ESCOLA
SUPERIOR
DE TECNOLOGIA
E GESTÃO

P.PORTO

REDES DE COMPUTADORES I – Network Media Types

Network Media Types

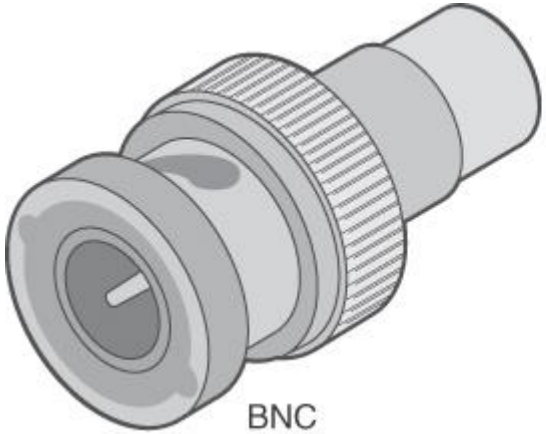
- Copper:
- Fiber:
- Connector types
- Ethernet standards

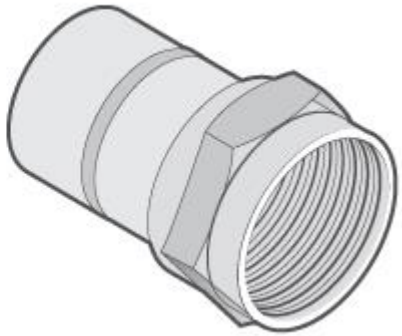
Copper
Coaxial Cable

- **coaxial/RG6** A network cable that is composed of two conductors. One of the conductors is an inner insulated conductor. This inner conductor is surrounded by another conductor. This second conductor is sometimes made of a metallic foil or woven wire. RG6 is used to distribute HDTV signals in a home or office. RG6QS uses quad shielding for better signal quality over long runs. Also known as coax.

Copper
Coaxial Cable

- **common connectors used on coaxial cables**


BNC

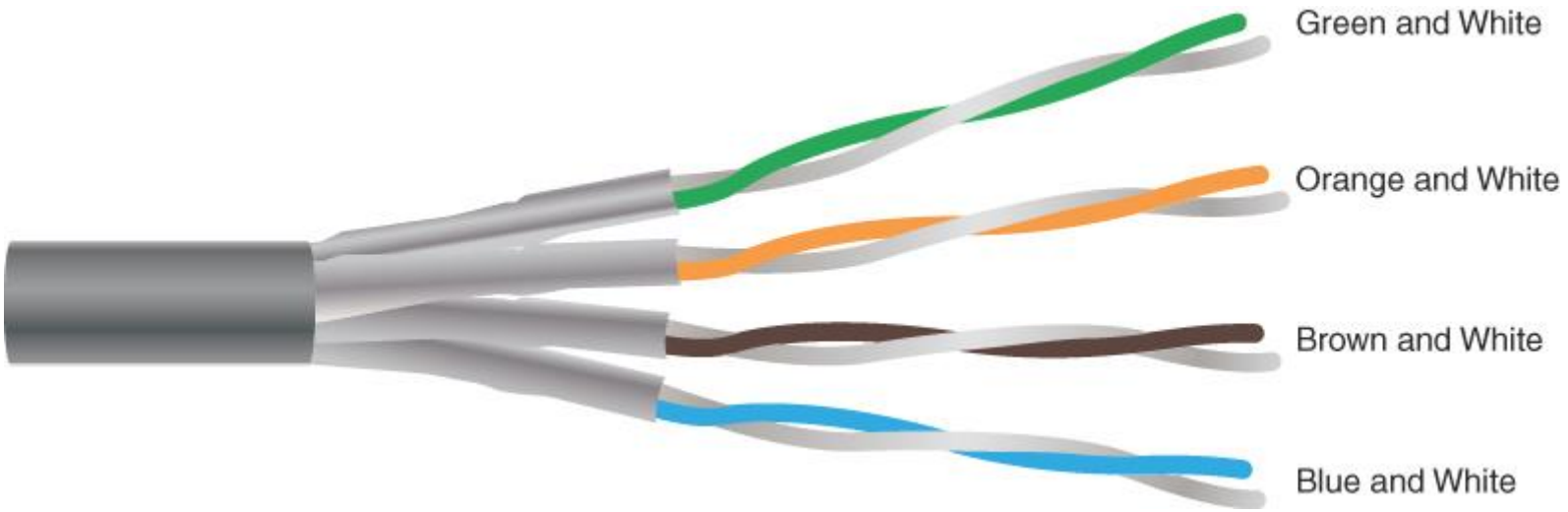

F-connector

Copper
Twisted-Pair Cable

- **twisted-pair** Today's most popular media type, in which individually insulated copper strands are intertwined into a twisted-pair cable. Two categories of twisted-pair cable are shielded twisted pair (STP) and unshielded twisted pair (UTP).
- **TIA/EIA-568A** A wiring standard that uses the following wires from pin 1 to 8: green stripe, green, orange stripe, blue, blue stripe, orange, brown stripe, brown.

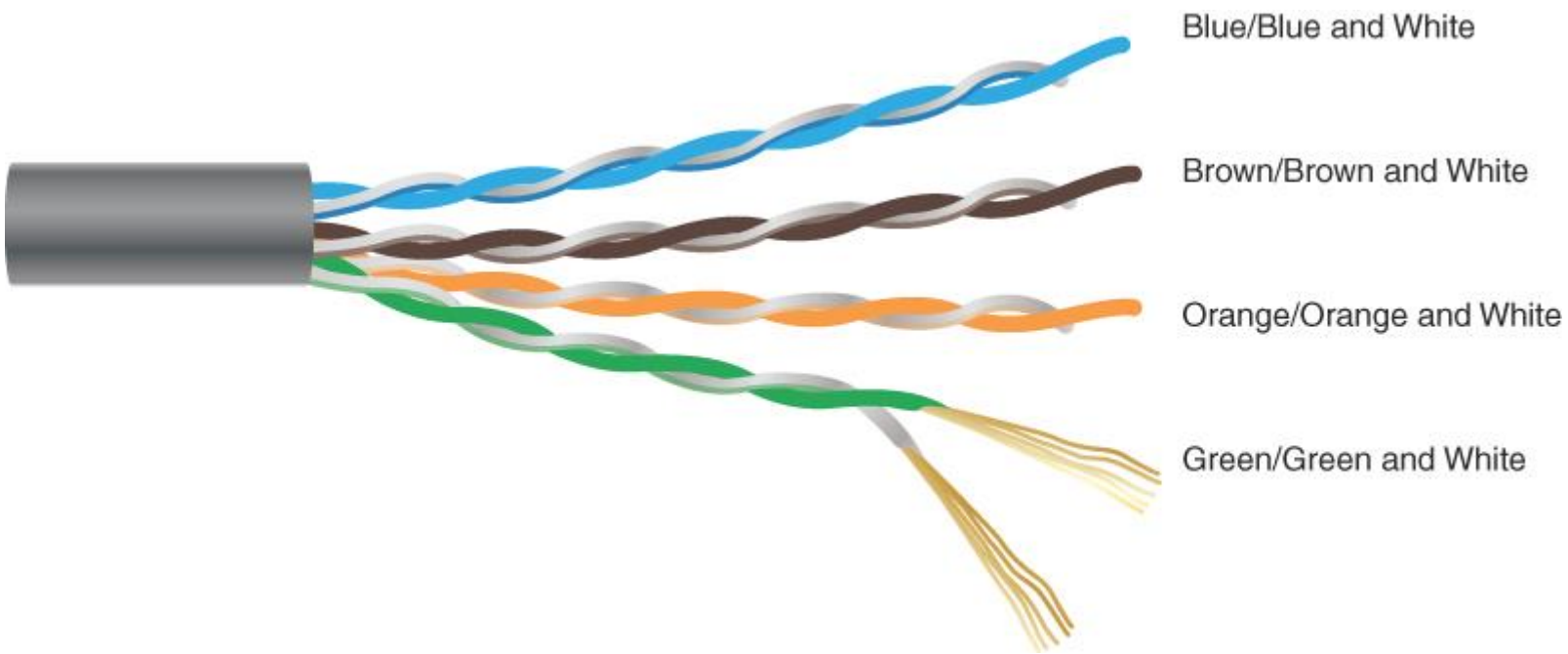
Copper
Twisted-Pair Cable

- **Shielded Twisted Pair (STP)**



Copper
Twisted-Pair Cable

- **Unshielded Twisted Pair (UTP)**

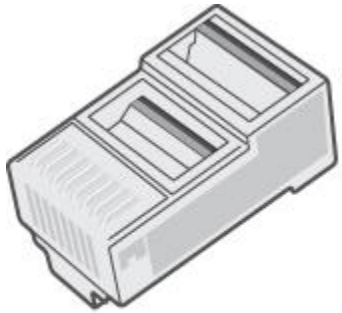


Copper
Twisted-Pair Cable

- **Unshielded Twisted Pair (UTP)**
  - **Category 5**
  - **Category 5e**
  - **Category 6**
  - **Category 6ª**
  - **Category 7**
  - **Category 8**

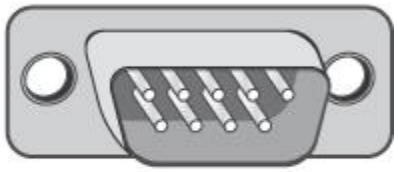
Copper
Twisted-Pair Cable

- **Twisted-Pair Cable Connectors**
  - **RJ45**
  - **RJ11**
  - **DB-9 (RS-232)**



RJ-45

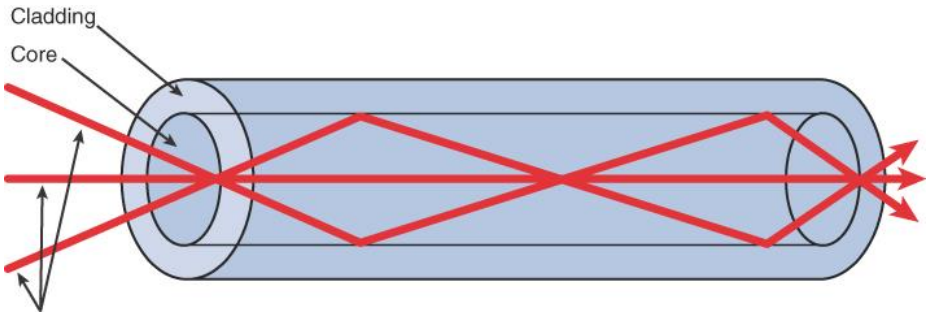
RJ-11



DB-9 (RS-232)

Fiber
Fiber-Optic Cable

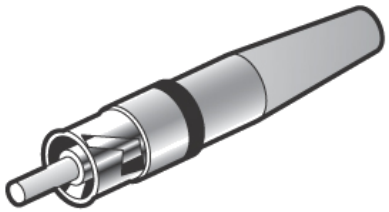
- **Multimode Fiber**



- **Single-Mode Fiber**

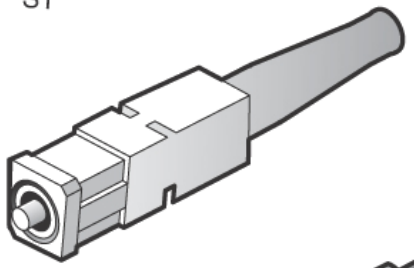
Fiber-Optic Cable

- **Fiber-Optic Cable Connectors**



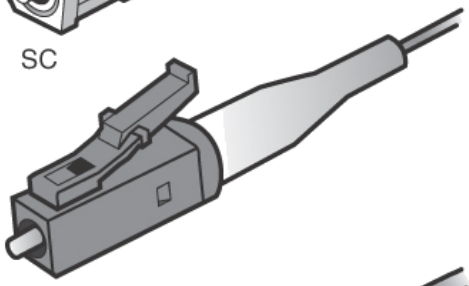
ST

The ST connector uses a half-twist bayonet type of lock.



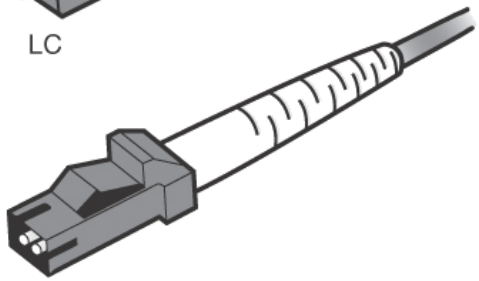
SC

The SC uses a push-pull connector similar to common audio and video plugs and sockets.



LC

LC connectors have a flange on top, similar to an RJ-45 connector, that aids secure connection.



MT-RJ

MT-RJ is a popular connector for two fibers in a very small form factor.

Fiber
Fiber-Optic Cable

- **Fiber Connector Polishing Styles**
  - **ultra physical contact (UPC)**
  - **angled physical contact (APC)**

Distance and Speed Limitations

Ethernet Type	Bandwidth Capacity
Standard Ethernet	10Mbps: 10 million bits per second (that is, 10 megabits per second)
Fast Ethernet	100Mbps: 100 million bits per second (that is, 100 megabits per second)
Gigabit Ethernet	1Gbps: 1 billion bits per second (that is, 1 gigabit per second)
10-Gigabit Ethernet	10Gbps: 10 billion bits per second (that is, 10 gigabits per second)
100-Gigabit Ethernet	100Gbps: 100 billion bits per second (that is, 100 gigabits per second)

Distance and Speed Limitations

Ethernet Standard	Media Type	Bandwidth Capacity	Distance Limitation
10BASE5	Coax (thicknet)	10Mbps	500 m
10BASE2	Coax (thinnet)	10Mbps	185 m
10BASE-T	Cat 3 (or higher) UTP	10Mbps	100 m
100BASE-TX	Cat 5 (or higher) UTP	100Mbps	100 m
100BASE-FX	MMF	100Mbps	2 km
100BASE-SX	MMF	100Mbps	850 m
1000BASE-T	Cat 5e (or higher) UTP	1Gbps	100 m

Distance and Speed Limitations

1000BASE-TX	Cat 6 (or higher) UTP	1Gbps	100 m
1000BASE-SX	MMF	1Gbps	550 m
1000BASE-LX	SMF	1Gbps	5 km
1000BASE-LH	SMF	1Gbps	10 km
1000BASE-ZX	SMF	1Gbps	70 km
10GBASE-SR	MMF	10Gbps	26–400 m
10GBASE-LR	SMF	10Gbps	10–25 km
10GBASE-ER	SMF	10Gbps	40 km
10GBASE-SW	MMF	10Gbps	300 m

Distance and Speed Limitations

10GBASE-LW	SMF	10Gbps	10 km
10GBASE-EW	SMF	10Gbps	40 km
10GBASE-T	Cat 6a (or higher)	10Gbps	100 m
40GBASE-T	Cat 8	40Gbps	30 m
100GBASE-SR10	MMF	100Gbps	125 m
100GBASE-LR4	SMF	100Gbps	10 km
100GBASE-ER4	SMF	100Gbps	40 km

Transceivers

- **small form-factor pluggable (SFP) (mini-GBIC)**

Media Converters

- **media converter** A device that connects different types of network devices together, such as a fiber-optic device that needs to communicate with a twisted-pair device in a network segment OR An adapter used to facilitate connectivity in an environment with a wide variety of copper and fiber cabling used by different network devices.
  - MMF to Ethernet
  - SMF to Ethernet
  - Fiber to coaxial
  - SMF to MMF

Network Media Types

- Copper:
- Fiber:1
- Connector types
- Ethernet standards

Bibliografia

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- ODOM, Wendell. *CCNA 200-301 Official Cert Guide, Volume 2*. Cisco Press, 2019.
- ODOM, W. CCNA 200-301, Volume 1 Official Cert Guide. 2019.