

# AVB Network Sizes

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# AVB performance

- Low latency
- Guaranteed network latency
- Guaranteed network bandwidth for media
- No need to reconfigure switches because of audio routing changes

# What happens as a network increases in size?

- Tiny networks
- Small scale networks
- Medium scale networks
- Large scale networks
- Considerations for deploying large scale networks

# Tiny scale AVB networks

- Either direct connection or a single low port count switch
- One or two talkers
- No need for media clock management

## Tiny scale AVB networks

- 1 Talker, 1 Listener, 1 Stream
- 1 to 24 channels of audio @ 48 or 96 kHz
- Digital Snake
- Computer to AVB Speaker
- Audio input box to AVB Speaker
- Tunnelling 8 MADl connections point-to-point through a GigE network (448 channels)

# Small scale AVB networks

- Home media centre
- Home studio
- More than a few different Talker streams
- Ability to manage media clock separately from media

# Small scale AVB networks

- One Controller, possibly embedded in a Talker or Listener
- One or two switches
- All media fits on one network link
- Any media can go anywhere

## Small scale AVB networks (home)

- 100baseT Ethernet
- 4 AVB Talker devices
- 8 channels per stream (48 kHz)
- 1 stream per AVB Talker device (8 ch)
- 4 media streams + 1 media clock stream
- 32 channels
- 74 688 000 bps



## Small scale AVB network (studio)

- Gigabit Ethernet
- One 24 port switch
- 14 AVB Talker devices
- 8 channels per stream (48 kHz)
- 3 streams per AVB Talker device (24 ch)
- 42 media streams + 1 media clock stream
- 336 channels
- 724 032 000 bps

# Medium scale AVB Networks

- Live theatre / musical
- Live concert
- One or two Controllers
- Multiple 24 port switches
- Mostly Gigabit Ethernet
- One 10 Gigabit Ethernet Fibre link for long runs
- Media does not fit on just one link

# Medium scale AVB networks

- 50 AVB Talker Devices, each with multiple stream sources
- 50 AVB Listener Devices
- 150 talker stream sources (48 or 96 kHz)
- 200 listener stream sinks

# Medium scale AVB networks

- 8 channels per stream (48 kHz)
- 3 streams per AVB Talker device (24 ch)
- 150 media streams + 1 clock stream
- 1200 channels: 2 569 536 000 bps

# Large scale AVB Networks

- Spectacular
- Theme Park
- Airport

# Large Scale AVB Networks (Theme park/Spectacular)

- Multiple controllers with redundancy
- Multiple network server rooms
- Multiple performance and audience areas with some shared audio
- Gigabit and 10 Gigabit links
- up to 1000 talker devices
- up to 2000 streams
- up to 1000 listener devices
- 48 kHz, 8 ch \* 2000 streams = 16000 channels
- 34 182 336 000 bps network bandwidth for media

# Deploying Large Scale AVB Networks

What issues exist on a large scale network that do not exist at a smaller scale?

# Considerations for Large Scale AVB Networks

- Multicast group limits
- Switch backplane limits
- Stream Reservation Protocol  
“attribute packing”



# Multicast group limits

- AVB streams are multicast
- Some enterprise switches have a limit of 1,000 multicast groups
- Some have a limit of 4,000

# Switch backplane limits

- Typically not a problem as “Enterprise” level switches handle wire-speed switching and “backplane bandwidth” and “backplane packets per second”

# SRP Packing

- The Stream Reservation Protocol (SRP) is a distributed database that allows all the bridges and nodes to keep track of all of the stream reservations on the network
- For AVB networks larger than 250 Talker devices the information about the streams must be “Packable”

## SRP Talker Attributes are packable when:

- They have the same bandwidth
- They have the same latency
- The Stream IDs are consecutive
- The Destination Addresses are consecutive

# Packing Attributes across Talkers

- Group the talkers together
- Use an AVDECC controller that allows you to set the Stream ID and Destination Address for each talker
- Make the attributes packable by the uplinks

# Conclusion

- Almost all media installations are medium sized or small sized
- There is no need to micro-manage the configuration of your AVB switches even in the case of the large media networks