

BIG-IP[®] Virtual Edition and VMware ESXi: Setup

Version 12.1



Table of Contents

Getting Started with BIG-IP Virtual Edition on ESXi.....	5
Steps to deploy BIG-IP VE.....	5
Prerequisites for BIG-IP Virtual Edition on ESXi.....	7
Host CPU requirements.....	7
Host memory requirements.....	7
Configuring SR-IOV on the hypervisor.....	7
Virtual machine memory requirements.....	8
Virtual machine storage requirements.....	8
Virtual machine network interfaces.....	9
Deploying BIG-IP Virtual Edition in ESXi.....	11
Deploying BIG-IP VE on ESXi.....	11
Configuring SR-IOV on the guest.....	12
Accessing the BIG-IP VE management user interface.....	12
After Deploying BIG-IP VE on ESXi.....	13
About licensing BIG-IP VE.....	13
Configuring the CPU reservation.....	13
Configuring TSO support.....	13
Turning off LRO or GRO.....	14
Increasing disk space for BIG-IP VE.....	14
Updating BIG-IP VE.....	17
Updating BIG-IP VE.....	17
Download and import a BIG-IP VE update.....	17
Install a BIG-IP VE update.....	17
Reboot after a BIG-IP VE update.....	18
Legal Notices.....	19
Legal notices.....	19

Getting Started with BIG-IP Virtual Edition on ESXi

Steps to deploy BIG-IP VE

To deploy the BIG-IP® Virtual Edition (VE) system on ESXi, you will perform these tasks.

Step	Details
1	Choose the license you want to buy, the BIG-IP VE modules you want, and the throughput you need. See <i>SOL14810: Overview of BIG-IP® VE license and throughput limits</i> on the AskF5™ Knowledge Base (http://support.f5.com) for details.
2	Confirm that you are running a hypervisor version that is compatible with a BIG-IP VE release. See <i>Virtual Edition and Supported Hypervisors Matrix</i> on http://support.f5.com for details.
3	Verify that the host hardware meets the recommended requirements.
4	If you plan to use SR-IOV, enable it on the hypervisor.
5	Download a BIG-IP VE image and deploy it.
6	Assign a management IP address to the virtual machine.

After you complete these tasks, you can log in to the BIG-IP VE system and run the Setup utility to perform basic network configuration.

Prerequisites for BIG-IP Virtual Edition on ESXi

Host CPU requirements

The host hardware CPU must meet the following requirements.

- The CPU must have 64-bit architecture.
- The CPU must have virtualization support (AMD-V or Intel VT-x) enabled.
- The CPU must support a one-to-one, thread-to-defined virtual CPU ratio, or on single-threading architectures, support at least one core per defined virtual CPU.
- In VMware ESXi 5.5 and later, do not set the number of virtual sockets to more than 2.
- If your CPU supports the Advanced Encryption Standard New Instruction (AES-NI), SSL encryption processing on BIG-IP® VE will be faster. Contact your CPU vendor for details about which CPUs provide AES-NI support.

Host memory requirements

The number of licensed TMM cores determines how much memory the host system requires.

Number of cores	Memory required
1	2 Gb
2	4 Gb
4	8 Gb
8	16 Gb

Configuring SR-IOV on the hypervisor

To increase performance, you can enable Single Root I/O Virtualization (SR-IOV). You need an SR-IOV-compatible network interface card (NIC) installed and the SR-IOV BIOS must be enabled.

You must also load the `ixgbe` driver and blacklist the `ixgbev` driver.

1. In vSphere, access the command-line tool, `esxcli`.

2. Check to see what the `ixgbe` driver settings are currently.

```
esxcli system module parameters list -m ixgbe
```

3. Set the `ixgbe` driver settings.

In this example, `16,16` is for a 2 port card with 16 virtual functions.

```
esxcli system module parameters set -m ixgbe -p "max_vfs=16,16"
```

4. Reboot the hypervisor so that the changes take effect.

When you next visit the user interface, the SR-IOV NIC will appear in the Settings area of the guest as a PCI device.

5. Using vSphere, add a PCI device, and then add two virtual functions.

```
05:10.0 | Intel Corporation 82599 Ethernet Controller Virtual Function
```

```
05:10.1 | Intel Corporation 82599 Ethernet Controller Virtual Function
```

6. Use either the console command line or user interface to configure the VLANs that will serve as pass-through devices for the virtual function. For each interface and VLAN combination, specify a name and a value.
 - Name - `pciPassthru0.defaultVlan`
 - Value - 3001

To complete SR-IOV configuration, after you deploy BIG-IP® VE, you must add three PCI device NICs and map them to your networks.

Virtual machine memory requirements

The guest should have a minimum of 4 GB of RAM for the initial 2 virtual CPUs. For each additional CPU, you should add an additional 2 GB of RAM.

If you license additional modules, you should add memory.

Provisioned memory	Supported modules	Details
4 GB or fewer	Two modules maximum.	AAM can be provisioned as standalone only.
4-8 GB	Three modules maximum.	BIG-IP® DNS does not count toward the module limit. Exception: Application Acceleration Manager™ (AAM®) cannot be provisioned with any other module; AAM is standalone only.
8 GB	Three modules maximum.	BIG-IP DNS does not count toward the module-combination limit.
12 GB or more	All modules.	N/A

Important: To achieve licensing performance limits, all allocated memory must be reserved.

Virtual machine storage requirements

The BIG-IP® modules you want to use determine how much storage the guest needs.

Provisioned storage	Supported modules	Details
8 GB	Local Traffic Manager™ (LTM®) module only; no space for LTM upgrades.	You can increase storage if you need to upgrade LTM or provision additional modules.
38 GB	LTM module only; space for installing LTM upgrades.	You can increase storage if you decide to provision additional modules. You can also install another instance of LTM on a separate partition.
139 GB	All modules and space for installing upgrades.	The Application Acceleration Manager™ (AAM®) module requires 20 GB of additional storage dedicated to AAM. For information about configuring the Datastore volume, see <i>Disk Management for Datastore</i> on the AskF5™ Knowledge Base (http://support.f5.com) for details.

For production environments, virtual disks should be deployed Thick (allocated up front). Thin deployments are acceptable for lab environments.

***Note:** To change the disk size after deploying the BIG-IP system, see [Increasing disk space for BIG-IP® VE](#).*

Virtual machine network interfaces

When you deploy BIG-IP® VE, a specific number of virtual network interfaces (vNICs) are available.

Four vNICs are automatically defined for you.

- For management access, one VMXNET3 vNIC or Flexible vNIC.
- For dataplane access, three VMXNET3 vNICs.

Each virtual machine can have a maximum of 10 virtual NICs.

Deploying BIG-IP Virtual Edition in ESXi

Deploying BIG-IP VE on ESXi

To create a BIG-IP® VE virtual appliance, download a template from F5® and deploy it in your environment.

1. In a browser, open the F5 Downloads page (<https://downloads.f5.com>) and log in.
2. On the Downloads Overview page, select **Find a Download**.
3. Under Product Line, select **BIG-IP v12.x/Virtual Edition**.
4. Under Name, select **Virtual-Edition**.
5. If the End User Software License is displayed, read it and then click **I Accept**.
6. Download one of the files that ends with `scsi.ova`.
7. Start the vSphere client and log in.
8. From the vSphere File menu, choose **Deploy OVF Template**.
9. Browse to the .ova file and click **Next**.
The template is verified.
10. Click **Next** and complete the wizard. Note the following.

Section	Details
Configuration	Choose from the available configurations. You can change CPU or RAM later.
Storage	If you decide to increase storage later, you must also adjust the BIG-IP directories to use the extra storage space. See <i>Increasing disk space for BIG-IP® VE</i> for details.
Datastore	Choose Thick for production environments. Thin is sufficient for lab environments.
Source Networks	The wizard leads you through creating four networks: internal, external, management, and high availability (HA).
Ready to Complete	Select the Power on after deployment check box.

11. Click **Finish**.

The virtual machine is created, as well as two user accounts.

- The root account provides access locally, using SSH, or the F5 Configuration utility. The root account password is `default`.
- The admin account provides access through the web interface. The admin account password is `admin`.

You should change passwords for both accounts before bringing a system into production.

If you need to create a redundant configuration, place the two BIG-IP VE virtual appliances (the active-standby pair) on separate physical hosts. You can accomplish this in one of two ways:

- Manually create a virtual machine peer on each host.

- If you are using VMware Dynamic Resource Scheduler (DRS), create a DRS rule with the **Separate Virtual Machine** option that includes each BIG-IP VE in the pair.

Configuring SR-IOV on the guest

Before you can complete these steps, you must have configured Single Root I/O Virtualization (SR-IOV) on the hypervisor.

After deploying BIG-IP® VE, to configure SR-IOV on the guest, you must add three PCI device NICs and map them to your networks.

1. In vSphere, delete the existing Source Networks for External, Internal, and HA.

***Important:** Leave the Source Network for Management.*

2. Edit the settings for the virtual machine to add a PCI device.
If your hypervisor was set up correctly, there will be 16 virtual functions on each port (05:10.x and 05:11:x).
3. Map the new device to the VLAN for your internal subnet.
4. Repeat steps 2 and 3 for the external and HA VLANs.
5. When all four destination networks are correctly mapped, click **Next**.
The Ready to Complete screen opens.

Accessing the BIG-IP VE management user interface

If your network has DHCP, an IP address is automatically assigned to BIG-IP® VE during deployment. You can use this address to access the BIG-IP VE user interface or `tmsh` command-line utility.

If no IP address was assigned, you can assign one by using the BIG-IP Configuration utility.

***Important:** Do not use VMware tools to configure the IP address; the BIG-IP system will not use these changes.*

1. In the vSphere client, click **Launch Virtual Machine Console**.
The console screen opens. After a few seconds, a login prompt appears.
2. At the <username> login prompt, type `root`.
3. At the password prompt, type `default`.
4. Type `config` and press Enter.
The F5 Management Port Setup screen opens.
5. Click **OK**.
6. If you want DHCP to automatically assign an address for the management port, select **Yes**. Otherwise, select **No** and follow the instructions for manually assigning an IP address and netmask for the management port.

When assigned, the management IP address appears in the Summary tab of the vSphere client.

Alternatively, a hypervisor generic statement can be used, such as `tmsh show sys management-ip`.

You can now log into the BIG-IP VE user interface, and license and provision BIG-IP VE.

After Deploying BIG-IP VE on ESXi

About licensing BIG-IP VE

In order to use BIG-IP VE, you must have a license from F5. In the 12.x versions of BIG-IP, starting with BIG-IP VE version 12.1.3.1, you can revoke the license from a virtual machine and re-use it on another virtual machine.

From the Configuration utility, to revoke the license, go to **System > License** and click **Revoke**.

From tmsh, to revoke the license, run the command `tmsh revoke sys license`.

This functionality works for BIG-IP VE Bring Your Own License (BYOL) only.

Configuring the CPU reservation

Based on selections you made when you deployed the OVA file, a specific amount of memory is reserved for the BIG-IP VE virtual machine.

CPU is not specifically reserved, so to prevent instability on heavily-loaded hosts, you should reserve it manually.

1. In vSphere, edit the properties of the virtual machine.
2. Click the Resources tab.
3. In the Settings area, click **CPU**.
4. In the Resource Allocation section, use the slider to change the reservation.

The CPU reservation can be up to 100 percent of the defined virtual machine hardware. For example, if the hypervisor has a 3 GHz core speed, the reservation of a virtual machine with 2 CPUs can be only 6 GHz or less.

5. Click **OK**.

Configuring TSO support

The TCP Segmentation Offloading (TSO) feature, which includes support for large receive offload (LRO) and Jumbo Frames, is enabled by default.

***Note:** You must have the admin user role to enable or disable TSO support.*

1. Use an SSH tool to access the BIG-IP® VE command line.
2. Log in as `root`.
3. Type `tmsh` to open the `tmsh` utility.
You will see `tmsh` at the prompt once the utility is opened.
4. To determine whether TSO support is currently enabled, use the command:
`show sys db tm.tcpsegmentationoffload`
5. To enable support for TSO, use the command:
`sys db tm.tcpsegmentationoffload enable`
6. To disable support for TSO, use the command:
`sys db tm.tcpsegmentationoffload disable`

Turning off LRO or GRO

Although there are a number of ways to turn off LRO, the most reliable way is to connect to the virtual machine and use the `ethtool` utility.

1. Use an SSH tool to access the BIG-IP® VE TMSH utility.
2. From the command line, log in as `root`.
3. Type `tmsch` to open the utility.
4. Run the following commands, replacing `<X>` in each of the examples with the NIC number.

To	Use this command
Turn off rx-checksumming.	<code>ethtool -K eth<X> rx off</code>
Turn off LRO.	<code>ethtool -K eth<X> lro off</code>
Turn off GRO.	<code>ethtool -K eth<X> gro off</code>

5. Confirm that LRO and GRO are turned off by running this command: `ethtool -k eth<X>`.

In the system response to your command, you should see this info:

```
generic-receive-offload: off
large-receive-offload: off
```

If either of these responses is `on`, your attempt to turn them off was not successful.

6. Repeat this process for each of the NICs that the BIG-IP VE uses to pass traffic.

See the ESXi documentation for more details.

Increasing disk space for BIG-IP VE

Before proceeding with these steps, use vSphere to expand the disk size for the BIG-IP® VE virtual machine and reboot.

Use the BIG-IP VE `tmsch` utility to increase the amount of disk space used by the four BIG-IP VE directories:

- `/config`
- `/shared`
- `/var`
- `/var/log`

Note: At the time of this release, decreasing the VE disk size is not supported.

For each directory you want to resize, complete these steps.

1. Use an SSH tool to access the BIG-IP VE `tmsch` utility.
2. From the command line, log in as `root`.
3. List the current size of the directories on your disk so you can determine which ones need to be resized.

```
tmsch show sys disk directory
```

4. Expand the size of the directories in which you need additional space.

```
tmsh modify sys disk directory <directory name> new-size <new directory  
size in 1KB blocks>
```

For example, use `tmsh modify sys disk directory /config new-size 3145740` to increase the size of `/config` directory to 3145740 1KB blocks (or roughly 3,221,237,760 bytes).

5. To confirm that the command you just submitted is properly scheduled, you can show the new list of directories again.

```
tmsh show sys disk directory
```

6. If you change your mind about a submitted size change, you can revoke the size change.

```
tmsh modify sys disk directory /config new-size 0
```

In this example, the size of the `/config` directory is left as is, revoking any scheduled size changes.

After you submit this sequence of `tmsh` commands, the directory size changes will be scheduled to occur the next time the BIG-IP VE virtual machine (VM) is rebooted.

The next time the VM running BIG-IP VE reboots, the changes are applied.

Updating BIG-IP VE

Updating BIG-IP VE

You do not need to reinstall BIG-IP® VE in order to install updates. You can use the Software Management tool in the Configuration utility, or you can upgrade the software from the command line.

To update BIG-IP VE, you will:

1. Download the ISO and MD5 files.
2. Install the downloaded files to an inactive boot location.
3. Boot the BIG-IP VE to the new boot location.

Download and import a BIG-IP VE update

To install an update, BIG-IP software needs access to the ISO file. If the update is a hotfix, you need the ISO files for both the base version and the hotfix.

1. In a browser, open the F5® Downloads page (<https://downloads.f5.com>).
2. Download the version's base ISO file and its associated MD5 checksum file.
3. Download the update ISO file and its associated MD5 checksum file.

***Important:** Before you perform the installation, you should test the integrity of the ISO files to verify that you have downloaded clean copies. Use an MD5 verification program to ensure that the downloaded ISO files' checksums match the values in their corresponding MD5 files.*

4. In the BIG-IP VE user interface, on the Main tab, click **System > Software Management > Image List > Import**.
5. Click **Browse** to navigate to the downloaded base level installation file.
6. When the image name appears in the **Software Image** field, click **Import** to begin the operation.

***Important:** Do not navigate away from this screen before the operation is done.*

When the import is complete, the Import page closes and the downloaded base image displays as an available image.

7. Click the Hotfix List tab.
8. At the right side of the screen, click **Import**.
9. Click **Browse** to navigate to the downloaded hotfix installation file.
10. When the image name appears in the **Software Image** field, click **Import** to begin the operation.

***Important:** Do not navigate away from this screen before the operation is done.*

When the import is complete, the Import page closes and the downloaded hotfix displays in the list of available images.

You can now install the downloaded update.

Install a BIG-IP VE update

After you download and import the software installation image, you can initiate the installation operation. There are three boot locations on which you can install images on the BIG-IP® system. The process for installing a hotfix or a base version is essentially the same.

1. On the Main tab, click **System > Software Management**.
The Software Management Image List screen opens.
2. In the Available Images area, select the software image you want to install and click **Install**.
The Install Software Image popup screen opens.
3. Select the disk you want to install the image on, and then type or select a volume name, and click **Install**.

The upgrade process installs the software on the inactive disk location that you specify. This process usually takes between three and ten minutes.

***Tip:** If there is a problem during installation, you can use log messages to troubleshoot a solution. The system stores the installation log file as `/var/log/liveinstall.log`.*

The software image is installed.

When the installation operation is complete, you can safely reboot the newly installed volume or partition.

Reboot after a BIG-IP VE update

When the installation operation is complete, you can safely reboot into the newly installed volume or partition.

1. On the Main tab, click **System > Software Management**.
The Software Management Image List screen opens.
2. On the menu bar, click **Boot Locations**.
The Boot Locations screen opens.
3. In the Boot Location column, click the link representing the boot location you want to activate.
The properties screen for the boot location opens.
4. Click **Activate**.
A confirmation screen opens.
5. Click **OK** to initiate the reboot operation.
The system presents progress messages during the restart operation.

When the BIG-IP® VE system reboot is complete, the system presents the login screen. To configure the system, log in using an account that has administrative permissions.

Legal Notices

Legal notices

Publication Date

This document was published on April 26, 2018.

Publication Number

MAN-0347-08

Copyright

Copyright © 2018, 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

For a current list of F5 trademarks and service marks, see <http://www.f5.com/about/guidelines-policies/trademarks>.

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.

Index

B

BIG-IP VE on VMware overview 5
 BIG-IP Virtual Edition
 updating 17

C

CPU reservation for ESXi 13

D

deployment overview 5
 disk size, See virtual disk size
 downloads
 and importing update 17
 of ISO base file 17
 of ISO update file 17

G

GRO
 turning off 14
 guest memory 8

H

hypervisor
 configuring for SR-IOV 7
 configuring for TSO 13

I

installation
 rebooting after 18
 installation operation 17
 ISO file
 and location on virtual machine 17
 downloading 17
 downloading base file 17
 downloading update file 17

L

licensing BIG-IP VE 13
 log file
 and location 17
 and media speed messages 17
 log in
 after updating 18
 LRO
 turning off 14

M

memory

memory (*continued*)
 guest 8

O

OVA file, location 11

P

PCI device NIC mapping 12
 PEM performance
 optimizing 14

R

reboot operation
 after updating 18

S

SR-IOV
 configuring hypervisor for 7
 system update procedure 17

T

task list
 for updating on virtual machine 17
 TSO support
 configuring hypervisor for 13

U

update
 downloading and importing 17
 installing 17

V

virtual disk size
 extending 14
 increasing 14
 VMware virtual machine 11

