CHAPTER 2

Installing or Upgrading ANM Virtual Appliance

This chapter describes how to deploy Cisco ANM Virtual Appliance 5.2.2 (new installation) and how to upgrade from a previous software version to ANM software.

This chapter includes the following sections:

System Requirements

This section describes the requirements of the target host system and the client and includes the following topics:

Target System Requirements

The following requirements and minimum resources for the host VMware ESX server are as follows:

- vCenter server version: vCenter 4.0 or 5.0
- ESX version: ESX 4.0 or 5.0
- Memory: 2 GB minimum, with 4 GB recommended
- Disk space: 128 GB

The memory and storage parameters are specified in the OVF file included in the distribution so you do not need to configure them manually. However, you should ensure that sufficient resources are available on the host, cluster, or pool that you are targeting for the ANM deployment to meet these requirements.

If sufficient resources are not available for allocation on the target system, the ANM OVF deployment will not succeed.

The OVF deployment allocates 2 GB of RAM to the virtual appliance. As indicated, while 2 GB serves as the minimum requirement, 4 GB is suggested. To avoid memory errors in the operation of ANM after installation, you should modify the memory allocation, as described in "OutOfMemoryException Errors" section on page 4-14.

Client Requirements

Each client accessing ANM Virtual Appliance must meet the following minimum requirements:

- IBM-compatible computer with 2-GHz or faster Pentium processor
- At least 1-GB minimum RAM

The client must run one of the following operating systems:

- Windows 7
- Windows Vista with Service Pack 1
- Windows XP Professional with Service Pack 2
- Red Hat Enterprise Linux 5 (base server)

The client requires one of the following browsers:

- Microsoft Internet Explorer as follows:
  - IE 7.0 on Windows XP Professional with Service Pack 2 or Windows Vista with Service Pack 1
  - IE 8.0 on Windows XP Professional with Service Pack 2, Windows Vista with Service Pack 1, or Windows 7
- Firefox 3.6 on Windows XP Professional with Service Pack 2, Windows Vista with Service Pack 1, Windows 7, or Red Hat Enterprise Linux 5

Note All browsers require that you enable cookies, JavaScript/scripting, Adobe Flash Player 9, and popup windows. If you reinstall ANM or upgrade to a newer release, before you access ANM, make sure that you delete the cookies and clear the browser cache of each client.

Acquiring the ANM Virtual Appliance Distribution

The ANM Virtual Appliance software is distributed as an Open Virtualization Archive (OVA) file. The file that contains the Cisco ANM Virtual Appliance 5.2.2 distribution is anm-va-5.2.2.ova.

The distribution archive contains the following items:

- OVF file that contains parameters for ANM Virtual Appliance
- Hard disk image (VMDK)
- Manifest for the archive

You deploy the OVA file directly from the vSphere Client; you do not need to extract the archive before performing the deployment.

Before Starting

You can install ANM Virtual Appliance using any method for deploying an OVF supported by the VMware environment. The following instructions describe how to create ANM Virtual Appliance with the VMware vSphere Client, a Windows application for managing and configuring the vCenter Server.

The instructions assume that the host or cluster to which you want to deploy ANM Virtual Appliance have already been configured in vCenter Server. The target system must meet the requirements listed in the "System Requirements" section on page 2-1.

Before starting, make sure that the ANM Virtual Appliance distribution archive is in a location that is accessible to the computer on which you are running the vSphere Client.

Note For more information about setting up your VMware environment, see the VMware vSphere 4.0 Documentation.

Deploying ANM Virtual Appliance

This section describes how to deploy ANM Virtual Appliance either from the vSphere Client using the Deploy OVF Wizard or from the command line.

This section includes the following topics:

Deploying ANM Virtual Appliance from vSphere Client

In the vSphere Client, you use the Deploy OVF Wizard to create a virtual machine running the ANM Virtual Appliance application, as described in this section.

While the following procedure provides a general guideline for how to deploy ANM Virtual Appliance, the exact steps that you need to perform may vary depending on the characteristics of your VMware environment and setup.

Procedure

Step 1 From the VMware vSphere Client main menu, choose **File > Deploy OVF Template**.

The Deploy OVF Template Source window appears.

Step 2 From the Deploy OVF Template Source window, click **Deploy from file** and choose the OVA file that contains the ANM distribution.

Step 3 Click **Next**.

The OVF Template Details window appears. The details include the product you are installing, the size of the OVA file (download size), and the amount of disk space that needs to be available for the virtual machine (size on disk).

Step 4 Verify the OVF Template Details and click **Next**.

The Name and Location window appears.

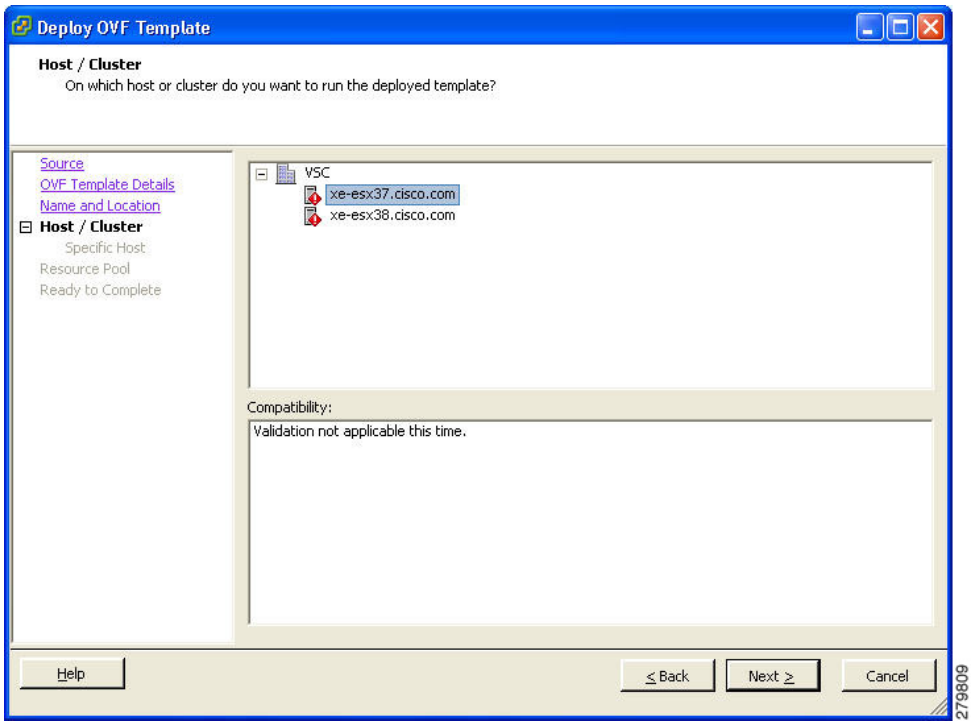
Step 5 Either keep the default name for the VM to be deployed in the **Name** field or provide a new one and click **Next**.

This name value is used to identify the new virtual machine in the VMware infrastructure so you should use any name that distinguishes this particular VM in your environment.

The Host / Cluster window appears (see Figure 2-1).

Step 6 Choose the destination host or HA cluster on which you want to deploy the ANM VM and click **Next**.

Figure 2-1 Host / Cluster Window



The Resource Pool window appears.

Step 7 If you have more than one resource pool in your target host environment, choose the resource pool to use for the deployment and click **Next**.

The Ready to Complete window appears.

Step 8 Review the settings shown for your deployment and, if needed, click the **Back** button to modify any of the settings shown.

Step 9 Click **Finish** to complete the deployment.

A message notifies you when the installation completes.

Step 10 Click **Close** to dismiss the Deployment Completed Successfully dialog box.

Note For more information about deploying OVF templates in the vSphere Client or for details about any of these options, see the VMware vSphere 4.0 documentation.

You have completed deploying (installing) ANM Virtual Appliance on a new virtual machine. A node for the virtual machine now appears in the resource tree in the VMware vSphere Client window. You now need to configure operating settings for the virtual appliance, as described in the "Setting Up ANM Virtual Appliance" section on page 2-5.

Deploying ANM Virtual Appliance using the Command Line Client

This section describes how to deploy ANM Virtual Appliance from the command line.

As an alternative to using the vSphere Client to deploy the ANM OVA distribution as described in the "Before Starting" section on page 2-3, you can use the VMware OVF Tool, which is a command-line client.

To deploy an OVA with the VMware OVF Tool, use the **ovftool** command, which takes the name of the OVA file to be deployed and the target location as arguments, as in the following example:

```
ovftool anm-va-5.2.2.ova vi://my.vmware-host.example.com/
```

In this case, the OVA file to be deployed is anm-va-5.2.2.ova and the target ESX host is my.vmware-host.example.com.

For complete documentation on the VMware OVF Tool, see the VMware vSphere 4.0 documentation.

Setting Up ANM Virtual Appliance

This section describes how to configure the initial operating settings of ANM Virtual Appliance.

Note You perform the procedure in this section only once, upon first installation of ANM Virtual Appliance. Skip this section if you already deployed the OVF template, for example if you are upgrading the installed ANM software (see the "Upgrading ANM Virtual Appliance" section on page 2-8).

Deploying the OVF template creates a new virtual machine in vCenter with the ANM Virtual Appliance application and related resources already installed on it. After deployment, you need to configure basic operating settings for ANM Virtual Appliance.

In these steps, you configure the basic network and login settings for the ANM Virtual Appliance operating system. When the steps are completed, ANM Virtual Appliance is accessible over the network.

Procedure

Step 1 In the vSphere Client, click the ANM Virtual Appliance node in the resource tree.

The virtual machine node should appear in the Hosts and Clusters tree below the host, cluster, or resource pool to which you deployed ANM Virtual Appliance.

Step 2 In the Getting Started tab, click the **Power on the virtual machine** link under Basic Tasks.

The Recent Tasks pane at the bottom of the vSphere Client window indicates the status of the task associated with powering on the virtual machine. After the virtual machine successfully starts, the status column for the task displays Completed.

Step 3 Click the **Console** tab.

Step 4 Click within the console pane to make the console prompt active for keyboard input.

Step 5 At the login prompt, enter **setup**:

```
localhost login: setup
```

The ANM configuration script starts. The script takes you through the initial configuration steps for ANM Virtual Appliance. In the first sequence of steps, you configure network settings.

Step 6 As prompted, enter values for the following settings:

- Hostname for the virtual appliance.
- IP address for the virtual appliance.
- Subnet mask for the IP address entered.
- IP address of the default gateway for the network environment in which you are creating the virtual machine.
- DNS domain for the target environment.
- IP address or hostname of the primary IP nameserver in the network.

  At the Add/Edit another nameserver prompt, you can enter **y** (yes) to add additional nameservers, if desired. Otherwise, press **Enter** to continue.
- NTP server location (or accept the default by pressing **Enter**). At the Add/Edit secondary NTP server prompt, you can enter **y** (yes) to add another NTP server. Otherwise, enter **n** (no) to continue.

Note ANM Virtual Appliance can use an NTP server to set its internal system clock. Alternatively, you can set the clock manually using the **clock set** command as described in the "clock set" section on page A-23.

Step 7 Enter the username for the user account used to access the Cisco ADE operating system running on the virtual machine.

The default username is admin, but you can change this to another username by typing it here.

This is the user account for accessing the ADE OS command line of ANM Virtual Appliance. You will need to configure an additional user account for accessing the ANM web interface later.

Step 8 Enter the password for the operating system admin user.

The password must be at least six characters and must include both lowercase and uppercase letters and at least one number. It cannot include the username or default Cisco passwords.

After you enter the password, the script verifies the network settings you configured. For instance, it attempts to reach the default gateway that you have configured.

After verifying the network settings, the script starts the ANM installation processes. This process can take several minutes, during which there is no screen feedback. When finished, the following banner appears on the screen:

```
=== Initial Setup for Application: ANM ===
```

Step 9 Enter the password for the ANM admin user.

This is the account that you will use to access the ANM web interface. Do not confuse this account with the credentials that you configured for the ANM Virtual Appliance operating system account.

Note The default username for the ANM user, admin, cannot be changed.

Step 10 Reenter the ANM admin user password.

The following prompt appears: Keep existing ANM configuration?

Step 11 Specify whether you want to keep the default settings for the web server component of the ANM application by entering **yes** or modify them by entering **no**. The web server component of ANM is responsible for serving its browser-based GUI.

If you enter **no**, the settings that make up the web server configuration appear in the following sequence. The default values are shown in brackets.

- HTTP Port of Web Services [8080]
- Enable HTTP for Web Services [false]
- HTTPS Port of Web Services [8443]
- Enable HTTPS for Web Services [false]
- Idle session timeout in msec [1800000]

As indicated by the bracketed information, by default, ANM serves its web application only to HTTPS requests at the default port of 443. In most cases, you can keep the default configuration; however, you may choose to modify the settings. For instance, you may want to have the ANM web server listen for HTTPS traffic on a different port. In this case, enter the new value when prompted.

If you accept the default web server configuration or when you finish specifying new values, the operating system reboots.

Note You can change the ANM web server configuration later if needed (see the "Changing Configuration Attributes After Installing ANM Virtual Appliance" section on page 4-1).

Step 12 After the system finishes rebooting, you can verify the installation by entering the following commands at the command line:

- **`show application version ANM`**

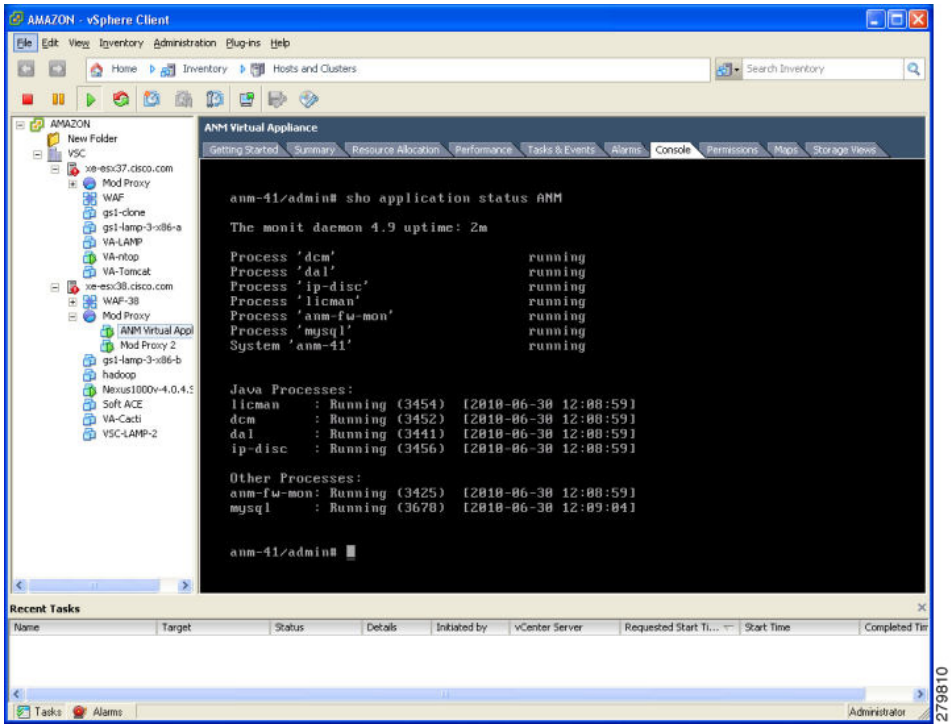
  The ANM version should be 5.2.2 (0).

- **`show application status ANM`**

  In the output, make sure that the version number is as expected and that all ANM processes listed are running without errors as shown in Figure 2-2.

Note Figure 2-2 shows the example output of an ANM 4.1 installation. The output that you see should reflect the appropriate installed ANM software version number.

Figure 2-2 ANM application status output (for ANM 4.1 only)



The ANM Virtual Appliance command line environment is now accessible from an SSH client or from the console tab in vSphere client.

Before you can use the ANM web interface to manage devices, you need to apply a license to the ANM installation, as described in Chapter 3, "Getting Started with Cisco Application Networking Manager Virtual Appliance."

Upgrading ANM Virtual Appliance

This section describes how to upgrade ANM Virtual Appliance from a previous ANM software version to ANM software Version 5.2.2. Table 2-1 shows the software upgrade path that you must follow.

Table 2-1 Upgrade Paths for ANM 5.2.2

Current Release	Previous Releases
Upgrade to ANM server 5.2.2	From ANM server 5.1, 5.2, or 5.2.1 only.
Upgrade to ANM server 5.2.1	From ANM server 5.1 or 5.2 only.
Upgrade to ANM server 5.2	From ANM server 5.1 only.
Upgrade to ANM server 5.1	From ANM server 4.1, 4.2 or 4.3 only.

Guidelines and Restrictions

This topics includes the following guidelines and restrictions:

- The software upgrade process includes creating an ANM backup that you use to restore the ANM configuration and device inventory at the end of the upgrade process. The ANM backup that you use can be generated using either ANM Virtual Appliance or ANM server (for more information about the two ANM applications, see the "ANM Overview" section on page 1-1).
- Beginning with ANM software Version 5.1, the building block feature by default is hidden. If you have used the building block feature in the past and want to continue using it after upgrading to ANM 5.1 or later, you must enable it. For more information, see the "Enabling the Building Block Feature" section in the *User Guide for the Cisco Application Networking Manager 5.2.2*.

Prerequisites

- The ANM Virtual Appliance being upgraded must be running ANM 5.1, 5.2, or 5.2.1 before you can upgrade to ANM 5.2.2. If the ANM Virtual Appliance is running ANM 4.x, upgrade to ANM 5.1, 5.2, or 5.2.1 first (see the *Installation Guide for the Cisco Application Networking Manager 5.2 Virtual Appliance*).
- You must have the Cisco ANM Virtual Appliance 5.2.2 OVA file (anm-va-5.2.2.ova) that you obtain from cisco.com.

This section includes the following topics:

Upgrading ANM Virtual Appliance Using an ANM Virtual Appliance Backup

This procedure describes how to upgrade your ANM Virtual Appliance from ANM 5.1, 5.2, or 5.2.1 to ANM 5.2.2. The upgrade process uses an ANM Virtual Appliance backup.

Note If you want to use an *ANM server backup* during the upgrade process, see the "Upgrading ANM Virtual Appliance Using an ANM Server Backup" section on page 2-10.

Procedure

Step 1 From the ANM Virtual Appliance being upgraded to ANM 5.2.2, create a backup by doing the following:

a. Create a remote repository for the backup (if one does not exist already) using the following commands:

repository *name*—Specifies the repository name.

url disk://*dirlocation*—Specifies the remote location of the repository.

For more information, see the "Creating a Repository for ANM Virtual Appliance Backups" section on page 4-6.

b. Create a backup using one of the following commands:

– **backup** *backup-name* **repository** *repository-name*—Creates a backup of the entire system, including the CARS configuration that includes the IP address, repository locations, gateway configuration, and so forth.

– **backup** *backup-name* **repository** *repository-name* **application** *appl-name*— Creates a backup of the ANM inventory and setup only.

For more information, see the "Creating an ANM Virtual Appliance Backup" section on page 4-6.

Step 2 Power down ANM Virtual Appliance, which allows you to use the same IP address and MAC address configuration on the ANM Virtual Appliance 5.2.2 instance to be deployed.

Caution If you are performing this upgrade using a backup of the entire system (see Step 1), all CARS configuration information that will be created for the new ANM Virtual Appliance 5.2.2 (such as IP address, gateway, hostname, and so forth) will be overwritten by the configuration present in the backup. For this reason, you must power off the corresponding ANM Virtual Appliance before you proceed with the upgrade to avoid duplicate IP scenarios.

Step 3 Deploy the Cisco ANM Virtual Appliance 5.2.2.OVA file (anm-va-5.2.2.ova).

Note Do not power up the newly created ANM Virtual Appliance (or VM) at this time.

Step 4 Reset the MAC address to the MAC address used by ANM Virtual Appliance (see the "Setting the MAC Address of ANM Virtual Appliance" section on page 3-2).

Because the license is associated with the MAC address, this step ensures that a new ANM license is not required for the upgrade.

Step 5 Power up the ANM Virtual Appliance and provide the necessary network connectivity information, such as IP address, gateway configuration, and so forth.

Step 6 Depending on the type of backup that you created in Step 1, restore the ANM configuration by entering one of the following commands:

- **restore** *name-YYMMDD-HHMM***.tar.gz repository** *repository-name* **application** *ANM*—Use this command if the backup contains the ANM inventory and setup only.
- **restore** *name-YYMMDD-HHMM***.tar.gz repository** *repository-name*—Use this command if the backup contains the entire system.

The restore operation can determine whether to perform a restore or an upgrade by comparing version numbers of ANM in the backup and in the current installation.

Related Topics

- Upgrading ANM Virtual Appliance Using an ANM Server Backup, page 2-10
- Upgrading ANM Virtual Appliance, page 2-8

Upgrading ANM Virtual Appliance Using an ANM Server Backup

This section describes how to upgrade your ANM Virtual Appliance from ANM 5.1, 5.2, or 5.2.1 to ANM 5.2.2. The upgrade process uses an ANM server backup from an ANM server operating in either standalone or HA mode.

Note If you want to use an *ANM Virtual Appliance backup* during the upgrade process, see the "Upgrading ANM Virtual Appliance Using an ANM Virtual Appliance Backup" section on page 2-9.

Caution This procedure requires logging in as the root user. As the root user, you can adversely affect your operating environment if you are unaware of the effects of the commands that you use. If you are an inexperienced Linux user, you should limit your activities as the root user to the tasks described in this procedure.

Prerequisites

Access to an ANM server with software Version 4.1 or later.

Procedure

Step 1 From an ANM server running ANM 5.1, 5.2, or 5.2.1, create a backup by doing the following:

a. From the Linux command line, log in as the root user as follows:

- If you are not logged in, log in as the root user:

  >login: root

  >Password: *root-password*

- If you are already logged in, but not as the root user, use the **su -** command to change your login to root:

  # su -

  # Password: *root-password*

b. From the command line, verify that the ANM server is running by entering the following command:

/opt/CSCOanm/bin/anm-tool info-services

c. From the command line, back up the ANM configuration by entering the following command:

/opt/CSCOanm/bin/anm-tool backup *backup-file*

The *backup-file* is the name of the file that you want to back up.

Step 2 Place the backup file on a server that is accessible from ANM Virtual Appliance.

Step 3 From the ANM Virtual Appliance being upgraded, power down ANM Virtual Appliance.

This step allows you to use the same IP address and MAC address configuration for the ANM Virtual Appliance 5.2.2 instance to be deployed.

Step 4 Deploy the Cisco ANM Virtual Appliance 5.2.2 OVA file (anm-va-5.2.2.ova).

Note Do not power up the new ANM Virtual Appliance (or VM) at this time.

Step 5 Reset the MAC address to the MAC address used by the previously installed version of ANM Virtual Appliance (see the "Setting the MAC Address of ANM Virtual Appliance" section on page 3-2).

Because the license is associated with the MAC address, this step ensures that a new ANM license is not required for the upgrade.

Step 6 Power up ANM Virtual Appliance and provide the necessary network connectivity information, such as IP address, gateway configuration, and so forth.

Step 7 When the newly deployed ANM Virtual Appliance has network connectivity, use the ADE OS **copy** command to copy the backup that you created in Step 1 to disk: of the ANM Virtual Appliance.

To copy the file, use any file transfer protocol supported by Cisco ADE-OS, such as TFTP or SFTP.

For example:

```
copy tftp://staging-server/backups/anm-4.3-backup.tar.gz disk:
```

Step 8 Load the inventory of network devices from the backup by entering the following command:

anm-tool load-inventory disk:*filename*

where *filename* is the name of the backup that you copied to disk: in Step 7.

Step 9 If the ANM server backup was created on an ANM server operating in HA mode, you must configure ANM to operate in standalone mode by doing the following:

a. Enter the following command:

anm-property set ha.enable false

b. Perform a reconfiguration of ANM so that it can restart in HA mode as follows:

anm-tool configure

The following anm-tool configuration output appears. Answer the prompts as shown below:

Note If you do not require a change to the port selections in the anm-tool configuration output, press **Enter** when prompted to keep the default port selection(s).

```
Configuring ANM

Checking ANM configuration files
  Keep existing ANM configuration? [y/n]: n
  Creating config file (/opt/CSCOanm/etc/cs-config.properties)

Enable HTTP for Web Server [false]:
Inbound Port for HTTP traffic to ANM Default [80]:
Enable HTTPS for Web Server [true]:
Inbound Port for HTTPS traffic to ANM Default [443]:

These are the values:
Enable HTTP for Web Server: false
Inbound Port for HTTP traffic to ANM Default: 80
Enable HTTPS for Web Server: true
Inbound Port for HTTPS traffic to ANM Default: 443

Commit these values? [y/n]: y
Committing values ... done
  Keeping existing configuration: /opt/CSCOanm/lib/java/thirdparty/ctm_config.txt
```

c. Restart ANM by entering the following command:

anm-tool restart

ANM reboots operating in standalone mode.

Related Topics

- Upgrading ANM Virtual Appliance Using an ANM Virtual Appliance Backup, page 2-9
- Upgrading ANM Virtual Appliance, page 2-8