



# Next Generation RUNet 10GB Core

Presented to the Network Admins Meeting

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May 7, 2008



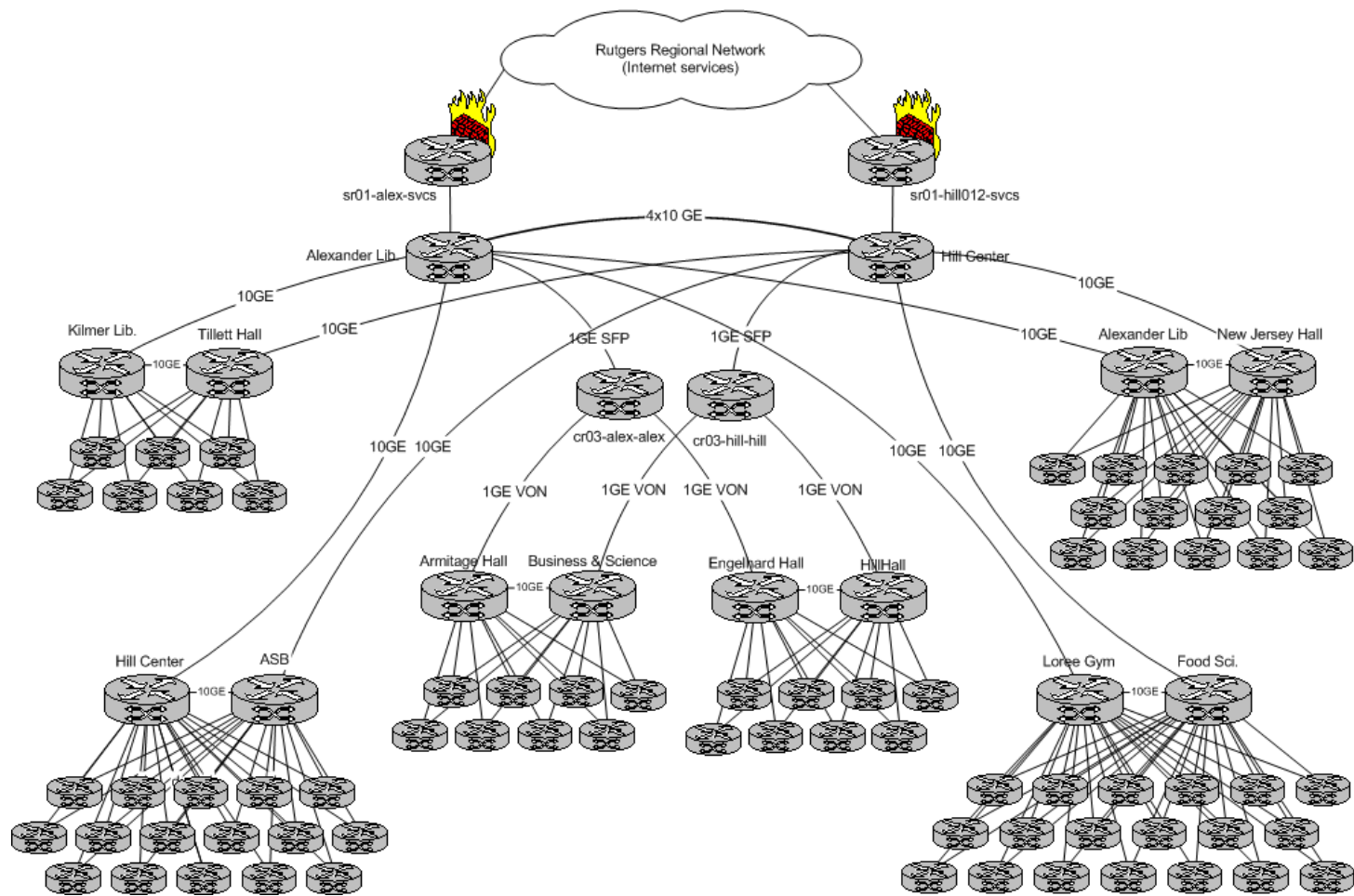
# Problems we're trying to solve

- Backbone “End of Life” exposures
  - Catalyst 4000 switches (9/2009)
  - Cisco GSR 12008 (2/2009)
    - GRP/GRP-B
    - OC48 SRP “Engine 0”
- Reliability
  - Three major faults in three years due to component failures
    - In all three cases, component failures introduced errors and oscillations into ring
    - Prompted our building the “Core for Hope” to ensure against ring partition
  - Gigabit Ethernet is better understood, supported and cheaper

# Problems we're trying to solve

- Scalability
  - OC48 is 2.488Gbps full-duplex - adequate but expensive to scale
  - SRP has poor Multicast heuristics
  - Distribution switches lacked support for Class of Service and Multicast
- Technology support
  - DPT/SRP for Rutgers is a blind alley; no viable path forward
  - Interest in real-time, interactive “rich media” technologies driving need for robust networking
  - Increasing demand for Gigabit-connected edge (“evolving standards”) prompting need for more aggregation

# The new look of RUNet



# Key highlights

- Based on Catalyst 6500E Series with:
  - Supervisor 720, MSFC3,
  - PFC3c Performance feature card
  - DFC3c Distributed switching line cards
- 10 Gbps Ethernet optics expandable to 40Gbps
- 1+1 Redundancy at campus edge mitigates risks from power fail
- Layer 3 links
  - Hardware switching as fast as Layer 2
  - No Spanning Tree convergence in the core
  - Distributed L3 switching can take advantage of Non-Stop Forwarding
- Design can scale (devolve) back to A-tree later, if necessary

## Benefits of the new core

- 10Gbps Ethernet is commoditized
  - Lower interface costs make scaling up cheaper
  - Familiar technology easier to manage
  - EtherChannel technology can help meet additional demand before 40Gbps and 100Gbps are ratified
- Sets RUNet on a food migration path to keep pace with demand and technology
- “Smarter” distribution layer and L3 core provide good heuristics for IP Multicast and Class of Service
- Newer hardware support could help RUNet move to a more distributed model
- Lets us focus on updating edge routers and access layer devices

# Questions?