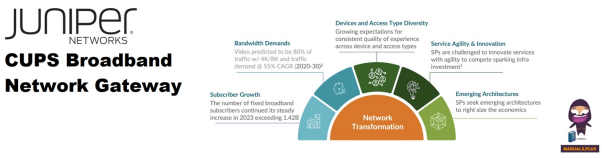

Juniper NETWORKS CUPS Broadband Network Gateway User Guide

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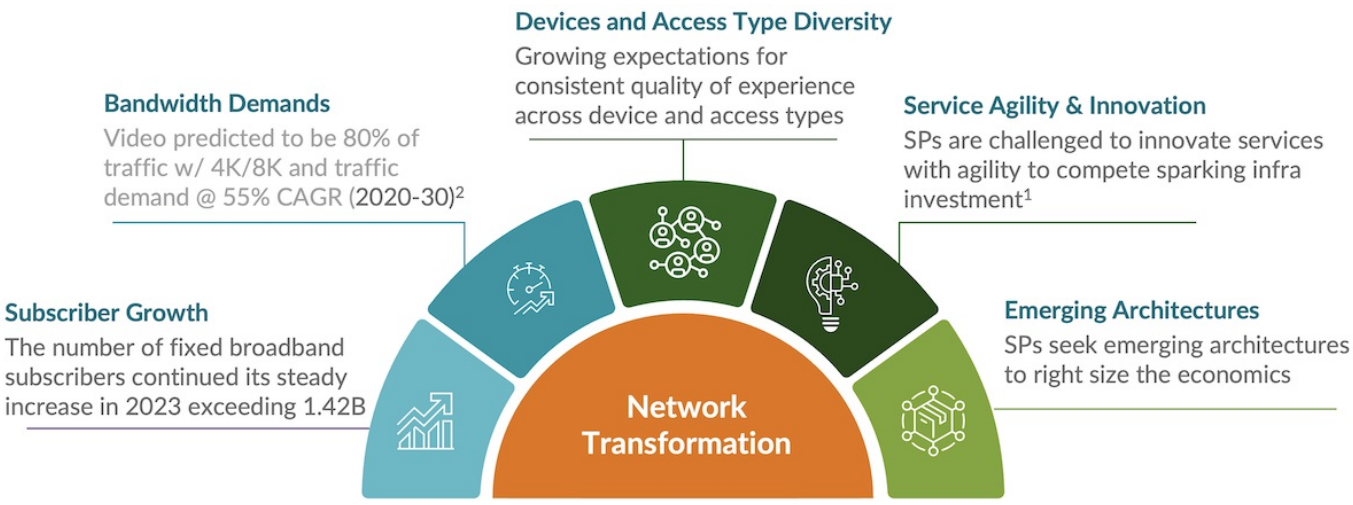

Specifications

- Product: Juniper BNG CUPS 24.4R1
- Published: 2025-01-07

Introduction

Juniper BNG CUPS disaggregates the broadband network gateway (BNG) function running in Junos OS into separate control plane and user plane components. The control plane is a cloud-native application that runs in a Kubernetes environment. The user plane component continues to run on Junos OS on a dedicated hardware platform. In Juniper BNG CUPS, the BNG functions are split into the BNG CUPS Controller (control plane) functions and the BNG User Plane (user plane) functions. The management, state, and control packet interfaces operate between the BNG CUPS Controller and the BNG User Planes. The benefits of Juniper BNG CUPS are the following:

- A centralized BNG CUPS Controller provides for more efficient use of network resources. Following are some examples:
  - Address allocation
  - Load balancing
  - Resiliency and high availability
  - Management and controlThe increased scale-The cloud environment that Juniper BNG CUPS utilizes, enables you to increase the number of subscribers supported.
- Locational independence and separate life-cycle management and maintenance.
- Throughput and latency optimization- Because the BNG User Planes are closer to the subscribers, throughput and latency are optimized.

These release notes accompany the Juniper BNG CUPS release 24.4R1. They describe new features and known problems.

Installation

BNG CUPS Controller Requirements
Juniper BNG CUPS 24.4R1 installation requires the minimum system requirements listed in this section.
NOTE: The system requirements listed in Table 1 on page 3 are for a single geographically located installation of Juniper BNG CUPS Controller (BNG CUPS Controller). For the system requirements of a multiple geographically located, multiple cluster setup, see Juniper BNG CUPS Installation Guide.
BNG CUPS Controller installs on a Kubernetes cluster comprised of physical or virtual machines (VMs). BNG CUPS Controller requires the minimal resources listed in Table 1 on page 3, from the Kubernetes cluster.

Cluster Requirements

Category	Details
Jump host	The jump host must be running Ubuntu version 22.04 LTS or later and have the following resources allocated to it: • CPU—2 cores • Memory—8 GB • Storage—128 GB If you are using a Red Hat OpenShift Container Platform cluster, you must have the OpenShift CLI installed.

Category	Details

Node specification (minimum of 3 nodes)	A node is a Linux system (either virtual or physical system) that has a management address and a domain name. The nodes must meet the following requirements:
	• Operating System:
	  • Ubuntu 22.04 LTS (for a BBE Cloudsetup cluster)
	  • Red Hat Enterprise Linux CoreOS (RHCOS) 4.15 or later (for an OpenShift Container Platform cluster)
	• CPU cores—12 cores (hyperthreading preferred)
	• Memory—64 GB
	• Storage—512 GB of free disk storage in the root partition
	We recommend that you partition your disk storage accordingly:
	  • 128 GB to the root (/) partition for the operating system
	  • 128 GB to **/var/lib/docker** for the Docker cache
	  • 256 GB to **/mnt/longhorn** for the application data. This is the default location, you can specify a different location during

	• All cluster nodes must have a user account with sudo access. • You must have root-level SSH access from the jump host, using key-based authentication, to all nodes. **NOTE**: To create the cluster, you can use either of the following applications:

Category	Details

	• BBE Cloudsetup release 2.1 or later
	• Red Hat OpenShift Container Platform release 4.15 or later. An OpenShift Container Platform cluster also, requires the following:
	  • A container registry
	  • A network load balancer with at least one IP Address Pool
	  • A storage class named jnpr-bbe-storage

New and Changed Features

Learn about new features or enhancements to existing features in Juniper BNG CUPS 24.4R1. For more information about a feature, click the link in the description. See the Juniper BNG CUPS Installation Guide and Juniper BNG CUPS User Guide for more details about new and changed features.

New and Changed Features
We've introduced the following in Juniper BNG CUPS 24.4R1:

- Support for Red Hat Openshift Container Platform. Juniper BNG CUPS can use the Red Hat Openshift Container Platform to set up the Kubernetes cluster environment in which the BNG CUPS Controller is deployed.
- Support for intelligent load sharing with redundancy enhanced load balancing capabilities across multiple BNG User Planes. This feature allows you to configure load-balancing ports as part of resilient subscriber groups with active and backup BNG User Planes, enabling you to minimize service disruption and traffic loss.
- Added compliance for the Broadband Forums TR-459 Issue 2-TR-459 Issue 2 compliance for Juniper BNG CUPS ensures that your broadband network gateway implementation adheres to the standards set by the Broadband Forum, leveraging PFCP (Packet Forwarding Control Protocol) and General Packet Radio Service (GPRS) tunneling protocol on the user plane, for efficient subscriber state management and control packet tunneling.
- The number of BNG User Planes supported by a BNG CUPS Controller increases to 32.
- Support for geographic redundancy-The BNG CUPS Controller can maintain continuous operation across multiple geographically distributed Kubernetes clusters. By utilizing a multiple cluster architecture managed by Karmada for orchestration and Submariner for inter-cluster networking, this feature ensures that BNG CUPS Controllers can failover in the event of a data center outage.
- Extends the capabilities of Juniper BNG CUPS to support static IPv4 and IPv6 address pools for DHCP and DHCPv6 local server access models and dynamic relay configurations. It introduces the ability to configure static address pools and prefixes, assign route tags, and prioritize control packets over the network. The feature enables BNG CUPS to handle diverse access models and meet resiliency requirements.
- BNG CUPS telemetry for subscriber and service accounting. Introducing Juno's telemetry interface (JTI) sensor support for accounting statistics information on the BNG CUPS Controller. Using this feature, you can stream

actual subscriber transit statistics, firewall filter statistics, and subscriber metadata.

Open Issues
This section lists the known issues in the following Juniper BNG CUPS releases. The following known issues exist in Juniper BNG CUPS Release 24.4R1:

- BNG CUPS Controller command processing issue when commands are entered incorrectly. PR1806751
- When using the BNG User Plane: mode user-plane transport routing-instance configuration, a reboot is required. PR1819336

Resolved Issues

The following issues are resolved in Juniper BNG CUPS 24.4R1:

- BNG User Planes does not validate if the BNG User Plane line card supports subscriber groups' subscriber oversubscription. PR1791676
- PFCP association is stuck in a disconnecting state for a BNG User PPlanwhen the BNG CUPS Controller becomes unreachable to other BNG User Planes. PR1812890
- When running over long periods, jdhcp service cores are seen. PR1813783
- Unable to commit any configuration changes. Also, no change commits are failing in a BNG User Plane with active subscribers. PR1814006
- The show system subscriber-management route summary command displays a negative gateway route count in the new master Route Engine after a BNG User Plane GRES. PR1814125
- The gateway route is incorrectly installed in the subscriber group's backup BNG User Plane's backup Route Engine. PR1814279
- After back-to-back subscriber group switchovers, discard and gateway routes are removed in the active BNG User Plane's backup Route Engine. PR1814342
- DHCP cores occur when the show dhcpv6 server binding command is executed. PR1816995

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active Juniper Care or Partner Support Services support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with TAC.

- JTAC policies a complete understanding of our JTAC procedures and policies, review the JTAC User Guide located at **https://www.juniper.net/us/en/local/pdf/resource-guides/7100059-en.pdf**.
- Product warranties-For product warranty information, visit **https://www.juniper.net/support/warranty/**.
- JAC hours of operation-The JTAC centers have resources available 24 hours a day, 7 days a week, 365 days a year.

Self-Help Online Tools and Resources
For quick and easy problem resolution, Juniper Networks has designed an online self-service portal called the Customer Support Center (CSC) that provides you with the following features:

- Find CSC offerings: https://www.juniper.net/customers/support/
- Search for known bugs: https://prsearch.juniper.net/
- Find product documentation: https://www.juniper.net/documentation/
- Find solutions and answer questions using our Knowledge Base: https://supportportal.juniper.net/s/Knowledge
- Download the latest versions of the software and review release notes: https://www.juniper.net/customers/csc/software/
- Search technical bulletins for relevant hardware and software notifications: https://supportportal.juniper.net/s/knowledge.
- Join and participate in the Juniper Networks Community Forum: https://www.juniper.net/company/communities/
- Create a service request online: https://supportportal.juniper.net/

Creating a Service Request with JTAC
You can create a service request with JTAC on the Web or by telephone.

Visit https://support.juniper.net/support/requesting-support/
Call 1-888-314-JTAC (1-888-314-5822 toll-free in the USA, Canada, and Mexico).
For international or direct-dial options in countries without toll-free numbers, see https://support.juniper.net/support/requesting-support/.

FAQ

Requesting Technical Support
If you require technical support for Juniper BNG CUPS 24.4R1, follow these steps:

- **Self-Help Online Tools and Resources** Access online tools and resources provided by Juniper Networks Technical Assistance Center (JTAC) for self-help.
- **Creating a Service Request with JTAC** You can create a service request with JTAC either through the web interface or by telephone.

Documents / Resources

	Juniper NETWORKS CUPS Broadband Network Gateway [pdf] User Guide CUPS Broadband Network Gateway, Broadband Network Gateway, Network Gateway, Gateway

References

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- CEC Juniper Community
- Elevate - Elevate Community | Juniper Networks
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- Product Warranty Policy - Support - Juniper Networks
- User Manual