

CIS 375/ENGR 455

Class 2: Fall 2008

Business

- Class on 22 – 9 – 2008 is a lab night. Work on your labs.

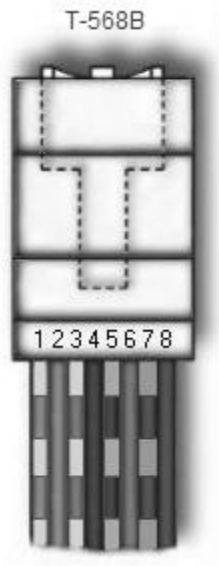
Next Picture

- A simple network
- Two machines, a channel
 - Terms
 - RJ-45
 - CAT Ve
 - NIC
 - Straight Cable
 - Crossover Cable
 - Switch

Building a way to talk

- T-568-A
- T-568-B
- If you have a on both ends – straight through cable
- If you have B on both ends – straight through cable
- If you have a on one end and b on the other end – cross over cable.

T-568 Specs for RJ45



Straight Through

Pin No.	conductor color	Name
1	white and orange	TX_D1+
2	orange	TX_D1-
3	white and green	RX_D2+
4	blue	
5	white and blue	
6	green	RX_D2-
7	white and brown	
8	brown	

Term List

- Auto-sensing – switches which can detect the pinouts RXTX and reverse them automatically so straight cables can be used
- 10 Base TX – refers to Mbps
- 100 Base TX
- 1000 Base TX
- Run length – maximum distance of hops
- Physical Layer – Lowest level of OSI networking model.

Terms, cont.

- UTP/STP – Unshielded and shielded
- Plenum – Space between the ceiling and the bulkhead
- Cladding – Cable wrapping.

Add to the picture

- Topology 1 – Peer to Peer (PTP)
- Topology 2 – Rings
 - Token ring and Twinax
 - Thinnet
- Topology 3 – BUS
 - Thicknet – 50 Ohm cable bundle (coaxial cable)
 - Thinnet – 50 Ohm cable
 - BNC – British Naval connector
 - Vampire Taps

Add to the Picture

- Topology 3 – BUS2
 - Fiber and TP cable
 - Backbone
- Topology 4 – MESH
 - Right!
- Topology 5 – Star
 - TP and devices
 - Hub
 - Switch

Term List

- Hub – simple Layer 1 devices that boosts and reroutes signals
- Modem – Modulate Demodulate – converts signals to other forms and back again
- Multiplexer – acts as a switching point for signals and manages them in turn (MUX/DMUX)

Layer 2 – The Data Link Layer

- IEEE 802.2 spec. (our discussion centers on TCP/IP)
- MAC – Media address control
- LLC – Logical Link control
- Framing – Encapsulation of data for transmission on L1
- Error correction (crc error validation)

L2 devices connect

- Exchange MAC information
 - MAC is 48 bit address in hex (ab:10:00:bc:dc:aa)
 - Use cmd line to access
 - Ifconfig (U)
 - Ipconfig /all (W)
 - Serial number plate or sticker
- Build an arp table of references showing physical locations mapped to mac addresses.
(LLC)

L2 connect

- Information is encapsulated in frames with mac source and dest attached

Bytes	Contents
8	Preamble and delimiters
6	Mac Destination
6	Mac Source
2	Length
<=1500	Data Payload
4	CRC32

L2 connect

- Source and dest are updated from hop to hop
- (see picture)

Some notes about L2

- Very simple protocol for sharing info.
- Large networks of L2 devices become problematic.
- Spanning tree errors – loops