

Field Testing BIG-IP[®] Hardware

800, 1600, 3600, 3900, 6900, 8900, 8950, 11000, 11050, EM4000



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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.

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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.

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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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VCCI-A

Chapter

1

What is the EUD?

- *End-User Diagnostic Notes*
- *Supported platforms*

The end-user diagnostic (EUD) is a compilation of tests for checking the integrity of F5 Networks hardware. The EUD exists independently from the host software and is available as a separate download. You should run the EUD only when you are advised to by your F5 Networks support representative.

End-User Diagnostic Notes

Caution: You should not run these test tools on a system that is in production. These tests stop the unit, and prevent it from passing traffic while these tests are run. Run this tool only if you are instructed to by a support representative, or if you are verifying a hardware issue with a unit that is already removed from production.

Caution: Before you run these tests, you must disconnect all network cables from the system. Any cables connected to the system during the tests could cause false-positive results.

Supported platforms

This table includes the platforms supported by this version of the EUD.

Platform name	Platform ID
BIG-IP® 800	C114
BIG-IP 1600	C102
BIG-IP 3600	C103
BIG-IP 3900	C106
BIG-IP 6900	D104
BIG-IP 8900	D106
BIG-IP 8950	D107
BIG-IP 11000	E101
BIG-IP 11050	E102
Enterprise Manager™ 4000	C106

Chapter 2

Deciding Which Files To Download

- *How to decide which files to download* |

How to decide which files to download

There are several file types available from the F5 Networks download site <http://downloads.f5.com> for the EUD.

File Name	Description
ISO image	The ISO image is provided for burning a CD or DVD of the EUD. You can boot the CD/DVD from a powered USB CD/DVD drive plugged into the BIG-IP® system.
IM file	The IM file is a self-extracting installation file. You can <code>scp</code> this file directly to the BIG-IP system and use it to upgrade the EUD on the system or load a USB flash drive.
MD5 file	There is a corresponding MD5 file for each ISO image and IM file you download. Use the MD5 file to verify the integrity of the file you download.
Readme-EUD.txt	This file includes details about the release such as supported platforms.

Determining the EUD version installed on the system

Perform this task before you download update files to determine the EUD version installed on your system, or to verify that the installation of a new version was successful.

To run the `eud_info` command and determine the EUD version installed on your system:

1. Log on to the command line of the BIG-IP® system using an account with root access.
2. Type the following command to verify the EUD version installed on your system.

```
eud_info
```

The version number of the EUD installed on the system displays.

Downloading the EUD IM file from F5 Networks

We recommend that you obtain the latest version of the EUD that is supported on your platform from the F5 Networks download site (<http://downloads.f5.com>) before you run these tests.

1. Log on to <http://downloads.f5.com/> and click **Find a Download**.
2. In the **Hardware-Specific** area, click **Platform / EUD**.
3. Select your platform from the list.
4. Click the name of the release with the most recent date.
You must accept the software terms and conditions before you can proceed.
5. Click the file name `<file_name>.im` to start the download.
The `<file_name>` consists of the platform family and the build number.

Note: You should copy the IM file to /var/tmp on the system you intend to update.

6. Download the corresponding checksum file.
The corresponding checksum file has the same name as the IM file, except that .md5 is the file extension.

After the download is complete, you should verify the integrity of the file by checking the MD5 checksum.

Downloading the EUD ISO file from F5 Networks

We recommend that you obtain the latest version of the EUD that is supported on your platform from the F5 Networks download site (<http://downloads.f5.com>) before you run these tests.

1. Log on to <http://downloads.f5.com/> and click **Find a Download**.
2. In the **Hardware-Specific** area, click **Platform / EUD**.
3. Select your platform from the list.
4. Click the name of the release with the most recent date.
You have to accept the software terms and conditions before you can proceed.
5. Click the file name `<file_name>.iso` to start the download.
The `<file_name>` consists of the platform family and the build number.
6. Download the corresponding checksum file.
The corresponding checksum file has the same name as the ISO file, except that .md5 is the file extension.

After the download is complete, you should verify the integrity of the ISO file by checking the MD5 checksum.

Chapter 3

After You Download The EUD Files

- *After you download the EUD files*

After you download the EUD files

There are several actions you can take after you download the EUD files.

Task	Description
Use the MD5 checksum to verify the files	Use the MD5 file to verify the integrity of the file you download.
Install the EUD from the IM installation package	You can <code>scp</code> this file directly to the BIG-IP system and use it to upgrade the EUD on the system.
Load the EUD onto a USB flash drive	Load the EUD onto a USB flash drive and run the EUD from the flash drive.

Using the MD5 checksum to check the integrity of the download

You can perform this task after you download update files and their corresponding `.md5` files from the F5 Networks downloads site (<http://downloads.f5.com>).

Verify the MD5 checksum on each file you download using the `md5sum` command. Use the output to verify the integrity of the downloaded file.

1. Log on to the command line of the system using an account with root access.
2. Type the following command to verify the integrity of the downloaded file, where `<file_name>.md5` is the name of the `.md5` file you downloaded.

```
md5sum -c <file_name>.md5
```

If the output is OK, the download was successful. If not, you should download the file again and repeat the process.

Installing the EUD from an IM installation package

You should copy the IM file to `/var/tmp` on the system you intend to update before you begin this procedure.

Installing the EUD from an IM file is one method you can use to get the latest EUD installed on your hardware.

1. Log on to the command line of the BIG-IP® system using an account with root access.
2. Type the following command to install the EUD, where `<file_name>.im` is the name of the file you downloaded.

```
im <file_name>.im
```

The latest EUD is installed on your hardware.

Loading the EUD onto a USB flash drive

You can run the EUD by booting the system from a USB flash drive loaded with the EUD software. Use this procedure to load the EUD onto a USB flash drive.

1. Log on to the command line of the BIG-IP® system using an account with root access.
2. Download the IM file to /tmp/eud.
3. Loopback mount the IM file using the following command, where *<file_name>* is the name of the file you downloaded:

```
mkdir /tmp/eud; mount -o ro,loop <file_name>.im /tmp/eud
```

4. Insert a USB mass storage device into the platform on which you mounted the IM file.
5. Use the following command to run the `mkdisk` utility:

```
cd /tmp/eud; ./mkdisk
```

Follow the prompts to load the EUD onto the USB flash drive.

After the installation is complete, remove the USB flash drive from the BIG-IP system.

Chapter 4

Running The EUD Tests

- *Running the EUD tests*
-

Running the EUD tests

There are several options for running the EUD tests.

Task	Description
Boot the EUD from a USB flash drive	Plug your EUD USB flash drive into the BIG-IP® system and boot to the EUD.
Boot the EUD from a USB DVD drive	Plug your USB DVD drive into the BIG-IP® system and boot to the EUD.
Run the EUD from the system boot menu	As the system is booting, select the EUD option from the boot menu.

Booting the EUD from a USB flash drive

You must load the EUD image onto the USB flash drive to run the EUD from the drive. You must have a console connected to the system to run the EUD.

You can use this method to boot the EUD from a USB flash drive.

1. If the system is powered on, turn it off.
2. Plug in the USB flash drive that holds the EUD image into the USB port on the BIG-IP® system.
3. Power on the system to boot the EUD.
When the EUD starts, the EUD menu displays on the console.

Booting the EUD from a USB DVD drive

You must create a disk using the EUD ISO image before you can boot the EUD from a USB DVD drive. You must have a console connected to the system to run the EUD.

You can use this method to boot the EUD from an externally-powered USB DVD drive.

1. If the system is powered on, turn it off.
2. Plug the USB DVD drive into the USB port on the BIG-IP® system and insert the EUD DVD.
3. Power on the system to boot the EUD.
When the EUD starts, the EUD menu displays on the console.

Starting the EUD from the boot menu

You should install the latest version of the EUD before you boot the EUD from the boot menu. You must have a console connected to the system to run the EUD.

You can use this method to boot the EUD installed on the BIG-IP® system.

1. If the system is powered on, turn it off.
2. Power on the system.

3. As the unit boots, it pauses briefly on the boot menu. Use the arrow keys to highlight **End User Diagnostics**.

When the EUD starts, the EUD menu displays on the console.

Chapter

5

EUD Tests

- *1 System Report*
- *2 Sensor Report*
- *3 SFP/SFP+ Report*
- *4 I2C Test*
- *5 PCI Test*
- *6 ECC Status Test*
- *7 Internal Packet Path Test*
- *8 Internal Loopback Test*
- *9 SSL Test*
- *10 SMART Test*
- *11 Power System Test*
- *12 Mezzanine USB Test*
- *13 Mezzanine Packet Test*
- *17 Hardware Firmware Update*
- *18 System RAM Test*
- *20 LED Test (Interactive)*
- *21 LCD Test*
- *A Run All (Non-Interactive) Tests*
- *I Run all interactive tests*
- *D Display Test Report Log*
- *S Display Test Summary*
- *Q Quit EUD and Reboot the System*

1 System Report

This report provides comprehensive details about all system hardware components, such as:

- Serial number
- F5 part number
- Host information
- BIOS version
- Firmware version
- Bootloader version
- Processor, processor version
- Power supply firmware version
- Memory in each socket
- Total memory

After the report completes successfully, a summary of system information displays, and you see the following message:

```
Test Complete: System Report: PASSED
```

2 Sensor Report

This sensor report performs the hardware sensor test on both the motherboard and the switchboard, if applicable. The following information is reported:

- Host temperatures
- Host voltages
- Mezzanine temperature
- Mezzanine voltages
- CPU temperature
- CPU fan speeds
- SuperIO temperatures

After the report completes successfully, you see the following message:

```
Test Complete: Sensor Report: PASSED
```

3 SFP/SFP+ Report

This test checks for interface modules installed in the system and reports the following information about those modules:

- Vendor name
- Part number
- Revision
- Media type

After the report completes successfully, you see the following message:

Test Complete: SFP/SFP+ Report: PASSED

4 I2C Test

This test verifies any Inter-Integrated Circuit (I2C) Bus protocol devices in the system. When you start the test, you see the following message:

```
Test Begin: I2C Test
```

After the test completes successfully, you see the following message:

```
Test Complete: I2C Test: PASSED
```

5 PCI Test

This test reports about and verifies the PCI devices on the PCI bus. When you start the test, you see the following message:

```
Test Begin: PCI Test Test Begin: Verify HOST PCI: HOST PCI devices found
```

The following devices are tested:

- Host PCI devices
- Host bridge
- System peripheral
- Communication controller
- ISA bridge
- RAID bus controller
- SMBus controller
- Signal processing controller
- Network and computing encryption device
- MIPS
- USB controller
- PCI bridge
- Ethernet controller
- Switch controller

After the test completes successfully, you see the following message:

```
Test Complete: PCI Test: PASSED
```

6 ECC Status Test

This test checks the ECC memory for error correction codes and reports single-bit or multi-bit errors.

After the test completes successfully, you see the following message:

```
Test Complete: ECC Status Test: PASSED
```

7 Internal Packet Path Test

This test uses the internal packet path to test the Ethernet interfaces in the system. This test sends known payload packets from the mainboard Ethernet interface back to the mezzanine Ethernet interface. The test checks for the correct receive order and payload. The test then checks the statistics at the switchboard and HSB. It takes approximately two minutes to run the internal packet path test.

After the test completes successfully, you see the following message:

```
Test Complete: Internal Packet Path Test: PASSED
```

8 Internal Loopback Test

This test sets the front interfaces into PHY or MAC loopback mode and runs packets through the path from the switch chips.

After the test completes successfully, you see the following message:

```
Test Complete: Internal Loopback Test: PASSED
```

9 SSL Test

Use this option to test the SSL hardware installed in the system.

After the test completes successfully, you see the following message:

```
Test Complete: SSL Test: PASSED
```

10 SMART Test

Use the Self-Monitoring Analysis and Reporting Technology (S.M.A.R.T.) option to test the internal status of the hard drive, including:

- Read error rate
- Start/Stop count
- Re-allocated sector count
- Power on hours count
- Spin-up retry count
- Drive calibration retry count
- Drive power cycle count
- Offline scan uncorrectable sector count
- Ultra ATA CRC error rate and multi-zone error rate

After the test completes successfully, you see the following message:

```
Test Complete: SMART Test: PASSED
```


11 Power System Test

Use this option to run the power system test. This tests reports information about the power supplies installed in the system. It also returns the chassis voltage measurements, fan speeds, and the mode of the fan controller.

After the test completes successfully, you see the following message:

```
Test Complete: Power System Test: PASSED
```

12 Mezzanine USB Test

Use this option to test the USB ports on the mezzanine card installed in the platform.

After the test completes successfully, you see the following message:

```
Test Complete: Mezzanine USB Test: PASSED
```

13 Mezzanine Packet Test

The Mezzanine packet test treats HSB as a standard Ethernet NIC card, once the NIC module/driver is loaded, a loop test is performed by sending and receiving network packets over the HSB network interface. The number of packets is sent to and from one HiGig interface to another HiGig interface.

After the test completes successfully, you see the following message:

```
Test Complete: Mezzanine Packet Test: PASSED
```

17 Hardware Firmware Update

Use this option to update the hard drive firmware on BIG-IP 3900 and EM 4000 platforms. This option appears only on BIG-IP 3900 and EM 4000 platforms, when the system is booted with an older version of the firmware.

Important: *F5 recommends that you back up your configuration before running the update.*

After the update completes successfully, you see the following message:

```
Test Complete: Western Digital Firmware Update: PASSED
```

18 System RAM Test

The System RAM Test performs an SDRAM data bus and address bus test. All available userland memory is tested.

Caution: This test might take several hours to complete depending on the amount of memory available to test.

- Stuck address test
- Random value test
- XOR comparison test
- SUB comparison test
- MUL comparison test
- DIV comparison test
- OR comparison test
- AND comparison test
- Sequential increment test

After the test completes successfully, you see the following message:

```
Test Complete: System RAM Test: PASSED
```

20 LED Test (Interactive)

This test sets each of the possible LED status levels and prompts you to verify the corresponding color and operation. You can perform this test from the console or LCD panel.

Important: Some LED questions time out after a minute. If a question times out, the LED test fails.

After the test completes successfully, you see the following message:

```
Test Complete: LED Test: PASSED
```

21 LCD Test

Use this option to test the functionality of the LCD panel. To successfully perform these tests you need access to the LCD panel on the unit you want to test.

The first part of this test lists the firmware version of the LCD panel. This part of the test also displays the LCD panel voltage tests. After the voltage test, the interactive part of the LCD panel test begins. F5 recommends that you use the LCD panel to view the interactive results. Certain tests, such as the keypad backlight, LCD backlight, and LCD pixel tests begin immediately after you press a key to begin the test.

The first two tests check the viability of the key pad backlight and the LCD backlight. To complete these tests successfully, you must be watching the LCD panel while you press any key to start the test.

```
Is LCD and keypad backlight On-Dim-Off..?(y/n)
Did the key pad backlight toggle correctly? (y/n)
Verify LCD backlight toggles On and Off...press any key to start.
Did the LCD backlight toggle correctly? (y/n)
```

After you complete the backlight tests, you are prompted to test the pixels and contrast changes for the LCD.

```
Verify all LCD pixels go On?...press any key to start.  
Did all LCD pixels go ON? (y/n)  
Verify LCD contrast changes smoothly...press any key to start  
Did LCD contrast change smoothly?
```

Next, you can test the keys on the LCD keypad. For the following series of tests, you must press the correct key on the LCD keypad.

```
LCD keypad test  
Press the [UP] key on the LCD Panel...[UP]  
Press the [LEFT] key on the LCD Panel...[LEFT]  
Press the [ENTER] key on the LCD Panel...[ENTER]  
Press the [RIGHT] key on the LCD Panel...[RIGHT]  
Press the [CANCEL] key on the LCD Panel...[CANCEL]  
Press the [DOWN] key on the LCD Panel...[DOWN]
```

After the test completes successfully, you see the following message:

```
Test Complete: LCD Test: PASSED
```

A Run All (Non-Interactive) Tests

Use this option to run all tests that are applicable to the system with the exception of the interactive tests.

I Run all interactive tests

Use this option to run the LED Test and optional LCD tests.

D Display Test Report Log

Use this option to display a test report. A report log is stored as the text file `/shared/log/eud.log` in the host file system.

Important: You must run `eud_log` from the command line to create output for this report.

S Display Test Summary

Use this option to display a test summary report. The test summary report displays the results of all tests run during a test session.

Q Quit EUD and Reboot the System

Use this option to quit the EUD and reboot the system. Using other methods, such as the `reboot` command or the command menu option can destabilize the system.