



# Hardware in the network

Computer networks - Administration | DV202

# OSI Physical Layer

- The role of the physical layer and its protocols
- Signaling and encoding in the physical layer
- Signals representing bits across the network
- Basic characteristics of copper, fiber and wireless networks
  - Common implementations of copper, fiber and wireless

# Purpose of the physical layer

- Physical media
- Representing bits in the media
- Encoding of data and control info
- Transmitting and receiving circuitry on the network devices

# Physical layer operation

- Copper cable
- Fiber-optic cable
- Wireless

# Physical layer standards

- ISO, IEEE, ANSI, ITU, EIA/TIA, FCC
- Physical and electric properties of the media
- Mechanical properties
- Encoding
- Control information signals

# Physical Signaling and Encoding - Representing the information

- Possible variations to represent the signal
  - Amplitude
  - Frequency
  - Phase

# Encoding

- Reducing bit level error
- Limiting the effective energy transmitted into the media
- Helping to distinguish data bits from control bits
- Providing better media error detection

# Data carrying capacity

- Theoretically as bandwidth
- Practically as throughput
- Qualitatively as goodput

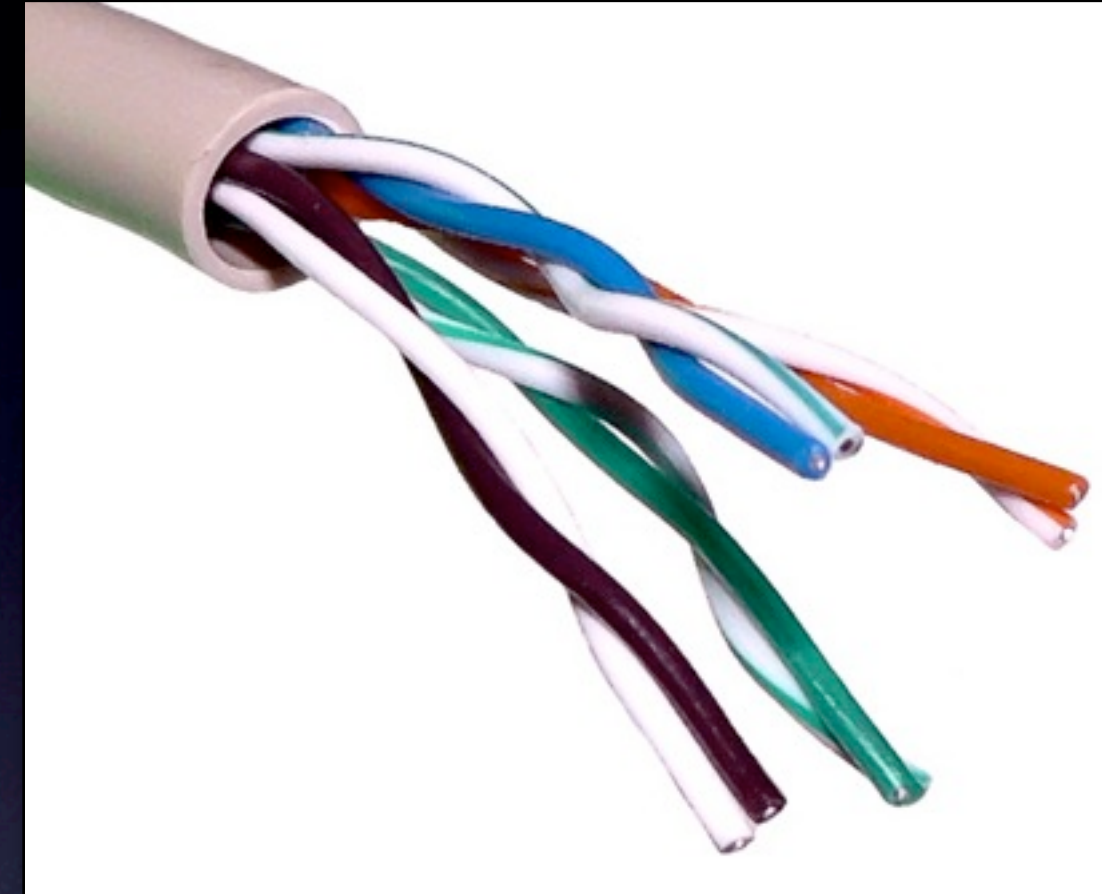


# Physical media and types of physical media

- 10BASE-T
- 100BASE-TX
- 100BASE-FX
- 100BASE-CX
- 1000BASE-T
- 1000BASE-SX
- 1000BASE-LX
- 1000BASE-ZX
- 10GBASE-ZR
- 10GBASE-T
- etc.

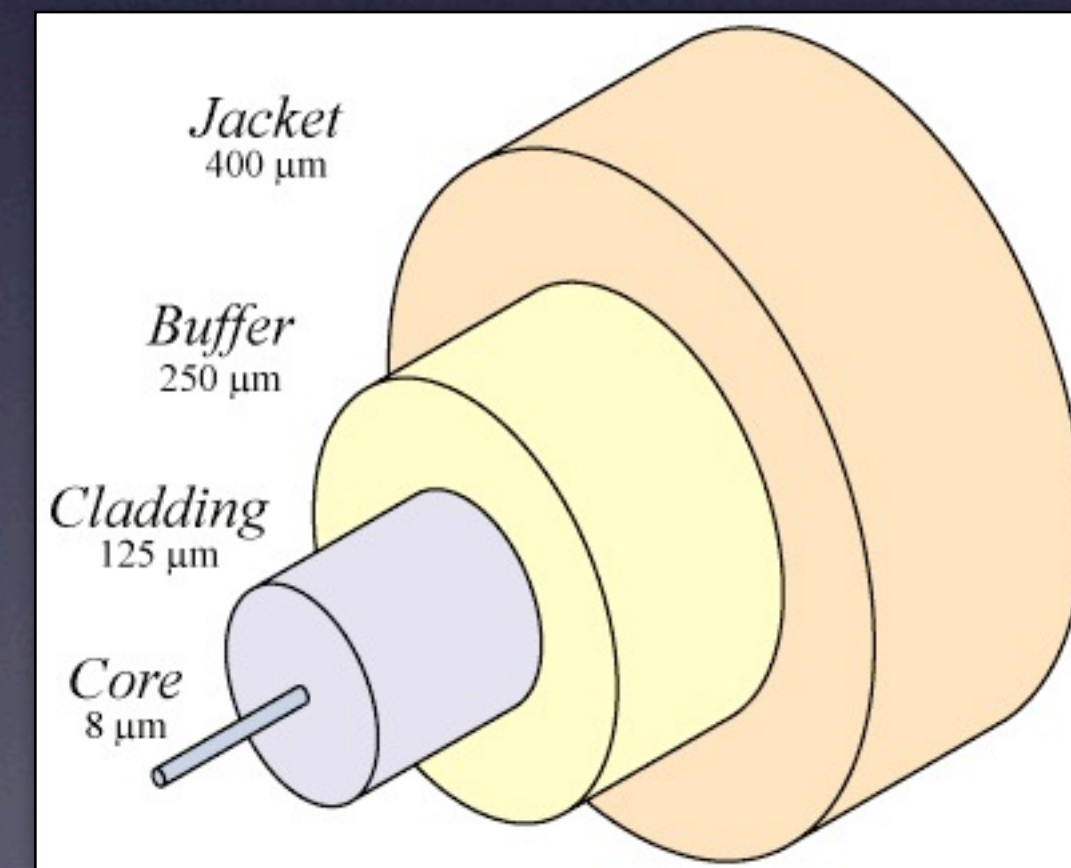
# UTP, Unshielded Twisted Pair

- Cabling used
- Bandwidth of communication
- Type of connectors used
- Pinout and color codes
- Maximum distance



# Optical cables

- Multimode / singlemode
- 2km / 100 km
- LED / Laser



# Wireless Media

- 802.11 a, b, g, n
- Access point and wireless NIC