



## Q&A

# CISCO IOS SOFTWARE MODULARITY ON THE CISCO CATALYST 6500 SERIES SWITCH

## GENERAL

**Q.** What is Cisco IOS® Software Modularity?

**A.** Cisco® Catalyst 6500® Series with Cisco IOS Software Modularity boosts operational efficiency and minimizes downtime through evolutionary software infrastructure advancements. By enabling modular Cisco IOS subsystems to run in independent processes, this innovation minimizes unplanned downtime through self-healing processes, simplifies software changes through subsystem In Service Software Upgrades (ISSU), and enables process-level, automated policy control by integrating Embedded Event Manager (EEM).

**Q.** What types of users will benefit from using Cisco IOS Software Modularity?

**A.** Enterprise, Commercial and Metro Ethernet customers will benefit from the availability features of Cisco IOS Software Modularity.

## HARDWARE AND SOFTWARE SUPPORT

**Q.** When will Cisco IOS Software Modularity be available on the Cisco® Catalyst® 6500 Series Switch?

**A.** Software Modularity will be introduced on the Cisco Catalyst 6500 Series Supervisor Engine 720 in Q4 CY2005 and on Supervisor Engine 32 in Q1 CY2006.

**Q.** Will Software Modularity be supported for the Cisco Catalyst 6500 Supervisor Engine 1A and Supervisor Engine 2 systems?

**A.** There are no plans for support on Cisco Catalyst 6500 Series Supervisor Engine 1A and Supervisor Engine 2 systems. Software Modularity will only be supported for the Catalyst 6500 Supervisor Engine 720 and Supervisor Engine 32.

**Q.** Will Software Modularity work with all the Ethernet line card options on the Cisco Catalyst 6500 Series?

**A.** At the initial product first customer shipment (FCS), Cisco IOS Software Modularity will work with all shipping Ethernet line cards already supported in Cisco IOS Software Release 12.2(18)SXE2.

**Q.** Will WAN cards be supported with Cisco IOS Software Modularity?

**A.** FlexWAN and Enhanced FlexWAN will be supported in the first release of Cisco IOS Software Modularity for Cisco Catalyst 6500 Supervisor Engine 720, and Enhanced FlexWAN will be supported with Supervisor Engine 32. Support is not planned for optical service modules (OSMs). Support for the next generation of WAN cards (Shared Port Adapter [SPA] and SPA Interface Processor [SIP]) is currently being planned for a future release in 2006.

**Q.** Are there any chassis restrictions to run Software Modularity on the Cisco Catalyst 6500 Series?

**A.** No. Software Modularity can be enabled on either Cisco Catalyst 6500 Series or Catalyst 6500-E Series chassis—provided the systems are based on Catalyst 6500 Supervisor Engine 720 or Supervisor Engine 32.

**Q.** Are there any differences in the feature sets with Cisco IOS Software Modularity?

**A.** Software Modularity is an infrastructure-level feature that will be enabled in all Cisco IOS Software reformation feature sets for the Cisco Catalyst 6500 Series. This includes the IP Base, IP Services, Advanced IP Services, Enterprise Services, and Advanced Enterprise Services features sets for Cisco IOS Software on the Catalyst 6500 Series. In short, there is no change in the feature sets with Software Modularity.

**Q.** Will Software Modularity be supported in native configurations (Cisco IOS Software on RP and SP) and hybrid configurations (Cisco IOS Software on Route Processor, Catalyst OS on Switch Processor)?

**A.** Software Modularity will only be supported in native configurations on the Cisco Catalyst 6500 Series with Catalyst 6500 Supervisor Engine 720 and Supervisor Engine 32.

**Q.** What are the minimum memory requirements to run Software Modularity for the Cisco Catalyst 6500 Series?

**A.** Table 1 shows the memory requirements to run Software Modularity.

**Table 1.** Memory Requirements

Cisco Catalyst 6500 Supervisor Engine	Minimum RP DRAM	Minimum SP DRAM	Minimum Compact Flash	Recommended Compact Flash
Supervisor Engine 720 (PFC3A/B/BXL)	512 MB	512 MB	256 MB	512 MB
Supervisor Engine 32 (PFC3B)	512 MB	512 MB	256 MB	512 MB

**Q.** What are the minimum software requirements (native versus hybrid, ROMMON, etc.) to run the Cisco IOS Software images supporting Software Modularity?

**A.** Table 2 lists the minimum software requirements to run the Cisco IOS Software images with Software Modularity:

**Table 2.** Software Requirements

Cisco Catalyst 6500 Supervisor Engine	Minimum Native-Mode Release	Minimum Hybrid-Mode Release	Minimum RP ROMMON	Minimum SP ROMMON
Supervisor Engine 720 (PFC3A/B/BXL)	Cisco IOS Software Release 12.2(18)SXF rebuild in Q4 CY2005	Not supported	12.2(17r)S2	8.1.3
Supervisor Engine 32 (PFC3B)	Cisco IOS Software Release 12.2(18)SXF rebuild in Q1 CY2006	Not supported	TBD	TBD

**Q.** Will Software Modularity support dual supervisor engine configurations?

**A.** Yes, dual supervisor engine configurations in all high-availability modes (Route Processor Redundancy [RPR], RPR+, and Stateful Switchover [SSO] with Nonstop Forwarding [NSF]) are fully supported.

## PERFORMANCE

**Q.** What is the CPU impact on operations like installing or removing patches, and repackaging?

**A.** Tasks such as installing and removing patches run as low priority—and so if the system is busy with other more important tasks such as routing, these functions will be given limited CPU time in order to protect the system.

**Q.** Is it possible to stop system processes?

**A.** At initial FCS, only restarting of processes will be supported. Stopping processes is not allowed.

**Q.** Because the file system is now being used for patching functions, what is required in order to obtain maximum performance of the file system?

**A.** Using the most recent ROMMON version and formatting the media on a system running Software Modularity will result in the optimal file system performance.

**Q.** Provided the system is running (bound) to a compact flash—can the compact flash be removed once the system has booted?

**A.** No. Portions of the software are dynamically loaded based on configuration and therefore the media where the system is bound must be available all the time.

**Q.** What happens if a process fails repeatedly?

**A.** Software Modularity has system-protection functions that monitor process restarts and will force a supervisor engine switchover (in a dual supervisor engine environment) or a system restart if a process is unable to recover within predefined thresholds.

**Q.** Is there a change in image size with Software Modularity?

**A.** Yes. Because of the improved process boundaries and new capability being added, the Software Modularity enhancements will increase the Cisco IOS Software image size slightly.

**Q.** How does the boot time of a system running Software Modularity compare to a traditional system?

**A.** The boot time for a system running Software Modularity is expected to be similar to current boot times for Cisco IOS Software on the Cisco Catalyst 6500 Series.

**Q.** Will I get a system message when a process restarts?

**A.** Embedded Event Manager (EEM) can be used to generate custom e-mail, syslog, or Simple Network Management Protocol (SNMP) messages when a process restarts.

## **PATCHING**

**Q.** Does Cisco IOS Software Modularity provide information on which processes are affected by a patch update?

**A.** Yes, it provides this information. During the patching process the system will explicitly list which process(es) will be affected by the patch being applied. The user will also have the opportunity to exit the patching process before the affected subsystems are patched.

**Q.** How will patches be applied in a dual supervisor engine configuration?

**A.** Patches will need to be applied manually on each supervisor engine in a dual supervisor engine configuration. In such environments, both supervisor engines must run the same base image and patches in order to support the NSF/SSO high-availability redundancy mode.

**Q.** Will Cisco provide patches for all software issues?

**A.** In order to simplify the patching process, Cisco will restrict patching support initially to address publicly announced Product Security Incident Response Team (PSIRT) issues only. Cisco is planning to extend this support to patches that address other types of updates at a later time.

**Q.** What is the smallest entity that can be replaced with a patch?

**A.** A subsystem is the smallest entity that can be replaced. One or more subsystems form a process.

**Q.** What is a maintenance pack?

**A.** A maintenance pack is a collection of individual patches. Maintenance packs will be cumulative; for example, if the first maintenance pack offered contains patch A, the next maintenance pack will contain patch A and patch B. This simplifies patch management by allowing the combination of a base image with a maintenance pack only and not any combination of patches.

**Q.** Can a base image and a maintenance pack (a cumulative collection of patches) be combined into a single image to simplify deployment?

**A.** Yes, there is a repackaging feature that allows this on the switch.

**Q.** Does the system store good base-image plus maintenance-pack configurations to allow a rollback to a previous state?

**A.** Cisco IOS Software Modularity supports a concept called “tagging” in which the user can define tags or use system defined tags to roll back to a previous configuration (base-image plus maintenance-pack) state.

- Q.** After a repackaged image is installed, can I remove patches and use previously used tags?
- A.** Yes. Repackaged images contain all relevant information to add/remove patches as well as roll back to previously set tags.
- Q.** Is there a central patch management tool available?
- A.** Cisco has plans to add this capability to CiscoWorks2000 Resource Manager Essentials (RME) within 6 months after FCS.
- Q.** Is there something extra beyond a regular software upgrade to run Software Modularity that needs to be done in order to support patching in the system?
- A.** There are two modes in which you can run a Software Modularity system: the traditional method in which software is loaded in the usual way, and an “install” process that generates the file and directory structure required to enable patching.
- Q.** If the system has two active patches, A and B (B applied after A), can I remove patch A but leave patch B?
- A.** Patches can only be removed in the reverse order that they were applied. Therefore, patch A cannot be removed before patch B.
- Q.** In which releases will patches be offered, and for how long will patching be supported after the release ships?
- A.** Patching support is planned for every major release that goes through the Safe Harbor certification process starting with a rebuild of Cisco IOS Software Release 12.2(18)SXF. Patches will be offered through maintenance packs on this release for a period of about 12 months. When a new major release completes the Safe Harbor certification process, customers may move to the new release to start a new 12-month cycle of patching support.
- Q.** Is there a process in place that allows me to un-install a patch?
- A.** Patches can be uninstalled as simply as they are installed. Please refer to Cisco IOS Software Modularity documentation for more information on this process.
- Q.** What happens if I try to install a patch for a version of software that does not support that patch? Does the system do some kind of a check to make sure the patch is for the software version I have installed?
- A.** The system automatically verifies that the patch applies to the loaded base image before allowing an install and activation of the patch. This is done through an internal versioning process for patches. Additionally, the Patch Navigator on Cisco Connection Online (<http://www.cisco.com>) will identify the patches applicable to a base image.

**Corporate Headquarters**

Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
www.cisco.com  
Tel: 408 526-4000  
800 553-NETS (6387)  
Fax: 408 526-4100

**European Headquarters**

Cisco Systems International BV  
Haarlerbergpark  
Haarlerbergweg 13-19  
1101 CH Amsterdam  
The Netherlands  
www-europe.cisco.com  
Tel: 31 0 20 357 1000  
Fax: 31 0 20 357 1100

**Americas Headquarters**

Cisco Systems, Inc.  
170 West Tasman Drive  
San Jose, CA 95134-1706  
USA  
www.cisco.com  
Tel: 408 526-7660  
Fax: 408 527-0883

**Asia Pacific Headquarters**

Cisco Systems, Inc.  
168 Robinson Road  
#28-01 Capital Tower  
Singapore 068912  
www.cisco.com  
Tel: +65 6317 7777  
Fax: +65 6317 7799

Cisco Systems has more than 200 offices in the following countries and regions. Addresses, phone numbers, and fax numbers are listed on **the Cisco Website at [www.cisco.com/go/offices](http://www.cisco.com/go/offices).**

Argentina • Australia • Austria • Belgium • Brazil • Bulgaria • Canada • Chile • China PRC • Colombia • Costa Rica • Croatia • Cyprus  
Czech Republic • Denmark • Dubai, UAE • Finland • France • Germany • Greece • Hong Kong SAR • Hungary • India • Indonesia • Ireland • Israel  
Italy • Japan • Korea • Luxembourg • Malaysia • Mexico • The Netherlands • New Zealand • Norway • Peru • Philippines • Poland • Portugal  
Puerto Rico • Romania • Russia • Saudi Arabia • Scotland • Singapore • Slovakia • Slovenia • South Africa • Spain • Sweden • Switzerland • Taiwan  
Thailand • Turkey • Ukraine • United Kingdom • United States • Venezuela • Vietnam • Zimbabwe

Copyright © 2005 Cisco Systems, Inc. All rights reserved. CCSP, CCVP, the Cisco Square Bridge logo, Follow Me Browsing, and StackWise are trademarks of Cisco Systems, Inc.; Changing the Way We Work, Live, Play, and Learn, and iQuick Study are service marks of Cisco Systems, Inc.; and Access Registrar, Aironet, ASIST, BPX, Catalyst, CCDA, CCDP, CCIE, CCIP, CCNA, CCNP, Cisco, the Cisco Certified Internetwork Expert logo, Cisco IOS, Cisco Press, Cisco Systems, Cisco Systems Capital, the Cisco Systems logo, Cisco Unity, Empowering the Internet Generation, Enterprise/Solver, EtherChannel, EtherFast, EtherSwitch, Fast Step, FormShare, GigaDrive, GigaStack, HomeLink, Internet Quotient, IOS, IP/TV, iQ Expertise, the iQ logo, iQ Net Readiness Scorecard, LightStream, Linksys, MeetingPlace, MGX, the Networkers logo, Networking Academy, Network Registrar, Packet, PIX, Post-Routing, Pre-Routing, ProConnect, RateMUX, ScriptShare, SlideCast, SMARTnet, StrataView Plus, TeleRouter, The Fastest Way to Increase Your Internet Quotient, and TransPath are registered trademarks of Cisco Systems, Inc. and/or its affiliates in the United States and certain other countries.

All other trademarks mentioned in this document or Website are the property of their respective owners. The use of the word partner does not imply a partnership relationship between Cisco and any other company. (0502R) 205309.BT\_ETMG\_CC\_8.05

