



The 7th Circle Of Hell

Making Whole-Facility Network Audio Work

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Jigsaw 24



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7 - Application
6 - Presentation
5 - Session
4 - Transport
3 - Network
2 - Data
1 - Physical

7 - Violence
6 - Heresy
5 - Wrath
4 - Avarice
3 - Gluttony
2 - Lust
1 - Limbo



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Whole Facility ?

- Multiple Rooms 20
- Shared Resources
- Streaming audio between them
- May need to integrate with Video Devices

Network Audio (AoIP)

- Audio Transport over IP.
- Production Capable
- Built on standard technologies

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Transport Over IP

QLAN	CobraNet
Livewire	AES50 / SuperMac
Ravenna	Soundgrid
Dante	Riedel Rocknet
?AES67?	Aviom Pro64
	AVB

Production Capable

Linear | PCM | Uncompressed

Minnimum Sampling Frequency 44.1kHz

Minnimum Bit Depth 16 bits

“Low” Latency <10mS

Built on Standard Technologies

RTP (RTCP RTSP) media transport

SIP (Session Initiation Protocol)

SDP (Session Description Protocol)

PTP synchronisation

Bonjour / SAP

Etc...



Why Bother? AoIP Advantages

- Bi directional
- Many channels on a single cable
- Audio routing at the IP layer
- Commodity Hardware
- Consolidated Clocking Architecture
- Automated Device Discovery
- **CHEAPER**
- **MORE FLEXIBLE**
- **EFFICIENT**

"To the 'disinterested observer', an ideal network audio system and an ideal conventional audio system should be identical."





Why Bother? AoIP Disadvantages

- Audio engineers are not network engineers
- Complexity of setup?
- Fear of change
- Timing / Clocking?

Any sufficiently advanced technology is indistinguishable from magic



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Making Network Audio Work

1. Easy Wins
2. Clocking
3. Network Considerations



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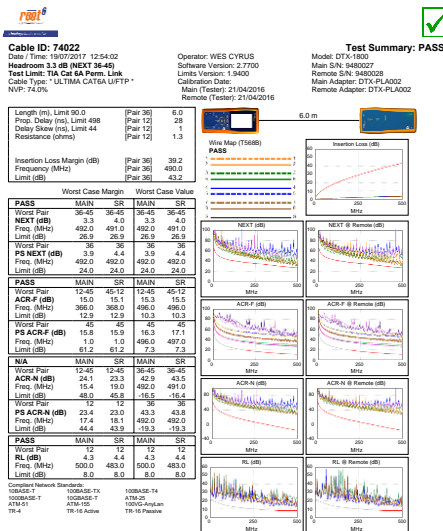


Easy Wins

- Name your paths and devices
- Logically Group devices by IP address
- Simplify routing options
- Redundancy?
- Static Reservation DHCP
- Don't just think about logical networking, consider the physical realities
- Cable Performance



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Project: DTDG VIRTUS
 Unlisted

Site: VIRTUS DC

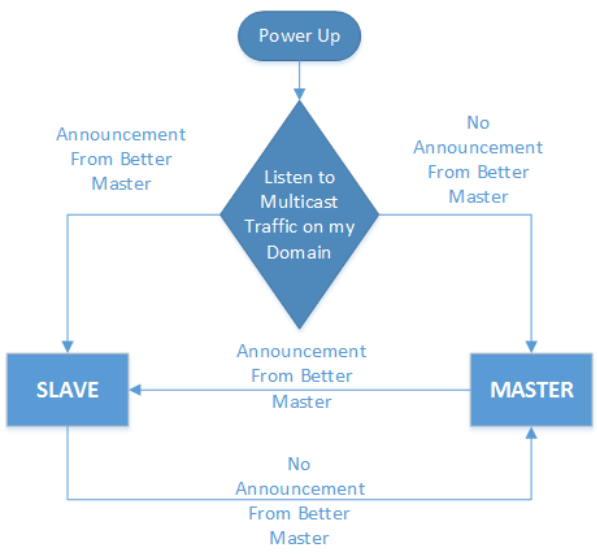


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Clocking

Review Best Master Clock Algorithm

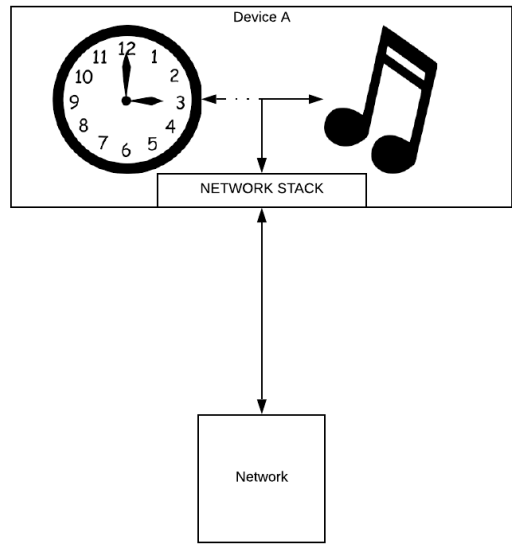


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Clocking

Review Best Master Clock Algorithm
Is there a flaw?



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Clocking

Review Best Master Clock Algorithm
Is there a Flaw

Ptp is a time protocol
Not a timing protocol



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Networking Considerations



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Network Segregation and QoS

It is not required to keep network traffic segregated.

- When appropriate
- How can we segregate

If not segregated QoS is essential for performance.



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Spanning Tree Protocol

“The Spanning Tree Protocol (STP) is a network protocol that builds a loop-free logical topology for Ethernet networks. The basic function of STP is to prevent bridge loops and the broadcast radiation that results from them. Spanning tree also allows a network design to include backup links to provide fault tolerance if an active link fails.”

- Turn it off! At least check it isn't turned on.
- Unless
 - You know what you are doing and designed the network with a schema in mind.
 - You don't have segregated traffic on your network (?QoS?).
 - You are implementing a per VLAN spanning tree protocol (MTSP or similar)



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Multicast

If you're an operator make sure you know when to use multicast flows.

Think about the old-fashioned analogue parallel

IGMP Snooping

Means that only devices that want to listen to multicast traffic need to
Make sure you configure this to conserve bandwidth on your backplane,
particularly if you're in a situation where you're likely to use a lot of
multicast flows (splitting large live feeds to recorders and transmission /
live mix? 2110 Running Dante AES67 mode?)

You may need to disable on specific ports if you need wi-fi access for
control!

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Thank you

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