Chap2

1. 請說明TCP/IP協定中哪幾層有定址,方式各式什麼? 並請利用Wireshark抓出一例子標示之.

> 1.

應用層 - 埠口號碼(Port Number)

傳輸層 - 協定號碼(Protocol Number)

網際網路層 - IP位址(IP Address)

網路存取層 - 網路實體位址(如Ethenet Address)

> 2.

Port Number: 80

Protocol Number: 6

IP Address: 2406:2000:ec:c58::3001

Ethenet Address: 2a:ff:a7:86:98:2c

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Wireshark · Packet 8798 · Wi-Fi

> Frame 8798: 74 bytes on wire (592 bits), 74 bytes captured (592 bits) on interface \Device\NPF_{502CF792-
v Ethernet II, Src: 2a:ff:a7:86:98:2c (2a:ff:a7:86:98:2c), Dst: IntelCor_84:53:4b (80:86:f2:84:53:4b)
  > Destination: IntelCor_84:53:4b (80:86:f2:84:53:4b)
  > Source: 2a:ff:a7:86:98:2c (2a:ff:a7:86:98:2c)
    Type: IPv6 (0x86dd)
v Internet Protocol Version 6, Src: 2406:2000:ec:c58::3001, Dst: 2001:b400:e48b:2e69:bd44:4908:7236:ff22
    0110 .... = Version: 6
  > .... 0000 0000 .... .... .... .... .... = Traffic Class: 0x00 (DSCP: CS0, ECN: Not-ECT)
    .... .... .... 0000 0000 0000 0000 0000 = Flow Label: 0x00000
    Payload Length: 20
    Next Header: TCP (6)
    Hop Limit: 50
    Source: 2406:2000:ec:c58::3001
    Destination: 2001:b400:e48b:2e69:bd44:4908:7236:ff22
v Transmission Control Protocol, Src Port: 80, Dst Port: 61111, Seq: 1, Ack: 418, Len: 0
    Source Port: 80
    Destination Port: 61111
    [Stream index: 159]
    [TCP Segment Len: 0]
    Sequence number: 1    (relative sequence number)
    Sequence number (raw): 2383173385
    [Next sequence number: 1    (relative sequence number)]
    Acknowledgment number: 418    (relative ack number)
    Acknowledgment number (raw): 3355110773
    0101 .... = Header Length: 20 bytes (5)
  > Flags: 0x010 (ACK)
    Window size value: 234
    [Calculated window size: 29952]
    [Window size scaling factor: 128]
    Checksum: 0x4574 [unverified]
    [Checksum Status: Unverified]
    Urgent pointer: 0
  > [SEQ/ACK analysis]
  > [Timestamps]
```

Chap 3

2. 請試舉4例應用層通訊協定. Please take at least 4 examples for TCP/IP Application layer protocols and services.

網域名稱服務協定(DNS)

超文字傳輸協定(HTTP)

簡易郵件傳輸協定(SMTP)

檔案傳輸協定(FTP)

3. 請指出我們 TCP/IP 應用層通訊協定和服務相關聯的 TCP 和 UDP 連接埠號-DNS,HTTP, SMTP, POP, Telnet, DHCP, FTP, SSH, HTTPS

DNS - TCP/UDP 53

HTTP - TCP/UDP 80

SMTP - TCP/UDP 25
POP - TCP 110
Telnet - TCP 23
DHCP - UDP 67、68
FTP - TCP/UDP 20、21
SSH - TCP/UDP 22
HTTPS - TCP/UDP 443

4. 請問DNS(Dynamic Name Services)的作用(用哪一個port number)與基本通訊方式? Please state the port number for the following TCP/IP Application layer protocols and services.

1. port 53.
2. 定義了一自動化服務，該服務將資源名稱所需的數位網路位址匹配。通訊協定涵蓋了尋找格式，回應格式及資料格式。DNS通訊協定通信採用單一格式，即訊息格式。該格適用於所有蕾型的用戶端尋找呵伺服器回應、報錯訊息、以及伺服器間的資源紀錄資訊傳輸。

5. 請問DNS(Dynamic Name Services)訊息格式主要有哪些欄位? 請說明Resouce Record中A, AAAA的定義? Please state the main message fields on DNS message. And, please explain the definition of A and AAAA in DNS resource record.

1. 標頭、問題、答案、權限、其他
2. A - 將DNS網域名稱對應到IPv4的32位元位址
   AAAA - 將DNS網域名稱對應到IPv6的128位元位址

6. 請問HTTP基本通訊流程以及用哪一個(port number)? HTTP的通訊方法除了GET外請舉例3種方法? Please explain the purpose of HTTP, using which transport port and its basic protocol.Also, in addition to HTTP GET, please state other 3 methods for HTTP REQUEST.

1. 當用戶端向伺服器發送請求訊息時，HTTP通訊協定將規定用戶端請求網頁訊息的類型，以及伺服器回應資訊的類型。
2. POST, PUT, DELETE