

About Broadcast Engineering Specialized Training Videos

Broadcast Engineering Specialized Training is a unique learning experience providing you with video training from some of the industry's leading experts. Purchase the entire series and benefit from a discount or purchase modules individually.

- A unique video training course written by and presented by an industry expert.
- All sessions are recorded in HD.
- 90 Days of On Demand Access from your purchase date.

Course Pricing

You have the option of purchasing the full training course at a discounted rate of \$185. This option includes all eight training modules and will provide you with access to the training course for 90 days. You may also purchase individual modules at a rate of \$29 per module. Each module is 45-60 minutes in length. Modules may be viewed stand-alone, but Module 1 is foundational for the other seven.

Full Session – File-based technology and workflow

Today's complex production and broadcast systems are increasingly 'data centric'. Content is digital and workflows are file-based. This requires engineering managers, chief engineers and technicians to understand how to generate, move, store and QC media, all within a digital and file-based environment. This eight-part video series, "File-based technology and workflow: The essentials of professional networked media" will provide both the experienced engineer and technicians with a integrated and thorough tutorial on key fundamentals required to manage today's increasingly IP-centric audio/video facilities. Students learn about A/V networks; maintaining frame-accurate I/O with IT systems, storage systems; RAID, the trade-offs between MTBF and MTTR protection. Storage networks including; SAN, iSCSI and NAS are compared. Fibre Channel and Ethernet are contrasted as networking topologies. TCP and UDP for AV file and stream transport is explained. Transition strategies to IPV6 are reviewed. AV timing domains are explained along with three fundamental time-based control methods. MAM essentials, MXF, file wrapper formats, metadata standards, the physical and logical layout of MXF are covered. The training concludes with a lecture on cloud computing and storage for A/V media.

Module 1 – Introduction to file-based technologies

The essential elements of AV/IT systems and file-based technology are reviewed. This includes the eight converging forces, three fundamental modes of transfer, client types. Hybrid AV/IT systems are compared to traditional AV systems showing the pros/cons of each method across 17 different metrics. Key methods are developed showing how to achieve video frame-accurate I/O with IT networking.

Module 2 – Storage systems for audio/video workflows

This material covers storage and the systems technology that underpins AV/IT systems. Consideration of storage virtualization, clustered file systems, hierarchical storage, storage connectivity, ATA vs. SAS drives, and optimizing storage for real-time AV I/O. SAN, iSCSI and NAS are compared. Fibre Channel and Ethernet are contrasted as SAN conduits. Storage QoS metrics, data transfer acceleration and caching methods are applied to AV systems.

Module 3 – Software technology for AV

Software systems organization is explored including system classifications and comparisons. Distributed models are explained, including client/server, peer-peer, Web services models (W3C and REST) and middleware's role. The service-oriented architecture (SOA) is explained with application to AV systems. Media services are explored with review of industry progress and the FIMS Initiative (Framework for Interoperable Media Services). Cloud basics are reviewed. Data center virtualization scenarios and their usage are explored for AV workflows.

Module 4 – Reliability and scalability methods

File-based technology depends on reliable IT platforms. This module develops the basics of high availability (HA) systems design, including RAID storage-array classifications and their operation for real-time AV. Trade-offs between MTBF and MTTR are examined in the context of high availability for AV systems. One- and two-dimensional RAID error correction means are compared. Alternate techniques for array reliability are described. Advantages and cautions of AV data striping are outlined. Fifteen strategies for creating HA designs are presented using standard IT methods.

Module 5 – Networking basics for AV

Basic network stacks are examined. Understanding layer 2 vs. layer 3 and the advantages of each layer. IPv4 LAN segmentation/VLANs are explored with real-world examples. Transition strategies to IPV6 are reviewed. TCP and UDP is explained and compared for AV file and stream transport across short and long distances. Techniques are outlined for speeding up file transfers across long distance and for cloud storage. The new IEEE Data Center Ethernet standard is applied to media systems. Switched and nonswitched WAN techniques are classified and segmented for AV use. Seven layers of QoS for transport are explained. MPLS is reviewed for interfacility streaming and file transfer.

Module 6 – Systems integration concepts

This section ties other module concepts together to create full-featured hybrid AV/IT systems. The three planes (data, control and management) are explained and applied to AV workflow design. Eight AV timing domains are explained along with three fundamental time-based control methods. Interoperability fundamentals are outlined. Other coverage includes file wrapper formats, metadata standards, the physical and logical layout of MXF and relevant specs from industry bodies. MAM essentials are explained. The “butterfly” problem is examined in relation to multiformat, multiplatform, multi-endpoint program distribution. Workflow patterns are reviewed.

Module 7 – Security for networked AV systems

Enterprise defense fundamentals are reviewed, including building blocks for the secure media facility. Included are understanding life-cycle threats, five tactics for secure isolation, bridging business and mission-critical media operational domains. Data encryption basics are explained using simple examples. Public and private key methods are compared. Digital signatures are explained and applied to AV materials. Program watermarking and fingerprinting methods are reviewed with applications.

Module 8 – The fundamentals of cloud computing

Cloud computing will change the landscape of the media facility. Coverage includes review of fundamentals and business benefits, the comparison of three cloud types, and examples of elasticity. Public and private clouds are contrasted. The “pay by the sip” cost models are examined. Server virtualization is shown to be a key enabling technology for secure, efficient and on-demand use of cloud computing resources. Compute benchmarks are provided. Examples of cloud-based, media-related applications are reviewed. The future is contemplated.

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Module 1 – Introduction to file-based technologies	_____ \$29.00
Module 2 – Storage systems for audio/video workflows	_____ \$29.00
Module 3 – Software technology for AV	_____ \$29.00
Module 4 – Reliability and scalability methods	_____ \$29.00
Module 5 – Networking basics for AV	_____ \$29.00
Module 6 – Systems integration concepts	_____ \$29.00
Module 7 – Security for networked AV systems	_____ \$29.00
Module 8 – The fundamentals of cloud computing	_____ \$29.00

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