Future Internet Assembly
Panel 3

Research Challenges in network management

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How to define Research Challenges

• EMANICS: European NoE on N&S management
• IRTF Network management Research Group
• Joint workshop, October 2006
• Paper IEEE Commag:

“Key Research Challenges in Network Management”
Aiko Pras, Jürgen Schönwälder, Mark Burgess, Olivier Festor, Gregorio Martínez Pérez, Rolf Stadler, and Burkhard Stiller
October 2007
Research challenges

- Management models
- Distributed monitoring
- Data analysis and visualization
- Economic aspects of management
- Uncertainty and probabilistic approaches
- Ontologies
- Behavior of managed systems
Management of the Future Internet

The preferred model is:

Autonomic management

Relevance: High
Originality: ...
Formulation: ...
Relation to Existing work: ...
Contribution: ...
"You know what they say: when you have lemmings, make lemming aid..."

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Formulation

• Terminology is unclear
• Definitions lacking
• What is relation between:
  – Automated
  – Automatic
  – Self *
  – Autonomic
  – Autonomous
Relation to existing work

- Nothing new
  - Expert systems (1990)
  - Routing, DHCP, …
  - Management lifecycle (1995)

Source: “Network Management Architectures”
Contribution

• Researchers generally focus on the advantages
• Researchers tend to avoid the real problems:
  – Application in specific domains
  – Interaction between multiple control loops
  – Stability of the entire system
  – Correctness of complex control software

• How to control the control loop???
Conclusion
Questions??