Run - II Networks

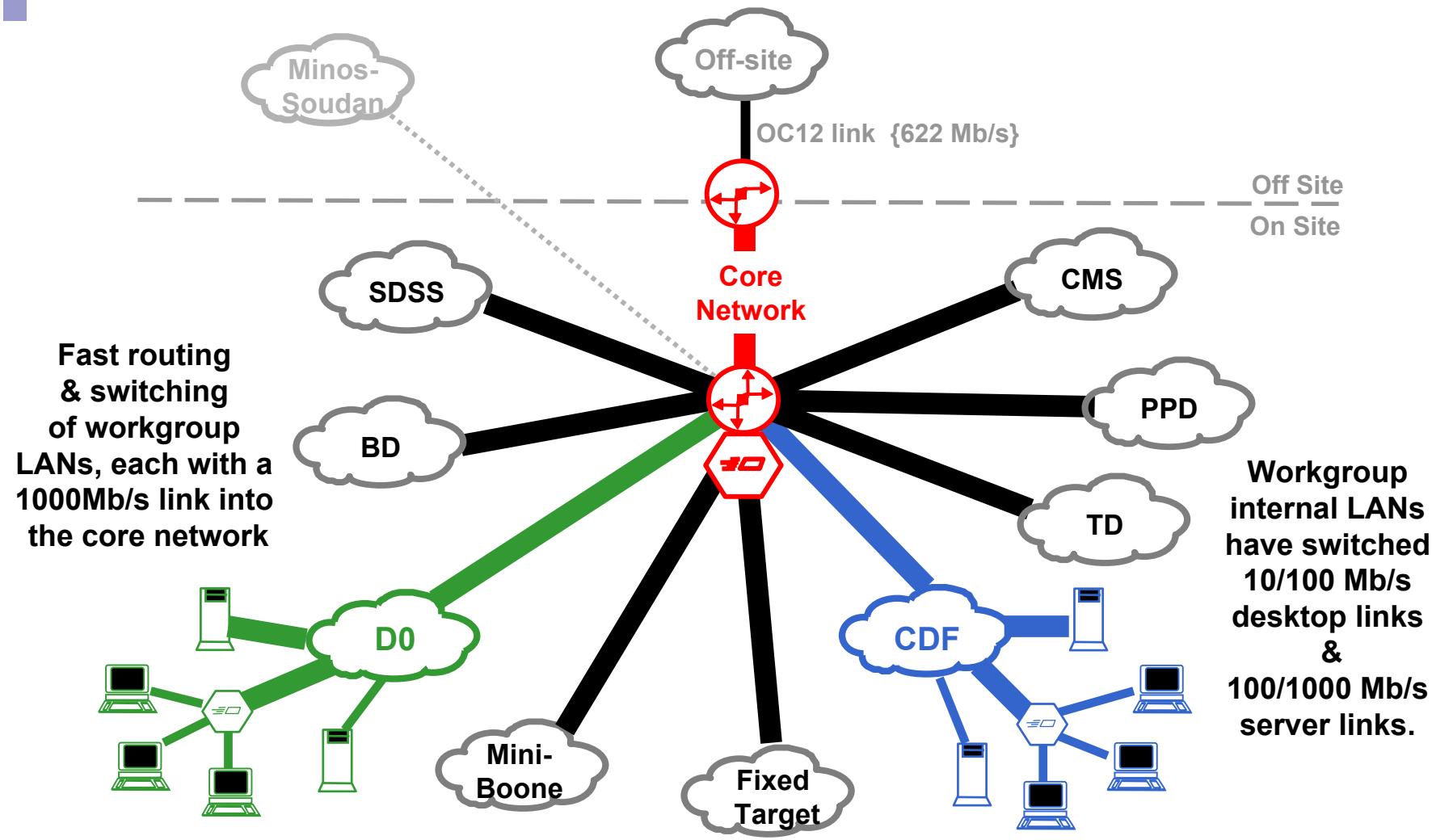
Run-II Computing Review

9/11/03

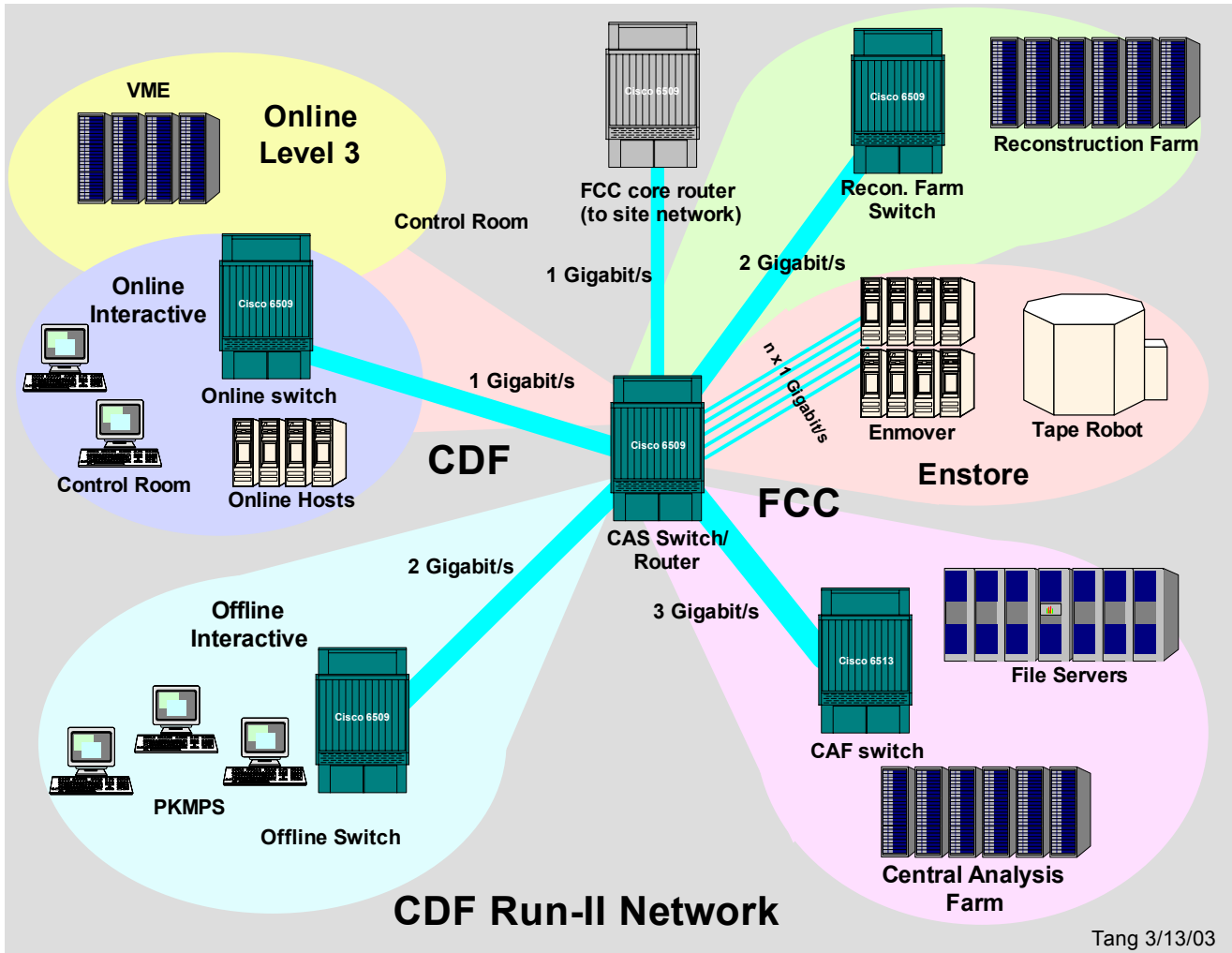
Phil DeMar

Data Comm. Group Leader

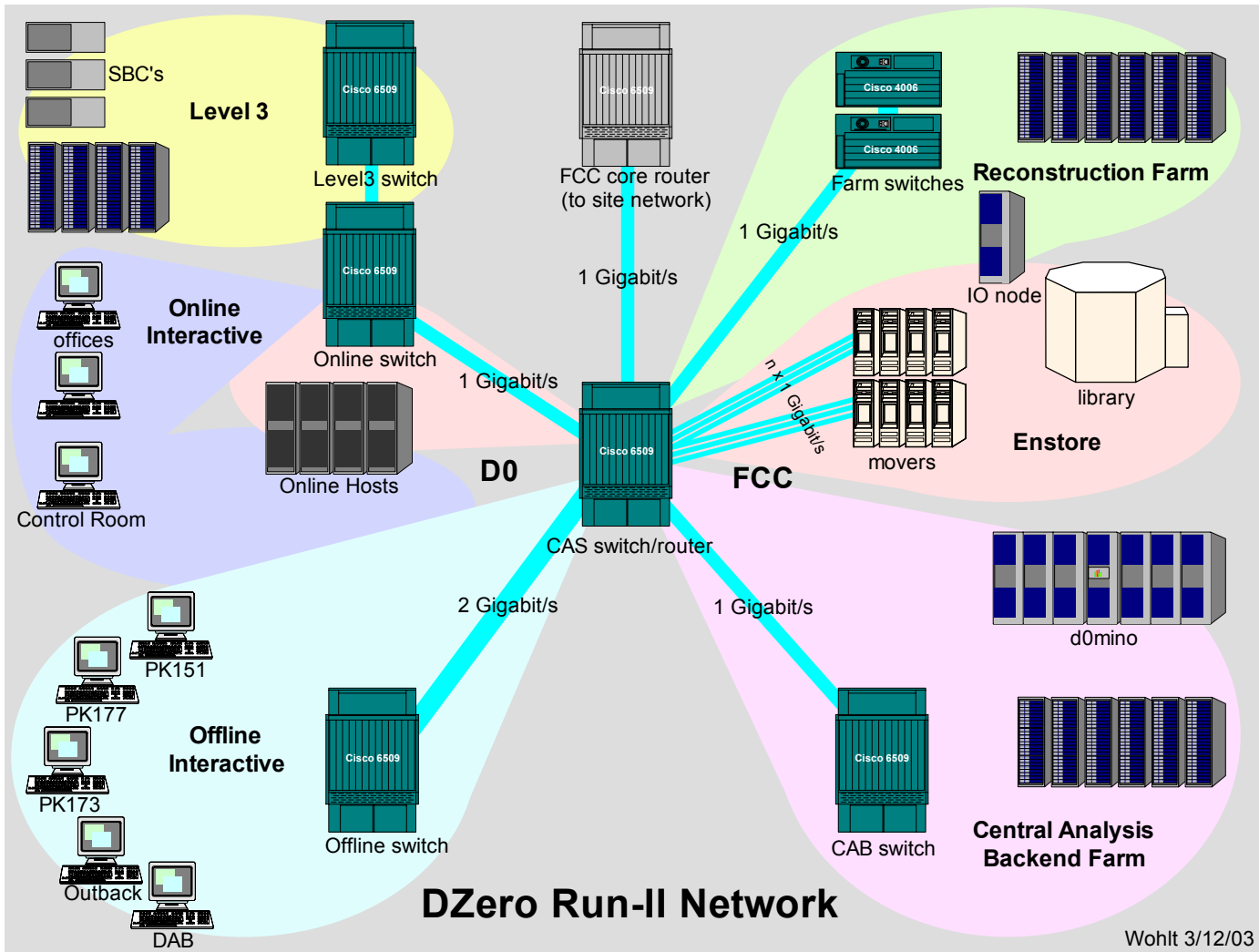
FNAL Network: A Conceptual View



CDF Run-II Network

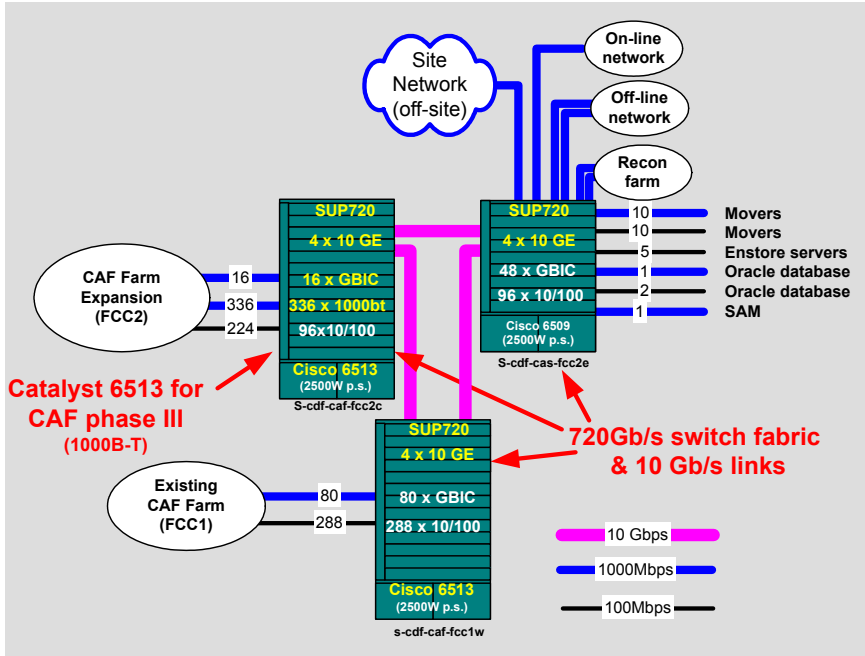


D0 Run-II Network



CDF upgrades for FY ’03
(in progress…)

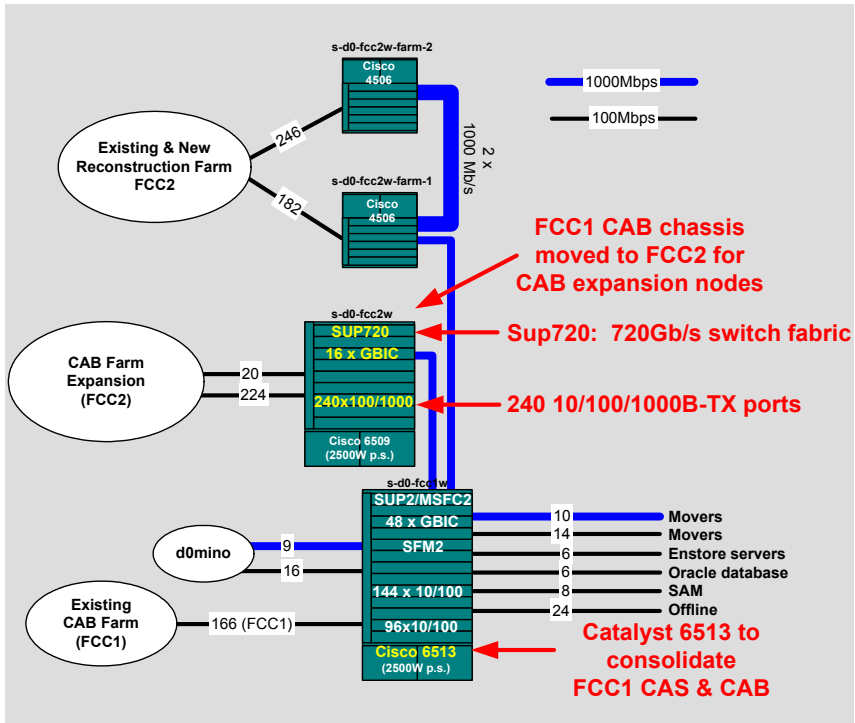
- FCC upgrades:
  - Catalyst 6513 for CAF phase III
    - → 1000B-T for worker nodes
  - 720 Gb/s fabric for CAS switch
  - 720 Gb/s fabric for FCC1 CAF
  - 10 Gigabit CAS ↔ CAF links



- Event collector migration from ATM to IP/ethernet:
  - Event collector LAN = Catalyst 6509 switch
- On-line data streaming transition from FCS to IP
  - Planning started; implementation in early ’04

D0 upgrades for FY '03
(in progress…)

- FCC upgrades:
  - FCC1 CAB farm consolidated on CAS (new 6513 chassis)
  - Old FCC1 CAB 6509 moved to FCC2 for CAB expansion:
    - 1000B-T ports for new nodes
    - 720Gb/s switch fabric
- DAB infrastructure:
  - Dedicated 100 Mb/s desktop connections for DAB offices

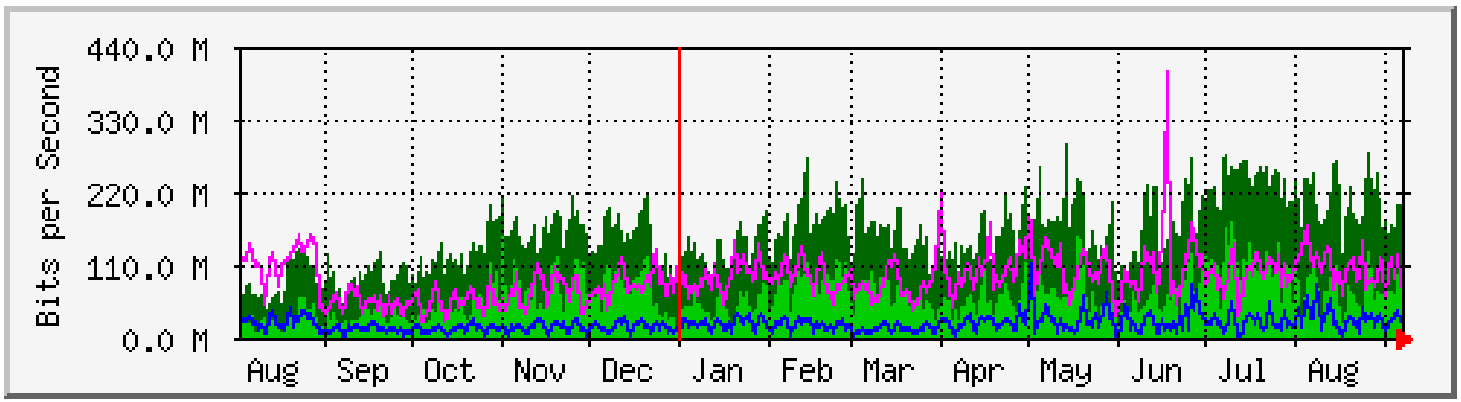


Expected FY ’04 Run-II network efforts

- Necessary:
  - Network infrastructure for FY’04 farms upgrades:
    - Including fiber infrastructure to remote computing center (WBL)
  - Upgrades to experiment’s core network facilities in FCC:
    - Switch fabric upgrades to Sup720 (720Gb/s)
    - Expanded 1000B-T support
    - 10 gigabit ethernet work group backbone links
- Highly Desirable:
  - Upgrade off-line networks to gigabit ethernet support:
    - 10 gigabit ethernet links back to FCC

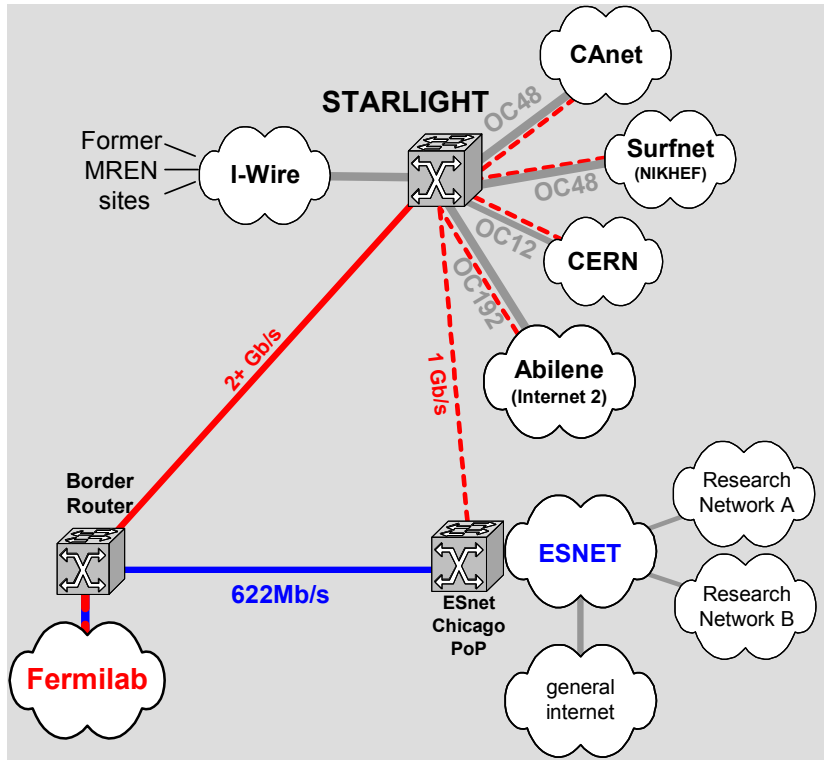
Off-Site Network Connectivity

- Site LAN has border router; not a firewall…
- Off-site access served by ESnet OC12 (622Mb/s)
  - Currently, some available bandwidth “head room”, but:
    - Outbound traffic growing at 150%/year
    - CMS Data Challenges will start this year
  - Plan to request Esnet link upgrade to OC48 this fall…



Starlight dark fiber project

- Procuring fiber to Starlight
  - StarLight = international optical network exchange pt.
  - Link optics by DWDM gear
    - Capable of multiple λs
    - Each λ can carry 1-10 Gb/s
    - But expensive, (O) $100k/λ
  - Initially, one λ @ 2 or 10Gb/s
  - In place by end-of-the-year?



Intended uses of StarLight fiber link

- WAN network R & D projects
- Overflow link for production WAN traffic
  - ESnet link to remain production network link
- Redundancy for ESnet link

Run-II networks manpower efforts

- Estimated effort specific to Run-II networks:

	CDF	D0
Network analyst assigned to experiment	.75 fte	.75 fte
Addtl network group support	.25 fte	.25 fte
Network infrastructure group support	.50 fte	.50 fte
total:	1.5 fte	1.5 fte

- Effort for core network facilities & services, WAN support, security, not included…

CDF FY04 network budget requests

2004 CAF expansion (inc 10GE to WBL)	$ 95k
CAS switch (misc. addtl modules; upgrades)	$ 25k
Off-line upgrades (inc. gigabit e'net support)	$ 85k
Recon. farm upgrades (gigabit e'net…)	$ 25k
Migrate wireless to separate LAN	$ 10k
On-line switch upgrade	$ 35k **(PPD)**
total	$ 275k

D0 FY04 network budget requests

2004 CAB/Recon expansion (10GE to WBL)	$ 75k
CAS switch (Sup720, addtl modules, etc)	$ 40k
Off-line upgrades (inc. gigabit e'net support)	$ 65k
10 Gigabit ethernet backbone	$ 40k
Completion of DAB desktop upgrades	$ 40k
total	$ 260k