



## Virtual CUBE

The Cisco Unified Border Element (CUBE) feature set has traditionally been delivered with hardware router platforms, such as the Cisco Integrated Services Router (ISR) series. A subset of CUBE features (vCUBE) may be used in virtualized environments with the Cisco CSR 1000v Series Cloud Services Router or Cisco Catalyst 8000V Edge Software (Catalyst 8000V).



**Note** When upgrading to Catalyst 8000V software from a CSR1000V release, an existing throughput configuration will be reset to a maximum of 250 Mbps. Install an HSEC authorization code, which you can obtain from your Smart License account, before reconfiguring your required throughput level.

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## Feature Information for Virtual CUBE

The following table provides release information about the feature or features described in this module. This table lists only the software release that introduced support for a given feature in a given software release train. Unless noted otherwise, subsequent releases of that software release train also support that feature.

Use Cisco Feature Navigator to find information about platform support and Cisco software image support. To access Cisco Feature Navigator, go to <https://cfngng.cisco.com/>. An account on Cisco.com is not required.

**Table 1: Feature Information for Virtual CUBE Support**

Feature Name	Releases	Feature Information
Virtual CUBE in Cisco Catalyst 8000V Edge Software (Catalyst 8000V)	Cisco IOS XE Bengaluru 17.4.1a	Virtual CUBE introduced for Cisco Catalyst 8000V Edge Software (Catalyst 8000V) in VMware ESXi and AWS environments.

Feature Name	Releases	Feature Information
vCUBE in Amazon Web Services (AWS)	Cisco IOS XE Gibraltar 16.12.4a	vCUBE offer introduced in AWS for Cisco CSR 1000v Series Cloud Services Router.
Virtual CUBE	Cisco IOS XE 3.15S	Virtual CUBE introduced for Cisco CSR 1000v Series Cloud Services Router in VMware ESXi environments.

## Prerequisites for Virtual CUBE

### Hardware

- The vCUBE feature set is bundled as part of the Cisco virtual router software and is used when deployed in VMware ESXi virtualized environments. For more information on how to deploy Cisco virtualized routers in VMware ESXi environments, see [Installing the Cisco CSR 1000V in VMware ESXi Environments](#) and [Installing in VMware ESXi Environment](#).
- For information on the best practices for setting ESXi host BIOS parameters for performance, see [BIOS Settings](#).
- Virtual CUBE is supported on the CSR 1000V and C8000V platforms.
- Virtual CUBE is also supported in AWS. You must use the AWS Marketplace product listing for virtual CUBE.
- For more information about the Cisco CSR 1000V in AWS, see [Cisco CSR 1000V Series Cloud Services Router Deployment Guide for Amazon Web Services](#).



#### Note

- The CSR1000V and Catalyst 8000V product may be used in several different public and private cloud environments. However, vCUBE is only supported when deployed on VMware ESXi and AWS platforms currently.
- When you use a consolidated (.bin) image to upgrade a CSR 1000V medium configuration (2 vCPU, 4 GB RAM) to Catalyst 8000V, you must change the virtual machine vRAM allocation to at least 5 GB to ensure advertised performance. Alternatively and when deploying in AWS environments, boot the router using individual packages rather than a consolidated image without the need for additional memory. Refer to [Installing Subpackages from a Consolidated Package](#) for details.

### Software

- Obtain the relevant license for the router platform. See [Virtual CUBE Licensing Requirements](#), on page 4 for more information.
- In AWS, only Bring Your Own License (BYOL) is supported for vCUBE. Pay as You Go (Subscription) versions of the CSR 1000V and C8000V are not supported. Make sure you choose the vCUBE AWS Marketplace product listing. Refer to [Cisco Virtual CUBE-BYOL](#).

- For more information about Cisco virtual routers, see [CSR 1000V Data Sheet](#) and [Catalyst 8000V Data Sheet](#).

## Features Supported with Virtual CUBE

vCUBE supports most of the CUBE features available in IOS XE releases. vCUBE does not support the following:

- DSP-based features
  - Codec Transcoding, Transrating
  - Raw Inband to RTP-NTE DTMF Interworking
  - Call progress Analysis (CPA)
  - Noise Reduction (NR), Acoustic Shock Protection (ASP), and Audio Gain
- H.323 Interworking
- IOS-based Hardware Media Termination Point (MTP)



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**Note** CUBE high availability is not currently supported on vCUBE when deployed in AWS.

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## Restrictions

- Software MTP is not supported.
- CSR1000V used as MTP/TRP for CUCM is not supported.



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**Note** All caveats, restrictions, and limitations of Cisco ASR IOS-XE 3.15 and later releases are applicable to virtual CUBE.

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## Information about Virtual CUBE

### Media

vCUBE media performance depends on the underlying host platform consistently providing packet switching latency of less than 5 milliseconds. The recommended hardware and virtual machine configurations ensure this performance when followed closely.

For more information on how to monitor media performance, see [Voice Quality Monitoring](#).

## Virtual CUBE Licensing Requirements

For information about licensing of virtual CUBE with CSR1000V and C8000V, refer to [CUBE Smart Licensing](#).

### Virtual CUBE with CSR1000V

vCUBE is enabled for the CSR1000V with the APPX and AX platform licenses. vCUBE processes and CLI commands are enabled when either of these licenses are enabled. Secure call features require the AX license. In common with all CUBE instances, L-CUBE Smart License options are required for each active session.

The following table details the license requirements for Virtual CUBE on the CSR1000V.

Virtual CUBE Session License	Platform License	Features	Throughput License
L-CUBE Smart License options	APPX	No TLS / SRTP support	Session count * (signaling + bidirectional media bandwidth)
	AX	All vCUBE features	

For detailed information about licensing, see [Cisco CSR 1000v Software Configuration Guide](#).

### Virtual CUBE with Catalyst 8000V

vCUBE is enabled for the Catalyst 8000V with the DNA Network Essentials license.

Virtual CUBE Session License	DNA Subscription	Features	DNA Bandwidth License
L-CUBE Smart License options	Essentials or above	All vCUBE features	Session count * (signaling + bidirectional media bandwidth)/2

For detailed information on licensing, see [Licensing](#).

## Install Virtual CUBE on ESXi

### SUMMARY STEPS

1. Use the CSR1000V or the Catalyst 8000V OVA application file (available from [software.cisco.com](http://software.cisco.com)) to deploy a new virtual instance directly in VMware ESXi.

### DETAILED STEPS

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Use the CSR1000V or the Catalyst 8000V OVA application file (available from <a href="http://software.cisco.com">software.cisco.com</a> ) to deploy a new virtual instance directly in VMware ESXi.	<b>Note</b> Select the required instance size during the OVA deployment.

	Command or Action	Purpose
		For further details on how to perform the deployment, see <a href="#">Cisco CSR 1000V Series Cloud Services Router Software Configuration Guide</a> or <a href="#">Cisco Catalyst 8000V Edge Software Installation And Configuration Guide</a> .

## How to Enable Virtual CUBE

### SUMMARY STEPS

1. Power on the virtual machine.
2. Enable platform and throughput licenses and register to a Cisco licensing server.
3. Enable virtual CUBE using the steps in [Enabling the CUBE Application on a Device](#).

### DETAILED STEPS

#### Procedure

	Command or Action	Purpose
<b>Step 1</b>	Power on the virtual machine.	Powers on the vCUBE.
<b>Step 2</b>	Enable platform and throughput licenses and register to a Cisco licensing server.	Enables platform and throughput licenses and registers that virtual CUBE to a licensing server.
<b>Step 3</b>	Enable virtual CUBE using the steps in <a href="#">Enabling the CUBE Application on a Device</a> .	Enables vCUBE on a device.

## Troubleshooting Virtual CUBE

To troubleshoot vCUBE, follow the same procedure for Cisco ASR routers. This procedure includes crash file decoding, decoding traceback, and so on. For more details, see [Troubleshoot Cisco ASR 1000 Series Aggregation Services Routers Crashes](#).

To troubleshoot virtual machine issues, see [Cisco CSR 1000V Series Cloud Services Router Software Configuration Guide](#) and [Cisco Catalyst 8000V Edge Software Configuration Guide](#).

