Platform Guide: VIPRION® 2200

MAN-0493-02

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The VIPRION® 2200 Platform

About the platform

The VIPRION® 2200 system provides you with the flexibility and feature-rich capabilities of F5® products on a powerful and highly-extensible hardware platform. With this platform, you install and configure multiple F5 products using hot-swappable blades. This provides you with the ability to add, remove, or change the platform's configuration to best fit your network. Many components are available for you to add, remove, or change including the blades, power supplies, fan tray, and more. This configuration allows for an extremely robust and flexible system that can manage large amounts of application traffic, and remain operational even if one of its components goes offline.

VIPRION platforms include two types of components: blades, which provide the hardware and software needed to manage network traffic, and a chassis, which houses the blades.

Important: *The chassis and blades are shipped in separate boxes. The blades are not designed to be shipped inside a chassis.*

Although the VIPRION 2200 platform is highly extensible and designed to be easy to implement, familiarity with the platform components can help ensure that you install and integrate the platform successfully and effectively.

About the chassis

The chassis is the housing unit that contains all of the components necessary for the VIPRION® 2200 platform to operate effectively.

Figure 1: Front view of a VIPRION C2200 chassis with AC power supplies

Figure 2: Front view of a VIPRION C2200 chassis with DC power supplies

1. Power supply 1
2. Power supply 2
3. Blanks for blades 1-2

The back of the AC-powered chassis includes the fan tray, two AC power receptacles, and a chassis grounding lug.

Figure 3: Back view of the AC-powered chassis

1. Chassis grounding lug
2. Receptacle for power supply 2
3. Fan tray
4. Receptacle for power supply 1

The back of the DC-powered chassis includes the fan tray, two DC power block terminals, and two chassis grounding lugs.

Figure 4: Back view of the DC-powered chassis

1. Chassis grounding lugs
2. Receptacle for power supply 2
3. Fan tray
4. Receptacle for power supply 1

About the blades

A blade is the primary component that handles the traffic management within the VIPRION® platform. You can install up to two blades in a VIPRION 2200 chassis. These blades comprise a group, known as a cluster. The chassis includes blanks in the slots where blades are not installed.

Blanks must be installed in all unused slots, as they help ensure proper airflow within the chassis and EMI compliance of the unit.

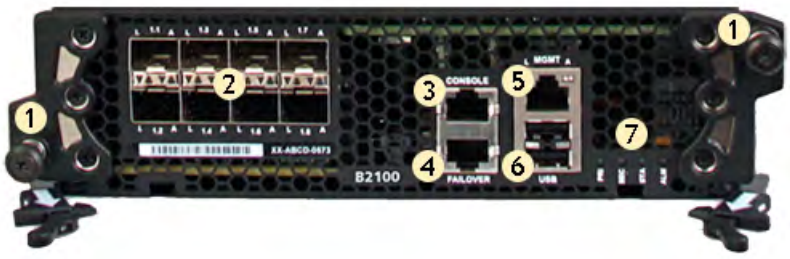


Figure 5: Front view of the B2100/B2150 blade

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

Figure 6: Front view of the B2250 blade

1. Captive screws
2. 40GbE ports (4)
3. Console port
4. Management port
5. USB ports (2)
6. Indicator LEDs

USB LCD module

An external USB LCD module is available for use with the VIPRION 2000 Series platform.

Note: *The USB LCD module is an optional device that is not included with the platform by default. It works only with VIPRION® 2000 Series platforms.*

Figure 7: USB LCD module

Using the USB LCD module

You can connect a USB LCD module to the primary blade in a VIPRION® 2000 Series chassis and use the module to configure and manage the unit without attaching a console or network cable.

1. Insert the plug into one of the two USB ports located on the front of the primary blade (the blade on which the Primary LED is lit).

   The USB LCD module powers on and displays BIG-IP® software information.

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

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

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

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

Pausing on a screen

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

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

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

Clearing alerts

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

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

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

About LCD menus

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

Options menu

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

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

Screens menu

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

Option	Description
DateScreen	Displays the date and time.
InfoScreen	Displays the information screen menu.
VersionScreen	Displays product version information.

System menu

You can use the System menu to configure the management interface on both clusters and blades. This menu also provides various options for the hardware.

Option	Description	Suboptions
Cluster	Configures the cluster IP address, netmask, and default gateway for managing the cluster.	Cluster Mgmt Select from these suboptions: • Cluster IP sets the cluster IP address. • Cluster IP Mask sets the netmask. • Gateway sets the default gateway for managing the cluster. • Commit saves your changes.

	Configures the management IP addresses of the blades within the cluster.	Cluster Mbrs
		Select from these suboptions:
		• Blade [1-2] Mgmt
		  • Blade Mgmt IP sets the management IP address of the selected blade within the cluster.
		  • Commit saves your changes.

Indicator LEDs

The VIPRION® 2200 platform includes indicator LEDs in three locations: on the individual blades, on the power supplies, and on the fan tray.

Indicator LED actions

The behavior of the LEDs indicate system or component status.

Action	Description
Off (none)	LED is not lit and does not display any color.
Solid	LED is lit and does not blink.
Blinking	LED turns on and off at a regular frequency.
Intermittent	LED turns on and off with an irregular frequency and might appear solid.

Blade indicator LEDs

The blade LEDs indicate whether the blade is a primary or secondary blade, and show alarm and blade status.

LED	Status
Primary	Indicates that the blade is a primary blade for a cluster.
Secondary	Indicates that the blade is a secondary blade for a cluster.
Status	Indicates the state of the system.
Alarm	Indicates a non-specific alert level. Use SNMP traps, system logs, or the LCD display for more information.

Blade standard operating states

The blade LEDs indicate the operating state of a blade.

Note: *On power up, the Status LED of each blade turns yellow. When the BIG-IP® software boots successfully, the Status LED changes to green.*

System state	Primary LED (PRI)	Secondary LED (SEC)	Status LED (STA)	Alarm LED (ALM)
Active mode	Off/None	Off/None	Green solid	Off/None
Powered off	Off/None	Off/None	Off/None	Off/None

Blade LED status conditions

The blade LEDs indicate specific operating conditions, such as high availability (HA) status, or when a blade is shut down, reset, or not properly seated.

Blade state	Primary LED	Secondary LED	Status LED	Alarm LED
Blade is fully functional and operating as the primary in a high availability (HA) configuration	Green solid	Off/None	Green solid	Off/None
Blade is fully functional and operating as a secondary in a high availability (HA) configuration	Off/None	Yellow solid	Green solid	Off/None
User-initiated blade power down	Green blinking	Green blinking	Green blinking	Off/None
Blade shut down due to thermal overtemp limit	Yellow blinking	Yellow blinking	Yellow blinking	Red solid
Blade not seated properly	Yellow blinking	Yellow blinking	Yellow solid	Red solid
Power supply inserted, but not supplying power	N/A	N/A	N/A	Red solid

Fan tray indicator LED

The fan tray LED indicates the status of the fan tray.

Action	Status
Yellow solid	Indicates that either the fan tray controller is powering on, or one or more fans are not spinning within the specified RPM range.
Green solid	Indicates that the fan tray controller is fully functional, and all fans are spinning within the specified RPM range.

AC power supply indicator LEDs

The AC power supply LEDs indicate the status of the power supply and power input.

LED	Status
AC	Indicates that AC input voltage is operational (on) or non-functioning (off).
DC	Indicates that DC output voltage is operational (on) or non-functioning (off).
FAIL	Indicates these conditions: • No AC input • Fan failure • Power supply errors or failures (for example, high temperature, high voltage)

LED	Status

SYS	Indicates these conditions:
	• Yellow status when the fan tray is powered, and one of these conditions are true:
	  • AC failure
	  • DC failure
	  • Any other power supply faults, such as fan failure (indicated by the FAIL LED)
	• Green status when the fan tray is powered, and the power supply is fully functional (AC and DC are OK; no other faults indicated by the FAIL LED).

DC power supply indicator LEDs

The DC power supply LEDs indicate the status of the power supply and power input.

LED	Status
IN	Indicates that DC input voltage is operational (on) or non-functioning (off).
OUT	Indicates that DC output voltage is operational (on) or non-functioning (off).
FAIL	Indicates these conditions: • No DC input • Fan failure • Power supply errors or failures (for example, high temperature, high voltage)

SYS	Indicates these conditions:
	• Yellow status when the fan tray is powered, and one of these conditions are true:
	  • DC failure
	  • Any other power supply faults, such as fan failure (indicated by the FAIL LED)
	• Green status when the fan tray is powered, and the power supply is fully functional (DC is OK; no other faults indicated by the FAIL LED).

LED alert conditions

The Alarm LED indicates when there is an alert condition on the system.

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

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

Defining custom alerts

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

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

   ```
   cd /config
   ```

3. Using a text editor, such as vi or Pico, open the `/config/user_alert.conf` file.
4. Add these lines to the end of the file:

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

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

5. Save the file and exit the text editor.
   The front panel LEDs now indicate when a node is down.

Platform interfaces

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

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

About blade interfaces

B2100 Series blades

The B2100 Series blades have eight 10GbE SFP+ optical interfaces that are connected internally. The SFP+ connectors can each support 10G speed with an F5®-branded optical SFP+ module or 1000 Mbit speed with an F5-branded optical SFP 1GbE module installed.

B2250 blade

The B2250 blade has four 40GbE QSFP+ fiber interfaces that support up to four 40GbE ports (2.1-2.4), which you can use as individual 10GbE ports or as 40GbE ports, depending on how you bundle the ports. There are LEDs for both 10GbE and 40GbE operation.

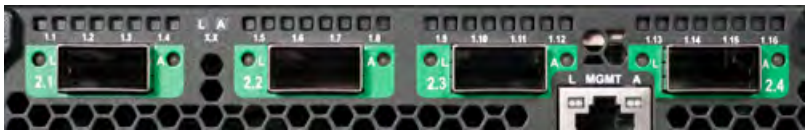


Figure 8: B2250 blade interfaces and LEDs

Supported transceivers

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

About 40GbE interfaces

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

Note: *Only the VIPRION B2250 blade includes 40GbE interface ports.*

40 GbE QSFP+ components

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 of this platform guide and not the Specifications for fiber SFP+ modules section.*

Figure 9: An example of a 40 GbE QSFP+ breakout cable

You can order these 40 GbE QSFP+ components from F5®:

- 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+ and F5-UPG-QSFP+LR4)

Configuring bundling for 40GbE interfaces using tmsh

You can use `tmsh` to configure bundling for the 40GbE interfaces on the platform. When you disable bundling, you can use the 40GbE ports as individual 10GbE ports using a QSFP+ breakout cable.

1. Open the Traffic Management Shell (tmsh).
   ```
   tmsh
   ```
2. Change to the network module.
   ```
   net
   ```
   The command prompt updates with the module name:
   ```
   user@bigip01(Active)(/Common)(tmos.net)#.
   ```
3. Configure bundling for a specific interface, where *<interface_key>* is 2.1, 2.2, 2.3, or 2.4.
   ```
   modify interface <interface_key> bundle [enabled | disabled]
   ```

Note: *When a 2.x port is bundled, the LEDs for the 10GbE ports remain off. When a 2.x port is unbundled, the 40GbE LEDs remain off.*

Configuring bundling for 40GbE interfaces using the Configuration utility

You can use the Configuration utility to configure bundling for the 40GbE interfaces on the platform. When you disable bundling, you can use the 40GbE ports as individual 10GbE ports using a QSFP+ breakout cable.

1. On the Main tab, click **Network** > **Interfaces**.
   This displays the list of available interfaces.
2. Click an interface name.
   The properties screen for that interface opens.
3. From the **Bundled** list, select whether to enable or disable bundling.
4. Click **Update**.

About managing interfaces

You can use `tmsh` or the Configuration utility to configure platform interfaces.

Viewing the status of a specific interface using tmsh

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

1. Open the Traffic Management Shell (tmsh).

```
tmsh
```

2. Change to the network module.

   ```
   net
   ```

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

3. Display the current status of a specific interface.
   `show interface <interface_key>`
   This is an example of the output that you might see when you run this command on interface 1/1.2 (slot 1, interface 1.2):

```
-------------------------------------------------------------------
Net::Interface
Name   Status    Bits  Bits  Pkts  Pkts  Drops  Errs       Media
                 In    Out    In    Out
-------------------------------------------------------------------
1/1.2      up  637.8G  5.8M  1.1G  5.7K   1.1G     0  10000SR-FD
```

Viewing the status of all interfaces using tmsh

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

1. Open the Traffic Management Shell (tmsh).
   `tmsh`
2. Change to the network module.

   ```
   net
   ```

   The command prompt updates with the module name:
   `user@bigip01(Active)(/Common)(tmos.net)#.`
3. Display the current status of all interfaces.
   `show interface`
   This is an example excerpt of the output that you might see when you run this command on B2000 Series blades:

```
-------------------------------------------------------------------------
Net::Interface
Name    Status    Bits   Bits    Pkts   Pkts  Drops  Errs       Media
                    In    Out      In    Out
-------------------------------------------------------------------------
1/1.1     miss       0      0       0      0      0     0        none
1/1.2       up  636.5G   5.5M    1.1G   5.4K   1.1G     0  10000SR-FD
1/1.3     miss       0      0       0      0      0     0        none
1/1.4     miss       0      0       0      0      0     0        none
1/1.5     miss       0      0       0      0      0     0        none
1/1.6     miss       0      0       0      0      0     0        none
1/1.7     miss       0      0       0      0      0     0        none
1/1.8     miss       0      0       0      0      0     0        none
1/1.9   uninit       0      0       0      0      0     0        none
1/1.10  uninit       0      0       0      0      0     0        none
1/1.11  uninit       0      0       0      0      0     0        none
1/1.12  uninit       0      0       0      0      0     0        none
1/1.13  uninit       0      0       0      0      0     0        none
1/1.14  uninit       0      0       0      0      0     0        none
1/1.15  uninit       0      0       0      0      0     0        none
1/1.16  uninit       0      0       0      0      0     0        none
1/2.1   uninit       0      0       0      0      0     0        none
```

```
1/2.2   uninit       0      0       0      0      0     0        none
1/2.3     miss       0      0       0      0      0     0        none
1/2.4     miss       0      0       0      0      0     0        none
1/mgmt      up   248.3M  42.8M  392.2K  16.1K      0     0    1000T-FD
```

Viewing the status of all interfaces using the Configuration utility

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

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

About interface media type and duplex mode

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

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

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

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

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

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

Valid media types

These media types are valid for the `tmsh interface` command.

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

10BaseT half	10GBaseLR full
10BaseT full	10GBaseER full
100BaseTX half	10SFP+Cu full
100BaseTX full	40GBaseSR4 full
1000BaseT half	40GBaseLR4 full

1000BaseT full	100GbaseSR4 full
1000BaseSX full	100GbaseLR4 full
1000BaseLX full	auto
1000BaseCX full	none
10GBaseT full	no-phy
10GBaseSR full	

Viewing valid media types for an interface

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

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

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

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

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

```
net interface 1.3 {
    media-capabilities-sfp {
        none
        auto
        1000T-FD
        1000LX-FD
        1000SX-FD
        1000CX-FD
        10000SR-FD
        10000LR-FD
        10000SFPCU-FD
    }
}
```

Network interface LED behavior

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

SFP+ port LED behavior

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

Blade type	Link	Speed LED	Activity LED
B2100/B2150	No link	Not lit	Not lit
B2100/B2150	1Gbit/s, half duplex	Not supported	Not supported
B2100/B2150	1Gbit/s, full duplex	Yellow solid	Green (with traffic)
B2100/B2150	10Gbit/s, half duplex	Not supported	Not supported
B2100/B2150	10Gbit/s, full duplex	Green solid	Green (with traffic)

QSFP+ port LEDs behavior

The appearance and behavior of the 40GbE QSFP+ optical interface LEDs indicate network traffic activity, interface speed, and interface duplexity. There are two sets of LEDs for QSFP+ ports. One set is for operation in 40GbE, and the other set is for operation in 4 x 10GbE.

Blade type	Link	Speed LED	Activity LED
B2250	No link	Not lit	Not lit
B2250	40 Gbit/s, full duplex	Green solid	Green (with traffic)

Transceiver module specifications

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

Cable pinout specifications

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

Always-On Management

The Always-On Management (AOM) subsystem enables you to manage the VIPRION® 2200 system remotely using serial console, even if the host is powered down. The AOM Command Menu operates independently of the BIG-IP® Traffic Management Operating System® (TMOS).

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

AOM Command Menu options

The AOM Command Menu provides the Always-On Management options for the VIPRION® 2200 platform.

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

Letter	Option	Description
B	Set baud rate	Configures the baud speed for connecting to AOM using the serial console. Select from these options: • 9600 • 19200 (default) • 38400 • 57600 • 115200
C	Capture blade console	Captures the console of a specified blade (1-2).
I	Display platform information	Displays information about the AOM firmware and bootloader, chassis serial and part numbers, blade serial number, MAC address, and power status for the active console.
P	Power on/off blade	Powers a specified blade (1-2) on or off.
R	Reset blade	Resets a specified blade (1-2) with a hardware reset. ***Important:*** *We do not recommend using this option under typical circumstances. It does not allow for graceful shutdown of the system.*
E	Display error report	Displays a list of latched events/errors or out-of-range sensors.
Q	Quit menu and return to console	Exits the AOM Command Menu and returns to terminal emulation mode.

Accessing the AOM Command Menu from the serial console

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

Important: *The serial console is the only supported method for accessing AOM on this platform.*

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

   `Esc (`

   The AOM Command Menu displays.

Capturing a blade console

You can use the AOM Command Menu **Capture blade console** option to manage the other blades installed in the chassis.

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

   `Esc (`
3. Type `C` to select the **Capture blade console** menu option.
4. When prompted to select a blade, type the slot number (`1-2`) for the blade that you would like to manage.

Note: *If the specified blade's console is already being redirected, you will be prompted to confirm that you still want to capture the specified blade's console.*

A message similar to this example confirms that you are now viewing the console for the specified blade:

```
Connecting to blade in slot n...success.
```

Platform Installation

About installing the platform

After you have reviewed the hardware requirements and become familiar with the VIPRION® 2200 platform, you can install the chassis.

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 and using the platform into a compatible rack and in the appropriate environment.*

Important: *F5® strongly recommends that you install the chassis into a rack before you install any blades. This ensures that the weight of the chassis remains manageable as you install the chassis into a rack.*

Note: *After you install a blade, wait approximately one to two minutes before installing another to ensure that each blade has sufficient time to boot. When the Status LED is green, the blade is fully booted.*

About general recommendations for rack mounting

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

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

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

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.*

Hardware included with the AC-powered chassis

The VIPRION® 2200 Series AC-powered chassis should include all of the hardware components listed here.

Quantity	Hardware
2	AC power cables (C19 to NEMA 5-15P)
2	Two-point rack mounting brackets
1	Four-point rack mounting rail kit (includes two rail assemblies, eight #8-32 thumb screws, and two cage nuts)
2	Four-point rack mounting brackets
6	M3.5 patch screws
2	Cable routing brackets
2	Cable management covers

Hardware included with the DC-powered chassis

The VIPRION® 2200 Series DC-powered chassis should include all of the hardware components listed here.

Quantity	Hardware
2	DC connectors
2	Two-point rack mounting brackets
1	Four-point rack mounting rail kit (includes two rail assemblies, eight #8-32 thumb screws, and two cage nuts)
2	Four-point rack mounting brackets
6	M3.5 patch screws
2	Cable routing brackets
2	Cable management covers

Hardware included with blades

VIPRION® B2000 Series blade should include all of the hardware components listed here.

Quantity	Hardware
1	RJ45 to DB9 console port cable (beige)
1	RJ45F to RJ45M rolled adapter (beige)
2	SFP+ 10G transceiver modules (B2100 and B2150 only)
1	Electrical static discharge (ESD) strap

Peripheral hardware requirements

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

Type of hardware	Description
Network hubs, switches, or connectors to connect to the platform network interface ports	You must provide networking devices that are compatible with the network interface ports on the platform. You can use either 10/100/1000/10000-Megabit or 40/100-Gigabit Ethernet switches.
External USB CD/DVD drive or USB flash drive	You can use a USB-certified CD/DVD mass storage device or a USB flash drive for installing upgrades and for system recovery.
	Note: *F5® recommends that external CD/DVD drives be externally powered.*
Serial console	You can remotely manage the platform by connecting to a serial console terminal server through the console port.
	Important: *In the event that network access is impaired or not yet configured, the serial console might be the only way to access the chassis. You should perform all installations and upgrades using the serial console, as these procedures require reboots, in which network connectivity is lost temporarily.*
Management workstation on the same IP network as the platform	You can use the default platform configuration if you have a management workstation set up.

Unpacking the chassis

The VIPRION® 2200 chassis ships in a custom-designed package that protects the product during shipment and facilitates ease of removal when you are ready to install the chassis into a rack. Due to the weight of the chassis, there is a specific procedure that you must follow to ensure that you remove the chassis from its packaging safely and securely.

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

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

2. Remove the accessory box from the foam insert.

3. Remove the foam insert from the top of the chassis.

4. Remove the plastic wrap from the top of the chassis.
5. Use two people and lift straight up to remove the chassis from the shipping box.
6. Carefully move the chassis to a flat surface and set it down until you are ready to install the chassis into a rack.

About installing the chassis

You should select a location for installing the VIPRION 2200 chassis that is easy to access for adding or removing power supplies, the fan tray, or blades. The location should also provide adequate ventilation to allow sufficient airflow through the platform. The platform employs a negative pressure fan system, which draws cold air in from the front of the chassis and exhausts hot air out the back of the chassis. After you have identified the intended location for the platform, you can install the chassis into the rack.

The chassis is designed for 19-inch racks. If you are installing into a wider rack, you will need to provide adapters. The four-point rack mounting rail kit will not work with 23-inch racks.

Caution: *If you have not yet removed the chassis from the shipping box, F5® Networks highly recommends that you have at least two people remove the chassis from the box. This ensures your safety and prevents damage to the chassis.*

Caution: *The fan tray handles are not intended to support the weight of the chassis. Lifting the chassis using the handles could damage the chassis and fan tray.*

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

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.*

About the two-point rack mounting brackets

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

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

Installing the two-point rack mounting brackets

Install the two-point rack mounting brackets onto the chassis if you would like to install the chassis directly onto a two-post rack.

1. Locate the two-point rack mounting brackets included with the chassis.

   These brackets, along with their corresponding screws, are in an accessory box that is included with the chassis.

2. Secure each mounting bracket to the chassis using three of the screws provided.

Important: *Using screws other than those provided risks damage to the system.*

After you install the two-point rack mounting brackets, you can install the chassis into a two-post rack.

About the four-point rack mounting rail kit

The four-point rack mounting rail kit helps ease installation and removal of the chassis from a rack. The rails snap into place in the rack, and no tools are required to install a platform using this kit. The rails are optimized for installation into square hole cabinets, but they can be installed in other cabinet styles, such as round hole cabinets, using the screws provided. The rails are easily converted to mount to either cabinet style.

The rail kit includes these parts:

- Two rail assemblies (left and right), which consist of an inner rail that you install onto the chassis and an outer rail that you install in the rack
- Eight #8-32 thumb screws
- Two cage nuts

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

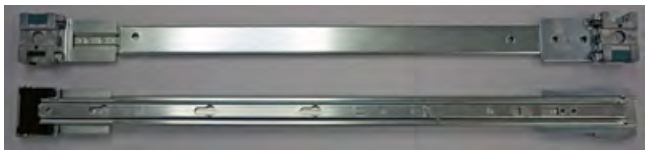


Figure 10: Four-point rack mounting rails

Figure 11: Four-point rack mounting rail kit thumb screws and cage nuts

For information about installing the platform using the four-point rack mounting rail kit, see the instruction guide provided by the manufacturer, which is included with the kit hardware. After you slide the unit into the rack, use the thumbscrew on the bracket to lock the unit in place. If the thumbscrew does not reach the rack cage nut, insert a customer-provided rack screw through a slot in the bracket to lock the unit to 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.*

Important: *The maximum rack mount depth supported by the four-point rack mounting rails is 38 inches (96.52 cm). Using the rails in a rack deeper than this might cause the brackets to be overextended and cause a structural failure.*

After the chassis is installed into a rack, you can install the four-point rack mounting brackets.

Installing the four-point rack mounting brackets

This platform includes a pair of four-point rack mounting brackets, which you can use to secure the four-point rack-mounted chassis to a rack.

1. Locate the four-point rack mounting brackets included with the chassis.

   These brackets, along with their corresponding screws, are in an accessory box that is included with the chassis.

2. Secure each mounting bracket to the chassis using two of the screws provided.

   Important: *Using screws other than those provided risks damage to the system.*

3. Secure the chassis to the rack by tightening the thumb screw on the four-point rack mounting bracket through the rack and into the threaded hole on the four-point rack mounting rail.

After you have secured the chassis to the rack, you can install the cable management system, and then supply power to the chassis.

Installing the cable management system

After you have installed and secured the chassis to a rack, you can install the cable management system.

1. Locate the cable routing brackets and covers included with the chassis.

   The brackets and covers are in an accessory box that is included with the chassis.

2. Attach the cable routing brackets to the four-point rack mounting brackets by tightening the captive screws clockwise until they are completely secured.

3. Attach the cable management covers to the brackets after you have connected cables to the blades.

About grounding the chassis

You should ground the platform after you install it in a rack.

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 copper grounding cable compression-type terminal lugs used for grounding must meet all appropriate safety standards.*

Note: *The VIPRION 2200 platform must be grounded to a common bonding network (CBN).*

Figure 12: AC-powered chassis grounding stud

Figure 13: DC-powered chassis grounding studs

Connecting the chassis grounding stud to the ground terminal

You will need these tools to properly ground the chassis:

- Crimping tool
- Single (AC) or double (DC) ring ground terminal lug
- For either AC or DC installations, one 14 AWG copper wire long enough to reach from the chassis to the common bonding network (CBN)

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

1. Remove the M4 Keps nut from the stud.
2. Use a crimping tool to crimp the copper ground wire to a single ring ground terminal lug.
3. Attach the single ring ground terminal lug to the chassis grounding stud.
4. Reinstall the M4 Keps nut to the grounding stud.
   Use 6 to 8 inch-pounds (.7 to .9 Newton-meters) of torque on the M4 Keps nut.
5. Connect the ground wire to a common bonding network (CBN).

About powering the VIPRION 2200 AC platform

The AC platform ships with two power cords that you must use with the installed power supplies to power the chassis.

Important: *Do not install blades or disconnect blades from the chassis before supplying power to the chassis.*

Important: *Do not use any power cords other than those specifically designed for the VIPRION 2200 platform.*

Caution: *The power supply cord is used as the main disconnect device, ensure that the socket-outlet is located or installed near the equipment and is easily accessible.*

Attention: *Le cordon d'alimentation est utilisé comme interrupteur général. La prise de courant doit être située ou installée à proximité de l'équipement et être facile d'accès.*

Caution: *This unit has more than one power supply cord. Disconnect two power supply cords before servicing to avoid electric shock.*

Attention: *Cet appareil comporte plus d'un cordon d'alimentation. Afin de prévenir les chocs électriques, débrancher les deux cordons d'alimentation avant de faire le dépannage.*

Powering the AC platform

You can connect the power cables to the platform after you install the chassis into a rack.

1. On the back of the chassis, locate the power outlets that correspond to the locations of the power supplies.
2. Attach a power cord to the outlet and press firmly until it is fully seated.

3. Plug the power cord into an approved power source.
4. Repeat this process for each power supply in the chassis.

About powering the VIPRION 2200 DC platform

If you ordered DC power as a factory option, your VIPRION® 2200 platform comes pre-installed with DC power supplies.

Before you power this VIPRION DC platform, see *Guidelines for DC-powered equipment* and *Guidelines for VIPRION DC platform installation*.

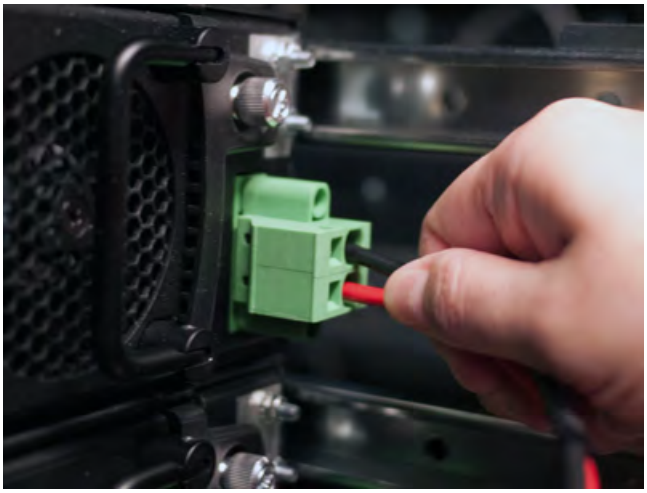
Connecting DC power to the platform

Important: *Be sure that the DC power source is off and the ground lug is connected to the ground terminal before you connect the platform to the DC power source.*

After you have assembled the DC input connector, you can connect the platform to the DC power source. When you connect the DC power source, you should also follow the safety requirements defined for your network operations center (NOC).

1. Plug the assembled DC input connector into the outlet on the back of the chassis and then press firmly until the connector is fully seated.

   If the connector does not readily insert into the power supply, you might need to manually align it.



2. Secure the DC input connector to the chassis by tightening the captive screws clockwise until they are secured to the chassis completely.
3. Connect the DC power cord to an approved power source.

   For more information about voltage input requirements, see *Chassis hardware specifications*.
4. Repeat this process for each power supply in the chassis.
5. Power on the DC power source.
   The system begins to boot.

About installing blades

The VIPRION® 2200 chassis supports up to two B2000 Series blades.

Note: *F5® does not support mixing blade models in a chassis.*

When you initially receive the chassis, the slots that can contain these blades are filled with blanks. A blank must be installed in each empty slot to ensure proper thermal management and regulatory compliance. To add a new blade, you first remove the blank from the corresponding slot and then insert the blade. Be sure to keep the blanks in case you need to change the blade configuration later. You should not operate the chassis for an extended period of time without all slots populated.

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: *Ensure that you supply power to the chassis prior to installing any blades.*

Note: *After you install a blade, wait approximately one to two minutes before installing another to ensure that each blade has sufficient time to boot. When the Status LED is green, the blade is fully booted.*

Removing a blank

If a blank is installed in the slot where you want to install a blade, you must remove it. If the slot does not contain a blank, you can skip this procedure.

1. Select the slot in which you want to insert the blade.
2. Loosen the captive screws on either side of the blank with a #2 Phillips screwdriver, if necessary.
3. Grasp the two captive screws on the front of the blank and pull straight out to remove the blank from the chassis.

Removing a blade

You can remove a blade from the chassis without powering down the system.

1. Identify the blade that you would like to remove from the chassis.
2. Halt the blade:
   a) Connect to the blade using the serial console.
   b) Halt the blade.
      `halt`
      The blade is halted when the system displays: `halted`.
3. Disconnect all cables and remove any optical modules.
4. Loosen the captive screws on either side of the blade with an appropriate screwdriver, if necessary.
5. Grasp the two latches on the front of the blade and pull toward you.

6. Fully extend the latches on both sides of the blade and pull out toward you to remove the blade.

If you are not going to insert a replacement blade, you must install a blank in the open slot.

Installing a blade

Check if a blank is in the slot in which you want to install a blade. If so, you must first remove it.

You can install a blade in the chassis without powering down the system.

1. Fully extend the latches, located on each side of the blade, into the open position.

2. Carefully lift the blade and insert it into the empty slot.
3. Slide the blade into the slot until it is fully seated and the latches engage.

4. Tighten the captive screws clockwise until they are secured to the chassis completely.

Important: *The captive screws must be tightened properly to ensure that the blade has a strong connection to the chassis.*

5. Repeat this process with each blade until all blades are secured in the chassis.

Note: *After you install a blade, wait approximately one to two minutes before installing another to ensure that each blade has sufficient time to boot. When the Status LED is green, the blade is fully booted.*

Connecting the cables and other hardware

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

Note: *Serial (hard-wired) failover is not currently supported between VIPRION chassis. If you would like to set up device service clustering (DSC®), previously known as a redundant system configuration, you must configure network failover. For more information, see BIG-IP® Device Service Clustering: Administration.*

1. Connect an Ethernet cable to the MGMT port if you are using the default network configured on the management interface.
2. Connect the platform to a serial console server.

   Important: *In the event that network access is impaired or not yet configured, the serial console might be the only way to access the chassis. F5® strongly recommends that you perform all installations and upgrades using the serial console, as these procedures require reboots, in which network connectivity is lost temporarily.*

   - Connect the serial console cable supplied by F5 to the CONSOLE port.

     Note: *The default serial port settings are 19200, n, 8, 1.*

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

     Figure 14: The RJ45F to RJ45M rolled serial (pass-through) adapter

3. If you have not already done so, power on the chassis.

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

Optionally, you should run the latest version of the qkview utility. This utility collects configuration and diagnostic information about your system into a single file that you can provide to F5 Support to aid in troubleshooting. For more information, see `http://support.f5.com/kb/en-us/solutions/public/1000/800/sol1858.html`.

About cluster management

The management IP address for a cluster is known as the cluster IP address. The cluster IP address enables you to access the browser-based Configuration utility to configure other aspects of the product, such as the product license, VLANs, trunks, and so on. Connecting to the cluster IP address connects you to the primary blade in the system.

With VIPRION® platforms, you assign cluster IP addresses on a per-cluster basis. Initially, all blades installed in the chassis belong to a single default cluster. During the initial setup, you only need to assign a single cluster IP address.

A blade within a cluster is known as a cluster member. You can assign a management IP address to each cluster member.

Important: *When you configure an IP address for a blade, that IP address corresponds to the slot in which the blade resides. If you replace that blade with another, the new blade automatically receives the previously-configured management IP address, provided that a second operating blade is installed in the system. At least one operational blade is required at all time to preserve the existing configuration data.*

You can manage clusters using these methods:

- USB LCD module
- `config` utility
- `tmsh` commands

Configuring the cluster IP address from the LCD

You can use the USB LCD module to configure the cluster IP address. The options for cluster and blade management are located in the Cluster menu item under the System menu.

Note: *The USB LCD module is an optional device that is not included with the platform by default. It works only with VIPRION® 2000 Series platforms.*

Note: *When using the LCD to manage clusters, be sure to use the Commit menu option after changing each setting. Alternatively, you can change all cluster-related settings and use the Commit option to save all settings at once.*

1. Press the X button to access the LCD menus.
2. Use the arrow keys to select **System** and press the Check button.
3. Use the arrow keys to select **Cluster** and press the Check button.
4. Use the arrow keys to select **Cluster Mgmt** and press the Check button.
5. Use the arrow keys to select **Cluster IP** and press the Check button.
   The LCD panel shows the current IP address of the cluster. The default value is `192.168.1.246`.
6. Use the arrow keys to configure the IP address of the cluster.
7. Press the X button until you return to the **Cluster Mgmt** menu.
8. Use the arrow keys to select **Commit** and press the Check button.

The system saves the new IP address for the cluster. You can now access the browser-based Configuration utility using the cluster IP address you assigned.

Configuring the cluster IP subnet mask from the LCD

You can use the LCD module to configure the cluster IP subnet mask.

1. Press the X button to access the LCD menus.
2. Use the arrow keys to select **System** and press the Check button.
3. Use the arrow keys to select **Cluster** and press the Check button.
4. Use the arrow keys to select **Cluster Mgmt** and press the Check button.
5. Use the arrow keys to select **Cluster IP Mask** and press the Check button.
   The LCD shows the current subnet mask address of the cluster. The default value is `255.255.255.0`.
6. Use the arrow keys to configure the subnet mask of the cluster.
7. Press the X button until you return to the **Cluster Mgmt** menu.
8. Use the arrow keys to select **Commit** and press the Check button.

The system saves the new subnet mask for the cluster.

Configuring the default gateway IP address for the cluster from the LCD

You can use the LCD module to configure the default gateway IP address for the cluster.

1. Press the X button to access the LCD menus.
2. Use the arrow keys to select **System** and press the Check button.
3. Use the arrow keys to select **Cluster** and press the Check button.
4. Use the arrow keys to select **Cluster Mgmt** and press the Check button.
5. Use the arrow keys to select **Gateway** and press the Check button.
   The LCD shows the current gateway IP address of the cluster. The default value is `0.0.0.0`.
6. Use the arrow keys to configure the gateway IP address of the cluster.
7. Press the X button until you return to the **Cluster Mgmt** menu.
8. Use the arrow keys to select **Commit** and press the Check button.

The system saves the new default gateway IP address for the cluster.

Configuring the management IP address of a cluster member from the LCD

You can use the LCD module to configure the management IP address of a cluster member.

1. Press the X button to access the LCD menus.
2. Use the arrow keys to select **System** and press the Check button.
3. Use the arrow keys to select **Cluster** and press the Check button.
4. Use the arrow keys to select **Cluster Mbrs** and press the Check button.
5. Use the arrow keys to select the appropriate blade (**Blade [1-2] Mgmt**) and press the Check button.
6. Use the arrow keys to select **Blade Mgmt IP** and press the Check button.
   The LCD shows the current IP address of the blade. The default value is `0.0.0.0`.
7. Use the arrow keys to configure the IP address of the blade.
8. Press the X button until you return to the Blade [1-2] Mgmt menu.
9. Use the arrow keys to select **Commit** and press the Check button.

The system saves the new IP address for the blade.

Configuring the cluster IP address using the config utility

You can configure the cluster IP address using the `config` utility after you connect a blade to a serial console.

1. Connect to the system using the serial console.
2. Start the `config` utility.

   `config`

   The `config` utility displays.
3. Follow the prompts to configure the cluster IP address, subnet mask, and gateway address for the management port.

The system saves the new IP address, subnet mask, and gateway address for the cluster. You can now access the browser-based Configuration utility using the cluster IP address you assigned.

Configuring the cluster IP address using tmsh

You can configure the cluster IP address using `tmsh` after you connect a blade to a serial console.

1. Connect to the system using the serial console.
2. Set the cluster IP address and subnet mask.
   `tmsh modify sys cluster default address <ip_address/mask>`
   Example: `tmsh modify sys cluster default address 192.168.217.44/24`
3. Set the default gateway for the cluster.
   `tmsh modify sys management-route default gateway <gateway_ip>`
   Example: `tmsh modify sys management-route default gateway 172.20.80.254`
4. Write the running configuration to the stored configuration files.
   `tmsh sys save [base-config | config]`

The system saves the new IP address, subnet mask, and gateway address for the cluster. You can now access the browser-based Configuration utility using the cluster IP address you assigned.

Licensing the platform

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

1. Using a Web browser, navigate to the cluster IP address that you assigned to the VIPRION system.

   Use this format, where *<cluster_ip_address>* is the cluster IP address you assigned:

   `https://<cluster_ip_address>`
2. Type `admin` as the user name and `admin` as the password.

   If this is the first time you have accessed the Configuration utility, the first screen you see is the License screen.
3. Follow the instructions in the Configuration utility to license the platform.

For more information about licensing the system, click the Help tab.

Verifying blade availability

At this point, you have installed the VIPRION platform, powered it, installed blades, assigned a cluster IP address to the system, and licensed it for use. Next, you need to ensure that the blades are recognized by the software and available for processing network traffic.

1. Using a Web browser, navigate to the cluster IP address that you have assigned to the VIPRION platform.
   The Configuration utility opens.
2. On the Main tab, click **System** > **Clusters**.
   The Clusters screen opens.
3. In the **Cluster Members** area, verify that all blades listed have a green status icon in the Status column.
   The green circle icon indicates that the cluster member is available.

Now you have installed a VIPRION platform successfully and prepared it for use on your network. The next steps involve further configuration of the platform by adding the trunks, VLANs, and self IP addresses that are necessary for the system to manage your network traffic effectively.

Platform Maintenance

About maintaining the platform

The VIPRION® 2200 platform contains several components that you can replace individually without exchanging the entire system. This platform contains these replaceable components:

- AC power supply
- DC power supply
- Fan tray
- Storage drive assembly

Note: *Applies only to the B2100 blade with hard disk drive (HDD).*

- Blades

About AC power supplies

The VIPRION® 2200 platform supports one to two hot swappable AC power supplies. The power supplies are auto-ranging 100-240VAC input.

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

Figure 15: A power supply partially removed from the platform

Caution: *Running without all power supplies installed in the platform can affect cooling and electromagnetic interference (EMI). If a power supply fails, you can leave it installed in the chassis and remove the power cord until you receive a replacement supply; the system, however, will continue to log errors.*

Caution: *The power socket outlet should be installed near the equipment and easily accessible.*

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

Removing a power supply

Before you can replace a power supply, you must remove the existing supply from the chassis, if one is installed.

Important: *If the chassis has at least one blade operating and you would like uninterrupted operation, make sure that one of the power supplies remains installed and operational during the replacement process.*

1. On the front of the chassis, locate the power supplies.

   Note: *The color of the power supply bezel varies depending on whether the supply is AC- or DC-powered. AC supplies are black, and DC supplies are grey. The photos shown are examples.*

2. On the back of the chassis, disconnect power for the power supply that you would like to remove.

   Note: *When you face the front of the chassis, power supply 1 is on the left, and power supply 2 is on the right.*

3. Loosen the captive screw on the power supply eject lever with a #1 Phillips screwdriver, if necessary.

4. Extend the power supply eject lever and pull straight toward you to eject the power supply from the power supply bay.

Installing a power supply

If a power supply is already installed in the bay where you are installing the replacement supply, disconnect power from the power supply prior to removing the supply. When you face the front of the chassis, power supply 1 is on the left, and power supply 2 is on the right.

You can add or replace a power supply as part of routine maintenance or in the event of a power supply failure.

Important: *If the chassis has at least one blade operating and you would like uninterrupted operation, make sure that one of the power supplies is installed and operating during the replacement process.*

1. Remove the existing supply, if one is installed.

   Note: *The color of the power supply bezel varies depending on whether the supply is AC- or DC-powered. AC supplies are black, and DC supplies are grey. The photos shown are examples.*

2. With the power supply eject lever fully extended, slide the new power supply into the empty power supply bay.

   Make sure that the tab on the left side of the power supply catches properly as you insert it into the chassis.

3. Press the front of the power supply and then close the power supply eject lever to fully seat the power supply in its bay.

4. Secure the power supply in its bay by tightening the screw on the power supply eject lever.

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

After you install the power supply, you can apply power to it.

About DC power supplies

The VIPRION® 2200 platform supports up to two hot swappable DC power supplies.

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. The DC power supply includes a DC input connector.

The DC power supply does not have an on/off switch. You can control the power from the rack switch or the DC power source.

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

Caution: *Running without all power supplies installed in the platform can affect cooling and electromagnetic interference (EMI). If a power supply fails, you can leave it installed in the chassis and remove power from the power supply until you receive a replacement supply; the system, however, will continue to log errors.*

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

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

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

Note: *All copper grounding cable must meet all appropriate safety standards and local electric codes.*

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

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

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

Removing a power supply

Before you can replace a power supply, you must remove the existing supply from the chassis, if one is installed.

Important: *If the chassis has at least one blade operating and you would like uninterrupted operation, make sure that one of the power supplies remains installed and operational during the replacement process.*

1. On the front of the chassis, locate the power supplies.

   Note: *The color of the power supply bezel varies depending on whether the supply is AC- or DC-powered. AC supplies are black, and DC supplies are grey. The photos shown are examples.*

2. On the back of the chassis, disconnect power for the power supply that you would like to remove.

   Note: *When you face the front of the chassis, power supply 1 is on the left, and power supply 2 is on the right.*

3. Loosen the captive screw on the power supply eject lever with a #1 Phillips screwdriver, if necessary.

4. Extend the power supply eject lever and pull straight toward you to eject the power supply from the power supply bay.

Installing a power supply

If a power supply is already installed in the bay where you are installing the replacement supply, disconnect power from the power supply prior to removing the supply. When you face the front of the chassis, power supply 1 is on the left, and power supply 2 is on the right.

You can add or replace a power supply as part of routine maintenance or in the event of a power supply failure.

Important: *If the chassis has at least one blade operating and you would like uninterrupted operation, make sure that one of the power supplies is installed and operating during the replacement process.*

---

1. Remove the existing supply, if one is installed.

   Note: *The color of the power supply bezel varies depending on whether the supply is AC- or DC-powered. AC supplies are black, and DC supplies are grey. The photos shown are examples.*

   ---

2. With the power supply eject lever fully extended, slide the new power supply into the empty power supply bay.

   Make sure that the tab on the left side of the power supply catches properly as you insert it into the chassis.

3. Press the front of the power supply and then close the power supply eject lever to fully seat the power supply in its bay.

4. Secure the power supply in its bay by tightening the screw on the power supply eject lever.

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

After you install the power supply, you can apply power to it.

Wiring the DC connector

You will need these components to wire the DC power supply:

- Wire stripping tool
- Two 6 AWG copper wires long enough to reach from the platform to the DC power source

The DC power supply for the VIPRION® 2200 platform includes a DC connector. You need a wire stripping tool to wire the DC connector.

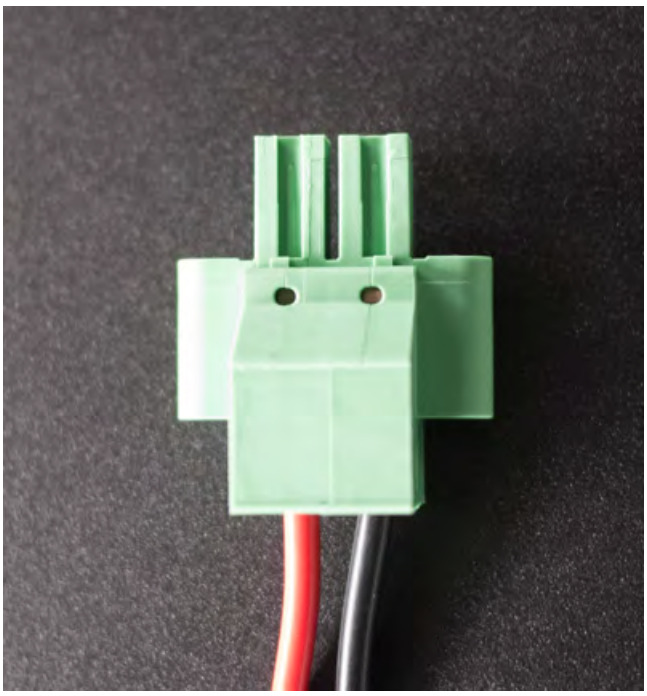
Figure 16: VIPRION 2200 DC power supply and connector

1. Use the wire stripping tool to remove 3/8 inch (9.56 mm) of insulation from the end of each 6 AWG wire.

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

2. Insert the exposed red (+) and black (-) conductors into the appropriate connectors on the DC plug.

   Insert a small flat-head screwdriver into the corresponding release hole on the DC plug to allow the conductor to be freely inserted into the contact opening.



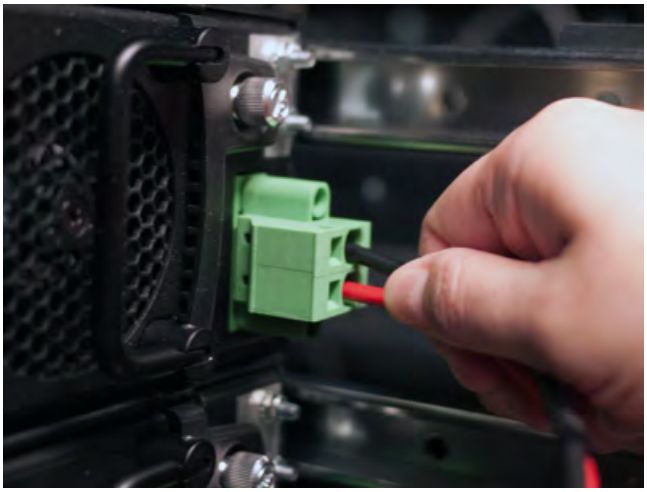
Connecting DC power to the platform

Important: *Be sure that the DC power source is off and the ground lug is connected to the ground terminal before you connect the platform to the DC power source.*

After you have assembled the DC input connector, you can connect the platform to the DC power source. When you connect the DC power source, you should also follow the safety requirements defined for your network operations center (NOC).

1. Plug the assembled DC input connector into the outlet on the back of the chassis and then press firmly until the connector is fully seated.

   If the connector does not readily insert into the power supply, you might need to manually align it.



2. Secure the DC input connector to the chassis by tightening the captive screws clockwise until they are secured to the chassis completely.

3. Connect the DC power cord to an approved power source.
   For more information about voltage input requirements, see *Chassis hardware specifications*.
4. Repeat this process for each power supply in the chassis.
5. Power on the DC power source.
   The system begins to boot.

About the fan tray

The VIPRION® 2200 platform has a removable fan tray that is designed to maintain airflow throughout the chassis. You can change or replace the fan tray as part of the routine maintenance of the unit, or in the event of a fan failure. The fans in the fan tray run constantly while the unit is on. Over time, the fans can wear out, requiring you to replace the fan tray.

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

Figure 17: The VIPRION 2200 platform fan tray

Replacing the fan tray

You can replace the fan tray as part of routine maintenance or in the event of a fan tray failure. You do not need special tools to replace the fan tray. You do not need to power down the unit when replacing the fan tray; however, do not leave the unit operating without a fan tray for longer than 30 seconds.

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

1. Stand at the back of the platform and locate the ejector handles on the left and right sides of the fan tray.
2. Loosen the captive screws on the fan tray with a #2 Phillips screwdriver, if necessary.
3. Extend the fan tray handles and remove the fan tray from the chassis by pulling straight toward you.

4. Place the new fan tray into the fan tray bay.
5. Push the fan tray into the chassis until it is seated firmly in the fan tray bay.

   When seated, the fan tray automatically powers up and begins circulating air through the chassis.

   Important: *Use only the fan tray handles to seat the fan tray in the chassis. Using the edges of the fan tray could result in pinched fingers.*

6. Tighten the captive screws on the fan tray with a #2 Phillips screwdriver, if necessary.

About the storage drive assembly

By default, VIPRION® B2000 Series blades contain one storage drive assembly that contains either one hard disk drive (HDD) or one solid-state drive (SSD).

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.*

Replacing a storage drive assembly

You can change or replace a storage assembly that contains a storage drive (hard disk drive or solid-state drive) in a VIPRION® B2000 Series blade as part of the routine maintenance of the unit or in the event of a drive failure.

1. Remove the blade from the chassis that contains the drive assembly to be replaced.
2. Remove the existing drive assembly, if one is installed:
   a) Loosen the drive assembly screw by turning it counterclockwise with a Phillips screwdriver, if necessary.

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

   b) Grasp the screw, lift the drive assembly slightly, and then rock the connector gently from side-to-side as you pull to remove the hard drive assembly from the blade.

3. Slide the new drive assembly into the bay.
   Be sure to place the bottom of the assembly under the cable connectors.

4. Tighten the screw into place.
   The drive assembly is connected to the system when you tighten the screw completely.
5. Place the blade back into the chassis.

Environmental Guidelines

General environmental guidelines

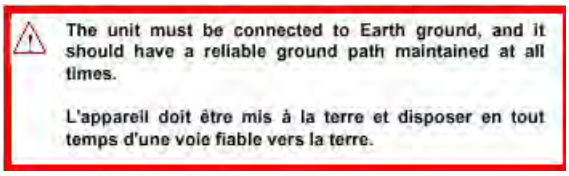
The VIPRION® 2200 platform is an industrial network appliance that is designed to be mounted in a standard 19-inch EIA rack. Follow these guidelines to adhere to safety precautions:

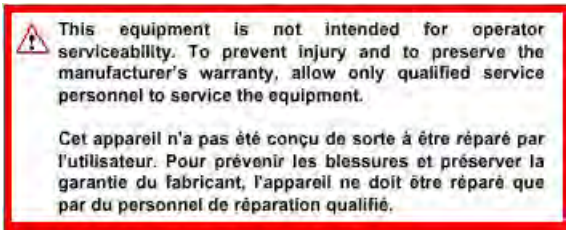
- Install the rack according to the manufacturer's instructions and check the rack for stability before placing equipment in it.
- Build and position the rack so that once you install the platform, the power supply and the vents on both the front and back of the unit remain unobstructed. The platform must have adequate ventilation around the unit at all times.
- Do not allow the air temperature in the room to exceed 104°F (40°C).
- Do not plug the unit into a branch circuit shared by more electronic equipment than the circuit is designed to manage safely at one time.

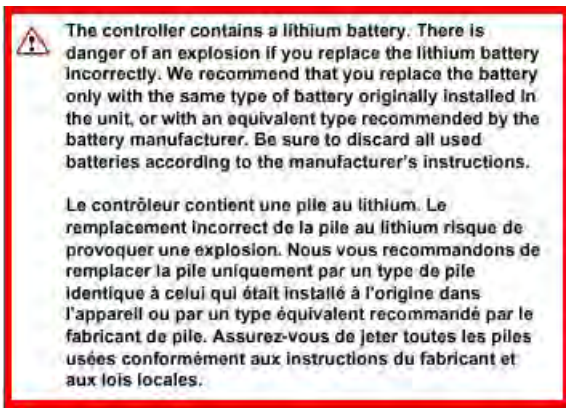
Important: *This product is sensitive to electrostatic discharge (ESD). F5® recommends that you use proper ESD grounding procedures and equipment when you install or maintain the unit.*

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

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







Guidelines for the AC-powered platform

An AC-powered installation must meet these requirements:

- Install the unit using a 20 amp external branch circuit protection device.
- Normally, one power feed is used for each individual power supply.

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

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

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

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

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

Guidelines for the DC-powered platform

A VIPRION® DC-powered installation must meet these requirements:

- Install the unit using a 50 amp external branch circuit protection device.
- One power feed must be used for each individual power supply.
- For permanently connected equipment, incorporate a readily accessible disconnect in the fixed wiring.
- Use only copper conductors.

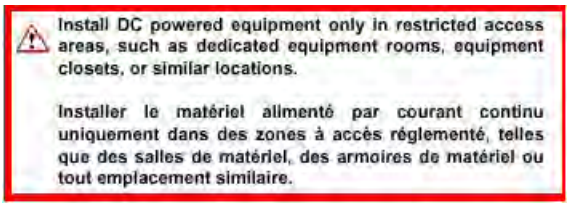
- The DC MAINS powering the equipment shall be connected to protective earth.

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

Note: *The power supply for the VIPRION® DC platform does not have an on/off switch. You control the power from the DC power source.*

Note: *You must use copper wire for the ground wire and all lead wires.*

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



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 and exhausts hot air out the back of the chassis.

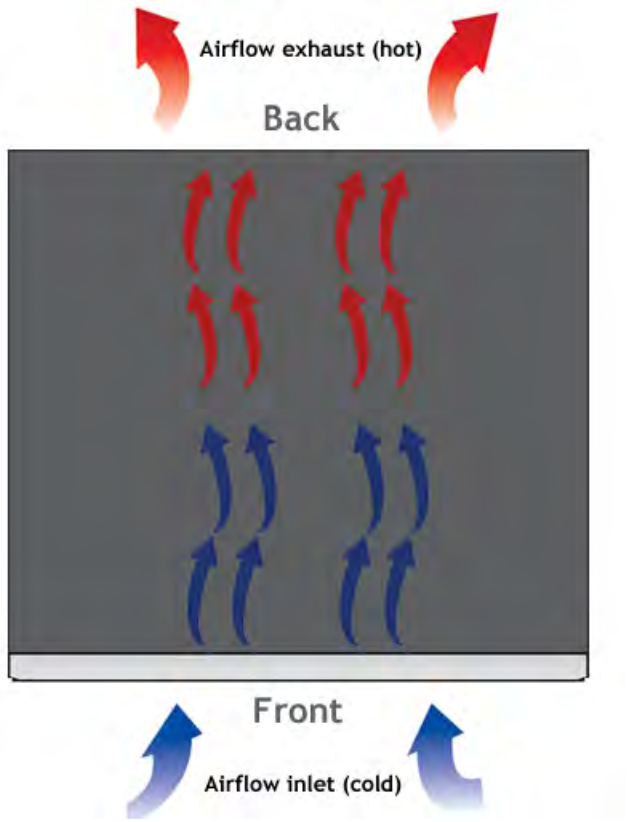


Figure 18: Airflow in the platform

Platform Specifications

General specifications for system features

This table lists general specifications for the VIPRION® 2200 platform.

Item	Specification
Transceiver modules hot swap	Support for hot swap of transceiver modules
Dynamic routing protocols	BFD, BGP4, IS-IS, OSPFv2, OSPFv3, RIPv1/RIPv2, RIPng
Jumbo frames	Support for maximum Ethernet frame size of 9216 bytes and MTU of 9128 bytes
Virtual Clustered Multiprocessing™ (vCMP™)	Supports provisioning and managing multiple, hosted instances of the BIG-IP software on a single hardware device

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

Blade hardware specifications

This table lists hardware specifications for VIPRION B2000 Series blades.

Specification	B2100	B2150	B2250
Dimensions	Proprietary to fit F5 Networks chassis		
Weight	9.5 pounds (4.3 kg)	9.5 pounds (4.3 kg)	10.0 pounds (4.5 kg)
Processor	1 x Quad-Core Intel® Xeon® processor (total 8 hyperthreaded logical processor cores)	1 x Quad-Core Intel® Xeon® processor (total 8 hyperthreaded logical processor cores)	1 x 10-Core Intel® Xeon® processor (total 20 hyperthreaded logical processor cores)
Communication interfaces	8 x 1GbE/10GbE SFP+ fiber ports 1 x 10/100/1000 Ethernet Management port 1 x RJ45 console port 1 x RJ45 failover port 2 x USB 2.0 interfaces	8 x 1GbE/10GbE SFP+ fiber ports 1 x 10/100/1000 Ethernet Management port 1 x RJ45 console port 1 x RJ45 failover port 2 x USB 2.0 interfaces	4 x 40GbE QSFP+ fiber ports 1 x 10/100/1000 Ethernet Management port 1 x RJ45 console port 2 x USB 2.0 interfaces
Hard drive capacity	1 x 300 GB hard disk drive (HDD)	1 x 400 GB solid-state drive (SSD)	1 x 800 GB SSD
RAM	16 GB	32 GB	64 GB

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

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

Chassis hardware specifications

This table lists hardware specifications for the VIPRION® 2200 chassis.

Item	Specification
Dimensions	H: 3.4 inches (8.6 cm) x W: 17.3 inches (44.0 cm) x D: 24.5 inches (62.2 cm) rack-mount chassis
Weight	Fully-loaded system (2 blades, 2 power supplies, 1 fan tray): 61.0-62.0 pounds (27.6-28.1 kg) Half-loaded system (1 blade, 2 power supplies, 1 blank line cards, 1 fan tray): 52.0-53.0 pounds (23.5-24.0 kg) Empty chassis (1 blank line cards, 0 power supplies, 0 blades, 1 fan tray): 31.0 pounds (14.1 kg) Power supply: 5.5 pounds (2.5 kg) B2100 blade: 9.5 pounds (4.3 kg) B2150 blade: 9.5 pounds (4.3 kg) B2250 blade: 10.0 pounds (4.5 kg) Blank line card: 0.5 pounds (0.23kg) Fan tray: 5.5 pounds (2.5 kg)
Processor	See blade specifications
Hard drive capacity	See blade specifications
RAM	See blade specifications
AC power input requirements	2 x 100 to 240VAC 800W auto-ranging 10A per input line (max) 2 x NEMA 5-15P power cords
DC power supply	1 to 2 x 800W -44 to 72 VDC 44A per input (max)

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

Chassis environmental operating specifications

This table lists environmental operating specifications for the VIPRION® chassis.

Item	Specification
Operational temperature	32° to 104°F (0° to 40°C)
Operational relative humidity	5 to 85% at 104°F (40°C)
Non-operational temperature	-40 to 158°F (-40 to 70°C)
Non-operational humidity	5 to 95% at 40°C non-condensing

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

About AC power requirements

When working with an AC-powered VIPRION® platform, it is important to understand the AC power options and requirements.

About AC power cables

The power cable supplied with the hardware is a 125V high-line input cable. This type of cable requires a NEMA 5-15R wall outlet or a region-specific equivalent. Region-specific power cables are available from F5® Networks.

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

AC power redundancy provisioning

This VIPRION® platform supports up to two AC power supplies. The power supplies are auto-ranging 100-240VAC (low/high line) input, and can supply 800W output power. The fan tray is provisioned to draw up to 100W, and each blade slot is provisioned for 350W. One power supply can support one or two B2000 Series blades, plus the fan tray with no redundancy. If redundancy is desired in any configuration, add the second power supply. This table shows some of the possible blade and power supply redundancy configurations.

		No redundancy	1 + 1 redundancy
Blade type	**Blade quantity**	**Supplies (low/high line)**	**Supplies (low/high line)**
B2100	1 (350W)	1 (800W available)	2 (1600W available)
	2 (600W)	1 (800W available)	2 (1600W available)
B2150	1 (350W)	1 (800W available)	2 (1600W available)
	2 (600W)	1 (800W available)	2 (1600W available)
B2250	1 (350W)	1 (800W available)	2 (1600W available)
	2 (600W)	1 (800W available)	2 (1600W available)

AC platform power consumption (low-line input)

The actual amount of power draw from the AC source depends on the type and number of blades, as well as the power supply AC source voltage and redundancy configuration. This table shows possible configurations for low-line voltage, and the typical and maximum power draw.

Blade quantity and type	Typical system power draw (W)	Maximum system power draw (W)	Typical system heat (BTU/hr)	Maximum system heat (BTU/hr)	Number of power supplies installed
Chassis only	< 75	< 100	< 250	< 340	1 or 2
1 x B2100	235	315	805	1075	1
2 x B2100	435	585	1485	2000	1
1 x B2100	245	325	840	1110	2
2 x B2100	445	595	1520	2035	2
1 x B2150	235	315	805	1075	1
2 x B2150	435	585	1485	2000	1
1 x B2150	240	340	820	1165	2
2 x B2150	445	595	1520	2035	2
1 x B2250	240	340	820	1165	1
2 x B2250	465	660	1590	2255	1
1 x B2250	255	360	845	1230	2
2 x B2250	465	660	1590	2255	2

AC platform power consumption (high-line input)

The actual amount of power draw from the AC source depends on the type and number of blades, as well as the power supply AC source voltage, and redundancy configuration. This table shows possible configurations for high-line input, and the typical and maximum AC mains power draw.

Blade quantity and type	Typical system power draw (W)	Maximum system power draw (W)	Typical system heat (BTU/hr)	Maximum system heat (BTU/hr)	Number of power supplies installed
Chassis only	< 75	< 100	< 250	< 340	1 or 2
1 x B2100	265	305	905	1045	1
2 x B2100	510	560	1745	1915	1
1 x B2100	285	315	975	1075	2
2 x B2100	515	565	1760	1930	2
1 x B2150	265	305	905	1045	1
2 x B2150	510	560	1745	1915	1
1 x B2150	285	315	975	1075	2
2 x B2150	515	565	1760	1930	2
1 x B2250	235	335	805	1145	1
2 x B2250	450	640	1540	2185	1
1 x B2250	245	345	840	1180	2
2 x B2250	455	645	1555	2205	2

DC power requirements

When working with a DC-powered VIPRION® 2200 platform, it is important to understand the DC power options and requirements.

The platform supports up to two hot swappable DC power supplies. One power supply powers a chassis that contains zero to four blades, with no redundancy. Two power supplies power a chassis with any blade configuration, with full redundancy.

DC platform power consumption

The actual amount of power draw from the DC power source depends on the type and number of blades, and the redundancy configuration. This table shows several possible configurations, and the typical and maximum power draw.

Blade quantity and type	Typical system power draw (W)	Maximum system power draw (W)	Typical system heat (BTU/hr)	Maximum system heat (BTU/hr)	Number of power supplies installed
Chassis only	< 100	< 100	< 340	< 340	1 or 2
1 x B2100	235	310	805	1060	1
2 x B2100	440	575	1505	1965	1
1 x B2100	245	325	840	1110	2
2 x B2100	445	580	1520	1980	2
1 x B2150	230	310	785	1060	1
2 x B2150	420	550	1435	1880	1
1 x B2150	240	315	820	1075	2
2 x B2150	425	555	1450	1895	2
1 x B2250	240	350	820	1195	1
2 x B2250	445	635	1520	2170	1
1 x B2250	245	355	840	1215	2
2 x B2250	460	610	1570	2085	2

Safety requirements

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

EC Type Examination Certificates: Master Contract: 252302

CB Scheme

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

IEC 60950-1:2005, A1:2009

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

ANSI/UL 60950-1-2011

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

EMC requirements

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

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

- This equipment may not cause harmful interference.
- 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 2004/108/EC:

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

Directive	Required Limits
ETSI EN 300 386 V1.5.1 (2010)	
EN 55022:2010	Class A
EN 61000-3-2:2006 A1:2009+A2:2009	
EN 61000-3-3:2008	

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

Directive	Required Limits
EN 55024:2010	
EN 55022:2010	Class A
EN 61000-3-2:2006 A1:2009+A2:2009	
EN 61000-3-3:2008	

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

Acoustic, airflow, and altitude specifications

This table lists acoustic levels, airflow movement, and operational altitude specifications for the VIPRION® 2200 platform.

Specification type	Detail	Units	Chassis with blade
Maximum acoustic output [1]	Front	dBA	67
	Left	dBA	65
	Right	dBA	66
	Rear	dBA	72
Altitude [2]	Operational	Feet	6000
	Non-operational	Feet	40,000
Airflow [3]	Entire chassis	CFM	244

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

[1] All measurements taken at 0.6 meter with two power supplies operational and fans at 100% duty cycle. Measurements recorded in decibels A-weighting (dBA).

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

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

China RoHS Requirements

RoHS declaration

The object of this declaration is in conformity with Directive 2011/65/EU of the European Parliament and of the Council of 8 June 2011 on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

Hazardous substance levels for China

This table shows how the VIPRION® 2200 platform components conform to the Restriction of Hazardous substances Directive (RoHS) standards for China.

VIPRION C2200 机箱危害物质表

VIPRION C2200 Series Chassis Hazardous Substance Table

部件名称 Part Name	有毒有害物质 Hazardous Substance					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	铬 6+ (Cr^{6+})	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 Metal Parts	o	o	o	o	o	o
印刷电路板 Printed Circuit Boards	x	o	o	o	o	o
风扇组件 Fan Assembly	o	o	o	o	o	o
电源 Power Supplies	x	o	o	o	o	o

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

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

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

VIPRION B2100, B2150, B2250 危险物质表

VIPRION B2100, B2150, B2250 Hazardous Substance Table

部件名称 Part Name	有毒有害物质 Hazardous Substance					
	铅 (Pb)	汞 (Hg)	镉 (Cd)	铬 6+ (Cr^{6+})	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
金属部件 Metal Parts	x	o	o	o	o	o
PCA 处理器板 PCA Processor Board	x	o	o	o	o	o
PCA 中楼板 PCA Mezzanine Board	x	o	o	o	o	o
硬盘 / 固态硬盘 Hard Drives or SSDs	x	o	o	o	o	o

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

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

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

Repackaging Guidelines

About repackaging the platform

The VIPRION® 2200 chassis and blades are designed to be shipped and packaged separately. 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.

Important: *Before returning any equipment, contact F5 to obtain a 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 XFP/SFP/SFP+ modules, GBICs, or other peripheral items if you are returning the platform to F5 Networks.*

Repackaging the chassis

The VIPRION® 2200 chassis must be shipped empty (with no blades installed) and in F5®-provided packaging.

1. Disconnect the power cords and other cables from the platform.
2. Remove all blades from the chassis.
3. Remove the chassis from the rack.
4. Place the empty chassis onto the shipping boxand cover it with the plastic wrap.

5. Place the foam insert on top of the chassis.

6. Place the accessory box on the foam insert.

7. Close and seal the shipping box.

Repackaging a blade

The VIPRION® B2000 Series blades must be shipped in F5-provided packaging.

1. Disconnect the network cables and other cables from the blade, and then remove any optical modules.
2. Loosen the captive screws on either side of the blade.
3. Grasp the two latches on the front of the blade and pull toward you.

4. Fully extend the latches on both sides of the blade and pull out toward you to remove the blade from the chassis.

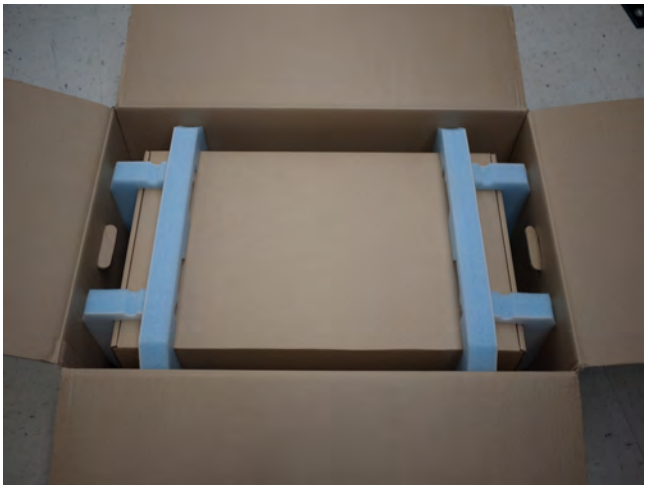
5. Place the blade into the antistatic bag, and then place the bagged blade into the black conductive wrapper sheet.

6. Close the black wrapper sheet by securing the tabs on the left and right sides of the box.

7. Place the foam cover on top of the blade box.

8. Close the blade box.

9. Install the foam end caps onto the outside edges of the blade box, and then place the blade box into the outer shipping box.



10. Close and seal the outer 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.

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

Accessible non-volatile memory

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

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

About removing data from F5 components

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

Removing sensitive data from storage drives

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

Perform a disk erase operation using one of these methods:

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

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

Removing IP address data from Always-On Management

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

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

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

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

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

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

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

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

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

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

Legal Notices

Legal Notices

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

Patents

This product may be protected by one or more patents indicated at: *https://f5.com/about-us/policies/patents*

Export Regulation Notice

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

RF Interference Warning

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

FCC Compliance

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

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

Canadian Regulatory Compliance

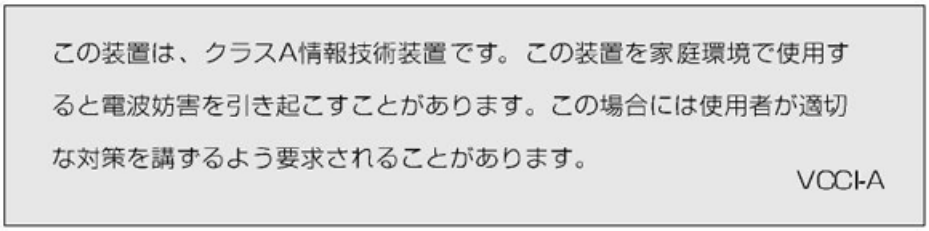
This Class A digital apparatus complies with Canadian ICES-003.

Standards Compliance

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

VCCI Class A Compliance

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



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