Ethernet

EE 475 Homework #5
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Primary Application: Local Area Networks (LANs).

Specification Comparison:

	Ethernet	Fast Ethernet	Gigabit Ethernet
Data Rate	10 Mbps	100 Mbps	1 Gbps
Medium[1], Max Length	10BASE-T, 100 m; 10BASE-2, 185 m; 10BASE-5, 500m; 10BASE-F, 2000 m	100BASE-T4, 100 m; 100BASE-TX, 100 m; 100BASE-FX, 412 m	Optical fiber
Serial/Parallel	Serial	Serial	Serial

Most devices in an Ethernet system are differential, but single-ended devices are usually supported as well.

An electrical limit of 100 devices per cable can possibly share a system using Carrier Sense Multiple Access with Collision Detection (CSMA/CD). In a multi-segment Ethernet, the device limit is 1024.

The maximum transition time for the attached Gigabit Ethernet transceiver is about 0.5 ns. The transceiver has a knee frequency of about 250 MHz and operates over a voltage range of –0.5 to 5.0 Volts.

[1] The media used for transmitting Ethernet and Fast Ethernet are named according to the data rate (10 or 100 Mbps), then the type of signaling (baseband) and finally the medium type—twisted-pair, fiber optic, or coaxial. For coaxial, a number is used to define the cable length in hundreds of meters.