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Quick Reference Guide to Auto-Negotiation

13.3 Full Duplex Ethernet Links

The Auto-Negotiation protocol provides for the entire range of twisted-pair Ethernet segments, as well as full duplex Ethernet links. Full duplex Ethernet is a variant of Ethernet technology that is currently being standardized by the IEEE. In the absence of an official standard, the rules for a full duplex link length may vary depending on the vendor in question. Until the standard is complete and vendors are building equipment based on it, you cannot assume that full duplex equipment from one vendor will correctly interoperate with another vendor's equipment. Despite the lack of a standard, full duplex operation is briefly described here since you may find it in use in Auto-Negotiation hubs and interfaces.

Full duplex operation is quite simple compared to normal Ethernet, and devices at each end of a full duplex link can send and receive data simultaneously over the link. One advantage of this approach is that the full duplex link can theoretically provide twice the bandwidth of normal (half duplex) Ethernet. The full duplex mode of operation requires that each end of the link only connects to a single device, such as a workstation or a switched hub port.

Since there are only two devices on a full duplex link, the link is not attempting to create a shared Ethernet channel capable of supporting multiple devices. Therefore, there is no need to adhere to the original Ethernet medium access control system. With no need to use the medium access control mechanism to share the signal channel with multiple stations, a device at the end of a full duplex Ethernet link does not have to listen for other transmissions or for collisions when sending data.

The 10BASE-T, 100BASE-TX, and 100BASE-FX signalling systems can support full duplex operation, since they have transmit and receive signal paths that can be simultaneously active. Another advantage is that full duplex fiber optic links can be much longer than the specifications for a normal 100BASE-FX segment allow. That's because the lack of any requirement to adhere to the round trip timing of a collision domain allows the fiber link to be as long as the optical loss budget permits. For that reason, a full duplex version of the 100-Mbps fiber link typically provides a segment length of around two kilometers.

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