Towards Programmable Networks

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Active Networks

- Networks where each node can be dynamically programmed
- Why do we need this?
  - Intractable standardization
  - Replace committees with market forces
  - Allow greater extensibility of intermediate nodes
  - Intermediate nodes not keeping up with technology
Active Node Architecture

NetScript Agent

Virtual Network Engine (VNE)

Virtual Links (VL)

Physical Network

VNE Services
NetScript

- Agents deployed from any VNE to any other VNE(s)
- Think --> a pool of communicating threads
- Three distinguishing features:
  - Universal abstraction
  - Dynamic language
  - Dataflow language
Applications

- Remote Network Monitor
- SNMP Agents
- Normal Network Stuff (router, switch, etc)
- Firewalls
- Internet Telephony
- Multimedia (jitter control)
Conclusions

- Active Networks have been an idea for a long time
- Still many problems that need solving
  - Security
  - Stability
  - Mobile agents
  - Network management
- NetScript is an interesting idea, but needs more motivation