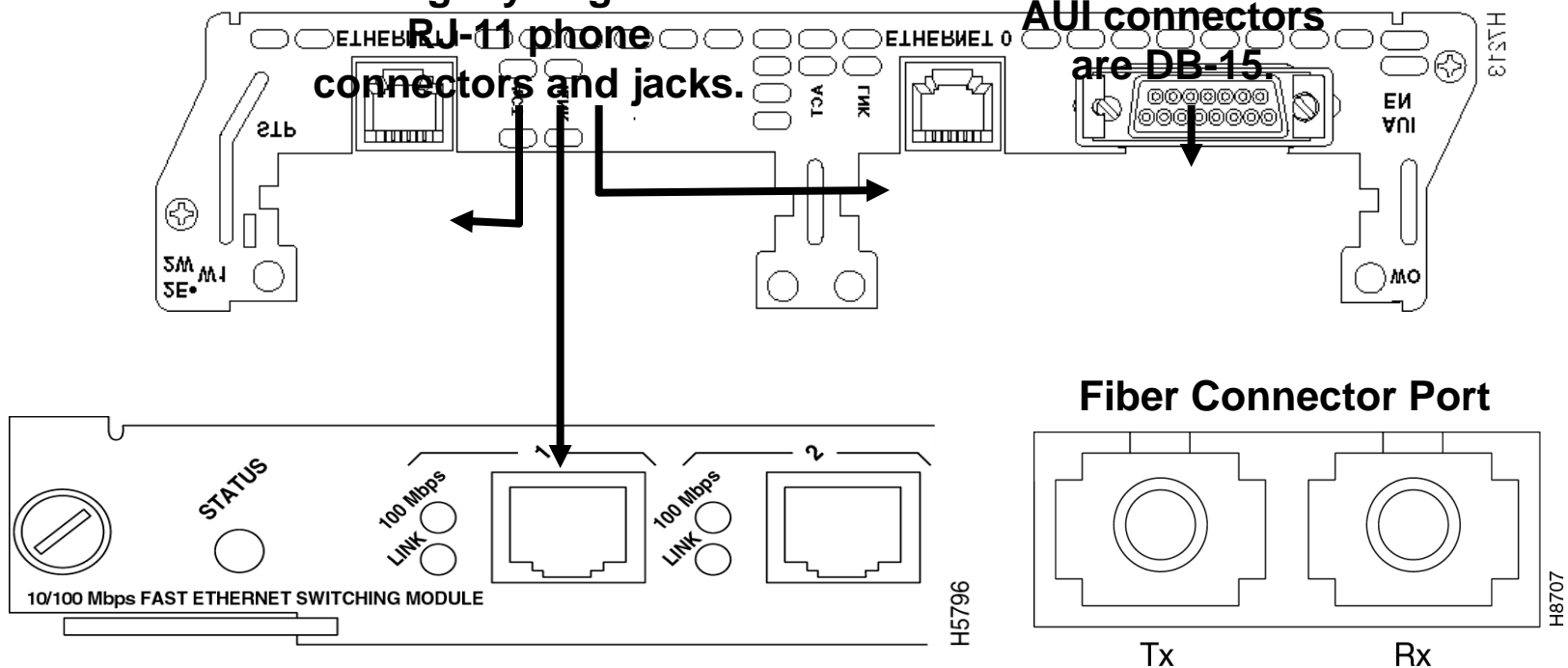# Media

# Differentiating Between Connections
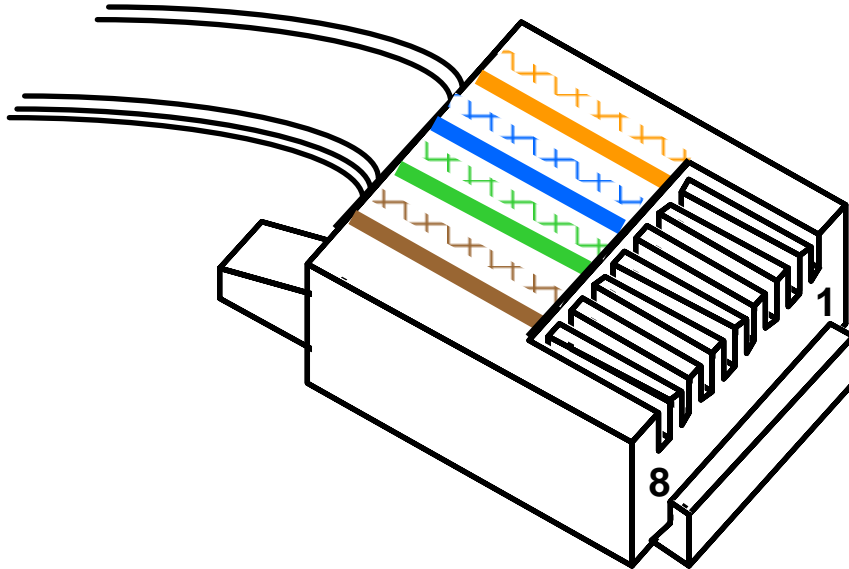
ISO 8877 (RJ-45)
connectors and jacks
are slightly larger than
RJ-11 phone
connectors and jacks.

AUI connectors
are DB-15.

Fiber Connector Port

Tx          Rx

# UTP Device



**The RJ-45 Connector**

| Pin | Wire Pair:<br>T is Tip<br>R is Ring |
|:---:|:---|
| 1 | Pair 3 T2 |
| 2 | Pair 3 R2 |
| 3 | Pair 2 T3 |
| 4 | Pair 1 R1 |
| 5 | Pair 1 T1 |
| 6 | Pair 2 R3 |
| 7 | Pair 4 T4 |
| 8 | Pair 4 R4 |

# UTP Implementation Straight-Through

## Cable 10BaseT/ 100BaseTX Straight-Through

**Hub/Switch**

**Server/Router**

| Pin | Label | | Pin | Label |
|-----|-------|---|-----|-------|
| 1 | RD+ | ← | 1 | TD+ |
| 2 | RD- | ← | 2 | TD- |
| 3 | TD+ | → | 3 | RD+ |
| 4 | NC | | 4 | NC |
| 5 | NC | | 5 | NC |
| 6 | TD- | → | 6 | RD- |
| 7 | NC | | 7 | NC |
| 8 | NC | | 8 | NC |

## Straight-Through Cable

8

1

1

8

1          8

w g w b w o w br
  g   o   b   br

1          8

w g w b w o w br
  g   o   b   br
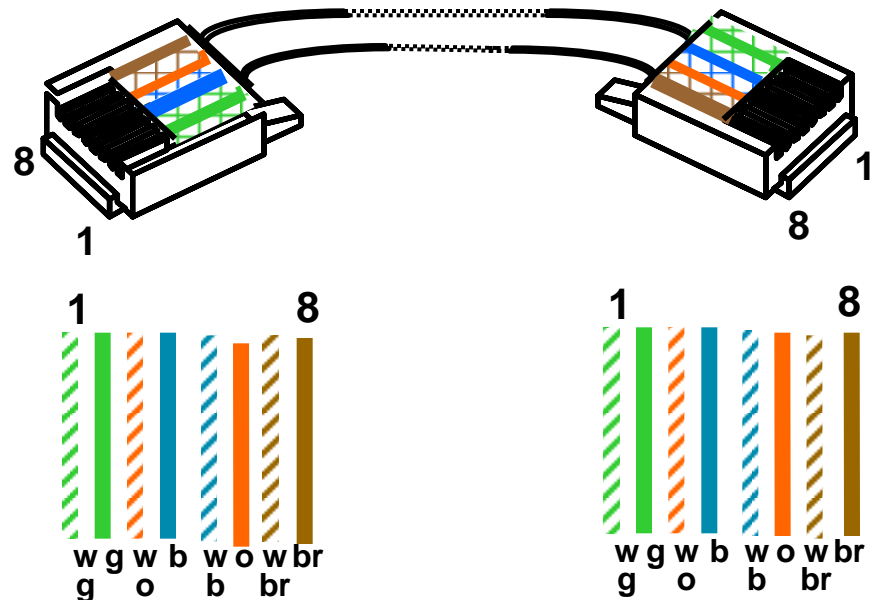
## Wires on cable ends are in same order.

# UTP Implementation Crossover

## Cable 10BaseT/ 100BaseT Crossover

**Hub/Switch**          **Hub/Switch**

| Pin | Label | Pin | Label |
|-----|-------|-----|-------|
| 1 | RD+ | 1 | RD+ |
| 2 | RD- | 2 | RD- |
| 3 | TD+ | 3 | TD+ |
| 4 | NC | 4 | NC |
| 5 | NC | 5 | NC |
| 6 | TD- | 6 | TD- |
| 7 | NC | 7 | NC |
| 8 | NC | 8 | NC |

## Crossover Cable

8          1

1          8

8          1          8          1

br  w  g  w  b  w  o  w          br  w  w  w  b  o  g
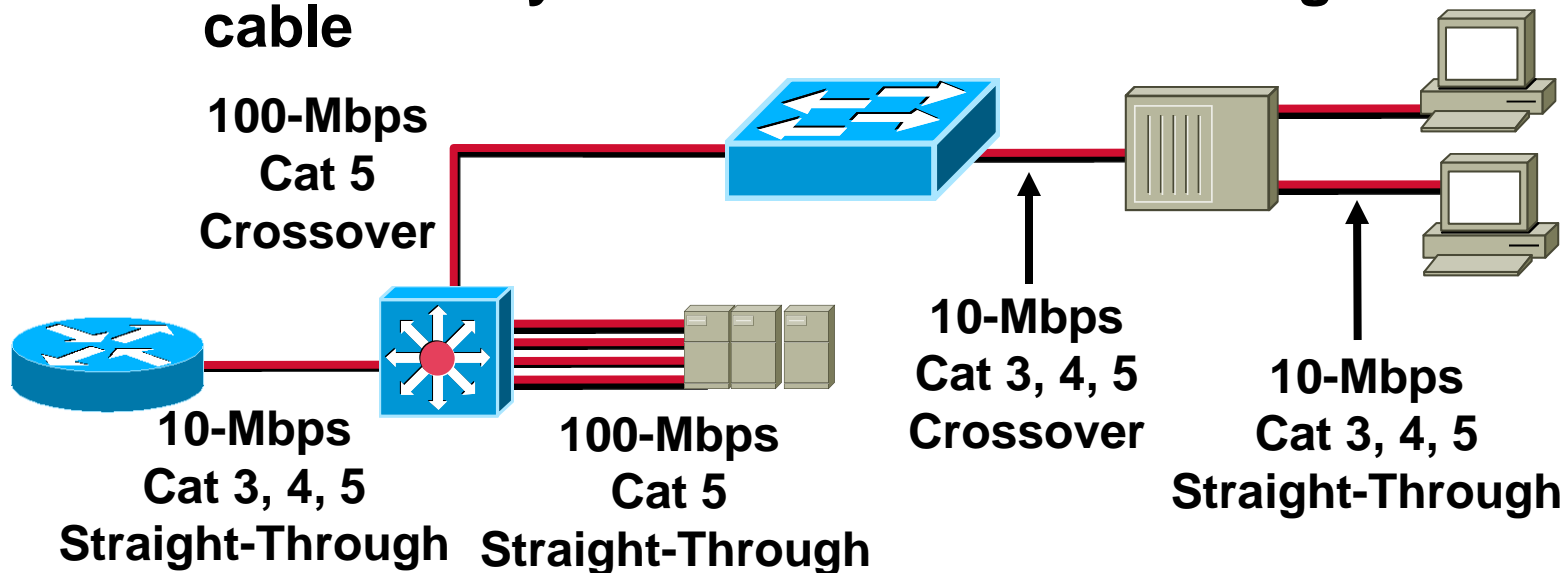    br    b    g    o          g  br  o  b
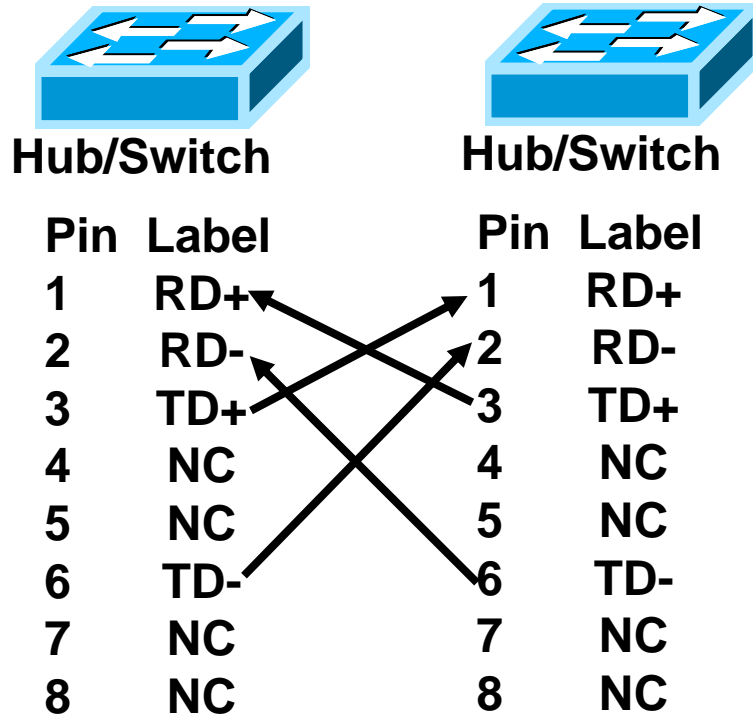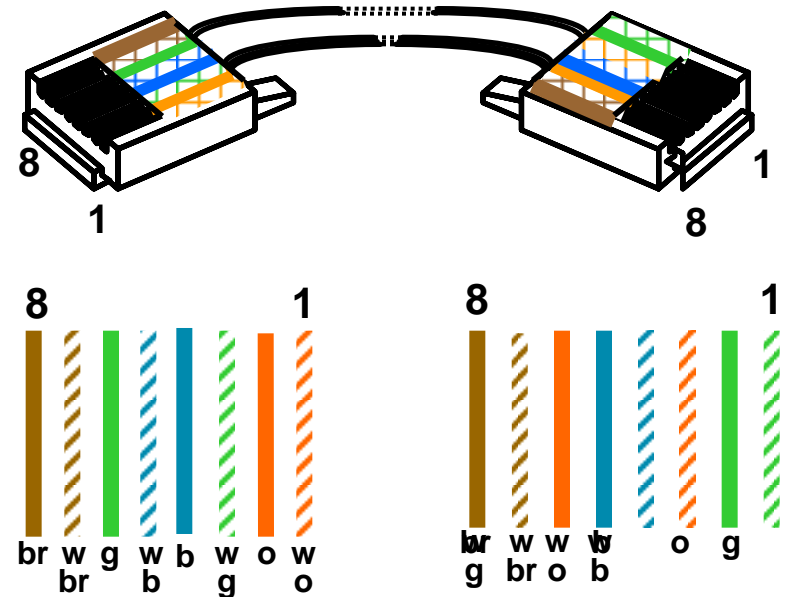
**Some wires on cable ends are crossed.**

# Cabling the Campus

- **Determine the physical media used: 10-Mbps or 100-Mbps.**

  – **Indicates what category of cable is required**

- **Locating interfaces on the chassis, determine if one or both ports have an "x."**

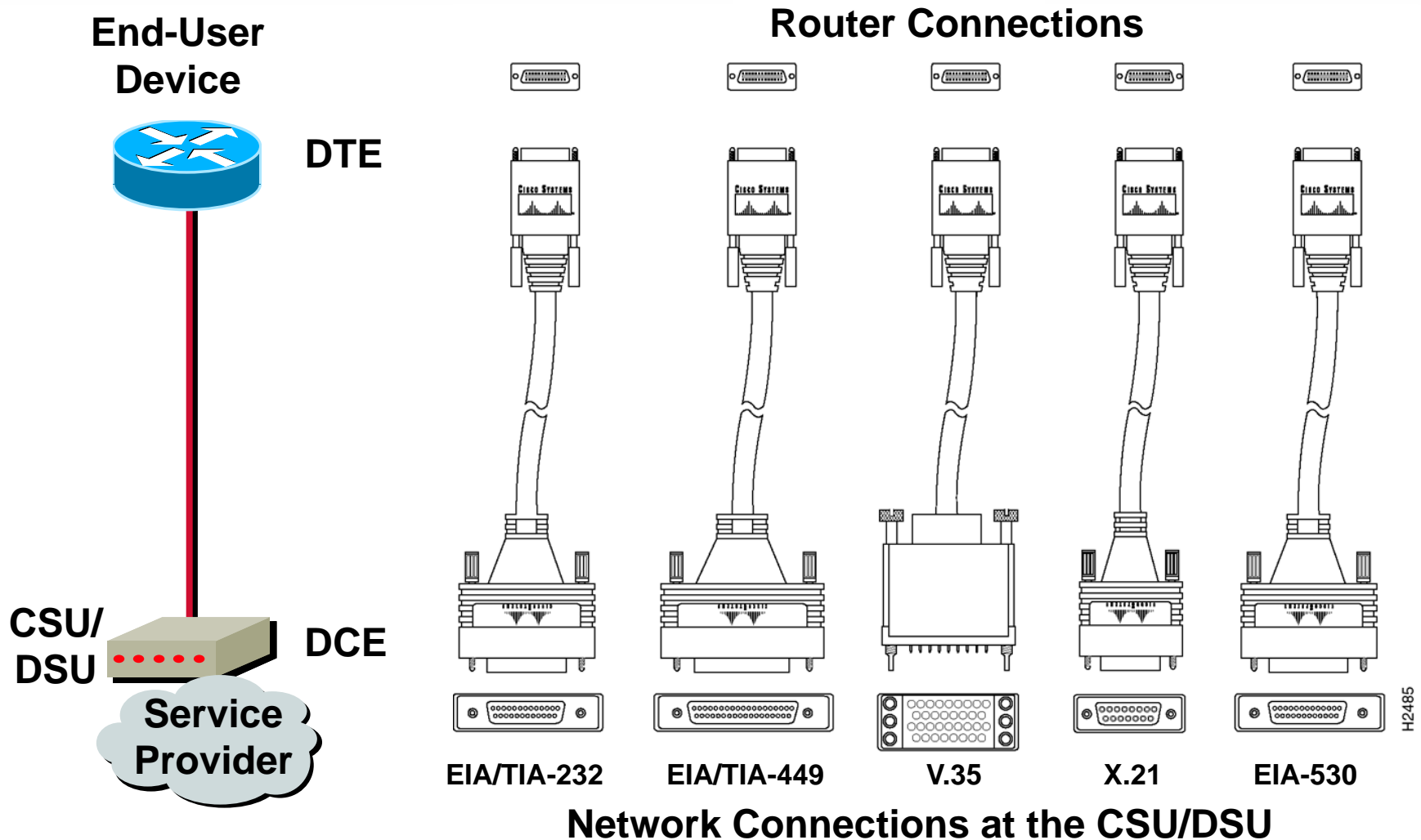  – **Indicates if you need crossover or straight-through cable**



**100-Mbps Cat 5 Crossover**

**10-Mbps Cat 3, 4, 5 Straight-Through**

**100-Mbps Cat 5 Straight-Through**

**10-Mbps Cat 3, 4, 5 Crossover**

**10-Mbps Cat 3, 4, 5 Straight-Through**

# WAN Physical Layer Implementations

- **Physical layer implementations vary.**

- **Cable specifications define speed of link.**

| HDLC | PPP | Frame Relay | ISDN BRI (with PPP) |
|------|-----|-------------|---------------------|
| EIA/TIA-232 EIA/TIA-449 X.21 V.24 V.35 HSSI | | | RJ-45 NOTE: Pinouts are different from RJ-45 used in campus. |

# Differentiating Between WAN Serial Connectors

**End-User Device**

**Router Connections**

DTE

**CSU/ DSU**  DCE

Service Provider

| EIA/TIA-232 | EIA/TIA-449 | V.35 | X.21 | EIA-530 |

**Network Connections at the CSU/DSU**

H2485

# Serial Implementation of DTE Versus DCE

**Data Terminal Equipment:**
- **End of the user's device on the WAN link.**

**Data Communications Equipment:**
- **End of the WAN provider's side of the communication facility.**
- **Responsible for clocking.**



**Modem CSU/DSU**

**DTE**      **DCE**

**DTE**   **DCE**     **DCE**   **DTE**
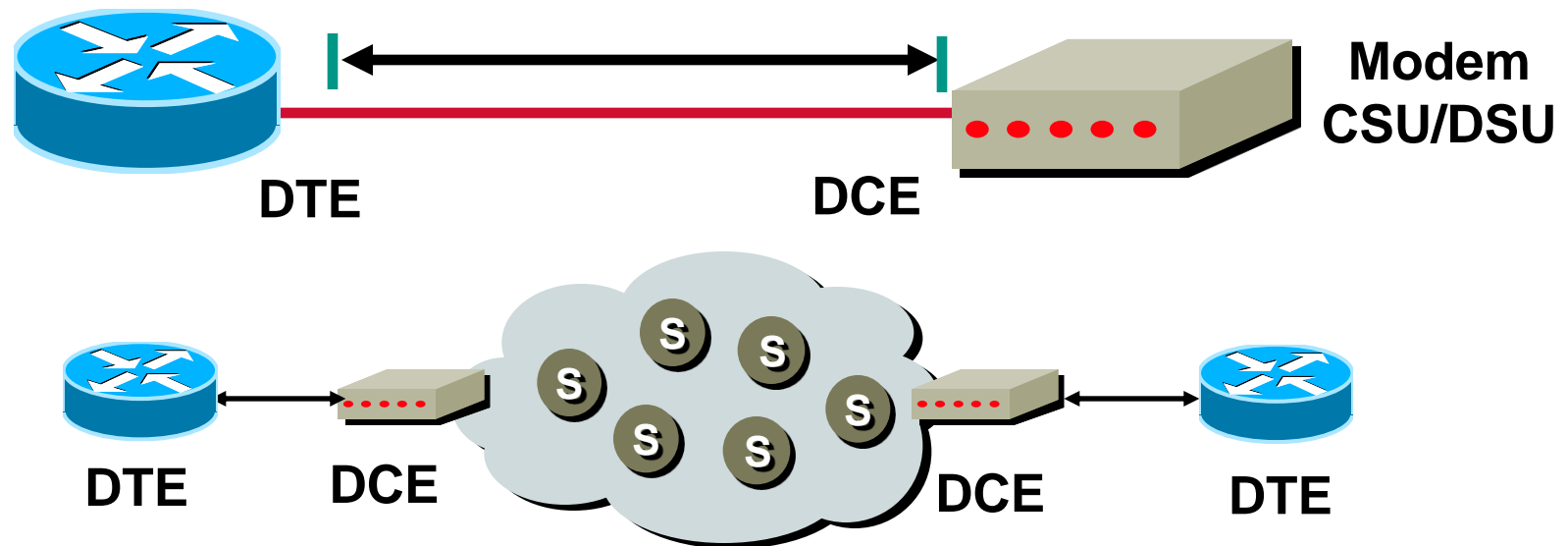
- **DTE/DCE—The point where responsibility passes**

# Fixed Interfaces



2500 Router—Rear View
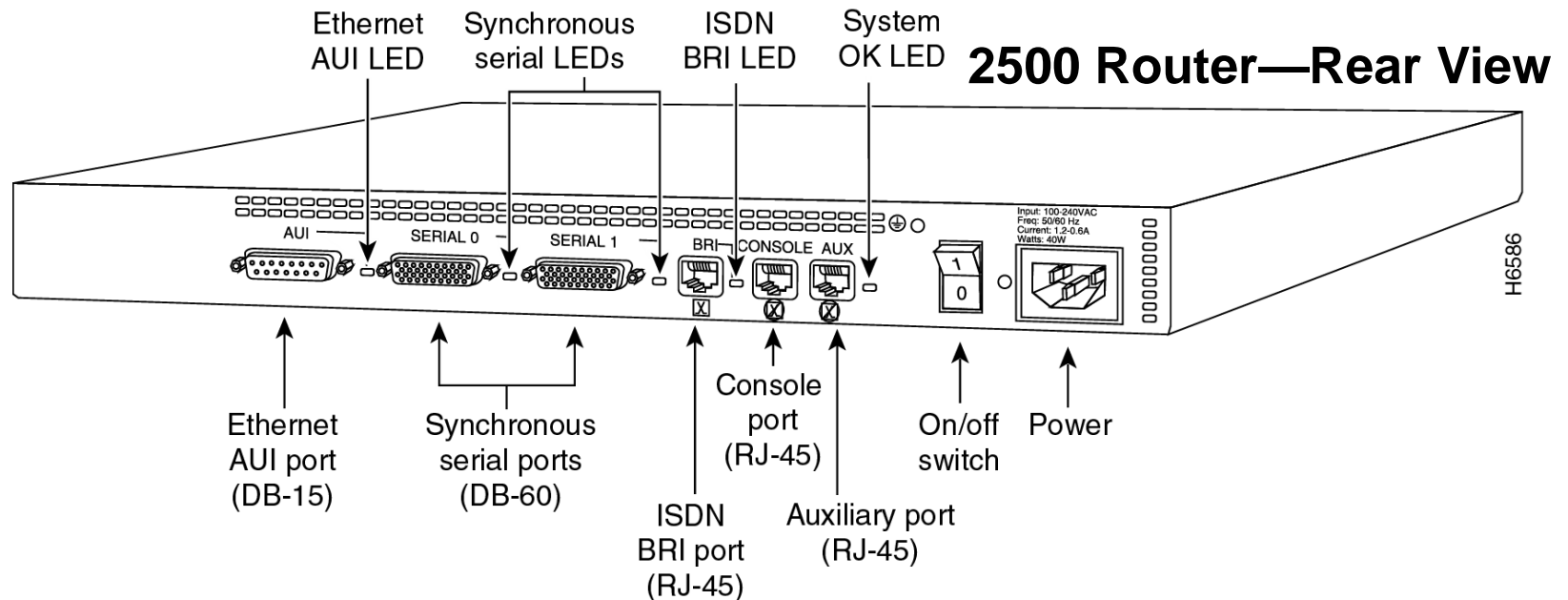
- **Serial WAN ports can be fixed.**

# Modular Interfaces

- **Serial WAN ports can be modular.**

**WAN Interface Card**

**Cisco 1603 Router—Rear View**

**Ethernet 10BaseT**  **Ethernet AUI**  **ISDN BRI S/T**  **Console**  **Module**
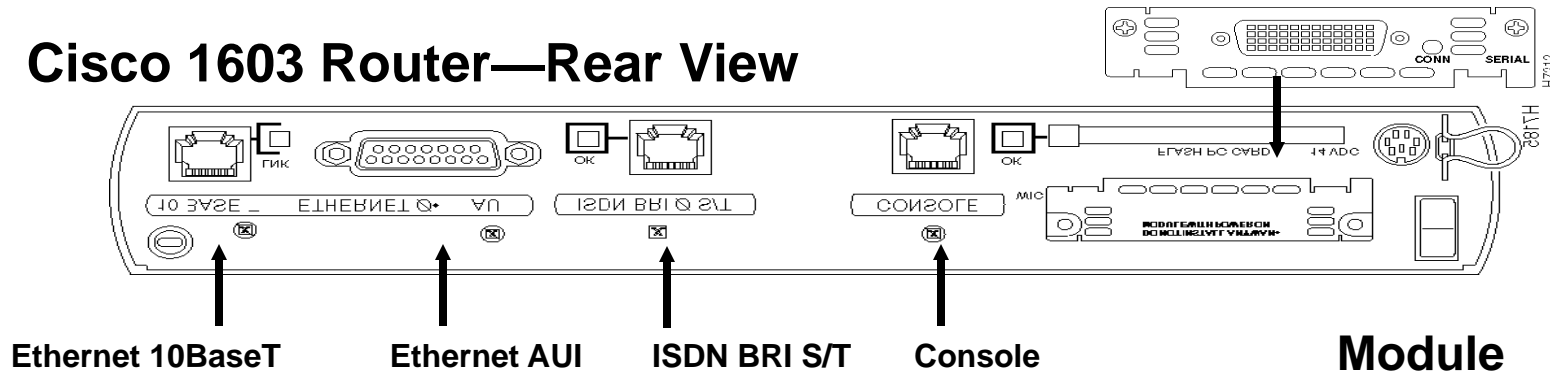
**Cisco 3640 Router— Rear View**

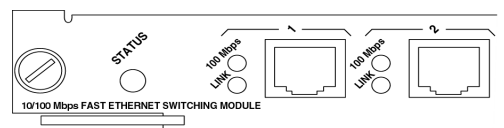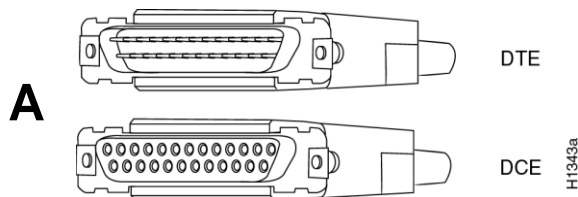Slot 3  Slot 2

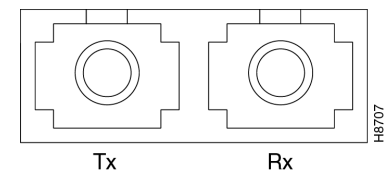Slot 1  Slot 0  Power supply
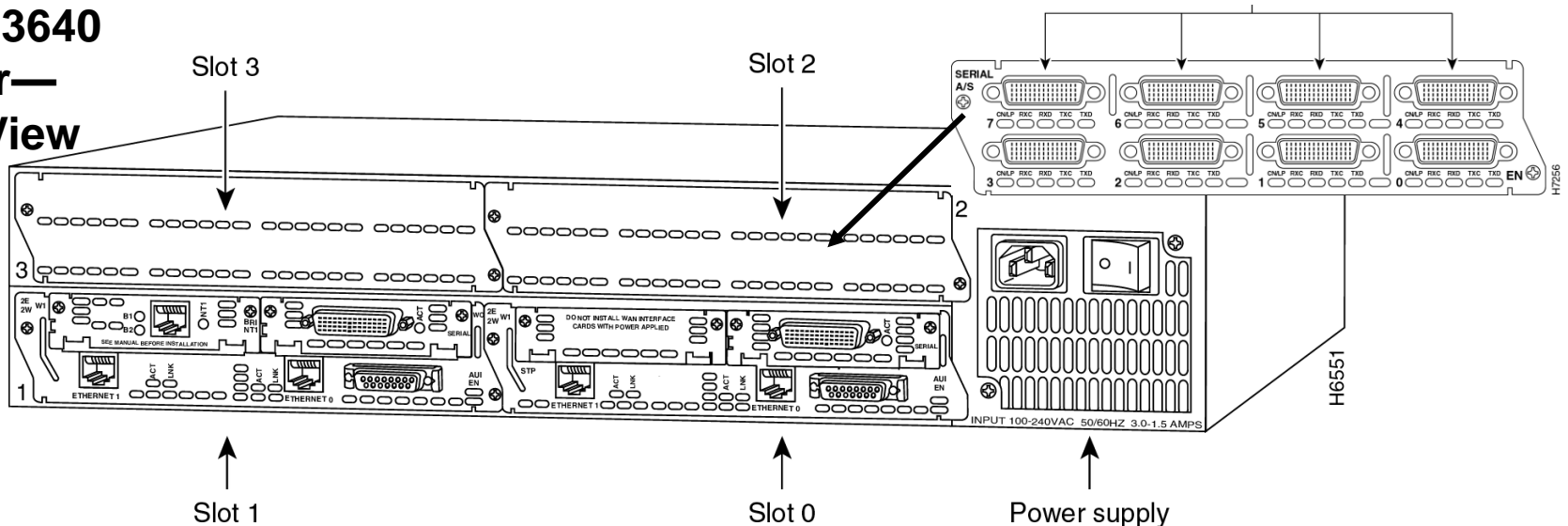
# Review Questions

1. Discuss three standards on which Ethernet LAN implementations are based.

2. If you want to upgrade your switch-to-switch connectivity to 100BaseT, what category of cable do you need?

3. Does the following pinout scheme reflect a straight-through, rollover, or crossover cable?
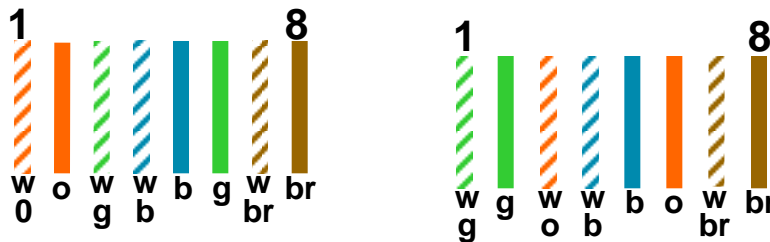


4. What media can be used for each connector type?