

# Understanding SMPTE ST 2110:

Standards for Professional Media Over Managed IP Networks, endorsed by IEEE BTS

## New Six-Course Program from SMPTE

The SMPTE ST 2110 Professional Media Over Managed IP Networks suite of standards is a major contributing factor in the movement toward implementation of internet protocol (IP) in professional media-creation facilities. The SMPTE ST 2110 standards suite specifies the carriage, synchronization, and description of separate elementary essence streams over IP for real-time production, playout, and other professional media applications enabling interoperability of ST 2110-compliant equipment.

To help prepare organizations to meet the demands of an IP-based infrastructure, SMPTE has created an online learning course program to train engineering staff on the rules and implications of SMPTE 2110.

Understanding SMPTE ST 2110: Standards for Professional Media Over Managed IP Networks, endorsed by IEEE BTS is a series of six online courses now available in the IEEE *Xplore* digital library.

Designed for engineers and technologists who need get ahead of the curve in adopting IP-based media technologies and workflows, understand how IP can be implemented in your professional media creation facility to ensure interoperability between all ST 2110 compliant equipment.



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## Understanding SMPTE ST 2110 Quick Facts

Six one-hour courses for professionals working with all elements of broadcast production: video, audio and metadata

Courses developed and peer reviewed by experts in their fields, a process that guarantees the quality of technical content

Printable IEEE CEU or PDH certificates awarded upon successful completion of the program

Available on-demand through the IEEE *Xplore* Digital Library or order files to load on a company LMS

Organizational pricing available: pay one price for perpetual access for all users in an organization. Multi-program discounts also available.

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# Understanding SMPTE ST 2110: Standards for Professional Media Over Managed IP Networks

## Course Titles and Descriptions

Upon completion of this six-course program, participants should be able to perform the following:

### Background and System Overview

- Describe why the move to IP is important for the broadcast industry, explain how media is transported over IP networks, and specify the different areas of application for SMPTE ST 2110 and SMPTE ST 2022

### Video Encapsulation

- Explain advantages of uncompressed video in live TV production and why it is better to transport active video only, describe how video image is segmented into sample row data for transport in RTP packets, apply knowledge of SMPTE ST 2110-20, and calculate size and number of RTP packets for 1 frame of video

### Audio Encapsulation

- Explain how AES6 works and describe its PTP profile, describe additional constraints SMPTE ST 2110-30, detail the differences between audio transport for LPCM and AES3 as per SMPTE ST 2110-30 and -31, and determine channel grouping symbol

### Data Encapsulation

- Explain how a specific ancillary data type is identified/what the identifier is, describe how ANC is packaged into RTP as per SMPTE AT 2110-40, and detail what constraints on ANC in RTP exist

### Synchronization and Identification

- Explain how the PTP synchronization system works/what PTP profiles exist, describe the functions of the different clocks of a device and how it relates to RTP timestamp creation in SMPTE ST 2110, signal specific media essence, and describe the session properties and identify what media format was signaled

### Traffic Shaping and Delivery Timing

- Explain reasons why a timing model for SMPTE ST 2110-10 RTP streams is needed, explain the two SMPTE ST 2110-21 parametric models, determine the Packet Read Time for specific Packet Read Schedule and image format, explain SMPTE ST 2110-21 Virtual Receiver Buffer Model, describe the different compliant sender and receiver types and synthesize the Cmax values for different sender types and image formats

## Course Instructors

Thomas Bause Mason will guide learners in exploring SMPTE 2110 and its tremendous potential.

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