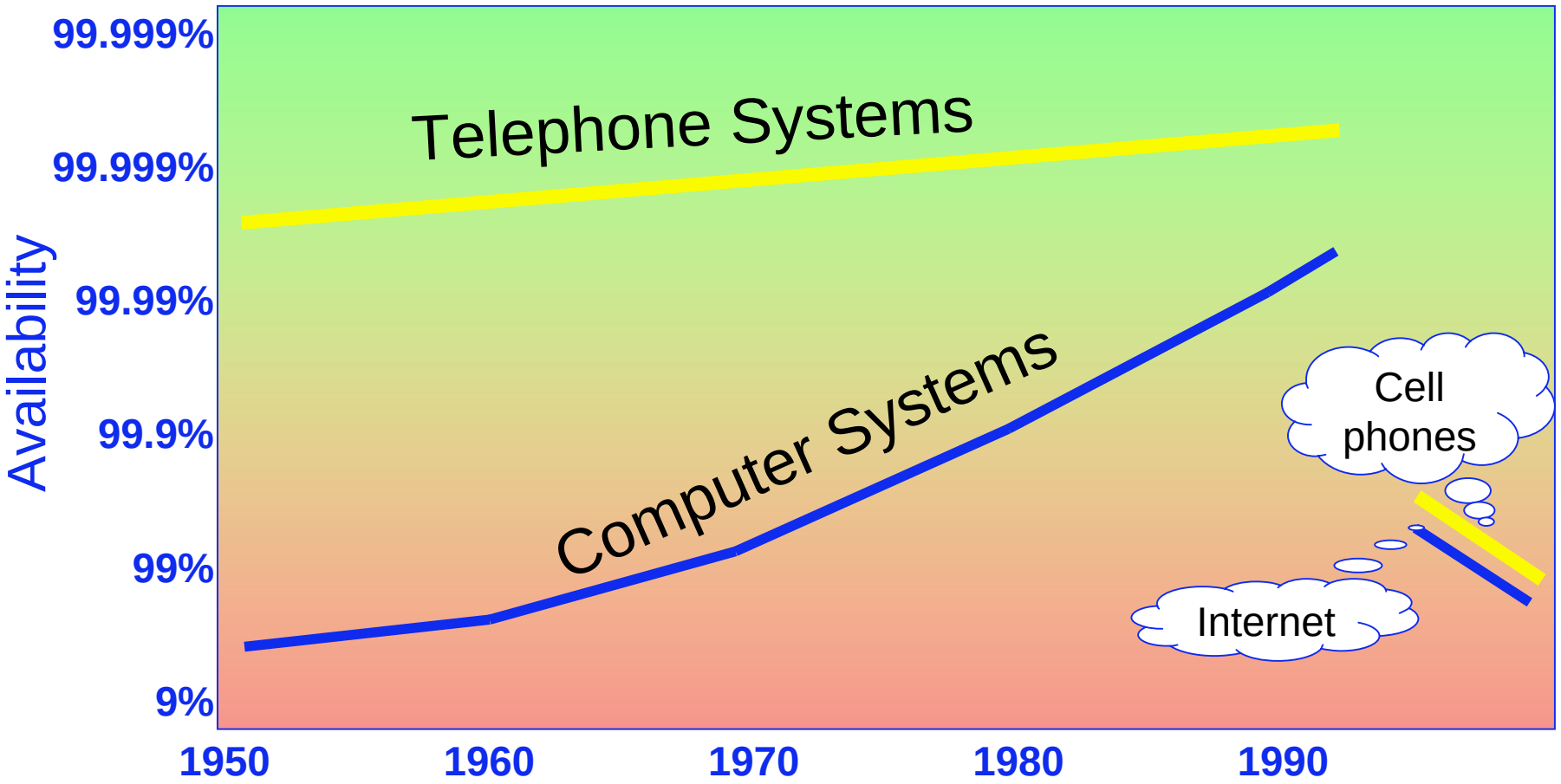
Fault Tolerance for Achieving Ambient Intelligence

Jean Arlat, Karama Kanoun and Jean-Claude Laprie

Consultation Workshop on "R&D Challenges for Resilience in Ambient Intelligence" — Brussels March 19, 2004

Evolution of Information Infrastructures



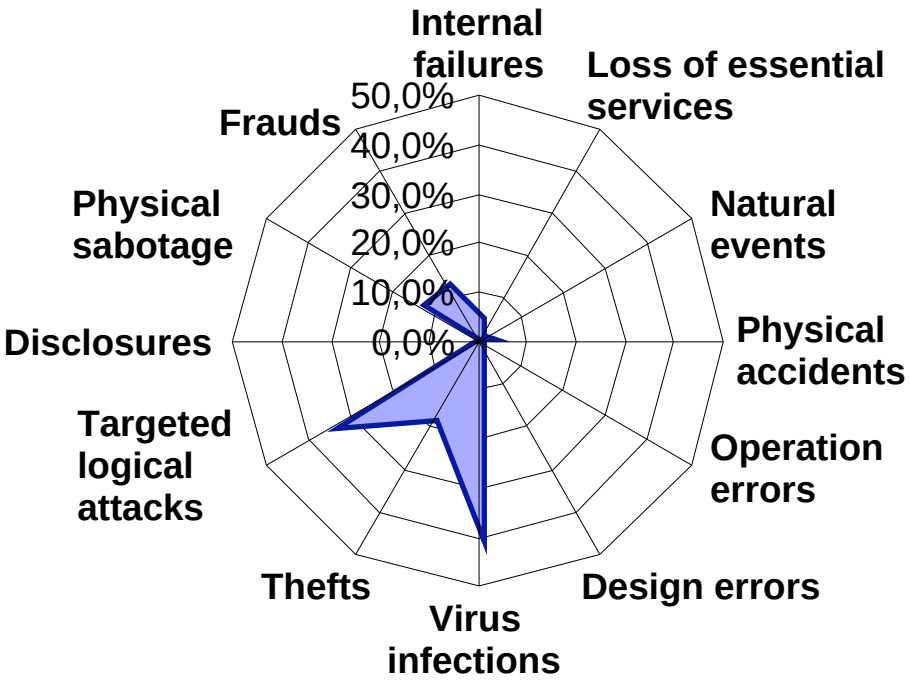
From J. Gray, Dependability in the Internet era

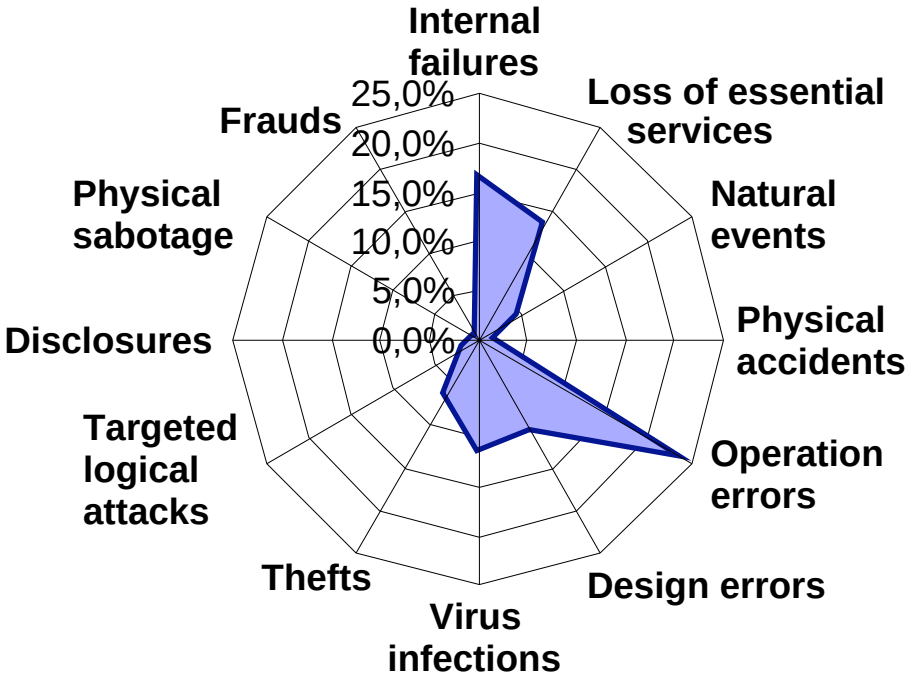
- Enhanced Functionalities and Complexity
- Economic Pressure

Perceived Risks *vs.* Actual Damages

- **Annual survey on computer damages in France**
  - **Year 2000**
  - **Representative sample of 450 organizations (size, activity domains)**

Perceived risks





Damage occurrences
(percentage of affected organizations)

The Important Issues

- Forecasted functionalities of the AmI make faults and vulnerabilities (even more) threatening

- Accordingly, dependability research has to face new challenges that are related to the AmI context

  -> Boundess openness

  -> Seamless evolutivity

  -> Dynamic mobility

A Way to Go

- Being able to tolerate (masking, detection, recovery) accidental faults (hardware, software and human-system interactions) in information infrastructures that support the AmI landscape is a prerequisite to be able to cope with malicious faults

- Assessment is required to support the design and deployment of trustworthy information infrastructures:
  - Analytical model-based dependability evaluation (large scale architectures and complex interdependencies)
  - Verification of fault tolerance (algorithms and mechanisms)
  - Controlled Experiments (robustness testing and dependability benchmarking)

- Assessment with respect to security-related properties and vulnerabilities