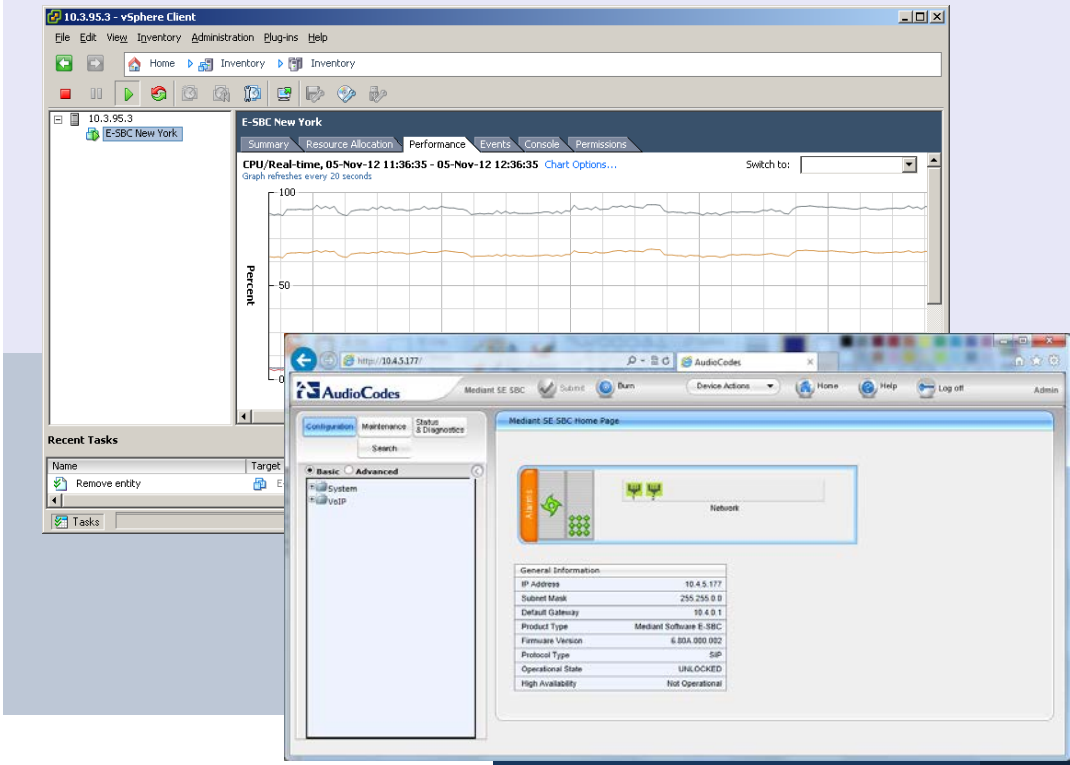
Mediant™ VE SBC

Session Border Controller

Virtual Edition

Installation Manual



HD VoIP Sounds Better

AudioCodes

Version 6.8

June 2015

Document #: LTRT-10352

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Notice

This document describes installation of AudioCodes' Mediant Virtual Edition (VE) SBC (Session Border Controller).

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Related Documentation

Manual Name
Mediant Server & Virtual Editions SBC User's Manual
SIP Release Notes

Note: The scope of this document does not fully cover security aspects for deploying the product in your environment. Security measures should be done in accordance with your organization's security policies. For basic security guidelines, see *AudioCodes Recommended Security Guidelines*.

1 Introduction

AudioCodes' Mediant Virtual Edition (VE) Session Border Controller (SBC) is a software product installed and hosted in a virtual machine environment, enabling connectivity and security between enterprises' and Service Providers' VoIP networks.

The Mediant VE SBC provides perimeter defense as a way of protecting companies from malicious VoIP attacks; voice and signaling mediation and normalization for allowing the connection of any PBX and/or IP-PBX to any Service Provider; and service assurance for service quality and manageability.

The product also offers call "survivability", ensuring service continuity to enterprises served by a centralized SIP-based IP-Centrex server or branch offices of distributed enterprises. Survivability functionality enables internal office communication between SIP clients in the case of disconnection from the centralized SIP IP-Centrex server or IP-PBX.

The product features full management through its HTTP/S-based Web server. This user-friendly Web interface allows remote configuration using any standard Web browser (such as Microsoft™ Internet Explorer™).

The product enables customers to significantly cut costs due to reduced hardware, power and cooling requirements.

1.1 Product Package

The Mediant VE SBC is delivered as a virtual appliance that can be deployed on VMware® vSphere ESXi™ 5 Hypervisor or Microsoft Hyper-V Server. Customers can choose how to obtain the product package according to preference. Two supply options are available:

- The product is supplied as a link, provided by AudioCodes, to a downloadable ZIP file containing the compressed virtual appliance image file.
- The product is also supplied as a DVD disk, containing the compressed virtual appliance image file.

1.2 Installation Prerequisites

The Mediant VE SBC software can be installed in two configurations:

- Low capacity SBC - using a single vCPU and 2GB RAM
- High capacity SBC - using 4 vCPUs and 4GB RAM

1.2.1 VMware vSphere ESXi Hypervisor / Microsoft Hyper-V Server

The physical server, on which Mediant VE SBC is installed, should have either VMware vSphere ESXi or Microsoft Hyper-V Server hypervisor preinstalled. Its hardware should be certified for the hypervisor being used and should meet these specifications:

Table 1-1: VMware vSphere ESXi / Microsoft Hyper-V Server Specifications

Resource	Specifications
Hypervisor	VMware ESXi version 5.1 or later Microsoft Hyper-V Server 2012 R2 or later
Processor type	64-bit Intel® CPU with support for hardware virtualization (Intel VT-x) enabled and AES-NI support
Number of CPU cores	Low capacity SBC: 4 cores or more High capacity SBC: 6 cores or more
Memory	8 GB or more
Disk space	60 GB or more
Network interfaces	2 or more

Note: The VMware vSphere ESXi / Microsoft Hyper-V are 'bare-metal' hypervisors installed directly on top of the physical server.

For instructions on installing VMware vSphere ESXi, see www.vmware.com.

For instructions on installing Microsoft Hyper-V, see the *Hyper-V Getting Started Guide* at http://technet.microsoft.com

1.2.2 Mediant VE SBC Virtual Machine

Mediant VE SBC runs in a virtual machine that must meet these minimum specifications:

Table 1-2: Mediant VE SBC Virtual Machine Specifications

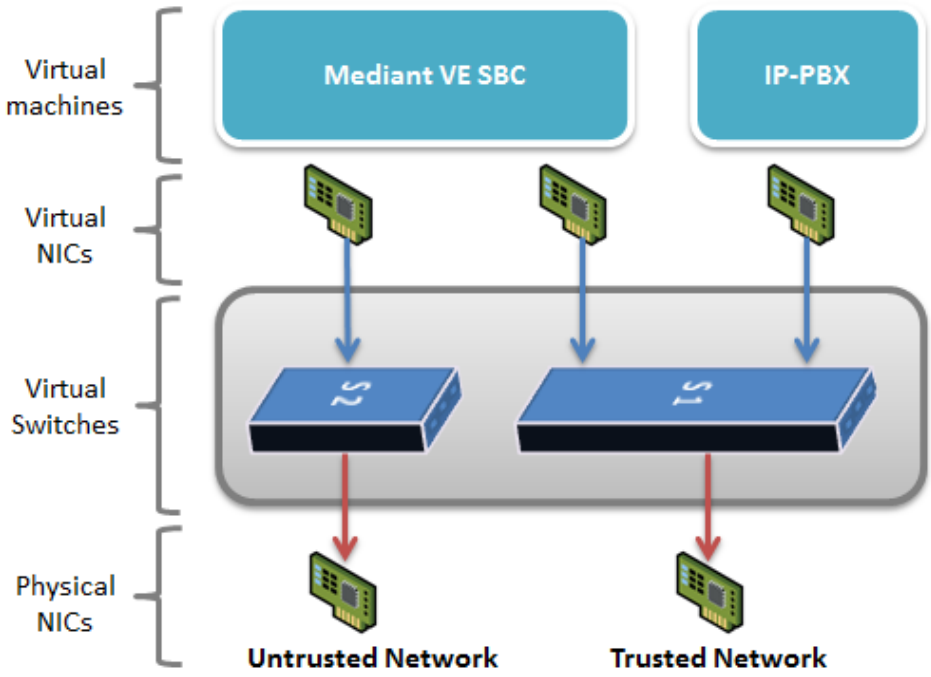
Resource	Specifications
Virtual CPU	Low capacity SBC: 1 vCPU High capacity SBC: 4 vCPUs Each vCPU must correspond to a physical CPU core fully reserved for the SBC VM.
Memory	Low Capacity SBC: 2 GB High Capacity SBC: 4 GB
Disk space	10 GB
Virtual Network Interfaces	2 vNICs are recommended (for trusted / untrusted traffic), an additional vNIC is recommended for HA configurations

The VM is automatically created when Mediant VE SBC virtual appliance is deployed.

1.2.3 Virtual Networking Configuration

The virtual machine hypervisor should be pre-configured with two virtual networks designated for trusted and untrusted network traffic correspondingly.

Figure 1-1: Virtual Networking Configuration



2 Installing the Mediant VE SBC

2.1 Installing Mediant VE SBC on VMware vSphere ESXi

This section shows the installation process of Mediant VE SBC on VMware vSphere ESXi 5.1 or later using the VMware vSphere client.

The installation process might differ for other hypervisor versions and installation methods (e.g. vCenter).

➢ **To install:**

1. Deploy the OVF Template (see Section 2.1.1).
2. Adjust the deployed VM (see Sections 2.1.2 and 2.1.3)
3. Start the Mediant VE SBC (see Section 2.1.4)
4. Reconfigure the default IP address to match your network settings (see Section 2.3).

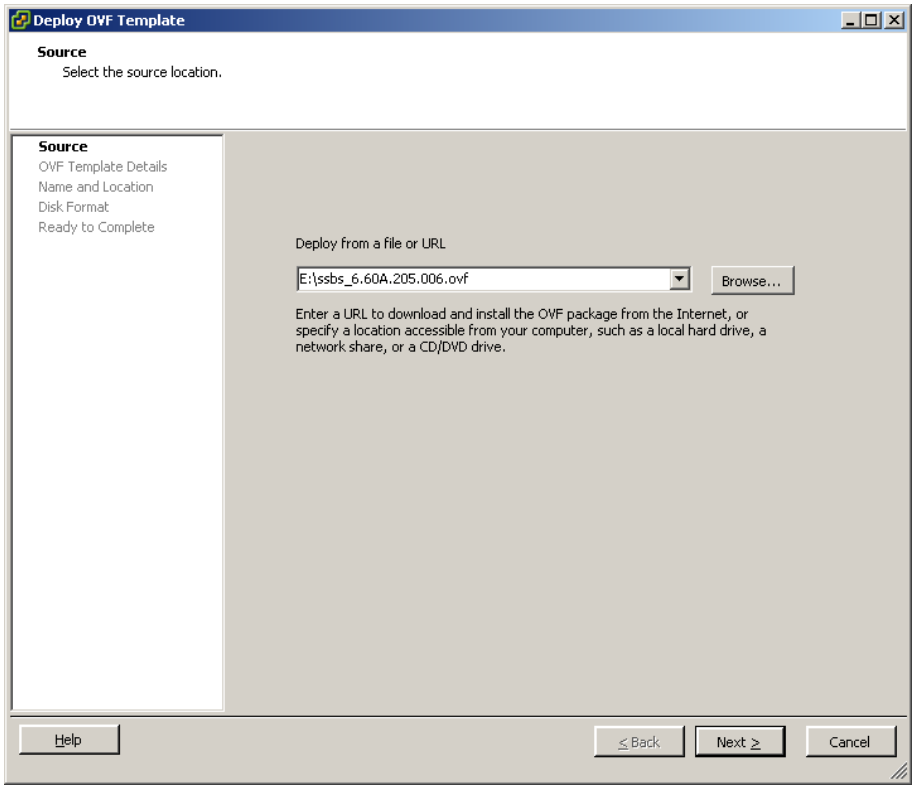
2.1.1 Deploying the OVF Template File

The Mediant VE SBC is distributed in the form of an Open Virtualization Format (OVF) file.

➢ **To deploy the file:**

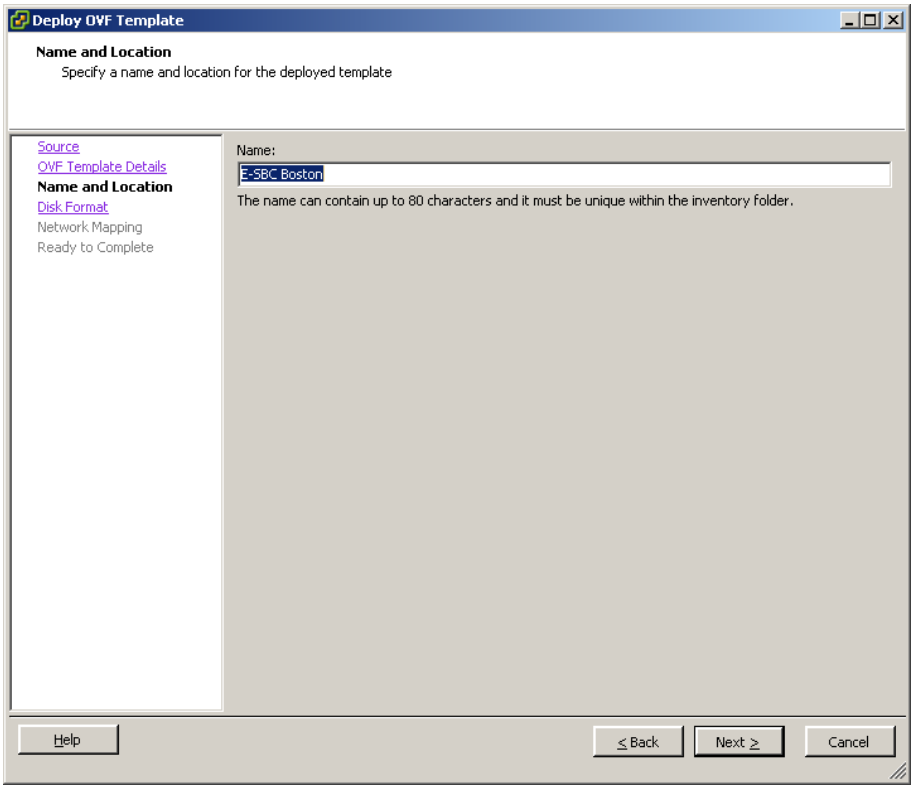
1. Log into vSphere client.
2. Select **File** > **Deploy OVF Template** and locate the host server on which to install the OVF Template file.
3. Browse to and select the SBC.ovf file supplied by AudioCodes.

Figure 2-1: Deploying the OVF Template – Selecting the OVF Template File



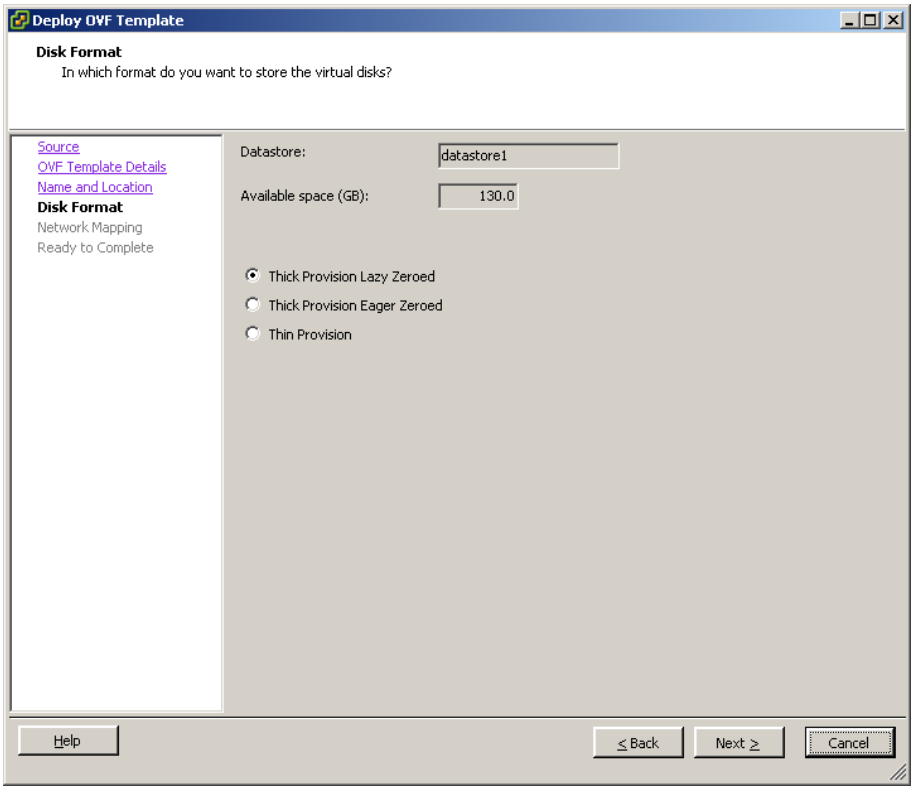
4. View the OVF details and click **Next**.
5. Select a name for the deployed template and click **Next**.

Figure 2-2: Deploying the OVF Template – Selecting VM Name



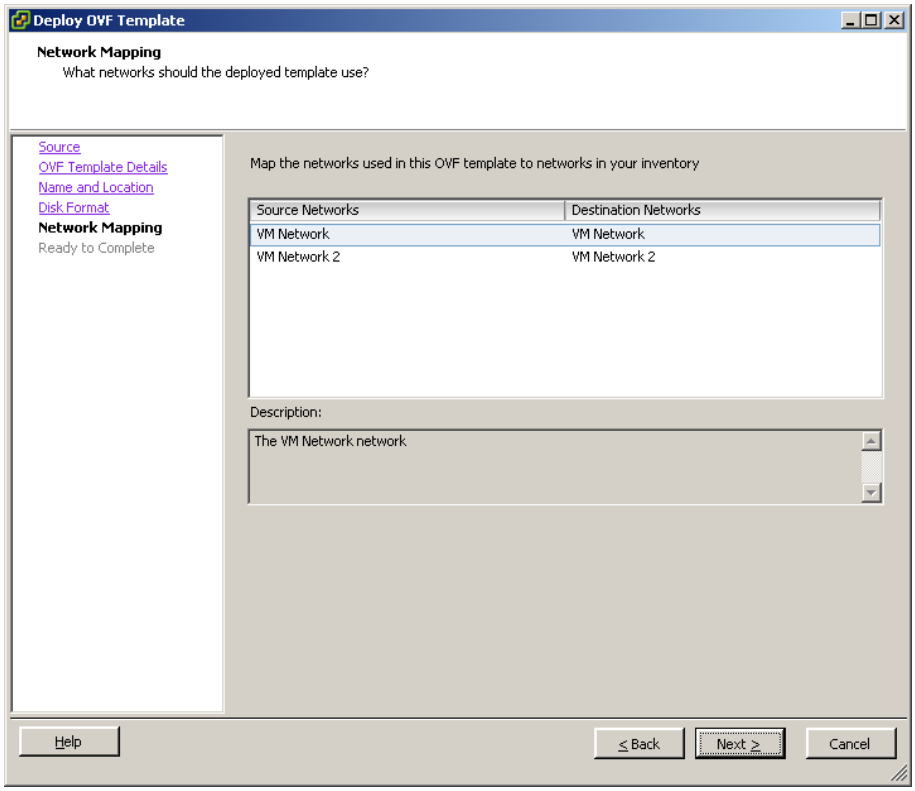
6. Select the **Thick Provision Lazy Zeroed** option and click **Next**.

Figure 2-3: Deploying the OVF Template - Selecting Disk Format



7. Select the Destination Network(s) to which two of the SBC virtual Network Interface Cards will be connected. Note that Destination Network(s) name(s) depend on VMware host configuration. The OVF template provides the virtual machine with two NICs of type VMXNET3. After installation of the SBC virtual machine, you can change the number of network connections and/or their type (see Appendix A, Configuring the Network, on page 29). Click **Next**.

Figure 2-4: Deploying the OVF Template - Selecting the VM Network



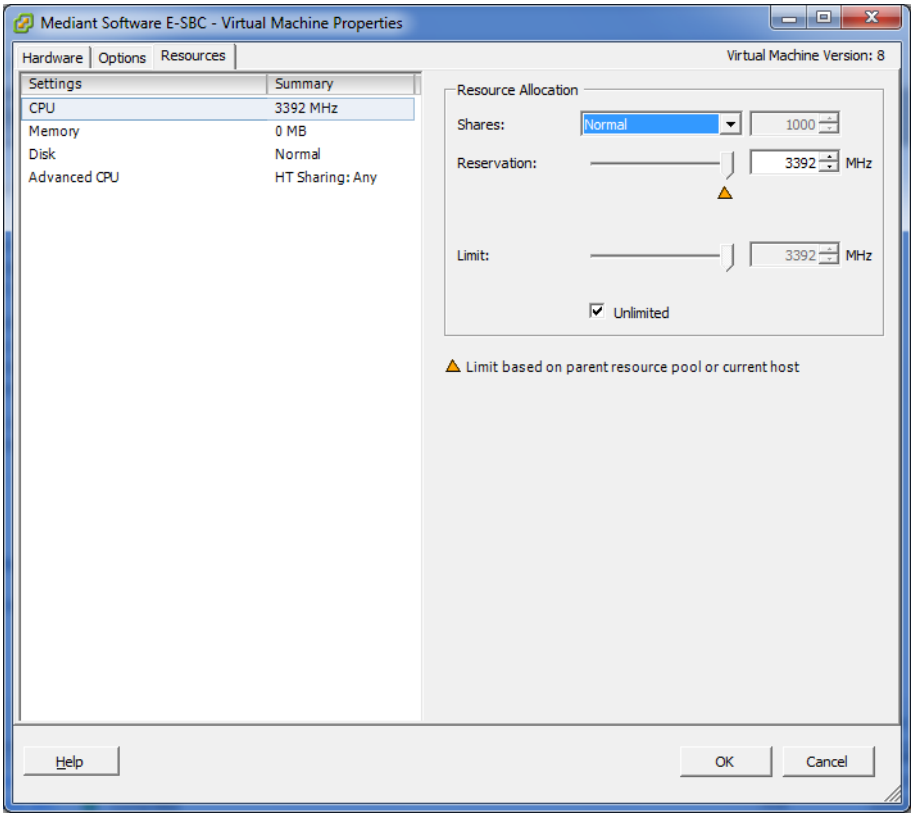
8. Wait for the deployment process to complete.
9. Adjust the deployed VM as described in Sections 2.1.2 and 2.1.3.

2.1.2 Adjusting the Virtual Machine for the Low Capacity SBC

➢ **To adjust the deployed VM for the Low Capacity SBC:**

1. Locate the new VM in the tree under your host, right-click it and select **Edit Settings;** the SBC Virtual Machine Properties screen opens.
2. Click the **Resources** tab, under Settings select **CPU**, configure 'Reservation' of the CPU frequency to the core CPU speed (maximum value). This will ensure that the full physical CPU core will be reserved for the Mediant VE SBC virtual machine. For example, for Intel® Xeon™ E5-2640, with a core frequency of 2.5 GHz, reserve 2.5 GHz.

Figure 2-5: Adjusting VM for the Low Capacity SBC – Reserve CPU Frequency



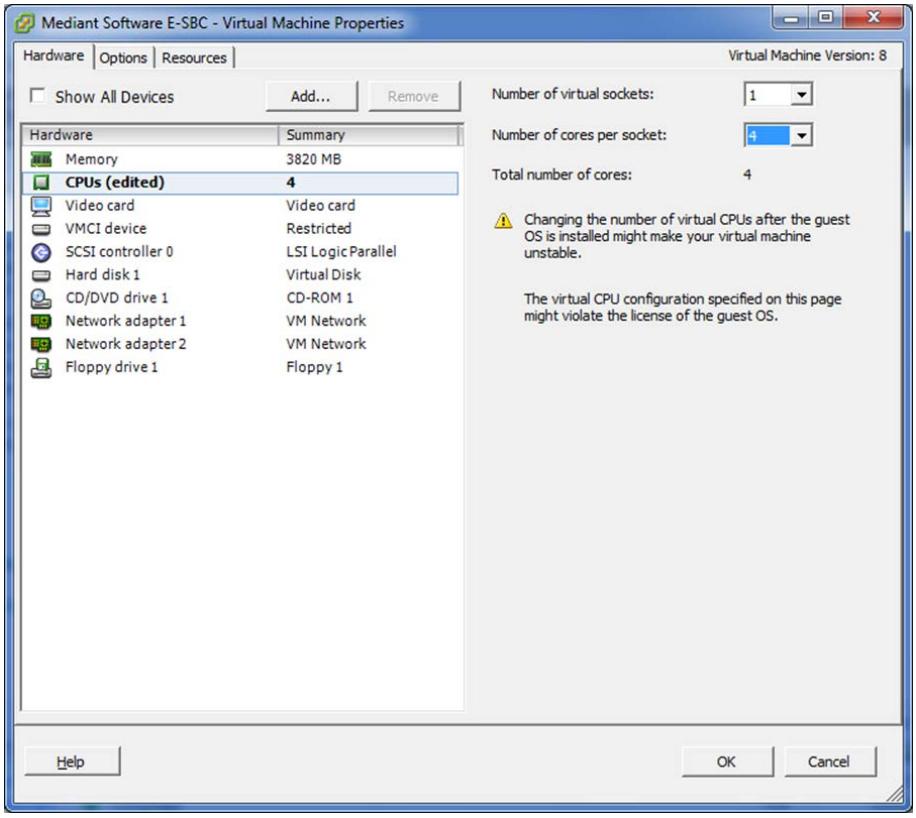
3. Select the 'Unlimited' option if it isn't already selected.
4. Click **OK**.

2.1.3 Adjusting the Virtual Machine for the High Capacity SBC

➢ **To adjust the deployed VM for the High Capacity SBC:**

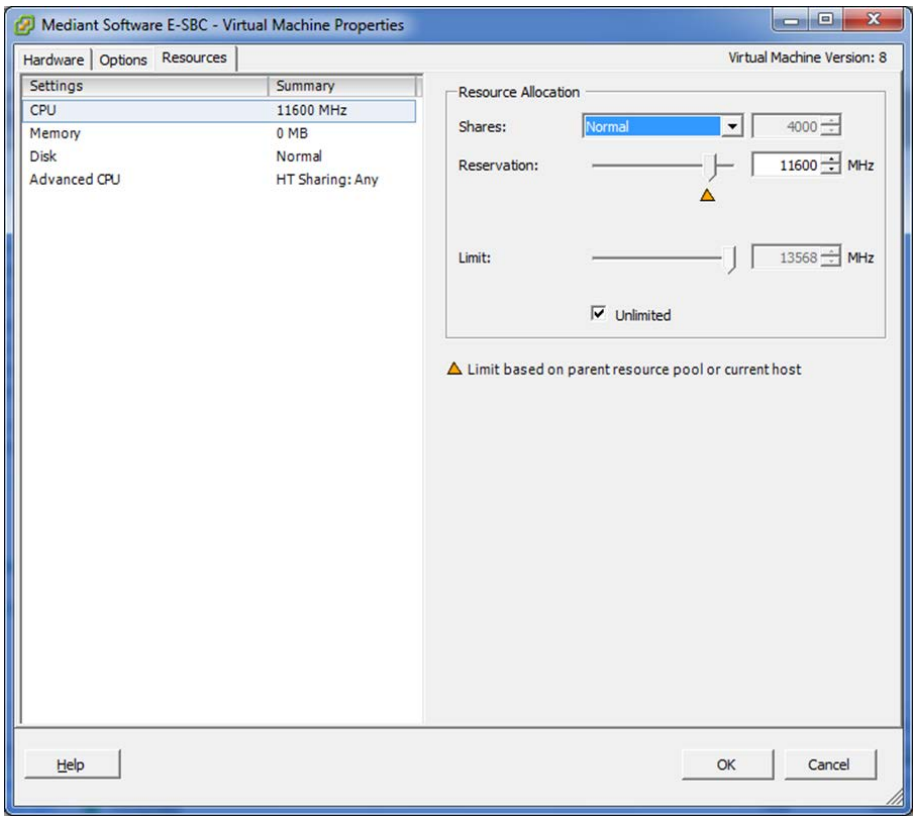
1. Locate the new VM in the tree under your host, right-click it and select **Edit Settings;** the SBC Virtual Machine Properties screen opens.
2. Click the **Hardware** tab, click **CPUs**, and then increase 'Number of cores per socket' to **4**.

Figure 2-6: Adjusting VM for High Capacity SBC - Increase 'Number of cores' to 4



3. Click the **Resources** tab; the screen shown in Figure 2-7 is displayed.

Figure 2-7: Adjusting VM for High Capacity SBC - Increase 'Number of cores' to 4 x Core CPU Speed



4. Under Settings, select **CPUs**, configure 'Reservation' of CPU frequency to 4 times the core CPU speed. This will ensure that four full physical CPU cores will be reserved for the Mediant VE SBC virtual machine. For example, for Intel® Xeon™ E5-2640 with a core frequency of 2.5 GHz, reserve 10 GHz. Select the 'Unlimited' option if it isn't already selected.
5. Click **Finish**.

2.1.4 Starting the Mediant VE SBC

1. In vSphere, right-click the name of the Virtual Machine, and then click **Power On**.
2. Proceed to Section 2.3.

2.2 Installing the Mediant VE SBC on Microsoft Hyper-V

This section shows the installation process of Mediant VE SBC on Microsoft Hyper-V Server 2012 R2.

➢ **To install:**

1. Install the Virtual Machine (see Section 2.1.12.2.1).
2. Adjust the deployed VM (see Sections 2.2.3 and 2.1.3)
3. Start the Mediant VE SBC (see Section 2.1.4)
4. Reconfigure the default IP address to match your network settings (see Section 2.3).

This section shows how to install the Mediant VE SBC on Microsoft Hyper-V.

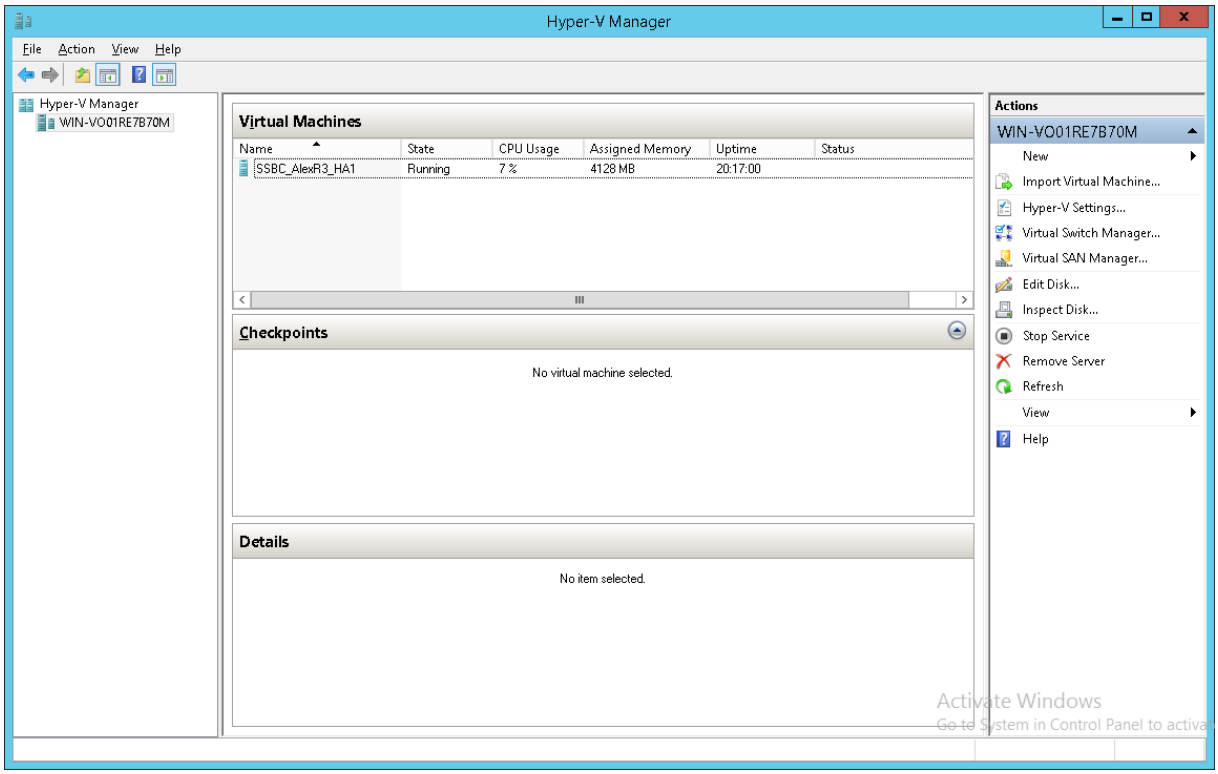
2.2.1 Installing the Virtual Machine

The Mediant VE SBC is distributed in the form of a VM image.

➢ **To install the Mediant VE SBC on Microsoft Hyper-V:**

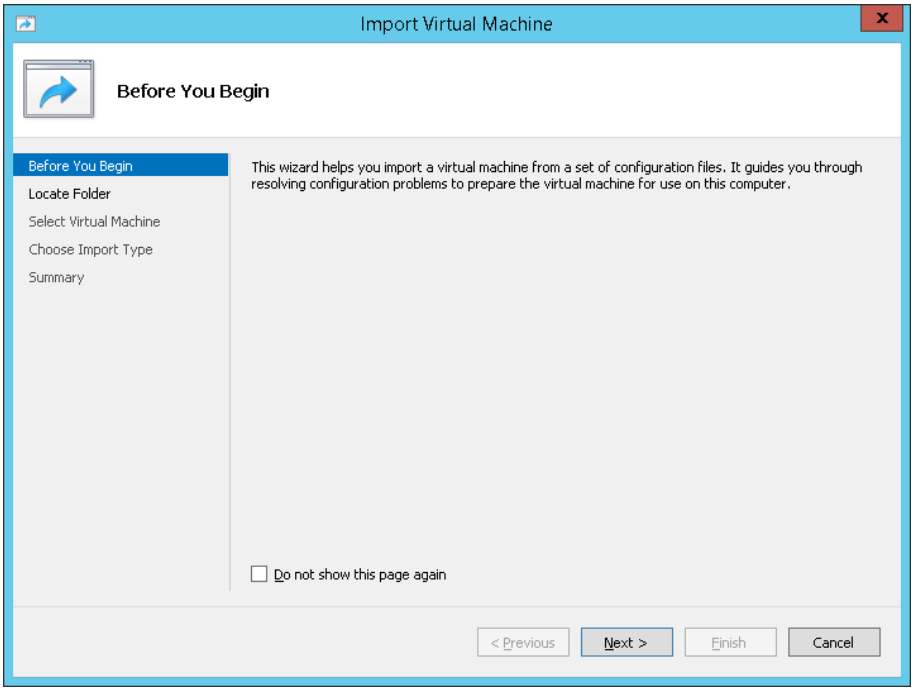
1. Extract the zip file containing the SBC VM installation received from AudioCodes, to a local directory.
2. Open Hyper-V Manager by clicking **Start** > **Administrative Tools** > **Hyper-V Manager**.

Figure 2-8: Installing the Mediant VE SBC on Hyper-V – Hyper-V Manager



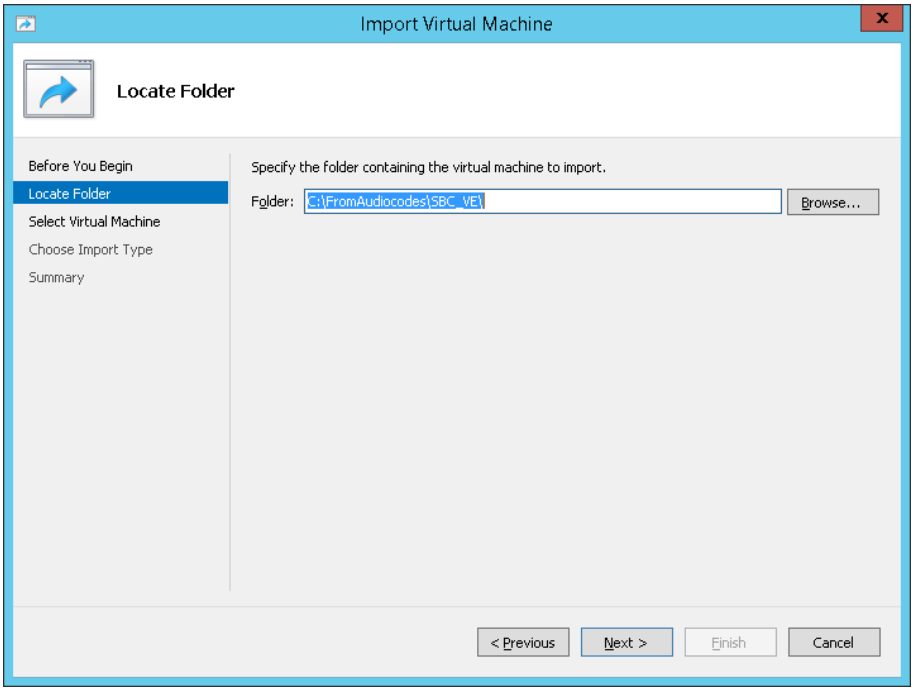
3. Start Import Virtual Machine wizard by clicking **Action** > **Import Virtual Machine**
4. At the “Before You Begin” screen click Next.

Figure 2-9: Installing Mediant VE SBC on Hyper-V – Import Virtual Machine Wizard



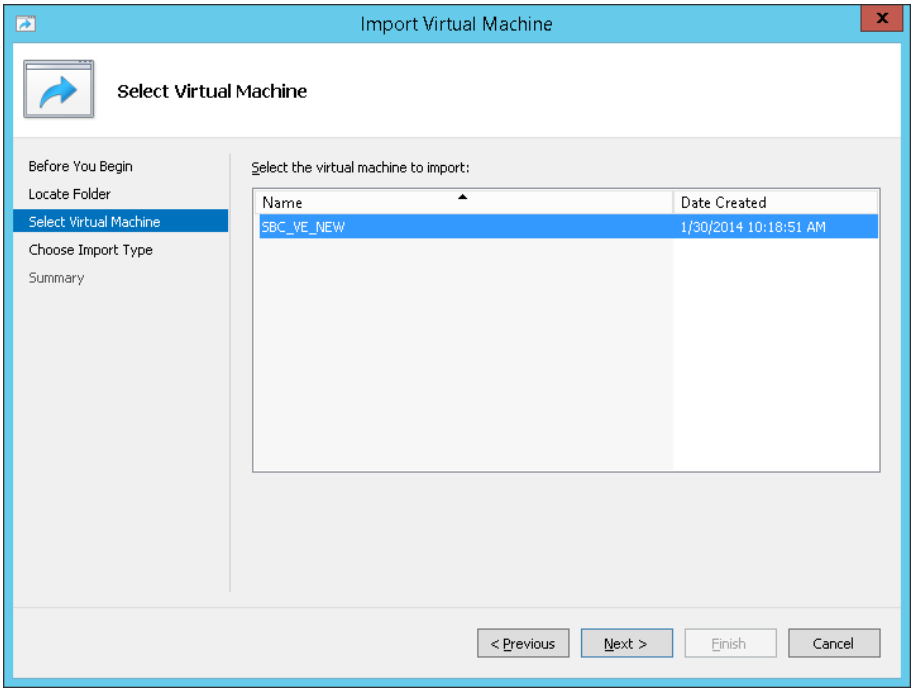
5. Enter the location of the VM installation received from AudioCodes, and click **Next**.

Figure 2-10: Installing Mediant VE SBC on Hyper-V – Enter Location of VM Installation



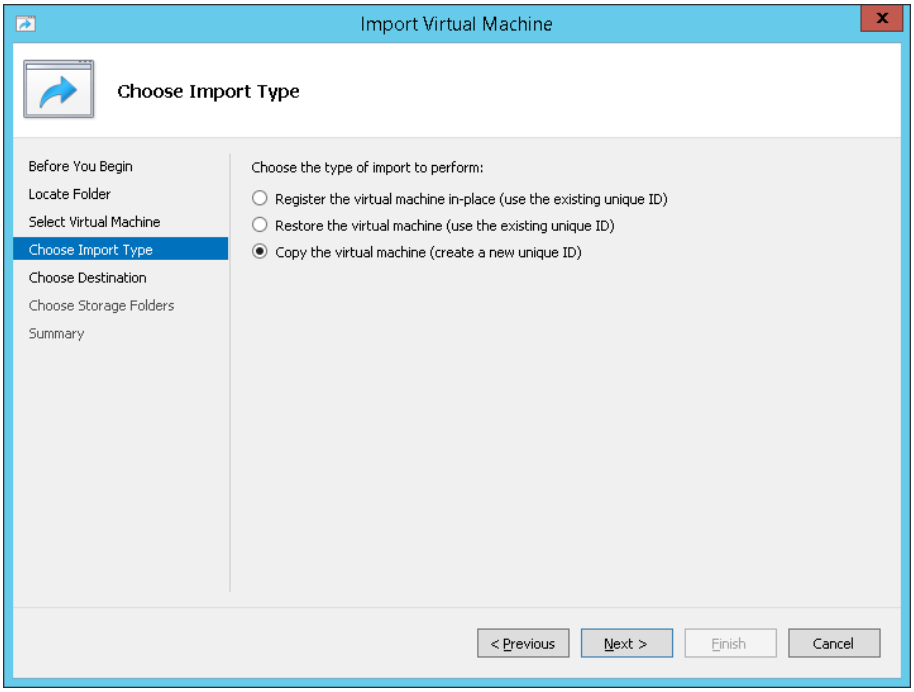
6. Select the Virtual Machine and click **Next**.

Figure 2-11: Installing Mediant VE SBC on Hyper-V – Select Virtual Machine



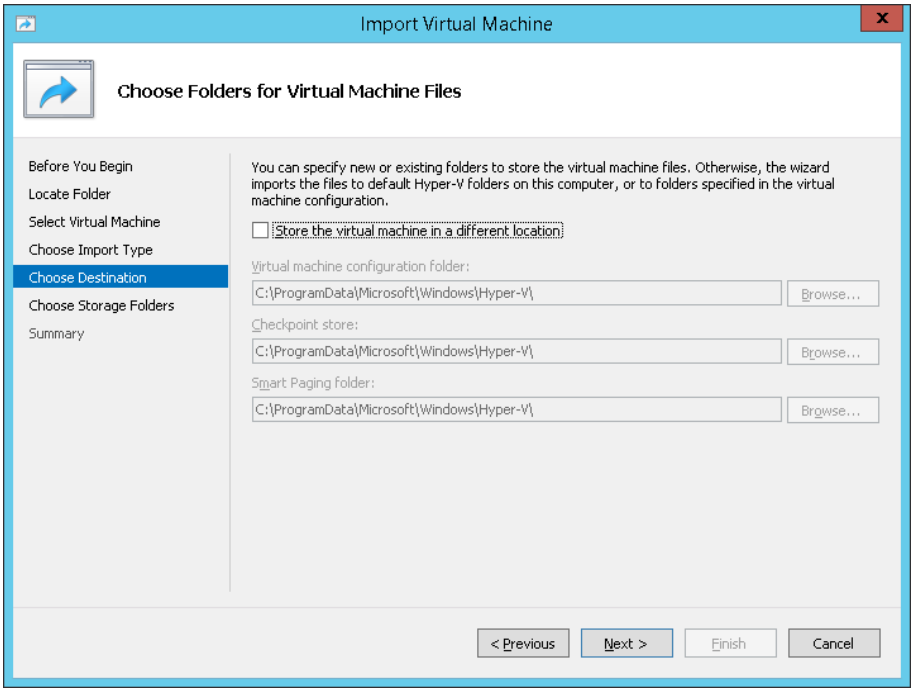
7. Choose **Copy virtual machine** import type and click **Next**.

Figure 2-12: Installing Mediant VE SBC on Hyper-V – Choose Import Type



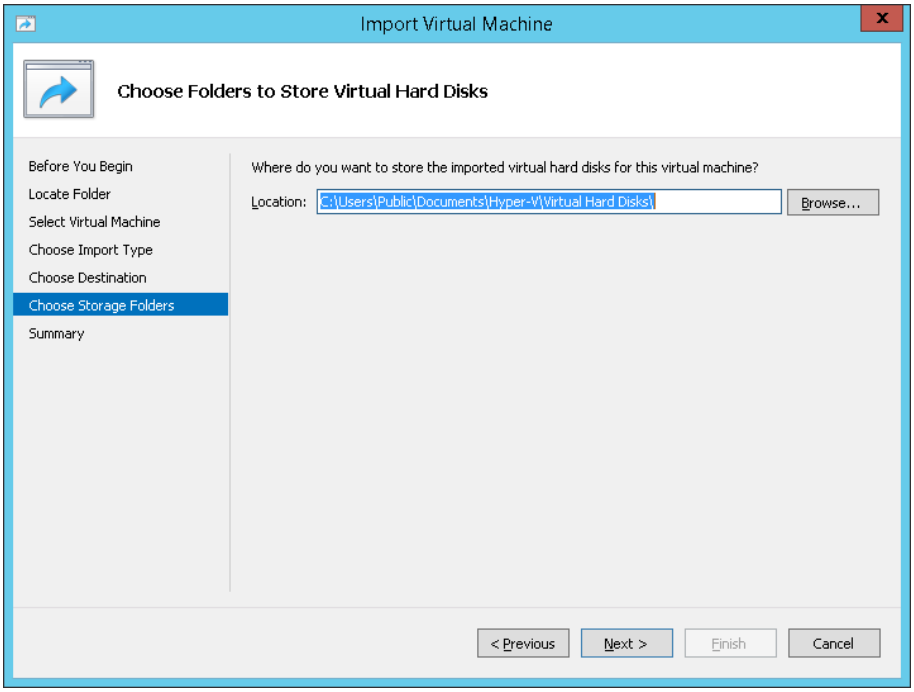
8. Choose the folders in which to store the Virtual Machine on your storage..

Figure 2-13: Installing Mediant VE SBC on Hyper-V – Choose Destination

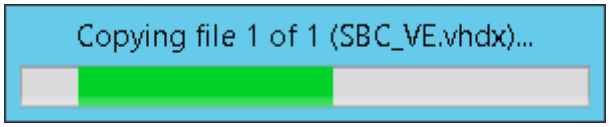


9. Select the location of the virtual hard disk and click **Next**.

Figure 2-14: Installing Mediant VE SBC on Hyper-V – Choose Storage Folders



10. Click **Finish** to start the creation of the VM; the installation progress indicator is shown.



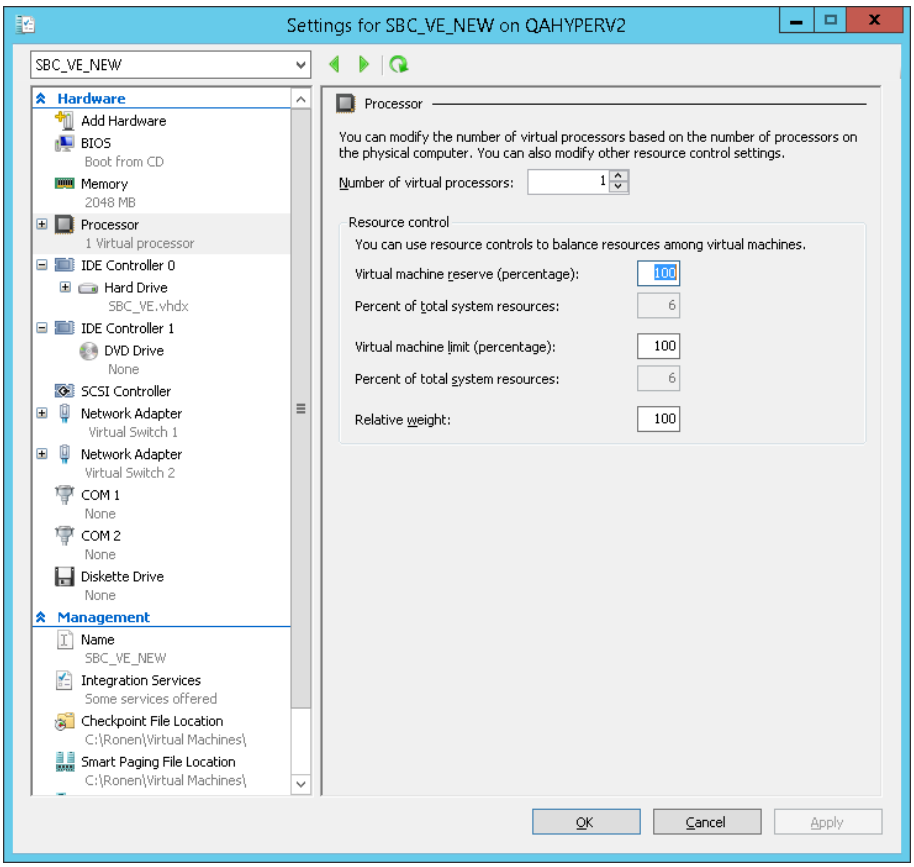
11. After the VM is created, adjust its properties as described in Sections 2.2.2 2.2.3and 2.1.3.

2.2.2 Adjusting the Virtual Machine for the Low Capacity SBC

➢ **To adjust the installed VM for the Low Capacity SBC:**

1. Locate the new VM in the tree in the Hyper-V Manager, right-click it, and select **Settings**; the SBC Virtual Machine Properties screen opens.

Figure 2-15: Adjusting VM for the Low Capacity SBC – Settings



2. Select **Processor** in the **Hardware** list.
3. Configure **'Virtual machine reserve (percentage)'** to **100%**, and then click **OK**.

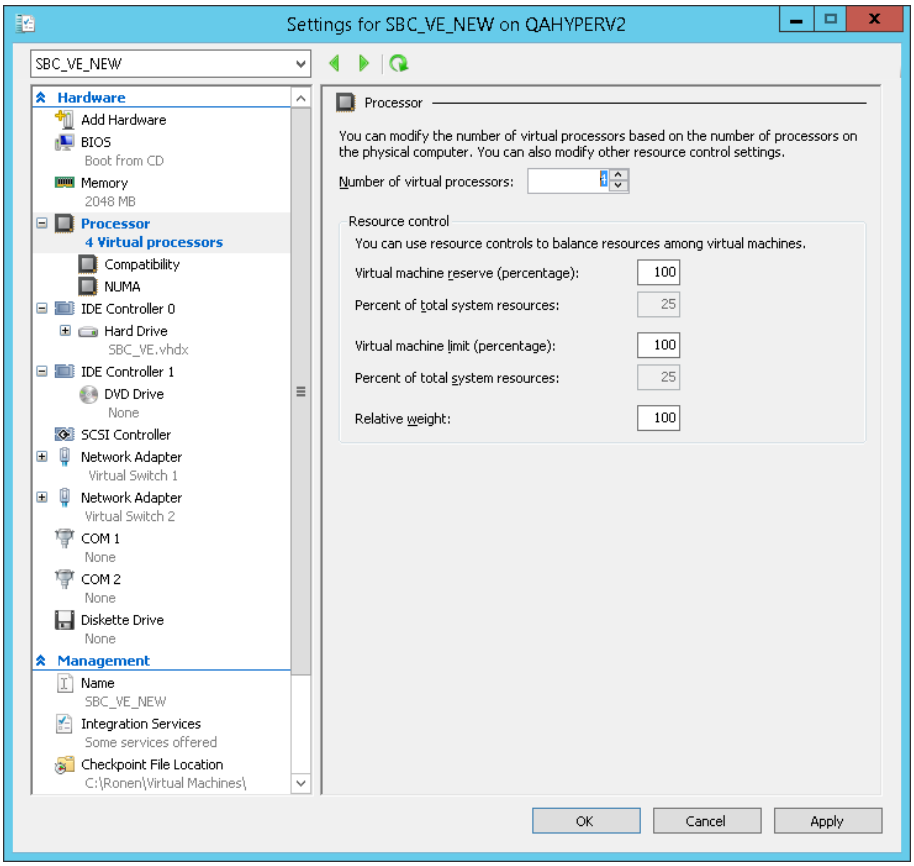
2.2.3 Adjusting the Virtual Machine for the High Capacity SBC

This section shows how to adjust the Virtual Machine for the High Capacity SBC.

➢ **To adjust the installed VM for the High Capacity SBC:**

1. Locate the new VM in the tree in the Hyper-V Manager, right-click it, and then select **Settings**; the SBC Virtual Machine Properties screen opens.

Figure 2-16: Adjusting VM for High Capacity SBC – Set 'Number of virtual processors' to 4



2. Select **Processor** in the **Hardware** list.
3. Configure the **'Number of virtual processors'** to be **4**.
4. Configure **'Virtual machine reserve (percentage)'** to **100%,** and then click **OK**.

2.2.4 Starting the Mediant VE SBC

1. In Hyper-V Manager, right-click the name of the virtual machine, and then click **Connect**.
2. In the Virtual Machine Connection window, click **Start**.
3. Proceed to Section 2.3.

2.3 Reconfiguring Default IP Address to Match Network Settings

After installation, the Mediant VE SBC is assigned a default IP address that will most likely be inaccessible from the customer's network. This address is assigned to the first virtual network interface card, connected to the 'trusted' virtual network switch during Mediant VE SBC installation.

Table 2-1: Default IP Address

Parameter	Value
IP Address	192.168.0.1
Subnet Mask	255.255.255.0

Reconfigure the IP address in order to connect to the Mediant VE SBC's Web-based Management Tool (hereafter referred to as 'Web interface'). The procedure below describes how to change the default IP address using the CLI. The procedure uses the regular CLI commands. Alternatively, you can use the CLI Wizard utility to set up your Mediant VE SBC with the initial OAMP settings. The utility provides a fast-and-easy method for initial configuration of the Mediant VE SBC through CLI. For more information, refer to the *CLI Wizard User's Guide*.

➢ **To reconfigure the IP address using CLI:**

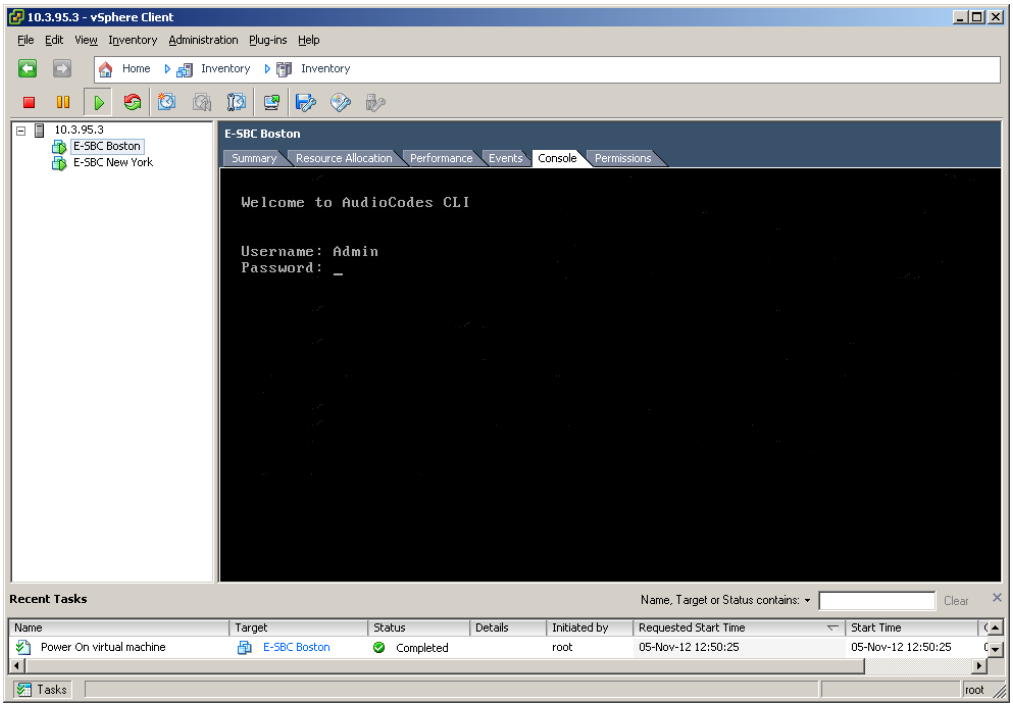
1. Connect to the VM's console (e.g., in vSphere, switch to **Console** tab); you will be presented with the CLI management interface.
2. At the prompt, type the username (default is **Admin** - case sensitive), and then press ENTER:

```
Username: Admin
```

3. At the prompt, type the password (default is **Admin** - case sensitive), and then press ENTER:

```
Password: Admin
```

Figure 2-17: CLI Management Interface



4. At the prompt, type **enable** and press ENTER:

```
Mediant SW> enable
```

5. At the prompt, type the password again and press ENTER:

```
Password: Admin
```

6. At the prompt, type the following commands to access the network interface configuration:

```
Mediant SW# configure voip
Mediant SW(config-voip)# interface network-if 0
Mediant SW(network-if-0)#
```

Note: Use the Tab key to auto-complete partially entered commands.

7. At the prompt, type the following commands to configure the IP address, prefix length and default gateway:

```
Mediant SW(network-if-0)# ip-address 10.4.212.155
Mediant SW(network-if-0)# prefix-length 16
Mediant SW(network-if-0)# gateway 10.4.0.1
```

Note: The IP and gateway addresses above are *by way of example* only. Use IP and gateway addresses appropriate to your network configuration.

8. At the prompt, type **exit** to complete the **network-if** configuration:

```
Mediant SW(network-if-0)# exit
```

9. If Mediant SE SBC is connected to the IP network that uses VLAN ID, type the following commands to configure it (otherwise skip to step 10):

```
Mediant SW(config-voip)# interface network-dev 0
Mediant SW(network-dev-0)# vlan-id 10
Mediant SW(network-dev-0)# exit
```

10. At the prompt, type **exit** to complete the configuration:

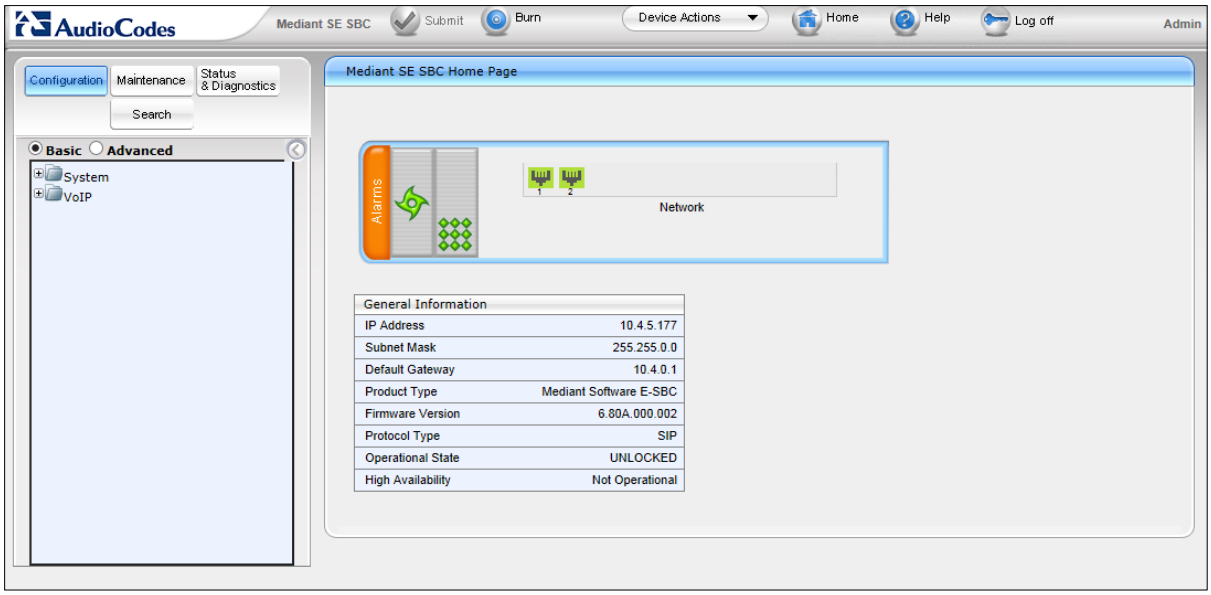
```
Mediant SW(config-voip)# exit
```

11. At the prompt, type **reload now** to reset the product and activate the new configuration:

```
Mediant SW# reload now
```

After the Mediant VE SBC restarts, connect to its Web interface to continue the provisioning (see the *Mediant Server & Virtual Editions SBC User's Manual* for details).

Figure 2-18: Web Interface



2.4 Identifying Incompatible Hardware Components

Each time Mediant VE SBC is started it validates its VM configuration and issues a warning if incompatible hardware and/or VM configuration is detected. The warning is displayed at the VM console for 10 seconds during the boot up sequence, after which normal start up sequence continues.

You can also view details of the VM configuration and/or hardware platform using the **show system hardware** CLI command. Incompatible components are indicated with an asterisk (*).

Note: Incompatible components should be replaced or, alternatively, not be mapped to the SBC VM.

The example below shows an incompatible NIC:

```
# show system hardware
cpu: Intel<R> Xeon<R> CPU E31220 @ 3.10GHz, total 4 cores
memory:  4096 MB
chassis: Microsoft Hyper-V Server
network:
Intel Corporation 82574L Gigabit Network Connection
Intel Corporation 82574L Gigabit Network Connection
*Realtek Semiconductor Co., Ltd. RTL-8169 Gigabit Ethernet (rev 10)
*Realtek Semiconductor Co., Ltd. RTL-8169 Gigabit Ethernet (rev 10)
```

2.5 Changing MAC Addresses from 'Dynamic' to 'Static'

By default, the MAC addresses of the SBC Virtual Machine are set dynamically by the hypervisor. Consequently, they might be changed under certain circumstances – for example, after moving the VM between Hyper-V hosts.

To prevent this, it's advisable to change the MAC Addressees from Dynamic to Static.

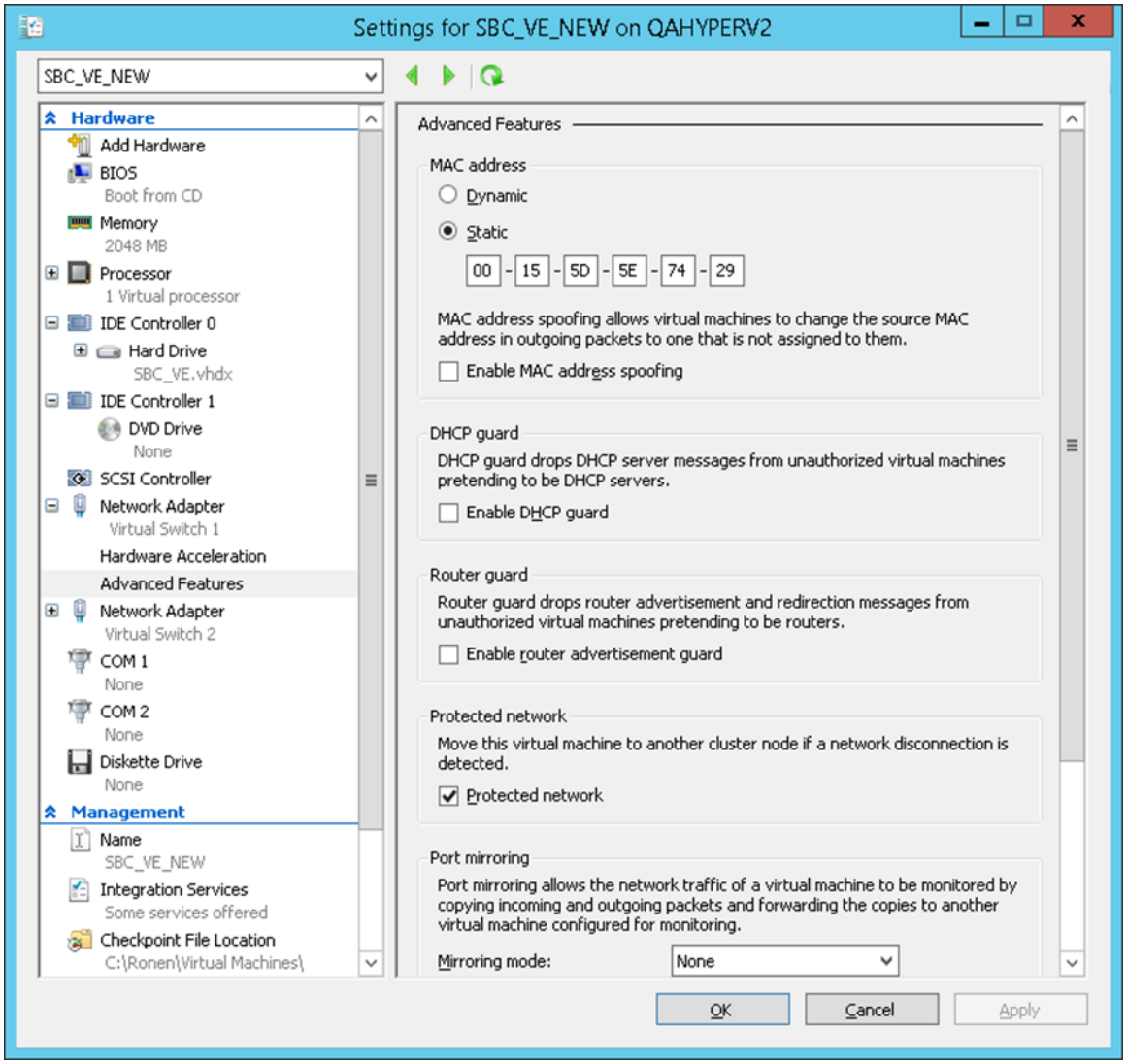
2.5.1 Changing MAC Addresses to 'Static' in Microsoft Hyper-V

This section shows how to change the MAC address to **Static** in Microsoft Hyper-V.

➢ **To change the MAC address to 'Static' in Microsoft Hyper-V:**

1. *Turn-off* the SBC VM.
2. Enter the **Settings** of the selected SBC VM
3. For each **Network Adapter**, do the following:
   a. Choose **Advanced Features**
   b. Change the 'MAC address' option to **Static**.

Figure 2-19: Advanced Features - Network Adapter – Static MAC Address



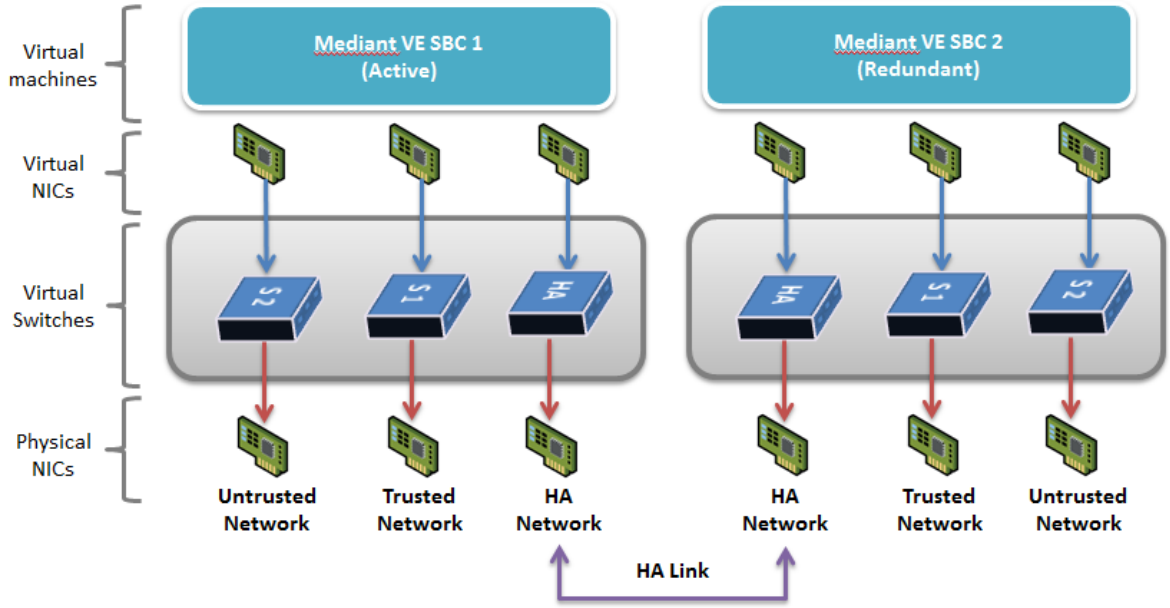
2.6 Installing an HA System

Users can configure two Virtual Machines, running on different servers to work in a High Availability (HA) configuration.

➢ **To configure an HA system:**

1. Reconfigure a temporary IP address for each device, according to the instructions under Section 2.3.
2. To support HA functionality, the devices must be installed with the an HA-enabled license. Follow the instructions described in Section 3 on page 27 for licensing each device in the HA system.
3. Follow the instructions described in the section 'High Availability System' in the Mediant *Server & Virtual Editions SBC User's Manual*, and configure each device accordingly using the Web interface.

Figure 2-20: Virtual Networking Configuration for HA System



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3 Licensing the Product

After you have successfully completed the software installation, you need to obtain and install the Software License Key file to enable the call capacity and features that you ordered with the product, as described in the following subsections.

Note: For HA systems, each unit has its own Serial Number, Product Key and Software License Key. Therefore, the instructions in this section must be done for each unit.

3.1 Entering the Product Key

The Product Key is used to identify a specific purchase of your device installation for the purpose of subsequent communication with AudioCodes, for example, for support and software upgrades. The Product Key is provided in the email confirmation at the time the product is purchased and must be entered on the product through the Web interface, as described below.

➢ **To enter the Product Key:**

1. Open the Software Upgrade Key Status page (**Maintenance** tab > **Software Update** menu > **Software Upgrade Key**).

Figure 3-1: Product Key on Software Upgrade Key Status Page

2. In the 'Product Key' field, enter the Product Key.
3. Click the **Change Product Key** button.

You can view the Product Key on the Device Information page (**Status & Diagnostics** tab > **System Status** menu > **Device Information**).

3.2 Obtaining the Software License Key

The procedure below describes how to obtain the Software License Key.

➢ **To obtain the Software License Key:**

1. Make a note of the product Serial Number. The Serial Number is displayed in the 'Serial Number' field on the Device Information page (**Status & Diagnostics** tab > **System Status** menu > **Device Information**).
2. Activate your product through AudioCodes License Activation tool at http://www.audiocodes.com/swactivation. You will need your Product Key and Fingerprint (Serial Number) for this activation process. The Product Key was provided to you in the e-mail that was sent to confirm your purchase order from AudioCodes. Upon activation, an e-mail will be sent to you with a Software License Key file.
3. When you receive the new Software License Key file, open the file with any text-based program (e.g., Notepad), and then verify that the "**S/N**" value reflects the Serial Number of your product.

Warning: Do not modify the contents of the Software License Key file.

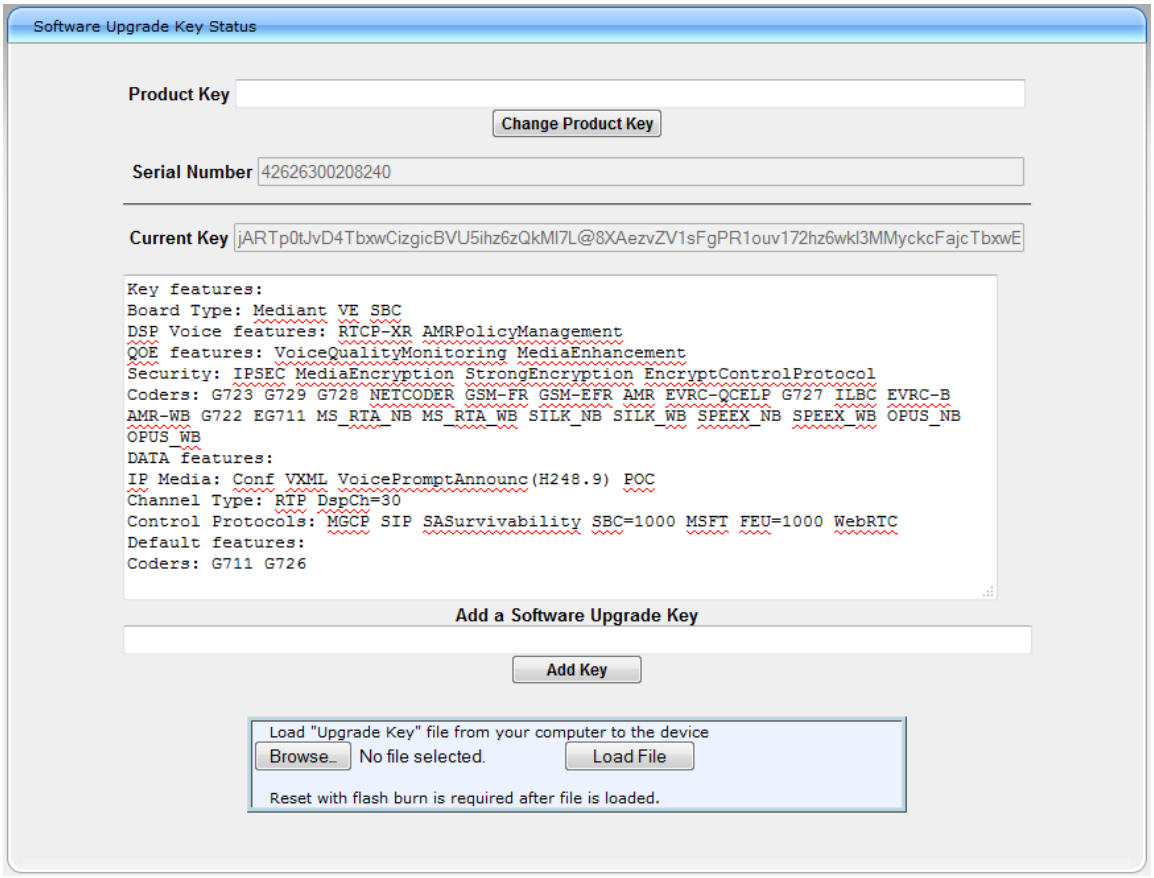
3.3 Installing the Software License Key

The procedure below describes how to install the received Software License Key.

➢ **To install the Software License Key:**

1. Open the Software Upgrade Key Status page (**Maintenance** tab > **Software Update** menu > **Software Upgrade Key**):

Figure 3-2: Software Upgrade Key Status Page



2. Back up the Software License Key currently installed on the product, as a precaution. You can reload this backup to restore the product's original capabilities if the key does not comply with your requirements.
   a. In the 'Current Key' field, select the entire text string and copy it to any standard text file (e.g., Notepad).
   b. Save the text file with any file name and file extension (e.g., key.txt) to a folder on your computer.
3. Open the Software License Key file using a text-based program such as Notepad.
4. Copy-and-paste the string from the file to the 'Add a Software Upgrade Key' field.
5. Click the **Add Key** button; the key is installed on the product and displayed in the 'Current Key' field.
6. Verify that the key was successfully installed. On the Software Upgrade Key Status page, check that the listed features and capabilities activated by the installed key match those that were ordered.
7. Reset the product; the new capabilities and resources enabled by the key are activated.

A Configuring the Network

A.1 Virtual NIC Types

The Mediant VE SBC virtual appliance provided by AudioCodes contains two virtual NICs.

For VMware ESXi:

- The OVF template contains two virtual NICs of type VMXNET3. This configuration provides optimal network and CPU performance. If you add additional virtual NICs, make sure that they are of the same VMXNET3 type.

For Hyper-V:

- The Virtual Machine image contains two virtual NICs of type “network adapter”. If you add additional virtual NICs, make sure that they are of the same type (and are not “legacy network adapters”).

Mediant VE SBC also supports passthrough NICs. This option gives the best network and CPU performance but requires allocation of a NIC to a specific VM without the capability of sharing it with other VMs. For details, refer to the *hypervisor documentation*.

Warning: For VMware, the Mediant VE SBC supports only virtual NICs of type VMXNET3. Other vNIC types, e.g., E1000 or VMXNET2, are not supported.

A.2 Changing the Number of Virtual NIC Adapters

You can add/remove virtual adapters to the Mediant VE SBC. When adding/removing a NIC, shutdown is required. For details, refer to the *hypervisor documentation*.

It’s recommended to take a System Snapshot before you add/remove a NIC (see Section B.1 on page 31).

A.3 Virtual Network Configuration

The virtual network can be configured in various configurations depending on your implementation, number of virtual machines, physical adapters, network security requirements, VLANs topology, etc.

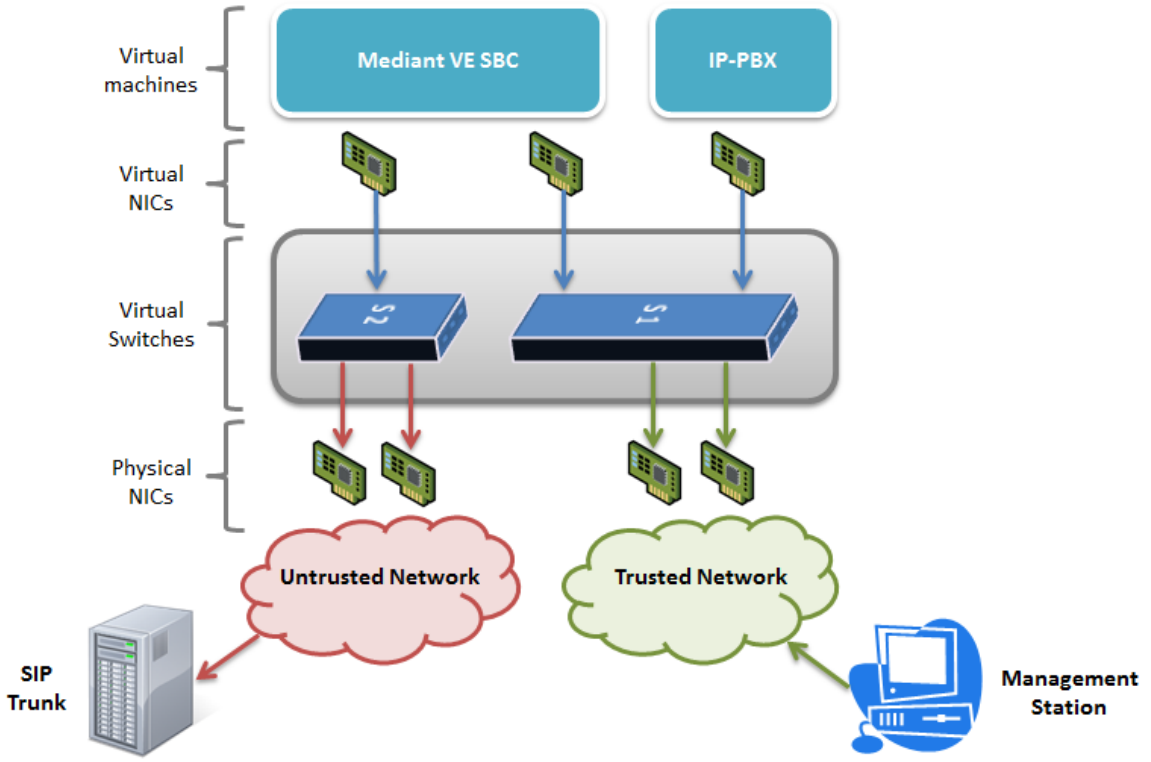
Use the following guidelines when implementing virtual network configuration:

- Create separate networks for trusted and untrusted traffic.
- Connect two physical network ports to each virtual network – to enable Ethernet port redundancy.

Note: Mediant VE SBC supports Ethernet port redundancy on its own (via Ethernet Groups that may be connected to two vNICs). In most deployments, however, this functionality is not needed – instead, only one vNIC is used and Ethernet port redundancy is implemented by virtual switch.

- Use trusted network for management traffic (Web, CLI, SNMP).
- For HA configurations, create a separate network for HA traffic.

Figure A-1: Network Configuration Example



B Rescue Options

The Mediant VE SBC features a System Snapshots mechanism that provides the capability of returning the system to a previous state. The mechanism may be used as a rescue option if a system malfunction occurs.

Note: In addition to the functionality described below, you can use the snapshots functionality provided by the virtual machine hypervisor.

B.1 Taking a Snapshot

Taking a System Snapshot captures a complete state of the Mediant VE SBC, including:

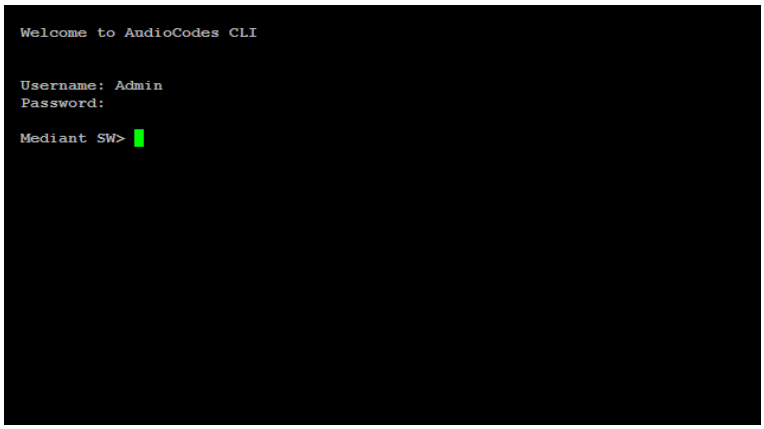
- installed Mediant VE SBC software
- the current configuration
- auxiliary files
- the Software License Key

The first 'factory' snapshot is automatically taken when initial installation is performed. Additional snapshots (up to 10) may be taken. The Mediant VE SBC can be returned to a snapshot, as described below.

➢ **To take a snapshot using the CLI:**

1. Connect to the CLI interface as described under Section 2.3.

Figure B-1: CLI Management Interface



2. At the prompt, type **enable** and press ENTER:

```
Mediant SW> enable
```

3. At the prompt, type the password and press ENTER:

```
Password: Admin
```

4. At the prompt, save the current configuration (burn) before creating a snapshot:

```
Mediant SW# write
```

5. Type the following commands to take a snapshot:

```
Mediant SW# configure system
Mediant SW# startup-n-recovery
Mediant SW (startup-n-recovery)# create-system-snapshot <name>
```

B.2 Viewing Available Snapshots

Currently available system snapshots can be viewed by using the **show-system-snapshots** command. The 'default' snapshot is indicated by asterisk.

```
Mediant SW(startup-n-recovery)# show-system-snapshots
first-install-2010-01-01_03-18-29
pre-production-6.70.037.010-2010-01-08_00-39-58
*production-6.70.037.010-2010-01-08_00-41-30
```

B.3 Changing the Default Snapshot

The 'default' snapshot indicates a restore point that is used by Automatic Recovery in the case of software malfunction (see Section B.6) and/or Manual Recovery (see Section B.5). The last user-created snapshot is automatically set as 'default' though it can be changed using the **set-default-snapshot** command.

```
Mediant SW(startup-n-recovery)# set-default-snapshot pre-
production-6.70.037.010-2010-01-08_00-40-27
```

B.4 Deleting a Snapshot

To delete a snapshot, use the **delete-system-snapshot** command:

```
Mediant SW(startup-n-recovery)# delete-system-snapshot pre-
production-6.70.037.010-2010-01-08_00-39-58
```

B.5 Manual Recovery

Manual recovery is performed on user request. When the Mediant VE SBC reboots, a GRUB menu is displayed that allows users to select one of the following rescue options:

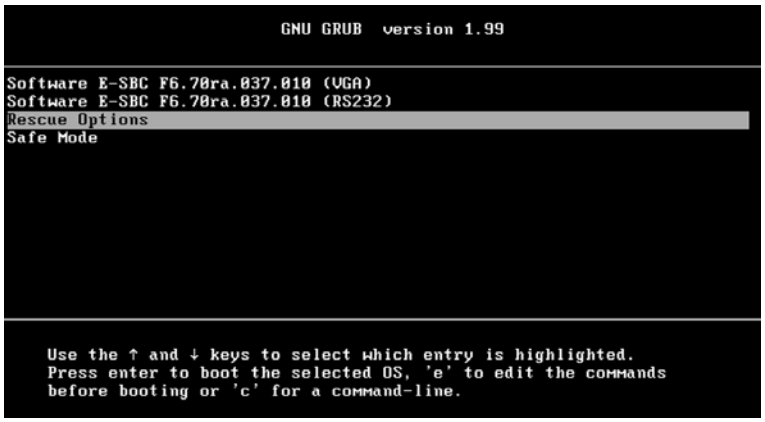
- Return to default snapshot
- Fix current installation
- Browse available system snapshots
- Return to factory snapshot (after install from CD)

B.5.1 Returning to the Default Snapshot

➢ **To return to the default snapshot:**

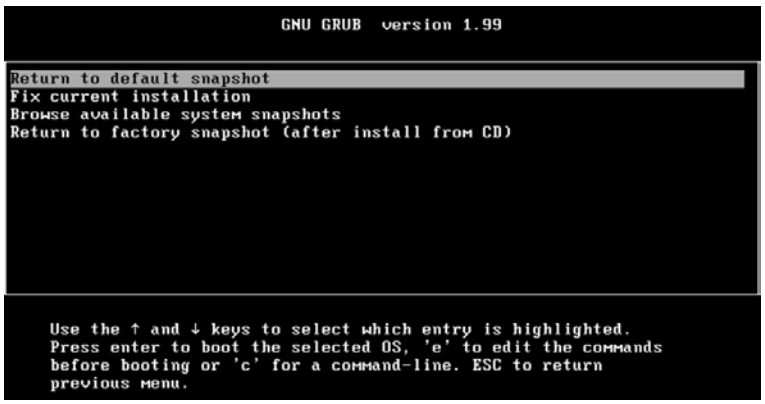
1. Reboot the server.
2. In the GRUB menu that's displayed for 5 seconds during the server start-up, press the Down ↓ key, select **Rescue option**, and press **Enter**.

Figure B-2: Main GRUB Menu



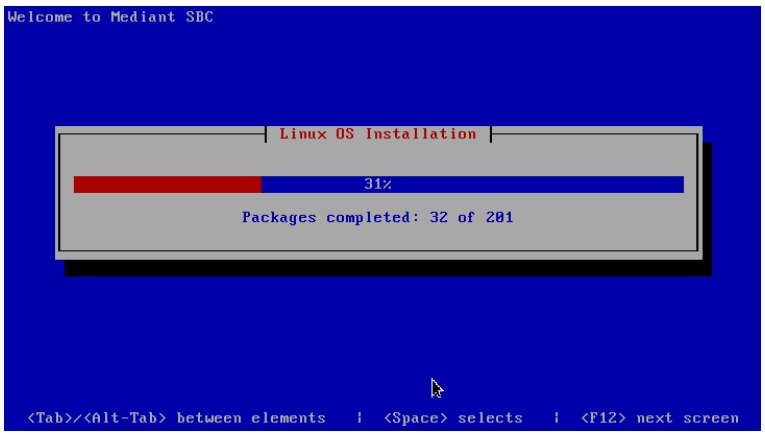
3. In the Rescue Options menu, select **Return to default snapshot** and press **Enter**.

Figure B-3: Rescue Options Menu



The system returns to the default snapshot, restoring the software version and the full configuration (see Section B.3). The process can take up to 10 minutes to complete.

Figure B-4: System Returning to Snapshot State



B.5.2 Fixing the Current Installation

➢ **To fix the current installation:**

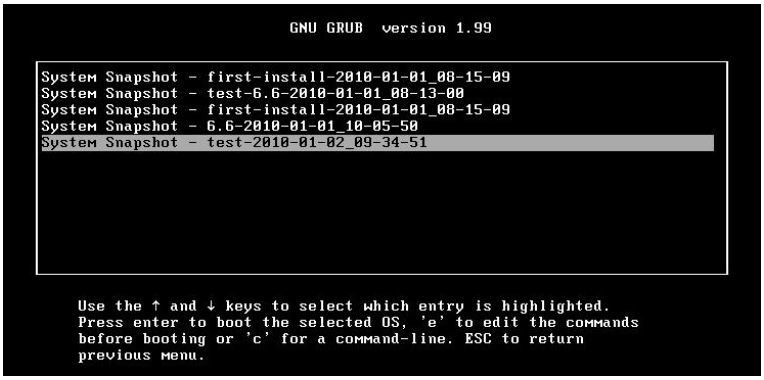
- In the GRUB menu, select **Fix current installation** and press **Enter**; the system is repaired while the currently installed software version and its configuration are preserved. The process can take up to 10 minutes to complete.

B.5.3 Returning to an Arbitrary Snapshot

➢ **To return to an arbitrary (non-default) system snapshot:**

1. In the GRUB menu, select **Browse available system snapshots** and press **Enter**; you're prompted to select a snapshot.

Figure B-5: Selecting a Snapshot



2. Select a snapshot and press **Enter**; the system returns to the selected snapshot, restores the software version and the full configuration. The process may take up to 10 minutes to complete.

B.5.4 Returning to a Factory Snapshot

➢ **To return to a factory snapshot (after install from CD):**

- In the GRUB menu, select **Return to factory snapshot (after install from CD)** and press **Enter**; the system returns to the first snapshot automatically taken when initial installation from CD was performed. The process can take up to 10 minutes to complete.

B.6 Automatic Recovery

The Mediant VE SBC activates Automatic Recovery when it encounters a severe software malfunction that prevents it from successfully booting for three subsequent attempts. Automatic Recovery returns the system to the 'default' snapshot and may take up to 10 minutes to complete.

Installation Manual

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