



# Digitizing AV Networks a Breeze with Audio Video Bridging

The old way of deploying audiovisual (AV) equipment is full of frustration, inflexibility, and high costs. Cisco solves these problems by supporting IEEE Audio Video Bridging (AVB).

## Overview

The Institute for Electrical and Electronics Engineers (IEEE) 802.1 Audio Video Bridging (AVB) standard makes it easier to integrate new services and for AV equipment from different vendors to interoperate. Whether the AV endpoint connections are analog or are inflexible digital one to one, the network transport enables many-to-many transparent plug-and-play connections for multiple AV endpoints. This includes talkers and listeners. The results of this standard are lower costs and fewer cables.

With Cisco IOS® XE Software Release 16.3, Cisco introduced support for the IEEE 802.1 AVB standard on select Cisco Catalyst® 3850 and 3650 Series Switches. Cisco IOS XE Software Release 16.8 now adds supports for the IEEE 802.1 AVB standard on Cisco Catalyst 9300 Series and select Cisco Catalyst 9500 Series Switches.

## How it works

The digitization of AV networks has become easier. The IEEE 802.1 AVB standard is supported on Cisco Catalyst 9300 Series and on select Cisco Catalyst 9500, 3850, and 3650 Series switches. These switches deliver the highest-capacity 1G, multigigabit, 10G, 25G, and 40G Ethernet ports in the industry. The Cisco Catalyst 9000 family is built for security, IoT, mobility, and cloud, and is the next generation of the industry's most widely deployed switching platform.

## Trends and challenges

Whatever industry you're in, keeping up with the latest audio and video trends isn't an easy task. You start with the high infrastructure cost, follow that up with licensing fees, and add in the headaches of countless wires and cables, and it can all be a high price to pay for allowing someone to be seen and heard. It doesn't have to be this way.

## What does this mean?

Quite simply, these switches are designed to deliver a comprehensive set of features to provide the best application experience, the highest levels of security, and precise control and management of the network.

The Cisco Catalyst 9300 Series is Cisco's lead stackable enterprise switching platform and is the next generation of the industry's most widely deployed switching platform. The Cisco Catalyst 9500 Series is Cisco's lead purpose-built fixed core/aggregation enterprise switching platform. The Cisco Catalyst 9000 Series switching platform constantly adapts to help you solve new challenges, introducing an entirely new era of networking. The Network. Intuitive. Cisco has also added rich next generation capabilities on those platforms including but not limited to Full Flexible Netflow, Programmability and AVC (Application Visibility and Control).

A closer look at the Cisco Catalyst switches:

- [Cisco Catalyst 9300 Series Switches](#)
  - 1G, Multigigabit, 10G, 25G and 40G
  - Highest density of 802.11ac Wave 2 (48 access points)
  - x86-based CPUs and pluggable local storage for third-party container-based app hosting
  - Support for Encrypted Threat Analytics (ETA)
  - Cisco Universal Power over Ethernet (Cisco UPOE®) and PoE+
- [Cisco Catalyst 9500 Series Switches](#)
  - Up to 960-Gbps switching capacity with up to 1440 Mpps of throughput
  - Purpose-built 40G line of switches, with support for nonblocking 40G Quad SFP Plus (QSFP+) and 1G and 10G SFP and SFP+ to enable 10G to 40G migration
  - x86-based CPUs and pluggable USB 3.0 local storage (up to 120 GB) for third-party container-based app hosting
- [Cisco Catalyst 3850 Series Switches](#)
  - 1G, multigigabit downlinks and 10G, 40G modular uplinks
  - 802.11ac Wave 2 support (24 access points)
  - Cisco Universal Power over Ethernet (Cisco UPOE®) and PoE+

## Benefits

- Improves quality of experience by lowering jitter and latency for time-synchronized delivery of AV. This means that audio and videos are crisper, resulting in a better experience.
- Easily scales applications over networked deployments. You have to make AV infrastructure improvements every year, but with the AVB they won't be nearly as costly or frequent.
- Lowers total cost of ownership with reduced cabling and no license fees. With AVB, forget one-to-one connections. AVB works with many-to-many connections, saving you big infrastructure dollars.

Allowing one of the Cisco Catalyst switches to facilitate your audio-video solutions provides you with a lower total cost of ownership through:

- Reduced capital expenses through less cabling and wiring.
- Reduced operational expenditures through no license fees for any proprietary technologies.

In addition, this Cisco solution offers greater scalability and quality with a more efficient deployment and installation and easier management.

## Cisco Capital

### Financing to help you achieve your objectives

Cisco Capital® can help you acquire the technology you need to achieve your objectives and stay competitive. We can help you reduce CapEx. Accelerate your growth. Optimize your investment dollars and ROI. Cisco Capital financing gives you flexibility in acquiring hardware, software, services, and complementary third-party equipment. And there's just one predictable payment. Cisco Capital is available in more than 100 countries. [Learn more.](#)

## Next steps

For additional information, refer to our [At-a-Glance](#) and [Cisco AVB](#) page.

- [Cisco Catalyst 3650 Series Switches](#)
  - Multigigabit ports support speeds up to 10 Gbps
  - 1G, multigigabit downlinks and 10G, 40G fixed uplinks
  - Cisco Universal Power over Ethernet (Cisco UPOE®) and PoE+

How did AVB come about, and what does it all mean? AVB is a set of technical standards created by the IEEE Audio Video Bridging Task Group. The IEEE AVB Task Group is a part of the IEEE 802.1 standards committee. IEEE 802.1 defined a set of standards that provided the means for highly reliable delivery of low-latency, time-synchronized AV streaming services through Layer 2 Ethernet networks.

The set of IEEE 802.1 standards consists of the following:

- **IEEE 802.1AS:** Generalized Precision Time Protocol (gPTP), which provides timing and synchronization for time-sensitive applications on Layer 2 devices.
- **IEEE 802.1Qat:** Stream Reservation Protocol (SRP)/Multiple Stream Reservation Protocol (MSRP), which is an end-to-end traffic admission control system that helps ensure the availability of resources, such as bandwidth and latency, that are required to transport AV streams.
- **IEEE 802.1Qav:** Forwarding and Queuing for Time-Sensitive Streams (FQTSS), which is AV traffic scheduling capability for mainstream Ethernet and other network switches.
- **IEEE 802.1BA:** An umbrella standard for the other three IEEE 802.1 standards that defines profiles for features, options, configurations, defaults, protocols, and procedures for AVB devices.

To see how each standard interacts with AVB and for more about the subject, [read](#) the “Cisco Audio Video Bridging Design and Deployment for an Enterprise Network” white paper.

## Use cases

Industry name	Description
Hospitality	For installed audio and video deployments used in conference rooms, casinos, and auditoriums.
Education	For installed audio and video deployments used in classrooms and auditoriums.
Government	For installed audio and video deployments used in courtrooms, auditoriums, and conference rooms.