



Release Notes for Cisco IOS XRd, IOS XR Release 7.8.1

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Release Notes for Cisco IOS XRd, IOS XR Release 7.8.1

XRd is a powerful IOS XR virtual platform that supports a wide variety of technology roles such as virtual route reflector (vRR), virtual cell-site router (vCSR), and virtual provider-edge (vPE). It is available in a containerized form-factor enabling both standalone and Kubernetes-based containerized network deployments.

Cisco IOS XRd Overview

XRd is the latest virtual platform from Cisco that brings the highly scalable, feature-rich, and reliable IOS-XR operating system to containerized network deployments. With XR control plane pedigree shared with the likes of Cisco 8000 and data plane capabilities that are derived from the powerful XRv9000, XRd brings the best of both worlds - enabling high scale control plane use cases such as virtual route-reflector (vRR) and high throughput requirements in virtual provider edge (vPE).

XRd is available in two formats:

- XRd Control Plane
- XRd vRouter

Cisco IOS XRd Licensing Model

The Cisco IOS XRd platform offers two types of licensing schemes. This table lists details of Cisco IOS XRd Router's software licenses or entitlements, arranged according to licensing PIDs.

The Cisco IOS XRd instances are pre-loaded with an evaluation license valid for 90 days. For licenses post the evaluation period, you can purchase the XRd licenses using [Cisco Smart Licensing](#).

Table 1: Cisco IOS XRd Licensing PIDs

PIDs	Description
XRD-VR-CP	XRd Control Plane
• XRD-VR-CP-DP-ESS • XRD-VR-CP-DP-ADN	XRd vRouter

What's New in Cisco IOS XR Release 7.8.1

Software Feature Introduced and Enhanced

Feature	Description
System Monitoring	

Feature	Description
EEDB Resource Segregation for Encapsulation Types	We have now segregated the Egress Encapsulation Database (EEDB) resources based on different egress encapsulation types, such as attachment circuits (AC), pseudowires, tunnels, and Address Resolution Protocol (ARP). This allows you to examine encapsulation-specific resource details using show commands. When resource usage exceeds the Out of Resource (OOR) threshold levels, the router also alerts you with system log messages. When resource usage exceeds the OOR thresholds, you can avoid traffic loss by taking corrective action to free up resources, such as reducing the scale of interfaces with the related encapsulation. The show controllers npu resources command is now modified to include the following optional keywords: • encapAC • encapPWE • encaptunnels • encapARP This feature is supported on Cisco 5700 Series Routers and on routers that have the NC57 line cards installed and operating in either native or compatibility mode

The following user scenarios are supported with this release:

User Scenarios	Deployment
Cloud Router	Amazon Elastic Kubernetes Service (EKS)
SR-PCE	Amazon Elastic Kubernetes Service (EKS)
vPE	• Standalone Docker • OpenShift based K8s
vRR	• Standalone Docker • OpenShift based K8s
vCSR	VMware Tanzu based K8s
Simulation	• Manual Testing • Automation • CI/CD Workflows

Cisco is continuously enhancing the product with every release and this section lists key features. It also includes links to detailed documentation, where available.

Cisco IOS XRd supports majority of the Cisco IOS XR technologies. The following sections detail the feature set per user scenarios:

Cloud Router

Feature	See the Following Documentation
Enhanced Networking Features with Elastic Network Adapter (ENA) on Amazon EC2 M5 Instances	You can launch your router with the Elastic Network Adapter (ENA) on Amazon Elastic Compute Cloud (Amazon EC2) M5 instances to deliver high network throughput. Amazon EC2 M5 instances provide more CPU cores, faster disk speeds, and higher network bandwidth that boosts the network performance.
Updated DPDK Driver Version	This release upgrades the Data Plane Development Kit (DPDK) driver to version 20.08. This version delivers the latest driver versions for ethernet interfaces, including the Elastic Network Adapter (ENA) NIC on AWS.
Enhanced router performance and scales	This feature enhances your router performance on AWS instances and reduces the traffic latency. The functionalities that provide enhanced performance and their scale values are: • BFD support on GRE (250 sessions) • QoS support on GRE (200 policies) • AWS ENA interfaces (15 interfaces) • IPV6 support on GRE (250 interfaces) For better router performance, you can use one thread per core for the CPU option in AWS.
Increase in BFD scale limit and BFD sessions	The BFD scale is increased from 1024 packets per second (PPS) to 2600 https://ciscoenterprise.acrolinx.cloud PPS, reducing the overall network convergence time by sending rapid failure detection packets to the routing protocols for recalculating the routing table. With this feature, support for BFD session is enhanced to 250 sessions per 100 msec timer. For more information, see BFD sessions overview.
QoS on IPv4 Release GRE Tunnels	This feature, which enables the capability to define and control the QoS for both incoming and outgoing customer traffic on provider edge (PE) routers in a service provider network, is introduced. For more information, see QoS on IPv4 GRE Tunnels.
ACL Based Forwarding (ABF)	ABF can be used to route certain traffic through specific paths instead of using paths determined by the routing protocols. To achieve this, configure a next-hop address in the ACL configuration. The system uses this address to forward packets instead of looking up the routing address table. This feature enables you to choose services from multiple providers for broadcast TV over IP, IP telephony, data, and so on.
Redirect IPV4 and IPv6 traffic using PBR	You can use the policy-based redirect feature to redirect IPv4 and IPv6 subscriber traffic to a destination other than the one it's destined initially. Here, a nexthop address is configured for both IPv4 and IPv6, and all the matching incoming traffic is directed to these pre-configured nexthop addresses instead of the intended destination. If the configured nexthop address isn't reachable, all the matching traffic is dropped. This feature allows you to route certain traffic through specific paths instead of using routing protocols computed path in service networks carrying voice, video, and data.

Feature	See the Following Documentation
BFD on GRE Tunnel Interface	This feature enables support for BFD on GRE tunnels with IS-IS and BGP clients. This feature shares the multipath resources on the line card when a failure is detected. When IS-IS and BGP sessions come up on tunnel interfaces, the clients request the BFD server to create the BFD session. BFD sessions are created and come up on the tunnel interfaces configured with the BGP IS-IS client.
Support for IPv6 over SR-MPLS through a GRE Tunnel towards an IPv6 Next Hop device	With this release, there's support for IPv6 GRE tunnel traffic between XRd routers over an SR-MPLS domain, wherein MPLS adjacency is formed between the XRd IPv6 routers.

SR-PCE

Feature	See the Following Documentation
SR-PCE	Configure Segment Routing Path Computation Element

XRd: Generic features

Feature	See the Following Documentation
GRE for XRd vRouter	Implementing Generic Routing Encapsulation
PBR for XRd vRouter	Implementing Enhanced Policy Based Routing

For the complete list of features supported on Cisco IOS XRd until Cisco IOS XR Release 7.8.1, see:

[Release Notes for Cisco IOS XRd, IOS XR Release 7.7.1](#)

Host Requirements

This section details the host requirements for both XRd Control Plane and XRd vRouter:

Table 2: XRd Control Plane

Parameter	Requirement
XRd Control Plane Host	
CPU	x86-64 CPU with at least 2 cores
RAM	4 GB
Linux kernel	Version 4 and above Note The Linux kernel must install the <i>dummy</i> and <i>nf_tables</i> modules.
Linux cgroups	Version 1 Note Support for unified hierarchy cgroups is not available.

Parameter	Requirement
XRd Control Plane instance on the host	
CPU	1 core minimum
RAM	2 GB minimum
Inotify user instances and watches	4000
XRd Control Plane on AWS EC2 instance	
Instance Type	m5.2xlarge
Number of threads per processor core	1
Minimum Disk Size	8 GB Note A XRd instance requires the minimum disk size of 8 GB, but there may be demand for additional disk space depending on how the node handles core files.
Operating System	Amazon Linux 2 with EKS Optimizations
Kernel Settings	4000 inotify user instances and watches per XRd instance

Table 3: XRd vRouter

Parameter	Requirement
XRd vRouter Host	
CPU	x86-64 CPU with at least 4 cores
CPU instruction set	• ssse3 • sse4.1 • sse4.2
Linux kernel	Version 4 and above Note The Linux kernel must install the <i>dummy</i> , <i>vfiio-pci</i> or <i>igb_uio</i> , and <i>nf_tables</i> modules.
Linux cgroups	version 1 Note Support for unified hierarchy cgroups is not available.
XRd vRouter instance on the host	
CPU	2 minimum, 1 isolated for the dataplane use
RAM	5 GB minimum

Parameter	Requirement
Hugepages	3 GB minimum Note The XRd vRouter instance must enable Hugepage support with 1GB hugepage size.
Inotify user instances and watches	4000
XRd vRouter on Amazon EC2 Instance	
Instance Types	• m5.24xlarge • m5n.24xlarge
Number of threads per processor core	1
Minimum Disk Size	8 GB Note A XRd instance requires the minimum disk size of 8 GB, but there may be demand for additional disk space depending on how the node handles core files.
Operating System	Amazon Linux 2 with EKS Optimizations
Kernel Settings	• 4000 inotify user instances and watches per XRd instance • CPU isolation settings for the required XRd deployments
Additional Kernel Modules	• uio (from Amazon Linux 2) • igb_uio from DPDK 19.11.12, with write combine mode enabled
Hugepages	6 GB Note The XRd vRouter instance must enable Hugepage support with 1GB hugepage size.



Note For using Docker to run the containers, you need Docker version 18 or above with permission to run Docker containers.



Note Cisco IOS XRd is not supported for production networks on Linux, including Ubuntu or any other distribution. Carefully consider this restriction when planning deployments to avoid potential issues.

Caveats

These caveats are applicable for Cisco IOS XRd Software:

Table 4: Cisco IOS XRd Specific Bugs

Bug ID	Headline
CSCwd49982	vRouter : PBR matched traffic is not getting dropped fully if configured next-hop is not reachable
CSCwd65258	Memory top consumer or snapshot calculation is not working

Other Important Information

Upgrading Cisco IOS XRd Software

Cisco IOS XRd software is a containerized form-factor deployment that follows the container pattern regarding software upgrades and does not support standard IOS-XR install or upgrade operations. To use the latest XRd software, you can create a new XRd instance with the latest software in place of the previous XRd instance and attach the necessary persistent state to the new XRd instance. The new XRd software may be a different version of IOS-XR or the existing version of IOS-XR with new or bugfix RPMs applied (or a combination of the two). An XRd container image containing new or bugfix RPMs is created from an existing XRd container image using standard container build tools (such as **docker build** or **buildah**) to install the new software packages to the existing **base** image. The **apply-bugfixes** script within the **xrd-tools** repository (<https://github.com/ios-xr/xrd-tools>) is available to achieve this using **docker build**, and you can use it as a template for other container build tools.

Related Documentation

The most current Cisco IOS XRd documentation is located at the following URL:

<https://www.cisco.com/c/en/us/support/routers/ios-xrd/series.html>

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