD by comparing the serial number and drive bay that you noted earlier.

   Note: The last seven digits of the serial number are printed on the front of the drive, behind the metal grille.

   Note: The STAT LED for the failed hard disk drive will be lit solid amber.

3. Remove the faulty drive:
   a) Loosen the HDD screw by turning it counterclockwise with an appropriate screwdriver, if necessary.

      Note: The screw that holds the ejector handle in place is captive and cannot be removed from the assembly.

   b) Grasp the ejector handle and pull straight toward you to eject the drive tray from the system.

4. Slide the new HDD into the empty drive bay, by pushing the front of the tray to engage the handle until it swings closed.
5. Tighten the screw into place.

   Use 4 to 5 inch-pounds (0.45 to 0.56 Newton-meters) of torque on the screw. The HDD is connected to the system when you tighten the screw completely.

6. View the status of the HDDs.
   ```
   tmsh show sys raid disk
   ```

   A disk summary similar to this example, displays:

   ```
   --------------------------------------------------------------
   Sys::Raid::Disk
   Name   Serial Number     Array    Array Status  Model
                            Member
   --------------------------------------------------------------
   HD1    WD-WXP1C52U8160   yes      ok            WDC WD1000CHTZ-0
   HD2    WD-WXG1C52Y5088   yes      undefined     WDC WD1000CHTZ-0
   ```

   The status of the replacement HDD is undefined, and the serial number should match that of the replacement drive.

   Note: If after a few seconds, you do not see the additional HDD in the disk summary, the drive might not be seated properly. If this occurs, remove and reinsert the drive.

7. Add the replacement drive (HD2 in the example) to the array.
   ```
   tmsh modify sys raid array MD1 add HD2
   ```

   The status of the replacement drive should change to replicating, and the STAT LED should change to solid green. The replication process typically takes between 15 and 45 minutes.

8. Attach the front bezel to the unit by grasping the bezel using the indentations located on either side. Secure the left side of the bezel by gently pressing forward and slightly upward.

Note: *Failure to use the indentations could result in pinched fingers.*

Environmental Guidelines

General environmental and installation guidelines

The 7000 platform is an industrial network appliance that is designed to be mounted in a standard 19-inch EIA rack. Follow these guidelines to adhere to safety precautions:

- Install the rack according to the manufacturer's instructions and check the rack for stability before placing equipment in it.
- Build and position the rack so that after you install the platform, the power supply and the vents on both the front and back of the unit remain unobstructed. The platform must have adequate ventilation around the unit at all times.
- Although not required, a 1U space between units makes it easier for you to remove the unit from the rack in the event that the unit requires service. A 1U space between units also provides additional cable routing options.
- Leaving at least 100 mm of space from the front panel of the unit to the rack front or rack door provides enough room for you to route the cables without excessive bending or insulation damage.
- A shelf or similar device is required to support the unit if only one person is installing the unit.
- Do not allow the air temperature in the room to exceed 104°F (40°C).
- Do not plug the unit into a branch circuit shared by more electronic equipment than the circuit is designed to manage safely at one time.

Warning: *Due to the weight of the platform, at least two people are required to install this chassis into a rack. Failing to use two people can result in severe personal injury or equipment damage.*

Important: *This product is sensitive to electrostatic discharge (ESD). F5® Networks recommends that you use proper ESD grounding procedures and equipment when you install or maintain the unit.*

Caution: *Customers should not attempt to replace batteries. There is a risk of explosion if a battery is replaced with an incorrect type. Field technicians should dispose of used batteries according to the instructions.*

Attention: *Il y a risque d'explosion si la batterie est remplacée par une batterie de type incorrect. Mettre au rebut les batteries usagées conformément aux instructions.*

⚠ The unit must be connected to Earth ground, and it should have a reliable ground path maintained at all times.

L'appareil doit être mis à la terre et disposer en tout temps d'une voie fiable vers la terre.
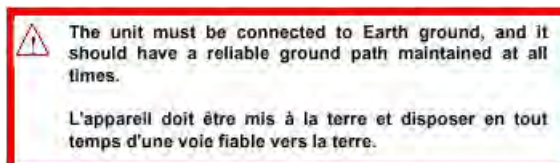
> ⚠ This equipment is not intended for operator serviceability. To prevent injury and to preserve the manufacturer's warranty, allow only qualified service personnel to service the equipment.
>
> Cet appareil n'a pas été conçu de sorte à être réparé par l'utilisateur. Pour prévenir les blessures et préserver la garantie du fabricant, l'appareil ne doit être réparé que par du personnel de réparation qualifié.

> ⚠ The controller contains a lithium battery. There is danger of an explosion if you replace the lithium battery incorrectly. We recommend that you replace the battery only with the same type of battery originally installed in the unit, or with an equivalent type recommended by the battery manufacturer. Be sure to discard all used batteries according to the manufacturer's instructions.
>
> Le contrôleur contient une pile au lithium. Le remplacement incorrect de la pile au lithium risque de provoquer une explosion. Nous vous recommandons de remplacer la pile uniquement par un type de pile identique à celui qui était installé à l'origine dans l'appareil ou par un type équivalent recommandé par le fabricant de pile. Assurez-vous de jeter toutes les piles usées conformément aux instructions du fabricant et aux lois locales.

Guidelines for AC-powered equipment

An AC-powered installation must meet these requirements:

• Use a 15 amp external branch circuit protection device to install the unit.
• Use one power feed for each individual power supply.

Important: *The platform must be installed in a RESTRICTED ACCESS LOCATION, such as a central office or customer premises environment.*

Note: *The power cables included with this unit are for exclusive use with this unit and should not be used with other electrical appliances.*

Note: *These guidelines apply to STATIONARY PLUGGABLE EQUIPMENT TYPE A with simultaneous multiple connections to the AC MAINS SUPPLY:*

• The building installation shall provide a means for connection to protective earth; and
• The equipment is to be connected to that means; and
• A SERVICE PERSON shall check whether or not the socket-outlet from which the equipment is to be powered provides a connection to the building protective earth. If not, the SERVICE PERSON shall arrange for the installation of a PROTECTIVE EARTHING CONDUCTOR from the separate protective earthing terminal to the protective earth wire in the building.

Note: *High leakage current. Earth connection essential before connecting supply.*

Guidelines for DC-powered equipment

A DC-powered installation must meet these requirements:

- Use a 15 amp external branch circuit protection device to install the unit.
- For permanently connected equipment, incorporate a readily accessible disconnect in the fixed wiring.
- Use only copper conductors.
- Cabling for the system must be grounded on both sides.
- Use one power feed for each individual power supply.

⚠ Install DC powered equipment only in restricted access areas, such as dedicated equipment rooms, equipment closets, or similar locations.

Installer le matériel alimenté par courant continu uniquement dans des zones à accès réglementé, telles que des salles de matériel, des armoires de matériel ou tout emplacement similaire.
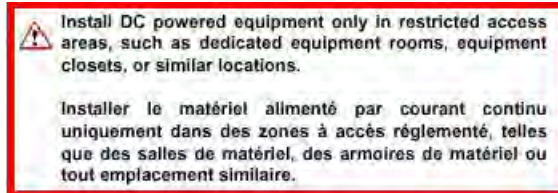
Platform airflow diagram

When you install the platform into a rack, it is important to understand the unit's airflow direction so that you can ensure proper cooling.

The platform employs a negative pressure fan system, which draws cold air in from the front of the chassis.

Exhaust (hot)

Back

Front

Airflow inlet (cold)
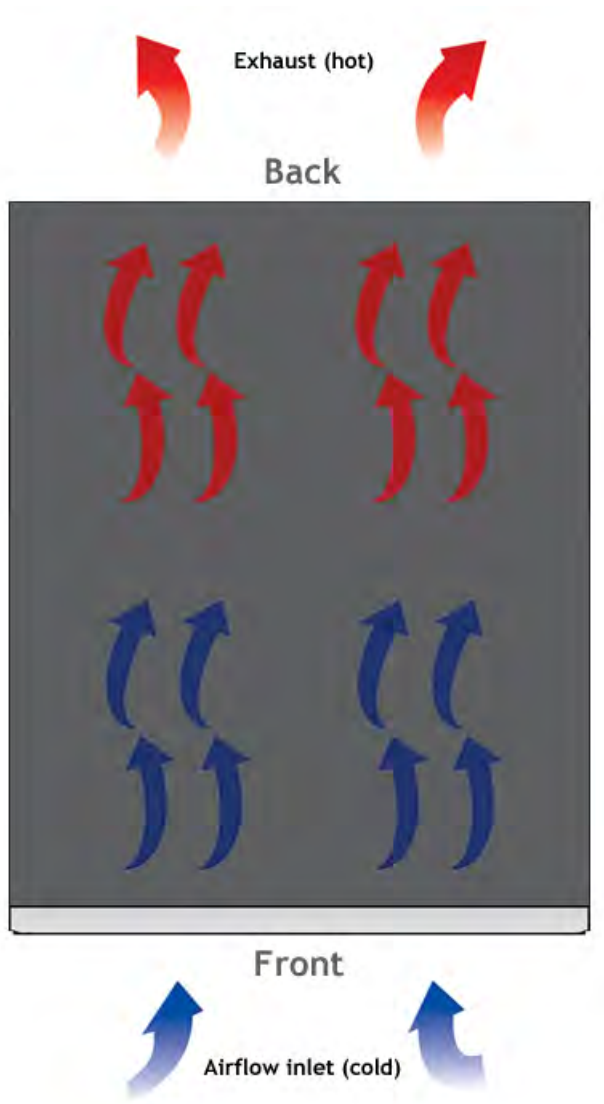
Figure 12: Airflow in the 7000 Series platform

Platform Specifications

General specifications for system features

This table lists general specifications for system features for the 7000 Series platform.

Item	Specification
Transceiver modules hot swap	Support for hot swap of SFP, SFP+, and QSFP+ transceiver modules
Power supply hot swap	Support for hot swap of the power supplies
Jumbo frames	Support for maximum Ethernet frame size of 9216 bytes and MTU of 9128 bytes
Virtual Clustered Multiprocessing™ (vCMP™)	Supports provisioning and managing multiple, hosted instances of the BIG-IP software on a single hardware device

Important: *Specifications are subject to change without notification.*

Platform hardware specifications

This table lists hardware specifications for the BIG-IP® 7000 Series platform.

Item	Specification
Dimensions	H: 3.45 inches (8.76 cm) x W: 17.3 inches (43.94 cm) x D: 21.4 inches (54.36 cm) (per unit) 2U industry standard rack-mount chassis
Weight	40 pounds (18.14 kg) with one power supply, two hard drives, and bezel installed (per unit) 43 pounds (19.50 kg) with two power supplies, two hard drives, and bezel installed (per unit) 42.4 pounds (19.23 kg) with two power supplies, one solid-state drive, and bezel installed (per unit) 42.6 pounds (19.32 kg) with two power supplies, two solid-state drives, and bezel installed (per unit) • Front mount rack brackets add 2 pounds (0.9 kg). • Quick install rail kit adds 5.5 pounds (2.27 kg).
Processor	1 x Quad-Core Intel® Xeon® processor
Communication interfaces	4 x 1GbE Cu RJ45 ports 8 x 10GbE SFP+ ports 1 x 10/100/1000 Ethernet Management port 1 x RJ45 console port 1 x RJ45 failover port 2 x USB 2.0 interfaces

Item	Specification
Storage drive capacity	2 x 1 TB hard disk drive (HDD) 1 x 400 GB solid-state drive (SSD) (7050 platform only) 2 x 400 GB solid-state drive (SSD) (7055 platform only)
RAM	32 GB
AC power input requirements	2 x 400 W 90-240VAC, 50-60hz
DC power supply	1-2 x 300 W DC Operating range: 40 to 72 VDC

Important: *Specifications are subject to change without notification.*

Important: *F5® Networks only provides support for F5-branded or F5-provided optical modules.*

Platform environmental operating specifications

This table lists platform environmental operating specifications.

Item	Specification
Operational temperature	32 to 104°F (0 to 40°C)
Operational relative humidity	GR-63-CORE table 4-4 5% to 85% (40°C) non-condensing 5% to 90% (40°C) non-condensing for a maximum of 96 hours
Non-operational temperature	-40 to 158°F (-40 to 70°C)
Non-operational relative humidity	5 to 95% (40°C) non-condensing

Important: *Specifications are subject to change without notification.*

Platform power specifications - 7000s/7200v

This table lists power specifications for the BIG-IP® 7000s/7200v platform.

Item	Single Power Supply	Dual Power Supply
Typical power draw (AC power; 50% load; temp 25°C)	110VAC input: 200W 220VAC input: 195W	110VAC input: 205W 220VAC input: 200W
Typical power draw (DC power; 50% load; temp 25°C)	48VDC input: 205W	48VDC input: 210W
Maximum power draw (AC power)	90VAC input: 290W	90VAC input: 295W

Item	Single Power Supply	Dual Power Supply
Maximum power draw (DC power)	40VDC input: 310W	40VDC input: 315W
Typical heat generated (AC power)	110VAC input: 683 BTU/hour 220VAC input: 666 BTU/hour	110VAC input: 700 BTU/hour 220VAC input: 683 BTU/hour
Typical heat generated (DC power)	48VDC input: 700 BTU/hour	48VDC input: 717 BTU/hour
Maximum heat generated (AC power)	90VAC input: 990 BTU/hour	90VAC input: 1007 BTU/hour
Maximum heat generated (DC power)	40VDC input: 1058 BTU/hour	40VDC input: 1075 BTU/hour

Important: *Specifications are subject to change without notification.*

Platform power specifications - 7050 Series

This table lists power specifications for the 7050 Series platform.

Item	Single Power Supply	Dual Power Supply
Typical power draw (AC power; 50% load; temp 25°C)	110VAC input: 210W 220VAC input: 200W	110VAC input: 215W 220VAC input: 210W
Typical power draw (DC power; 50% load; temp 25°C)	48VDC input: 215W	48VDC input: 220W
Maximum power draw (AC power)	90VAC input: 300W	90VAC input: 305W
Maximum power draw (DC power)	40VDC input: 320W	40VDC input: 325W
Typical heat generated (AC power)	110VAC input: 715 BTU/hour 220VAC input: 680 BTU/hour	110VAC input: 735 BTU/hour 220VAC input: 715 BTU/hour
Typical heat generated (DC power)	48VDC input: 735 BTU/hour	48VDC input: 750 BTU/hour
Maximum heat generated (AC power)	90VAC input: 1025 BTU/hour	90VAC input: 1040 BTU/hour
Maximum heat generated (DC power)	40VDC input: 1090 BTU/hour	40VDC input: 1075 BTU/hour

Important: *Specifications are subject to change without notification.*

Safety requirements

This equipment complies with these requirements of the Low Voltage Directive 2006/95/EC:

EC Type Examination Certificates: Master Contract 252302

  CB Scheme

  EN 60950-1:2006+A11:2009+A1:2010+A12:2011

  IEC 60950-1:2005, A1:2009

  CSA 60950-1-07, Including Amendment 1:2011

  ANSI/UL 60950-1-2011

Important: Specifications are subject to change without notification.

EMC requirements

USA--FCC Class A, Canada--Industry Canada Class A

This equipment complies with Subpart B of Part 15 of FCC Rules for Class A digital devices, Industry Canada ICES-003, Issue 5. Operation is subject to these two conditions:

1. This equipment may not cause harmful interference.
2. This device must accept any interference received, including interference that may cause undesired operation.

Important: Specifications are subject to change without notification.

Acoustic, airflow, and altitude specifications

This table lists acoustic levels, airflow movement, and operational altitude specifications for the BIG-IP® 7000 Series platform.

Specification type	Detail	Units	Value
Acoustic [1]	Front	dBA	67
	Back	dBA	78
	Left	dBA	66
	Right	dBA	69
	Top	dBA	69

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[1] Acoustic measurements taken at 0.6 meter with two power supplies operational and fans at normal operating conditions (27°C and 80% duty cycle). Maximum acoustic noise is 83dBA at 100% duty cycle. Measurements recorded in Decibels A-weighting.

Specification type	Detail	Units	Value
Altitude [2]	Operational Non-operational	Feet (Meters) Feet (Meters)	6,000 (1,829) 40,000 (12,192)
Airflow [3]	Open air	CFM	135.7

__Important:__ *Specifications are subject to change without notification.*

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[2] Per BELCORE GR-63-CORE, section 4.1.3: This unit is functional when installed at elevations between 60m (197 feet) below sea level and 1800m (6000 feet) above sea level at the aisle ambient temperatures of 40°C.

[3] Fan Tray airflow measurements taken at 100% duty cycle and in open air.

China RoHS Requirements

Hazardous substance levels for China

This table shows how the BIG-IP® 7000 Series platform components conform to the Restriction of Hazardous Substances (RoHS) Directive standards for China.

7000 系列有害物质表

7000 Series Hazardous Substance Table

部件名称 Part Name	有毒有害物质 Hazardous Substance					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	铬 6+ (Cr⁶⁺)	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 Metal Parts	X	O	O	O	O	O
电源 Power Supplies	X	O	X	O	O	O
主板 Motherboard	X	O	O	O	O	O
排热器部件 Heatsink Assemblies	O	O	O	O	O	O
闪存卡 Compact Flash Card	X	O	O	O	O	O
硬盘 / 固态硬盘 Hard Drives or SSDs	X	O	O	O	O	O
风扇装置 Fan Assembly	X	O	O	O	O	O

o: 表示该有毒有害物质在该部件所有均质材料中的含量均在 **SJ/T 11363-2006** 标准规定的限量要求以下
Expresses that this hazardous substance is below the specified limits as described in **SJ/T 11363-2006.**

x: 表示该有毒有害物质至少在该部件的某一均质材料中的含量超出 **SJ/T 11363-2006** 标准规定的限量要求
（企业可在此处，根据实际情况对上表中打"×"的技术原因进行进一步说明）
Expresses that this hazardous substance is above the specified limits as described in **SJ/T 11363-2006.**

除非另外特别的标注，此标志为针对所涉及产品的环保使用期标志。某些零部件会有一个不同的环保使用期（例如，电池单元模块）贴在其产品上。
此环保使用期限只适用于产品是在产品手册中所规定的条件下工作。
The Environmentally Friendly Use Period (EFUP) for all enclosed products and their parts are per the symbol shown here, unless otherwise marked. Certain parts may have a different EFUP (for example, battery modules) and so are marked to reflect such. The Environmentally Friendly Use Period is valid only when the product is operated under the conditions defined in the product manual.

Repackaging Guidelines

About repackaging the platform

If it becomes necessary to transport the platform to another location or return it to F5® Networks, these guidelines will help ensure that you repackage the platform properly.

If you are running BIG-IP® software version 11.6 or later, you can perform a disk erase operation to erase all sensitive data from solid-state drives (SSDs) and hard disk drives (HDDs) before you return a platform to F5. For more information, see *F5® Platforms: Essentials*.

Important: Before returning any equipment, contact F5 Networks to obtain a Service Order (SO) or Return Material Authorization (RMA) case number.

Important: You must use shipping materials and packaging provided by F5 Networks when repackaging the platform.

Note: Be sure to keep a record of the tracking number and ship date. These will be needed to track lost shipments.

Note: Do not include any cables, removable XFP/SFP modules, GBICs, or other peripheral items if you are returning the platform to F5 Networks.

Repackaging the platform

The 7000 Series platform must be shipped in packaging provided by F5® Networks.

1. Disconnect the network cables and other cables from the platform, and then remove any optical modules.
2. Remove the platform from the rack.
3. Remove any rack-mounting hardware, such as the brackets or rail kit.
4. Remove the front bezel.
5. Place the platform in the shipping box on top of the plastic wrapping.
   Orient the chassis so that the power supplies fit the cutouts in the lower foam end.

6. Cover the platform with the plastic wrapping.

7. Place the upper foam inserts on the front and back sides of the platform.

8. Place the accessory tray on top of the upper foam inserts.

9. Place the mounting options box in the accessory tray.

10. Close and seal the shipping box.

Returned Material Data Security Statement

About returned material data security

Follow these data security guidelines when returning equipment to F5® Networks for reprocessing or repair. The guidelines include reprocessing procedures and optional customer-end procedures.

About memory technologies used in F5 equipment

F5® Networks equipment contains volatile, battery-backed volatile, and non-volatile memory. Volatile memory loses all traces of data on power down. Battery-backed volatile memory retains data as long as battery charge is maintained. Non-volatile memory retains data indefinitely.

Volatile memory

Volatile memory loses all traces of data on power down; therefore, customer data that is stored in volatile memory is secure when power is removed from the platform. No further action is required by customers for equipment that includes volatile memory.

Battery-backed volatile memory

This F5® platform contains a coin battery for maintaining BIOS settings and the system clock. All data maintained by the coin battery is used only for system specific tasks. No customer data is maintained by the battery-backed volatile memory. No further action is required by customers for equipment that includes volatile memory.

Non-volatile memory

F5® platforms include various non-volatile memory components. These non-volatile memory components can be categorized as either user inaccessible or user accessible.

Inaccessible non-volatile memory components are programmed during manufacture or software installation. The data stored in user inaccessible non-volatile memory is used for setting voltage levels, determining the sequence of operational events, and the managing appliance operational condition. Data held within user inaccessible, non-volatile memory represents no data security risk to customers. User inaccessible, non-volatile memory cannot be modified by appliance users, and therefore, contains no customer data.

Inaccessible non-volatile memory

This table lists the inaccessible non-volatile memory in this system.

Description	Data	Customer data
Programmable firmware stores	Firmware	No
Switch Card SEEPROM	Platform ID, serial number, part number, and so on.	No
PHY EEPROMs	PHY MAC address	No

Accessible non-volatile memory

This table lists the accessible non-volatile memory in this system. Not all platform variants include all of these non-volatile memory items.

Description	Data	Customer data	Data security method
Hard disk drive (HDD)	F5® product software, customer configuration, and log files	Yes	Standard reprocessing or customer removal
Solid-state drive (SSD)	F5 product software, customer configuration and log files	Yes	Standard reprocessing or customer removal
Always-On Management (AOM) Flash chip (soldered-down flash chip)	AOM boot code and customer custom configuration	Yes	Standard reprocessing or customer action
FIPS card (if present)	FIPS security domain and private keys	Yes	Standard reprocessing or customer action

About removing data from F5 components

For components that contain sensitive customer data and cannot be removed from your F5® Networks system, you can take optional steps to remove the data from these components before you return the system to F5 for processing.

Removing sensitive data from storage drives

The hard disk drive (HDD) and solid-state drive (SSD) components included in F5® platforms might include sensitive customer data. If you purchase the HDD removal SKU, you can remove the HDD/SSD and coin battery, and these components will be replaced during F5 reprocessing. Otherwise, HDD and SSD components are processed by F5 through standard processing. You can perform a disk erase operation on your system to remove sensitive customer data.

Perform a disk erase operation using one of these methods:

- On systems running BIG-IP® software version 11.6.0 and later, you can use the F5 `Disk Erase` utility to remove all data on hard disk drives (HDDs) or solid-state drives (SSDs) using a single-pass, zero write disk erase operation. For more information, see `http://support.f5.com/kb/en-us/solutions/public/15000/500/sol15521.html`.
- On systems running earlier versions of BIG-IP software, you can create and use a bootable USB drive to rebuild the system with a clean image of BIG-IP software. This runs a disk erase operation

and removes the master boot record (MBR). For more information see
`http://support.f5.com/kb/en-us/solutions/public/13000/100/sol13164.html`.

Removing IP address data from Always-On Management

If you have configured an IP address for the Always-On Management (AOM) subsystem, you can remove the customized IP address from the system before returning it to F5® Networks.

1. Connect to the system using the serial console.
2. Open the AOM Command Menu.
   `Esc (`
3. Assign a new management IP address, netmask, and gateway:
   - To use DHCP to assign the addresses, type `y` when prompted about using DHCP.
   - To manually assign the addresses, type `n` when prompted about using DHCP. At the prompts, type values for IP address (required), netmask (required), and gateway (optional).

   A confirmation message displays the configured management IP address, netmask, and gateway.
4. (Optional) Type `i` to verify the assigned addresses.

Removing sensitive data from an internal hardware security module (HSM)

If the system includes an internal hardware security module (HSM), also referred to as a FIPS card, you can remove the sensitive customer data from HSM before returning it to F5® Networks.

Important: The HSM cannot be removed from the platform.

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1. Use the Configuration utility to delete all key/certificate pairs.
   a) On the Main tab, click **System** > **File Management** > **SSL Certificate List**.
      This displays the list of certificates installed on the system.
   b) Select the certificates that you want to delete and click **Delete**.

   This removes all `.crt`, `.exp`, and `.key` files from the system.
2. Log on to the command line of the system using an account with root access.
3. Initialize the HSM and reconfigure it using fictitious data.
   `run util fips-util -f init`

   For more information on using this command on a FIPS platform, see *BIG-IP® Platform: FIPS Administration*.

Important: This deletes all keys and makes any previously exported keys unusable.

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