



Platform Guide: IP Application Switch™

Product Version

This manual applies to hardware platforms 1000, 2000, 2400, 5000, 5100, and 5110 created by F5 Networks, Inc.

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Export 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 generates, uses, and may emit radio frequency energy. The equipment has been type tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC rules, which are designed to provide reasonable protection against such radio frequency interference.

Operation of this equipment in a residential area may cause 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 I CES-003.

Standards Compliance

The product conforms to ANSI/UL Std 1950 and Certified to CAN/CSA Std. C22.2 No. 950.



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Working with the IP Application Switch platform

The IP Application Switch™ platforms are powerful systems capable of managing traffic for any size of enterprise.

Externally, the IP Application Switch platforms look similar. However, there are internal differences and some external differences.

- ◆ **1000 series**

This is the switch designed for the best performance at the price. This switch can manage all the capabilities of F5 Networks traffic management software. The 1000 series (Figure 1.1) provides the power of a 1 (Fiber Gigabit Ethernet) X 8 (10/100) switch, with SSL processing available as an additional add-on through the software license. For details, see *Reviewing hardware specifications*, on page 2-1.

- ◆ **2000 series**

The 2000 series switch has 2 (Fiber Gigabit Ethernet) X 16 (10/100) ports (Figure 1.2). The 2400 version of this switch incorporates the F5 Networks Packet Velocity ASIC™ for accelerating Layer 4 (IP address and port) requests. All BIG-IP 2000 series switches include integrated SSL processing. For details, see *Reviewing hardware specifications*, on page 2-1.

- ◆ **5000 series**

The 5000 series switches are available with 4 (Fiber Gigabit Ethernet) X 24 (10/100) ports (Figure 1.3). The 5110 version of the switch includes 4 Copper Gigabit Ethernet interfaces instead of 4 Fiber Gigabit Ethernet interfaces. While all versions of the IP Application Switch accelerate Layer 7 traffic, the 5100 version of the switch is optimized to accelerate Layer 7 traffic. All 5000 series switches include dual processors and integrated SSL processing. For details, see *Reviewing hardware specifications*, on page 2-1.



Figure 1.1 An example of the IP Application Switch, in this case a BIG-IP 1000



Figure 1.2 An example of a 2000 series IP Application Switch, in this case a BIG-IP 2000



Figure 1.3 An example of a 5000 series IP Application Switch, in this case a BIG-IP 5000

Getting started

There are several basic tasks you must complete to get the IP Application Switch platform installed and set up.

- Review the hardware requirements.
- Familiarize yourself with the IP Application Switch hardware.
- Review the environmental requirements.
- Connect the IP Application Switch to the network, and optionally connect the peripheral hardware.
- Activate the license.

The IP Application Switch comes with the hardware that you need for installation and maintenance. However, you must also provide standard peripheral hardware, such as a keyboard or serial terminal, if you want to administer the IP Application Switch directly.

Components provided with the IP Application Switch

When you unpack the IP Application Switch, you should make sure that the following components, shown in Figure 1.4, are included:

- One power cable
- Four rack-mounting screws
- Documentation and Software CD

If you purchased a hardware-based redundant system, you also received one fail-over cable to connect the two IP Application Switch units together (network-based redundant systems do not require a fail-over cable).

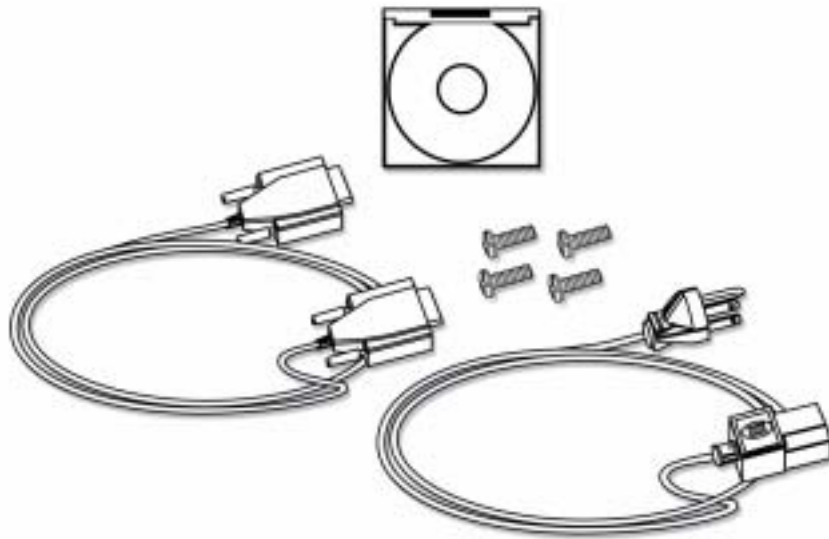


Figure 1.4 Components included with the IP Application Switch

Peripheral hardware that you provide

For each IP Application Switch in the system, you need to provide the following peripheral hardware:

- ◆ If you plan to use direct administrative access to the IP Application Switch, you need standard input/output hardware. This requires a serial terminal and a null modem cable. For serial terminal configuration information, refer to the ***BIG-IP Reference Guide***, Chapter 3, *Post-Setup Tasks* in the section *Using a serial terminal with the BIG-IP system*.
- ◆ If you want to use the default IP Application Switch configuration, you must have an administrative workstation on the same IP network as the IP Application Switch.
- ◆ You also need network hubs, switches, or concentrators to connect to the IP Application Switch network interfaces. The devices you select must be compatible with the network interface cards installed in the IP Application Switch. The devices can support 10/100 Ethernet or Gigabit Ethernet.
 - Ethernet requires either a 10 Mbps or 100 Mbps hub or switch.
 - Gigabit Ethernet requires a compatible Gigabit Ethernet switch.

If you plan on doing remote administration from your own PC workstation as most users do, we recommend that you have your workstation already in place. Keep in mind that the Setup utility prompts you to enter your workstation's IP address when you set up remote administrative access.

Familiarizing yourself with the IP Application Switch

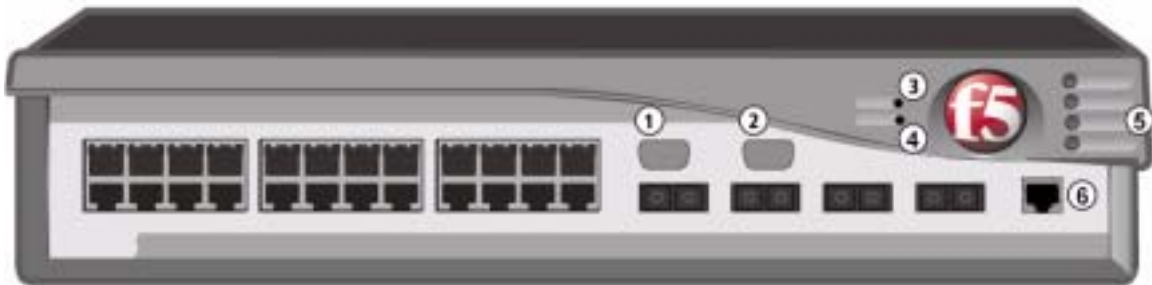
The IP Application Switch is offered in several different hardware configurations. Before you begin to install the IP Application Switch, you may want to quickly review the following figures that illustrate the controls and ports on both the front and the back of an IP Application Switch.

Using the IP Application Switch hardware

This section describes the front and back layout of a IP Application Switch. Figure 1.5 illustrates the front of a IP Application Switch. On the front of the unit, you can turn the unit off and on, or you can reset the unit. You can also view the indicator lights for hard disk access.

◆ Note

The interfaces on every IP Application Switch are labeled, so it should be clear what each port is, no matter which hardware configuration you have purchased.



- | |
|--|
| <ul style="list-style-type: none"> 1. Serial terminal port 2. Hard-wired fail-over port 3. Reset button 4. Netboot button 5. Status LEDs 6. Management interface |
|--|

Figure 1.5 Front view of an IP Application Switch

If you have a special hardware configuration, such as one that includes more than two interfaces, the ports on the back of your unit differ slightly from those shown in Figure 1.6, on page 1-7.

Table 1.1 describes the behavior of the LEDs in normal startup and in error conditions.

Description	Power LED	Status LED	Activity LED	Alarm LED
Normal Startup:				
Power is off	Black	Black	Black	Black
Starting Up - BIOS	Green	Black	Black	Yellow
Starting Up - Loader	Green	Black	Yellow	Yellow
Starting Up - Kernel	Green	Blink Yellow	Flicker Yellow* for storage device	Yellow
System ready - (standby mode)	Green	Yellow	Flicker Green** for Traffic	Black
System ready - (active mode)	Green	Green	Flicker Green for Traffic	Black
Error Conditions:				
Overtemp or fan failure	Green	Yellow or Green	Flicker Green for Traffic	Blink Red
Out of memory or other serious condition	Green	Yellow or Green	Flicker Green for Traffic	Red
One or more virtual servers have all nodes down	Green	Yellow or Green	Flicker Green for Traffic	Blink Yellow
One or more health monitors failed	Green	Yellow or Green	Flicker Green for Traffic	Yellow
Self Test Failed in Phase 1	Green	Black	Black	Red
Self Test Failed in Phase 2	Green	Black	Black	Black
Self Test Failed in Phase 3	Green	Blink Yellow	Black	Red
*After startup, LED3 never flickers yellow, even though the storage device may be accessed.				
**Flicker Green means traffic is being load balanced or routed.				

Table 1.1 Behavior of the status LEDs

Figure 1.6, following, illustrates the back of a IP Application Switch. Note that all ports are labeled.

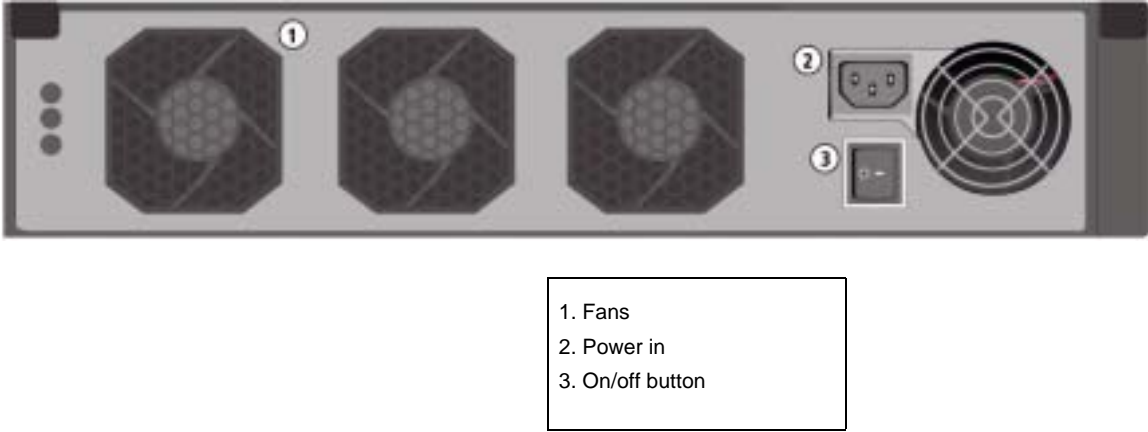


Figure 1.6 Back view of an IP Application Switch

Environmental requirements

Before you install the IP Application Switch, review the following guidelines to make sure that you are installing and using the IP Application Switch in the appropriate environment.

General guidelines

An IP Application Switch is an industrial network appliance, designed to be mounted in a standard 19-inch rack. To ensure safe installation and operation of the unit:

- 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 IP Application Switch, the power supply and the vents on both the front and back of the unit remain unobstructed. The IP Application Switch must have adequate ventilation around the unit at all times.
- Do not allow the air temperature in the room to exceed 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.
- Verify that the voltage selector is set appropriately before connecting the power cable to the unit.



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



The controller contains a lithium battery. There is danger of an explosion if you replace the lithium battery incorrectly. We recommend that you replace the battery only with the same type of battery originally installed in the unit, or with an equivalent type recommended by the battery manufacturer. Be sure to discard all used batteries according to the manufacturer's instructions.



This equipment is not intended for operator serviceability. To prevent injury and to preserve the manufacturer's warranty, allow only qualified service personnel to service the equipment.

Guidelines for DC-powered equipment

A DC-powered installation must meet the following requirements:

- Install the unit using a 20 Amp external branch circuit protection device.
- For permanently connected equipment, incorporate a readily accessible disconnect in the fixed wiring.
- Use only copper conductors.



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

Installing and connecting the hardware

There are two basic tasks required to install the hardware. You simply need to install the IP Application Switch in a rack, and then connect the peripheral hardware and the interfaces.

◆ WARNING

Do not turn on an IP Application Switch until all peripheral hardware is connected to the unit.

To install the hardware in a rack

1. Lift the unit into place. This requires more than one person.
2. Secure the unit using the four rack-mounting screws that are provided.

Figure 1.7 shows the orientation of the IP Application Switch and the mounting screws for installation in a standard 19" rack. Figure 1.8 shows the IP Application Switch installed in the rack.

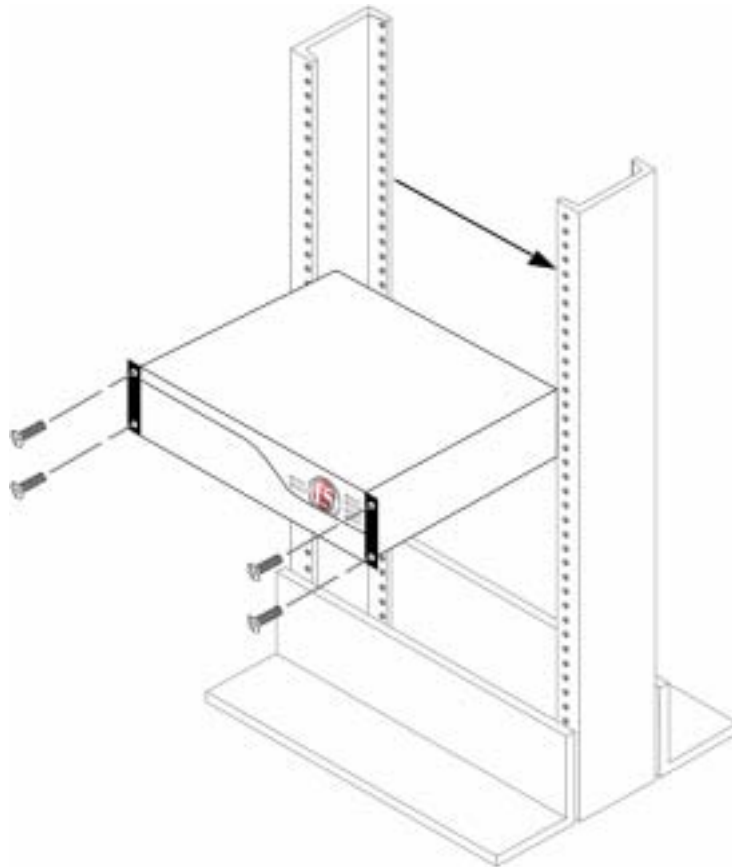


Figure 1.7 Platform orientation for rack mounting

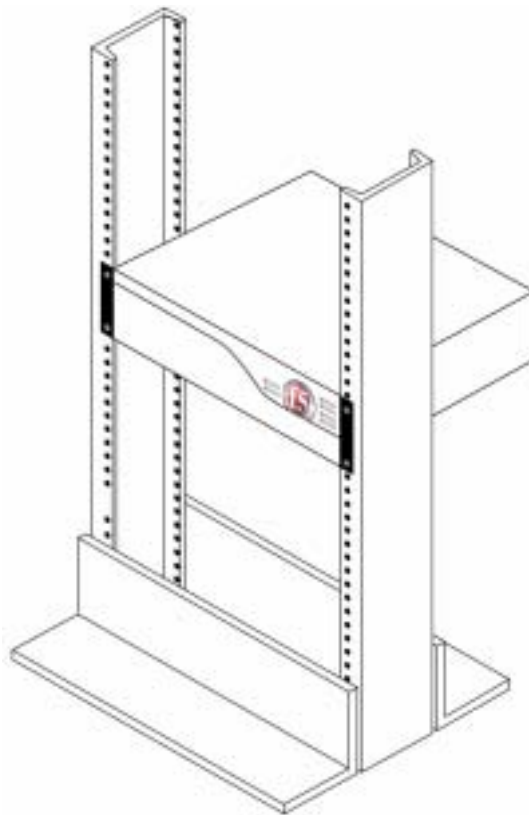


Figure 1.8 Platform installed in a 19" rack

To connect the cables and hardware for input/output

1. Connect the hardware that you have chosen to use for input/output:
If you are using a serial terminal as the console, connect the serial cable to the terminal serial port (number 1 in Figure 1.5).
2. Connect the interfaces to the network from which the IP Application Switch processes connection requests. For more information about interfaces, see *Interfaces*, on page 1-12.
3. If you have a hardware-based redundant system, connect the fail-over cable to the fail-over port on each unit (number 2 in Figure 1.5).
4. Connect the power cable to the IP Application Switch power in (number 2 in Figure 1.6), and then connect it to the power source.

Interfaces

This platform can have as few as one network interface. It is helpful to understand interface naming conventions before you perform configuration tasks such as displaying interface status and settings, setting the media type, and setting the duplex mode.

Interface naming conventions

By convention, the Ethernet interfaces on the platform take the name `<s>.<p>`, where `s` is the slot number of the NIC, and `p` is the port number on the NIC. As shown in Figure 1.9, for the Application Switch, slot numbering is left-to-right and port numbering is top-to-bottom, as shown in Figure 1.9. Note that slot 2 is used for the gigabit ports, and slot 3 for a dedicated administrative port.

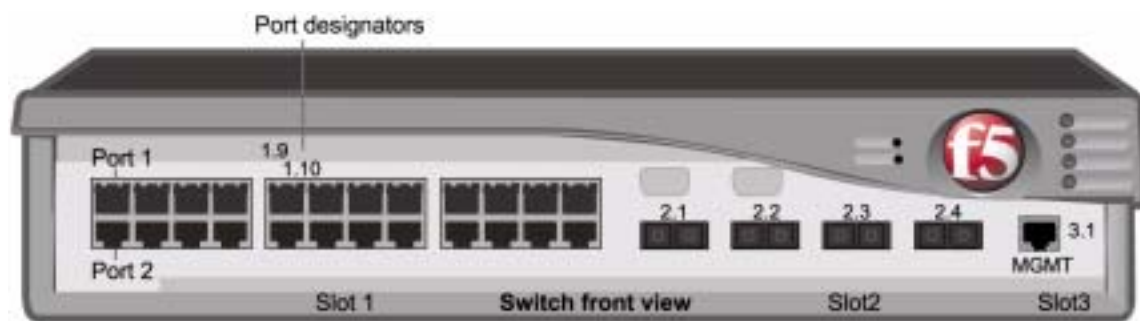


Figure 1.9 IP Application Switch platform slot and port numbering

When a **bigpipe** command calls for a list of interfaces, the list may consist of one or more interfaces, with multiple interfaces separated by spaces. For example:

```
1.1 1.2 2.1 2.2
```

Displaying status and settings for interfaces

From the command line interface, use the following syntax to display the current status and the settings for all installed interfaces:

```
b interface show
```

Figure 1.10 shows an example of the output you see when you issue this command on an active/standby unit in active mode.

interface	speed	pkts	pkts	pkts	pkts	bits	bits	errors	trunk	STP
	Mb/s	in	out	drop	coll	in	out			
1.1	UP 100 HD	0	213	0	0	0	74.2K	0		
1.2	UP 100 HD	20	25	0	0	28.6K	33.9K	0		

Figure 1.10 The bigpipe interface show command output

Use the following syntax to display the current status and the setting for a specific interface:

```
b interface <if_name> show
```

Media type and duplex mode

Properties that are configurable on the interfaces include media type and duplex mode, as shown in Table 1.2.

Interface Properties	Description
media	You may specify a media type or use auto for automatic detection.
duplex	You may specify a full or half duplex mode, or use auto for automatic selection.

Table 1.2 Attributes you can configure for an interface

Setting the media type

You can set the media type to that of the interface, or to **auto** for auto-detection. If the media type is set to **auto** and the card does not support auto-detection, the default type for that interface is used, for example **100BaseTX**.

Use the following syntax to set the media type:

```
b interface <if_name> media <media_type> | auto
```

(Default media type is **auto**.)

To view the valid media types for an interface, type the following command:

```
b interface <if_name> media show
```

◆ Note

If the platform is inter-operating with an external switch, the media setting should match that of the switch.

Setting the duplex mode

You can set duplex mode to full or half duplex. If the media type does not allow duplex mode to be set, this is indicated by an onscreen message. If media type is set to **auto**, or if setting duplex mode is not supported for the interface, the duplex setting is not saved to **bigip_base.conf**.

Use the following syntax to set the duplex mode:

```
b interface <if_name> duplex full | half | auto
```

(Default mode is **auto**.)

Activating the license

Once the platform is installed in the rack and connected to the network, you need a valid license certificate to activate the software. To gain a license certificate, you need to provide two items to the license server: a registration key and a dossier.

The **registration key** is a 25-character string. In some cases, you may have received the key by email. If you received a CD, the number is on the back of the CD case. The registration key lets the license server know which F5 products you are entitled to license.

The **dossier** is obtained from the software, and is an encrypted list of key characteristics used to identify the platform

You can obtain a license certificate using one of the following methods:

◆ **Automatic license activation**

You perform automatic license activation from the command line, the License utility on an unlicensed unit, or from the web-based Configuration utility of an upgraded unit. The automatic method automatically retrieves and submits the dossier to the F5 license server, as well as installing the signed license certificate. In order for you to use this method, the unit must be installed on a network with Internet access.

◆ **Manual license activation**

You perform manual license activation from the License utility on an unlicensed unit, or from the web-based Configuration utility of an upgraded unit. With the manual method, you submit the dossier to, and retrieve the signed license file from, the F5 license server manually. In order for you to use this method, the administrative workstation must have Internet access.

◆ **Note**

You can open the Configuration utility with Netscape® Navigator version 4.7x, or Microsoft® Internet Explorer version 5.0, 5.5, or 6.0.

Automatically activating a license

You can perform automatic license activation from the command line, the License utility on an unlicensed unit, or from the web-based Configuration utility of an upgraded unit. This section describes the automatic license activation process in the following cases:

- From the web-based License utility or Configuration utility
- From the command line, first-time installation
- From the command line, upgrading a current installation

To automatically activate a license using the Configuration utility

1. Open the Configuration utility according to the type of BIG-IP unit you are licensing:
 - If you are licensing a previously configured BIG-IP unit, open the Configuration utility using the configured address.
 - If you are licensing a new BIG-IP unit, from the administrative workstation, open the Configuration utility using one of the following addresses:
https://192.168.1.245
https://192.168.245.245.
These are default addresses on the unit's local area network.
2. Type the name and password, based on the type of BIG-IP unit you are licensing:
 - If you are licensing a previously configured BIG-IP unit, type your user name and password at the log on prompt.
 - If you are licensing a new BIG-IP system, type the user name **root**, and the password **default** at the log on prompt.

The product welcome screen displays.

3. Access the License utility based on the type of BIG-IP unit you are licensing:
 - If the unit does not have a license from a previous version, click **License Utility** to open the License Administration screen.
 - If the unit has a license from a previous version, or an evaluation license, click **Configuration Utility**. In the navigation pane, click **System Admin**, and then click the License Administration tab.
4. In the **Registration Key** box, type the 25-character registration key that you received. If you have more than one key to install, click **Enter More Keys** to install multiple keys. Once you have entered all registration keys, click **Automated Authorization**.

The License Status screen displays status messages, and **Process complete** appears when the licensing activation is finished.

5. Click **License Terms**, review the EULA, and accept it.
6. At the Reboot Prompt screen, select when you want to reboot the platform.
License activation is complete only after rebooting.

To automatically activate a license from the command line for first time installation

1. Type the user name **root** and the password **default** at the logon prompt.
2. At the prompt, type **license**.
The following prompts appear:
IP:
Netmask:
Default Route:
Select interface to use to retrieve license:
The platform uses this information to make an Internet connection to the license server.
3. After you type the Internet connection information, continue to the following prompt:
The Registration Key should have been included with the software or given when the order was placed.
Do you have your Registration Key? [Y/N]:
4. Type **Y**, and the following prompt appears:
Registration Key:
5. Type the 25-character registration key you received.
After you press Enter, the dossier is retrieved and sent to the F5 license server, and a signed license file is returned and installed. A message displays indicating the process was successful. If the licensing process is not successful, contact your vendor.
6. You are asked to accept the End User License Agreement.
The system will not be fully functional until you accept this agreement.
7. You are prompted to reboot the system. Press Enter to reboot.
The system will not be fully functional until you reboot.

To automatically activate a license from the command line for upgrades

1. Type your user name and password at the log on prompt.
2. At the prompt, type **setup**.
3. Choose menu option **L**.
4. The following prompt displays:
Number of keys: 1
If you have more than one registration key, enter the appropriate number.
5. The following prompt displays:
Registration Key:

6. Type the 25-character registration key you received. If you received more than one key, enter all of the keys separated by blanks.

After you press Enter, the dossier is retrieved and sent to the F5 license server, and a signed license file is returned and installed. A message displays indicating the process was successful.

7. If the licensing process is not successful, contact your vendor.
8. When you are finished with the licensing process, type the following command to restart the services on the system:

```
bigstart restart
```

Manually activating a license

You can perform manual license activation from the License utility on an unlicensed unit, or from the web-based Configuration utility of an upgraded unit. With this method, you submit the dossier to, and retrieve the signed license file from, the F5 license server manually. This section describes the manual license activation process using the Configuration utility or License utility.

To manually activate a license using the License utility or Configuration utility

1. Open the Configuration utility according to the type of BIG-IP unit you are licensing:
 - If you are licensing a previously configured BIG-IP unit, open the Configuration utility using the configured address.
 - If you are licensing a new BIG-IP unit, from the administrative workstation, open the Configuration utility using one of the following addresses:
https://192.168.1.245
https://192.168.245.245.
These are default addresses on the unit's local area network.
2. Type the name and password, based on the type of BIG-IP unit you are licensing:
 - If you are licensing a previously configured BIG-IP unit, type your user name and password at the log on prompt.
 - If you are licensing a new BIG-IP system, type the user name **root**, and the password **default** at the log on prompt.The product welcome screen displays.
3. Access the License utility based on the type of BIG-IP unit you are licensing:
 - If the unit does not have a license from a previous version, click **License Utility** to open the License Administration screen.

- If the unit has a license from a previous version, or an evaluation license, click **Configuration Utility**. In the navigation pane, click **System Admin** and then click the License Administration tab.
4. In the **Registration Key** box, type the 25-character registration key that you received. If you have more than one key to install, click **Enter More Keys** to install multiple keys. Once you have entered all registration keys, click **Manual Authorization**.
 5. At the Manual Authorization screen, retrieve the dossier using one of the following methods:
 - Copy the entire contents of the **Product Dossier** box.
 - Click **Download Product Dossier**, and save the dossier to the hard drive.
 6. Click the link in the **License Server** box.
The Activate F5 License screen opens in a new browser window.
 7. From the Activate F5 License screen, submit the dossier using one of the following methods:
 - Paste the data you just copied into the **Enter your dossier** box, and click **Activate**.
 - At the **Product Dossier** box, click **Browse** to locate the dossier on the hard drive, and then click **Activate**.

The screen returns a signed license file.
 8. Retrieve the license file using one of the following methods:
 - Copy the entire contents of the signed license file.
 - Click **Download license**, and save the license file to the hard drive.
 9. Return to the Manual Authorization screen, and click **Continue**.
 10. At the Install License screen, submit the license file using one of the following methods:
 - Paste the data you copied into the **License Server Output** box, and click **Install License**.
 - At the **License File** box, click **Browse** to locate the license file on the hard drive, and then click **Install License**.

The License Status screen displays status messages, and **Process complete** appears when licensing activation is finished.
 11. Click **License Terms**, review the EULA, and accept it.
 12. At the Reboot Prompt screen, select when you want to reboot the platform.
License activation is complete only after rebooting.

Using the Setup utility

Once you install the platform and obtain a license, you can configure the software with the Setup utility. The Setup utility defines the initial configuration settings required to install the platform into the network.

See the *BIG-IP Reference Guide*, Chapter 2, *Using the Setup Utility* for full details and instructions. You can download the guide from the CD.

Hardware acceleration

The Packet Velocity ASIC optimizes application performance, and reduces application wait times. An *ASIC* is an Application Specific Integrated Circuit. The Packet Velocity ASIC is designed to accelerate Layer 4 decisions. Off-loading the Layer 4 decisions enables the BIG-IP system to increase performance and throughput for basic routing functions (Layer 4) and application switching (Layer 7). Figure 1.11 is an example of the Packet Velocity ASIC.

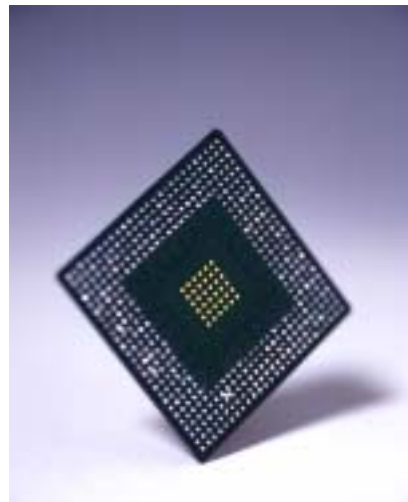


Figure 1.11 The Packet Velocity ASIC

Optional redundant power supply

Several switch platforms are available with a redundant power supply. With this option, the standard power supply is replaced with a new unit which occupies the same space, but includes two independent power supply modules with separate connections to the power mains.

The redundant power supply has no user controls. If one unit fails or is disconnected, the other unit takes over transparently.

To report the status of the redundant power supply modules from the command line

Type the following command to report the status of the redundant power supply modules:

```
b power [show]
```

Figure 1.12 is an example of the output when both modules are active.

```
top power supply: active
bottom power supply: active
```

Figure 1.12 Redundant power supply status

Figure 1.13 shows how the redundant power supply modules are located in the switch chassis.

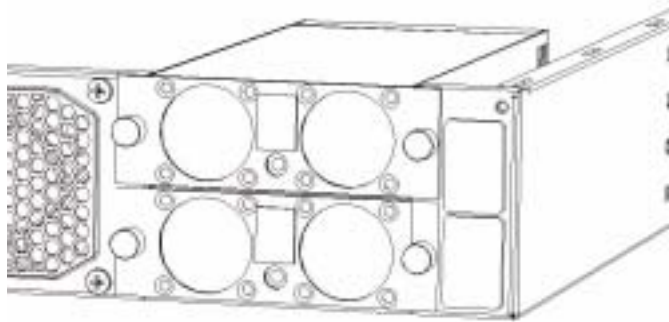


Figure 1.13 Location of the power modules in the redundant power supply option

Additional resources

You can find additional technical information about this product in the following resources:

- ◆ **CD**
You can download additional documentation such as the ***BIG-IP Reference Guide*** and the ***BIG-IP Solutions Guide***.
- ◆ **Release notes**
Release notes for the current version of this product are available from the product web server home page, and are also available on the technical support site. The release notes contain the latest information for the current version, including a list of new features and enhancements, a list of fixes, and, in some cases, a list of known issues.
- ◆ **Online help**
You can find help online in three different locations:
 - The web server on the product has PDF versions of the guides included on the Software and Documentation CD.
 - The web-based Configuration utility has online help for each screen. Simply click the **Help** button.
 - Individual **bigpipe** commands have online help, including command syntax and examples, in standard UNIX man page format. Simply type the command followed by the word **help**, and the BIG-IP software displays the syntax and usage associated with the command.
- ◆ **Third-party documentation for software add-ons**
The Product and Documentation CD contains online documentation for all third-party software, such as the Advanced Routing Modules.
- ◆ **Technical support through the World Wide Web**
The F5 Networks Technical Support web site, <http://tech.f5.com>, provides the latest technical notes, answers to frequently asked questions, updates for administrator guides (in PDF format), and the Ask F5 natural language question and answer engine. To access this site, you need to register at <http://tech.f5.com>.

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Additional Hardware Specifications

- Reviewing hardware specifications
- 1000 specifications
- 2000 specifications
- 2400 specifications
- 5000 specifications
- 5100 specifications
- 5110 specifications
- Logging hardware failures

Reviewing hardware specifications

The following section contains additional information about the IP Application Switch hardware platforms.

Specification	Description
Server/Node Operating System Compatibility	Load balancing of any TCP/IP OS, including Windows NT, Windows 95, all UNIX platforms, and Mac/OS
Internet/Intranet Protocol Support	All TCP services, UDP, SIP, and SSL; nearly all IP-based protocols
Administrative Environment Support	DNS proxy, SMTP, SSH, SNMP, dynamic/static network monitoring, scheduled batch job processing, system status reports, and alarms event notification
Network Management & Monitoring	Secure SSL browser-based interface, remote encrypted login and file transfer using SSH monitor, BIG-IP system network monitoring utilities and additional contributed software; SNMP gets and traps, iControl API using CORBA & SOAP/XML
Dynamic Content Support	ASP (active server pages), VB (visual basic script), ActiveX, JAVA, VRML, CGI, Cool Talk, Net Meeting, Real Audio, Real Video, Netshow, Quick Time, PointCast, any HTTP encapsulated data
BIG-IP Device Redundancy	Watchdog timer card, fail-safe cable (primary & secondary)
Web Server Application Compatibility	Any IP-based web or application server
Routing Protocols	RIP, OSPF, BGP
Operating Temperature	23° to 122° F (-5° to 50° C) per Telcordia GR-63-CORE 5.1.1 and 5.1.2
Relative Humidity	10 to 90% @ 40° C, per Telcordia GR-63-CORE 5.1.1 and 5.1.2
Power Supply	350W 110/220 VAC AUTO Switching
Safety Agency Approval	UL 60950 (UL1950-3) CSA-C22.2 No. 60950-00 (Bi-national standard with UL 60950) CB TEST CERTIFICATION TO IEC 950 EN 60950
Electromagnetic Emissions Certifications	EN55022 1998 Class A EN55024 1998 Class A FCC Part 15B Class A

Table 2.1 General IP Application Switch specifications

1000 specifications

The following specifications apply to only the 1000 IP Application Switch platform.

Specification	Description
Dimensions	3.5"H x 19"W x 21.7"D (per unit) 2U industry standard rack-mount chassis
Weight	26 lbs. (per unit)
Processor	Single PIII 1 GHz
Network Interface	8x10/100 with 1 Fiber Gigabit Ethernet interface
Hard Drive Capacity	512 MB flash
RAM	512 MB (expandable to 2 Gigabit Ethernet)

Table 2.2 The 1000 IP Application Switch platform specification

◆ Important

Specifications are subject to change without notification.

2000 specifications

The following specifications apply to only the 2000 platform.

Specification	Description
Dimensions	3.5"H x 19"W x 21.7"D (per unit) 2U industry standard rack-mount chassis
Weight	26 lbs. (per unit)
Processor	Dual PIII 1 GHz
Network Interface	16x10/100 with 2 Fiber Gigabit Ethernet interface
Hard Drive Capacity	512 MB flash
RAM	1 GB (expandable to 2 GB)

Table 2.3 The 2000 IP Application Switch platform specification

◆ Important

Specifications are subject to change without notification.

2400 specifications

The following specifications apply to only the 2400 platform.

Specification	Description
Dimensions	3.5"H x 19"W x 21.7"D (per unit) 2U industry standard rack-mount chassis
Weight	26 lbs. (per unit)
Processor	Single PIII 1.26 GHz
ASIC	Packet Velocity ASIC™
Network Interface	16x10/100 with 2 Fiber Gigabit Ethernet interfaces
Hard Drive Capacity	512 MB flash
RAM	1 GB (expandable to 2 GB)

Table 2.4 The 2400 IP Application Switch platform specification

◆ Important

Specifications are subject to change without notification.

5000 specifications

The following specifications apply to only the 5000 platform.

Specification	Description
Dimensions	3.5"H x 19"W x 21.7"D (per unit) 2U industry standard rack-mount chassis
Weight	26 lbs. (per unit)
Processor	Dual PIII 1 GHz
Network Interface	24x10/100 with 4 Fiber Gigabit Ethernet interfaces
Hard Drive Capacity	512 MB flash
RAM	1 GB (expandable to 2 GB)

Table 2.5 The 5000 IP Application Switch platform specification

◆ Important

Specifications are subject to change without notification.

5100 specifications

The following specifications apply to only the 5100 IP Application Switch platform.

Specification	Description
Dimensions	3.5"H x 19"W x 21.7"D (per unit) 2U industry standard rack-mount chassis
Weight	26 lbs. (per unit)
Processor	Dual PIII 1.26 GHz
Network Interface	24x10/100 with 4 Fiber Gigabit Ethernet interfaces
Hard Drive Capacity	512 MB flash
RAM	1 GB (expandable to 2 GB)

Table 2.6 The 5100 IP Application Switch specification

◆ Important

Specifications are subject to change without notification.

5110 specifications

The following specifications apply to only the 5110 IP Application Switch platform.

Specification	Description
Dimensions	3.5"H x 19"W x 21.7"D (per unit) 2U industry standard rack-mount chassis
Weight	26 lbs. (per unit)
Processor	Dual PIII 1.26 GHz
Network Interface	24x10/100 with 4 Copper Gigabit Ethernet interfaces
Hard Drive Capacity	512 MB flash
RAM	1 GB (expandable to 2 GB)

Table 2.7 The 5110 IP Application Switch platform specification

◆ Important

Specifications are subject to change without notification.

Logging hardware failures

The BIG-IP system includes a script, called **system_check**, which monitors certain hardware components and notifies the user of their status. The hardware components that the **system_check** script monitors are:

- Chassis fan speed
- CPU fan speed (one or two)
- Power supply (for platforms that include redundant power supplies)

It is the UNIX **cron** daemon that runs the **system_check** script. The **cron** daemon runs the script on an ongoing basis at a regular interval, specified in the **/config/crontab** file.

Failure notification

When run, the **system_check** script reports the hardware status to the console. The script also logs all fan and power-supply failures to the file **/var/log/bigip**.

In addition to displaying status to the console and logging failures in the file **/var/log/bigip**, the BIG-IP system also displays an alarm condition on the front panel LEDs of the Application Switch platform. Table 2.8 shows the LED usage for alarm conditions related to fans and power supplies.

Hardware component	Status LED	Activity LED	Alarm LED
Chassis and CPU fans	X	X	Blinking red
Power supply 1 (upper)	Blinking yellow	Solid green	Blinking red
Power supply 2 (lower)	Solid green	Blinking yellow	Blinking red

Table 2.8 LED usage for hardware failures

Configuring system_check monitoring

You can customize the behavior of the **system_check** script in the following ways:

- By changing the interval at which the **cron** daemon runs the script
- By changing the way that the script displays output on the console
- By disabling the monitoring of redundant power supplies.

To change the system_check monitoring interval

You can change the interval at which the **cron** daemon runs the **system_check** script by editing the interval value specified in the **/config/crontab** file.

To configure the `system_check` output to the console

By default, the status of chassis fans, CPU fans, and power supplies is suppressed from appearing on the console. (This is known as *quiet mode*.) Only error conditions are displayed. This automatic suppression of status is specified by default in the `/config/crontab` file, with the string `system_check -q`.

You can remove the suppression of status and thus cause the BIG-IP system to display status on the console. You can do this by editing the `/config/crontab` file to remove the `-q` option from the string `system_check -q`.

To display full SNMP platform table information (that is, run in debug mode), type the following:

```
system_check -d
```

To enable or disable power-supply monitoring

You can enable or disable the monitoring of redundant power supplies by configuring the database key `Local.Platform.PowerSupplyMonitor`. The default setting enables the monitoring of the power supplies.

If the database key is not present or is set to `1`, the power supplies are monitored. If the database key is set to `0`, the power supplies are not monitored.

Glossary

bigpipe

The **bigpipe** utility provides command line access to the BIG-IP software.

BIOS

BIOS stands for Basic Input/Output System. The BIOS is software that is built-in to the computer and determines what the computer can do without accessing programs from a disk.

Configuration utility

The Configuration utility is the browser-based application that you use to configure the software.

DHCP

DHCP stands for Dynamic Host Configuration Protocol. It is a protocol used to assign dynamic IP addresses to network devices. When using DHCP, a network device can have a different IP address each time it connects to the network.

DNS

DNS stands for Domain Name System. It is a service that translates domain names into IP addresses. For example, the domain name **www.sample.com** might translate to **101.102.103.104**.

dossier

A dossier is an encrypted list of key platform characteristics used to identify the platform, and to enforce or restrict activation on the platform.

host

A host is a network server that manages one or more virtual servers that the BIG-IP software uses for load balancing.

license certificate

A license certificate is a digital file created by the F5 license server. The license server uses your product registration key and dossier to process the file, which is stored on the BIG-IP system. See also *registration key* and *dossier*.

network boot

A network boot is a method of starting up a computer—loading the operating system and other basic software—from a network, rather than from a source within the computer itself, such as the hard drive or CD-ROM.

NIC

NIC stands for Network Interface Card. It is an expansion board used to connect a computer to a network.

port

A port is represented by a number that is associated with a specific service supported by a host. Refer to the Services and Port Index for a list of port numbers and corresponding services.

PXE

PXE stands for Pre-Boot Execution Environment, a network boot method. It allows you to boot a computer from a server on a network before you boot the operating system on the local hard drive. See also *network boot*.

registration key

The registration key is a 25-character string that you need in order to license your F5 products. You may have received it from F5 by email, or you may find it on the back of the CD case.

Setup utility

The Setup utility guides you through the initial system configuration process. The Setup utility is available from the command line, or as a web-based wizard from the product splash screen.

SSH

SSH is a protocol for secure remote login and other secure network services over a non-secure network.

SSL

SSL stands for Secure Sockets Layer. It is a protocol that uses a public key to encrypt data transmitted through the Internet over an SSL connection. URLs using an SSL connection start with **HTTPS:** instead of **HTTP:**.

subnet

The portion of a network that shares a common address component. For instance, on TCP/IP networks, a subnet is all devices whose IP addresses have the same prefix segment.

Telnet

Telnet is a terminal emulation program for TCP/IP networks. Telnet runs on your computer and connects it to a server on the network. It then allows you to enter and execute commands as though you were directly connected to the server console.

terminal emulator

A terminal emulator is a program that mimics a terminal.

virtual server

Virtual servers are a specific combination of virtual address and virtual port, associated with a content site that is managed by BIG-IP software or other type of host server.

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