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Beyond 200 Gbps

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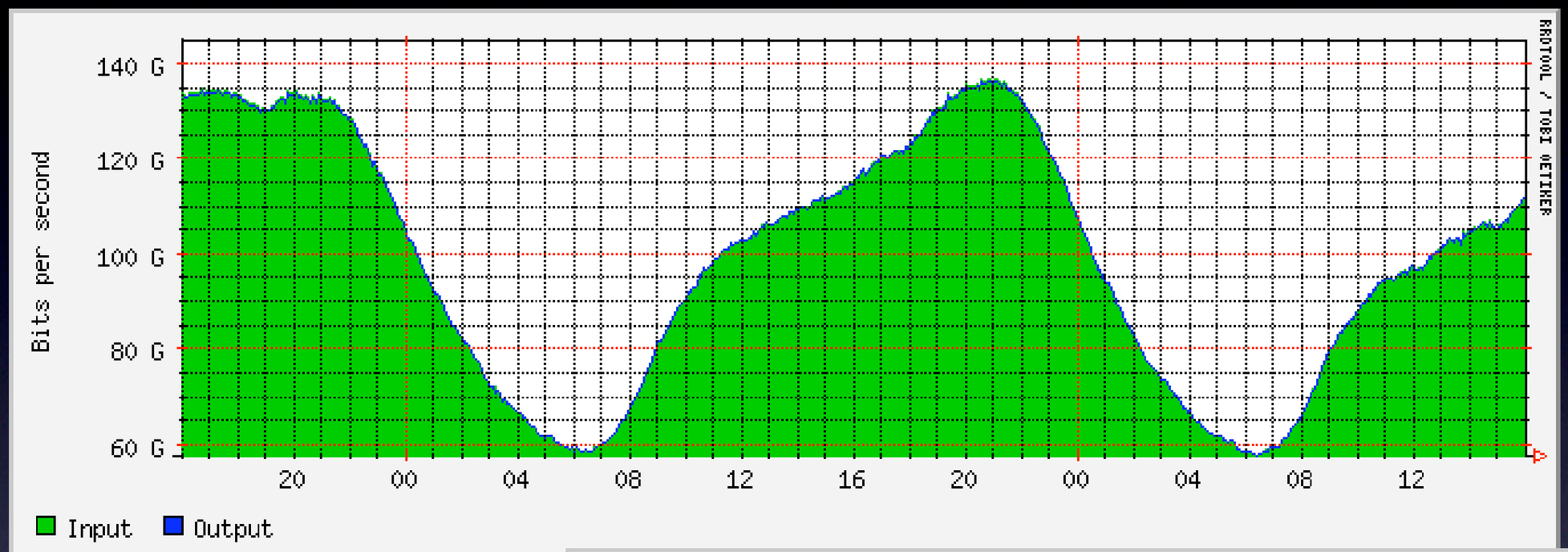
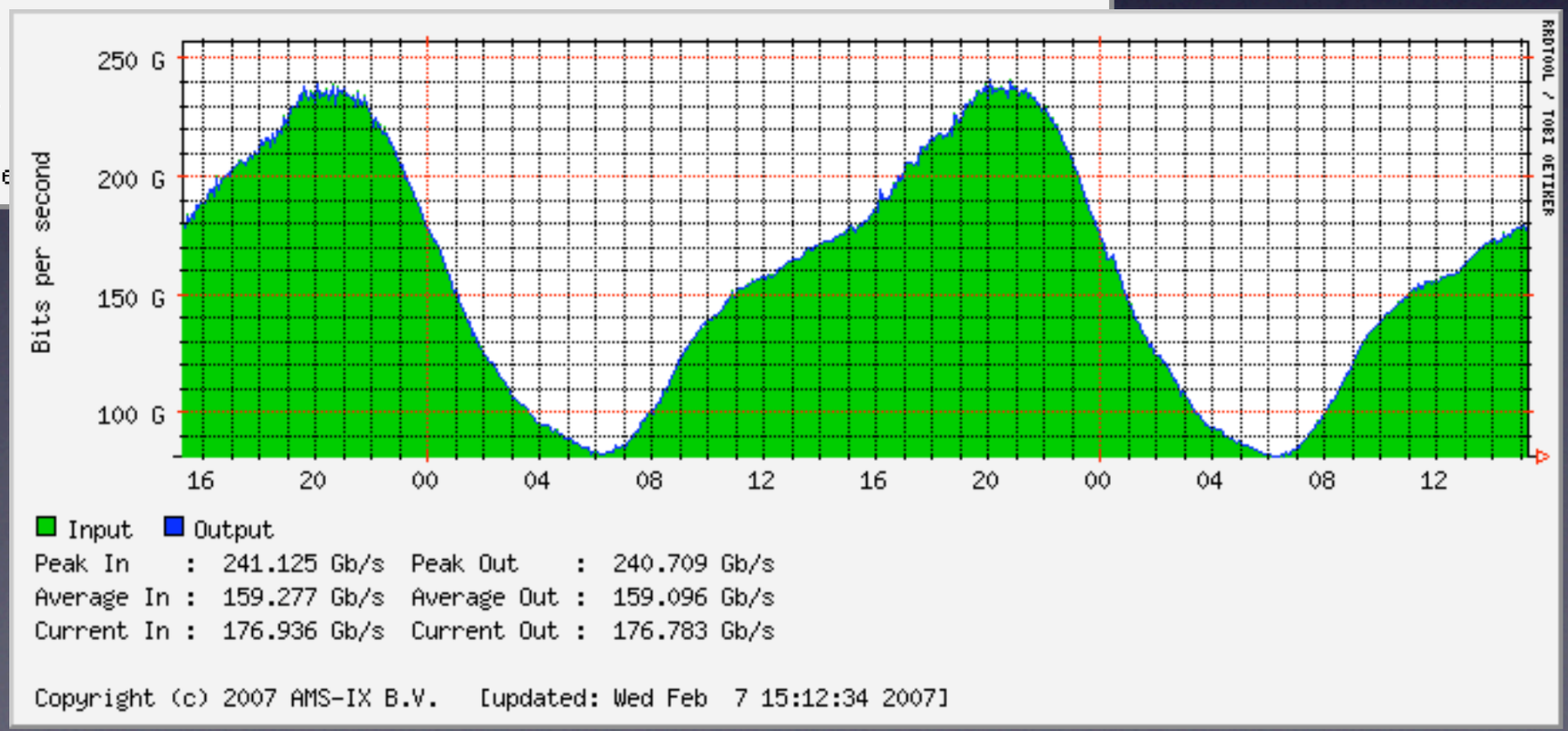
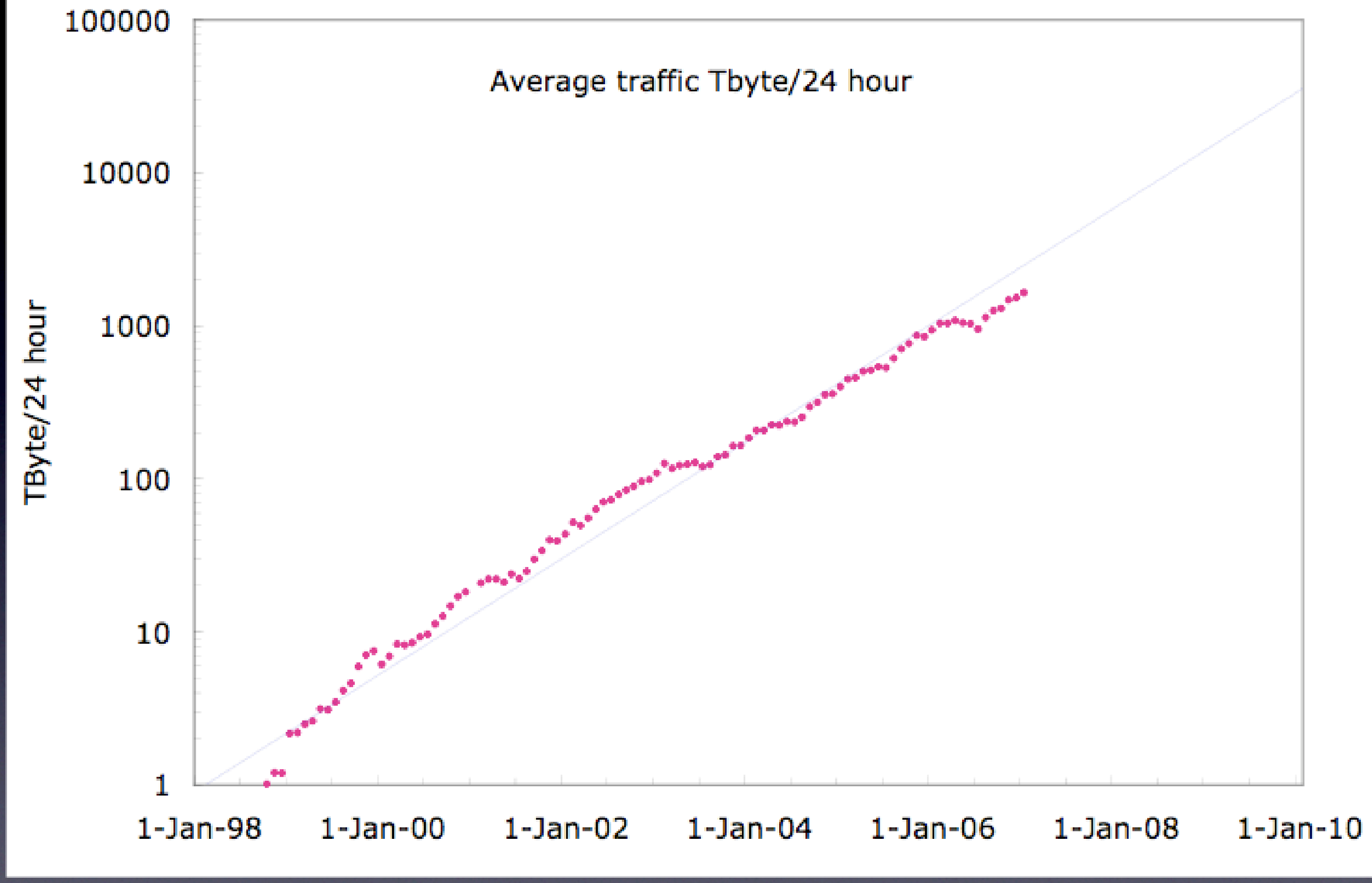
Daily Traffic Patterns



Feb 2006

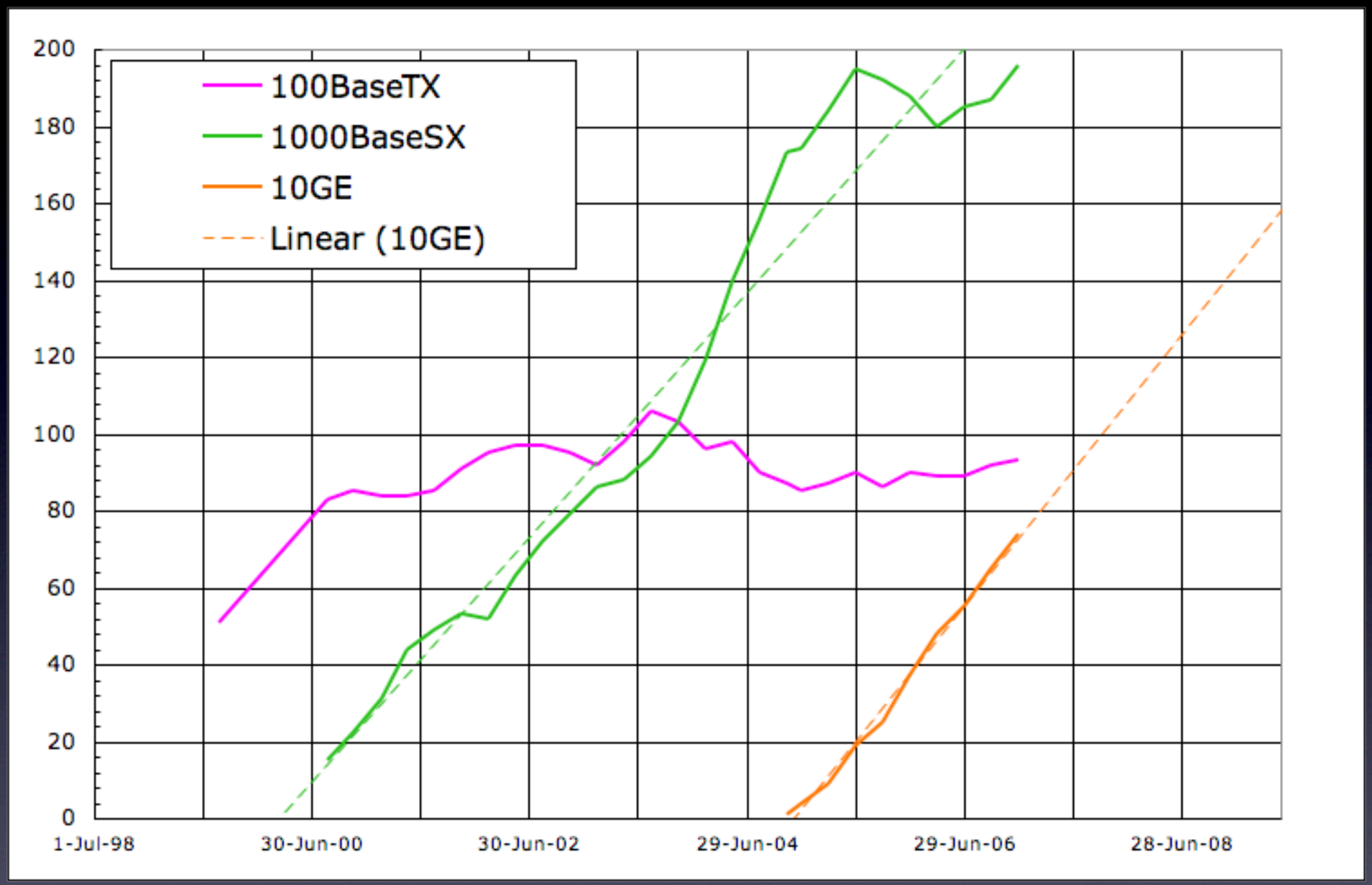
Feb 2007




Average traffic Tbyte/24 hour
TByte/24 hour
100000
10000
1000
100
10
1
1-Jan-98
1-Jan-00
1-Jan-02
1-Jan-04
1-Jan-06
1-Jan-08
1-Jan-10

Growth

- Average traffic growth 7% per month since 2001
- Not expected to change in the near future
- Sustaining this growth by large-scale upgrades of access ports to 10GE
- First 5-port (50 Gbit/sec) aggregated link for a member planned



430 Ports, 260 Members

Challenge

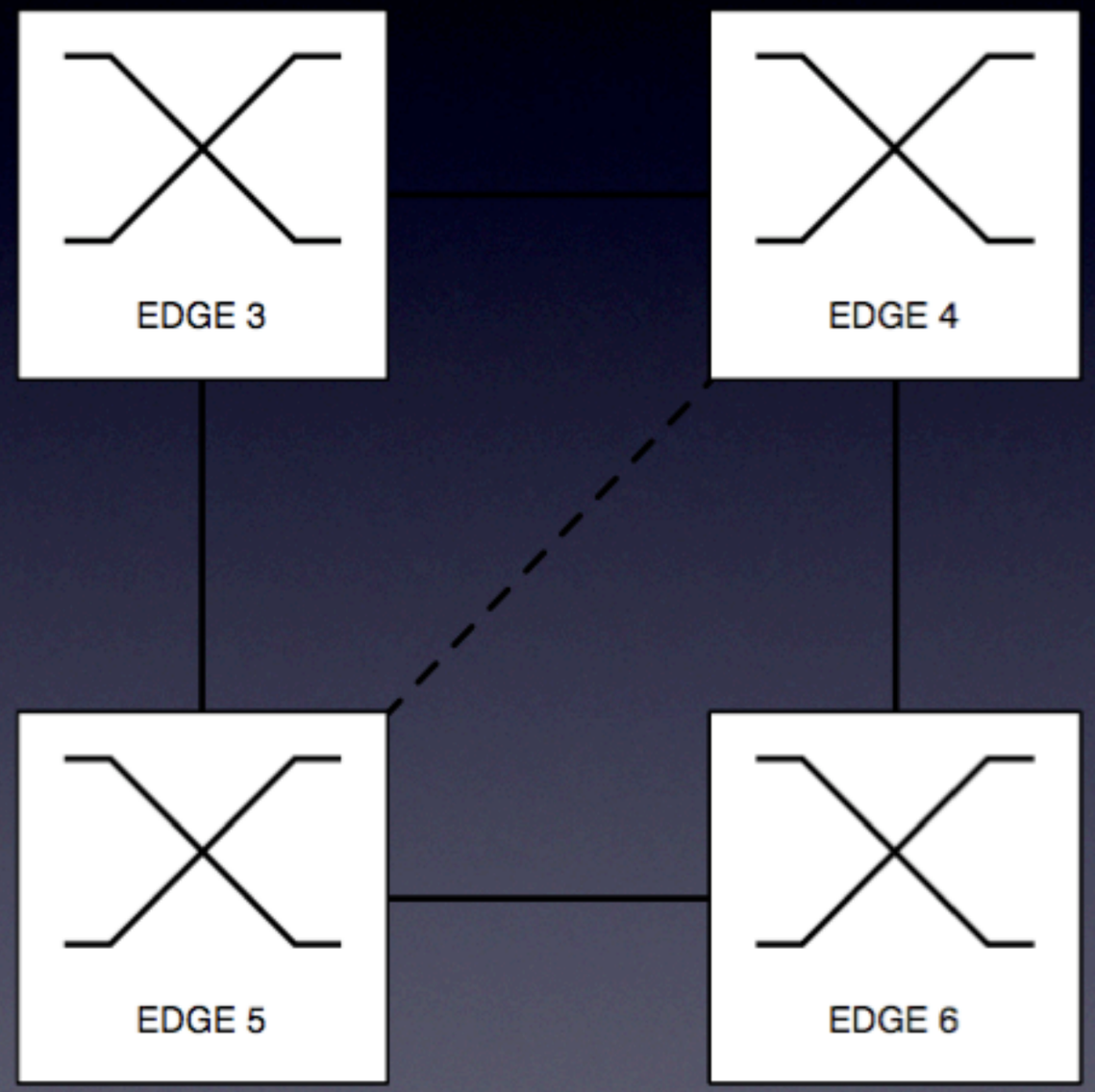
Being able to build out the infrastructure to support the demand for 10GE ports fast enough

Topology 1999

- Phase 1
- Phase 2
- Phase 3

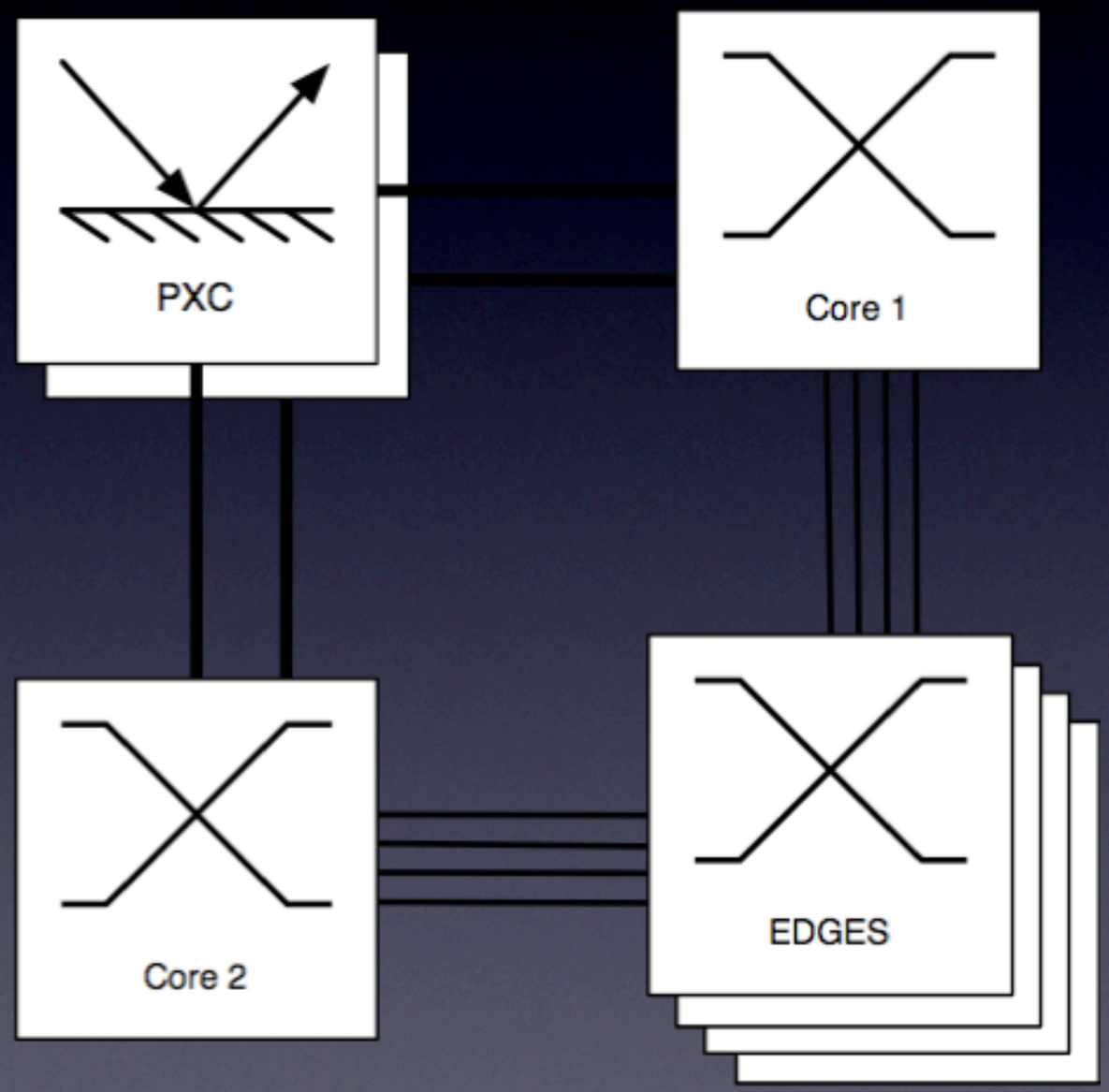
Topology 2000

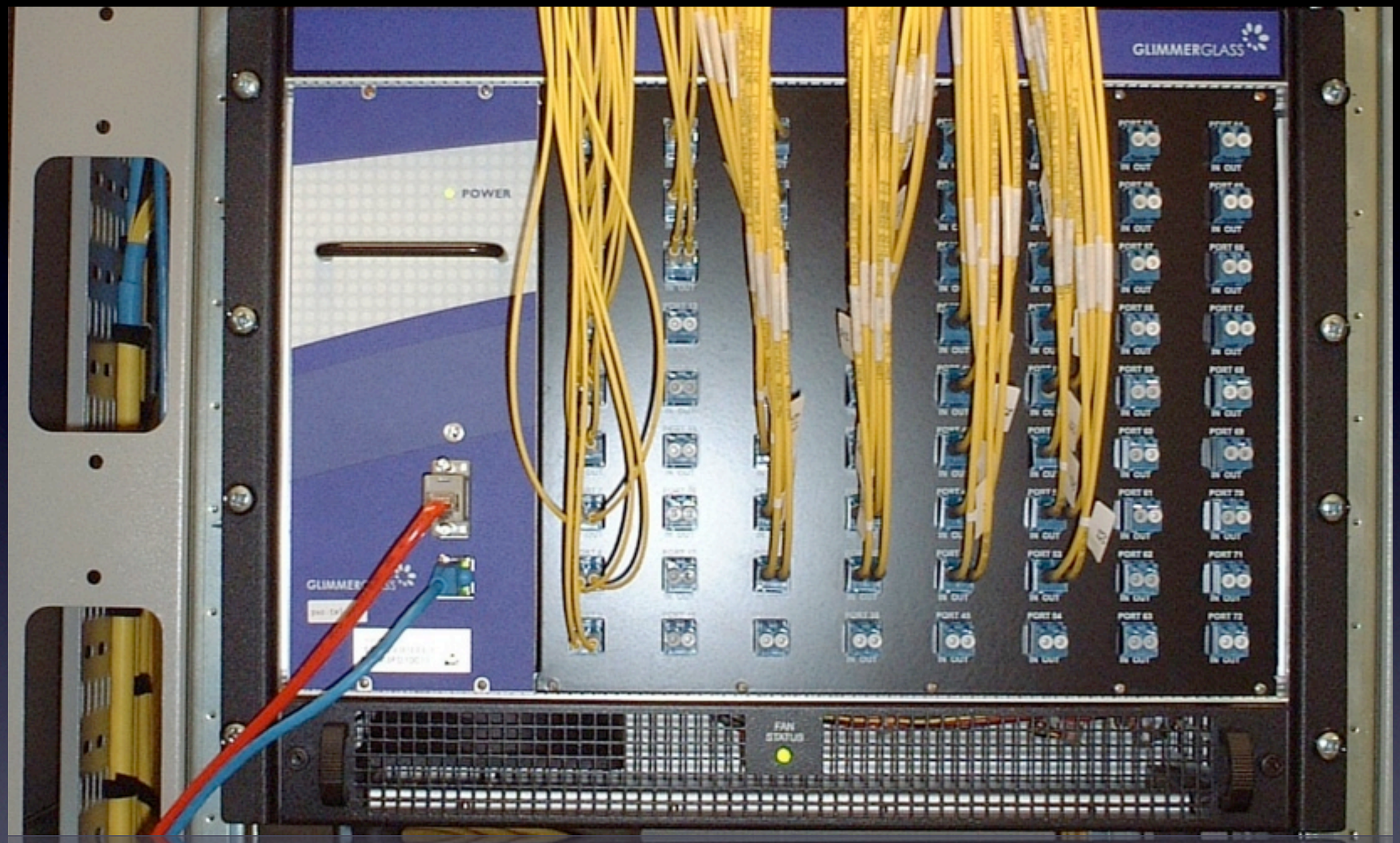
- Phase 1
- Phase 2
- Phase 3



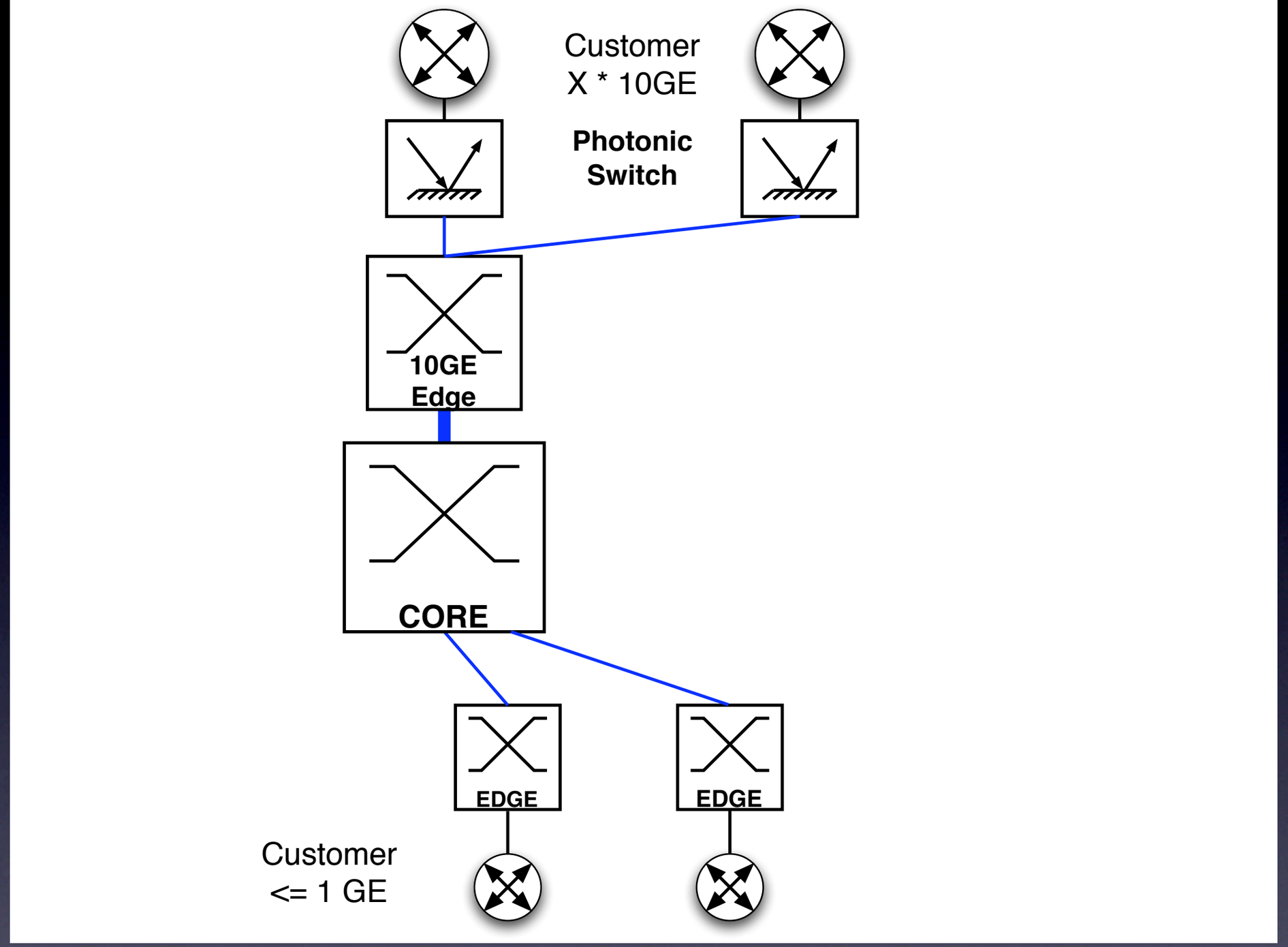
Topology 2004

- Phase 1
- Phase 2
- Phase 3

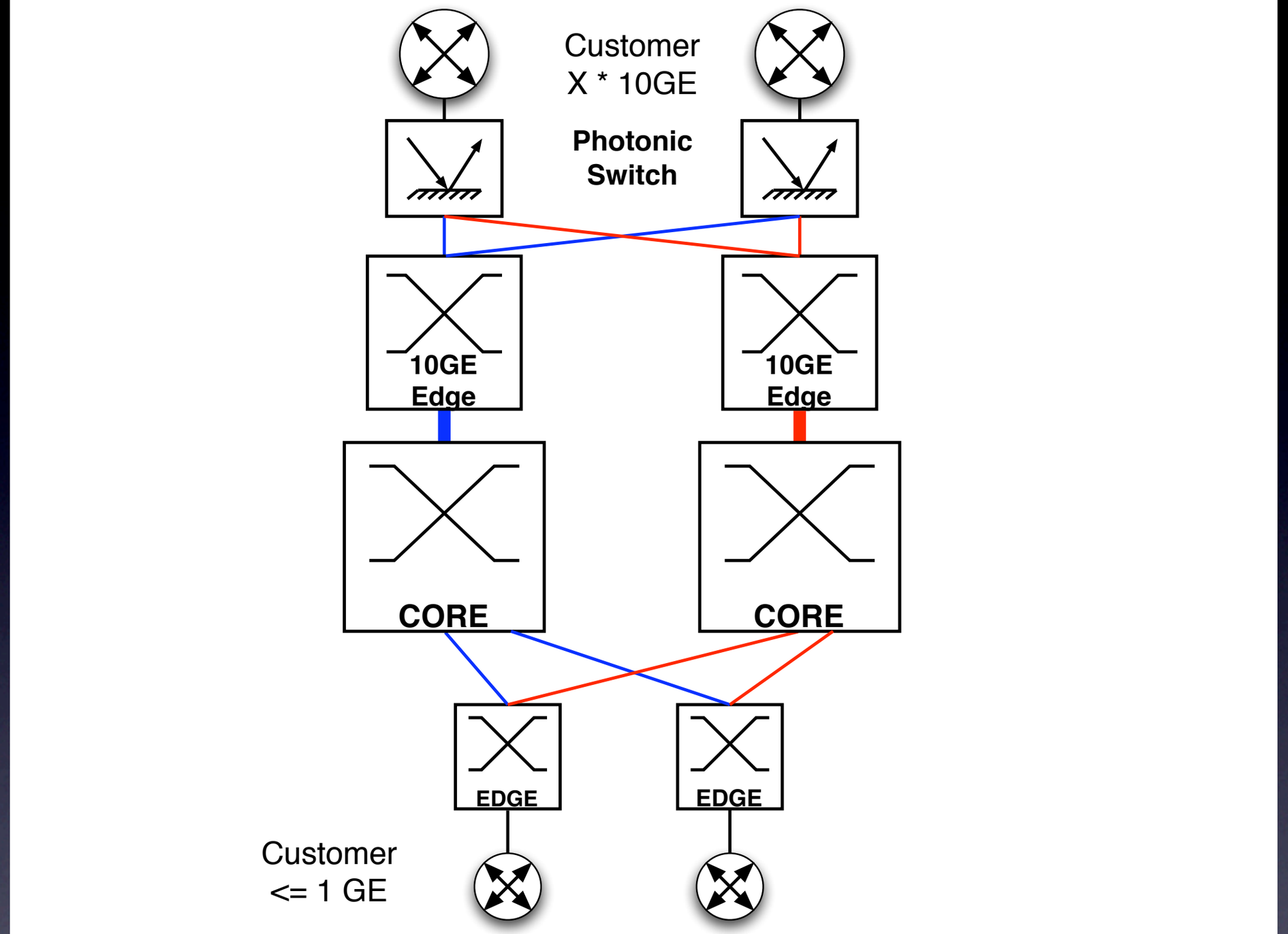




Photonic Cross-Connect



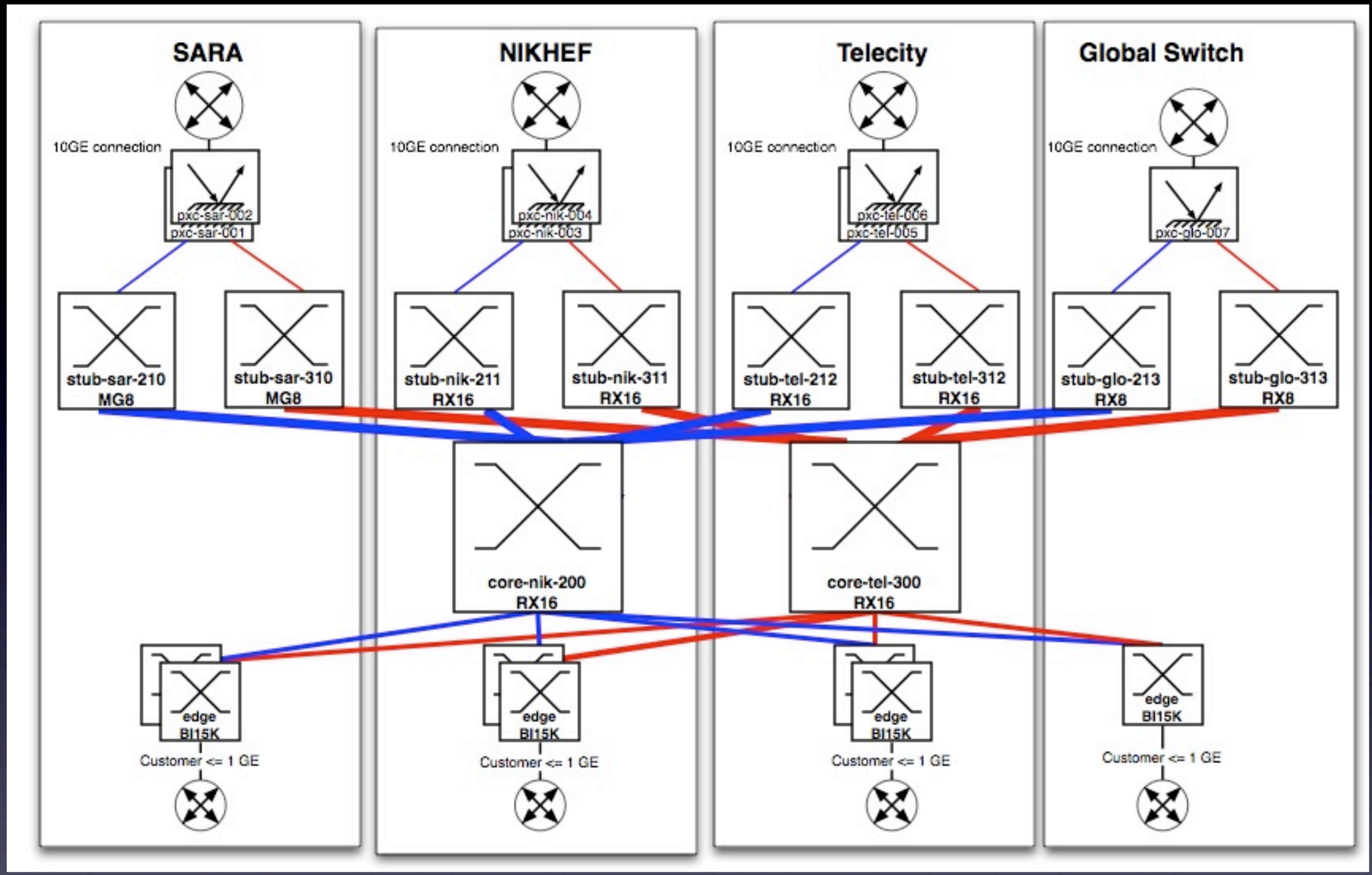
10GE Member Ports



10GE Member Ports

10GE Member Ports

- Started offering 10GE access ports Q4 2004
- During 2004 and early 2005 limited interest
  - Expensive hardware
  - Forecast 15 to 20 ports end of 2005
- May 2006: 49 10GE ports operational
  - >10 requests queued
- Feb 2007: 71 10GE ports operational
  - >10 requests queued
- 8 connections 2 * 10GE aggregated ports,
  2 connections 3 * 10GE aggregated ports!



Current Topology

What's Next?

- Estimate: 127 10GE ports end 2007, early 2008
- After that:
  - Larger switches: 128 10GE ports on a single switch
    - We know these are being worked on.
  - Introduction 100GE
    - Between 2008 and 2011
  - Bring high-traffic member 10GE ports to core to offload links to 10GE edge switches
  - Meshing the network (e.g. TRILL) probably not useful, will cost too many interfaces in 10GE edge switches
- Slow start of 100GE standardisation process
  - Greg Hankins (Force10) at Peering BOF yesterday

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Thanks