

Configure High Availability (HA) on CUBE Routers

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Introduction

This document describes how to configure High Availability (HA) on two Cisco Unified Border Element (CUBE) routers with all required commands.

Prerequisites

Requirements

Cisco recommends that you have knowledge of these topics:

- Cisco Unified Border Element (CUBE)
- Cisco Switch
- IP Routing

Components Used

Cisco ASR1001-X routers running the version "16.09.04"

The information in this document was created from the devices in a specific lab environment. All of the devices used in this document started with a cleared (default) configuration. If your network is live, ensure that you understand the potential impact of any command.

Configure

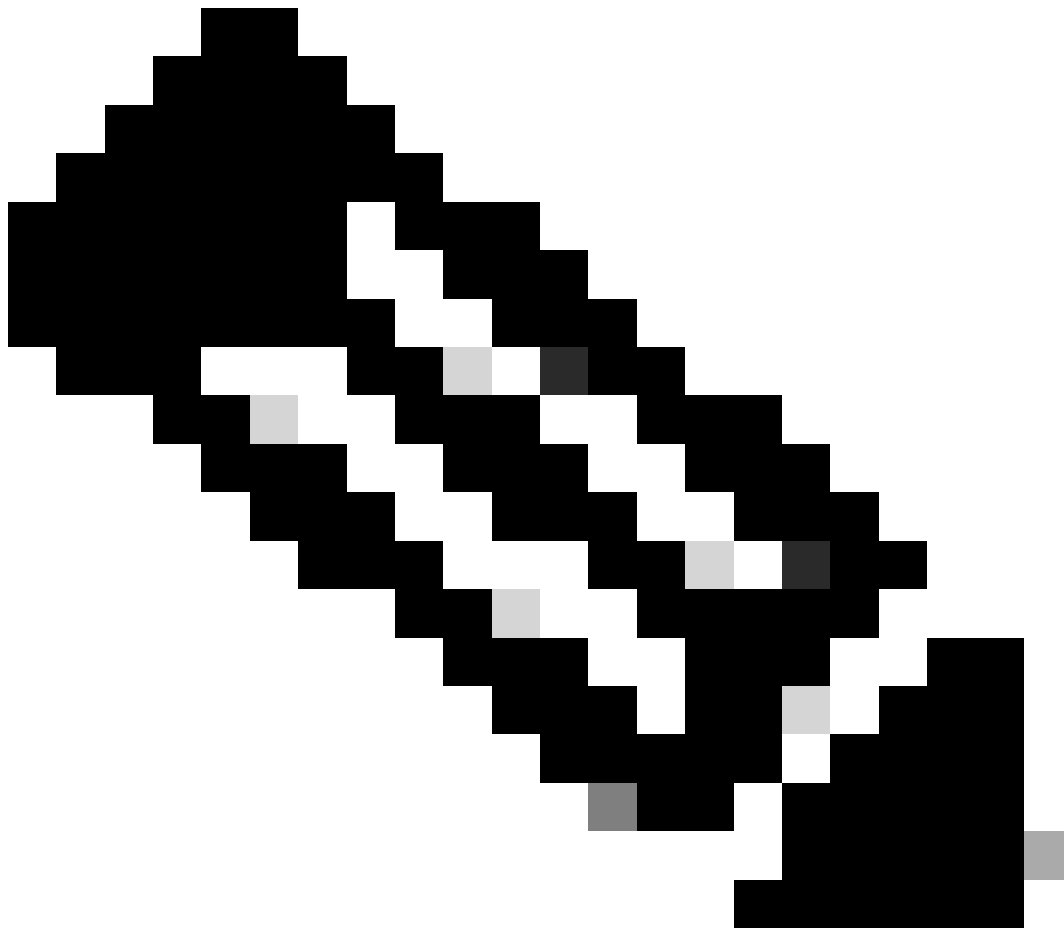
Network Diagram

This network connectivity diagram shows you how the CUBE routers are connected to the network.

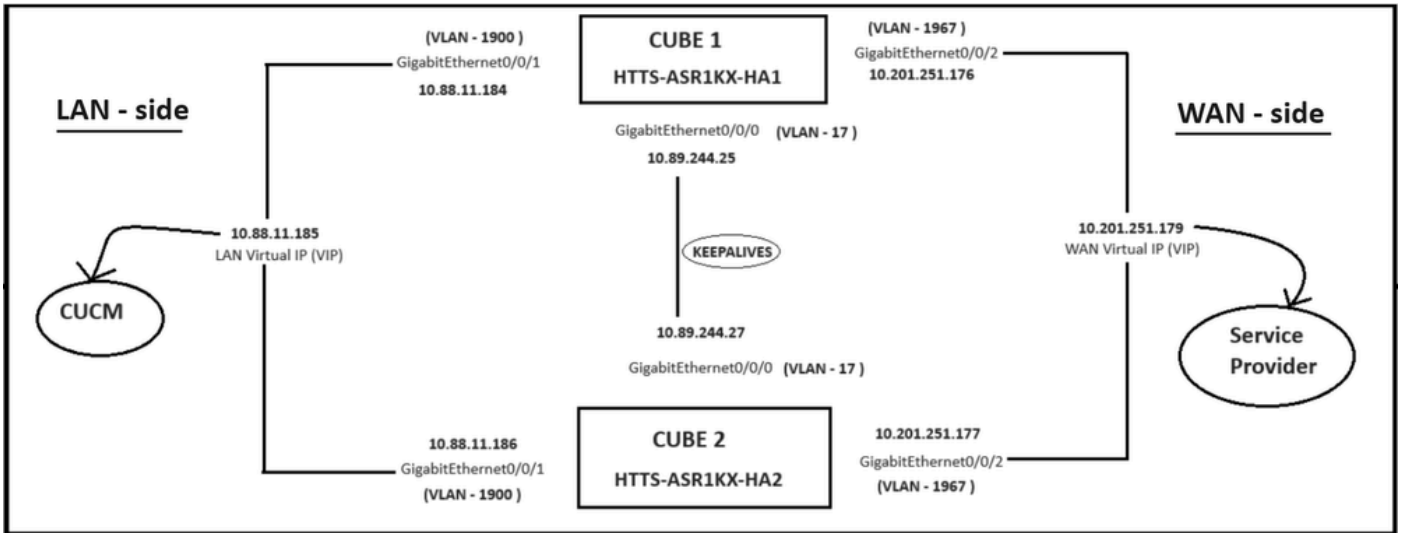
Ingress side (Local Area Network - LAN) of both the CUBEs are connected to VLAN 1900 via the interface Gi 0/0/1

Egress side (Wide Area Network - WAN) of both the CUBEs are connected to VLAN 1967 via the interface Gi 0/0/2

Keepalives interfaces of both the CUBEs are connected to VLAN 17 via the interface Gi 0/0/0



Note: CUBEs' interfaces are connected to physical Cisco Switch and the switchports are configured to allow the respective VLANs.



Network Diagram.

Configurations

Steps to configure the CUBE HA.

1. Checkpointing Configuration.
2. Commands to track the status of the LAN & WAN interfaces on the CUBEs.
3. Assign the configured tracks to redundancy group
4. Configuring virtual IP (VIP) on the LAN side.
5. Configuring virtual IP (VIP) on the WAN side.
6. Enable CUBE Redundancy.
7. Save the configuration and reboot.

1. Checkpointing Configuration.

For checkpointing, configure these commands on both the CUBEs



Note: Here the interface Gi 0/0/0 on both the CUBE-2 routers are used for checkpointing.

```
#conf t
(config)#redundancy
(config-red)#
(config-red)#application redundancy
(config-red-app)#group 1
(config-red-app-grp)#
(config-red-app-grp)#name cube-ha
(config-red-app-grp)#data gi 0/0/0
(config-red-app-grp)#control gi 0/0/0 protocol 1
(config-red-app-grp)#
```

This screenshot shows the command ran on the CUBE-2 router. You need to run the same set of commands on CUBE-1 router too.

```
HTTS-ASR1KX-HA2#
```

```
HTTS-ASR1KX-HA2#conf t
```

Enter configuration commands, one per line. End with CNTL/Z.

```
HTTS-ASR1KX-HA2 (config)#redundancy
```

```
HTTS-ASR1KX-HA2 (config-red)#
```

```
HTTS-ASR1KX-HA2 (config-red)#application redundancy
```

```
Feature Name:fwnat_red
```

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Activation of the software command line interface will be evidence of your acceptance of this agreement.

```
ACCEPT? (yes/[no]): yes
```

```
HTTS-ASR1KX-HA2 (config-red-app)#
```

```
HTTS-ASR1KX-HA2 (config-red-app)#group 1
```

```
HTTS-ASR1KX-HA2 (config-red-app-grp)#
```

```
HTTS-ASR1KX-HA2 (config-red-app-grp)#name cube-ha
```

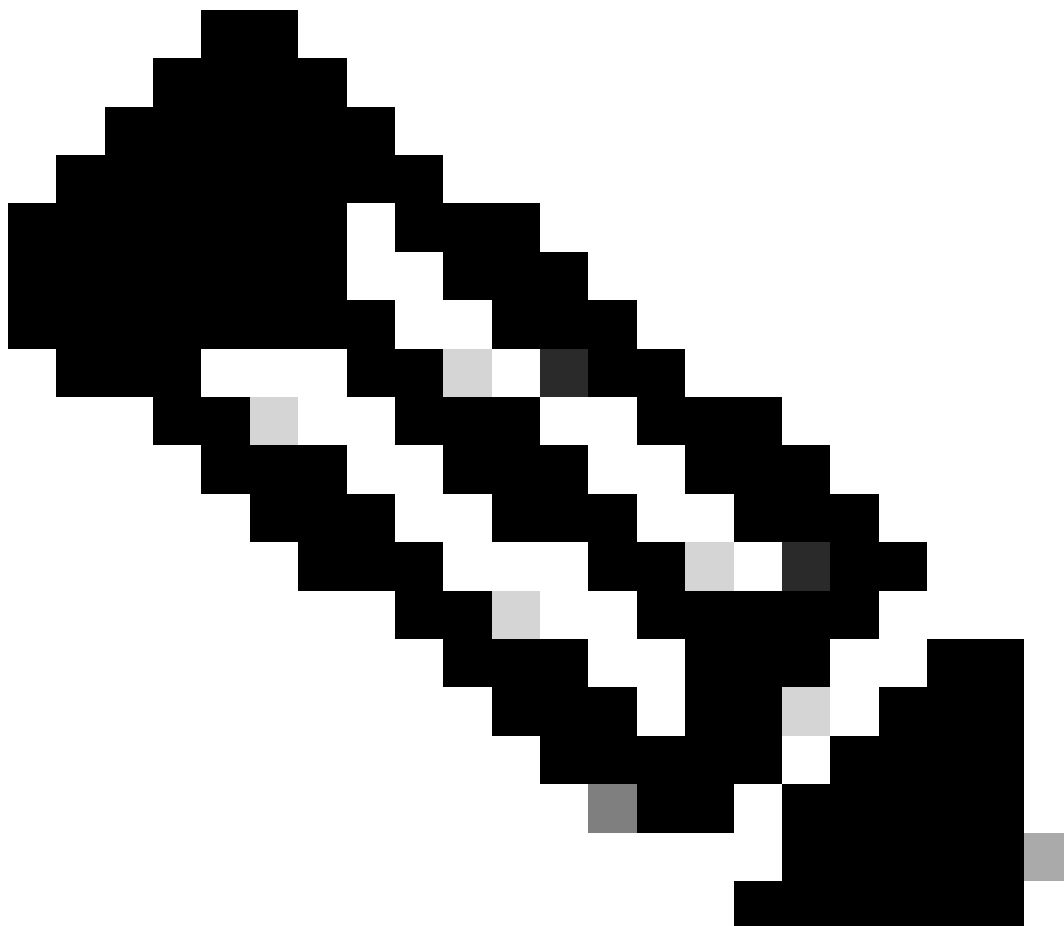
```
HTTS-ASR1KX-HA2 (config-red-app-grp)#data gi 0/0/0
```

```
HTTS-ASR1KX-HA2 (config-red-app-grp)#control gi 0/0/0 protocol 1
```

```
HTTS-ASR1KX-HA2 (config-red-app-grp)#
```

2. Commands to track the status of the LAN & WAN interfaces on the CUBEs:-

Configure these commands for tracking the status of the LAN & WAN interfaces. You must execute these commands on both the CUBE routers.



Note: Here the interface Gi 0/0/1 on both the CUBEs are connected to LAN network and Gi 0/0/2 are connected to the WAN network.

```
#conf t  
(config)#track 1 interface gi 0/0/1 line-protocol  
(config-track)#track 2 interface gi 0/0/2 line-protocol
```

CUBE-1

```
HTTS-ASR1K-HA1#
HTTS-ASR1K-HA1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
HTTS-ASR1K-HA1(config)#track 1 interface gi 0/0/1 line-protocol
HTTS-ASR1K-HA1(config-track)#track 2 interface gi 0/0/2 line-protocol
HTTS-ASR1K-HA1(config-track)#
```

Interface status tracking commands on CUBE-1.

CUBE-2

```
HTTS-ASR1KX-HA2 (config) #
HTTS-ASR1KX-HA2 (config) #
HTTS-ASR1KX-HA2 (config) #track 1 interface gi 0/0/1 line-protocol
HTTS-ASR1KX-HA2 (config-track) #track 2 interface gi 0/0/2 line-protocol
HTTS-ASR1KX-HA2 (config-track) #
```

Interface status tracking commands on CUBE-2.

3. Assign the configured tracks to redundancy group

Assign the configured tracks to the group 1 by running these commands on both the CUBE routers.

```
#conf t
(config)#redundancy
(config-red)#
(config-red)#application redundancy
(config-red-app)#group 1
(config-red-app-grp)#track 1 shutdown
(config-red-app-grp)#track 2 shutdown
```

CUBE-1

```
HTTS-ASR1K-HA1#
HTTS-ASR1K-HA1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
HTTS-ASR1K-HA1 (config) #
HTTS-ASR1K-HA1 (config) #redundancy
HTTS-ASR1K-HA1 (config-red) #application redundancy
HTTS-ASR1K-HA1 (config-red-app) #group 1
HTTS-ASR1K-HA1 (config-red-app-grp) #
HTTS-ASR1K-HA1 (config-red-app-grp) #track 1 shutdown
HTTS-ASR1K-HA1 (config-red-app-grp) #track 2 shutdown
HTTS-ASR1K-HA1 (config-red-app-grp) #
HTTS-ASR1K-HA1 (config-red-app-grp) #
```

Assign the tracked interfaces to the redundancy group on CUBE-1.

CUBE-2

```

HTTS-ASR1KX-HA2 (config) #redundancy
HTTS-ASR1KX-HA2 (config-red) #application redundancy
HTTS-ASR1KX-HA2 (config-red-app) #group 1
HTTS-ASR1KX-HA2 (config-red-app-grp) #
HTTS-ASR1KX-HA2 (config-red-app-grp) #
HTTS-ASR1KX-HA2 (config-red-app-grp) #track 1 shutdown
HTTS-ASR1KX-HA2 (config-red-app-grp) #track 2 shutdown
HTTS-ASR1KX-HA2 (config-red-app-grp) #

```

Assign the tracked interfaces to the redundancy group on CUBE-2.

4. Configuring virtual IP (VIP) on the LAN side of both the CUBEs.

These commands help you to configure the VIP for the LAN side of the CUBEs.

```

(config)#interface GigabitEthernet0/0/1
(config-if)#description VLAN-1900 LAN side
(config-if)#ip address 10.88.11.184 255.255.255.0
(config-if)#redundancy rii 1
(config-if)#redundancy group 1 ip 10.88.11.185 exclusive

```

CUBE-1

```

HTTS-ASR1K-HA1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
HTTS-ASR1K-HA1 (config) #
HTTS-ASR1K-HA1 (config) #interface GigabitEthernet0/0/1
HTTS-ASR1K-HA1 (config-if) #
HTTS-ASR1K-HA1 (config-if) #description VLAN-1900 LAN side
HTTS-ASR1K-HA1 (config-if) #
HTTS-ASR1K-HA1 (config-if) #ip address 10.88.11.184 255.255.255.0
HTTS-ASR1K-HA1 (config-if) #
HTTS-ASR1K-HA1 (config-if) #redundancy rii 1
HTTS-ASR1K-HA1 (config-if) #
HTTS-ASR1K-HA1 (config-if) #redundancy group 1 ip 10.88.11.185 exclusive
HTTS-ASR1K-HA1 (config-if) #
HTTS-ASR1K-HA1 (config-if) #
HTTS-ASR1K-HA1 (config-if) #exit
HTTS-ASR1K-HA1 (config) #

```

LAN side Virtual IP (VIP) configuration on CUBE-1.

CUBE-2


```

HTTS-ASR1KX-HA2#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
HTTS-ASR1KX-HA2 (config)#
HTTS-ASR1KX-HA2 (config)#interface GigabitEthernet0/0/1
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)# description VLAN-1900 LAN side
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)# ip address 10.88.11.186 255.255.255.0
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)#redundancy rii 1
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)#redundancy group 1 ip 10.88.11.185 exclusive
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)#exit
HTTS-ASR1KX-HA2 (config)#

```

LAN side Virtual IP (VIP) configuration on CUBE-2.

5. Configuring virtual IP (VIP) on the WAN side of both the CUBEs.

These commands help you to configure the VIP for the WAN side of the CUBEs.

```

(config)#interface GigabitEthernet0/0/2
(config-if)#description VLAN-1967 WAN side
(config-if)#ip address 10.201.251.176 255.255.255.224
(config-if)#redundancy rii 2
(config-if)#redundancy group 1 ip 10.201.251.179 exclusive

```

CUBE-1

```

HTTS-ASR1K-HA1#
HTTS-ASR1K-HA1#conf t
Enter configuration commands, one per line.  End with CNTL/Z.
HTTS-ASR1K-HA1 (config)#
HTTS-ASR1K-HA1 (config)#interface GigabitEthernet0/0/2
HTTS-ASR1K-HA1 (config-if)#description VLAN-1967 WAN side
HTTS-ASR1K-HA1 (config-if)#
HTTS-ASR1K-HA1 (config-if)#
HTTS-ASR1K-HA1 (config-if)#ip address 10.201.251.176 255.255.255.224
HTTS-ASR1K-HA1 (config-if)#
HTTS-ASR1K-HA1 (config-if)#redundancy rii 2
HTTS-ASR1K-HA1 (config-if)#
HTTS-ASR1K-HA1 (config-if)#redundancy group 1 ip 10.201.251.179 exclusive
HTTS-ASR1K-HA1 (config-if)#
HTTS-ASR1K-HA1 (config-if)#exit
HTTS-ASR1K-HA1 (config)#
HTTS-ASR1K-HA1 (config)#

```

WAN side Virtual IP (VIP) configuration on CUBE-1.

CUBE-2

```
HTTS-ASR1KX-HA2#
HTTS-ASR1KX-HA2#conf t
Enter configuration commands, one per line. End with CNTL/Z.
HTTS-ASR1KX-HA2 (config)#
HTTS-ASR1KX-HA2 (config)#
HTTS-ASR1KX-HA2 (config)#interface GigabitEthernet0/0/2
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)# description VLAN-1967 WAN side
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)#ip address 10.201.251.177 255.255.255.224
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)#redundancy rii 2
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)#redundancy group 1 ip 10.201.251.179 exclusive
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)#
HTTS-ASR1KX-HA2 (config-if)#exit
HTTS-ASR1KX-HA2 (config)#
```

WAN side Virtual IP (VIP) configuration on CUBE-2.

6. Enable CUBE Redundancy.

Enable CUBE Redundancy on both the routers by running these commands.

#conf t

Enter configuration commands, one per line. End with CNTL/Z.

```
(config)#
(config)#voice service voip
(conf-voi-serv)#redundancy-group 1
(conf-voi-serv)#
(conf-voi-serv)#exit
(config)#
(config)#ip rtcp report interval 3000
(config)#
(config)#gateway
(config-gateway)#media-inactivity-criteria all
(config-gateway)#
(config-gateway)#timer receive-rtcp 5
(config-gateway)#
(config-gateway)#timer receive-rtp 86400
(config-gateway)#
```

CUBE-1

```

HTTS-ASR1K-HA1#
HTTS-ASR1K-HA1#
HTTS-ASR1K-HA1#conf t
Enter configuration commands, one per line. End with CNTL/Z.
HTTS-ASR1K-HA1(config)#
HTTS-ASR1K-HA1(config)#voice service voip
HTTS-ASR1K-HA1(config-voi-serv)#redundancy-group 1
% Created RG 1 association with VOICE B2B HA; reload the router for new configuration to take effect

HTTS-ASR1K-HA1(config-voi-serv)#
HTTS-ASR1K-HA1(config-voi-serv)#
HTTS-ASR1K-HA1(config-voi-serv)#
HTTS-ASR1K-HA1(config-voi-serv)#
HTTS-ASR1K-HA1(config-voi-serv)#
HTTS-ASR1K-HA1(config-voi-serv)#exit
HTTS-ASR1K-HA1(config)#
HTTS-ASR1K-HA1(config)#
HTTS-ASR1K-HA1(config)#
HTTS-ASR1K-HA1(config)#ip rtcp report interval 3000
HTTS-ASR1K-HA1(config)#
HTTS-ASR1K-HA1(config)#gateway
HTTS-ASR1K-HA1(config-gateway)#media-inactivity-criteria all
HTTS-ASR1K-HA1(config-gateway)#
HTTS-ASR1K-HA1(config-gateway)#timer receive-rtcp 5
non dsp based inactivity detection is set
HTTS-ASR1K-HA1(config-gateway)#
HTTS-ASR1K-HA1(config-gateway)#timer receive-rtp 86400
HTTS-ASR1K-HA1(config-gateway)#

```

Enable CUBE Redundancy on CUBE-1.

CUBE-2

```

HTTS-ASR1KX-HA2(config)#
HTTS-ASR1KX-HA2(config)#voice service voip
HTTS-ASR1KX-HA2(config-voi-serv)#redundancy-group 1
% Created RG 1 association with VOICE B2B HA; reload the router for new configuration to take effect

HTTS-ASR1KX-HA2(config-voi-serv)#
HTTS-ASR1KX-HA2(config-voi-serv)#
HTTS-ASR1KX-HA2(config-voi-serv)#exit
HTTS-ASR1KX-HA2(config)#
HTTS-ASR1KX-HA2(config)#ip rtcp report interval 3000
HTTS-ASR1KX-HA2(config)#
HTTS-ASR1KX-HA2(config)#gateway
HTTS-ASR1KX-HA2(config-gateway)#
HTTS-ASR1KX-HA2(config-gateway)#media-inactivity-criteria all
HTTS-ASR1KX-HA2(config-gateway)#
HTTS-ASR1KX-HA2(config-gateway)#timer receive-rtcp 5
non dsp based inactivity detection is set
HTTS-ASR1KX-HA2(config-gateway)#
HTTS-ASR1KX-HA2(config-gateway)#timer receive-rtp 86400
HTTS-ASR1KX-HA2(config-gateway)#
HTTS-ASR1KX-HA2(config-gateway)#
HTTS-ASR1KX-HA2(config-gateway)#exit
HTTS-ASR1KX-HA2(config)#

```

Enable CUBE Redundancy on CUBE-2.

7. Save the configuration and reboot both the CUBEs.

After enabling the redundancy, you need to reload both the routers. Prior to the reload, save the configurations.

CUBE-1

```
HTTS-ASR1K-HA1#  
HTTS-ASR1K-HA1#wr  
Building configuration...  
[OK]  
HTTS-ASR1K-HA1#  
HTTS-ASR1K-HA1#reload  
The following licenses (s) are
```

Save the configuration and reboot the CUBE-1.

CUBE-2

```
HTTS-ASR1KX-HA2#  
HTTS-ASR1KX-HA2#wr  
Building configuration...  
[OK]  
HTTS-ASR1KX-HA2#  
HTTS-ASR1KX-HA2#reload
```

Save the configuration and reboot the CUBE-2.

Verify

You can validate the CUBE HA by running this show command.

```
#show redundancy application group 1
```

CUBE-1

```
HTTS-ASR1K-HA1#  
HTTS-ASR1K-HA1#  
HTTS-ASR1K-HA1#show redundancy application group 1  
Group ID:1  
Group Name:cube-ha  
  
Administrative State: No Shutdown  
Aggregate operational state : Up  
My Role: ACTIVE  
Peer Role: STANDBY  
Peer Presence: Yes  
Peer Comm: Yes  
Peer Progression Started: Yes  
  
RF Domain: btob-one  
      RF state: ACTIVE  
      Peer RF state: STANDBY HOT  
  
HTTS-ASR1K-HA1#  
HTTS-ASR1K-HA1#
```

Output of the command 'show redundancy application group 1' from CUBE-1.

CUBE-2

```
HTTS-ASR1KX-HA2#  
HTTS-ASR1KX-HA2#show redundancy application group 1  
Group ID:1  
Group Name:cube-ha  
  
Administrative State: No Shutdown  
Aggregate operational state : Up  
My Role: STANDBY  
Peer Role: ACTIVE  
Peer Presence: Yes  
Peer Comm: Yes  
Peer Progression Started: Yes  
  
RF Domain: btob-one  
      RF state: STANDBY HOT  
      Peer RF state: ACTIVE  
  
HTTS-ASR1KX-HA2#
```

Output of the command 'show redundancy application group 1' from CUBE-2.

You can check the Virtual IP (VIP)'s status by running this show command.

#show redundancy application if-mgr group 1

For the active CUBE the VIP status is shown as 'no shut' and for the standby CUBE the VIP status is shown as 'shut'.

CUBE-1

```
HTTS-ASR1K-HA1#  
HTTS-ASR1K-HA1#show redundancy application if-mgr group 1  
  
RG ID: 1  
=====
```

interface	GigabitEthernet0/0/2
VMAC	0007.b421.0002
VIP	10.201.251.179
Shut	no shut
Decrement	0

interface	GigabitEthernet0/0/1
VMAC	0007.b421.0001
VIP	10.88.11.185
Shut	no shut
Decrement	0

```
HTTS-ASR1K-HA1#
```

Output of the command 'show redundancy application if-mgr group 1' from CUBE-1.

CUBE-2

```

HTTS-ASR1KX-HA2#
HTTS-ASR1KX-HA2#show redundancy application if-mgr group 1

RG ID: 1
=====

interface      GigabitEthernet0/0/2
-----
VMAC           0007.b421.0002
VIP            10.201.251.179
Shut           shut
Decrement      0

interface      GigabitEthernet0/0/1
-----
VMAC           0007.b421.0001
VIP            10.88.11.185
Shut           shut
Decrement      0

HTTS-ASR1KX-HA2#

```

Output of the command 'show redundancy application if-mgr group 1' from CUBE-2.

Troubleshoot

There is currently no specific troubleshooting information available for this configuration.

Related Information

For more information about the CUBE HA, you can refer these links.

- [Cisco Unified Border Element Configuration Guide Through Cisco IOS® XE 17.5](#)
- [Video link - Configure High Availability for CUBE](#)

I hope this article is helpful !