

# Networks and Switches

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## Can I connect a Dante device directly to my computer?

Yes. Simply connect your Dante enabled devices to an Ethernet switch, using Cat5e or Cat 6 Ethernet cable, and then connect your computer to the same switch.

If you have only one Dante-enabled device to connect to your computer, you may eliminate the switch and simply connect the two with a Cat5e or Cat6 Ethernet cable.

## What type of Ethernet cable is recommended for Dante?

As most Dante devices support gigabit Ethernet, Cat5e or Cat6 cable is recommended. For purely 100Mbps networks, CAT5 may be used.

## Does Dante work with Fiber Optic network cable?

Yes. Because Dante works with standards based networking technology, using fiber is simple. Use a switch that supports fiber connections to send Dante data over a fiber optic cable.

Ethernet is not copper or fiber based, it is independent of the cabling medium. Many organizations will have fiber already in place from other projects and this can simply be re-used on a Dante network.

## Is it possible to make direct connections between Dante-enabled equipment?

Yes. Once routes are established with Dante Controller, a simple network of two Dante devices will work in a stand-alone fashion.

## Can Dante devices be daisy chained?

In most cases the answer is “no”. Dante devices are connected via a network switch, which most often means a “star” topology – all devices are connected to a single central point, which minimizes the number of “hops” through which data must pass. This also avoids the scenario in which the failure of one device causes the entire “daisy chain” to break.

**Note:** the Secondary Port found on some Dante devices is NOT to be used for daisy chaining – this is for Dante Redundancy only.

## Can Dante operate over a Wi-Fi network?

No. While possible in principle, the practical limitations of current wireless technology (802.11a/b/g/n) render reliable performance unachievable. For this reason Dante software such as Virtual Soundcard will not recognize wireless connections for audio data.

## Does Dante require any special network infrastructure?

No, special network infrastructure is not required. Since Dante is based upon universally accepted networking standards, Dante-enabled devices can be connected using inexpensive off-the-shelf Ethernet switches and cabling.

## Does Dante require a dedicated network infrastructure?

No, a dedicated network infrastructure is not required. Dante-enabled devices can happily coexist with other equipment making use of the network, such as general purpose PCs sending and receiving email and other data.

## Can you mix control and audio on the same network?

Yes, the audio can be sent over the same network as control information, and even unrelated data traffic.

## Does Dante require special switches?

No. We strongly recommend that Gigabit switches be used due to the clear advantages in performance and scalability.

Read other **Networks and Switches FAQs** for suggestions and requirements.

## What is the minimum requirement for switches in a Dante network?

All Ethernet switches are capable of working with Dante. However, please be aware that there are some features on some kinds of switches that will allow you to build larger and more reliable Dante networks.

While Gigabit switches are recommended, 100Mbps switches may be used in limited scenarios.

- For channel counts of 32 or more, Gigabit switches are essential. QoS is required when using Dante in networks that have 100Mbps devices. QoS is also recommended for Gigabit switches on networks that share data with services other than Dante.
- For lower channel count (<32) applications, a 100Mbps switch may be used as long as it supports proper QoS, and QoS is active. The use of 100Mbps switches without QoS is not recommended or supported.

## What features are important when purchasing a switch?

Dante makes use of standard Voice over IP (VoIP) Quality of Service (QoS) switch features, to prioritize clock sync and audio traffic over other network traffic. VoIP QoS features are available in a variety of inexpensive and enterprise Ethernet switches. Any switches with the following features should be appropriate for use with Dante:

- Gigabit ports for inter-switch connections
- Quality of Service (QoS) with 4 queues
- Diffserv (DSCP) QoS, with strict priority
- A managed switch is also recommended, to provide detailed information about the operation of each network link: port speed, error counters, bandwidth used, etc.

## Can I use switches with 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 IEEE 802.3az.

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 synchronisation

performance and occasional dropouts.

[Download list of incompatible, unmanaged switches with Energy Efficient Ethernet](#)

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.

## What is Quality of Service (QoS)?

Quality of Service (QoS) is a feature of managed switches, which ensures that certain types of network packets (e.g. clock sync and audio packets) get preferential treatment and are "moved to the front of the line" ahead of other traffic. This is achieved by attaching a priority number to each packet, which is then used by the switches to ensure that high priority packets get processed before lower priority packets.

## When do I need to use QoS in a Dante network?

QoS is required when using Dante in networks that have 100Mbps devices and is optional in networks with Gigabit devices. We recommend that QoS be enabled in all Dante networks in order to ensure proper operation under all possible conditions.

## How does Dante manage QoS?

Dante uses standard Voice over IP (VoIP) Quality of Service (QoS) switch features to prioritize clock sync and audio traffic over other network traffic. QoS is available in many inexpensive and enterprise Ethernet switches. Any switch that supports Diffserv (DSCP) QoS with strict priority and 4 queues, and has Gigabit ports for inter-switch connections should be appropriate for use with Dante.

## How does Dante use DSCP / Diffserv priority values when configuring QoS?

Switches prioritize packets using what are called DSCP/Diffserv values. Although Dante packet priority values have been chosen to make it simple to configure QoS with many switches, some switches require special configuration to recognize and prioritize specific DSCP values.

The table below shows how Dante uses various Diffserv Code Points (DSCP) packet priority values:

Priority	Usage	DSCP Label	Hex	Decimal	Decimal
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