



Cisco Enhances MPLS Layer 2 VPN Transport and Manageability with Cisco IOS Software Release 12.4(11)T



Network Software and Systems Technology Group

November 20, 2006

Agenda

- Cisco IOS® Software Release 12.4T Family
- Introducing Release 12.4(11)T
- Cisco IOS Packaging
- Upgrade Paths
- Summary

Cisco IOS Software Release 12.4T

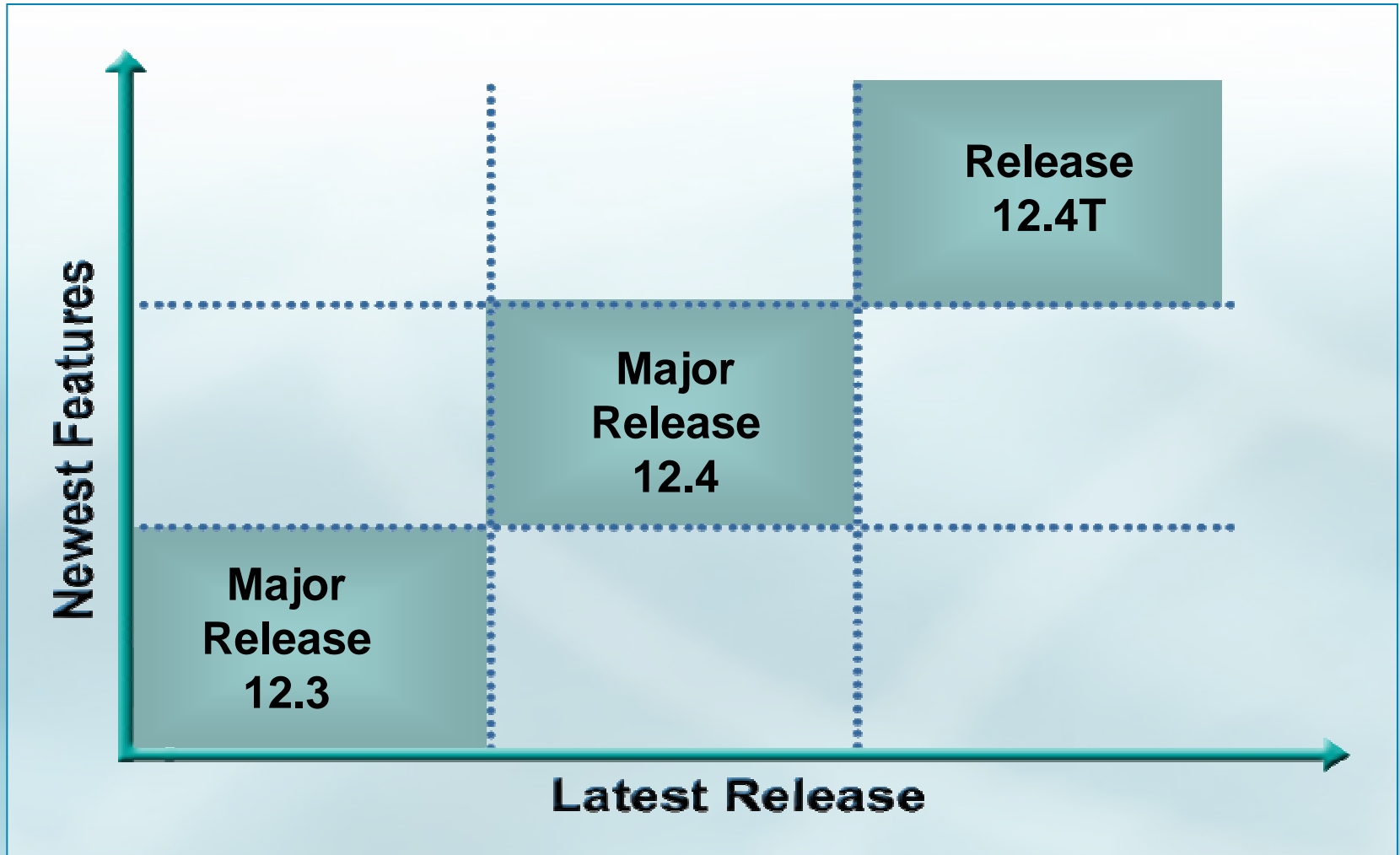
Extending Security, Voice, MPLS, and IP Services

**Integrates a portfolio of new capabilities,
including security, voice, and IP services,
with powerful hardware support**

**Delivers advanced services for
Enterprise and access customers**

**Series of regularly scheduled individual releases,
which Cisco will ultimately consolidate
to form the next major release**

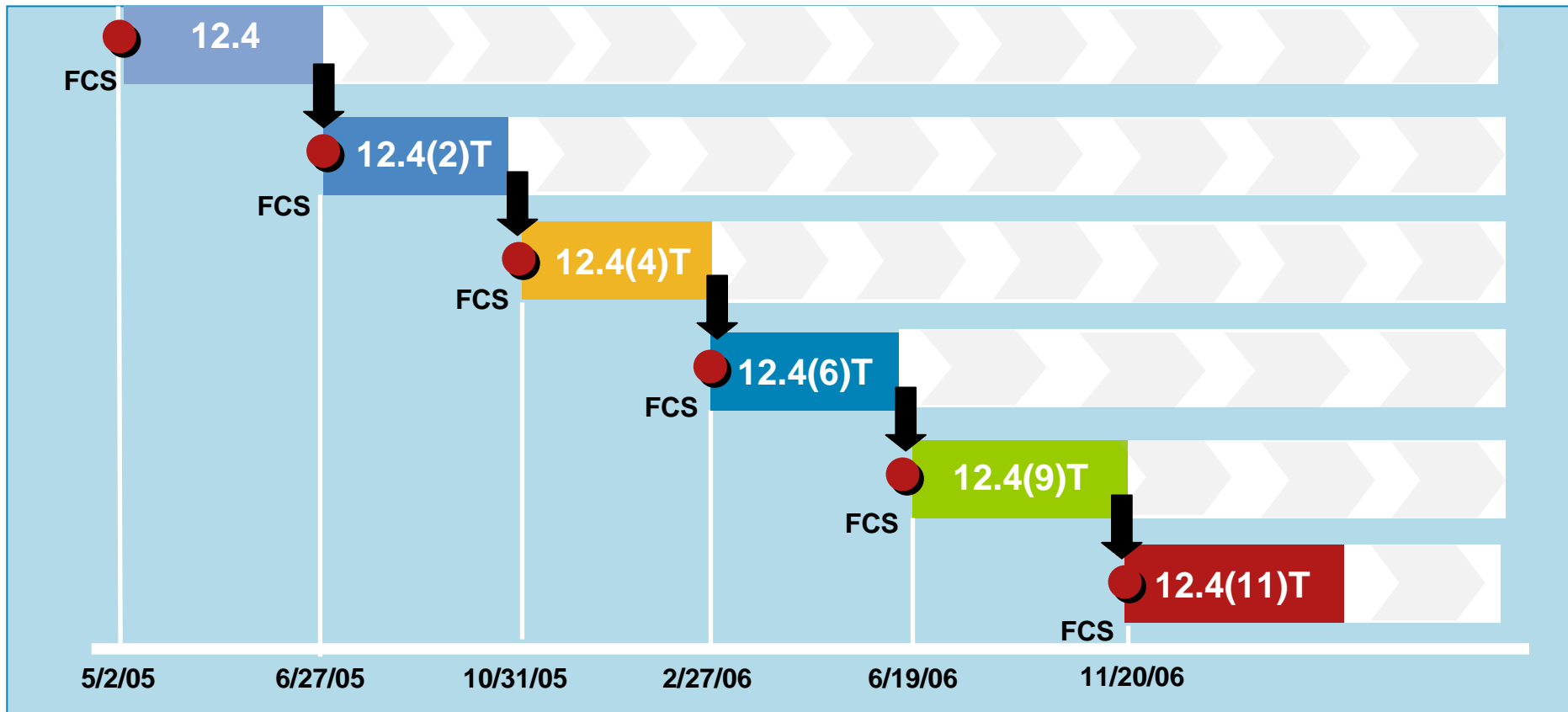
Release 12.4T: Built on the Mature Base of Major Release 12.4



Release 12.4T within the Cisco IOS Software Release Portfolio

Release Families	Target Market	Hardware Platforms
Cisco IOS XR	Service Provider Core	Cisco Carrier Router System-1 (CRS-1)
Release 12.4	Enterprise Access Service Provider Aggregation	Cisco 800, 1700, 1800, 2600, 2600XM, 2800, 3600, 3700, 3800, and 7200 Series Routers Cisco 7301 Router
Release 12.4T	Enterprise Access	Cisco 800, 1700, 1800, 2600, 2600XM, 2800, 3600, 3700, 3800, and 7200 Series Routers Cisco 7301 Router Cisco AS5000 Series
Release 12.2S	Enterprise Core / Switching / WAN Aggregation, Service Provider Aggregation	Cisco Catalyst 2970, 3750, 4500, 6500 Series Switches Cisco 7200, 7300, 7500, 7600, 10000, ONS155x0 Cisco uBR7000/ uBR10000 Series Routers
Release 12.0S	Service Provider Core / Aggregation	Cisco 7200, 7500, 10000, and 12000 Series Routers

Release 12.4T Family Inheritance



Each release inherits the functionality of its predecessor in the Release 12.4T family

Release 12.4T Family: Key Features in Release 12.4(2)T

Hardware

- Cisco 850 Series Integrated Services Routers
- Cisco 870 Series Integrated Services Routers
- Cisco 1800 Series Integrated Services Routers - Fixed Configuration Models
- Cisco High-Speed Intra Chassis Module Interconnect
- Inline Power Auto Negotiation

Cisco IOS Security

- Cisco Router and Security Device Manager 2.1.2
- Transparent Cisco IOS Intrusion Prevention System
- EasyVPN Dynamic Virtual Tunnel Interfaces
- Other EasyVPN Enhancements
- Certificate Authority Key Rollover
- Configurable Certificate Storage Location
- NAT Optimize Media Path for SIP Traffic

Cisco IOS Infrastructure

- Cisco IOS EEM Version 2.2

Voice

- SIP Support of Resource Priority Header and Reason Header
- SIP: User Agent MIB
- Configurable Hostname in Locally Generated SIP Headers
- Secure Communication between IP-STE Endpoint and STE Endpoint
- Land Mobile Radio over IP Enhancement
- MGCP Controlled Backhaul of Basic Rate Interface Signaling
- SCCP Analog (FXS) Ports Supplementary Feature Support for Cisco VG 224
- E1 R2 Collect Call Blocking

Quality of Service

- BitTorrent PDLs Native Implementation
- Citrix ICA Published Applications Native Implementation
- Multiple Matches Per Port
- MQC Policy Map Support on Configured Virtual Circuit Range ATM

Access Technology

- AAA CLI Stop Record Enhancement
- Calling Number Suppression for L2TP Setup
- Multilink Frame Relay (FRF.16.1) Variable Bandwidth Class Support
- SSG - Configurable Maximum Number of Allowed Subscribers
- SSG Support for WISPr RADIUS Attributes
- Routed Bridge Encapsulation Client Side Encapsulation with QoS
- Define Interface Policy-Map AV Pairs AAA

Management Instrumentation

- Cisco IOS IP SLAs Random Scheduler
- NetFlow Top Talker CLI - Phase 2
- AES and Triple-Data Encryption Standard Algorithm Encryption Support for SNMPv3

IP Services

- IPv6 ACL Extensions for Mobile IPv6
- IPv6 Default Router Preference
- Foreign Agent Local Route Optimization

IP Routing

- Application-Aware Routing: Policy Based Routing
- TCP Show Extension
- ICMP Unreachable Rate Limiting User Feedback
- "Clear IP Traffic" CLI

IP Multicast

- Multicast Listener Discovery Group Limits
- IPv6 Boot Strap Router—Ability to Configure Rendezvous Point Mapping
- IPv6 Source Specific Multicast Mapping
- Multicast Source Discovery Protocol MD5 Password Authentication



Cisco IOS
Software
Release
12.4(2)T

Release 12.4T Family: Key Features in Release 12.4(4)T

Cisco IOS Security

- Flexible Packet Matching
- Application Firewall – Instant Message Traffic Enforcement
- VRF aware DNS
- EasyVPN Enhancements
- Control Plane Protection
- VRF Aware IPsec MIB
- IPV6 support for Site-Site IPsec VPN
- DMVPN QoS Support

Management Instrumentation

- NetFlow Top Talkers CLI

High Availability

- HSRP for IPv6
- NetFlow Reliable Export (SCTP)

IP Routing

- BDF Detection Standard Implementation
- BGP Route-Map Continue Support for Outbound Policy
- BGP Selective Next-Hop Route Filtering

Quality of Service

- Skype Classification vis NBAR PDLMS
- DirectConnect PDLMS



Broadband

- Multicast User Authentication & Profile Support
- PPPoE Circuit-ID Tag Processing

Hardware

- Cisco 1801, 1802, and 1803 Integrated Services Routers
- Multi-Processor Forwarding for Broadband LAC, LNS, and PTA
- ADSL2/ADSL2+ Support for Integrated Service Routers

Voice

- Cisco IOS IP SLAs for VoIP with RTP
- Cisco CallManager Express 3.4
- Survivable Remote Site Telephony 3.4
- Secure Communication Between IP-STE and Lineside STE Endpoints
- Interoperability Enhancements to the Cisco Multiservice IP-IP Gateway
- Identify Alternate Endpoint Call Attempts in RADIUS Call Accounting Records
- Cisco Modem Relay
- SIP:CLI for Passing Calling Name when Privacy Exists
- Fax Relay Support for SG3 Fax Machines at G3 Speeds
- Basing SIP-SIP Support on the Cisco Multiservice IP-to-IP Gateway

Release 12.4T Family: Key Features in Release 12.4(6)T

Cisco IOS Security

- Cisco IOS Firewall Enhancements- Firewall Stateful Failover, Zone-based Policy Configuration, Cisco Unified Firewall MIB
- Cisco IOS WebVPN Enhancements
- Complete Certificate Chain Validation in Cisco IOS Public Key Infrastructure
- Enhanced Online Certificate Status Protocol in Cisco IOS Public Key Infrastructure
- EasyVPN Password Aging via Authentication, Authorization, and Accounting
- EasyVPN Dynamic Firewall / ACL Policy Push to Cisco VPN Software Client
- Secure Multicast
- Control Plane Logging
- Management Plane Protection
- ANI Suppression During L2TP Set-Up for Cisco AS5000 Series

Management Instrumentation

- Cisco IOS IP Service Level Agreements – LSP HealthMonitor
- Cisco IOS Service Level Agreements ICMP Jitter Operation

Hardware

- G.SHDSL WAN Interface Card

Broadband

- ATM Oversubscription for DSL
- Private VLAN Edge on Cisco 1800 Fixed Configuration Routers



Cisco IOS Software Release 12.4(6)T

High Availability

- Cisco Gateway Load Balancing Protocol for IPv6
- Hot Standby Router Protocol – Multiple Group Optimization

Voice

- Resource Reservation Protocol Agent for Call Admission Control
- Cisco Text Relay for Baudot Text Phones
- Extended Session Initiation Protocol-Session Initiation Protocol Support on the Cisco Multiservice IP-to-IP Gateway
- In Service Updates to Gatekeeper Zone Prefix Configuration
- Packet Mode Service on D Channel
- Skinny Client Control Protocol Private Line Automatic Ringdown with DTMF Out Pulse Digits for FXS Analog Phones
- Session Initiation Protocol Gateway Support for Busy Out
- Session Initiation Protocol Transport Layer Security Support

IP Routing

- Enhanced Interior Gateway Routing Protocol for IPv6
- Dynamic Host Configuration Protocol Option 82 Per Interface
- RIPv2 : RFC1724 MIB Extension
- Open Shortest Path First version 2 RFC 3623 Graceful Restart – Helper Mode

Release 12.4T Family: Key Features in Release 12.4(9)T

Cisco IOS Security

- Cisco IOS Firewall- HTTP Application Inspection and Control, Session Policing and Ingress Rate Policing based on Firewall Policies, P2P Application Filtering
- Cisco EasyVPN 7.1
- DMVPN Manageability Enhancements
- Virtual Private Network (VPN) Advanced Integration Module (AIM) for Cisco 1841/2800/3800 Integrated Services Routers (ISRs)
- Cisco IOS WebVPN – Auto-Applet Port Forwarding Download, HTTP Authentication, RADIUS Accounting

Mobility

- Mobile IP- Mobile Router Multi-Path Support

Voice

- Cisco Unified CallManager Express 4.0
- Cisco Multiservice IP-to-IP Gateway – Hosted NAT Traversal
- Skinny Call Control Protocol (SCCP) Controlled Analog (FXS) Ports with Supplementary Features In Cisco IOS Gateway
- High-Density Packet Voice for Cisco AS5400XM and AS5350XM Universal Gateways

IP Routing

- Bidirectional Forwarding Detection (BFD) Echo Mode
- ACL-based Rate Based Satellite Control Protocol (RBSCP)
- Open Shortest Path First version 3 (OSPFv3) IPsec ESP Encryption and Authentication

IP Services

- Enhanced Object Tracking (EOT) Support for Carrier Delay
- Domain Name Service – Split DNS

Management Instrumentation

- Flexible NetFlow
- Cisco Networking Services (CNS) Security Enhancements
- Netconf Access for Configuration over SSH and BEEP

High Availability

- Hot Standby Router Protocol – HSRP Group Shutdown



Cisco IOS
Software
Release
12.4(9)T

Release 12.4T Family: Key Features in Release 12.4(11)T

Cisco IOS Security

- Group Encrypted Transport VPN
- Cisco IOS SSLVPN – Application ACL, Netegrity Single Sign-on support, Port-forwarding enhancements, Debug infrastructure, URL obfuscation
- RFC 2547 over DMVPN
- Easy VPN Manageability Enhancements
- Easy VPN Identical Addressed spokes
- IOS Firewall and Voice support enhancements

Layer 2 VPN

- Any Transport over MPLS (AToM) L2 VPN encapsulation
- AToM Pseudowire Redundancy
- AToM Interworking
- Multilink Frame Relay over MPLS
- AToM High Availability
- Layer 2 Local Switching with Interworking

MPLS Management

- MPLS LSP Ping for Layer 2 VPN Pseudowires (RFC4379)
- MPLS OAM support for Pseudowire (PW) VCCV validation
- MPLS Pseudowire MIBs

IP Mobility & Wireless

- Mobile IPv6 Authentication Option Support

Voice

- VoiceXML Browser Enhancements for the ISR and AS5000
- Enhancements to Cisco IOS Session Border Controller (SBC)- Cisco Multiservice IP-to-IP Gateway

IP Services

- Cisco Express Forwarding (CEF) L4 Port Load Balancing
- DHCP Class support for Option 60, 77, 124, 125
- DHCP Relay Per interface VPN ID support

Hardware

- 7200VXR Series NPE-G2 Network Processing Engine
- VPN Service Adapter for Cisco 7200 Series Router

QoS

- ATM QoS Features for the ADSL2 and ADSL2+ High-Speed WAN Interface Card for Cisco 1800, 2800, and 3800 Series Integrated Services Routers



Cisco IOS
Software
Release
12.4(11)T

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- **Introducing Release 12.4(11)T**
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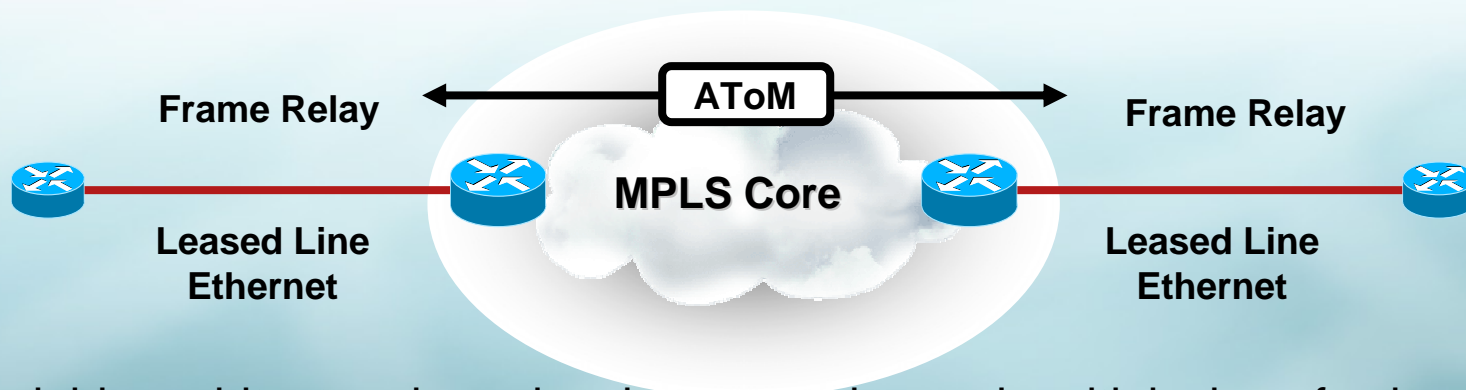
Introducing Release 12.4(11)T

Cisco IOS Software Release 12.4(11)T

- **Advanced Layer 2 VPN over MPLS transport (Any Transport over MPLS) and high availability capabilities**
- **Improved MPLS management for Layer 2 VPNs**
- **Enhanced Mobile IPv6 authorization and identity support**
- **VoiceXML browser enhancements for the Cisco ISR Series Router and AS5000 Series Gateway**
- **Next-generation WAN encryption technology (Group Encrypted Transport VPN)**
- **Support for the high performance Network Processing Engine G2 (NPE-G2) and VPN Service Adapter (VSA) for the Cisco 7200 Series Router**
- **Fifth in a series of individual Release 12.4T releases, each of which aggregate the functionality delivered via its predecessor**

Any Transport over MPLS (AToM)

- MPLS L2VPNs that provide ability to transport Layer 2 traffic across packet networks to support point-to-point site connectivity
- MPLS virtual leased line like service that is enabled on provider's edge devices

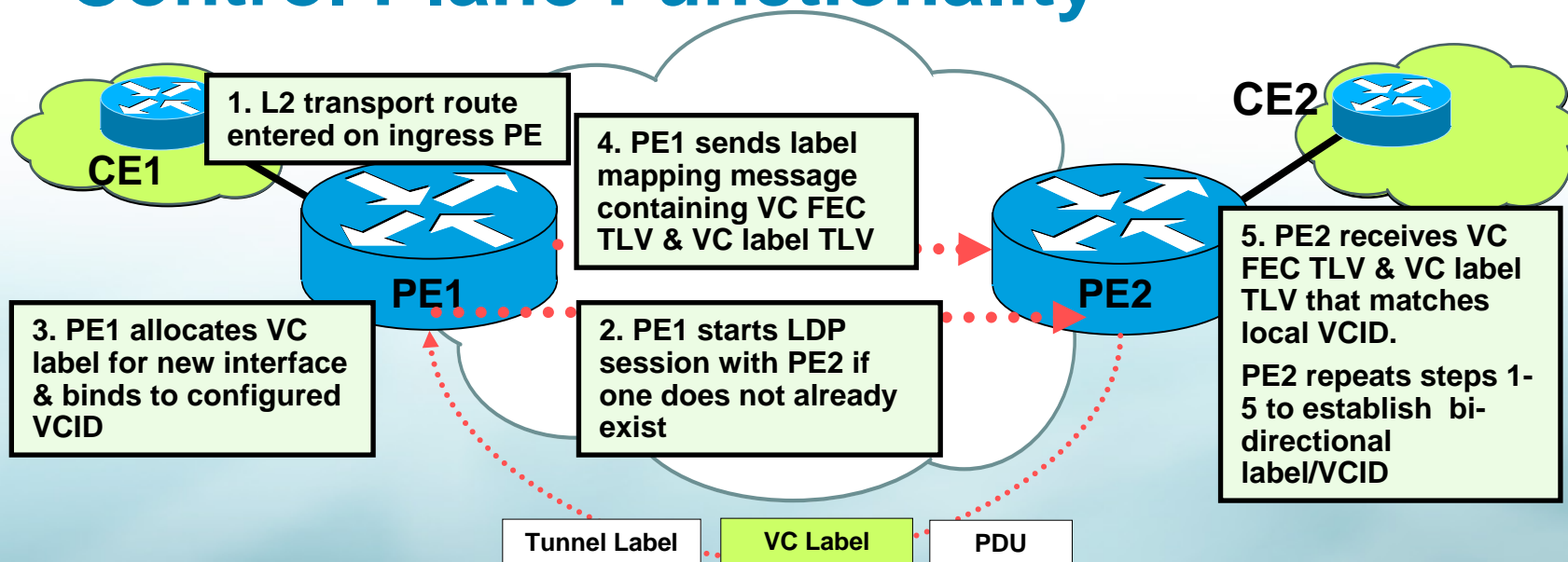


- Scalable architecture based on label stacking and multiplexing of subscriber connections
- Compliant to IETF PWE3 Working Group, and is based on the Martini drafts:
 - draft-martini-l2circuit-trans-mpls
Describes label distribution mechanisms for VC labels
 - draft-martini-l2circuit-encap-mpls
Describes emulated VC encapsulation mechanisms

Any Transport over MPLS Benefits

- Value add transparent L2VPN service for MPLS Enterprises, network providers, and subscribers
 - No need for subscriber migration to different encapsulation types, or share Layer 3 information (example: routing updates) with MPLS provider
- Allows network providers to maintain and increase customer base with existing encapsulations without having to change their core network infrastructure
- Supports Multicast routing and forwarding as a value-added service offering
- Provides point-to-point fixed QoS mappings between sites
- Supports a multitude of different encapsulation types:
 - Frame Relay over MPLS DLCI – DLCI Switching
 - Frame Relay over MPLS Port mode
 - Ethernet over MPLS – Port Mode
 - Ethernet over MPLS – VLAN Mode

Any Transport over MPLS Control Plane Functionality

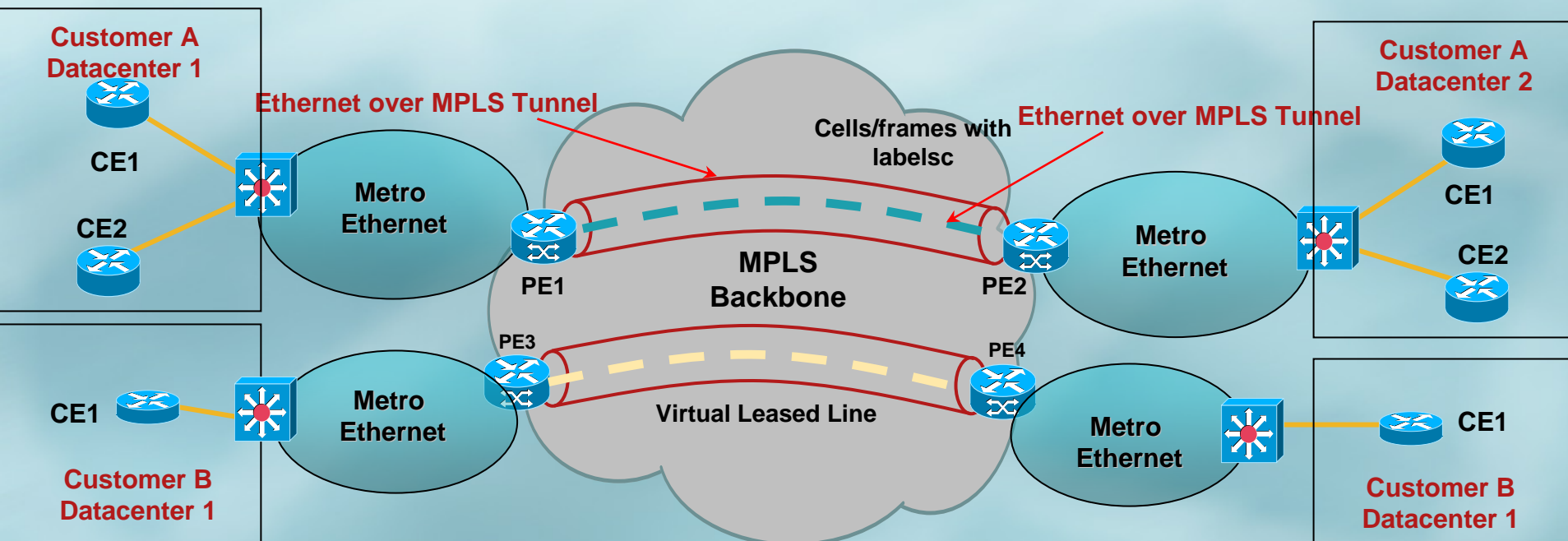


- VC labels are exchanged across a directed LDP session between PEs
Carried in Generic Label TLV within LDP Label Mapping Message (RFC3036 -LDP)
- New LDP FEC element defined to carry VC information
FEC element type value 128 carried within LDP Label Mapping Message
- VC information exchanged using Downstream Unsolicited label distribution procedures
Described in draft-martini-l2circuit-trans-mpls

Any Transport over MPLS

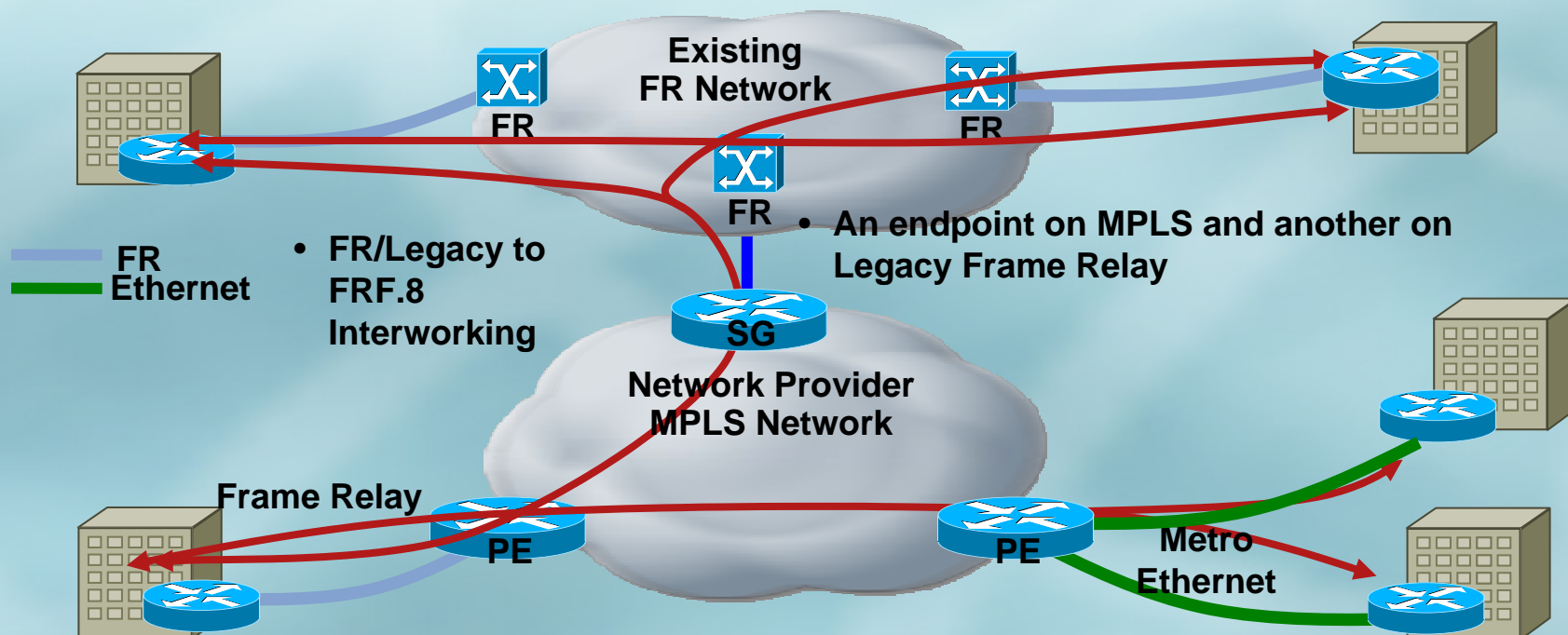
Encapsulations Ethernet over MPLS (EoMPLS)

- Allows Enterprise and network providers to extend services to Metro Networks
- Extends reachability among subscriber LAN islands by providing transport over MPLS core
- Cisco IOS Release 12.4(11)T supports EoMPLS Port and VLAN modes



AToM Layer 2 Transport Interworking

- Allows Enterprise and network providers to provide L2 transport for customers with disparate attachment circuits
 - No need for customer edge subscribers to convert to destination encapsulation
- Release 12.4(11)T supports Interworking between
 - Ethernet Port mode – Ethernet VLAN mode
 - Ethernet Port mode – Frame Relay
 - Ethernet VLAN – Frame Relay



Multilink Frame Relay over MPLS (AToM)

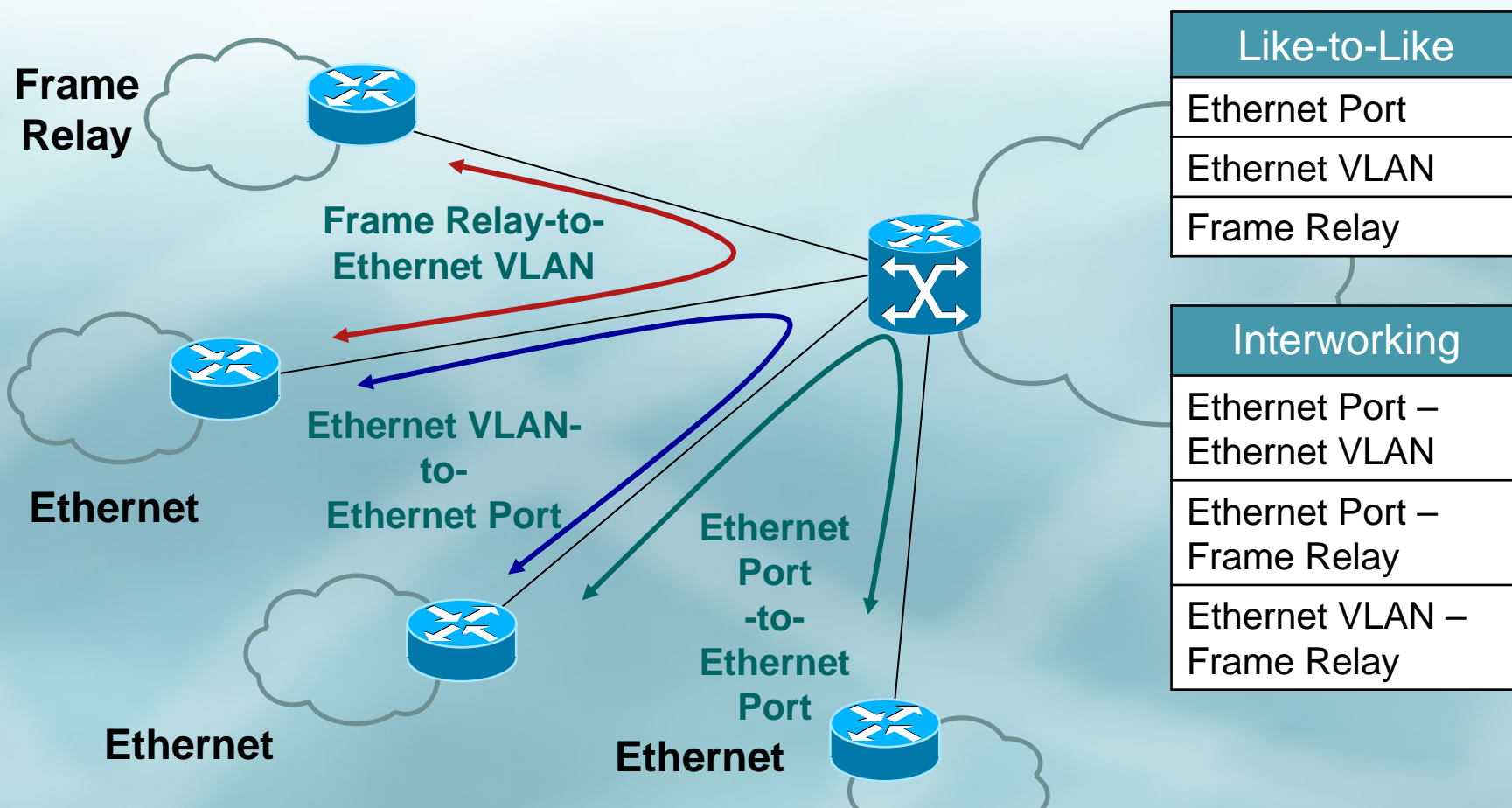
- Multilink Frame Relay is a logical grouping of one or more physical interfaces between two devices of the User-to-Network Interface/Network-to-Network Interface (UNI/NNI) as one single Frame Relay data link
- Logical bundle interface is associated with physical interfaces, and Pseudowires are created between bundle interfaces
- Works with “like-to-like” and “disparate” interfaces to support L2VPN Interworking
- Release 12.4(11)T support considerations
 - Frame Relay DLCI-DLCI mode only
 - Multilink Frame Relay interfaces support Frame Relay DLCI mode to Ethernet VLAN mode Interworking only

AToM High Availability

- It's essential to build highly available networks to minimize service disruptions due to network failures
 - Highly available and quickly converging networks reduce down time and improve service level agreements
- Network failures could occur due to
 - Hardware failure: Route Processor, Link or Node failures
 - Recovery can be improved by adding backup links and devices
 - Software failure
 - Recovery can be improved by building intelligence in network protocols
- Release 12.4(11)T provides support for
 - AToM Pseudowires Redundancy
 - AToM Graceful Restart

Layer 2 Local Switching with Interworking

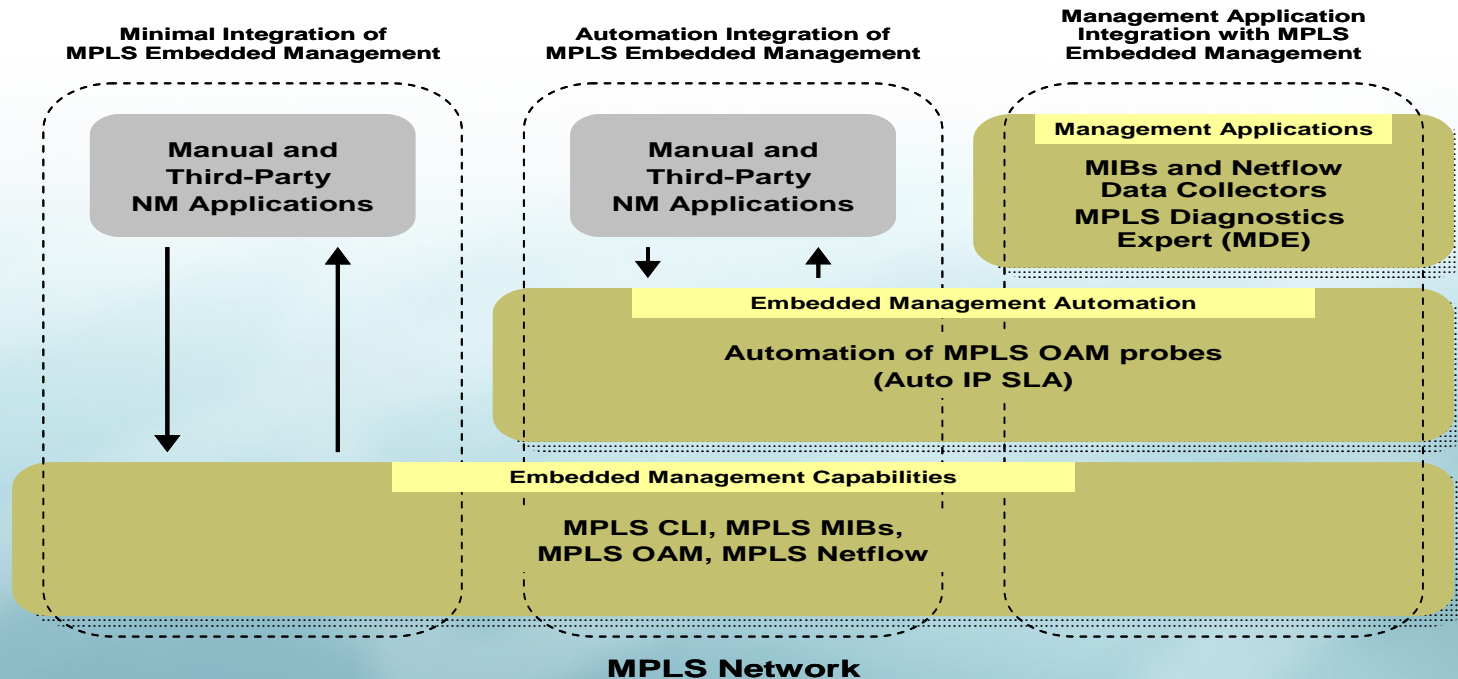
Provides like-to-like and interworking local switching between transport protocols



MPLS Management

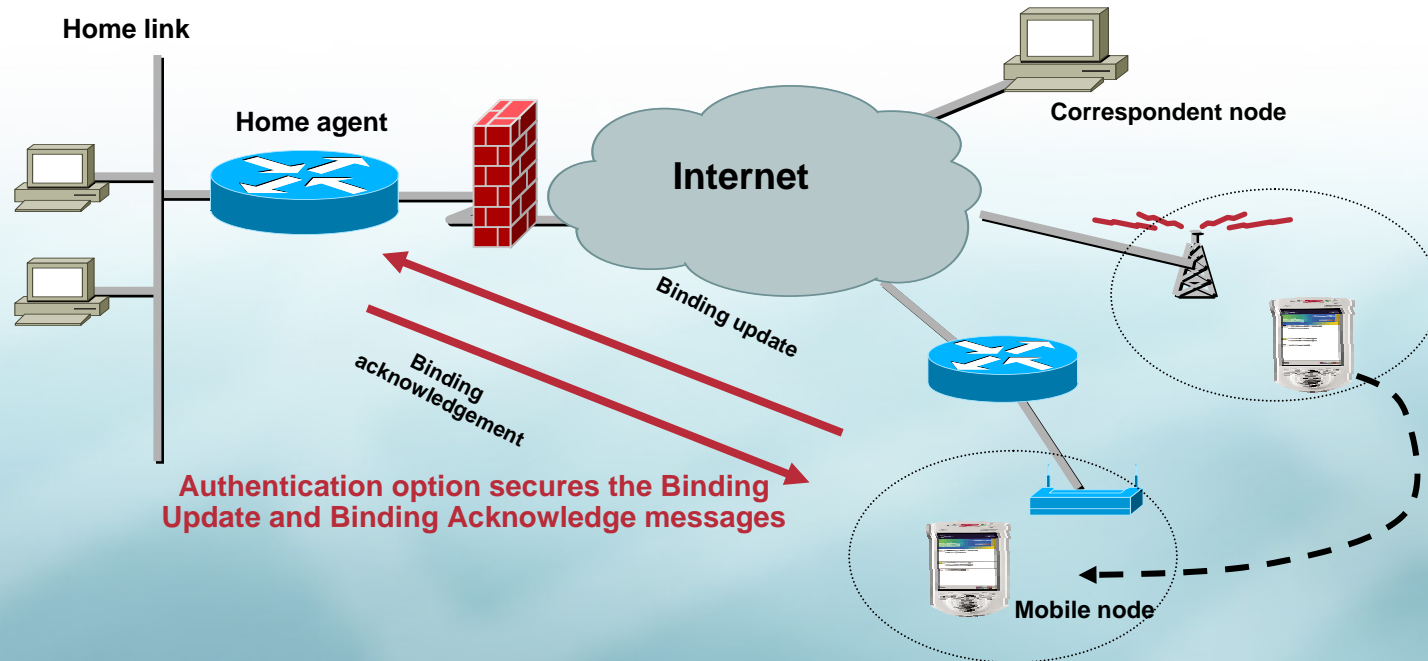
- Standards-based embedded management capabilities for IP/MPLS networks
 - Detailed MPLS resource monitoring
 - MPLS connectivity troubleshooting
- Release 12.4(11)T introduces the following new capabilities
 - MPLS Pseudowire (PW) MIBs
 - PW-STD-MIB (based on draft-ietf-pwe3-pw-mib-00.txt)
 - PW-MPLS-STD-MIB (based on draft-ietf-pwe3-pw-mpls-mib-00.txt)
 - PW-ENET-STD-MIB: (based on draft-ietf-pwe3-enet-mib-00.txt)
 - PW-TC-STD-MIB (based on draft-ietf-pwe3-pw-tc-mib-00.txt)
 - MPLS OAM Features
 - MPLS LSP Ping for Layer 2 VPN Pseudowires (based on RFC4379)
 - MPLS OAM support for Pseudowire (PW) VCCV validation

MPLS Management Benefits



- Enables Enhanced MPLS Resource Monitoring**
 MPLS Pseudowire (PW) MIBs provide standard SNMP access to a wide variety of MPLS L2 VPN-specific resources, including MPLS PW forwarding and session information
- Increases Operational Efficiency**
 MPLS OAM tools, such as LSP ping and trace, enable fast detection and isolation of complex MPLS connectivity problems, reducing trouble resolution time
- Provides Comprehensive Solution for MPLS Network and Service Availability**
 Supported by Cisco MPLS Diagnostics Expert (MDE)

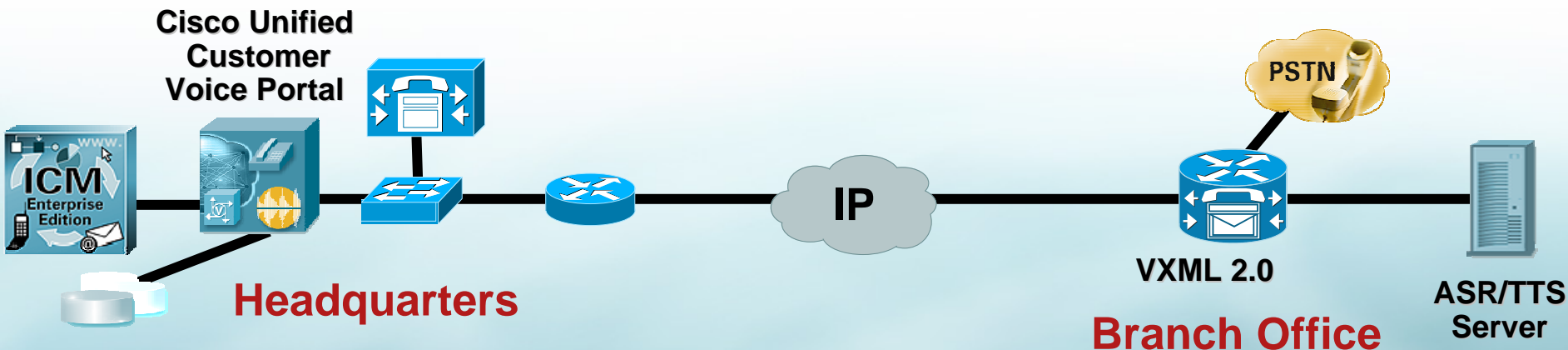
Mobile IPv6 Authentication Option Support



- Supports secure IPv6 mobility services by protecting signaling messages between a mobile node (end user) and Home Agent anchor point
 - Secures “Binding Update” and “Binding Acknowledge” message exchanges
- Provides a lightweight Mobile IPv6 authentication mechanism as compared to IPsec
 - Results in reduced CPU processing and lower control message overhead

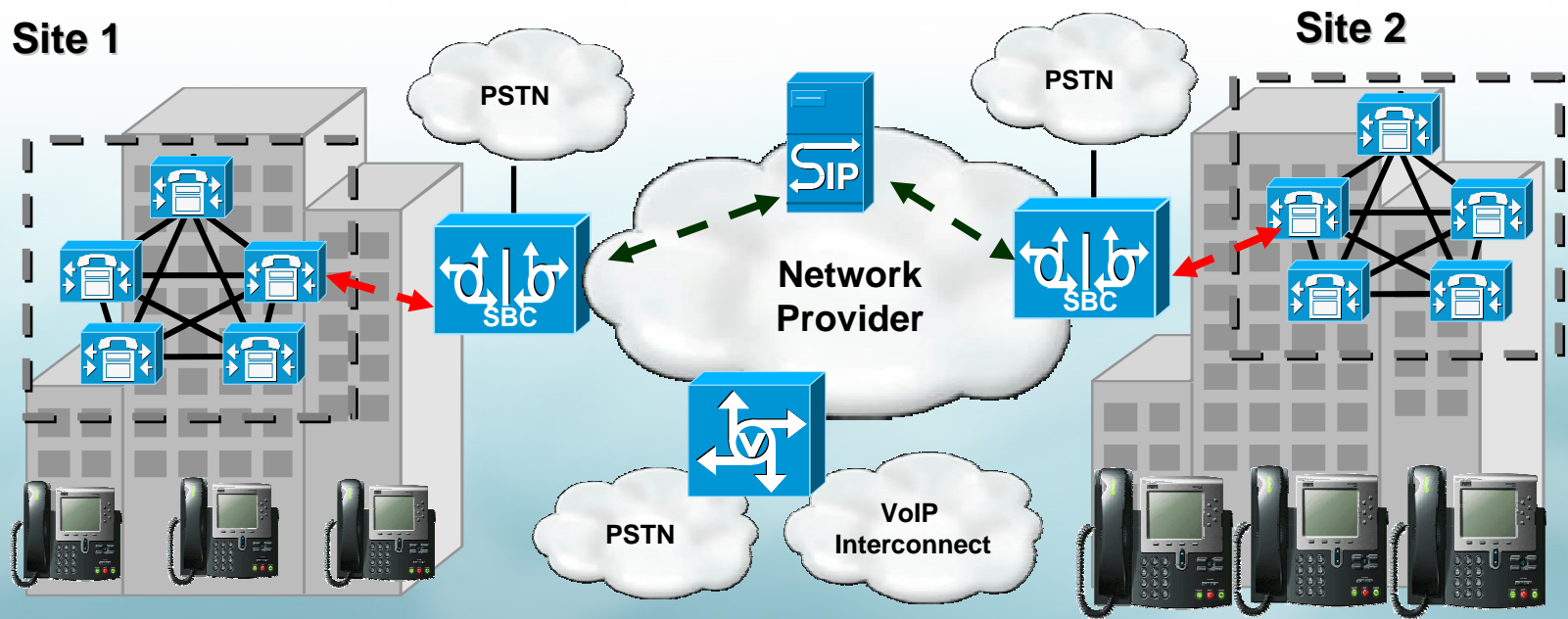
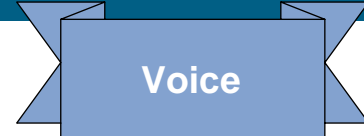
Cisco IOS VoiceXML Browser Enhancements for the ISR and AS5000

Voice



- Provides better customer service; superior speech-based call routing through emerging VoiceXML technologies
- Preserves WAN bandwidth, improved quality and responsiveness, media and IVR treatment at the branch
- W3C VoiceXML 2.0 Standard compliant, and certified by the VoiceXML Forum
- Supported on a wide range of Cisco IOS Voice Gateways; Cisco AS5350XM, AS5400XM, AS5400HPX, Cisco 2800 ISR Series, Cisco 3800 ISR series, Cisco 3700

Cisco Multiservice IP-to-IP Gateway Session Border Controller Enhancements



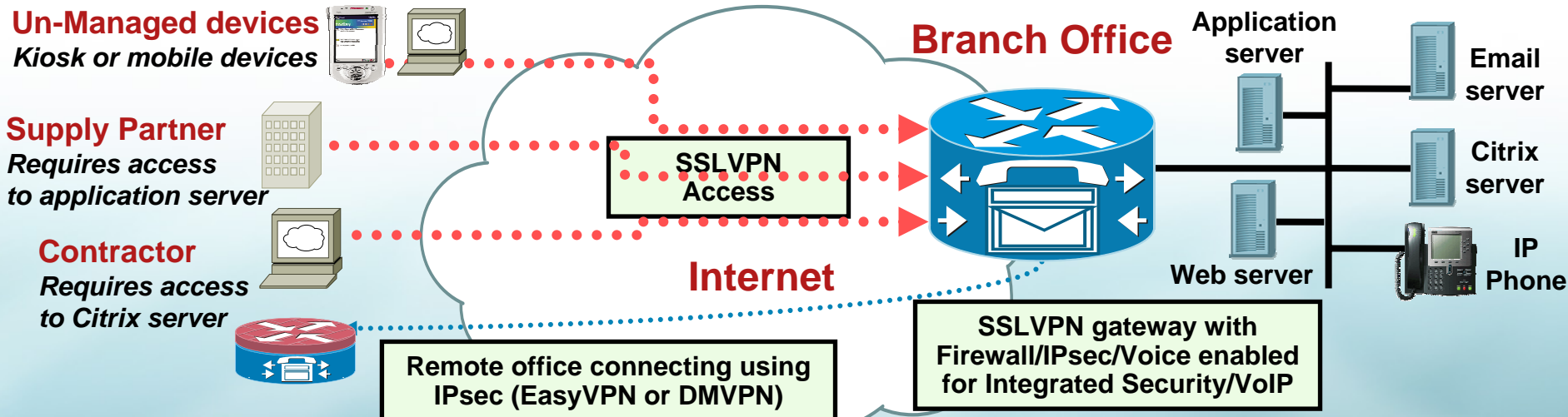
- Interconnects independent Voice over IP (VoIP) networks for data, voice, and video transport

Critical component for scaling network islands within a single customer network to an end-to-end IP community
- Release 12.4(11)T introduces support for H.323 to Session Initiation Protocol (SIP) supplementary services for Cisco Unified CallManager (CUCM) with media termination points (MTP) on the H.323 trunk

Provides enhanced termination and re-origination of signaling and media between VoIP and Video Networks in conformance with RFC3261



Cisco IOS SSLVPN



- Provides **integrated Security & Voice** on a single platform
- Provide IPsec (for remote offices) while using the same router to provide SSLVPN to Mobile users connecting from **partners, mobile devices or public kiosks**
- Provides **fully secured** access for any user from any location

Release 12.4(11)T introduces Cisco IOS SSLVPN enhancements for:

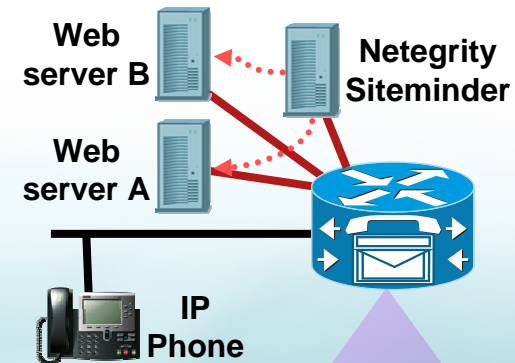
- Application ACL
- Netegrity SSO (Single Sign-on)
- URL Obfuscation

- Port forwarding enhancements
- Debug Infrastructure

Cisco IOS SSLVPN Feature Enhancements

Security &
VPN

- Application ACL
 - Ability to control end-user access to corporate resources
 - Support for both Network-level and Application-level ACL
 - Provides compliance for corporate security policies
- Netegrity Single Sign-on support
 - Seamless end-user access by storing the login credentials to allow single unified login to all applications
 - Eliminates the need to authenticate to individual server
- URL Obfuscation
 - Provides added security by hiding/masquerading Internal host names/IP addresses
- Port-forwarding applet enhancements
 - Uses the HTTP proxy mechanism for better performance
 - Provides client side caching
- Debug infrastructure
 - Filter debug messages based on the client information such as user name, context name, source IP etc.



Mobile worker

Cisco IOS SSLVPN Benefits

- Application ACL
 - Provides a broad range of filtering options to allow employees and partners access to only the applications defined by the security policy
- Netegrity Single Sign-on
 - Provides seamless login access to internal web servers by providing the convenience of single unified login to all web applications
- URL Obfuscation
 - Provides added security by hiding internal URLs
- Port-forwarding enhancements
 - Support for Virtually all client-side web technologies while using the HTTP proxy mechanism for improved performance
- Debug Infrastructure
 - Provide customers great help in troubleshooting SSLVPN problems

www.cisco.com/go/iossslvpn

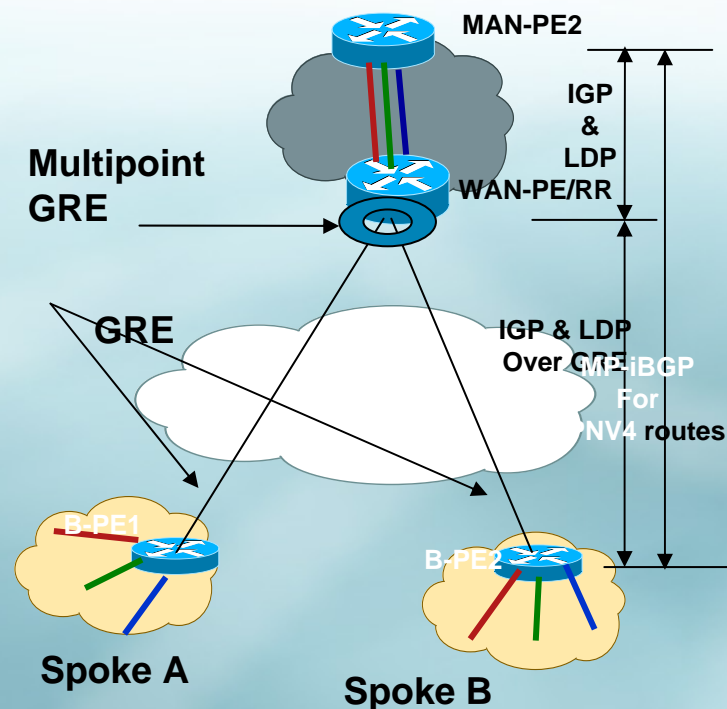
RFC 2547 over Dynamic Multipoint VPN (DMVPN)

Benefits:

- Enables Enterprise (DMVPN) customers the ability to offer segmentation
- Enables Service Providers the ability to offer customers an encrypted 2547 VPN solution
- Shares common control plane between 2547 and DMVPN for advertising the BGP/VPN prefixes

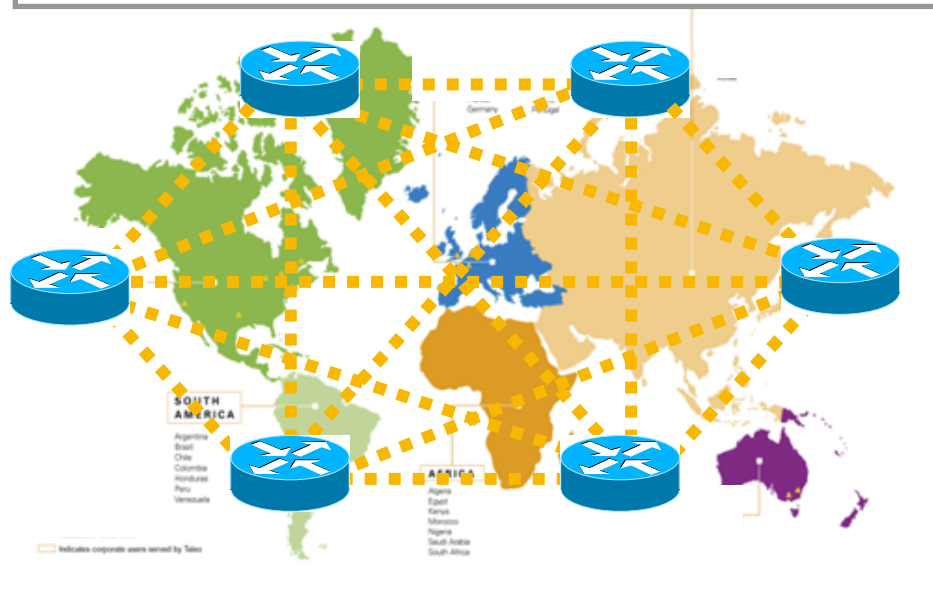
Restrictions:

- Supports hub and spoke DMVPN only



Group Encrypted Transport VPN Enables Any-Any Secure Connectivity

Group Encrypted Transport (GET) VPN is a next-generation WAN security technology/model that eliminates the trade-off between network intelligence and security on WANs



Secures Any to Any Branch
Connectivity over WAN

Key Benefits:

- Easy to manage high scale any to any encrypted communications
- Secured packets continue to use existing routing infrastructure
- Network-wide QoS and Multicast capabilities preserved increasing network performance
- Offers balanced span of control

Benefits key for VoIP/Video traffic

Benefits of IOS GET VPN

Previous Limitations	New Feature and Benefits	Associated
<p>Multicast traffic encryption was supported through IPsec tunnels:</p> <ul style="list-style-type: none"> – Not scalable – Difficult to troubleshoot 	<p>Encryption supported for Native Multicast and Unicast traffic with GDOI</p> <ul style="list-style-type: none"> – Allows higher scalability – Simplifies Troubleshooting – Extensible standards-based framework 	
<p>Overlay VPN Network</p> <ul style="list-style-type: none"> – Overlay Routing – Sub-optimal Multicast replication – Lack of Advanced QoS 	<p>No Overlay</p> <ul style="list-style-type: none"> – Leverages Core network for Multicast replication via IP Header preservation – Optimal Routing introduced in VPN – Advanced QoS for encrypted traffic 	
<p>Full Mesh Connectivity</p> <ul style="list-style-type: none"> – Hub and Spoke primary support – Spoke to Spoke not scalable 	<p>Any to Any Instant Enterprise Connectivity</p> <ul style="list-style-type: none"> – Leverages core for instant communication – Optimal for Voice over VPN deployments 	

Cisco 7200VXR Network Processing Engine NPE-G2

Hardware -
Routing



General purpose Forwarding Engine of the Cisco 7200VXR Series

Up to 2MPPS of CEF forwarding

Three pairs of build-in 10/100/1000 and SFP Gigabit Ethernet ports

One 10/100 Ethernet port for management

Two USB ports for extra storage and VPN eTokens

Memory Default: 1GB SDRAM & 256MB CF

Memory Max.: 2GB SDRAM & 256 MB CF

7200VXR NPE-G1 vs. NPE-G2 Comparison

	NPE-G1	NPE-G2
Performance	Up to 1 Mpps	Up to 2 Mpps
Dedicated Management Port	No	Yes
USB Ports	No	Yes
Memory – Default	64 MB Flash/256MB DRAM	256 MB Flash/1GB DRAM
Memory – Maximum	256 MB Flash/1GB DRAM	256 MB Flash/2GB DRAM
Memory Type / Speed	DDR / 125 Mhz	DDR / 200 Mhz
NVRAM	512KB	2MB
Bootflash	16MB	64MB
Layer2 Cache	512KB	1MB
ECC Memory	Yes	Yes
# of Memory Slot	2	1
# of Built-In Ethernet	3 Copper / GBIC	3 Copper / SFP

VPN Services Adapter (VSA) for the Cisco 7200 Series Router

Hardware -
Security &
VPN

- Up to **3X performance** improvement with VSA and prerequisite NPE-G2 network processing engine
- Performance and scalability to **fill OC-3** aggregation WAN pipe
- IPsec hardware acceleration module

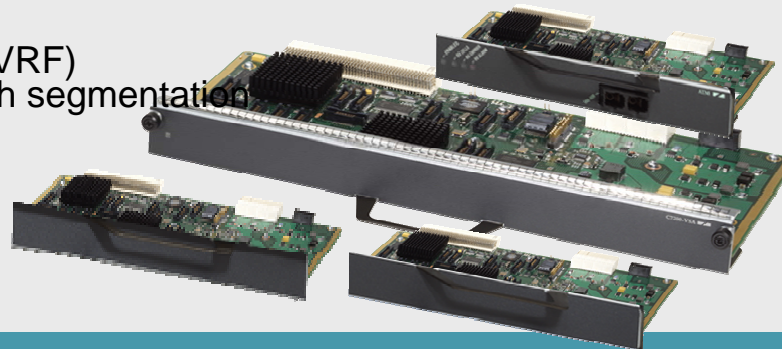
Increased performance to support large-scale IPsec aggregation architectures

Cisco IOS® Software Secure VPN Connectivity:

Easy VPN, V3PN, **DMVPN**, 3DES, AES (128, 192, and 256 bit key encryption)

Multi-Virtual Route Forwarding (Multi-VRF) to connect central site to branches with segmentation

IPsec Virtual Tunnel Interface (VTI) for simplified VPN design and configuration



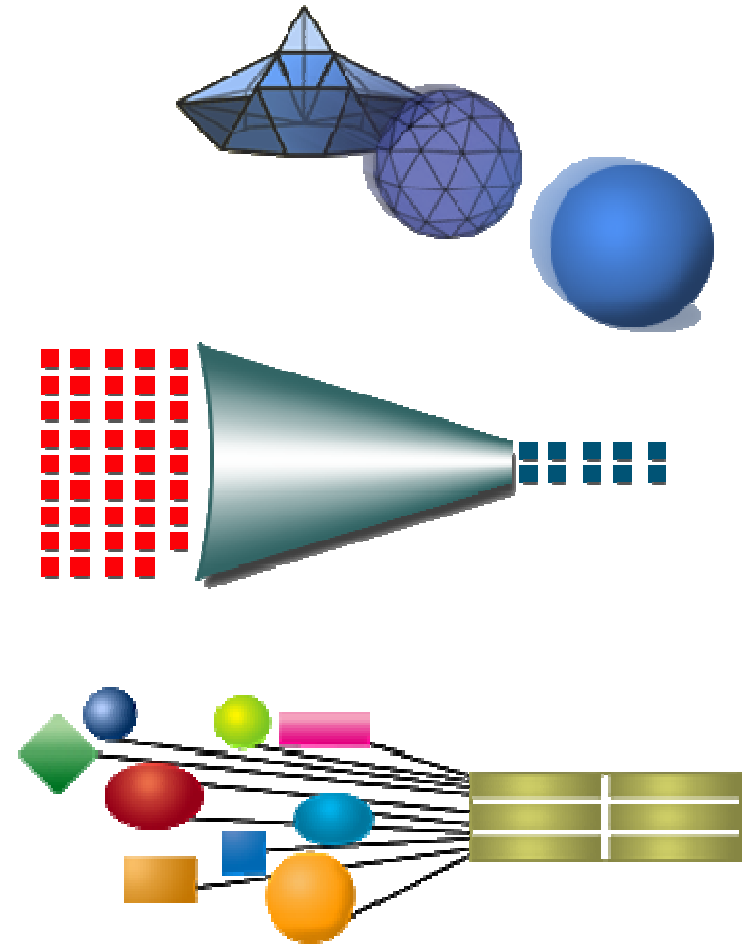
VSA utilizes I/O slot and frees up valuable bandwidth and slot real estate for other connectivity needs

Agenda

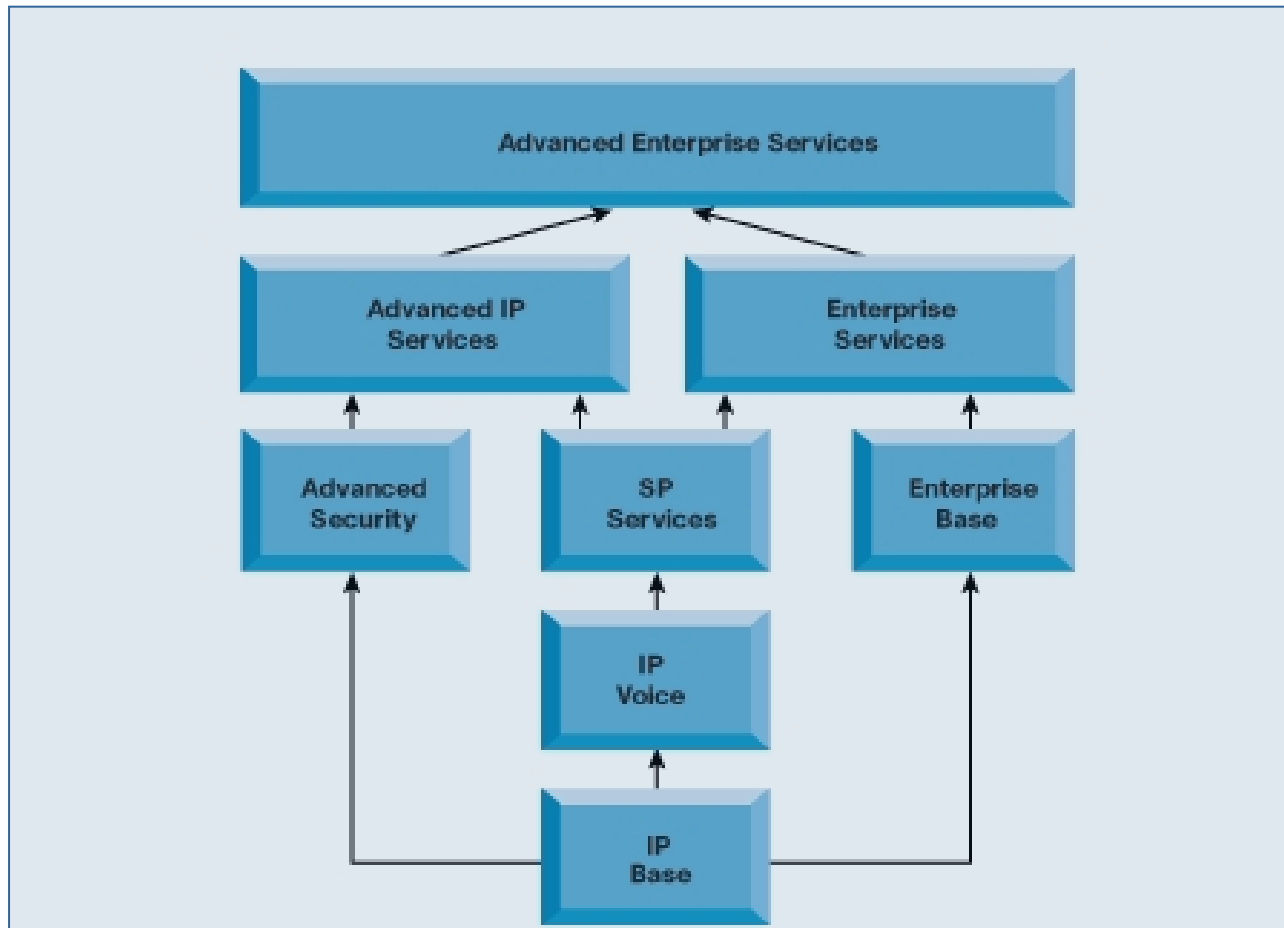
- Cisco IOS Software Release 12.4T Family
- Introducing Release 12.4(11)T
- Cisco IOS Packaging
- Upgrade Paths
- Summary

Cisco IOS Packaging Introduction and Benefits

- **Simplification**
Minimize user disruption during the software selection process
- **Consolidation**
Streamline packaging across hardware that runs Cisco IOS Software
- **Consistency**
Consistent image names
Consistent functionality across hardware that runs Cisco IOS Software
Consistent Cisco IOS Software pricing



Cisco IOS Packaging for Cisco Routers



www.cisco.com/go/packaging/

Packaging Changes in Release 12.4T

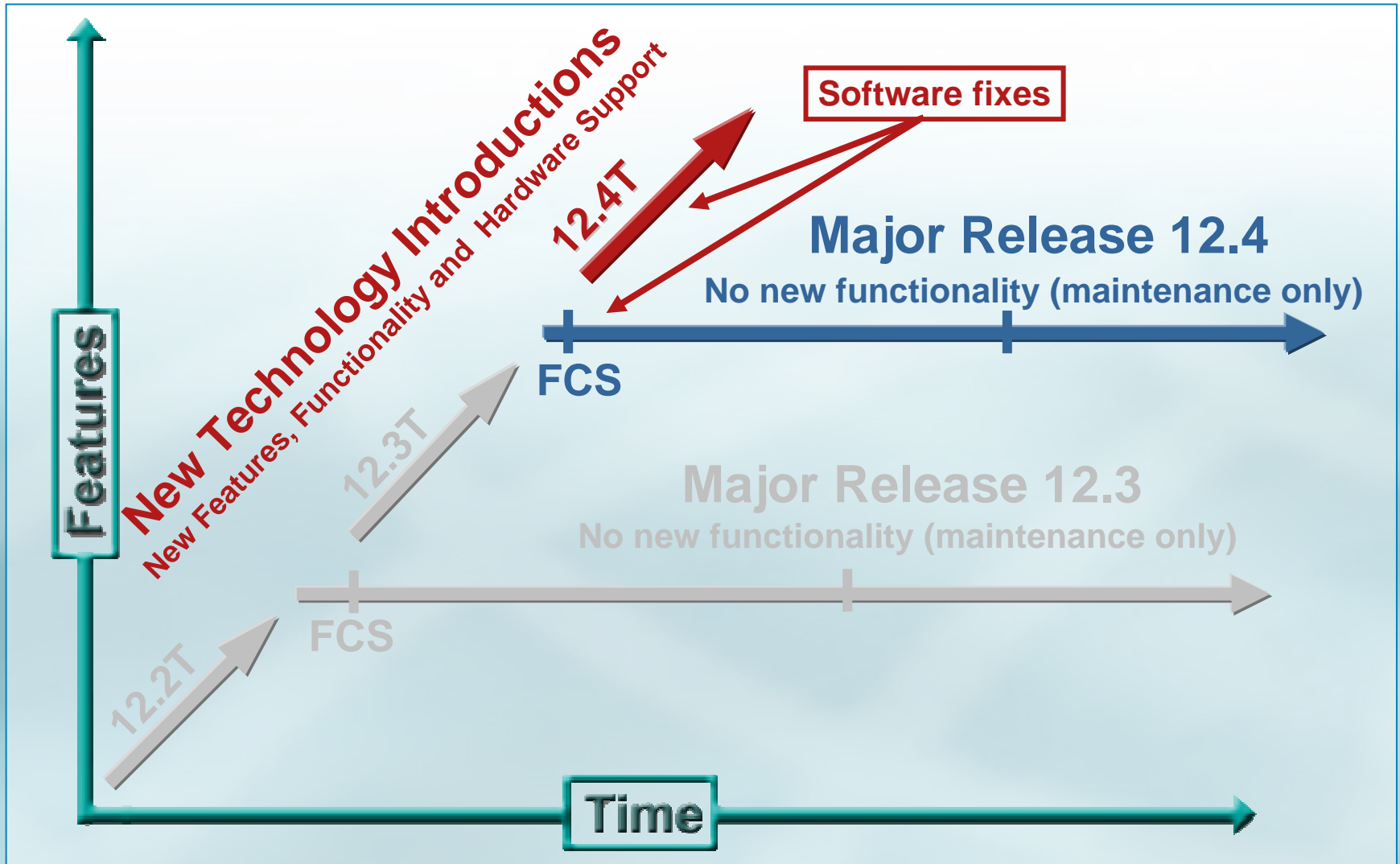
- No Packaging changes in Release 12.4(11)T
- Beginning with Cisco IOS Release 12.4(4)T, the Advanced Security image includes the Border Gateway Protocol (BGP) feature

Prior to Release 12.4(4)T, users needed Advanced IP Services in order to deploy both Security and BGP in the same image

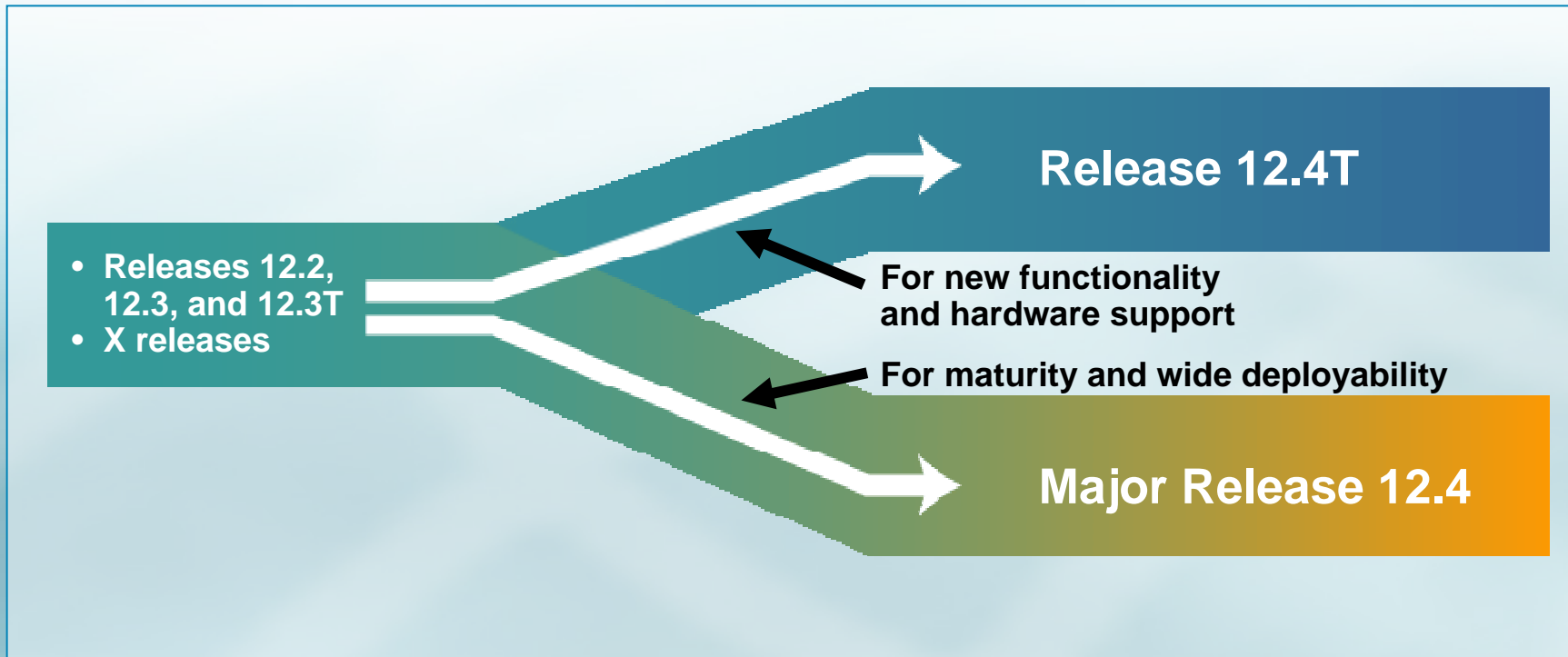
Agenda

- Cisco IOS Software Release 12.4T Family
- Introducing Release 12.4(11)T
- Cisco IOS Packaging
- Upgrade Paths
- Summary

Evolution to Release 12.4T



Release 12.4T Upgrade Paths



Agenda

- Cisco IOS Software Release 12.4T Family
- Introducing Release 12.4(11)T
- Additional Features and Enhancements
- Cisco IOS Packaging
- Upgrade Paths
- **Summary**

Summary

Cisco IOS Software Release 12.4(11)T

- **Advanced Layer 2 VPN over MPLS transport (Any Transport over MPLS) and high availability capabilities**
- **Improved MPLS management for Layer 2 VPNs**
- **Enhanced Mobile IPv6 authorization and identity support**
- **VoiceXML browser enhancements for the Cisco ISR Series Router and AS5000 Series Gateway**
- **Next-generation WAN encryption technology (Group Encrypted Transport VPN)**
- **Support for the high performance Network Processing Engine G2 (NPE-G2) and VPN Service Adapter (VSA) for the Cisco 7200 Series Router**

References

Release 12.4(11)T Highlights

- Any Transport over MPLS (AToM)

http://www.cisco.com/en/US/tech/tk436/tk428/technologies_q_and_a_item09186a008009d4e3.shtml

http://www.cisco.com/en/US/tech/tk436/tk428/technologies_q_and_a_item09186a00800949e5.shtml

- MPLS Embedded Management Enhancements

http://www.cisco.com/en/US/products/ps6566/products_feature_guide09186a008063d009.html

- Cisco Mobile Wireless Home Agent

<http://www.cisco.com/en/US/products/ps5940/index.html>

References

Release 12.4(11)T Highlights (Cont.)

- Network Processing Engine G2 (NPE-G2) for Cisco 7200 Series Router

<http://www.cisco.com/go/7200>

- Cisco IOS Router Security

<http://www.cisco.com/en/US/products/ps6540/index.html>

References

Release 12.4T

- Cisco IOS Software Release 12.4T

www.cisco.com/go/release124t/

- Release 12.4T New Features and Hardware Support, Product Bulletin No. 3001

http://www.cisco.com/en/US/products/ps6441/prod_bulletin09186a00804a8728.html

Changes to Cisco IOS Software Product Support in Release 12.4T, Product Bulletin No. 3000

www.cisco.com/go/124thardware/

- Cisco IOS Packaging

www.cisco.com/go/packaging/

References

Release 12.4T (Cont.)

- Download Cisco IOS Software releases and upgrade planners

www.cisco.com/public/sw-center/sw-ios.shtml

- Cisco Feature Navigator – A web-based application that quickly matches Cisco IOS Software release features to supported hardware

<http://tools.cisco.com/ITDIT/CFN/jsp/index.jsp>



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