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The rise and fall of ATM

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Contents

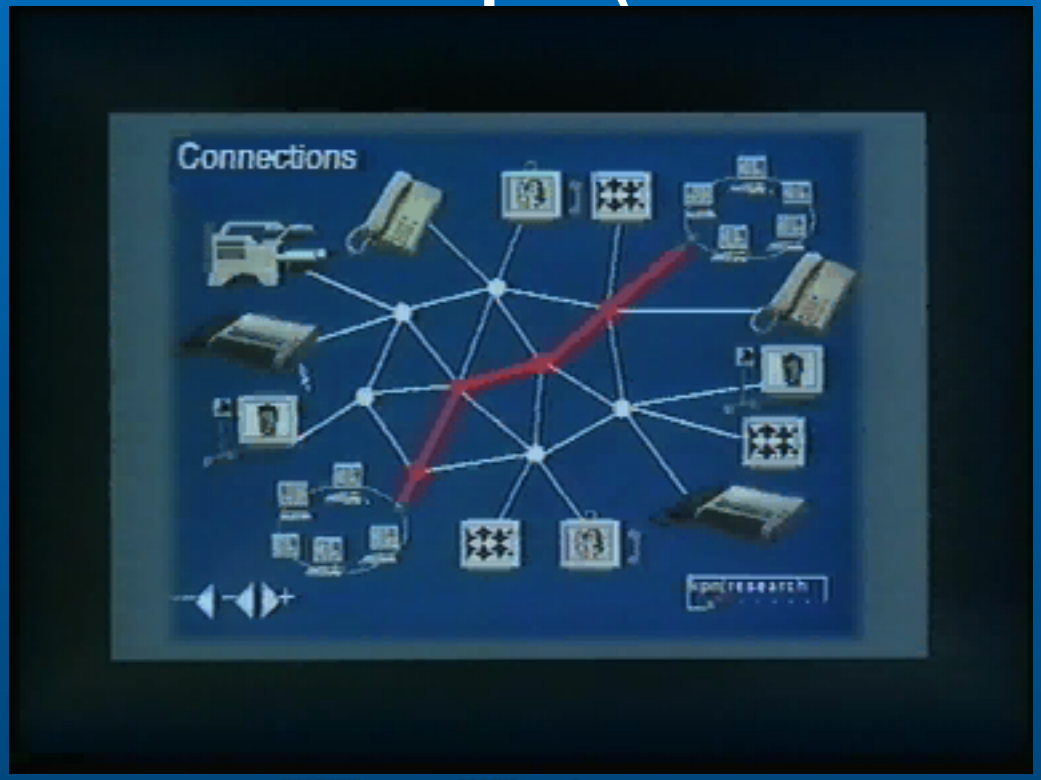
- Explain the title
- History
- Why ATM
- Progress (or not)
- Technology scenarios
- End user motivation
- Cost model

History

- 1994 SURFnet and PTT choose ATM
  - Data, voice and video mixed on backbone
  - Call for proposals on Applications
- 1995 Utrecht - Amsterdam tests
- 1996 All universities and research labs
- 1997 TF-TEN European pilot network
- 1998 Abandon ship, what has happened?

The train model

- **ATM looks so simple (movie 45/13 ≈ 3 min)**



Switches got complex

- Switched Virtual Connections
- Call Admission Control
- VBR, ABR
- Shaping
- Policing
- Flow Control
- Leaky Bucket
- Leaky as the pest

The swamp

- AAL, ABR, ATM, AvCR, CAC, CBR, CDV, CLP, CLR, CLR0, CRM, CTD, DSP, DTL, GCAC, IAS, ICR, IISP, NNI, NSAP, PG, PGL, PNNI, PVC, PVC, RCC, SVC, SVCC, UBR, UNI, VBR, VCC, VCI, VP, VPC, VPI, ...

The three scenarios

- **Bureaucracy**
  - Long turnaround (rtt ≈ days)
  - Expensive rented lines system
- **Complexity**
  - Automatic call setup
  - Needs probably also bureaucracy
- **Throw Bandwidth at the problem**
  - Might go wrong at bottlenecks
  - Easiest solution (UBR).

Positive remarks on ATM

- European PTT's learned to talk (n^2)
- Using CBR makes it a flexible leased lines system
- Can indeed give guaranteed RTT's and QoS

The remaining problem

- The big common sausage is not acceptable for everybody
- Need for differentiated services
- Balance resources
- Ways to go:
  - Higher layer (ATM -> IP)
  - RSVP
  - FLOW LABELS in IPv6

The management domains

- **Physics-UU to IPP-FZJ => 8 kingdoms**
  - **Physics dept**
  - **ACCU**
  - **SURFnet**
  - **PTT**
  - **Deutsche Telecom**
  - **WINS/DFN**
  - **FZJ-ZAM**
  - **FZJ-IPP**

End user motivation

- End users don’t want to pay
  - Decentralization places bills at end user
  - Users have a different “core business”
  - Internet is perceived as free and it works
- We must move forward
- Applications are the key

New cost model

- There is nothing like a free lunch
- Networks are expensive resources
- Borrow from supercomputer era
- New unit: megabit kilometer second (mks)
  - SURFnet has: 10 * 155 * 200 * 31536000 ≈ 9.8E12 mks
  - Dynacore needs: 20*400*80*8*3600 ≈ 1.8E10 mks
  - DAS needs: 24*10*100*50*24*3600 ≈ 1.0E11 mks
- Use ecash on virtual bank to account
- Use chipcards with certificates to do CAC

Discussion

- Which scenario to follow?
- Which other cost models are possible?
- If “real” money is the model, will it kill research networks?
  - I don’t contact Leiden University low temperature research group for a refrigerator
- Thanks