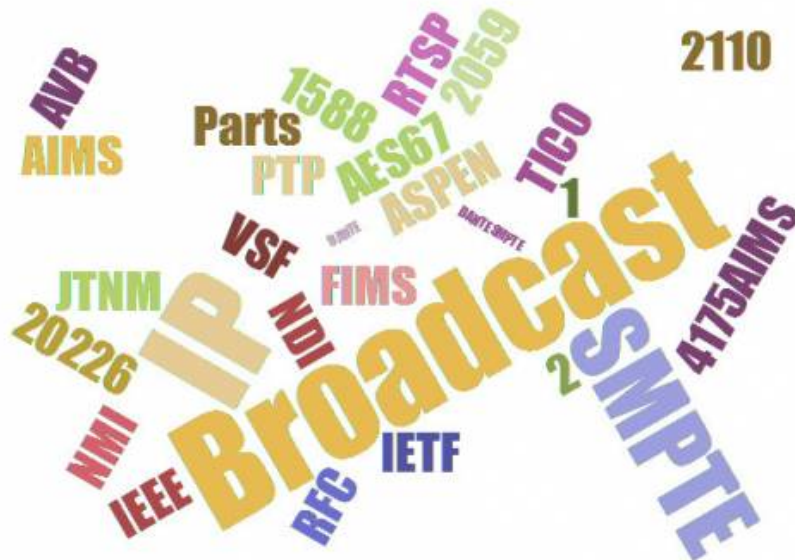


Understanding the Terminology Behind IP Standards



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The broadcast and production industries are filled with acronyms and terms. The author provides guidance into understanding them.

I was due to write another terminology article and thought doing one that explains the terms, alliances, and standards might be helpful. There is no shortage of new terms, so let's get started.

So here we go!

There's AIMS, ASPEN, VSF, NDI, NMI, FIMS, AVB, TIC0, RTSP, DANTE. But no sentence would be complete if we didn't toss in a little SMPTE2022-6, AES67 with a touch of SMPTE 2059 Parts 1 & 2 and just a smidge of PTP aka IEEE 1588.

But wait, there's more! SMPTE 2110, coming soon to a Standards Committee near you!! AND then let's not forget IETF – RFC 4175. OMG - I almost forgot JT-NM.

AIMS - or better known as - AIMS Alliance | The Alliance for IP Media Solutions. This is a trade group that grew out of the Video Services Forum (**see VSF**) to promote their ideas and concept for a video over IP standard. This group is promoting the VSF TR03 and TR04 “protocols”. **TR** stands for Technical Recommendations. [The Broadcast Bridge](#) has supporting **articles here and here**.

ASPEN – (Adaptive Sample Picture Encapsulation). This term originated with [Evertz](#) and their IP initiative and others who wanted compatibility with the Evertz product line. ASPEN is based on MPEG TS using SMPTE ST 302 (audio over TS), SMPTE ST 2038 (ancillary data over TS) and some of SMPTE 2022.

VSF - Video Services Forum. This group originated in the Telco industry looking at video transport over telephone networks between RBOC's – (Regional Bell Operating Companies). These were the Baby Bells created when Ma Bell was broken up.

VSF redefined its mission to video networking and as the broadcast industry moved to IP, VSF has re-aligned its focus on video over IP in the broadcast space. The group created two technical references which are being proposed as Standards TR03 & TR04, the AIMS initiative.

NDI – (Network Device Interface). [NewTek](#) has tossed its hat in the IP Standards ring for interoperability consideration. With a large user base of their products, they have a good start for adoption. Their products are very IP centric already.

NMI – (Network Management Interface). This is a [Sony](#) technology that includes both a protocol and hardware (chip) device. This is actually a compression technology to squeeze high bitrate video, like UHD, 4K and higher resolutions, into an IP pipe.

Sony has been using their own LLVC (Low Latency Video Codec) codec embedded in their products for quite a while and forgot to mention it to their customers. It kind of leaked out as they are promoting their NMI as a standard. They have now submitted it to SMPTE to be considered as a standard.

FIMS – Framework for Interoperable Media Solutions. This is an EBU initiative with much of the broadcast industry as members. Their core focus was on file based media transport over networks and creating an interoperable embedded protocol so end devices knew what to do with the file when it arrived. Currently they are standing on the sidelines in the live IP format wars.

AVB - Audio Video Bridging also known as IEEE 802.1BA, 802.1Qat, 802.1Qav and 802.1AS. This was supposed to become the industry standard and move on, but that didn't quite happen. A lot of the transport guys liked it and adopted it in the fiber extender mesh technologies. For a while it seemed like it might succeed as a standard.

TICO - The TICO Alliance is focused on UHD and higher resolution imagery that all need compression to fit in the pipe.

JT-NM - Joint Task Force on Networked Media. This was created by the EBU, SMPTE and VSF to support the transition to IP.

RTSP – Real Time Streaming Protocol falls under Internet Streaming and being adopted for real time streaming over networks. This probably plays a larger role in optimising network performance to support live IP across the network and less involvement in the IP live standards wars.

IETF - Internet Engineering Task Force develops and promotes voluntary Internet standards. Now that “professional” video and audio are transported over the same networks as internet traffic Ethernet or IP. They are contributing recommendations, standards and protocols. Their mechanism for technical suggestions comes under RFC – Request For Comments. Sometimes the IETF adopts some of the RFC's as Internet Standards.

DANTE - (Digital Audio Network Through Ethernet) was developed by Australian company [Audinate](#). It is being proposed as an Audio over IP Standard, not to be confused with AES67 or SMPTE ST302.

Standards – there are many

SMPTE 2022 – 5,6,7 – These are the three (currently popular) of the seven part SMPTE 2022 Standard that describes how to send digital video over IP networks. Most of the standards proponents accept SMPTE 2022 as video and then use different encapsulating schemas.

SMPTE 2059 Parts 1 and 2 - These are the timing and synchronising standards. This is based on the IEEE 1588 Precision Time Protocol (PTP) standard.

SMPTE ST 302 - This audio standard specifies how to transport AES3 audio in an MPEG-2 TS stream.

SMPTE 2110 – This is the SMPTE designation assigned to the VSF TR03 & TR04 submittal as the Standard to transport audio and video over IP networks.

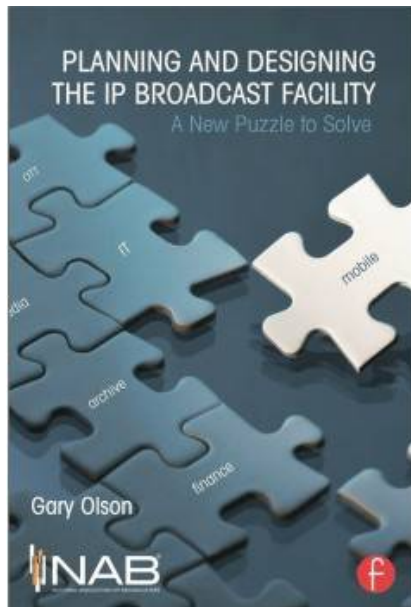
AES67 – This is the mostly accepted standard for audio over IP.

TR04 – So the first thing to notice is that this is the second protocol, not the first one. This is basically encapsulating the SDI embedded stream into IP. What this means is that each end device first decapsulates and then debeds audio and video plus any ancillary data.

TR03 – This is keeping audio, video and ancillary data as separate streams multiplexed with PTP to keep them in sync (remember analog) then multiplexing command and control, communications as VoIP, and everything else that needs to be transported as part of the stream. The concept here is that audio consoles don't need video and production switchers (vision mixers) don't need audio. If we send separate streams, it reduces the processing end points needed to perform before and after their core functions.

RFC4175 – This is the IETF protocol to encapsulate SDI to an IP Stream for transport. Think of this like the container concept for files. MXF, BXF, QT are containers. You still need the matching codec when

you unwrap the container to work with the content. RFC4175 is only the encapsulating technology not the transport protocol.



Editor's Note: Gary Olson has a book on IP technology, "Planning and Designing the IP Broadcast Facility – A New Puzzle to Solve", which is available at bookstores and online.

Other related articles posted on The Broadcast Bridge.

[Decoding IP terminology: Part 1](#)

[Decoding IP terminology: Part 2](#)