

Field Testing BIG-IP[®] and BIG-IQ[™] Hardware

BIG-IP 2000, 4000, 5000, 7000, 10000, 12000, and BIG-IQ 7000



Table of Contents

Legal Notices.....	5
Legal Notices.....	5
The End-User Diagnostic (EUD).....	7
About the End-User Diagnostic (EUD).....	7
End-User Diagnostic Notes.....	7
Supported platforms.....	7
Downloading the EUD Files.....	9
Deciding which files to download.....	9
Determining the EUD version installed on the system.....	9
Downloading the EUD IM file from F5 Networks.....	9
Downloading the EUD ISO file from F5 Networks.....	10
Verifying, Installing, and Loading the EUD Files.....	11
After you download the EUD files.....	11
Using the MD5 checksum to check the integrity of the download.....	11
Installing the EUD from an IM installation package.....	11
Loading the EUD onto a USB flash drive.....	12
Running the EUD Tests.....	13
Running the EUD tests.....	13
Booting the EUD from a USB flash drive.....	13
Starting the EUD from the boot menu.....	13
EUD Tests.....	15
1 System Report.....	15
2 Sensor Test.....	15
3 SFP/SFP+ Report.....	16
4 Verify Host I2C.....	16
5 Verify PCIe Devices.....	16
6 ECC Status Test.....	17
7 Internal Packet Path Test.....	17
8 SSL Test.....	17
9 Compression Test.....	17
10 SMART Test.....	18
11 System RAM Report.....	18
12 System RAM Test.....	18

Table of Contents

13 Power Supply Test.....	19
14 Fan Report.....	19
15 FIPS Test.....	19
20 LED Test (Interactive).....	20
21 LCD Test.....	20
A Run All (Non-Interactive) Tests.....	21
B Run tests in [A] but exclude test 12 (System RAM Test).....	21
D Display Test Report Log.....	21
S Display Test Summary.....	21
Q Quit EUD and Reboot the System.....	21

Legal Notices

Legal Notices

Publication Date

This document was published on March 11, 2016.

Publication Number

MAN-0421-07

Copyright

Copyright © 2016, F5 Networks, Inc. All rights reserved.

F5 Networks, Inc. (F5) believes the information it furnishes to be accurate and reliable. However, F5 assumes no responsibility for the use of this information, nor any infringement of patents or other rights of third parties which may result from its use. No license is granted by implication or otherwise under any patent, copyright, or other intellectual property right of F5 except as specifically described by applicable user licenses. F5 reserves the right to change specifications at any time without notice.

Trademarks

AAM, Access Policy Manager, Advanced Client Authentication, Advanced Firewall Manager, Advanced Routing, AFM, APM, Application Acceleration Manager, Application Security Manager, AskF5, ASM, BIG-IP, BIG-IP EDGE GATEWAY, iWorkflow, Cloud Extender, Cloud Manager, CloudFucious, Clustered Multiprocessing, CMP, COHESION, Data Manager, DDoS Frontline, DDoS SWAT, Defense.Net, defense.net [DESIGN], DevCentral, DevCentral [DESIGN], DNS Express, DSC, DSI, Edge Client, Edge Gateway, Edge Mobile, Edge Mobility, Edge Portal, ELEVATE, EM, ENGAGE, Enterprise Manager, F5, F5 [DESIGN], F5 Agility, F5 Certified [DESIGN], F5 Networks, F5 SalesXchange [DESIGN], F5 Synthesis, f5 Synthesis, F5 Synthesis [DESIGN], F5 TechXchange [DESIGN], Fast Application Proxy, Fast Cache, FCINCO, Global Traffic Manager, GTM, GUARDIAN, iApps, IBR, iCall, iControl, iHealth, Intelligent Browser Referencing, Intelligent Compression, IPv6 Gateway, iQuery, iRules, iRules OnDemand, iSession, L7 Rate Shaping, LC, Link Controller, LineRate, LineRate Point, LineRate Precision, LineRate Systems [DESIGN], Local Traffic Manager, LROS, LTM, Message Security Manager, MobileSafe, MSM, OneConnect, Packet Velocity, PEM, Policy Enforcement Manager, Protocol Security Manager, PSM, Ready Defense, Real Traffic Policy Builder, SalesXchange, ScaleN, SDAS (except in Japan), SDC, Signalling Delivery Controller, Solutions for an application world, Software Designed Application Services, Silverline, SSL Acceleration, SSL Everywhere, StrongBox, SuperVIP, SYN Check, SYNTHESIS, TCP Express, TDR, TechXchange, TMOS, TotALL, TDR, TMOS, Traffic Management Operating System, Traffix, Traffix [DESIGN], Transparent Data Reduction, UNITY, VAULT, vCMP, VE F5 [DESIGN], Versafe, Versafe [DESIGN], VIPRION, Virtual Clustered Multiprocessing, WebSafe, and ZoneRunner, are trademarks or service marks of F5 Networks, Inc., in the U.S. and other countries, and may not be used without F5's express written consent.

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

Export Regulation Notice

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

RF Interference Warning

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

FCC Compliance

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

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

Canadian Regulatory Compliance

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

Standards Compliance

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

VCCI Class A Compliance

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

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

VCCI-A

The End-User Diagnostic (EUD)

About the End-User Diagnostic (EUD)

The End-User Diagnostic (EUD) is a compilation of tests for checking the integrity of F5[®] 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 Support representative.

End-User Diagnostic Notes

***Caution:** Before you run these tests, you should 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 [®] 2000 Series	C112
BIG-IP 4000 Series	C113
BIG-IP 5000 Series	C109
BIG-IP 7000 Series	D110
BIG-IP 10000 Series	D112, D113
BIG-IP 12000 Series	D111
BIG-IQ [™] 7000 Series	D110

Downloading the EUD Files

Deciding which files to download

There are several file types available from the F5[®] 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 in to 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 IM file that 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 system using an account with root access.
2. 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[®] 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® 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.

Verifying, Installing, and Loading 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	Use secure copy (<code>scp</code>) to copy the IM file directly to the BIG-IP system and use the IM file 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[®] 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. 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 that you can use to get the latest EUD installed on your hardware.

1. Log on to the command line of the system using an account with root access.
2. 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 system using an account with root access.
2. Download the IM file to `/tmp/eud`.
3. Loopback mount the IM file, 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. 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.

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.

Starting the EUD from the boot menu

You should install the latest version of the EUD before you boot the EUD from the boot (grub) 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.

EUD Tests

1 System Report

The Blade Report provides comprehensive details about all system hardware components, including:

- 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 this message:

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

2 Sensor Test

This sensor report performs the hardware sensor test on both the motherboard and the switchboard, if applicable, and displays this information:

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

After the report completes successfully, you see this message:

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

3 SFP/SFP+ Report

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

- Vendor name
- Part number
- Revision
- Media type

After the report completes successfully, you see this message:

```
Test Complete: SFP/SFP+ Report: PASSED
```

4 Verify Host I2C

This test verifies any Inter-Integrated Circuit (I2C) Bus protocol devices in the system.

When you start the test, you see this message:

```
Test Begin: Verify Host I2C
```

After the test completes successfully, you see this message:

```
Test Complete: Verify Host I2C: PASSED
```

5 Verify PCIe Devices

The PCIe Devices Test reports about and verifies the PCI devices on the PCI bus.

When you start the test, you see this message:

```
Test Begin: Verify PCIe Devices
```


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

```
Test Complete: Verify PCIe Devices:  
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 this 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 this message:

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

8 SSL Test

This test verifies the SSL hardware installed in the system.

After the test completes successfully, you see this message:

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

9 Compression Test

This test verifies the compression hardware installed in the system.

After the test completes successfully, you see this message:

```
Test Complete: Compression Test: PASSED
```

10 SMART Test

The Self-Monitoring Analysis and Reporting Technology (S.M.A.R.T.) test verifies the internal status of the hard drive, including this information:

- 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 this message:

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

11 System RAM Report

The System RAM report displays this information about each DIMM installed in the system:

- Part number
- Size in Megabytes (MB)
- Speed in Megahertz (MHz)
- SUB comparison test
- Serial number

After the test completes successfully, you see this message:

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

12 System RAM Test

The System RAM Test performs an SDRAM data bus and address bus test. All available Linux user RAM 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 this message:

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

13 Power Supply Test

This test reports the status of the power supplies installed in the system.

After the test completes successfully, you see this message:

```
Test Complete: Power Supply Test: PASSED
```

14 Fan Report

This report describes the status of the fans in the system.

After the report completes successfully, you see this message:

```
Test Complete: Fan Report: PASSED
```

15 FIPS Test

This test reports this information about the Federal Information Processing Standards (FIPS) hardware security module (HSM) installed in the system:

- FIPS card type and version
- FIPS card temperature
- FIPS card serial number

After the test completes successfully, you see this message:

```
Test Complete: FIPS 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 this message:

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

21 LCD Test

The LCD Test verifies 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, serial number, and PCA number of the LCD panel. After these items display, the interactive part of the LCD panel test begins. We recommend that you use the LCD panel to view the interactive results. Certain tests, such as the LCD backlight and LCD contrast tests begin immediately after you press a key to start the test.

The first test checks the viability of the F5 Logo Ball lighting. The next two tests check the viability of the LCD backlight and the LCD contrast. To complete these tests successfully, you must be watching the LCD panel while you press any key to start the test.

```
Is the F5 Logo Ball Flashing..? (y/n)

LCD backlight toggle On-Off...Press any key to start
Did LCD backlight toggles On and Off..? (y/n)

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

Next, you can test the keys on the LCD keypad. For these 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 this message:

Test Complete: LCD Test: PASSED

A Run All (Non-Interactive) Tests

This option runs all tests that are applicable to the system, excluding the interactive tests.

This process takes approximately one to two hours.

B Run tests in [A] but exclude test 12 (System RAM Test)

This option runs all tests that are applicable to the system, excluding the interactive tests and the System RAM test.

D Display Test Report Log

This option displays 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

This option displays a test summary report that contains the results of all tests run during a test session.

Q Quit EUD and Reboot the System

This option quits the EUD and reboot the system. Using other methods, such as the `reboot` command or the command menu option can destabilize the system.

Index

B

- boot (grub) menu
 - booting EUD 13
- booting EUD
 - boot (grub) menu 13
 - USB flash drive 13

C

- compression test 17

E

- ECC status test 17
- EUD
 - about 7
 - after downloading files 11
 - checking file integrity 11
 - determining version 9
 - downloading files 9
 - notes on running 7
 - options for running tests 13
 - supported platforms 7
- EUD commands
 - displaying test report log 21
 - displaying test summary report 21
 - quit EUD 21
 - running non-interactive system tests 21
 - running non-interactive system tests (excluding system RAM test) 21

F

- fan report 19
- FIPS test 19

H

- Host I2C test 16

I

- IM file
 - downloading 9

- IM file *(continued)*
 - installing 11
- internal packet path test 17
- ISO file
 - downloading 10

L

- LCD test (Interactive) 20
- LED test 20

M

- MD5 checksum 11

N

- non-interactive system tests
 - running all 21
- non-interactive system tests (excluding system RAM test)
 - running all 21

P

- PCIe test 16
- power supply test 19

S

- sensor test 15
- SFP/SFP+ report 16
- SMART test 18
- SSL test 17
- system RAM report 18
- system RAM test 18
- system report 15

U

- USB flash drive
 - booting EUD 13
 - loading EUD onto 12
- USB jump drive, See USB flash drive.
- USB mass storage device, See USB flash drive.