

Cisco Wireless VideoStream Technology



As a core networking capability of Cisco medianet architecture, Cisco® VideoStream technology enables wireless networks to provide superior video quality, with reliable and consistent performance of streaming video. Cisco VideoStream provides the features needed to support the rich-media requirements of a medianet, an end-to-end network optimized for a rich media and video. Cisco VideoStream removes the challenges associated with streaming video over the wireless network by enforcing video priority levels, controlling resource reservation, and delivering reliable multicast.

The Challenge of Video on Wireless Networks

The growth of mobile devices and the demand for anywhere access to video have made the wireless network a critical component of the overall network infrastructure. Increasingly, IT managers strive for the same level of quality, performance, and reliability on wireless networks as on wired networks. It's become critical for business productivity to support the surge of video applications over the both the wired and wireless infrastructure.

Today's Wi-Fi networks must be capable of supporting multiple voice, video, and data streams in a reliable, synchronized manner that provides performance consistency. For video applications, any disruptions – including delay, packet loss, or jitter – can produce visual distractions that undermine the core benefits of video.

Current estimates predict that by 2015, the world will reach 3 trillion Internet video minutes per month, which is 1 million Internet video minutes every second. Core video applications used by enterprises today include interactive teleconferencing to save the cost of travel, video-on-demand for training, and live-streaming video for global corporate communications or video

surveillance. End users are extending the need for flexibility by demanding access to video applications from any place using any device. For most organizations, the existing wireless network is not able to cost-effectively meet the demand for a reliable, rich-media user experience.

The Cisco VideoStream Solution

Cisco's 802.11n products extend the high-definition video experience to Wi-Fi networks. Cisco VideoStream technology optimizes the way video is delivered through the wireless infrastructure. Using Cisco's RF and video expertise, VideoStream delivers reliable, consistent, high-quality video performance to the client without creating a burden on the network.

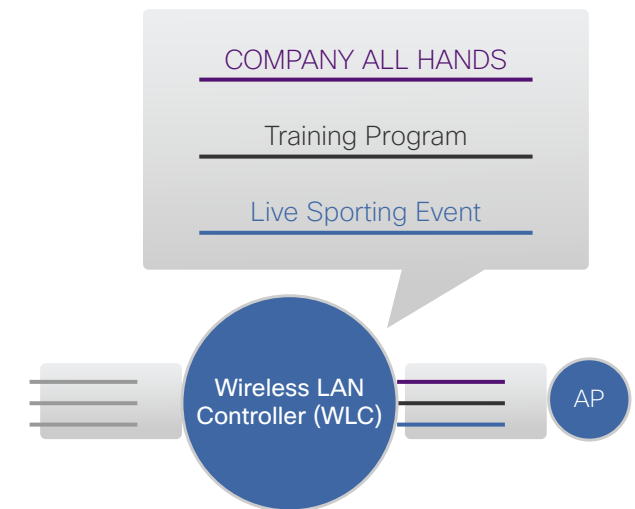
Cisco VideoStream technology enables the wireless infrastructure to:

- Assign stream prioritization to any stream at up to eight priority levels. This helps to ensure quality and consistent delivery of critical video applications.
- Manage admission and policy control with Resource Reservation Control for bandwidth protection and channel optimization against additional requests causing oversubscription.
- Ensure the reliability of video stream delivery by converting video streams to unicast, rather than having the controller send multicast downstream to all access points using a multicast Control and Provisioning of Wireless Access Points (CAPWAP) tunnel.
- Enable higher video scale at the client level by pushing stream conversion to the edge at the access point with the Multicast Direct feature, thus utilizing the overall network efficiently.

Quality and Consistent Delivery of Critical Video Applications

Not all video content is of equal importance: organizations investing in video cannot afford to have network bandwidth consumed without prioritization of business-critical media. The Stream Prioritization feature in Cisco VideoStream allows IT managers to assign up to eight priority levels for streams marked for preferential quality of service (QoS). (keep this next sentence) CEO corporate addresses can take precedence over sports replays while the network maintains the integrity of video surveillance streams (Figure 1). With Stream Prioritization, quality and consistency of video streams are protected and maintained even in varying channel conditions. This feature can be flexibly used at the radio level (2.4 GHz and 5 GHz) or at the WLAN or Service Set Identifier (SSID) level.

Figure 1. Stream Prioritization





Video Bandwidth Protection Against Oversubscription

As workplace Wi-Fi endpoints handle more and more video traffic, it's critical to be able to gracefully manage and scale a continuous, high-quality experience for fluctuating groups of users at any given time or location. Audio and video quality can begin to degrade when too many active demands appear on a channel and when available bandwidth is oversubscribed. In addition, video traffic can have an adverse effect on other applications.

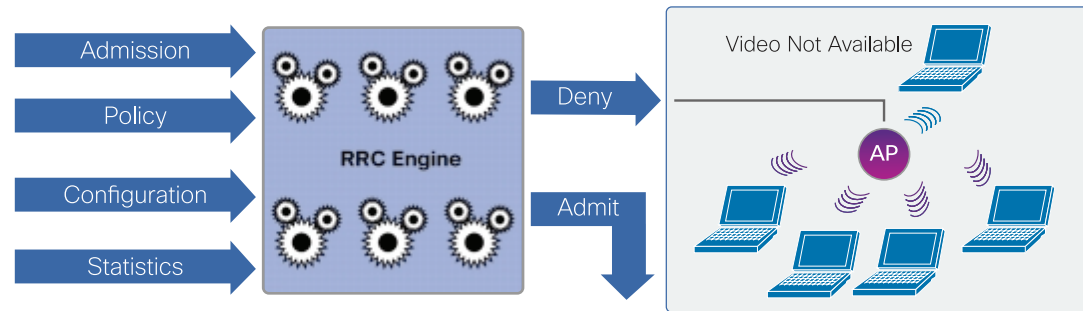
Resource Reservation Control (RRC) provides bandwidth protection for the video stream by denying other requests that would cause oversubscription. Resource allocation decisions are made taking specific access point statistics into consideration, rather than overall controller domain statistics. For example, corporate technical training videos can preserve a constant bandwidth level regardless of additional video chat requests.

It is critical that the infrastructure have a sophisticated admission control algorithm for determining when a new stream can be accommodated (Figure 2). Cisco is positioned to provide an end-to-end, media-ready network that includes VideoStream technology driving the ability to keep business-critical video content prioritized and constant in the face of varying bandwidth demands.

Optimal Channel Utilization for Higher Video Scale

Higher video scaling is a measure of the number of clients supported per controller while optimizing the traffic flow from wired to wireless network. With Cisco VideoStream technology, all the replication is done at the edge, on the access point, thus utilizing the overall network more efficiently. Avoiding stream replication at

Figure 2. Resource Reservation Control



the controller frees up upstream network bandwidth for higher video scale using multiple other access points.

On-the-fly copying of video streams is done at the access point without involving CPU cycles and thus keeping throughput high. Packet header conversion to unicast overcomes the lack of Wi-Fi network acknowledgement created by multicast traffic, a limitation that often results in packet loss. Packet header modifications to unicast also happen at the very edge at the access point keeping channel utilization efficient.

Cisco VideoStream is enabled end-to-end from the edge of the wireless network on Cisco Aironet® Access Points, through Cisco Wireless Controller products, and into the enterprise infrastructure with support on the Wireless Service Modules for Cisco Catalyst® Switches.

Market Differentiators

Cisco VideoStream is an important medianet capability that reduces the complexity of deploying streaming video over Wi-Fi and also improves the video experience for a variety of endpoints. Critical market differentiators for Cisco VideoStream technology include the integration of the VideoStream's capabilities with the underlying intelligent network services and the rich-media applications on medianets.

VideoStream takes advantage of the existing Cisco Unified Wireless Network infrastructure, which helps ensure that video applications delivery the high quality and reliable performance required for video traffic.

VideoStream empowers the network administrator to:

- Prioritize individual video streams, making certain business-critical applications maintain performance.
- Use Resources Reservation Controls to preserve bandwidth for important media applications and to intelligently determine when supporting lower priority bandwidth requests will impact high-priority video performance.
- Utilize bandwidth most efficiently to support higher scale. Avoiding the take-and-replicate process, VideoStream keeps the controller-to-access-point bandwidth open for scaling additional clients.
- Reliably deliver video traffic with acknowledgements, in contrast to traditional multicast.

For More Information

For more information about Cisco VideoStream, visit:

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