Lessons from Implementing MIPv4 Mobile Nodes

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Toshiba Corporation

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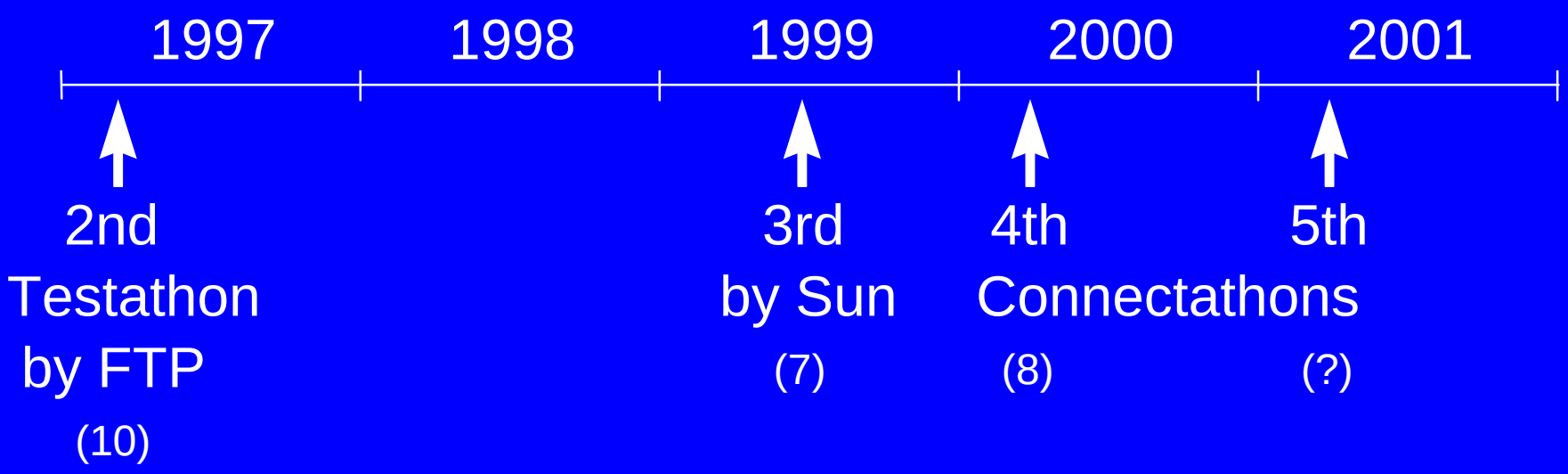
- Our experiences
- Protocol issues, related to MIPv4 Mobile Nodes
- Performance issues

1. Our experiences:



Toshiba:

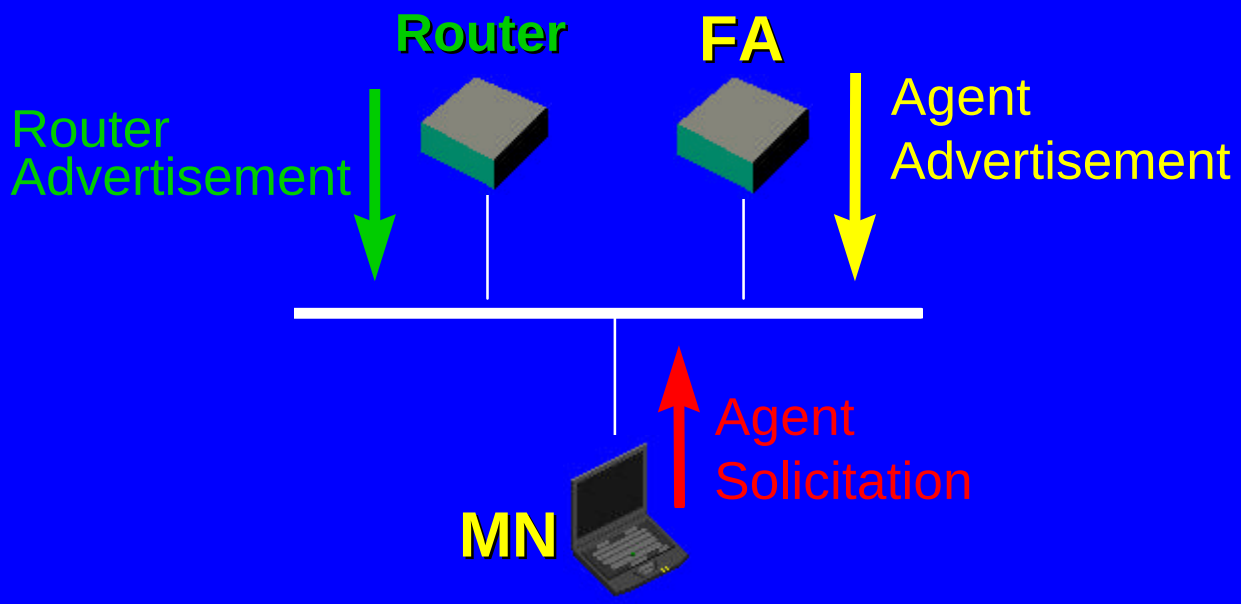
HA/FA on BSD MN on NT3.51	HA/FA/D MN on 95	HA/FA/D MN on 95/98	HA/FA MN on 2000?

2. Protocol issues:

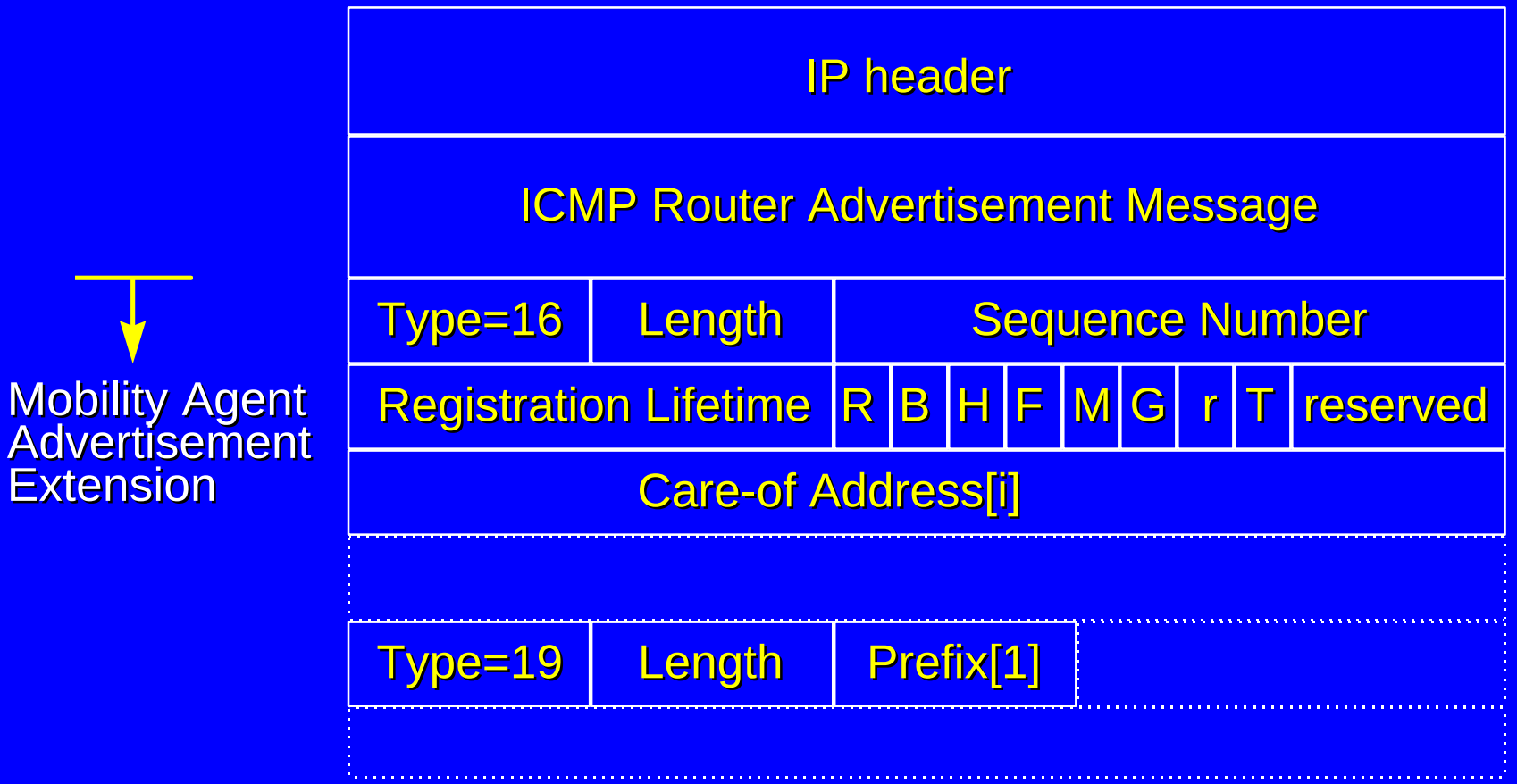
a) Solicitation
b) Advertisements
c) ARP issues
d) Registration Requests/Replies
e) IP-in-IP encapsulation/decapsulation

2-1. Advertisement issues (1):

- Which comes first ?
- Which is believed or selected ?

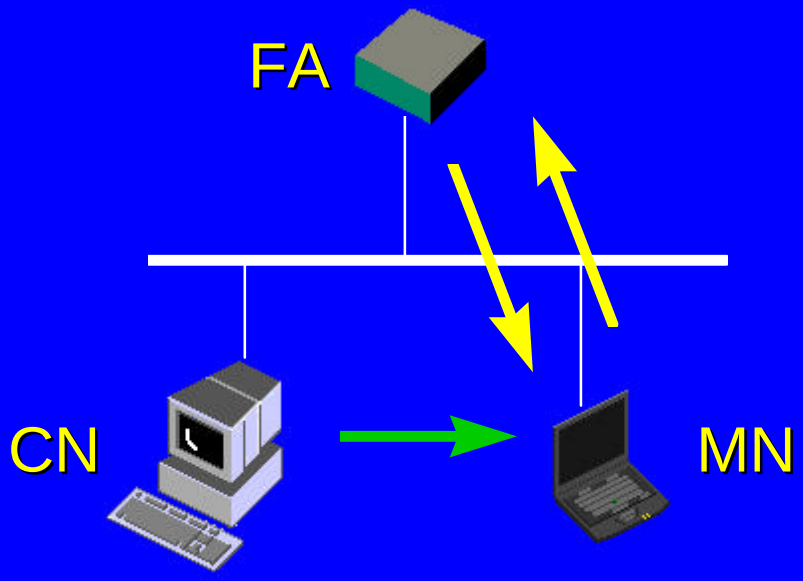


2-2. Advertisement issues (2):



2-3. ARP issue:

- Some FAs need ARP replies.
- Otherwise, an MN must NOT reply ARP, in case of using an FA care-of address...



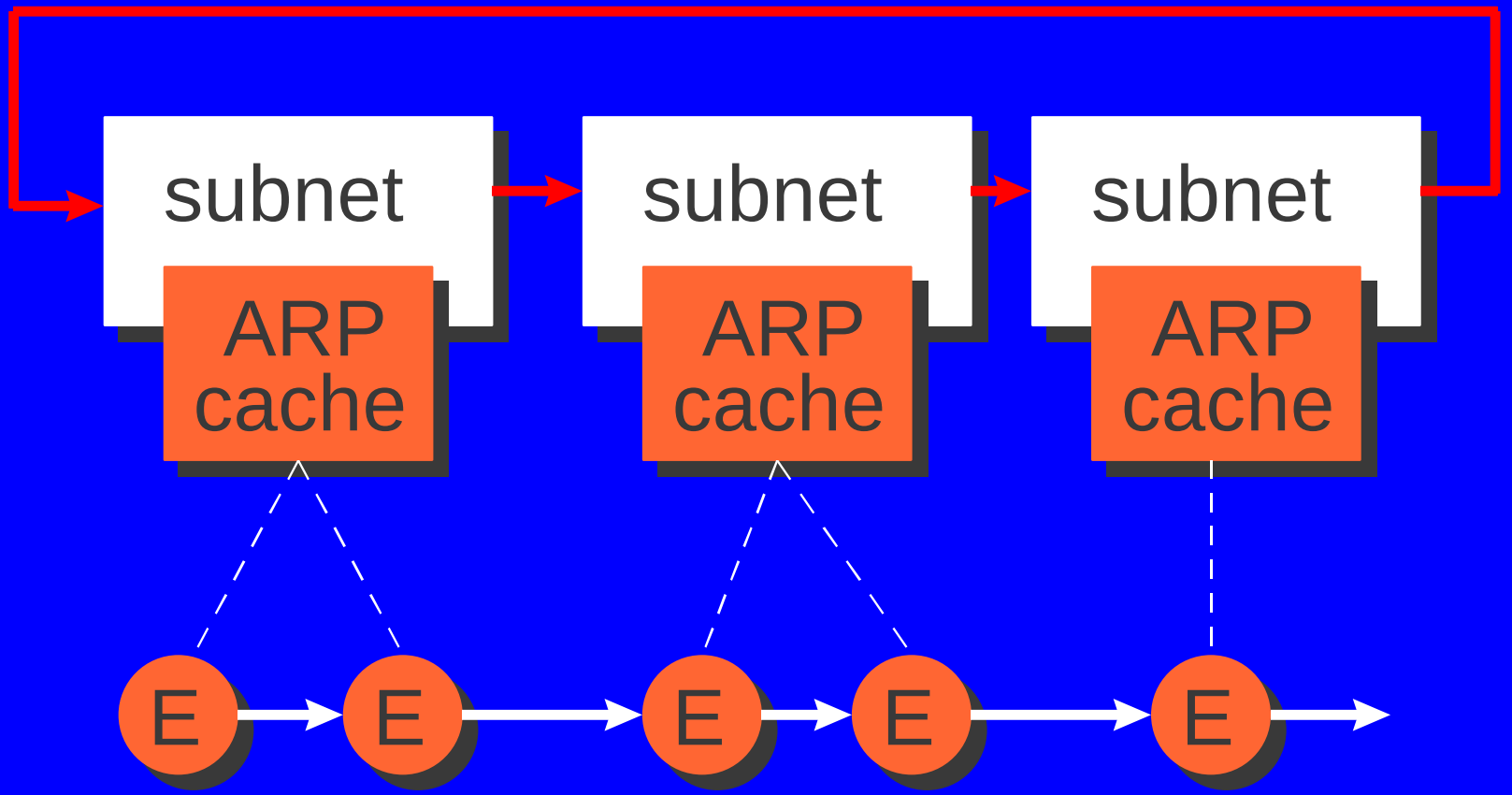
3. Performance issues:

a) Notification: switching subnets

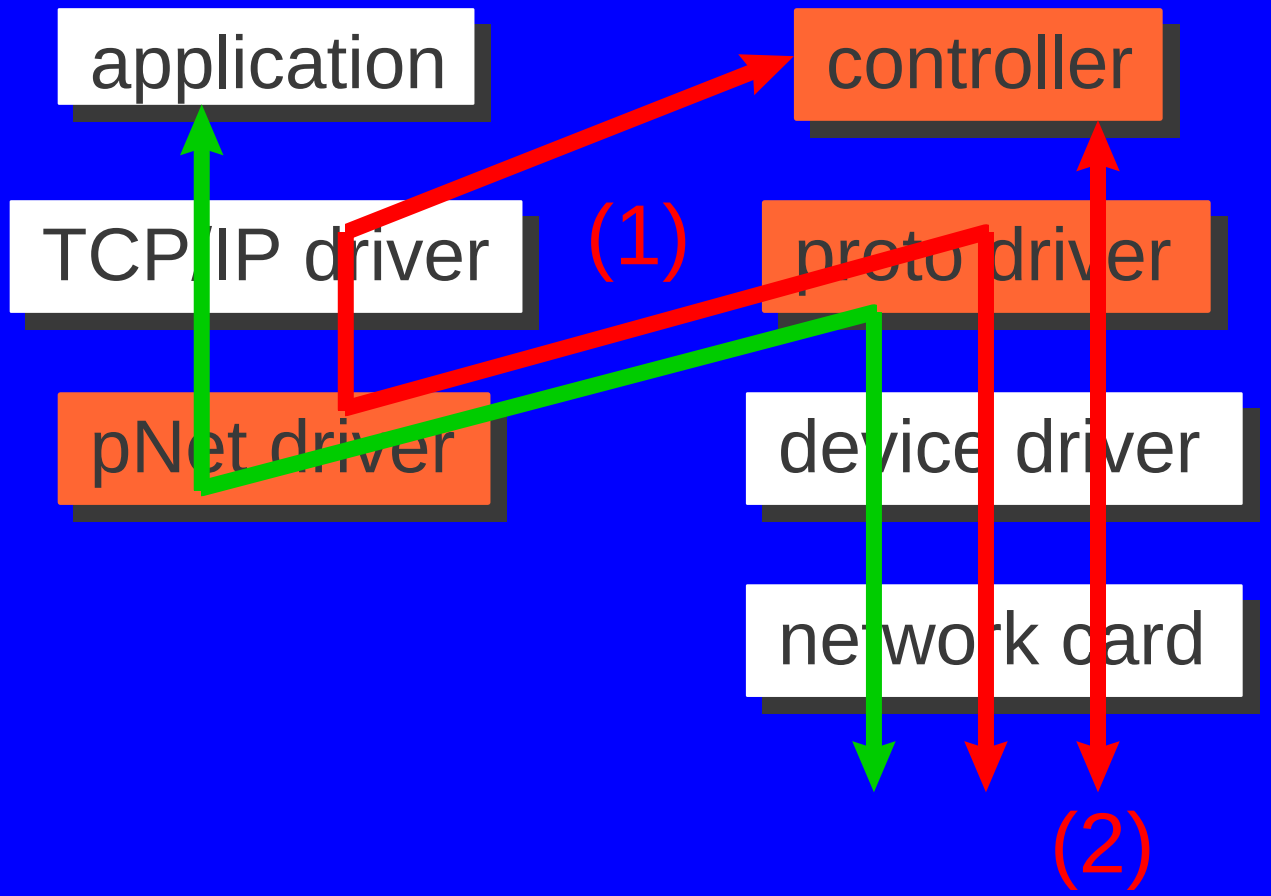
b) Registration Requests/Replies

c) IP-in-IP encapsulation/decapsulation

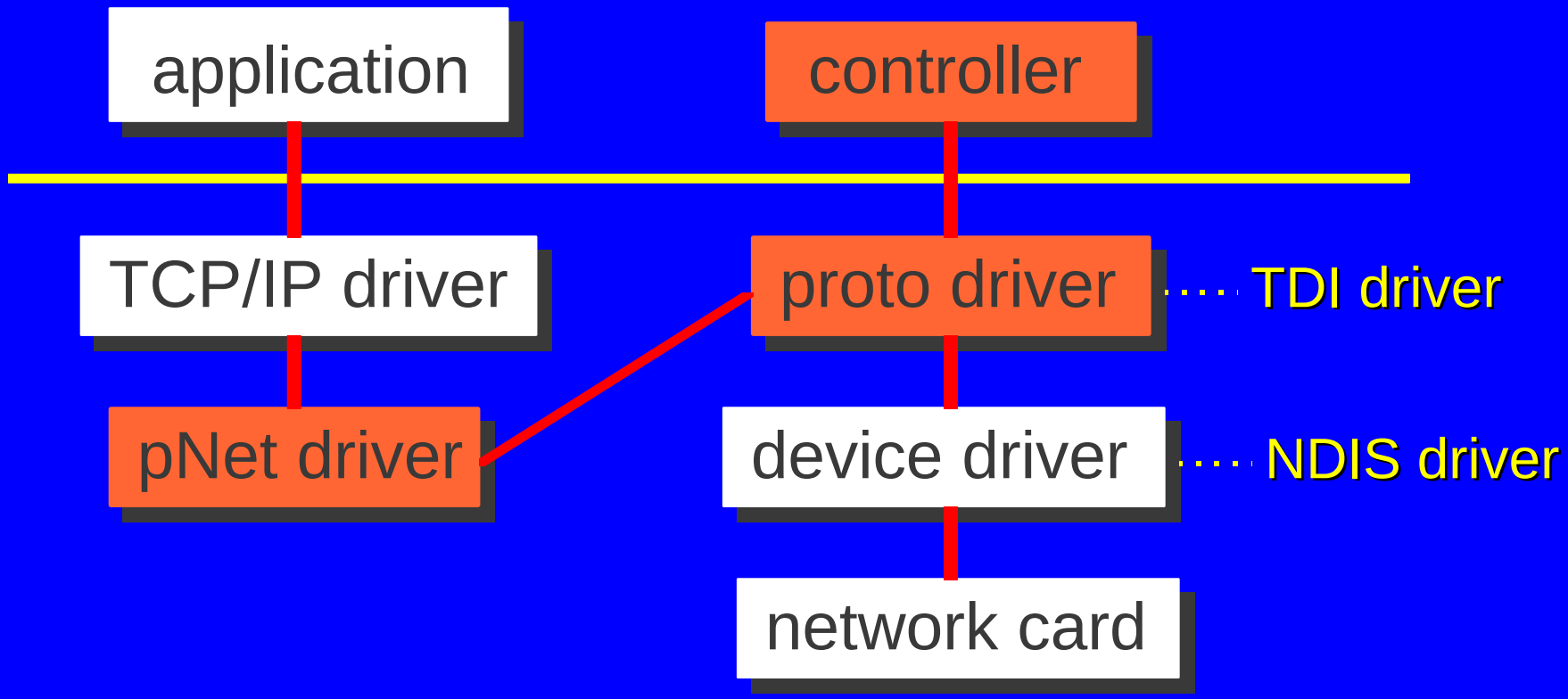
3-1(a). Delayed ARP cache flash



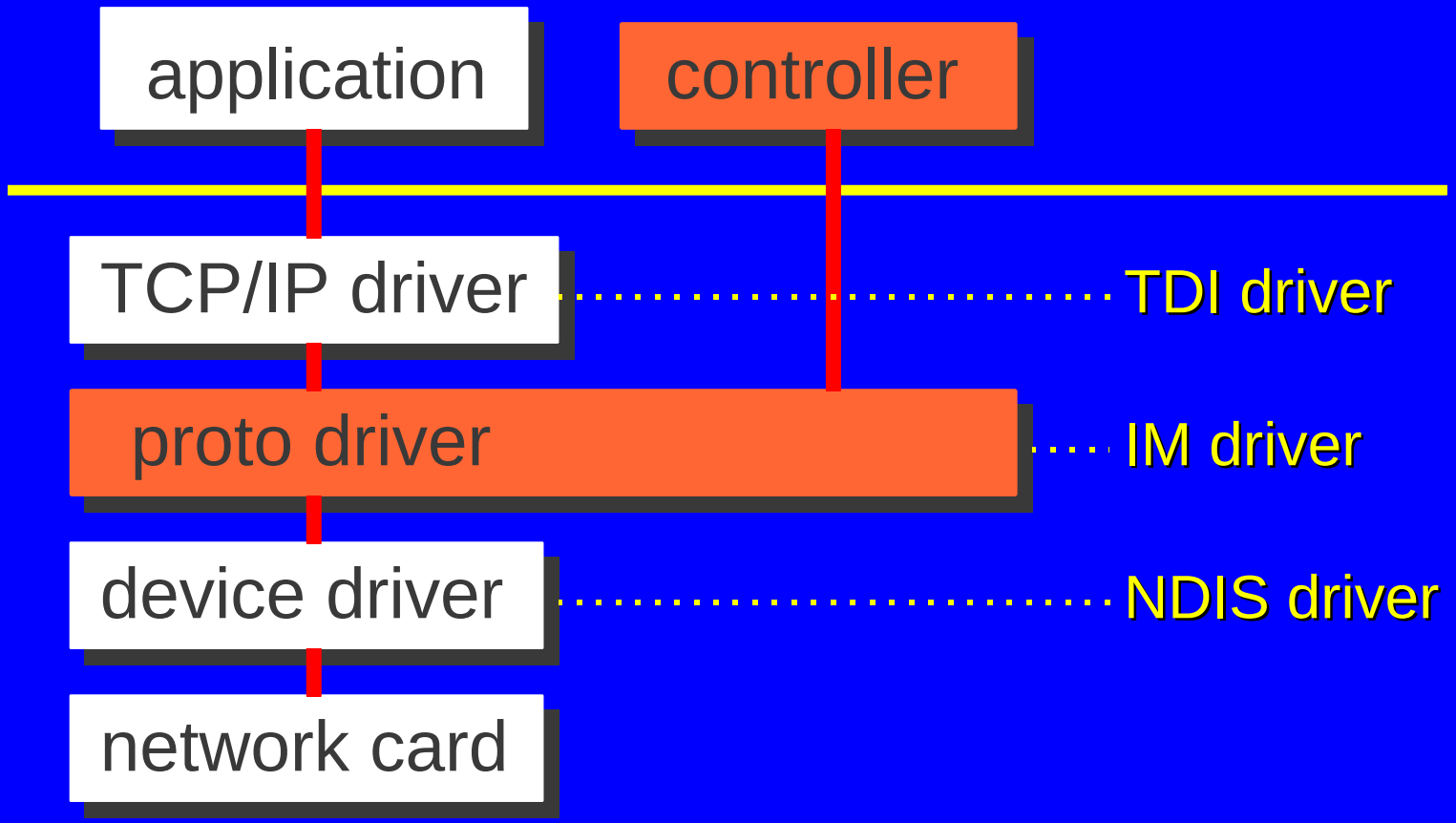
3-1(b). Registration paths



3-1(c). Driver configuration (Win95/98)

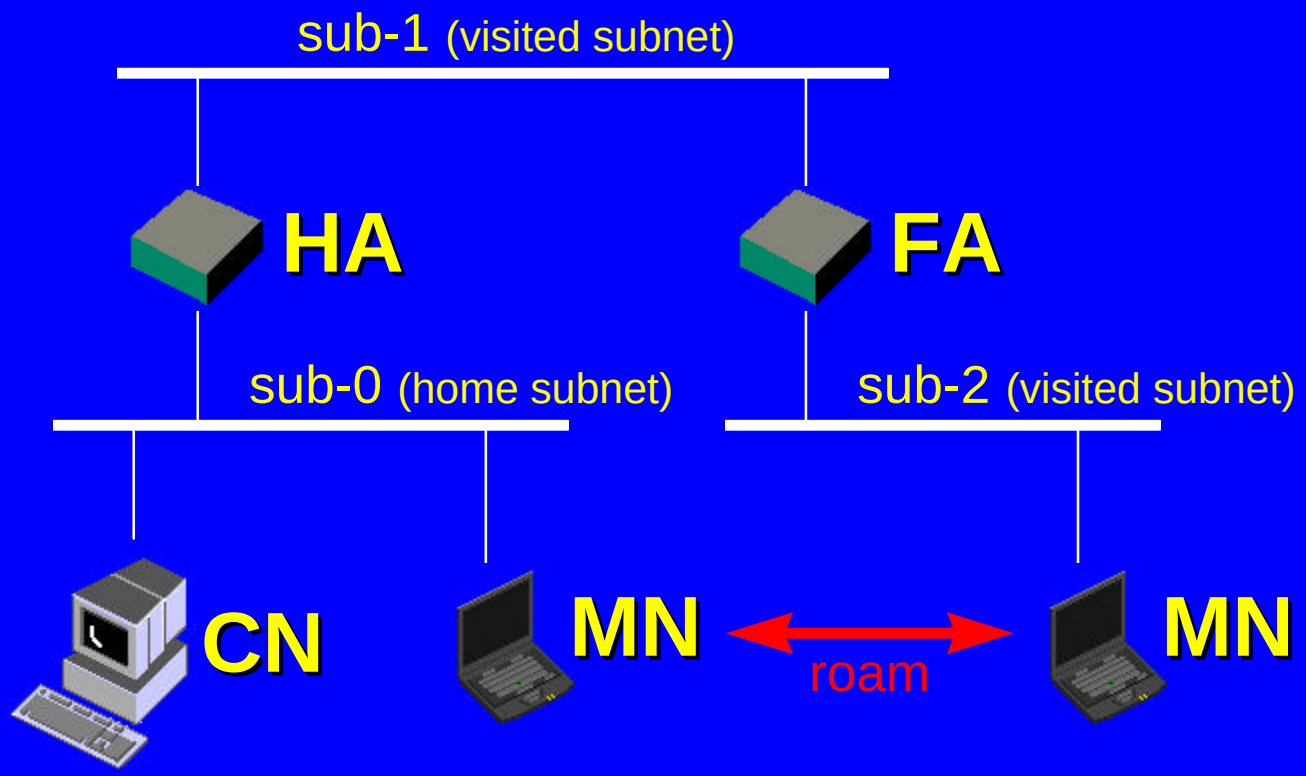


3-1(d). Driver configuration (Win98/2000)



3-2. Machine Configuration:

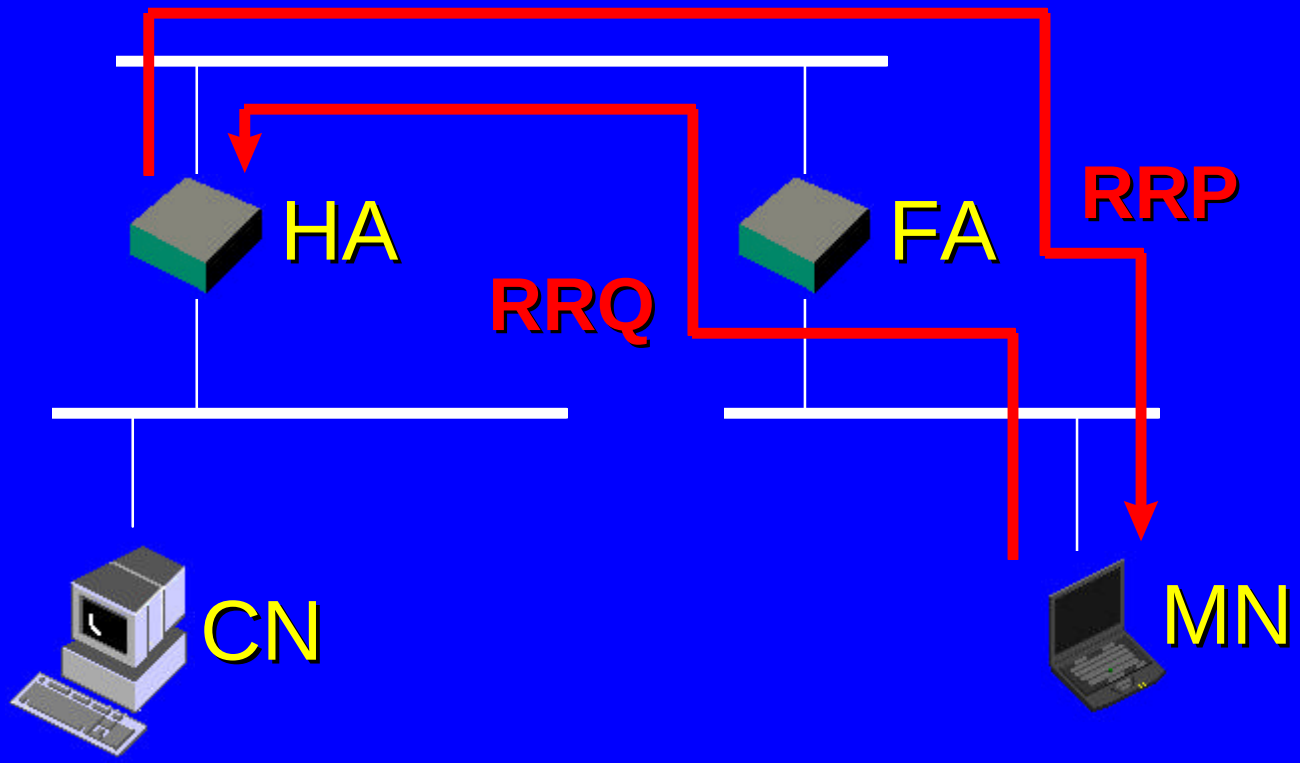
Network: 10 M Ethernet



3-2. Machine specs:

MN1	Pentium 100MHz + 32M RAM Windows 95 + SP1
MN2	MMX Pentium 233MHz + 128M RAM Windows 98 SE
HA/FA	Cisco 4700, IOS 12.0T

3-3. Registration measurements(1):

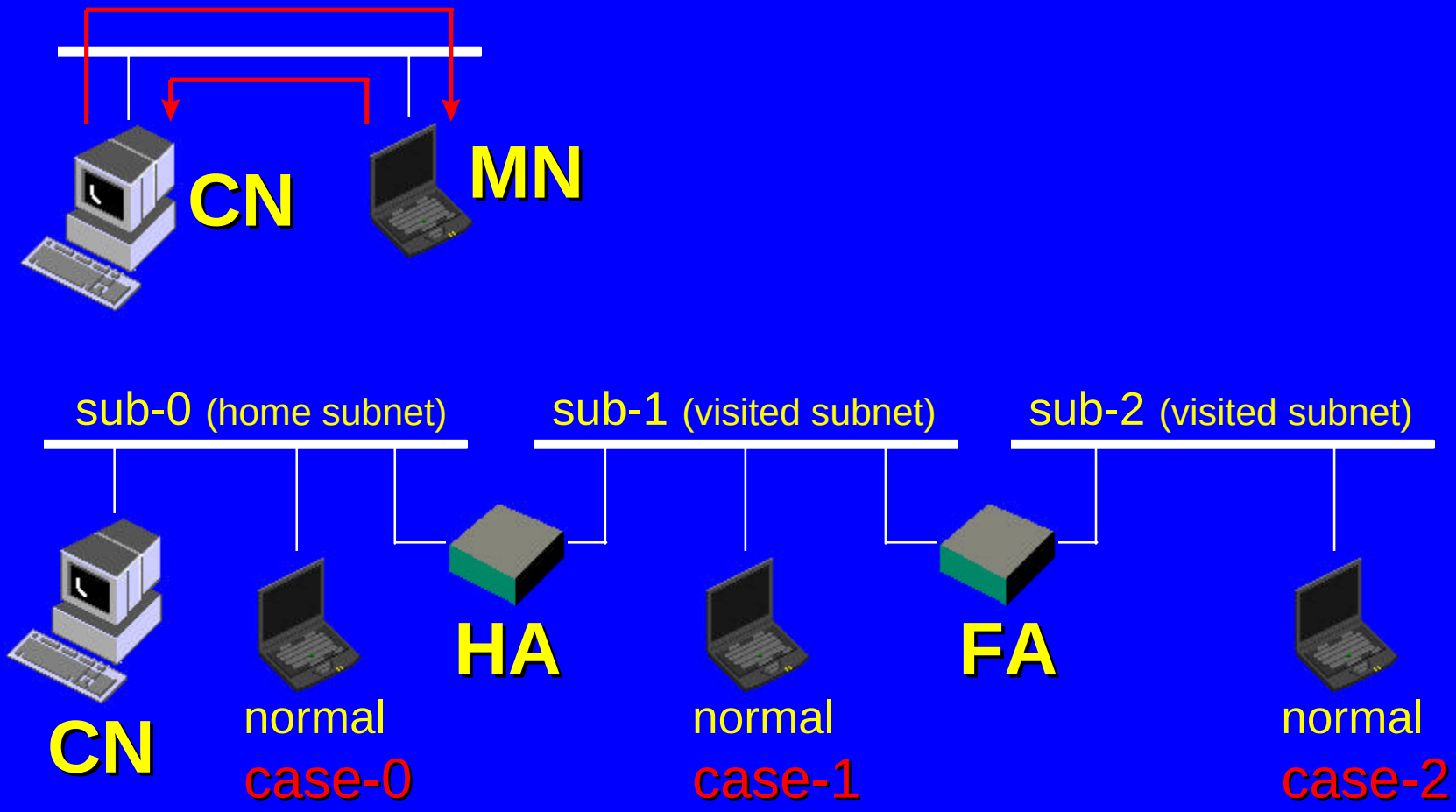


3-3. Registration measurements(2):

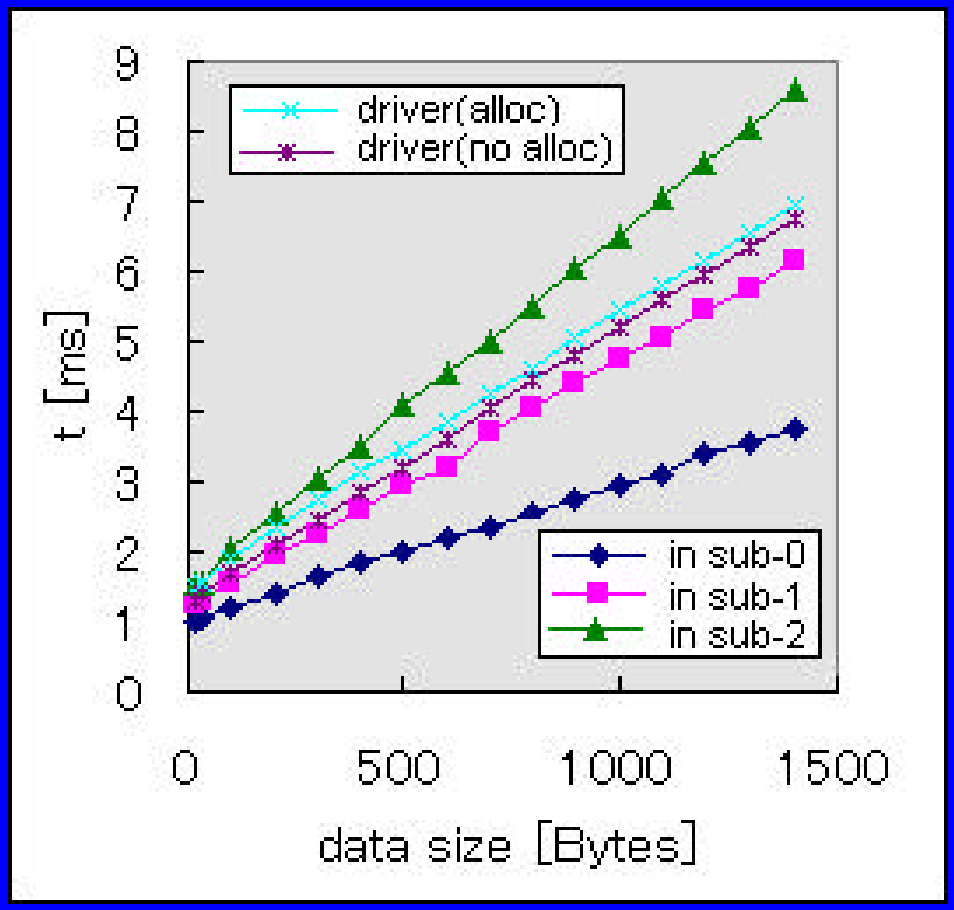
	1st	later
MN1 (on Win95)	38 ms	22 ms
MN2 (on Win98)	15 ms	10 ms

Notes: These and the following performance numbers aren't Cisco endorsed ones. Performance may vary in each networking environment.

3-4. Latency measurements(1):

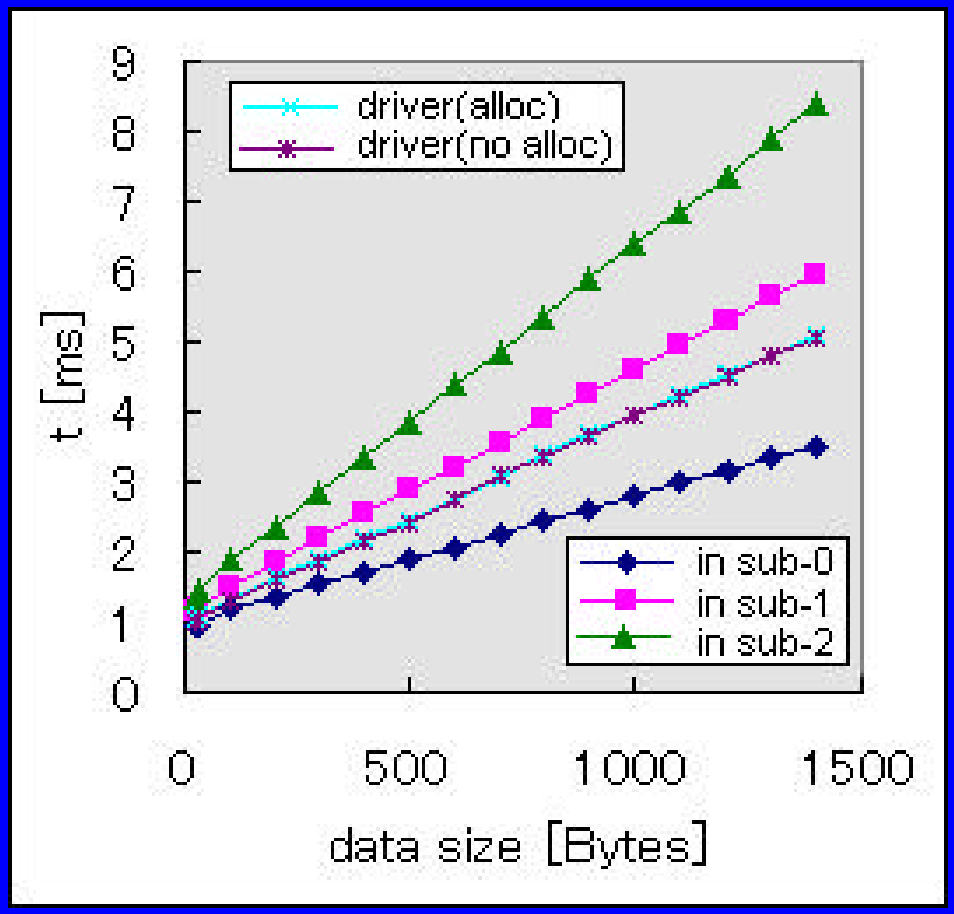


3-4. Latency measurements(2):



See notes at page 16.

3-4. Latency measurements(3):



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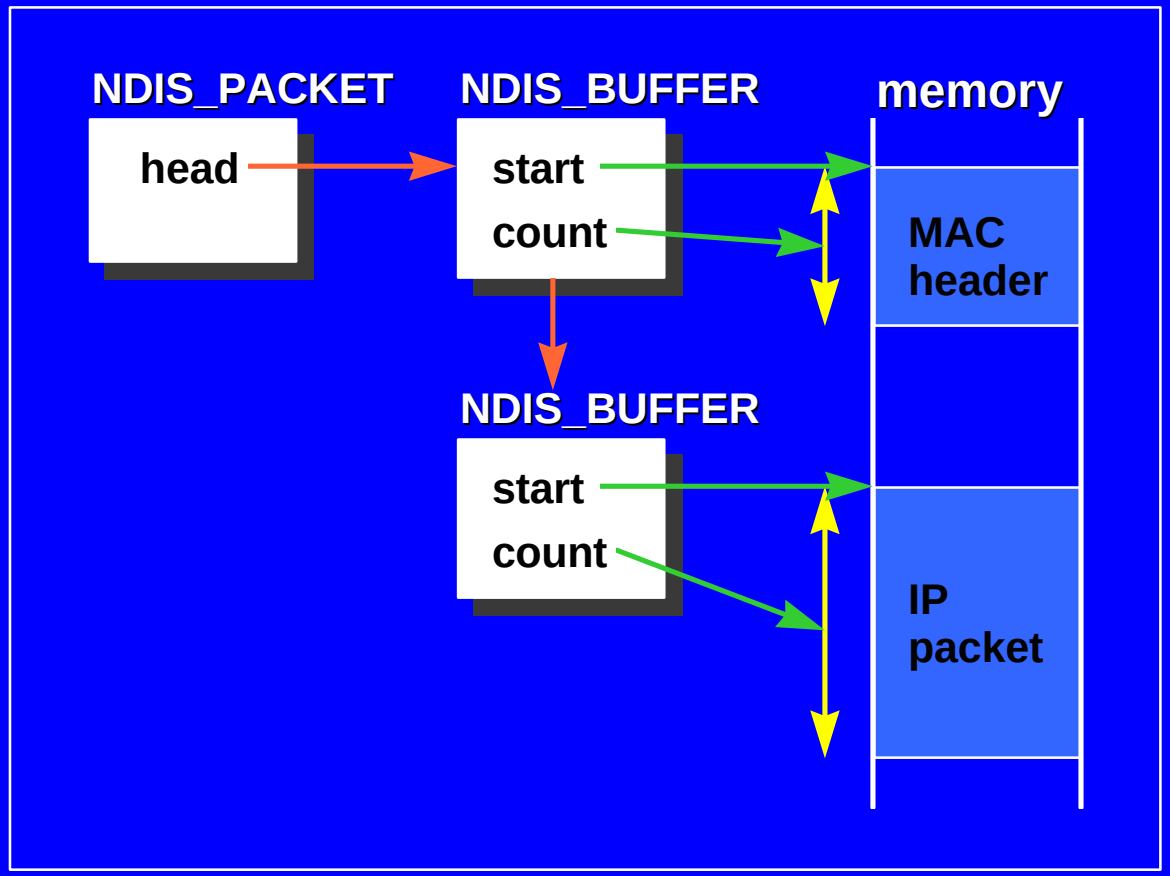
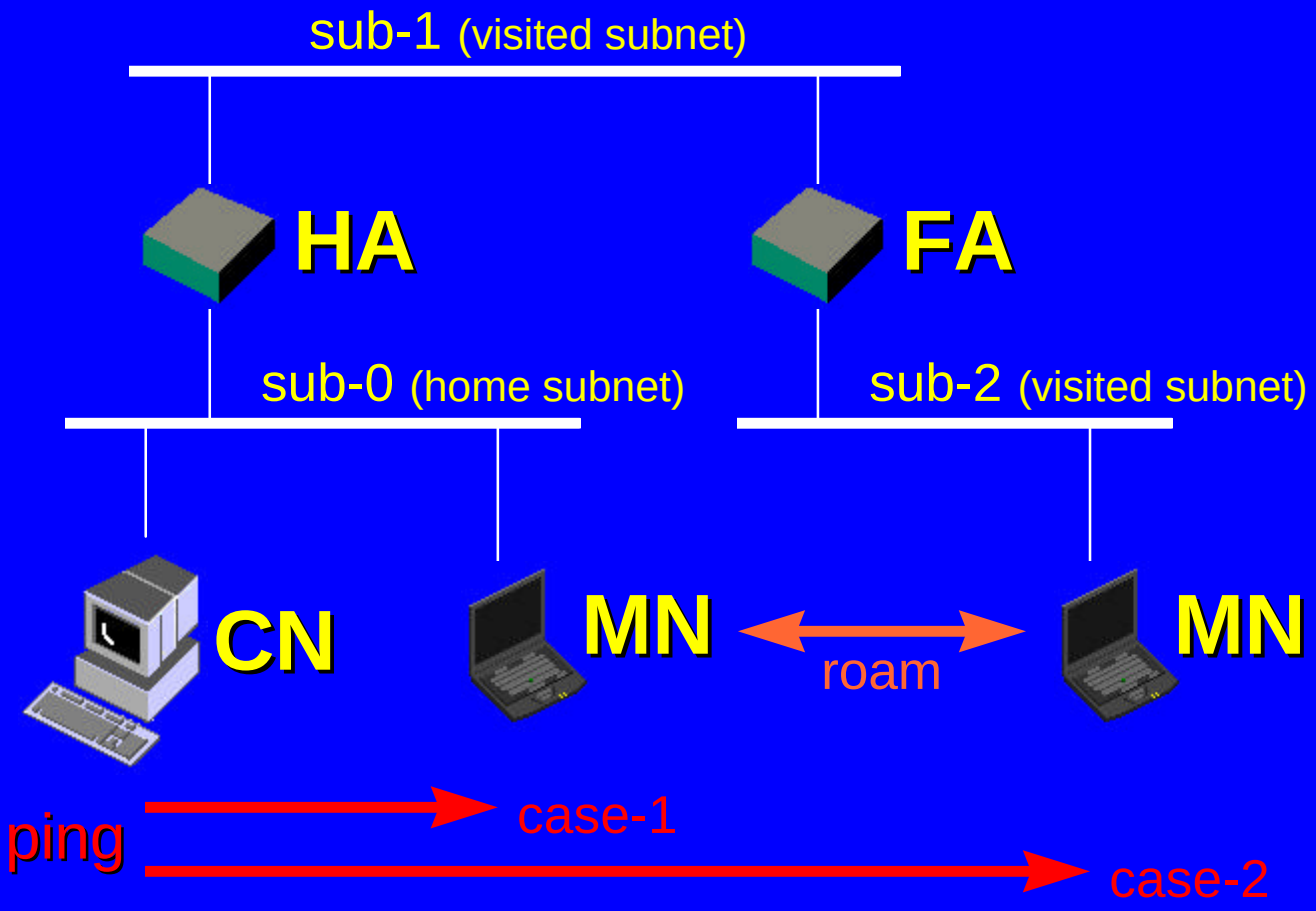
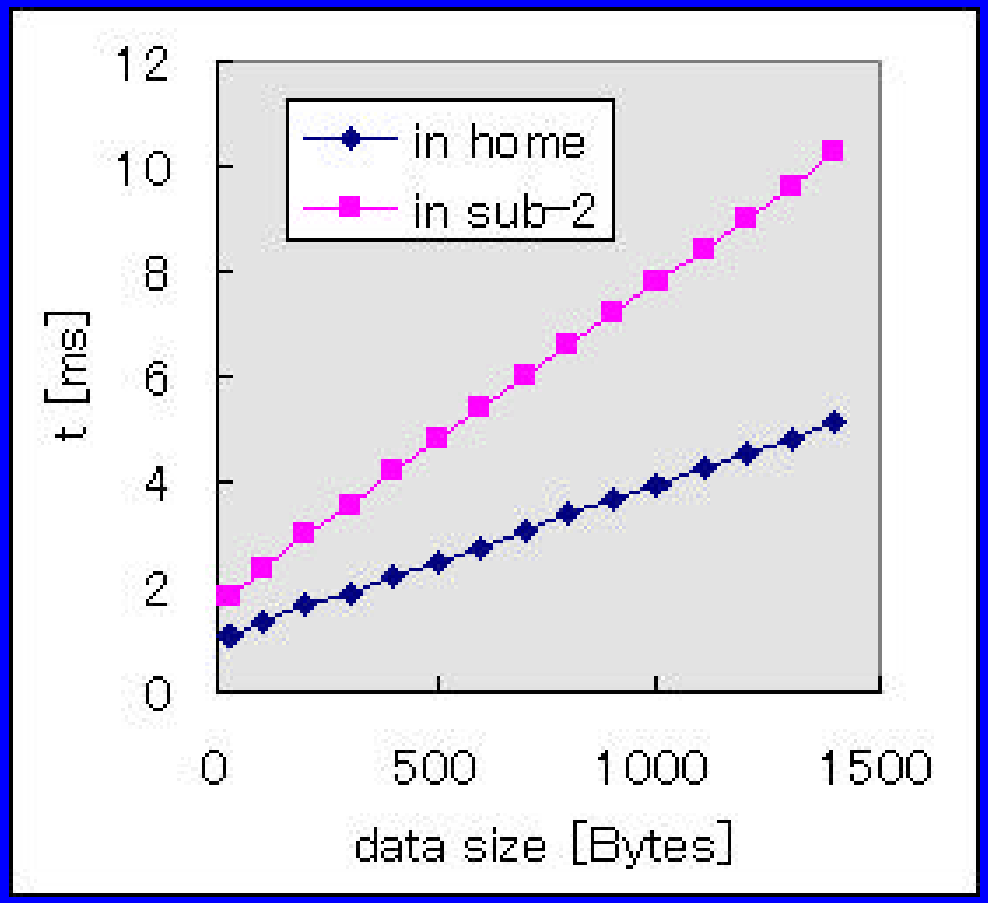
3-4. Latency measurements(4):



3-5. Latency measurements(1):



3-5. Latency measurements(2):



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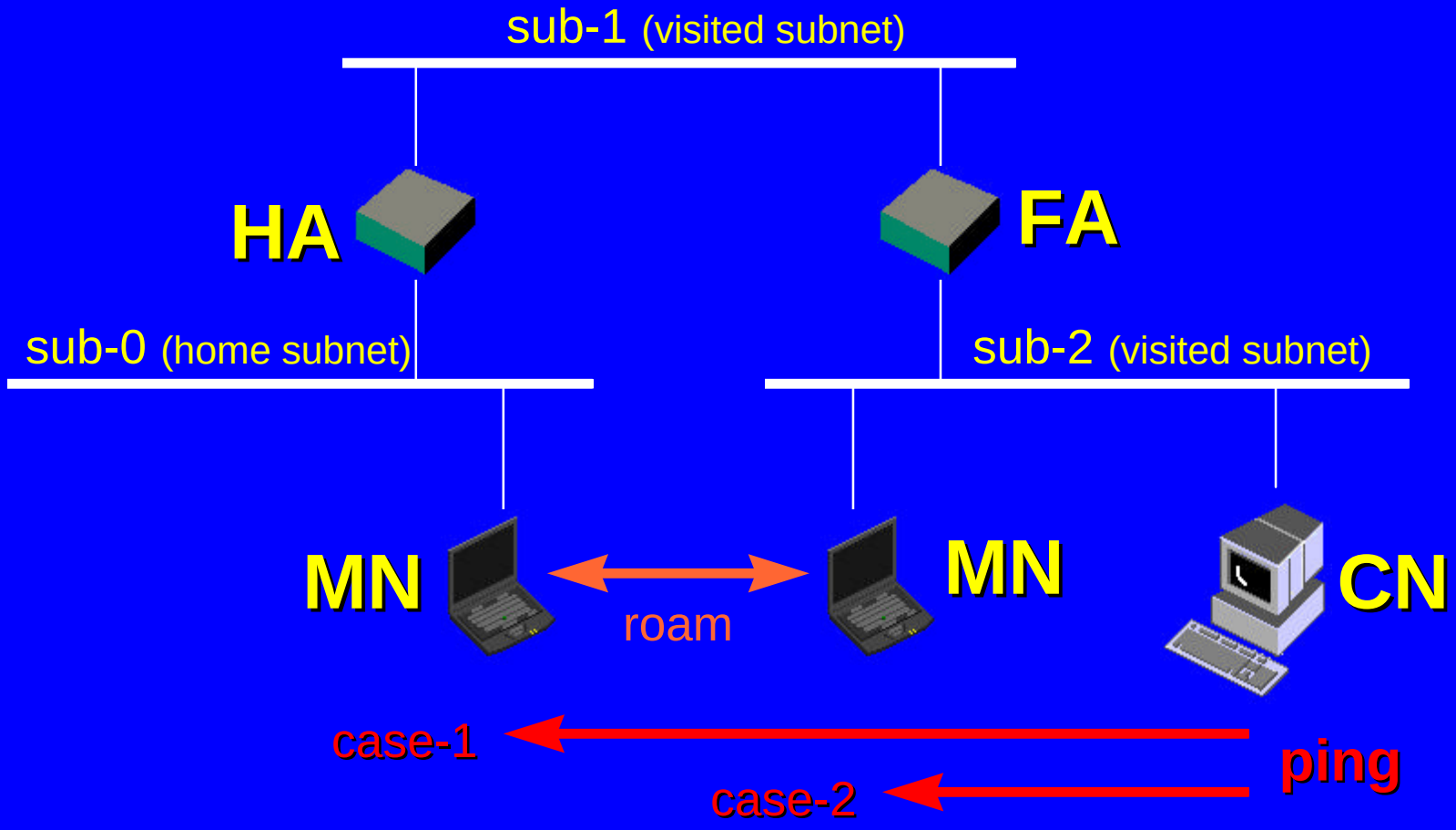
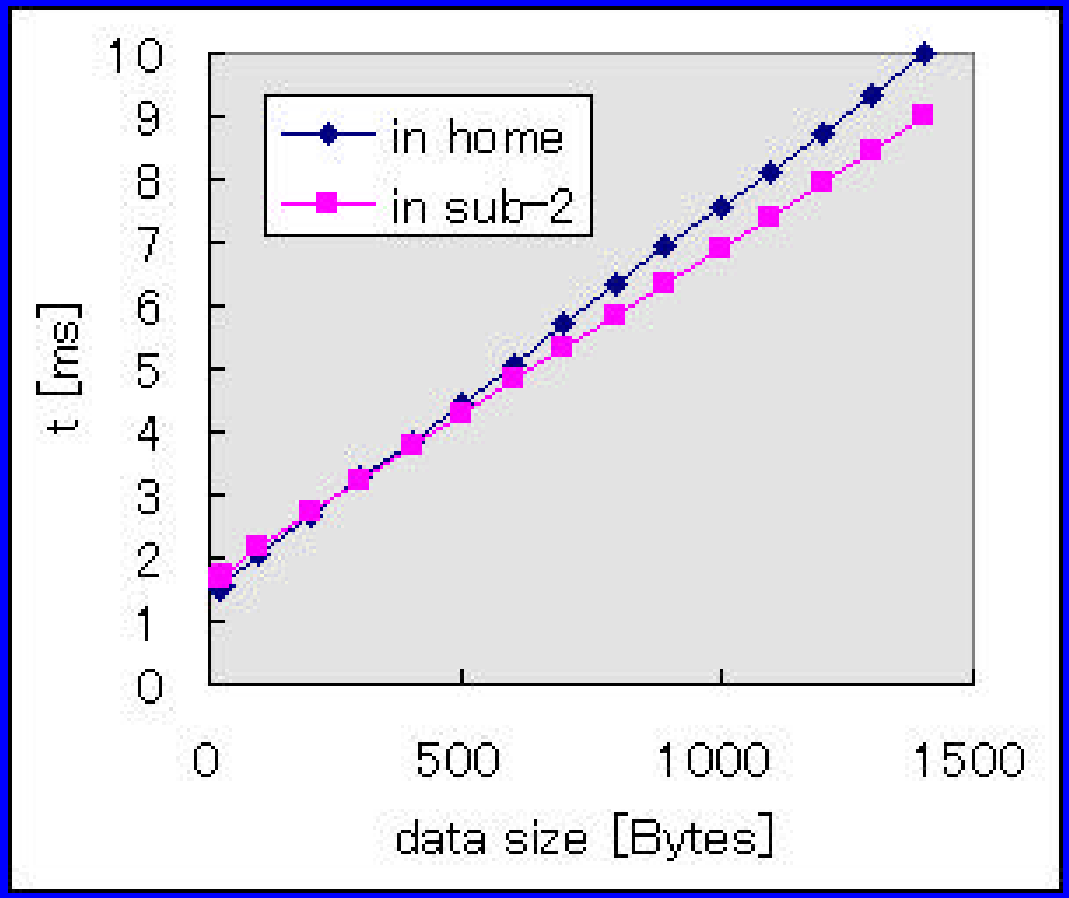
3-6. Latency measurements(1):



3-6. Latency measurements(2):



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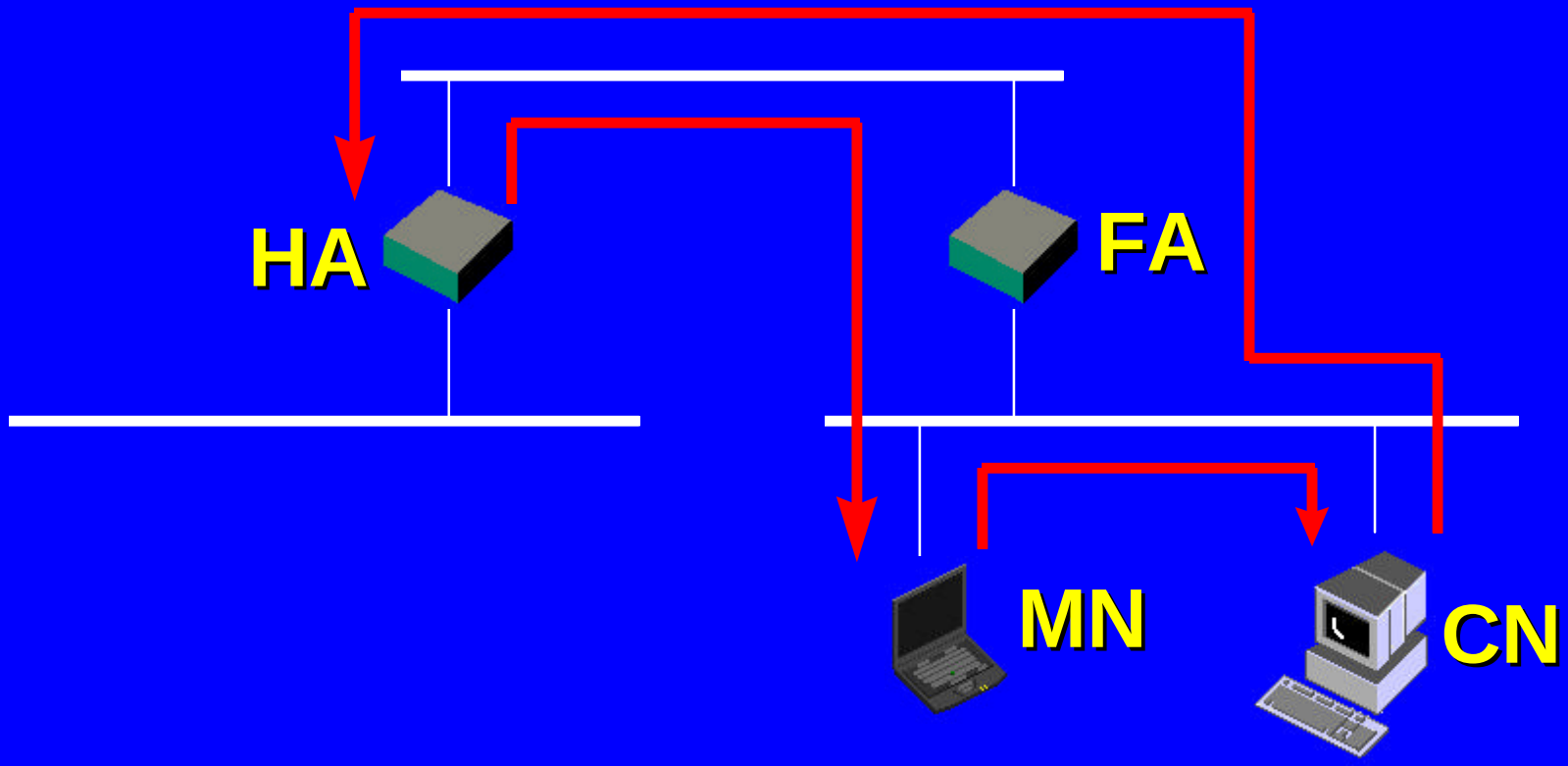
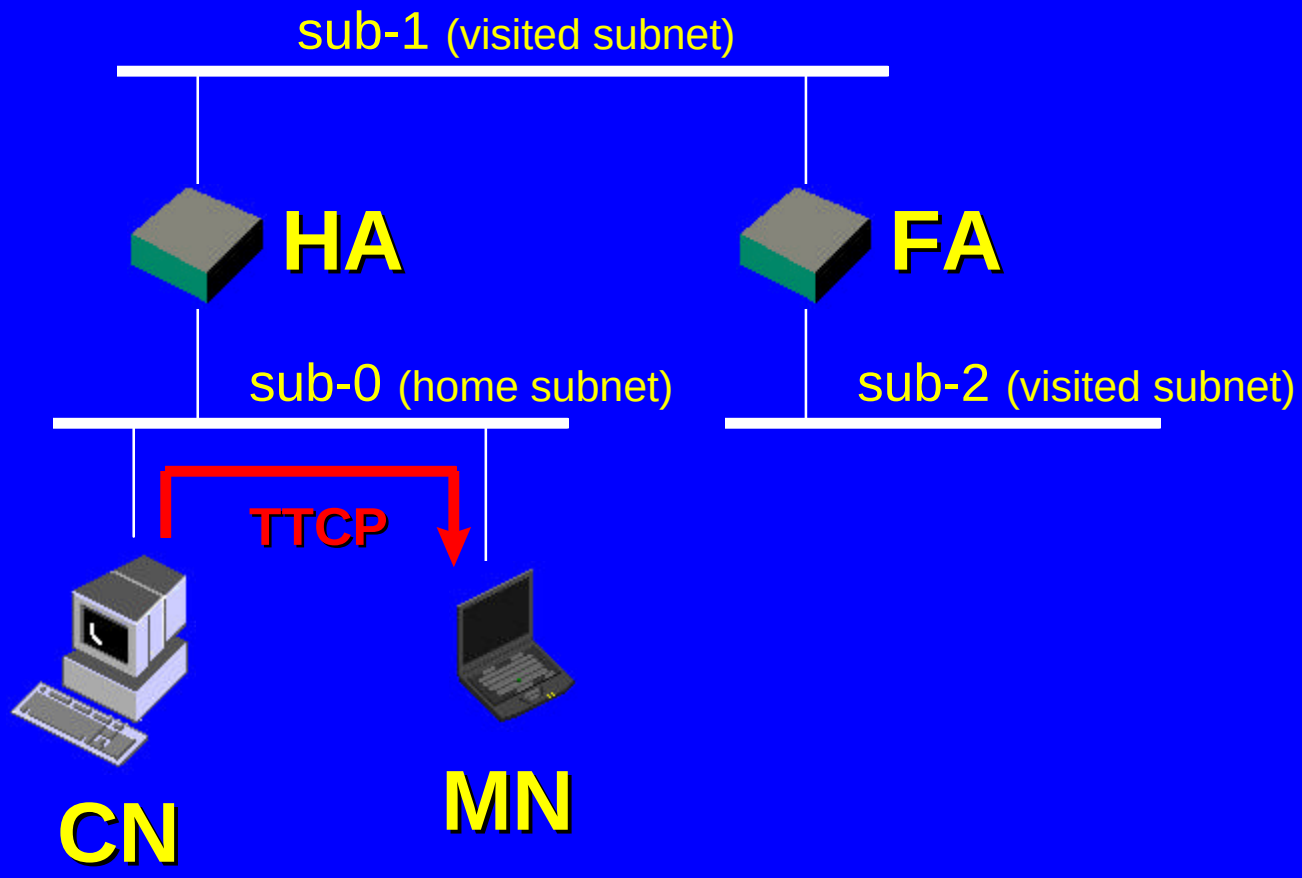
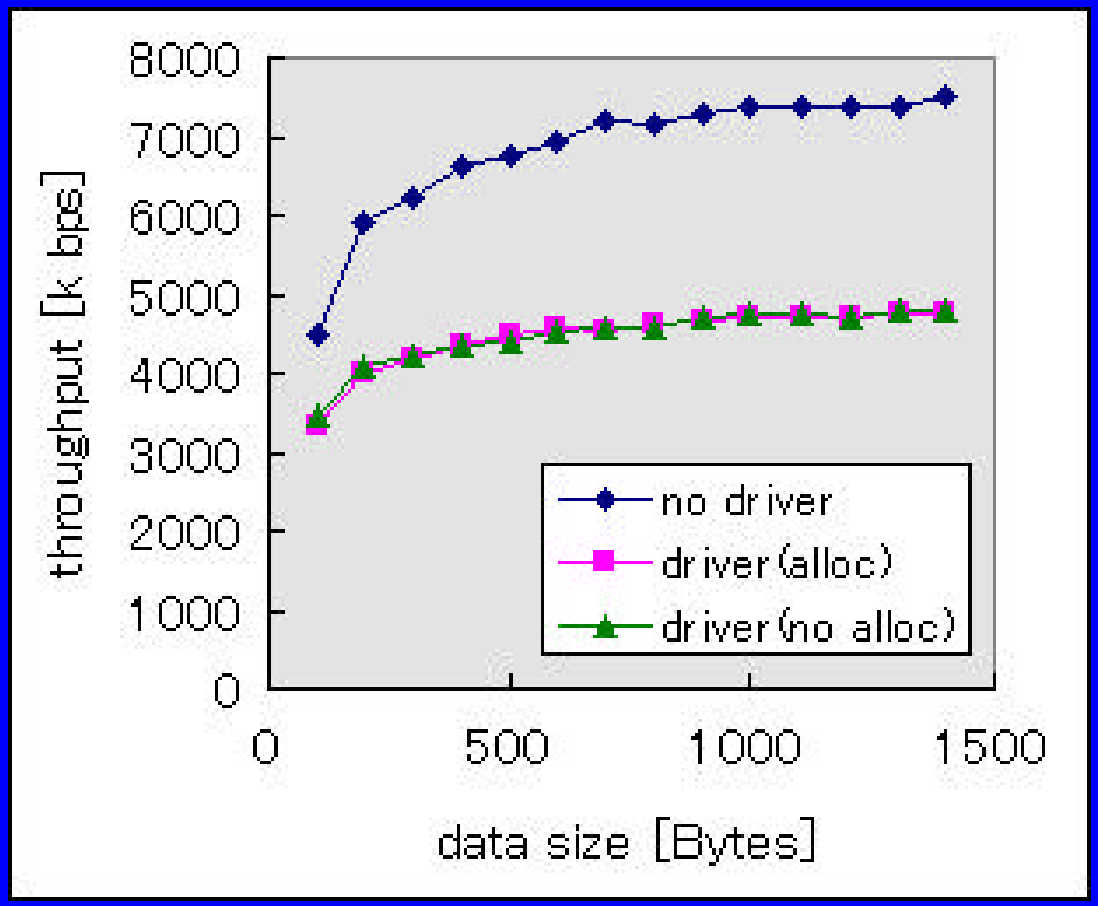
3-6. Latency measurements(3):



3-7. Throughput measurements(1):

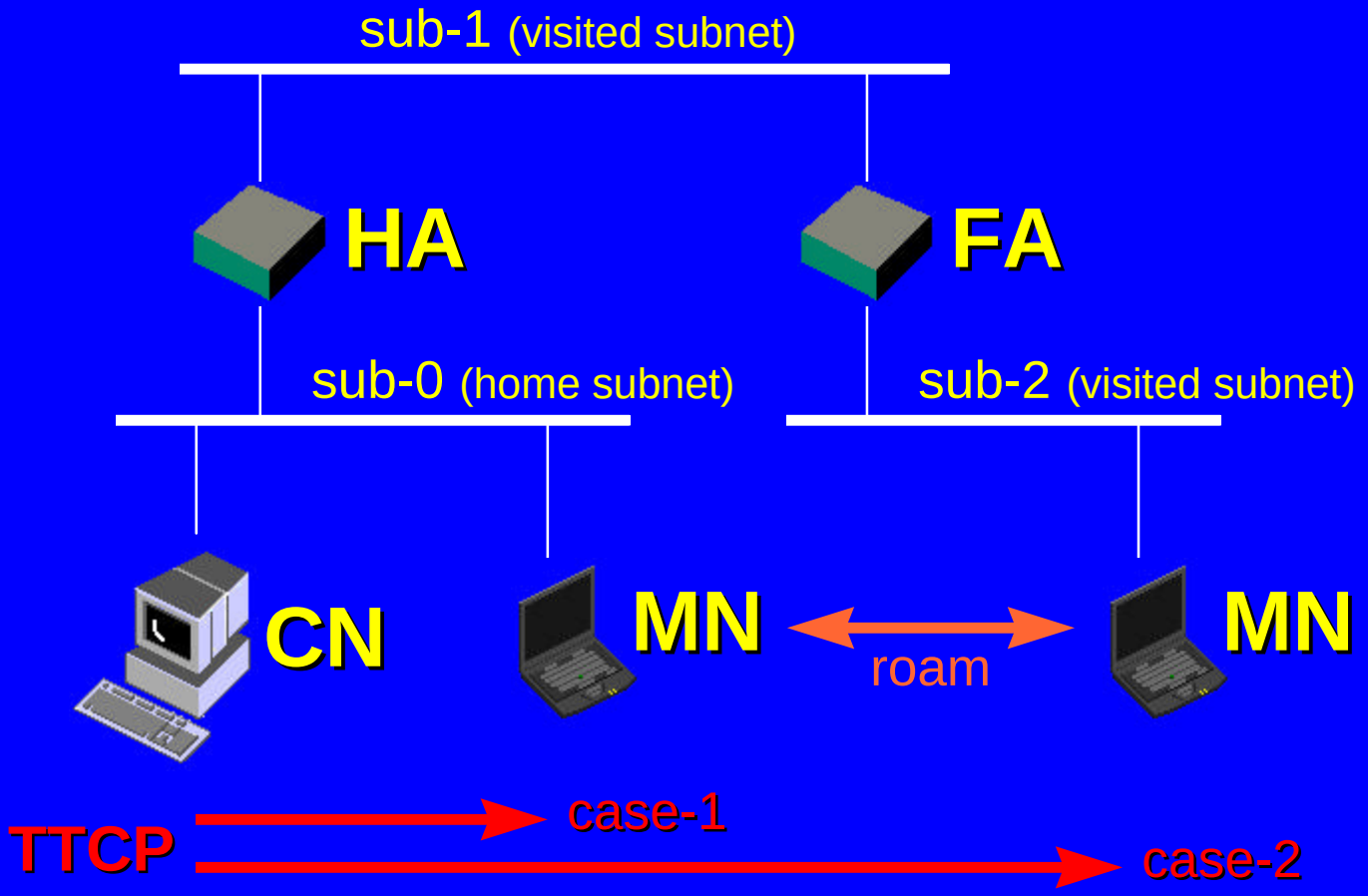


3-7. Throughput measurements(2):

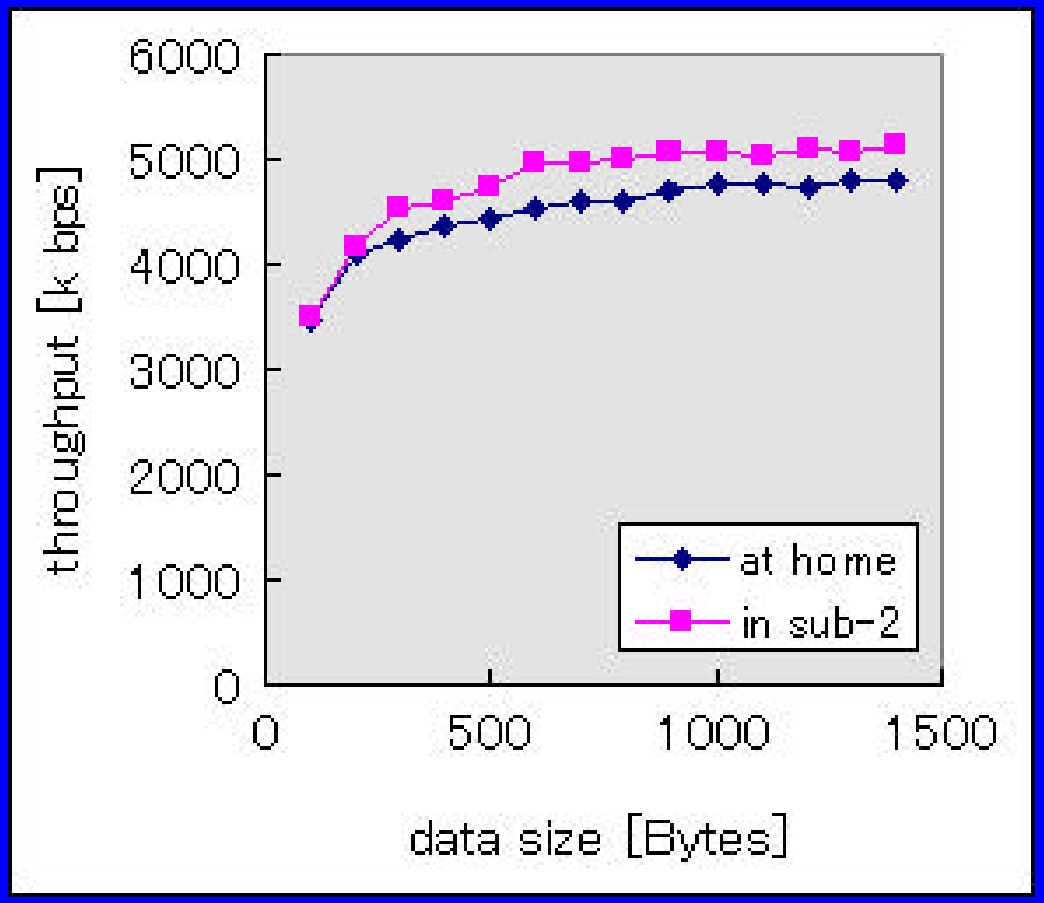


See notes at page 16.

3-8. Throughput measurements(1):



3-8. Throughput measurements(2):



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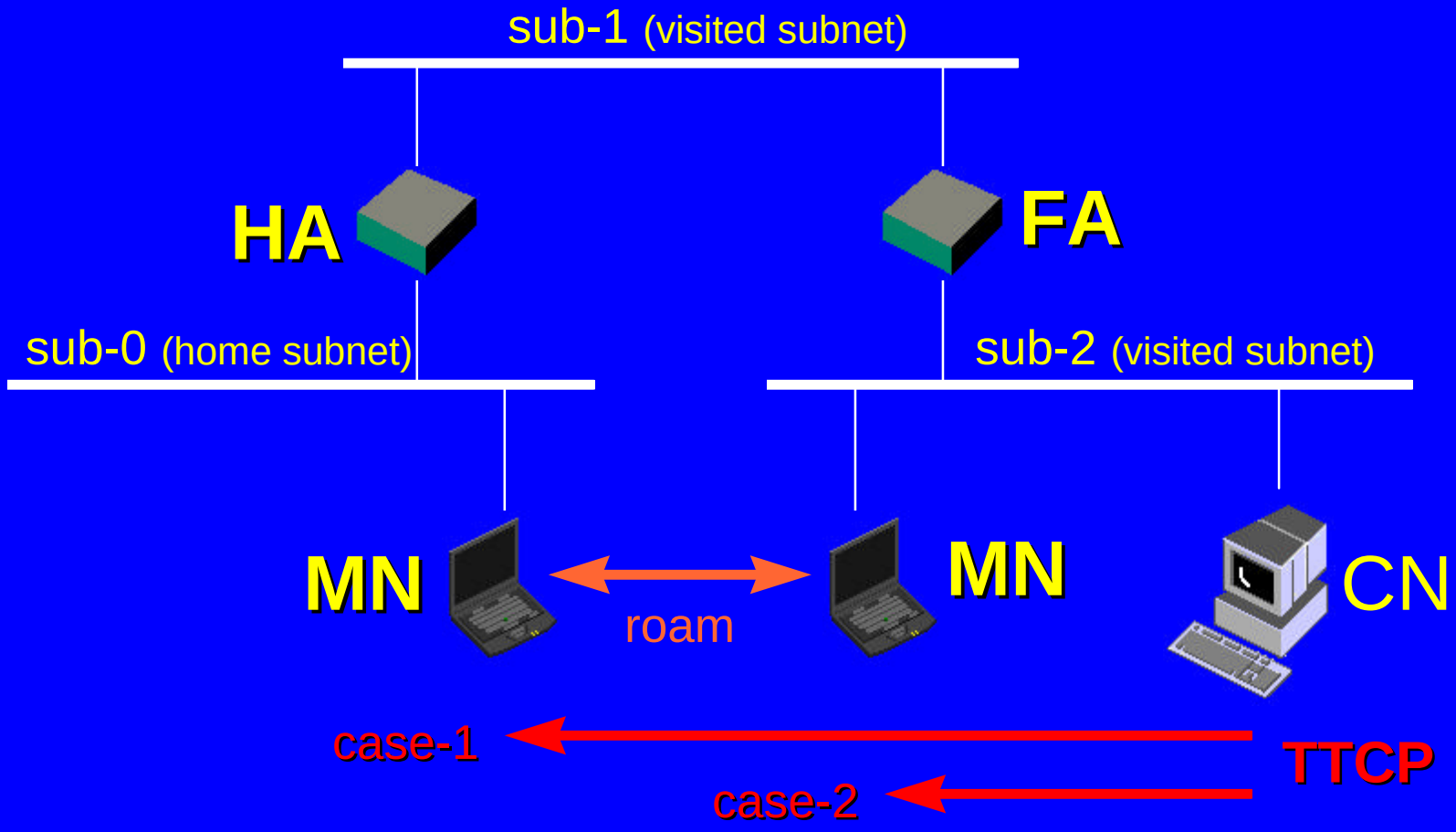
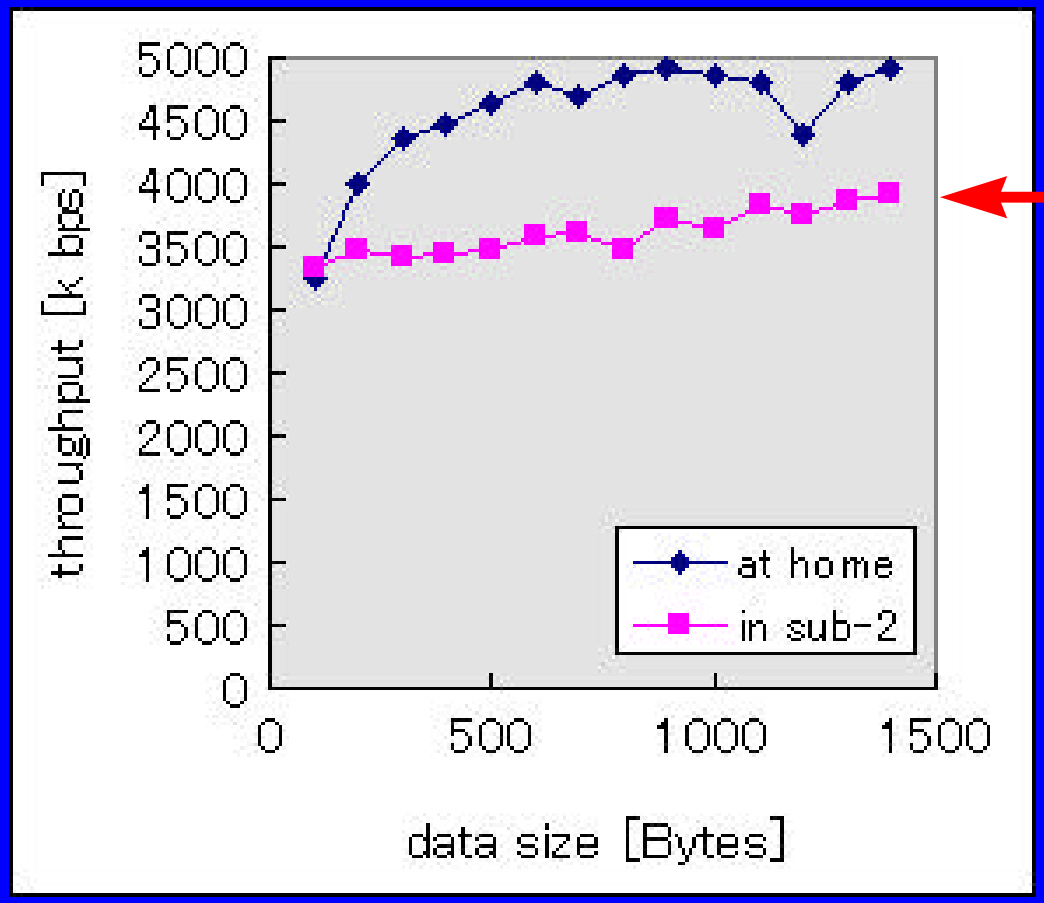
3-9. Throughput measurements(1):



3-9. Throughput measurements(2):



saturated !

See notes at page 16.

3-9. Throughput measurements(3):