SLAC Scientific Computing Network

Anatomy of the SLAC HPC ("FARM") Network

2x10G ESNet - ISP
2x10G Internet2

FARM "Core"
Router

Farm01
(Farm Switch-Router)

SLAC Core
Routers

2-8x
10G

250-400x
1G

4x 10G

Farm02

4x 10G

SLAC
Enterprise
Network
(Offices etc.)

Farm03

...Farm23

...Farm22

...Farm21

Red: 10G routed (L3) links
Black: switch (L2) links

- Scope: general computing (LSF batch, file servers).
- All Farm switches are also routers - "Routing at the Access Layer".
- The topology of the FARM network is known as "Partial Mesh".
- Automatic failover and load balancing on equal cost paths.
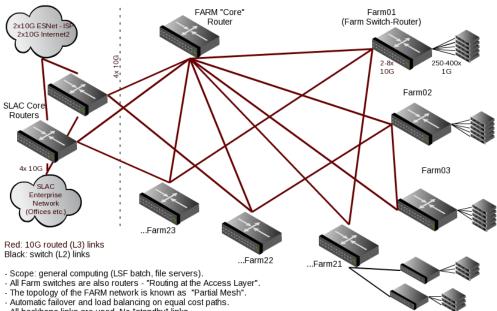- All backbone links are used. No "standby" links.
- To achieve this design, no subnets can exist on more than one router.
- Average: 250-350x 1G switch ports, 2-8x 10G backbone links.
- In special cases, such as lower performance requirements, smaller
switches are connected to a Farm router, with 1G or 10G links.
- Beginning to see 10G connected hosts - buffer design challenge.

Future trends:
- denser switches vs small TOR switches
- 40GE early next year, 100GE later
- "fabric" marketing