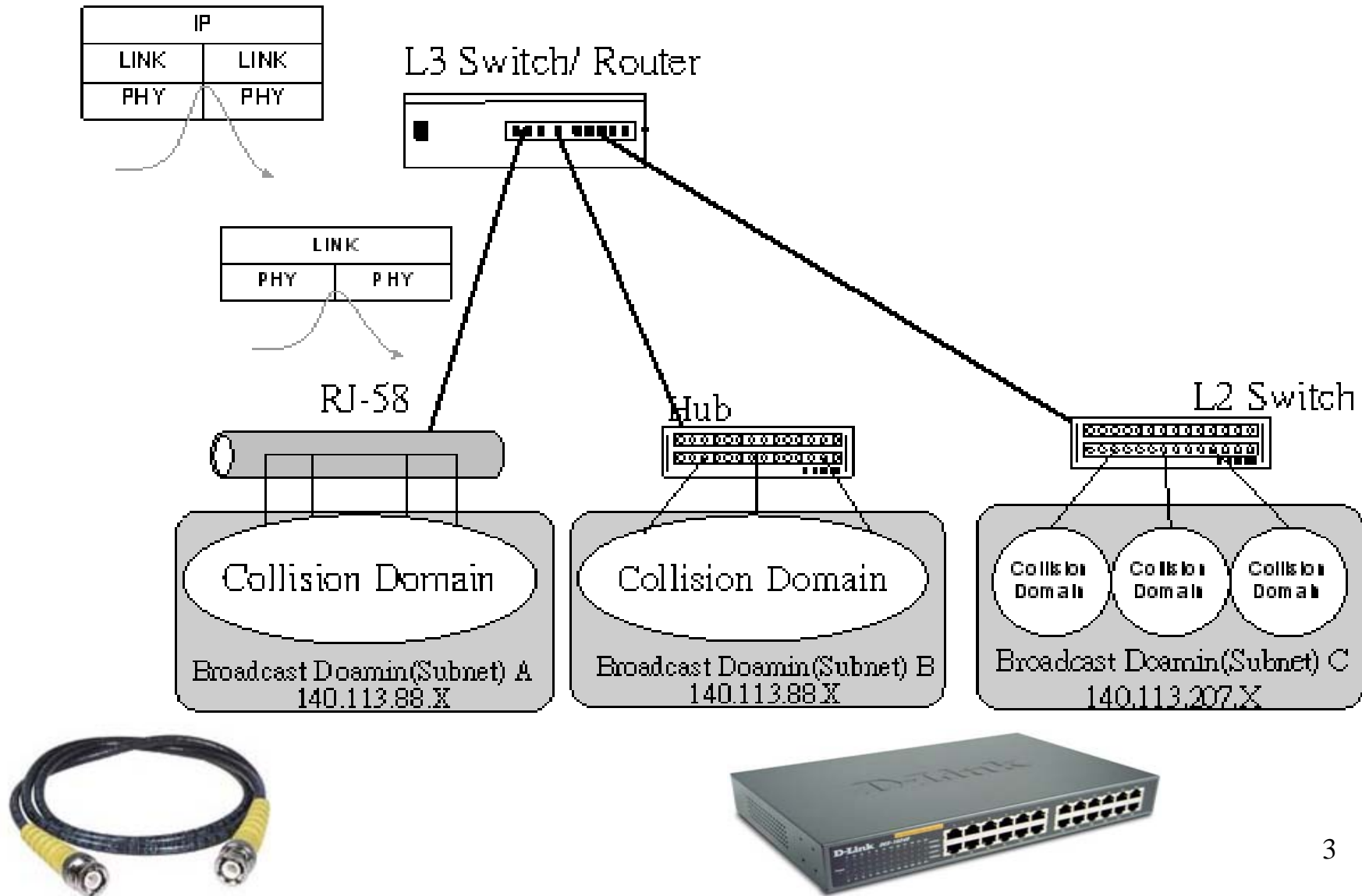


區域網路線材製作

Outline

- Structure of a Typical LAN
- Specification of PHY
- Wiring and Making connectors
- Experiment Steps

Structure of a Typical LAN



Specification of PHY

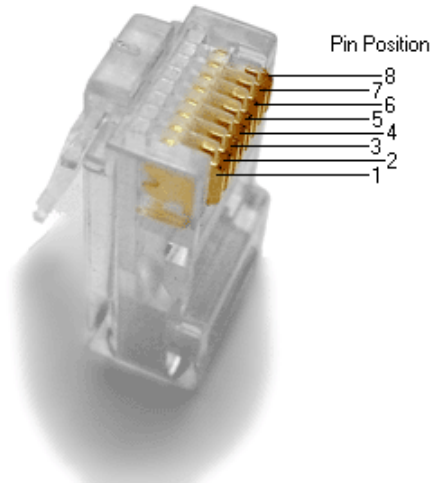
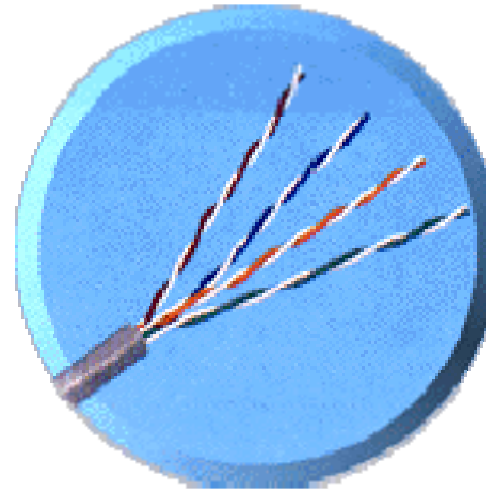
- n-signal-PHY
 - n: 資料速度 (1, 10, 100, 1000 Mb/s)
 - signal: BASE (基頻) or BROAD (寬頻)
 - PHY: 距離 or 媒介種類 (10BASE5 → 500公尺、10BASE-T → 雙絞線、10BASE-FL → 光纖)
- 10M Ethernet
 - coaxial cable: 10BASE2 (thin Ethernet), 10BASE5 (thick Ethernet)
 - Twisted pair: 10BASE-T
 - Fiber-optic: 10BASE-FL
- FAST/GIGABIT Ethernet
 - 100BASE-TX, 100BASE-T4, 100BASE-FX, 1000BASE-X, 1000BASE-T

Connector and Wire

- Connector : RJ-45
- Wiring : Category 5
 - NIC to Hub/Switch
 - NIC to NIC
 - Hub/Switch to Hub/Switch
- Before Making A Cable
 - NIC
 - Hub/Switch
 - Wiring and Connectors

Connector : RJ-45

- Colors vs. Twisted Pairs
 - W-O & O (橙)
 - W-G & G (綠)
 - W-BL & BL (藍)
 - W-BR & BR (棕)
- 8 wires for 8 functions ?
 - Nope !



網路卡插槽	
接頭腳位	功能
1	Tx+
2	Tx-
3	Rx+
4	-
5	-
6	Rx-
7	-
8	-

EIA/TIA Twisted Pair Cable Categories

Category	Description	傳輸率
1	銅線沒有纏繞，僅能傳輸聲音	-
2	銅線沒有纏繞，可傳資料	4 Mbps
3	銅線纏繞絞距為 3 次/英尺	10 Mbps
4	纏繞更密	16 Mbps
5	纏繞最密	100 Mbps
6		250 Mbps
7		600 Mbps

3 Configurations

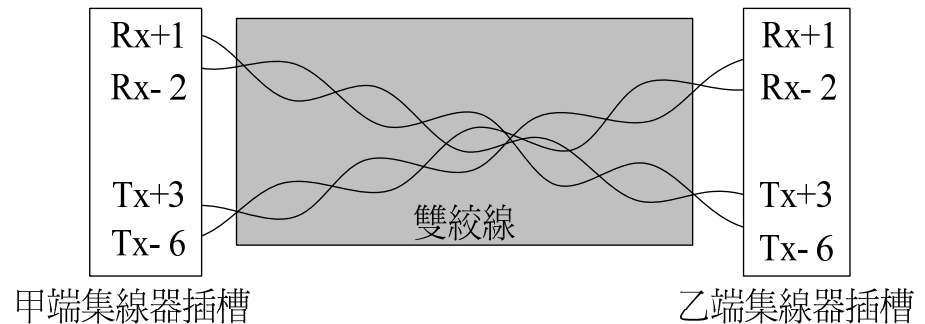
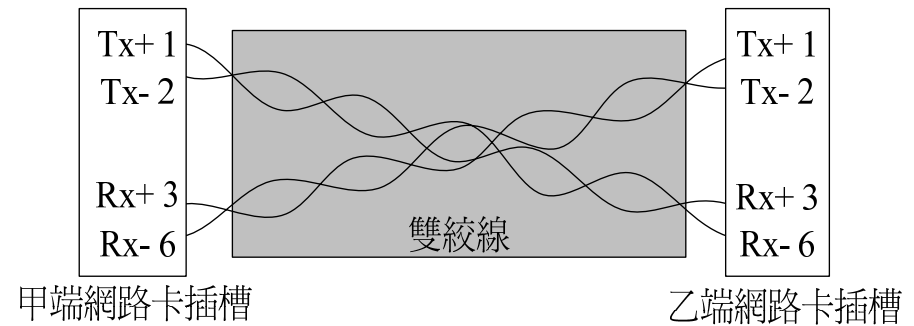
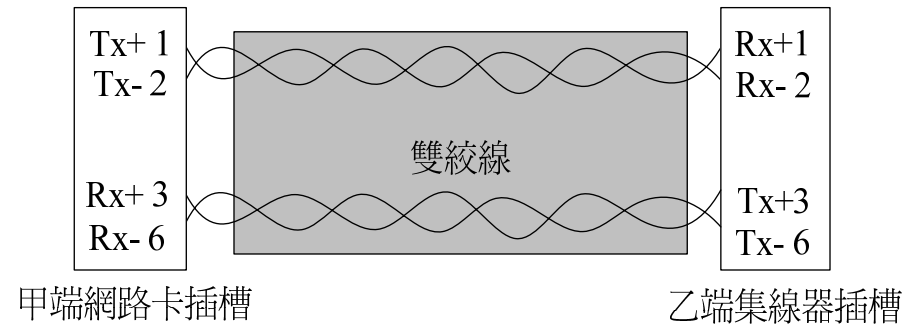
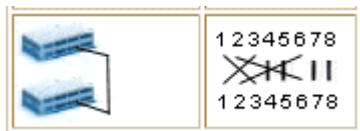
- NIC to Hub



- NIC to NIC

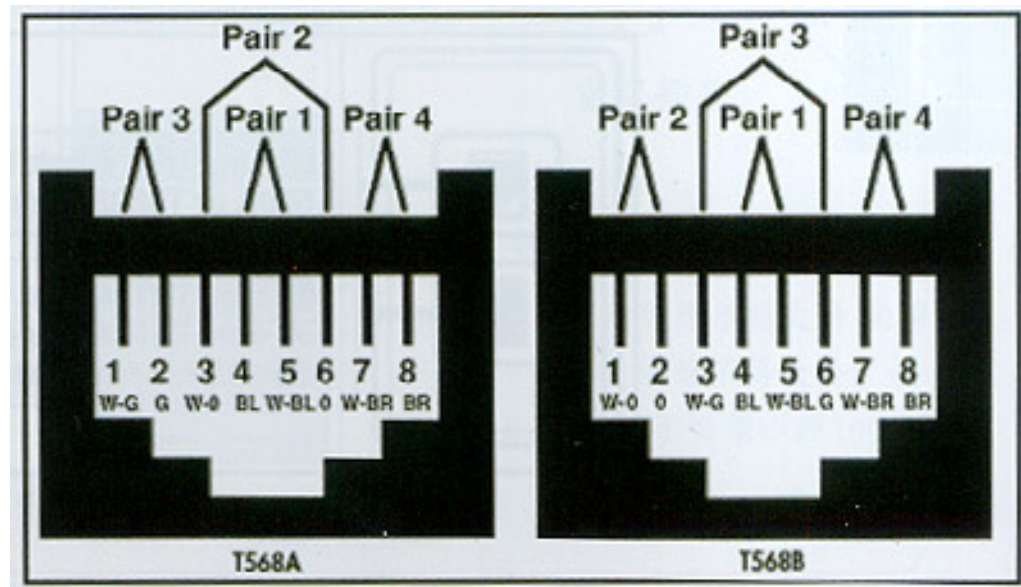


- Hub to Hub

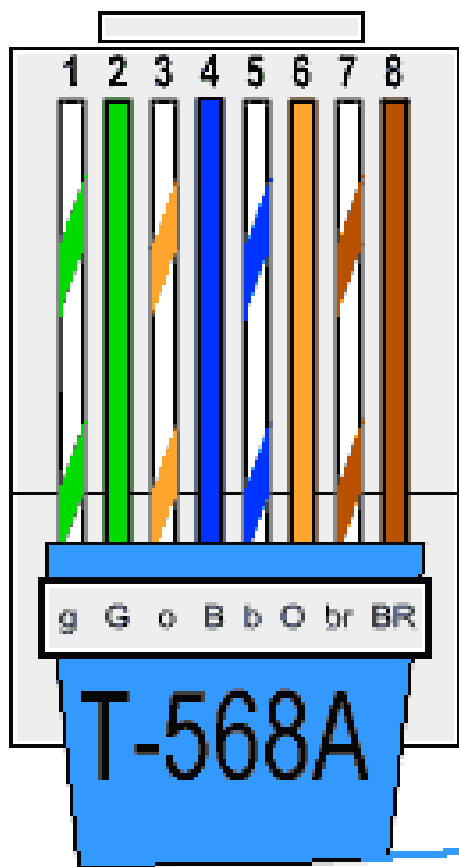


Before Making A Cable

- NIC-driver configuration
- Hub/Switch
- Wiring

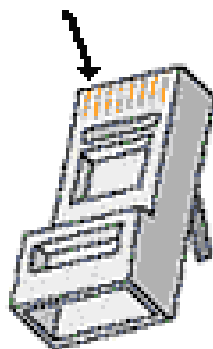


- Caution
 - Auto-Sense don't always sense automatically

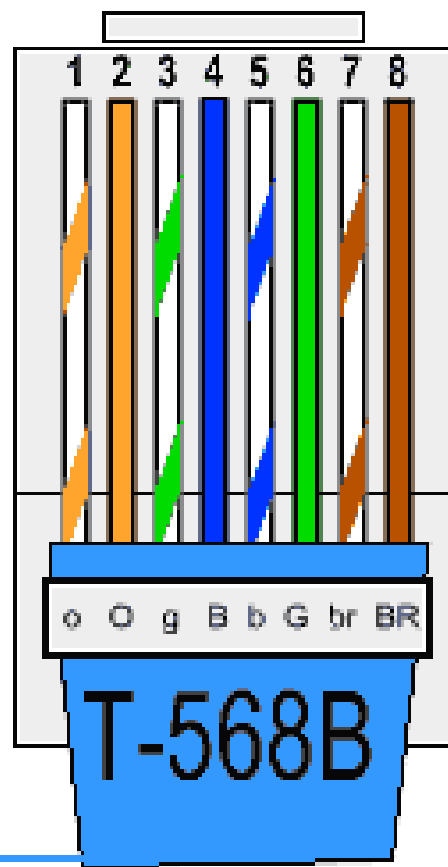


RJ-45 Plug

Pin 1



Clip is pointed away from you.



Experiment Steps (1/2)

- 製作一條兩用（跳接/非跳接）網路線
- 製作一條資訊插座

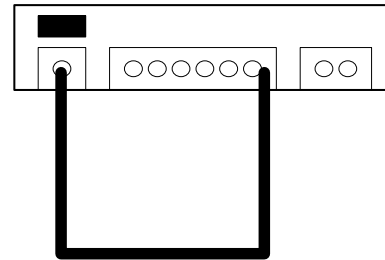


- **RJ-45接頭安裝說明**

- 使用剝線器撥掉外皮 <注意使用剝線器要小心不要剝到自己的手 >
- 將各絞線依序導入接頭中的小溝
- 放入壓線器8P的壓線孔中，接著用力夾緊，接頭即告完成

Experiment Steps (2/2)

- 測試線材與接頭
 - 利用Hub（10/100Mbps）的燈號來測試每一條線是否正常



- 若網路線在測試步驟中都沒有使燈亮過，很有可能是您的製程有問題
- 利用兩台NB互相ping的方式測試跳接線