
VLAN Tagging Video, Dante Audio, and Other Network Traffic Using Visionary's AV-over-IP Endpoints

Introduction

As the demand for AV-over-IP systems grows, so does the complexity of network traffic management. In modern AV systems, networks are tasked with transmitting high-bandwidth video, low-latency audio (such as Dante audio), and various other types of data traffic. Efficient management of these different traffic types is crucial to ensure optimal performance, minimal latency, and reliable quality of service (QoS).

Visionary Solutions' AV-over-IP endpoints provide powerful and flexible solutions for handling these challenges. One of the most effective strategies for managing different traffic types is VLAN tagging, which separates traffic into distinct virtual local area networks (VLANs). This white paper explores the benefits of VLAN tagging video, Dante audio, and other network traffic on a shared LAN or flat subnet using Visionary's AV-over-IP technology.

What is VLAN Tagging?

VLAN tagging allows network administrators to segment different types of network traffic into isolated logical networks, even if the traffic is flowing through the same physical infrastructure.

Each VLAN is assigned a unique identifier (VLAN ID), which helps the network switches and routers determine which traffic belongs to which VLAN. By separating traffic based on VLANs, administrators can enforce policies, prioritize traffic, and avoid

congestion, all while maintaining a more organized and secure network.

In an AV-over-IP system, where different types of traffic coexist—such as high-bandwidth video, low-latency audio (Dante), and control or management data—VLAN tagging plays a critical role in managing and prioritizing this traffic to ensure smooth and reliable performance.

Visionary's AV-over-IP Endpoints: A Key Enabler

Visionary's AV-over-IP solutions are designed with advanced features to handle high-bandwidth video, low-latency audio, and other network services. The capability to support VLAN tagging for multiple streams coming through a single LAN port simplifies the deployment and management of these systems.

These endpoints allow integrators to streamline the AV infrastructure by using a unified network while still isolating traffic types for optimal performance.

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Key Benefits of VLAN Tagging

1. Traffic Segmentation and Prioritization

Different types of traffic on the network have different requirements. High-resolution video demands significant bandwidth, while low-latency audio like Dante requires prioritization to avoid timing issues. VLAN tagging enables administrators to assign video, Dante audio, and other network traffic (such as control signals) to separate VLANs. This segmentation allows the network to handle each type of traffic according to its needs, preventing bandwidth-hungry video from interfering with the timing-sensitive Dante audio.

By segmenting traffic into VLANs, network administrators can also apply Quality of Service (QoS) policies that prioritize mission-critical traffic. For example, Dante audio can be given priority over video traffic to ensure that there is no delay or jitter, which could degrade audio quality.

2. Enhanced Network Security

Separating traffic into VLANs adds a layer of security by isolating different traffic types. This ensures that unauthorized access to one type of traffic does not automatically grant access to all network data. For example, video streams can be kept on a VLAN separate from management traffic, limiting access to sensitive control commands. VLAN tagging can also prevent unwanted traffic from crossing into a different domain, reducing the risk of network attacks or data leaks.

With Visionary's AV-over-IP endpoints, VLANs can easily be assigned to specific traffic types, ensuring that critical AV traffic is kept secure and separate from other types of network traffic.

3. Reduced Congestion and Improved Performance

In a flat network, all traffic competes for the same bandwidth, leading to potential congestion, especially when video streams consume large amounts of data. By implementing VLAN tagging, network administrators can isolate traffic and distribute it more efficiently across the network. For example, video traffic can be sent to one VLAN, audio to another, and general network traffic to a third. This separation prevents different types of traffic from interfering with each other, significantly reducing congestion and improving overall network performance.

This is especially important in high-density environments, such as corporate AV deployments or large venues, where multiple video and audio streams coexist. With Visionary's endpoints, VLAN tagging ensures that each traffic type is managed efficiently without impacting the quality of service.

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Key Benefits of VLAN Tagging (cont.)

4. Simplified Network Management and Troubleshooting

A network using VLANs is easier to manage and troubleshoot compared to a flat network. By segmenting traffic into VLANs, network administrators can quickly isolate and identify issues. For instance, if there is a problem with video transmission, the issue can be confined to the VLAN handling video traffic without affecting audio or other network services. This reduces troubleshooting time and minimizes the impact of network issues on overall system performance.

Visionary's AV-over-IP endpoints allow administrators to configure VLANs directly, making network management more straightforward and reducing the complexity typically associated with troubleshooting a flat network.

5. Scalability and Flexibility

As AV-over-IP systems grow and evolve, VLAN tagging provides the scalability needed to manage increasing traffic. Visionary's AV-over-IP endpoints allow new VLANs to be added for additional video streams, audio channels, or other services without the need for significant reconfiguration of the physical network. This flexibility ensures that the AV network can grow alongside the organization's needs without requiring costly upgrades or network overhauls.

VLAN tagging also provides flexibility when integrating other services, such as IP telephony or IT data, ensuring that these services can coexist with AV traffic on the same infrastructure without negatively impacting performance.

Best Practices for Implementing VLAN Tagging in AV-over-IP Systems

To maximize the benefits of VLAN tagging in AV-over-IP systems, it is important to follow some best practices:

- **Separate VLANs for Video, Audio, and Control Traffic** - Ensure that each traffic type has its own VLAN to avoid conflicts and to manage bandwidth and latency requirements effectively.
- **Apply Quality of Service (QoS) Policies** - Use QoS to prioritize critical traffic, such as Dante audio, over less time-sensitive traffic like video streams.
- **Monitor and Adjust VLAN Assignments** - Regularly monitor the performance of each VLAN and adjust traffic assignments as needed to optimize network performance.
- **Use Managed Switches** - Ensure that your network infrastructure, including switches and routers, supports VLAN tagging and QoS policies.

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Conclusion

Visionary's AV-over-IP endpoints, combined with VLAN tagging, provide a powerful solution for managing complex AV networks. By separating video, Dante audio, and other network traffic into distinct VLANs, administrators can ensure that each traffic type receives the bandwidth, priority, and security it needs.

This approach leads to improved performance, reduced congestion, enhanced security, and easier management of the AV system. As AV-over-IP deployments continue to grow in size and complexity, VLAN tagging will remain a critical tool for optimizing network performance and ensuring the reliability of AV services.

Visionary Solutions' AV-over-IP products are designed to seamlessly integrate with VLAN tagging, making them an ideal choice for AV installations of any scale. With the flexibility to handle diverse traffic types and the power to ensure optimal performance, Visionary's solutions deliver the advanced capabilities needed for the next generation of AV-over-IP systems.