

Connection-oriented vs.
Connectionless communications

Convergence / Integration &
Co-existence

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Contents

- Keys for the implementation of data networks
- Elements of a vision
 - Network architecture
 - Access to Internet
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IP versus ATM

- “In fact, the designers of IPv6 could easily explain why they believe that ATM is a serious mistake.”
 - *C. Huitema, “IPv6: the new Internet Protocol”, Prentice Hall, 1996.*

- “The decision to migrate to ATM for the high-speed, low-delay links of the Internet may be forced by the advantages of ATM over IP.”
 - *J. Walrand and P. Varaiya, “High-performance communication networks”, Morgan Kaufmann, 1996.*

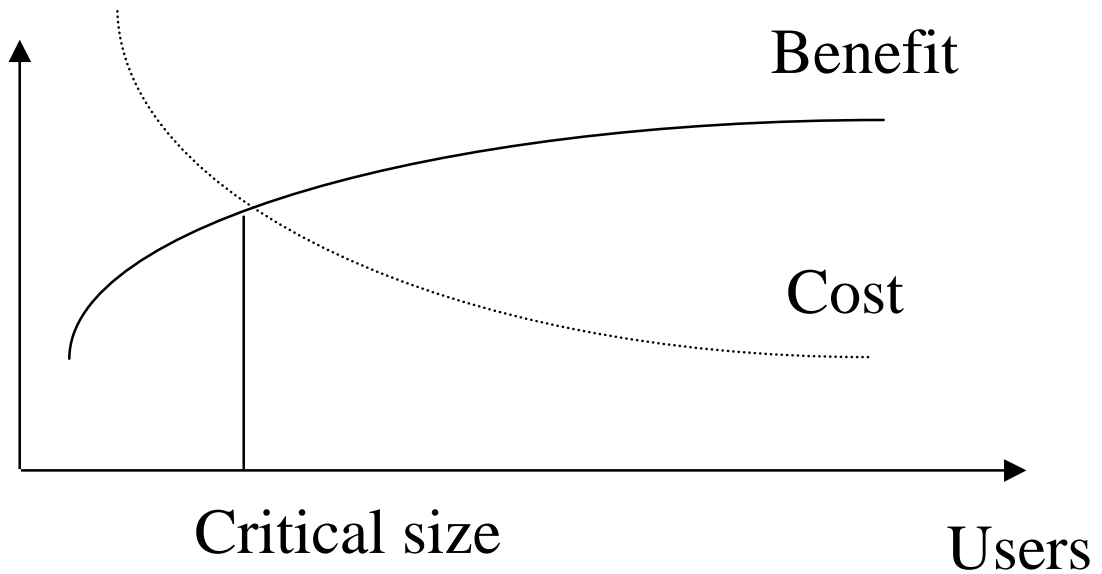
Keys for the implementation of data networks

- Economies of scale
- Economies of scope - service integration
- Market and applications driven, not technology driven
 - IP for applications
 - ATM for LAN interconnection

Is IP the driving force for ATM?

Economics

Benefit/Cost



- Costs
 - Bandwidth
 - Operation
 - Administration
 - Maintenance
- Benefit
 - Billing?

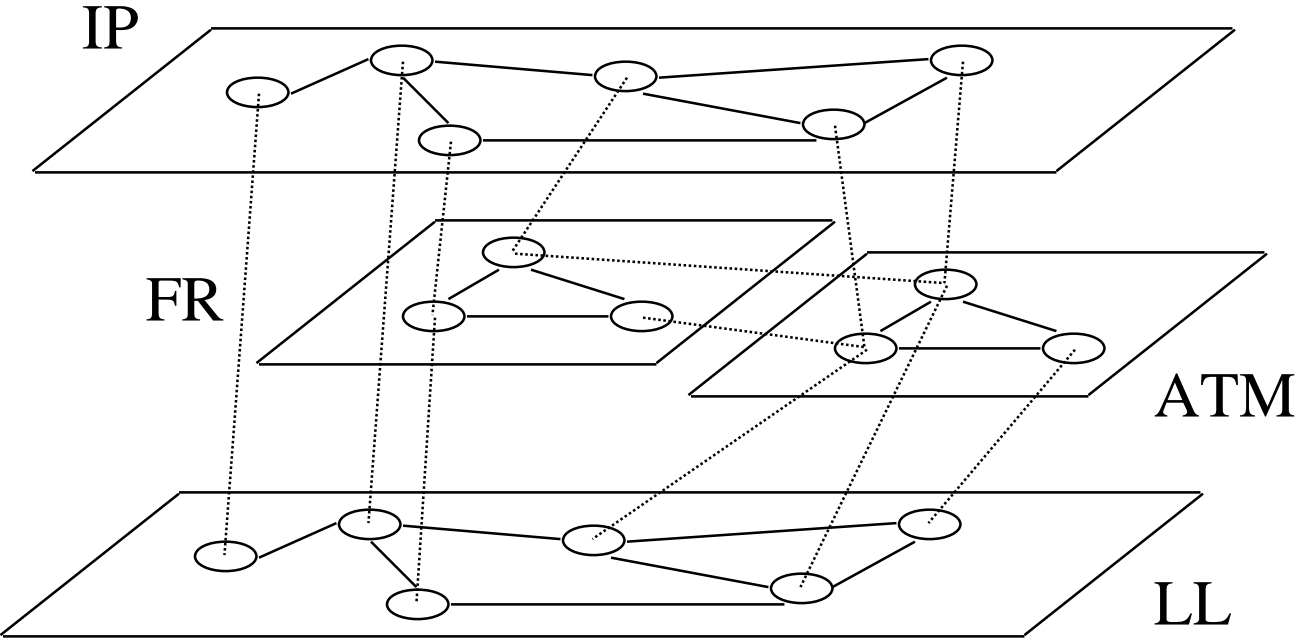
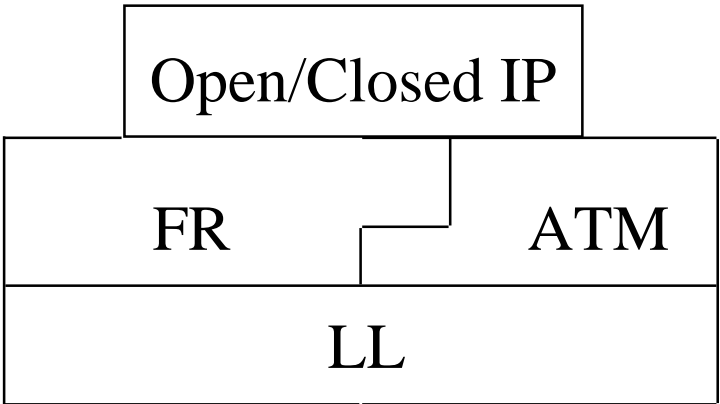
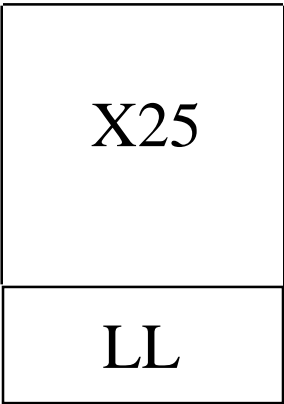
Elements of a vision

- No single network technology will emerge as the undisputed winner. The reason is in part technological, in part economic.

=> Co-existence of technologies

- Increase the number of functionalities on the platforms:
 - Service integration
 - Network interworking
 - Service interworking
- Shorten cycle time for provisioning and roll-out of new services

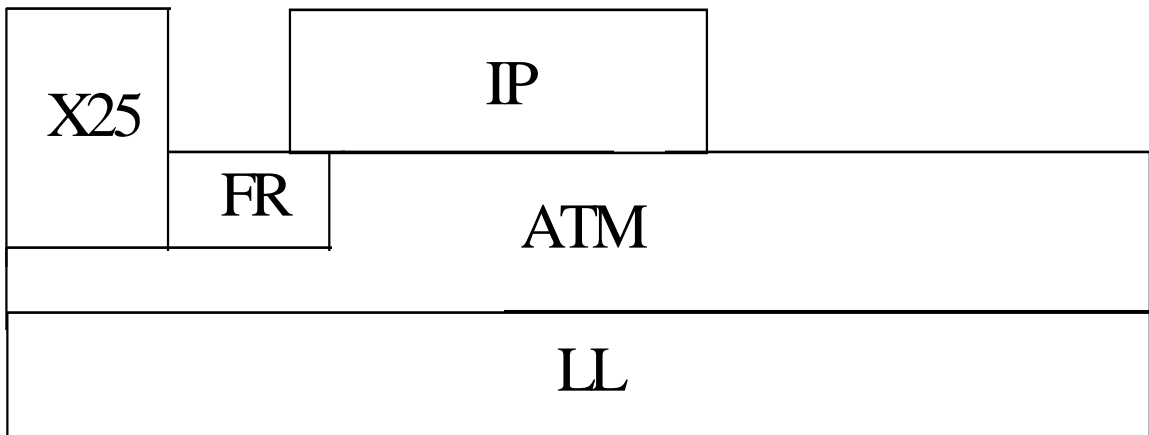
Architecture of data networks



FR = Frame Relay
LL = Leased Lines

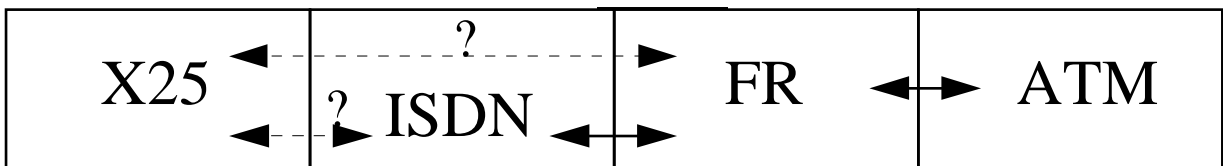
Long term data network

- Migration towards a single backbone platform
- Introduce many high speed nodes

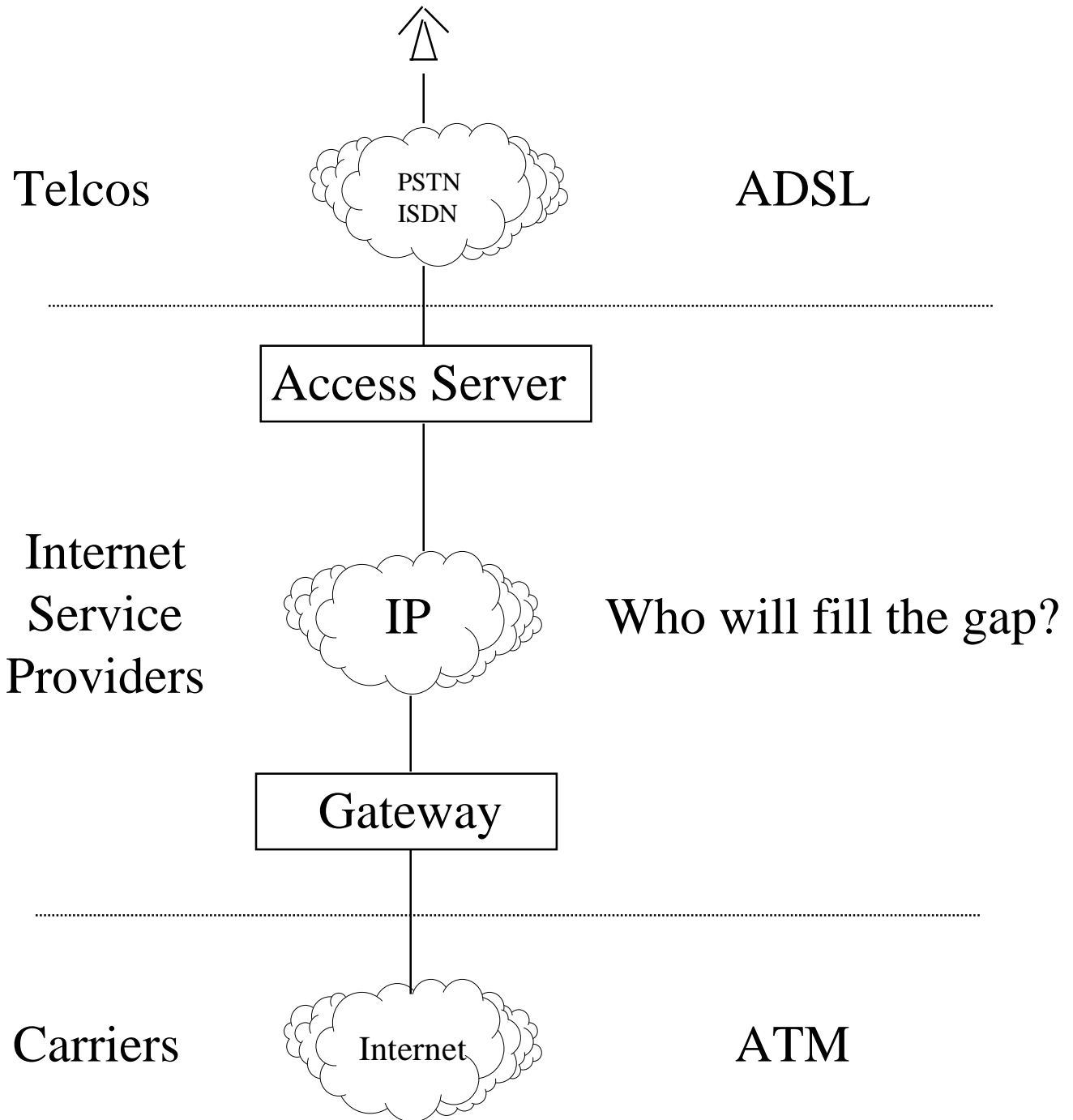


FR = Frame Relay
LL = Leased Lines

Service interworking between technologies



Access to Internet



Critical issues

- Challenges
 - Architecture
 - Quality of service and reliability
 - Mobility
 - Security
- Open questions
 - Who controls the access to the network?
 - Which applications?
 - On-line performance monitoring
 - Monitor the usage
- Role of a TELCO*ng*?

Conclusions

- Trends
 - Migration towards a single backbone platform
 - Increase in service integration and service interworking
- Rationale
 - Cheaper transmission costs (e.g. less leased circuits) and bandwidth
 - Better network management in longer term
 - Faster introduction of new services