Test bed inventory, setup and configuration

Following is a description of the testbed system for test and development of ctrlKeys over Dante.

In order to evaluate ctrlKeys and Dante to meet the needs of the use case scenarios enumerated in the CtrlKey Scalability and Dante Hardware scenario documents, a three host computer network was assembled. A variety of hardware was chosen to explore any possible limitations between different operating systems and machines.

Equipment list:

Apple MacMini, OSX
Apple MacBook, OSX
Dell 9020 Micro PC, Windows

Audinate Dante AVIO 20 channel output adapter
Netgear GS308EP Network Switch
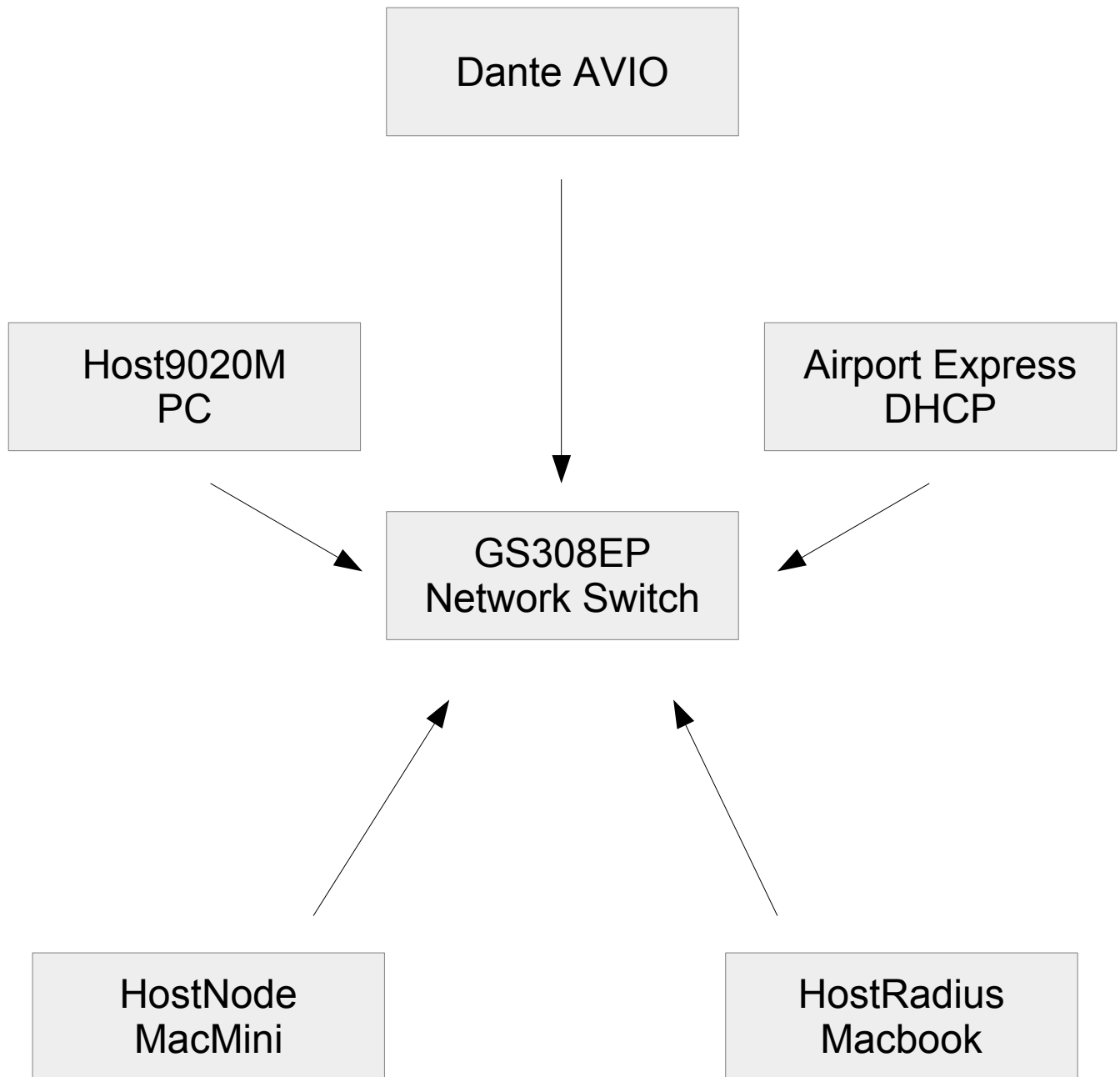Insigniea USB 3.0 gigabit ethernet adapter
Apple Airport Express

Mackie 802vlz3 mixer
Yamaha HS8 Monitors

Behringer CMD DV-1 MIDI Controller
ROLI Light Block
Roland EV-1 Bluetooth MIDI footpedal
Roland FS-6 Foot switches

Software list:

Dante Controller 4.7
Dante Virtual Soundcard 4.12
SuperCollider 3.12

Ethernet connections

Dante AVIO

Host9020M
PC

Airport Express
DHCP

GS308EP
Network Switch

HostNode
MacMini

HostRadius
Macbook

Discussion

The Netgear GS308EP is a managed network switch for gigabit ethernet with PoE+ and has 8 ports and can supply 62 watts of power. This switch was chosen because it meets the "on paper" requirements for Dante audio networking. Quality of Service (QoS) Mode 802.1P/DSCP and Power over Ethernet (PoE) are two of the main requirements for a switch to handle audio. Broadcast filtering was disabled. IGMP Snooping was disabled. Power Saving also known as Energy Efficient Ethernet (EEE) was disabled. In practice this switch works well with Dante without any issues to note.
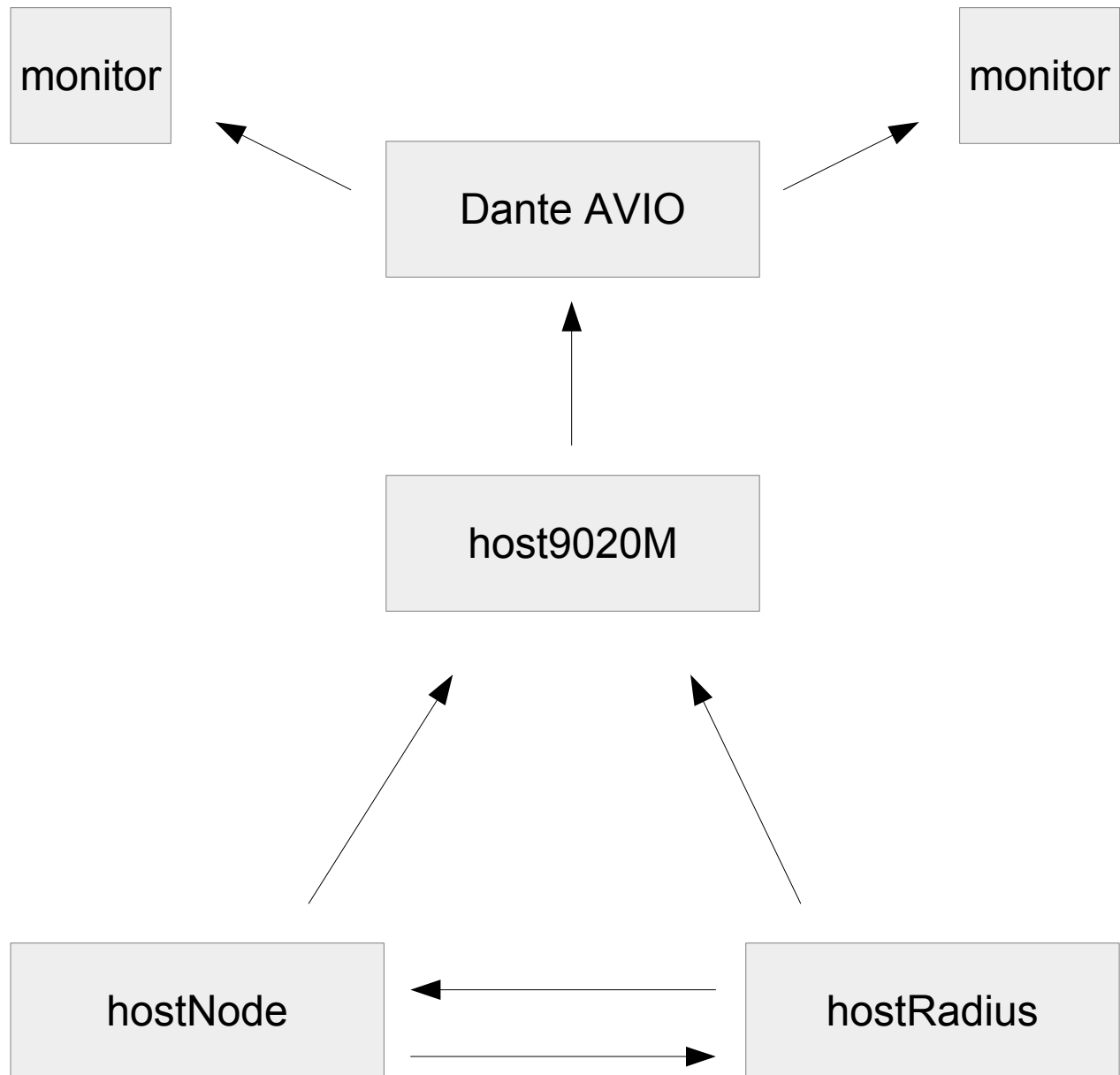
Each of the host computers was connected to the network switch via Cat 6 ethernet cables. The Macbook does not have a built in ethernet adapter so the connections was made using an Insignia USB 3 adapter.

The Aduinate Dante AVIO, also connected to the network switch and power via PoE, is also wired to the Mackie mixer which is in turn connected to the powered studio monitors.

The Apple Airport Express is used in this network for its DHCP server. Having automatically distributed IP addresses is convenient, but can be done manually in most cases. Note that, while the GS308EP has a discoverable interface that allows manual IP configuration, testing this feature was not done. Manual IP addressing for the AVIO was also not explored.

The Dante AVIO was the network Network Primary Leader Clock for all hosts – this happens automatically. Without Dante hardware on the network synchronization was not able to be established.

Dante audio signal flow

Network Hosts setup

host_radius
Macbook Pro Laptop, OSX 10.13.6
Insginia USB 3 gigabit network adapter
EV-1 Bluetooth Midi foot controller pedal
FS-6 foot switches
Dante Virtual Sound Card, 4 in, 4 out, 4 ms latency, 48k
SuperCollider 3.12.1
ctrlKey 1.3

host_Node
MacMini, OSX 10.13.6
Behringer CMD DV-1 MIDI Controller
Dante Virtual Sound Card, 4 in, 4 out, 4 ms latency, 48k
SuperCollider 3.12.1
ctrlKey 1.3

host_9020M
Dell Optiplex 9020 Micro PC, Windows 10 21H1
Roli Light Block MIDI controller
Dante Virtual Sound Card, 4 in, 4 out, 4 ms latency, 48k
SuperCollider 3.12.1
ctrlKey 1.3

Dante subscriptions list (unicast connections)

Audinate AVIO
input 1, subscribe to 9020M output 1
input 2, subscribe to 9020M output 2

9020M
input 1, subscribe to Node output 1
input 2, subscribe to Node output 2
input 3, subscribe to radius output 1
input 4, subscribe to radius output 2

Node
input 1, subscribe to radius output 1
input 2, subscribe to radius output 2

radius
input 1, subscribe to Node output 1
input 2, subscribe to Hode output 2

SuperCollider server configuration

radius
```
s.options.device_("Dante Virtual Soundcard");
s.options.inputStreamsEnabled_("1111");
s.options.numOutputBusChannels_(4);
s.options.numInputBusChannels_(4);
s.options.blockSize_(64);
s.options.hardwareBufferSize_(64);
```

Node
```
s.options.device_("Dante Virtual Soundcard");
s.options.inputStreamsEnabled_("1111");
s.options.numOutputBusChannels_(4);
s.options.numInputBusChannels_(4);
s.options.blockSize_(64);
s.options.hardwareBufferSize_(64);
```

9020M
```
s.options.inDevice_("Dante Virtual Soundcard");
s.options.outDevice_("Dante Virtual Soundcard");
s.options.sampleRate_(48000);
s.options.numOutputBusChannels_(4);
s.options.numInputBusChannels_(4);
s.options.blockSize_(64);
s.options.hardwareBufferSize_(64);
```