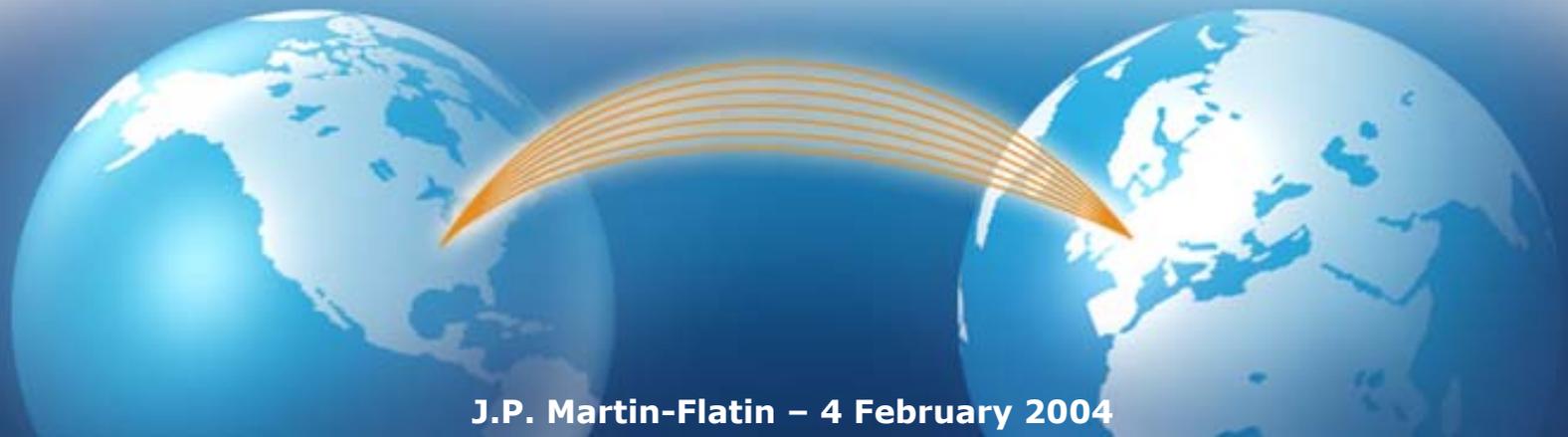# Research Perspectives on Managing Networked Systems and Services

J.P. Martin-Flatin, CERN, Switzerland
jp.martin-flatin@ieee.org
http://cern.ch/jpmf/

Interdisciplinary Research

- Networking
- Software Engineering
- Distributed Systems
- Artificial Intelligence
- Control Theory

Convergence

- Telecoms:
  - Network management
  - Service management
  - Network operators
  - ISPs
  - Service providers
- Enterprise management:
  - Systems management
  - Application management
  - (Service management)

Lessons Learned (1/2)

- Poor market awareness:
    - Mgmt concerns come second to technical perf.
- Security breaches call for better mgmt
- Open management: we have lost the initial vision
- From device monitoring to integrated mgmt

Lessons Learned (2/2)

- Scalability through distribution:
    - management by delegation
- Fast correlation of events against network topology:
    - codebook techniques
- Low-level data models for basic instrumentation are not enough

Research Topics (1/2)

- Event Correlation:
  - Distribution
  - Dynamically changing dependencies
  - Artificial intelligence:
    - learning systems
  - Fuzzy logic
  - Control theory
- Scalability through automation:
  - Self-managed systems
  - Autonomic computing
  - Configuration management

Research Topics (2/2)

- Management information modeling:
  - Ontologies
  - MDA
  - Multi-tier models
- Integration of management:
  - Devices, systems, applications, services, policies, etc.
- Information models and policies:
  - Adding constraints to behavior
- Security