Cisco Networking Capabilities for Medianet

Product Overview

A medianet is an end-to-end architecture for a network comprising advanced, intelligent technologies and devices in a platform optimized for the delivery of rich-media experiences. A medianet has the following characteristics:

- Media-aware: Can detect and optimize different media and application types (telepresence, video surveillance, desktop collaboration, and streaming media) to deliver the best experience
- Endpoint-aware: Automatically detects and configures media endpoints
- Network-aware: Can detect and respond to changes in device, connection, and service availability

With the increasing adoption of new video and rich-media applications, medianet technologies become critically important to address challenges associated with the transmission of video, voice, and data over the network, including ensuring predictability, performance, quality, and security.

By accelerating deployment of applications, minimizing complexity and ongoing operational costs, increasing visibility into the network, and helping to scale the infrastructure for the best quality of experience (QoE), medianet technologies help address these challenges.

Capabilities and Benefits

Cisco® Networking Capabilities for Medianet extend the boundary of networks to the endpoints, creating tight integration between intelligent network services and the rich-media applications delivered over a variety of endpoints. Cisco endpoints are equipped with the **Media Services Interface (MSI)**, a software component that enables endpoints to consistently take advantage of intelligent network services to improve the quality of experience and reduce the cost of deployment and operations. MSI enables:

- The network to become media-aware so that the network can intelligently apply critical network services
- Rich-media applications to become network-aware, enabling them to dynamically adapt to network conditions and improve the range of troubleshooting options through tighter network integration

Cisco Networking Capabilities for Medianet provides capabilities across a range of network and endpoint devices to enable a medianet system to send, deliver, and optimize rich-media applications. Today's Cisco Networking Capabilities for Medianet focuses on reducing IT costs and the complexity of deploying video as well as improving the video experience. The capabilities also provide much improved visibility into the network to accelerate troubleshooting and the ability to assess the impact of voice, video, and data on the network.

Table 1 describes the capabilities, components, benefits, and features of Cisco Networking Capabilities 2.x for Medianet. The appendix discusses Cisco Networking Capabilities 1.0 for Medianet.

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Table 1. Switches and Minimum Cisco IOS Software Release Requirements

Capabilities	Benefit	Components and Features
Autoconfiguration of video endpoints	Helps simplify the deployment and reduce the ongoing operational costs of rich-media applications and endpoints	• **Cisco IOS® Auto Smartports:** Automates device configuration and registration to simplify management and equipment moves, adds, and changes; provides built-in recommended configurations for a variety of device types that are automatically applied when the device is plugged into the switchport • **Cisco IOS Location:** Automates physical location configuration and enables device asset tracking • **Cisco AutoQoS:** Simplifies access-switch quality-of-service (QoS) deployment • **Media Services Interface (MSI):** Residing on endpoints, enables autoconfiguration capabilities • **Cisco Prime™ LAN Management Solution (Cisco Prime LMS):** ◦ Offers a work center that simplifies the deployment of Cisco IOS Auto Smartports and facilitates the configuration of Cisco IOS Location settings to help enable and track medianet endpoints ◦ Performs an assessment of the network infrastructure to determine network readiness, including hardware, software, and performance capability based on Cisco Networking Capabilities 2.2 for Medianet recommendations; facilitates updates of device software to Cisco best practices recommendations.
Media monitoring	Enhances visibility into the network to simplify, generate baselines, and accelerate troubleshooting of video, voice, and data applications, and validates network capacity and configuration before deploying new applications or before events	• **Cisco IOS Performance Monitor:** Helps network operators quickly find and identify problems, including fault location, that impact the quality of video, voice, and data ◦ Provides performance statistics (packet loss, jitter, etc.) based on analysis of user traffic ◦ Allows creating application class-specific threshold crossing alerts ◦ Provides reporting through NetFlow export and MIB • **Cisco IOS Mediatrace:** Helps network operators understand the status and health of a network path by collecting critical information hop by hop, on specific media streams as they traverse the network ◦ Layer 2 and Layer 3 node discovery, with multiple profiles of information gathering ◦ Dynamic configuration of a granular performance monitor policy as well as data retrieval • **Cisco IOS IPSLA Video Operation (Traffic Simulator):** Helps network operators validate whether a network is ready for video and rich-media applications by stressing the network path with realistic, application-specific media streams ◦ Supports customized application profiles • **MSI:** Software component residing on endpoints, enables: ◦ Collection of network performance statistics (packet loss, jitter, etc.) ◦ Automatic triggering of a mediatrace for diagnostics upon detection of quality degradation by an endpoint • **Cisco Prime Collaboration:** Simplifies operations of video collaboration services with end-to-end application and network visibility and identifies source of media service degradation and interruption from endpoints, video, and network infrastructure • **Cisco Prime LMS Borderless Work Center for Medianet:** Provides a dashboard for monitoring the status of medianet and visibility to all medianet endpoints, including where they are attached to the network
Auto-Registration of video endpoints	Automates the discovery of and registration to services available on the network.	• **Auto-registration:** Enables automated registration to services to automate endpoint/application deployment and configuration.
Media Awareness	Helps differentiate business critical applications for service assurance, consistency and optimal quality of user experience end-to-end.	• **Flow Metadata:** Manages and transfers application attributes to the network allowing appropriate policies to be applied at each hop, end to end • **Media Services Proxy:** Uses light weight deep packet inspection techniques to snoop standard based signaling protocols to produce flow metadata attributes that can then allow appropriate policies to be applied at each hop, end to end • **Network Based Application Recognition 2 (NBAR2):** Enables protocol detection for a network which is the process by which the system determines that a particular network flow is from a specific application. • **Media Services Interface (MSI):** Residing on endpoints, explicitly signals application context attributes (flow metadata) to the network

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System Requirements

Tables 2 and 3 list the switches and routers, respectively, and minimum Cisco IOS Software release requirements for each medianet capability. Table 4 lists the devices and requirements for the Cisco Media Services Interface.

The products and features listed in Tables 2 through 4 have been tested and documented to support reliable predictable customer deployments.

Table 2. Switches and Minimum Cisco IOS Software Release Requirements

Platform	Minimum Cisco IOS Software Release	Package	Capabilities
Cisco Catalyst® 2960S and Catalyst 2960 Series Switches	12.2(55) SE or later	LAN Base or higher	Autoconfiguration: • Auto Smartports • Location • AutoQoS
Cisco Catalyst 3560-X, 3560V2, 3750-X, 3750-E**, 3750G** and 3750V2 Series Switch	12.2(55) SE or later	LAN Base or higher	Autoconfiguration: • Auto Smartports • Location • AutoQoS
	12.2(58)SE2 or later	IP Base or higher	Media monitoring: • Performance Monitor • Mediatrace • IPSLA Video Operation—Sender and Responder
Cisco Catalyst 4500E Supervisor Engine 7-E and 7L-E	XE 3.3.0 SG or later	LAN Base or higher	Autoconfiguration: • Auto Smartports • Location • AutoQoS
	XE 3.3.0SG or later	IP Base or higher	Media monitoring: • Performance Monitor • Mediatrace • IPSLA Video Operation—Sender and Responder* Media Awareness: • Flow Metadata • Media Services Proxy
Cisco Catalyst 4500E Supervisor Engine 6-E and Cisco Catalyst 4500 Supervisor Engine 6L-E	12.2(54)SG1	LAN Base or higher	Autoconfiguration: • Auto Smartports • AutoQoS
	15.1(1)SG or later	LAN Base or higher	Autoconfiguration: • Auto Smartports • Location • AutoQoS
	15.1.(1)SG or later	IP Base or higher	Media monitoring: • Performance Monitor • Mediatrace • IPSLA Video Operation—Responder Media Awareness: • Flow Metadata • Media Services Proxy

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Platform	Minimum Cisco IOS Software Release	Package	Capabilities
Cisco Catalyst 4500X Series	XE 3.3.0 SG or later	IP Base or higher	Autoconfiguration: • Auto Smartports • Location • AutoQoS Media monitoring: • Performance Monitor • Mediatrace • IPSLA Video Operation—Sender and Responder* Media Awareness: • Flow Metadata • Media Services Proxy
Cisco Catalyst 4900M, Catalyst 4948-10GE***, Catalyst 4948****, Catalyst 4948E, and Catalyst 4948E-F Switches	12.2(54)SG1	LAN Base or higher	Autoconfiguration: • Auto Smartports • AutoQoS
	15.1(1)SG or later	LAN Base or higher	Autoconfiguration: • Auto Smartports • Location • AutoQoS
Cisco Catalyst 4900M, Catalyst 4948E, and Catalyst 4948E-F Switches	15.1(1)SG or later	IP Base or higher	Media monitoring: • Performance Monitor • Mediatrace • IPSLA Video Operation—Responder
	15.1(1)SG or later	LAN Base or higher	Media Awareness: • Flow Metadata • Media Services Proxy
Cisco Catalyst 6500-E Series Switches Supervisor Engine 2T	15.0(1)SY or later	IP Base or higher	Media monitoring: • Performance Monitor • Mediatrace Media Awareness: • Flow Metadata
Cisco Catalyst 6500-E Series Switches Supervisor Engine 720	15.1(2)SY or later	IP Base or higher	Media monitoring: • Performance Monitor • Mediatrace Media Awareness: • Flow Metadata

* Hardware accelerated

** End-of-Life announced on January, 31, 2012

*** End-of-Life February 28, 2013

**** End-of-Life August 1, 2013

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Table 3. Routers and Minimum Release Requirements

Platform	Switch Blade	Switch Image	Minimum Cisco IOS Software Release	Package	Capabilities
Cisco 3900 Series Integrated Services Routers (ISRs)	SM-D-ES3G-48-P	12.2(55)EX	15(0). 1M or later	-	Autoconfiguration: • Auto Smartports • Location • AutoQoS
	SM-D-ES3-48-P				
	SM-ES3G-24-P				
	SM-ES3-24-P				
	SM-ES3G-16-P				
	SM-ES3-16-P				
Cisco 2900 Series ISRs **Note:** Cisco 1800 and 1900 Series and Cisco 2801 and 2901 ISRs do **not** support these switch blades.	SM-ES3G-24-P	12.2(55)EX			
	SM-ES3-24-P				
	SM-ES3G-16-P				
	SM-ES3-16-P				
Cisco 3900 Series Integrated Services Routers (ISRs)	SM-D-ES3G-48-P	12.2(58)SE2	15(0). 1M or later	-	Media monitoring: • IPSLA Video Operation—Sender and Responder
	SM-D-ES3-48-P				
	SM-ES3G-24-P				
	SM-ES3-24-P				
	SM-ES3G-16-P				
Cisco 2900 Series ISRs **Note:** Cisco 1800 and 1900 Series and Cisco 2801 and 2901 ISRs do **not** support these switch blades.)	SM-ES3-16-P	12.2(58)SE2			
	SM-ES3G-24-P				
	SM-ES3-24-P				
	SM-ES3G-16-P				
	SM-ES3-16-P				
Cisco 2900 and 3900 Series Integrated Services Routers	Not applicable		15.1(3)T or later	UC or Data	Media monitoring: • Performance Monitor • Mediatrace
	Not applicable		15.2(2)T	UC	Media monitoring: • IPSLA Video Operation—Sender (also requires PVDM3 DSPs)*
	Not applicable		15.2(2)T	IP Base	Media monitoring: • IPSLA Video Operation—Responder
	Not applicable		15.2(1) T	Data	Media Awareness: • Flow Metadata
	Not applicable		15.2(3) T	Data	Media Awareness: • Media Services Proxy
Cisco 1900 Series Integrated Services Routers	Not applicable		15.1(3)T or later	Data	Media monitoring: • Performance Monitor • Mediatrace
	Not applicable		15.2(2)T	IP Base	Media monitoring: IPSLA Video Operation—Responder

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Platform	Switch Blade	Switch Image	Minimum Cisco IOS Software Release	Package	Capabilities
	Not applicable		15.2(1) T	Data	Media Awareness: Flow Metadata
	Not applicable		15.2(3) T	Data	Media Awareness Media Services Proxy
Cisco 880 and 890 Series Integrated Services Routers	Not applicable		15.1(3)T or later	Universal Image with Advanced IP feature license	Media monitoring: • Performance Monitor • Mediatrace
	Not applicable		15.2 (1) T	Universal Image with Advanced IP feature license	Media Awareness: Flow Metadata
	Not applicable		15.2(4) M2	Universal Image with Advanced IP feature license	Media Awareness: Media Services Proxy
Cisco ASR 1000 Series Aggregation Services Routers	Not applicable		Cisco IOS XE Software Release 3.5 or later	Advanced Enterprise	Media monitoring: • Performance Monitor* • Mediatrace
	Not applicable		Cisco IOS XE 3.7 or later	Advanced Enterprise	Media Awareness: Flow Metadata
Cisco ASR 9000 Series Aggregation Services Routers	Not applicable		Cisco IOS XR Software Release 4.3 or later	Advanced Video License	Media Monitoring • Vidmon

* Hardware accelerated

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Table 4. Devices and Requirements for Media Services Interface

Devices and Products	Software Version	Capabilities
Cisco Digital Media Player 4310G	5.2.2 or later	Location
Cisco Digital Media Player 4310G	5.2.3 or later	Autoregistration
Cisco Digital Media Player 4400	5.2.3 or later	Autoregistration
Cisco Jabber for Windows	UC 9.0(1) or later	Media Awareness (Flow Metadata)
Cisco TelePresence Profile Series	TC 6.0 or later	Media Monitoring (Performance Monitor & Mediatrace) Media Awareness (Flow Metadata)
Cisco TelePresence MX Series	TC 6.0 or later	Media Monitoring (Performance Monitor & Mediatrace) Media Awareness (Flow Metadata)
Cisco TelePresence SX Series	TC 6.0 or later	Media Monitoring (Performance Monitor & Mediatrace) Media Awareness (Flow Metadata)
Cisco TelePresence Integrator C Series	TC 6.0 or later	Media Monitoring (Performance Monitor & Mediatrace) Media Awareness (Flow Metadata)
Cisco TelePresence EX Series	TE 6.0 or later	Media Monitoring (Performance Monitor & Mediatrace) Media Awareness (Flow Metadata)
Cisco TelePresence 500-32 Series	TX 6.0	Media Monitoring (Performance Monitor & Mediatrace) Media Awareness (Flow Metadata)
Cisco TelePresence TX1300 Series	TX 6.0	Media Monitoring (Performance Monitor & Mediatrace) Media Awareness (Flow Metadata)
Cisco TelePresence TX9000 Series	TX 6.0	Media Monitoring (Performance Monitor & Mediatrace) Media Awareness (Flow Metadata)
Cisco Video Surveillance 2600 Series IP Cameras	4.4.0-13 or later	Auto Smartports Autoregistration
Cisco Video Surveillance 3000 series IP Cameras	1.1.3-86	Auto smartports Autoregistration
Cisco Video Surveillance 4300 and 4500 Series IP Cameras	2.0.0 or later	Auto Smartports
	2.4.0-271 or later	Autoregistration
Cisco Video Surveillance 4300E and 4500E Series IP Cameras	3.2.1-200 or later	Auto Smartports Autoregistration
Cisco Video Surveillance 6000 series IP Cameras	1.1.2-30	Auto smartports Autoregistration
Cisco Video Surveillance 7000 series IP Cameras	1.1.4-48	Auto smartports Autoregistration
Cisco WebEx® meeting (Windows)	WebEx Business Suite (WBS28) or higher	Media Monitoring (Performance Monitor) Media Awareness (Flow Metadata)

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Management Solutions

Cisco Prime Infrastructure

Cisco Prime Infrastructure accelerates business and network transformation with unified lifecycle management and application visibility. It provides a single integrated solution for comprehensive lifecycle management of the wired/wireless access, campus, and branch networks, and rich visibility into end-user connectivity and application performance assurance issues.

Cisco Prime Infrastructure collects data from Medianet-enabled devices to provide visibility into voice statistics enterprise-wide and to help accelerate voice/video troubleshooting, while reducing instrumentation configuration and data collection complexity. In addition to Mediatrace, Cisco Prime Infrastructure collects data from a broad array of embedded technologies such as NetFlow, IOS Performance Agent, and SNMP. This permits network operators to quickly and easily gain comprehensive insights into network and application performance to more effectively manage the services their network delivers.

For more information about Cisco Prime Infrastructure, please visit http://www.cisco.com/go/primeinfrastructure.

Cisco Prime LAN Management Solution

Cisco Prime LAN Management Solution (LMS) is an integrated suite of management functions that simplify the configuration, administration, monitoring, and troubleshooting of Borderless Networks.

The Medianet Work Center provides day-1 through day-N workflows for assessing, preparing, and setting-up auto-configuration and location settings to simplify the provisioning and tracking of Medianet endpoints such as digital media players and IP video surveillance cameras. The Medianet workflows enable the network operator to select the type of Medianet to provision, automatically prepare the network for deployment and check to ensure the appropriate location attributes are configured for tracking and monitoring purposes, reducing the chance for errors and time required to set-up an end-to-end video infrastructure.

For more information about Cisco Prime LMS, please visit: http://www.cisco.com/go/lms.

Cisco Prime Collaboration

Cisco Prime Collaboration provides accelerated, automated provisioning of Cisco® Unified Communications and continuous real-time monitoring and advanced troubleshooting tools for Cisco Unified Communications and Cisco TelePresence® systems including the underlying transport infrastructures.

The solution provides efficient, integrated service assurance management through a single, consolidated view of the Cisco voice and video collaboration environment. Real-time monitoring of voice and video networks includes dashboard summaries and alarm correlation. The solution proactively notifies operators of issues and facilitates speedy resolution of problems through proactive fault detection and rapid isolation using purpose-built diagnostic tools. For video, the solution allows operators to view end-to-end session paths over Cisco and third-party devices, and on Cisco Medianet routers, jitter and packet loss statistics help pinpoint hotspots affecting session quality. As a result, Cisco Prime Collaboration expedites operator resolution of service quality issues before affecting end users—for a superior end-user collaborative experience.

For more information about Cisco Prime Collaboration, please visit http://www.cisco.com/go/primecollaboration

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Partner Solutions-Medianet Ecosystem Programs

The medianet ecosystem programs allow 3rd party vendors to work with Cisco to create medianet solutions that help organizations deploy, manage, monitor, troubleshoot and optimize their video, voice and data applications. These programs are available through the Cisco Developer Network (CDN) and enable interoperability among the network, applications, endpoints, and system management solutions—helping ensure business continuity and reduce IT costs while maximizing the user experience.

The CDN program for **medianet systems management** offers application programming interfaces (APIs) and documentation to enable network and application management vendors to support enterprise medianet features that offer customers a range of management and operation solutions. To learn more about the existing partner management solutions for enterprise medianet, please visit http://developer.cisco.com/web/mnets/partners

The CDN program for **media services proxy** (MSP) enable endpoint device vendors to verify their interoperability MSP so that the devices can become part of medianet solutions leveraging medianet services such as automated port configuration and media awareness. To learn more about the physical security devices that have been verified for interoperability with MSP, please visit: http://developer.cisco.com/web/msp/partners

The CDN program for **MSI management** offers APIs and documentation that enhances the ability of application management vendors to support MSI enabled endpoints and applications. This allows application management vendors to support (1) Session visibility & awareness (2) Operational monitoring and (3) Accelerated troubleshooting To learn more about the existing partner solutions for MSI management, please visit: http://developer.cisco.com/web/msi/partners

Services

Medianet Readiness Assessment Service

The Cisco Medianet Readiness Assessment Service (MRA) helps organizations ensure the successful implementation of rich-media applications and realize the full value of a video technology investment. The MRA assesses the readiness of the network based on a thorough analysis of the current infrastructure and the video and rich-media applications to be supported, and provides prepare and plan recommendations drawing from best practices.

For more information, please visit: http://www.cisco.com/go/mra.

For More Information

For more information about Cisco Networking Capabilities for Medianet, please visit: http://www.cisco.com/go/medianet or contact your local Cisco account representative.

Appendix: Cisco Networking Capabilities 1.0 for Medianet

The first step toward a medianet is a converged network for voice, video, and data. Cisco Networking Capabilities 1.0 for Medianet establishes a foundation for medianets. Recommendations for a foundation architecture are available in the Medianet Reference Guide: http://www.cisco.com/en/US/docs/solutions/Enterprise/Video/Medianet_Ref_Gd/medianet_ref_gd.html.

Table 5 lists capabilities, features, and benefits of Cisco Networking Capabilities for 1.0 for Medianet.

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Table 5. Capabilities, Features, and Benefits of Cisco Networking Capabilities 1.0 for Medianet

Capabilities	Benefits	Features
Video-optimized technologies • Cisco Performance Routing (PfR) • QoS • IP Multicast • Cisco Wide Area Application Services (WAAS)	Reduce traffic and server load and optimize the use of the network to achieve successful end-to-end video streaming.	• Improve application performance and availability with Cisco Performance Routing by selecting the best path for each. application based upon advanced criteria (delay, loss, jitter, etc.). • Maximize existing network resources with Cisco Performance Routing by using all possible paths without compromising performance. • Reduce traffic and server loads using IP Multicast to simultaneously deliver a single stream of information to thousands of users. • Deliver truly differentiated services for media applications using QoS. • Use WAN optimization technologies such as Cisco WAAS to improve performance and "reduce bandwidth footprint" of certain applications and create bandwidth media applications.
Visibility: • Network-Based Application Recognition (NBAR) • NetFlow	Obtain end-to-end visibility to meet expanding and changing business needs.	• Automatically discover media applications running on the network with NBAR so that appropriate network policies can be applied. • Achieve better visibility of the applications that are running on the network with NBAR and NetFlow integration to support business goals; for example, understanding the growth and patterns of network and media usage to allow for better planning and control of the network resources.
Extension of medianets to wired or wireless IP surveillance cameras: • Cisco VideoStream	Extends IEEE 802.11n support to enable enterprise-class, wireless Cisco Video Surveillance IP Cameras and other live video streams	• Includes Cisco Compatible Extensions to provide optimal network performance and video quality • Adds resilient wireless IP Multicast support to ensure reliable delivery of mission-critical live video stream traffic

For information about each of the technologies, please visit the following links:

- Cisco Performance Routing (PfR): http://www.cisco.com/en/US/partner/products/ps8787/products_ios_protocol_option_home.html
- Cisco Wide Area Application Services (WAAS): http://www.cisco.com/en/US/partner/products/ps6870/index.html
- IP Multicast: http://www.cisco.com/en/US/partner/products/ps6552/products_ios_technology_home.html
- Quality of service (QoS): http://www.cisco.com/en/US/partner/products/ps6558/products_ios_technology_home.html
- Network-Based Application Recognition (NBAR): http://www.cisco.com/en/US/partner/products/ps6616/products_ios_protocol_group_home.html
- NetFlow: http://www.cisco.com/en/US/partner/products/ps6601/products_ios_protocol_group_home.html
- Cisco VideoStream: http://www.cisco.com/en/US/partner/prod/collateral/wireless/ps6302/ps8322/ps10315/ps10325/white_paper_c11-577721.html

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