

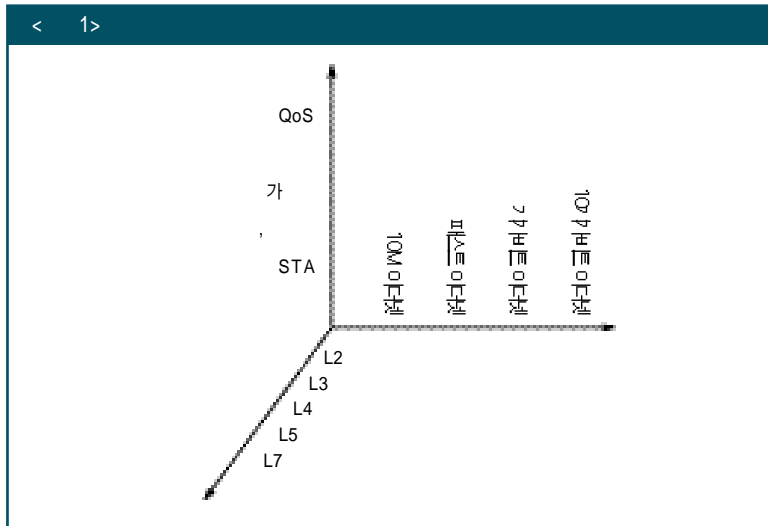
L4/L7

(Bandwidth), (Function), (Intelligence) < 1>  
CSMA-



CD(10Mbps) , 가 , 10 가  
( ) L2 , 가 QoS  
L3 가 OSI 7  
, L2/L3/L4/L7 가 .

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< 1> OSI

OSI	
2	II, IEEE 802.3/802.2 SNAP, , 802.3 Raw
3	IP, ARP, IPX, Non IP/IPX, IPv6
4	TCP, UDP, ICMP
5 ~ 7	HTTP, SNMP, , FTP, RTSP

4  
2 OSI MAC, ( MAC)  
3 (TCP/IP OSI

1 : L4/L7 ( )

2 : L4/L7

3 : L4/L7

가

L2/L3

4

ASIC

L4

L2/L3

가

L4/L7

IP, IP)

4

4

2

4

3

4

가

4

CPU

F5

L4/L7

(SLB)

(CR)

/VPN (FWLB)

/

L4

SLB ( )

( )

SLB

L4

CR

BIG-IP,

가

2000

(Resonate)

L2/L3

L4

FWLB

가

(VPN) 가 , FWLB (throughput)

. VPN L4

FWLB VPN

가 ,

2. (Concurrent connections)

TCP

. TCP

. VPN

가 ,

TCP

. , HTTP v1.1

L4/L7 HTTP v1.0 TCP

TCP

L4/L7 L2/L3 가

, L4/L7 가 L4

L2/L3 가

(unlimited) . , L4

1. (Connections per second) (state-less) ( , )

TCP ( , HTTP) 가 (barrier)

TCP , UDP 가

- (three-way handshake) ( UDP UDP

SYN ACK ) .

(transactions . UDP

per second) ' (sessions per second) ' L4 가 ,

TCP (opening) ( : ,

(closing) L4 가 (least) ) UDP

, L4 , L4 TCP

(opening) TCP 3. (Throughput)

L4 ' Gbps, Gbps '

2 1 . (L4 ) 가 가

가

SLB UDP Gbps, Gbps L4

. UDP - L2

(connection- ,

less) UDP L4

(connection) . , UDP L4

L4

(Uplink) 가 ( 가 )  
 가 )  
 Gbps L2 가 L4  
 , , 100Mbps, 1Gbps  
 ,  
 L2 (trunking)

SLB  
 DSR(Direct Server Return)  
 가  
 bps(bit per second)  
 pps(packet per second)  
 , 40  
 1,500 가  
 , 1 = 8  
 ,  

$$\text{bps} = (\text{pps}) \times (\text{packet size}) \times 8$$

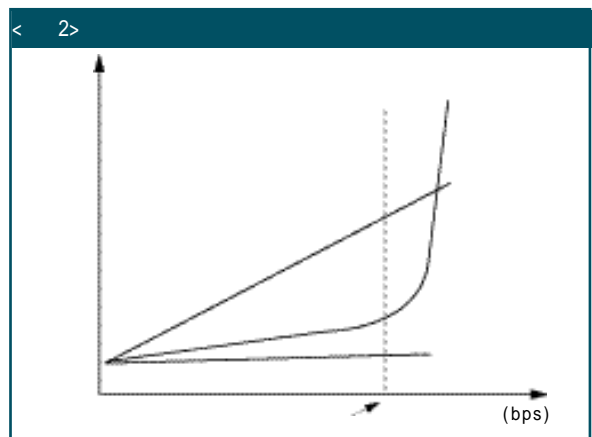
pps  
 bps  
 , bps  
 , 10,000pps  

$$10,000\text{pps} = 10\text{K} \times 1.5\text{Kbytes(MTU)} \times 8\text{bps} = 120\text{Mbps}$$
  
 Mbps 120bps  
 , pps  
 , 64  

$$10,000\text{pps} = 10\text{K} \times 64 \times 8\text{bps} = 4.9\text{Mbps}$$
  
 8bps = 4.9Mbps  
 120Mbps 가 . 100Mbps  
 1Gbps 가

< 2>		pps				
bps \	64	128	512	1024	1500B	
100Mbps	204.8K	102.4K	25.6K	12.8K	8.7K	
1Gbps	2048K	1024K	256K	128K	87.3K	

100% , pps  
 < 2>  
 3. (Threshold)  
 L4  
 가  
 L4 가 L4  
 (Latency) 90Mbps  
 , URL- (parsing)  
 (cookie-based persistence) 45Mbps  
 L5~L7



, HTTP  
 가,  
 가  
 ASIC  
 L4 CPU  
 (linearly) 가  
 가 ASIC  
 가 L4  
 L4  
 (Latency)  
 ASIC  
 , L5~L7

L4/L7

