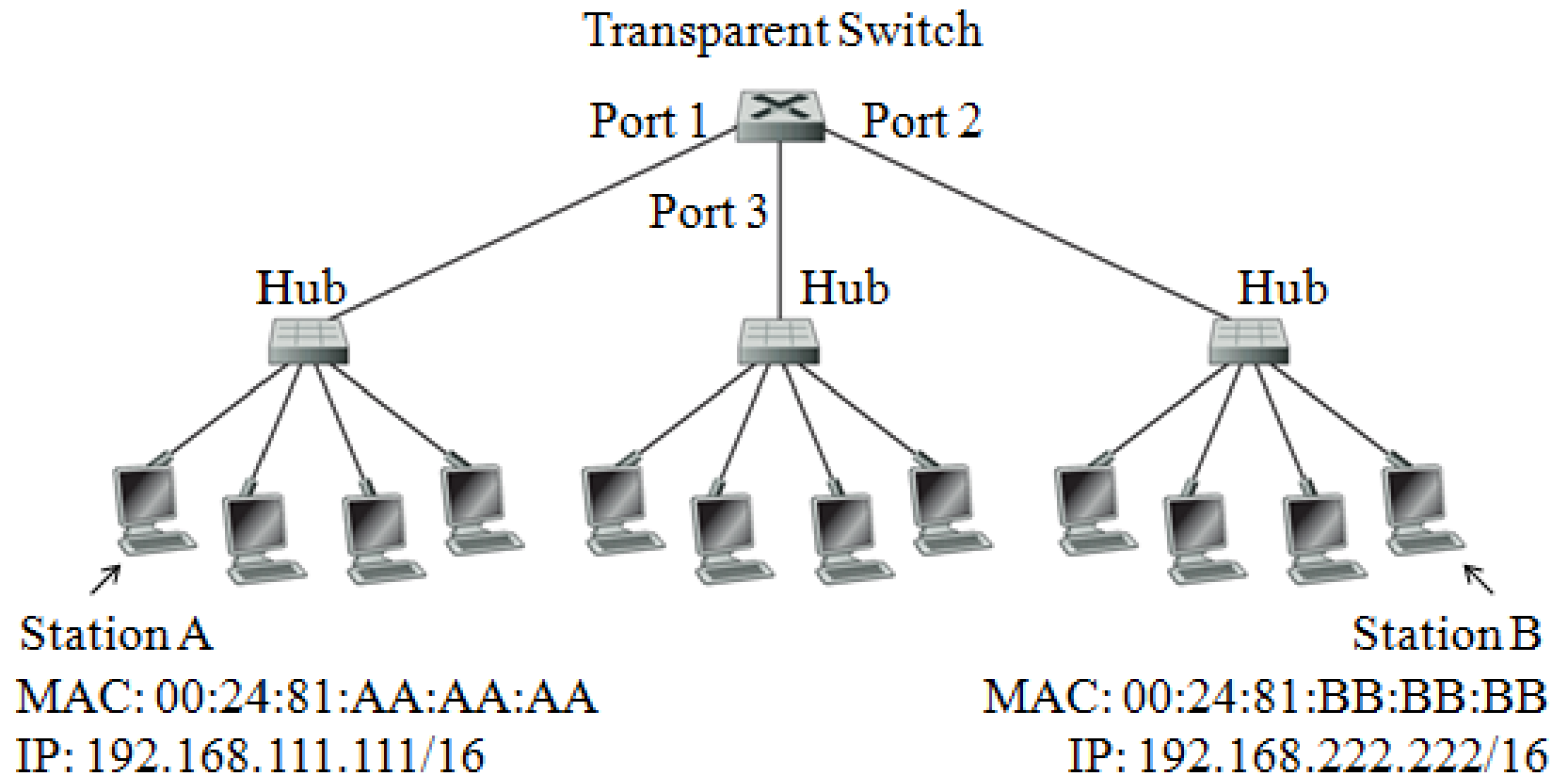


CE3005/CZ3006/SC2008

Computer Networks

Tutorial 2-2

Q1



Q1: ping, ARP and switch operation

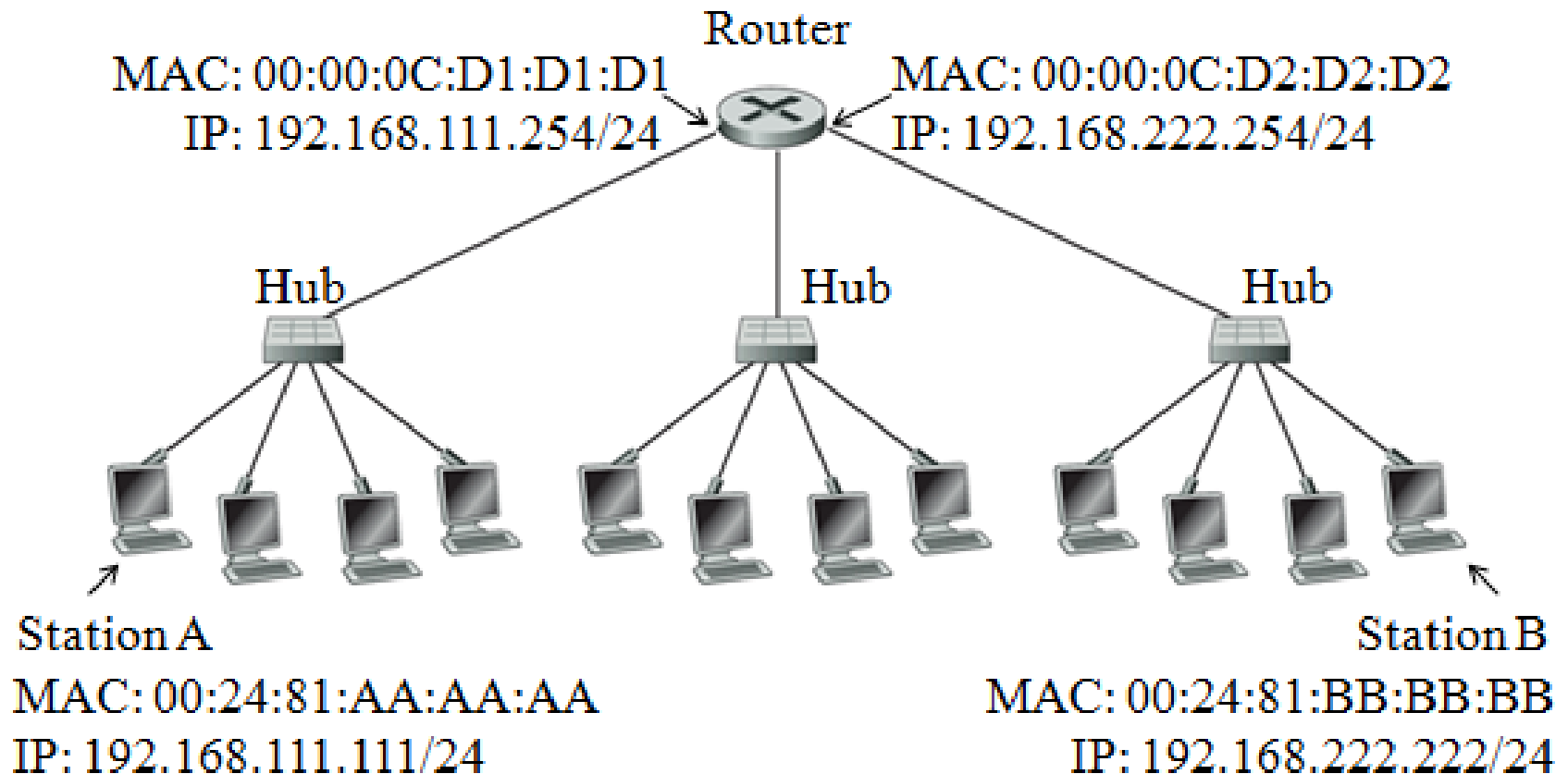
Frame	MAC Address		Purpose of Frame	Actions taken by Switch
	Source	Destination		
1.	00-24-81-AA-AA-AA	FF-FF-FF-FF-FF-FF	ARP request for 192.168.222.222	<ul style="list-style-type: none">- new entry forwarding table 00-24-81-AA-AA-AA/port 1/ time- broadcast ARP request frame to both port 2, 3
2.	00-24-81-BB-BB-BB	00-24-81-AA-AA-AA	ARP reply	<ul style="list-style-type: none">- new entry forwarding table 00-24-81-BB-BB-BB/port 2/ time- forward ARP reply to port 1

Q1: ping, ARP and switch operation

Frame	MAC Address		Purpose of Frame	Actions taken by Switch
	Source	Destination		
3.	00-24-81-AA-AA-AA	00-24-81-BB-BB-BB	ping request for 192.168.222.222	<ul style="list-style-type: none">- update forwarding table 00-24-81-AA-AA-AA/port 1/ new time- forward ping request to port 2
4.	00-24-81-BB-BB-BB	00-24-81-AA-AA-AA	ping reply	<ul style="list-style-type: none">- update forwarding table 00-24-81-BB-BB-BB/port 2/ new time- forward ping reply to port 1

For simplicity, assume ping sends 1 packet instead of 4.

Q2



: ping, ARP and router operation

Frame	MAC Address		Purpose of Frame	Actions taken by Router
	Source	Destination		
1.	00-24-81-AA-AA-AA	FF-FF-FF-FF-FF-FF	ARP request for default gateway 192.168.111.254	- new entry ARP cache 192.168.111.111/00-24-81-AA-AA-AA
2.	00-00-0C-D1-D1-D1	00-24-81-AA-AA-AA	ARP reply	- send ARP reply

Q2: ping, ARP and router operation

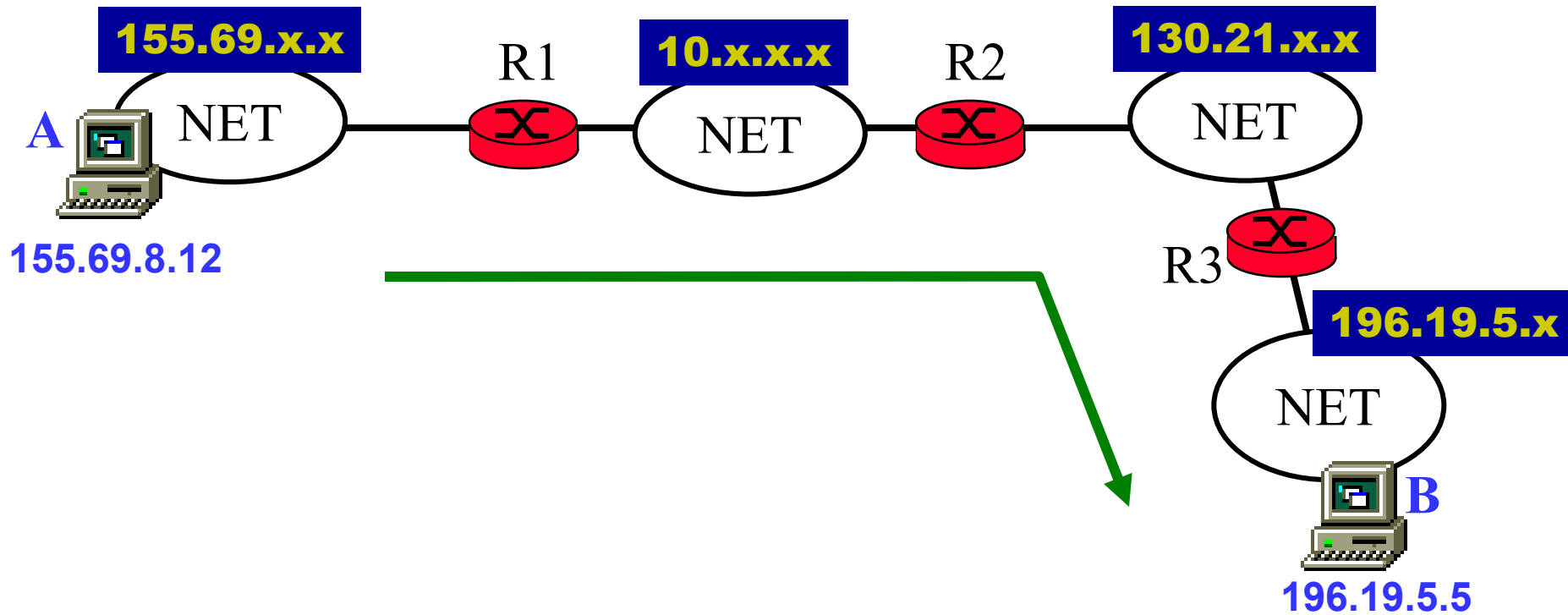
Frame	MAC Address		Purpose of Frame	Actions taken by Router
	Source	Destination		
3.	00-24-81-AA-AA-AA	00-00-0C-D1-D1-D1	ping request for 192.168.222.222	<ul style="list-style-type: none">- broadcast ARP request for 192.168.222.222 at subnet 192.168.222.0/24- receive ARP reply- new entry ARP cache 192.168.222.222/00-24-81-BB-BB-BB- forward ping request to 192.168.222.222
4.	00-00-0C-D1-D1-D1	00-24-81-AA-AA-AA	ping reply	<ul style="list-style-type: none">- receive ping reply- forward ping reply to 192.168.111.111

For simplicity, assume ping sends 1 packet instead of 4.

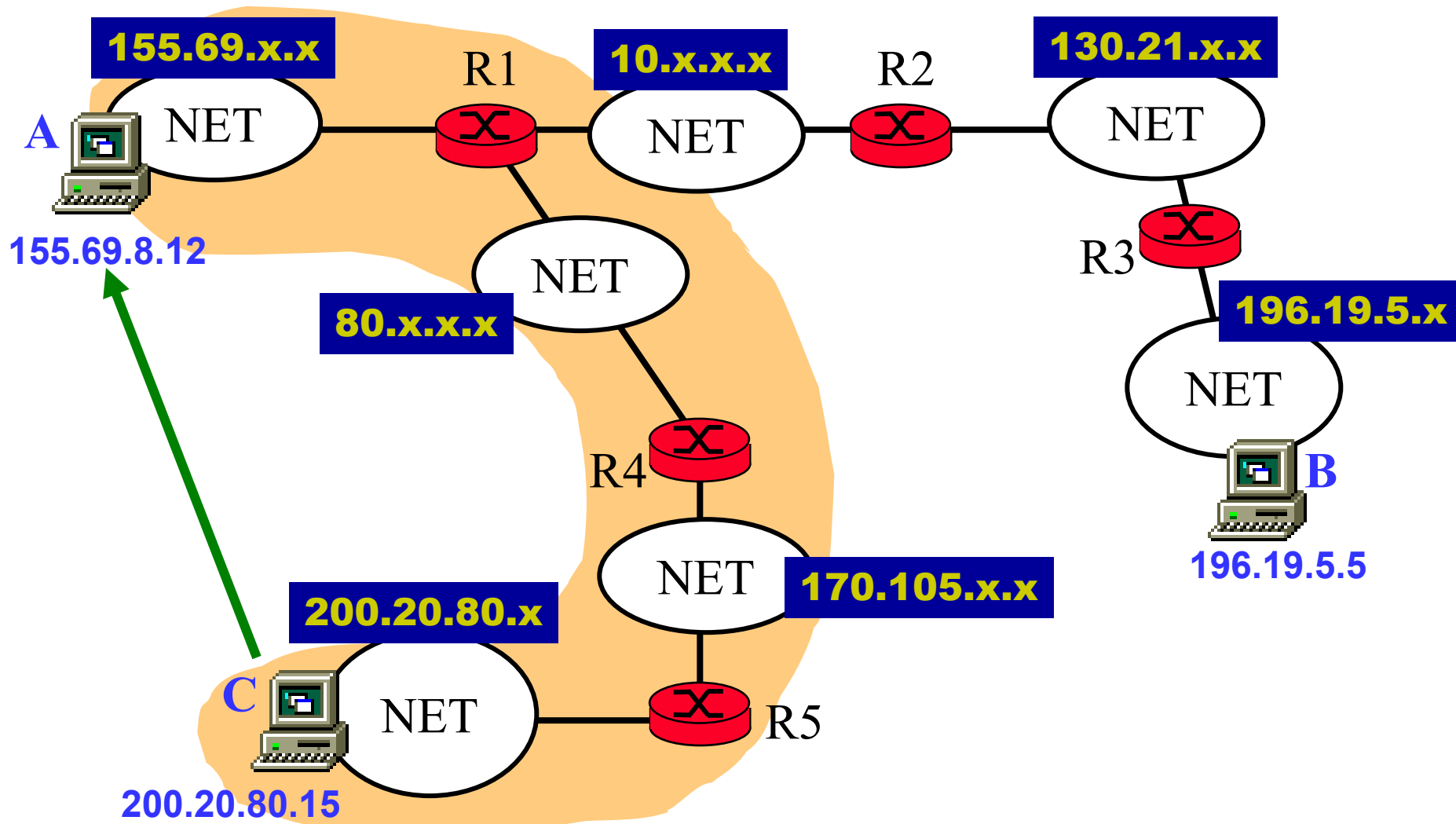
Q3

From Station A to B	From Station C to A	From Station B to C
155.69.8.10	200.20.80.12	196.19.5.104
10.203.20.10	170.105.10.21	130.21.80.90
130.21.10.30	80.90.10.3	90.80.120.10
196.19.5.5	155.69.8.12	170.105.10.20
		200.20.80.15

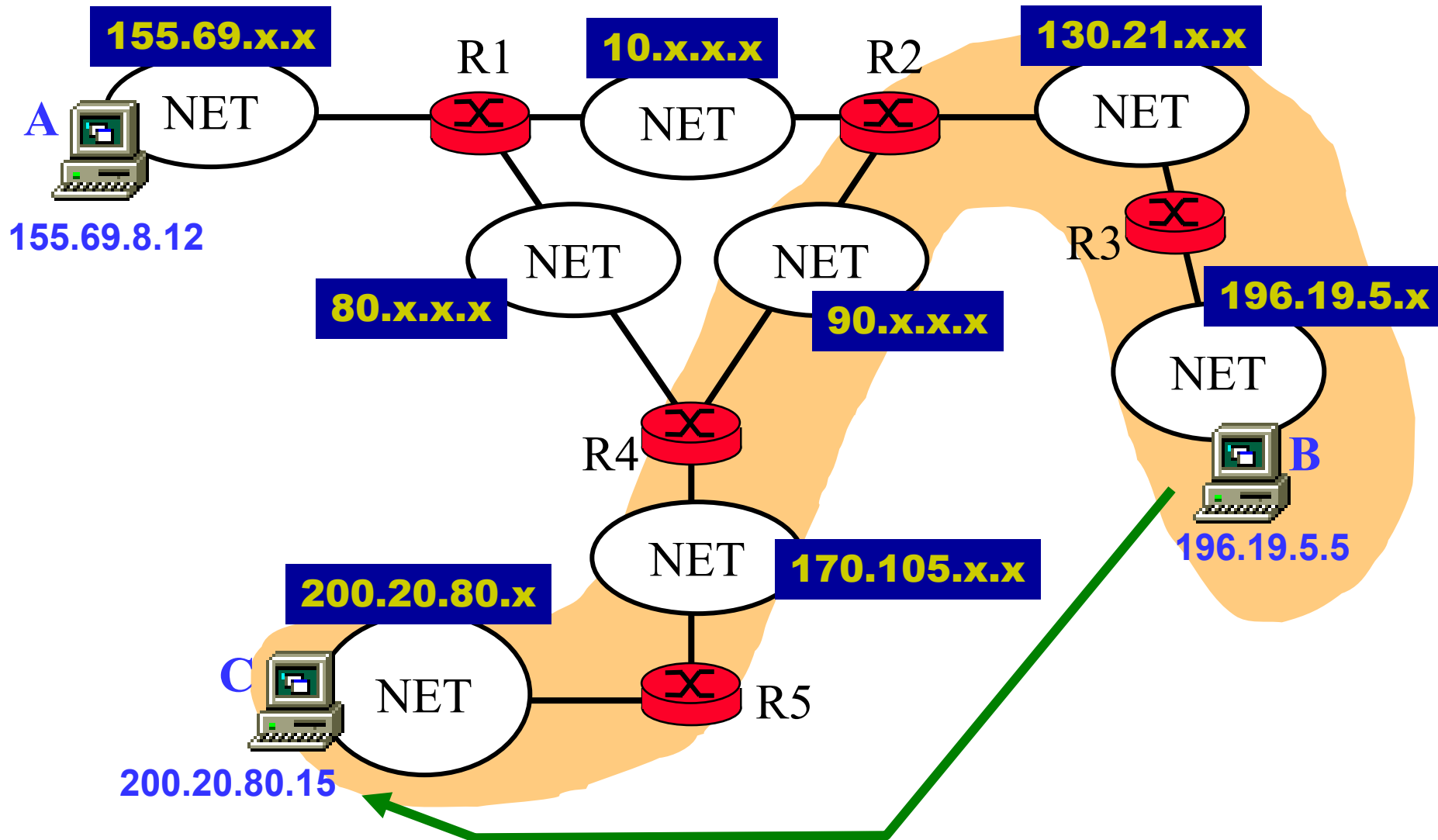
Q3: tracer A→B



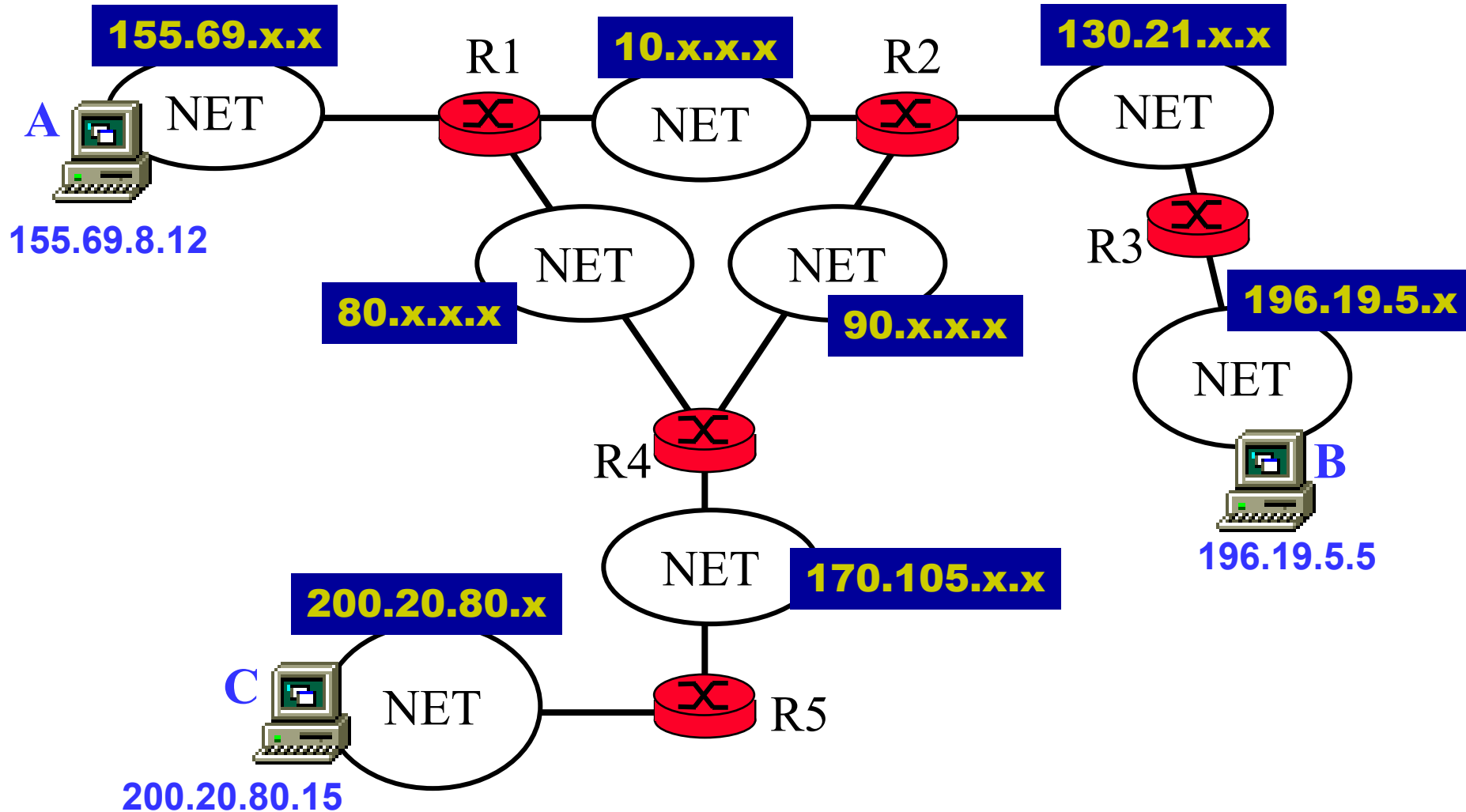
Q3: tracer C→A



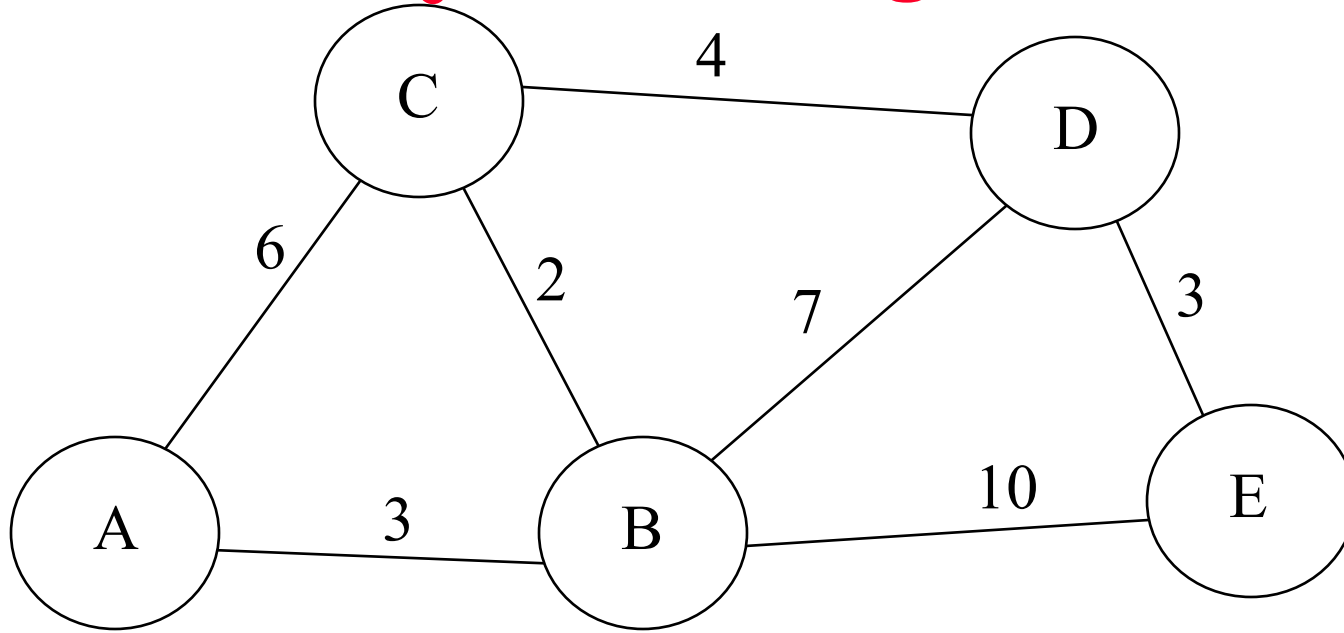
Q3: tracer B→C



Q3: tracert



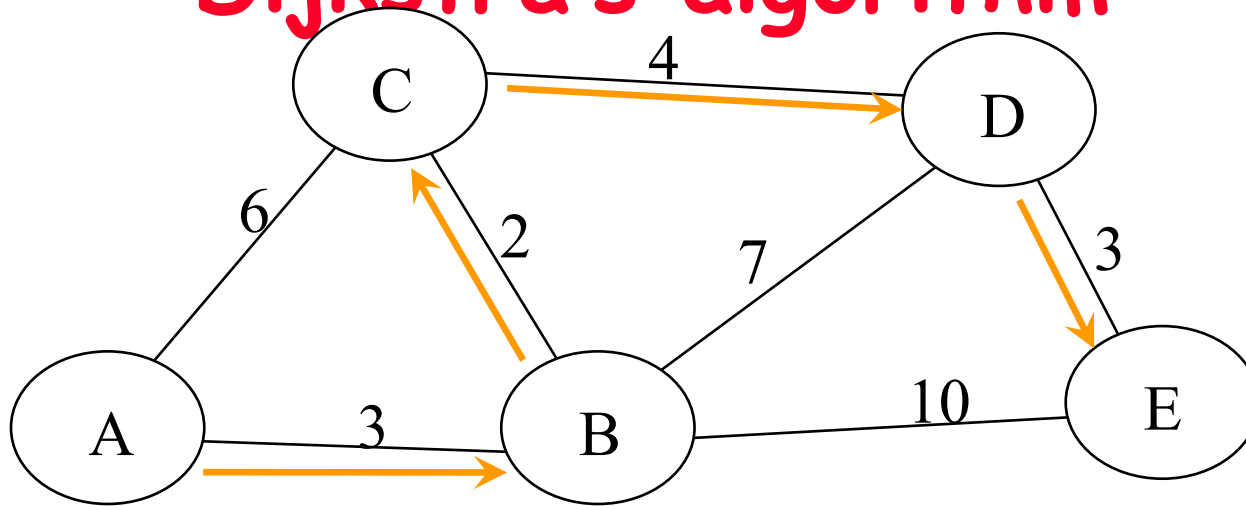
Q4: Link state routing protocol - Dijkstra's algorithm



LSA:

A	B	C	D	E
B=3	A=3	A=6	B=7	B=10
C=6	C=2	B=2	C=4	D=3
	D=7	D=4	E=3	
	E=10			

Q4: Link state routing protocol - Dijkstra's algorithm



Iterations of the algorithm

	B	C	D	E
{A}	3✓	6	∞	∞
{A,B}	3	5✓	10	13
{A,B,C}	3	5	9✓	13
{A,B,C,D}	3	5	9	12✓
{A,B,C,D,E}	3	5	9	12