

Control Plane and User Plane Association

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Feature Summary and Revision History

Summary Data

Table 1: Summary Data

Applicable Product(s) or Functional Area	cnBNG
Applicable Platform(s)	SMI
Feature Default Setting	Disabled - Configuration Required
Related Changes in this Release	Not Applicable
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
Introduced support for multiple CP associations to an UP.	2026.02.0

Revision Details	Release
Introduced support for IPv6 transport between the Control Plane and a peer User Plane.	2024.02.0
UP Rollback Failure Handling Notification support added.	2022.01.0
UP Session Disconnect Notification support added.	2021.03.0
First introduced.	2021.01.0

Feature Description

The Control Plane (CP) associates with a peer User Plane to synchronize with the number of subscriber sessions and state of each session. The CP and UP must maintain the total number of active sessions and their state on both sides.

To associate a UP to the CP, see the Associating the User Plane, on page 3.

Manually remove CP-UP association

Use this procedure to remove a CP-UP association and prevent stale session states. This process clears subscriber sessions and dynamic routes.

Procedure

Step 1 Remove subscriber sessions on CP to ensure that no session state remains in the database.

Example:

```
clear subscriber sessmgr [ gr-instance gr_instance_id | srg-peer-id srg_peer_id | upf upf_name ]
```

Step 2 Ensure that all dynamic and static routes associated with the UP are removed to prevent routing loops or stale RIB entries.

Example:

```
clear cnbng-nal dynamic-routes afi all
```

Step 3 Remove the Subscriber Redundancy Group (SRG) configuration that binds the UP to the Control Plane.

Example:

```
clear cnbng-nal cp-srg-association srg-group all
```

If Subscriber Redundancy Group of particular instance ID to be cleared, use the keyword **up-instance-id <1-15>**

Step 4 Clear CP-UP Association.

Example:

```
clear cnbng-nal cp-association
```

If association of particular instance ID to be cleared, use the **up-instance-id <1-15>**

Enabling Control Plane and User Plane Association

This section describes how to enable CP to UP association.

Associating the CP and UP involves the following procedure.

Associating the User Plane

Associating the User Plane

Use the following commands to associate the Control Plane (CP) to the peer User Plane.

```
config
  user-plane user_plane_name
  offline
  peer-address { ipv4 ipv4_address | ipv6 ipv6_address }
  port-id port_identifier subscriber-profile subscriber_profile
  subscriber-profile subscriber_profile
  exit
```

NOTES:

- **user-plane** *user_plane_name*: Specifies the User Plane (UP) name and enter UP Configuration mode.
- **offline**: Marks the UP offline for a graceful disconnect.

  The CP-UP association must be down before the **offline** command is enabled. You must first complete the procedure to remove the CP-UP association. For more information, see Manually remove CP-UP association, on page 2.
- **peer-address ipv4** *ipv4_address*: Specifies the peer IPv4 address of the UP.
- **peer-address ipv6** *ipv6_address*: Specifies the peer IPv6 address of the UP.
- **port-id** *port_identifier* **subscriber-profile** *subscriber_profile*: Specifies the port identifier of the UP. **subscriber-profile** *subscriber_profile* associates the subscriber profile at the port identifier level.
- **subscriber-profile** *subscriber_profile*: Associates the subscriber profile at UP level.

Multiple Control Plane associations

A multiple control plane association is a deployment capability that

- allows a single User Plane (UP) to simultaneously connect to multiple Control Plane (CP) instances
- enables Subscriber Redundancy Groups (SRG) to be mapped flexibly across different CPs, and
- improves scalability, redundancy, and migration flexibility in Broadband Network Gateway (BNG) environments.

Table 3: Feature History

Feature Name	Release Information	Description
Multiple Control Plane associations	2026.02.0	You can now improve cnBNG redundancy and flexibility by enabling a single User Plane (UP) to connect to multiple Control Plane (CP) instances at the same time. This allows Subscriber Redundancy Groups (SRG) to be mapped more flexibly across different Control Planes.

Traditionally, a User Plane could connect to only one Control Plane instance, which limited the ability to support complex SRG peering or to optimize resource utilization in large, distributed networks. With this enhancement, a User Plane (such as Cisco ASR 9000) can maintain up to 10 logical associations with different Control Plane instances or Geo-Redundancy (GR) instances. Each logical association acts as a separate User Plane context from the Control Plane perspective.

Benefits of multiple Control Plane associations

These are the key benefits:

- Enhanced network resilience through improved redundancy.
- Reduced operational complexity by simplifying migration processes.
- Support for scalable deployment across different environments.

Restrictions for multiple Control Plane associations

These restrictions apply when configuring multiple Control Plane associations with a single User Plane:

- Only IP over Ethernet (IPoE) hot standby Service Redundancy Group (SRG) sessions are supported across multiple user plane instances. PPPoE, LNS, and LAC session types are not supported in this mode.
- Warm standby is not supported when using logical User Plane instances.
- Support for non-SRG subscribers is available only on the default instance (ID 0).
- Parallel reconciliation involving subscriber, route, or SRG information, in any combination, is not supported.
- Changing a user-plane name on the Control Plane while the association is up is not supported.

Configure and verify multiple CP associations for a UP

To configure the Multiple CP associations feature, you must complete these tasks:

Configure multiple CP associations for a UP

Set up one or more logical associations between a UP and multiple CP instances to enable advanced redundancy and scalability.

Use this task when you want a UP node to support multiple CP clusters or SRG instances simultaneously, such as during migration or when optimizing SRG group mapping.

Before you begin

Ensure you have these prerequisites:

- Confirm the number and addresses of CP instances you wish to connect.

Follow these steps to configure multiple CP associations for a UP.

Procedure

Step 1 On the UP, configure the default (global) association parameters (instance-id 0).

Example:

```
Router# configure
Router(config)# cnbng-nal location 0/RSP0/CPU0
Router(config-cnbng-nal-local)# hostidentifier asr9k-1-cp-1-inst-0
Router(config-cnbng-nal-local)# up-server ipv4 10.1.1.51 vrf default gtp-port 15002 pfcp-port 15003
Router(config-cnbng-nal-local)# cp-server primary ipv4 192.0.2.1
Router(config-cnbng-nal-local)# cp-association retry-count 6
```

By default, the device uses instance ID 0 if no **up-instance-id** is specified.



Note You can also configure **up-server** at the global level. If **up-server** is not configured locally, the individual UP instance inherits the global **up-server** setting.

Step 2 Configure additional logical UP instances to support multiple CP-UP association.

Example:

```
Router# configure
Router(config)# cnbng-nal location 0/RSP0/CPU0
Router(config-cnbng-nal-local)# up-instance-id 1
Router(config-cnbng-nal-local)# hostidentifier asr9k-1-cp-1-inst-1
Router(config-cnbng-nal-local)# up-server ipv4 10.1.1.52 vrf default gtp-port 15002 pfcp-port 15003
Router(config-cnbng-nal-local)# cp-server primary ipv4 192.0.2.2
Router(config-cnbng-nal-local)# cp-association retry-count 6
```

Repeat this step for each additional logical UP instance. Assign a unique **up-instance-id** (1–15) and **hostidentifier** per instance.

Example:

```
Router# configure
Router(config)# cnbng-nal location 0/RSP0/CPU0
Router(config-cnbng-nal-local)# up-instance-id 2
Router(config-cnbng-nal-local)# hostidentifier asr9k-1-cp-1-inst-2
Router(config-cnbng-nal-local)# up-server ipv4 10.1.1.53 vrf default gtp-port 15002 pfcp-port 15003
Router(config-cnbng-nal-local)# cp-server primary ipv4 192.0.2.3
Router(config-cnbng-nal-local)# cp-association retry-count 6
```

Step 3 On the UP, configure SRG groups to be mapped to UP instances.

Example:

Associating a group to default UP instance:

```
Router# configure
Router(config)# cnbng-nal location 0/RSP0/CPU0
Router(config-cnbng-nal-local)# subscriber-redundancy
Router(config-cnbng-nal-sub-red)# group group2001
Router(config-cnbng-nal-srg-grp)# virtual-mac 0000.1111.03e9
Router(config-cnbng-nal-srg-grp)# access-tracking track_group2001
Router(config-cnbng-nal-srg-grp)# access-interface-list
Router(config-cnbng-nal-srg-grp-intf)# interface Bundle-Ether40.2001
```

Example:

Associating a group to UP instance 1:

```
Router# configure
Router(config)# cnbng-nal location 0/RSP0/CPU0
Router(config-cnbng-nal-local)# up-instance-id 1
Router(config-cnbng-nal-local)# subscriber-redundancy
Router(config-cnbng-nal-sub-red)# group group2002
Router(config-cnbng-nal-srg-grp)# virtual-mac 0000.1111.03ea
Router(config-cnbng-nal-srg-grp)# access-tracking track_group2002
Router(config-cnbng-nal-srg-grp)# access-interface-list
Router(config-cnbng-nal-srg-grp-intf)# interface Bundle-Ether40.2002
```

Step 4 On the CP, configure each UP instance as a separate UP.



Important The **user-plane** hostname configured on the CP must exactly match the **hostidentifier** configured for the corresponding UP instance on the UP.

Example:

```
user-plane
  instance 0
    user-plane asr9k-1-cp-1-inst-0
      peer-address ipv4 10.1.1.51
      subscriber-profile SUBS_PROF_1
      exit
      subscriber-redundancy
        group group2001
          preferred-role-active
          peer-identifier peer2001-x
          port-id-map port-name Bundle-Ether40.2001 1
        exit
      exit

  instance 1
    user-plane asr9k-1-cp-1-inst-1
      peer-address ipv4 10.1.1.52
      subscriber-profile SUBS_PROF_1
      exit
      subscriber-redundancy
        group group2002
          peer-identifier peer2002-x
          port-id-map port-name Bundle-Ether40.2002
        exit
      exit
```

Step 5 (Optional) On the UP, configure per-instance flow control thresholds.

Example:

```
Router(config-cnbng-nal-instance-id)# up-cp-notification flow-control 100
Router(config-cnbng-nal-instance-id)# up-cp-stats flow-control 150
```

Adjust per-instance flow and statistics thresholds as needed for scale and performance requirements.

Step 6 (Optional) On the UP, configure global flow control thresholds if required.

Use only if you require system-wide aggregate limits.

Example:

```
Router(config-cnbng-nal-local)# up-cp-notification global-flow-control 500
Router(config-cnbng-nal-local)# up-cp-stats global-flow-control 250
```

Step 7 On the UP, execute the **cnbng-nal cp-association start [up-instance-id 1] location 0/RSP0/CPU0** command to bring up the association.

Verify multiple CP associations to a UP

Ensure each logical UP instance is correctly associated and operating with its SRG CP peer. Diagnose and resolve issues related to SRG mapping, session and route allocation, and association failures.

Procedure

Step 1 Verify CP-UP association status for a specific or all UP instances.

Example:

```
Router# show cnbng-nal cp connection status up-instance-id 1

Tue Jun  2 08:25:19.093 IST
Location: 0/0/CPU0

UP Instance ID: 1

User-Plane configurations:
--------------------------
 IP   : 21.21.21.1
 GTP Port  : 15002
 PFCP Port  : 15003
 VRF   : default

Control-Plane configurations:
-----------------------------
 PRIMARY IP  : 21.21.21.2
 GTP Port  : 2152
 PFCP Port  : 8805

 Association retry count: 5

 Connection Status: Up
 Connection Status time stamp:  Mon Jun  1 19:23:18 2026

 Connection Prev Status: Init
 Connection Prev Status time stamp:  Mon Jun  1 19:20:48 2026

 Association status: Active
 Association status time stamp: Mon Jun  1 19:23:18 2026
```

```
 GTPu socket bind rc: Success
 PFCP socket bind rc: Success

[NAL-CP-INST-EVENTS]

| Event Name                    | Time Stamp              | User Data
| Association Active            | Jun  1 19:23:18.090052  | -- NA --
| Transport Up                  | Jun  1 19:23:18.091136  | -- NA --
```

```
Router# show cnbng-nal cp connection status up-instance-id all

Tue Jun  2 08:25:26.696 IST
Location: 0/0/CPU0
================================================================================
UP Instance ID: 1

User-Plane configurations:
--------------------------
 IP   : 21.21.21.1
 GTP Port  : 15002
 PFCP Port  : 15003
 VRF   : default

Control-Plane configurations:
-----------------------------
 PRIMARY IP  : 21.21.21.2
 GTP Port  : 2152
 PFCP Port  : 8805

 Association retry count: 5

 Connection Status: Up
 Connection Status time stamp:  Mon Jun  1 19:23:18 2026

 Connection Prev Status: Init
 Connection Prev Status time stamp:  Mon Jun  1 19:20:48 2026

 Association status: Active
 Association status time stamp: Mon Jun  1 19:23:18 2026

 GTPu socket bind rc: Success
 PFCP socket bind rc: Success

[NAL-CP-INST-EVENTS]

| Event Name                    | Time Stamp              | User Data
| Association Active            | Jun  1 19:23:18.090052  | -- NA --
| Transport Up                  | Jun  1 19:23:18.091136  | -- NA --

UP Instance ID: 2

User-Plane configurations:
--------------------------
 IP   : 31.31.31.1
 GTP Port  : 15004
 PFCP Port  : 15005
 VRF   : default

Control-Plane configurations:
-----------------------------
 PRIMARY IP  : 31.31.31.2
 GTP Port  : 2152
 PFCP Port  : 8805
```

```
 Association retry count: 5

 Connection Status: Up
 Connection Status time stamp:  Mon Jun  1 19:23:18 2026

 Connection Prev Status: Init
 Connection Prev Status time stamp:  Mon Jun  1 19:20:48 2026

 Association status: Active
 Association status time stamp: Mon Jun  1 19:23:18 2026

 GTPu socket bind rc: Success
 PFCP socket bind rc: Success

[NAL-CP-INST-EVENTS]

| Event Name                    | Time Stamp              | User Data
| Association Active            | Jun  1 19:23:18.092553  | -- NA --
| Transport Up                  | Jun  1 19:23:18.093636  | -- NA --
```

Expected result: Each UP instance reports an **ESTABLISHED** state with its assigned CP group. If state is **FAILED** or **ATTEMPTING**, proceed to troubleshooting.

Step 2 Verify SRG group assignments and operational roles.

Example:

```
Router# show cnbng-nal srg-group

Tue Jun  2 08:25:37.200 IST
====================
Location: 0/0/CPU0
====================

Group-name   SRG role  Access OT  Core OT  Subs Count V4 routes V6 routes UP Inst ID
-------------------------------------------------------------------------------

Router# show cnbng-nal srg-group up-instance-id 1

Tue Jun  2 08:25:41.905 IST
====================
Location: 0/0/CPU0
====================

Group-name  SRG role  Access OT  Core OT  Subs Count V4 routes V6 routes UP Inst ID
-------------------------------------------------------------------------------
group1       Active    Up         Up       1          2         2         1

Total Entries : 1

Summary
-------
Category                  Total      Active     Standby    None
-------------------------------------------------------------------
Groups                    1          1          0          0
Subscribers               1          1          0          0
V4 subnet routes          2          2          0          0
V6 subnet routes          2          2          0          0

Router# show cnbng-nal srg-group detail up-instance-id 1

Tue Jun  2 08:25:55.846 IST
====================
Location: 0/0/CPU0
```

```
====================

SRG group name                    : group1
SRG group admin state             : UP_CP_Configured
SRG group state                   : Up
SRG role                          : Active
SRG ID                            : 0x00000fa1
UP Instance ID                    : 1
SRG VRF name                      : **srg_4001
SRG mode                          : HOT
Last SRG role update time         : Jun 01 19:28:26.046033
Virtual mac                       : 0AAA.0BBB.0C01
V4 Table Id                       : 0xe0000012
V6 Table Id                       : 0xe0800012
V4 Proto Id                       : 0x00000002
V6 Proto Id                       : 0x00000001
Subscriber count                  : 1
Warm Subscriber count             : 0
IPV4 route count                  : 2
IPV6 route count                  : 2
Damping timer interval            : 120 Sec
Subnet route tag                  : 0
Route export on Standby enable    : False
Fast switchover enable            : True
Ready for role change             : Yes [Success]
FSM State                         : COMPLETE
Update Request State              : IDLE
Stats state                       : IDLE
Sub disconnect resp pend          : NA
Sub count for keep alive start    : 0
Group for routed subscribers      : FALSE

Access tracking object
----------------------
    Object name                     : track1
    Tracking state                  : Up
    Last tracking state update time : Jun 01 19:26:49.537142

Core tracking object
--------------------
    Object name                     : core1
    Tracking state                  : Up
    Last tracking state update time : Jun 01 19:26:49.537217

Access Interfaces
-----------------
    Bundle-Ether1.1

IM counters
------------
    Total errors                    : 0

RIB counters
------------
    Total entries                   : 0
    Pending                         : 0
    Total errors                    : 0

Terminate counters
------------------
    IM terminate                    : 0
    RIB terminate                   : 0
    Stats terminate                 : 0
```

```
Flags
-----
Value: [0x0000007C]

 [VRF_CREATE | V4_RIB_CREATE | V6_RIB_CREATE |
  V4_RIB_COMPLETE | V6_RIB_COMPLETE]

Checkpoint Flags
----------------
Value: [0x00000000]
 None

CP Recon data
-------------
    Duration                        : 0 secs
    Replay reqs in progress         : 0
    Replay subs in progress         : 0
    CP Recon Flags                  : 0x0

Subscriber transaction Info
---------------------------
    Subscribers in transaction      : 0
    Subscribers in AF down queue    : 0
    Subscribers in disc queue       : 0

Group role switchover stats Info
--------------------------------
    Last stats interaction time(A->S)   : 1.060 secs
    Last stats interaction time(S->A)   : 0.060 secs
    Max stats interaction time(A->S)    : 1.060 secs (Jun 01 19:25:40.854170)
    Max stats interaction time(S->A)    : 0.060 secs (NA)

Group role switchover RIB Info
------------------------------
    Last rib interaction time(A->S)     : 0.06103 secs
    Last rib interaction time(S->A)     : 0.060 secs
    Max rib interaction time(A->S)      : 0.06103 secs (Jun 01 19:25:40.853550)
    Max rib interaction time(S->A)      : 0.060 secs (NA)

    Active role change count            : 9
    Standby role change count           : 8

[SRG-GROUP-EVENTS]

| Event Name                              | Time Stamp              | User Data
| Group create                            | Jun  1 19:22:58.093098  | -- NA --
| V4 backup vrf create                    | Jun  1 19:22:58.093283  | -- NA --
| V6 backup vrf create                    | Jun  1 19:22:58.093311  | -- NA --
| V4 backup vrf create rsp                | Jun  1 19:22:58.109535  | -- NA --
| V4 backup rib tbl create                | Jun  1 19:22:58.109582  | -- NA --
| V6 backup vrf create rsp                | Jun  1 19:22:58.109585  | -- NA --
| V6 backup rib tbl create                | Jun  1 19:22:58.109593  | -- NA --
| V4 backup rib tbl create rsp            | Jun  1 19:22:58.112594  | -- NA --
| V6 backup rib tbl create rsp            | Jun  1 19:22:58.211073  | -- NA --
| State update held, transport down       | Jun  1 19:24:07.182998  | -- NA --
| Role none                               | Jun  1 19:24:15.954512  | -- NA --
| CP action add                           | Jun  1 19:24:29.121120  | -- NA --
| Subs rib route deletion started         | Jun  1 19:25:40.853550  | -- NA --
| Subs rib route deletion completed       | Jun  1 19:25:40.957261  | -- NA --
| Fast swo timer expiry, Role Active      | Jun  1 19:25:56.235268  | -- NA --
| Notify: State Down                      | Jun  1 19:26:39.621205  |
in_prog:F,comp:T,role:stdby,state:down
| Role standby                            | Jun  1 19:28:04.552720  | -- NA --
| Role standby start                      | Jun  1 19:28:04.552762  | -- NA --
```

```
| Role standby end                          | Jun  1 19:28:04.553567  | -- NA --
| Role active                               | Jun  1 19:28:26.046033  | -- NA --
| Role active start                         | Jun  1 19:28:26.046107  | -- NA --
| Role active end                           | Jun  1 19:28:26.046878  | -- NA --
| Notify: State Up                          | Jun  1 19:28:31.046323  |
in_prog:F,comp:T,role:act,state:up
| State change ack'ed                       | Jun  1 19:28:31.046495  | -- NA --
| Sent srg role response to CP              | Jun  1 19:28:37.642414  |
in_prog:F,comp:T,role:act,state:up

======================================================================

Total Entries : 1
```

```
Router# show cnbng-nal srg-group detail up-instance-id all

Tue Jun  2 08:25:58.913 IST
====================
Location: 0/0/CPU0
====================

SRG group name                    : group1
SRG group admin state             : UP_CP_Configured
SRG group state                   : Up
SRG role                          : Active
SRG ID                            : 0x00000fa1
UP Instance ID                    : 1
SRG VRF name                      : **srg_4001
SRG mode                          : HOT
Last SRG role update time         : Jun 01 19:28:26.046033
Virtual mac                       : 0AAA.0BBB.0C01
V4 Table Id                       : 0xe0000012
V6 Table Id                       : 0xe0800012
V4 Proto Id                       : 0x00000002
V6 Proto Id                       : 0x00000001
Subscriber count                  : 1
Warm Subscriber count             : 0
IPV4 route count                  : 2
IPV6 route count                  : 2
Damping timer interval            : 120 Sec
Subnet route tag                  : 0
Route export on Standby enable    : False
Fast switchover enable            : True
Ready for role change             : Yes [Success]
FSM State                         : COMPLETE
Update Request State              : IDLE
Stats state                       : IDLE
Sub disconnect resp pend          : NA
Sub count for keep alive start    : 0
Group for routed subscribers      : FALSE

Access tracking object
----------------------
    Object name                     : track1
    Tracking state                  : Up
    Last tracking state update time : Jun 01 19:26:49.537142

Core tracking object
--------------------
    Object name                     : core1
    Tracking state                  : Up
    Last tracking state update time : Jun 01 19:26:49.537217

Access Interfaces
-----------------
```

```
    Bundle-Ether1.1

IM counters
------------
    Total errors                    : 0

RIB counters
------------
    Total entries                   : 0
    Pending                         : 0
    Total errors                    : 0

Terminate counters
------------------
    IM terminate                    : 0
    RIB terminate                   : 0
    Stats terminate                 : 0

Flags
-----
Value: [0x0000007C]

 [VRF_CREATE | V4_RIB_CREATE | V6_RIB_CREATE |
  V4_RIB_COMPLETE | V6_RIB_COMPLETE]

Checkpoint Flags
----------------
Value: [0x00000000]
 None

CP Recon data
-------------
    Duration                        : 0 secs
    Replay reqs in progress         : 0
    Replay subs in progress         : 0
    CP Recon Flags                  : 0x0

Subscriber transaction Info
---------------------------
    Subscribers in transaction      : 0
    Subscribers in AF down queue    : 0
    Subscribers in disc queue       : 0

Group role switchover stats Info
--------------------------------
    Last stats interaction time(A->S)   : 1.060 secs
    Last stats interaction time(S->A)   : 0.060 secs
    Max stats interaction time(A->S)    : 1.060 secs (Jun 01 19:25:40.854170)
    Max stats interaction time(S->A)    : 0.060 secs (NA)

Group role switchover RIB Info
------------------------------
    Last rib interaction time(A->S)     : 0.06103 secs
    Last rib interaction time(S->A)     : 0.060 secs
    Max rib interaction time(A->S)      : 0.06103 secs (Jun 01 19:25:40.853550)
    Max rib interaction time(S->A)      : 0.060 secs (NA)

    Active role change count            : 9
    Standby role change count           : 8

[SRG-GROUP-EVENTS]

| Event Name                            | Time Stamp              | User Data
| Group create                          | Jun  1 19:22:58.093098  | -- NA --
```

```
| V4 backup vrf create                     | Jun  1 19:22:58.093283  | -- NA --
| V6 backup vrf create                     | Jun  1 19:22:58.093311  | -- NA --
| V4 backup vrf create rsp                 | Jun  1 19:22:58.109535  | -- NA --
| V4 backup rib tbl create                 | Jun  1 19:22:58.109582  | -- NA --
| V6 backup vrf create rsp                 | Jun  1 19:22:58.109585  | -- NA --
| V6 backup rib tbl create                 | Jun  1 19:22:58.109593  | -- NA --
| V4 backup rib tbl create rsp             | Jun  1 19:22:58.112594  | -- NA --
| V6 backup rib tbl create rsp             | Jun  1 19:22:58.211073  | -- NA --
| State update held, transport down        | Jun  1 19:24:07.182998  | -- NA --
| Role none                                | Jun  1 19:24:15.954512  | -- NA --
| CP action add                            | Jun  1 19:24:29.121120  | -- NA --
| Subs rib route deletion started          | Jun  1 19:25:40.853550  | -- NA --
| Subs rib route deletion completed        | Jun  1 19:25:40.957261  | -- NA --
| Fast swo timer expiry, Role Active       | Jun  1 19:25:56.235268  | -- NA --
| Notify: State Down                       | Jun  1 19:26:39.621205  |
in_prog:F,comp:T,role:stdby,state:down
| Role standby                             | Jun  1 19:28:04.552720  | -- NA --
| Role standby start                       | Jun  1 19:28:04.552762  | -- NA --
| Role standby end                         | Jun  1 19:28:04.553567  | -- NA --
| Role active                              | Jun  1 19:28:26.046033  | -- NA --
| Role active start                        | Jun  1 19:28:26.046107  | -- NA --
| Role active end                          | Jun  1 19:28:26.046878  | -- NA --
| Notify: State Up                         | Jun  1 19:28:31.046323  |
in_prog:F,comp:T,role:act,state:up
| State change ack'ed                      | Jun  1 19:28:31.046495  | -- NA --
| Sent srg role response to CP             | Jun  1 19:28:37.642414  |
in_prog:F,comp:T,role:act,state:up

======================================================================

SRG group name                    : group2
SRG group admin state             : UP_Configured
SRG group state                   : Up
SRG role                          : None
SRG ID                            : 0x00000fa2
UP Instance ID                    : 2
SRG VRF name                      : -NA- (fast-switchover disabled)
SRG mode                          : HOT
Last SRG role update time         : Jun 01 19:24:15.954725
Virtual mac                       : 0AAA.0BBB.0A02
V4 Table Id                       : 0x00000000
V6 Table Id                       : 0x00000000
V4 Proto Id                       : 0x0000ffff
V6 Proto Id                       : 0x0000ffff
Subscriber count                  : 0
Warm Subscriber count             : 0
IPV4 route count                  : 0
IPV6 route count                  : 0
Damping timer interval            : 120 Sec
Subnet route tag                  : 0
Route export on Standby enable    : False
Fast switchover enable            : False
Ready for role change             : Yes [Success]
FSM State                         : UNKNOWN
Update Request State              : IDLE
Stats state                       : IDLE
Sub disconnect resp pend          : NA
Sub count for keep alive start    : 0
Group for routed subscribers      : FALSE

Access tracking object
----------------------
    Object name                     : track1
    Tracking state                  : Up
```

```
    Last tracking state update time : Jun 01 19:26:49.537187

Core tracking object
--------------------
    Object name                     : core1
    Tracking state                  : Up
    Last tracking state update time : Jun 01 19:26:49.537261

Access Interfaces
-----------------
    Bundle-Ether1.2

IM counters
------------
    Total errors                    : 0

RIB counters
------------
    Total entries                   : 0
    Pending                         : 0
    Total errors                    : 0

Terminate counters
------------------
    IM terminate                    : 0
    RIB terminate                   : 0
    Stats terminate                 : 0

Flags
-----
Value: [0x00000000]
 None

Checkpoint Flags
----------------
Value: [0x00000048]

 [STATE_RESP_PENDING | ROLE_CHG_IN_PROG]

CP Recon data
-------------
    Duration                        : 0 secs
    Replay reqs in progress         : 0
    Replay subs in progress         : 0
    CP Recon Flags                  : 0x0

Subscriber transaction Info
---------------------------
    Subscribers in transaction      : 0
    Subscribers in AF down queue    : 0
    Subscribers in disc queue       : 0

Group role switchover stats Info
--------------------------------
    Last stats interaction time(A->S)   : 0.060 secs
    Last stats interaction time(S->A)   : 0.060 secs
    Max stats interaction time(A->S)    : 0.060 secs (NA)
    Max stats interaction time(S->A)    : 0.060 secs (NA)

Group role switchover RIB Info
------------------------------
    Last rib interaction time(A->S)     : 0.060 secs
    Last rib interaction time(S->A)     : 0.060 secs
    Max rib interaction time(A->S)      : 0.060 secs (NA)
```

```
    Max rib interaction time(S->A)      : 0.060 secs (NA)

    Active role change count            : 0
    Standby role change count           : 1

[SRG-GROUP-EVENTS]

| Event Name                              | Time Stamp              | User Data
| Group create                            | Jun  1 19:22:58.095173  | -- NA --
| V4 backup vrf create                    | Jun  1 19:22:58.095296  | -- NA --
| V6 backup vrf create                    | Jun  1 19:22:58.095324  | -- NA --
| Role standby start                      | Jun  1 19:24:07.754079  | -- NA --
| Role standby                            | Jun  1 19:24:07.754079  | -- NA --
| Role standby end                        | Jun  1 19:24:07.755454  | -- NA --
| CP action add                           | Jun  1 19:24:07.755455  | -- NA --
| Sent srg role response to CP            | Jun  1 19:24:07.755510  |
in_prog:T,comp:F,role:stdby,state:up
| State update held, transport down       | Jun  1 19:24:07.756603  | -- NA --
| Role none                               | Jun  1 19:24:15.954725  | -- NA --

==========================================================================

Total Entries : 2
```

Check for correct mapping to UP instances and proper Active/Standby roles.

Step 3 Verify dynamic route distribution across UP instances.

Example:

```
Router# show cnbng-nal dynamic-routes summary up-instance-id all

Tue Jun  2 08:26:15.612 IST

Location: 0/0/CPU0
-----------------------

Counter Name             Value
---------------------------------
V4 OC Entries            2
V6 OC Entries            2
V4 Primary Entries       0
V4 Secondary Entries     2
V4 RIB Entries           2
V6 RIB Entries           2
OC replay entry count    0
V6 OC replay entry count 0
V6 Enabled Entries       0


Router# show cnbng-nal dynamic-routes summary up-instance-id 1

Tue Jun  2 08:26:23.611 IST
Location: 0/0/CPU0
-----------------------
Counter Name             Value
---------------------------------
V4 OC Entries            2
V6 OC Entries            2
V4 Primary Entries       0
V4 Secondary Entries     2
V4 RIB Entries           2
V6 RIB Entries           2
OC replay entry count    0
V6 OC replay entry count 0
```

```
V6 Enabled Entries       0
```

Routes must be correctly distributed per instance. Look for overlaps or missing entries.

Step 4 Verify subscriber session distribution and status.

Example:

```
Router# show cnbng-nal subscriber all up-instance-id all

Tue Jun  2 08:26:39.880 IST

====================
Location: 0/0/CPU0
====================
Codes: CN - Connecting, CD - Connected, AC - Activated,
       ID - Idle, DN - Disconnecting, IN - Initializing
       UN - Unknown


CPID(hex)  Interface              State  Mac Address     Subscriber IP Addr / Prefix (Vrf) Ifhandle
-------------------------------------------------------------------------------------------------
d2         BE1.1.ip3221227008      AC     001b.0000.00d2  100.0.0.210 (default) 0x2b0
                                                          200.0.210.0/24 (Framed IPv4)
                                                          201.0.210.0/24 (Framed IPv4)
                                                          202.0.210.0/24 (Framed IPv4)
                                                          203.0.210.0/24 (Framed IPv4)
                                                          cafe:feed::d2 (IANA)
                                                          cafe:bead:0:d2::/128 (IAPD)
                                                          1:cee:bad:c0de:0:d2::/96 (Framed IPv6)
                                                          1:cee:bad:c0de:100:d2::/96 (Framed IPv6)
                                                          1:cee:bad:c0de:200:d2::/96 (Framed IPv6)
                                                          1:cee:bad:c0de:300:d2::/96 (Framed IPv6)
Session-count: 1

Router# show cnbng-nal subscriber all up-instance-id 1

Tue Jun  2 08:26:42.928 IST
====================
Location: 0/0/CPU0
====================
Codes: CN - Connecting, CD - Connected, AC - Activated,
       ID - Idle, DN - Disconnecting, IN - Initializing
       UN - Unknown


CPID(hex)  Interface              State  Mac Address     Subscriber IP Addr / Prefix (Vrf) Ifhandle
-------------------------------------------------------------------------------------------------
d2         BE1.1.ip3221227008      AC     001b.0000.00d2  100.0.0.210 (default) 0x2b0
                                                          200.0.210.0/24 (Framed IPv4)
                                                          201.0.210.0/24 (Framed IPv4)
                                                          202.0.210.0/24 (Framed IPv4)
                                                          203.0.210.0/24 (Framed IPv4)
                                                          cafe:feed::d2 (IANA)
                                                          cafe:bead:0:d2::/128 (IAPD)
                                                          1:cee:bad:c0de:0:d2::/96 (Framed IPv6)
                                                          1:cee:bad:c0de:100:d2::/96 (Framed IPv6)
                                                          1:cee:bad:c0de:200:d2::/96 (Framed IPv6)
                                                          1:cee:bad:c0de:300:d2::/96 (Framed IPv6)
Session-count: 1

Router# show cnbng-nal subscriber all summary up-instance-id all

Tue Jun  2 08:26:55.300 IST
====================
```

```
Location: 0/0/CPU0
======================

                Type            PPPoE                   IPoE                    LAC             LNS
                ====            =====                   ====                    ===             ===
                                                    L2-Conn         Routed
                                                    =======         ======

Session Counts by State:
        initializing  0  0  0  0  0
          connecting  0  0  0  0  0
           connected  0  0  0  0  0
           activated  0  1  0  0  0
                idle  0  0  0  0  0
       disconnecting  0  0  0  0  0
               Total:  0  1  0  0  0


Session Counts by Address-Family:
                none  0  0  0  0  0
                ipv4  0  0  0  0  0
                ipv6  0  0  0  0  0
                dual  0  1  0  0  0
                 lac  0  0  0  0  0
              Total:  0  1  0  0  0

Router# show cnbng-nal subscriber all summary up-instance-id 1

Tue Jun  2 08:26:58.062 IST
======================
Location: 0/0/CPU0
======================

                Type            PPPoE                   IPoE                    LAC             LNS
                ====            =====                   ====                    ===             ===
                                                    L2-Conn         Routed
                                                    =======         ======

Session Counts by State:
        initializing  0  0  0  0  0
          connecting  0  0  0  0  0
           connected  0  0  0  0  0
           activated  0  1  0  0  0
                idle  0  0  0  0  0
       disconnecting  0  0  0  0  0
               Total:  0  1  0  0  0


Session Counts by Address-Family:
                none  0  0  0  0  0
                ipv4  0  0  0  0  0
                ipv6  0  0  0  0  0
                dual  0  1  0  0  0
                 lac  0  0  0  0  0
              Total:  0  1  0  0  0

Router# show cnbng-nal subscriber all detail up-instance-id 1

Tue Jun  2 08:27:21.590 IST
======================
Location: 0/0/CPU0
======================
Interface:                Bundle-Ether1.1.ip3221227008
```

```
UPID:                       0xc0000600
CPID:                       0x000000d2
UP Instance ID:             1
Type:                       IPoE
  Sub-type:                 L2 Connected
IPv4 Address:               100.0.0.210
IPv4 Framed Route:
  Prefix:                   200.0.210.0/24
  Next Hop:                 3.1.1.1
  Tag:                      0
  Metric:                   0
  Distance:                 0
  Next Hop VRF:
  Prefix:                   201.0.210.0/24
  Next Hop:                 3.1.1.1
  Tag:                      0
  Metric:                   0
  Distance:                 0
  Next Hop VRF:
  Prefix:                   202.0.210.0/24
  Next Hop:                 3.1.1.1
  Tag:                      0
  Metric:                   0
  Distance:                 0
  Next Hop VRF:
  Prefix:                   203.0.210.0/24
  Next Hop:                 3.1.1.1
  Tag:                      0
  Metric:                   0
  Distance:                 0
  Next Hop VRF:
IPv6 IANA Address:          cafe:feed::d2
IPv6 IAPD Prefix:           cafe:bead:0:d2::/128
IPv6 Slaac Prefix:          ::/0
CPE link local Address:     ::
IPv6 Framed Route:
  Prefix:                   1:cee:bad:c0de:0:d2::/96
  Next Hop:                 192::1
  Tag:                      0
  Metric:                   0
  Distance:                 0
  Next Hop VRF:
  Prefix:                   1:cee:bad:c0de:100:d2::/96
  Next Hop:                 192::1
  Tag:                      0
  Metric:                   0
  Distance:                 0
  Next Hop VRF:
  Prefix:                   1:cee:bad:c0de:200:d2::/96
  Next Hop:                 192::1
  Tag:                      0
  Metric:                   0
  Distance:                 0
  Next Hop VRF:
  Prefix:                   1:cee:bad:c0de:300:d2::/96
  Next Hop:                 192::1
  Tag:                      0
  Metric:                   0
  Distance:                 0
  Next Hop VRF:
IPv4 State:                 UP, Mon Jun  1 19:28:40 2026
IPv6 State:                 UP, Mon Jun  1 19:28:40 2026
Mac Address:                001b.0000.00d2
Inner VLAN ID:              Not Set
```

```
Outer VLAN ID:             1
Outer VLAN Cos:            0
Outer VLAN DEI:            0
Created:                   Mon Jun  1 19:28:40 2026
State:                     Activated
Ifhandle:                  0x000002b0
VRF:                       default
Access-interface:          Bundle-Ether1.1
SRG role:                  Active
SRG group name:            group1
IPOE-AFI-Cap:              SUB_AFI_IPV4_IPV6
Loopback-name:             Loopback0
IPV4-GW-addr:              100.0.0.1
 Attribute List: 0xdade20
1:  ipv4-unnumbered len=  9  value= Loopback0
2:  ipv6-enable     len=  4  value= 1(1)
3:  sub-ipv4-gateway len= 12  value= 100.0.0.1/32

Session Accounting:       disabled
Interim Interval:          0 secs
Interim fail count: None
Last interim failed reason: NA
Last stats:
  BytesIn: 0
  BytesOut: 0
  BytesInGiga: 0
  BytesOutGiga: 0

Activated Services: NA
Feature IDs activated : NA

[NAL-SUBSCRIBER-EVENTS]

| Event Name                    | Time Stamp                | User Data
| Transaction start             | Jun  1 19:28:40.024840  | txn id: 0x33, src_port: 0x33
| Interface create req          | Jun  1 19:28:40.024913  | -- NA --
| Interface create resp         | Jun  1 19:28:40.087462  | rc: OK
| SVM create req                | Jun  1 19:28:40.087533  | -- NA --
| Sub GW addr add               | Jun  1 19:28:40.087547  | addr: 100.0.0.1/32
| UP Install req                | Jun  1 19:28:40.087598  | -- NA --
| UP Install resp               | Jun  1 19:28:40.213931  | rc: OK
| UP Assoc req                  | Jun  1 19:28:40.213958  | -- NA --
| UP Assoc resp                 | Jun  1 19:28:40.215440  | rc: OK
| Produce done req              | Jun  1 19:28:40.215456  | req id: 0x3
| Produce done - Cfg gen        | Jun  1 19:28:40.268242  | rc: OK, req id: 0x3
| Produce done resp             | Jun  1 19:28:40.327444  | rc: OK, req id: 0x3
| SVM create resp               | Jun  1 19:28:40.327446  | rc: OK
| IPv6 Caps Up                  | Jun  1 19:28:40.328977  | vrf table id: 0xe0800000
| IPv4 caps wait                | Jun  1 19:28:40.328978  | -- NA --
| IPv4 Caps Up                  | Jun  1 19:28:40.329475  | vrf table id: 0xe0000000
| Init data req                 | Jun  1 19:28:40.329947  | -- NA --
| Init data resp                | Jun  1 19:28:40.383178  | rc: OK
| IPv4 route req                | Jun  1 19:28:40.383188  | addr: 100.0.0.210/32
| IPv4 framed route req         | Jun  1 19:28:40.383250  | addr: 203.0.210.0/24
| IPv6 route req                | Jun  1 19:28:40.383262  | addr: cafe:feed::d2/128
| IPv6 PD route req             | Jun  1 19:28:40.383336  | addr: cafe:bead:0:d2::/128
| IPv6 framed route req         | Jun  1 19:28:40.383361  | addr: 1:cee:bad:c0de:300:d2::/96
| IPv4 route resp               | Jun  1 19:28:40.484099  | rc: OK
| IPv4 framed route resp        | Jun  1 19:28:40.484182  | rc: OK, addr: 203.0.210.0/24
| IPv6 route resp               | Jun  1 19:28:40.484195  | rc: OK
| IPv6 PD route resp            | Jun  1 19:28:40.484215  | rc: OK
| IPv6 framed route resp        | Jun  1 19:28:40.484241  | rc: OK, addr: 1:cee:bad:c0de:300:d2::/96
| IPv4 Up                       | Jun  1 19:28:40.484247  | -- NA --
| IPv6 ND session req           | Jun  1 19:28:40.484300  | -- NA --
```

```
| IPv6 ND session resp           | Jun  1 19:28:40.484617  | rc: OK
| IPv6 Up                        | Jun  1 19:28:40.484618  | -- NA --
| Session up notified            | Jun  1 19:28:40.484620  | -- NA --
| Transaction stop               | Jun  1 19:28:40.484869  | rc: OK, txn id: 0x33, src_port: 0x33
==================__#__======================


Session-count: 1
```

Sessions should align with expected UP instance and SRG group associations.

Step 5 Review PFCP message, reconciliation, and notification history.

Example:

```
Router# show cnbng-nal spa pfcp-api structure dump all up-instance-id 1

Tue Jun  2 08:27:51.777 IST
Entry               : 1 (NAL Response for session create request),
Timestamp           : Jun 01 19:28:40.484898,
UPID                : 0xc0000600
CPID                : 0xd2
Session Txn id      : 261
Return value        : SPA_RC_SUCCESS
Access Interface    : Bundle-Ether1.1
Router name         :
Error message       :

Up-Instance-ID      : 1
================================================================================
Entry               : 2 (SPA Create Request),
Timestamp           : Jun 01 19:28:40.024568,
UPID                : 0x00000000
CPID                : 0x000000d2
Msg Txn id          : 51
Source port id      : 51
Session Txn id      : 261
Oper code           : SPA_OPER_TYPE_CREATE
IPOE AFI Cap        : SPA_SUB_AFI_IPV4_IPV6

Feature mask        : 0x1ee00
SRG report id       : 0
Feature flags
-------------
[SPA_FEATURE_IPv4_ADDR | SPA_FEATURE_IANA_ADDR | SPA_FEATURE_IAPD_ADDR | SPA_FEATURE_V4_ROUTE |
 SPA_FEATURE_V6_ROUTE | SPA_FEATURE_SRG | SPA_FEATURE_OUTER_VLAN]

IPv4 address Info
-----------------
Oper code           : SPA_OPER_TYPE_CREATE
IPv4 address        : 100.0.0.210

IPv6 address Info
-----------------
Oper code           : SPA_OPER_TYPE_CREATE
IPv6 address(iana)  : cafe:feed::d2
IPv6 address(iapd)  : cafe:bead:0:d2::
Link local          : ::
Prefix length       : 128

Session Data
------------
Access interface    : Bundle-Ether1.1
Mac address         : 001b.0000.00d2
VRF name            :
```

```
Session type        : SPA_SESSION_TYPE_IPOE
SRG group name      : group1

    Vlan Info
    ---------
    Outer vlan          : 1

IPv4 route Info
---------------
Oper code           : SPA_OPER_TYPE_CREATE
VRF name            : default
IPv4 address        : 200.0.210.0
Prefix length       : 24
Next hop            : 3.1.1.1
Tag                 : 0
Metric              : 0
Next hop VRF name   :
Distance            : 0

IPv4 route Info
---------------
Oper code           : SPA_OPER_TYPE_CREATE
VRF name            : default
IPv4 address        : 201.0.210.0
Prefix length       : 24
Next hop            : 3.1.1.1
Tag                 : 0
Metric              : 0
Next hop VRF name   :
Distance            : 0

IPv4 route Info
---------------
Oper code           : SPA_OPER_TYPE_CREATE
VRF name            : default
IPv4 address        : 202.0.210.0
Prefix length       : 24
Next hop            : 3.1.1.1
Tag                 : 0
Metric              : 0
Next hop VRF name   :
Distance            : 0

IPv4 route Info
---------------
Oper code           : SPA_OPER_TYPE_CREATE
VRF name            : default
IPv4 address        : 203.0.210.0
Prefix length       : 24
Next hop            : 3.1.1.1
Tag                 : 0
Metric              : 0
Next hop VRF name   :
Distance            : 0

IPv6 route Info
---------------
Oper code           : SPA_OPER_TYPE_CREATE
VRF name            : default
IPv6 address        : 1:cee:bad:c0de:0:d2::
Prefix length       : 96
Next hop            : 192::1
Tag                 : 0
Metric              : 0
```

```
Next hop VRF name   :
Distance            : 0

IPv6 route Info
---------------
Oper code           : SPA_OPER_TYPE_CREATE
VRF name            : default
IPv6 address        : 1:cee:bad:c0de:100:d2::
Prefix length       : 96
Next hop            : 192::1
Tag                 : 0
Metric              : 0
Next hop VRF name   :
Distance            : 0

IPv6 route Info
---------------
Oper code           : SPA_OPER_TYPE_CREATE
VRF name            : default
IPv6 address        : 1:cee:bad:c0de:200:d2::
Prefix length       : 96
Next hop            : 192::1
Tag                 : 0
Metric              : 0
Next hop VRF name   :
Distance            : 0

IPv6 route Info
---------------
Oper code           : SPA_OPER_TYPE_CREATE
VRF name            : default
IPv6 address        : 1:cee:bad:c0de:300:d2::
Prefix length       : 96
Next hop            : 192::1
Tag                 : 0
Metric              : 0
Next hop VRF name   :
Distance            : 0
....
```

```
Router# show cnbng-nal spa notif-history type keep-alive-failure up-instance-id 1

Tue Jun  2 08:28:19.816 IST
---- Total entries: 0 ----
```

```
Router# show cnbng-nal spa notif-history type subscriber-event up-instance-id 1

Tue Jun  2 08:28:29.198 IST
---- Total entries: 0 ----
```

Identify unusual message logs or recon reports that could indicate communication or failover issues.

Step 6 Check UP instance process information and flow control status.

Example:

```
Router# show cnbng-nal process-info detail

Tue Jun  2 08:28:38.242 IST
Location: 0/0/CPU0

 HA Pre_Init Role    : PRIMARY
 HA Role     : PRIMARY
 Restart-flag     : FALSE
 Node-Id     : 0
 Disc-Hist File-logging    : Enable
```

```
Test-server config-enabled: FALSE

Proc-flags : 87FFFF9F

   OT Connection Status: UP
   IM Connection Status: UP
   IPv4 RIB Connection Status: UP
   IPv6 RIB Connection Status: UP
   SUBDB Connection Status: UP
   Stats Connection Status: UP
   L2TP FIB Connection Status: DOWN
   L2TP Netio Connection Status: DOWN
   SPIO PPPoE Connection Status: UP
   SPIO PPP Connection Status: UP

SVM SUBDB PDone Req-ID     : 3
SVM Reconcilation Last UPID    : 0x0
SVM Reconcilation Pending-Req count      : 0
SVM Reconcilation Request Max    : 3072
RSI File-Descriptor     : 158
Bulk-Disconnect Start-time    : Tue Jun  2 08:28:38 2026
Clear-session Stats Timer-Running    : FALSE
Clear-feature Stats Timer-Running    : FALSE
Statistics Flags     : 0x00000005
SPA message Local seq-no    : 0
SPA message Global seq-no    : 0
Stats Hold time-out     : 200 secs
Stats Hold Request count    : 0
Stats Hold Request max     : 1000
Stats Stop Request count    : 0
Stats Interim Request count    : 0
Stats Clear Session Request count   : 0
Stats Clear Feature Request count   : 0
Interim Inflight Quota     : 4000
Interim Inflight LWM     : 4000
Pending Interim Queue Depth    : 0
Pending Interim Enqueue count    : 0
Pending Interim Dequeue count    : 0
Pending Interim Drop count    : 0
Pending Interim Dup-Skip count    : 0
SRG Stats Request Q-size    : 0
SRG Stats Retry Q-size     : 0
Sub-context Replay-In-Progess    : 0
Sub-context Cache Q-size    : 1
Sub-context Stale Q-size    : 0

Session stats:
===============
Create in progress: 0      [Peak: 1      Timestamp: Jun 01 19:25:10.448945]
Delete in progress: 0      [Peak: 1      Timestamp: Jun 01 19:25:14.858014]
Update in progress: 0      [Peak: 0      Timestamp: -NA-]
Total in progress:  0      [Peak: 1      Timestamp: Jun 01 19:25:10.448945]

CP Recon data:
===============
Duration                  : 300 secs
Replay reqs in progress   : 0
Replay subs in progress   : 0
Flags                     : 0x6

Notification flow control data:
===============================
Sub disconnect notification count       : 0
LCP timeout notification count          : 0
```

```
Sub disconnect notification drop count  : 0
LCP timeout notification drop count     : 0
Timer expiry count                      : 0
Timer running                           : No
LCP outstanding ka notification count   : 0
Notification global rate limit          : 1200

Stats flow control data:
========================
Interim stats message count      : 0
SRG stats message count          : 0
Stats oustanding message count   : 0
Stats global rate limit          : 1250

SRG Stats flow control data
===========================
Max outstanding requests  : 600
In-flight requests        : 0
Peak requests             : 0
Peak timestamp            : -NA-

Inflight flow configurations
============================
Maximum creates in-flight      : 600
Maximum updates in-flight      : 1000
Maximum deletes in-flight      : 3000
Maximum warm create in-flight  : 100
Delete batch timer             : 400
Delete batch size              : 800

Warm role change inflight data
==============================
Warm create in-progress        : 0

Features enabled on platform:
=============================
IPoE L2 Terminated        : ENABLED
PPPoE-PTA                 : ENABLED
L2TP-LAC                  : ENABLED
L2TP-LNS                  : ENABLED

Standby group cached SPA request statistics
===========================================
Max cache requests        : 200
Inflight count            : 0
Create cache count        : 0
Update cache count        : 0

UP Instance specific statistics:
================================================

UP Instance ID                          : 1
Notification rate limit                 : 20
Stats rate limit                        : 20
Interim stats message count             : 0
SRG stats message count                 : 0
LCP outstanding ka notification count   : 0
Stats outstanding message count         : 0
Create outstanding message count        : 0
Update outstanding message count        : 0
Delete outstanding message count        : 0
Active session count                    : 1

UP Instance ID                          : 2
```

```
Notification rate limit               : 20
Stats rate limit                      : 20
Interim stats message count           : 0
SRG stats message count               : 0
LCP outstanding ka notification count  : 0
Stats outstanding message count       : 0
Create outstanding message count      : 0
Update outstanding message count      : 0
Delete outstanding message count      : 0
Active session count                  : 0

=========================================
```

Investigate abnormal states or threshold limits that could signal resource or configuration issues.

Step 7 If any UP association is not in **ESTABLISHED** state, validate critical configuration parameters:

- Confirm `hostidentifier` values match on both UP and CP for each instance.
- Validate that `cp-server primary` address, `up-server IP`, and SRG mapping are unique and correct for each instance.
- Check for port or IP conflicts, missing exit commands, or duplicate values.

Expected result: The instance re-associates after correcting discrepancies.

Step 8 If association or SRG mapping fails repeatedly, verify CP connectivity and logs.

- Ping `cp-server` and `up-server` addresses to confirm reachability.
- Check system and debug logs for errors (for example, PFCP handshake failures).
- Ensure CP node process health and end-to-end connectivity.

Expected result: Connectivity and process issues are identified and resolved, restoring association.

Adding a new CP-UP association without disrupting existing connections

When you need to establish a new CP-UP association while an existing association is already active, this feature allows each CP GR instance to form its own connection to the User Plane.

If an association from CP GR instance 1 is already running, simply configure and bring up the new association for another CP GR instance. There is no need to change or interrupt the existing connection.

The new association can onboard additional SRG groups to provide greater redundancy or scalability. You can introduce the second association at any time so the active association remains unaffected.

Behavior during CP–UP connectivity failure

SRG mode

When a UP detects that it has lost its CP connection, it changes its active SRG groups to standby. If the CP detects that the UP association is inactive, it activates the corresponding groups on the peer UP. Existing subscriber traffic can continue through the peer UP when available and if it has the synchronized session state.

After connectivity is restored, the UP sends accounting statistics buffered during the outage to the CP. The CP adds these statistics to the accounting state and forwards the updated data to RADIUS. The CP and UP reconcile subscriber session state after recovery

Non-SRG mode

Loss of CP–UP connectivity does not affect forwarding of existing sessions on the UP. These sessions continue to use their installed forwarding state.

After connectivity is restored, accumulated statistics are sent to the CP in the next session report. After recovery, session reconciliation addresses events that may have occurred during the outage, such as lease-timer expiry

CP-GR behavior

CP-GR role behavior applies to both SRG and non-SRG modes. A CP–UP connectivity failure does not change CP-GR roles. CP-GR manages its role transitions and failover independently from CP–UP connectivity and SRG state

UP Session Disconnect Notification

Feature Description

The User Plane (UP) Session Disconnect Notification feature enables the UP to send a session disconnect notification to the Control Plane (CP) in the following scenario:

When the UP deletes a session locally following any local event (for example, mark and sweep).

For a list of scenarios that trigger a session disconnect notification, see the *Broadband Network Gateway Configuration Guide for Cisco ASR 9000 Series Routers* here: https://www.cisco.com/c/en/us/support/routers/asr-9000-series-aggregation-services-routers/products-installation-and-configuration-guides-list.html.

This notification carries the final statistics for the session and for all services, if accounting is enabled.

The CP initiates the session disconnect for this session only in the CP. The CP then deletes this session. If the session accounting is enabled for this session, the CP sends an accounting "stop record" message to RADIUS.

The UP deletes the session after initiating the session disconnect request to the CP. Therefore, the CP doesn’t send a session release Packet Forwarding Control Protocol (PFCP) message to the UP.

UP Rollback Failure Handling Notification

Feature Description

The User Plane (UP) Rollback Failure Handling Notification feature sends a failure notification to the Control Plane (CP) as follows:

- The CP sends the subscriber configuration in a session modification request to the UP. The UP rolls back the configuration if the application of the configuration fails. The UP deletes the session if the rollback configuration also fails and returns the rollback failure error in the session modification response to the CP.

- The UP sends the final statistics, if applicable, for the session and for each service activated for the failed session, in the session modification response.
- The CP deletes the session in the CP only after receiving a rollback failure in the session modification response from the UP.