

## Guidelines for Cisco IOS XR Software

PB478699

[Disclaimer: This paper was revised on April 2, 2008, and it supersedes all previous versions of this paper under the same title.]

### Introduction

This document explains the Cisco IOS<sup>®</sup> XR Software time-based release model and answers some common questions:

- What are the definitions of the Cisco IOS XR Software releases?
- What is covered in a given software release?
- How often are Cisco IOS XR Software releases delivered?
- What are the differences between Cisco IOS XR Software release types?
- How long is a given release supported?
- When should I plan to migrate to the next available software release?
- How does Cisco communicate the availability of Cisco IOS XR Software releases?
- When does Cisco provide Software Maintenance Upgrades (SMUs)?

### Types of Software Releases

The Cisco IOS XR Software model has four types of software releases. Each release type has its own content scope and release frequency.

#### Major Feature Release

The Cisco IOS XR Software major release is signified by the first digit in the release version number (for example, the “2” in Cisco IOS XR Software Release 2.0.0). A major feature release is indicated when Cisco increments the major release number. Major feature releases are delivered for one or more of the following reasons:

- Introduce significant changes throughout software, including infrastructure or architectural changes
- Introduce support for a new hardware platform family

For example, Cisco IOS XR Software Release 2.0.0 introduced the Cisco CRS-16 Carrier Routing System platform. Release 3.0.0 introduced the Cisco CRS-1 8-Slot Line Card Chassis. The frequency of major feature releases is influenced by events, and is therefore not time-based. A Cisco IOS XR Software Major Feature Release is also described as a feature release, governed by the software lifecycle policy in the section “Lifecycle of Cisco IOS XR Software Releases.”

A major feature release can also include bug fixes and enhancements to existing functions delivered in previous major releases. The list of critical bug fixes and features added to a major feature release is provided in the release notes along with installation instructions and dependencies. Cisco announces new major feature releases by posting a product bulletin on

Cisco.com. The software images are available for download at the Cisco.com Software Center. Please note that certain features may require the purchase of an additional license or licenses.

### **Minor Feature Release**

The Cisco IOS XR Software Minor Release is signified by the second digit in the release version number (for example, the “5” in Cisco IOS XR Software Release 3.5.0). A minor feature release is indicated when Cisco increments the minor release number. A minor feature release includes:

- New functions and features: For example, Release 3.3.0 introduced Layer 3 VPN (L3VPN) functions, and Release 3.4.0 introduced L2VPN capability.
- Bug fixes and enhancements to existing functions introduced in a previous major release: For example, Release 3.4.0 also enhanced L3VPN capability by supporting inter-autonomous system (Inter-AS) and Carrier Supporting Carrier (CSC) functions.

Minor feature releases are delivered approximately every 6 months. Cisco may increase the frequency of this release interval upon customers’ feedback and market conditions in the future. A Cisco IOS XR Software Minor Feature Release is also described as a feature release, governed by the software lifecycle policy in the section “Lifecycle of Cisco IOS XR Software Releases.”

The list of critical bug fixes and features added to a minor feature release is provided in the release notes along with installation instructions and dependencies. Cisco announces new minor feature releases by posting a product bulletin on Cisco.com. The software images are available for download at the Cisco.com Software Center. Please note that certain features may require the purchase of an additional license.

### **Maintenance Release**

Maintenance releases are the primary mechanism to deliver critical bug fixes to Cisco IOS XR Software feature releases. The Cisco IOS XR Software Maintenance release is signified by the third digit in the release version number (for example, the “4” in Cisco IOS XR Software Release 3.3.4). A new maintenance release is indicated when Cisco increments the maintenance release number.

Cisco provides primary software maintenance support on a feature release for 18 months after it is introduced. Software maintenance support will provide customers with routine maintenance releases as well as point bug fixes as explained in the section “SMU”. Cisco continues to provide Cisco Technical Assistance Center (TAC) support for Cisco IOS XR feature releases until they reach the end of life, governed by the software lifecycle policy in the section of “Life Cycle of Cisco IOS XR Releases.”

At present, the first three maintenance releases are time-based for each feature release. A planned maintenance release is provided approximately once every 3 months after the initial feature release. After that, maintenance releases are provided on an as-needed basis. Representatives from the Cisco TAC and Engineering evaluate the priority of bug fixes and determine which ones are included in each maintenance release. Cisco encourages Cisco IOS XR Software customers to include maintenance releases in their software maintenance plan to avoid possible operational effects from known software bugs.

The list of critical bug fixes in a maintenance release is provided in the release notes along with installation instructions and dependencies. Maintenance releases are cumulative for the minor feature release they support. At the time it is published, the latest maintenance release includes all critical fixes published since the minor feature release was introduced. Cisco encourages all Cisco

IOS XR Software customers to actively migrate to the latest maintenance release at their earliest convenience. If you encounter a bug that has been fixed in a maintenance release, the Cisco support policy is to recommend an upgrade to the latest available maintenance release.

## SMU

A SMU is a point fix provided between regular maintenance releases. Customers SMUs are typically confined to a limited number of software components and are intended to be a simple fix. SMUs are not intended to deliver new features and they are not a replacement for maintenance releases. The effect of an SMU and its installation procedure is documented in the release note that accompanies the SMU.

### Types of SMUs

#### Production SMU

Production SMUs are provided to fix bugs that affect live network deployment. Production SMUs are tested and certified prior to release and are fully supported by Cisco TAC. Individual SMUs reach their end-of-life milestone after the bug fix is integrated into a maintenance release.

#### Cisco PSIRT SMU

Cisco Product Security Incident Response Team (PSIRT) SMUs are provided in response to security-related problems and are released under guidance from the Cisco PSIRT in accordance with the Cisco Security Vulnerability Policy. Cisco PSIRT SMUs are supported by Cisco TAC.

#### Engineering SMU

Engineering SMUs are provided for critical problems found during the customer qualification phase to accelerate testing of a given release and to verify bug fixes. Engineering SMUs are not intended for use in a production network because they have not been fully tested and Cisco TAC does not support them.

### SMU Priorities

As defined earlier, a SMU is a point fix provided between regular maintenance releases. Cisco does not produce SMUs for every software bug fix. Cisco evaluates each bug fix against several criteria to be considered a candidate for a possible SMU release. In general, a bug fix must satisfy one or more of the following criteria to be considered as a candidate:

- The bug fix repairs critical problems that cause a network outage or affect live network deployment.
- The Cisco PSIRT team or Cisco Engineering recommends a SMU.
- No near-term maintenance release is available to include the fix.
- No viable operational workaround exists.

SMU requests are assigned a priority: P1 or P2.

- P1 SMUs affect the network or Cisco PSIRT and include a 24-hour response time for initial evaluation.
- P2 priority SMU requests affect neither the Cisco PSIRT nor the network. These SMUs are evaluated over a 2-week time period.

Please note that this time period is not the response time for delivering a fix. It is indicative of the speed of initial response to investigate the viability of a SMU.

Most approved SMU requests deliver a SMU in 30 days, subject to due diligence between Cisco and the customer.

#### SMU Delivery and Posting

SMUs are posted on Cisco.com for download on the Cisco IOS XR Software Maintenance Upgrade Download page. A list of recommended SMUs is available on the page. Each SMU is customized for a specific Cisco IOS XR Software release based on the affected customer's software.

With the introduction on each release type and SMU operation policy, the following section describes the entire release lifecycle.

### Lifecycle of Cisco IOS XR software Releases

Figure 1 illustrates primary milestones of a feature release lifecycle, including the end-of-sales announcement, the end of sale, the end of maintenance support, and the end of maintenance through migration timeframes.

**Figure 1.** Cisco IOS XR Software Feature Release Lifecycle



The entire lifecycle of any feature release is 6.5 years, which includes 18 months since the first publication date until the end-of-sale date of the feature release, plus 5 years starting from the end-of-sale date until the release end-of-life date. All maintenance releases of a particular feature release will share the same end-of-sale, end-of-maintenance, end-of-maintenance through migration, and end-of-life milestones.

As described in the “Maintenance Release” section, Cisco provides software maintenance support on a feature release for 18 months after it is introduced. Software maintenance support will provide customers with routine maintenance releases as well as point bug fixes through SMUs.

In addition to this 18-month support, there is a 12-month period since the end-of-sale date until the end-of-software maintenance releases through migration date for any given feature release and its associated maintenance releases. The end-of-maintenance through migration date is the last date that Cisco Engineering may release any final software maintenance release(s) or bug fix(es) through a SMU in subsequent migration software releases for any newly found problem in that particular feature release. For example, the end-of-sale date of Cisco IOS XR Software Release 3.4 is December 31, 2008; then between December 31, 2008, and December 31, 2009, Cisco will fix any new bug found in Cisco IOS XR Software Release 3.4.0 either: a) in Release 3.5.0 or later software releases; b) through SMUs based on Release 3.5.0 or later releases. After December 31, 2009, Cisco Engineering will no longer develop, repair, maintain, or test Cisco IOS XR Software Release 3.4.0.

Cisco continues to provide TAC support for Cisco IOS XR minor feature releases until they reach the end-of-life milestone in accordance with the published Cisco end-of-life policy.

### **Upgrade Paths**

Maintenance releases are cumulative for the minor feature release they support. At the time it is published, the latest maintenance release includes all critical fixes published since the minor feature release was introduced. Cisco encourages all Cisco IOS XR Software customers to actively migrate to the latest maintenance release at your earliest convenience. If you encounter a bug that has been fixed in a maintenance release, the company's support policy is to recommend an upgrade to the latest available maintenance release.

For the upgrade path of a major or minor release, each customer may have unique requirements, and you are encouraged to work with local Cisco customer representatives to find the most optimal release for your network.

### **Customer Notifications**

Cisco notifies customers the lifecycle and major milestone of a particular release by the following methods:

- When a feature release is introduced, Cisco publishes a release note and a release product bulletin on Cisco.com for that particular minor release. In both of those two documents, the major end-of-sale, end-of-maintenance, and end-of-life dates of that release is indicated.
- Nine months before the end-of-sale date of the feature release, Cisco issues an official end-of-sale bulletin for the minor software release, which includes all end-of-sale milestones affected.
- Three months before the end-of-sale date, Cisco updates the official end-of-sale announcement document with indication of end-of-sale milestones of all available maintenance releases for that particular minor release.

All of the documents are intended to provide advanced notification to Cisco IOS XR Software customers of the pending end-of-sale and end-of-life milestones.

### **Cisco Services**

Cisco offers a wide range of services programs to accelerate customer success. These innovative services programs are delivered through a unique combination of people, processes, tools, and partners, resulting in high levels of customer satisfaction. Cisco services help you protect your network investment, optimize network operations, and prepare your network for new applications to extend network intelligence and the power of your business.

### **Summary**

Cisco understands that our customers operate on disciplined, time-sensitive service-deployment operations with predictable qualification lead times. With the trend of convergence at application, service, and network toward a common packet-based infrastructure, the right release model is vital for mutual success. In conclusion, you must address two fundamental requirements:

- Deliver features (including feature enhancements) in a timely manner: A given Cisco IOS XR Software feature must have consistent behavior on all supported Cisco IOS XR Software platforms.

- Fix problems found in deployed services

Cisco IOS XR Software has defined multiple software release types to address the two fundamental requirements:

- On-demand major feature release (to introduce major hardware platforms or software architecture changes)
- Periodic twice-a-year minor feature releases (to introduce new software and hardware features)
- Periodic and on-demand maintenance releases to cumulatively fix problems found
- On-demand point bug fixes using SMU

Cisco continuously improves the release and support practices based on customer needs and inputs. For any questions related to release practice or suggestions for improvements, please contact your local Cisco sales team.

### For More Information

For more information about the Cisco IOS XR Software, visit [www.cisco.com](http://www.cisco.com) or contact your local Cisco account representative. For information about Cisco service and support programs and benefits, visit: [http://www.cisco.com/public/Support\\_root.shtml](http://www.cisco.com/public/Support_root.shtml).



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