Communication Networks

Spring 2021

Tobias Bühler

https://comm-net.ethz.ch/

ETH Zürich

April 01 2021

IP example from the lecture

Given the prefix 82.130.0.0/17

Compute

# of addressable hosts

the prefix mask

network address

1st host address

last host address

broadcast address

IP example from the lecture

Given the prefix 82.130.0.0/17

Compute

# of addressable hosts	2 ** (32 - 17) - 2 = 32766
the prefix mask	11111111.11111111.10000000.00000000
network address	
1st host address	
last host address	
broadcast address	

IP example from the lecture

Given the prefix 82.130.0.0/17

Compute

# of addressable hosts	2 ** (32 - 17) - 2 = 32766
the prefix mask	11111111.11111111.10000000.00000000
network address	82.130.0.0
1st host address	82.130.0.1
last host address	
broadcast address	

IP example from the lecture

Given the prefix 82.130.0.0/17

Compute

# of addressable hosts	2 ** (32 - 17) - 2 = 32766
the prefix mask	11111111.11111111.10000000.00000000
network address	82.130.0.0
1st host address	82.130.0.1
last host address	82.130.127.254
broadcast address	82.130.127.255

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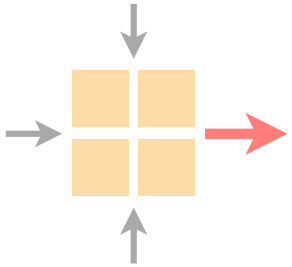
Exercise 5



General information

Solution to last week's assignment

Overview current assignment

Solutions will be published next week

Group registration

Please register your groups for the routing project:
https://comm-net.ethz.ch/registration/php/index.php

Use the #group_search channel on Slack
if you look for other group members

Let us know via Slack or email if there are any problems

Mid-course survey

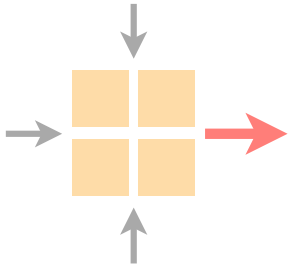
The survey is still open: https://docs.google.com/forms/d/e/1FAIpQLScECdAOOsbHy50zcPjAMnFP9Y2PleCd_SOekXDPBalyl9iKTg/viewform

Thanks to all of you who already gave us some feedback

After the Easter break we will show you the results
and announce possible changes based on your feedback

Communication Networks

Exercise 5



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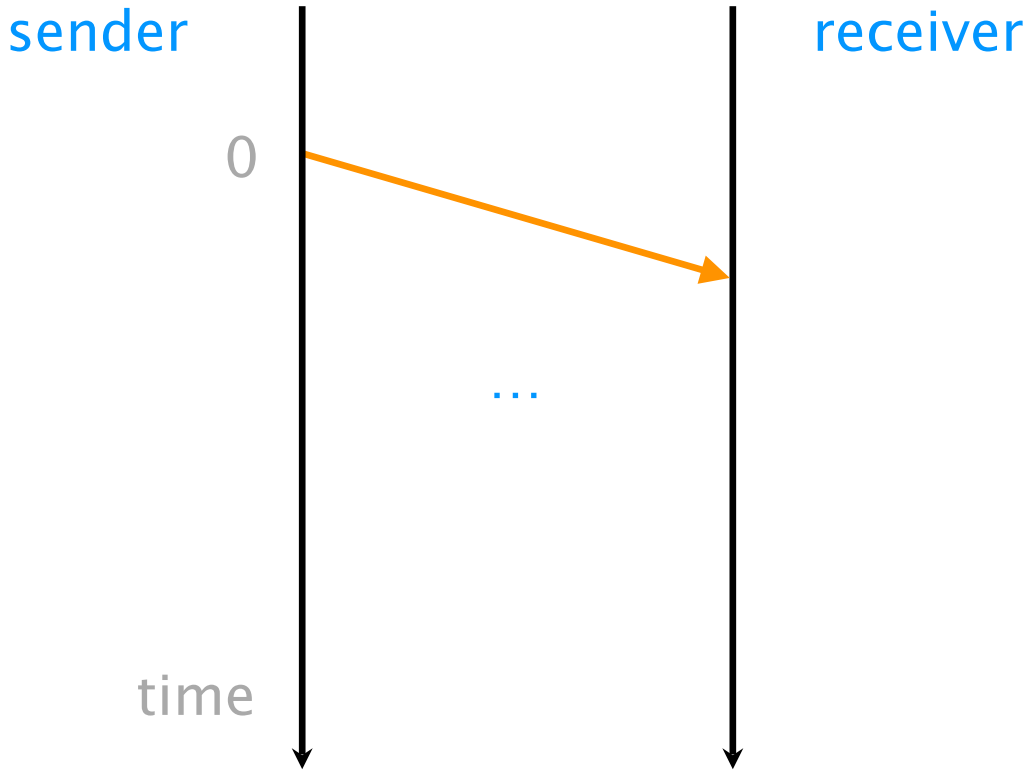
Detailed look at the solution of question 4.2-b)



How long would a transfer take?

Task 4.2-b) Setting

Go-Back-N (GBN) sender and receiver

10Mbps link with propagation delay of 100ms

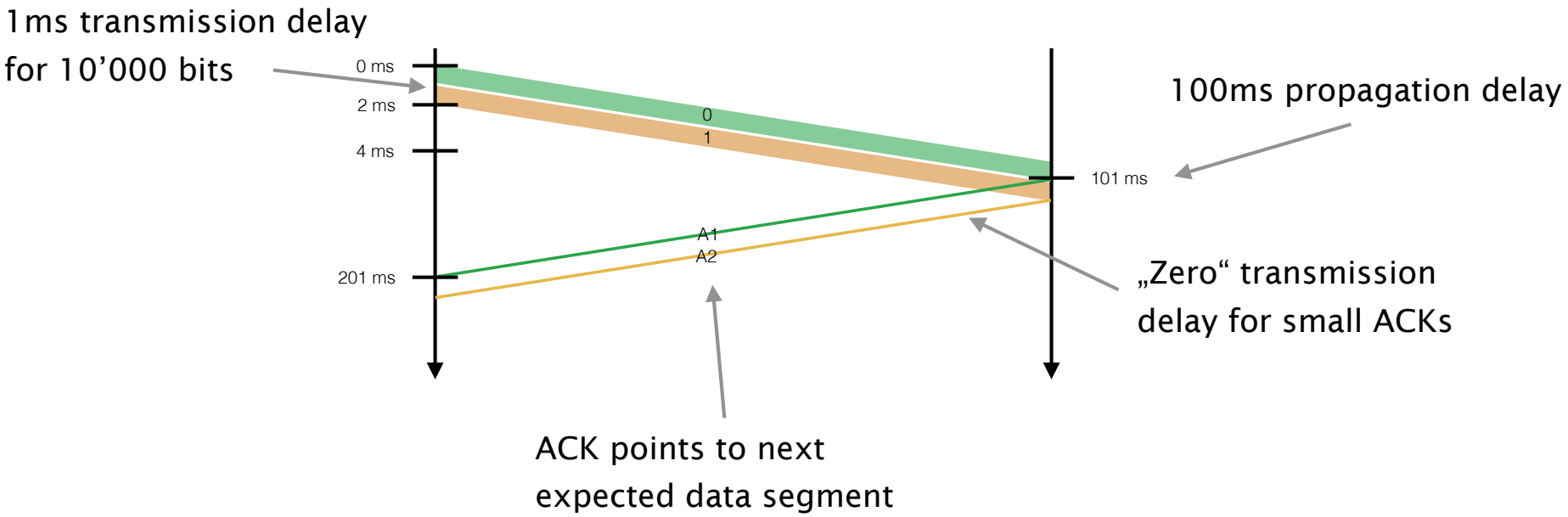
A data segment contains 10’000 bits (ACKs very small)

we need 1ms to transmit 10’000 bits given a 10Mbps link

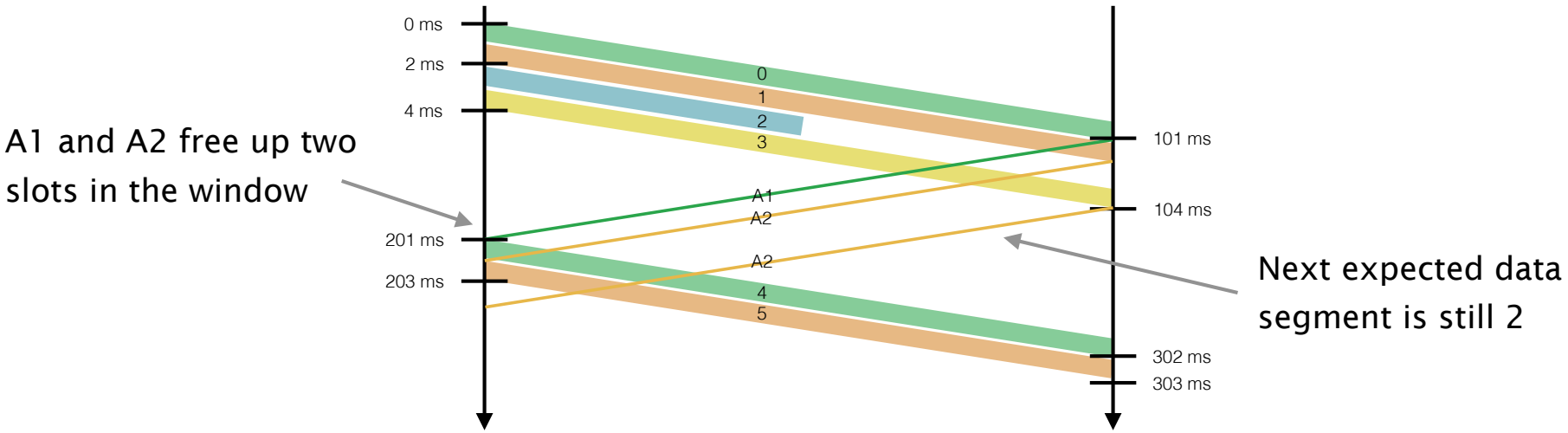
3 second retransmission timer and a window of 4 segments

For task b), the 3rd and last segment are lost *once*

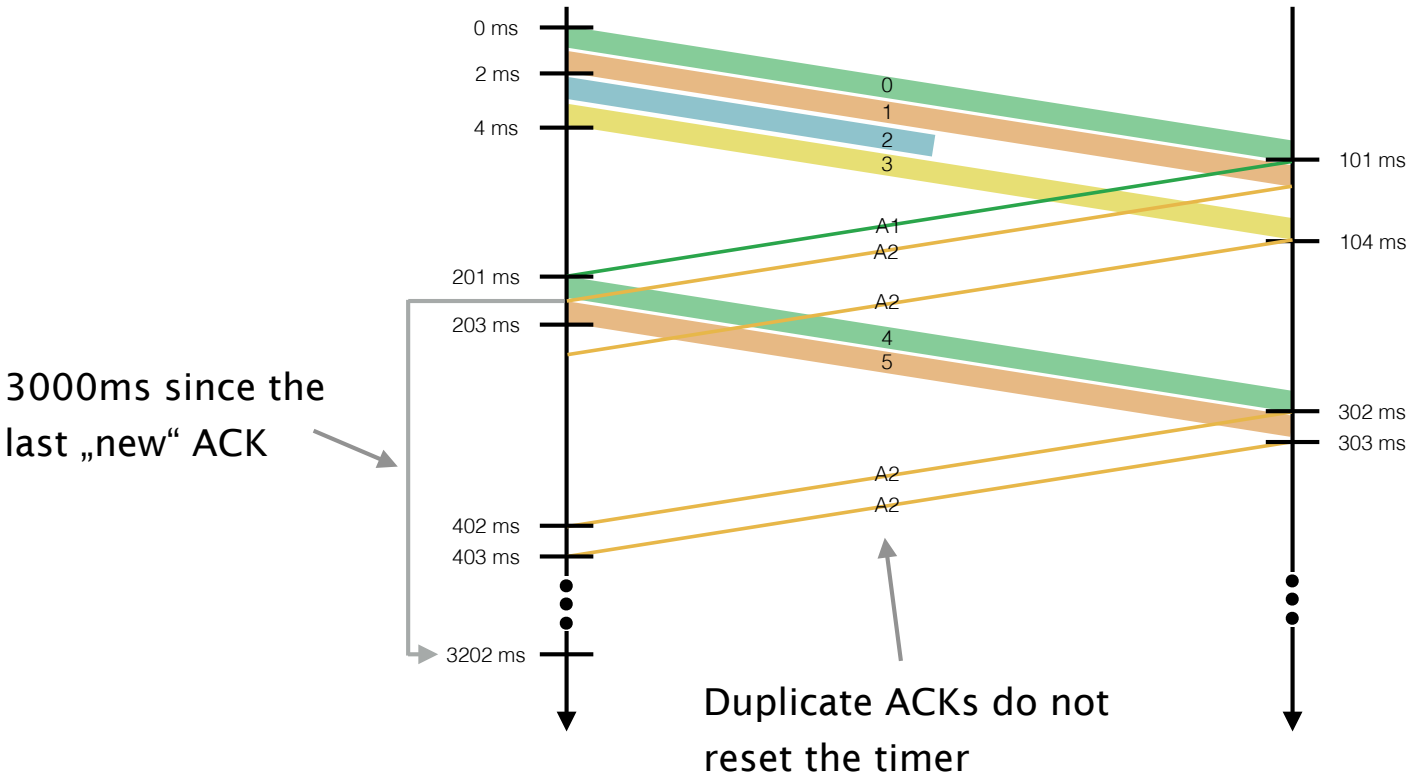
Task 4.2-b) normal transmission of the first 2 segments



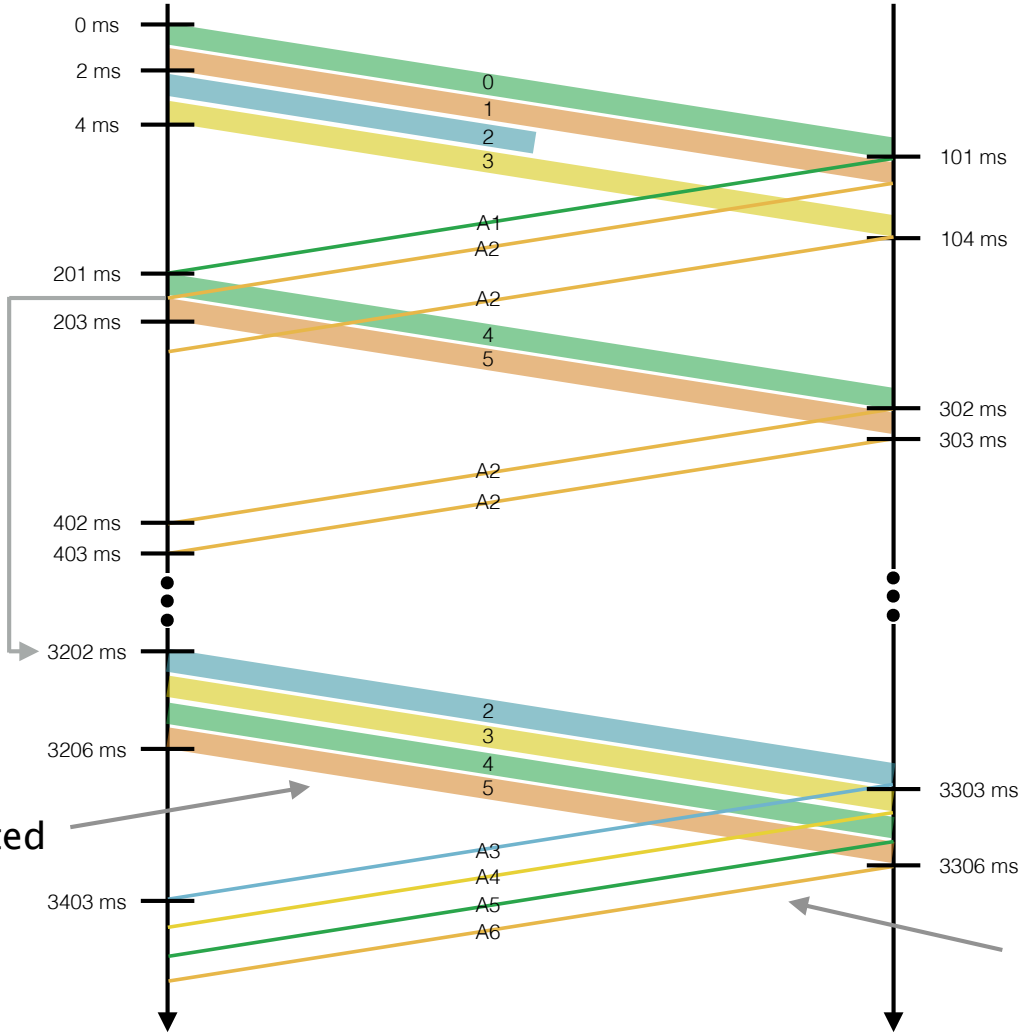
Task 4.2-b) 3rd segment is lost (no ACK)



Task 4.2-b) retransmission timeout reached at 3202ms



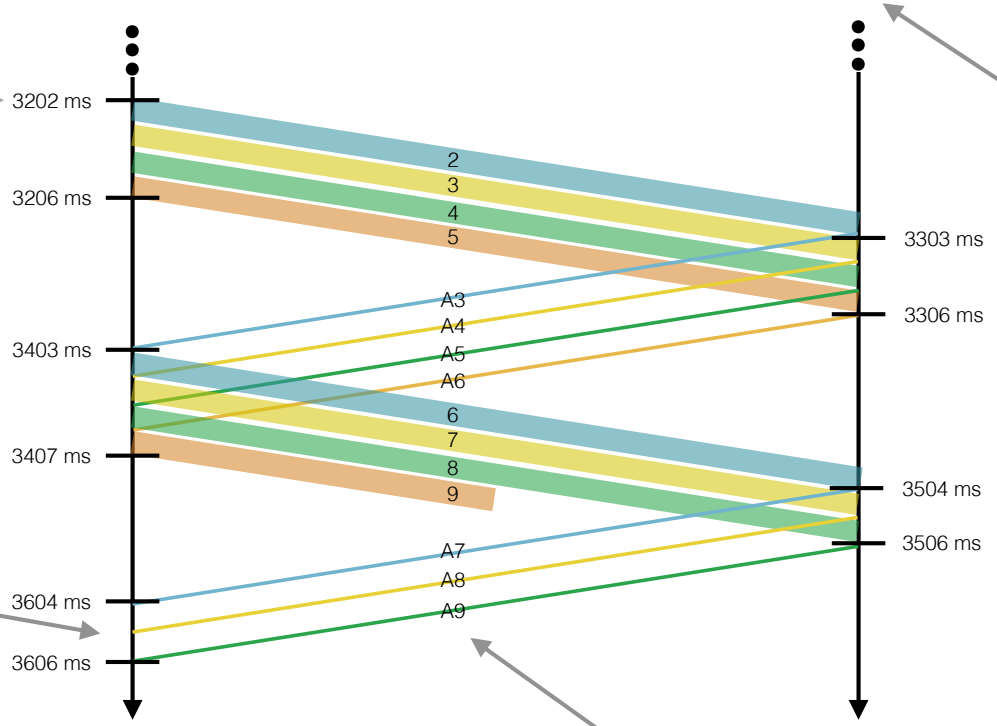
Task 4.2-b) GBN retransmission of segments 2-5



All N segments in the window are retransmitted (Go-Back-N)

Receiver can answer with new ACKs

Task 4.2-b) last segment (9) is lost

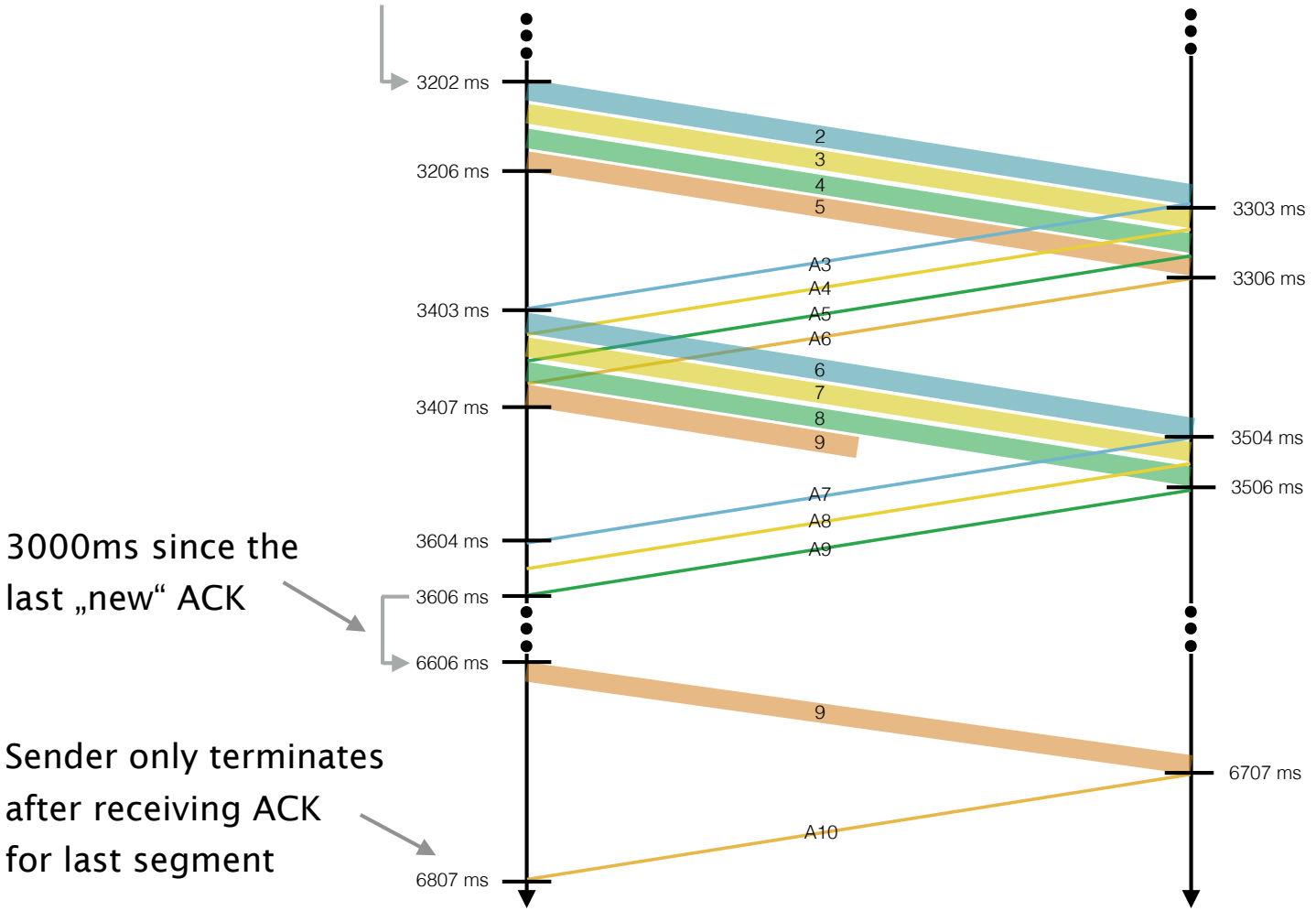


Beginning no longer shown

No more segments to send even though there is space in the window

No duplicate ACKs this time as last segment was lost

Task 4.2-b) last segment retransmitted after 3000ms



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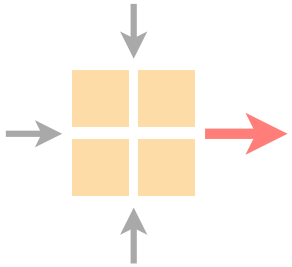
Exercise 5



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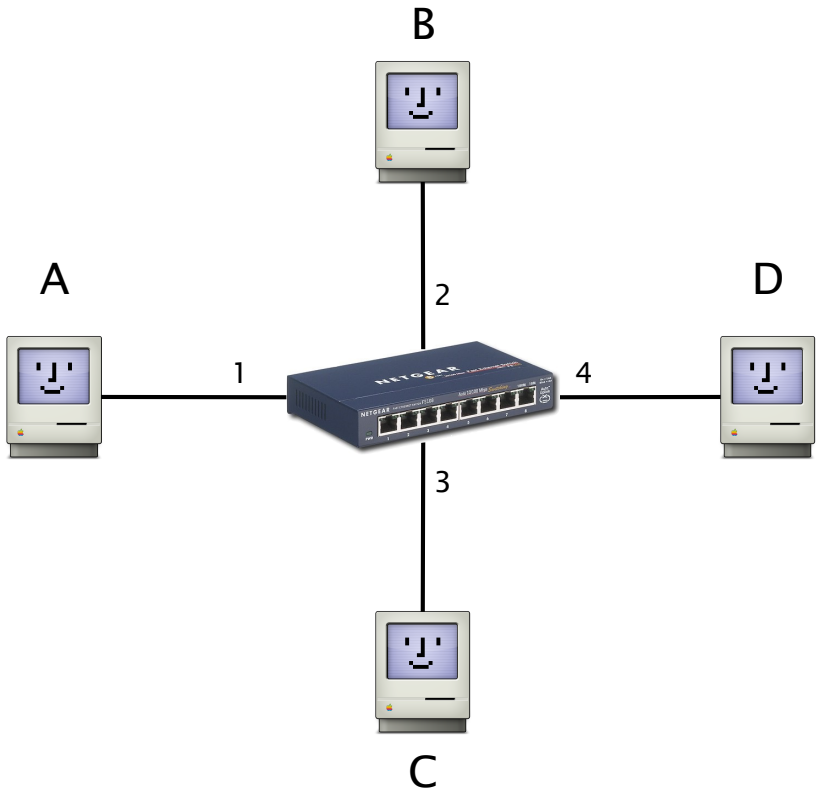
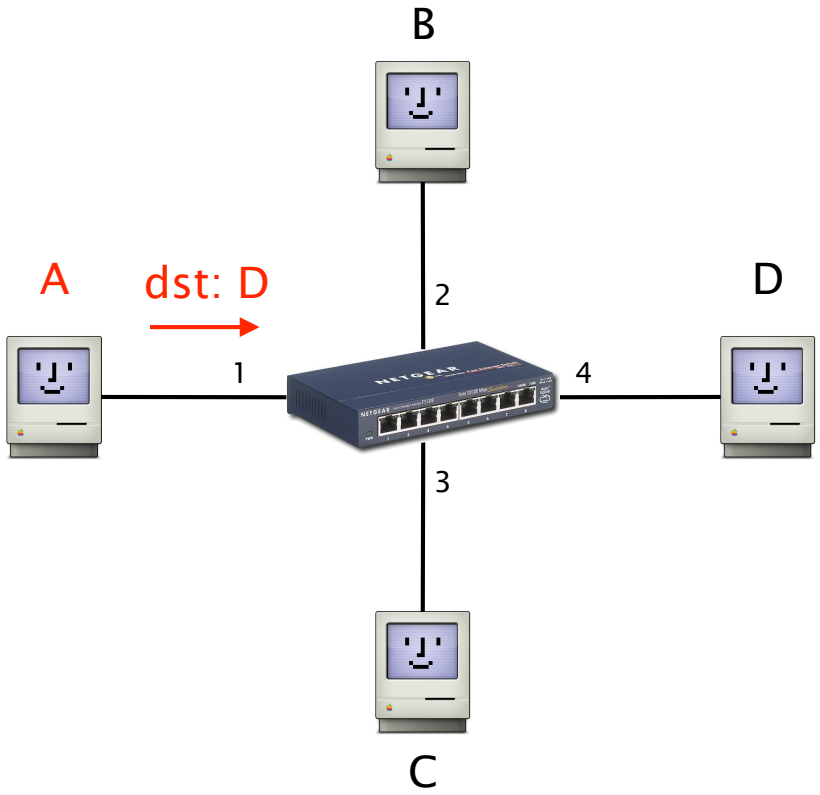
Task 1: Duplicate MAC address



dst	port

Switch learns how to map MACs to ports

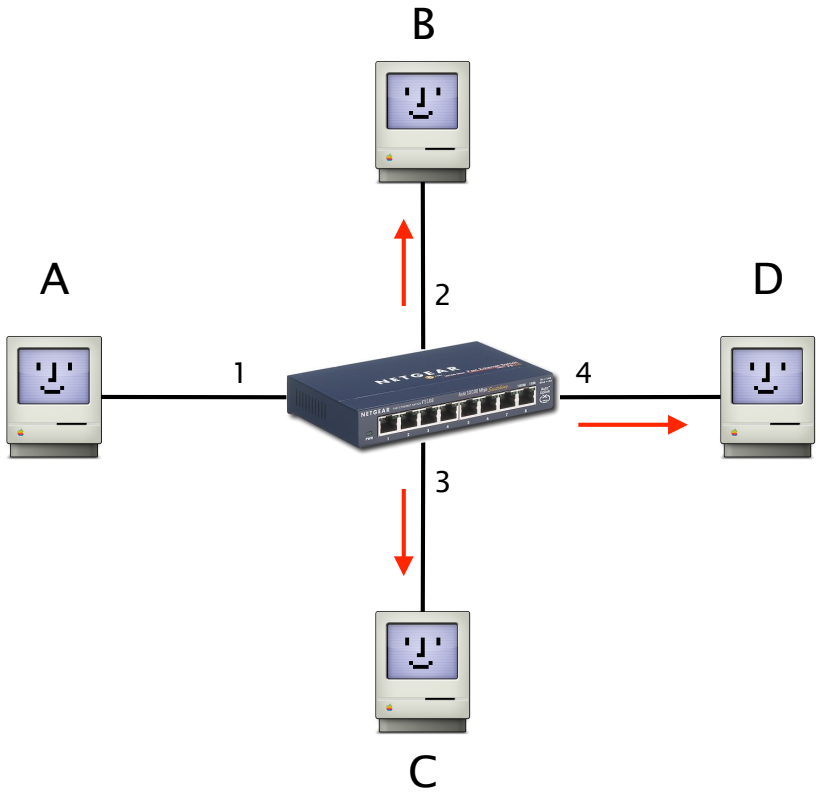
Task 1: Duplicate MAC address



dst	port
A	1

Switch learns how to map A to port 1

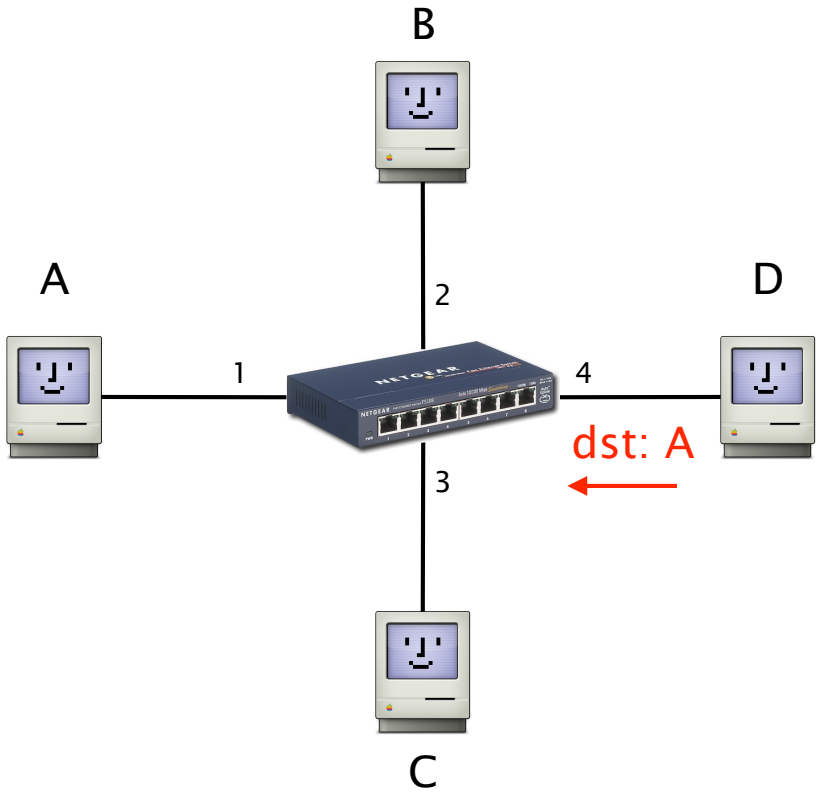
Task 1: Duplicate MAC address



dst	port
A	1

Dst D unknown: broadcast

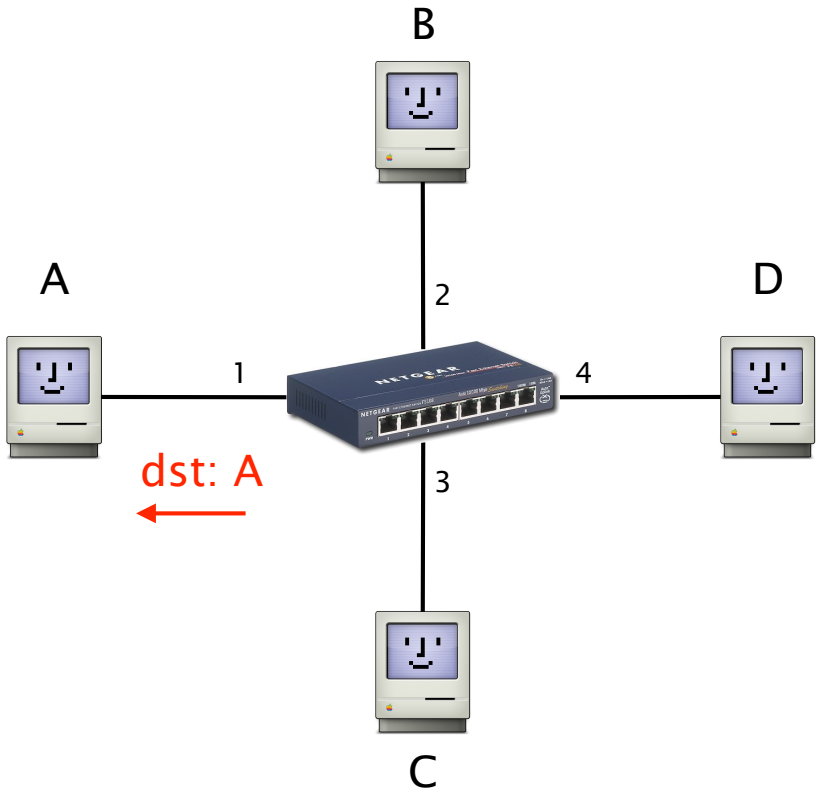
Task 1: Duplicate MAC address



dst	port
A	1
D	4

Switch learns how to map D to port 4

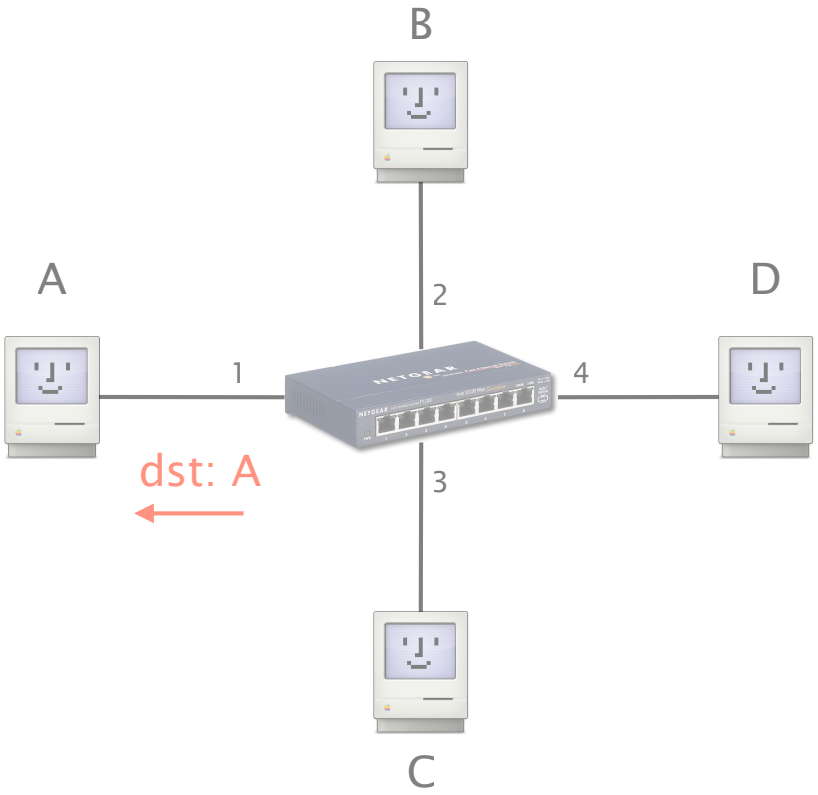
Task 1: Duplicate MAC address



dst	port
A	1
D	4

Dst A known, no broadcast required

Task 1: Duplicate MAC address



dst	port
A	1
D	4

More details: Slides 69-72 (week 5)

Task 2: Imposter

Who am I?

MAC-to-IP binding

How do I acquire an IP address?

Dynamic Host Configuration Protocol (DHCP)

Who are you?

IP-to-MAC binding

Given an IP address reachable on a link, how do I find out what MAC to use?

Address Resolution Protocol (ARP)

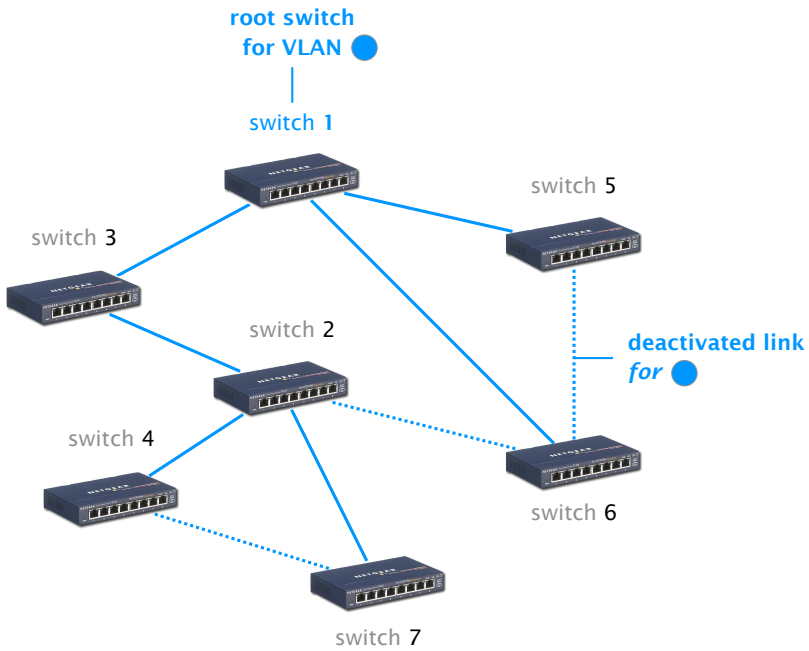
More details: Slides 31-45 (week 5)

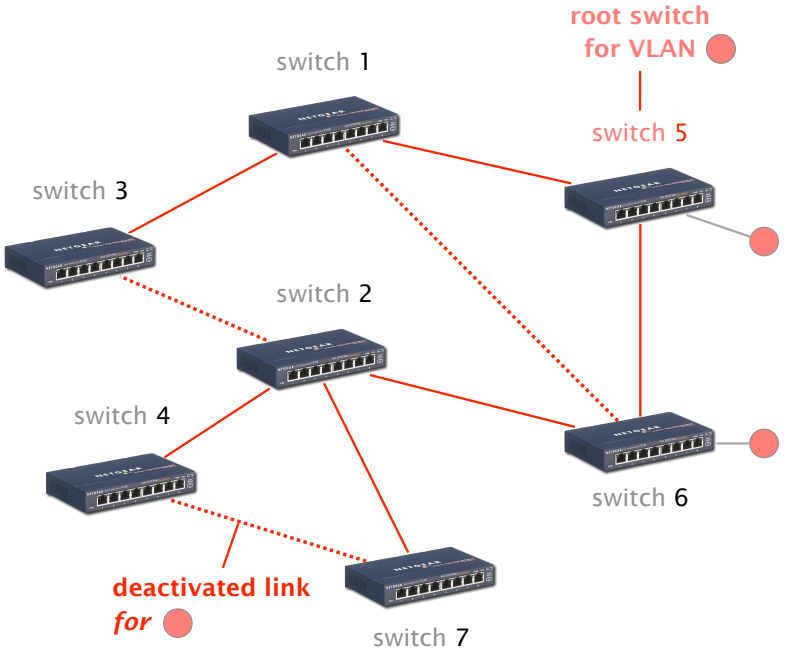
Task 3 & 4: Spanning Tree

More details: Slides 73-84 (week 5)

Tip: compared to a single switch,
you already have knowledge of the entire network.
I.e., you immediately know which switch will be the root.

Task 5: VLAN





More details: Slides 18-39 (week 6)

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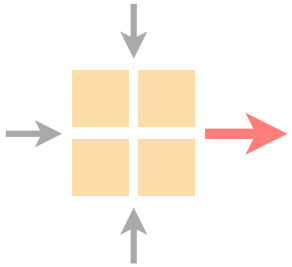
Exercise 5



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