

Mediant Virtual Edition (VE) SBC

Deployment on Google Cloud

Version 7.2



Google Cloud

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Abbreviations and Terminology

Each abbreviation, unless widely used, is spelled out in full when first used.

Related Documentation

Manual Name
Mediant Software SBC User's Manual
SBC-Gateway Series Release Notes for Latest Release Versions 7.2
SBC-Gateway Series Release Notes for Long Term Support Versions 7.2

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Documentation Feedback

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1 Introduction

This document describes the deployment of AudioCodes' Mediant Virtual Edition (VE) Session Border Controller (SBC), hereafter referred to as *Mediant VE*, in a Google Cloud environment.

**Note:**

- For configuring the Mediant VE, refer to the *Mediant Software SBC User's Manual*.
- For instructions on how to install Mediant VE in other virtual environments, for example, VMware, refer to the *Mediant Virtual Edition SBC Installation Manual*.

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2 Deployment Methods

You can deploy Mediant VE as a virtual machine in the Google Cloud environment using one of the following methods:

- **Standalone SBC Deployments:** use Google Cloud Platform Console to launch a new virtual machine instance (see Section 4).
- **HA SBC Deployment (Two SBC Instances Operating in 1+1 Active/Standby Mode):** use Stack Manager to create the deployment (see Section 5).



Note: Currently, Mediant VE supports only IPv4 addresses (not IPv6) on Google Cloud.

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3 Prerequisites

Prior to deploying Mediant VE SBC in the Google Cloud environment, make sure that you meet the following prerequisites:

- You have a Google Cloud account. If you don't have a Google Cloud account, you can sign up for one on Google's website at <https://cloud.google.com>.
- You have uploaded AudioCodes Mediant VE/CE Image to the image repository. For more information, see Section 3.1.
- You have created all Subnets needed for Mediant VE deployment and corresponding Firewall Rules. For more information, see Section 3.2 .

3.1 AudioCodes Mediant VE Image

To deploy Mediant VE on Google Cloud, you must use the *Mediant VE/CE Image for Google Cloud*. For more information, go to <https://www.audiocodes.com/library/firmware>.

➤ **To upload Mediant VE image to Google Cloud image repository:**

1. Extract the .tar.gz file from the Mediant VE/CE Image for the Google Cloud .zip file.
2. In the Google Cloud Platform Console, go to the **Storage > Browser** page (<https://console.cloud.google.com/storage/browser>).
3. Choose an existing bucket or create a new one.
4. Choose an existing folder(s) inside the bucket or create a new one if needed.
5. Click **Upload files**, and then select the Mediant VE/CE image for the Google Cloud .tar.gz file.
6. When the upload completes, go to the **Compute Engine > Images** page (<https://console.cloud.google.com/compute/images>).
7. Click **Create Image**.
8. Enter a name for the image.
9. Specify the source as the Cloud Storage file, and then choose the .tar.gz file that you uploaded in the previous steps.
10. Specify the additional properties for your image (e.g., family or description).
11. Click **Create** to create the image.

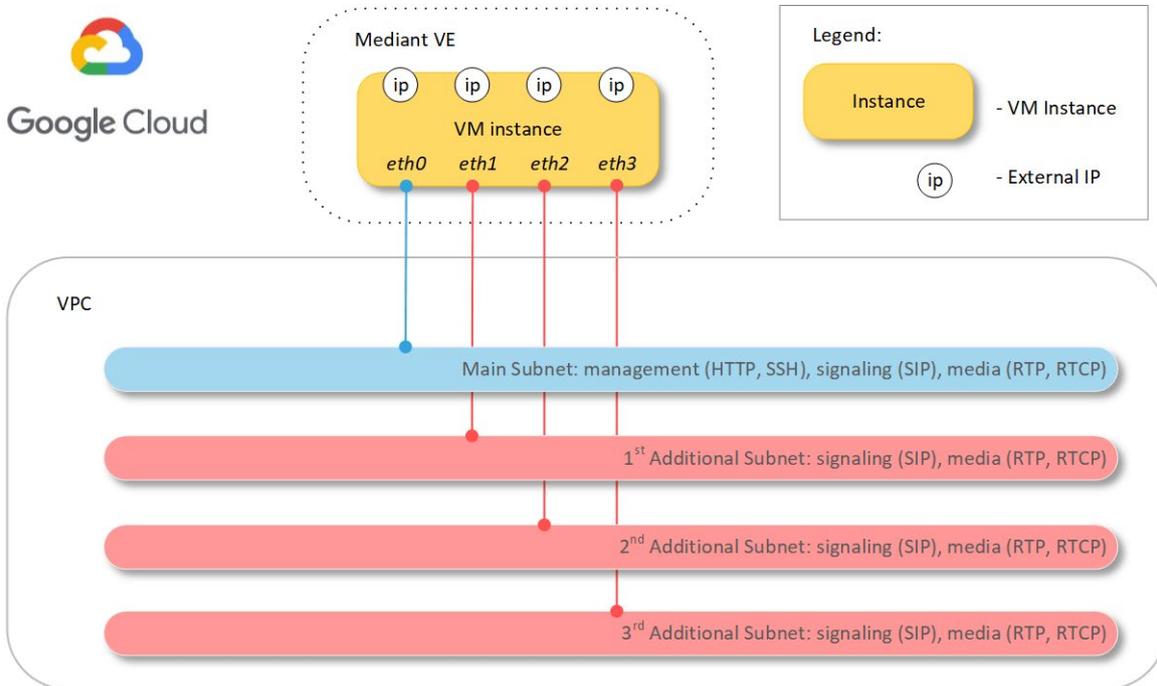
3.2 Network Architecture

This chapters describes the network architecture of Mediant VE on Google Cloud.

3.2.1 Network Architecture for Standalone Deployment

The network architecture for a standalone Mediant VE on Google Cloud is illustrated below.

Figure 3-1: Network Architecture for Standalone Deployment



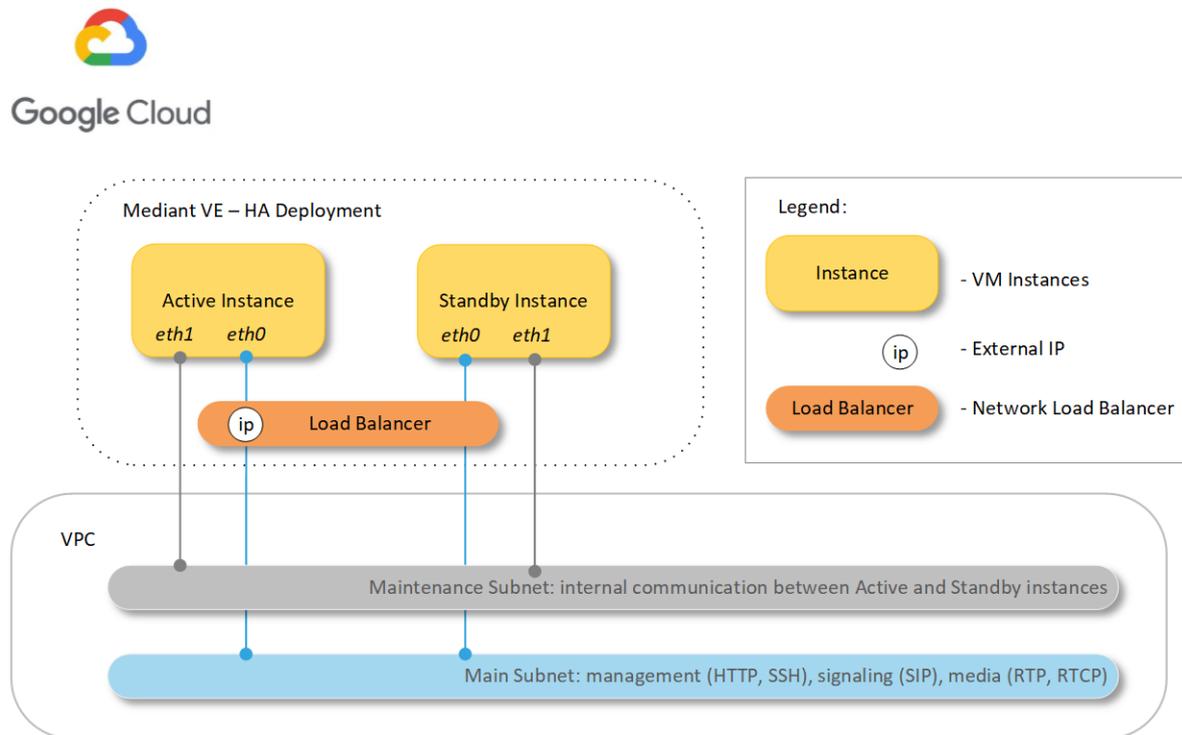
Up to three subnets may be used:

- **Main Subnet:** Carries management (e.g., HTTP and SSH), signaling (SIP) and media (RTP and RTCP) traffic. This is connected to the virtual machine instance as the first network interface (eth0).
- **Additional Subnets:** Carry signaling (SIP) and media (RTP and RTCP) traffic. This is connected to the virtual machine instance as additional network interfaces (eth1, eth2, and eth3). These subnets are optional, as the Main Subnet may carry all traffic types.

3.2.2 Network Architecture for HA Deployment

The network architecture for Mediant VE in High-Availability (HA) mode on Google Cloud is illustrated below.

Figure 3-2: Network Architecture for HA Deployment



Two subnets are used:

- **Main Subnet:** Carries management (e.g., HTTP and SSH), signaling (SIP) and media (RTP and RTCP) traffic. This is connected to the virtual machine instances as the first network interface (eth0).
- **Maintenance Subnet:** For internal communication between Active and Standby Mediant VE instances. This is connected to the virtual machine instances as the second network interface (eth1).

3.2.3 Implementation Guidelines

- Subnets may reside in the same or different Virtual Networks. However, for security reasons it is recommended to separate the Maintenance subnet from the other subnets and use a dedicated Virtual Network for it.
- All needed subnets must be created prior to the Mediant VE deployment.
- During deployment, Stack Manager creates all relevant Mediant VE components, including virtual machine instances, load balancer and external IP addresses.
- For HA deployment, all communication with Mediant VE (management, signaling, and media traffic) must be performed via the IP addresses attached to the Load Balancer. Most setups use a single external IP address attached to the Network Load Balancer for this purpose. For additional configuration options, see the next chapter.

3.2.4 Firewall Rules

On Google Cloud, firewall rules are configured at network level rather than at the instance / network interface level. Therefore, you must manually configure them prior to the first Mediant VE deployment, as described below.

It is recommended to create firewall rules for the "sbc" target tag and assign the latter to virtual machine instances during creation. For deployment via Stack Manager, assigned tags may be customized by changing the **tags** parameter in the stack configuration file (default value is "sbc,ve").

The following firewall rules must be created for successful Mediant VE deployment:

Subnet	Name	Protocol	Port	Description	Target Tag
<i>Maintenance</i>	udp-669	UDP	669	Internal communication between VM instances	sbc
	udp-680	UDP	680	Internal communication between VM instances	sbc
	http	TCP	80	Internal communication between VM instances	sbc
	tcp-2442	TCP	2442	Internal communication between VM instances	sbc
<i>Main</i>	ssh	TCP	22	CLI management interface	sbc
	http	TCP	80	Web management interface	sbc
	https	TCP	443	Secure Web management interface	sbc
	sip-udp	UDP	5060-5090	SIP signaling traffic	sbc
	sip-tcp	TCP	5060-5090	SIP signaling traffic	sbc
	media	UDP	6000-65535	RTP media traffic	sbc
<i>Additional Subnets</i>	sip-udp	UDP	5060-5090	SIP signaling traffic	sbc
	sip-tcp	TCP	5060-5090	SIP signaling traffic	sbc
	media	UDP	6000-65535	RTP media traffic	sbc

➤ **To create Firewall Rules:**

1. In the Google Cloud Platform Console, go to the **VPC Network > Firewall rules** page (<https://console.cloud.google.com/networking/firewalls>).
2. Click **Create Firewall Rule**.
3. Create firewall rules according to the table above:
 - Direction of traffic: Ingress
 - Action on match: Allow
 - Targets: Specified target tags
 - Tag name: <tag>
 - Source filter: IP ranges

- Source IP ranges: 0.0.0.0/0
- Protocols and ports: Specified protocol and ports
 - ◆ <protocol>: <ports>

3.3 Machine Types

It is recommended to use the following machine types for Mediant VE instances:

- **Deployments without transcoding:** n1-standard-2 or n1-standard-4
- **Deployments with transcoding:** n1-standard-8 or n1-standard-16

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4 Deploying Mediant VE via Google Cloud Platform Console

This section describes the deployment of a standalone Mediant VE via Google Cloud Platform Console.



Note: This method is applicable only to standalone (i.e., non-HA) deployments.

➤ **To deploy a standalone Mediant VE via Google Cloud Platform Console:**

1. In the Google Cloud Platform Console, go to the **Compute Engine > VM Instances** page (<https://console.cloud.google.com/compute/instances>).
2. Click **Create Instance**.
3. Enter a name for the virtual machine.
4. Choose a region and zone where the deployment will be performed.
5. Choose the machine type, as described in Section 3.3.
6. Change Boot disk to use custom image, and then select *Mediant VE/CE Image for Google Cloud* that you created in Section 3.1.
7. Expand the 'Management, security, disks, networking, sole tenancy' section.
8. Under the **Networking** tab, configure Network tags as "sbc".
9. For the primary network interface, configure the network, subnet, and external IP address.
10. Add additional network interfaces if needed and configure them accordingly.
11. Click **Create**.
12. Wait until the new instance is created. Wait an additional 5 minutes for the SBC software to fully start.
13. Determine the internal and external IP addresses assigned to the created instance.
14. Connect to the instance through one of the following:
 - Web browser
 - SSH client
 - Serial console (Google Cloud Platform Console > **Instance details** > **Connect to serial console**)

Default login credentials are:

- Username: **Admin**
- Password: **Admin**



Note: You will be unable to connect to the instance using Google Cloud Platform Console's built-in SSH client. Instead, use an external client such as PuTTY.

Figure 4-1: Creating New Instance via Google Cloud Platform Console

The screenshot displays the Google Cloud Platform console interface for creating a new VM instance. The left sidebar shows navigation options: 'New VM instance' (selected), 'New VM instance from template', 'New VM instance from machine image', and 'Marketplace'. The main content area is titled 'Create an instance' and contains the following configuration sections:

- Name:** sbc-1 (permanent)
- Labels:** + Add label
- Region:** us-central1 (Iowa)
- Zone:** us-central1-a (permanent)
- Machine configuration:**
 - Machine family:** General-purpose
 - Series:** N1
 - Machine type:** n1-standard-2 (2 vCPU, 7.5 GB memory)
- Boot disk:** New 10 GB standard persistent disk, Image: sbc-7-2-256-511
- Identity and API access:** Service account: Compute Engine default service account; Access scopes: Allow default access (selected)
- Network interface (expanded):**
 - Network:** oam
 - Subnetwork:** oam (10.0.2.0/24)
 - Primary internal IP:** Ephemeral (Automatic)
 - External IP:** Ephemeral
 - Network Service Tier:** Premium (Current project-level tier)
 - IP forwarding:** Off
 - Public DNS PTR Record:** Not enabled

At the bottom right, a 'Create' button is visible, along with a 'Cancel' button. A monthly estimate of \$48.95 is shown in the top right corner.

5 Deploying Mediant VE via Stack Manager

This section describes the deployment of Mediant VE via Stack Manager.



Note: This method is applicable to both standalone and HA deployments. However, it is typically used for HA deployments.

➤ **To deploy Mediant VE via Stack Manager:**

1. Install the Stack Manager tool, as described in the *Stack Manager User's Manual*, which you can download from AudioCodes website at <https://www.audiocodes.com/library/technical-documents>.
2. Create a new Mediant VE stack via Stack Manager's **create** command, as described in the *Stack Manager User's Manual*.

Figure 5-1: Creating New Instance via Stack Manager

Create new stack

Name

Stack type

Environment

Region

Image

Compute

HA Mode

VM Type

Networking

HA Subnet

Main Subnet

1st Additional Subnet

2nd Additional

Admin User

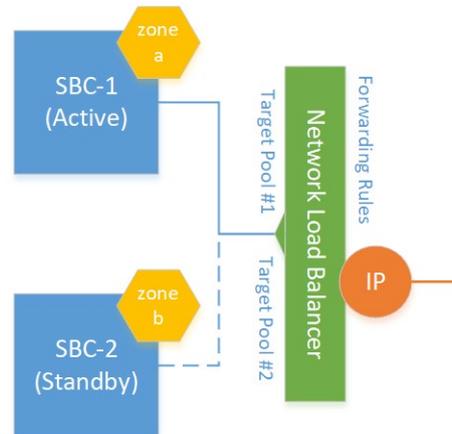
Username

Password

5.1 HA Deployment Topology

HA deployment of Mediant VE consists of two virtual machine instances deployed across two availability zones of the Google Cloud region and a Network Load Balancer, as shown in the following diagram.

Figure 5-2: HA Deployment Topology



Communication with SBC instances is performed through the IP addresses attached to Google Load Balancer. The Load Balancer steers inbound (signaling and management) traffic towards the active SBC instance. It is recommended to use external IP addresses when communicating with SBC instances.

Google Load Balancer doesn't perform NAT translation and forwards traffic without modifying the IP packet's destination address. Therefore, all IP addresses attached to the Load Balancer should be configured as virtual IP addresses in both SBC instances and be used for all applications (e.g., SIP Interfaces).

Since Google Load Balancer supports only the primary network interface (eth0), only the Main Subnet may be used for management, signaling and media traffic in HA deployments.

5.2 Multiple External IP Addresses

The default Mediant VE HA deployment uses a single external IP address to communicate with SBC instances. This IP address is attached to the Network Load Balancer that steers traffic towards the active SBC instance.

You may define additional external IP addresses to communicate with SBC instances, by configuring the following stack configuration parameter (e.g., via Advanced Config section in the Web interface):

- **public_ips**

You may set this parameter to "eth0:<num>", where <num> is the total value of external IP addresses to be created. For example, this configuration,

```
public_ips = eth0:2
```

creates two external IP addresses and corresponding Forwarding Rules. This enables signaling (SIP) and media (RTP) traffic to be sent towards SBC instances via two distinct IP addresses. Note that management (e.g., HTTP and SSH) traffic is always sent to the 1st external IP address and therefore, this IP address should be used for communication with OVOC.

5.3 Internal IP Addresses

The default Mediant VE HA deployment uses external IP addresses to communicate with SBC instances.

If you want SBC to communicate with VoIP equipment (e.g., IP-PBX) that is also deployed in the Google Cloud, you may use internal IP addresses by modifying the following stack configuration parameter (e.g., via Advanced Config section in the Web UI):

- **additional_ips**

If you want to use internal IP addresses to communicate with SBC, set this parameter to "eth0:<num>", where <num> is the total value of internal IP address pairs to be created. Internal IP addresses are attached to the Internal Load Balancer that steers traffic towards the active SBC instance. Note that contrary to the Network Load Balancer, Internal Load Balancer doesn't support mix or UDP and TCP traffic. Therefore, two distinct Internal Load Balancers are created – for UDP and TCP traffic accordingly.

For example, this configuration,

```
additional_ips = eth0:1
```

creates two internal IP addresses and corresponding Forwarding Rules. One of these IP addresses is used for forwarding UDP traffic (SIP over UDP, RTP) and another one for TCP traffic (SIP over TCP or TLS).



Note: Use of internal IP addresses (and Internal Load Balancers) is an experimental feature and is not recommended for production environment.

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6 Changing Network Configuration after Deployment

During initial deployment, Mediant VE automatically discovers all network interfaces and external IP addresses attached to it and populates corresponding network configuration tables accordingly.

If network configuration is changed after deployment (during normal Mediant VE operation), corresponding Mediant VE network configuration tables must be manually updated to match the updated Google Cloud configuration.

The following sections describe the most common network configuration changes to the deployed standalone Mediant VE instance and provide detailed instructions on how to perform them.

**Note:**

- Currently, change of networking configuration for Mediant VE HA deployment is not supported.
- Mediant VE's `write factory` CLI command restores configuration to factory settings and triggers automatic network discovery upon the next reboot. It may be used as an alternative to online network configuration, as described below, in cases where losing current Mediant VE configuration is not a concern.

6.1 Adding a Network Interface



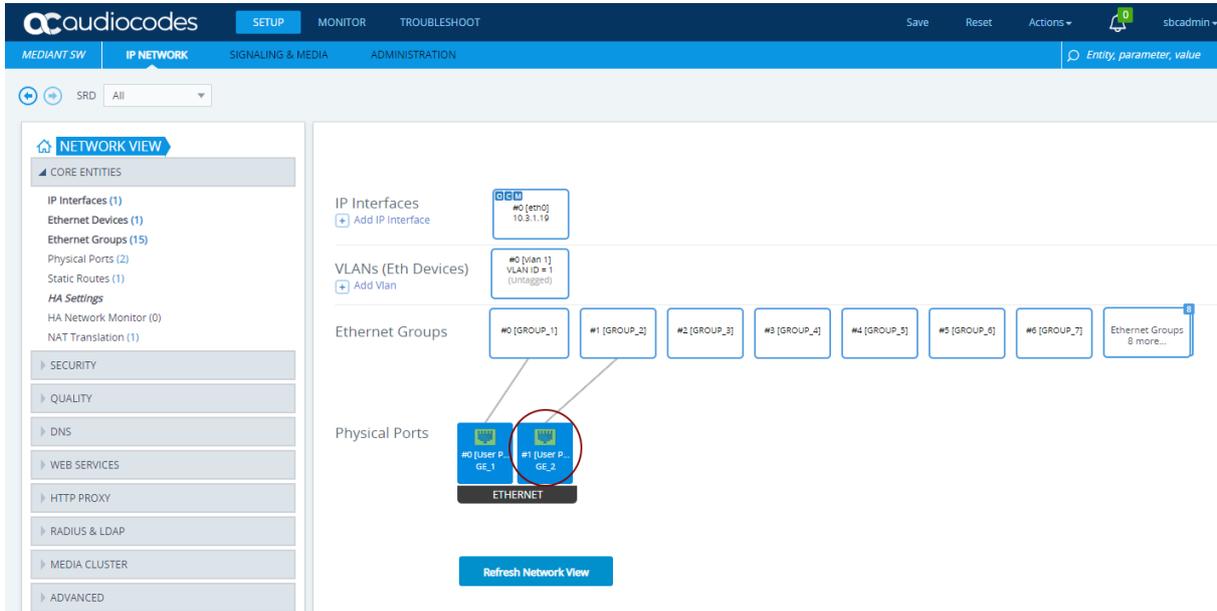
Note: This section is applicable only to a standalone Mediant VE deployment. Change of networking configuration for Mediant VE HA deployment is currently not supported.

➤ **To add a network interface to deployed Mediant VE:**

1. In the Google Cloud Platform Console, go to the **Compute Engine > VM Instances** page (<https://console.cloud.google.com/compute/instances>).
2. Stop the VM instance.
3. Click the VM instance, and then on the VM Instance Details page, click **EDIT**.
4. Add a new network interface and configure its properties.
5. Start the VM instance.
6. Determine the IP address of the created network interface.
7. Connect to the Mediant VE management interface through its Web interface.

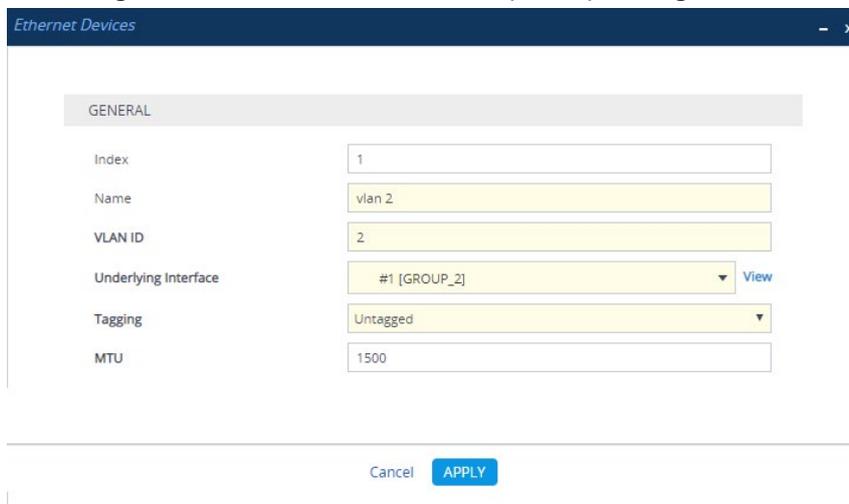
8. Open the Network View page (**SETUP > IP NETWORK > NETWORK VIEW**).
 Note that Mediant VE detected a new network interface and created corresponding Physical Ports configuration object. The object is already attached to the corresponding Ethernet Group. However, Ethernet Device (VLAN) and IP Interface configuration is missing and must be manually created.

Figure 6-1: New Physical Ports Configuration Object



9. Click **Add Vlan** to create a new Ethernet Device (VLAN) configuration object, as follows:
 - Configure 'VLAN ID' as the next unused VLAN number.
 - Configure 'Tagging' as **Untagged**.
 - Configure 'Name' with a unique value (e.g., **vlan <VLAN ID>**).
 - Configure 'Underlying Interface' to reference the Ethernet Group associated with the new physical port.

Figure 6-2: New Ethernet Device (VLAN) Configuration



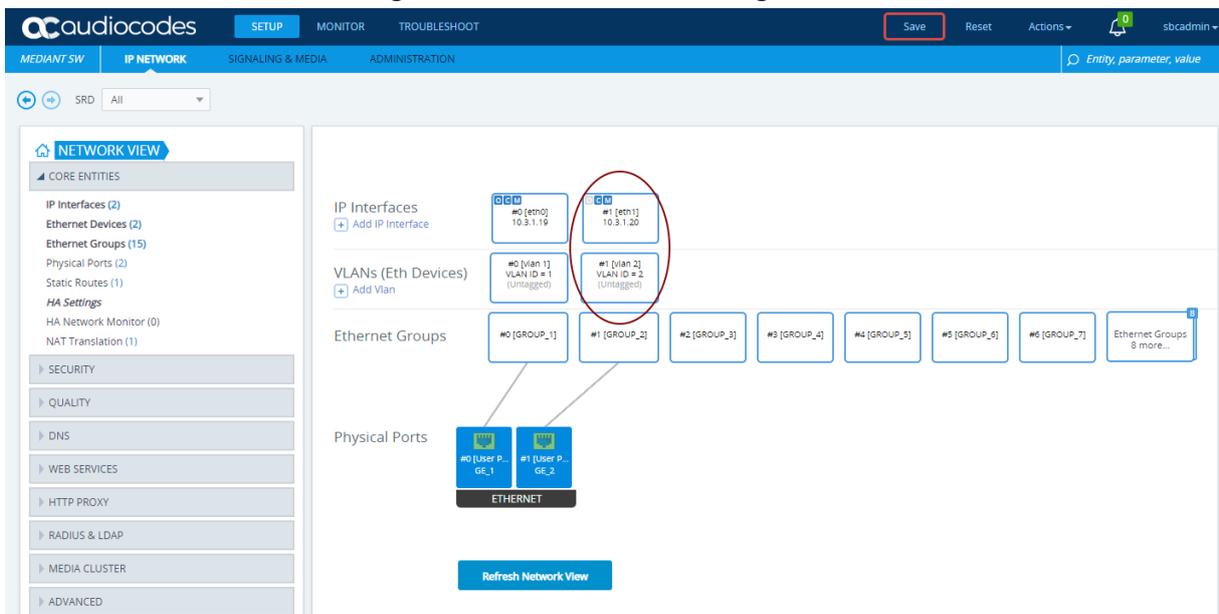
10. Click **Apply**; you are returned to the Network View page.

11. Click **Add IP Interface** to create a new IP Interface configuration object, as follows:
 - Configure 'IP Address' with the IP address of the created network interface (as determined in Step 6).
 - Configure 'Prefix Length' with the prefix length of the corresponding subnet.
 - Configure 'Default Gateway' with the corresponding default gateway.
 - Configure 'Name' with a unique value (e.g., **eth<id>**).
 - Configure 'Application Type' as **Media + Control**.
 - Configure 'Ethernet Device' to reference the Ethernet Device (VLAN) created in the previous step.

Figure 6-3: New IP Interface Configuration

12. Click **Apply**; you are returned to the Network View page.
13. Review the updated network configuration.

Figure 6-4: New Network Configuration



14. Click the **Save** button located on the toolbar to save the updated configuration.

6.2 Deleting the Network Interface

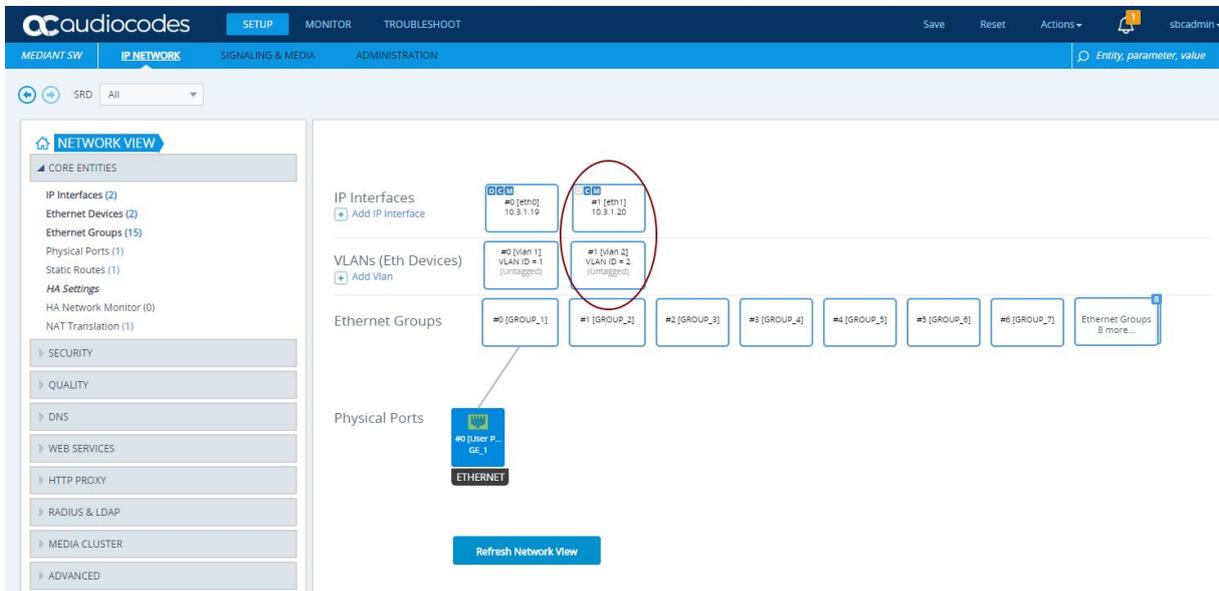


Note: This section is applicable only to a standalone Mediant VE deployment. Change of networking configuration for Mediant VE HA deployment is currently not supported.

➤ **To delete network interface from deployed Mediant VE:**

1. In the Google Cloud Platform Console, go to the **Compute Engine > VM Instances** page (<https://console.cloud.google.com/compute/instances>).
2. Stop the VM instance.
3. Click the VM instance, and then in the VM Instance Details screen, click **EDIT**.
4. Delete the new network interface.
5. Start the VM instance.
6. Connect to the Mediant VE management interface through its Web interface.
7. Open the Network View page (**SETUP > IP NETWORK > NETWORK VIEW**).
8. Locate the remaining network configuration objects that correspond to the deleted network interface.

Figure 6-5: Remaining Network Configuration Objects

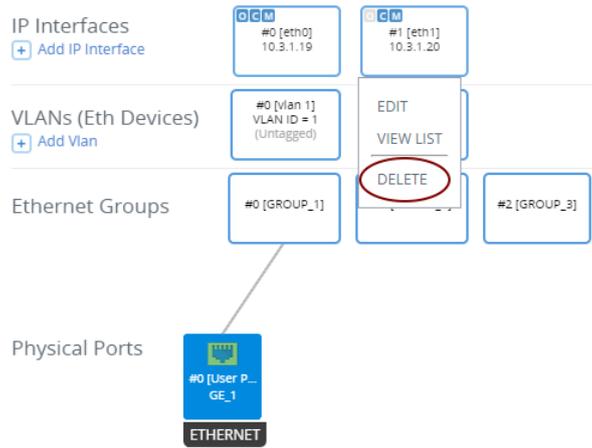


In the above example, the remaining network configuration objects include:

- IP Interface #1 [eth1]
- VLAN #1 [vlan 2]

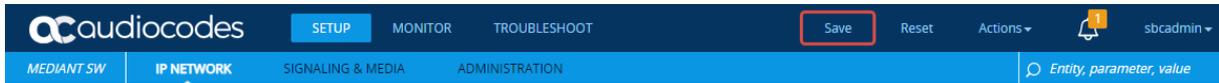
9. Delete the remaining configuration objects—first the IP Interface and then the VLAN—by clicking them, and then from the shortcut menu, choosing **Delete**.

Figure 6-6: Deleing Remaining IP Interface



10. Click the **Save** button located on the toolbar to save the updated configuration.

Figure 6-7: Saving Updated Configuration



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7 Licensing the Product

Once you have successfully completed Mediant VE deployment, you need to obtain, activate and then install your purchased SBC license.



Note: By default, the product software installation provides a free license for up to three concurrent sessions (signaling and media) and three user registrations (far-end users). This allows you to evaluate the product prior to purchasing it with your required capacity and features. To allow call transcoding with this free license, you need to configure the 'SBC Performance Profile' parameter to **Optimize for Transcoding** (for more information, refer to the *User's Manual*).

7.1 Obtaining and Activating a Purchased License Key

For the product to provide you with all your capacity and feature requirements, you need to purchase a new License Key that allows these capabilities. The following procedure describes how to obtain and activate your purchased License Key.



Note:

- License activation is intended **only** for first-time software activation upon product purchase (or if your License Key is "lost", due to whatever reason). For subsequent software feature upgrades, the License Key file is e-mailed to you after your Purchase Order has been processed.
- For HA, each unit has its own Serial Number, Product Key and License Key. Therefore, the instructions in this section must be done for each unit.

➤ **To obtain and activate the License Key:**

1. Open AudioCodes Web-based Software License Activation tool at <http://www.audiocodes.com/swactivation>:

Figure 7-1: Software License Activation Tool

License Activation

Please enter your Product Key received from AudioCodes and the fingerprint (e.g. Serial Number or Server Signature) that was generated as a result of your installation.
For technical assistance, please contact AudioCodes support at support@audiocodes.com.

Product Key*

Fingerprint*

Email* +

Validation 3ECF8

Please enter the characters shown in the image. To refresh the image, [click here](#).

Send

2. Enter the following information:
 - **Product Key:** The Product Key identifies your specific Mediant VE SBC purchase for the purpose of subsequent communication with AudioCodes (for example, for support and software upgrades). The Product Key is provided in the Order Confirmation e-mail sent to you by AudioCodes upon your purchase, as shown in the example below:

Figure 7-2: Product Key in Order Confirmation E-mail



- **Fingerprint:** The fingerprint is the Mediant VE SBC's Serial Number. The Serial Number uniquely identifies the software installation. The Serial Number is displayed in the 'Serial Number' field on the Device Information page (**Monitor** menu > **Monitor** menu > **Summary** tab > **Device Information**).
 - **Email:** Provide one or more e-mail addresses to where you want the License Key to be sent.
3. Click **Send** to submit your license activation request.
 4. Once AudioCodes processes and completes your license activation, you will receive an e-mail notification with the License Key file attached. Open the file with any text-based program (such as Notepad) and make sure that the serial number ("**S/N**") in the License Key is correct and reflects the Serial Number of your Mediant VE SBC.



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

7.2 Installing the License Key

For installing the License Key on Mediant VE, refer to the *Mediant Software SBC User's Manual*.



Note:

- The License Key installation process includes a device reset and is therefore, traffic-affecting. To minimize disruption of current calls, it is recommended to perform this procedure during periods of low traffic.
- The License Key file for Mediant VE HA contains two License Keys - one for the Active device and one for the Redundant device. Each License Key has a different serial number ("**S/N**"), which reflects the serial number of each device in the HA system.

7.3 Product Key

The Product Key identifies a specific purchase of your device installation for the purpose of subsequent communication with AudioCodes (e.g., support and software upgrades). The Product Key is provided in the order-confirmation email sent to you upon your product purchase and is used for activating your license through AudioCodes Software License Activation tool.

The Product Key is included in the License Key. Once the License Key is installed, you can view the Product Key in the following Web pages:

- License Key page (**Setup** menu > **Administration** tab > **License** folder > **License Key**). The Product Key is displayed in the read-only 'Product Key' field, as shown in the example below:

Figure 7-3: Viewing Product Key

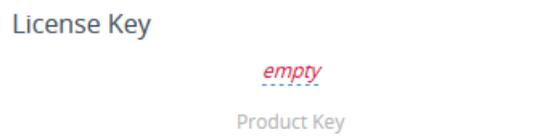


- Device Information page (**Monitor** menu > **Monitor** tab > **Summary** folder > **Device Information**).

If your License Key was purchased in an earlier version (for example, 7.0), the 'Product Key' field may appear empty. In such a scenario, request the Product Key from your AudioCodes sales representative. Once received, do the following:

1. Open the License Key page.
2. Locate the Product Key group:

Figure 7-4: Empty Product Key Field



3. Click "empty"; the following appears:

Figure 6-7-5: Entering Product Key



4. In the field, enter the Product Key, and then click **Submit**  (or **Cancel**  to discard your entry).

International Headquarters

1 Hayarden Street,
Airport City
Lod 7019900, Israel
Tel: +972-3-976-4000
Fax: +972-3-976-4040

AudioCodes Inc.

200 Cottontail Lane,
Suite A101E,
Somerset, NJ 08873
Tel: +1-732-469-0880
Fax: +1-732-469-2298

Contact us: <https://www.audiocodes.com/corporate/offices-worldwide>

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