“Video-Ready” Campus Network

At-A-Glance

Why Should My Network Be “Video-Ready”?

Adoption of digitized rich-media content has progressively changed the business landscape as enterprises have started to adopt video usage by integrating it into the fabric of their business for corporate communication, e-learning, and digital signage. The video applications have enabled enterprises to significantly increase worker productivity, improve collaboration, reduce costs, and streamline and optimize business operations. The following factors will accelerate adoption of video solutions over the next few years:

- Video communication solutions have become affordable and easier to build.
- Video-based collaboration is an attractive alternate option to traveling, saving business time and money.
- Marketers now advertise at low cost through e-mail marketing and digital signage.
- New security risks have prompted the demand for improved and more scalable video surveillance systems.

Video Applications

Today businesses have access to an unprecedented variety of applications. Technology that was once available only to Fortune 500 companies is now available to businesses of all sizes. Cisco expands its video product portfolio with a suite of video applications, including Cisco® TelePresence, digital signage, desktop video, video on demand, video telephony, and IP surveillance (Figure 1).

Figure 1. Video applications needed for Corporate, Consumer Communication and other Business operations

What Does It Mean to Have a “Video-Ready” Campus Network?

Video applications introduce additional challenges on the underlying network infrastructure. To support these enterprise video applications, a tightly controlled network foundation providing the services listed in Table 1 is required.

Table 1. Network Requirements for “Video-Ready” Campus

Feature	Description
Optimized video delivery	· The network must have quality-of-service (QoS) mechanisms to help organizations deliver video without disrupting business-critical traffic. · The network must have IP Multicast support to allow wide delivery to multiple clients. · A video-ready campus must have nonstop communi-cation to ensure reliable video delivery in case of failure. · Video performance must be proactively monitored and measured across the network. · The network must have application intelligence to differentiate between business-critical and noncritical video streams.
Security for video applications	· The network must have integrated video security to protect authorized access to video applications. · Mitigation of attacks and protection of traffic from snooping and intrusion by malicious users is essential. · IP Multicast streaming must be protected from video “hijacking”, and malicious users must be prevented from transmit-ting unauthorized video. · Network virtualization techniques are needed to segregate video traffic.
Scalability and performance	· Network scalability is critical to supporting increasing bandwidth demands as more video applications are deployed. To maintain optimal performance, the network should easily accommodate higher bandwidths, scaling to support Gigabit Ethernet to the desktop and 10 Gigabit Ethernet for uplinks into the core. · The network should allow video forwarding without introducing significant latency. · The aggregation network layers must support 10 Gigabit Ethernet to handle high bandwidth · System scalability is important to maintaining optimal performance for memory and processing resources (Ternary content addressable memory resources [TCAMs]) in network switches.

Why Cisco Catalyst Switches for “Video-Ready” Campus Network Deployment?

Cisco offers a comprehensive range of switching solutions supporting a wide variety of deployment requirements in campus networks of all sizes. Yet Cisco Catalyst® switches are much more than a collection of point products to meet isolated IT needs; they are part of an integrated approach to the broader goal of optimizing, protecting, and scaling networks for years to come. Three important Cisco Catalyst switches for video deployment are the Cisco Catalyst 6500, Catalyst 4500, and Catalyst 3750E Series (Figure 2).

The Cisco Catalyst 6500 Series is an innovative switching platform, delivering high levels of integrated intelligent services and operational efficiency to meet the needs of most campus video-ready networks. The rich features (refer to Table 2 for details), flexibility, and scalability of the Cisco Catalyst 6500 sets the standard for converged video, voice, and data networks.

Figure 2. Cisco Catalyst Switching Portfolio for the Campus

The Cisco Catalyst 4500 Series is the Cisco midrange scalable modular switching solution for converged access services, high resiliency, and operational simplicity in the campus wiring closet.

The Cisco Catalyst 3750E Series is an enterprise-class line of stackable wiring closet switches featuring Cisco StackWise® Plus technology to help businesses build a unified, resilient stacking solution for the wiring closet.

Table 2. Cisco Catalyst Switching Portfolio

	Cisco Catalyst 6500 Series	Cisco Catalyst 4500 Series	Cisco Catalyst 3750-E Series
			
Place in the network (PIN)	• Campus and data center core, and distribution and access layers	• Access layer and midsize campus distribution	• Access layer
Optimized video delivery	• Leading QoS mechanisms including policing, queuing, traffic shaping, and congestion avoidance • Leading multicast capabilities among the Cisco Catalyst Switches with high performance replication and support of Protocol Independent Multicast sparse mode (PIM-SM), bidirectional PIM (Bidir PIM), and Source Specific Multicast (SSM) support • Nonstop forwarding with subsecond failover with Nonstop Forwarding with Stateful Switchover (NSF/SSO), In Service Software Upgrade (ISSU), Virtual Switching System (VSS), and software modularity • Application intelligence with Cisco Catalyst 6500 Supervisor Engine 32 PISA to provide video application recognition and control • Proactive monitoring and video performance analytics with IP service-level agreement (IP SLA) and the Cisco Network Analysis Module (NAM)	• QoS features including policing, queuing, traffic shaping, and congestion avoidance • Multicast capabilities with PIM-SM and SSM support • Nonstop forwarding with subsecond failover with NSF/SSO and ISSU • Proactive monitoring and video performance analytics with IP SLA	• QoS features including policing, queuing, traffic shaping, and congestion avoidance • Multicast capabilities with PIM-SM and SSM support
Video security	• 802.1x (Identity Based Networking Services [IBNS]) to provide authentication and security policies • Mitigation of attacks with Cisco Catalyst Integrated Security features such as Dynamic Host Configuration Protocol (DHCP) Snooping and IP Source Guard • Control-plane policing • Access control with VLAN access control lists (ACLs) • IP Multicast security with Internet Group Management Protocol (IGMP) filtering, PIM/IGMP Snooping, and Multicast Router Guard • Network virtualization techniques such as MPLS and Virtual Route Forwarding (VRF)-Lite support	• 802.1x (IBNS) to provide authentication and security policies • Mitigation of attacks with Cisco Catalyst Integrated Security • Access control with VLAN ACLs	• 802.1x (IBNS) to provide authentication and security policies • Mitigation of attacks with Cisco Catalyst Integrated Security • Access control with VLAN ACLs
Scalability and performance	• 48-port Ethernet line cards to provide Gigabit Ethernet to the desktop • Scalable Power over Ethernet (PoE) beyond 18 watts • High-density 10 Gigabit Ethernet aggregation • Ample TCAM resources • Wire-speed nonblocking-performance line cards	• 48-port Ethernet line cards to provide Gigabit Ethernet to the desktop • Scalable PoE beyond 18 watts • Ample TCAM resources • Wire-speed nonblocking-performance line cards	• Stackable wiring closet switches with Cisco StackWise® Plus technology

Why Cisco?

Cisco has long been an industry leader in network technology, and is now developing and bringing to market numerous innovative video-related products. These products cross multiple functional boundaries such as real-time collaboration, surveillance, signage, streaming video, and more. Cisco's combined expertise in both video and network technology gives the company a unique advantage in delivering high-quality, business-class video solutions.

Additional Links of Interest

- Cisco Campus Communication Fabric Webpage: http://www.cisco.com/go/ccf
- Cisco Catalyst 6500 Series Webpage: http://www.cisco.com/en/US/products/hw/switches/ps708/index.html

C45-468223-00 04/08