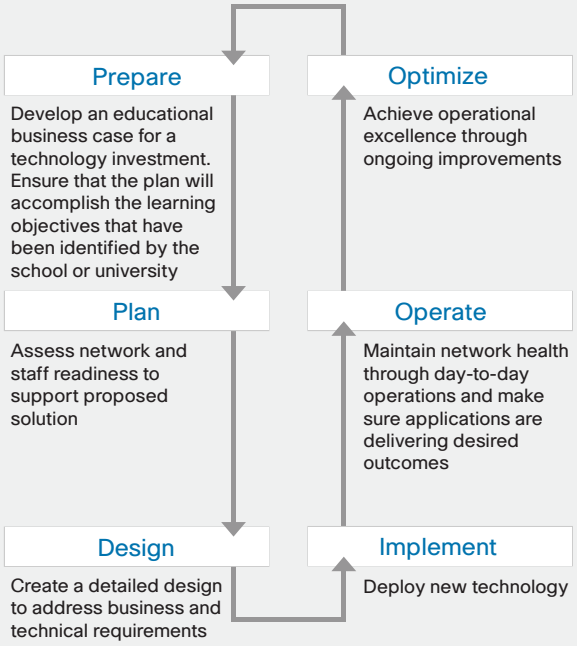
Cisco Medianet Readiness Assessment Service for Education

The Cisco® Medianet Readiness Assessment (MRA) Service helps educational institutions accelerate smooth deployments of media-rich applications to enable next-generation learning environments.

The Cisco Lifecycle Services Approach



The unique Cisco lifecycle approach to services defines the requisite activities at each phase of the network lifecycle to help ensure service excellence. With a collaborative delivery methodology that joins the forces of Cisco, our skilled network of partners, and our customers, we achieve the best results.

Service Overview

A fundamental shift is happening in education as schools and higher education institutions adopt creative new teaching methods to better meet the needs of their 21st-century students. One of the essential ways to achieve this next-generation learning environment is through the innovative use of video. For instance, face-to-face video communication allows schools and universities to:

- Connect subject matter experts with students from anywhere in the world
- Reduce the cost and time involved in conducting district- or university-wide meetings
- Enhance classroom engagement and deliver optimal learning outcomes

To reap these benefits, however, educational institutions must overcome several challenges as they design and prepare their networks for video adoption. Unlike voice, video is more "bursty" and bandwidth intensive and is more sensitive to delay, jitter, and packet loss. To improve learning and collaboration through media-rich applications, schools and universities must carefully prepare and plan as they make their networks media-ready.

Turning to an expert such as Cisco can help ensure success in deploying a media-ready or medianet architecture, optimized for video and rich media applications. The Cisco Medianet Readiness Assessment (MRA) is a comprehensive service that evaluates the entire network infrastructure and its ability to transport rich media applications. MRA is part of Cisco's lifecycle approach—prepare, plan, design, implement, operate, and optimize (PPDIOO)—to delivering services that help enhance student, faculty, and administrator interaction and make sure of return on investment. An offering of Cisco Services, MRA delivers the expertise needed to make sure the medianet architecture meets the learning and business objectives for video deployment.

Challenges in Deploying Media-Rich Applications in Education

Cisco offers media-rich applications that can make a profound effect on both the educational and administrative processes at schools and higher education institutions. However, to provide a consistent, high-quality experience for users, both the school's network and educational applications must be optimally designed and implemented. Without careful consideration of an institution's specific requirements, IT and end-user experience, as well as effect of the solution on the overall network, the full potential of these media-rich applications might not be realized.

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Video is a powerful learning tool, but inherent challenges need to be addressed in order to meet teacher expectations and provide a flawless experience for students. Converging video onto an IP network is much more complex than converging voice over IP (VoIP) because of the bandwidth requirements and intermittent characteristics of video. Your network strategy needs to consider the requirements of video applications such as:

- Live and on-demand high-definition streaming video
- Synchronous and asynchronous applications
- High-definition digital signage
- High-definition video surveillance
- Standard-definition desktop video conferencing
- High-definition virtual-presence interactive video (Cisco TelePresence® conferencing)

By understanding the unique requirements of media-rich applications such as these and planning your network to address these needs, you can make sure of a high-quality user experience for your school, campus, or districtwide IP network.

Quality of Service

Like voice, video applications have strict requirements and are generally much more sensitive to packet loss because each packet could represent a tremendously compressed amount of visual information. Even small packet losses can result in visible degradation of video quality.

Video traffic has stringent quality-of-service (QoS) requirements for bandwidth, packet loss, jitter, and delay. These are even more stringent for applications that are real time or interactive and require high-definition resolution. Video traffic is very bandwidth intensive; a high-definition stream could require more than 20-Mbps bandwidth for delivery over the network. And unlike the constant-rate nature of voice packet transmission, video packets are variable in rate and size.

Degradations in video quality because of packet loss or jitters can create a less-than-optimal communication experience. Imagine the frustration of both students and faculty members if a transmission is disrupted midlecture or during an important meeting. That is why latency must be kept to a minimum—so that large buffers in the network or at receiving endpoints are not needed to compensate for high jitter.

As an additional challenge, not all media-rich applications have the same network requirements. The table below shows how different applications can vary significantly.

Metric	Video Collaboration	Digital Media System (DMS) or Digital Signage	Cisco TelePresence	Video Surveillance
Latency	200ms	200 ms	150 ms	500 ms
Jitter	10 ms	10 ms	10 ms	10 ms
Loss	0.05%	0.05%	0.05%	0.5%

High Availability

Video applications require millisecond-level network service recovery because video traffic cannot accept unpredictable or large network recovery timeouts. Thus convergence targets will be higher, and packet loss must be kept to a minimum to make sure of reliable transmission of classroom video or cafeteria signage, for example.

Schools and universities also need a survival strategy to use localized services in case of link failure; satellite or sister campuses need to be able to function alone.

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Security

Numerous security threats can affect media-rich communications. Take, for example, the possibility of hackers gaining control of an in-class video endpoint or on-campus signage. They would have the ability to transmit inappropriate or offensive content to students and staff, which is an especially disturbing scenario for school environments. A comprehensively designed, media-ready network can provide visibility into threats such as:

- Eavesdropping: Unauthorized listening to and recording of video conversations present the risks of privacy loss, reputation loss, and regulatory noncompliance.
- Denial of service: The loss of media-rich services can lead to lost productivity and a less-effective learning environment.
- Compromised video clients: Hacker control of video clients, such as cameras, displays, and conferencing units, can result in risk to students' safety, data theft, and damaged reputation.
- Compromised system integrity: Hacker control of video application servers or the video control infrastructure presents risks similar to those of compromised clients, but on a significantly greater scale. There is potential to cause not only major productivity loss, but also a breach in school, campus, or district-wide security.

Bandwidth

Video applications contribute to the use of large amounts of bandwidth. Short, uneven network transmissions are another critical bandwidth-related concern. When provisioning bandwidth, educational institutions must also consider burst requirements.

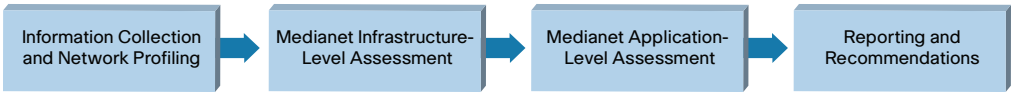
Some video applications have a traffic model with a single or a few video sources transmitting to many simultaneous viewers. Deploying optimization techniques to minimize bandwidth requirements is highly advantageous. IP multicast and stream splitting can provide efficient distribution across the network.

Visibility and Monitoring

Successful video delivery requires school IT organizations to continuously make sure of the acceptable performance of their video applications. This is done by constantly measuring the performance and evaluating the network capacity to verify that learning objectives and service quality goals are being met.

How the MRA Process Works

The MRA service follows a proven process to make sure of success.



Phase One: Information Collection and Network Profiling

This phase involves interviewing various school district or higher education contacts to gather relevant technical details and educational objectives. This information helps Cisco evaluate the current and planned network implementation, including hardware, software, network design, network links, and applications, and helps to bring all the organization requirements together and understand them. Each of these areas is evaluated against Cisco best practices and requirements for a video-ready network. This phase also involves active monitoring of the network and obtaining details about bandwidth utilization, QoS statistics, and device performance.

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Phases Two and Three: Infrastructure- and Application-Level Assessments

Cisco follows a modular approach to the MRA, dividing the assessment into different logical modules, each covering specific checks. The infrastructure-level assessment evaluates the network infrastructure layer, while the application-level assessment looks at application-specific aspects to make sure your network is ready to support video applications.

Schools and universities that are beginning to deploy educational video can request just an infrastructure-level assessment. Those that already know what they want to deploy into their network or have already deployed one or more video applications and want to enable other types of video applications would need to include both the infrastructure-level assessment and the appropriate application-specific assessments.

Also included in these assessment phases are:

Bandwidth/Device Utilization and QoS Statistics

Bandwidth, device utilization, and packet loss/jitter/latency statistics can be obtained at regular intervals. This is done while taking various educational or administrative activities into consideration in order to capture performance during periods of high network activity interleaved with mission-critical traffic. Network traffic monitoring and service-level measurement tools are used to collect this information. Peak-hour utilization of bandwidth and device resources are also calculated and tabulated.

Predeployment Service-Level Assessment

Cisco conducts a network service-level assessment to ascertain the current service delivery performance provided by the network. Traffic simulation tools are utilized to inject sample video flows into the network and collect service-level stats. These sample flows simulate various video applications such as Cisco TelePresence, high-definition and standard-definition video collaboration, and live streaming video. Successful tests with sample video do not guarantee that scalability/performance can be achieved during the actual deployment; rather the predeployment sample video flows merely help determine any gaps. Based on this assessment, a gap analysis of the current network and network service-level expectations for a medianet are provided.

Medianet Infrastructure-Level Assessment	Medianet Application-Level Assessment

· Hardware and software compliance
  · Campus infrastructure
  · Data center infrastructure
  · Branch infrastructure
  · WAN infrastructure
  · Software release level
· QoS compliance
· Performance compliance
· Medianet infrastructure-level design compliance
· Compliance with service level goals
	· Educational video collaboration
	· Cisco TelePresence
	· DMS/digital signage
	· Flip™ Video and Show and Share® applications
	· Video surveillance
	· Interop and third party
	· Application-specific network consideration

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Phase Four: Reporting and Recommendation

At this point, the MRA team tabulates the data obtained for various hardware and software features/parameters. It then evaluates any missing capabilities in either the network architecture or software needed to enable educational and administrative video applications. The analysis takes into consideration the educational institution's specific requirements and expectations for the medianet architecture, including what multimedia learning applications will be deployed and planned size/scale of the deployment.

The resulting report and recommendations address issues such as:

- Whether current hardware needs to be upgraded to support the new requirements
- Whether the network/link bandwidth must be upgraded
- Which high-availability network capabilities are required

Why Your Organization Should Consider a Medianet Readiness Assessment

The MRA service from Cisco allows schools and universities to design for all the hurdles presented by media-rich applications such as:

- QoS and service-level requirements of media-rich applications
- Bandwidth considerations
- Coexistence with mission-critical applications
- Security implications
- High availability

In addition, the MRA service allows educational institutions to:

- Make sure of smooth deployment
- Provide greater reliability
- Create a stringent security profile
- Reduce cost through network efficiencies
- Deliver optimal student and teacher interactions

Summary

In order to realize the educational benefits of media-rich applications, schools and universities should comprehensively prepare and plan with the help of an MRA service. This assessment allows educational institutions to understand what gaps they need to bridge in order to deliver the best user experience not only with their new media-rich applications but also with their existing mission-critical applications. The Cisco MRA service delivers the preparation and planning expertise schools need to design and deploy innovative Cisco media-rich solutions with confidence.

Why Cisco Services

Cisco Services make networks, applications, and the people who use them learn better together.

In today's 21st-century learning environment, the network needs to be a service-ready platform that enables better integration and interaction between students, teachers, information, and ideas. The network works better when services, together with products, create solutions aligned with your institution's educational needs and goals.

The unique Cisco lifecycle approach to services defines the requisite activities at each phase of the network lifecycle to help ensure service excellence. With a collaborative delivery methodology that joins the forces of Cisco, our skilled network of partners, and our customers, we achieve the best results.

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Availability and Ordering Information

The Cisco MRA is available globally. Details may vary by region.

For More Information

- To learn more about Cisco Business Video services, visit www.cisco.com/go/services/businessvideo.
- To learn more about the Cisco Medianet Readiness Assessment Service, visit www.cisco.com/go/mra.
- To learn more about Cisco's educational services, visit www.cisco.com/go/publicsectorservices.

For an MRA quote or further information, contact your Cisco service account manager.

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