ATLONA
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OmniStream Application Guide

OmniStream™

Overview

AV over IP (also known **as networked AV**) is a class of AV systems in which video, audio, and other signals are distributed over data networks. Networked AV is widely adopted by system designers, integrators, and consultants for the scalability and flexible adaption possible with network infrastructure.

OmniStream

Integrating AV distribution over standard data networks brings several important benefits:

- Advanced VCx™ codec delivers 4K/60 4:4:4 and HDR from encode to decode
- High-efficiency coding enables 4K and 1080p streams over Gigabit Ethernet
- Ultra-low encode-to-decode latency less than 1 frame
- Ultra-fast switching between 4K video streams (less than 0.5 seconds)
- Video wall processing and multiview window processing modes available

A key distinction of OmniStream is that the latest advancements are available in newly shipping products, and also as a firmware update. This means that new system designs can include an end user's existing products.

AV over IP Applications

OmniStream is used in a wide variety of installation environments, from light commercial such as retail and small offices, to general commercial installations (meeting rooms, lecture halls, conference centers etc.), all the way up to university campuses and enterprises.

Generally, networked AV is ideal whenever there are numerous inputs and outputs, the need to expand systems over time, and a desire for unrestricted flexibility in routing AV signals. This Application Guide will highlight some of the numerous system applications where networked AV, with the aid of key OmniStream features and capabilities, can be particularly advantageous.

AT-OMNI-111
Networked AV Encoder

AT-OMNI-111-WP
Wallplate Networked AV Encoder

AT-OMNI-112
Dual-Channel Networked AV Encoder

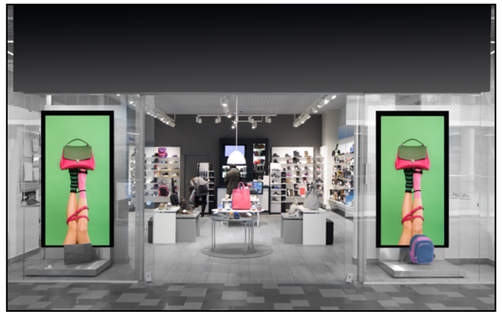
AT-OMNI-121
Networked AV Decoder

AT-OMNI-311
USB to IP Adapter

AT-OMNI-324
IP to USB Adapter

Visit **atlona.com** for more complete product information, including datasheets and specifications.

Digital Signage



There is the desire to display signage throughout many types of public venues, from retail establishments to live performance venues. It's also common to see signage throughout a university campus. The essential requirement for AV is the ability to accommodate a large quantity of displays.

Needs Assessment

PURPOSE – Create an AV distribution system that allows a digital signage source to be delivered to as many displays as needed for the facility.
SOURCES – There will be one or more PCs set up to play media files or web-based signage content.
DISPLAYS – Flat-panel displays are to be installed throughout the venue.
AUDIO – Audio isn't commonly expected, but can be a nice complement in a lobby or waiting area where people gather for extended periods.
CONTROL – The IT staff or an AV technician will use AV control to select a source, power down the system, and designate signage content to specific zones.

AV over IP System

An **AT-OMNI-111** AV encoder will be installed with the digital signage source in a centrally located AV equipment rack. If there are two sources, the **AT-OMNI-112** is ideal for providing two channels of AV encoding in one box.

An **AT-OMNI-121** AV decoder is to be placed behind each display. A primary advantage of a networked AV architecture is that there is no theoretical limit on the number of destinations (decoders) allowed in a system. Displays can be added, removed, or relocated, all without major system modifications.

Networking

A managed Gigabit network switch will serve as the hub of the networked AV system, with sufficient power to deliver PoE (Power over Ethernet) to all OmniStream endpoints. If necessary, multicast groups can be created to define segregated zones of signage.

Audio

For areas with audio playback, the OMNI-121 decoder de-embeds the audio and provides a balanced output for an amplifier and speakers. Alternatively, OmniStream encoders can deliver AES67 audio streaming to a third-party audio system.

Control

Atlona **Velocity™** is the companion to OmniStream for setup, configuration, management, and system control. The **AT-VGW-HW** gateway delivers essential control processing, while the **AT-VTP-1000VL** touch panel provides intuitive system functions for staff members.

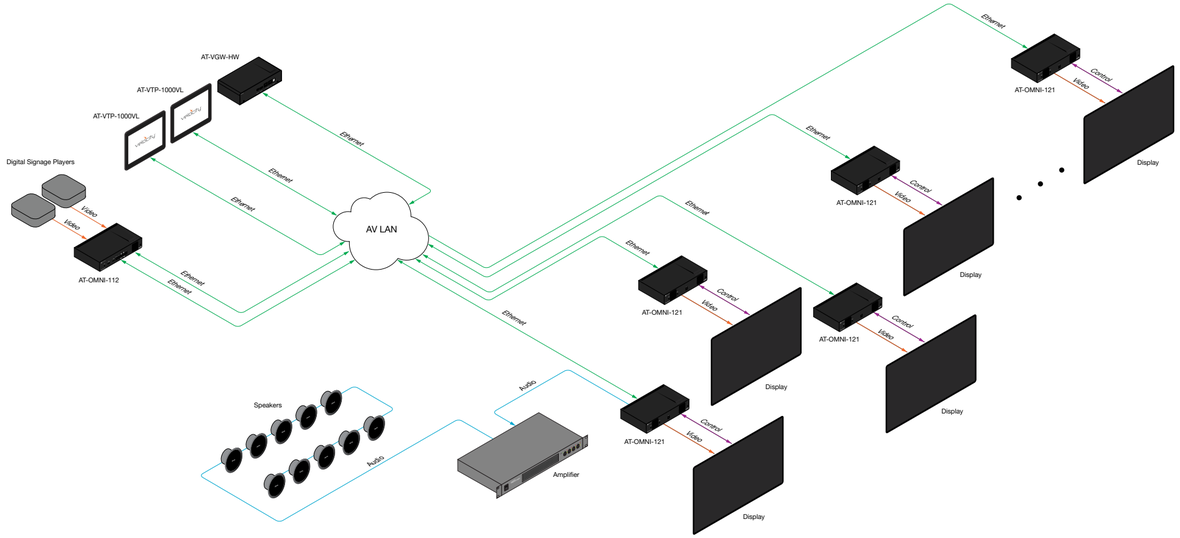


Figure 1 – AV over IP is ideal for digital signage systems, with no theoretical limit on the number of display destinations.

Video Wall

Video walls enable prominent display of content in locations where people gather. They're intended to grab attention by dramatically enlarging one or more sources of content. Video walls have historically been deployed in control rooms, but are now popular in corporate lobbies, sports bars, university student centers, and more.

Needs Assessment

PURPOSE – Create an AV distribution and processing system for displaying one or more sources on a video wall.
SOURCES – The sources depend on the specific application, but typically will include PCs, streaming media players, and television set-top boxes.
DISPLAYS – The video wall is to be a wall-mounted array of flat-panel displays.
AUDIO – Audio usually is not part of video wall installations, but may be desired in corporate lobbies, retail, and university student centers.
CONTROL – An intuitive AV control user interface is important, so that a non-technical user can operate the video wall with simple functions.

AV over IP System

One **AT-OMNI-111** AV encoder will be specified for each AV source in the system. For every two sources, the **AT-OMNI-112** is ideal for providing two channels of AV encoding in a half-rack, 1 RU box. This can save valuable space in an equipment rack.

An **AT-OMNI-121** AV decoder is to be placed behind each display in the video wall. The decoders provide image processing to optimize presentation of a single video source, or multiple sources, across the video wall array.

Many video walls are part of a larger AV over IP distribution system, so that content intended for the video wall can be duplicated to other displays in a facility. Likewise, content from a user's workstation can be shared to the video wall for everyone to see.

Networking

A managed Gigabit network switch, such as the **NETGEAR M4250 Series**, will serve as the hub of the video wall system, with sufficient power available to deliver PoE to all OmniStream endpoints.

Audio

For audio playback, one of the OMNI-121 decoders can deliver analog, balanced output to an audio system.

Control

An Atlona **Velocity™** system with the **AT-VGW-HW** gateway facilitates system setup, management, and user operation. The **AT-VTP-1000VL** touch panel can be configured to allow source selection, switching between pre-configured video wall display modes, and powering off the displays for the evening.

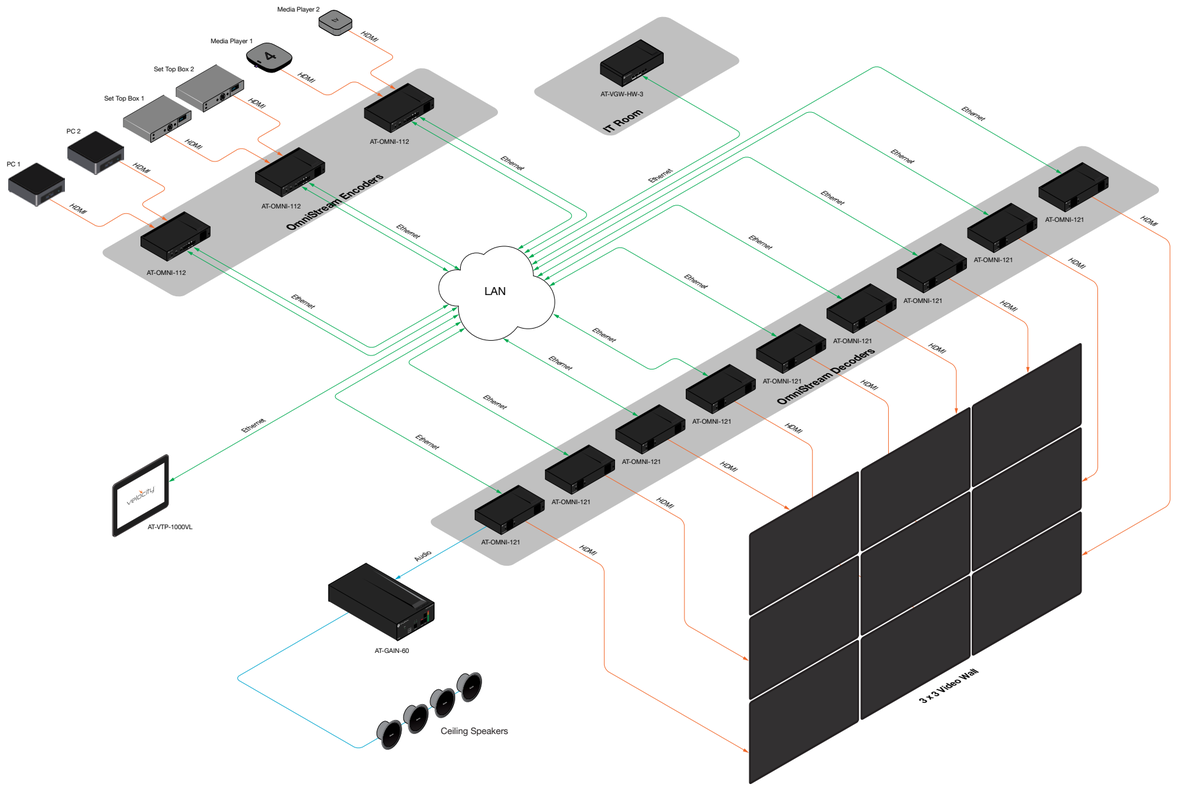


Figure 2 – OmniStream delivers optimized video processing for each display in the video wall.

Meeting Room

In today's meeting rooms, AV application needs have been continually evolving, as companies review their hybrid work policies and the ways colleagues gather and collaborate. This calls for AV system designs that can be modified and adapted to meet the necessary changes in functional requirements.

Needs Assessment

PURPOSE – Design AV for a meeting space that can be modified later, as user needs evolve depending on workplace trends.
SOURCES – AV sources are to be primarily from BYOD. Cameras are desired on the front and side walls for video meetings.
DISPLAYS – Two displays, to be placed side-by-side along the front wall.
AUDIO – A quality audio experience is important for natural communication with remote participants.
CONTROL – The system should provide some automation, with touch interaction only necessary to trigger specific functions.

AV over IP System

At the conference table, there will be an **AT-OMNI-112** dual AV encoder, interfaced with the **Omega™ AT-OME-MH21-CP** two-input switcher for a laptop and a room PC, and the **AT-WAVE-101** for hosting wireless BYOD presentations. The OME-MH21-CP will also be the USB integration hub for video conferencing with Zoom, Microsoft Teams, or other platforms.

On the front wall, there is an **AT-OMNI-121** AV decoder behind each of the dual displays. The wall-mounted **AT-HDVS-CAM** PTZ cameras are to be paired with **AT-OMNI-324** IP to USB Adapters. They work together with the **AT-OMNI-311** USB to IP Adapter at the conference table, for USB extension and routing over the network.

A key advantage of this networked-based AV system design is that its modular nature makes it easily replicated to other meeting spaces, and adaptable with additional inputs or outputs.

Networking

A managed Gigabit network switch will serve as the hub of the networked AV system, with sufficient power to deliver PoE to all OmniStream endpoints.

Audio

Audio for video conferencing will be served by the **Captivate™ Series AT-CAP-SP100** speakerphone, which provides microphone pickup for up to six people, as well as audio from remote participants.

Control

An Atlona **Velocity™** system with the **AT-VGW-HW** gateway facilitates system setup, management, and user operation. The **AT-VTP-1000VL** touch panel can be used to power up the system, and select video conferencing or wireless BYOD modes. Automation can be provided by the OME-MH21-CP and OmniStream to automatically display content from a newly connected laptop. An **AT-OCS-900N** occupancy sensor triggers system power-up when someone walks into a vacant room.

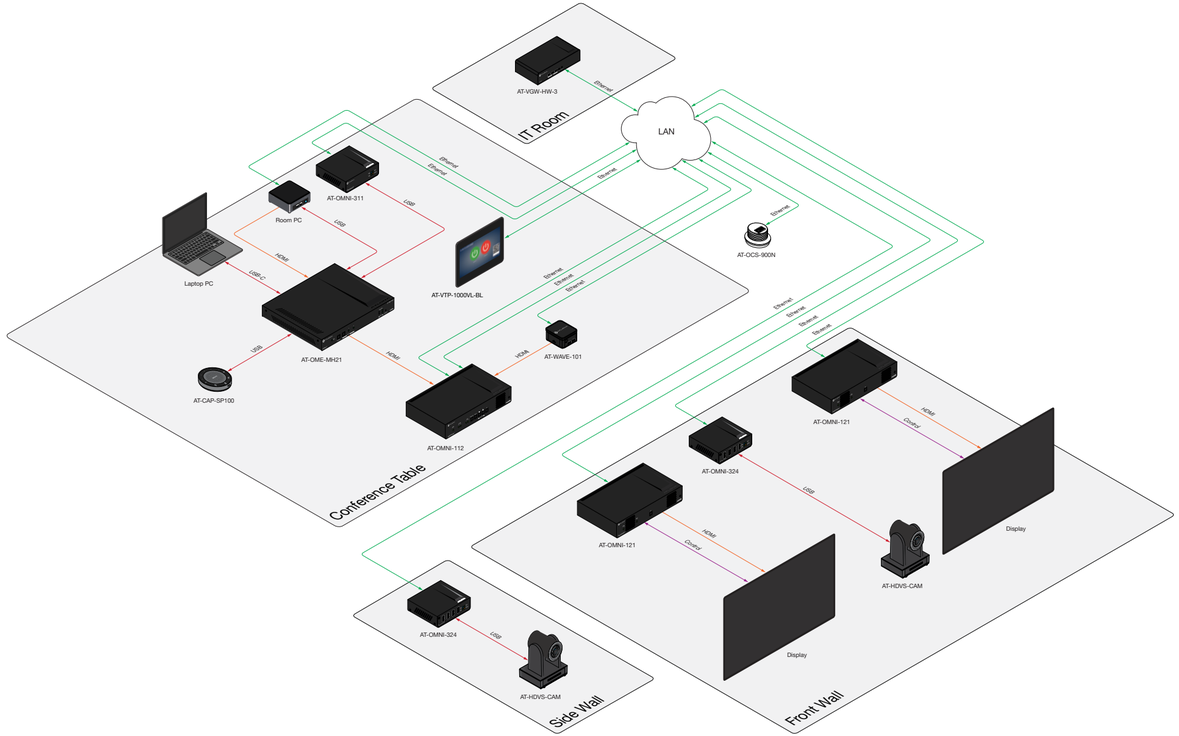


Figure 3 – OmniStream allows a modular system design for a meeting room, that can easily be replicated or adapted to many other rooms.

Classroom

Modern classrooms often are used for several modes of learning, including instructor-led sessions, student collaboration in groups (or pods), distance learning for students attending remotely, and recorded class sessions (lecture capture). The supporting AV system must be adaptable to these and possibly additional instruction modes.

Needs Assessment

PURPOSE – Design an AV system that can help deliver for the various ways students learn in the classroom, or online.
SOURCES – Access for connecting an instructor's laptop, as well as a PC. For lecture capture and distance learning, cameras are needed for the instructor and students.
DISPLAYS – There will be two projectors serving as the main displays the room, a confidence monitor for the instructor, and a flat-panel display at each student pod.
AUDIO – Audio will be essential for amplifying the instructor's voice, lecture capture, and ensuring a quality audio experience for remote students.
CONTROL – A multitude of AV system functions are necessary to support the various instructional modes. The challenge is for these to be easily accessible to the instructor.

AV over IP System

A networked AV system architecture allows unrestricted flexibility in routing AV signals, which will be essential in a multi-functional classroom. At the instructor's desk, an **AT-OMNI-112** dual AV encoder is to be interfaced with the **Omega™ AT-OME-MH21-CP** two-input switcher for a laptop and the PC, as well as the **AT-WAVE-101** for wireless casting and livestreaming. The OME-MH21-CP will also be the USB integration hub for distance learning with Zoom or Microsoft Teams.

Two **AT-OMNI-121** AV decoders are to support the two projectors, along with two **AT-OMNI-111** AV encoders for the two **AT-HDVS-CAM** PTZ cameras. An OMNI-121 decoder, at the instructor's desk, will receive networked AV from the cameras prior to conversion into USB for distance learning and lecture capture functions. At each student pod, an OMNI-111 interfaces with a student's laptop, while an OMNI-121 goes into the local flat-panel display. AV over IP allows student content sharing at a pod, or for the instructor to share a student's screen with everyone.

This system design includes an additional function: delivering instruction to additional students in another room. The instructor's camera feed and presentation can be sent to any room with a display and OMNI-121 decoder, and shown together on-screen.

Networking

A managed Gigabit network switch will serve as the hub of the networked AV system, with sufficient power to deliver PoE to all OmniStream endpoints.

Audio

The OmniStream system will interface into a DSP, the **AT-GAIN-120** power amplifier, and a series of distributed audio speakers. There is to be a microphone for the instructor, and a ceiling array microphone to capture the students.

Control

An Atlona **Velocity™** system with the **AT-VGW-HW** gateway facilitates system setup, management, and control. The **AT-VTP-1000VL** touch panel is to allow the instructor to select from a series of instructional modes, each with a set of intuitive user controls.

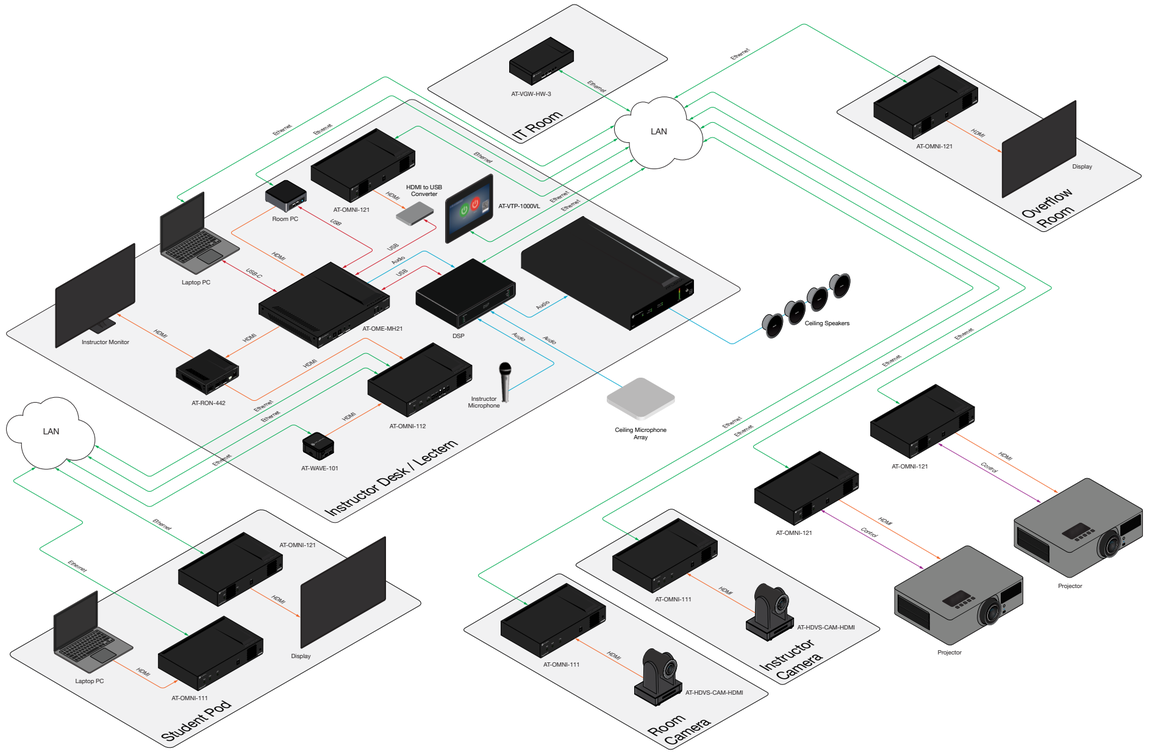


Figure 4 – AV over IP is ideal system architecture to support classrooms serving a multitude of learning functions.

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