



Dante Domain Manager™

Clocking

Visit Us Online:
www.audinate.com/ddm

Introduction

Questions?

- Please ask any questions via the Q&A function
- We will try to get to as many relevant questions as possible
- There will be a short Q&A after each section and a longer Q&A at the end of the presentation



Post this webinar you will receive an email containing:

- PDF version of the presentation
- Recording of the presentation available for 90 days
- Link to Q&A

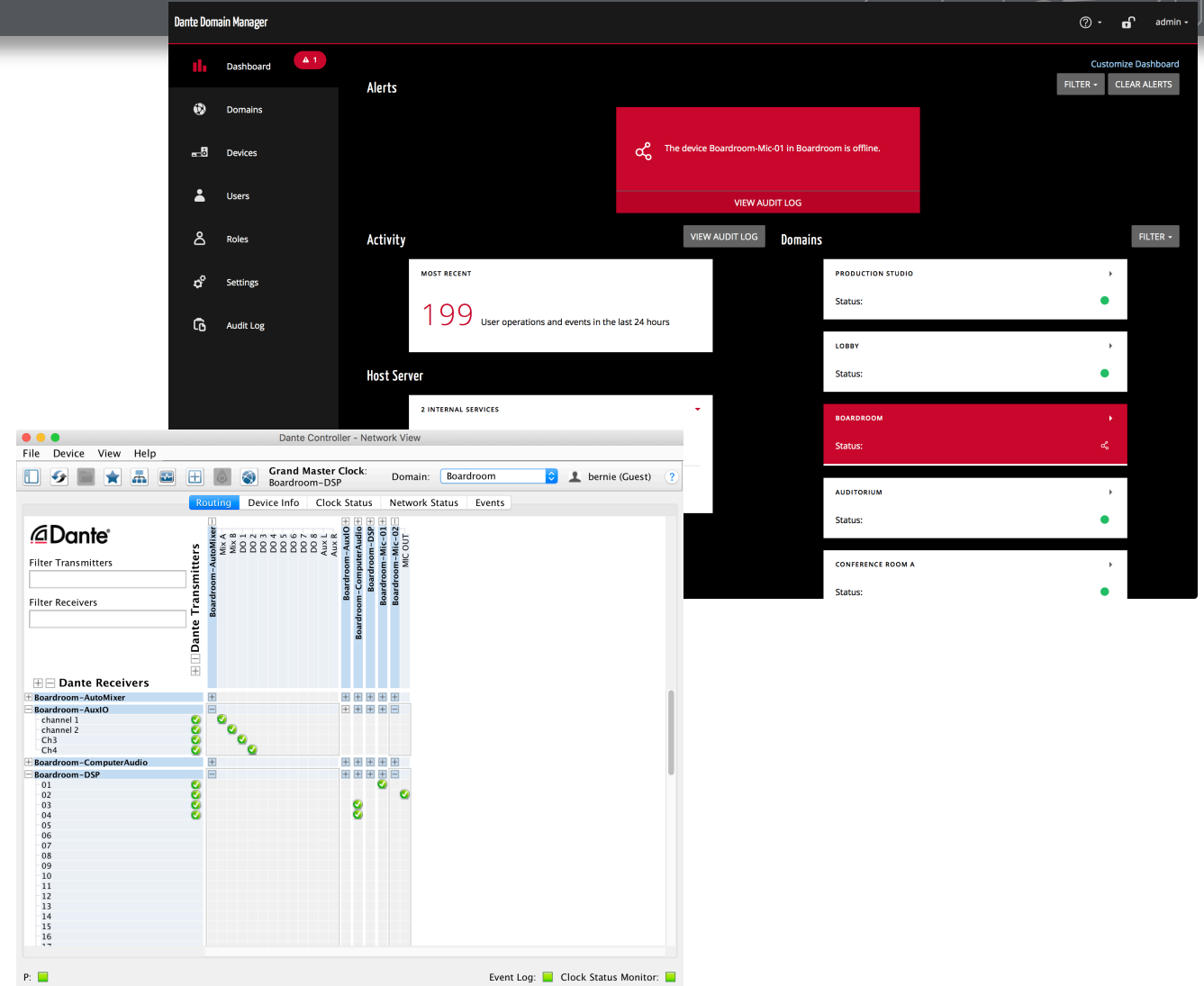


Where can I get a free trial of Dante Domain Manager?

audinate.com/contact/sales

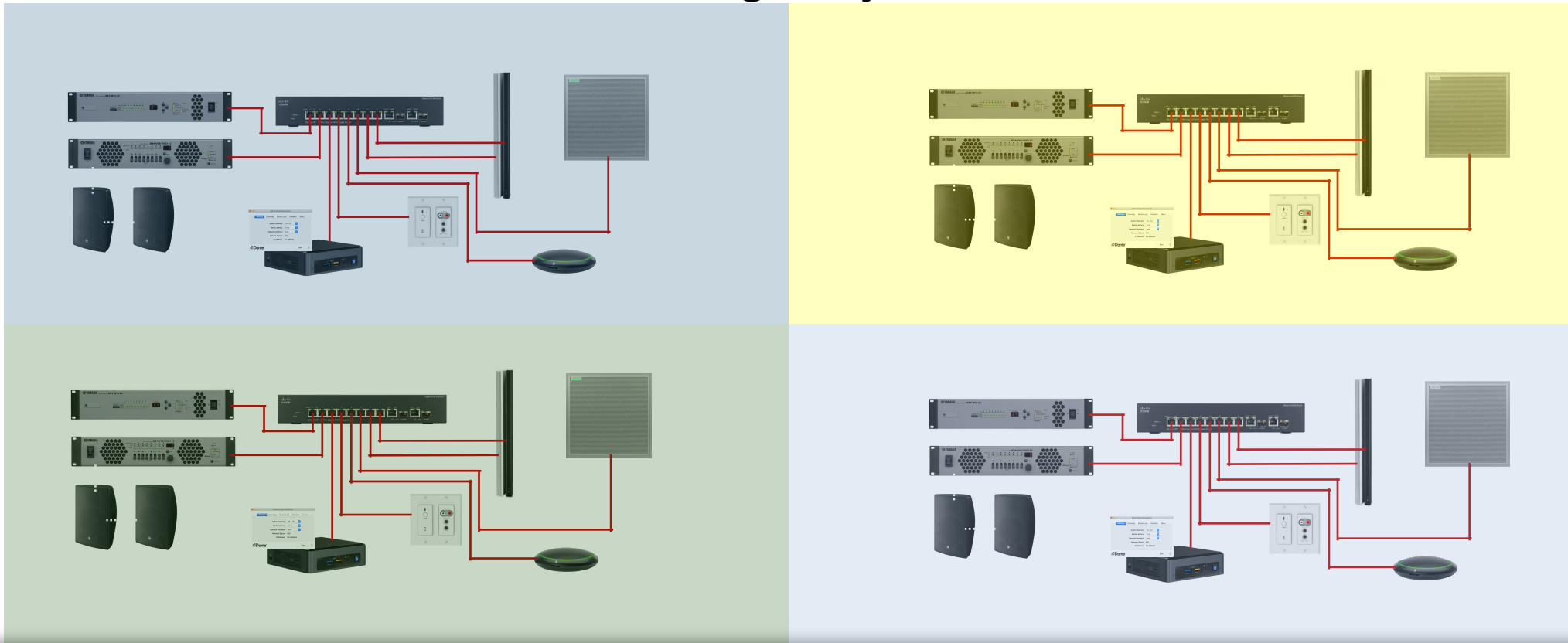
Dante Domain Manager

- Dante Domain Manager is a server application that **organizes, secures and enhances** Dante networks
- Affects control only - **does not pass audio**



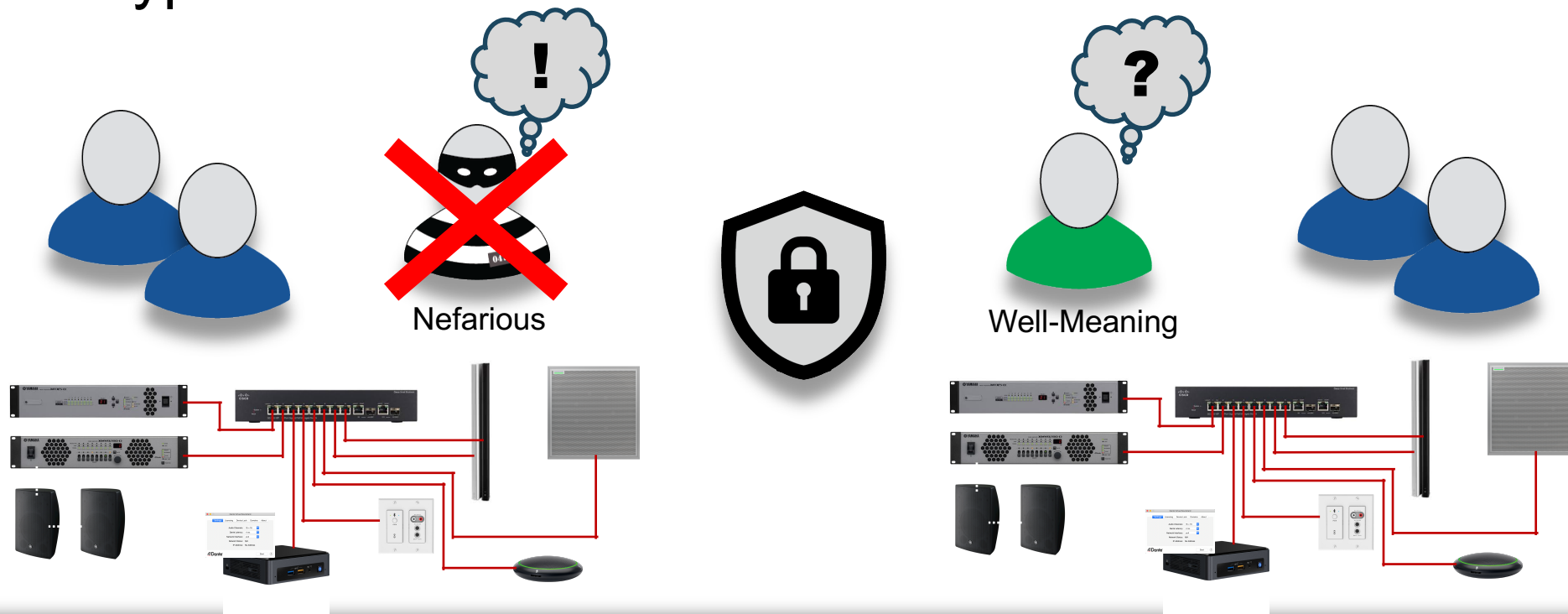
Do More With Dante Domain Manager

- **ORGANIZE:** Define domains (zones) of Dante devices
 - Correlate to rooms, buildings, systems etc.



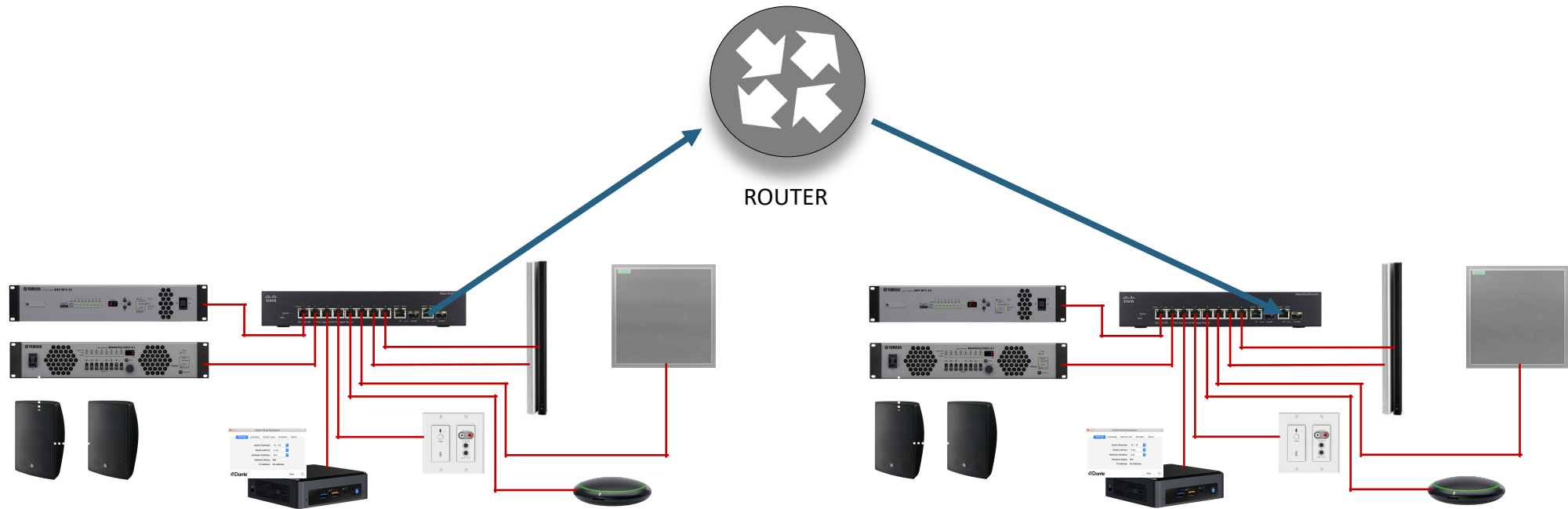
Do More With Dante Domain Manager

- **SECURE:** Control user access to each domain
 - Integrate with existing directory system
 - Encrypt control traffic



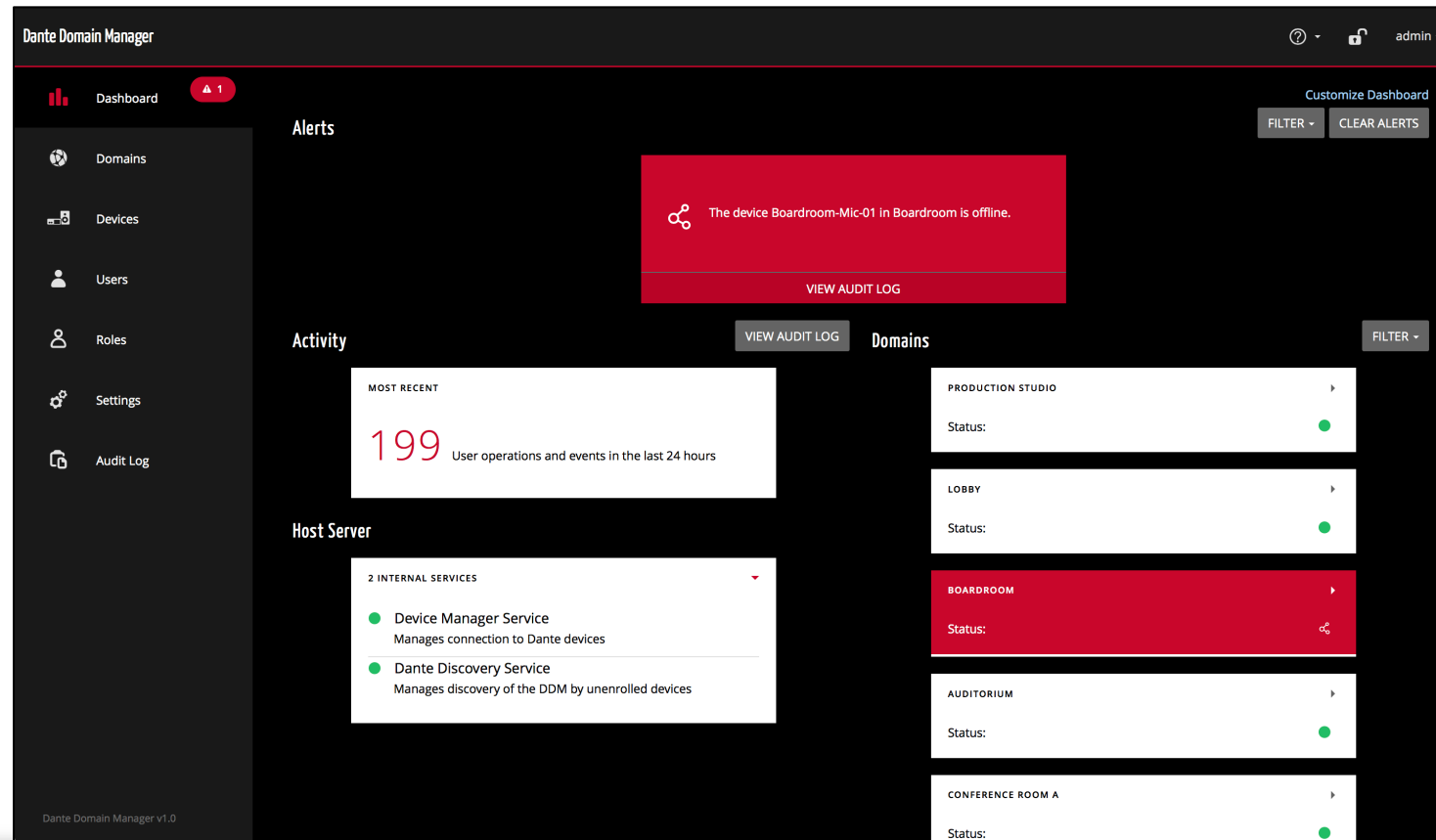
Do More With Dante Domain Manager

- **EXPAND:** Dante networks beyond single LAN operation
 - De-complicate installations the cross multiple rooms, floors or buildings



Do More With Dante Domain Manager

- **MONITOR:** Alerts and notifications about AV system health



Do More With Dante Domain Manger

- **LOG:** Keep track of everything that happens with your Dante system

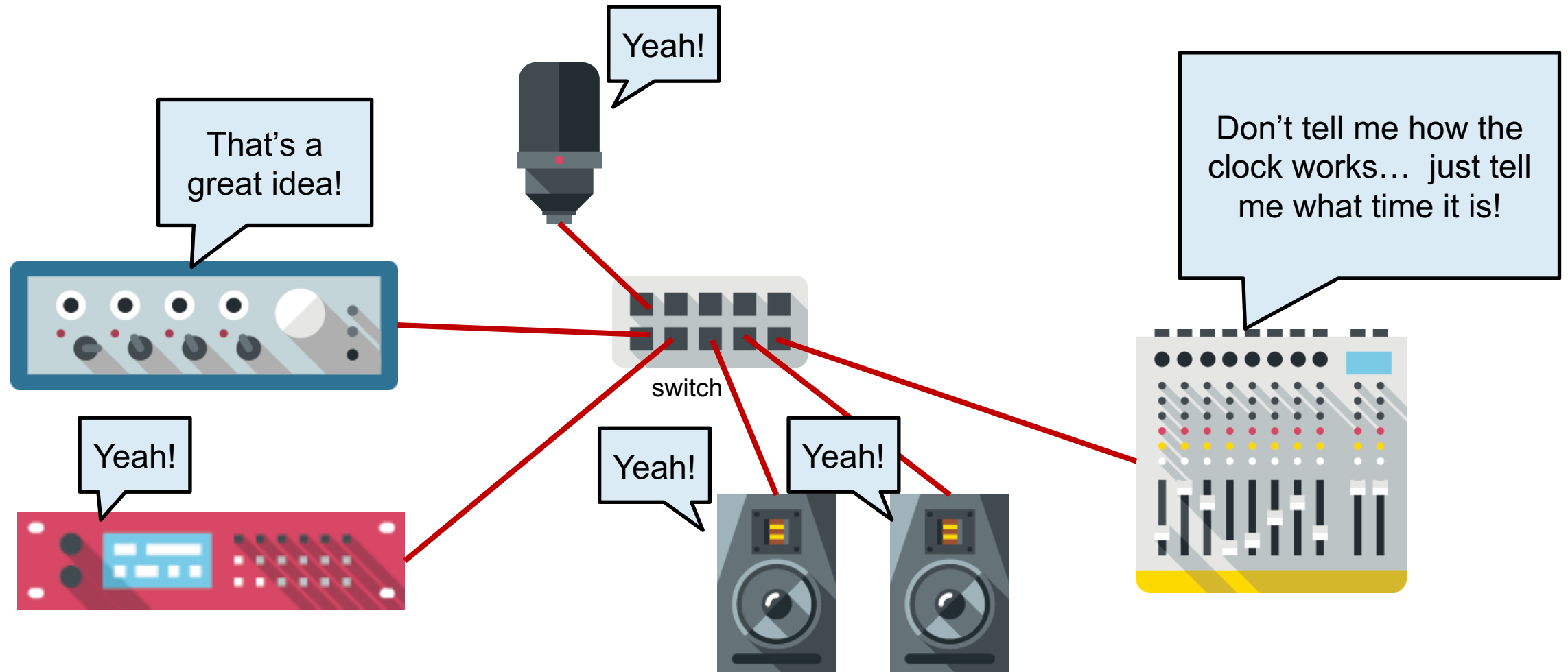
The screenshot displays the Dante Domain Manager web interface, specifically the Audit Log section. The left sidebar contains navigation links for Dashboard, Domains, Devices, Users, Roles, Settings, and Audit Log (which is currently selected). The main content area is titled 'Audit Log' and includes a search bar, filters for 'Whole words only' and 'Match Case', and buttons for 'CUSTOMIZE COLUMNS', 'CLEAR LOG', 'EXPORT TO CSV', and 'ADD FILTER'. Below these, there are filters for 'Domain' (Name), 'IS', and 'BOARDROOM +', with a 'REMOVE' button. The log shows 25 entries (filtered from 6,131 total). The table below lists the events:

TIMESTAMP	DOMAIN	DETAILS	SOURCE	SEVERITY	TYPE
Thu, Dec 20, 2018 2:28 PM	Boardroom	Configured device clocking - isPreferredMaster:1	admin	Info	User Action
Thu, Dec 20, 2018 2:22 PM	Boardroom	Subscriptions for device Boardroom-DSP restored	Boardroom-DSP	Info	Device Event
Thu, Dec 20, 2018 2:22 PM	Boardroom	Error in subscriptions for device Boardroom-DSP	Boardroom-DSP	Error	Device Event
Thu, Dec 20, 2018 2:21 PM	Boardroom	Device Boardroom-Mic-01 enrolled in Boardroom came back online	Boardroom-Mic-01	Info	Device Event
Thu, Dec 20, 2018 2:16 PM	Boardroom	Device Boardroom-Mic-01 enrolled in Boardroom went offline	Boardroom-Mic-01	Warn	Device Event
Thu, Dec 20, 2018 2:05 PM	Boardroom	Subscriptions for device Boardroom-DSP restored	Boardroom-DSP	Info	Device Event
Thu, Dec 20, 2018 2:05 PM	Boardroom	Subscriptions for device Boardroom-Speaker-R restored	Boardroom-Speaker-R	Info	Device Event
Thu, Dec 20, 2018 2:05 PM	Boardroom	Subscriptions for device Boardroom-Speaker-L restored	Boardroom-Speaker-L	Info	Device Event
Thu, Dec 20, 2018 2:05 PM	Boardroom	Error in subscriptions for device Boardroom-DSP	Boardroom-DSP	Warn	Device Event
Thu, Dec 20, 2018 2:05 PM	Boardroom	Subscriptions for device Boardroom-AuxIO restored	Boardroom-AuxIO	Info	Device Event

Dante Domain Manager v1.0

Review How Dante Does Clocking

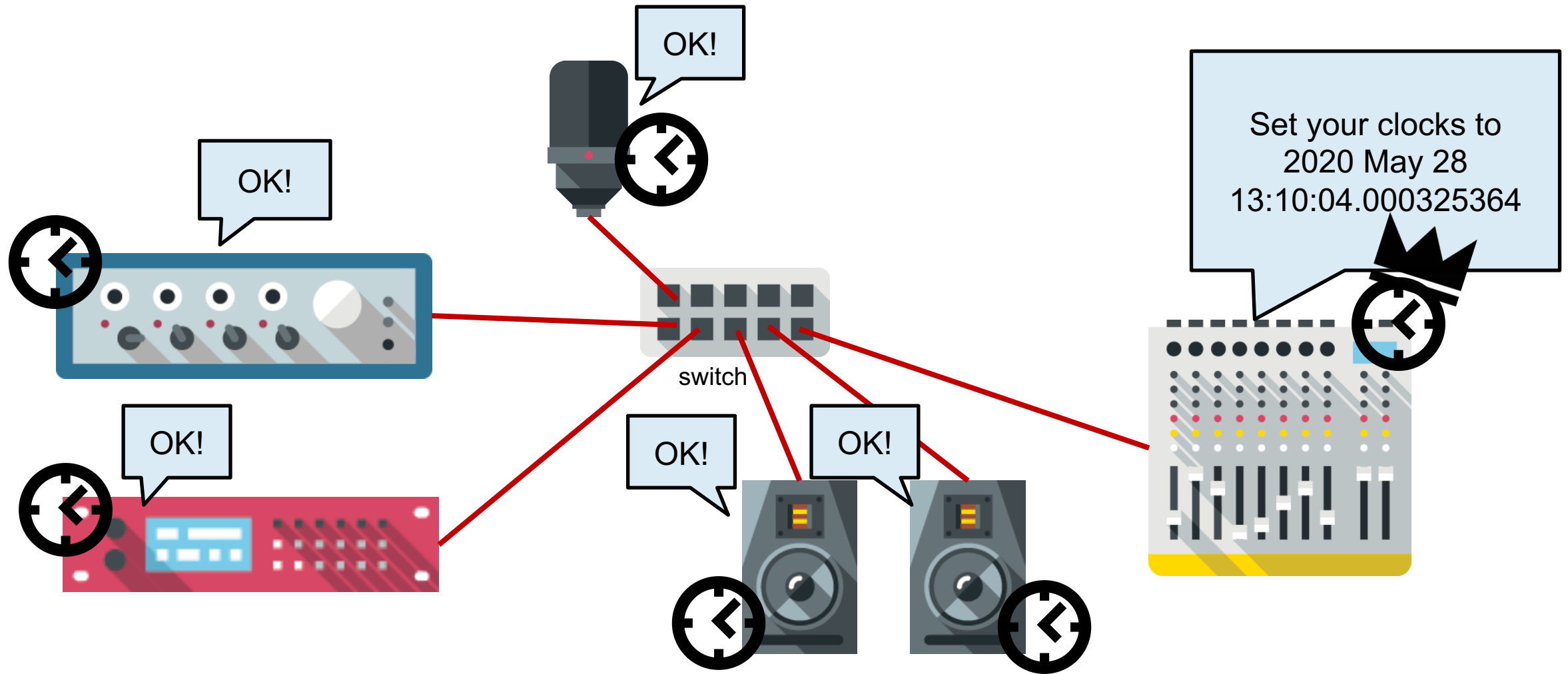
Network Synchronization



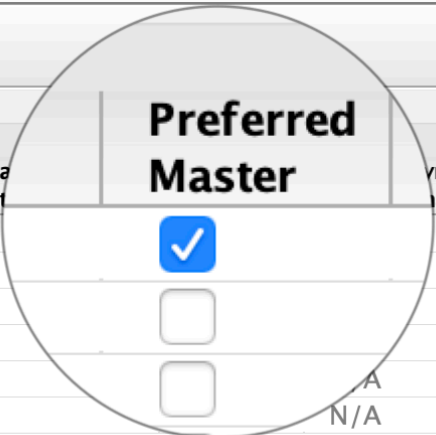
- Dante use PTP (IEEE 1588) for clocking
 - Resolution in nanoseconds
- One device gets elected as a Master clock
- Every device has a clock
- All devices get sync'd to Master



Network Synchronization



- **Priority** – User defined



cond	Preferred Master	ync
! Mult	<input checked="" type="checkbox"/>	al
/A	<input type="checkbox"/>	
/A	<input type="checkbox"/>	
/A	<input type="checkbox"/>	
/A	<input type="checkbox"/>	
/A	<input type="checkbox"/>	
/A	<input type="checkbox"/>	N/A
/A	<input type="checkbox"/>	N/A

☒ PTP V2 PRIORITY 1

128

☒ PTP V2 PRIORITY 2

128

PTP Election Process

- **Priority** – User defined
- **Quality** – most accurate



VS.



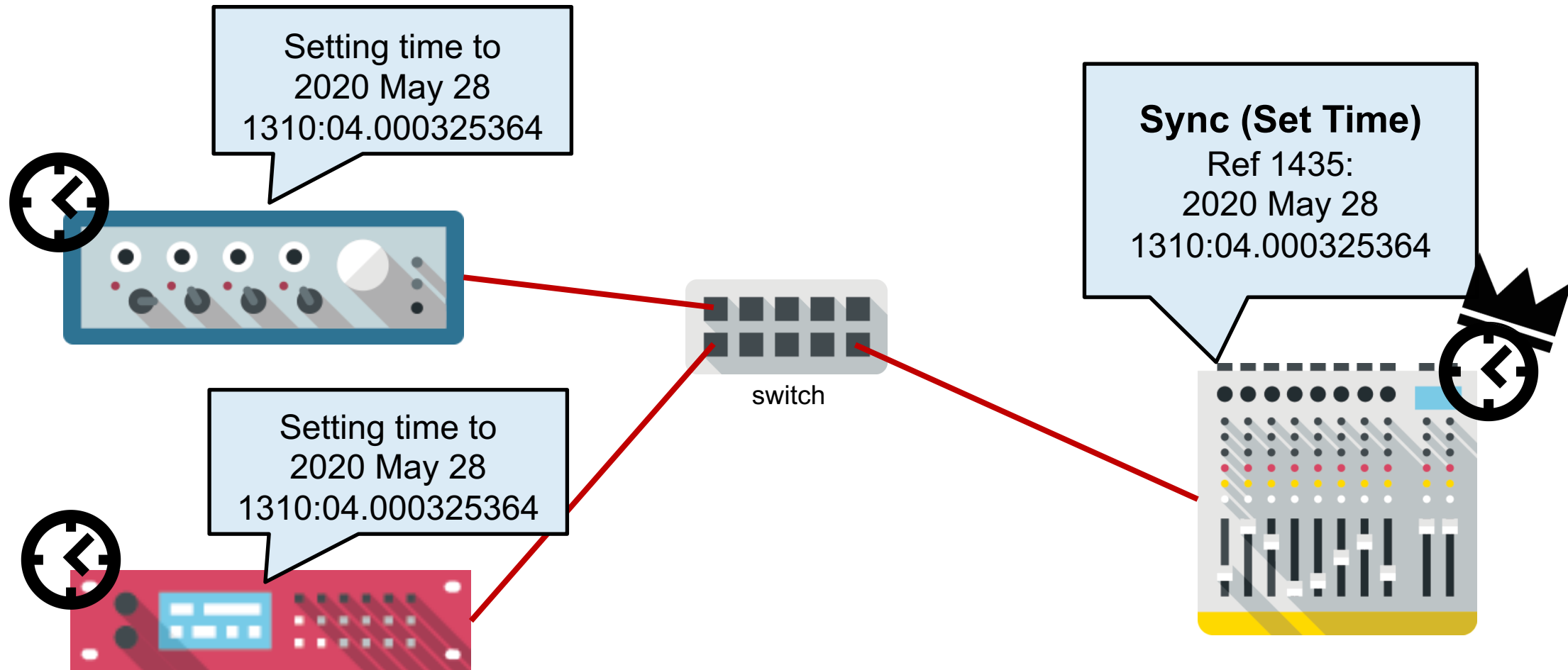
- **Priority** – User defined
- **Quality** – most accurate
- **Unique Identifier** – MAC address

00:1D:C1:50:01:99

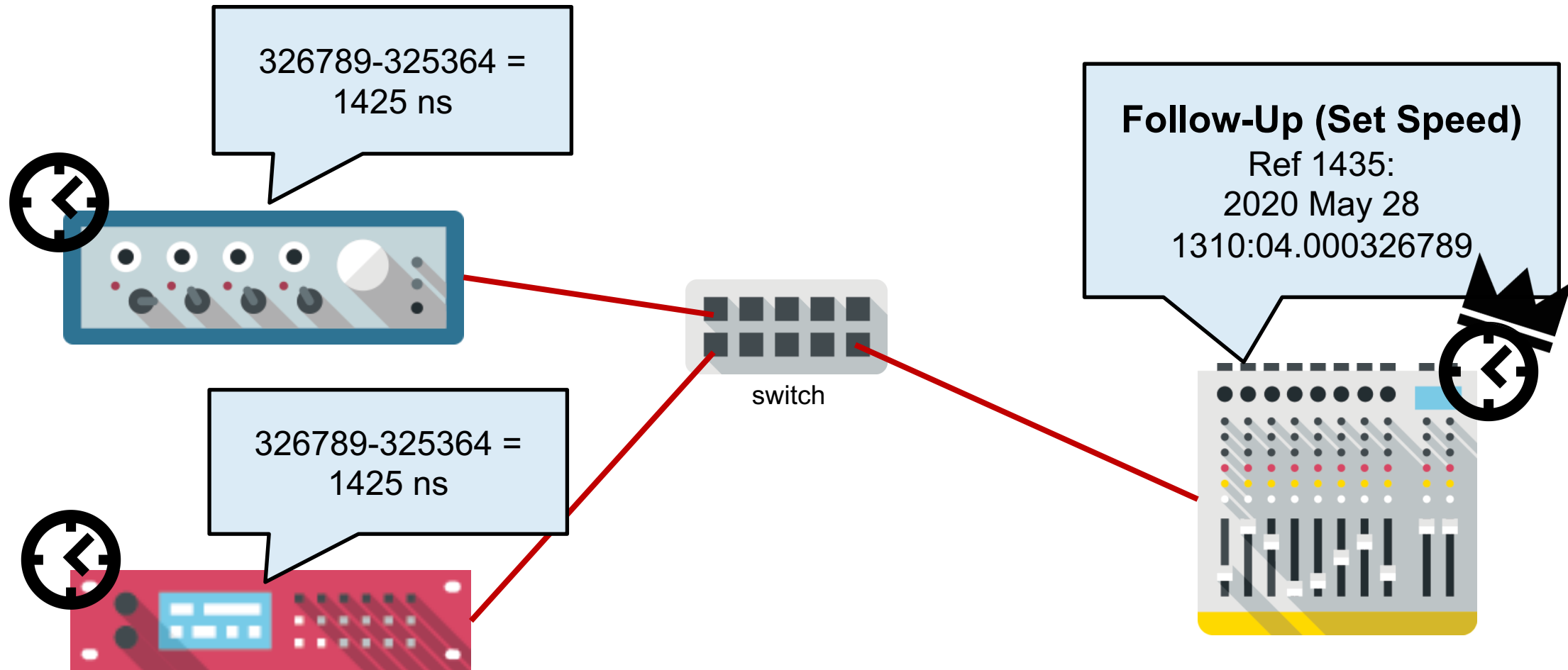
VS.

00:1D:C1:50:19:6F

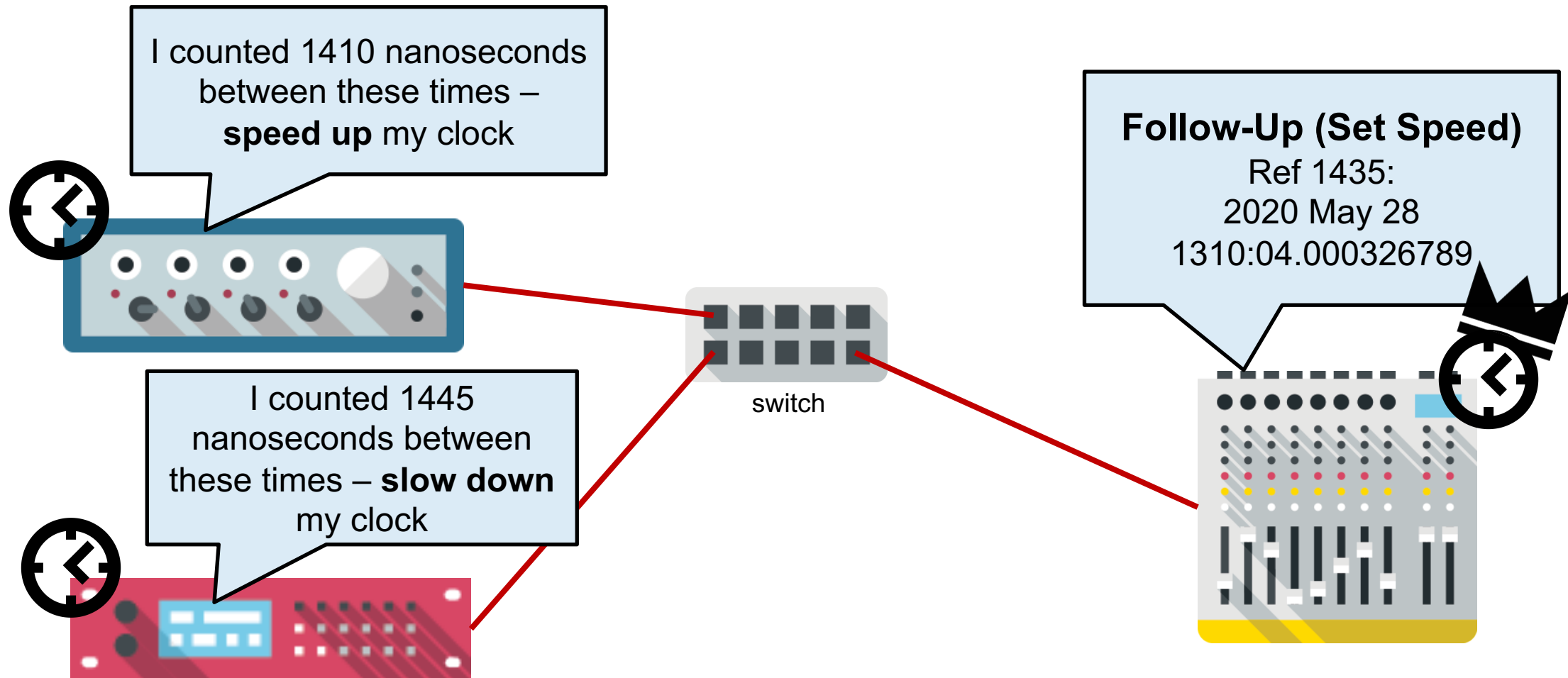
PTP: Sync (Time) and Follow-ups (Speed)



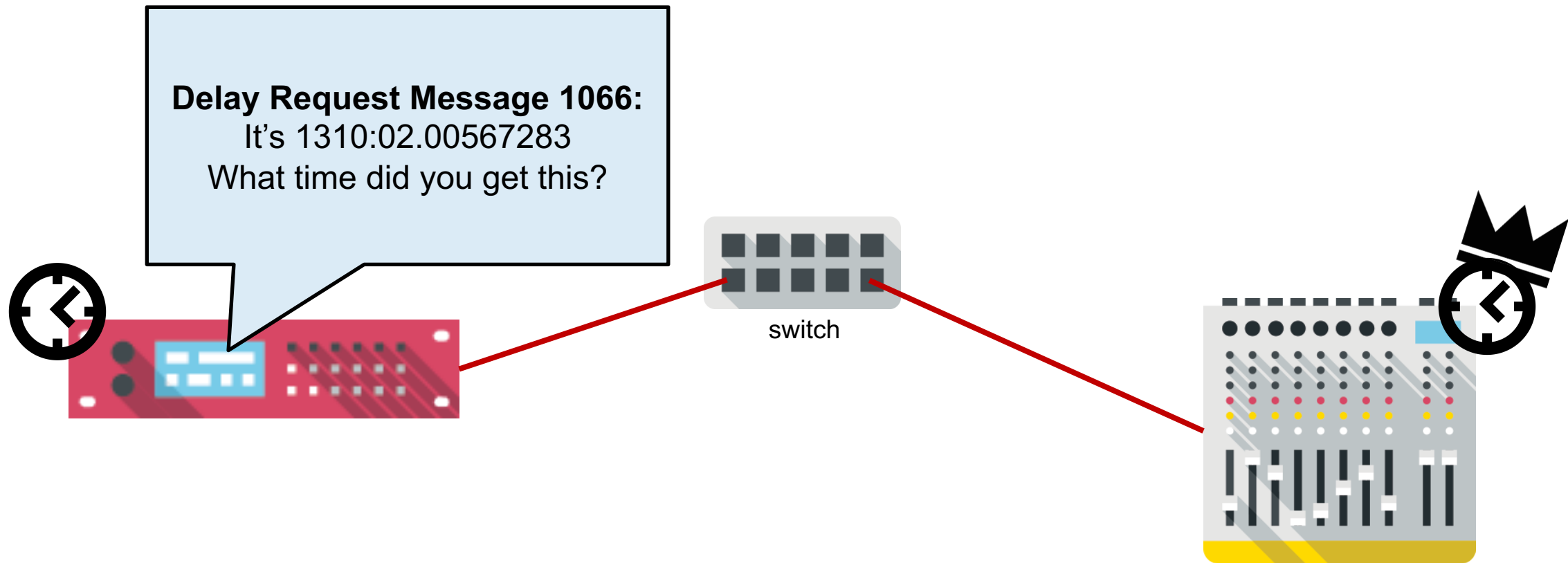
PTP: Sync (Time) and Follow-ups (Speed)



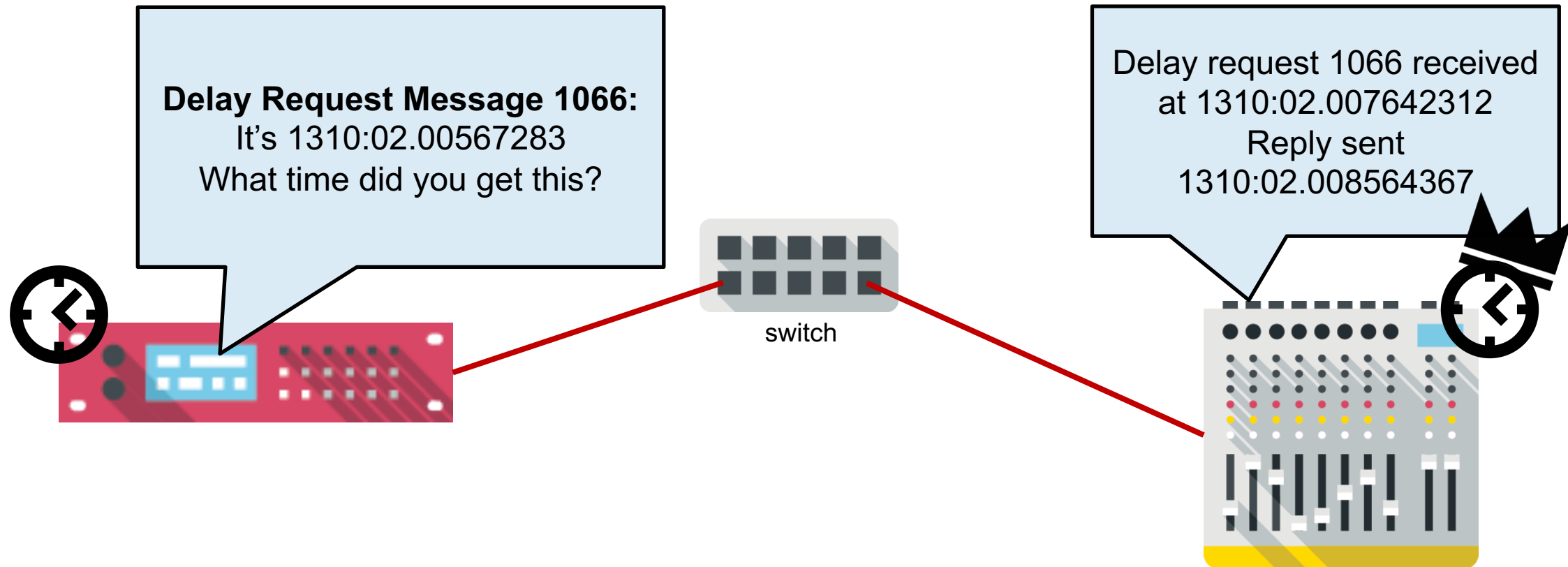
PTP: Sync (Time) and Follow-ups (Speed)



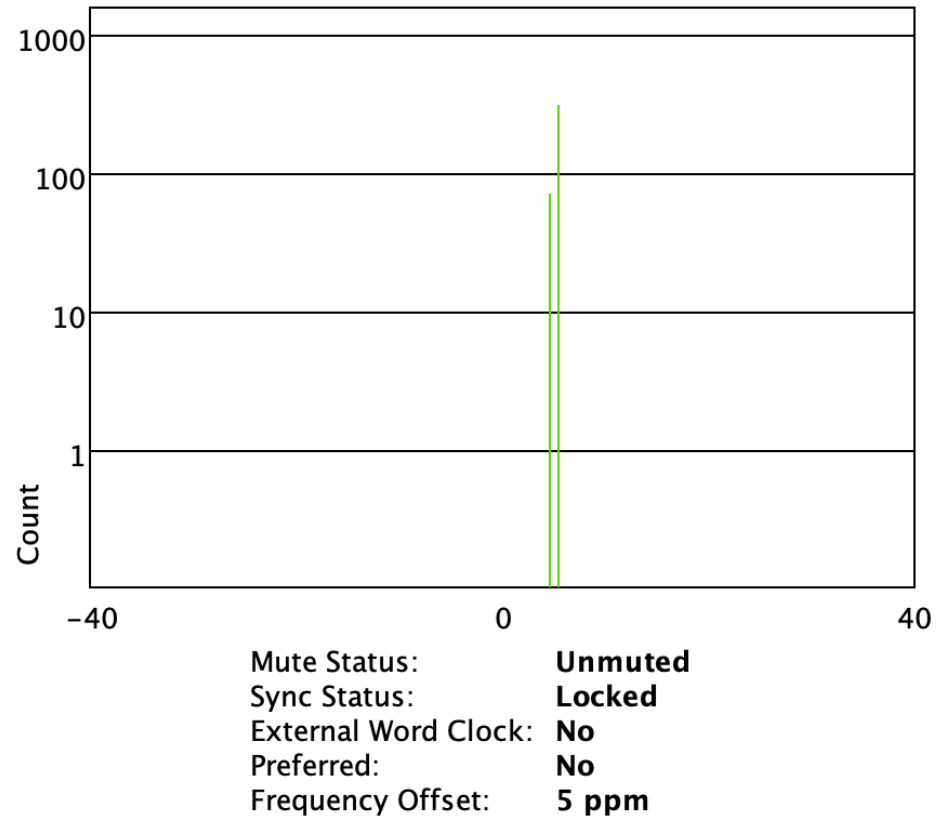
PTP Delay Requests (Propagation Delay)



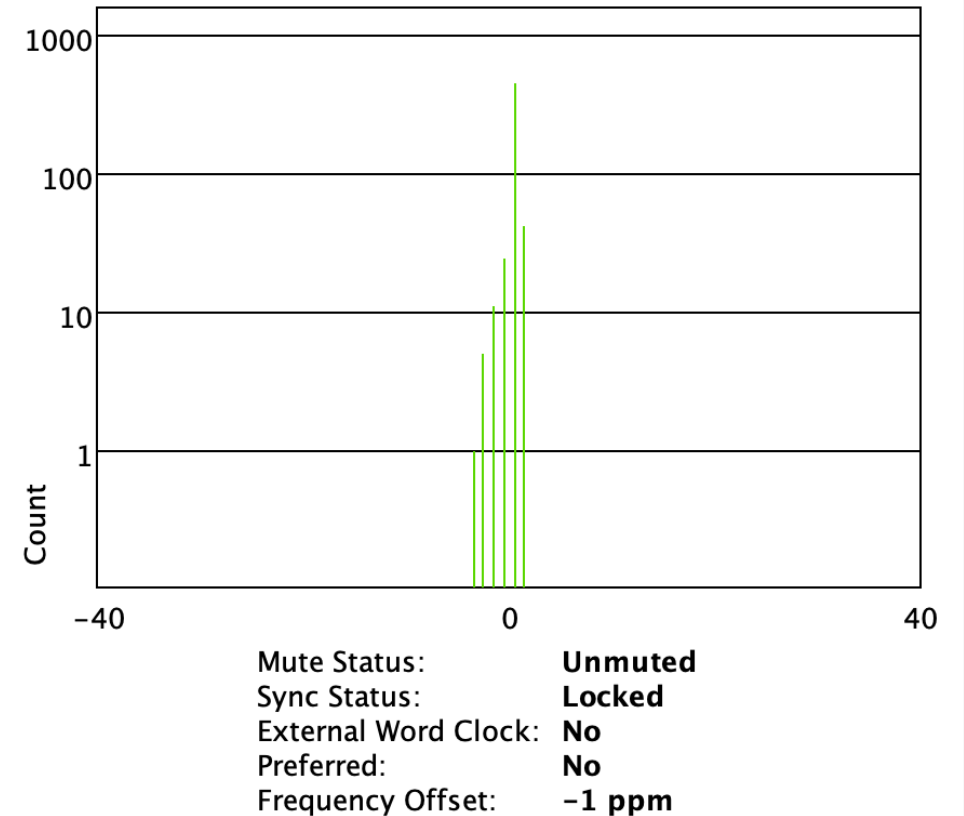
PTP Delay Requests (Propagation Delay)



Dante Controller Clock Histogram View - Good

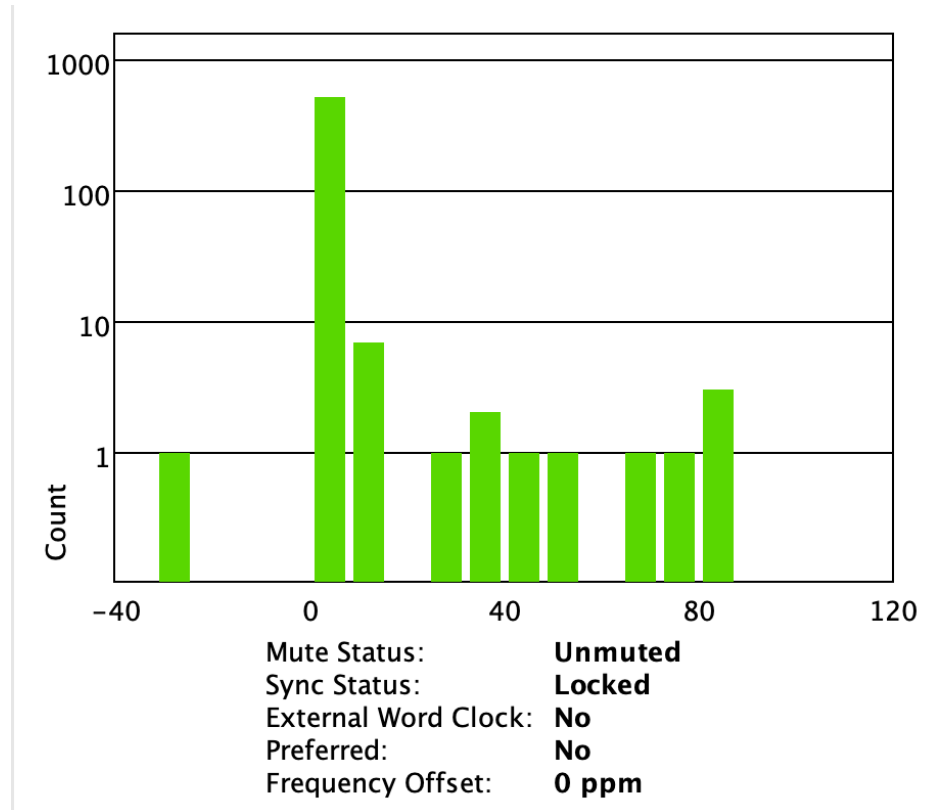


Great!

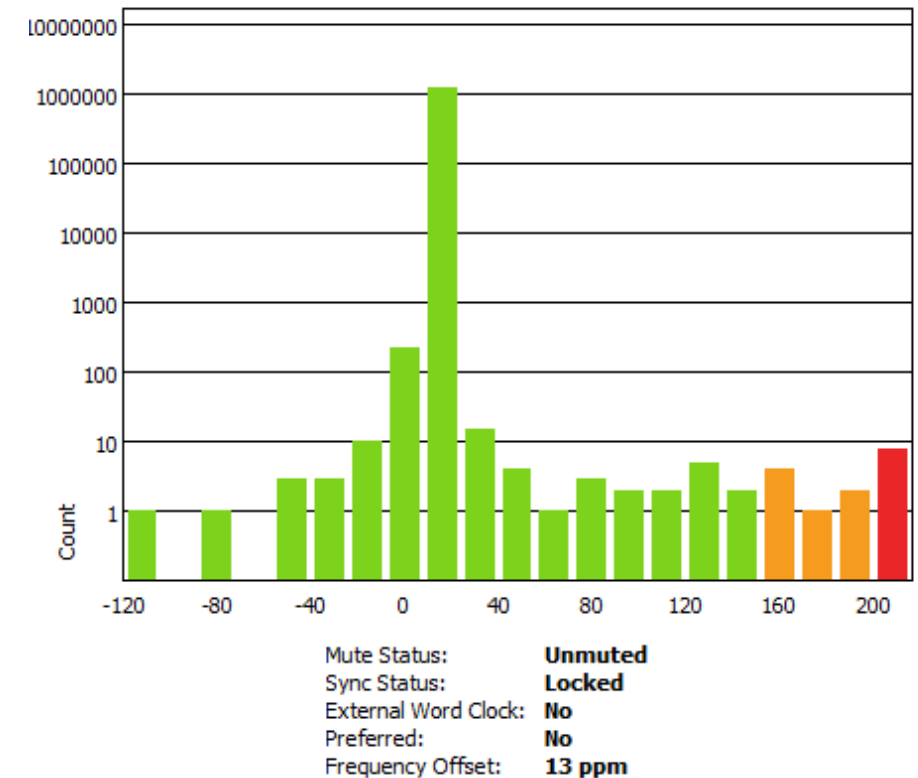


Fine

Dante Controller Clock Histogram View - Bad

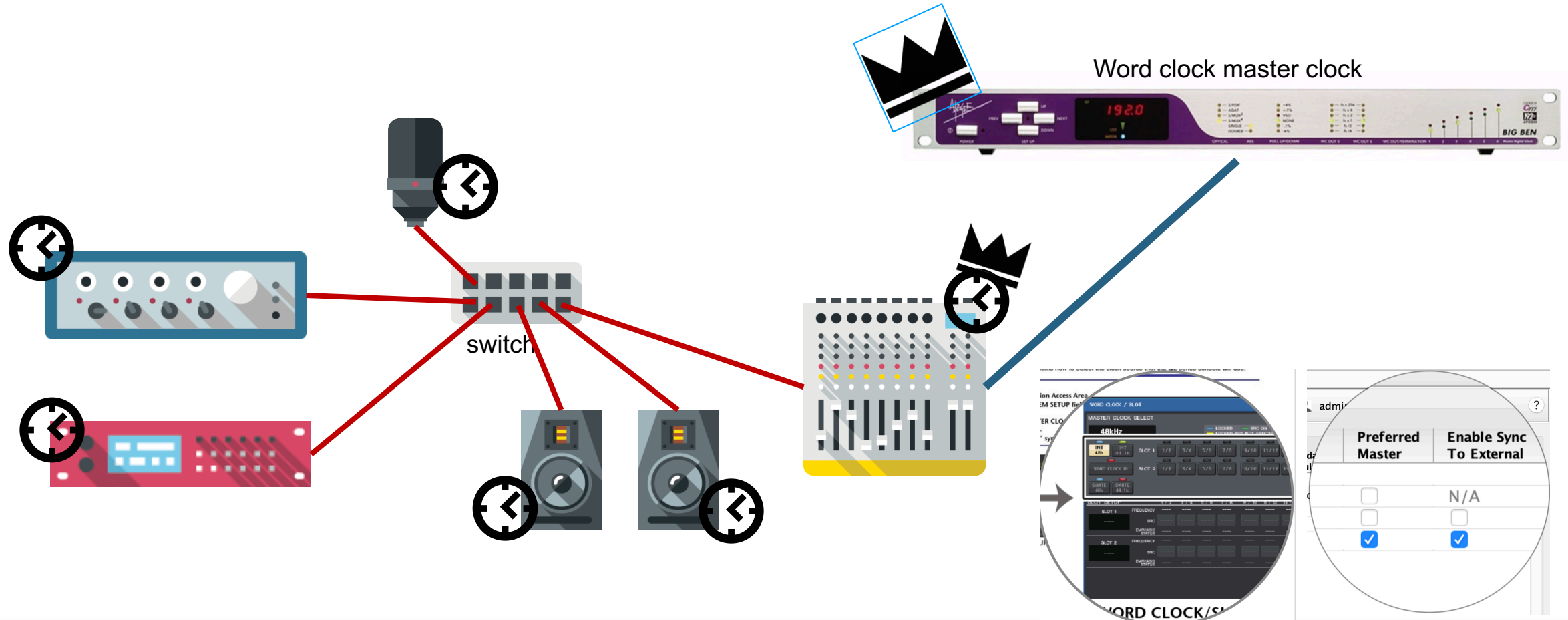


Interruptions in Audio Likely



Oh no...

Syncing to External Word Clocks






- IEEE 1588-2002–PTP v.1
- IEEE 1588-2008–PTP v.2
 - Dante uses both!
- What does PTP v2 “Not Backward Compatible” really mean?
 - Synchronization between PTP v1 and v2 is accomplished using boundary clocks
- Is PTP v.2 more accurate?
 - Accuracy of $< 1 \mu\text{s}$ attainable by both versions.
- PTP v.2 additional features include: unicast messaging, additional sync message rates, transparent clock.

Dante Domain Manager Default Dante Clocking

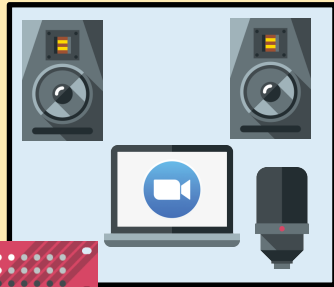
Clocking in DDM

- Clocking is on a per domain basis
 - Enrolling a device in a domain means it follows the clock master in its domain
 - A device in a different domain, but in the same IP subnet will be ignored
 - Allows you to break up “flat” networks into multiple clocking domains
- Multicast PTPv1 is used by default
- Uses the same clock election method as an unmanaged network
 - Can be customized in Dante Controller or Dante Domain Manager

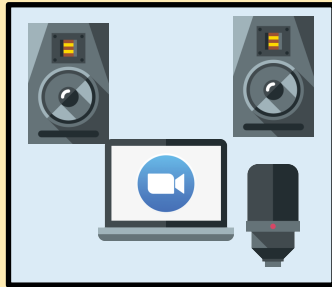
DEVICE NAME	STATUS	UNICAST CLOCKING	CUSTOMIZE CLOCKING
TestDevice	  	<input type="checkbox"/>	Edit
PTP PREFERRED		<input checked="" type="checkbox"/>	
MASTER			
PTP SYNC EXTERNAL		<input type="checkbox"/>	
PTP V1 DELAY		<div>Multicast</div>	
REQUESTS			
<div>CLOSE</div>			

Single Subnet Domains

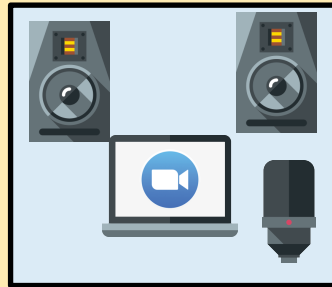
North Meeting Rooms



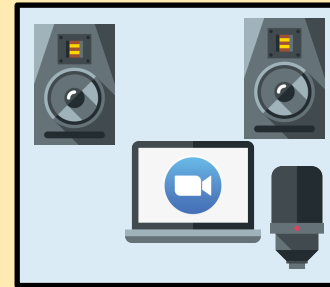
10



11

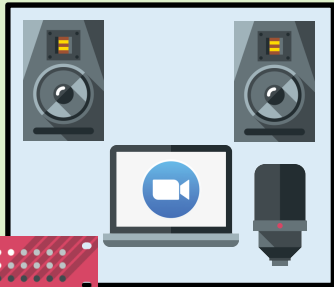


12

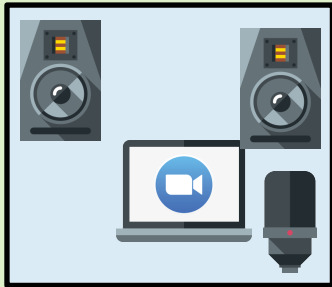


13

South Meeting Rooms



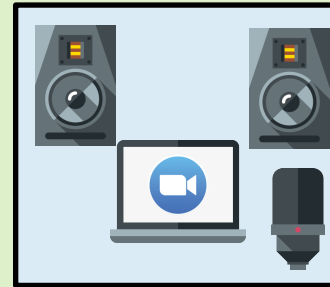
20



21

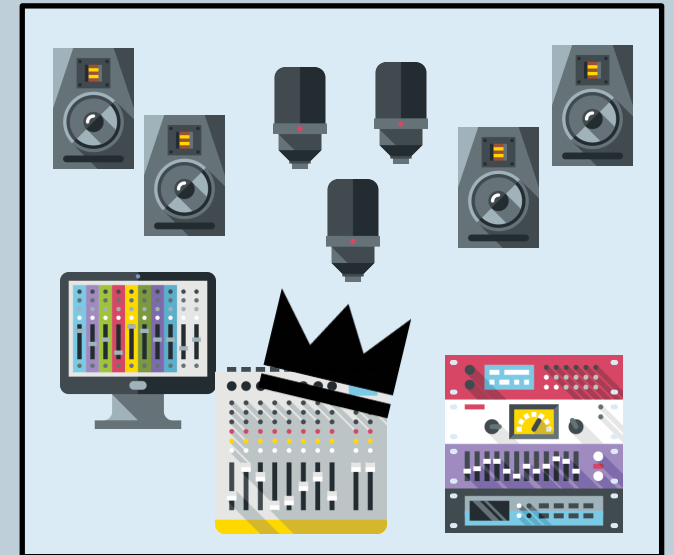


22



23

Atrium



Single Subnet Domains – Slide with DDM/Controller Views

Dante Controller - Network View

File Device View Help

Grand Master Clock: DSP Domain: Background Music admin (Site Administrator)

Routing Device Info Clock Status Network Status Events

Device Name	Sync	Mute	Clock Source	Domain Status	Primary v1 Multicast	Primary v2 Multicast	Secondary v1 Multicast	Secondary v2 Multicast	Preferred Master	Enable Sync To External
192.168.2.0/24										
AVIOAES3-501b05			Dante	Disabled	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
Computer			Dante	Disabled	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
DemoSpeaker			Dante	Disabled	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
DSP			Dante	Disabled	Master	Disabled	N/A	N/A	<input type="checkbox"/>	N/A
InputAdapter			Dante	Disabled	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
PresenterMic			Dante	Disabled	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
Zone2Amp			Dante	Disabled	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A

Background Music

Settings

ADVANCED SETTINGS

CLOCKING TYPESingle-subnet

AUTO-CONFIGURE

GRAND MASTERDSP

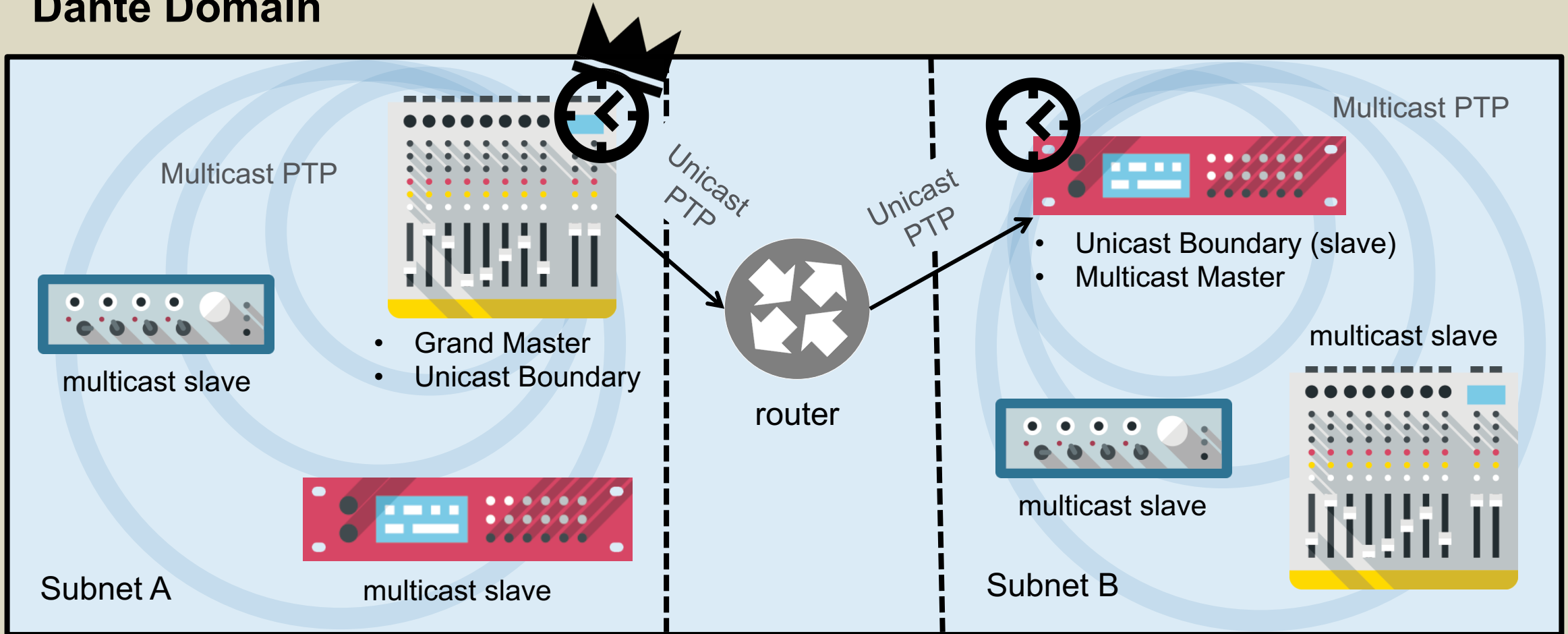
Domain Clocking

Subnet 192.168.2.0/24

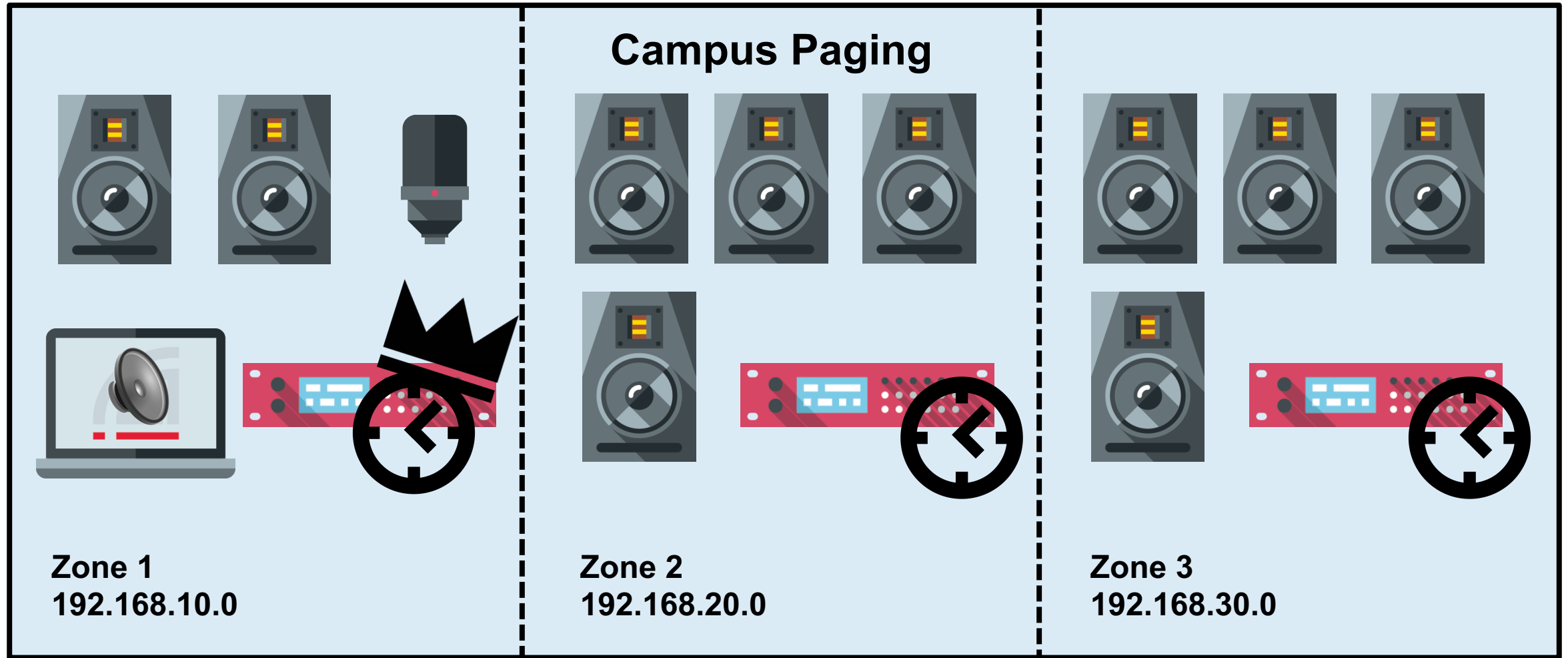
DEVICE NAME	STATUS	UNICAST CLOCKING	CUSTOMIZE CLOCKING
PresenterMic			Customize
DemoSpeaker			Customize
Computer			Customize
Zone2Amp			Customize
InputAdapter			Customize
AVIOAES3-501b05			Customize
DSP			Customize

Domains Spanning Multiple Subnets

Dante Domain



Domains Spanning Multiple Subnets



Domains Spanning Multiple Subnets

Dante Controller - Network View

File Device View Help

Grand Master
Clock: Zone1-DSP

Domain: Paging

kat (Site Administrator)

Routing Device Info Clock Status Network Status Events

Device Name	Sync	Mute	Clock Source	Domain Status	Primary Status	Secondary Status
192.168.0.0/24						
Zone1-DSP	<div></div>		Dante	Master	Master	Link down
Zone1-Speaker-01	<div></div>		Dante	N/A	Slave	N/A
Zone1-Speaker-02	<div></div>		Dante	N/A	Slave	N/A
192.168.1.0/24						
Zone2-DSP	<div></div>		Dante	Slave	Master	N/A
Zone2-Speaker	<div></div>		Dante	Standby	Slave	N/A
192.168.5.0/24						
AnnoucementMic	<div></div>		Dante	N/A	Slave	N/A
PlaybackMonitor	<div></div>		Dante	Slave	Master	N/A
SystemPlayback	<div></div>		Dante	Standby	Slave	N/A
192.168.6.0/24						
Zone3-DSP	<div></div>		Dante	Slave	Master	N/A
Zone3-Speaker-01	<div></div>		Dante	Standby	Slave	N/A
Zone3-Speaker-02	<div></div>		Dante	Disabled	Slave	N/A

P:

Unmanaged Multicast Bandwidth: 0 bps

Dante Domain Manager

Dashboard

Domains

Devices

Users

Roles

Settings

Audit Log

Search

Auditorium

Boardroom

Conference Room A

Conference Room B

Conference Room C

Huddle Room

Lobby

Paging

Production Studio

ADD DOMAIN

DELETE DOMAIN

Devices

ENROLL DEVICES

UNENROLL DEVICES (11)

Subnet 192.168.0.0/24

DEVICE NAME	ENROLL STATE	CONNECTIVITY
Zone1-Speaker-01	Enrolled	Online
Zone1-Speaker-02	Enrolled	Online
Zone1-DSP	Enrolled	Online

Subnet 192.168.6.0/24

DEVICE NAME	ENROLL STATE	CONNECTIVITY
Zone3-Speaker-01	Enrolled	Online
Zone3-Speaker-02	Enrolled	Online
Zone3-DSP	Enrolled	Online

Subnet 192.168.5.0/24

DEVICE NAME	ENROLL STATE	CONNECTIVITY
SystemPlayback	Enrolled	Online
PlaybackMonitor	Enrolled	Online
AnnoucementMic	Enrolled	Online

Auto Configure Clocking

- **When You Enroll a Device From a Different Subnet into a Domain:**
 - The DDM server will alert you clocking needs to be configured.
 - Navigate to the **Domain** page to adjust clocking.
 - You can click **Auto-Configure** to have DDM setup the clocking automatically
 - You can manually configure the clocking in **Advanced Settings**

The screenshot displays a red warning banner at the top with a clock icon and the text: "A unicast clocking capable device is available but not enabled in subnet 192.168.2.0/24 in Background Music". Below this is a red button labeled "MANAGE CLOCK SETTINGS".

The main interface is titled "Settings" with a tab for "ADVANCED SETTINGS". A grey warning box states: "Warning! There are multiple (2) grandmaster devices." Below this, the "CLOCKING TYPE" is set to "Multi-subnet". To the right of this setting is a blue-bordered button labeled "AUTO-CONFIGURE".

The "GRAND MASTERS" section shows "Mixer and 1 other." Below this is a toggle switch for "Allow association with pre v4.0 firmware devices", which is currently turned on (green).

Advanced Clocking Options – Default Dante

- You can define which devices you wish to act as subnet masters (boundary clocks) on the Advanced Clocking options page by enabling unicast clocking for those specific devices.
- A backup unicast clocking device is encouraged in each subnet.

Device Clocking

Subnet 192.168.1.0/24

ASSIGN ZONE

DEVICE NAME	STATUS	UNICAST CLOCKING	CUSTOMIZE CLOCKING
Mixer	➡ ⌚ ⌚ ⬅	<input checked="" type="checkbox"/>	Customise
MusicPlayback		<input checked="" type="checkbox"/>	Customise
AnnouncementMic		<input type="checkbox"/>	Customise
Zone2Amp		<input type="checkbox"/>	Customise

Device Clocking

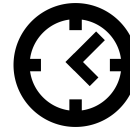
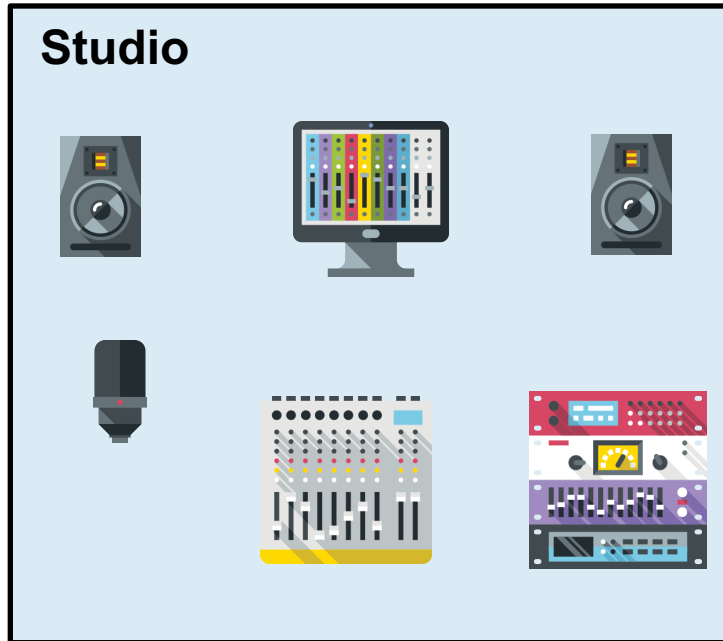
Subnet 192.168.2.0/24

ASSIGN ZONE

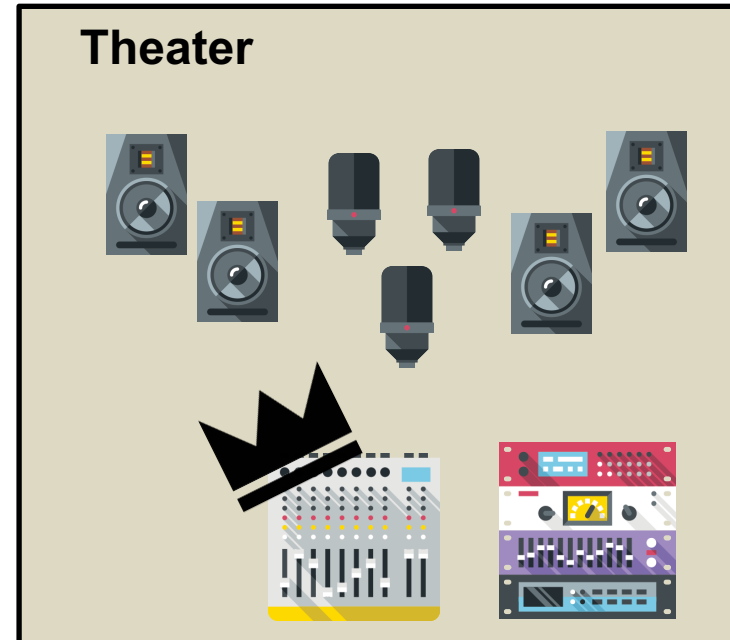
DEVICE NAME	STATUS	UNICAST CLOCKING	CUSTOMIZE CLOCKING
DSP	👑 ⌚ ➡	<input checked="" type="checkbox"/>	Customise
Zone1Amp		<input checked="" type="checkbox"/>	Customise

Shared Audio Groups

Shared Group



Theater



Shared Audio Groups

Dante Controller - Network View

FileDeviceViewHelp

Grand Master

Clock: Unknown Device*

Domain: North Building

ktaub (Site Administra... ?)

RoutingDevice InfoClock StatusNetwork StatusEvents

Device Name	Sync	Mute	Clock Source	Domain Status	Primary v1 Multicast	Primary v2 Multicast	Secondary v1 Multicast	Secondary v2 Multicast	Pref Mas
192.168.2.0/24									
InputAdapter	<div></div>		Dante	Disabled	Slave	N/A	N/A	N/A	<div></div>
tableMic	<div></div>		Dante	N/A	Slave	N/A	N/A	N/A	<div></div>
Wallplate	<div></div>		Dante	N/A	Slave	N/A	N/A	N/A	<div></div>


P:

Unmanaged Multicast Bandwidth: 0 bps

Event Log:

Clock Status Monitor:

Advanced Settings

 Auditorium (+1 other in shared)

Advanced settings can be used to configure interoperability, site-based clocking partitioning and unicast clocking device selection.

Warning! Changing settings may interrupt audio.

Audio/Clocking Parameters

MODE

Default

PTP CONFIGURATION

Default (v1 only)

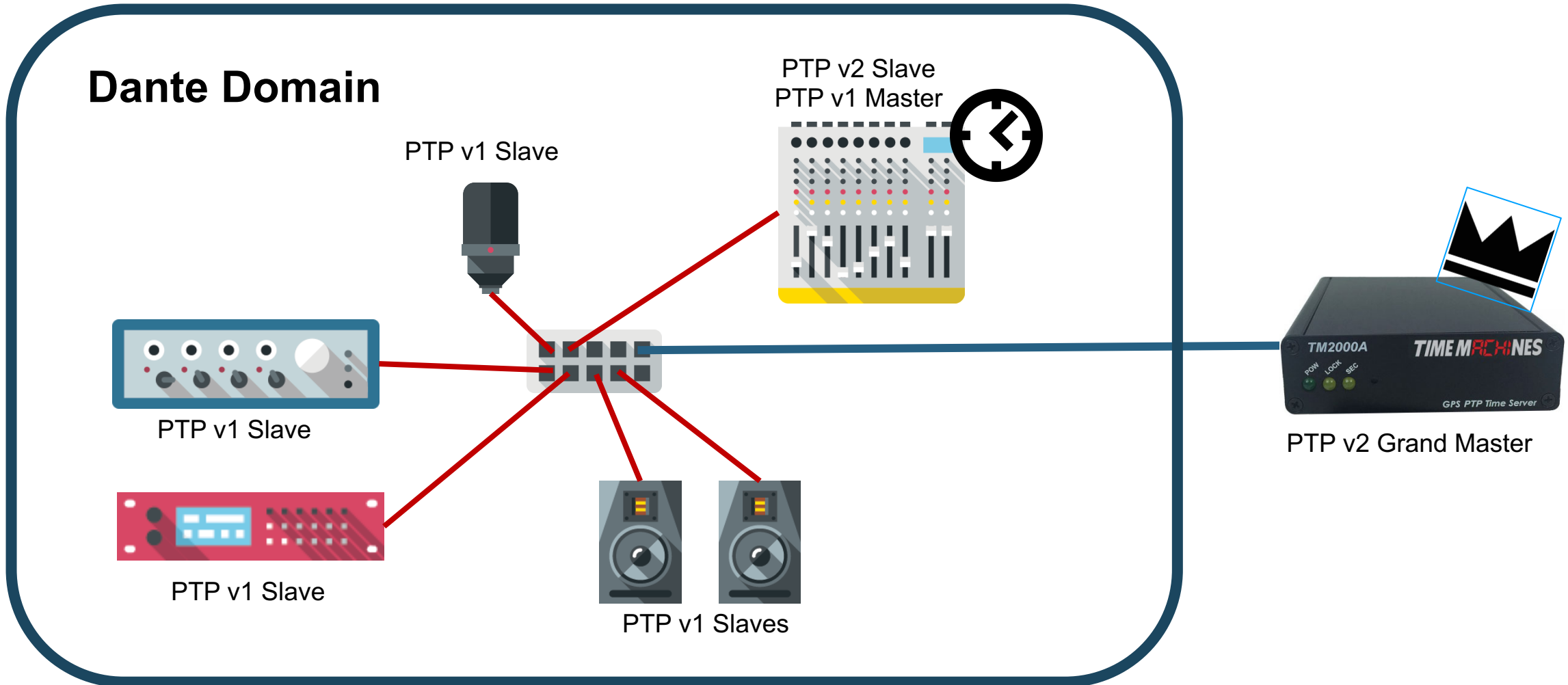
Shared Audio Clocking

Subnet 192.168.2.0/24

DEVICE NAME	STATUS	UNICAST CLOCKING	CUSTOMIZE CLOCKING
Wallplate	<div></div>	Not Supported	Customize
InputAdapter	<div></div>	<div></div>	Customize
DemoSpeaker	<div></div>	<div></div>	Customize
tableMic	<div></div>	Not Supported	Customize
DSP	<div></div>	<div></div>	Customize
Digital-IO	<div></div>	<div></div>	Customize

Dante Domain Manager Custom Dante Clocking

Sync to an External Network Clock



Sync to an External Network Clock

Audio/Clocking Parameters

MODE

Default

PTP CONFIGURATION

Custom (v1+v2)

PTP V2 DOMAIN NUMBER

3

PTP V2 PRIORITY 1

128

PTP V2 PRIORITY 2

128

Domain Clocking

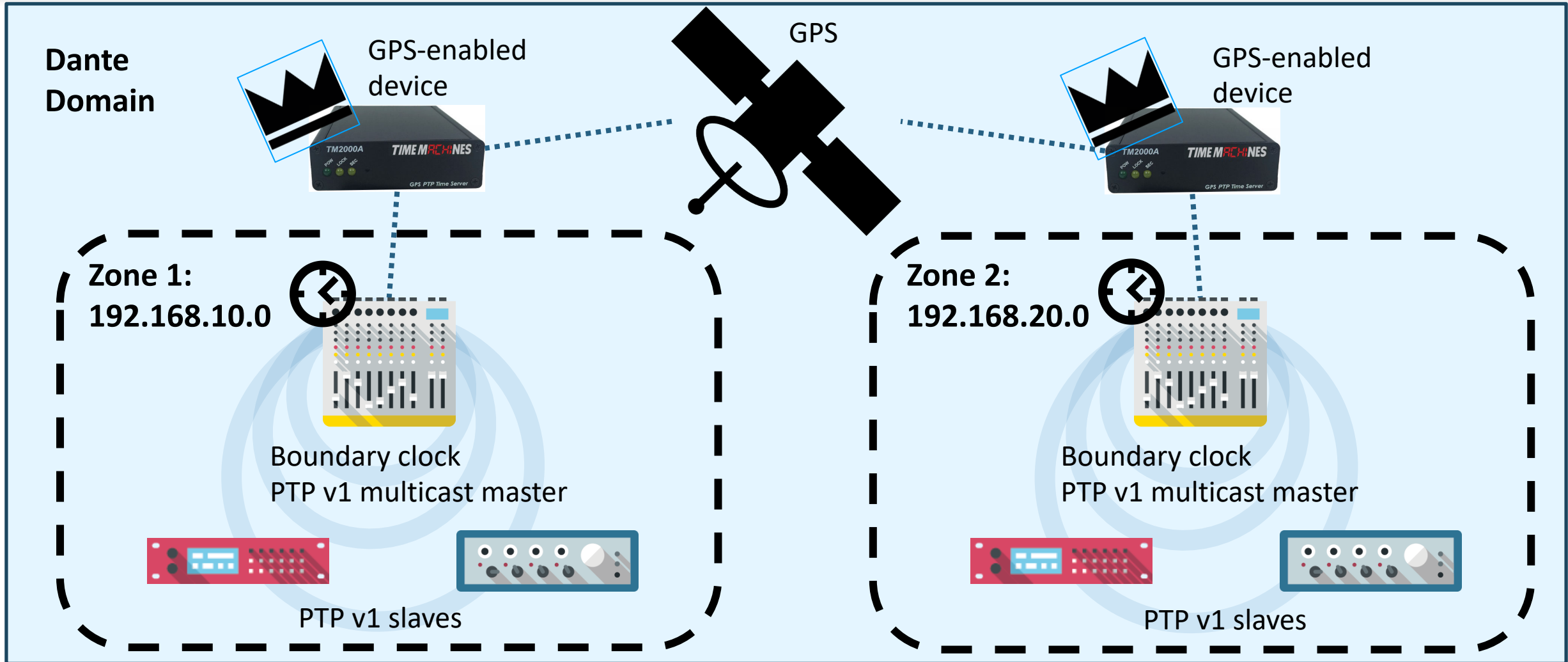
EXTERNAL GRANDMASTERS 1

Subnet 192.168.1.0/24

ASSIGN ZONE

DEVICE NAME	STATUS	UNICAST CLOCKING	CUSTOMIZE CLOCKING
SSL-SB-i16-Stagebox			Customize
AVIOAES3-504b8f			Customize
ST-MS204-800a2b			Customize
B2-PDK-Mixer			Customize
Studio-ControlRoom-Monitoring		Not Supported	Customize
Music-Playback-Computer		Not Supported	Customize
lyo3232M-1462be			Customize
unDNEMO-07b25b		Not Supported	Customize

Clocking Zones



Clocking Zones

- Zones must be separate subnets
- External Grandmasters must be synced
- At least one device with 4.2 Dante firmware required if syncing to PTPv2

?

admin

-New York-

EXTERNAL GRANDMASTERS1

Subnet 192.168.1.0/24

ASSIGN ZONE

DEVICE NAME	STATUS	UNICAST CLOCKING	CUSTOMIZE CLOCKING
Symetrix-0ed884	<div><div></div><div></div></div>	<div><div></div><div>x</div></div>	Customize
FoH-VirtualSoundcheck	<div><div></div></div>	Not Supported	Customize

-Boston-

EXTERNAL GRANDMASTERS1

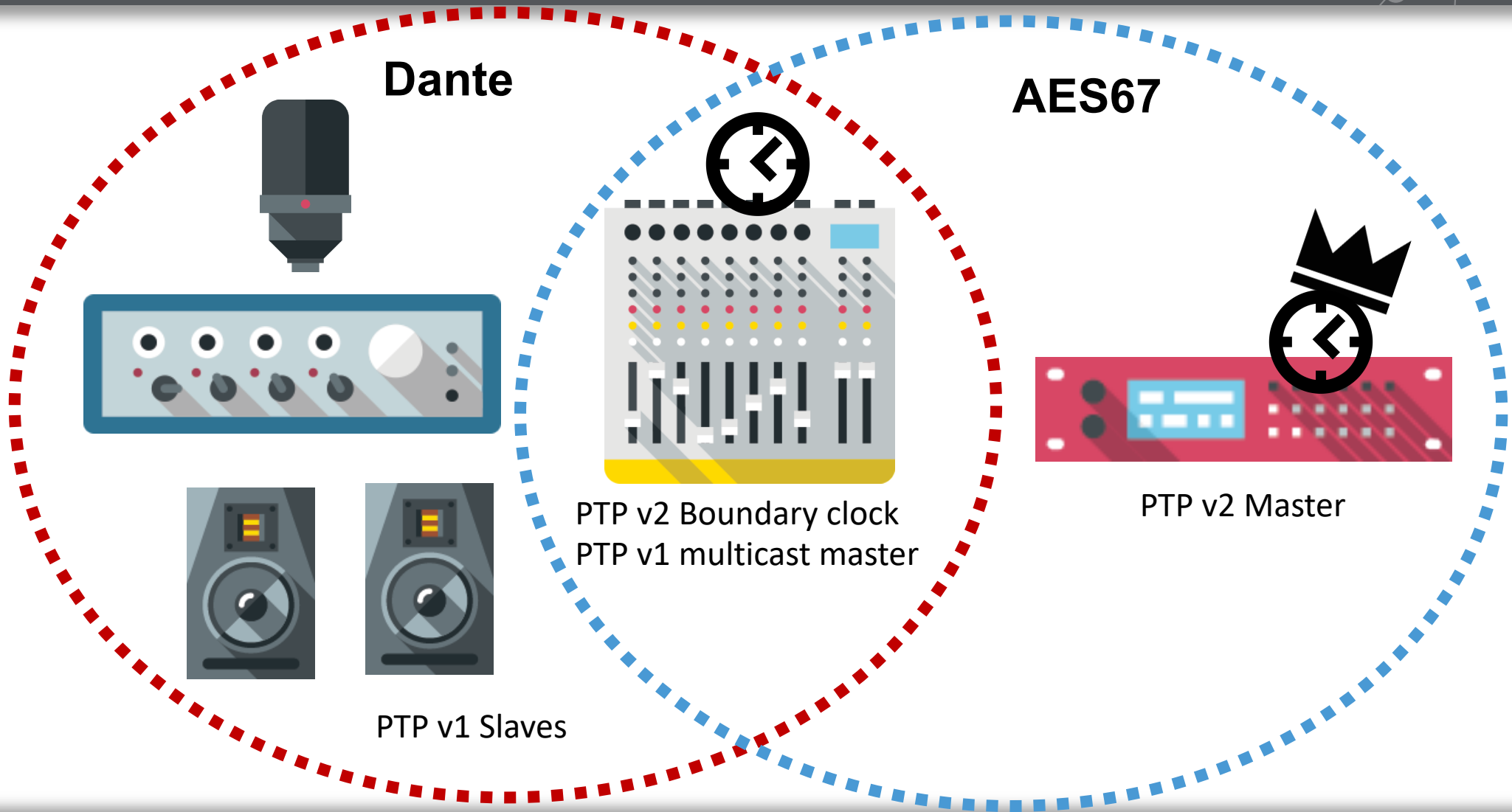
Subnet 192.168.2.0/24

ASSIGN ZONE

DEVICE NAME	STATUS	UNICAST CLOCKING	CUSTOMIZE CLOCKING
BKN2-102996	<div><div></div><div></div></div>	<div><div></div><div>x</div></div>	Customize
Booth-Intercom-IO	<div><div></div></div>	Not Supported	Customize

AES67 & SMPTE 2110 Clocking

Unmanaged AES67



Unmanaged AES67

Dante Controller - Network View

File Device View Help

Grand Master Clock: Unknown Device*

Routing Device Info Clock Status Network Status Events

Device Name	Sync	Mute	Clock Source	Domain Status	Primary v1 Multicast	Primary v2 Multicast	Secondary v1 Multicast	Secondary v2 Multicast	Preferred Master	Enable Sync To External
ARC-8-Ch-7	<input checked="" type="checkbox"/>		Dante	N/A	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
AVIO-USB-Laptop	<input checked="" type="checkbox"/>		Dante	N/A	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
AVIOAO1-501c02	<input checked="" type="checkbox"/>		Dante	N/A	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
Dante-Bridge-Truck	<input checked="" type="checkbox"/>		Dante	N/A	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
Glensound-AOIP44	<input checked="" type="checkbox"/>		Dante	N/A	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
M-Audio-Spk-Left	<input checked="" type="checkbox"/>		Dante	N/A	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
M-Audio-Spk-Right	<input checked="" type="checkbox"/>		Dante	N/A	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
PCIe-080350-Desktop	<input checked="" type="checkbox"/>		Dante	N/A	Master	Slave	Link down	N/A	<input type="checkbox"/>	N/A
Wohler-Monitor-Left	<input checked="" type="checkbox"/>		Dante	N/A	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A
Wohler-Monitor-Right	<input checked="" type="checkbox"/>		Dante	N/A	Slave	N/A	N/A	N/A	<input type="checkbox"/>	N/A

P: ☒ S: ☐


Unmanaged Multicast Bandwidth: 32Mbps Event Log: ☐ Clock Status Monitor: ☒

AES67 with Dante Domain Manager

- Change the domain's clocking mode to **AES67** in **Advanced Settings**
- Requires DDM 1.1
- Devices in interop mode require version 4.2 Dante firmware
- PTP Domain Number is always 0 for AES67 meaning **ONLY 1 AES67 Domain!**

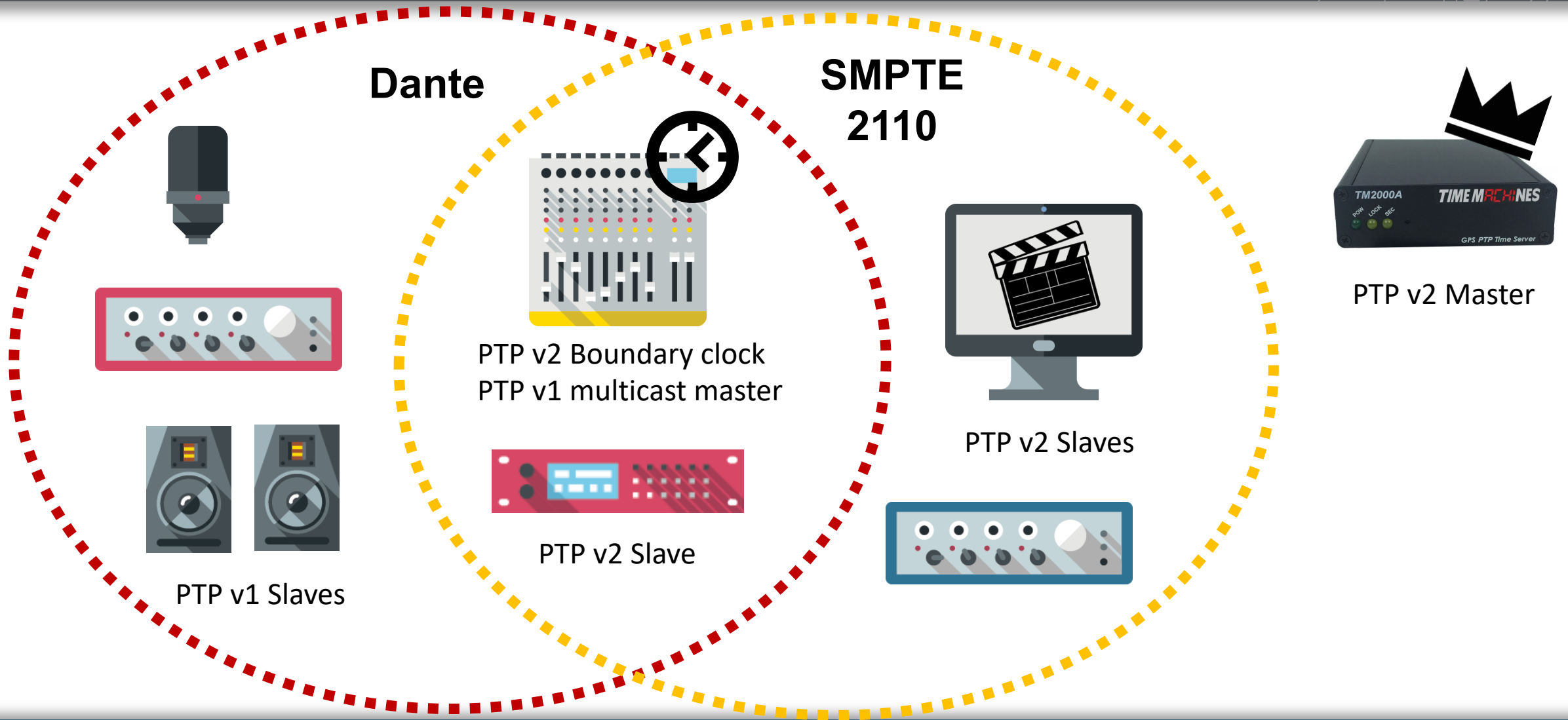
Audio/Clocking Parameters

SAVE CHANGESCANCEL EDITING

 The current configuration can cause clocking problems if you use Dante devices in the unmanaged domain. Please ensure all devices in the unmanaged domain have AES67 disabled.

MODE	<div>AES67</div>
PTP CONFIGURATION	<div>Custom</div>
PTP V2 PRIORITY 1	<div>248</div>
PTP V2 PRIORITY 2	<div>248</div>
PTP V2 MULTICAST TTL	<div>16</div>
RTP PREFIX V4	<div>69</div>

SMPTE 2110 Clocking



SMPTE 2110 Clocking

- Change the domain's clocking mode to **SMPTE** in *Advanced Settings*
- Requires DDM 1.1
- Devices in interop mode require version 4.2 Dante firmware

Audio/Clocking Parameters

MODE	<div>SMPTE</div>
PTP V1 MULTICAST	<div><input checked="" type="checkbox"/></div>
PTP V2 DOMAIN NUMBER	<div>127</div>
PTP V2 PRIORITY 1	<div>128</div>
PTP V2 PRIORITY 2	<div>128</div>
PTP V2 SYNC INTERVAL	<div>-3</div>
PTP V2 ANNOUNCE INTERVAL	<div>-2</div>
PTP V2 MULTICAST TTL	<div>16</div>
PTP SLAVE ONLY	<div><input type="checkbox"/></div>

Q&A



Dante Domain Manager™

Clocking

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