



Assignment-2

- Adding Congestion Control
- Implement the protocol



Tasks

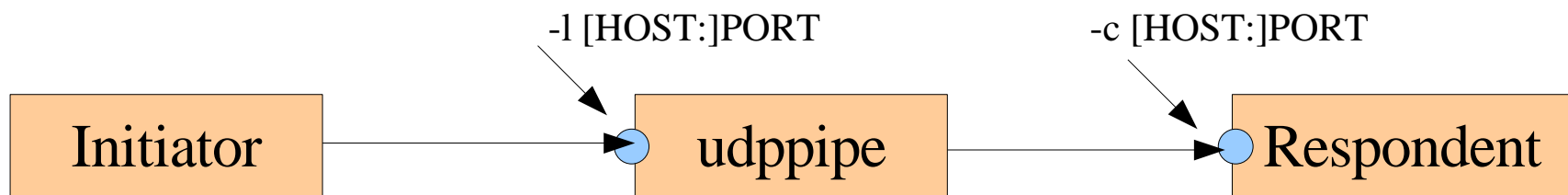
- ▶ Design a suitable congestion control mechanism for your proposed protocol
- ▶ Add congestion control specification to the Assignment-1 specification
- ▶ Implement the protocol
- ▶ Document the performance of protocol under different test scenarios



Tool for testing/debugging: udppipe

```
udppipe -p LOSSFRACTION -l [HOST:]PORT -c [HOST:]PORT -b BITRATE -d DELAY
```

- p: Packet Loss Fraction. (introducing packet loss, simulation congestion)
- l: The host/port the initiator sends to
- c: The host/port where the respondent is waiting
- b: Bitrate in bit/s (float)
- d: Delay in s (float)
- f: File Representing Loss variations against time scale
(yet to be added, Will be available in a week)





udppipe: -f Option

```
udppipe -p 0.0 -l 5000 -c 5001 -b 1000000 -d 20 -f lossVar.txt
```

- ▶ lossVar.txt contains two columns(Time, Loss Fraction)
- ▶ A Sample of lossVar.txt

1	0.02	--> At 1 second after starting udppipe, loss fraction is set to 2%
5	0.00	--> At 5 second after starting udppipe, loss fraction is set to 0%
195	0.03	--> At 195 second after starting udppipe, loss fraction is set to 3%
256	0.01	--> At 256 second after starting udppipe, loss fraction is set to 1%



Analyzing Protocol Performance

- ▶ Make the implementation keep track of the number of bytes sent(including re-transmission and protocol header overhead)
- ▶ Log the changes in sending rate value to a file
 - `<Time Elapsed in secs(float), newSendingRate(in bytes/sec)>`
 - $\text{Time Elapsed} = \text{CurrentTime} - \text{BaseTime}(\text{Sender Initiated})$
- ▶ Once a file transfer completes, the sender instance must print the following information
 - Original File Size (In Bytes)
 - Number of Bytes actually sent
 - Time taken for the File Transfer



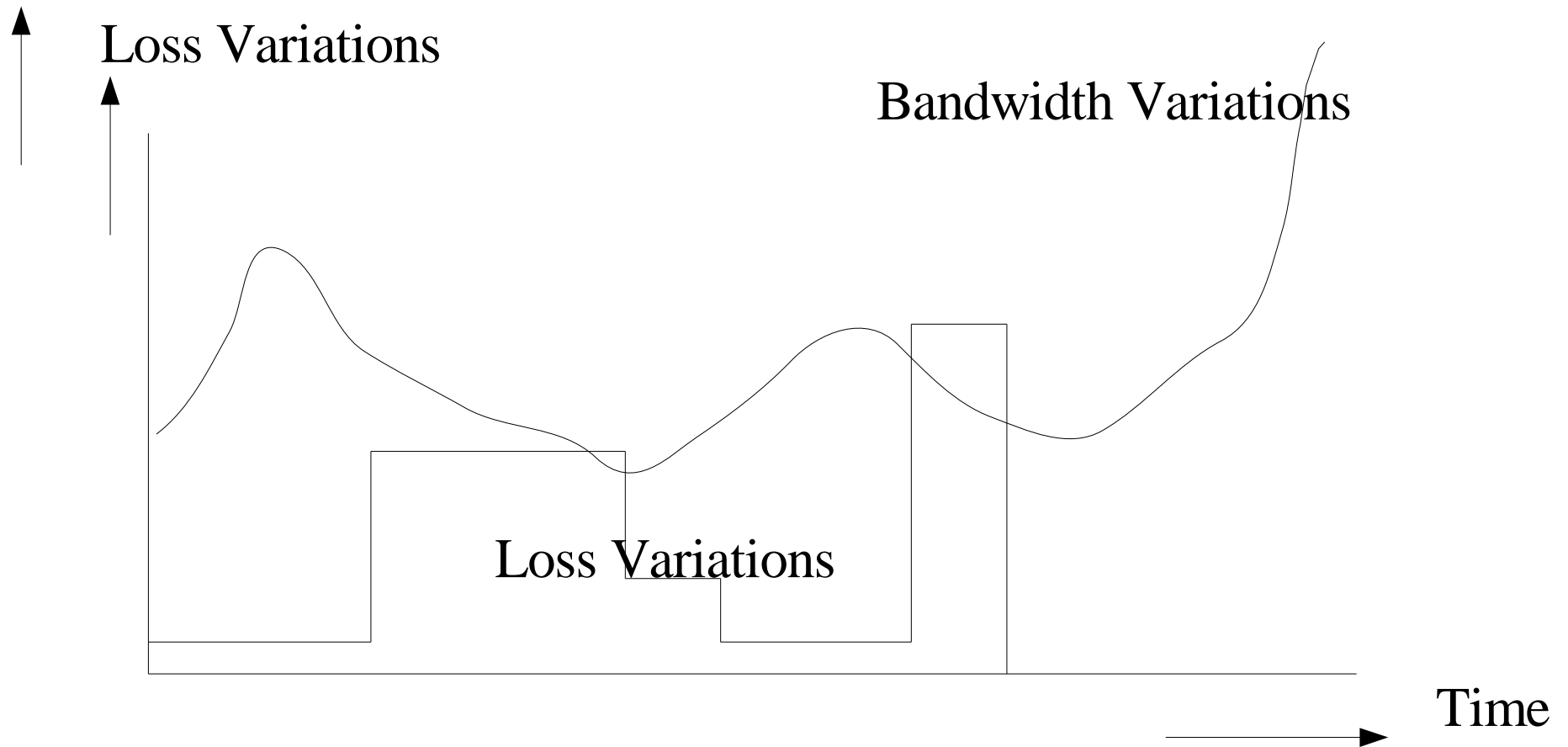
Plotting Loss Variations Against Sender Rate

- ▶ At the end of a File Transfer
 - Sender rate variations are available in the log file
 - The Loss rate variations(simulated) are available in file attached to the udppipe
- ▶ Plot the data of both files, in below format
 - x-axis: Time
 - y-axis-1: Loss variations
 - y-axis-2: Sender rate variations
- ▶ The graph shall depict the responsiveness of the congestion control mechanism



A Sample: Loss Variations Vs Sender Rate

Bandwidth Variations





Assignment-2 Deliverables

- ▶ Specification document: Add congestion control mechanism to the Assignment-1 specification.
- ▶ Protocol Implementation (Do not Forget to attach a simple readMe file with execution instructions)
- ▶ Submit a document that shows your protocol performance for four distinct test cases (you can also describe more test cases)
 - Each test case must contain the following data
 - Original File Size (In Bytes)
 - Number of Bytes actually sent
 - Time taken for the File Transfer
 - Link characteristics
 - Sender Rate variations
 - Options used in udppipe
 - Graph depicting sender rate variations against loss variations



Assignment-2 Deliverables contd..2

- You could also provide other statistics that can describe your protocol performance
- Make sure that the test case are really **distinct** from each other
- Test cases can be used to explain
 - In What scenarios the protocol performs well (and WHY)
 - In What scenarios, the performance gets bad (and WHY)
 - Reasons for observed protocol behavior
- ▶ All documents need to be in PDF
- ▶ DEADLINE: 26.05.2008 23:59



Thank You !
Any Questions ?