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Platform Overview

About i5000/i7000/i10000/i11000 Series models

The i5000/i7000/i10000/i11000 Series platform is a powerful system that is designed specifically for application delivery performance and scalability.

F5® offers three performance levels of SSL offload in the i11000 Series: the i11800-DS, the i11600-DS, and the i11400-DS. All have dual solid-state drives (SSDs) and feature high-performance SSL hardware that frees servers from the task of encrypting and decrypting data.

The i5000 and i7000 Series platforms are available with a FIPS-validated hardware security module (HSM) as a factory-installed option (i5820-DF and i7820-DF). These platforms have dual solid-state drives (SSDs).

The i7000 and i10000 Series platforms are available in a dual solid-state drive (SSD) configuration (i7000-D and i10000-D).

For more information, please see the data sheet at www.f5.com/pdf/products/big-ip-platforms-datasheet.pdf.

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 use the LCD touchscreen to view information about, manage, and reset the system. You can also use the front-panel LEDs to assess the condition of the system.

Figure 1: Front view of the i5000 platform

Figure 2: Front view of the i7000 Series platform

Figure 3: Front view of the i10000 Series platform
Figure 4: Front view of the i11000 Series platform

1. 10/100/1000-BaseT capable management port
2. Hi-Speed USB port
3. Console serial port
4. Serial (hard-wired) failover port
5. 10GbE SFP+ ports (8)
6. 40GbE QSFP+ ports (46)
7. Indicator LEDs
8. 2.2 inch LCD touchscreen

The back of the i5000 Series platform includes one power supply, one power blank, and a chassis ground terminal.

Figure 5: Back view of the i5000 Series AC-powered platform

1. Power input panel 1 (AC power receptacle)
2. Power blank
3. Chassis ground terminal

Figure 6: Back view of the i5000 Series DC-powered platform

1. Power input panel 1 (DC terminal)
2. Power blank
3. Chassis ground terminal

The back of the i7000/i10000/i11000 Series platform includes the fan tray, two power supplies, a chassis ground terminal, and the storage drives (located behind the fan tray).

Figure 7: Back view of the i7000/i10000/i11000 Series AC-powered platform

1. Fan tray (removable)
2. Power input panel 1 (AC power receptacle)
3. Power input panel 2 (AC power receptacle)
4. Chassis ground terminal

Figure 8: Back view of the i7000/i10000/i11000 Series DC-powered platform

1. Fan tray (removable)
2. Power input panel 1 (DC terminal)
3. Power input panel 2 (DC terminal)
4. Chassis ground terminal

Hardware included with the platform

This platform includes all of the hardware components listed here.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 or 2</td>
<td>Power cables (black), AC power only, per platform configuration. Might include multiple power cable types if product is delivered outside of the US/Canada. By default, these platforms include one power supply and power cable: i5000 Series.</td>
</tr>
<tr>
<td>2</td>
<td>Power cables (black), AC power only, per platform configuration. Might include multiple power cable types if product is delivered outside of the US/Canada.</td>
</tr>
<tr>
<td>2</td>
<td>DC ring terminals, DC power only. By default, these platforms include one power supply and two ring terminals: i5000 Series.</td>
</tr>
<tr>
<td>4</td>
<td>DC ring terminals, DC power only. By default, these platforms include two power supplies and four ring terminals: i7000/i10000/i11000 Series.</td>
</tr>
<tr>
<td>1</td>
<td>RJ45 to RJ45 failover cable, CAT 5 crossover (blue)</td>
</tr>
<tr>
<td>1</td>
<td>RJ45 to DB9 console port cable (beige)</td>
</tr>
<tr>
<td>1</td>
<td>RJ45F to RJ45M rolled adapter (beige)</td>
</tr>
<tr>
<td>1</td>
<td>Quick-install rail kit</td>
</tr>
<tr>
<td>2</td>
<td>Rail lock brackets</td>
</tr>
<tr>
<td>4</td>
<td>M3 x 8mm flathead screws, black with patch</td>
</tr>
<tr>
<td>4</td>
<td>#8-32 pan head screws, steel zinc</td>
</tr>
</tbody>
</table>

Peripheral hardware required

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.
<table>
<thead>
<tr>
<th>Type of hardware</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network hubs, switches, or connectors to connect to the platform network interfaces</td>
<td>You must provide networking devices that are compatible with the network interface ports on the platform. You can use either 1000/10000-Megabit or 40-Gigabit Ethernet switches.</td>
</tr>
<tr>
<td>External USB CD/DVD drive or USB flash drive</td>
<td>You can use any USB-certified CD/DVD mass storage device or a USB flash drive for installing upgrades and for system recovery.</td>
</tr>
<tr>
<td>Note: External CD/DVD drives must be externally powered.</td>
<td></td>
</tr>
<tr>
<td>Serial console</td>
<td>You can remotely manage the platform by connecting to a serial console terminal server through the console port.</td>
</tr>
<tr>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>Management workstation on the same IP network as the platform</td>
<td>You can use the default platform configuration if you have a management workstation set up.</td>
</tr>
</tbody>
</table>

**About LCD menus**

The touchscreen LCD provides the ability to manage the unit without attaching a console or network cable. You can configure the display options to meet your needs. There are four menu options available on the LCD.

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

**System menu**

You can use the System menu to reboot, reset, halt, power off, or power on the system.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Soft Reboot</td>
<td>Performs a properly sequenced reboot of the unit.</td>
</tr>
<tr>
<td>Hard Reset</td>
<td>Performs a hard reset on the unit.</td>
</tr>
<tr>
<td>Halt</td>
<td>Halts or shuts down the unit.</td>
</tr>
<tr>
<td>Power Off</td>
<td>Powers off the unit.</td>
</tr>
<tr>
<td>Power On</td>
<td>Powers on the unit.</td>
</tr>
</tbody>
</table>

**Alerts menu**

You can use the Alerts menu to view system alerts by priority, or to clear all alerts from the LCD.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Emergency</td>
<td>Displays alerts that match the Emergency priority.</td>
</tr>
<tr>
<td>Critical</td>
<td>Displays alerts that match the Critical priority.</td>
</tr>
</tbody>
</table>
### Options menu

You can use the Options menu to configure the LCD brightness and enable/disable the chassis locator LED.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Error</td>
<td>Displays alerts that match the Error priority.</td>
</tr>
<tr>
<td>Warning</td>
<td>Displays alerts that match the Warning priority.</td>
</tr>
<tr>
<td>Alert</td>
<td>Displays alerts that match the Alert priority.</td>
</tr>
<tr>
<td>Info</td>
<td>Displays alerts that match the Informational priority.</td>
</tr>
<tr>
<td>Display</td>
<td>Adjusts LCD backlight brightness.</td>
</tr>
</tbody>
</table>
| Locator LED  | Controls the use of the chassis locator feature, which causes the F5® logo ball on the chassis front panel to flash on and off. Select from these options:  
  - OFF (default)  
  - ON |

### Setup menu

You can use the Setup menu to configure the management interface, AOM management interface, and serial port baud rate.

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
</table>
| Management   | Changes the management interface information. Select from these options:  
  - Type indicates whether to use an IPv4 or IPv6 address.  
  - DHCP indicates whether DHCP is enabled or disabled (default).  
  - IP Address sets the management interface IP address and routing prefix. You can use an IPv4 or IPv6 address.  
  - Gateway sets the default route for the management interface. This route is necessary if you plan to manage the unit from a different subnetwork. |
| AOM Management | Changes the AOM management interface information. Select from these options:  
  - Type indicates that the AOM management interface uses an IPv4 address.  
  - DHCP indicates whether DHCP is enabled or disabled (default).  
  - IP Address sets the management interface IP address and routing prefix. You can use only an IPv4 address.  
  - Gateway sets the default route for the management interface. This route is necessary if you plan to manage the unit from a different subnetwork. |
| Baud Rate    | Changes the baud rate of the management serial port. Select from these options:  
  - 9600  
  - 19200 (default)  
  - 38400  
  - 57600  
  - 115200 |
About using the LCD

To manage the platform using the LCD menu options, tap the touchscreen LCD to put it into menu mode. The LCD is operational even when the Host is powered off, provided that Always-On Management and the LCD are fully booted.

**Important:** It might take a few minutes for the LCD to become operational when the system is started from a powered off state.

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

Reboot the unit

You can use the touchscreen LCD to perform a soft reboot of the unit.

1. Touch the screen to activate the LCD menus.

2. Tap **System**.
   The System screen displays.

3. On the System screen, tap **Soft Reboot**.
4. Tap **Confirm** to reboot the unit.

Reset the unit

You can use the touchscreen LCD to perform a hard reset of the unit.

1. Touch the screen to activate the LCD menus.
2. Tap **System**.
   The System screen displays.

3. On the System screen, tap **Halt**.
4. Tap **Confirm** to halt the unit.

### Halt the unit

You can use the touchscreen LCD to halt the unit.

1. Touch the screen to activate the LCD menus.
2. Tap **System**.
   The System screen displays.

3. On the System screen, tap **Halt**.
4. Tap **Confirm** to halt the unit.
Power off/on the unit

You can use the touchscreen LCD to power the unit off and on.

1. Touch the screen to activate the LCD menus.

2. Tap System.
   The System screen displays.

3. On the System screen, swipe up to scroll down and tap Power Off or Power On.

4. Tap Confirm to power off/on the unit.

Clear alerts

You can use the touchscreen LCD to clear alerts from the LCD.

1. Touch the screen to activate the LCD menus.
2. Tap Alerts.
   The Alerts screen displays.

3. On the Alerts screen, clear either all alerts or alerts of a specific priority:
   • To clear all alerts, tap Clear All.
   • To clear only alerts of only a specific priority, tap the priority name to view alerts with that priority, and then tap Clear.

Configure LCD brightness

You can use the touchscreen LCD to adjust the brightness of the display.

1. Touch the screen to activate the LCD menus.

2. Tap Options.
   The Options screen displays.
3. Tap Display.
   The Brightness screen displays.

   ![Brightness Screen]

4. Use the left and right arrows to adjust the brightness of the LCD in real-time.
5. Click Back to return to the previous screen.

Enable/Disable the chassis locator LED

You can use the touchscreen LCD to enable and disable the chassis locator LED.

1. Touch the screen to activate the LCD menus.

   ![LCD Menus]

2. Tap Options.
   The Options screen displays.

   ![Options Screen]

3. Click Locator LED.
   The Locator LED screen displays.

   ![Locator LED Screen]
4. Tap to enable or disable the chassis locator LED.

## About platform LEDs

The behavior of the various LEDs on the platform indicate the status of the system or component.

### Status LED

The status LED indicates the operating state of the system.

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>off/none</td>
<td>System is powered down.</td>
</tr>
<tr>
<td>green solid</td>
<td>System is running in normal mode. Also indicates that the system is in an</td>
</tr>
<tr>
<td></td>
<td>Active state of a device group.</td>
</tr>
<tr>
<td>amber solid</td>
<td>System is running in an impaired mode or is operating in one of these</td>
</tr>
<tr>
<td></td>
<td>conditions:</td>
</tr>
<tr>
<td></td>
<td>• It is in the standby power state</td>
</tr>
<tr>
<td></td>
<td>• It is powered on and in the process of booting to TMOS®</td>
</tr>
<tr>
<td></td>
<td>• It is powered on, but offline, such as when booted to the End-User</td>
</tr>
<tr>
<td></td>
<td>Diagnostic (EUD)</td>
</tr>
<tr>
<td></td>
<td>• It is booted to TMOS and is operating as a Standby member of a device</td>
</tr>
<tr>
<td></td>
<td>group</td>
</tr>
<tr>
<td>amber blinking</td>
<td>System might be in a state in which a software or hardware problem is</td>
</tr>
<tr>
<td></td>
<td>interfering with control of the LCD or communication is lost between the</td>
</tr>
<tr>
<td></td>
<td>system and the LCD.</td>
</tr>
</tbody>
</table>

### Alarm LED

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

There are five levels of messages.

*Note:* The alarm LED remains lit until you have used the LCD panel to clear alerts above an informational level.

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>off/none</td>
<td>Informational or no alarm conditions are present. System is operating properly.</td>
</tr>
<tr>
<td>amber solid</td>
<td>Warning (0). System may not be operating properly, but the condition is not</td>
</tr>
<tr>
<td></td>
<td>severe or potentially damaging.</td>
</tr>
<tr>
<td>amber blinking</td>
<td>Error (1). System is not operating properly, but the condition is not severe or</td>
</tr>
<tr>
<td></td>
<td>potentially damaging.</td>
</tr>
<tr>
<td>red solid</td>
<td>Alert (2) or Critical (3). System is not operating properly, and the condition is</td>
</tr>
<tr>
<td></td>
<td>potentially damaging.</td>
</tr>
<tr>
<td>red blinking</td>
<td>Emergency (4). System is not operating, and the condition is potentially</td>
</tr>
<tr>
<td></td>
<td>damaging.</td>
</tr>
</tbody>
</table>
Power 1 and Power 2 LEDs

The Power 1 and Power 2 LEDs on the front of the chassis indicate the general operating state of the power supplies.

<table>
<thead>
<tr>
<th>Power supply state</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>green solid</td>
<td>Power supply is present and operating properly. Also indicates when the system is in power standby mode.</td>
</tr>
<tr>
<td>amber solid</td>
<td>Power supply is present, but not operating properly.</td>
</tr>
<tr>
<td>off/none</td>
<td>No power supply is present.</td>
</tr>
</tbody>
</table>

AC power supply LEDs

The LEDs located on the AC power supplies indicate the operating state of the power supplies.

<table>
<thead>
<tr>
<th>Input LED</th>
<th>Output LED</th>
<th>Condition</th>
</tr>
</thead>
<tbody>
<tr>
<td>green solid</td>
<td>green solid</td>
<td>Normal operation</td>
</tr>
<tr>
<td>off</td>
<td>off</td>
<td>Fault: Input UV, Input OV, VSB SC</td>
</tr>
<tr>
<td>off</td>
<td>amber solid</td>
<td>Not valid</td>
</tr>
<tr>
<td>green solid</td>
<td>amber solid</td>
<td>Warning: VSB OC</td>
</tr>
<tr>
<td>green solid</td>
<td>amber blinking</td>
<td>Warning: FAN, OTP, OC, VOUT OV/UV</td>
</tr>
<tr>
<td>green blinking</td>
<td>amber solid</td>
<td>Fault: Input OV</td>
</tr>
<tr>
<td>green blinking</td>
<td>amber blinking</td>
<td>Warning: Input OV, Input UV</td>
</tr>
<tr>
<td>green blinking</td>
<td>off</td>
<td>Not valid</td>
</tr>
<tr>
<td>green solid</td>
<td>green blinking</td>
<td>PS_ON_L is high</td>
</tr>
<tr>
<td>green solid</td>
<td>off</td>
<td>PS_KILL PSU not inserted</td>
</tr>
</tbody>
</table>

OV - Over Voltage; OTP - Over Temperature Protection; UV - Under Voltage; OC - Over Current; VSB - Standby Voltage

DC power supply LEDs

The LEDs located on the DC power supplies indicate the operating state of the power supplies.

<table>
<thead>
<tr>
<th>Input LED</th>
<th>Output/Fault LED</th>
<th>Condition (PWR-0307-01)</th>
<th>Condition (PWR-0307-02 and later)</th>
</tr>
</thead>
<tbody>
<tr>
<td>green solid</td>
<td>green solid</td>
<td>Normal operation</td>
<td>Normal operation</td>
</tr>
<tr>
<td>off</td>
<td>off</td>
<td>Fault: Input UV</td>
<td>Fault: Input UV, VSB SC</td>
</tr>
<tr>
<td>off</td>
<td>amber solid</td>
<td>Fault: Input OV</td>
<td>Not valid</td>
</tr>
</tbody>
</table>
### Define custom alerts

Two files on the system define alerts that could cause the LED behavior to change:

- The `/etc/alertd/alert.conf` file defines standard system alerts. Do not edit this file.
- The `/config/user_alert.conf` file defines custom settings. You should edit only this file.

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

   ```bash
   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.

---

<table>
<thead>
<tr>
<th>Input LED</th>
<th>Output/Fault LED</th>
<th>Condition (PWR-0307-01)</th>
<th>Condition (PWR-0307-02 and later)</th>
</tr>
</thead>
<tbody>
<tr>
<td>green solid</td>
<td>amber blinking</td>
<td>Warning: FAN, OTP, OC, VOUT OV/UV</td>
<td>Warning: FAN, OTP, OC, VOUT OV/UV</td>
</tr>
<tr>
<td>green blinking</td>
<td>amber solid</td>
<td>Not valid</td>
<td>Fault: Input OV</td>
</tr>
<tr>
<td>green blinking</td>
<td>amber blinking</td>
<td>Not valid</td>
<td>Warning: Input OV, Input UV</td>
</tr>
<tr>
<td>green blinking</td>
<td>off</td>
<td>Fault/Warning: Input OV</td>
<td>Not valid</td>
</tr>
<tr>
<td>green solid</td>
<td>green blinking</td>
<td>PS_ON_L is high</td>
<td>PS_ON_L is high</td>
</tr>
<tr>
<td>green solid</td>
<td>off</td>
<td>Fault: VSB SC, PS_KILL PSU not inserted</td>
<td>PS_KILL PSU not inserted</td>
</tr>
</tbody>
</table>

OV - Over Voltage; OTP - Over Temperature Protection; UV - Under Voltage; OC - Over Current; VSB - Standby Voltage
About 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.

For information about optical transceivers and cable pinouts for this platform, see F5 Platforms: Accessories at support.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/f5-plat-accessories.html.

About 10GbE SFP+ interfaces

The i5000/i7000/i10000/i11000 Series platforms include 10 GbE (SFP+) ports (1.1-1.4 and 2.1-2.4), in which you can use 10 GbE (SFP+) or 1GbE (SFP) transceiver modules.

About 40GbE QSFP+ interfaces

On platforms that include 40GbE interface ports, you can use the ports as a single 40GbE port or as four 10GbE SFP+ ports.

Each 40GbE port supports four bicolor green/amber LEDs to indicate the combined link and activity status of each port while operating in both native 40GbE modes (bundled), in addition to in 4 x 10GbE breakout mode (unbundled). When operating in a native 40GbE mode, all four LEDs operate in unison per port to indicate the combined link and activity status for a given port. When operating in a 4 x 10GbE breakout mode, all four LEDs are used independently to indicate the combined link and activity status for each 10GbE breakout port.

The 40GbE ports (i5000/i7000 Series: 3.0-6.0 and i10000/i11000 Series: 3.0-8.0) default to 40GbE. The cable that you use when operating at 40GbE is an industry-standard OM3 qualified multi-mode fiber optic cable with female MPO/MTP connectors at both ends. You must provide your own cable for 40GbE operation.

You can also disable the 40GbE bundle and use them as individual 10GbE ports using a QSFP+ breakout cable. This cable has a female MPO/MTP connector at one end, which connects to the QSFP+ port, and four LC duplex connectors at the other end, which connect to SFP+ modules on an upstream switch.

Note: If you are using a breakout cable for 10GbE connectivity, you should use the supported distance as detailed in the Specifications for fiber QSFP+ modules section and not the Specifications for fiber SFP+ modules section of the F5® Platforms: Accessories guide at support.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/f5-plat-accessories.html.

You can order these QSFP+ components from F5 Networks:

- QSFP+ breakout cables (MTP to LC), provided as a pair, in these lengths:
  - 1 meter (F5-UPG-QSFP+-1M-2)
  - 3 meter (F5-UPG-QSFP+-3M-2+)
  - 10 meter (F5-UPG-QSFP+-10M-2)
- F5-branded 40GbE QSFP+ transceiver modules (F5-UPG-QSFP+)

Configure bundling for 40GbE QSFP+ interfaces using tmsh

You can use tmsh to configure bundling for the 40GbE QSFP+ interfaces on a platform. When you disable bundling, you can use the 40GbE ports as individual 10GbE ports.
1. Open the TMOS Shell (tmsh).
   
tmsh

2. Change to the network module.
   
et
   The system prompt updates with the module name: user@bigip01(Active)(/Common)
   (tmos.net)# user@bigiq01(Active)(/Common)(tmos.net)#

3. Configure bundling for a specific interface.
   
   modify interface <interface_key> bundle [enabled | disabled]

**About managing interfaces**

You can use the TMOS Shell (tmsh) or the Configuration utility to manage platform interfaces.

**View 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 TMOS Shell (tmsh).
   
tmsh

2. Change to the network module.
   
et
   The system prompt updates with the module name: user@bigip01(Active)(/Common)
   (tmos.net)# user@bigiq01(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 a specific interface:

   ![Output Example](image)

**View the status of all interfaces using tmsh**

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

1. Open the TMOS Shell (tmsh).
   
tmsh

2. Change to the network module.
   
et
   The system prompt updates with the module name: user@bigip01(Active)(/Common)
   (tmos.net)# user@bigiq01(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.

   ![Output Example](image)
### View 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 > 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.

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:

```plaintext
Syntax: [media type] [speed] [duplex]
```
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.

**View 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 TMOS Shell (`tmsh`).
   
   `tmsh`

2. Change to the network module.
   
   `net`
   
   The system prompt updates with the module name: `user@bigip01(Active) (/Common)`
   
   `(tmos.net)# user@bigiq01(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 a specific interface:

```
net interface 2.0 {
  media-capabilities-sfp {
    none
    auto
    40000SR4-FD
    40000LR4-FD
  }
}
```

**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 TMOS Shell (`tmsh`).

| 10baseT half | 1000baseLX full |
| 10baseT full | 1000baseCX full |
| 10GbaseER full | 1000baseT half |
| 10GbaseLR full | 1000baseT full |
| 10GbaseSR full | 1000baseSX full |
| 10GbaseT full | 100GbaseSR4 full |
| 10SFP+Cu full | 100GbaseLR4 full |
About 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.

SFP/SFP+ port LED behavior

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

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>off (not lit)</td>
<td>No link.</td>
</tr>
<tr>
<td>amber solid</td>
<td>Linked at 1/10GbE.</td>
</tr>
<tr>
<td>amber blinking</td>
<td>Link is actively transmitting or receiving data at 1/10GbE.</td>
</tr>
</tbody>
</table>

SFP+ port 40GbE bundled LED behavior

The appearance and behavior of the SFP+ port 40GbE bundled LEDs indicate network traffic activity, interface speed, and interface duplexity. When bundled, all four LEDs blink in unison.

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>off (not lit)</td>
<td>No link.</td>
</tr>
<tr>
<td>amber solid</td>
<td>Linked at 40GbE.</td>
</tr>
<tr>
<td>amber blinking</td>
<td>Link is actively transmitting or receiving data at 40GbE.</td>
</tr>
</tbody>
</table>

QSFP+ port LED behavior

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

<table>
<thead>
<tr>
<th>State</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>off (not lit)</td>
<td>No link.</td>
</tr>
<tr>
<td>green solid</td>
<td>Linked at 40GbE when operating as a single 40GbE port (with all four LEDs operating in unison).</td>
</tr>
<tr>
<td>green blinking</td>
<td>Link is actively transmitting or receiving data at 40GbE (with all four LEDs operating in unison).</td>
</tr>
<tr>
<td>amber solid</td>
<td>Linked at 10GbE when operating as four 10GbE ports.</td>
</tr>
<tr>
<td>amber blinking</td>
<td>Link is actively transmitting or receiving data at 10GbE.</td>
</tr>
</tbody>
</table>
About Always-On Management

The Always-On Management (AOM) subsystem enables you to manage the system remotely using the 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.

Access the AOM Command Menu from the serial console

You can access the AOM Command Menu after connecting to the front panel serial console.

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

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.*

<table>
<thead>
<tr>
<th>Letter</th>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>B</td>
<td>Set console baud rate</td>
<td>Configures the baud speed for connecting to AOM using the serial console. Select from these options:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 9600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 19200 (default)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 38400</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 57600</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• 115200</td>
</tr>
<tr>
<td>I</td>
<td>Display platform information</td>
<td>Displays information about the AOM firmware, bootloader, and management network configuration; chassis serial and part numbers; MAC address; power supply status; LCD status; and power status for the active console.</td>
</tr>
<tr>
<td>P</td>
<td>Power on/off host subsystem</td>
<td>Powers the host subsystem on or off.</td>
</tr>
<tr>
<td>R</td>
<td>Reset host subsystem</td>
<td>Resets the host subsystem with a hardware reset.</td>
</tr>
<tr>
<td>N</td>
<td>Configure AOM network</td>
<td>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.</td>
</tr>
<tr>
<td>Letter</td>
<td>Option</td>
<td>Description</td>
</tr>
<tr>
<td>--------</td>
<td>-------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>S</td>
<td>Configure SSH Server</td>
<td>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).</td>
</tr>
<tr>
<td>A</td>
<td>Reset AOM</td>
<td>Resets the AOM subsystem. In this case, the system is reset with a hardware reset.</td>
</tr>
<tr>
<td>Q</td>
<td>Quit menu and return to console</td>
<td>Exits the AOM Command Menu and returns to terminal emulation mode.</td>
</tr>
</tbody>
</table>

Create an AOM admin user account

If you would like to access AOM over the network rather than using the serial console, you need to create an AOM admin user account.

*Note:* This account is created on the AOM subsystem only and is not saved to your BIG-IP® system configuration.

1. Connect to the system using the serial console.
2. Create an admin user account:
   - On a newly configured BIG-IP system, type `aom_setup_user`.
   - On a previously configured BIG-IP system, type `aom_setup_user -o` to override the existing AOM admin user account.
3. Type the username you want.
4. Type the required password.
5. Type the new password again to confirm it.
   When the account creation is successful, a message similar to this one displays: AOM username aom-admin successfully set and enabled. Note that the AOM network must be configured via the AOM menu.
6. (Optional) Verify that the AOM admin user account is enabled and set up correctly.
   `aom_setup_user -l`
   A message similar to this one displays: Current AOM username: aom-admin (enabled)

Configure the AOM 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.
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.

Access 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 must also create an AOM admin user account.

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 <aom-username> is the AOM admin user account that you configured for the system, and <ip-addr> is the IP address that you configured for AOM.
   
   `ssh <aom-username>@<ip-addr>`

2. Type the previously configured AOM user password.

3. Open the AOM Command Menu.
   
   `Esc` (Set 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` (Set an SSH idle session timeout

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).

Disable 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` (Set an SSH idle session timeout

3. Type n to open the AOM management network configurator.

4. When prompted about using DHCP, type n.

5. At the IP address prompt type 0.0.0.0.
   
   A confirmation message displays the configured management IP address, netmask, and gateway.

6. (Optional) Type i to verify that network configuration is disabled.
Platform Installation

About installing the i5000/i7000/i10000/i11000 Series platform

After you have reviewed the hardware requirements and become familiar with the i5000/i7000/i10000/i11000 Series platform, you can install the unit into a 19-inch rack.

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

**Note:** F5® recommends that you keep all original packaging, in case you need to repackage and ship the platform later.

About the quick-install rails

The quick-install rails are optimized for installation into square hole cabinets, but 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 9: Quick-install rails](image)

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

**Caution:** Be sure that the rotating mount brackets located on the ends of the rails are locked into place on both sides of the platform when installing the quick-install rails.

After installing the platform, secure the chassis to the rack with the rail lock brackets that are provided.

Quick-install rail kit hardware

When you are installing with the quick-install rail kit, use these components.

<table>
<thead>
<tr>
<th>Quantity</th>
<th>Hardware</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>Quick-install rails</td>
</tr>
<tr>
<td>2</td>
<td>#8-32 pan head screws, steel zinc</td>
</tr>
</tbody>
</table>
### Install the rail lock brackets

Be sure that the rails are installed onto the chassis before you install the rail lock brackets.

The rail lock brackets secure the platform to the rack when you are using the quick-install rail kit.

1. Use a #1 Philips screwdriver to attach the rail lock brackets to each side of the unit using two of the black M3 x 8mm flathead screws that are provided with the kit.
   
   Use 5 inch-pounds (0.6 Newton-meters) of torque on these screws.

2. Slide the unit into the rack.

   **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.

3. Use a #2 Philips screwdriver to secure the rail lock brackets to the rack on each side of the unit using one of the #8-32 pan head screws that are provided with the kit.
   
   Use 14 to 16 inch-pounds (1.6 to 1.8 Newton-meters) of torque on these screws.
About grounding the platform

You must 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).
Connect the ground lug to the ground terminal

You must provide these components to properly ground the chassis:

- Crimping tool
- Single ring ground terminal lug
- One 12 AWG copper wire long enough to reach from the chassis to the common bonding network (CBN)

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

1. Remove the M5 Keps nuts from the ground lug on the back of the chassis.
2. Attach a ground ring terminal to the 12 AWG copper ground wire.
3. Install the ground ring terminal onto the chassis ground terminal.
4. Secure the ground ring terminal with the M5 Keps nuts.
   - Use 18 to 24 inch-pounds (2.0 to 2.7 Newton-meters) of torque on these Keps nuts.
5. Connect the ground wire to a common bonding network (CBN).

Connect 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. If you are using the default network configured on the management interface, connect an Ethernet cable to the management port.

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

2. Connect the console port to a serial console server. Depending on which F5® system you have and the console network to which you are attaching, you can use either the supplied RJ45 to DB9 console port cable or the RJ45F to RJ45M rolled serial adapter to connect the system to a serial console.

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

   **Note:** The default baud rate and serial port configuration is 19200/8-N-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. For information about cable and connector pinout specifications, see F5 Platforms: Accessories at support.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/f5-platform-accessories.html.

   ![Figure 11: The RJ45F to RJ45M rolled serial (pass-through) adapter (CBL-0143-00)](image)

3. Connect power to installed power supplies:

   **Note:** Be sure to route the power cords away from the fan tray so that the cords do not impede access to it.

   - For AC-powered systems, connect an auto locking power cable to the power input panel on all installed power supplies, and then connect the cable to the power source.

     **Note:** Not all country-specific power cables include a locking feature.

     **Note:** To remove the locking power cord, pull one or both of the power cord locking tabs away from the power supply.

   - For DC-powered systems, connect a DC cable to each power supply and then connect the cable to your DC mains power source.

4. If you plan to set up device service clustering (DSC®) with hard-wired failover capacity, connect the serial failover cable to the FAILOVER port on each unit.

   For more information about configuring failover, see BIG-IP® Device Service Clustering: Administration at support.f5.com.
You can now assign a management IP address to the system, and then license and provision the software. Optionally, you should run 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 support.f5.com/csp/article/K12878.

**Configure a management IP address using the LCD**

You can use the touchscreen LCD to configure the management IP address. With the management IP address, you can access the Configuration utility to configure other aspects of the product, such as the product license, VLANs, and trunks.

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

1. (Optional) Remove the protective film from the LCD panel using the small cutout on the lower right corner of the film.

![LCD panel with arrow pointing to cutout](image)

2. Touch the screen to activate the LCD menus.

![LCD menu options](image)

3. Tap Setup.

The Setup screen displays.

![Setup menu options](image)

4. Tap Management.
The Management screen displays.

5. For the Type setting, tap to select either IPv4 or IPv6.

6. If you are using IPv4, you can configure the management IP address using DHCP:
   a) Tap DHCP.
      The DHCP option displays.
   b) Tap to set the DHCP option to ON.
   c) Tap Commit to save your changes.

7. If you are using IPv6 or IPv4, you can configure the management IP address manually:
   a) Tap DHCP.
      The DHCP screen displays.
   b) Make sure that the DHCP option is set to OFF.
      If the DHCP option was set to ON, tap OFF, and then tap Commit to save the change.
   c) Tap Back to return to the Management screen.
      If you selected IPv4, this screen displays:

If you selected IPv6, this screen displays:
d) Tap **IP Address**.
   The IP Address screen displays.

e) Use the left, right, up, and down arrows to configure the management IP address and the length of the routing prefix for the IPv4 or IPv6 management IP address.
   For an IPv4 address, this screen displays:

   ![IPv4 IP Address Screen]

   For an IPv6 address, this screen displays:

   ![IPv6 IP Address Screen]

f) Tap **Commit** to save your changes.

g) On the Management screen, swipe to scroll down and tap **Gateway**.

   ![Management Screen]

h) Use the left, right, up, and down arrows to configure the default route for the management interface.
i) Tap **Commit** to save your changes.

You can now access the browser-based Configuration utility using the IP address that you configured.

---

**License the platform**

Once the management IP address is configured for the platform, you can use the Configuration utility to license the appropriate F5® 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 that you assigned:

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

   For example, type an IPv4 management IP address like this: `https://192.168.0.22`. For an IPv6 management address of `2001:0DB8::f5f5/64`, type the address like this: `https://[2001:0DB8::f5f5]`.

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 Introduction screen.

3. Click **Next** to view the License screen.

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

   For more information about licensing your platform, see *BIG-IP System: Essentials* at support.f5.com.
Platform Maintenance

About maintaining the platform

The i5000/i7000/i10000/i11000 Series platform contains 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 (i7000/i10000/i11000 Series only)
- Storage drive (i7000/i10000/i11000 Series only)

About AC and DC power supplies

The i5000/i7000/i10000/i11000 Series platform supports up to two AC or DC hot-swappable power supply units (PSUs). Most platforms come with only one power supply by default.

Caution: Running without power supply units installed in all available bays in the platform can affect cooling and electromagnetic interference (EMI). If you need to run the unit with one power supply unit (PSU), you must install a blank supply bracket into the empty power supply bay. 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 disconnect power from any unused PSUs.

Caution: Do not mix power supply unit (PSU) models. If two PSUs are installed in the same system, use only PSUs of the same model.

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

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

Note: Be sure to use only the power supply unit (PSU) that is designed for your platform. For example, a lower wattage PSU might not electrically connect if your platform is designed to use a higher wattage PSU.

Note: The power supply units (PSUs) do not have an on/off switch. Power is controlled from the rack switch or the mains power source.

Note: After removing input power from any power supply unit (PSU), wait 30 seconds before reapplying input power to the PSU.

About AC power supplies

This platform can support up to two AC power supplies. You can hot swap a power supply without powering down the system if there are two installed, and one remains installed and operational during the replacement process.
The platform supports power supply redundancy, which ensures that the system is unaffected if a single power supply fails in a system containing more than one operational power supply.

Figure 12: The 650W AC power supply (Platform: i5000/i7000/i10000/i11000; Part number: PWR-0306-xx)

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

### Replace an AC power supply

In the event of a power supply unit (PSU) failure, you can replace an AC PSU in your system. For a dual-supply system, you can perform the replacement without powering down the system, provided that there is at least one PSU operating during the replacement process.

**Caution:** Be sure that you are using the correct wattage and model of power supply unit (PSU) for your platform model when performing a power supply replacement.

**Note:** All photos shown are examples. The appearance of your components or accessories might vary slightly.

1. **Prepare the system for PSU replacement:**
   - For a single-supply system, use the touchscreen LCD to halt and power off the system.
   - For a dual-supply system, make sure that you have an operational supply already installed in your system if you want to hot swap a supply while the system is running. If you do not want to hot swap, you can perform the replacement with the system powered off.

2. **Before removing the PSU from your system, disconnect the AC power cord from the power supply by pulling one or both of the power cord locking tabs away from the power supply.**

**Important:** Locking AC power cords might not be available in all countries.
3. Remove the failed AC PSU by squeezing the ejector latch and pulling the handle straight toward you.

Note: After you remove a power supply unit (PSU) from the system, ensure that the replacement PSU has been unpowered for 30 seconds to ensure that the PSU circuitry is fully discharged before inserting the replacement PSU into the system.

4. If a connector protective cap is installed on your new PSU, remove it before installing the PSU into your system.
5. Inspect the new PSU, especially the connector area, for any damage that might have occurred during shipment.

6. Slide the new PSU into the empty slot, and push it in until the ejector latch engages and clicks.

   **Note:** While installing the supply, use care to ensure that the supply's connector does not come into contact with the rear of the chassis.

7. Ensure that the PSU is fully seated in the chassis by making sure it does not come out when gently pulled.

8. Connect an auto locking AC power cord to the power input panel on the new PSU.

   **Note:** Be sure to route the power cords away from the fan tray so that the cords do not impede access to it.

9. Connect the power cord to the power source.

   **Note:** If the system is fully powered down and does not boot after you apply power to the PSU, use the touchscreen LCD to power on the system.

10. Use the LCD touchscreen to clear any alert messages that might have resulted from performing the PSU replacement.

---

### About DC power supplies

This platform can support up to two DC power supplies. 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 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.

**Important:** Your platform must be running BIG-IP® software versions 12.1.1HF2, 12.1.2, or later to support DC power.
Figure 13: The 650W DC power supply (Platform: i5000/i7000/i10000/i11000; Part number: PWR-0307-xx)

Caution: Before installing a DC power supply unit (PSU), be sure that the circuit breaker for the DC mains power to the PSU is switched off.

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

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.

Note: When you are running a redundant DC power supply configuration, F5® strongly recommends that each DC power supply unit (PSU) in the system receives power from independent DC main power sources with independent circuit breakers.
Replace a DC power supply

Before you perform a DC power supply unit (PSU) replacement, you need to provide these tools and components:

- 12 AWG copper cable long enough to reach from the platform to the DC power source
- Flat-head or Phillips head screwdriver

In the event of a power supply unit (PSU) failure, you can replace a DC PSU in your system. For a dual-supply system, you can perform the replacement without powering down the system, provided that there is at least one PSU operating during the replacement process.

Caution: Be sure that you are using the correct wattage and model of power supply unit (PSU) for your platform model when performing a power supply replacement.

1. Prepare the system for PSU replacement:
   - For a single-supply system, use the touchscreen LCD to halt and power off the system.
   - For a dual-supply system, make sure that you have an operational supply already installed in your system if you want to hot swap a supply while the system is running. If you do not want to hot swap, you can perform the replacement with the system powered off.

2. Be sure that the circuit breaker for the DC mains power source is switched off.

3. Remove the failed DC PSU by squeezing the ejector latch and pulling straight toward you.

   Note: After you remove a power supply unit (PSU) from the system, ensure that the replacement PSU has been unpowered for 30 seconds to ensure that the PSU circuitry is fully discharged before inserting the replacement PSU into the system.

4. If a connector protective cap is installed on your new PSU, remove it before installing the PSU into your system.
5. Inspect the new PSU, especially the connector area, for any damage that might have occurred during shipment.

6. Assemble the DC cable by connecting one of the included DC ring terminals to one end of each of your 12 AWG copper cables.

7. Remove the terminal cover.

8. Use a screwdriver to remove the screws from the DC power terminals.

9. Connect the ring terminal for the positive (+) DC wire (typically red) to the left terminal, and the ring terminal for the negative (-) DC wire (typically black) to the right terminal.

10. After you have attached the ring terminals to the terminals, secure them using a screwdriver. Use 13.5 inch-pounds (1.53 Newton-meters) of torque on these screws.

11. If the chassis is not connected to Earth ground, connect the power supply Earth ground terminal to Earth ground.

12. Verify that the DC power cables are connected to the appropriate terminal.

   The red wire should be connected to the terminal labeled positive (+), and the black wire should be connected to the terminal labeled negative (-).

13. Replace the terminal cover.

14. Slide the new PSU into the empty slot, and push it in until the ejector latch engages and clicks.

   **Note:** While installing the supply, use care to ensure that the supply’s connector does not come into contact with the rear of the chassis.

15. Ensure that the PSU is fully seated in the chassis by making sure it does not come out when gently pulled.

16. Reapply input power from DC mains power source by switching the circuit breaker back on.

17. Use the LCD touchscreen to clear any alert messages that might have resulted from performing the PSU replacement.
About the fan tray

The i7000/i10000/i11000 Series platforms have 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.

![Image of the fan tray](image)

**Figure 14: The i7000/i10000/i11000 Series fan tray**

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

Replace the fan tray

To ensure that you can easily access the fan tray, route the power cords away from the fan tray so that the cords do not drape over or cross in front of it.

You do not need special tools and do not need to power down the unit when replacing the fan tray.

**Caution:** Operating the unit without a fan tray for more than 30 seconds might result in performance throttling or a thermal shutdown of the unit.

1. Locate the fan tray on the back of the chassis.
2. Loosen the fan tray screws by turning them counterclockwise with a Phillips screwdriver.

   **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 chassis by grasping the handles and pulling straight toward you.
4. Slide the new fan tray into the fan tray slot.
5. Tighten the screws into place with a Phillips screwdriver.
Use 5 inch-pounds (0.6 Newton-meters) of torque on these screws. The fan tray is connected to the system when you tighten the screws completely. Once seated, the fan tray automatically powers up and begins circulating air through the chassis.

About storage drive options

For BIG-IP® platforms that include one or two solid-state drives (SSDs), you can replace drives in the event of a drive failure.

<table>
<thead>
<tr>
<th>Platform model</th>
<th>Single solid-state drive</th>
<th>Dual solid-state drives</th>
</tr>
</thead>
<tbody>
<tr>
<td>i7000</td>
<td>i7000</td>
<td>i7000-D</td>
</tr>
<tr>
<td>i10000</td>
<td>i10000</td>
<td>i10000-D</td>
</tr>
<tr>
<td>i11000</td>
<td>i11000</td>
<td>N/A</td>
</tr>
</tbody>
</table>

About replacing a drive in single-drive system

For iSeries platforms that include only one drive by default, the drive is located in drive bay 1, and you must install the replacement drive back into drive bay 1. You must also power down the system when replacing a drive as part of routine maintenance or in the event of a drive failure.

Important: The replacement storage drive provided by F5® does not come with pre-installed software. You will need to create a bootable USB flash drive to install software onto the drive. Alternately, you can use a PXE server to install the software. For more information, see support.f5.com/kb/en-us/solutions/public/13000/100/sol13117.html.

Prerequisites for replacing a single drive

Before you replace a storage drive in a single-drive system, you need:

- A USB flash drive with a storage capacity that exceeds the size of the desired F5® software ISO image
- An F5 software ISO image
- An F5 system or a Linux system that is used to create a bootable USB flash drive

Note: For information on creating a bootable USB drive, see F5 Platforms: Essentials at support.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/f5-plat-hw-essentials.html

Replace a storage drive tray in a single-drive system

You can remove the faulty drive from the chassis and install the blank replacement drive that you received from F5® Networks. You can access the storage drives after removing the fan tray from the back of the chassis.

Note: All photos shown are examples. The appearance of your components or accessories might vary slightly.

1. Locate the fan tray on the back of the chassis.
2. Loosen the fan tray screws by turning them counterclockwise with a Phillips screwdriver.
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 chassis by grasping the handles and pulling straight toward you.
4. Remove the faulty drive by pushing the lever in the middle of the drive tray to the left.
5. Pull the large latch straight toward you to eject the drive tray from the chassis.
6. Slide the new drive tray into the empty drive bay until the latch engages the chassis.
7. Push the latch inward toward the chassis until it clicks.
8. Slide the fan tray back into the fan tray slot.
9. Tighten the screws into place with a Phillips screwdriver.
   Use 5 inch-pounds (0.6 Newton-meters) of torque on these screws. The fan tray is connected to the system when you tighten the screws completely. Once seated, the fan tray automatically powers up and begins circulating air through the chassis.

About creating a bootable USB flash drive on an iSeries system

You can use mkdisk, which is included in the F5® software installation ISO image file, to create a bootable USB flash drive that contains an F5 software ISO image. You can then use this bootable USB flash drive to install or upgrade a system when you either do not have the installation image on the storage drive, or when you cannot access the storage drive. Additionally, you can use the USB flash drive to recover the system.

Linux system requirements for creating a bootable USB flash drive

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.

<table>
<thead>
<tr>
<th>Component</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linux</td>
<td>2.6.x kernel</td>
</tr>
<tr>
<td>Perl</td>
<td>Version 5.8 or later</td>
</tr>
<tr>
<td>Library for WWW in Perl (LWP) package</td>
<td>Downloadable from cpan.org</td>
</tr>
</tbody>
</table>
Create a bootable USB flash drive

You can create a bootable USB flash drive that contains an F5® software ISO image using either an existing F5 system that is running a recent an software release or a Linux workstation that is running a recent Linux distribution.

1. Log in to the command line of the system using an account with root access.
2. Mount the installation as a loopback device, using one of these methods:
   - If you have an F5 system with the F5 ISO image located in the /shared/images directory:
     - Create a new directory:
       ```bash
       mkdir /mnt/iso
       ```
     - Mount the ISO image:
       ```bash
       mount -o loop BIGIP-version.iso /mnt/iso
       ```
   - If you have a DVD drive attached to the system that contains a valid F5 software image, insert the DVD into the DVD drive.
3. Insert a 2 GB or larger flash drive into a USB port on the F5 system or Linux workstation.
4. Change to the root directory to the mounted image.
   ```bash
   cd /mnt/iso
   ```
5. Start the mkdisk script.
   ```bash
   ./mkdisk
   ```
6. Respond to the series of questions that display by choosing the appropriate options for your configuration.
   a) Specify the F5 system that you plan to use as the target for USB flash drive installation.
   b) Specify the device to be used by mkdisk (that is, the USB flash drive that you are creating).
   c) Confirm that you want to continue by typing y.
   d) Specify the product to transfer (for example, version 11.6.0) or type y if there is only one product.

   The script checks for the required tools and creates the flash drive. The flash drive creation process might take several minutes.
7. When the process is complete, unmount the ISO image.
   ```bash
   umount /mnt/iso
   ```

You can now remove the USB flash drive and use it to boot other F5 systems, as needed.

Boot the iSeries system from a bootable USB flash drive

Before you boot the F5® system to the Maintenance OS (MOS), be sure that you have console access to the system, either through a console server or directly through a serial connection.

---

**Important:** Once you boot to the MOS, you lose connection with the system over SSH on the management port.

You can use a bootable USB flash drive as the installation source to install or upgrade an F5 system.

1. Insert the flash drive into the USB port of the target system.
2. Boot the target system.
   - The device automatically boots to the MOS on the attached USB flash drive.

---

About replacing a drive in a dual-drive system

For iSeries platforms that include two solid-state drives (SSDs) by default, when a drive fails, you can replace the failed drive. These platforms support drive mirroring using RAID. For these platforms, you do not need to power down the system when replacing a drive as part of routine maintenance or in the event of a drive failure.

**Important:** Replacement drives provided by F5 do not come pre-installed with software.
Identify the faulty storage drive

To physically access the storage drives, you must first remove the fan tray from the unit.

Before you remove a storage drive from your system, you should identify the faulty drive.

1. Open the TMOS 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

<table>
<thead>
<tr>
<th>Bay ID</th>
<th>Serial Number</th>
<th>Name</th>
<th>Array Member</th>
<th>Array Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>S2HSNX0HB02143</td>
<td>HD2</td>
<td>yes</td>
<td>failed</td>
</tr>
<tr>
<td>2</td>
<td>S2HSNX0HB02237</td>
<td>HD1</td>
<td>yes</td>
<td>ok</td>
</tr>
</tbody>
</table>

---
Sys::Raid::Bay

<table>
<thead>
<tr>
<th>Bay</th>
<th>Shelf</th>
<th>Name</th>
<th>Serial Number</th>
<th>Array Member</th>
<th>Array Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>1</td>
<td>HD2</td>
<td>S2HSNX0HB02143</td>
<td>yes</td>
<td>failed</td>
</tr>
<tr>
<td>2</td>
<td>1</td>
<td>HD1</td>
<td>S2HSNX0HB02237</td>
<td>yes</td>
<td>ok</td>
</tr>
</tbody>
</table>

---
Sys::Raid::Disk

<table>
<thead>
<tr>
<th>Name</th>
<th>Serial Number</th>
<th>Array</th>
<th>Array Status</th>
<th>Model</th>
</tr>
</thead>
<tbody>
<tr>
<td>HD1</td>
<td>S2HSNX0HB02143</td>
<td>yes</td>
<td>ok</td>
<td>ATA</td>
</tr>
<tr>
<td>HD2</td>
<td>S2HSNX0HB02237</td>
<td>yes</td>
<td>failed</td>
<td>ATA</td>
</tr>
</tbody>
</table>

3. Make note of the bay number and serial number for the faulty drive (the drive with the **failed** status).

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

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

The faulty drive is HD2 in this example.

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

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

Replace a storage drive tray in a dual-drive system

For dual drive systems, F5 sends you a replacement drive to replace the failed drive

1. Verify the location of the faulty drive by comparing the serial number and drive bay that you noted earlier.

2. Remove the faulty drive by pushing the lever in the middle of the drive tray to the left.
3. Slide the new drive tray into the empty drive bay until the latch engages the chassis.
4. Push the latch inward toward the chassis until it clicks.
5. View the status of the drives.
   
   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   S2HSNX0HB02143   yes     ok            SAMSUNG MZ7KM480
   HD2   S2HSNX0HB02237   yes     undefined     SAMSUNG MZ7KM480

   The status of the replacement 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 additional drive in the disk summary, the drive might not be seated properly. If this occurs, remove and reinset the drive.

6. 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.
Environmental Guidelines

General environmental and installation guidelines

The i5000/i7000/i10000/i11000 Series 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 supportive structure is required to support the unit if only one person is installing the unit.
• 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.
• Route and secure power cords so that they do not obstruct removal of the fan tray.

**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® 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.

Chassis rack-mount spatial requirements

The i5000/i7000/i10000/i11000 Series platforms ship with a rack mount kit to help install the system more easily. This kit requires that the rack or cabinet has certain clearances and spacing, as shown here.
Figure 15: Rack mounting spatial requirements for the i5000/i7000/i10000/i11000 Series platform
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.
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.

**Caution:** Install DC-powered equipment only in restricted access areas, such as dedicated equipment rooms, equipment closets, or similar locations.

Avertissement : Installer le matériel alimenté par courant continu uniquement dans des zones à accès reglementé, telles que des salles de matériel, des armoires de materiel 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.
Figure 17: Airflow in iSeries platforms
Platform Specifications

General specifications for system features

This table lists general specifications for system features for BIG-IP iSeries platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transceiver modules hot swap</td>
<td>Support for hot swap of optical transceiver modules</td>
</tr>
<tr>
<td>Fan tray hot swap</td>
<td>Support for hot swap of the fan tray</td>
</tr>
</tbody>
</table>

**Note:** Applies only to i7000/i10000/i11000 Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Power supply hot swap</td>
<td>Support for hot swap of the power supplies in dual supply systems</td>
</tr>
<tr>
<td>Jumbo frames</td>
<td>Support for maximum Ethernet frame size of 9216 bytes and MTU of 9128 bytes</td>
</tr>
<tr>
<td>F5® Virtual Clustered Multiprocessing™ (vCMP®)</td>
<td>Supports provisioning and managing multiple, hosted instances of F5® software on a single hardware device</td>
</tr>
</tbody>
</table>

**Note:** Supported only in platforms running a high performance license (x800).

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>F5® TurboFlex™ Profiles</td>
<td>TurboFlex Profiles are groupings of hardware-accelerated (FPGA) features that are associated with a specific use case. TurboFlex Profiles are groupings of hardware-accelerated features that are dependent on module licensing. If BIG-IP® LTM® is licensed and provisioned, then the ADC profile is available. If BIG-IP AFM™ is licensed and provisioned, then the Security profile is available. TurboFlex Profiles are supported only in platforms running a high performance license (x800). Also, TurboFlex Profile availability varies depending on the platform series tier. For more information, see F5 Platforms: TurboFlex Profiles at support.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/f5-platform-turboflex-profiles.</td>
</tr>
</tbody>
</table>

Hardware specifications - i5000 (i5600/i5800) Series

This table lists hardware specifications for i5000 (i5600/i5800) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>H: 1.72 inches (4.37 cm) x W: 17.4 inches (44.20 cm) x D: 30.6 inches (77.72 cm) (per unit) 1U industry standard rack-mount chassis</td>
</tr>
<tr>
<td>Weight</td>
<td>24.5 pounds (11.11 kg) with one power supply (per unit)</td>
</tr>
<tr>
<td></td>
<td>• Quick install rail kit adds 4.5 pounds (2.04 kg).</td>
</tr>
<tr>
<td></td>
<td>• Optional mid-mount rack brackets add 2.5 pounds (1.13 kg).</td>
</tr>
<tr>
<td></td>
<td>• Additional power supply adds 2.0 pounds (0.91 kg).</td>
</tr>
</tbody>
</table>
### Hardware specifications - i5000F (i5820-DF)

This table lists hardware specifications for i5000 (i5600/i5800) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>H: 1.72 inches (4.37 cm) x W: 17.4 inches (44.20 cm) x D: 30.6 inches (77.72 cm) (per unit) 1U industry standard rack-mount chassis</td>
</tr>
<tr>
<td>Weight</td>
<td>24.5 pounds (11.11 kg) with one power supply (per unit)</td>
</tr>
<tr>
<td></td>
<td>• Quick install rail kit adds 4.5 pounds (2.04 kg).</td>
</tr>
<tr>
<td></td>
<td>• Optional mid-mount rack brackets add 2.5 pounds (1.13 kg).</td>
</tr>
<tr>
<td></td>
<td>• Additional power supply adds 2.0 pounds (0.91 kg).</td>
</tr>
<tr>
<td>Processor</td>
<td>1 x Quad-Core Intel® Xeon® processor (total 8 hyperthreaded logical processing cores)</td>
</tr>
<tr>
<td>FIPS hardware security module (HSM)</td>
<td>Cavium Nitrox III</td>
</tr>
<tr>
<td>Communication interfaces</td>
<td>8 x 10GbE SFP+</td>
</tr>
<tr>
<td></td>
<td>4 x 40GbE QSFP+ fiber ports</td>
</tr>
<tr>
<td></td>
<td>1 x 1GbE management port</td>
</tr>
<tr>
<td></td>
<td>1 x RJ45 console port</td>
</tr>
<tr>
<td>Storage drive capacity</td>
<td>2 x 480 GB solid-state drives (SSDs)</td>
</tr>
<tr>
<td>RAM</td>
<td>48 GB</td>
</tr>
</tbody>
</table>
### AC power supply

- 1 x 650 W 100-240 VAC(+- 10%) AUTO Switching Platinum
- 1 x NEMA 5-15P power cords

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

---

### Hardware specifications - i7000 (i7600/i7800) Series

This table lists hardware specifications for i7000 (i7600/i7800) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>H: 1.72 inches (4.37 cm) x W: 17.4 inches (44.20 cm) x D: 30.6 inches (77.72 cm) (per unit) 1U industry standard rack-mount chassis</td>
</tr>
<tr>
<td>Weight</td>
<td>30.0 pounds (13.61 kg) with two power supplies (per unit)</td>
</tr>
</tbody>
</table>
  - Quick install rail kit adds 4.5 pounds (2.04 kg).
  - Optional mid-mount rack brackets add 2.5 pounds (1.13 kg).
| Processor          | 1 x Six-Core Intel® Xeon® processor (total 12 hyperthreaded logical processing cores) |
| Communication      | 8 x 10GbE SFP+                                                               |
  - 4 x 40GbE QSFP+ fiber ports
  - 1 x 1GbE management port
  - 1 x RJ45 console port
  - 1 x RJ45 failover port
  - 1 x USB 2.0 interface
| Storage drive capacity | 1 to 2 x 480 GB solid-state drives (SSDs)                                          |
| RAM                | 96 GB                                                                         |
| AC power supply    | 2 x 650 W 100-240 VAC(+- 10%) AUTO Switching Platinum                      |
  - 2 x NEMA 5-15P power cords
| DC power supply    | 2 x 650W DC                                                                   |
  - Operating range: 44-72 VDC
  - Minimum start up voltage: 44 VDC

**Note:** Power supply will not start below 44 VDC.

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

---

### Hardware specifications - i7000F (i7820-DF)

This table lists hardware specifications for i7000F (i7820-DF) platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>H: 1.72 inches (4.37 cm) x W: 17.4 inches (44.20 cm) x D: 30.6 inches (77.72 cm) (per unit) 1U industry standard rack-mount chassis</td>
</tr>
<tr>
<td>Weight</td>
<td>30.0 pounds (13.61 kg) with two power supplies (per unit)</td>
</tr>
</tbody>
</table>
## Platform Specifications

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>1 x Six-Core Intel® Xeon® processor (total 12 hyperthreaded logical processing cores)</td>
</tr>
<tr>
<td>FIPS hardware security module (HSM)</td>
<td>Cavium Nitrox III</td>
</tr>
</tbody>
</table>
| Communication interfaces | 8 x 10GbE SFP+  
4 x 40GbE QSFP+ fiber ports  
1 x 1GbE management port  
1 x RJ45 console port  
1 x RJ45 failover port  
1 x USB 2.0 interface |
| Storage drive capacity   | 2 x 480 GB solid-state drives (SSDs)                                                                                                             |
| RAM                      | 96 GB                                                                                                                                            |
| AC power supply          | 2 x 650 W 100-240 VAC(+/− 10%) AUTO Switching Platinum  
2 x NEMA 5-15P power cords |

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

## Hardware specifications - i10000 (i10600/i10800) Series

This table lists hardware specifications for i10000 (i10600/i10800) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dimensions</td>
<td>H: 1.72 inches (4.37 cm) x W: 17.4 inches (44.20 cm) x D: 30.6 inches (77.72 cm) (per unit) 1U industry standard rack-mount chassis</td>
</tr>
<tr>
<td>Weight</td>
<td>36.0 pounds (16.33 kg) with two power supplies (per unit)</td>
</tr>
</tbody>
</table>
|                          | • Quick install rail kit adds 4.5 pounds (2.04 kg).  
                          | • Optional mid-mount rack brackets add 2.5 pounds (1.13 kg).                                                                                 |
| Processor                | 1 x Eight-Core Intel® Xeon® processor (total 16 hyperthreaded logical processing cores)                                                      |
| Communication interfaces | 8 x 10GbE SFP+  
6 x 40GbE QSFP+ fiber ports  
1 x 1GbE management port  
1 x RJ45 console port  
1 x RJ45 failover port  
1 x USB 2.0 interface |
| Storage drive capacity   | 1 to 2 x 480 GB solid-state drives (SSDs)                                                                                                      |
| RAM                      | 128 GB                                                                                                                                          |
| AC power supply          | 2 x 650 W 100-240 VAC(+/− 10%) AUTO Switching Platinum  
2 x NEMA 5-15P power cords |
| DC power supply          | 2 x 650W DC                                                                                                                                     |
### Operating range:
44-72 VDC

### Minimum start up voltage:
44 VDC

**Note:** Power supply will not start below 44 VDC.

---

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

---

## Hardware specifications - i11000 (i11600/i11800) Series

This table lists hardware specifications for i11000 (i11600/i11800) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td>H: 1.72 inches (4.37 cm) x W: 17.4 inches (44.20 cm) x D: 30.6 inches (77.72 cm) (per unit) 1U industry standard rack-mount chassis</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>36.0 pounds (16.33 kg) with two power supplies (per unit)</td>
</tr>
<tr>
<td></td>
<td>• Quick install rail kit adds 4.5 pounds (2.04 kg).</td>
</tr>
<tr>
<td></td>
<td>• Optional mid-mount rack brackets add 2.5 pounds (1.13 kg).</td>
</tr>
<tr>
<td><strong>Processor</strong></td>
<td>1 x 18-Core Intel® Xeon® processor (total 32 hyperthreaded logical processing cores)</td>
</tr>
<tr>
<td><strong>Communication interfaces</strong></td>
<td>8 x 10GbE SFP+</td>
</tr>
<tr>
<td></td>
<td>6 x 40GbE QSFP+ fiber ports</td>
</tr>
<tr>
<td></td>
<td>1 x 1GbE management port</td>
</tr>
<tr>
<td></td>
<td>1 x RJ45 console port</td>
</tr>
<tr>
<td></td>
<td>1 x RJ45 failover port</td>
</tr>
<tr>
<td></td>
<td>1 x USB 2.0 interface</td>
</tr>
<tr>
<td><strong>Storage drive capacity</strong></td>
<td>1 x 960 GB solid-state drive (SSD)</td>
</tr>
<tr>
<td><strong>RAM</strong></td>
<td>256 GB</td>
</tr>
<tr>
<td><strong>AC power supply</strong></td>
<td>2 x 650 W 100-240 VAC(+/- 10%) AUTO Switching Platinum</td>
</tr>
<tr>
<td></td>
<td>2 x NEMA 5-15P power cords</td>
</tr>
</tbody>
</table>

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

---

## Hardware specifications - i11000S (i11800-S)

This table lists hardware specifications for i11000S (i11800-S) platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Dimensions</strong></td>
<td>H: 1.72 inches (4.37 cm) x W: 17.4 inches (44.20 cm) x D: 30.6 inches (77.72 cm) (per unit) 1U industry standard rack-mount chassis</td>
</tr>
<tr>
<td><strong>Weight</strong></td>
<td>36.0 pounds (16.33 kg) with two power supplies (per unit)</td>
</tr>
<tr>
<td></td>
<td>• Quick install rail kit adds 4.5 pounds (2.04 kg).</td>
</tr>
<tr>
<td></td>
<td>• Optional mid-mount rack brackets add 2.5 pounds (1.13 kg).</td>
</tr>
</tbody>
</table>
**Platform Specifications**

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processor</td>
<td>1 x 18-Core Intel® Xeon® processor (total 32 hyperthreaded logical processing cores)</td>
</tr>
</tbody>
</table>
| Communication interfaces | 8 x 10GbE SFP+  
6 x 40GbE QSFP+ fiber ports  
1 x 1GbE management port  
1 x RJ45 console port  
1 x RJ45 failover port  
1 x USB 2.0 interface   |
| Storage drive capacity   | 1 x 960 GB solid-state drive (SSD)                                                                                                           |
| RAM                      | 256 GB                                                                                                                                        |
| AC power supply          | 2 x 650 W 100-240 VAC(+/− 10%) AUTO Switching Platinum  
2 x NEMA 5-15P power cords |

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

---

**Environmental operating specifications**

This table lists platform environmental operating specifications.

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
</tr>
</thead>
<tbody>
<tr>
<td>Operational temperature</td>
<td>32 to 104°F (0 to 40°C)</td>
</tr>
</tbody>
</table>
| Operational relative humidity | 5% to 85% (40°C) non-condensing  
Up to 93% (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 93% (40°C) non-condensing                                                |

---

**Power specifications - i5000 (i5600/i5800) Series**

This table lists power specifications for i5000 (i5600/i5800) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Single power supply</th>
<th>Dual power supply</th>
</tr>
</thead>
</table>
| Idle power draw (AC power)        | 110VAC input: 195W  
220VAC input: 190W        | 110VAC input: 205W  
220VAC input: 205W        |
| Typical power draw (AC power; 50% load; temp 25°C) | 110VAC input: 265W  
220VAC input: 260W        | 110VAC input: 265W  
220VAC input: 265W        |
| Typical power draw (DC power; 50% load; temp 25°C) | 48VDC input: 260W     | 48VDC input: 265W     |
| Maximum power draw (AC power)     | 110VAC input: 330W  
220VAC input: 325W        | 110VAC input: 330W  
220VAC input: 325W        |
<p>| Maximum power draw (DC power)     | 48VDC input: 320W     | 48VDC input: 320W     |
| Typical heat generated (AC power) | 110VAC input: 905 BTU/ hour | 110VAC input: 905 BTU/ hour |</p>
<table>
<thead>
<tr>
<th>Item</th>
<th>Single power supply</th>
<th>Dual power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical heat generated (DC power)</td>
<td>220VAC input: 890 BTU/hour</td>
<td>220VAC input: 905 BTU/hour</td>
</tr>
<tr>
<td>Maximum heat generated (AC power)</td>
<td>48VDC input: 890 BTU/hour</td>
<td>48VDC input: 905 BTU/hour</td>
</tr>
<tr>
<td>Maximum heat generated (DC power)</td>
<td>1130 BTU/hour</td>
<td>1130 BTU/hour</td>
</tr>
<tr>
<td></td>
<td>1095 BTU/hour</td>
<td>1095 BTU/hour</td>
</tr>
</tbody>
</table>

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

### Power specifications - i5000F (i5820-DF)

This table lists power specifications for i5000F (i5820-DF) platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Single power supply</th>
<th>Dual power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle power draw (AC power)</td>
<td>110VAC input: 230W</td>
<td>110VAC input: 240W</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 225W</td>
<td>220VAC input: 235W</td>
</tr>
<tr>
<td>Typical power draw (AC power; 50% load; temp 25°C)</td>
<td>110VAC input: 325W</td>
<td>110VAC input: 340W</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 320W</td>
<td>220VAC input: 330W</td>
</tr>
<tr>
<td>Maximum power draw (AC power)</td>
<td>110VAC input: 420W</td>
<td>110VAC input: 435W</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 410W</td>
<td>220VAC input: 420W</td>
</tr>
<tr>
<td>Typical heat generated (AC power)</td>
<td>110VAC input: 1110 BTU/hour</td>
<td>110VAC input: 1165 BTU/hour</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 1110 BTU/hour</td>
<td>220VAC input: 1130 BTU/hour</td>
</tr>
<tr>
<td>Maximum heat generated (AC power)</td>
<td>1435 BTU/hour</td>
<td>1485 BTU/hour</td>
</tr>
</tbody>
</table>

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

### Power specifications - i7000 (i7600/i7800) Series

This table lists power specifications for i7000 (i7600/i7800) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Single power supply</th>
<th>Dual power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle power draw (AC power)</td>
<td>110VAC input: 210W</td>
<td>110VAC input: 225W</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 210W</td>
<td>220VAC input: 220W</td>
</tr>
<tr>
<td>Typical power draw (AC power; 50% load; temp 25°C)</td>
<td>110VAC input: 300W</td>
<td>110VAC input: 310W</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 295W</td>
<td>220VAC input: 305W</td>
</tr>
<tr>
<td>Typical power draw (DC power; 50% load; temp 25°C)</td>
<td>48VDC input: 290W</td>
<td>48VDC input: 300W</td>
</tr>
<tr>
<td>Maximum power draw (AC power)</td>
<td>110VAC input: 390W</td>
<td>110VAC input: 390W</td>
</tr>
<tr>
<td></td>
<td>240VAC input: 380W</td>
<td>240VAC input: 390W</td>
</tr>
<tr>
<td>Maximum power draw (DC power)</td>
<td>48VDC input: 370W</td>
<td>48VDC input: 380W</td>
</tr>
</tbody>
</table>
### Power specifications - i7000F (i7820-DF)

This table lists power specifications for i7000F (i7820-DF) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Single power supply</th>
<th>Dual power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical heat generated (AC power)</td>
<td>110VAC input: 1025 BTU/hour</td>
<td>110VAC input: 1060 BTU/hour</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 1010 BTU/hour</td>
<td>220VAC input: 1280 BTU/hour</td>
</tr>
<tr>
<td>Typical heat generated (DC power)</td>
<td>48VDC input: 990 BTU/hour</td>
<td>48VDC input: 1025 BTU/hour</td>
</tr>
<tr>
<td>Maximum heat generated (AC power)</td>
<td>1045 BTU/hour</td>
<td>1335 BTU/hour</td>
</tr>
<tr>
<td>Maximum heat generated (DC power)</td>
<td>1265 BTU/hour</td>
<td>1300 BTU/hour</td>
</tr>
</tbody>
</table>

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

### Power specifications - i10000 (i10600/i10800) Series

This table lists power specifications for i10000 (i10600/i10800) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Single power supply</th>
<th>Dual power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle power draw (AC power)</td>
<td>110VAC input: 240W</td>
<td>110VAC input: 24W</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 235W</td>
<td>220VAC input: 250W</td>
</tr>
<tr>
<td>Typical power draw (AC power; 50% load; temp 25°C)</td>
<td>110VAC input: 355W</td>
<td>110VAC input: 360W</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 345W</td>
<td>220VAC input: 355W</td>
</tr>
<tr>
<td>Maximum power draw (AC power)</td>
<td>110VAC input: 465W</td>
<td>110VAC input: 470W</td>
</tr>
<tr>
<td></td>
<td>240VAC input: 450W</td>
<td>240VAC input: 460W</td>
</tr>
<tr>
<td>Typical heat generated (AC power)</td>
<td>110VAC input: 1215 BTU/hour</td>
<td>110VAC input: 1230 BTU/hour</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 1180 BTU/hour</td>
<td>220VAC input: 1215 BTU/hour</td>
</tr>
<tr>
<td>Maximum heat generated (AC power)</td>
<td>1590 BTU/hour</td>
<td>1605 BTU/hour</td>
</tr>
</tbody>
</table>

**Important:** Specifications are subject to change without notification.
### Power specifications - i11000 (i11600/i11800) Series

This table lists power specifications for i11000 (i11600/i11800) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Single power supply</th>
<th>Dual power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum power draw (DC power)</td>
<td>48VDC input: 510W</td>
<td>48VDC input: 510W</td>
</tr>
<tr>
<td>Typical heat generated (AC power)</td>
<td>110VAC input: 1385 BTU/hour</td>
<td>110VAC input: 1420 BTU/hour</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 1365 BTU/hour</td>
<td>220VAC input: 1400 BTU/hour</td>
</tr>
<tr>
<td>Typical heat generated (DC power)</td>
<td>48VDC input: 1365 BTU/hour</td>
<td>48VDC input: 1745 BTU/hour</td>
</tr>
<tr>
<td>Maximum heat generated (AC power)</td>
<td>1775 BTU/hour</td>
<td>1795 BTU/hour</td>
</tr>
<tr>
<td>Maximum heat generated (DC power)</td>
<td>1385 BTU/hour</td>
<td>1745 BTU/hour</td>
</tr>
</tbody>
</table>

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

### Power specifications - i11000S (i11400-DS/i11600-DS/i11800-DS)

This table lists power specifications for i11000S (i11400-DS/i11600-DS/i11800-DS) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Single power supply</th>
<th>Dual power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle power draw (AC power)</td>
<td>110VAC input: 340W</td>
<td>110VAC input: 340W</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 330W</td>
<td>220VAC input: 330W</td>
</tr>
<tr>
<td>Typical power draw (AC power; 50% load; temp 25°C)</td>
<td>110VAC input: 460W</td>
<td>110VAC input: 455W</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 440W</td>
<td>220VAC input: 440W</td>
</tr>
<tr>
<td>Maximum power draw (AC power)</td>
<td>110VAC input: 575W</td>
<td>110VAC input: 570W</td>
</tr>
<tr>
<td></td>
<td>240VAC input: 550W</td>
<td>240VAC input: 550W</td>
</tr>
<tr>
<td>Typical heat generated (AC power)</td>
<td>110VAC input: 1570 BTU/hour</td>
<td>110VAC input: 1555 BTU/hour</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 1505 BTU/hour</td>
<td>220VAC input: 1505 BTU/hour</td>
</tr>
<tr>
<td>Maximum heat generated (AC power)</td>
<td>1965 BTU/hour</td>
<td>1945 BTU/hour</td>
</tr>
</tbody>
</table>

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

### Power specifications - i11000S (i11400-DS/i11600-DS/i11800-DS) Series

This table lists power specifications for i11000S (i11400-DS/i11600-DS/i11800-DS) Series platforms.

<table>
<thead>
<tr>
<th>Item</th>
<th>Single power supply</th>
<th>Dual power supply</th>
</tr>
</thead>
<tbody>
<tr>
<td>Idle power draw (AC power)</td>
<td>110VAC input: 295W</td>
<td>110VAC input: 305W</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 290W</td>
<td>220VAC input: 295W</td>
</tr>
<tr>
<td>Typical power draw (AC power; 50% load; temp 25°C)</td>
<td>110VAC input: 435W</td>
<td>110VAC input: 435W</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 425W</td>
<td>220VAC input: 430W</td>
</tr>
<tr>
<td>Maximum power draw (AC power)</td>
<td>110VAC input: 575W</td>
<td>110VAC input: 565W</td>
</tr>
<tr>
<td></td>
<td>240VAC input: 560W</td>
<td>240VAC input: 560W</td>
</tr>
<tr>
<td>Item</td>
<td>Single power supply</td>
<td>Dual power supply</td>
</tr>
<tr>
<td>-------------------------------------------</td>
<td>---------------------</td>
<td>-------------------</td>
</tr>
<tr>
<td>Typical heat generated (AC power)</td>
<td>110VAC input: 1485</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BTU/hour</td>
<td>110VAC input: 1485</td>
</tr>
<tr>
<td></td>
<td>220VAC input: 1455</td>
<td></td>
</tr>
<tr>
<td></td>
<td>BTU/hour</td>
<td>220VAC input: 1470</td>
</tr>
<tr>
<td>Maximum heat generated (AC power)</td>
<td>1965 BTU/hour</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>1930 BTU/hour</td>
</tr>
</tbody>
</table>

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

### Safety requirements

This equipment complies with these requirements of the Low Voltage Directive 2014/35/EU:

- **EC Type Examination Certificates:** Master Contract 252302
- CB Scheme
- ANSI/UL 60950-1-2014

### EMC requirements

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

This equipment complies with Part 15 of FCC Rules. 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.

**European Union**

This equipment complies with these requirements of the EMC Directive 2014/30/EU:

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

- ETSI EN 300 386 V1.6.1 (2012)
- EN 61000-3-2:2014
- EN 61000-3-3:2013

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

- EN 55024:2010
Acoustic and altitude specifications

This table lists acoustic levels and operational altitude specifications for iSeries platforms.

<table>
<thead>
<tr>
<th>Specification type</th>
<th>Detail</th>
<th>Value</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Acoustic</td>
<td>Sound power</td>
<td>72.72 dBA</td>
<td>A-weighted Sound Power at 27°C full system load.</td>
</tr>
<tr>
<td>Altitude</td>
<td>Operational</td>
<td>13,000 Feet</td>
<td>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.</td>
</tr>
<tr>
<td></td>
<td>Non-operational</td>
<td>40,000 Feet</td>
<td></td>
</tr>
</tbody>
</table>

Airflow specifications

This table lists airflow movement specifications for BIG-IP® iSeries platforms.

Note: Fan tray airflow measurements are taken at 100% duty cycle and in open air.

<table>
<thead>
<tr>
<th>Platform</th>
<th>Value (max)</th>
</tr>
</thead>
<tbody>
<tr>
<td>i5000</td>
<td>97 CFM</td>
</tr>
<tr>
<td>i7000/i10000/i11000</td>
<td>146 CFM</td>
</tr>
</tbody>
</table>

Restriction of Hazardous Substances Directive (RoHS) for China

Products listed on this declaration comply with the Restriction of Hazardous Substances (RoHS) directive 2011/65/EU, and produce required technical documentation in compliance with EN50581:2012.

In accordance with China's Management Methods for the Restriction of the Use of Hazardous Substances in Electrical and Electronic Products #32, the following information is provided regarding the names and concentration levels of toxic substances or hazardous substances that may be contained in the following product relative to the standards set by the Standardization Administration of the People's Republic of China.
<table>
<thead>
<tr>
<th>Component Name</th>
<th>Hazardous/Toxic Substance Name</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>铅 Pb</td>
</tr>
<tr>
<td>Metal Parts</td>
<td>X</td>
</tr>
<tr>
<td>PCA Processor Board</td>
<td>X</td>
</tr>
<tr>
<td>PCA Mezzanine Board</td>
<td>X</td>
</tr>
<tr>
<td>Internal Cables</td>
<td>0</td>
</tr>
<tr>
<td>Hard Drives or SSDs</td>
<td>0</td>
</tr>
</tbody>
</table>

This table is prepared in accordance with the provisions of SJ/T 11364.
此表是按照规定制定 SJ/T 11364

| 0: Indicates that this toxic or hazardous substance contained in all the homogeneous materials for this part is below the limit requirement of GB/T 26572. |
| X: Indicates that this toxic or hazardous substance contained in all the homogeneous materials for this part is above the limit requirement of GB/T 26572. |

0：表示此部件的均质材料中所含的有毒或危险物质低于 GB/T 26572 限值要求。
X：表示此部件的均质材料中所含的有毒或危险物质高于 GB/T 26572 限值要求。

（注：表中标记“X”的部件，皆因全球技术发展水平限制而无法实现有害物质的替代。）
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.

You can perform a disk erase operation to erase all sensitive data from storage drives (for example, solid-state drives and hard disk drives) before you return a platform to F5. For more information, see F5 Platforms: Essentials at support.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/f5-plat-hw-essentials.html.

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

**Important:** You must use shipping materials and packaging provided by F5 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 transceiver modules, GBICs, or other peripheral items if you are returning the platform to F5.

Repackage the platform

The iSeries platforms must be shipped in F5-provided packaging.

**Caution:** To ensure your safety and to prevent damage to the platform, we highly recommend that you have at least two people remove the platform from the rack and repackage it into the shipping box.

1. Halt the platform using the LCD panel.
2. Disconnect the AC power cord or DC power supply terminal from the power supplies.
3. Disconnect the network cables and other cables from the chassis, and then remove any optical modules.
4. Remove the chassis from the rack.
5. Remove all installation hardware from the chassis.
6. Place the chassis onto the bottom foam in the shipping box.
7. Place the top foam pieces into the slot on the bottom foam.
8. 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® for reprocessing or repair. The guidelines include reprocessing procedures and optional customer-end procedures.

About memory technologies used in F5 equipment

F5® 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.

<table>
<thead>
<tr>
<th>Description</th>
<th>Data</th>
<th>Customer data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Programmable firmware stores</td>
<td>Firmware</td>
<td>No</td>
</tr>
<tr>
<td>Switch Card SEEPROM</td>
<td>Platform ID, serial number, part number, and so on.</td>
<td>No</td>
</tr>
<tr>
<td>PHY EEPROMs</td>
<td>PHY MAC address</td>
<td>No</td>
</tr>
</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>Description</th>
<th>Data</th>
<th>Customer data</th>
<th>Data security method</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard disk drive (HDD)</td>
<td>F5® product software, customer configuration, and log files</td>
<td>Yes</td>
<td>Standard reprocessing or customer removal</td>
</tr>
<tr>
<td>Solid-state drive (SSD)</td>
<td>F5 product software, customer configuration, and log files</td>
<td>Yes</td>
<td>Standard reprocessing or customer removal</td>
</tr>
<tr>
<td>Always-On Management (AOM) Flash chip (soldered-down flash chip)</td>
<td>AOM boot code and customer custom configuration</td>
<td>Yes</td>
<td>Standard reprocessing or customer action</td>
</tr>
<tr>
<td>FIPS hardware security module (HSM) (if present)</td>
<td>FIPS security domain and private keys</td>
<td>Yes</td>
<td>Standard reprocessing or customer action</td>
</tr>
</tbody>
</table>

About removing data from F5 components

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

Remove 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 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 about storage drive maintenance, see F5® Platforms: Essentials at support.f5.com/kb/en-us/products/big-ip_ltm/manuals/product/f5-plat-hw-essentials.html.

Remove 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.
3. Manually assign a new management IP address, netmask, and gateway by typing n when prompted about using DHCP. At the prompts, type 0.0.0.0 for IP address (required), and values for 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.
Remove sensitive data from an embedded hardware security module (HSM)

If the system includes an embedded 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.

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

1. Log in to the command line of the system using an account with root access.
2. Delete all key/certificate pairs.
   
   tmsh sys crypto cert delete all
   
   This removes all .crt, .exp, and .key files from the system.
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.
Legal Notices

Publication Date
This document was published on June 11, 2018.

Publication Number
MAN-0633-07

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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.

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.
Brazil Compliance

This product is homologated by ANATEL, in accordance with the procedures regulated by Resolution n. 242/2000 and meets the technical requirements applied.

This product is homologated by ANATEL, in accordance with the procedures regulated by Resolution n. 242/2000 and meets the technical requirements applied including the exposure limits of the Specific Absorption Rate for electric, magnetic and electromagnetic fields of radio frequency in accordance with Resolutions 303/2002 and 533/2009.

This equipment is not subject to the protection from harmful interference and may not cause interference with duly authorized systems.

For more information, see the ANATEL website at www.anatel.gov.br.

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

この製置は、クラス A 情報技術製置です。この製置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。VCCI-A
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