Configure High Availability (HA) on CUBE Routers

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Related Information

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:

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

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.

Components Used

Cisco ASR1001-X routers running 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.

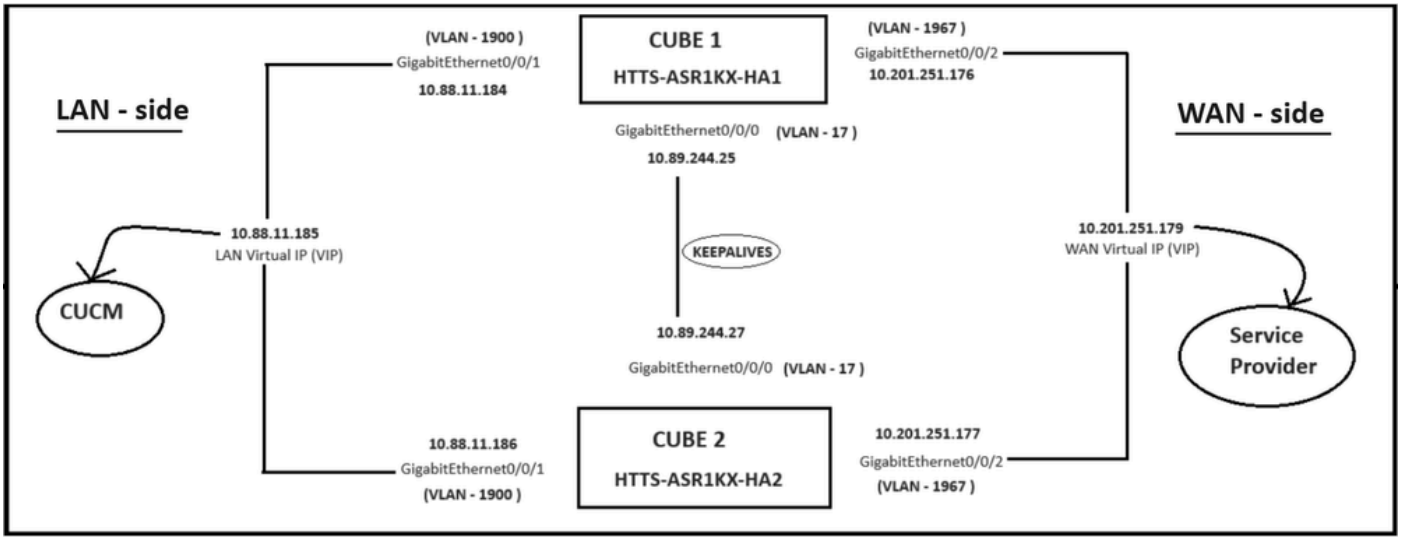
Configure

Network Diagram

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

- Ingress side (Local Area Network - LAN) of both 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.
- Keepalive interfaces of both CUBEs are connected to VLAN 17 via the interface Gi 0/0/0

Note: CUBE 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 the 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

Checkpointing Configuration

For checkpointing, configure these commands on both the CUBEs

---



Note: The interface Gi 0/0/0 on both the CUBEs 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 must run the same set of commands on CUBE-1 router:

```
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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above  applies  even if the evaluation  license  is  not  automatically
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evaluation  period.  It is your  responsibility  to  determine when the
evaluation  period is complete and you are required to make  payment to
Cisco for your use of the product feature beyond the evaluation period.

Your  acceptance  of  this agreement  for the software  features on one
product  shall be deemed  your  acceptance  with  respect  to all  such
software  on all Cisco  products  you purchase  which includes the same
software.  (The foregoing  notwithstanding, you must purchase a license
for each software  feature you use past the 60 days evaluation  period,
so  that  if you enable a software  feature on  1000  devices, you must
purchase 1000 licenses for use past  the 60 day evaluation period.)

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)#
```

Checkpointing configuration on the CUBE-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: The interface Gi 0/0/1 on both the CUBEs are connected to the 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.

Assign the Configured Tracks to Redundancy Group

Assign the configured tracks to 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)#
```

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.

Configuring the Virtual IP (VIP) on the LAN Side of Both CUBEs

These commands help 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
```

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
```

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

Configuring the Virtual IP (VIP) on the WAN Side of both CUBEs

These commands help 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)#
```

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
```

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

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(conf-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(conf-voi-serv)#
HTTS-ASR1K-HA1(conf-voi-serv)#
HTTS-ASR1K-HA1(conf-voi-serv)#
HTTS-ASR1K-HA1(conf-voi-serv)#
HTTS-ASR1K-HA1(conf-voi-serv)#
HTTS-ASR1K-HA1(conf-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(conf-voi-serv)#redundancy-group 1
% Created RG 1 association with VOICE B2B HA; reload the router for new configuration to take effect

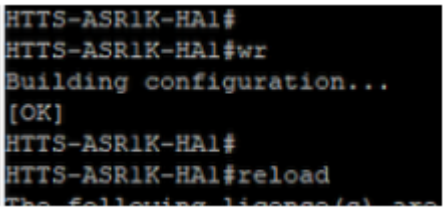
HTTS-ASR1KX-HA2(conf-voi-serv)#
HTTS-ASR1KX-HA2(conf-voi-serv)#
HTTS-ASR1KX-HA2(conf-voi-serv)#exit
HTTS-ASR1KX-HA2(config)#
HTTS-ASR1KX-HA2(config)#ip rtcp report interval 3000
HTTS-ASR1KX-HA2(config)#
HTTS-ASR1KX-HA2(config)#gateway
HTTS-ASR1KX-HA2(config-gateway)#
HTTS-ASR1KX-HA2(config-gateway)#media-inactivity-criteria 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.

Save the Configuration and Reboot both CUBEs

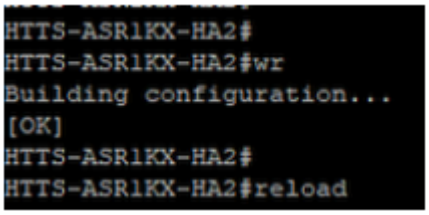
After enabling redundancy, you must reload both routers. Before the reload, save the configurations.

CUBE-1



Save the configuration and reboot the CUBE-1.

CUBE-2



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#
```

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 the standby CUBE 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 are currently no specific troubleshooting information available for this configuration.

Related Information

For more information about the CUBE HA, refer to these links:

- Cisco Unified Border Element Configuration Guide Through Cisco IOS® XE 17.5
- Cisco Unified Border Element Configuration Guide - Cisco IOS XE 17.6 Onwards
- Configure High Availability for CUBE