Bandwidth Measurements from a Consumer Perspective
A Measurement Infrastructure in Sweden

Mats Björkman, Andreas Johnsson, Bob Melander

The Department of Computer Science and Engineering

Mälardalen University

Outline

➤ Background

➤ Description of an infrastructure and its tools

➤ Up and running, but for whom?

➤ Any objections?

➤ Experiences

➤ Future

Background

I am are here to report on an existing infrastructure for bandwidth measurements in Sweden.

Providers of tools and infrastructure:

Now we are getting involved!

Background cont.

Increase of broadband network access
Today: approx. 80 broadband access providers in Sweden
Link speeds from 0.25 Mbps to 100 Mbps
"Its a jungle"

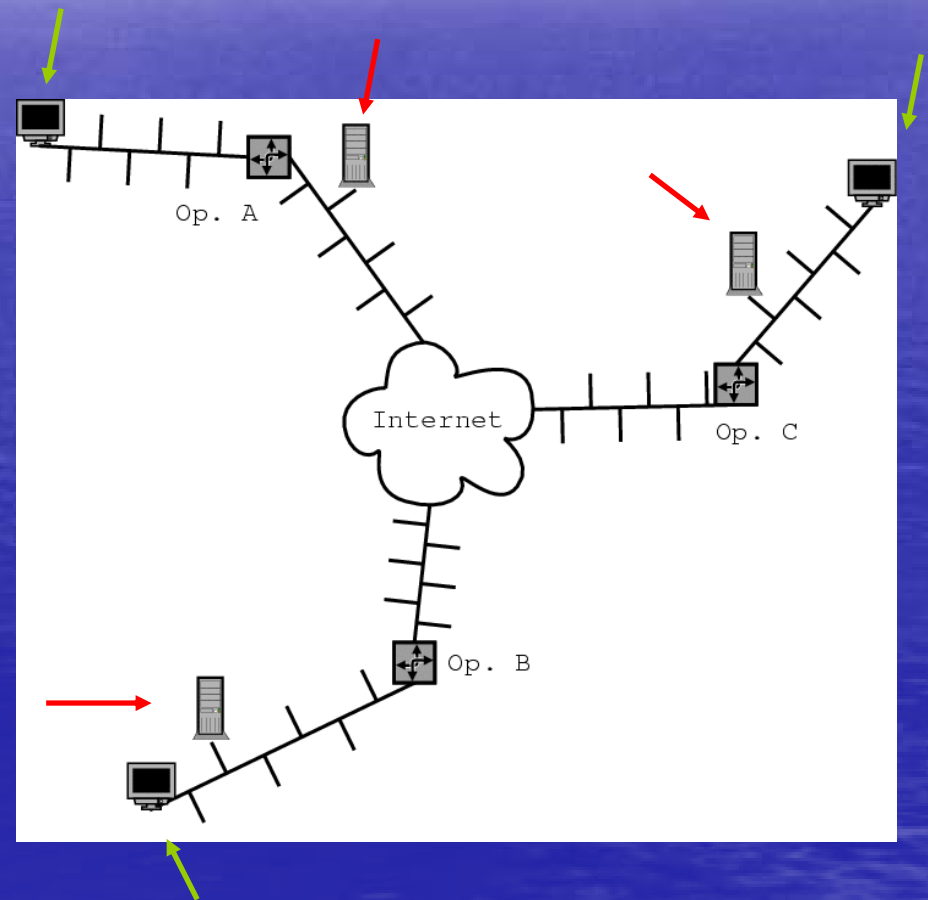A need for evaluation and comparison of broadband connections
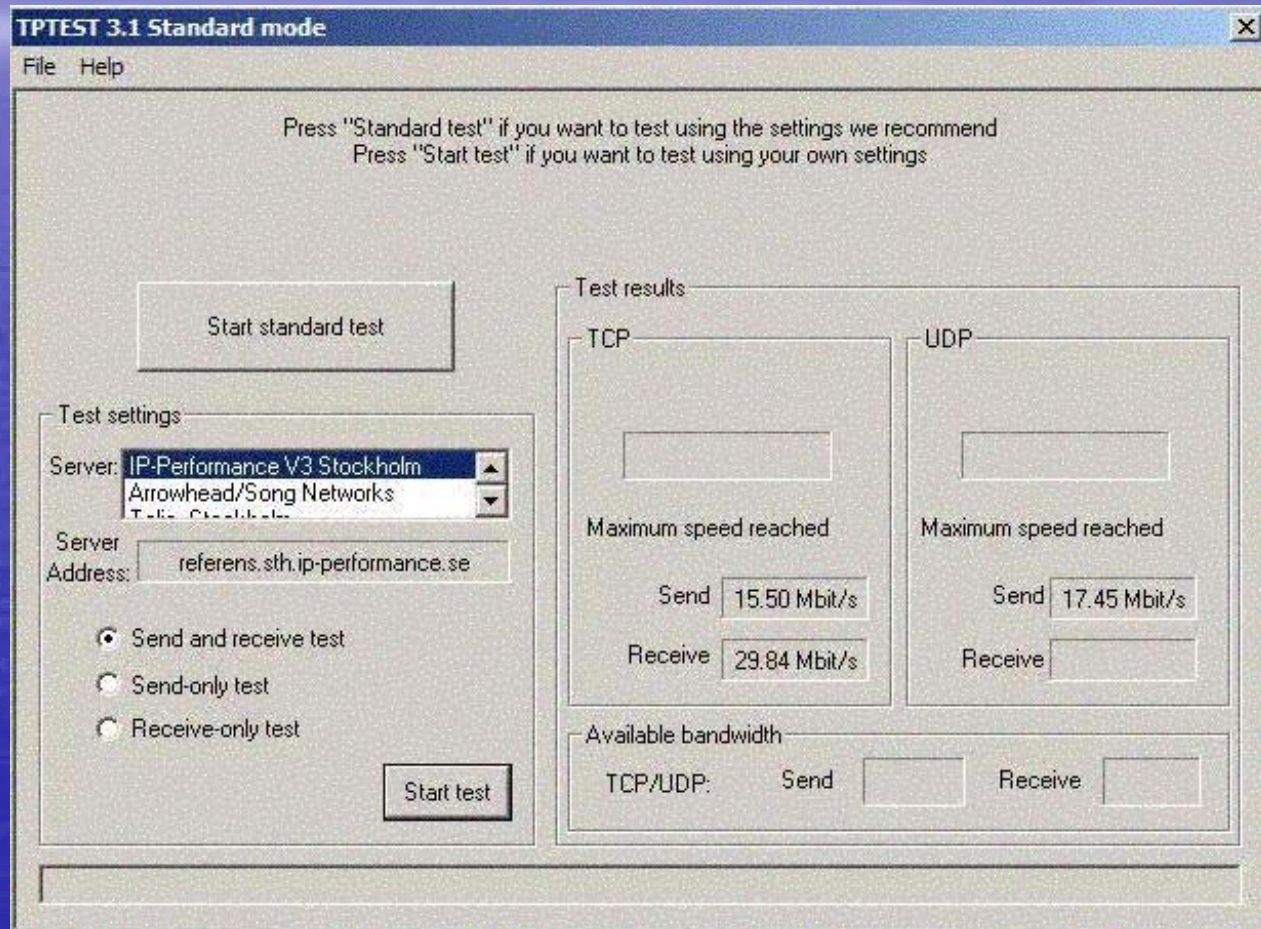
TPTEST

TPTEST infrastructure

- Test servers located at strategic points

- Clients choose which one to use for measurements

- Measures UDP and TCP throughput
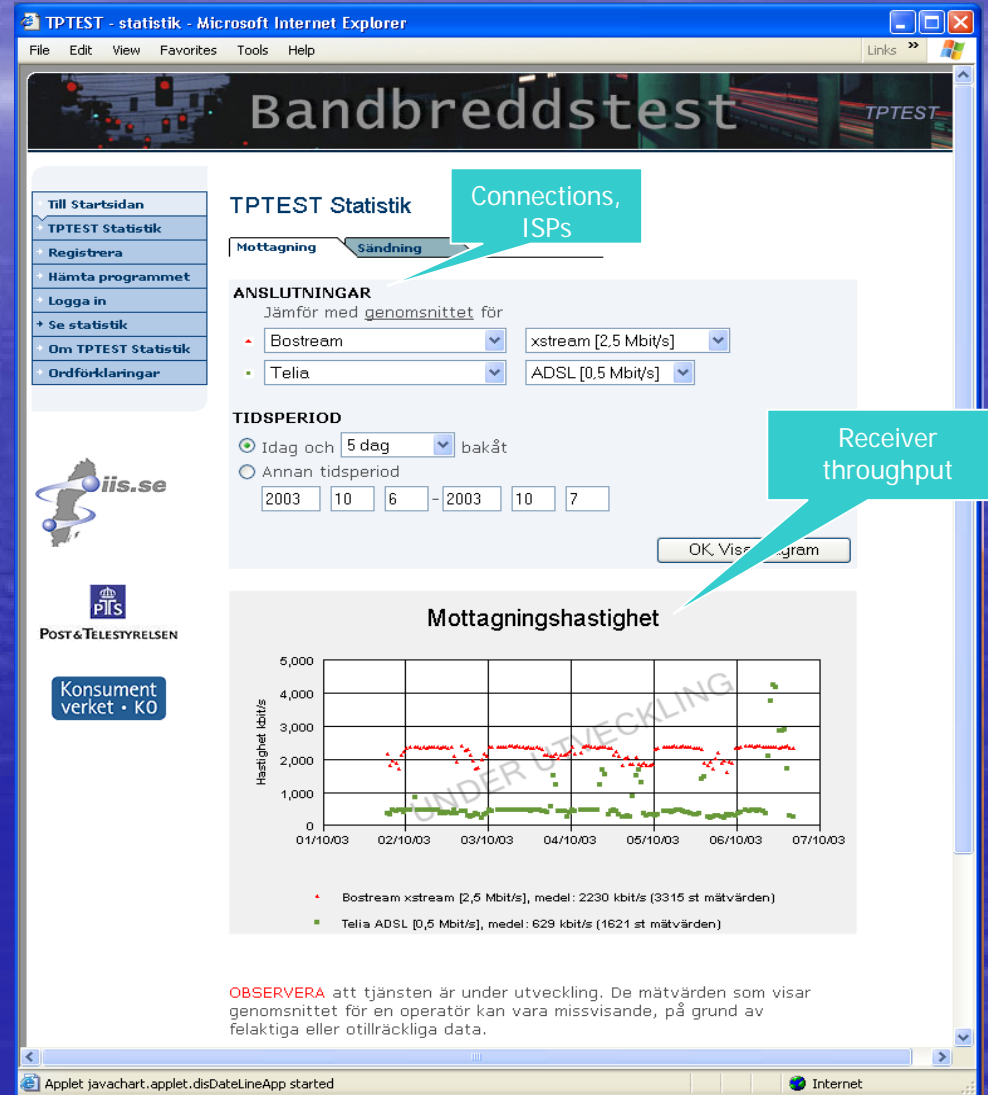
- Reference server provided by SUNET

TPTEST v.3

- TCP and UDP throughput tests

- Measure to and from servers

- Hard for users to interpret the metrics

- Improvement needed…

TPTEST 3.1 Standard mode

File   Help

Press "Standard test" if you want to test using the settings we recommend
Press "Start test" if you want to test using your own settings

Start standard test

Test settings

Server: IP-Performance V3 Stockholm
Arrowhead/Song Networks

Server Address: referens.sth.ip-performance.se

- Send and receive test
- Send-only test
- Receive-only test

Start test

Test results

TCP

Maximum speed reached

Send   15.50 Mbit/s

Receive   29.84 Mbit/s

UDP

Maximum speed reached

Send   17.45 Mbit/s

Receive

Available bandwidth

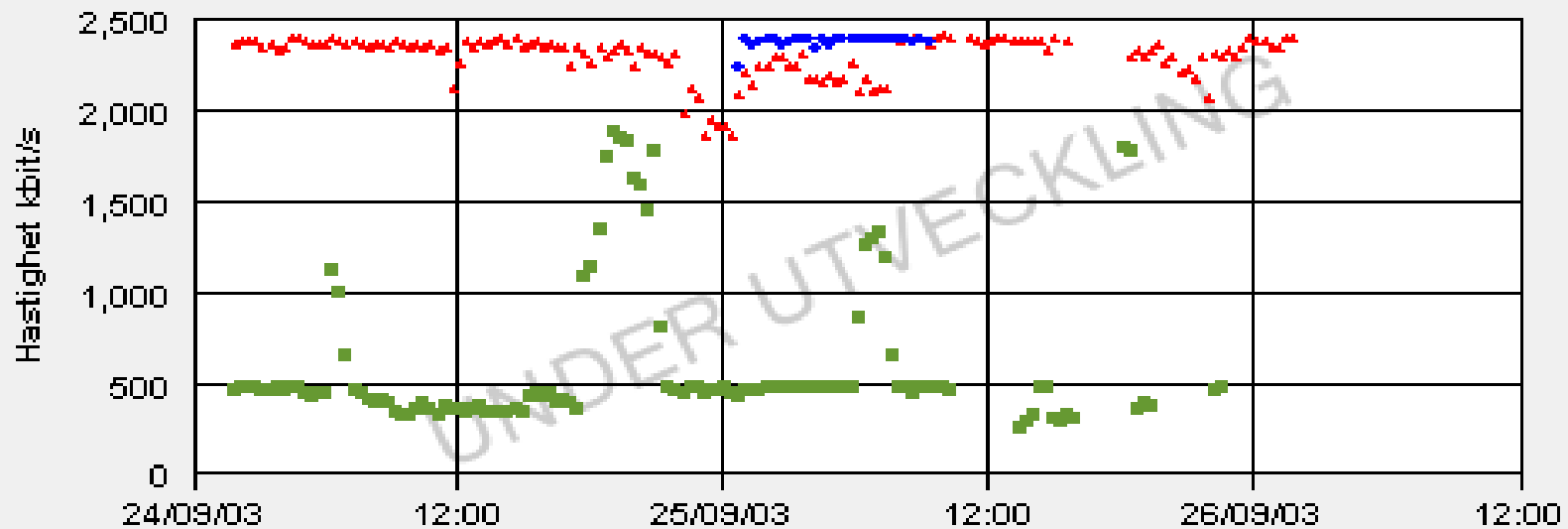TCP/UDP: Send   Receive

TPTEST Statistics (v. 4)

- No english version yet

- Users supply connection informaiton

- Offers comparison of operators

- User measurements can be stored in global database

- User measurements can be compared

The statistics in detail

Up and running, but for whom?

➢ Infrastructure

More than 10 operators offer measurement

servers

➢ Consumers

TPTEST v.3: around 5-6000 measurements / 24h

TPTEST v.4 has approx. 400 beta users

TPTEST objections

- Measurement by TCP
- Client computer bottlenecks
- Demands high amount of resources to do large throughput measurements
- TCP throughput and link bandwidth relation? (what do we really want to measure?)
- And more…

Experiences - Consumer view

- Keep it simple!
  - Installation and execution must be trivial
  - Interpretion of results must be simple (however, simplicity may lead to erroneous or unfair results)
- TPTEST v.3 has metrics that are hard to interpret, complaints from users
  - Only TCP throughput in v.4
  - Uses diagrams
- Pedagogics:
  - Why is TCP throughput much lower than the raw bandwidth promised by operators?
  - However, users seem to be educated through the TPTEST project...

Experiences – Governmental view

- The results must be trustworthy
  - in Sweden people trust the government to a higher degree than single companies
  - The service is not provided by a competitor (operator view…)
  - There are test servers provided by governmental agencies

- Important with user support
  - The organisations provide a bulletin board

Experiences – ISP/operator view

- Overall positive reception
- Operators in Sweden trust TPTEST developers and sponsors
  - Needed to make the infrastructure grow and to make consumers interested
- Concerns:
  - Important that TPTEST is accurate
  - Who is responsible if comparisons are unfair?
  - Can operators put their test servers at strategic positions that will benifit some and not others?

Experiences – ISP/operator view cont

➢ Used to find errors

ISPs use TPTEST to evaluate customer connections
when customers complain, ISPs ask "have you run TPTEST?"

➢ Less expected

ISPs/operators use TPTEST to find errors within their own networks
Want something that is easy to use…

Future

- Successful so far, project expected to grow

- Project openness to more accurate methods and metrics

- Help to interpret the results when using new methods and metrics

- TPTEST infrastructure – good platform to try out new research findings in a real topology

- More? Discussion wanted! ☺

More information?

My email:
andreas.johnsson@mdh.se

TPTEST steering group:
bandbreddstest@iis.se

TPTEST development:
ragnar.lonn@gatorhole.se

Sourceforge:
http://tptest.sourceforge.net
http://www.sourceforge.net/projects/tptest