

# Network Communications

## Chapter 13

Gigabit Ethernet Networking  
Technology

# Gigabit Ethernet Applications

- High speed LAN Backbone
  - Using Gigabit switches
  - Tie 100BaseT LANs together
- High Speed Point-to-point
  - Fiber connection
  - Bridge sites together

# 802.3z: Gigabit Ethernet Protocol Architecture

- Physical Layer
  - 1000BaseLX: 1300 nm laser (long infrared) 5 Km SMF
  - 1000BaseSX: 850 nm laser (barely infrared) 500 m MMF
  - 1000BaseCX: 150Ω balanced twinax 25 m
  - 1000BaseT: 4 pair Cat5 UTP 100m

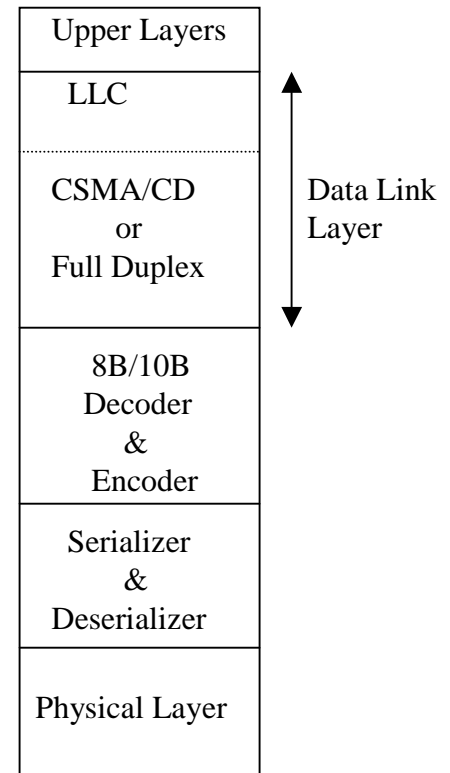


Figure 13.1

# Minimum Gigabit Ethernet Frame

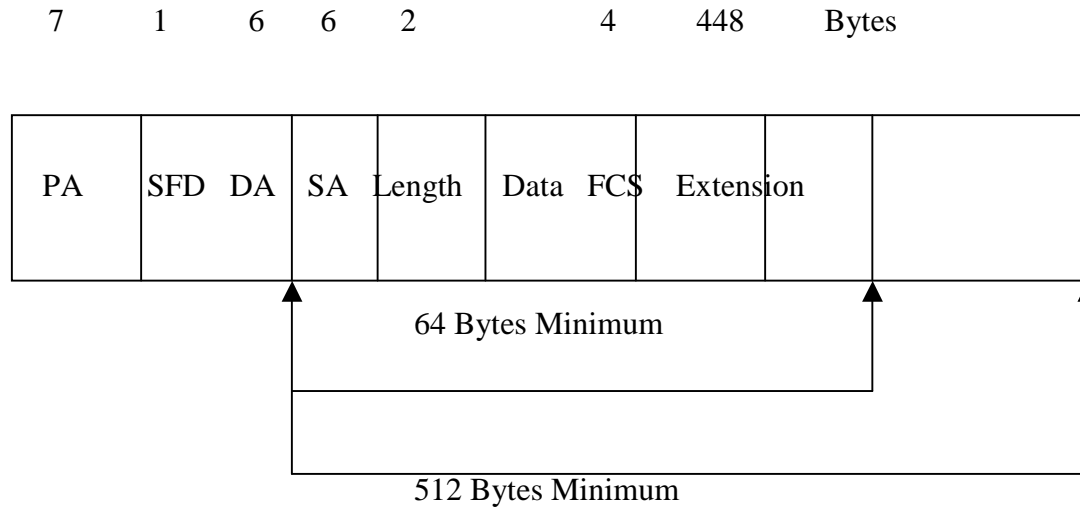


Figure 13.2

# Full vs. Half Duplex Gigabit Ethernet

- Full-duplex connections

- Point-to-point
- No collisions

- Half-duplex

- Collision segments
- Requires longer frames

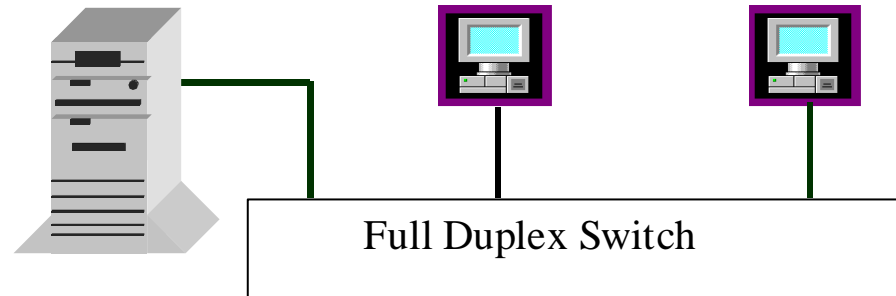


Figure 13.3

# Gigabit Ethernet Components

- Serializer
  - 8B/10B Encoding

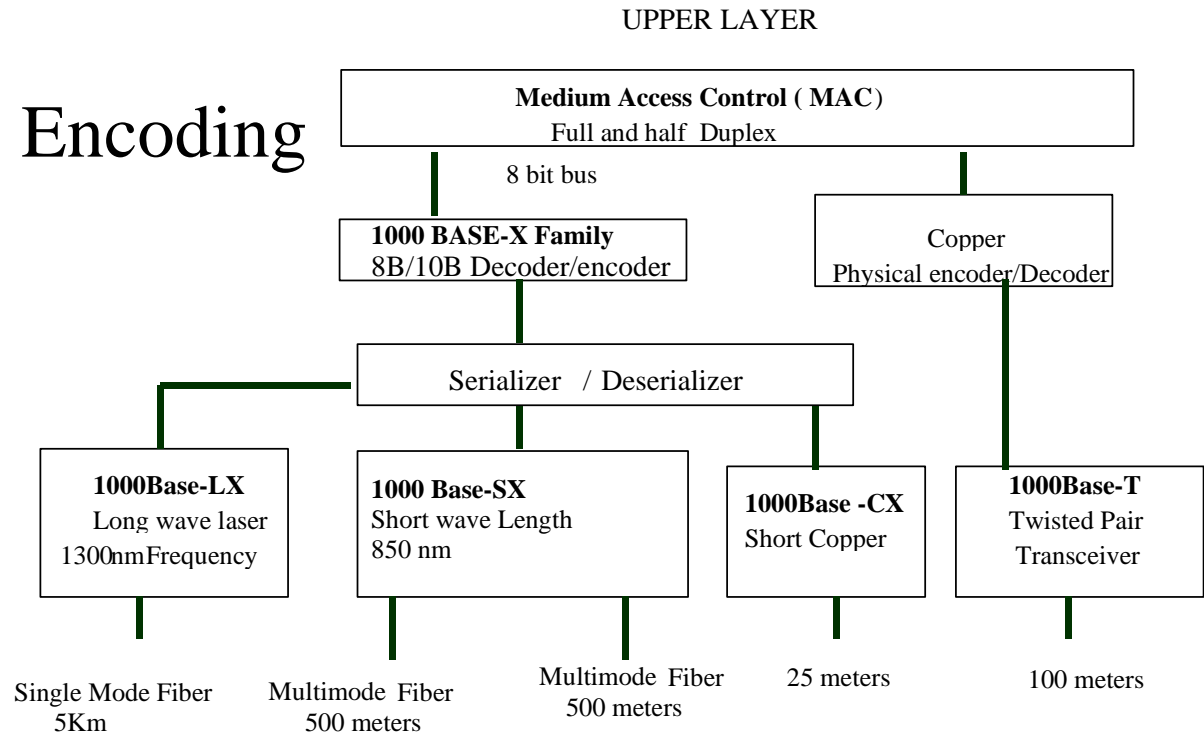


Figure 13.4

# Upgrading Fast Ethernet to Gigabit Ethernet

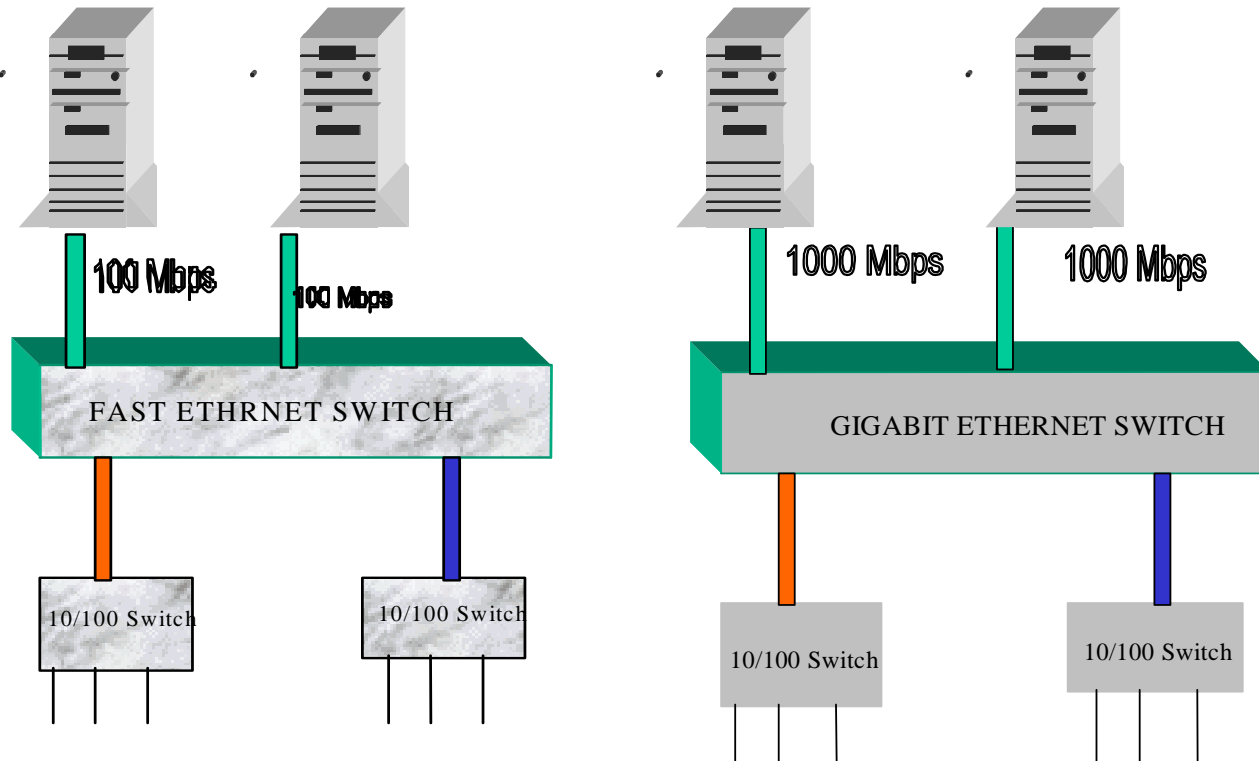


Figure 13.5a and b

# Upgrading the Server Links to Gigabit Ethernet

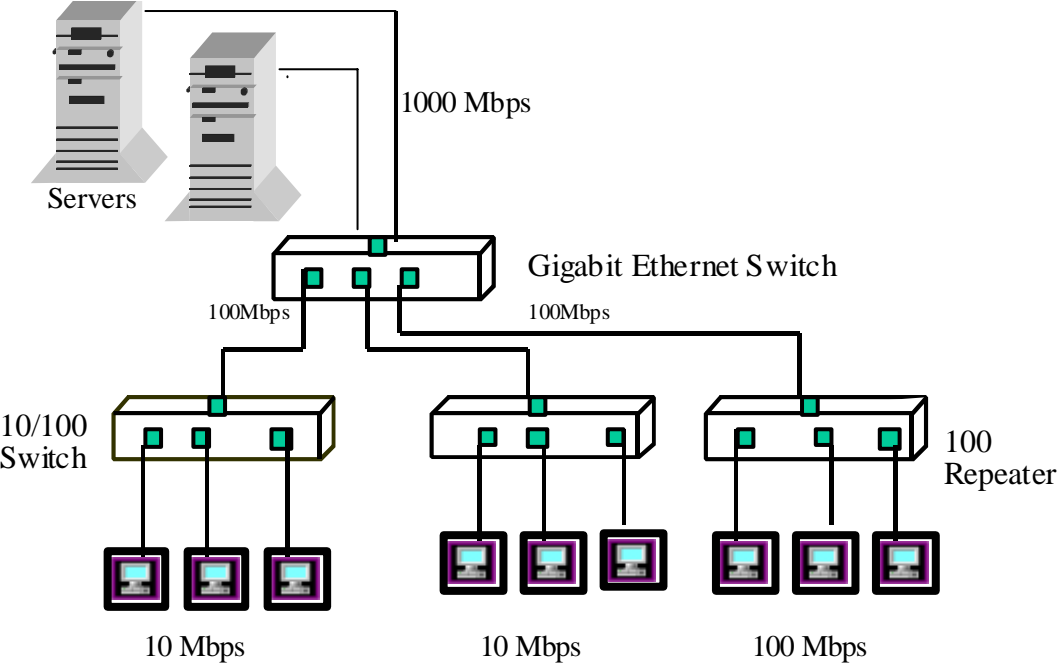


Figure 13.6



# Upgrading the Backbone to Gigabit Ethernet

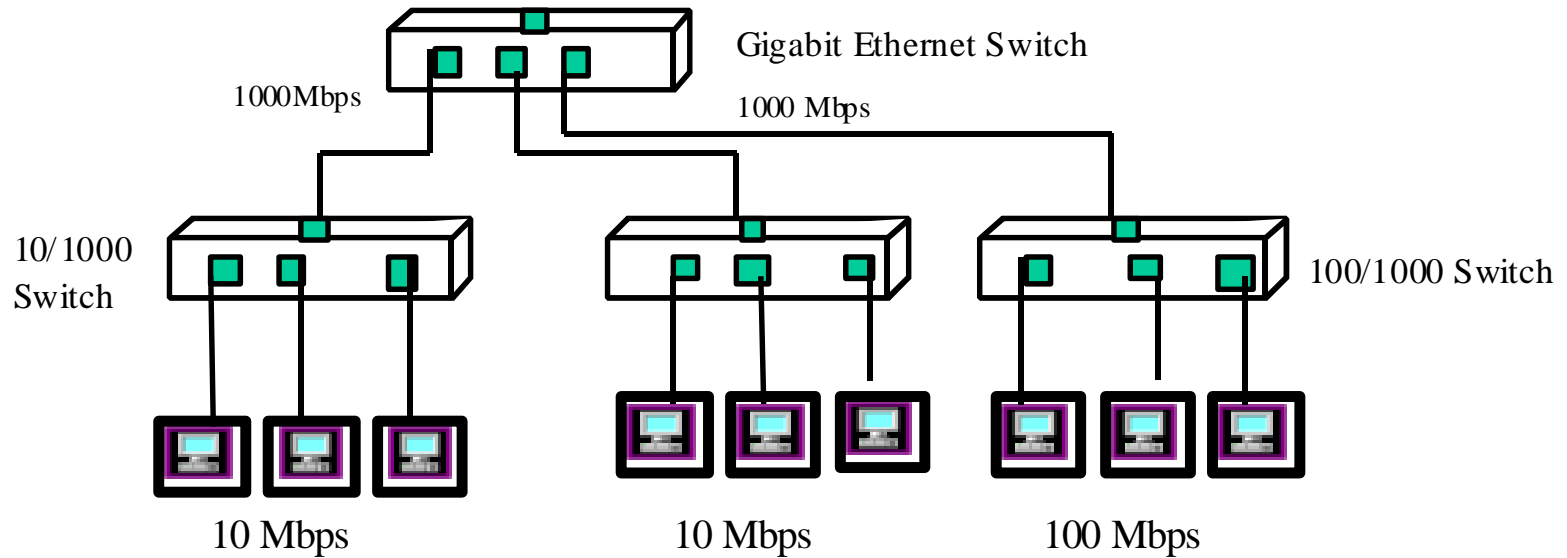


Figure 13.7

# Upgrading a Switch-to-Switch Link to Gigabit Ethernet

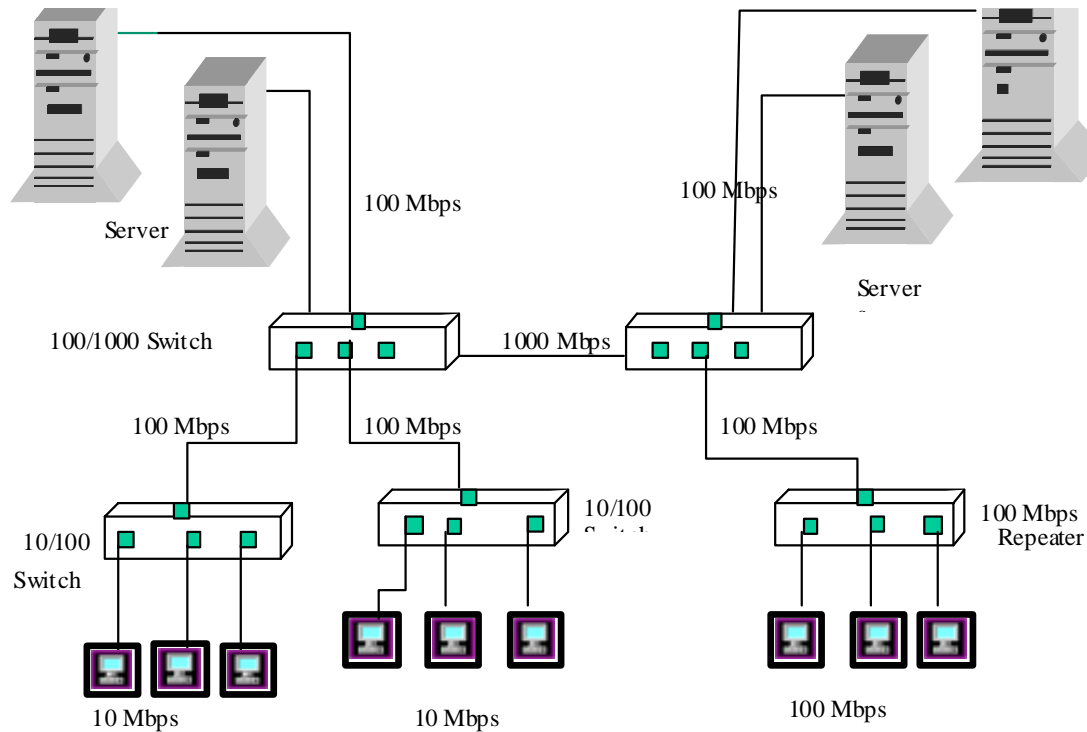


Figure 13.8