

# Active Fabric Manager (AFM) Deployment Guide 2.6



# Notes, Cautions, and Warnings

 **NOTE:** A NOTE indicates important information that helps you make better use of your computer.

 **CAUTION:** A CAUTION indicates either potential damage to hardware or loss of data and tells you how to avoid the problem.

 **WARNING:** A WARNING indicates a potential for property damage, personal injury, or death.

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# Configure Active Fabric Manager as a Virtual Appliance

Deploy Active Fabric Manager (AFM) as a virtual appliance on a VMware® ESX® virtual machine. This guide describes how to configure AFM as a virtual appliance. Before proceeding, install and configure an ESX host where you plan to run AFM. For additional information about installing and configuring the ESX virtual host machine, refer to the VMware documentation.

 **NOTE:** To deploy AFM using the RPM package manager (RPM) installation instead of the open virtualization format (OVF), refer to [RPM Installation](#).

## Prerequisites

 **NOTE:** If you are using the AFM virtual machine (VM) as a syslog and a trivial file transfer protocol (TFTP) or file transfer protocol (FTP) server, the following information is not required.

Before you begin, gather the following information:

- Your local or remote DHCP information
- Whether you want to use a Telnet or Secure Socket Shell (SSH) session within the fabric
- The SNMP community string (by default, it is `private` for set and `public` for get)
- The Syslog IP addresses (IP address of the remote syslog server)
- The TFTP or FTP server address (IP address of the TFTP or FTP server for the Dell Networking operating system software images and configuration files during bare metal provisioning [BMP])

 **NOTE:** If you are using an FTP server, obtain the user name and password.

If you are using the **Active Link Settings** option, gather the following OpenManage Network Manager (OMNM) server information:

- OMNM server IP address
- Communication protocol (HTTP or HTTPS)
- User name and password

For more information, refer to *OMNM Requirements* in the *AFM User Guide*.

## Hardware Requirements

**Table 1. Hardware Requirements**

Hardware	Requirement
Processor	Intel® Xeon® E5620 2.4Ghz, 12M Cache, Turbo, HT, 1066MHz Max Mem
System Type	64-bit operating system

Hardware	Requirement
Memory	32GB Memory (8x4GB), 1333MHz Dual Ranked LV RDIMMs for 2 Processors, Advanced ECC
Disk Space	1TB 7.2K RPM SATA 3.5 Hot Plug Hard Drive

## Virtual Appliance Requirements

AFM runs as a virtual appliance and requires the following host software:


- VMware® vSphere® Hypervisor (ESXi) 5.1 and higher (must meet virtual appliance, port access, and listening port requirements)

 **NOTE:** VMware® vCenter™ is required for High Availability (HA) and Fault Tolerance (FT).

## Deploy the OVF with HA and FT

The following are required to implement High Availability (HA) and Fault Tolerance (FT) using a VMware® ESX® Virtual Machine:


- VMware® vCenter™ 5.0 Standard License
- ESXi® 5.0 Enterprise Plus License
- Dell M1000e chassis (for MXL blade or IOA blade switches)
- Shared storage for the OVF

 **NOTE:** By default, the AFM VM CPU is set to 2. To use the HA feature, change the virtual CPU to 1.

## Deploy the OVF without HA and FT

The following are required to deploy AFM without HA or FT using a VMware® ESX® Virtual Machine:

- VMware® ESXi® 5.0 Open Source License
- Servers (rack or blade switch).


 **NOTE:** To use an MXL blade or IOA blade switches, AFM requires a M1000e blade chassis.

- Shared storage for the OVF

## Deploy the OVF with HA

When you deploy AFM with HA only using a VMware® ESX® VM, the requirements are as follows:

- VMware® ESXi® 5.0 Open Source License
- Shared storage for the OVF

 **NOTE:** By default, the AFM VM CPU is set to 2. To use the HA feature, change the virtual CPU to 1.

## AFM Client Browser Requirements

- Internet Explorer® 9 and higher


- Firefox® 12 and higher

## OMNM Requirements

### NOTE:

The following is required to use the OMNM feature on the AFM:

- OMNM Server Release 5.3 and higher

 **NOTE:** The OMNM server is not installed on the same server as AFM. To activate the performance statistics, login directly as write permission into Dell OMNM web service.

For information on how to install and configure OMNM, refer to the following URL:

<http://www.dell.com/support/Manuals/us/en/555/Product/dell-openmanage-network-manager>.

 **NOTE:** By default, the web service is disabled in the OMNM server.

1. Navigate to the server installation directory on the OMNM server.
2. Navigate to the **installed.properties** file at **C:\ProgramFiles\Dell\OpenManage\Network Manager\wareapps\installprops\lib**
3. Disable the application server and the synergy network management server.
4. Add the following three lines in the **installed.properties** file:
 

```
com.dorado.core.ws.disable=false
com.dorado.core.ws.legacy.soap.enabled=true
ware.webservices.authrequired=false
```
5. Enable **Resource Monitoring**.
6. Start the application server and synergy network management server.

## Port Usage

The following table lists the default ports used by the various AFM services. To troubleshoot connectivity issues with the AFM server, use the following table:

**Table 2. Ports**

Port	Description
20 & 21	FTP
22	SSH and SCP (communication to switches and CLI access to the AFM server)
23	Telnet (communication to switches)
67 & 68	DHCP
69	TFTP
80	AFM server port listening for client connection and requests
8080	OMNM client connection
8089	OMNM web service port
8443	OMNM client HTTPS connection

Port	Description
123	NTP
161	For the SNMP get and set protocol between the AFM server and switch.
162	For the SNMP trap listener between the AFM server and switch.
443	For the HTTPS communication protocol where the AFM takes requests from the client browser.
5432	Database server
8080	TCP/UDP
61616	ActiveMQ

## Disabling VMotion on an ESX/ESXi Host

To disable VMotion® on an VMware® ESX/ESXi® host, refer to the VMware documentation at [http://kb.vmware.com/selfservice/microsites/search.do?language=en\\_US&cmd=displayKC&externalId=1010376](http://kb.vmware.com/selfservice/microsites/search.do?language=en_US&cmd=displayKC&externalId=1010376) or search in the VMware knowledge base using the key words "Disabling VMotion® on an ESX/ESXi host".

## Step 1: Deploy the OVF Template


Deploy the OVF template with the VMware ESX virtual machines.

### Deploy the OVF Template Using a Microsoft HyperV Virtual Machine


1. Start the Microsoft SCVMM client on the Windows server.
2. Copy the AFM VHDx image file from the directory containing the AFM package to a location where the SCVMM client can access it.
3. Import the VHDx image file to create the AFM VM.
4. Power on the VM.


## Step 2: Start the Virtual Machine

After completing the VM Creation wizard and deploying the VM, power on the AFM VM and connect to the console.

 **NOTE:** Before starting the VM console, modify the VM settings by clicking **Edit Settings**.

1. To start the VM, click it and select **Power > Power On**.
2. To open the VM console, right-click it and select **Open Console**.
3. Open the console and log in with the default credentials. Log in from the console or SSH for the first time using the `superuser` account. If an IP is assigned to the VM, AFM prompts you to change the password for the `superuser` account. This password is used for both the web URL login and console login.

 **NOTE:** The default AFM user name is `superuser` and password is `Superuser1`. When the software requires HyperV Shell CLI command, the Shell CLI user name is `superuser` and the password is `Superuser1`.

4. When the VM is on and DHCP is available, an IP address is automatically assigned to the VM. If no IP is assigned to the VM because DHCP is not enabled, AFM displays with following message: "There is no IP address assigned. Press the <Enter> and the Network Configuration Wizard will be started (This wizard can be manually started by selecting "Configure System" from the console menu):" If this message displays, press `Enter` and configure the network:
  - a. When the network configuration warning message appears, enter `Y` to continue.  
The **Select Action** screen displays.
  - b. Select **Device configuration**. To navigate between elements, use the **Tab** and down arrow keys.  
The **Network Configuration** screen displays.
  - c. Select the `eth0` device.  
 **NOTE:** Do not rename the device during the configuration process.
  - d. In the **Static IP** field, specify the static IP Address of the AFM server. To verify IP address is not in use by another system, ping the IP address assigned to AFM. If the destination host is unreachable, you can safely assign the IP address to AFM.
  - e. Select **OK** to save your changes.
  - f. Select **Quit** to exit this screen. The AFM VM now reboots for the network changes to take effect.
5. Manage the AFM virtual appliance.

## Step 3: Manage the AFM Virtual Appliance

After deploying the AFM OVF and performing the initial configuration, use the AFM Virtual Appliance to finish configuring AFM.

**NOTE:** To access the AFM virtual appliance, go to the AFM VM, click the **Console** button and login as `superuser`. If there is an IP assigned to the VM the first time you log in from the console or SSH using `superuser`, AFM prompts you to change the password for `superuser`. This password is used for both the web URL login and console login. If no IP is assigned to the VM because DHCP is not enabled, AFM prompts you to configure the network and reboots the VM.

The AFM virtual appliance options are shown in the following screen shot.

```
Active Fabric Manager (AFM) VIRTUAL APPLIANCE

AFM Portal:
  https://          /index.html

Use the <UP> and <DOWN> arrow keys to select an option:

Configure System
Change AFM superuser Password
Update AFM Server
Set AFM Software to Next Reboot
Restart AFM Application
Reboot AFM Server
Shutdown AFM Server
Transfer File
Edit File
Upload Switch Software Image
Backup Database
Restore Database
Log out
Press <Enter> to continue.
```

Figure 1. AFM Virtual Appliance Menu

### Configuring the System

To configure the AFM server settings, use the **Configure System** option.

- **Device configuration** (Network Configuration) — Use this option to configure a static IP as the AFM Ethernet controller or change another device's `eth0` attribute.
- **DNS configuration** — Configure the AFM DNS settings.

1. Select **Configure System** and press **Enter**.

The following network configuration warning message displays: \*WARNING\* System will have to restart to properly update all the services if network configuration is changed. Do you wish to continue? Y or N? :

2. Enter Y.

The **Select Action** screen displays.

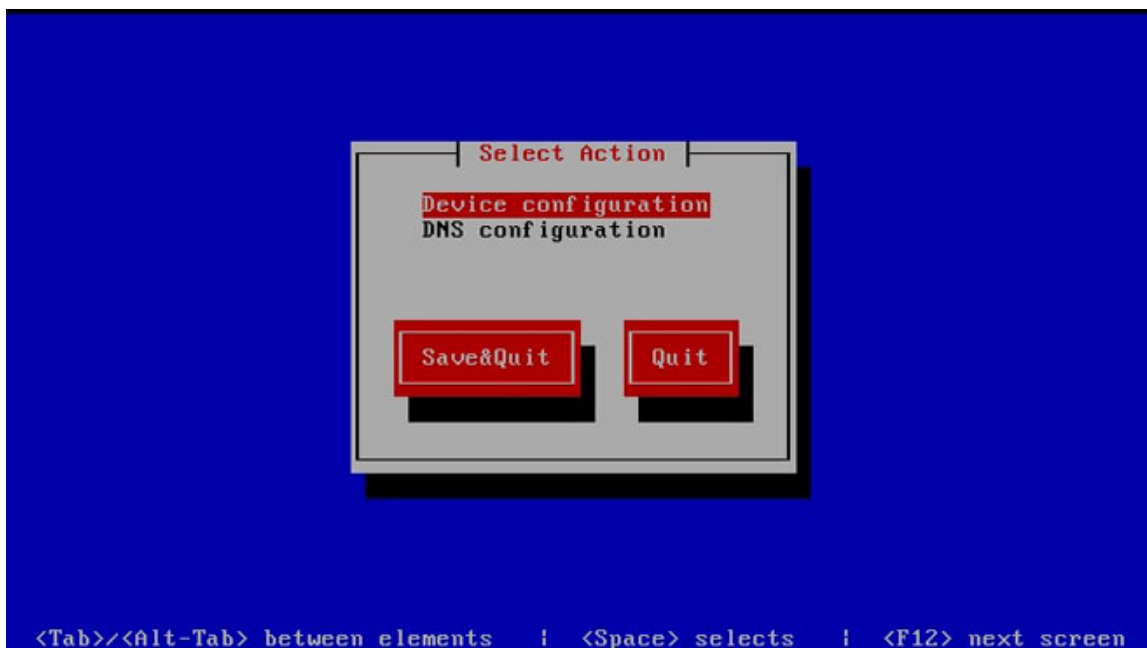


Figure 2. Select Action Screen

3. Select **Device configuration**. To navigate between elements, use the **Tab** and down arrow keys. The **Network Configuration** screen displays.

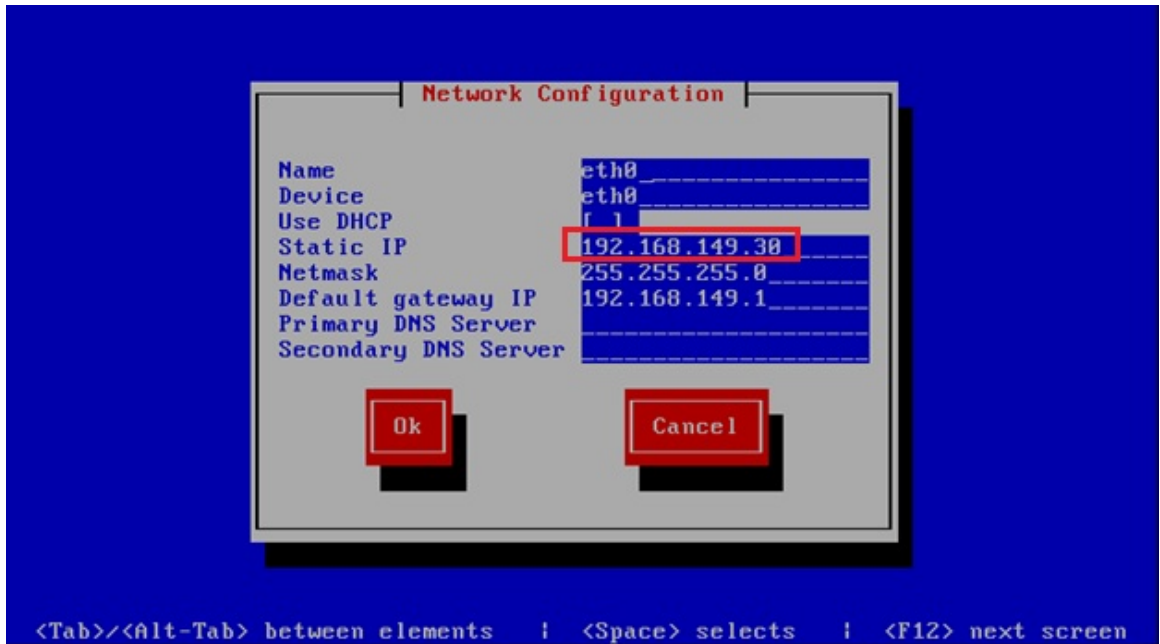


Figure 3. Network Configuration Settings

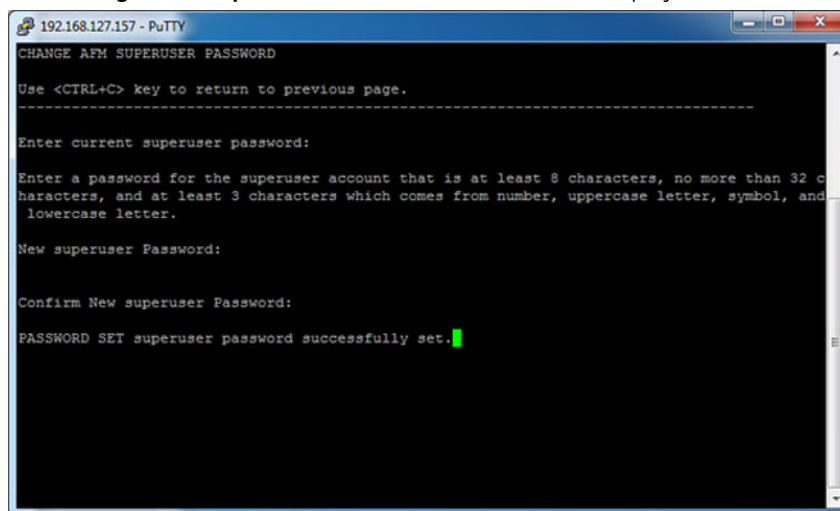
4. View or modify the following settings as needed:
  - **Name** – Displays the name of the AFM server.
    - ✎ **NOTE:** Do not change the default device name (eth0).
  - **Device** – Displays the name of the NIC Card.
    - ✎ **NOTE:** Do not change the default device name (eth0).
  - **Use DHCP** – Enable DHCP and assign an IP address to the VM.
  - **Static IP** – Specify the static IP Address of the AFM server. When you change the AFM IP address, the system prompts you to restart the AFM server.
  - **Netmask** – Specify the subnet mask of the static IP address for the AFM Server.
  - **Default gateway IP** – Specify the gateway IP Address of the AFM server.
  - **Primary DNS Server** – Specify the primary DNS server address. To enable the DNS server on AFM Server, use this option.
  - **Secondary DNS Server** – Specify the secondary DNS server address.
5. Restart the AFM server.
6. Verify connectivity to the AFM server. Ping the AFM server IP address and validate that the IP address has changed.
7. Login to the AFM using the new IP address using the following format: **https://new\_ip\_address/afm** (where **new\_ip\_address** represents the new IP address).
8. Navigate to the **Administration > Settings > System Information** screen.
9. Click **Edit** and then select the new AFM server IP address from the **System IP Address** drop-down menu.
10. Validate the following information to verify that the new AFM IP address is being used:
  - **TFTP/FTP settings** – Validate local settings only
  - **SNMP Configuration** – Verify that the new AFM IP address has been applied to the SNMP configuration, ensuring that the traps are registered to the switch and that AFM receives the alarms.

- **Syslog IP Address** – Verify that the new IP address has been applied to the first system log entry. The AFM IP address uses the first system log entry by default, so the first system log entry is typically the AFM server.
11. Click the refresh icon on the top right of the **Settings** screen and verify that the new AFM IP address has been applied.
  12. On the AFM Virtual Appliance console, login as `superuser` and select **Restart AFM Application**. When AFM starts, the AFM server uses the new IP address.
  13. Redeploy all the fabrics with the new IP address to register the trap host and system log IP address.
  14. To save your changes, select **OK**.
  15. To exit this screen, select **Quit**.

## Changing the AFM Superuser Password

1. Select **Change AFM Superuser Password**.
2. Press **Enter**.

The **Change AFM Superuser Password Screen** screen displays.




**Figure 4. Change AFM Superuser Password Screen**

3. In the **Enter current superuser password** field, enter the `superuser` account password. The default password is `Superuser1`.
  - NOTE: The password must be 8–32 characters and include at least three characters from the following categories:
    - lowercase alphabetic character
    - uppercase alphabetic character
    - numeric character (0–9)
    - special character
4. Press **Enter**.
5. In the **Confirm New Superuser Password** field, enter the new `superuser` password again to confirm the `superuser` password.
6. Press **Enter** to return to the main menu.

## Updating the AFM Server

1. Select **Update AFM Server** and press **Enter**.

The **Update AFM Server** screen displays the current version and the version of any available updates.

 **NOTE:** If you download an updated RPM from the remote server, it overwrites the current available update software version.

2. To download the latest AFM software package in RPM format file from the remote URL to the available partition, enter `y`. To download the AFM software package RPM format file from the local workstation where the AFM console is launched to the AFM server, enter `n`.
3. If the location is a remote server, enter the URL location of the RPM file on the remote server using the following formats and then press **Enter**.

 **NOTE:** The RPM file name must start with AFM and must end with `.noarch.rpm`; for example, `AFM2.5.0.79.noarch.rpm`

- `https://ipaddress/path_to_rpm.file`
- `ftp://ipaddress/path_to_rpm.file`
- `sftp://ipaddress/path_to_rpm.file`

4. If the location is local, enter the absolute path of the RPM file and press **Enter**.
5. If necessary, enter your username and password.
6. Press **Enter** to return to the main menu.

 **NOTE:**

To use the new RPM on the active partition, refer to [Setting AFM as the Next Restart](#) and [Restarting AFM](#).

## Applying AFM Updates on Restart

There are two versions of the AFM software package: one in the current partition and the other in the available partition.

1. Select **Set AFM Software to Next Restart** and press **Enter**.
2. To apply the available update on the next reboot, enter `y` and press **Enter**.
3. Press **Enter** to return to the main menu.

## Restarting AFM

1. Select **Restart AFM Application** and press **Enter**.

The following warning message displays: The next software version is AFM `<VersionNumber>` from current software. Are you sure you want to restart the AFM application? Y or N?: (where `<VersionNumber>` is the version number).

2. Enter `y` to restart the application.
3. Press **Enter** to return to the main menu.

## Rebooting the AFM Server

1. Select the `Reboot AFM Server` option and press `Enter`.
2. Enter `y`.
3. Select `Shutdown AFM Server` and press `Enter`.
4. Enter `y` to shutdown the AFM server VM.

## Shutting Down the AFM Server (VM)

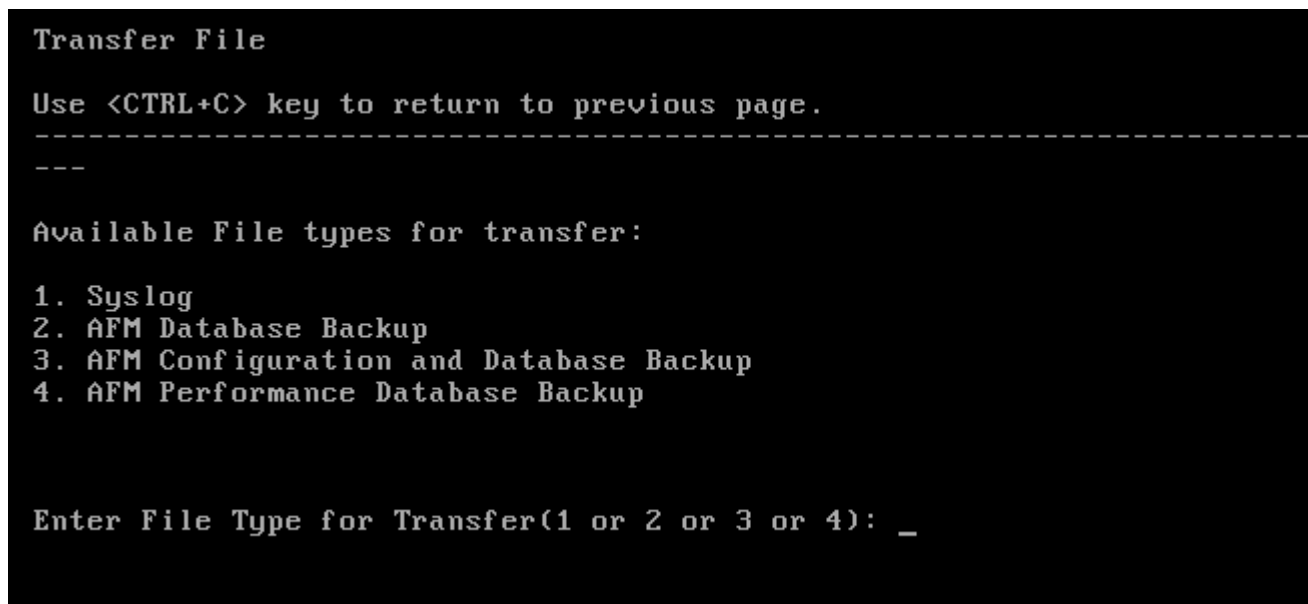
1. Select the `Shutdown AFM Server` option and press `Enter`.
2. Enter `y`.

## Transferring Files

Verify FTP or TFTP configuration was configured during the initial AFM server setup.

1. To transfer all files from the AFM server to the remote server using the FTP or TFTP, select **Transfer File**, and press **Enter**.

The **Transfer File** screen displays.



```
Transfer File

Use <CTRL+C> key to return to previous page.
-----
---

Available File types for transfer:

1. Syslog
2. AFM Database Backup
3. AFM Configuration and Database Backup
4. AFM Performance Database Backup

Enter File Type for Transfer(1 or 2 or 3 or 4): _
```

Figure 5. Transfer Files Screen

2. Enter the file type to transfer:
  - **1. Syslog**
  - **2. AFM Database Backup**
  - **3. AFM Configuration and Database Backup**
  - **4. AFM Performance Database Backup**

3. Press **Enter**.
4. Enter `y` to upload all the files to the FTP or TFTP server.
5. Press **Enter**.
6. Press **Enter** again to return to the main menu.

## Editing AFM Files

To edit the following file types, use the **Edit File** option:

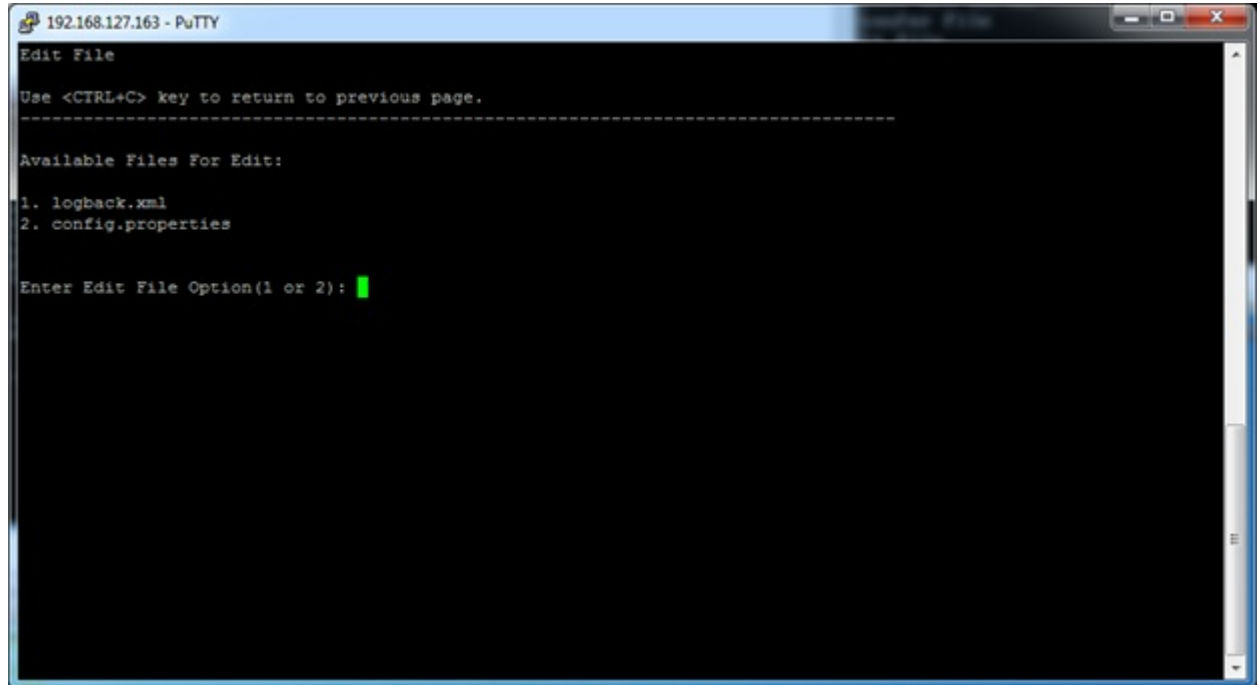


Figure 6. Edit File Screen

- **1. logback.xml** – The `logback.xml` file contains the database logging file and enables or disables debugging. By default, the logging level is set to INFO. The available logging levels are:
  - ALL
  - DEBUG
  - ERROR
  - INFO
  - OFF
  - TRACE
  - WARN

The typical use case is changing the logging level from INFO to DEBUG, as shown in the following example:

```
<logger name="com.dell.indigo" level="INFO" /> change to
<logger name="com.dell.indigo" level=" DEBUG" />
<logger name="com.dell.dfm" level=" INFO " />
changed to <logger name="com.dell.dfm" level="DEBUG" />
<logger name="com.dell.wnm" level=" INFO " /> changed to
<logger name="com.dell.wnm" level="DEBUG" />
```

**2. config.properties** — The **config.properties** file contains the system level configuration for the database backup, which is based on the Linux cron job.

## Editing Logback Files

1. Select **Edit File**.
2. To select the **logback.xml** option, enter 1.
3. Press **Enter**.
4. Search for **com.dell.dfm** and **com.dell.wnm** keywords and change the logging level (for example, from **level=INFO** to **level=DEBUG** as shown in the following example).

```
<logger name="com.dell.dfm" level="DEBUG">
    <appender-ref ref="DCM-MESSAGE" />
    <!-- appender-ref ref="DCM-ERROR" />
    <appender-ref ref="DCM-TRACE" /-->
</logger>
<logger name="b" level="DEBUG">
    <appender-ref ref="WNM-MESSAGE" />
    <!-- appender-ref ref="WNM-ERROR" />
    <appender-ref ref="WNM-TRACE" /-->
</logger>
```

5. Save the file using the vi editor commands such as **:w** (save file) and quit **:q** (quit editing).
6. To return to the main menu, press **Enter**.

## Editing Config Properties Files

1. Select **Edit File**.
2. Enter the edit file option **2** and then select **config.properties**.
3. Press **Enter**.
4. To change the time of the cron job, search for **2am** or **1am** as a keyword. You can change **2am** to **3am** for backup PostgreSQL DB or change it from **1am** to **4am** for the Hbase. Refer to the following example.

```
# The folder to store backed up database files. If the folder does not
exist, the backup program will try to create it.
wnm.database.backup.folder=/data/backup/postgres
# The backup job will be started every day at 2am.
wnm.database.backup.schedule=0 0 2am * * ?
# ***** Database parameter : END *****
# ***** HBASE parameter : Start *****
# The folder to store backed up database files. If the folder does not
exist, the backup program will try to create it
wnm.database.hbase.backup.folder=/data/backup/hbase
#The backup job will be started every day at 1am.
wnm.database.hbase.backup.schedule=0 0 1am * * ?
```

5. Save the file using the vi editor commands such as **:w** (save file) and quit **:q** (quit editing).
6. Press **Enter** to return to the main menu.

## Uploading the Switch Software Image

1. Select **Upload Switch Software Image** and press **Enter**.  
The **Upload Switch Software Image** screen displays.

```
UPLOAD Switch Software Image

Use <CTRL+C> key to return to previous page.
-----
---

Choose a switch model:

1. MXL Blade
2. S4810
3. S4820T
4. S55
5. S60
6. Z9000
7. S6000
8. S5000
9. IOA

Enter switch model option (1, 2, 3, 4, 5, 6, 7, 8 or 9): █
```

Figure 7. AFM Virtual Appliance Upload Software Image Screen

2. Enter a switch model option. The range is 1–9.
  - 1. MXL Blade
  - 2. S4810
  - 3. S4820T
  - 4. S55
  - 5. S60
  - 6. Z9000
  - 7. S6000
  - 8. S5000
  - 9. IOA
3. Enter your user name and password for the FTP connection. This option transfers the software image file into the `/data/FTOS/<SwitchModel>` directory and copies the files to the TFTP/FTP location.
4. Enter the URL location to upload the switch software image using the formats listed in the **Upload Switch Software Image** screen.
5. To return to the main menu, press **Enter**.

# Backing Up the AFM Database


## NOTE:

- The backup file does not include AFM historical performance data.
- The AFM server IP must be the same as the location of the database backup file.


### 1. Select **Backup Database**.

The **Backup Configuration and Database** screen displays.

### 2. Select a backup option:

 **NOTE:** If AFM uses the local DHCP server and/or a local FTP server, select **AFM Configuration and Database** to back up the database instead of **AFM Database**.

- **1. AFM Database** — Back up the AFM database files only. The switch configuration and `dhcpd.conf` files are not included.
- **2. AFM Configuration and Database** — Back up the AFM configuration and database files.

 **NOTE:** The backup file extensions are type-specific. You cannot restore the AFM database files using the **2. AFM Performance Database** or **3. AFM Configuration and Database** options. You must use the **1. AFM Database** option. Similarly, you cannot restore configuration files using the **1. AFM Database** option.

### 3. Wait while AFM backs up the files and note the backup location that displays at the bottom of the screen.

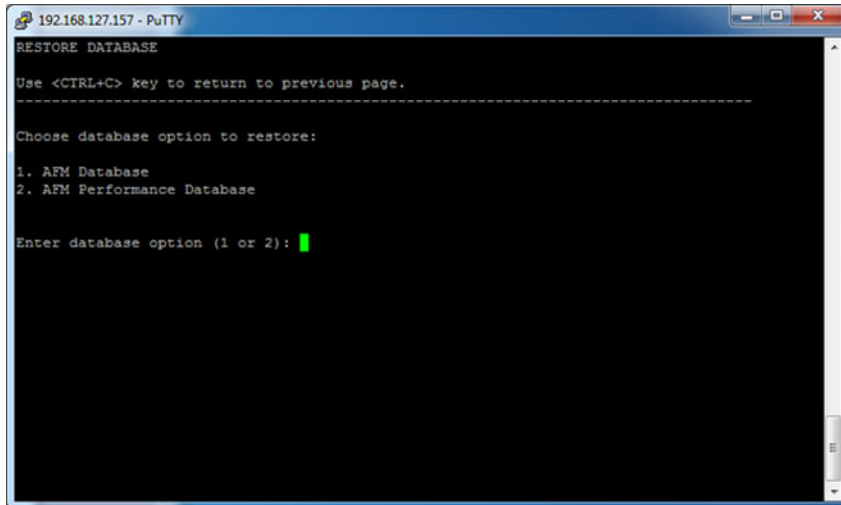
```
pg_dump: dumping contents of table wnm_seededipaddr
pg_dump: dumping contents of table wnm_slot
pg_dump: dumping contents of table wnm_stackport
pg_dump: dumping contents of table wnm_swmodule
pg_dump: dumping contents of table wnm_unit
pg_dump: dumping contents of table wnm_vlan
pg_dump: dumping contents of table wnm_vltdomain
pg_dump: dumping contents of table wnm_vltmember
pg_dump: dumping contents of table wnm_vltpeerlag
pg_dump: dumping contents of table wnm_vrrpoperation

Database backup created: /data/backup/postgres/afm-db-backup-2014_06_04-04_32_27.custom

Backup completed. Press <Enter> to return main menu.
```

## Restoring AFM Database Files

To restore AFM database files, use the **Restore Database** option. Select a file type to restore (configuration or performance history).



### Restoring the AFM Configuration Database

1. Select **Restore Database** .  
The **RESTORE DATABASE** screen displays.
2. To select the **AFM Database** option, enter 1.  
The **AFM DATABASE FILES** screen displays.
3. Enter an AFM database file option.
4. To restore the database process and restart AFM, enter **Y**.

### Restoring the AFM Performance Database

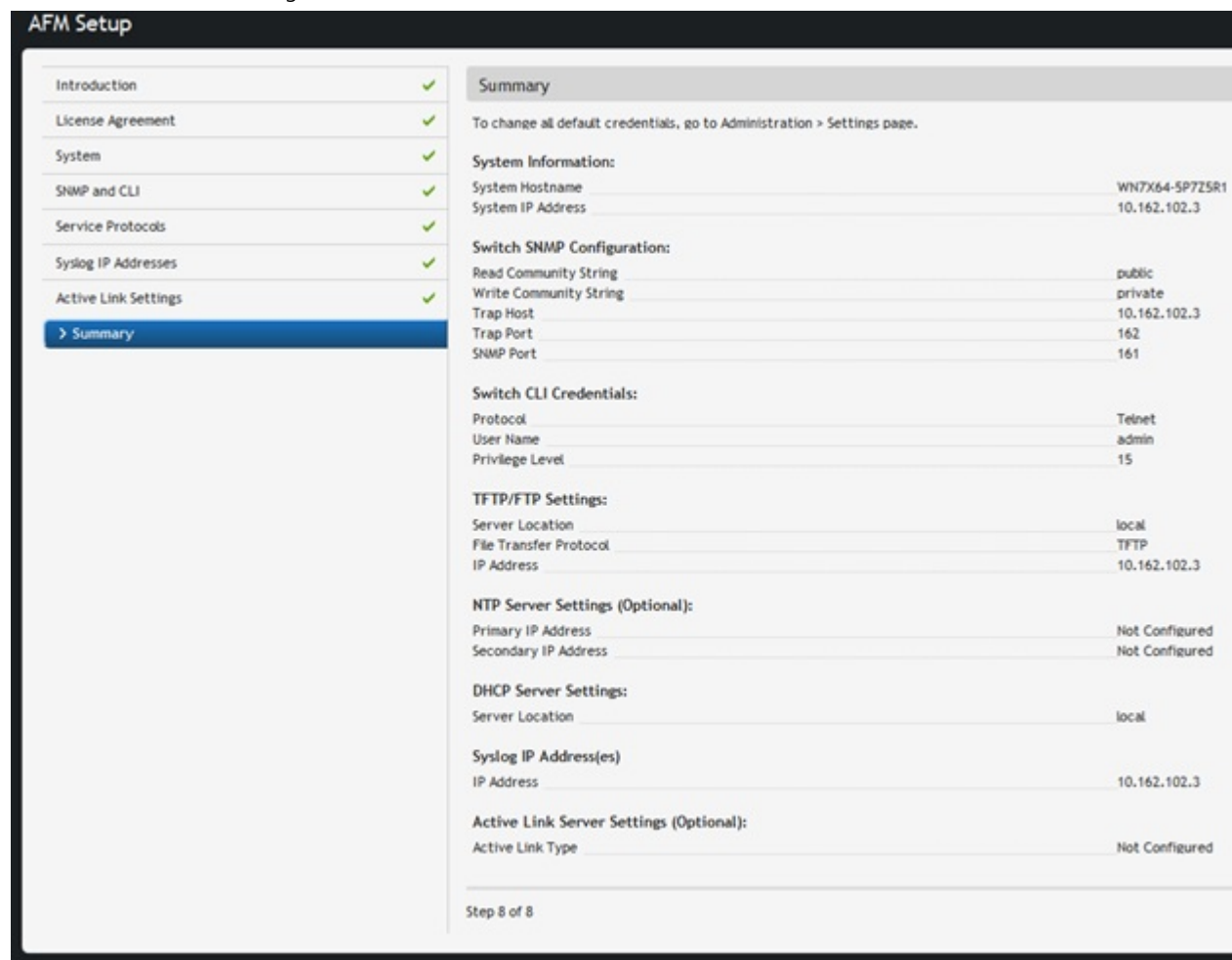
1. Select **Restore Database**.  
The **RESTORE DATABASE** screen displays.
2. To select the **AFM Performance Database** option, enter 2.  
The **PERFORMANCE DATABASE FILES** screen displays.
3. Enter a performance database file option.
4. To restore the selected performance database and restart AFM, enter **Y**.

## Logging Out of the AFM Virtual Appliance

1. Select **Log out**.
2. Press **Enter**.

## Step 4: Perform Initial Configuration

After deploying the AFM server as a virtual appliance, the AFM setup wizard displays when you connect to AFM for the first time using the browser client.




**Figure 8. AFM Setup Wizard**


Configure the following services using the AFM setup wizard:

- System (SNMP, switch CLI, and Telnet credentials)
- Service Protocols (TFTP, FTP, NTP, and DHCP)
- (Optional) Active Link Settings


1. Start the browser.

2. To log in to AFM, , enter the following information in the **URL** field using one of the following URL syntaxes:
  - `http://vm_ip_address`
  - `https://vm_ip_address`
3. Enter your user name and password. The AFM Setup wizard starts and displays the **Introduction** screen.
 





 **NOTE:** Specify the user name as `superuser`.
4. Review the **Introduction** screen.
5. Click **Next** to go to the **License Agreement** screen.
6. Check the **I Accept the terms of the license Agreement** checkbox and click **Next**. The System Screen displays.
7. From the **System IP Address** drop-down menu, select the IP address for managing AFM and click **Next**.
 

 **NOTE:** If there are multiple network interface card (NIC) adapter cards on the AFM server, select an IP address to manage AFM.

The **SNMP and CLI** screen displays.
8. Configure the following settings in the **Switch SNMP Configuration** area:
  - a. Enter the read community string in the **Read Community String** field; for example, `public`.
  - b. In the **Write Community String** field, enter the write community string; for example, `private`.
9. Configure the following settings in the **Switch CLI Credentials (FTOS CLI user credentials)** area:
  - a. From the **Protocol** drop-down menu, select one of the following protocols:
    - **Telnet**
    - **SSHv2**
  - b. In the **User Name** field, enter the user name.
  - c. In the **Password** field, enter the password.
  - d. In the **Confirm Password** field, enter confirm the password.
  - e. In the **Enable Password** field, enter the enable password.
  - f. In the **Confirm Enable Password** field, confirm the enable password.
10. To go to the **Service Protocols** screen, click **Next**.
11. Select one of the following options in the **TFTP/FTP Settings** area:
  - **Local — Provision AFM as a TFTP or FTP server**

 **NOTE:** To use the **Local** option, the TFTP or FTP server must be in the same subnet.

    - For the local TFTP server option, the TFTP server uses the AFM management IP address.
    - For the local FTP server option, the FTP server uses the AFM management IP address. Enter the AFM user name and password.
  - **Remote — Use an external TFTP/FTP server**
    - If you select the FTP protocol and remote options, enter the FTP server IPv4 address, user name, and password.
    - If you select the TFTP protocol and remote options, enter the TFTP IPv4 address.
12. Select one of the following options from the **File Transfer Protocol** drop-down menu:
  - **TFTP**

- **FTP** (default) — If you select this option, enter the FTP username and password.
13. (Optional) Synchronize AFM's system clock to the remote NTP time servers in the **NTP Server Settings** area using the following settings:
    - a. Enter the primary NTP IPv4 address in the **Primary IP Address** field.
    - b. Enter the secondary NTP IPv4 address in the **Secondary IP Address** field.
  14. Select one of the following settings in the **DHCP Server Settings** area:
    - **Local — Provision the AFM as a DHCP server.**: If you select this option, AFM automatically integrates the `dhcpd.config` file into the DHCP server on the AFM generated during pre-deployment.
      -  **NOTE:** AFM can only be provisioned as a local DHCP server when the AFM server belongs to the same subnet as the network switches management interface subnet.
    - **Remote — Use an external DHCP server:** If you select this option, manually install the `dhcpd.config` file generated during pre-deployment into the DHCP server before deploying the fabric.
  15. To go to the **Syslog IP Addresses** screen, click **Next**.
  16. Configure up to eight syslog IP addresses in the **Syslog IP Addresses** area for event logging for the switches in the fabric. By default, the first syslog IP address entry is the AFM system IP address. AFM logs all system and switch events to the syslog server. The log file is located in the following directory: `/var/log/afm/afm.log`.
  17. Click **Next**.  
The **Active Link Settings** screen displays.
  18. (Optional) To display additional performance statistics in AFM using a Dell OpenManage Network Manager (OMNM) server, configure the following settings in the **Active Link Settings** area. AFM provides view-only integration with the Dell OMNM web application.
    - a. Check the **Integrated to Dell OpenManage Network Manager (OMNM)** checkbox.
    - b. Specify the Active Link server IP address of the element management system in the **Active Link IP Address** field.
    - c. Select one of the following protocols in the **Communication Protocol** area:
      - **Use HTTP protocol to connect through AFM Server**
      - **Use HTTPS protocol to connect through AFM Server**
    - d. In the **User Name** field, enter the EMS user name.
    - e. In the **Password** field, enter the EMS user password.
      -  **NOTE:** After installing AFM, change these settings if necessary on the **Administrative > Settings > Active Link Settings** screen.
      -  **NOTE:** Do not install the OMNM software on the same server as AFM. To activate performance statistics, log into the Dell OMNM web service directly using `write` permissions. For OMNM requirements, refer to *Prerequisites* and *OMNM Requirements* in the *AFM User Guide*.
  19. To go to the **Summary** screen, click **Next**.
  20. Carefully review the settings and click **Finish**. After you click **Finish**, the AFM UI displays the **Getting Started** screen.
    -  **NOTE:** After installing AFM, change these settings if necessary on the **Administration > Settings** screen.

# RPM Installation

Instead of using the OVF with the CentOS 6.5 64-bit architecture, you can use the RPM to install the AFM software. For information about using the OVF to deploy AFM, refer to [Deploying the OVF](#).

## Prerequisites

Before you begin, install the following:

1. CentOS 6.5 64-bit.

For information about installing CentOS 6.5, refer to [https://access.redhat.com/documentation/en-US/Red\\_Hat\\_Enterprise\\_Linux/6/html/Installation\\_Guide/index.html](https://access.redhat.com/documentation/en-US/Red_Hat_Enterprise_Linux/6/html/Installation_Guide/index.html). Dell Networking recommends CentOS 6.5 64-bit architecture.

2. PostgreSQL 64-bit software, version 9.1

The PostgreSQL core distribution and download URL is located at <http://www.postgresql.org/download/linux/redhat/>.

3. Download the install script from Dell Networking Technical Support. The name of the install file is **AFM-INSTALLER-2.6.0.rpm**.

## Step 1: Configuring CentOS

Because the default CentOS `iptables` configuration does not allow access to the HTTP (TCP Port 80) and HTTPS (TCP Port 443) ports, configure the firewall to allow the web server access.

1. Set the host name of web server. The following example shows how to set the host name to `Centos62`.

```
# vi /etc/sysconfig/network
NETWORKING=yes
HOSTNAME=Centos62
GATEWAY=10.16.148.254
:wq
```

2. Add the host name in `etc/hosts` file. The following example adds the IP address **10.16.148.119** and host name **Centos62** to this file.

```
# vi /etc/hosts
127.0.0.1 localhost localhost.localdomain localhost4
localhost4.localdomain4
::1 localhost localhost.localdomain localhost6
localhost6.localdomain6
10.16.148.119 Centos62
```

- Configure the IP table to accept web server ports 443 and 80. AFM uses HTTPs port 443 and HTTP port 80 for the web server.

```
# vi /etc/sysconfig/iptables
# Firewall configuration written by system-config-firewall
# Manual customization of this file is not recommended.
*filter
:INPUT ACCEPT [0:0]
:FORWARD ACCEPT [0:0]
:OUTPUT ACCEPT [0:0]
-A INPUT          -m state --state ESTABLISHED,RELATED -j ACCEPT
-A INPUT          -p icmp -j ACCEPT
-A INPUT          -i lo -j ACCEPT
-A INPUT          -p tcp -m state --state NEW --dport 80 -j ACCEPT
-A INPUT          -p tcp -m state --state NEW --dport 443 -j ACCEPT
-A INPUT          -m state --state NEW -m tcp -p tcp --dport 22 -j ACCEPT
-A INPUT          -j REJECT --reject-with icmp-host-prohibited
-A FORWARD       -j REJECT --reject-with icmp-host-prohibited
COMMIT
```

- After modifying the firewall configuration to accept the port numbers, restart the iptables service to accept the changes using the `service iptables restart` command and then use the `service iptables status` command to check the status.

```
#service iptables restart
iptables: Flushing firewall rules: [ OK ]
iptables: Setting chains to policy ACCEPT: filter [ OK ]
iptables: Unloading modules: [ OK ]
iptables: Applying firewall rules: [ OK ]
#service iptables status
Table: filter
Chain INPUT (policy ACCEPT)
```

num	target	prot	opt	source	destination	
1	ACCEPT	all	--	0.0.0.0/0	0.0.0.0/0	state RELATED,ESTABLISHED
2	ACCEPT	icmp	--	0.0.0.0/0	0.0.0.0/0	
3	ACCEPT	all	--	0.0.0.0/0	0.0.0.0/0	
4	ACCEPT	tcp	--	0.0.0.0/0	0.0.0.0/0	state NEW tcp dpt:80
5	ACCEPT	tcp	--	0.0.0.0/0	0.0.0.0/0	state NEW tcp dpt:443
6	ACCEPT	tcp	--	0.0.0.0/0	0.0.0.0/0	state NEW tcp dpt:22
7	REJECT	all	--	0.0.0.0/0	0.0.0.0/0	reject-with icmp-host-prohibited

```
Chain FORWARD (policy ACCEPT)
```

```

num      target      prot  opt  source      destination
1        REJECT      all   --   0.0.0.0/0  0.0.0.0/0  reject-with icmp-
                                         host-prohibited

Chain OUTPUT (policy ACCEPT)
num target      prot opt source      destination

num      target      prot  opt  source      destination

```


## Step 2: Install the AFM RPM Software on the Linux CentOS Machine

1. Download the AFM RPM file **AFM2.6.0.<label#>.noarch.rpm** from Dell Networking Support. For information about Dell Networking Support, refer to [Dell Networking Support](#).
2. Search for the existing AFM package by using the RPM `-qa` option .
 

```
# rpm -qa | grep AFM
AFM2.6.0.<label#>.noarch
```
3. If AFM exists, erase the package by using the command `-e -- nodeps -noscripts - notriggers` command with the package name. The package name displays in the output of the `-qa` command.
 

```
# rpm -e - vv --nodeps --noscripts --notriggers AFM2.6.0.<label#>.noarch
```
4. If the `/opt/dell/dfm` or `/usr/hbase` directories exist, delete them.
 

```
# rm -rf /opt/dell/dfm
# rm -rf /usr/hbase
```
5. Verify the OpenSSL version is **openssl-1.0.0-20.el6.x86\_64** using the following command: `rpm -qa | grep openssl`  
If another version is installed, install this version.
6. Run the `rpm -ivh AFM.rpm file` installer to extract and install the required RPMs.
 

 **NOTE:** The dependencies for this RPM include the Unzip, DHCP, TFTP server and PostgreSQL packages.

```
# rpm -ivh AFM.rpm file
```
7. After the installer has completed installing all the RPMs, go to the following directory:**`/opt/dell/dfm/bin`**.  
This file contains all the applications including HBase software.
8. Run the **`dfmDB.sh`** script and install the PostgreSQL Database.
 

```
# /opt/dell/dfm/bin/dfmDB.sh
```
9. Start the HBase server using the `/usr/hbase/hbase-0.94.1/bin/start-hbase.sh` command.
10. Create the HBase table for the HBase database using the `/usr/hbase/hbase-0.94.1/bin/initTable.sh` command. When running the script the first time, error messages display. Ignore them and run the script again to clear the error messages. The output should look similar to the following:

```

/usr/hbase/hbase-0.94.1/bin/initTable.sh
0 row(s) in 3.0460 seconds
0 row(s) in 1.1920 seconds
0 row(s) in 1.0470 seconds
0 row(s) in 2.0710 seconds
0 row(s) in 0.2530 seconds
0 row(s) in 1.0560 seconds
0 row(s) in 2.1750 seconds
0 row(s) in 0.1950 seconds

```

```

0 row(s) in 1.0770 seconds
0 row(s) in 2.1620 seconds
0 row(s) in 0.3120 seconds
0 row(s) in 1.0470 seconds
0 row(s) in 2.1200 seconds
0 row(s) in 0.2780 seconds
0 row(s) in 1.0680 seconds
0 row(s) in 2.1250 seconds
0 row(s) in 0.1780 seconds
0 row(s) in 1.0540 seconds
0 row(s) in 2.1300 seconds
0 row(s) in 0.3530 seconds
0 row(s) in 1.0800 seconds
0 row(s) in 2.1860 seconds
0 row(s) in 0.1700 seconds
0 row(s) in 1.0590 seconds
0 row(s) in 2.1360 seconds
0 row(s) in 0.2000 seconds
0 row(s) in 1.0550 seconds
0 row(s) in 2.0990 seconds
0 row(s) in 0.2750 seconds
0 row(s) in 1.0630 seconds
0 row(s) in 2.1860 seconds
0 row(s) in 0.1620 seconds
0 row(s) in 1.0570 seconds
0 row(s) in 2.1250 seconds
0 row(s) in 0.1730 seconds
0 row(s) in 1.0620 seconds
0 row(s) in 2.0980 seconds
0 row(s) in 0.1860 seconds
0 row(s) in 1.0810 seconds
0 row(s) in 2.0790 seconds
0 row(s) in 0.1780 seconds
0 row(s) in 1.0530 seconds

```

11. Link the AFM startup script **dfmserver** to AFM as shown in the following example.

```

# cd /etc/init.d
# ln -s /opt/dell/dfm/bin/dfmServer.sh dfmserver
#cd /etc/rc3.d
# ln -s ../init.d/dfmserver S99dfmserver
#cd /etc/rc3.d
# ln -s ../init.d/dfmserver K01dfmserver

```

12. Restart AFM using the **dfmServer.sh script**, which starts all required AFM software including the Apache service, PostgreSQL DB, and HBase DB.

```

# /etc/init.d/dfmserver start
Starting AFM Server
waiting to start postgres ...Starting postgresql-9.1 service [ OK ]
Done
Starting HBASE Server
waiting to start HBASE ...starting master, logging to /usr/hbase/
hbase-0.94.1/bin/../logs/hbase-root-master-Centos65.out
Done
waiting to start AFM Web Service...nohup: ignoring input and appending
output to `nohup.out'
Done

```

13. Verify that all servers (AFM, HBASE) are running after restarting AFM using the `ps -ef |grep java` command.

# Upgrading the RPM

To upgrade the RPM:

- use the RPM upgrade option in the AFM Virtual Appliance (refer to [Updating the AFM Server](#))
- use the RPM upgrade option in the AFM GUI (refer to *Updating AFM* in the *AFM User Guide* or online help)
- use the following manual upgrade procedure

If you upgrade the RPM, install the new RPM installation to a new location. The data migration requires that you manually run it to upgrade the database. The current data migration supports the upgrade from AFM 2.5.0 to release AFM 2.6.0.

1. Stop the watchdog software process, then stop the AFM server.

```
# ps -ef|grep watchdfm
# kill -9 <dfm_pid>
# /etc/init.d/dfmServer stop
```

2. Save the existing AFM release.

```
# mv /opt/dell/dfm /opt/dell/dfm_old
```

3. Extract the AFM RPM in the **/opt/dell/dfm** directory.

```
# rpm -ivhF AFM_ VersionNumber.<label#>.noarch
```

4. Create the file **dfmboot** in **/etc/sysconfig/dfmboot** directory with the following content:

```
# vi /etc/sysconfig/dfmboot
RUN_FIRSTBOOT=NO DFM_CURBOOTDIR=/opt/dell/dfm_old
DFM_NEXTBOOTDIR=/opt/dell/dfm
```

5. Create the directory **/usr/share/dfmscripts** and copy the **restartDFM.sh** script to the location.

```
# mkdir -f /usr/share/dfmscripts
# cp /opt/dell/dfm/db/restartDFM.sh /usr/share/dfmscripts/restartDFM.sh
# chmod +x /usr/share/dfmscripts/restartDFM.sh
```

The RPM installation is now completed and ready to use.

6. To restart the AFM server, link the startup script to the new directory.

```
# cd /etc/init.d
# rm /etc/init.d/dfmServer
# ln -s /opt/dell/dfm/bin/dfmServer.sh /etc/init.d/dfmServer
```

7. The **restartDFM.sh** script migrates the data from the old release to the new release. After the database is complete, link the startup script and restart the AFM server.

```
# /usr/share/dfmscripts/restartDFM.sh
```

# Technical Support

Dell Networking Technical Support provides a range of documents and tools to assist you with effectively using Dell Networking equipment and mitigating the impact of network outages.

## Accessing Dell License Portal

When you receive the Order Fulfillment email, follow these instructions to download the software.

1. Go to <http://www.dell.com/support/licensing>.
2. Enter your order number and click **Available Software List**.
3. Select the latest released version.
4. Accept the End User License Agreement (EULA).
5. Chose to download the file directly or use the NetSession client.
6. Click the **Download Now** button.

## Contacting Dell Technical Support

Downloading Software	Download the latest released version of the software at <a href="http://www.dell.com/support/licensing">http://www.dell.com/support/licensing</a>
Technical Documentation	<a href="#">Dell Networking Product Support page for AFM</a>
Contact Information	<a href="mailto:DellNetworking-Support@dell.com">DellNetworking-Support@dell.com</a>