

# So you're adding Dante™ to your network?

## Here is all you need to know!

Basically, what you need to know is that Dante is all IP-based, and makes use of common IT standards. Each Dante device behaves much like any other network device you would already find on your network.

In order to make integration into an existing network easy, here are some of the things that Dante does:

- Dante uses DHCP for addressing when available, and will auto-assign an IP address if it is not, exactly like a PC or Mac.
  - Dante devices will continue to 'look' for DHCP even after auto-assigning an IP address.
  - Some (but not all) Dante devices allow the setting of static IP addresses.
- Dante implements IGMPv3/v2 to assist with multicast management.
  - Support for IGMP is not required in a network; it is in Dante to make integration into mixed-use networks simpler.
- Dante can make use of DiffServ QoS in the network. Dante will tag packets, and its tags can be integrated into an existing IT network QoS scheme:

Priority	Usage	DSCP Label	Hex	Decimal	Binary
High	Time critical PTP events	CS7	0x38	56	111000
Medium	Audio, PTP	EF	0x2E	46	101110
Low	(reserved)	CS1	0x08	8	001000
None	Other traffic	BestEffort	0x00	0	000000

- QoS is only required for 100Mbps or mixed 1Gbps/100Mbps networks. It can be helpful on mixed-use networks. It is not required for dedicated, all gigabit, Dante-only networks. When used, it must be configured with strict priority.
- Note that the QoS could be re-marked, provided that the PTP packets still receive high priority.

So that you know what to expect, here is the kind of network traffic you will be seeing on your network with Dante devices:

- Dante uses UDP for audio distribution, both unicast and multicast.
  - Bandwidth usage is about 6 Mbps per *typical* unicast audio flow (containing 4 channels and 16 audio samples per channel). Flows are pre-allocated a capacity of 4 channels. The samples-per-channel can vary between 4 and 64, depending on the latency setting of the device. For multicast flows, channels-per-flow can be varied from 1 to 8 channels per flow.
  - Multicast audio is always on UDP port 4321. Unicast audio ports come from a range: 14336 - 14600.
  - Audio traffic should not take up more than 70% of the bandwidth of any network link.
- mDNS and DNS-SD for discovery and enumeration of other Dante devices (including Dante Controller and Dante Virtual Soundcard).
  - This traffic is on 224.0.0.251:5353.
- Precision Time Protocol (PTP) for time synchronization.
  - This is generally a few small packets, a few times per second. This traffic is on 224.0.1.129 - 224.0.1.132 ports 319/320.
- Dante-specific monitoring traffic on multicast addresses 224.0.0.230 - 224.0.0.232:8700-8706.

### Can I use EEE (Energy Efficient Ethernet or 'Green Ethernet') in my Dante network?

Short answer: No.

EEE (Energy Efficient Ethernet) is a technology that reduces switch power consumption during periods of low network traffic. It is also sometimes known as Green Ethernet and IEEE802.3az. Although power management should be negotiated automatically in switches that support EEE, it is a relatively new technology, and some switches do not perform the negotiation properly. This may cause EEE to be enabled in Dante networks when it is not appropriate, resulting in poor synchronization performance and occasional dropouts.

Therefore, we strongly recommend that:

1. If you use managed switches, ensure that they allow EEE to be disabled. Make sure that EEE is disabled on all ports used for real-time Dante traffic.
2. If you use unmanaged switches, do not use Ethernet switches that support the EEE function, because you cannot disable EEE operation in these switches.