Redundant Root Access Point (RAP) Ethernet Daisy Chaining

Redundant RAP Ethernet daisy chaining

A redundant RAP Ethernet daisy chain is a network topology feature that

- connects Root APs (RAPs) in a sequence using wired Ethernet links
- provides redundant paths with two switches acting as designated ports for failover, and
- minimizes latency in backhaul link failure recovery by reversing data flow through a new STP root.

This feature proposes a redundancy in the daisy chain, wherein two switches act as a redundant Designated Port, each connected to either end of the daisy chain. In case of a link failure, the link direction is reversed using a new STP root.

A redundant RAP Ethernet daisy chain shares capabilities with the mesh daisy chain feature. Both topologies provide redundancy and improve network resiliency. In the redundant RAP Ethernet daisy chain topology, each AP encapsulates a packet with a CAPWAP header and forwards it from its wireless client to the controller. The AP bridges the packet from its secondary Ethernet interface to its primary Ethernet interface, including CAPWAP packets sent from other APs' wireless clients. Both 2.4 GHz and 5 GHz radios are available for client access.

Redundant RAP Ethernet daisy chain is supported on the IW6300 AP model.

The daisy chain strict RAP configuration is applicable to Cisco IOS APs only.

If a CAPWAP loss occurs on the first RAP connected to the switch in an Ethernet daisy chain topology, the entire chain loses its uplink, causing a long recovery time. When the RAP Ethernet daisy chain is enabled, the CAPWAP data keepalive interval increases threefold.

Note Only the wired uplink configuration is valid when an AP is configured as a Bridge or Flex Bridge mode Root AP.

Prerequisites for redundant RAP Ethernet daisy chaining support

To successfully configure redundant RAP Ethernet daisy chaining, ensure that you:

- Enable Ethernet bridging.
- Enable the strict-wired-uplink feature.

Configure redundant RAP Ethernet daisy chaining support (CLI)

Enable redundant RAP Ethernet daisy chaining on a mesh profile to provide link redundancy in wireless mesh networks.

Use this configuration to improve network robustness by allowing redundant paths in the RAP Ethernet daisy chain topology.

Procedure

Step 1 Enter global configuration mode.

Example:

```
Device# configure terminal
```

Step 2 Configure a mesh profile and enter mesh profile configuration mode.

Example:

```
Device(config)# wireless profile mesh profile-name
```

Step 3 Configure daisy chain STP redundancy.

Example:

```
Device(config-wireless-mesh-profile)# daisychain-stp-redundancy
```

Redundant RAP Ethernet daisy chaining is enabled for the specified mesh profile.

```
Device# configure terminal
Device(config)# wireless profile mesh default-mesh-profile
Device(config-wireless-mesh-profile)# daisychain-stp-redundancy
```

Verify daisy chain redundancy

To verify the ethernet daisy chain summary, use this command:

```
Device# show wireless mesh ethernet daisy-chain summary

AP Name      BVI MAC          BGN     Backhaul      Ethernet          STP Red
-----------------------------------------------------------------------------------------------
RAP4         683b.78bf.15f0   IOT     Ethernet0     Up  Up  Dn  Dn   Enabled
RAP3         683b.78bf.1634   IOT     Ethernet0     Up  Up  Dn  Dn   Enabled
RAP1         6c8b.d383.b4d4   IOT     Ethernet0     Up  Up  Dn  Dn   Enabled
RAP2         6c8b.d383.b4e8   IOT     Ethernet0     Up  Up  Up  Dn   Enabled
```

To verify the ethernet daisy chain Bridge Group Name (BGN) details, use this command:

```
Device# show wireless mesh ethernet daisy-chain bgn <IOT>

AP Name   BVI MAC          BGN    Backhaul    Ethernet          STP Red
-------------------------------------------------------------------------------------------------
RAP4      683b.78bf.15f0    IOT    Ethernet0   Up  Up  Dn  Dn   Enabled
RAP3      683b.78bf.1634    IOT    Ethernet0   Up  Up  Dn  Dn   Enabled
RAP1      6c8b.d383.b4d4    IOT    Ethernet0   Up  Up  Dn  Dn   Enabled
RAP2      6c8b.d383.b4e8    IOT    Ethernet0   Up  Up  Up  Dn   Enabled
```

To verify the mesh profile, use this command:

```
Device# show wireless profile mesh detailed default-mesh-profile

Mesh Profile Name : default-mesh-profile
-----------------------------------------------
Description : default mesh profile
Bridge Group Name : IOT
Strict match BGN : ENABLED
Amsdu : ENABLED
Background Scan : ENABLED
Channel Change Notification : ENABLED
Backhaul client access : ENABLED
Ethernet Bridging : ENABLED
Ethernet Vlan Transparent : DISABLED
Daisy Chain STP Redundancy : ENABLED
Full Sector DFS : ENABLED
IDS : ENABLED
Multicast Mode : In-Out
Range in feet : 12000
Security Mode : EAP
Convergence Method : Standard
LSC only Authentication : DISABLED
Battery State : ENABLED
Authorization Method : eap_methods
Authentication Method : eap_methods
Backhaul tx rate(802.11bg) : auto
Backhaul tx rate(802.11a) : auto
===============
```