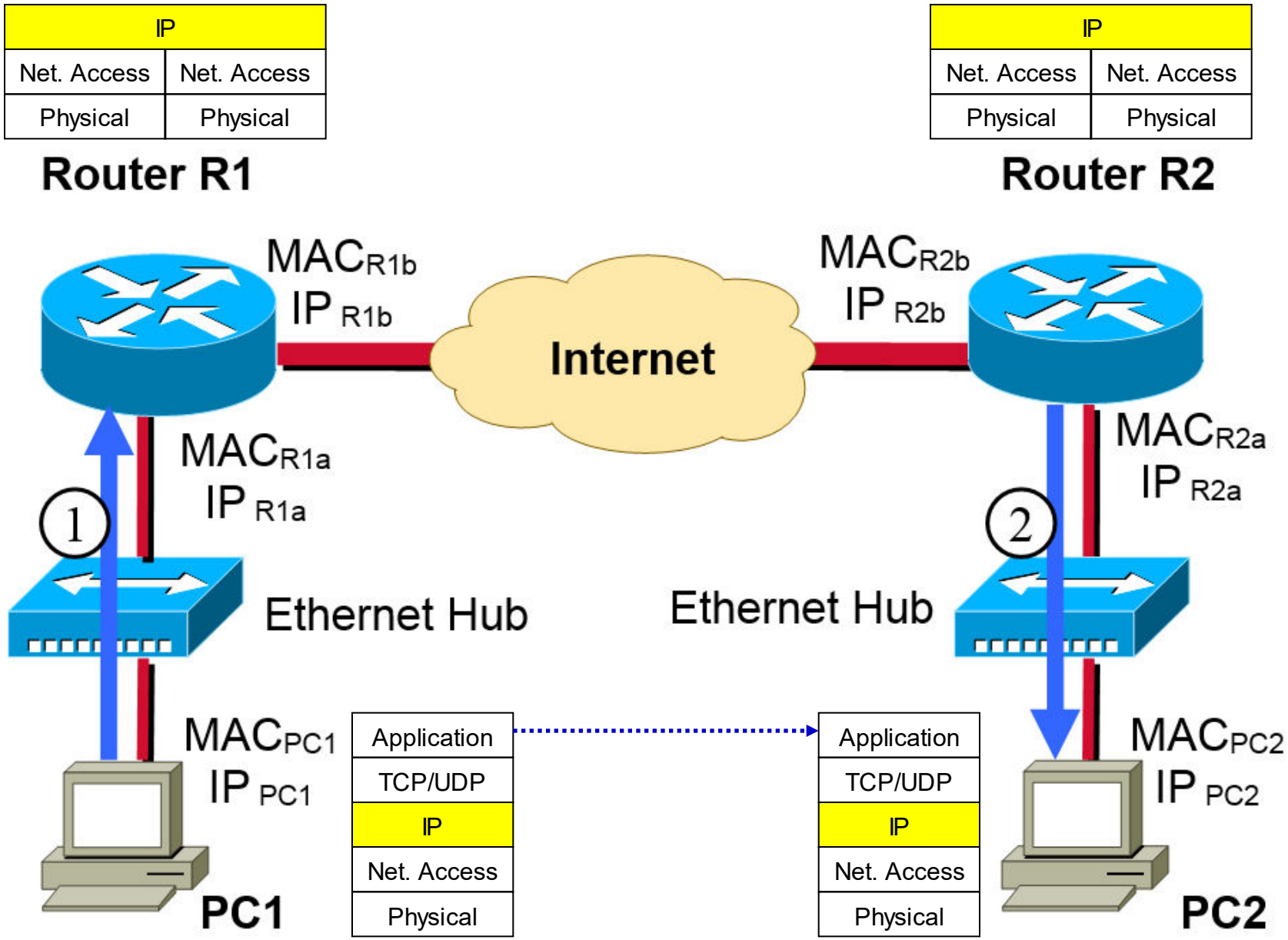

IP
Net. Access
Net. Access
Physical
Physical
Router R1
IP
Net. Access
Net. Access
Physical
Physical
Router R2
MAC R1b
IP R1b
Internet
MAC R2b
IP R2b
MAC R1a
IP R1a
MAC R2a
IP R2a
1
2
Ethernet Hub
Ethernet Hub
MAC PC1
IP PC1
MAC PC2
IP PC2
Application
TCP/UDP
IP
Net. Access
Physical
Application
TCP/UDP
IP
Net. Access
Physical
PC1
PC2

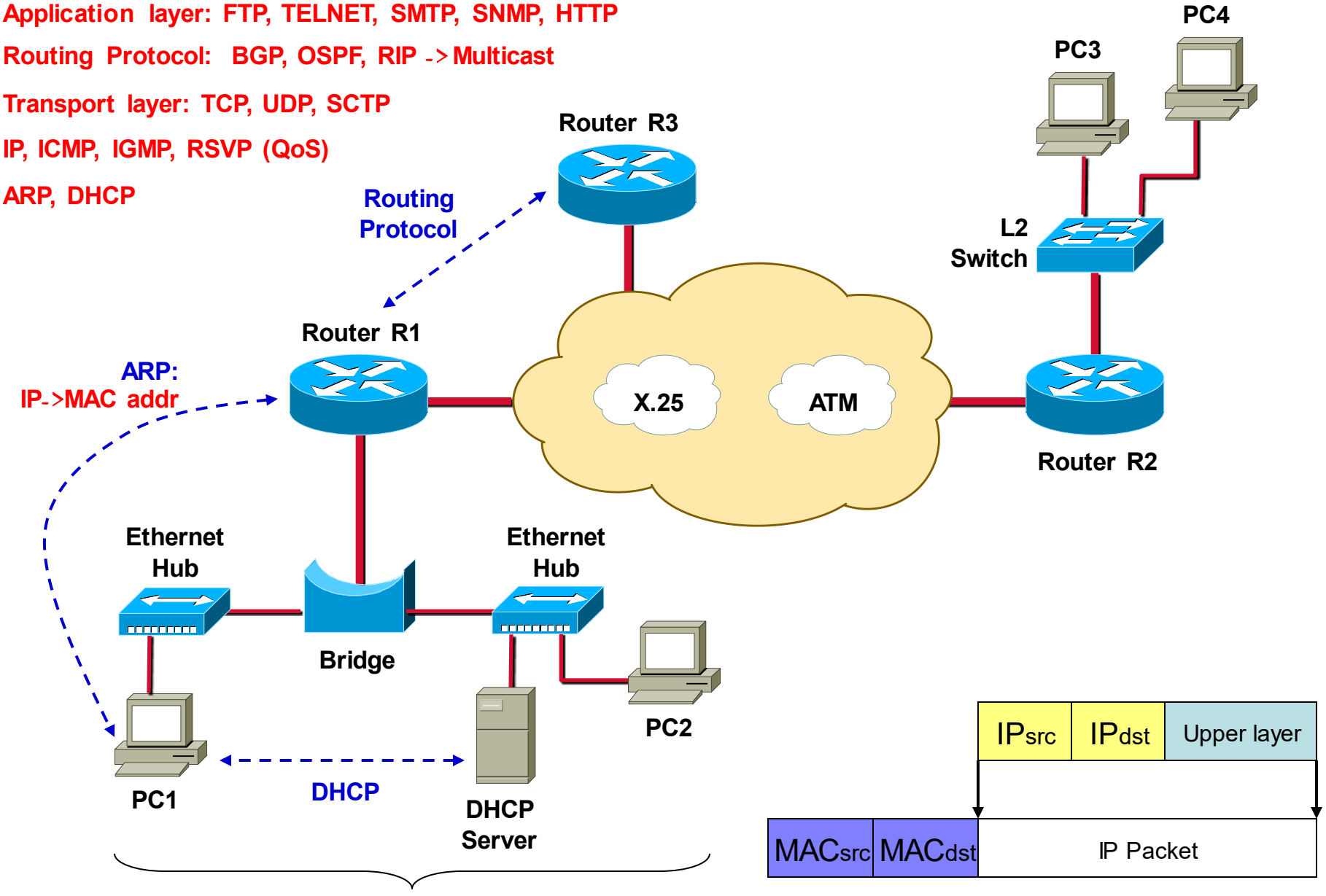
Application layer: FTP, TELNET, SMTP, SNMP, HTTP

Routing Protocol: BGP, OSPF, RIP -> Multicast

Transport layer: TCP, UDP, SCTP

IP, ICMP, IGMP, RSVP (QoS)

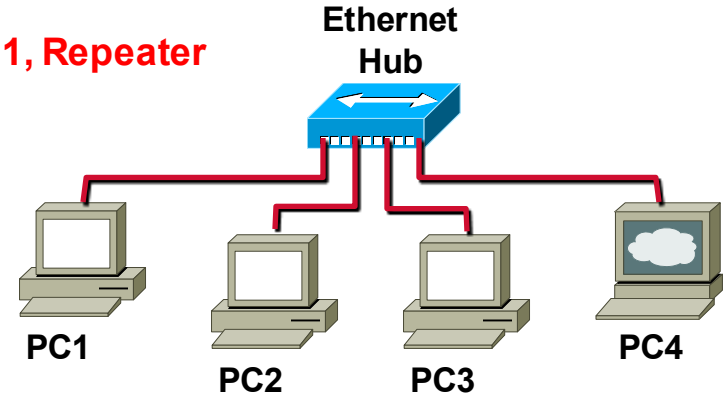
ARP, DHCP

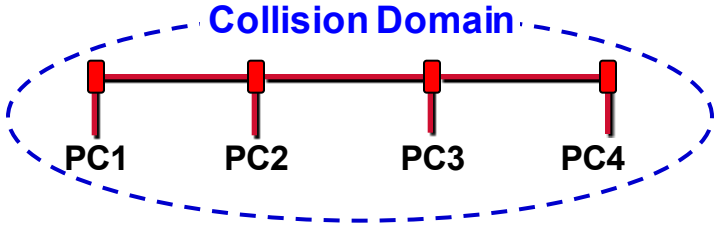


subnet (IP addr. bitwise-AND SubnetMask)

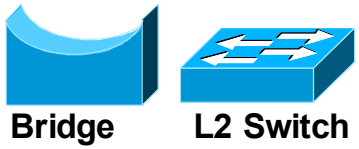
Interconnected Device

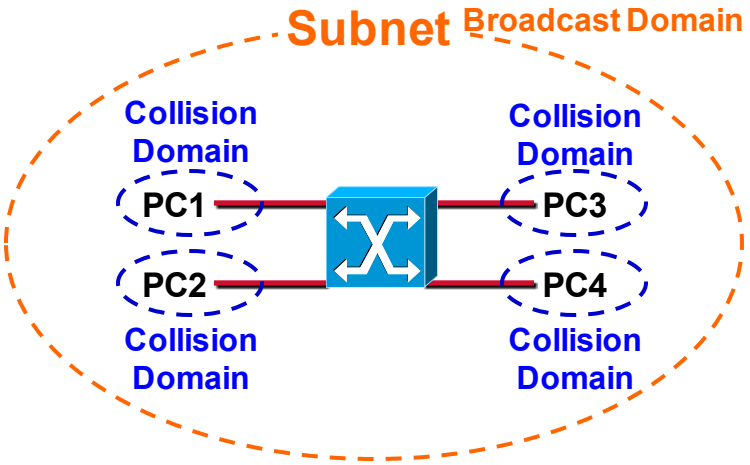
L1, Repeater



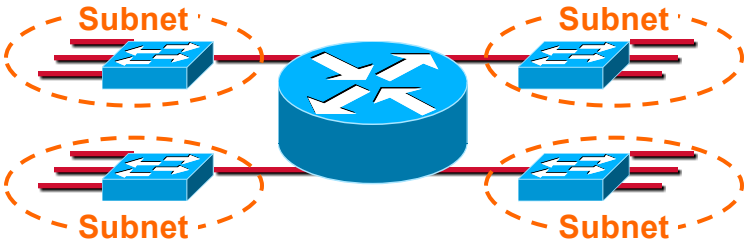
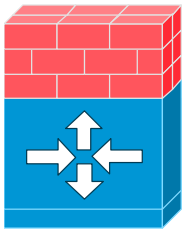


L2 Device





L3 Device



All-layer Device