

## S-38.3180: Quality of Service in Internet

### Exercise 1: Rate Control and Queue Management

## Exercise material

- Source files for the exercises can be downloaded from the web-server
  - [www.netlab.hut.fi/opetus/s-38.3180/2006/harj/H1/](http://www.netlab.hut.fi/opetus/s-38.3180/2006/harj/H1/)

## diffnet.tcl

- Main program file containing
  - policy definitions
    - *confDSEdges voip1 voip5 <rate> <bucket size> 29\_app AF*
  - simulation
    - time controls
    - seeds

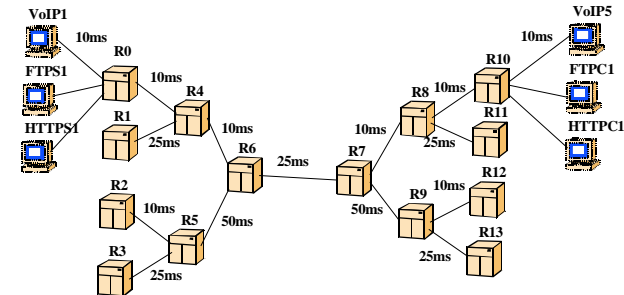
## 2q2p.tcl

- Configuration file containing necessary functions to setup appropriate queuing actions for each and every router.
- In the beginning of file there is a definitions for Random Early Detection parameters.
  - *set AF(in\_min) 30*
  - *set AF(in\_max) 60*
  - *set AF(in\_prob) 0.05*
  - *set AF(out\_min) 30*
  - *set AF(out\_max) 60*
  - *set AF(out\_prob) 0.05*
  - *set AF(qlimit) 100*

## Files

- topology.tcl
  - contains the definitions for the network topology
- peer\_setup.tcl
  - contains the definitions for setting the traffic sources up and running
- monitoring.tcl
  - contains functions needed to set up flow monitoring for each end every transfer within the network
- awk scripts to parse monitoring files
- shell scripts (\*.scr) to presentation of results

## Topology



## Running simulations

- In principle exercise requires that you
  - Make changes to the files
    - diffnet.tcl – rate control exercise
    - 2q2p.tcl - queue management exercise
  - run the simulation program with command
    - *ns diffnet.tcl*
  - run the shell script with command
    - *source stats.scr*

## Task (1/3)

- What is the effect of rate control mechanisms to different traffic types.
  - Set policies to form
    - *confDSEdges voip1 voip5 <rate> <bucket size> <application> EF*
      - To have drop policy for excess rate packets
  - How sensitive is the selection of token bucket parameters
    - How does TCP connections behave when different parameters are used
      - FTP which are long connections (low aggregation)
      - HTTP which are short connections (high aggregation)

## Task (2/3)

- How conventional RED operates
  - Set policies to form
    - *confDSEdges voip1 voip5 <rate> <bucket size> <application> BE*
      - Rate and bucket size have no meaning
  - Control of RED parameters is in 2q2p.tcl file BE section
    - See how throughputs change if set RED to be
      - Aggressive (low minimum and maximum threshold and large probability)
      - Conservative (large minimum and maximum threshold with low probability)

## Task (3/3)

- How conventional RIO operates
  - Set policies to form
    - *confDSEdges voip1 voip5 <rate> <bucket size> <application> AF*
      - Rate and bucket sizes should follow following principle
        - » Voip rate 100000 size 1500
        - » Http rate 150000 size 60000
        - » Ftp rate 500000 size 80000
  - Control of RIO parameters is in 2q2p.tcl file AF section
    - Configure RIO parameters so that you attain best throughput with uniform service among similar clients

## Documentation

- Write a report which answers the questions in previous slides.
- Also write your personal feeling of these mechanisms ability to control the part of quality they should.
- Your report should not exceed 2 pages
- Return it before 28.11.2006 / 1600
  - Course locker in G2-wing