LAN Wiring Physical Topology and Interface Hardware
Chapter 10

Hardware vs. Software
• Hardware is Faster but can't be changed easily.
• Software can be Changed Easily but is slower.
• Firmware is Fast and Flexible.

Network Interface Card (NIC)
• Plugs into either a PCI or ISA slot on a PC.
• Cable or Fiber plugs into the NIC and attaches it to the network.
• The NIC is unique for the Type of network e.g. Token Ring, Ethernet, ATM etc.
• However a Network Type may use different types of NICs.

Ethernet
• Thicknet 10Base5 (uses a transceiver)
• Thinnet 10Base2 (Coax Connector)
• Twisted Pair 10BaseT (RJ45 Connector, uses a Hub or Switch)
• Twisted Pair 100BaseT (RJ45 Connector, uses a Hub or a Switch)

Connections for Universal Ethernet Card

Thicknet
• Older technology Uses Coax and AUI cable.
• You still see AUI interfaces on Routers.
Thinnet

- A simple arrangement that doesn't require a Hub.
- Uses Coax and BNC connectors.

Twisted Pair 10/100BaseT

- Can support 10BaseT.
- Can support 10/100BaseT with CAT V wiring and a 10/100 Hub.

Three Examples

a) Thicknet
b) Thinnet
c) 10BaseT or 100BaseT

10/100 Auto negotiation

- Three standards for the same connector RJ-45
  - 10Base-T (10 Mbps)
  - 100Base-T (100 Mbps)
  - 1000Base-T (1 Gbps)
- 100Base-T designed to be backward compatible
  - Auto negotiation sets the actual speed used.
  - Sometimes the NIC and the Hub get confused.

Categories of Wire

<table>
<thead>
<tr>
<th>Cat</th>
<th>BW (MHz)</th>
<th>Typical Uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>16</td>
<td>Older, low-speed networks, analog telephones</td>
</tr>
<tr>
<td>4</td>
<td>20</td>
<td>Short distance 10Base-T</td>
</tr>
<tr>
<td>5</td>
<td>100</td>
<td>10Base-T, some 100Base-T</td>
</tr>
<tr>
<td>5E</td>
<td>100</td>
<td>100Base-T, some 1000Base-T</td>
</tr>
<tr>
<td>6</td>
<td>250</td>
<td>1000Base-T, ATM</td>
</tr>
<tr>
<td>7</td>
<td>600</td>
<td>Future 10 Gigabit Ethernet</td>
</tr>
</tbody>
</table>