

DANTE

ADVANCED TOPICS

DANTE LATENCY, CLOCKING, & DANTE DOMAIN MANAGER

DANTE LATENCY & CLOCKING

LATENCY

- Learn how devices with different latency settings interact with each other.

CLOCKING

- Understanding the clock election and syncing to external clocks.

DANTE LATENCY

UNDERSTANDING HOW DANTE DEVICES DIFFERENT
LATENCY SETTINGS WORK ON THE SAME NETWORK

LATENCY IN DANTE

- 100% deterministic – always well-defined
- Default Dante latency 1ms – suitable for large networks
- Adjustable to suit needs
 - Minimum 150µs
 - Maximum 5ms
- Set per Device

Device Latency

Current latency: 1 msec

	Latency	Maximum Network Size
<input type="radio"/>	150 usec	Gigabit network with one switch
<input type="radio"/>	250 usec	Gigabit network with three switches
<input type="radio"/>	500 usec	Gigabit network with five switches
<input checked="" type="radio"/>	1 msec	Gigabit network with ten switches or gigabit network with 100Mbps leaf nodes
<input type="radio"/>	2 msec	Gigabit network with 100Mbps leaf nodes
<input type="radio"/>	5 msec	Safe value

LATENCY - LOWER BOUNDS

- If only 1 switch, Dante latency can be set to 150µs
- 3 switches, 250µs
- 10 switches, 1ms (Dante default)
- Recommended values are based upon worst-case scenarios
- **Monitor actual network performance**

Device Latency

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	Latency	Maximum Network Size
<input type="radio"/>	150 usec	Gigabit network with one switch
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<input type="radio"/>	500 usec	Gigabit network with five switches
<input checked="" type="radio"/>	1 msec	Gigabit network with ten switches or gigabit network
<input type="radio"/>	2 msec	Gigabit network with 100Mbps leaf nodes
<input type="radio"/>	5 msec	Safe value

DIFFERENT LATENCY SETTINGS – RULES

Dante-enabled devices can simultaneously receive audio from transmitters with different latency settings at the same time.

TRANSMITTING DEVICES

Device 1
Latency = 1ms



Device 2
Latency = 2ms



Device 3
Latency = 500µs



RECEIVING DEVICE with Latency Set at 1ms

Latency Matches:

This audio will play out at their matching latency settings of 1ms.

Easy to understand!

TX Device has a higher latency setting:

This audio will play out at 2ms.

The receiving device adopts the TX device latency setting for the associated channels.

TX Device has a lower latency setting:

This audio will play out at 1ms.

The receiving device will use its latency setting for the audio from this TX device.

Device Receiving
Multiple Audio
Channels from Different
Transmitting Devices

DIFFERENT LATENCY SETTINGS – RULES

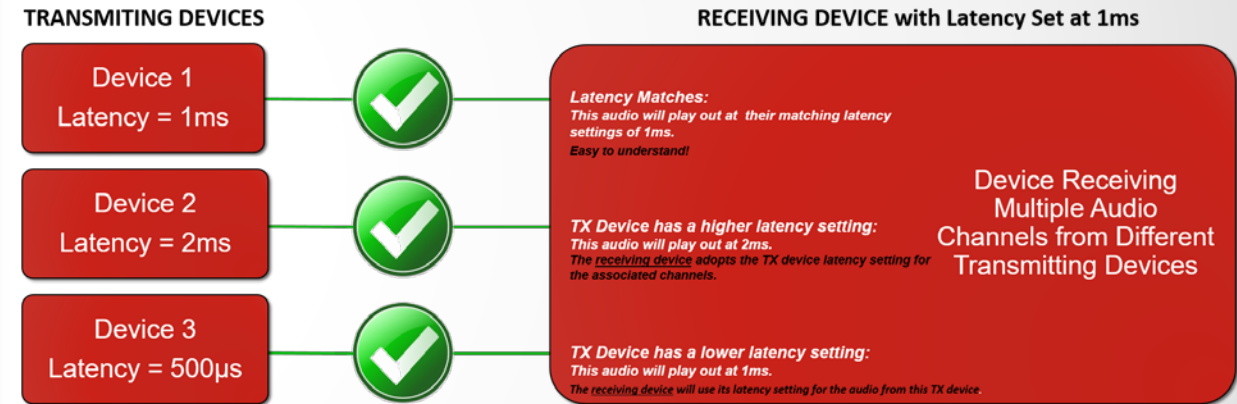
You should match the latency settings of source devices feeding a common receiving device.



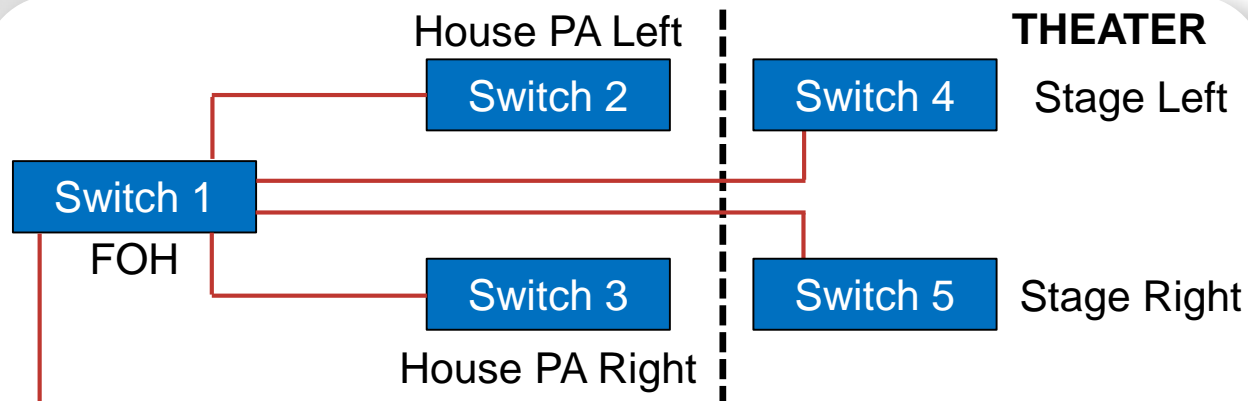
Or in situations where time alignment is critical.



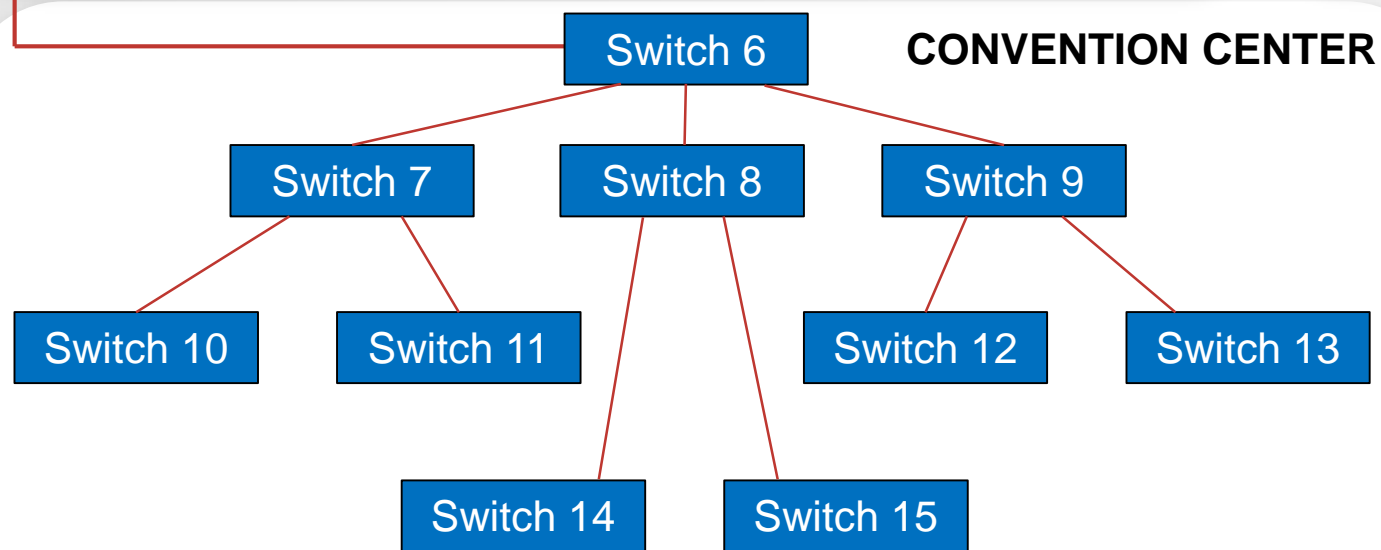
Exceptions: DVS & Via, remote devices and/or systems.



DIFFERENT LATENCIES ON A NETWORK



- Set Dante stage devices for 250 μ s for ultra-low latency for performers.
- Set FOH mixer/DSP/amps to 500 μ s.



- Set Dante devices in the Convention Center for 1ms.
- A mix from the Theater can play in any Convention Center ballroom.
- Any source from the Convention Center can be used in the theater.

DANTE CLOCKING

THE DANTE CLOCK ELECTION AND BEST PRACTICES WHEN
USING EXTERNAL CLOCKS

HOW DOES DANTE CLOCKING WORK?

Dante handles clocking automatically via election

- IEEE1588 PTP

- All devices sync'd to Master

- Each device has a clock

- New Clock Master elected as needed



**CLOCK
MASTER**

CLOCK MASTERS

Clock Master determined by election in accordance with IEEE1588



Rig Election with “Preferred Master” and “Enable Sync to External” settings



Understanding the election process

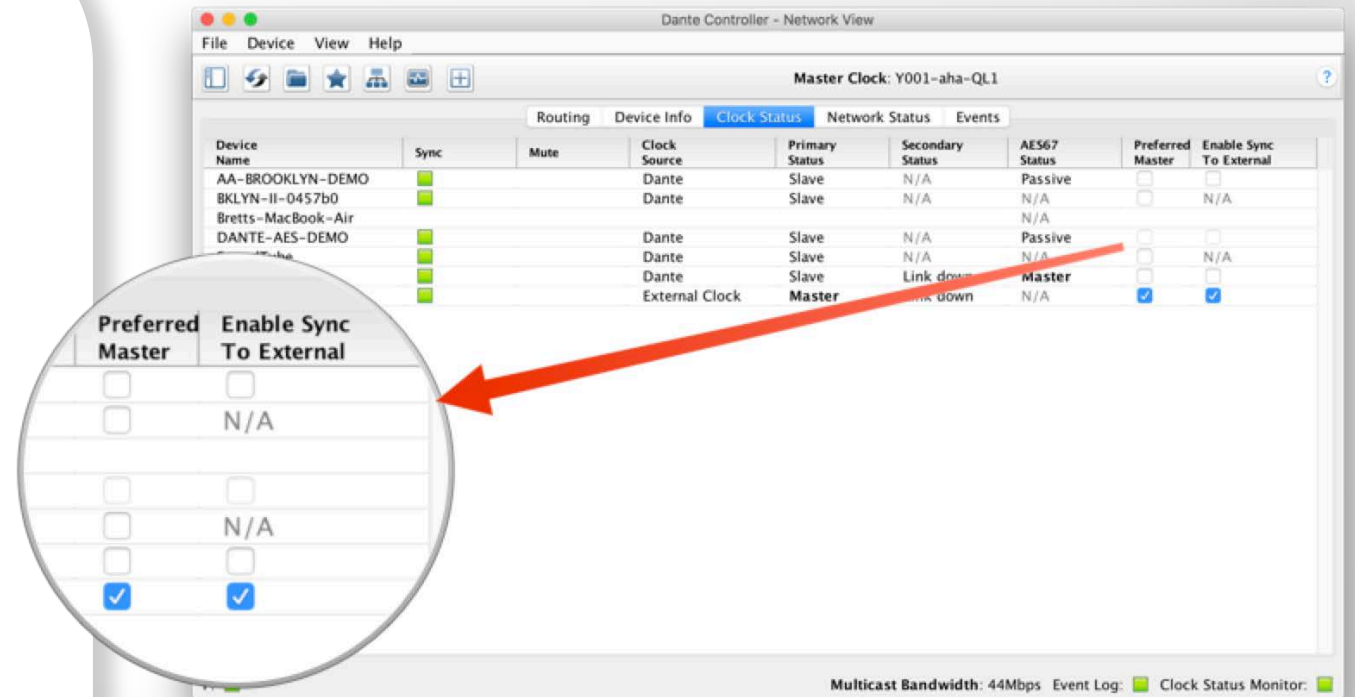


	Preferred Master	Enable Sync To External
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	N/A
	<input type="checkbox"/>	<input type="checkbox"/>
	<input type="checkbox"/>	N/A
	<input type="checkbox"/>	<input type="checkbox"/>
	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

ADJUSTING CLOCKS

Clock Status tab in Dante Controller

•
Checkboxes for Preferred Master and Enable Sync to External



CLOCK ELECTION



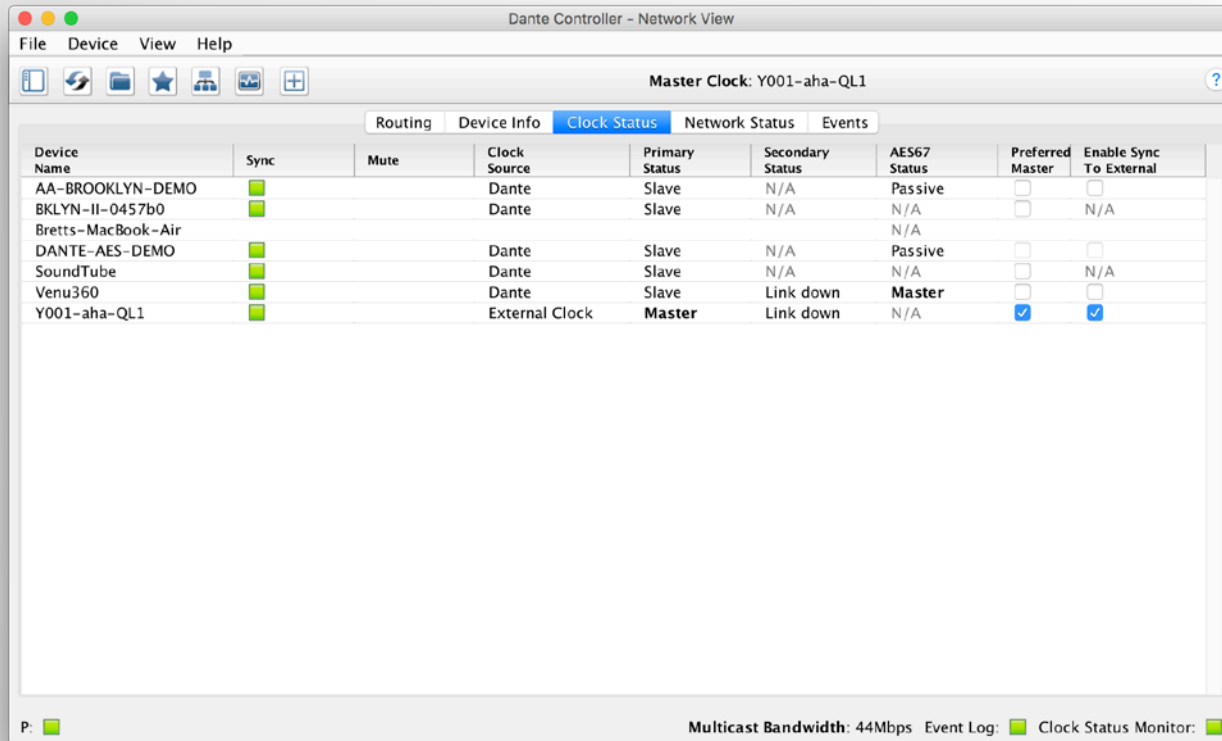
WIN

Preferred Master ✓ ✓

Enable Sync to External ✓

Nothing checked

PREFERRED MASTER



The screenshot shows the Dante Controller Network View window. The title bar reads "Dante Controller - Network View". The menu bar includes "File", "Device", "View", and "Help". Below the menu bar, there are icons for home, refresh, save, star, and a plus sign. The main window displays a table of device clock status. The table has columns for Device Name, Sync, Mute, Clock Source, Primary Status, Secondary Status, AES67 Status, Preferred Master, and Enable Sync To External. The device "Y001-aha-QL1" is highlighted as the Preferred Master.

Device Name	Sync	Mute	Clock Source	Primary Status	Secondary Status	AES67 Status	Preferred Master	Enable Sync To External
AA-BROOKLYN-DEMO	<input checked="" type="checkbox"/>		Dante	Slave	N/A	Passive	<input type="checkbox"/>	<input type="checkbox"/>
BKLYN-II-0457b0	<input checked="" type="checkbox"/>		Dante	Slave	N/A	N/A	<input type="checkbox"/>	N/A
Bretts-MacBook-Air						N/A		
DANTE-AES-DEMO	<input checked="" type="checkbox"/>		Dante	Slave	N/A	Passive	<input type="checkbox"/>	<input type="checkbox"/>
SoundTube	<input checked="" type="checkbox"/>		Dante	Slave	N/A	N/A	<input type="checkbox"/>	N/A
Venu360	<input checked="" type="checkbox"/>		Dante	Slave	Link down	Master	<input type="checkbox"/>	<input type="checkbox"/>
Y001-aha-QL1	<input checked="" type="checkbox"/>		External Clock	Master	Link down	N/A	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

At the bottom of the window, there is a status bar with "P:" on the left and "Multicast Bandwidth: 44Mbps Event Log: Clock Status Monitor:

Dante will always elect a Clock Master without intervention

•
Changes to Clock Master are automatic and do not affect audio

•
Any hardware device can be made a "Preferred Master" clock

•
Preferred Master should be a device that is always present in system

USING EXTERNAL CLOCKS

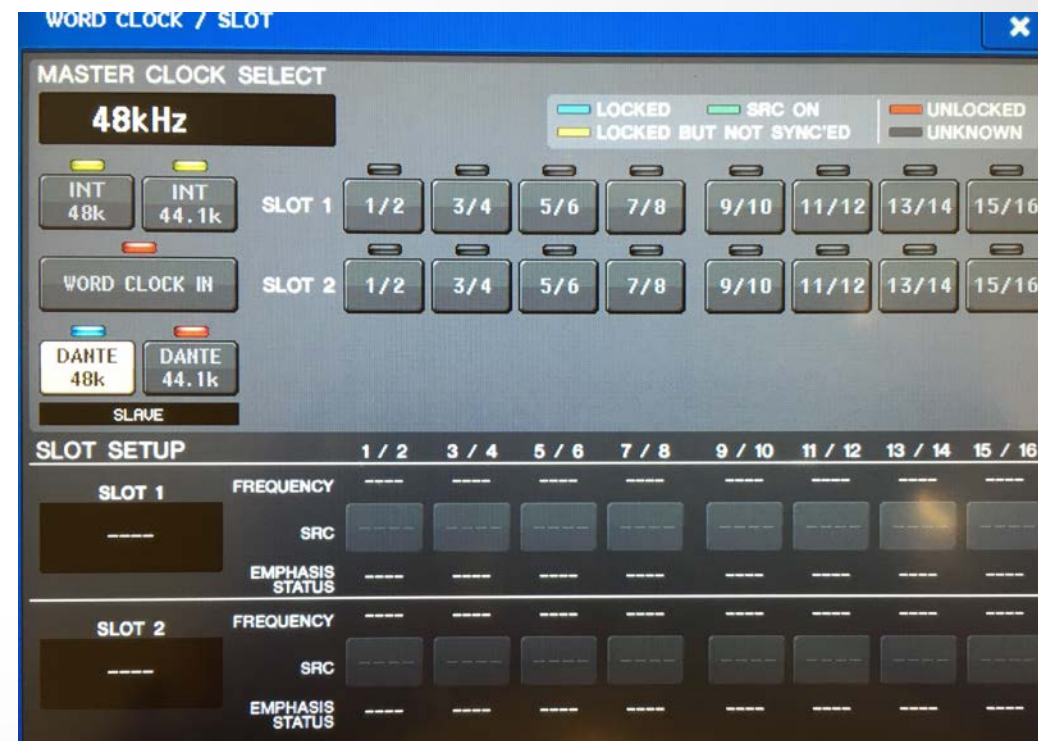
“Enable Sync to External” allows use of console (or other) clock

- Configure in console, too

- Check “Preferred Master”

- Mismatch may result in pops and clicks

- Using Active Clock Monitoring to ensure quality of external clock



EXTERNAL CLOCK BEST PRACTICES

If using an external clock, configure in both device and Dante Controller (Enable Sync to External)



Always check Preferred Master on the device using Enable Sync to External



Symptom: clicks and pops

EXTERNAL CLOCK **BEST PRACTICES**

To provide a backup to your externally synced Dante device:

Connect the external word clock to the two Dante devices on the network.



Configure in both devices and Dante Controller (Enable Sync to External) and check Preferred Master on these as well.



Dante devices will break this “tie” by choosing the device with the lowest value MAC address to be the clock master.

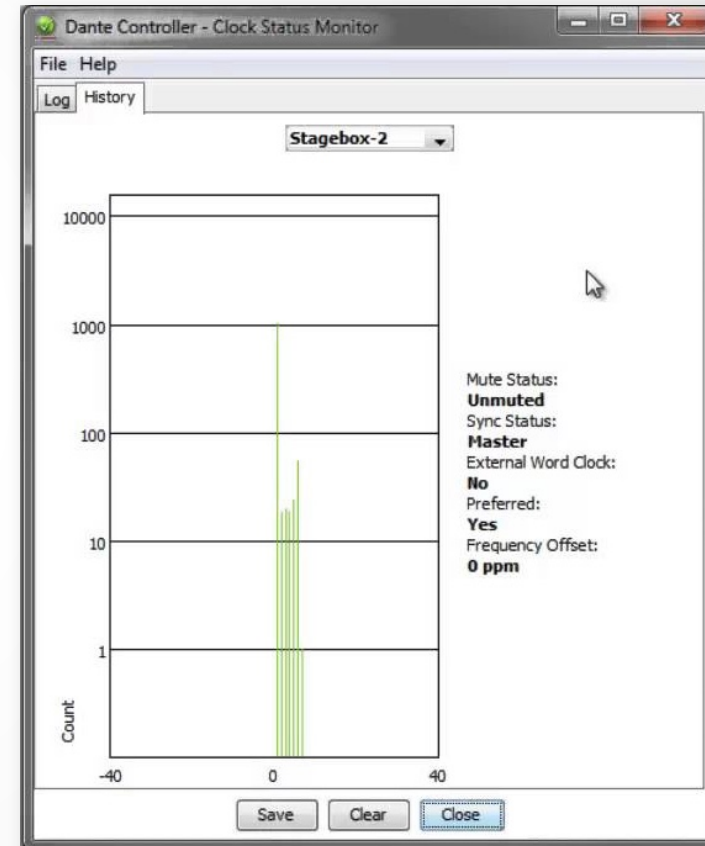
CLOCK STATUS MONITORING

Passive: always on

- Clock Master changes only

Active: select in toolbar to turn on

- *Useful for troubleshooting external clocks*
- Looks for instability
- Accumulates data over time
- Displays spread of clock frequency



DANTE

DOMAIN MANAGER

COMPLETE NETWORK MANAGEMENT FOR DANTE SYSTEMS

WHAT IS DANTE DOMAIN MANAGER?

- ✓ Dante Domain Manager is server-based software that manages your Dante network

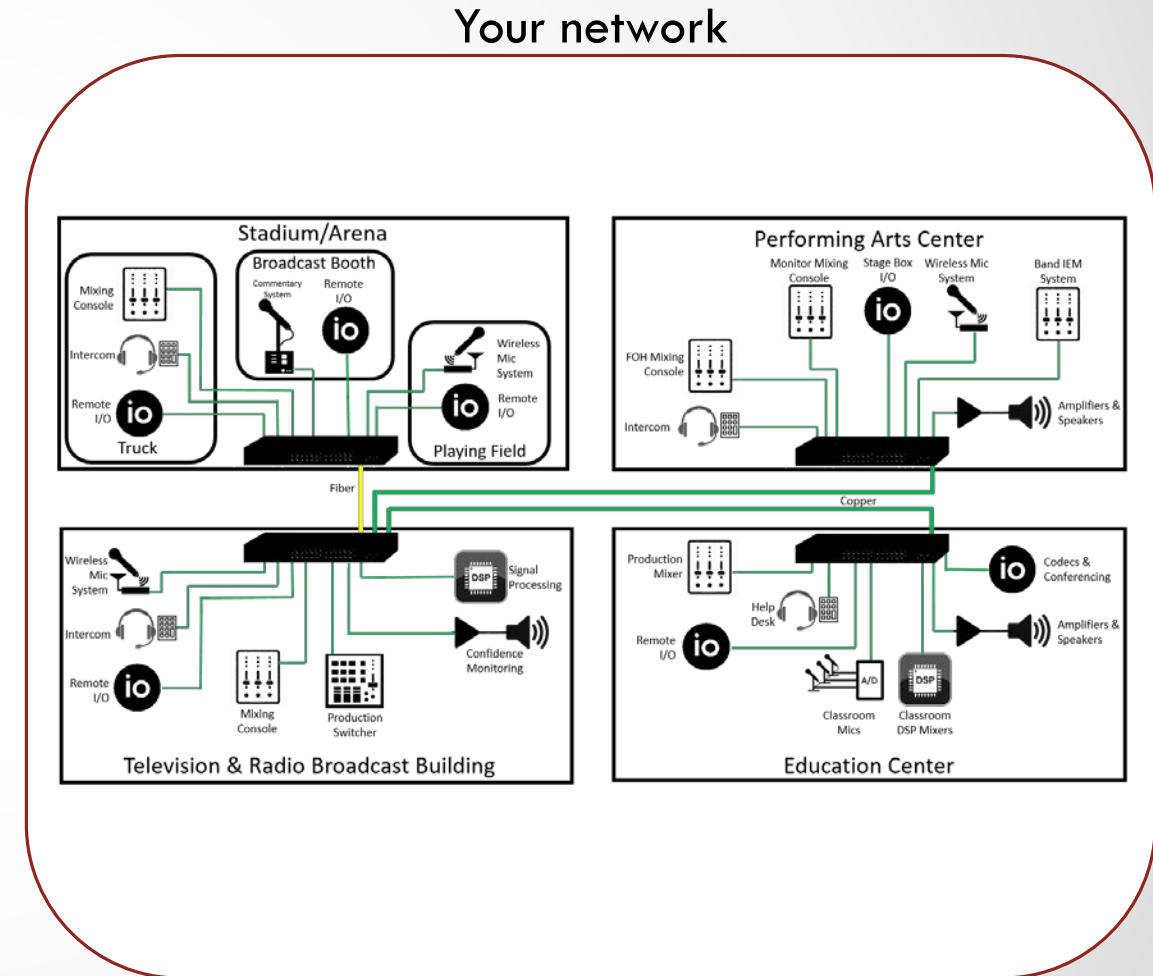
- ✓ Delivered as a Virtual Appliance: Vmware (Vsphere, ESXI), Microsoft Hyper Vee, Xen, Virtual Box

- ✓ Managed with a web browser from computer, tablet or phone

- ✓ Not in the audio path – audio continues even if the server has failed or is unreachable

ABOUT DANTE DOMAINS

- ✓ A Dante Domain is a logical group of devices and users with access controls
- ✓ A Dante Domain may be used to represent a location, building, zone, ...
- ✓ Many Dante Domains can share one underlying network
- ✓ A Dante Domain may span IP subnets
- ✓ A Dante Domain can be isolated



DANTE DOMAIN MANAGER

The screenshot displays the Dante Domain Manager (DDM) web interface. The browser address bar shows 'ddm.ddm/dashboard'. The interface features a dark theme with a sidebar on the left containing navigation links: Dashboard, Domains, Devices, Users, Roles, Settings, and Audit Log. The main content area is titled 'Dante Domain Manager' and includes a 'STADIUM' label and a user profile 'admin'. The dashboard is divided into several sections:

- Alerts:** A section titled 'High Availability' with a dropdown menu set to 'STANDALONE'.
- External Services:** A list of services, each with a warning icon and a 'Disabled' status:
 - SNMP Proxy Agent:** Receives SNMP queries and sends responses.
 - Email Service:** Sends notifications and reset password link.
 - LDAP Service:** Authenticates users against an LDAP directory.
- Activity:** A section titled 'Activity' with a dropdown menu set to 'MOST RECENT'. It shows a large red '1' and the text 'User operations and events in the last 24 hours'.
- Domains:** A section titled 'Domains' with a dropdown menu set to 'MY DEFAULT DOMAIN'. It shows a large red '0' and the text 'Enrolled devices'. Below this is a 'Status' section with a legend:
 - Clocking
 - Connectivity
 - Latency
 - Subscriptions

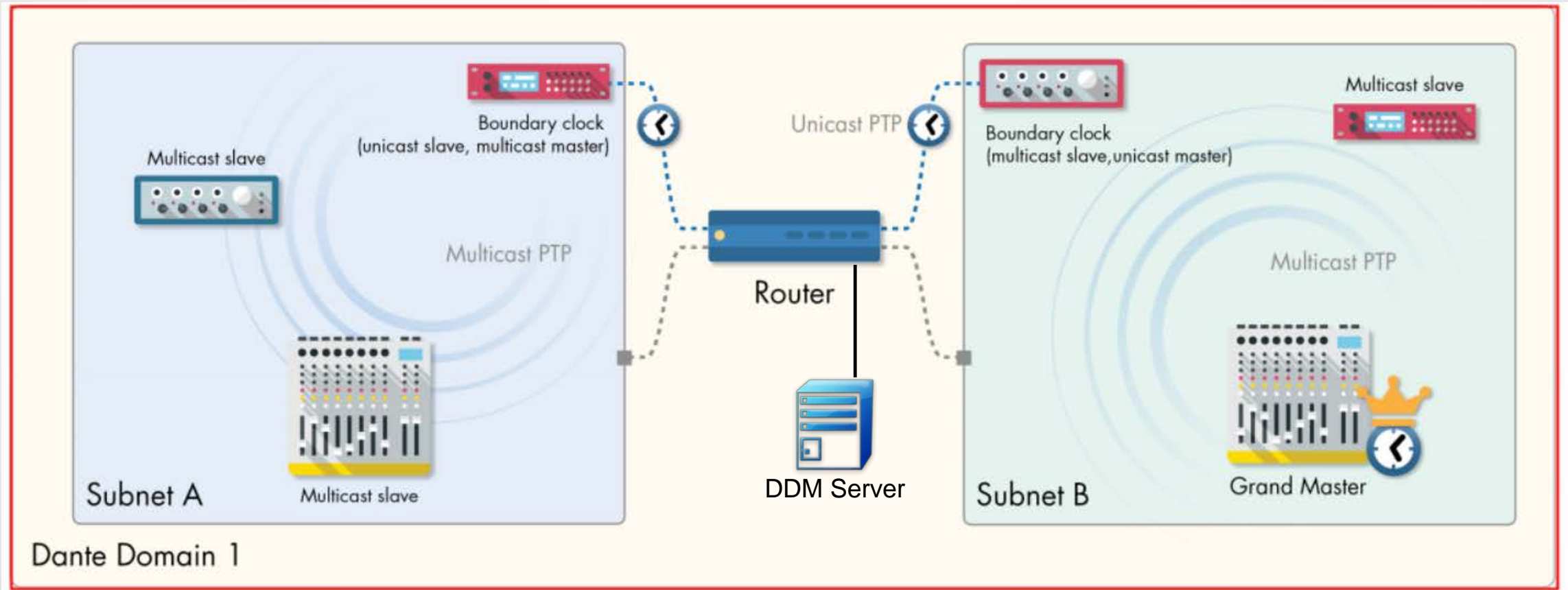
The bottom left corner of the interface displays 'Dante Domain Manager v1.0'.

DEBNET SCROUSTRING

The screenshot shows the Dante Domain Manager web interface. On the left is a navigation sidebar with options: Dashboard, Domains, Devices, Users, Roles, Settings, and Audit Log. The 'Domains' section is active, showing a search bar and a list of domains: Performing Arts Center, Stadium, and Law School. A red box labeled 'Domains' points to this list. Below the list are 'ADD DOMAIN' and 'DELETE DOMAIN' buttons. The main content area is titled 'Devices' and shows two subnets: 10.10.70.0/24 and 10.10.72.0/24. Each subnet has a table of devices. A red box labeled 'Devices in domain' points to the top of the first table. A red box labeled 'Subnets in domain' points to the first table. The first table contains the following data:

NAME	ENROLL STATE	CONNECTIVITY
Stage Managers Mic	ENROLLED	ONLINE
Stage Box	ENROLLED	ONLINE
House DSP	ENROLLED	ONLINE
FOH Console	ENROLLED	ONLINE
RTL Intercom	ENROLLED	ONLINE
House Amplifier	ENROLLED	ONLINE

SUBNET CROSSING



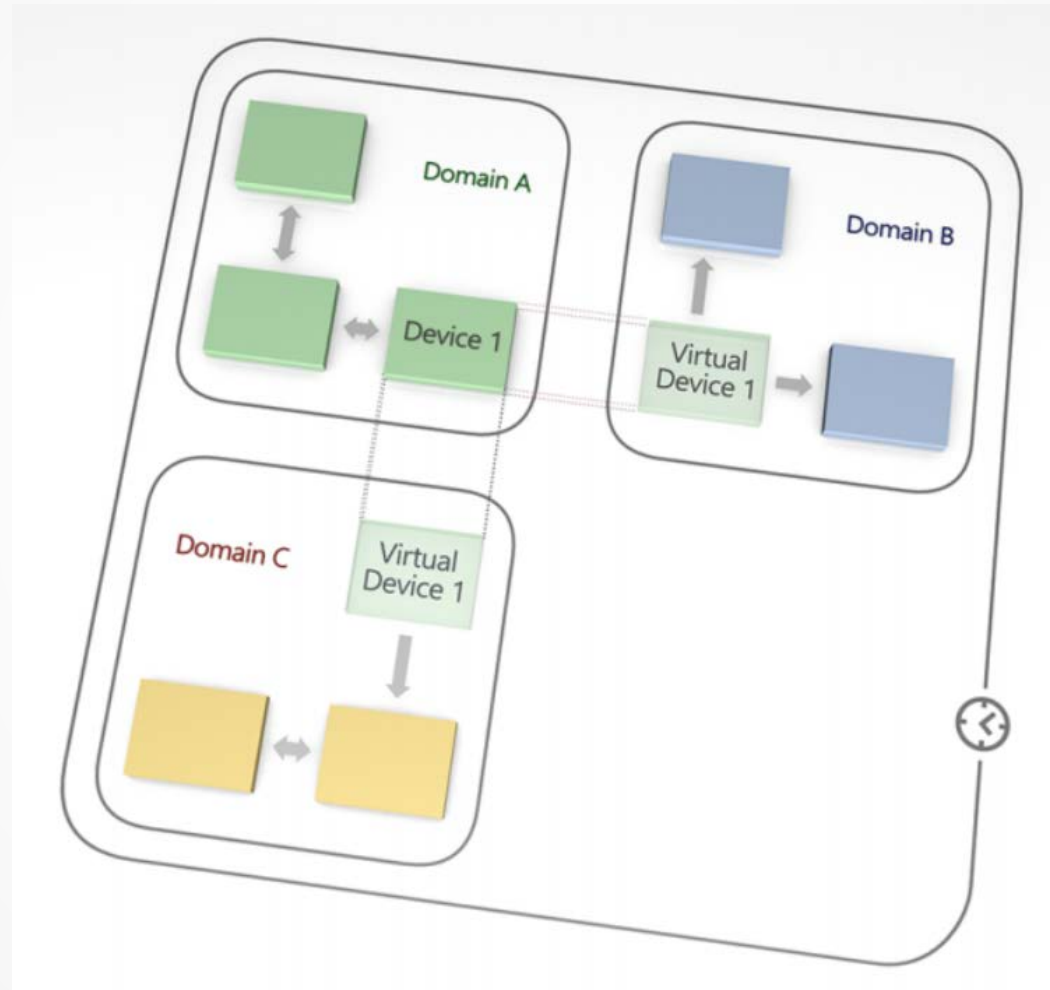
INTERDOMAIN ROUTING

The screenshot displays the Dante Domain Manager v0.2 web interface. On the left is a navigation sidebar with menu items: Dashboard, Domains, Devices, Users, Roles, Groups, Settings, and Audit Log. The 'Devices' section is expanded, showing a list of devices under the 'Performing Arts Center' domain. The selected device is 'PCIe-0805d8' (PCIe (Audinate Pty. Ltd.)). Below the device list is an 'ENROLL DEVICES' button. The main content area is titled 'Tx Channel Sharing' and shows configuration for a 'SHARED AUDIO GROUP' named 'Tielines'. The 'SCOPE' is set to 'Selected domains & channels'. A table below lists the shared channels:

DOMAIN	SHARED NAME	SHARED CHANNELS
Performing Arts Center	PCIe-0805d8	128 channels

Below the table is the 'Network Interface' section, which shows the 'PRIMARY IP ADDRESS' as 10.0.3.36 and the 'SECONDARY IP ADDRESS' as 0.0.0.0. The top right of the interface shows the user 'admin' and some utility icons.

INTERDOMAIN ROUTING



DEFINE USERS AND PRIVILEGES

The screenshot displays the Dante Domain Manager web interface. The top left shows the application name and a user dropdown set to 'admin'. A sidebar on the left contains navigation links for Dashboard (with a notification badge '1'), Domains, Devices, Users, Roles, Settings, and Audit Log. The main content area is titled 'User Details' and features a search bar and a list of users: 'admin' and 'Kelly S'. Below this, a form for creating a user is shown with fields for USERNAME* (Danu), PASSWORD* (masked with dots), CONFIRM PASSWORD* (masked with dots), and EMAIL ADDRESS (dvino@example.com). The 'Privileges' section, highlighted with a red box, includes a dropdown menu for 'DEFAULT ROLE' set to 'Domain Administrator'. Below this is the 'Domain-Specific Privileges' section, which includes an 'ADD DOMAIN ROLE' button and a table with columns for 'DOMAIN' and 'ROLE'. The table contains one entry: 'Stadium' for the domain and 'Domain Administrator' for the role, with a 'REMOVE' button next to it. At the bottom left, the version 'Dante Domain Manager v0.1' is displayed, and at the bottom center, there are 'ADD USER' and 'DELETE USER' buttons.

LIMIT ACCESS TO KEY FUNCTIONS

The screenshot displays the Dante Domain Manager interface. On the left is a navigation sidebar with options: Dashboard, Domains, Devices, Users, Roles (highlighted), Settings, and Audit Log. The main content area is divided into three sections: Role Details, Configuration Privileges, and Inspection Privileges. Under Role Details, the 'Operator' role is selected. The Configuration Privileges section lists three items: 'CONFIGURE ROUTING' (enabled), 'CONFIGURE CLOCKING' (disabled, highlighted with a red box), and 'CONFIGURE DEVICE SETTINGS' (enabled). The Inspection Privileges section lists three items: 'INSPECT DOMAINS' (enabled), 'INSPECT ROUTING' (enabled), and 'INSPECT DEVICE SETTINGS' (enabled). The top right corner shows the user 'admin' and the bottom left corner shows the version 'Dante Domain Manager v0.1'.

AUDIT LOG

Dante Domain Manager admin ▾

Thu Jan 26 2017 11:46:27 AM	Created user account	Created user account Kelly S - fullname: Kelly S, password: *****, email: ksmith@example.com, defaultRole: Operator	admin 10.8.0.6	
Thu Mar 09 2017 6:47:39 PM	Relabelled Tx channel	Added label Pgm R to Tx channel 4	admin 169.254.60.246	RU-LB4-0a23f7 169.254.248.35
Thu Mar 09 2017 6:47:29 PM	Labelled Rx channel	Relabelled Rx channel 4 to Main Mix Out	admin 169.254.60.246	RU-LB4-0a23f7 169.254.248.35
Thu Mar 09 2017 6:47:13 PM	Labelled Rx channel	Relabelled Rx channel 3 to ALS Out	admin 169.254.60.246	RU-LB4-0a23f7 169.254.248.35
Thu Jan 26 2017 10:41 AM	Clock out of sync	Clocking of UltimoX2-900010 enrolled in green out of sync	UltimoX2-900010 10.10.70.65	
Jan 26 2017 10:40 AM	Clock sync restored	Clocking of BKNII-06ea1c enrolled in green restored	BKNII-06ea1c 10.10.70.74	
Jan 26 2017 10:39 AM	Clock sync restored	Clocking of Ultimo4-0a180f enrolled in green restored	Ultimo4-0a180f 10.10.72.51	

Dante Domain Manager v0.1

Who did what,
and when

SNMP INTEGRATION

The screenshot displays the ServiceNow IT Service Management Suite interface. At the top, the logo "servicenow™" and "IT Service Management Suite" are visible. The user is logged in as "ITIL User" in the "global" domain. The main area shows an incident form for incident number "INC11092". The form fields include:

- Number: INC11092
- Caller: [Empty]
- Location: San Diego West
- Configuration item: [Empty]
- Impact: 3 - Low
- Urgency: 3 - Low
- Priority: 4 - Low
- Short description: new meeting office 365
- Opened: 2014-11-18 11:45:41
- Opened by: ITIL User
- Incident state: New
- Category: Inquiry / Help
- Escalation: Normal
- Assignment group: [Empty]
- Assigned to: [Empty]

Below the incident form, a "Knowledgebase" search overlay is active. The search term is "new meeting office 365". The search results show two articles:

- How to: Show-IT - Create a meeting in Outlook Web App in Microsoft Office 365.** (5 stars)
Click Outlook, click New, click Meeting Request option.
- How to: Create a calendar meeting in Outlook Web App in Microsoft Office 365.** (5 stars)
Click Outlook, click New, click Meeting Request option.

At the bottom of the screen, a network monitoring dashboard is visible, showing various metrics such as "High Transmit Percent Utilization", "Ethernet1 WAN (NetFlow)", and "Bas-HPS400".

WHY DDM SHOULD BE IN EVERY DEAL

DANTE DOMAIN MANAGER

SECURITY



CONTROL

SCALABILITY



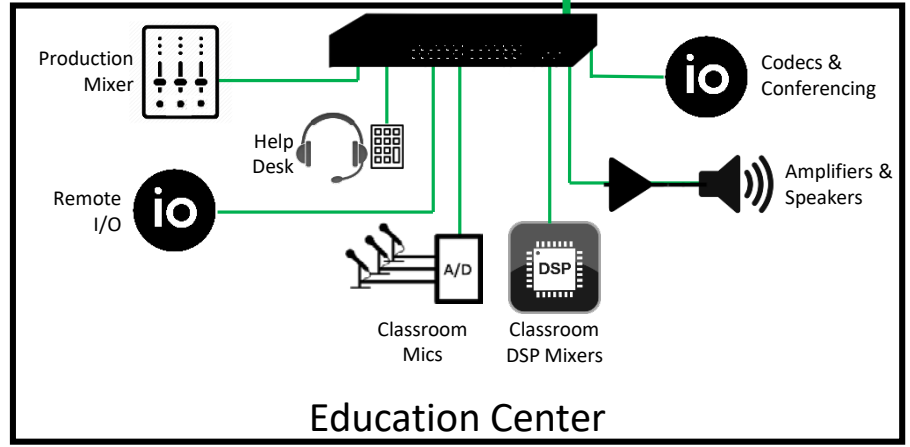
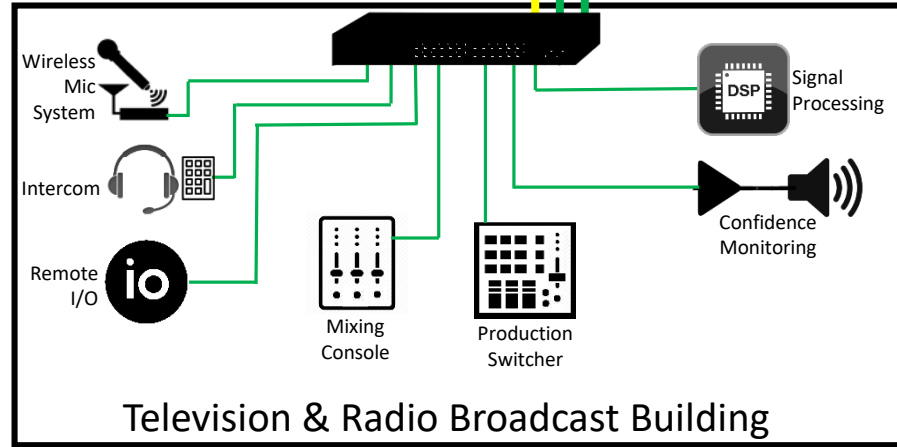
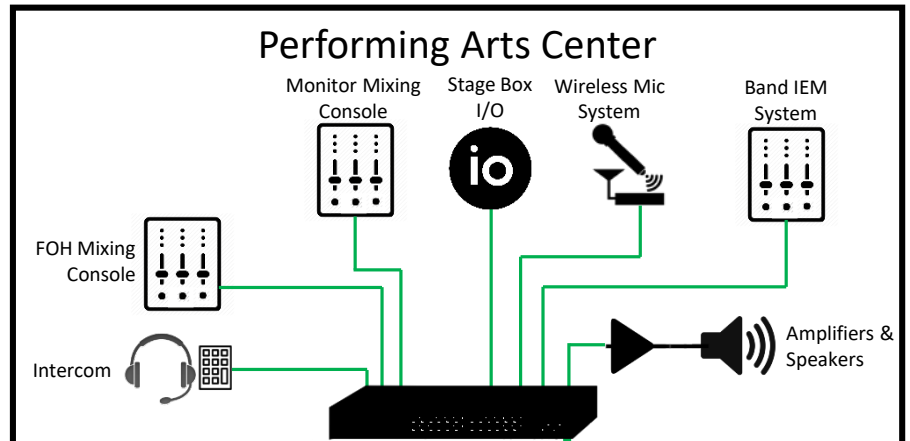
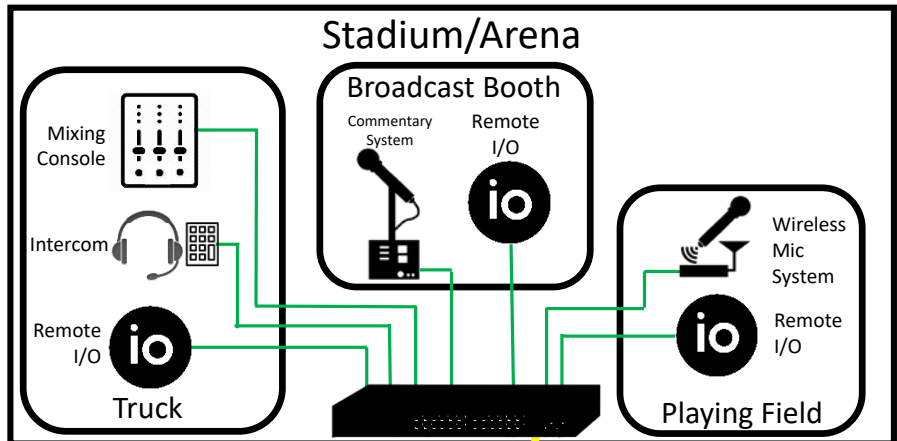
FLEXIBILITY

VISIBILITY



ACCOUNTABILITY

USE CASE: HIGHER EDUCATION



SEAMLESS INTEGRATION WITH IT

VIRTUAL SERVER SUPPORT

- Run Dante Domain Manager on virtual machines in data centers

ACTIVE DIRECTORY & LDAP

- Connect Dante Domain Manager to your Active Directory or LDAP server for user management

HIGH AVAILABILITY

- Support for redundant DDM servers in one site

COMMON TOOLS & METHODS

- SNMP Support, Email integration

WHAT CAN I DO WITH THE DDM?

**AV
Managers**



✓ Easily trouble-shoot AV System problems, identify root causes and take corrective actions quickly

**IT
Administrators**



✓ Use my Directory service to manage access to AV systems
✓ Prevent unauthorized changes to AV systems

**System
Integrators,
AV Consultants**



✓ Divide systems into manageable sub-domains
✓ Deploy Dante in campus routed IP networks

**AV System
Owners**



✓ Get notified of AV System issues so they can be actioned immediately

DDM: VERSIONS & PRICING

Base Capacity	SILVER	GOLD	PLATINUM*
Number of Domains	2	10	50
Number of Nodes	10	50	250
Available Features			
Create and manage domains	✓	✓	✓
Configure domains across subnets	✓	✓	✓
Dashboards and alerts	✓	✓	✓
Detailed audit log	✓	✓	✓
Automatic discovery of Dante devices	✓	✓	✓
Responsive browser interface	✓	✓	✓
User definition and role management	✓	✓	✓
Virtual server support	✓	✓	✓
System backup and restore	✓	✓	✓
Secure, encrypted control traffic	✓	✓	✓
Route audio between Dante domains	✓	✓	✓
Custom user views	x	✓	✓
LDAP and Active Directory integration	x	✓	✓
High Availability redundancy	x	x	✓
SNMP alerts	x	x	✓
Suggested Pricing	USD \$995	USD \$3,995	USD \$9,995

* Need more than Platinum? [CONTACT US](#) to discuss

SILVER: Ideal for smaller installations, such as a conference room, reception area, house of worship or classroom.

GOLD: Suited to many mid-sized business environments, allowing for easy management of multiple rooms and public spaces.

PLATINUM*: Designed for organizations with many users, rooms and devices in multiple buildings spread over large areas

IT BEST PRACTICES HAVE COME TO AV

DANTE DOMAIN MANAGER

THANK
YOU

Bernie Farkus
Senior Technical Sales Engineer
bernie.farkus@audinate.com
512-960-6303
1200 NW Naito Parkway, Suite 630
Portland, OR 97209