

INTERNET

TECHNICAL DEVELOPMENTS AND NEW APPLICATIONS

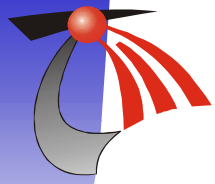
AIKO PRAS

<http://wwwhome.ctit.utwente.nl/~pras>

10 April 1999

BEROEPENORIENTATIEDAG TELEMATICA

UT - ENSCHEDE



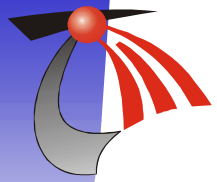
OVERVIEW

TECHNICAL DEVELOPMENTS

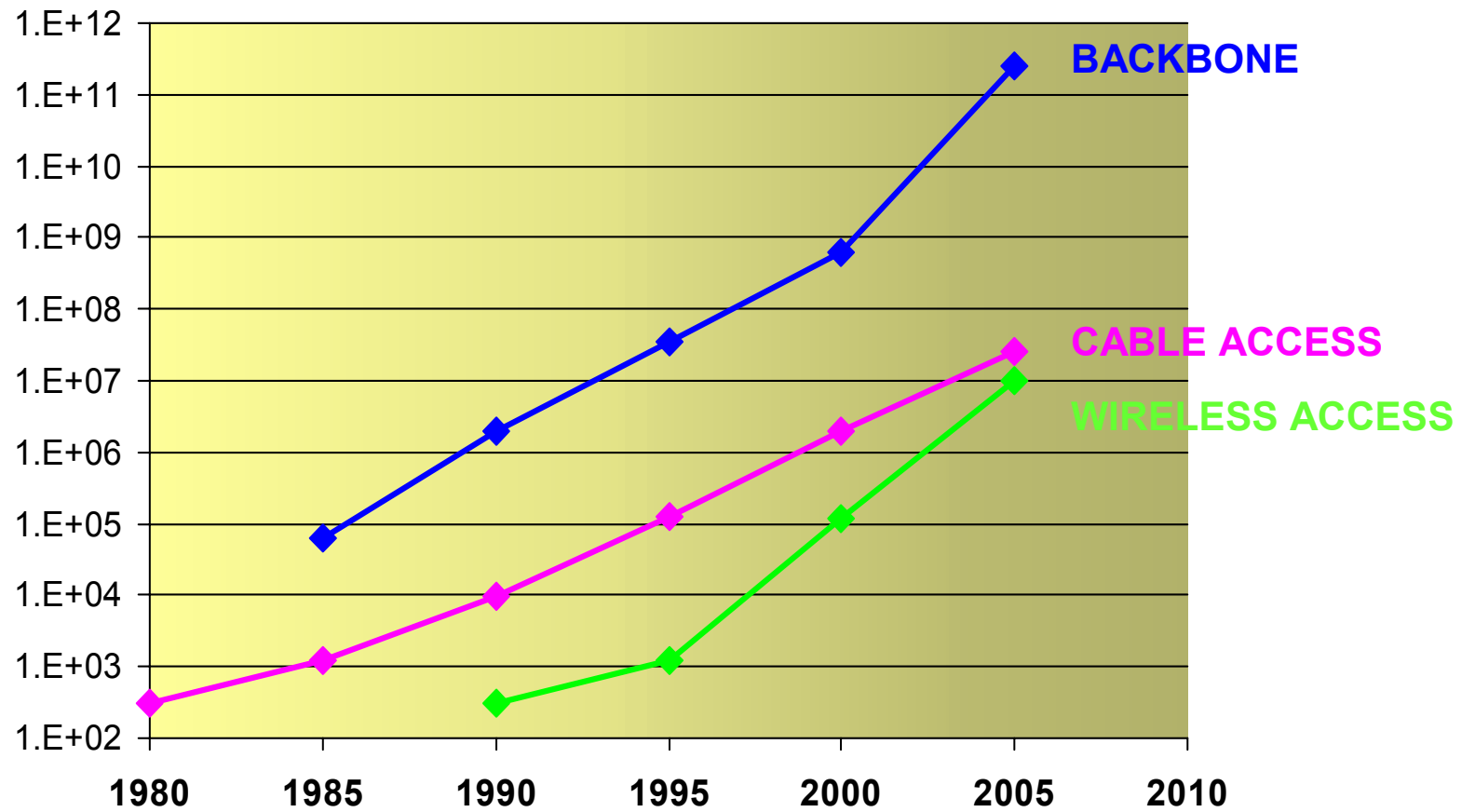
INCREASING NUMBER OF USERS

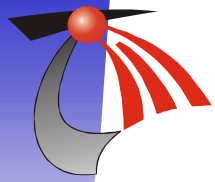
EXAMPLE APPLICATIONS:

- **ELECTRONIC COMMERCE**
 - **TELE-EDUCATION**
 - **ENTERTAINMENT**



BANDWIDTH





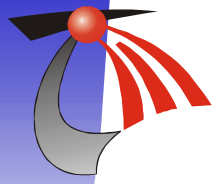
BANDWIDTH

CAPACITY ACCESS LINE IN THE YEAR 2005:

- **4 TO 10 DIGITAL TV SIGNALS**
- **100 TO 250 HIFI AUDIO SIGNALS**
- **2000 WEB PAGES PER SECOND**

CAPACITY BACK BONE LINE IN THE YEAR 2005:

- **100.000 DIGITAL TV SIGNALS**
- **2.500.000 HIFI AUDIO SIGNALS**
- **15 MILLION TELEPHONE CALLS**
- **25 MILLION WEB PAGES PER SECOND**

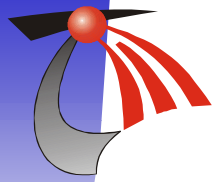


BANDWIDTH

DEVELOPMENT GOES ON!

CAPACITY BACK BONE IN THE YEAR 2010:

- **3 MILLION DIGITAL TV SIGNALS**
- **75 MILLION HIFI AUDIO SIGNALS**
- **500 MILLION TELEPHONE CALLS**
- **1 BILLION WEB PAGES PER SECOND**

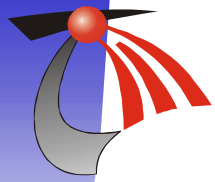


DIFFERENT QUALITIES

**APPLICATIONS HAVE DIFFERENT REQUIREMENTS
IT IS NOT SURE THAT THE NETWORK WILL ALWAYS BE ABLE
TO SATISFY THESE REQUIREMENTS**

**CAPACITY FOR (WIRELESS) ACCESS WILL BE SCARCE
WE NEED RESERVATION SCHEME'S
IETF: INTSERV**

**CAPACITY FOR BACKBONE MAY BE SCARCE
RESERVATION DOESN'T WORK
IETF: DIFFSERV**



DIFFERENT QUALITIES - II

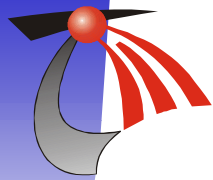
INTERNET NEXT GENERATION PROJECT

CTIT (UT), ERICSSON, KPN-RESEARCH, TI-CO

<http://ing.ctit.utwente.nl/>

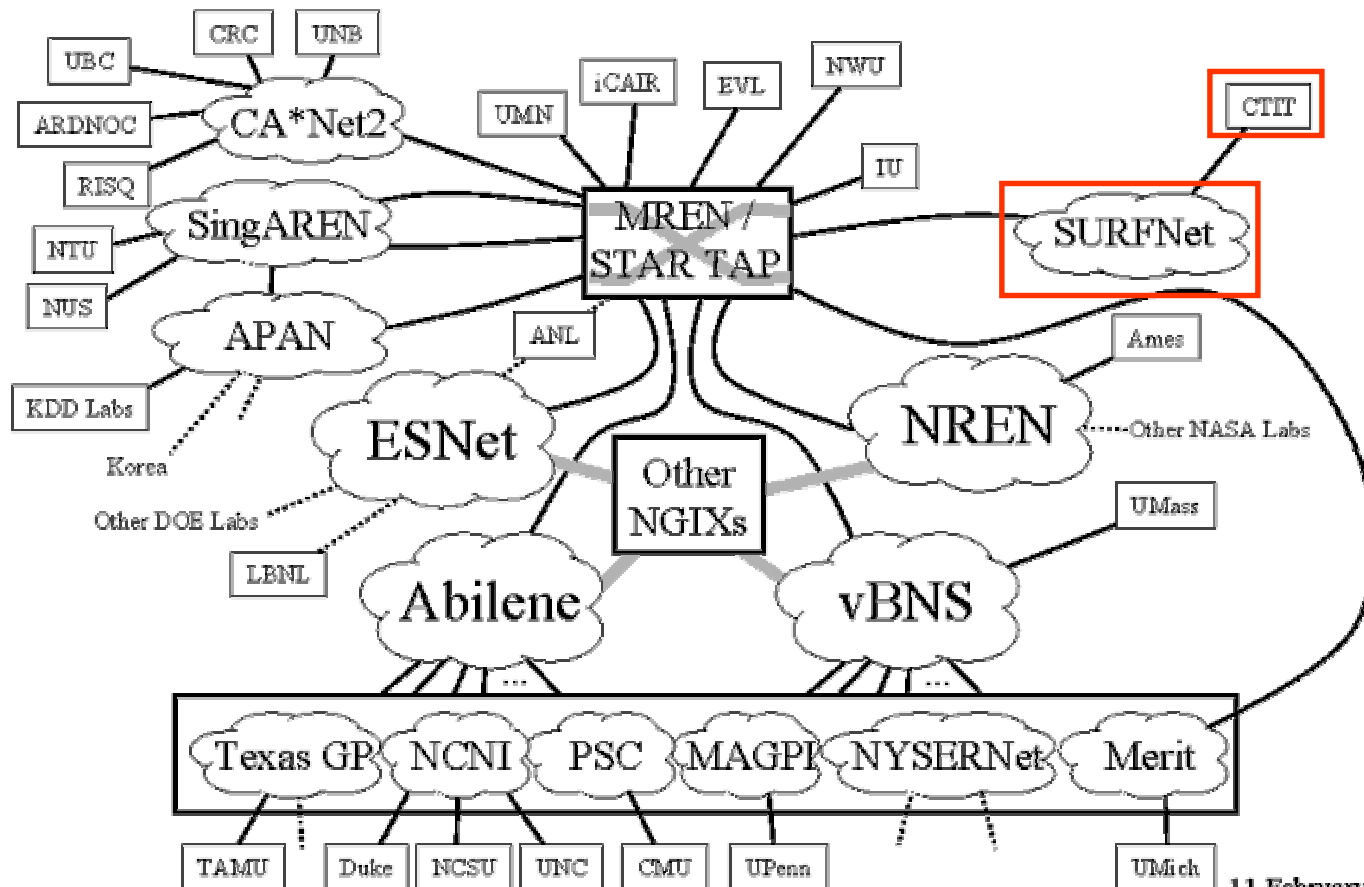
QBONE

INTERNET-2



Initial QBone Participants and Connectivity*

* Actual connectivity and participant group will vary as deployment progresses

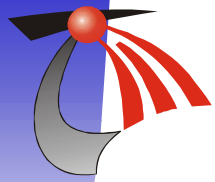




ACCOUNTING - I

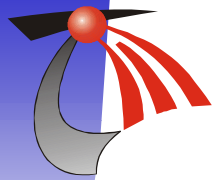
DIFFERENT QUALITIES?

DIFFERENT PRICES!

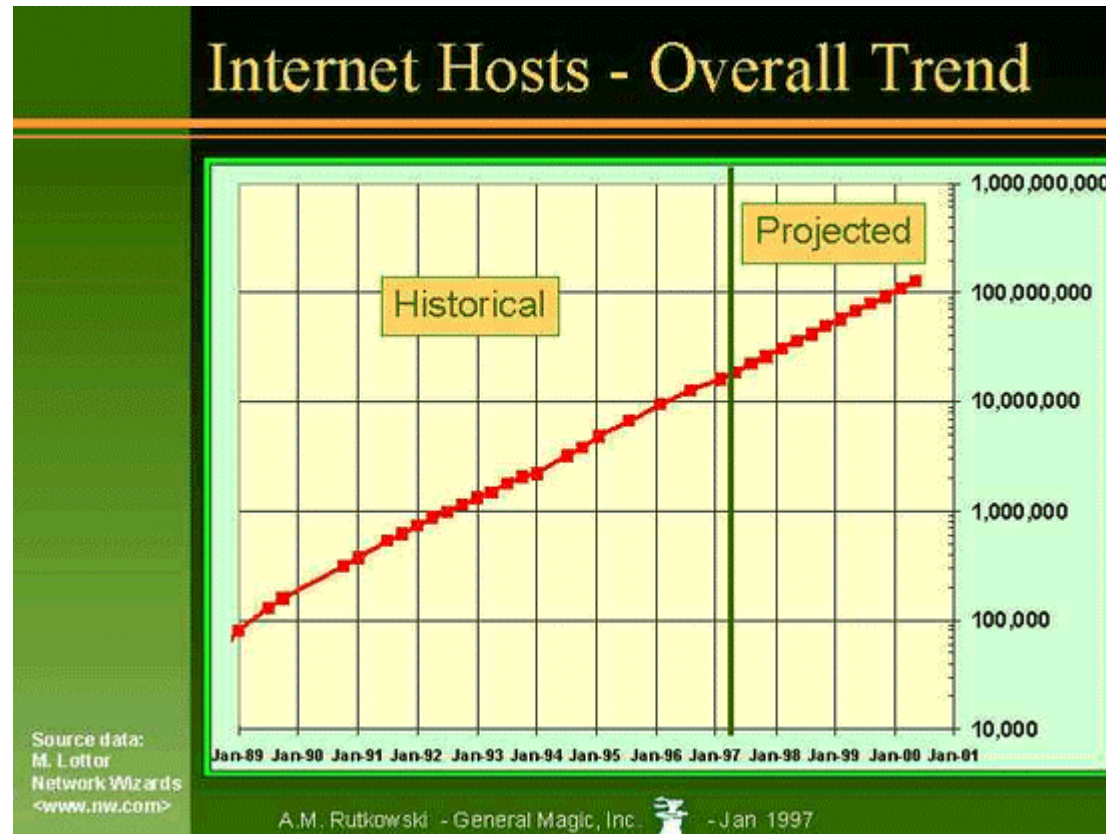


ACCOUNTING - II

- **IS IT POSSIBLE TO HAVE DIFFERENT TARIFS FOR LOCAL, NATIONAL AND INTERNATIONAL TRAFFIC?**
- **IS IT POSSIBLE TO HAVE DIFFERENT TARIFS FOR INTER AND INTRA OPERATOR TRAFFIC?**
 - **SHOULD ACCOUNTING BE BASED ON VOLUME?**
 - **WHAT INFORMATION IS NEEDED FOR ACCOUNTING**
 - **WHERE SHOULD THIS INFORMATION BE COLLECTED?**
 - **WHO MAKES THE BILL?**

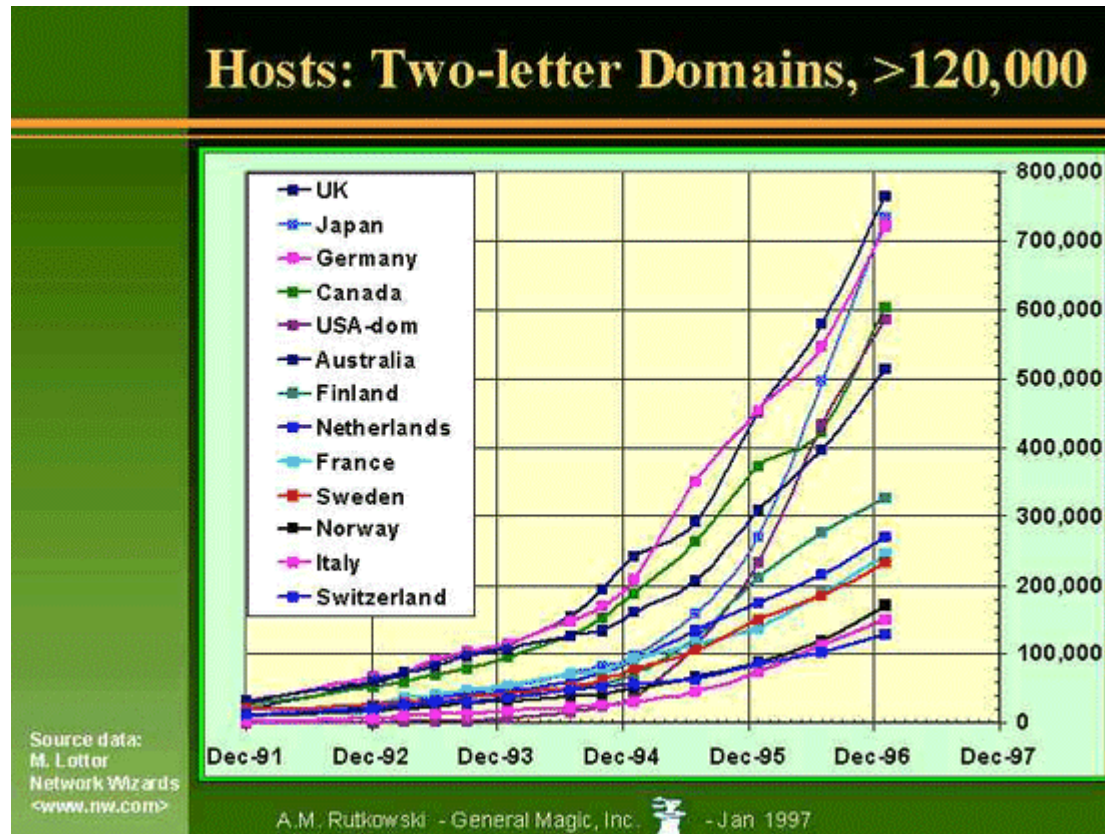


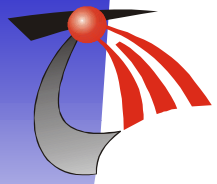
INCREASING NUMBER OF USERS





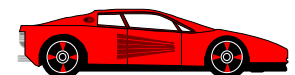
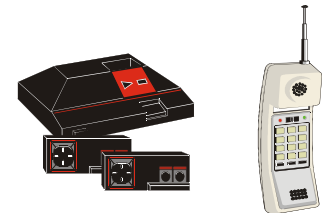
II INCREASING NUMBER OF USERS - II

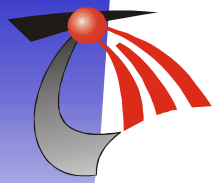




IINCREASING NUMBER OF USERS - III

- **MORE PERSONS**
- **MORE PCs PER HOUSEHOLD**
- **NEW TYPES OF EQUIPMENT**

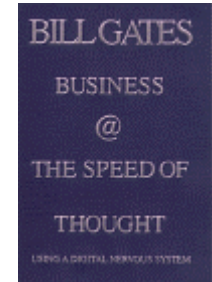




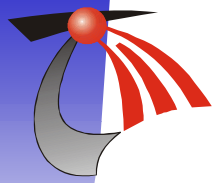
ELECTRONIC COMMERCE - I



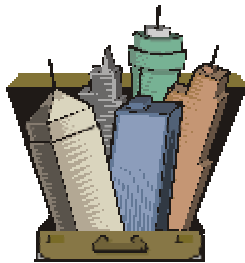
ELECTRONIC BOOKSHOPS
www.amazon.com



- **ROLE OF LOCAL BOOK SHOP?**
 - **ELECTRONIC BOOKS?**
 - **ROLE OF PUBLISHERS?**
 - **ROLE OF CENSORSHIP?**



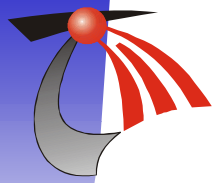
ELECTRONIC COMMERCE - II



HOUSES
www.nvm.nl



- **ROLE OF REAL ESTATE AGENTS?**
- **NO MORE INFORMATION MONOPOLY?**



ELECTRONIC COMMERCE - III

IN GENERAL:

- **SMALL COMPANIES GET DIRECT ACCESS TO END-USERS**
- **END-USERS GET DIRECT ACCESS TO MANUFACTURERS**



- **MORE SPECIALIZATION**
- **MORE DIFFERENTIATION**
- **GLOBAL COMPETITION**



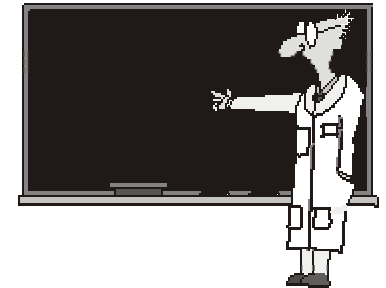
TELE-EDUCATION

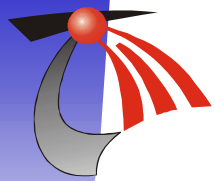
WITHIN UNIVERSITIES

<http://teletop.edte.utwente.nl/>

BETWEEN UNIVERSITIES

- COURSE COMPONENTS
- COMPLETE COURSES





ENTERTAINMENT

CONTACTS

RADIO

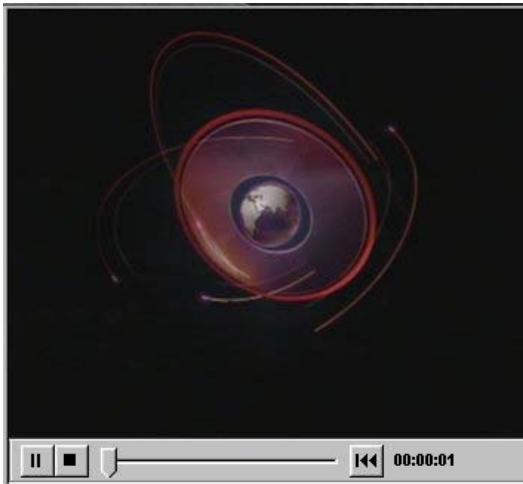
GAMES

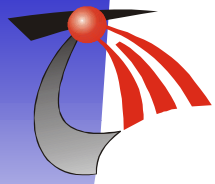
MULTI-USER GAMES

VIDEO ON DEMAND

TELEVISION

WHAT ROLE REMAINS FOR
THE GOVERNMENT?





CONCLUSIONS

- MAJOR TECHNICAL DEVELOPMENTS
 - MANY NEW APPLICATIONS
- IMPORTANT CHANGES IN SOCIETY
- CHANGING ROLE OF GOVERNMENT

- WE'RE JUST AT THE BEGINNING ...