Q2S-Centre for Quantifiable Quality of Service in Communication Systems

Centre of Excellence

at

NTNU-Norwegian University of Science and Technology

by

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URL: http://www.ntnu.no/Q2S/

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Outline of the talk

- NTNU
- The Centre of Excellence (CoE) scheme in Norway
- Centre for Quantifiable Quality of Service in Communication Systems *Centre of Excellence*
- Objectives of Q2S
- Key figures and status
- Research areas for Q2S
- Labs
- International collaboration

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NTNU facts

- Situated in Trondheim, Norway

- Started with NTH in 1910, NTNU established in 1996

- 7 faculties, 3 CoEs, and 53 departments

- 40 000 applicants each year, 5 500 of these admitted

- 20 000 registered students

- 2 500 degrees awarded each year

- 200 PhD degrees awarded each year

- Budget NOK 2.8 billion (EUR 340 million)

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Gløshaugen Campus

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The Centre of Excellence scheme

The Research Council of Norway initiated a Centres of Excellence (CoE) scheme, start-up 2003

The intention is to bring more researchers and research groups up to a high international standard. The centres will be devoted to long-term, basic research.

At present time there are 13 CoE in Norway

(http://www.forskningsradet.no)

Q2S-Centre for Quantifiable Quality of Service in Communication Systems
Centre of Excellence

Objectives

- The Centre will deal with Quality of Service (QoS) issues in heterogeneous, multilayered networks where packet switching technology is employed

- By services is meant traditional teleservices along with multimedia, messaging, web and information services, as well as location and content aware services

http://www.q2s.ntnu.no

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Objectives – cont.

- The Centre will study principles and mechanisms, methods and technical solutions and assess properties and performance by means of experiments and models

- The Centre will work within the areas multimedia signal processing, dependability, traffic and security as applied to multiparty communication.

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Key Figures for Q2S

Total yearly budget

- MNOK 30 (EUR 4.1 million)

Personnel

Today approx. 35 persons

- 6 professors
- 18 doctoral students
- 9 postdocs
- 1 visiting professors/scholars
- support personnel

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Research project areas

- Audio over IP Networks

- Multimedia over IP networks

- Interdomain and Overlay Networks

- Intradomain networks

- Trustworthy Multiparty Interactions in Dynamic Networking Environments

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Trustworthy Multiparty Interactions in Dynamic Networking Environments - I

Quantitatively assess whether an interaction among two parties can be established and completed with sufficient trustworthyness wrt availability, reliability, intergrity and confidentiality. Study mechanisms and assess them.

Interesting problems

- Development of dependability models and analysis of middleware

- Assessment of performance aspects of multicast protocols to ensure reliable, atomic or causal broadcast

- Development of models for (multicast) communication in ad-hoc and hybrid access and transport networks

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Trustworthy Multiparty Interactions in Dynamic Networking Environments - II

- Development of analysis mechanisms for sustainable interactions in highly unreliable environments
- Security mechanisms in dynamic environments with non-trusted parties, probabilistic assessment of them
- Models for quantitatively negotiable security policies
- Models for trust relationships in dynamic environments

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Labs

Audio lab

Video lab

Networking lab

-Nortel access routers

-Agilient protocol monitors

-Emprix network emulator

-simulators

Lab/testbeds

-routers

-live traffic

-traffic generators

-measurement tools
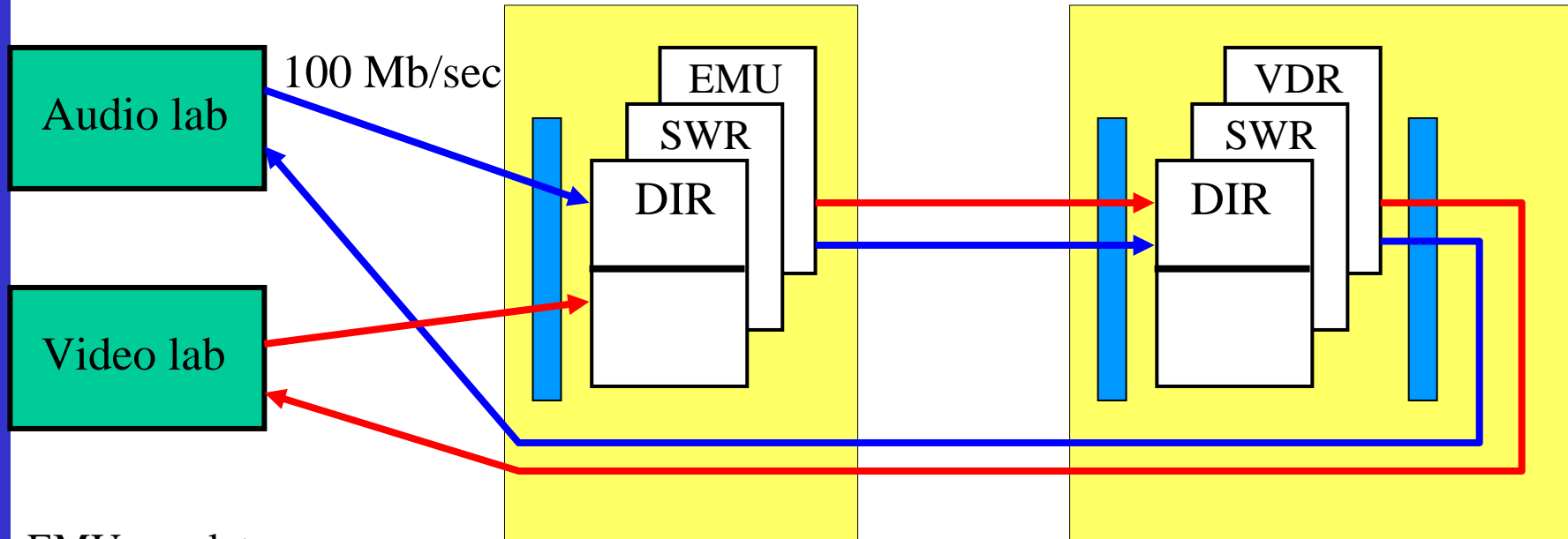
Dept. of Electronics and Telecomm.

Dept. of Telematics

UNINETT

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Labs for traffic studies

Multimedia lab

Networking lab

Networking lab
UNINETT

Audio lab

100 Mb/sec

Video lab

EMU
SWR
DIR

VDR
SWR
DIR

EMU-emulator
SWR-software router
DIR-direct connection
VDR-vendor routers

Instrumentation for measurements, registration
and storing of packets

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International collaboration

• Design and Engineering of the Next Generation Internet (EuroNgi), a Network of Excellence

• COST 276 "Information and Knowledge Management for Integrated Media Communication"

• COST 290 "Traffic and QoS Management in Wireless Multimedia Networks"

• SCAMPI - Scalable monitoring tools for the Internet

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EuroNgi
Joint Research Activities for Q2S

- WP.JRA.1.1 Horizontal and Vertical Integration of Fixed and Mobile Networks
- WP.JRA.2.1 Mechanisms and protocols for controlled bandwidth sharing
- WP.JRA.2.2 Traffic management in a multi-provider context
- WP.JRA.2.3 Traffic engineering for a cost effective network
- WP.JRA.2.4 QoS in multi-service wireless networks
- WP.JRA.3.3 Study of Methods for Achieving Network Resilience/Robustness
- WP.JRA.5.1 IP traffic characterization, measurements and statistical methods
- WP. JRA.6.3 Creation of trust by advanced security concepts

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