Cisco Video Assurance Management Solution 3.0

Solution Overview

Cisco® Video Assurance Management Solution (VAMS) 3.0 delivers to service providers real-time, centralized monitoring of their headend/hubs and their core, distribution, and aggregation networks for broadcast video transport. Cisco VAMS provides the framework for a modular, end-to-end assurance management architecture for video services, such as linear broadcast and video on demand (VoD) based on MPEG-2 transport streams and uncompressed flows.

Today most service providers use IP as the backbone to transport video. TV-class video being very sensitive to loss and delay, any network-based impairments can adversely affect the end users' quality of experience, which can lead to customers abandoning the service provider. The challenge for service providers is to detect and resolve these issues before customers start calling the customer service reps. Service providers require ways to monitor media delivery performance and track causes for any degradation.

Cisco VAMS 3.0 allows service providers to monitor all their video flows directly from the data plane of the router without having to pull the video flows to a dedicated card or appliance. With the Cisco 7600 and Cisco ASR 9000 Series Routers supporting inline video monitoring, or VidMon, VAMS gives service providers the ability to gather and display per flow metrics by directly polling these routers. This is a tremendous benefit for operators, who can now detect, diagnose, and pinpoint where in the IP transport network video impairment occurs due to loss and delay. See Table 1.

Table 1. Video Monitoring Metrics Supported by VAMS

Metric	Description	Support
MRV	Media Rate Variation: This metric allows the measurement of packets per second of an IP constant bit rate (CBR) flow against a user-configured nominal setting for that flow. MRV is most applicable for uncompressed flows such as serial digital interface (SDI) and high definition SDI (HD-SDI) where it is not possible to inspect the payload.	Cisco 7600 Series Ethernet Services Plus (ES+) line card and Cisco ASR 9000 Series
MDI_MLR	Media Delivery Index – Media Loss Rate: This metric is derived by summarizing the total missing MPEG frames for a given reporting period for a given PID (program).	Cisco 7600 ES+ line card
DF	Delay Factor: This metric is applicable to both MDI and MRV and measures the difference between the arrival and drain rates of a media stream. The DF over an interval period represents the buffering required to handle variations in transmission at a point in the transmission path.	Cisco 7600 ES+ line card as MDI:DF and Cisco ASR 9000 Series as MRV:DF
MDC	Media Discontinuity Counter: This measures the number of MPEG discontinuities and provides the per MPEG program identifier (PID) MDC, which gives the frequency of the discontinuities for that program.	Cisco 7600 ES+ line card
MSE	Media Stop Event: As Cisco devices are control-plane aware, it is possible to isolate unexpected media loss at a point in the network from loss that occurs as a result of normal control-plane changes. This is reported as a Media Stop Event.	Cisco 7600 ES+ line card and Cisco ASR 9000 Series

Cisco Video Assurance Management Solution 3.0 consists of the following Cisco products and solutions:

- **Cisco Info Center (IBM Tivoli Netcool):** This suite of products provides the manager of managers functionality for VAMS 3.0. Traps from the ROSA® Network Management System (NMS), Cisco Active Network Abstraction (ANA), Cisco Multicast Manager, and video probes are collected and correlated with affected broadcast services. In addition, the service dashboard provides a simple overview of the traps and their association to the services and helps enable the user to focus on specific service-related events. Using specific extensions to Cisco Info Center, the user may cross-launch Cisco Multicast Manager from multicast-related traps received to support problem isolation and multicast troubleshooting.
- **Cisco Multicast Manager 3.1.1:** This tool provides a rich set of multicast and VidMon capabilities that allow Cisco VAMS 3.0 to be notified of any changes in multicast or threshold events, such as the VidMon metrics, on elements in the multicast trees that may affect video performance. In addition Cisco Multicast Manager directly polls video probes to gather video quality metrics. Cisco Info Center collects the outputs from Cisco Multicast Manager, providing views of both device and multicast faults.
- **The ROSA Network Management System 4.0:** ROSA NMS offers a comprehensive management solution capable of monitoring and controlling nearly all aspects of service management, network management, and element management of broadcast networks. It can immediately pinpoint critical issues with powerful alarm logging, alarm filtering, repetitive alarm suppression, and intelligent root-cause alarm correlation functions.
- **Cisco Active Network Abstraction 3.7:** This system operates between the network and the operations support system (OSS) layers acting as a mediation and abstraction between OSS applications and the network devices. Its abstracted network model removes the complexity of upgrading each and every OSS application when there is an upgrade of any element within the network. It also provides a gateway to the network for OSS applications supporting correlation and aggregation of events in the network and provides this correlated information northbound.
- Video probes: VAMS 3.0 has support for external video probes. Cisco Multicast Manager supports IneoQuest and Bridge Technologies probes natively, while Cisco Info Center supports probes from Mixed Signals. Tektronix probes are supported through a custom virtual network element (VNE) in ANA.

Cisco VAMS 3.0 makes use of northbound APIs that support integration with OSS applications. Cisco Info Center (IBM Tivoli Netcool software) provides the consolidated view of the services and their association to faults in the video transport network.

Cisco VAMS 3.0 provides a video service assurance solution with a wide breadth of coverage across not only the transport network for broadcast video services but also the headends and hubs.

Features and Benefits

Cisco VAMS 3.0 provides the following features and benefits:

- Service visualization
  - A service dashboard view of the services supported (specifically, program IDs), providing associated multicast addresses that support the programs and correlated multicast-related traps collected from both headend/hubs and the IP transport network.
- Transport network visualization
  - Network map and device views
  - Multicast visualization
- Advanced monitoring and troubleshooting
  - Video quality measurements related to loss and delay directly from the data plane on the routers (VidMon)

- Service alerts, ETR 290 first-priority alarms, and video quality measurements from the headend and hub offices
- Context-sensitive cross-launch of multicast troubleshooting tool
- Network faults
- Multicast faults
- Performance degradation
- Video probe information collection

Table 2 further describes the features and benefits of Cisco VAMS 3.0.

Table 2. Features and Benefits

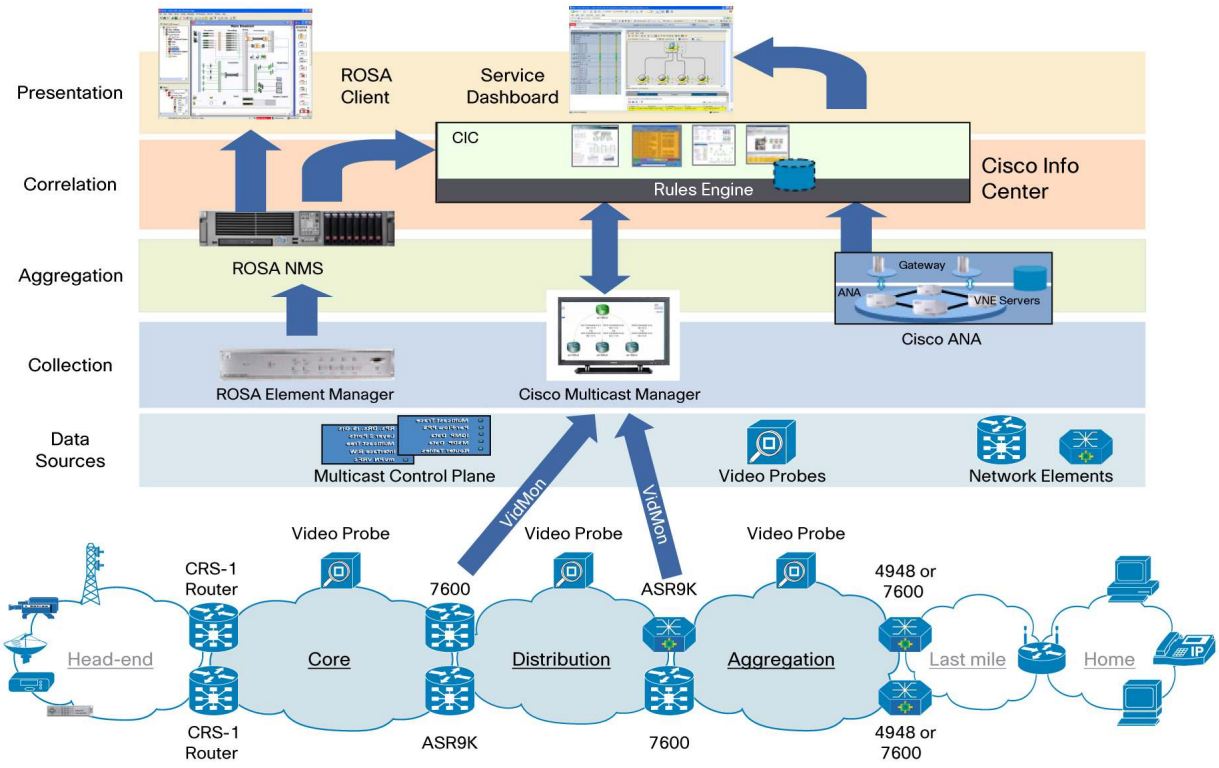
Feature	Benefit
Visualization	
Multicast Address to Video service correlation	Allows easy correlation and association of video service to all the related multicast transport streams that are carrying the service as a result of re-muxing or ad splicing.
Core and distribution topology map	Allows operators to view their core and distribution networks in a single map
Service-level dashboard	A single view of the services supported (specifically, program IDs), providing associated multicast addresses that support the programs and correlated multicast related traps collected
Event view	A single view of all events received provided with information about the source, the time of last receipt, and the number of occurrences
Context-sensitive cross-launch	The user may select specific multicast-related traps and cross-launch Cisco Multicast Manager to facilitate problem isolation and troubleshooting.
Chassis views for elements on map	Allows operators to find more details on devices and status in both a tabular and graphical manner
Multicast view	Allows operators to see how the multicast trees overlay the physical topology
Visualize VidMon metrics and video probes on map	Allows pinpointing of problem areas by using information from VidMon metrics and video probes and their location on the topology map and the multicast trees
Monitoring	
Service monitoring	Uses network device instrumentation (inline video monitoring) to detect service-affecting packet drops and uses video probes to detect service degradation. This gives the user the ability to pinpoint where in the IP network the degradation occurred.
Device fault monitoring	Aggregates device and service faults into a consolidated fault view
OSS integration API	Northbound API to support integration with third-party OSS products, for example, IBM Tivoli Netcool
Extended Device Support	
Digital Content Manager	Traps related to service alerts, ETR 290 first-priority alarms, video transport, and video quality measurements in the headend
Cisco CRS-1 Carrier Routing System **Cisco 7600 Series Routers** **Cisco ASR 9000 Series Routers** **Cisco Catalyst® 4948 Switches**	Traps based on: Non-Reverse Forwarding Path (non-RFP) drops, for example, video packets arriving on the “wrong” interface Inline video monitoring on the Cisco 7600 and ASR 9000 Series Routers Ingress/egress cyclical redundancy check (CRC) packet drop rates exceeding the rate threshold (only on Protocol Independent Multicast [PIM]–enabled interfaces) Configurable drop/error rate thresholds
Video Probes	
Tektronix MTM400	Supported through custom VNE in ANA
IneoQuest	Supported in Cisco Multicast Manager
Bridge Technologies	Supported in Cisco Multicast Manager
Mixed Signals	Traps supported in Cisco Info Center and Cisco Multicast Manager

Solution Architecture

The components of Cisco VAMS 3.0 provide the following functions (Figure 1):

- Cisco Info Center (Omnibus 7.3 with Web GUI, IBM Tivoli Business Service Manager [TBSM] 4.2, and Impact 5.1) provides a service-level dashboard and a common database for collection of faults from multiple sources including ANA and Multicast Manager, correlation of multicast-related faults to program IDs, and context-sensitive cross-launch of Multicast Manager.
- Cisco Multicast Manager 3.1.1 provides IP multicast visualization, performs VidMon polling and troubleshooting, and reports multicast faults to Cisco Info Center.
- ROSA NMS provides coverage of the video delivery systems in the headends and video hub offices.
- ANA 3.7 covers the backbone, regional, and aggregation network, providing device, performance, and network monitoring.

Figure 1. Cisco VAMS 3.0 Solution Architecture



Solution Specifications

To order Cisco VAMS 3.0, any of the following products/solutions must be purchased as prerequisites:

- Cisco Multicast Manager 3.1.1 with the Video Operations Solution (VOS) extensions
- Cisco Info Center – Omnibus 7.3 with web GUI, TBSM 4.2, and Impact 5.1
- ROSA NMS 4.0
- Cisco ANA 3.7

Cisco VAMS 3.0 may then be deployed as extensions to the above.

Note: VAMS has been structured in a modular architecture. Customers may choose to deploy specific modules of VAMS depending on their existing NMS/OSS environment. Customers may also choose to take a phased approach to rolling out VAMS, selecting Cisco Multicast Manager 3.1, for example, as an initial starting point for deployment and then building out from there.

Customers are recommended to work with their account teams and with Cisco Advanced Services to identify the appropriate strategy.

Table 3 lists hardware specifications for Cisco VAMS 3.0.

For specifications for Cisco ANA, see the ANA datasheet.

For specifications for ROSA NMS see the ROSA datasheet.

For specifications for Cisco Info Center see the CIC datasheet.

Table 3. Hardware Specifications

Cisco Multicast Manager Server 3.1.1	
Disk space	2 GB or more free space for Cisco Multicast Manager application and data
Hardware	**Linux** • Dual AMD Opteron Processor 250 2.4-GHz 64 Bit for Large Enterprise (more than 500 devices) • Dual 2.8-GHz Intel Pentium IV or dual 2.8-GHz Intel Xeon processor for Large Enterprise (more than 500 devices) • 2.8-GHz Intel Pentium IV or 2.8-GHz Intel Xeon processor **Solaris** • Sun Fire v440 Up to four 1.593-GHz UltraSPARC IIIi processors for Large Enterprise (more than 500 devices) • Sun Fire v240 One 1.34-GHz or two 1.5-GHz UltraSPARC processors
Memory	• 2 GB • 4 GB for Large Enterprise (more than 500 devices)
Software	**Linux** • Red Hat Enterprise Linux ES/AS 3 • Red Hat Enterprise Linux ES/AS 4 **Solaris** • Solaris 8 • Solaris 9 • Solaris 10 Note: Solaris x86 is not supported
Browser	• Firefox 1.5 or later • Internet Explorer 6 • Netscape 7.0 • Mozilla 1.7 • Safari 2.0

Ordering Information

Table 4 lists ordering information for Cisco VAMS 3.0.

Table 4. Ordering Information

VAMS 3 Cisco Info Center Extensions	
VAMS 3, Extensions to Cisco Info Center (Top level part number)	VAMS3-CIC73-SW-K9
VAMS 3 Cisco Info Center License Options	
VAMS 3.0 Extensions to Cisco Info Center 7.3	VAMS3CIC73-LIC
VAMS 3.0 Extensions to Cisco Info Center 7.3 – Non Prod	VAMS3CIC73NP-LIC

Service and Support

Using Cisco Lifecycle Services, Cisco and its partners provide a broad portfolio of end-to-end services and support that can help increase your network's business value and return on investment. This approach defines the minimum set of activities needed, by technology and by network complexity, to help you successfully deploy and operate Cisco technologies and optimize their performance throughout the lifecycle of your network.

For More Information

For more information about Cisco Video Assurance Management Solution, visit http://www.cisco.com/go/vams or contact your local Cisco account representative.

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