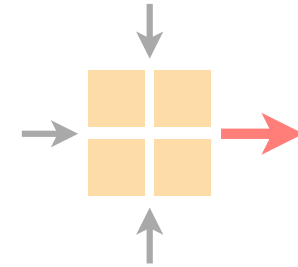# Communication Networks

## Spring 2021

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# Two important pillars of today's Internet

Internet-wide routing

Covered in the first project

Reliable transport

Main focus of the second project

# Implement your own Reliable Transport Protocol

recover from packet loss
and reordering

# Implement your own <mark>Reliable</mark> Transport Protocol

recover from packet loss
and reordering

Part 1    **Complete a simple Go-Back-N implementation**

Retransmit all packets after a timeout

Part 2    **Add support for Selective Repeat**

Fast retransmission after duplicated ACKs

Part 3    **Add support for Selective Acknowledgements (SACK)**

SACK contains blocks of correctly received segments

Bonus    **Implement your own congestion control algorithm**

# Proposed timetable

| | |
|---|---|
| Part 1 | Complete a simple Go-Back-N implementation |
| <span style="color:red">21.05.2021</span> | Retransmit all packets after a timeout |
| Part 2 | Add support for Selective Repeat |
| <span style="color:red">28.05.2021</span> | Fast retransmission after duplicated ACKs |
| Part 3 | Add support for Selective Acknowledgements (SACK) |
| <span style="color:red">04.06.2021</span> | SACK contains blocks of correctly received segments |
| Bonus | Implement your own congestion control algorithm |

# We use a custom header for the GBN protocol

24 bits

| | 1 | 7 | 16 | |
|---|---|---|---|---|

**Mandatory header**

| Type | Options | Segment Length | |
|---|---|---|---|
| Header Length | Sequence Number | Window | |

**Optional header**

| Block Length | Left edge 1st block | Length 1st block |
|---|---|---|
| Padding | Left edge 2nd block | Length 2nd block |
| Padding | Left edge 3rd block | Length 3rd block |

| Payload |
|---|

# The assignment text on our website contains detailed instructions

This project counts as **10%** to your final grade

Every group member receives the same grade

You will once again write a report

Max 10 pages but should be much shorter

Most of the tasks also include a theoretical question

Answer them in the report

# A new VM and <mark>GitLab repository</mark> wait for you

let us know if you
have no access

All the scrips/skeleton files are already on your VM

Use git (preferred) or scp to transfer files

You keep your group number from the first project

**Important:** VM port number is **3000** + group number

Use the password from your GitLab repository

Let's see how the final sender
and receiver should look like

# There are multiple options to test your implementation

Run your sender against your receiver

This should be your main focus

Test with the implementation of another group

Good way to find out if you follow all the specifications

**Optionally**, use our test framework

Passing all the tests does not guarantee a 6

# (Optional) new test framework under development

We are working on a new framework

More tests, better feedback, new features, …

We will enable the new framework during the project

Will be buggy and could report wrong results

We welcome any feedback from you

More information via Slack

# If you have questions

Ask on Slack or send us an email

Please use the **#transport_project** channel

We will announce additional online Q&A sessions

During the sessions we also offer voice/video chats

Follow the exercise session on Thursday

More demos to Git and Python

# Final comments

Deadline: June 04 2021, at midnight

Submit code, report and decl. of originality via GitLab

Read the assignment text carefully

Make sure you follow all the specifications

Do not copy code from other groups

We will check your code with automated tools