Classifying Network Complexity

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Intuitively, Network Complexity is Increasing ...

... but, what is “Network Complexity”?
You Need Complexity (at least some)

Robustness requires some complexity!
Dealing with Complexity

• Divide and conquer
  – Layering, object oriented approaches, ...

• Shifting complexity
  – E.g., away from the human

• Meta languages
  – CIM, NetConf

• Structural approaches
  – Reduce dependencies by design

“classes” matter, not instantiations!

Less human intervention: generally less complexity!
Elements To Consider: “State”

The “Complexity Cube”

The operator constitutes state.
Elements To Consider: “State”

The operator constitutes state.

You can shift complexity.

The “Complexity Cube”
Elements To Consider: “State”

The operator constitutes state

You can shift complexity

Shifting state may reduce complexity

The “Complexity Cube”

physical network

operator

network management
Security and Complexity

- Complexity can impact predictability
- Security requires predictability
Summary

• Need to understand and control complexity
• Human factor = state = complexity
• Shifting complexity can reduce overall complexity

• Future work:
  – Quantitative metrics
  – Impact of the rate of change
  – Investigate human factors