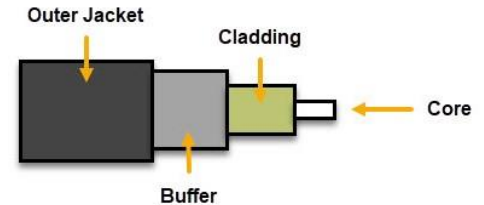


Fiber Optic Cabling

- Glass or plastic fiber that carries light (photons)
 - **High Bandwidth:** Photons travel faster than electrons.
 - **Long Distances:** Less attenuation.
 - Immune to Electromagnetic Interference (EMI)
 - Doesn't Emit Signals
- Two Types
 - **Multi-mode Fiber (MMF)**
 - Shorter Distances (LAN / Building-to-Building)
 - Up to 2 Kilometers
 - **Single-mode Fiber (SMF)**
 - More expensive than multi-mode
 - Longer Distances (WAN / Across Town)
 - Up to 200 Kilometers

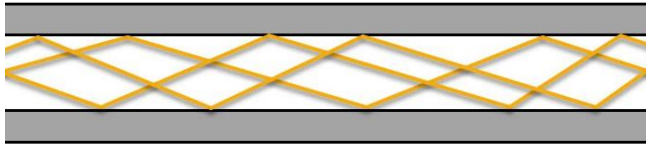


Informational Note: 9-micron Single-Mode Fiber can travel 75 miles at 400 Gbps

MMF versus SMF

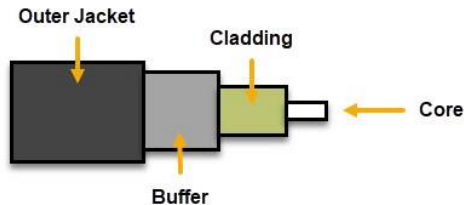
Multi-Mode Fiber (MMF)

- Many photons of light travel through the cable at once, and bounce off the walls, which reduces the distance and speed.
- **Larger Core:** 50 to 62.5 microns



Single-Mode Fiber (SMF)

- A single direct photon of light travels through the cable, which allows greater distances and speed.
- **Smaller Core:** 8 to 10 microns



Fiber Optic Cable Connectors

Lucent Connector (LC)

- Small form-factor design that has a flange on the top, similar to an RJ-45 connector.
- Commonly used in MMF & SMF gigabit and 10-gigabit Ethernet networks.



Subscriber Connector (SC)

- Square connector that uses a push-pull connector similar to A/V equipment.
- Commonly used in MMF & SMF gigabit Ethernet networks.



Straight Tip (ST)

- BNC style connector with a half-twist bayonet locking mechanism.
- Was used in MMF networks but not commonly used anymore.



Mech. Transfer Register Jack (MTRJ)

- Similar to the RJ-45 connector, and houses two fiber optics cables.
- Designed for MMF networks.



Why use Fiber?

- Fiber cable is more expensive than twisted pair, as is the equipment
- But you can perform much longer network cable runs with fiber.
 - 100m versus up to 200 Kilometers
- So you have decreased network equipment costs
 - Switches, routers, etc.
- Plus fiber is:
 - Immune to EMI and signal emanations
 - Has lower signal attenuation
 - Making it more reliable and secure
- Costs are steadily decreasing as more people adopt fiber