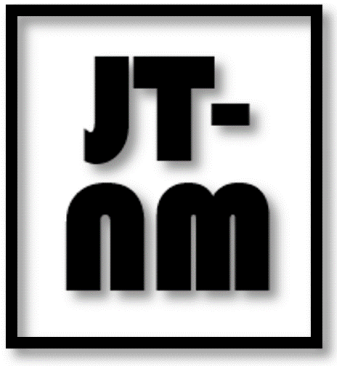


Joint Task Force on Networked Media

ProAV Technology Roadmap

15 January, 2021

Ownership and copyright

ProAV TECHNOLOGY ROADMAP

Executive Summary

The goal of the JT-NM ProAV Technology Roadmap is to build upon established Broadcast audio/video standards to define a practical set of AV-over-IP specifications suitable for wide-spread adoption by the ProAV industry. The roadmap addresses the following areas: Media Transport, System Control, Time Services, and Directory Services. While acknowledging that ProAV standards and equipment may be used anywhere, the following definition is used to scope the JT-NM ProAV Roadmap:

The market for audiovisual (AV) communication equipment used in professional, industrial, commercial, and retail environments as a means to communicate with people.

Note that in addition to this roadmap, the JT-NM maintains a list of PROAV User requirements which may be viewed at:

https://github.com/AMWA-TV/pro-av-user-requirements

EXAMPLE APPLICATIONS

Examples of ProAV applications include but are not limited to:

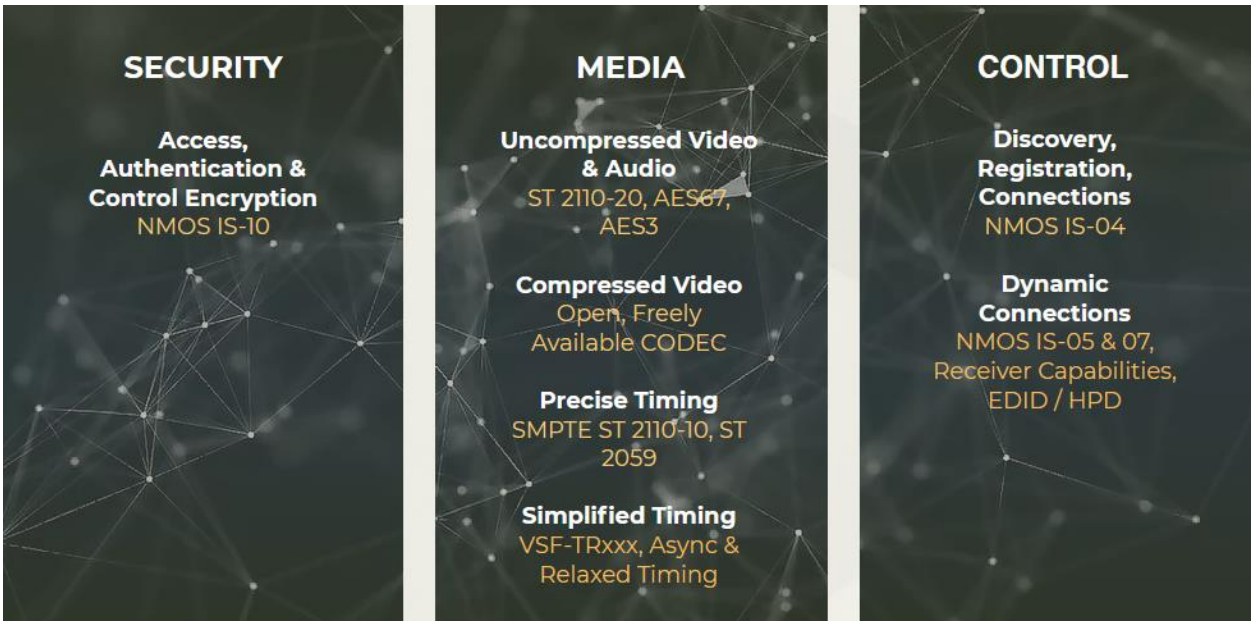
- AV systems in public or private spaces in business, education, government, hospitality, restaurants, sports venues, including mission-critical systems for evacuation and other kinds of emergency response
- AV systems for emergency call centers (e.g. 911 systems) and related control rooms
- Digital signage systems
- Background music and noise-masking systems
- Parliamentary conferencing and simultaneous translation systems
- AV systems used for the production of live events for school sports, local government meetings, and other events that are typically supported by non-professional production personnel.
- AV systems used in corporate, industrial, health, and educational venues for meetings, training, and meeting room presentation purposes.
- Boardroom presentation and teleconferencing systems
- AV systems that participate in mass notification systems as defined by, for example, the U.S. National Fire Prevention Association (NFPA).

KEY FEATURES

- Secure from the start
- Low-cost installation/maintenance
- Scales to and integrates with broadcast SMPTE ST 2110/AMWA NMOS installations
- Compressed/uncompressed video & audio
- Simplified timing and infrastructure requirements
- Interoperability with existing IP-based broadcast facilities
- Open discovery & registration services
- Appropriate open control and configuration features
- Supports software-only implementations

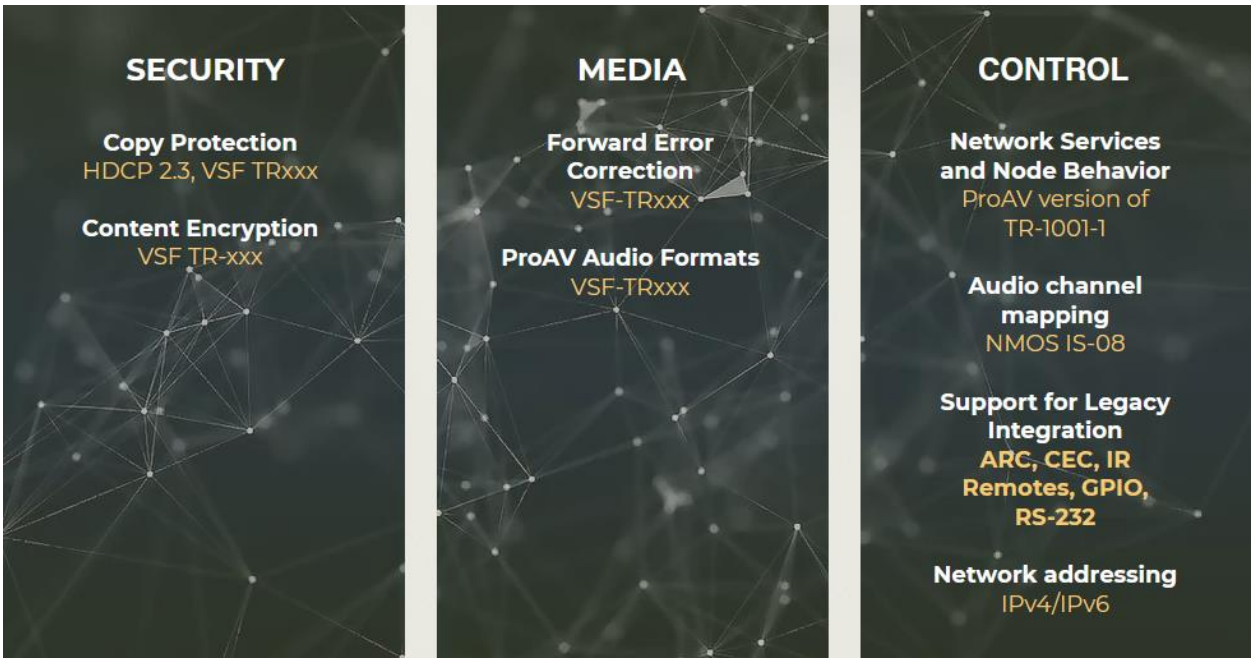
PROPOSED ROADMAP

PHASE 1



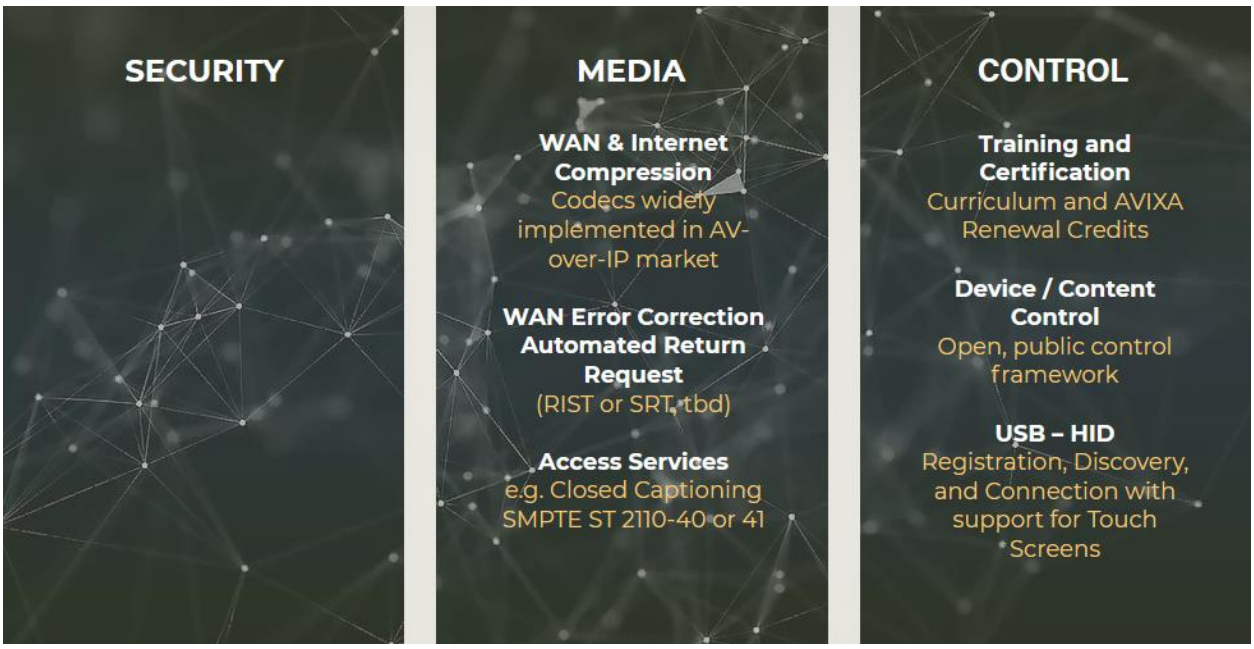
Phase 1 focuses on secure control, essence transport, timing, and connection management. The work in this phase consists of identifying existing standards and specifications that can be applied to the A/V over IP effort, and creating new standards and specifications if required. JT-NM stresses the use of existing work over creation of new technology, if possible. As an example, the ProAV user requirements specify simplified timing, as compared to the timing approach currently taken in the SMPTE ST 2110/PTP for professional applications. In this case, the Video Services Forum is developing a document (VSF-TRxxx, Async & Relaxed Timing) which builds on existing standards, but describes how to use those standards to achieve a timing implementation that is simplified.

PHASE 2



Phase 2 builds on basic functionality by adding additional functionality as required by the ProAV user Requirements. As with Phase 1, this phase seeks to identify existing standards and specifications, if possible.

PHASE 3



Phase 3 adds elements critical for ProAV WAN applications, and support for access services such as Closed Captioning.

TIMING & NETWORK INFRASTRUCTURE

- Simple/Relaxed Timing
    - Support for synchronous and asynchronous sources
    - No latency penalties
    - PTP optional/relaxed requirements
    - Automatic synchronization of audio/video streams
- Simple Network Infrastructure & Network Services

CONTROL

In order to facilitate rapid integration and implementation of IPMX environments, certain elements of the control and management environments must be implemented using open public APIs and protocols.

Common Elements:

- Adding new elements to the environment through semi-automated configuration
- Provisioning (reading and changing) certain controls during build-out
- Operating (reading and changing) certain controls dynamically
- Inventorying the media devices and streams generated by devices
- Distributing/Connecting media streams to destination devices
- Monitoring (reading) certain operational status values
- Reporting certain operational events to a logging system
- Maintaining the management system relationship with the devices
- Integrating with other enterprise subsystems
- Securing access to the management environment and protocols

JT-NM REQUEST TO MEMBER ORGANIZATIONS

JT-NM requests that any JT-NM member organizations who undertake technical development of items on this roadmap, at the conclusion of any significant deliverables, evaluate those deliverables against this roadmap and the JT-NM ProAV User Requirements.

CONTRIBUTORS

Jeff Berryman - Bosch	David Chiappini - Matrox
Bruce Devlin - SMPTE	Jack Douglass - Packetstorm
Richard Friedel - Fox Television	Brad Gilmer - AMWA
Hans Hoffmann - EBU	Thomas Kernen - Nvidia
Ievgen Kostiukevych – EBU	Ethan Wetzell - Bosch

Jean Lapierre - Matrox	John Mailhot - Imagine
Karl Paulsen - Diversified	Danny Pierini - Matrox
Bob Ruhl - VSF	Andrew Starks - Macnica
Andre Testra - Matrox	Willem Vermost - VRT

ACKNOWLEDGING THE ALIANCE FOR IP MEDIA SOLUTIONS (AIMS)

JT-NM wishes to acknowledge and thank the ProAV Working Group of the Alliance for IP Media Solutions (AIMS) for an initial contribution to the JT-NM ProAV Technology Roadmap. This provided a starting point for this work.

AIMS surveyed the market to discover use cases and determine the demand in the market for an open standard for ProAV. They drafted a marketing roadmap for ProAV, they developed the marketing name IPMX (IP Media eXperience) to promote AV-over-IP standards, and they continue to promote and evangelize open standards for the AV-over-IP market.