



P1722.1 Use Case

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Use-Case Summary

This description gives an 802.1AVB Use-case for large-scale live-audio events

Key Requirements:

- Multiple vendors must independently operate on one network
- A balance of auto-configuration and manual configuration is desirable for repeatable, predictable operation.

Pro Audio Use Case Block Diagram

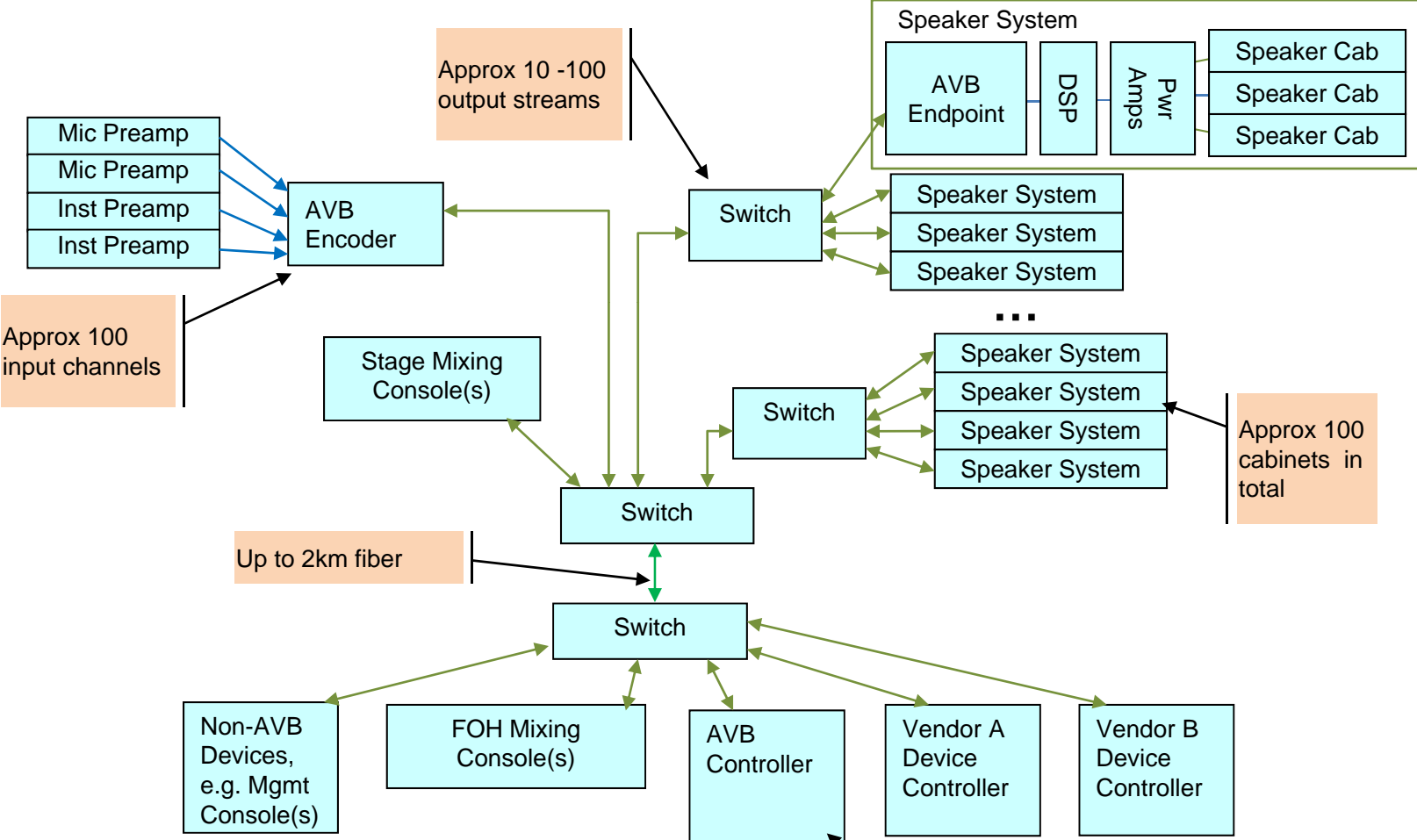


Figure 1: Use Case Block Diagram

Controller:
 - Address management
 - Stream identification

Interworking Goals

- Allow speaker systems, AVB-enabled switches, microphone and instrument pre-amps and mixing consoles to be interconnected to create a reliable, easy-to-use sound reinforcement systems.
- **Minimize configuration complexity**, (e.g. MAC addresses shall not be tapped into a keypad to make a stream happen.)
- **Maintain enough centralized control to ensure reliable, predictable and repeatable configurations.**

Interworking Non-Goals

- Standardized Application-specific and Device-specific configuration isn't a requirement... Just get the streams to flow...

Assumptions

- Multiple Speaker Control and Mixing Console systems may be in separate administrative domains.
 - They're all plugged into one AVB network, but each requires its own focus of control, with “just enough” visibility into each others' devices.
 - E.g. Not every controller can set up connections on every part of the network
- A system controller may be beneficial in this network
 - i.e., completely automatic self-configuration is not required
 - Functions that cross administrative domains should be minimized
 - Failure of a System Controller should not affect the flow of established streams.
- WiFi / 802.11 is not expected to be used for audio connectivity
 - But WiFi might be used for network control
- Devices may not be physically accessible without substantial effort.
 - i.e., access must not be required for control and/or configuration.

Scaling

In one L2 network domain, there might be:

- ~100 streams from sources to one or more mixing desk(s)
- More than one mixing desk
 - Microphone/instrument channels may be multicast to monitor, Front-of-House (FOH) and recording mixers
- ~10 multicast streams from FOH mixing desk to stage (or ~100 multicast streams in the case of large fixed-install conference centers)
- ~100 speaker cabinets.

Areas where Interworking Must Work

- **Transport protocol, P1722/1733**
Endpoints must identify/configure the expected bit rates... 48, 96 kHz and 192kHz x 24 bit are all used
- **Stream configuration**
i.e. endpoints must agree on which MAC address corresponds to which program stream, with what coding & rate
- **L2 and L3 address assignment**
MAAP for L2, ZeroConf or whatever for L3
- **Multicast tree pruning**
Fully covered by MMRP, aka 802.1Qak?
- **Bandwidth Reservation**
Fully covered by SRP

Areas where Interworking Agreements Might be Helpful

- Network Security, Authentication, Access Control, possibly Encryption
- Device Naming
- Transport Protocol Performance Monitoring
 - E.g. RTP/P1733 has the associated RTCP where end points can report transmission impairments such as lost packets in a standardized way
- Redundancy Plan
 - Spanning tree provides basic redundancy, but additional standardized redundancy may be valuable.
- Fault Diagnosis

