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THE NEW CEDIA ACADEMY'S HOLISTIC APPROACH TO EDUCATION

The philosophy behind CEDIA's new approach to education, and the coursework built into the CEDIA Academy

Steve Rissi, CEDIA Director of Technical Training

Most companies tend to take a very utilitarian approach to training new staff members. Many training programs are built with the idea that if there is some area of knowledge that cannot be proven to have a direct and immediate benefit or specific application to completing a required task, it therefore has no value. When this philosophy is at the core of training and development, it does not prepare technicians, or staff in general, for long-term success.

Building the Foundation

Applying utilitarianism as a starting point almost always skips over essential and foundational principles that may not be strictly speaking “necessary” for a technician to connect cable A to slot B. However, knowledge of the underlying principles that dictate how a certain type of signal travels over cable A and why that signal needs to be received with a particular voltage at slot B, becomes invaluable when that same technician needs to troubleshoot problems with signal quality.

The Learning Gap

Another offshoot of the utilitarian attitude is that it tends to promote a somewhat minimalistic viewpoint regarding the educational process as a whole. It supports the notion that it is fine to achieve only the minimum amount of knowledge to obtain an immediate benefit. The outcome is commonly a decision, veiled in a false sense of efficiency,

that the necessary knowledge can be obtained by watching another technician. Subsequently, much of the training process ends up delegated to other technicians.

In contrast to minimalism, which only looks to the very next step, a holistic model views the success of an educational plan with the long-term goal in mind.

The CEDIA Academy

With that backdrop in mind, CEDIA has completely redeveloped our educational programs with a holistic approach at the core of the new learning model. All the courses offered through the new CEDIA Academy have been built from the ground up by subject matter experts with extensive industry experience. These courses include both the foundational knowledge, as well as real world recommendations and examples to aid in getting technicians up-to-speed quickly and boosting confidence on the jobsite. This comprehensive education has been built in parallel with the upcoming improvements to our certification program and offers learning pathways that will not only provide for effective exam preparation, but also success in the field. The holistic philosophy that undergirds the new CEDIA Academy will provide learners not only with what they need to do the job today, but also a comprehensive education built upon the foundational principles necessary to promote further learning and ongoing success in their career.

CABLING & INFRASTRUCTURE TECHNICIAN (CIT) PATHWAY

This educational pathway supports new technicians entering the systems integration industry. The content covered in this pathway has a strong focus on providing the foundational knowledge necessary to begin working as a technician installing cabling and infrastructure to support integrated communications and entertainment systems. The knowledge domains covered in the pathway include audio, video, wire and cabling, termination and testing, construction methods and materials, project processes, equipment installation, retrofit installation techniques, as well as safety practices and applicable building codes and standards.



- » **Jobsite Basics**
- » **Fundamentals of Wiring/Cabling**
- » **Fundamentals of Cable Connectors, Termination, and Testing**
- » **Fundamentals of Audio**
- » **Fundamentals of Video**
- » **Fundamentals of Equipment Installation**
- » **Fundamentals of Retrofit Projects**

INTEGRATED SYSTEMS TECHNICIAN (IST) PATHWAY

This educational pathway supports cabling and infrastructure technicians to take the next step in their professional development. With a focus on specific applications for technology installation and configuration, the content in this pathway provides the foundational knowledge to begin working as an Integrated Systems Technician with minimal supervision. Knowledge domains covered in this pathway include IT networking, distributed audio systems, lighting, motorization, energy management, systems programming and control, home cinema and systems commissioning for project completion.



- » **Fundamentals of IT/Networking**
- » **Fundamentals of Distributed Audio**
- » **Fundamentals of Subsystems**
- » **Fundamentals of Home Cinema**
- » **Fundamentals of Systems Control**
- » **Fundamentals of System Commissioning**

CABLING & INFRASTRUCTURE TECHNICIAN (CIT) PATHWAY

Jobsite Basics

Jobsite Basics covers the fundamentals of what a tech needs to know before setting foot on a client's property — from safety and tools to electricity, from basic math to commonsense manners, this course covers the foundation you need for success.

Tools and Safety

Knowledge of common tools and recommended safety practices is a foundational component of working on any jobsite. This module details the necessary tools technicians need to be familiar with while working on a jobsite, as well as the equipment and procedures that should be followed to ensure a safe working environment. The ability to identify which tool is appropriate for a specific job will ensure a new technician can efficiently perform their duties. Proper tool usage also decreases mistakes, limits unnecessary damage to the tools, and reduces the risk of injury on the job. Safety procedures, including the use of required personal protective equipment, are often strictly enforced and must be followed for successful project completion.

Customer Service

Client satisfaction is a major driver of ongoing business and is directly related to the level of customer service that the client receives from the technicians that work on a project. This module is an overview of customer service basics. The ability to offer exceptional customer service is a great way for businesses to differentiate themselves from their competitors — satisfied customers are more likely to recommend the firm to others. Strong customer service also provides financial benefits to the company, it is easier and more cost effective to maintain current customers than it is to find new customers.

Basics of Electricity

Knowledge of the fundamental principles of electrical theory is a requirement for any technician working with audio, video, or communications signaling. This module provides an understanding of electricity vital to success as a cabling and infrastructure technician. From a standard light switch to the complex world of system programming, electricity is a fundamental element of an integrated system. It is necessary for technicians to know the terms and equations introduced throughout this module as they are used in nearly every aspect of a technician's career.

Applied Math

Performing basic mathematical calculations is a requirement on all jobsites. This module provides information regarding math concepts that technicians need to be proficient in. Common applications include calculating the square footage of a room, taking measurements, calculating load capacities, calculating or verifying display sizes, and verifying structure angles. Mastering these math concepts is a key part of becoming a successful technician.

Construction Fundamentals

Technicians must have knowledge of the applicable codes, standards, and recommended practices related to construction projects. This module provides the information necessary to ensure proper adherence to building codes and industry standards when running infrastructure cabling in residential and commercial environments. Variations in building construction methods will also influence how

cabling is installed, which tools should be used, and what timelines may be expected for project completion.

Fundamentals of Wiring/Cabling

"Pulling cable" has long been at the heart of what a CEDIA technician does. In this course, you'll learn about the types of cable and how they're made — and recommended practices for ensuring that cable goes into the home properly.

Cable Construction

Electronic systems in the home depend upon a physical infrastructure made up of interconnects and radio frequencies that carry information and power to, from, and between system components. Use of the correct interconnects on a jobsite can be the difference between great system performance and complete system failure. Many systems used for networking, security, audio, video, and home automation rely on the types of cables and connectors discussed. Completion of this module will build a foundational knowledge of how infrastructure cabling is constructed and used to transport communications signals.

Types of Cables

The purpose of a cable is to move information or data from one point to another without significant alteration. This module provides an overview of the two common groupings of cables used within the integration industry and their applications.

Premises Wiring

An important part of executing an integration project is to ensure that all steps of the premises wiring installation are completed efficiently and accurately, as this is the last phase where all cabling will be visible. Completing the installation of the cabling infrastructure correctly will save time and money for the phases that follow. This module covers how using proper materials and procedures is a key to successfully executing this phase of the project.

Fundamentals of Cable Connectors, Termination, and Testing

Any run of cable needs proper connections and terminations, and this course will provide you with the critical info you need to ensure the best results — and test your work so that it's held to the highest industry standards.

Common Connectors and Termination Procedures for General Purpose Cables

New building construction projects include a trim-out (second-fix) phase, during which cables previously installed as part of the premises wiring are prepped, terminated, and connected to appropriate outlet hardware and equipment. This module provides instruction on the connectors and termination procedures typically used when working with general purpose cables. While cable termination and testing are skills a technician must master in a hands-on environment, knowledge of the tools and techniques necessary to successfully terminate cables promotes successful outcomes in the field.

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Common Connectors and Termination Procedures for Communication Cables

Proper termination of communications cables is critical to the successful completion of a project. This module provides instruction on the connectors and termination procedures typically used when working with communications cables. The premises wiring will be the communication backbone of all electronic systems in a structure. Care must be taken to ensure all terminations support the highest possible performance for networking, audio, and video transmissions. Improper termination is the most common cause of system failures and malfunctions.

Cable Testing and Verification

During the trim-out (second-fix) phase, built-in devices are installed, as well as supporting equipment such as keypads, controllers, sensors, thermostats, volume controls, antennas, and speakers. To complete the trim-out phase, all cables must be tested and verified for signal transmission and functionality. Executing additional testing to check performance is often recommended and sometimes required in the project specifications. This module provides information on recommended testing and verification procedures for infrastructure cabling.

Fundamentals of Audio

From impedance to decibels, from room reflection to types of amplification, this course covers everything you need to learn about the ways sound waves move in space, and how different gear delivers those waves.

Sound and Audio Basics

Most integration projects include the design and installation of audio systems. This module provides information on the basic principles of sound which are required to develop a foundational knowledge of audio recording and reproduction systems. Learners will explore the processes involved with sound production, recording, and playback as well as review common audio equipment found in integrated system projects.

Types of Sound and Audio Equipment

Knowledge of the types of signals and components found in audio systems is essential to proper system installation. This module provides details on the differences between analog and digital signals, and explains the basic functionality of amplifiers and loudspeakers. The learner will also become familiar with the various types of loudspeakers and their applications.

Signaling, Sources, and Calibration

The correct use and connection of cables is necessary to ensure optimal signal transmission and achieve the highest level of performance. Awareness of the different types of cables and methods for transmitting audio signals helps to ensure that the installation of infrastructure to support an audio system is completed correctly. This module provides information on the various cables typically used to connect audio equipment.

Fundamentals of Video

You'll discover how human beings perceive color, depth, and motion, and the various ways video can deliver the most lifelike experience possible to the viewer. You'll also learn to speak knowledgeably about the alphabet soup of acronyms in the video universe: HDMI, HDR, and so on.

How We See Motion, Color, and Resolution

Knowledge of the human visual system as well as the fundamentals of producing video images is necessary to design and install a video system correctly. This module provides instruction on the science of sight: how we see motion, color, and resolution.

Video Imaging

Knowledge of video imaging processes and functionality is necessary to deliver the highest quality image for the viewer. This module provides a look at the different processes used to display video images. Key areas of video reproduction include scanning processes, video imaging, aspect ratios, and sources for video.

Connectivity, Display Technologies & Calibration

Consumers are presented with many terms, acronyms, and technologies such as OLED and Quantum Dot displays, HDMI, and DisplayPort cables: What are they and what do they do? This module provides information on the differences between common display technologies as well as the cabling infrastructure necessary to support signal transmission. Familiarity with other topics related to video connectivity, displays, and calibration will further enable technicians to successfully install video-related products and infrastructure.

Fundamentals of Equipment Installation

After cabling is in, devices are ultimately attached to that cabling — and mounted in or on walls, and powered up. There's a good bit to learn here about safety, aesthetics, proper placement, and providing clean power to all that gear.

Equipment Installation

The cabling and infrastructure technician is responsible for ensuring equipment installation is accurate, professional, attractive, and safe. This module provides instruction on the critical aspects and best practices of equipment installation in racks and cabinet systems.

Mounting Displays and Projectors

This module details the steps necessary to safely and correctly install equipment such as displays and projectors to walls and ceilings in a variety of scenarios. This requires a working knowledge of task-specific hardware and a variety of fasteners.

Power Quality and Conditioning

Installation of appropriate power protection and conditioning equipment not only reduces the chances of damage to a system, but also improves system performance. Quality electrical power is a common integration challenge. Learners will identify and mitigate the key areas of concern when working with electrical power systems.

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Fundamentals of Retrofit Projects

Retrofits — putting systems into an existing structure — carries with it a set of challenges that are vastly different than integrating technology into new construction. This course will help you create the detailed plans needed for retrofits, and the various techniques used to install cable and gear into walls that are already standing and finished.

Retrofit Project Overview & Planning

Detailed planning is necessary for all retrofit projects. This module provides recommendations on how to plan and organize a retrofit project to support efficient installation practices and minimize impact to the environment.

Retrofit Tools and Supporting Technologies

Working on existing structures requires specialized tools and the knowledge of how and when to use them. Learn the common tools required to complete retrofit projects and information about signal transmission technologies that enable existing infrastructure to be used for new technology installation.

Retrofit Installation Techniques

There is often more than one way to install a cable into an existing structure. This module offers recommendations on common wire and cable installation techniques and recommended practices for solving challenging situations, which will enable a skilled technician to complete their installation quickly and efficiently.

INTEGRATED SYSTEMS TECHNICIAN (IST) PATHWAY

Fundamentals of IT/Networking

Ever heard the clever mnemonic “Please do not throw sausage pizza away?” The first letter of each word stands for the seven layers of the Open System Interconnection model. Confused? You won’t be after learning about this and all the other aspects of basic networking and IT systems.

Introduction to Networking

The topic of network design, installation, and configuration is broad and complex. Networking has become the primary communication system for the integration of technologies. This module provides an introduction to the fundamental components and principles involved in network communication.

The OSI Model

There are two primary models used to describe communications within a network — the Open Systems Interconnection (OSI) model, which breaks down the various stages of communication within a network using seven layers of communication processes, and the TCP/IP model, which is similar, but uses only four layers. While either can be used to describe an IP network, this module employs the full seven-layer model since it can also be used to describe other networks such as Bluetooth, ZigBee, and Z-Wave. Developing a full understanding of the OSI model will be useful when working with other networks in the future.

Network Hardware

A home network commonly requires a number of hardware devices to be present to support data transmissions between connected equipment. This module provides an overview of common types of network hardware available and the role each plays. Familiarity with the common network communications protocols and features available in different types of network hardware enables proper installation and configuration of network devices.

Network Configuration

Proper configuration is necessary to connect devices to the internet. This module provides instruction on the basic connection and configuration of common network devices. Typical configurations include designation of static and dynamic IP addresses, creation of an IP addressing plan, and implementation of best practices for SSIDs and guest networks.

Fundamentals of Distributed Audio

For many homeowners, the most satisfying experience delivered by their integrated home is the ability to listen to music in any room of that home. There are different systems and methods to deliver that experience, and you’ll learn how to fill a structure with sound efficiently, beautifully, and often in a manner that’s hidden from view.

Distributed Audio

Distributed audio, also known as multi-room, multi-zone, or whole-home audio, enables one or more audio sources to be distributed to many rooms around the home. This module provides an overview of distributed audio sources and system topologies, along with technical design requirements for optimal performance and safe installation.

Types of Distributed Audio Systems

There are four common distributed audio system technology platforms: multi-zone low impedance systems, constant voltage systems, audio over point-to-point twisted pair cabling, or audio over a wired or wireless network. This module provides details on these platforms, the benefits and limitations of each, and how selecting a platform will affect the necessary infrastructure cabling to support the system.

System Design and Wiring

When designing distributed audio systems, it is extremely important to be well versed in applicable electrical theory

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as well as the physics of sound pressure waves. This module provides knowledge that is essential to different aspects of design and installation, from troubleshooting complicated system problems to something as simple as proper planning of a speaker cable run.

Fundamentals of Subsystems

Every home has systems that can be controlled manually — think of simple, old-school binary light switches and roller shades, for example. But when automation or connected technologies are added to those systems, they become part of a greater experience, and you'll learn how to deliver another level of magic to your clients.

Lighting and Lighting Control

Lighting in modern homes has evolved from a handful of overhead fixtures that provide general illumination in a space to multiple lights in a room installed to meet specific needs and make a space more usable. The addition of lighting control in a home takes aesthetics and functionality to a new level. Integration and automation of lighting systems is a popular and profitable offering for many technology professionals. This module provides an overview of lighting hardware as well as information regarding common lighting control technologies.

Energy Monitoring and Management

Many clients are interested in the benefits of managing and reducing energy usage. Managing energy consumption is often a multi-pronged approach, where the energy usage must first be monitored, and then decisions can be made regarding control and management. This module provides a look at the key components necessary to support the goal of reducing energy usage and costs.

Motorization in the Home

Motorization makes many technologies easier to use while often providing concealment for aesthetic reasons. Motorization allows a room to serve different roles and when integrated with other systems, one button push can initiate multiple functions making the motorization just one part of a series of related functions. When automated, these functions — such as blinds opening and closing depending on time of day and year — can take place with no user input. This module provides recommendations for working with motorized equipment to ensure system reliability and environmental safety.

Fundamentals of Home Cinema

What's the difference between a dedicated home cinema and a media room? What considerations need to be taken into account when it comes to delivering the best possible image and sound to that space? The variables are endless, but you'll learn how to tackle the complexities of ensuring your clients receive the best possible experience when watching movies and sports, and even playing their favorite video games.

Home Cinema and Audio Components

Explaining the concept of a home cinema and media space will go a long way to pleasing the client. This module

provides an introduction to the key concepts of home cinema and media spaces, as well as some basics on audio system components.

Design Considerations and Recommended Practices

There are several things to consider when designing home cinemas and media spaces, including speaker placement, screen size, seating location, and room shape and size. This module provides the foundational knowledge needed to begin properly designing these spaces. A number of the items introduced may be further examined in more advanced CEDIA courses.

Performance Goals and Metrics

Acoustics is an important, but complex area of cinema design. This module provides fundamental knowledge about how the overall environment of an entertainment space can affect the listening experience. Expertise in the area of acoustics requires extensive study and experience, but awareness of the effects of common construction methods and the correct usage of room treatments will support successful outcomes for those getting started in this challenging discipline.

Fundamentals of Systems Control

A critical element in any integration project is the control system, the user interface or "UI." These solutions come with their own set of challenges when an integrator is trying to create an intuitive, frictionless means of operating the connected home's various systems.

Systems Integration, Control, and Automation

The ability to enable multiple devices to work together for ease of control and improved functionality is the primary goal of the systems integration industry. This module provides an overview of the fundamental concepts of device-to-device (D2D) communication. The ability to identify common communication protocols is necessary to understanding the right questions to ask a client to successfully integrate their space.

User Interfaces

User interfaces (UIs) range from remote controls to mobile devices to voice assistants. This module provides an introduction to the key concepts involved when working with user interfaces. Knowledge of the various types and functions of UIs enables design and implementation of a system that meet a client's real needs.

Programming Fundamentals

Systems programming is a complex and challenging discipline, but for many integration professionals, mastery of the fundamental skills leads to a highly rewarding career. This module provides instruction on basic programming concepts including command types, macros, Boolean logic, and conditional statements. Programming of control systems involves knowledge of multiple disciplines, including communications, protocols, and user interface (UI) design. It also requires an ability to think logically through various steps to reach a final outcome.

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Fundamentals of System Commissioning

A key to any successful integration is that last five or 10%. This course covers what you need to know about verifying that a system works properly, that devices are configured correctly, and that the homeowner understands their system, how to operate it, and what components might require service in the future.

System Verification & Troubleshooting

Before completing a project, every function must be tested and verified for proper operation. This module provides details on the verification process as well as the recommended steps to troubleshoot any items that don't perform as expected.

Video & Audio Configuration

Performing a basic setup of all audio and video devices

is the minimum requirement for all projects. This module provides an introduction to the fundamental steps required to complete a basic configuration for all entertainment systems. A skilled technician can complete these requirements efficiently and ensure a quality experience for every client.

Client Orientation, Project Completion, and Ongoing Service

Obtaining final client signoff for substantial completion is a critical step as the project closes and transitions from the installation team to the service team. This module provides instruction on the process and recommended practices for client orientation and final system handoff, as well as the transition to ongoing support. This final step of the process is critical to client satisfaction and a smooth and efficient ongoing service process.

IMAGING SCIENCE FOUNDATION - DAY 1 ONLINE

Imaging Science Foundation - Day 1 Online

The first part of the three-day ISF course covers the basics of video calibration. Any display, from the most advanced two-piece projection system to the simplest flat screen, can be improved vastly by learning and applying the techniques developed by the Imaging Science Foundation.

Managing and Measuring Human Vision and the CIE Model

In this module, human vision and the CIE model are covered in-depth. Having a foundational understanding of these topics will assist ISF calibrators throughout their careers.

White Balance in Analog Color

Calibrating televisions with the appropriate white balance is a crucial part of ensuring the best picture possible. In this module, learn the reasoning for and impacts of calibration.

Development and Evolution of Video Display Standards

The way video displays appear in today's market is the culmination of over 150 years of work. In this module, learn why understanding these standards and guidelines is an imperative part of becoming an ISF calibrator.

How Digital Video Standards Simplify and Demystify Calibration

Getting the whole picture and nothing but the picture while watching television is essential to consumers, but unfortunately many televisions come set to a factory menu option that may not give the consumer the best picture. This module will demonstrate how to give the client what they are looking for.

The Language of Light and Color Volume

Every visual art has a language of light that conveys the

artistic intent of the creators. Painters use textures, colors, shading, and tones. Photographers can capture both natural and artificial light, and can add limitless lighting effects in editing and printing. Videographers are the same. In this module, gain an understanding of why television systems are considered a Language of Light.

Level 1 ISF Calibration Basic Steps

Display technology has evolved tremendously over the years, but the goal remains the same: match the picture on the television used for reproduction to the monitor used for production. This module details how to get there.

Level 2 and 3 ISF Calibration Preview

There are several steps involved in the ISF Level 3 SDR workflow. Upon completing this module, learners will have previewed all steps and be prepared to get hands-on with colorimeters and UHD generators in the Level 3 session.

Understanding HD and UHD Screen Sizes and Viewing Angles

We thought we understood human vision and why television systems were failing, but we were wrong. This module tells us why we were wrong and dives into the critical topic of viewing distances.

Physics and Math of Calibrating White Balance

An ISF calibrator must understand where the industry came from and where it is going. This module introduces two individuals who played a large part in what our calibration techniques mean today.

Three Dimensional RGBCMY Color Management

A critical part of becoming of ISF certification is knowing how to calibrate primary and secondary colors in three dimensions. Throughout this module, learners will receive important tips and practices to perform this type of calibration.

CYBERSECURITY

Cybersecurity for Integrators

“Anything that can be hacked, will be hacked,” is a bit of conventional wisdom that should be of concern for every integrator. The modern connected home is filled with devices that can be compromised by bad guys, and here you’ll learn how to protect your clients from attacks — and protect your company, too.

Introduction to Cybersecurity for Integrators

Today, there are more connected devices online than ever before and the data they are generating is increasing at a rapid rate. As more devices become network-enabled, the implications and scope of security incidents become greater, making the need to secure these devices more important than it has ever been. This module provides an introduction to cybersecurity and an understanding of why it is an important topic for integrators.

Cybersecurity Basics for Integrators

Cybersecurity is a growing concern for Internet of Things (IoT) and smart home devices. The challenge of securing systems is a new, and increasingly more important skill set for many technicians and business managers. This module provides an overview of the various threats to system security, key areas to improve current security, and the basic knowledge of the National Institute of Standards and Technology (NIST) framework for cybersecurity.

The NIST Cybersecurity Framework

To better manage cybersecurity risks, organizations need to take a structured approach to improve systems, policies, and processes. This module provides an introduction to the National Institute of Standards and Technologies (NIST) Cybersecurity Framework and how it can be applied to an integrator’s business and client systems. Such an approach involves addressing an organization’s most critical concerns, implementing security metrics, and making improvements over time.

AV-OVER-IP

AV-over-IP

As technology rapidly evolves, the ability to deliver quality audio and video signals via IP has become more and more reliable, providing better and better experiences for clients. In this AV-over-IP course, you’ll learn about the exciting new ways to distribute and deliver content throughout the modern home using these techniques.

Basics of AV Distribution and AV-over-IP

Utilizing Audio Video-over-Internet Protocol (AV-over-IP) capabilities have enabled audio and video distribution to be more efficient, reliable, scalable, and cost-effective. AV-over-IP has emerged as a technology that is capable of replacing traditional matrix switching hardware in favor of standard IP network switching infrastructure. This module provides an introduction to AV-over-IP technology as an option for distributing high-quality multimedia content.

AV-over-IP for Integrators

AV-over-IP technology continues to mature and evolve as

an option for distributing high-quality multimedia content. Knowledge of the evolution of AV distribution allows integrators to look for new ways to satisfy client viewing habits as content quality improvements and cabling standards create new challenges and opportunities. This module provides education on the basics of video, the technical architecture and use cases for an AV-over-IP system, and the networking, cabling, protocols, and other considerations to allow AV to be distributed over the IP network.

AV-over-IP Under the Hood

Successful deployment an AV-over-IP distribution system relies heavily on an intricate knowledge of advanced networking protocols and configurations. Developing the ability to properly design and configure an AV-over-IP distribution system can support success for clients and enable environments with scalability for future system growth. This module provides a deep dive into the performance paradigm, describes common compression techniques, and discusses other potential alternative distribution solutions to AV-over-IP.