Cloud Native BNG Control Plane Release Change Reference, Release 2022.03

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About this Guide

Note The documentation set for this product strives to use bias-free language. For purposes of this documentation set, bias-free is defined as language that does not imply discrimination based on age, disability, gender, racial identity, ethnic identity, sexual orientation, socioeconomic status, and intersectionality. While any existing biased terms are being substituted, exceptions may be present in the documentation due to language that is hardcoded in the user interfaces of the product software, language used based on RFP documentation, or language that is used by a referenced third-party product.

This Release Change Reference (RCR) describes new and modified feature and behavior change information for the applicable Cloud Native Broadband Network Gateway (cnBNG) Control Plane (CP) release.

• Conventions Used, on page v

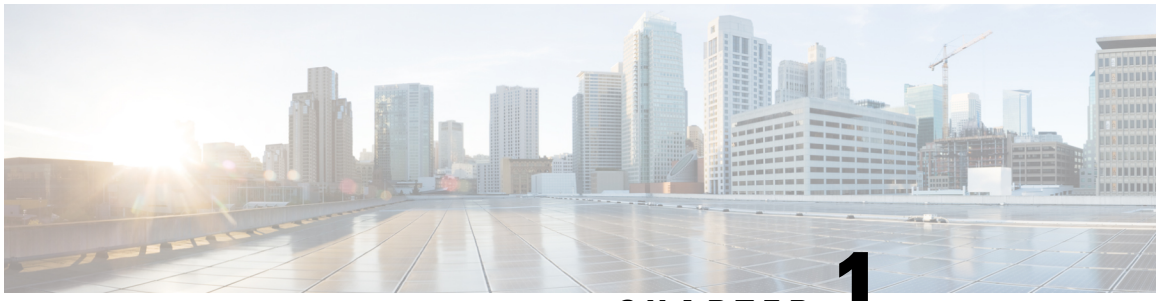
Conventions Used

The following tables describe the conventions used throughout this documentation.

Notice Type	Description
Information Note	Provides information about important features or instructions.
Caution	Alerts you of potential damage to a program, device, or system.
Warning	Alerts you of potential personal injury or fatality. May also alert you of potential electrical hazards.

Typeface Conventions	Description
Text represented as a `screen display`	This typeface represents displays that appear on your terminal screen, for example: `Login:`

Typeface Conventions	Description
Text represented as **commands**	This typeface represents commands that you enter, for example: **show ip access-list** This document always gives the full form of a command in lowercase letters. Commands are not case sensitive.
Text represented as a **command** *variable*	This typeface represents a variable that is part of a command, for example: **show card** *slot_number* *slot_number* is a variable representing the desired chassis slot number.
Text represented as menu or sub-menu names	This typeface represents menus and sub-menus that you access within a software application, for example: Click the **File** menu, then click **New**



CHAPTER 1

Cloud Native BNG Control Plane Release Change Reference

Feature and Changes Quick Reference

The following table provides the list of Cloud Native BNG (cnBNG) Control Plane (CP) features and changes in this release.

Features / Behavior Changes	Release Introduced / Modified
cnBNG Scale and Performance, on page 2	2022.03.0
Flow Control Support, on page 3	2022.03.0
LAC and LNS Sessions Support for HA and Rolling Upgrade, on page 5	2022.03.0
Kubernetes Version Upgrade, on page 4	2022.03.0

Feature Defaults Quick Reference

The following table indicates what features are enabled or disabled by default.

Feature	Default
cnBNG Scale and Performance	Enabled – Always-on
Flow Control Support	Disabled – Configuration Required

Feature	Default
HA and Rolling Upgrade Support for LAC and LNS Sessions	Disabled – Configuration Required
Kubernetes Version Upgrade	Enabled – Always-on

cnBNG Scale and Performance

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	Enabled - Always-on
Related Documentation	Not Applicable

Revision History

Table 2: Revision History

Revision Details	Release
Enhancement Introduced: cnBNG supports the pod layout configuration and event tracing configuration.	2022.03.0
Enhancement Introduced: The Subscriber Manager pod supports the charging functionality, that is, subscriber access and subscriber management.	2021.03.0
First introduced.	2021.01.0

Feature Description

To support scale and performance, cnBNG supports the following configuration commands:

- cnBNG pod layout configuration when the virtual machine is short of CPU and memory resource:

- **cpu { max-process | request }:***process_thread_count* | **request** *resource_request_number* **}**—Enable the K8s pod CPU configuration.
- **memory { limit** *max_resource_limit* | **request** *resource_request_number* **}**—Enable the K8s pod memory configuration.

- Event tracing configuration to trace session level event history in CDL records:
  - **event-trace-disable**—Disable event tracing.
  - **event-trace-max-count** *event_trace*—Limit the number of entries in event tracing.

For more information, see the Cloud Native BNG Control Plane Configuration Guide > Pods and Services Reference chapter.

Flow Control Support

Feature Summary and Revision History

Summary Data

Table 3: Summary Data

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

Revision History

Table 4: Revision History

Revision Details	Release
The Flow Control feature supports the following functionalities: • Different rate limit and queue size for different UPFs • Packet priority and differential treatment to packets based on packet type or DSCP value of the packet • FSOL token mechanism	2022.03.0
First introduced.	2021.04.0

Feature Description

The End-to-End Flow Control feature optimizes flow control and rate limit of the traffic toward the control plane ingress.

The End-to-End Flow Control feature supports the following functionalities in this release:

- Configurable rate limits and queue sizes for different UPFs. The rate limits and queue sizes vary for all UPFs depending on the UPF's capability.

  In the endpoint udp-proxy configuration, use the **flowctrl-group** *group_name* **{ capacity** *inbound_queue_size* **| outbound-capacity** *outbound_queue_size* **| outbound-rate-limit** *outbound_rate_limit* **| rate-limit** *inbound_rate_limit* **}** command to configure the inbound and outbound queue size and rate limit for the specified flow control group.

- Packet priority and differential treatment to packets based on the packet type or DSCP value of the packet.

- FSOL token mechanism—This is a protection method to control the maximum inflight transactions on control plane at each FSOL pod. Token mechanism addresses higher packet rates and works with UDP proxy flow control to protect the control plane. The flow control configuration acts as the first-level check in the control plane to control the incoming GTPU and PFCP message rates.

  Use the **subscriber token { dhcp | pppoe }** *token_count* command to set the maximum token available for the FSOL pod.

For more information, see the Cloud Native BNG Control Plane Configuration Guide > End-to-End Flow Control chapter.

Kubernetes Version Upgrade

Feature Summary and Revision History

Summary Data

Table 5: Summary Data

Applicable Product(s) or Functional Area	cnBNG
Applicable Platform(s)	SMI
Feature Default Setting	Enabled – Always-on
Related Documentation	Not Applicable

Revision History

Table 6: Revision History

Revision Details	Release
First introduced.	2022.03.0

Feature Description

cnBNG Control Plane is built on Cisco® Cloud Native Infrastructure, which is a Kubernetes-based platform that provides a common execution environment for container-based applications.

In this release, the Kubernetes (K8s) version is upgraded from 1.21 to 1.22.

LAC and LNS Sessions Support for HA and Rolling Upgrade

Feature Summary and Revision History

Summary Data

Table 7: Summary Data

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

Revision History

Table 8: Revision History

Revision Details	Release
First introduced.	2022.03.0

Feature Description

High Availability and CP Reconciliation

The high availability (HA) and Reconciliation feature for the control plane supports all cnBNG-specific service pods. This feature is extended to support the LAC and LNS session types.

- CP Reconciliation—This feature supports reconciliation between PPP and L2TP for LAC and LNS sessions. To recover L2TP service after HA events and to avoid service impact, critical information such as L2TP sequence numbers (Ns/Nr), Session Count, and SessionID bitmap must be recovered. The tunnel state for L2TP HA is recovered through recovery from another L2TP service.
- Pod Restart—The HA support for L2TP is provided using a local peer service to synchronize the necessary L2TP tunnel information and recover it after restart. It also supports hitless operation during pod restart, and the restart of pods without impacting the existing sessions and tunnels. This feature helps to recover the L2TP control connection information such as Ns/Nr sequence numbers, Tunnel Context, and Session Bitmap, and also resume the control channel.

For more information, see the Cloud Native BNG Control Plane Configuration Guide > High Availability and CP Reconciliation chapter.

Rolling Software Update

The Rolling Software Update feature enables incremental update of pod instances with minimal downtime. cnBNG supports rolling upgrade for LAC and LNS sessions in addition to PTA and IPoE sessions.

cnBNG supports rolling upgrade for LAC and LNS clusters without impacting the existing tunnels by modifying the L2TP service with an initial readiness delay of 60 seconds. The K8s infrastructure upgrades an instance of L2TP pod only after the active instance is successfully upgraded and resynchronizes all existing tunnel data in the peer L2TP instance. If more than one L2TP instance exists, rolling upgrade updates only one instance at a time. The stateful set pairing must be done accordingly to avoid peer L2TP instance going down at the same time.

For more information, see the Cloud Native BNG Control Plane Configuration Guide > Rolling Software Update chapter.