Platform Guide: 11000

MAN-0365-02

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The 11000 Platform

About the 11000 Platform

The BIG-IP® 11000 platform is a powerful system that is capable of managing traffic for any size of enterprise.

Before you install the 11000 platform, review helpful information about the controls and ports located on both the front and the 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 hard disk access. You can also use the front-panel LEDs to assess the condition of the unit. On the back, you can power off the unit.

1. Management port
2. USB ports
3. Console port
4. Serial (hard-wired) failover port
5. SFP+ ports
6. LCD display
7. LCD control buttons
8. Indicator LEDs

Figure 1: Front view of the platform

The back of the platform includes two power supplies.

1. Power input panel (power switch and power receptacle)

2. Power input panel (power switch and power receptacle)
3. SAS expander port (future use)
4. Cluster 1 and Cluster 2 ports (future use)
5. Fan tray

Figure 2: Back view of the platform

Components provided with the platform

When you unpack the platform, verify that the following components are included.

Quantity	Hardware
2	Power cables (black), AC power only
2	DC terminal blocks, DC power option only
1	Serial failover cable (blue)
1	Console cable (beige)
1	Front-mounting kit
1	Rail-mounting kit
1	Front bezel
2	SFP+ 10G optical transceivers

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 installed in the platform. You can use either 10/100/1000 Ethernet or 10 Gigabit Ethernet switches.
External USB CD/DVD drive or USB flash drive	You can use any USB-certified CD or DVD mass storage device for installing upgrades and for system recovery. ***Note:*** *External CD/DVD drives must be externally powered.*
Serial terminal console	You can remotely manage the platform by connecting to a serial terminal console through the console port.
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 LCD menus

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

LCD config menu

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

Option	Description
Backlight	Specifies an LCD screen backlighting option. Select from the following 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.

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 menu.

Option	Description
MACscreen	Displays the MAC addresses on the unit.
SysinfoScreen	Displays system information.
TMMAuthScreen	Displays the number of authentication requests being processed.
TMMCPUScreen	Displays the CPU usage percentage.
TMMMemoryScreen	Displays the memory usage.
TMMStatScreen	Displays simple statistics, such as bytes and packets in and out of the system.
VersionScreen	Displays product version information.

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
Management	Changes the management interface information. Select from the following options: • Mgmt IP sets the management interface IP address. You can use only an IPv4 address. • Mgmt Mask sets the netmask for the management interface 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 serial port. Select from the following 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.

Using LCD menus

Press the X button to put the LCD in Menu mode.

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

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

Halting the unit

We recommend that you 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 into standby mode

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

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

Rebooting 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

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.

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.

Status LED

When the unit is in a standard operating state, the Status LED behaves in a defined manner.

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	The system is not under host computer control. This might be due to the host being halted or due to a software or hardware problem that interferes with the host's control of the LED.

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

LED alert conditions

When there is an alert condition on the unit, the Alarm LED behaves in a specific manner.

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

Action	Description
System situation	Alarm LED behavior
Emergency	Red blinking
Alert or Critical	Red solid
Error	Yellow blinking

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.

Note: *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. Add the following lines to the end of the file:

```
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.
   The front panel LEDs now indicate when a node is down.

Additional indicator LED status conditions

A few LED status conditions are not covered in the definition tables in the `/etc/alertd/alert.conf` file.

Yellow intermittent Status LED indicator

A yellow intermittent Status LED indicates that the unit is not under host computer control. This might be due to the host being halted or due to a software or hardware problem that interferes with the host's control of the LED.

Green/Yellow solid Status LED indicator

When the Status LED indicator is solid yellow or green, it indicates that the system is in a Standby state (yellow) or an Active state (green). It displays solid green if the unit is Standalone or if it is the Active unit of a redundant system configuration. It displays yellow if the unit is the Standby member of a redundant system configuration.

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 `tmsh` or the Configuration utility to configure 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>
   ```

   The following is an example of the output you might see when you issue this command on interface 1.2:

```
-------------------------------------------------------
Net::Interface
Name  Status  Bits  Bits  Errs  Errs  Drops  Drops  Colli
                In   Out    In   Out     In    Out  sions
-------------------------------------------------------
1.2       up 191.4K    0     0     0    374      0      0
```

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
   ```

   The following is an example of the output you might see when you issue this command:

```
-------------------------------------------------------------
Net::Interface
Name  Status   Bits    Bits  Errs  Errs  Drops  Drops  Colli
                 In     Out    In   Out     In    Out  sions
-------------------------------------------------------------
1.1     down      0       0     0     0      0      0      0
1.2       up 191.4K       0     0     0    374      0      0
1.3     down      0       0     0     0      0      0      0
1.4       up  22.5K       0     0     0     44      0      0
2.1     miss      0       0     0     0      0      0      0
2.2     miss      0       0     0     0      0      0      0
mgmt      up  43.2G  160.0G     0     0      0      0      0
```

Viewing the status of all interfaces using the Configuration utility

You can use the Configuration utility to view the status of all interfaces on the platform.

1. On the Main tab, click **Network** > **Interfaces**.
   This displays the list of available interfaces.
2. 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 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 duplexsettings, 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: *If you manually configure the platform to use specific speed and duplex settings on interfaces, Auto-MDI/MDIX functionality is disabled by default. When an interface is set manually, it functions as a data terminal equipment (DTE) port. This means that crossover cables are required to connect to other DTE devices (such as servers), and straight-through cables are required for connecting to data communications equipment (DCE) devices (for example, switches or routers). Be sure to use the correct cable type (straight-through or crossover) if you manually set interface speed and duplex settings.*

Important: *Starting with BIG-IP software versions 9.4.8 and 10.1.0, Auto-MDI/MDIX functionality is retained when you manually configure an interface to use specific speed and duplex settings. With these versions of the BIG-IP system, 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

The following 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 `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 using tmsh

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.

```
show running-config interface <interface_key> media-capabilities
```

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

The following is an example of the output you might see when you issue 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	Not lit	Not lit
10Mbit/s, half duplex	Yellow blinking	Yellow solid
10Mbit/s, full duplex	Yellow blinking	Green blinking
100Mbit/s, half duplex	Yellow solid	Yellow blinking
100Mbit/s, full duplex	Yellow solid	Green blinking
1Gbit/s, half duplex	Green solid	Yellow blinking
1Gbit/s, full duplex	Green solid	Green blinking

SFP port LED behavior

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

Link	Speed LED	Activity LED
No link	Not lit	Not lit
10 Mbit/s, half duplex	Yellow blinking	Yellow solid
10 Mbit/s, full duplex	Yellow blinking	Green blinking
100 Mbit/s, half duplex	Yellow solid	Yellow blinking
100 Mbit/s, full duplex	Yellow solid	Green blinking
1 Gbit/s, half duplex	Green solid	Yellow blinking
1 Gbit/s, full duplex	Green solid	Green blinking

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 BIG-IP® system remotely using SSH or serial console, even if the host is powered down. The AOM Command Menu operates independently of the BIG-IP 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.

AOM consists of the host console shell (hostconsh) and the AOM Command Menu, which contains the options for AOM.

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

AOM Command Menu options

The AOM Command Menu provides Always-On Management options for the BIG-IP system.

Number/Letter	Option	Description
1	Connect to Host subsystem console	Exits the AOM Command Menu and returns to terminal emulation mode.

Number/Letter	Option	Description
2	Reboot Host subsystem (sends reboot command)	Reboots the host subsystem. In this case, the Traffic Management Operating System (TMOS) is rebooted.
3	Reset Host subsystem (issues hardware reset--USE WITH CARE!)	Resets the host subsystem. In this case, TMOS is halted. ***Important:*** *We do not recommend using this option under normal circumstances. It does not allow for graceful shutdown of the system.*
4	Reset AOM subsystem (issues hardware reset--USE WITH CARE!)	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.*
5	Power off/on Host subsystem (issues hardware shutdown--USE WITH CARE!)	Powers off the Host subsystem. In this case, TMOS is powered off. If the Host subsystem is already powered off, this option powers on the Host subsystem.
B	AOM baud rate configurator	Configures the baud speed for connecting to AOM using the serial console.
L	AOM subsystem login	Presents a logon prompt for the AOM subsystem. This subsystem cannot be configured by end users.
N	AOM network configurator	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.
P	AOM platform information	Displays information about the platform, including serial number and MAC address.

Accessing the AOM Command Menu from the serial console

You can access the AOM Command Menu through the host console shell (hostconsh) using the front panel serial console.

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

```
Esc (
```

Setting up Always-On Management SSH access

You can use the AOM Command Menu to set up remote SSH access to the system and then connect remotely using an SSH client.

1. Connect to the system using the serial console.

2. Open the AOM Command Menu.
   ```
   Esc (
   ```
3. Type `n` to open the AOM network configuration utility.
4. Configure an IP address and gateway for the AOM subsystem.

Accessing the AOM Command Menu using SSH

You can access the AOM Command Menu through the host console shell (hostconsh) remotely through SSH, provided you have configured an IP address for AOM.

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 hostconsh shell.
   ```
   hostconsh
   ```
4. Open the AOM Command Menu.
   ```
   Esc (
   ```

Platform Installation

About platform installation

After you have reviewed the hardware requirements and become familiar with the 11000 platform, you can install the unit.

Caution: *Due to the weight of the chassis, at least two people are required to install the platform into a rack.*

Determining which rack mounting kit to use

The 11000 platform comes with two types of rack mounting kits: stationary front-mounting and sliding rail-mounting. An advantage of installing the sliding rail-mounting kit is that you can then slide the unit in and out of the rack as needed.

Note: *You should use the front-mounting kit to install 11000 series platforms only if you are installing the platform into a two-post rack. For installing the platform into all other types of racks or cabinets, you should use the quick-install rail kit.*

The tasks required to install the platform 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 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 if that the unit requires service. A 1U space between units also provides additional cable routing options.

Leaving at least 100 mm spacing 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.

Caution: *To prevent personal injury or damage to the unit, F5 Networks strongly recommends that at least two people perform the installation.*

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.*

About the front-mounting kit

You can use the front-mounting kit if you are installing into a two-post rack.

Note: *You should use the front-mounting kit to install 11000 series platforms only if you are installing the platform into a two-post rack. For installing the platform into all other types of racks or cabinets, you should use the quick-install rail kit.*

Front-mounting kit hardware

The front-mounting kit includes these parts.

Quantity	Hardware
2	front-mounting brackets
10	M4 x 10mm flat head screws
4	M4 finishing washers

Installing using a front-mounting kit

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

This platform includes front-mounting brackets, which you can use to attach the unit directly to the rack.

Caution: *Due to the weight of this platform, two people are required to unpack and install it. Failing to use two people can result in severe personal injury or equipment damage and might violate safety regulations.*

1. Align the holes on the front-mounting bracket with the holes on the side of the unit.
2. Secure the front bracket to the unit using two of the finishing washers and five of the flat head screws that are included in the kit.

   Loosely install all five screws, and then tighten them securely. Use 18 to 20 inch-pounds (2.0 to 2.3 Newton-meters) of torque on these screws.

3. Repeat steps 1 and 2 for the other bracket.

4. Lift the unit into place in the rack.

   Caution: *Due to the weight of the chassis, this step requires two people.*

5. Secure the front-mounting brackets to the rack using four rack manufacturer-provided screws.

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

6. Attach the front bezel to the unit by grasping the bezel on either side using the indentations provided.

   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. We recommend that you use a shelf kit created by the rack manufacturer, if available.

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 the following hardware:

- two rails (left and right)
- 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 4: 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.

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.*

Figure 5: An example of a platform installed using the quick-install rail kit

After installing the platform, you should secure it to the rack using the included rail locks. You should also attach the front bezel to the unit by grasping the bezel on either side using the indentations provided.

Connecting the cables and other hardware

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

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.*

2. Connect the serial console cable supplied by F5® Networks to 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. F5 Networks recommends that you perform all installations and upgrades using the serial console, as these procedures require reboots, in which network connectivity is lost temporarily.*

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

3. For AC-powered systems, connect the power cable to the power input panel, and then connect the cable 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/1000/800/sol1858.html`.

Configuring a management IP address

You can use the LCD panel to configure the management IP address. The management IP address enables you to access the 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. Use the arrow keys to select **System**, and then press the Check button.
3. Press the Check button to select **Management**.

4. Press the Check button to select **Mgmt IP**.
5. Enter your management IP address using the up and down arrow keys, and then press the Check button.
6. Use the arrow keys to select **Mgmt Mask**, and then press the Check button.
7. Enter the netmask using the up and down arrow keys, and then press the Check button.
8. Use the arrow keys to select **Mgmt Gateway**, and then press the Check button.
9. Enter your default route using the up and down arrow keys, and then press the Check button. If you do not have a default route, enter 0.0.0.0.
10. Use the arrow keys to select **Commit**, and then press the Check button.
11. Press the Check button to select **OK**.

Platform Maintenance

About platform maintenance

The 11000 platform contains several components that can be replaced individually without exchanging the entire system. This platform contains the following 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 if there are two installed in your system.

Figure 6: A power supply partially removed from the platform

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.*

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: *F5 Networks strongly recommends that you use only one power supply type (AC or DC) in a platform.*

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 that holds the ejector handle in place is captive and cannot be removed from the assembly.*

3. Grasp the ejector handle and rotate it downward to eject the power supply from the system.

4. Remove the power supply from the system by pulling straight toward you.
5. Ensure that the latch on the new power supply is in the down position and slide the power supply into the power supply slot until the latch engages.
6. Rotate the latch upward to fully seat the power supply.
7. Tighten the screw into place.

   Use 4 to 5 inch-pounds (0.45 to 0.56 Newton-meters) of torque on the screw. The power supply is connected to the system when you tighten the screw completely.
8. Attach the power cord to the new power supply.
9. Ensure that the power switch, located on the power supply next to the screw, is in the ON position.

About DC power supplies

The BIG-IP® platforms support DC power supplies. You can hot swap power supplies if there are two installed in your system. 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 7: The 11000 platform DC power supply and terminal block

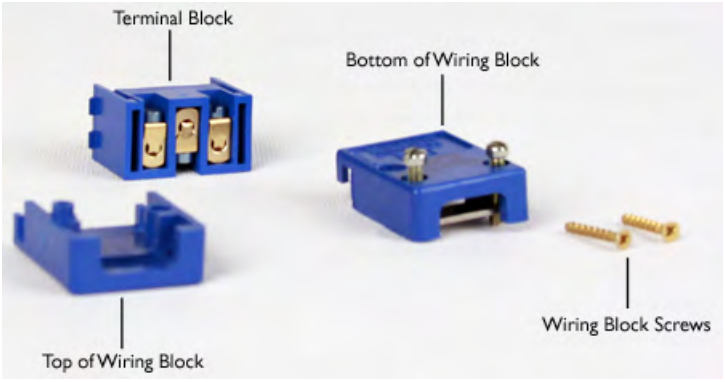


Figure 8: DC terminal block components

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.*

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: *All copper grounding cable used for grounding must meet all appropriate UL standards.*

Note: *You should coat bare conductors with an appropriate antioxidant compound before you make crimp connections. You should bring all unplated connectors, braided strap, and bus bars to a bright finish and then coat them with an antioxidant before you connect them.*

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.*

Wiring the DC power supply terminal block

You will need the following tools to assemble and wire the DC terminal block:

- Wire stripping tool
- Small Phillips screwdriver
- Small flat head screwdriver

The DC power supply for the 11000 platform includes a DC terminal block. You connect the wires to the terminal block and then insert the terminal block into the DC power supply.

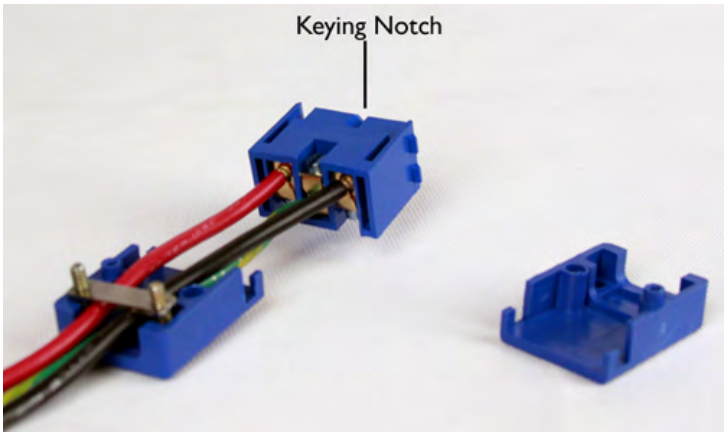
1. Review the DC power supply label and determine the correct wire size for your installation.
2. Use the wire stripping tool to remove 3/8 inch (9.56 mm) of insulation.

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. Thread the wires through the bottom of the terminal block, with the positive DC wire (typically red) on the left, the chassis ground wire in the middle, and the negative DC wire (typically black) on the right.

   Note the orientation of the keying notch on the terminal block. When the keying notch is up, the positive terminal is on the left.



4. Insert each exposed wire into the appropriate connector on the terminal block.

   If necessary, use a small flat head screwdriver to loosen the screws above the openings in the terminal block to open the terminal connectors.

5. Attach the wired half of the terminal block to the other half of the terminal block, and then connect the top of the terminal block until the two halves click into place.
6. Tighten the wire clamp screws on the bottom of the terminal block using a small flat head screwdriver.
7. Insert the two gold screws that are provided with the DC power supply kit into the top and bottom of the terminal block, and then use a Phillips screwdriver to secure the two halves.

Installing a DC power supply

After you have assembled and wired the terminal block, you can install the DC power supply into the platform and connect the platform to the DC power source. 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.

Important: *When you connect the DC power source, F5 Networks recommends that you follow the safety requirements defined for the facilities where the DC-powered platforms will be installed.*

1. Make sure that the power from the DC power source is off.
2. Ensure that the terminal block is not connected to the power supply before adding it to the unit.
3. Remove the existing AC or DC power supply, if one is installed.
   a) Disconnect the AC power cord or DC terminal block from the power supply.
   b) Loosen the power supply 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.*

   c) Grasp the ejector handle and rotate it downward to eject the power supply from the system.
   d) Remove the power supply from the system by pulling straight toward you.
   e) Ensure that the latch on the new power supply is in the down position, and then slide the power supply into the power supply slot until the latch engages.
   f) Rotate the latch upward to fully seat the power supply.
   g) Tighten the screw into place.

   Use 4 to 5 inch-pounds (0.45 to 0.56 Newton-meters) of torque on the screw. The power supply is connected to the system when you tighten the screw completely.
4. Loosen the power supply screw on the DC power supply by using an appropriate screwdriver, if necessary.
5. Slide the DC power supply into the power supply slot.
6. Connect the terminal block that you assembled earlier to the DC power source and be sure to connect the ground wire to a common bonding network (CBN).
7. 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 panel to begin booting the system.

About the fan tray

The 11000 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 on. Over time, the fans can wear out, requiring you to replace 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.*

Figure 9: An example of a fan tray in a platform

Replacing the fan tray

You do not need special tools to replace the fan tray. You 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 ejector handle on the fan tray.
2. Loosen the fan tray screw by turning it counterclockwise with a Phillips screwdriver, if necessary.

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

3. Grasp the ejector handle and rotate it downward to eject the fan tray from the system.
4. Remove the fan tray from the system by pulling straight toward you.
5. Ensure that the handle on the new fan tray is in the down position and slide the fan tray into the fan tray slot until the latch engages.
6. Rotate the handle upward to fully seat the fan tray.
7. Tighten the screw into place.

   Use 4 to 5 inch-pounds (0.45 to 0.56 Newton-meters) of torque on the screw. The fan tray is connected to the system when you tighten the screw completely. Once seated, the fan tray automatically powers up and begins circulating air through the chassis.

About 11000 Series Platform Drive Options

The BIG-IP® 11000 platforms have four drive bays. The default platform configuration includes two hot swappable hard disk drives (HDDs).

Figure 10: The front of a platform with front bezel removed and the orientation of the drive bays

The 11000 platform also supports the use of solid-state drives (SSDs) that come in a dual-disk drive sled and are installed along with hard disk drives. HDDs are installed in the two leftmost drive bays (bays 1 and 2), and SSDs are installed in the two rightmost bays (bays 3 and 4). You can distinguish a drive sled that contains SSDs by the red-colored metal grille on the front of the drive sled.

Figure 11: An example of a solid-state drive sled installed in a platform

You can change or replace the drives as part of the routine maintenance of the unit or in the event of a drive failure. When replacing SSDs, you must replace both of the dual-disk drive sleds installed in the platform.

Installing a hard disk drive or solid-state drive

After you receive a hard disk drive sled or solid-state drive sled from F5 Networks, you can install it into your platform.

Note: *When replacing SSDs, you must replace both of the dual-disk drive sleds installed in the platform. Only the 11000 platform supports the use of SSDs.*

1. Remove the front bezel from the unit.
2. Loosen the drive sled 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.*

3. Slide the new drive sled into the empty drive bay.
4. Tighten the screw into place.

   Use 4 to 5 inch-pounds (0.45 to 0.56 Newton-meters) of torque on the screw. The drive sled is connected to the system when you tighten the screw completely.
5. Type the following command to see the status of the drives:

   ```
   tmsh show sys raid disk
   ```

A disk summary similar to the following displays:

```
-------------------------------------------------------------------------
Sys::Raid::Disk
Name  Serial Number         Array   Array Status  Model
                            Member
-------------------------------------------------------------------------
CF1   CB225535315009033B03  no      undefined     SILICONSYSTEMS INC 8GB
HD1   WD-WCAT1E420107       yes     ok            ATA     WDC WD3000BLFS-0
HD2   WD-WCAT1E477614       no      undefined     ATA     WDC WD3202ABYS-0
SSD1  CVPO014601CG160AGN    no      undefined     ATA     INTEL SSDSA2M160
SSD2  CVPO0146016R160AGN    no      undefined     ATA     INTEL SSDSA2M160
```

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

Note: *If you do not see the recently-added drive in the disk summary, the drive sled might not be seated properly. If this occurs, remove and reinsert the drive sled.*

6. Prepare the drive for use by the system:
   - If you installed a hard disk drive, you can add the replacement drive (HD1 in the example) to the RAID array by typing the following command: `tmsh modify sys raid array MD1 add HD2`

     Note: *The status of the replacement drive should change to replicating, and the indicator LED should change to solid green. The replication process typically takes between 15 and 45 minutes.*
   - If you installed a solid-state drive sled, you must change the mode of the drive to datastor and provision the drive before the system can use it. You can use either the Traffic Management Shell (tmsh) or the browser-based Configuration Utility to accomplish these tasks. For more information, see the *Traffic Management Shell (tmsh) Reference Guide* or the *BIG-IP® Systems: Getting Started Guide*.
7. Attach the front bezel to the unit by grasping the bezel on either side using the indentations provided.

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

About hard disk drive replacement

The BIG-IP® 11000 platforms support hard disk drive mirroring using RAID. You can add the replacement hard disk drive sled that you received from F5 Networks to the system.

Identifying a faulty hard disk drive

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

1. Log on to the command line of the system using the root account.
2. Type the following command to see the status of the drives:

   `tmsh show sys raid`

   A disk summary similar to the following displays:

```
---------------------
Sys::Raid::Array: MD1
---------------------
Size (MB)  279.4K
```

```
-------------------------------------------------------
Sys::Raid::ArrayMembers
Bay ID  Serial Number    Name  Array Member  Array Status
-------------------------------------------------------
1       WD-WCAT1E420107  HD2   yes           failed
2       WD-WCAT1E477614  HD1   yes           ok

-------------------------------------------------------------------
Sys::Raid::Bay
Bay  Shelf  Name  Serial Number       Array Member  Array Status
-------------------------------------------------------------------
1    1      HD2   WD-WCAT1E420107     yes           failed
2    1      HD1   WD-WCAT1E477614     yes           ok
3    -      -     -                   -             -
4    2      SSD1  CVPO014601CG160AGN  no            undefined
4    1      SSD2  CVPO0146016R160AGN  no            undefined

-------------------------------------------------------------------------------
Sys::Raid::Disk
Name  Serial Number         Array   Array Status  Model
                            Member
-------------------------------------------------------------------------------
CF1   CB225535315009033B03  no      undefined     SILICONSYSTEMS INC 8GB
HD1   WD-WCAT1E477614       yes     ok            ATA     WDC WD3000BLFS-0
HD2   WD-WCAT1E420107       yes     undefined     ATA     WDC WD3202ABYS-0
SSD1  CVPO014601CG160AGN    no      undefined     ATA     INTEL SSDSA2M160
SSD2  CVPO0146016R160AGN    no      undefined     ATA     INTEL SSDSA2M160
```

3. Make note of the bay number and serial number for the faulty hard disk drive.

   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 hard disk drive from the system, type the following command to remove the faulty hard disk drive (HD2 in the example) from the array:

   ```
   tmsh modify sys raid array MD1 remove HD2
   ```

5. Optionally, to ensure that you remove the correct drive, you can make the LED blink for that bay (bay 1 in the example) by typing the following command:

   ```
   tmsh modify sys raid bay 1 flash-led
   ```

   The LED continues to blink until the new hard drive begins the replication process.

Next, you can physically remove the hard disk drive 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 hard disk drive.

Replacing a hard disk drive

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.
2. Verify the location of the faulty hard disk drive 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 hard disk drive, behind the metal grille.*

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

3. Remove the faulty hard disk drive:
   a) Loosen the hard disk drive 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 hard disk drive from the system.
4. Slide the new hard disk drive into the empty hard drive bay.
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 hard disk drive is connected to the system when you tighten the screw completely.
6. Type the following command to see the status of the hard disk drives:

   ```
   tmsh show sys raid disk
   ```

   A disk summary similar to the following displays:

```
Sys::Raid::Disk
Name  Serial Number         Array   Array Status  Model
                            Member
------------------------------------------------------------------------
CF1   CB225535315009033B03  no      undefined     SILICONSYSTEMS INC 8GB
HD1   WD-WCAT1E420107       yes     ok            ATA     WDC WD3000BLFS-0
HD2   WD-WCAT10944438       yes     undefined     ATA     WDC WD3202ABYS-0
SSD1  CVPO014601CG160AGN    no      undefined     ATA     INTEL SSDSA2M160
SSD2  CVPO0146016R160AGN    no      undefined     ATA     INTEL SSDSA2M160
```

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

   Note: *If after a few seconds, you do not see the recently-added hard disk drive in the disk summary, the drive might not be seated properly. If this occurs, remove and reinsert the hard disk drive.*
7. Add the replacement drive (HD2 in the example) to the array by typing the following command:

   ```
   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 on either side using the indentations provided.

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

About solid-state drive replacement

The BIG-IP® 11000 platform supports the use of solid-state drives (SSDs).

Important: *Before you physically remove a solid-state drive (SSD) from the system, you should use either the Traffic Management Shell (tmsh) or the browser-based Configuration Utility to identify and prepare the drives for removal.*

Preparing solid-state drives for replacement using tmsh

Before you physically remove a solid-state drive (SSD) from the platform, you can use the Traffic Management Shell (tmsh) to identify and prepare the drives for removal from the platform.

Important: *If an SSD in your 11000 platform needs to be replaced, you must replace all dual-disk drive sleds installed in the platform with replacement drive sleds from F5 Networks.*

1. Log on to the command line of the system using the root account.
2. Type the following command to view the current provisioning for the system:

   ```
   tmsh list sys provision
   ```

   A provisioning summary similar to the following displays:

```
sys provision apm { }
sys provision asm { }
sys provision avr { }
sys provision gtm { }
sys provision lc { }
sys provision ltm {
    level nominal
}
sys provision psm { }
sys provision wam { }
sys provision wom {
    level nominal
}
sys provision woml { }
```

3. Type the following command to deprovision the module that is using the SSDs (for example, BIG-IP® WAN Optimization Manager™ or BIG-IP® WebAccelerator™):

   ```
   tmsh modify sys provision [ wom | wam ] level none
   ```

   A provisioning summary similar to the following displays:

```
sys provision apm { }
sys provision asm { }
sys provision avr { }
sys provision gtm { }
sys provision lc { }
sys provision ltm {
    level nominal
}
sys provision psm { }
sys provision wam { }
sys provision wom { }
sys provision woml { }
```

4. Type the following command to see the status of the drives:

   ```
   tmsh show sys raid
   ```

   A disk summary similar to the following displays:

```
---------------------
Sys::Raid::Array: MD1
---------------------
Size (MB)  279.4K

-------------------------------------------------------
Sys::Raid::ArrayMembers
```

```
Bay ID  Serial Number    Name  Array Member  Array Status
-------------------------------------------------------
1       WD-WCAT1E420107  HD2   yes           ok
2       WD-WCAT1E477614  HD1   yes           ok

-------------------------------------------------------------------
Sys::Raid::Bay
Bay  Shelf  Name  Serial Number       Array Member  Array Status
-------------------------------------------------------------------
1    1      HD2   WD-WCAT1E420107     yes           ok
2    1      HD1   WD-WCAT1E477614     yes           ok
3    -      -     -                   -             -
4    2      SSD1  CVPO014601CG160AGN  no            undefined
4    1      SSD2  CVPO0146016R160AGN  no            undefined

-----------------------------------------------------------------------------
Sys::Raid::Disk
Name  Serial Number         Array   Array Status  Model
                            Member
-----------------------------------------------------------------------------
CF1   CB2255353150090 33B03  no      undefined     SILICONSYSTEMS INC 8GB
HD1   WD-WCAT1E477614       yes     ok            ATA     WDC WD3000BLFS-0
HD2   WD-WCAT1E420107       yes     ok            ATA     WDC WD3202ABYS-0
SSD1  CVPO014601CG160AGN    no      undefined     ATA     INTEL SSDSA2M160
SSD2  CVPO0146016R160AGN    no      undefined     ATA     INTEL SSDSA2M160
```

5. Make note of the bay number and serial number for all installed SSDs.

Note: *The serial number is printed in its entirety on the labels, on top of the drive.*

After you have deprovisioned the modules and verified which drive bays contain SSDs, you can remove the SSD sleds from the platform.

Preparing solid-state drives for replacement using the Configuration Utility

Before you physically remove any solid-state drive (SSD) sleds from the system, you can use the browser-based Configuration Utility to identify and prepare the drives for removal.

Important: *If an SSD in your 11000 platform needs to be replaced, you must replace all dual-disk drive sleds installed in the platform with replacement drive sleds from F5 Networks.*

1. Log on to the Configuration Utility.
2. Use the browser-based Configuration Utility to perform the following tasks before you physically remove the drive sleds from the platform:
   a) On the Main tab, click **System** > **Resource Provisioning** and deprovision the module that is using the SSDs (for example, BIG-IP® WAN Optimization Manager™ or BIG-IP® WebAccelerator™).
   b) On the Main tab, click **System** > **Disk Management** and make note of the bay number and serial number for installed SSDs.

After you have deprovisioned the modules and verified which drive bays contain SSDs, you can remove the SSD sleds from the platform.

Replacing a solid-state drive

After you identify and remove the SSDs to replace from the platform, you can install the replacement drives that you received from F5 Networks.

1. Remove the front bezel from the unit.
2. Verify the location of the SSDs by comparing the drive bays that you noted earlier.

3. Remove the drive sleds:
   a) Loosen the drive sled 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 sled from the system.
4. Slide the new drive sleds into the empty bay.
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 drive sled is connected to the system when you tighten the screw completely.
6. Type the following command to see the status of the drives:

   ```
   tmsh show sys raid disk
   ```

   A disk summary similar to the following displays:

```
Sys::Raid::Disk
Name  Serial Number         Array   Array Status  Model
                            Member
------------------------------------------------------------------------
CF1   CB225535315009033B03  no      undefined     SILICONSYSTEMS INC 8GB
HD1   WD-WCAT1E420107       yes     ok            ATA     WDC WD3000BLFS-0
HD2   WD-WCAT1E477614       yes     undefined     ATA     WDC WD3202ABYS-0
SSD1  CVPO014601AT340AGN    no      undefined     ATA     INTEL SSDSA2M160
SSD2  CVPO014601AT201AGN    no      undefined     ATA     INTEL SSDSA2M160
```

   The status of the replacement hard drive is undefined, and the serial numbers for the SSDs should match that of the replacement drives.

   Note: *If after a few seconds, you do not see the recently-added drives in the disk summary, the drive sleds might not be seated properly. If this occurs, remove and reinsert the drive sleds.*
7. Attach the front bezel to the unit by grasping the bezel on either side using the indentations provided.

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

Environmental Guidelines

General environmental and installation guidelines

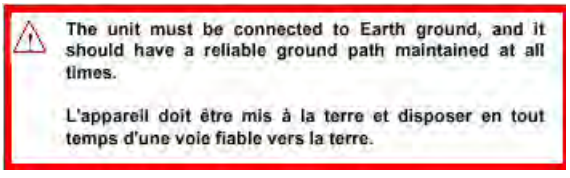
The 11000 platform is an industrial network appliance that is designed to be mounted in a standard 19-inch EIA rack. Follow these guidelines to adhere to safety precautions:

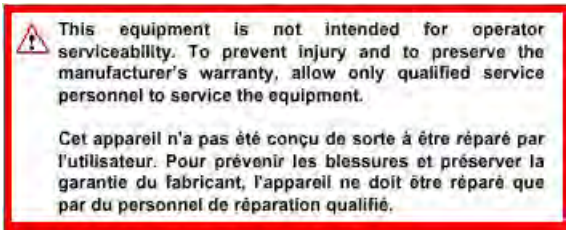
- Install the rack according to the manufacturer's instructions and check the rack for stability before placing equipment in it.
- Build and position the rack so that once you install the platform, the power supply and the vents on both the front and back of the unit remain unobstructed. The platform 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.
- 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.

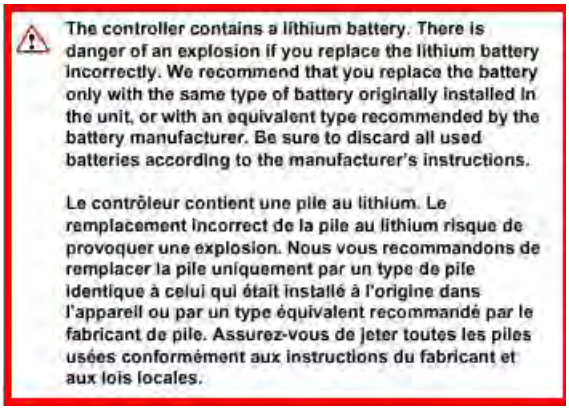
Important: *This product is sensitive to electrostatic discharge (ESD). F5 Networks recommends that you use proper ESD grounding procedures and equipment when you install or maintain the unit.*

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.*







Guidelines for AC-powered equipment

An AC-powered installation must meet the following requirements:

- Use a 20 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 following guidelines apply to STATIONARY PLUGGABLE EQUIPMENT TYPE A with simultaneous multiple connections to the AC MAINS SUPPLY:*

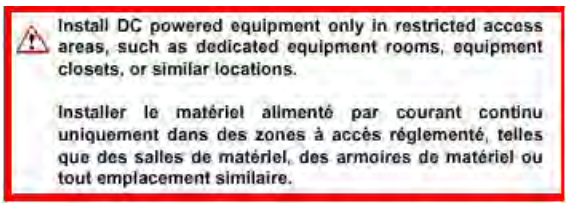
- The building installation shall provide a means for connection to protective earth; and
- The equipment is to be connected to that means; and
- A SERVICE PERSON shall check whether or not the socket-outlet from which the equipment is to be powered provides a connection to the building protective earth. 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 the following requirements:

- Use a 25 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.
- Ground the cabling for the system on both sides.
- Use one power feed for each individual power supply.



Platform airflow diagram

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

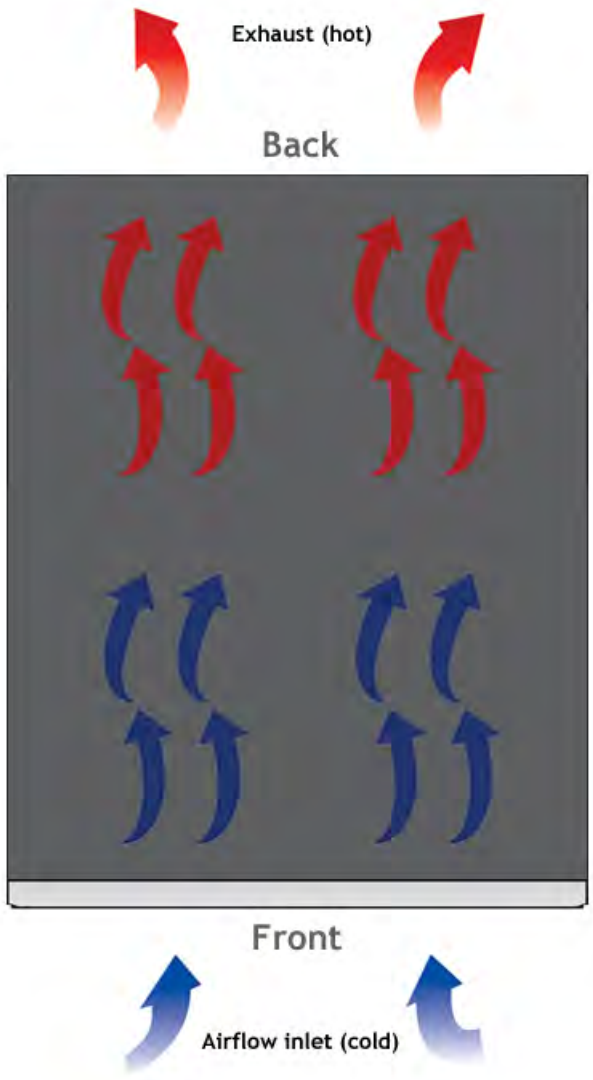


Figure 12: Airflow in the 11000 platform

Platform Specifications

General specifications for system features

This table lists general specifications for BIG-IP® system features for the 11000 platform.

Item	Specification
Server/Node operating system compatibility	Load balancing of any TCP/IP operating system: 32- and 64-bit Windows® operating systems; all UNIX® platforms; and Mac OS
Internet/Intranet protocol support	All TCP services, UDP, SIP, and SSL; nearly all IP-based protocols
Administrative environment support	DNS proxy, SMTP, SSH, SNMP, dynamic/static network monitoring, scheduled batch job processing, system status reports, and alarms event notification
Network management and monitoring	Secure SSL browser-based interface, remote encrypted logon and file transfer using SSH monitor, BIG-IP system network monitoring utilities and additional contributed software; SNMP gets and traps; iControl API using CORBA and SOAP/XML
Dynamic content support	ASP, VB, ActiveX, Java, VRML, CGI, Cool Talk, Net Meeting, Real Audio, Real Video, Netshow, QuickTime, PointCast, or any HTTP-encapsulated data
Device redundancy	Watchdog timer, failsafe cable (primary and secondary)
SFP hot swap	Support for hot swap of the SFP modules
Web server application compatibility	Any IP-based web or application server
Routing protocols	RIP, OSPF, and BGP with optional ZebOS Advanced Routing Modules
Jumbo frames	Support for maximum Ethernet frame size of 1818 bytes and MTU of 1800 bytes

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

Platform hardware specifications

This table lists hardware specifications for the 11000 platform.

Item	Specification
Dimensions	H: 5.2 inches (13.21 cm) x W: 17.4 inches (44.20 cm) x D: 21.4 inches (54.36 cm) (per unit) 3U industry standard rack-mount chassis

Item	Specification
Weight	52.0 pounds (23.59 kg) with two power supplies, two hard drives, and bezel installed (per unit) • Front mount rack brackets add 1 pound (0.45 kg). • Quick install rail kit adds 5.5 pounds (2.49 kg). • 19-inch center mount brackets add 2 pounds (0.91 kg). • 23-inch center mount brackets add 1.5 pounds (0.68 kg). • Four-point mount kit adds 3.75 pounds (1.70 kg). • Hard drives add 1.5 pounds (0.68 kg) each.
Processor	2 x Six-Core AMD Opteron® processors
Communication interfaces	10 x 10GE SFP+ fiber ports 1 x 10/100/1000 Ethernet Management port Cluster 1-2 ports (future use) SAS Expander port (future use)
Hard drive capacity	2 x 600 GB (supports up to four hard drives; default configuration is two hard drives and two blanks)
RAM	48 GB
AC power supply	2 x 850 W 90 - 125 VAC(+/- 10%) or 200 - 240 VAC(+/- 10%) AUTO Switching 2 x NEMA 5-15P power cords
DC power supply	2 x 850W DC Operating range: 44 to 72 VDC Minimum start up voltage: 44 VDC ***Note:*** *Power supply will not start below 44 VDC.*

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

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

Platform operating specifications

This table lists operating specifications for the 11000 platform.

Item	Specification
Typical power draw (dual AC power supplies; 50% load; temp 25°C)	110VAC input: 440 W 220VAC input: 466 W
Typical power draw (dual DC power supplies; 50% load; temp 25°C)	48VDC input: 425 W
Maximum power draw (AC power)	220VAC input: 536 W
Maximum power draw (DC power)	48VDC input: 488 W
Typical heat generated (AC power)	110VAC input: 1501 BTU/hour 220VAC input: 1590 BTU/hour

Item	Specification
Typical heat generated (DC power)	48VDC input: 1450 BTU/hour
Maximum heat generated (AC power)	1829 BTU/hour
Maximum heat generated (DC power)	1665 BTU/hour
Operational temperature	32° to 104°F (0° to 40°C)
Operational temperature (NEBS-certified system)	23° to 131°F (-5° to 55°C)
Operational relative humidity	5 to 85% at 104°F (40°C)
Non-operational temperature	-40 to 158°F (-40 to 70°C)
Non-operational temperature (NEBS-certified system)	-40° to 158°F (-40° to 70°C)
Non-operational relative humidity	5 to 95% at 40°C non-condensing

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

Safety requirements

This equipment complies with the following requirements of the Low Voltage Directive 2006/95/EC.

EC Type Examination Certificates:

EN 6090-1:2006+A11:2009

IEC 60950-1:2005, 2nd Edition

CB Scheme

UL 60950-1 2nd Edition, CSA C22.2 No. 60950-1-07 Master Contract 252302

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

EMC requirements

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

This equipment complies with Part 15 of the FCC Rules. Operation is subject to the following 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.

European Union

This equipment complies with the following requirements of the EMC Directive 2004/108/EC:

As Telecommunication Network Equipment (TNE) in Both Telecom Centers and Other than Telecom Centers per (as applicable):

Directive		Required Limits
ESTI EN	300 386 V1.3.3 (2005-04)	
EN	55022:2006 + C1:2006	Class A
EN	61000-3-2:2006	
EN	61000-3-3:1995 + A1:2001 + A2:2005	
	IEC61000-4-2	6 kV (Direct), 8 kV (Air)
	IEC61000-4-3	3 V/m 80-1000MHz, 10 V/m 800-960 MHz and 1400-2700 MHz
	IEC61000-4-4	1 kV AC and DC Power Lines, 0.5 kV Signal Lines
	IEC61000-4-5	2 kV AC Line-Gnd, 1 kV AC Line-Line and Outdoor Signal Lines, 0.5 kV Indoor Signal Lines > 10m
	IEC61000-4-6	3 V
	IEC61000-4-11	

As Information Technology Equipment (ITE) Class A per (as applicable):

EN	55024:1998 + A1:2001 + A2:2003	
EN	55022:2006 + C1:2006 Class A	Class A
EN	61000-3-3:1995 + A1:2001 + A2:2003	
EN	55024:1998 + A1:2001 + A2:2003	
	IEC61000-4-2	4 kV (Direct), 8 kV (Air)
	IEC61000-4-3	3 V/m
	IEC61000-4-4	1 kV AC Power Lines, 0.5 kV Signal, and DC Power Lines
	IEC61000-4-5	1 kV AC Line-Line and Outdoor Signal Lines, 2 kV AC Line-Gnd, 0.5 kV DC Power Lines
	IEC61000-4-6	3 V
	IEC61000-4-11	

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 11000 platform.

Specification type	Detail	Units	Value
Acoustic [1]	Front	dBA	66
	Left	dBA	67
	Right	dBA	67
	Rear	dBA	76
	Top	dBA	71
Altitude [2]	Operational	Feet	6,000
	Non-operational	Feet	40,000
Airflow [3]	Open air	CFM	285 (maximum)

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

[1] All measurements taken at 0.6 meter with one power supply operational and fans at 75% duty cycle. Measurements recorded in Decibels A-weighting.

[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 F5 Networks® 11000 platform components conform to the Restriction of Hazardous Substances Directive (RoHS) standards for China.

11000, 11050 平台危害物质表

11000, 11050 Platform 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+ (Cr^{6+})	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 Metal Parts	o	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
风扇装置 Fan Assembly	x	o	o	o	o	o
硬盘 Hard Drives	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"x"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, the following guidelines will help ensure that you repackage the platform properly.

Important: *Before returning any equipment, contact F5 Networks to obtain a 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 that you 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 11000 platform must be shipped in F5-provided packaging.

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. Place the platform into the shipping box.

4. Place the foam inserts on top of the platform.

5. Place the accessory box on the foam insert.

6. 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
Removable CompactFlash (CF) card	F5 product software, customer configuration	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, CompactFlash (CF), and coin battery, and these components will be replaced during F5 reprocessing. Otherwise, HDD, SSD, and CF 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)

You can remove the sensitive customer data from the hardware security module (HSM) installed in the system before returning it to F5® Networks.

Note: *The HSM cannot be removed from the platform.*

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`

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

Legal Notices

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All other product and company names herein may be trademarks of their respective owners.

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.

FCC Compliance

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.

Any modifications to this device, unless expressly approved by the manufacturer, can void the user's authority to operate this equipment under part 15 of the FCC rules.

Canadian Regulatory Compliance

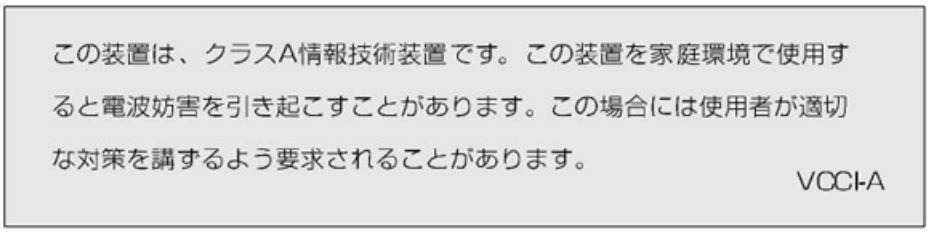
This Class A digital apparatus complies with Canadian ICES-003.

Standards Compliance

This product conforms to the IEC, European Union, ANSI/UL and Canadian CSA standards applicable to Information Technology products at the time of manufacture.

VCCI Class A Compliance

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 corrective actions. VCCI-A



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