BENCHMARK BROADCAST SYSTEMS (S) PTE. LTD.

25th Nov 2020

ABU ANNUAL MEET - TC2020

ABOUT US

- **Benchmark Broadcast Systems** –

  Consultant and Technology Partner for Media & Broadcast companies in Asia.

- Benchmark group was started in 1986 at Sunnyvale, US.
- Headquartered in Singapore, with offices in Chennai, Delhi, Dhaka, Kuala Lumpur & Manila.
- Over 30 years of success in Broadcast Industry with over 500 man-year experience.

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OUR SERVICES

Consultancy

System Integration

Managed Services

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SKILLED TEAM

Certified Project Management Professionals

Certified Network Architects & Engineers

Certified CAD Design Engineers

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DANTE AUDIO

IMPLEMENTATION IN BROADCAST

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IN THIS SESSION

- Overview - DANTE
- Why DANTE & How it works
- Design & Network Considerations
- Applications & Schematics
- Recent DANTE Project implementation in Asia

ABOUT DANTE - AUDINATE

- Developed by Audinate, a Sydney-based company in 2006.
- By 2012, most of the leading pro audio brands had embraced Dante technology in their flagship products, including Yamaha, Bosch, Harman, Shure, Allen & Heath, and more.
- In 2017, Audinate came up with Dante Domain Manager, server-based software that provides advanced user & domain management for Dante networks.
- In 2018, Dante came up with AVIO Adapters to connect legacy analog and digital audio equipment to Dante networks.

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WHAT IS DANTE..

- **DANTE** is an acronym for **Digital Audio Network Through Ethernet**
- Dante is a combination of **software, hardware, and network protocols** that delivers **uncompressed, multi-channel, low-latency digital audio** over a standard Ethernet network.
- Dante uses ATP (Audinate Transport Protocol) to transmit Audio over the network.
- The audio packets can be transmitted using either unicast or multicast.
- Can Configure, Control and Monitor using Dante Controller.

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WHY DANTE

Old way of doing:

- Heavy multi-core snake cables and everything is point-to-point
- Signal degradation with distance

Benefits with DANTE

- Less Cabling – Multiple channels in a single cable, between different Broadcast areas
- Long Distance Travel
- Flexible Audio routing, operations - No physical patching
- Redundancy, User-friendly maintenance
- Configure, Control and Monitor from a single terminal

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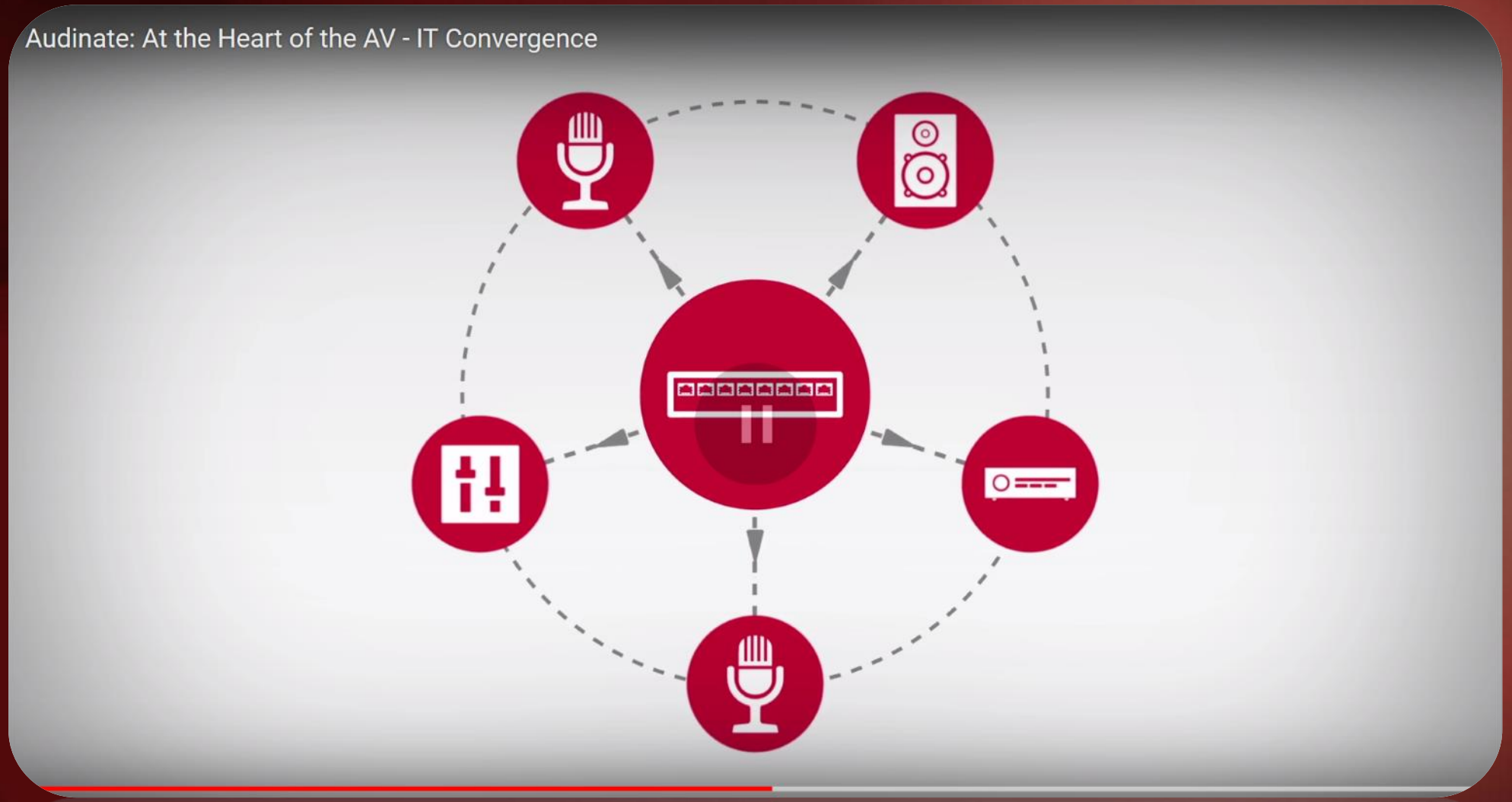
HOW IT WORKS..



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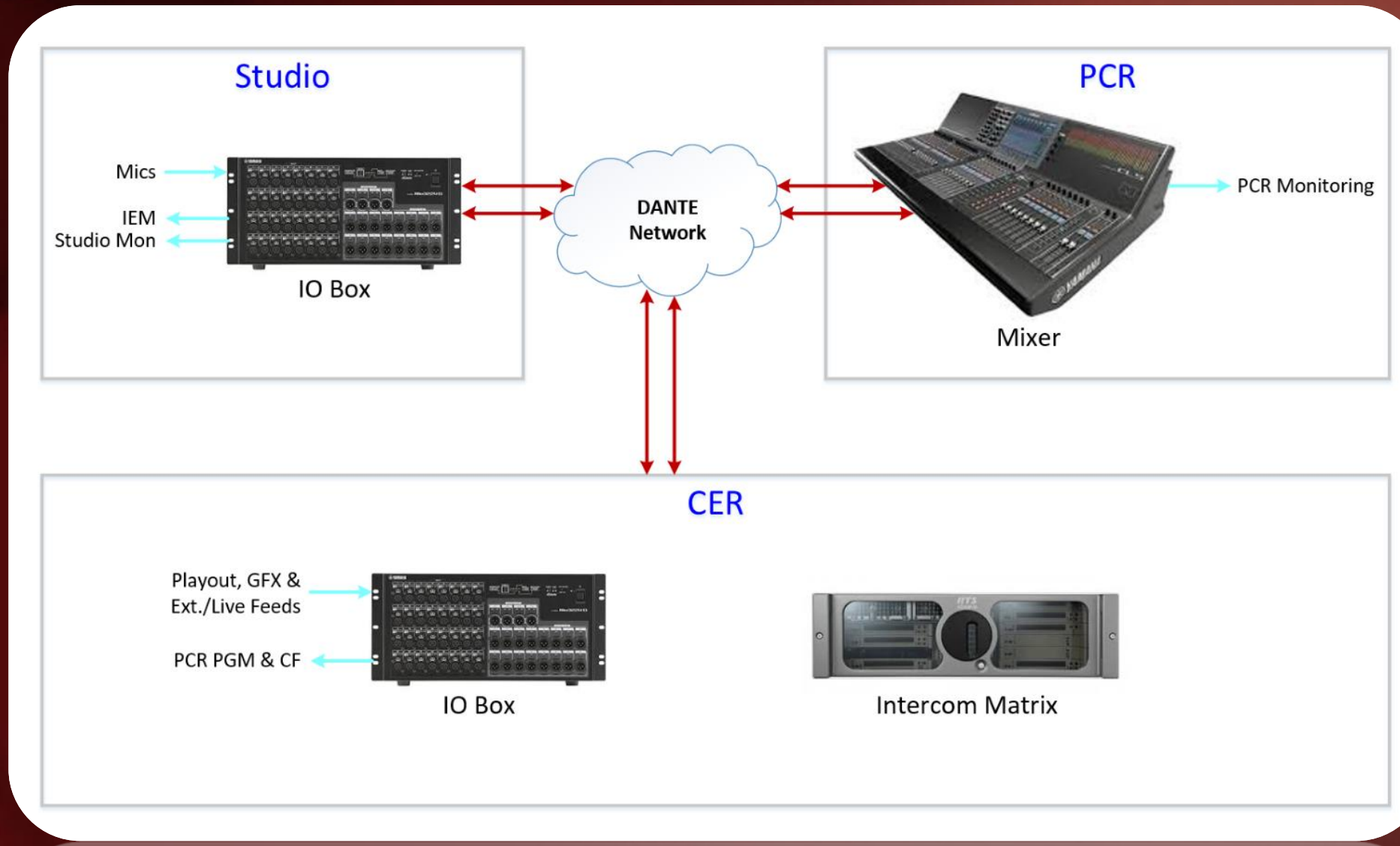
HOW IT WORKS..


Studio
Mics
IEM
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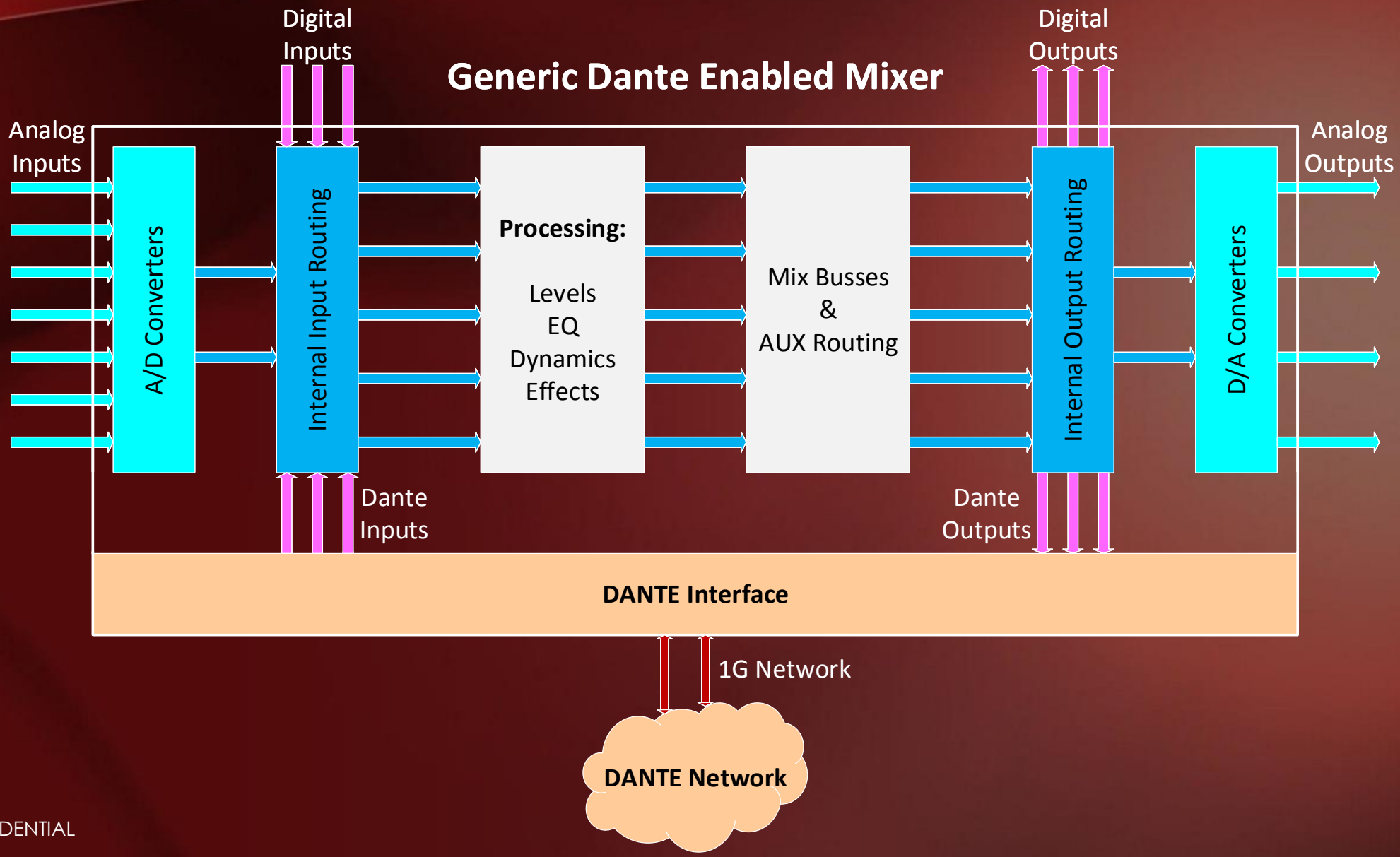
DANTE
Network
PCR
PCR Monitoring
Mixer
CER
Playout, GFX &
Ext./Live Feeds
PCR PGM & CF
IO Box
Intercom Matrix

HOW DANTE IS IMPLEMENTED IN AUDIO DEVICES



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DESIGN CONSIDERATIONS

- **DANTE Flows**
- **Unicast Flows & Multicast Flows**
- **Clocking/Synchronization**

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DESIGN CONSIDERATIONS

DANTE Flows

- A DANTE flow is a group of Channels.
- When an audio channel is routed from one Dante device to another, a "flow" will be created.
- A "transmit flow" is used for sending audio from a Dante device; a "receive flow" is used to accept audio from another Dante device.
- No. of Chls and Flows Support varies based on Dante Device Design.
- Dante enabled device supports from 1 to 64 chls and 2 to 32 Flows.
- Two type of DANTE flows:
  - Unicast Flow
  - Multicast Flow

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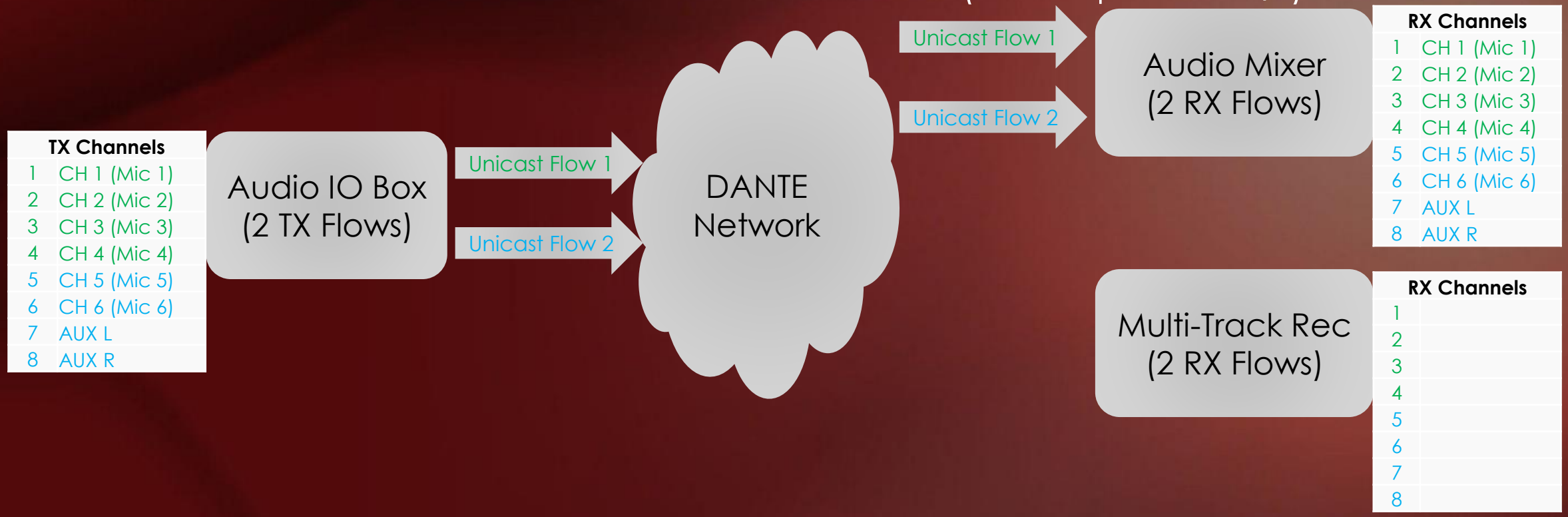
DESIGN CONSIDERATIONS

Unicast Flow

- Unicast flows are point-to-point from a single transmitter to a single receiver.
- Unicast flows have room for 4 channels of audio. (takes up to 6 Mb/s)



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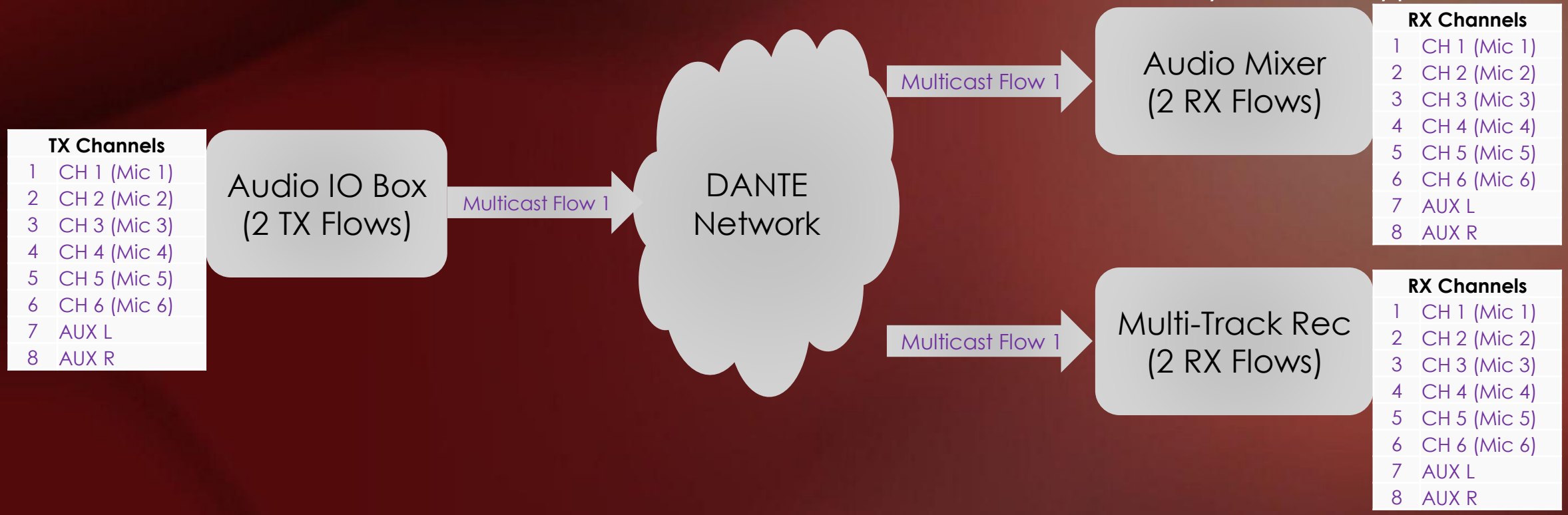
DESIGN CONSIDERATIONS

Multicast Flow

- Multicast flows are one to many; from a single transmitter to multiple receivers.
- In general, Multicast flows have room for 8 channels of audio, but the number of channels that can be added to a Dante multicast flow varies by device type.



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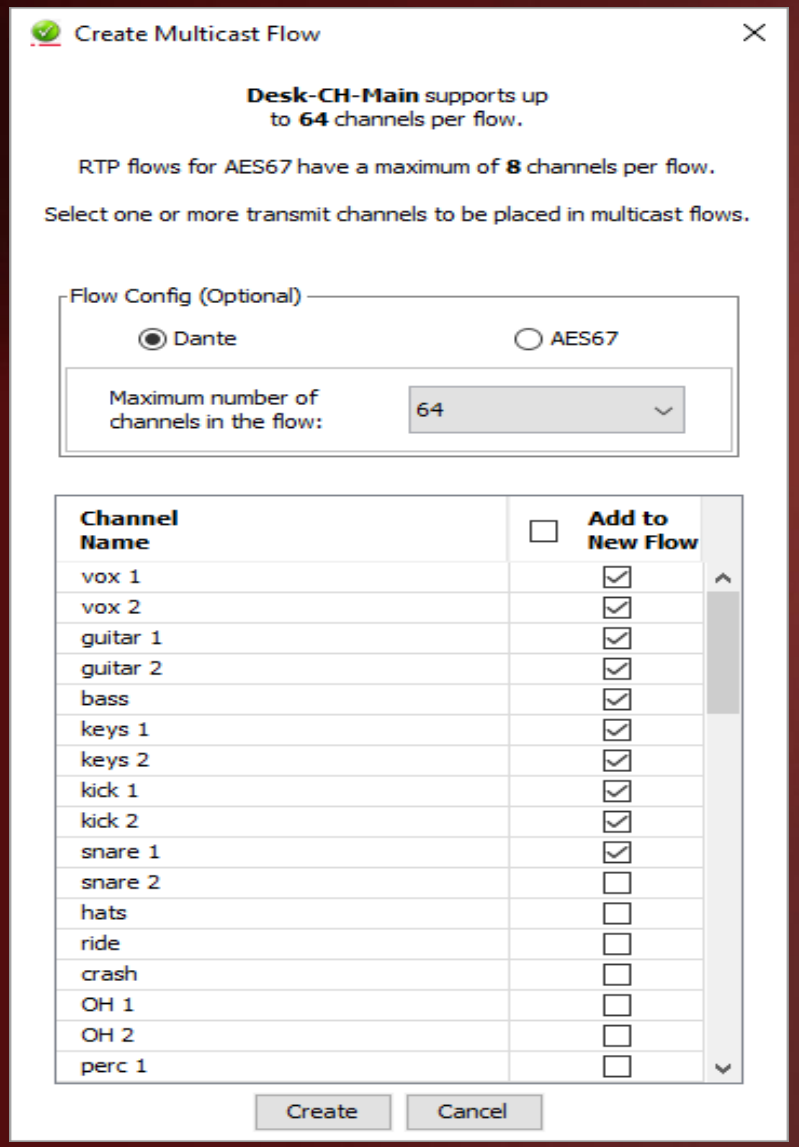
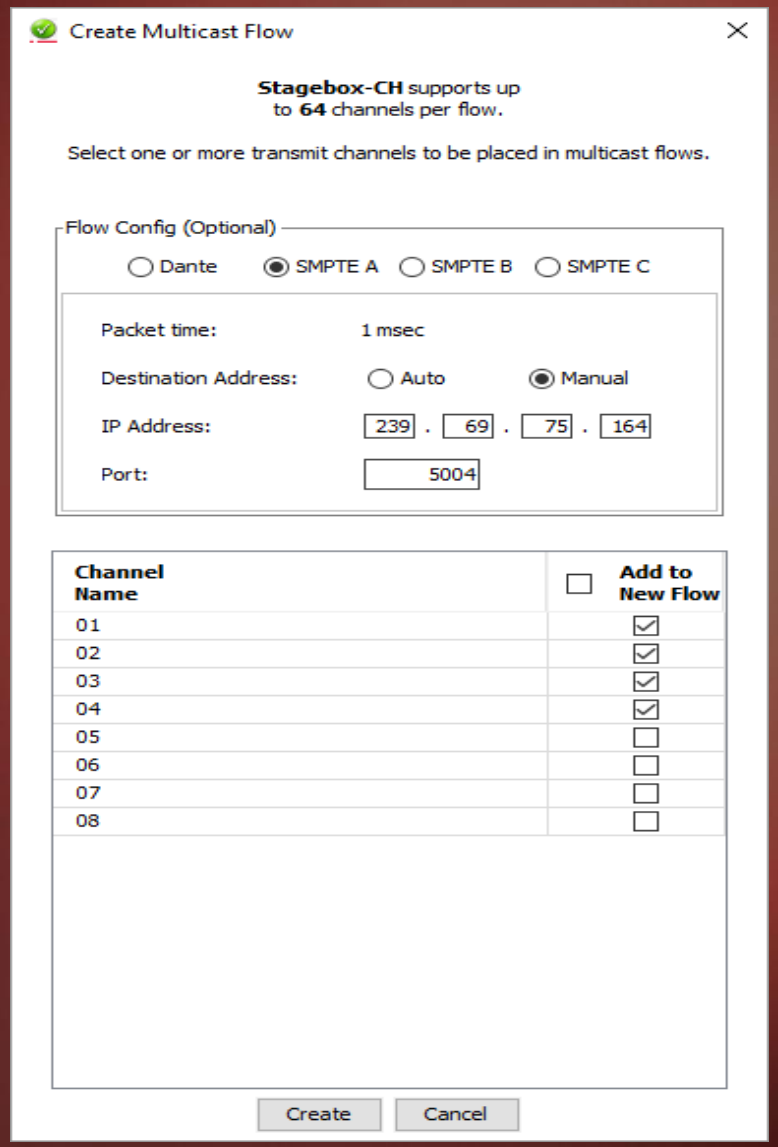
DESIGN CONSIDERATIONS

Creating Multicast Flow in Dante Controller:





DESIGN CONSIDERATIONS

Clocking/Synchronization

- To make sure all the devices are synchronized so that audio is captured and played back in sync.
- Word Clock is used to sync DANTE devices.
- Two ways to provide clock signal:
  - Provide Word Clock to all DANTE Devices.
  - Provide Word Clock to 2 selected devices (Master Clock & Slave Clock) in the DANTE Network and rest of the devices will synchronize over Network.
- We can select the devices manually in Dante Controller or the devices will elect the Master Clock automatically.
- DANTE uses PTP Protocol to sync the devices over Network.

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DESIGN CONSIDERATIONS

Clocking and Synchronization in Redundant Networks:

- Clock synchronization protocol operates over both primary & secondary networks.
- Each network will have a designated PTP master clock;
- Usually this will be the same device on both networks.

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NETWORK CONSIDERATIONS

- **Network Design**
- **Network Switch Requirements**
- **Latency**

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NETWORK CONSIDERATIONS

Network Design & Switch Requirements

- 1G Switches are preferred.
- Managed switches are recommended.
- Separate VLANs for Primary and Redundant DANTE Network.
- Recommended to have Static IP addresses for DANTE devices.
- PTP (Precision Time Protocol) support.
- Support for QoS & IGMP Snooping
- Energy Efficient Ethernet (EEE) Switches are not recommended.

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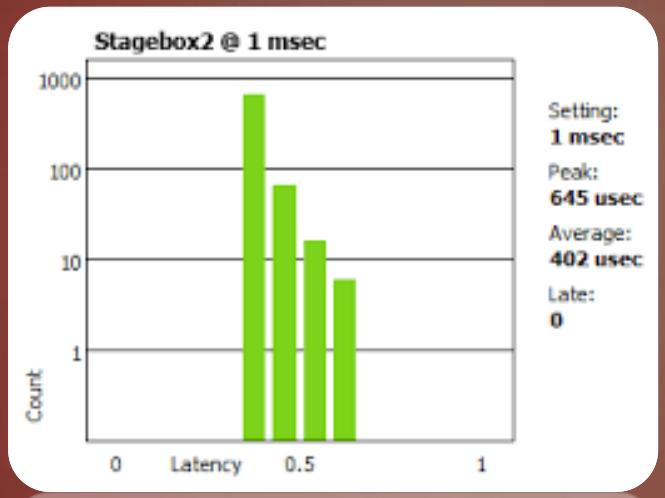
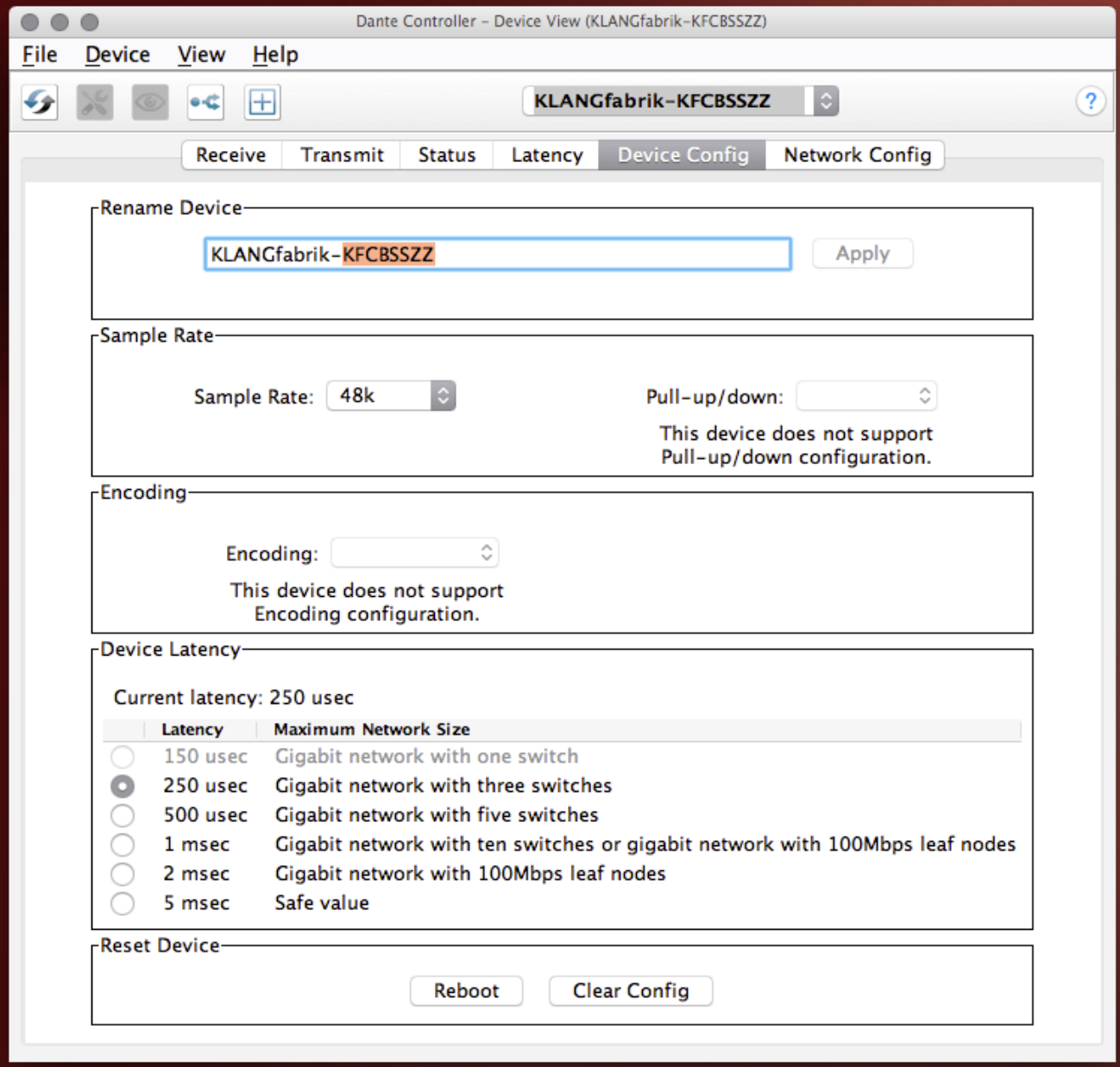
NETWORK CONSIDERATIONS

Latency:

- Time taken by a packet to reach the destination.
- All the packets will be timestamped at the TX.
- Latency of each device can be measured in DC.
- The typical default latency for a Dante device is 1ms
- This defines the recommended tolerance range



NETWORK CONSIDERATIONS



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APPLICATIONS

Few applications where DANTE can be implemented:

- Television & Radio Setups
- Auditorium/ Live Performances
- House of Worship
- Recording Studios/DAW
- Corporate – Conferencing

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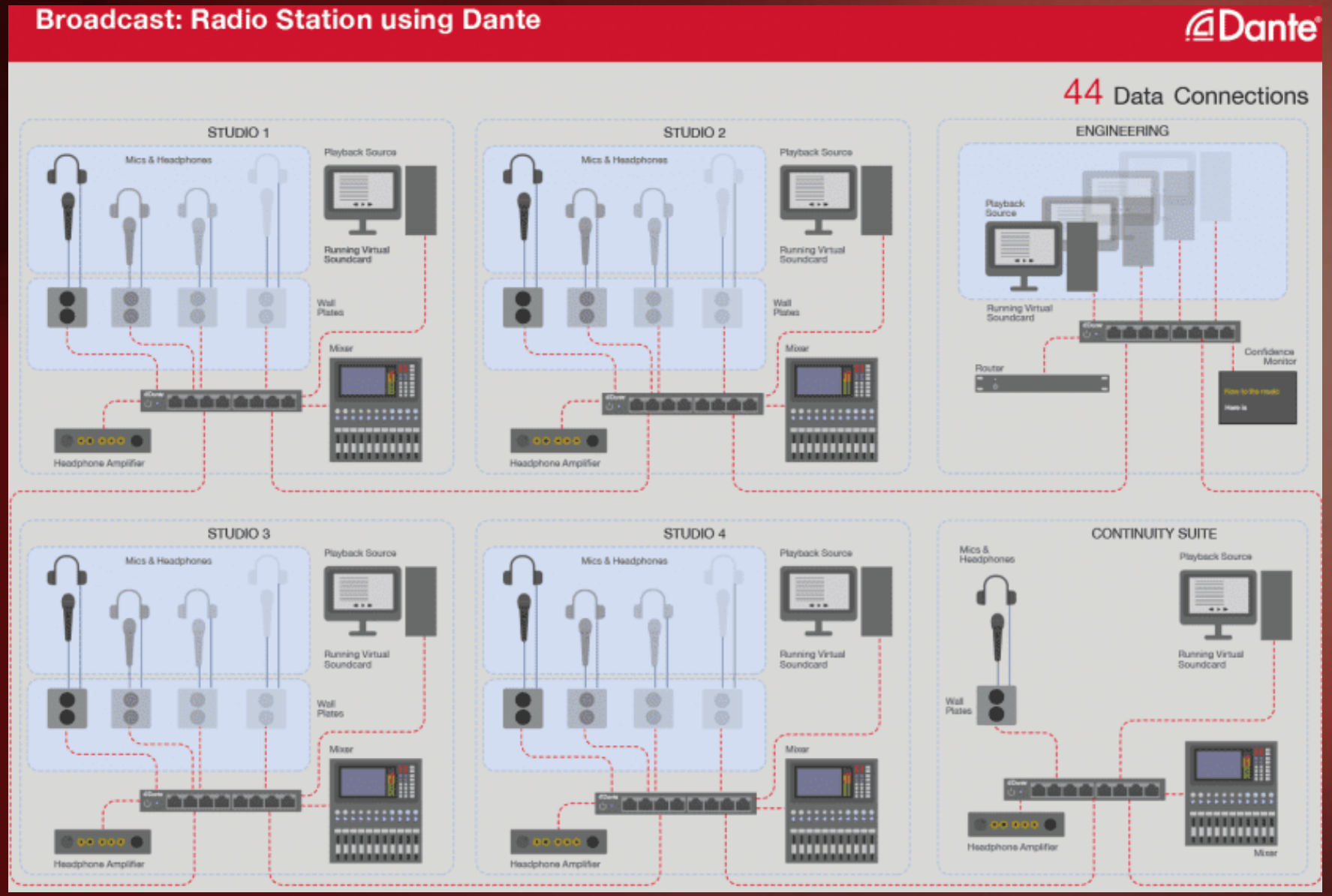
APPLICATION SCHEMATICS



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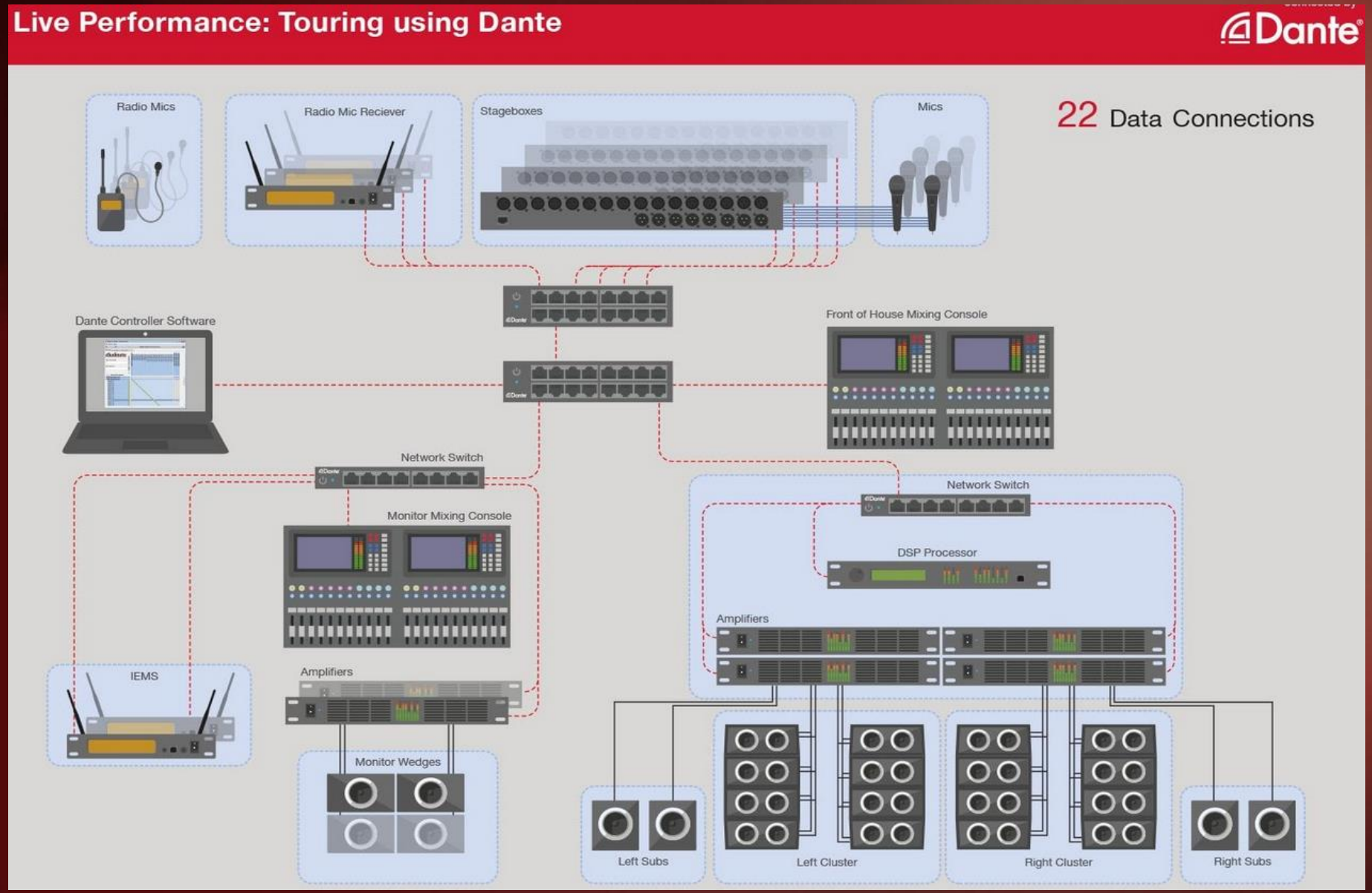
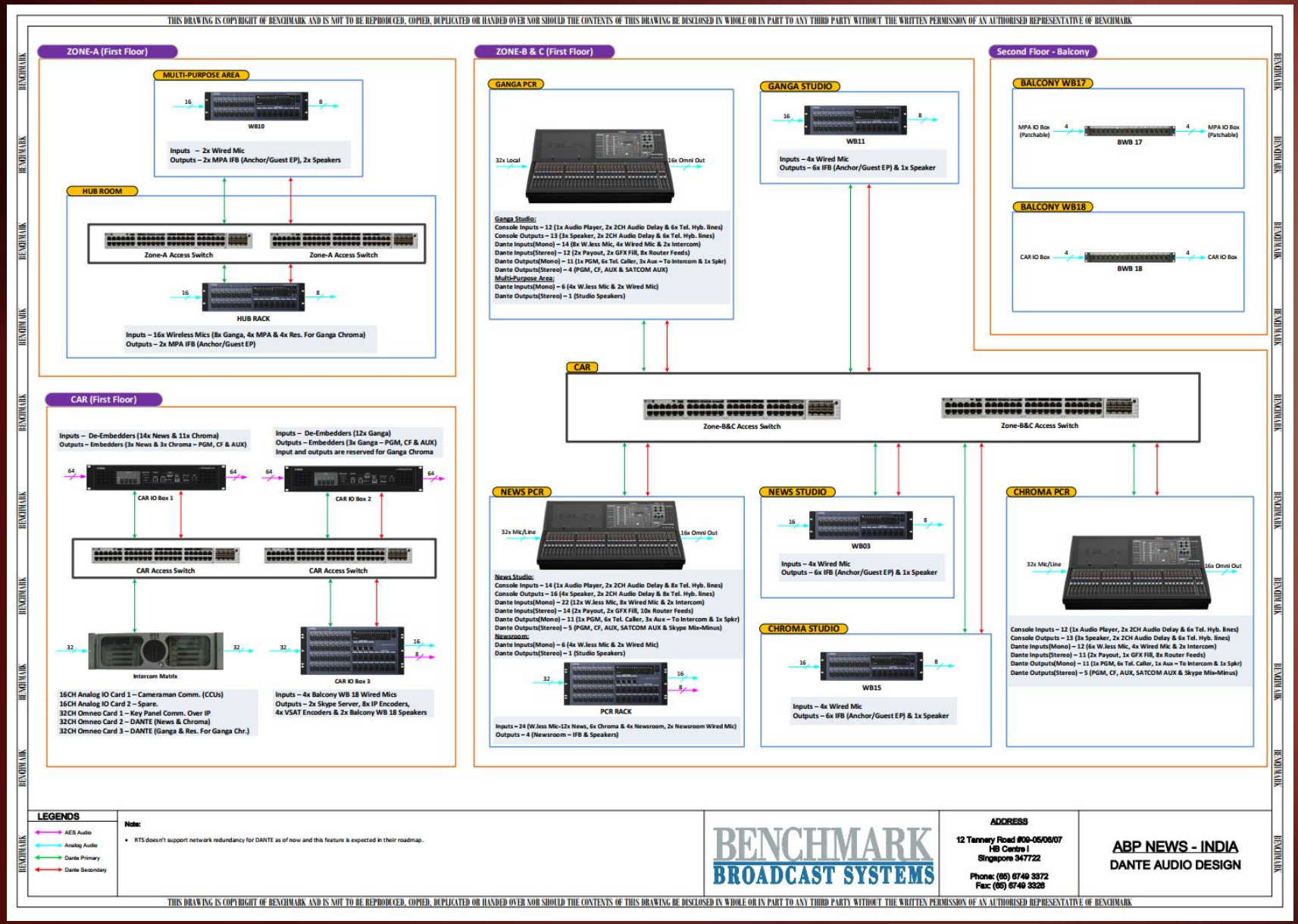
APPLICATION SCHEMATICS



RECENT IMPLEMENTATION



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SUMMARY

DANTE & Benefits

- **Multiple Audio channels transport** over standard network device & cable.
- **Flexible** Audio **routing**, operations & **User-friendly** maintenance.
- **Better Source sharing** & accessibility across different areas in a facility like: *Studios, Production Control Rooms, CAR/CER, etc.,*
- Can avoid bunch of Audio cables and their limitations.
- **Savings in Cost**, Resources - *cables, cabling works, dedicated Tielines, etc.,*
- High availability, **Redundancy link** supported

Thank You for your time!