

DUNE FD Network

October 14 2020

DUNE Network Discussion

Bonnie King, FNAL

DUNE FD Network Proposal

- Preliminary design to accommodate DAQ, cryo, and General Purpose network
- Supportable by FNAL computing
 - Relies on fiber access from Yates Admin to underground
 - Either via LZ fibers + patch or other path
 - Not in current design
- Relies on equipment in Yates admin
- Assumes no safety systems
- May be implemented on smaller scale for General Purpose, CF networks even if full architecture not used by DAQ



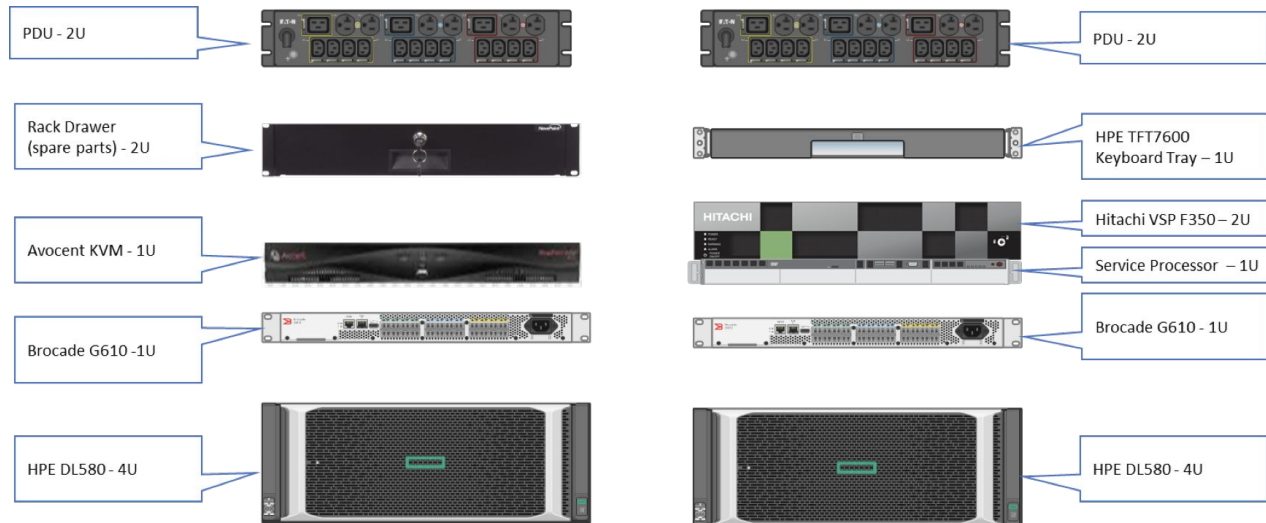
DUNE FD Network Proposal

- Separation of general purpose, DAQ/Data processing and (networking) management networks
 - Physical separation – independent physical infrastructure (links, equipment)
 - Virtual separation sharing same physical infrastructure
 - Redundant infrastructure is a must due to remote operation
- Assuming a possibility to locate equipment in two locations (Ross & Yates), both underground and on the surface.
- Incorporate as much resilience as possible using redundancy, flexibility, interoperability and manageability



Yates equipment

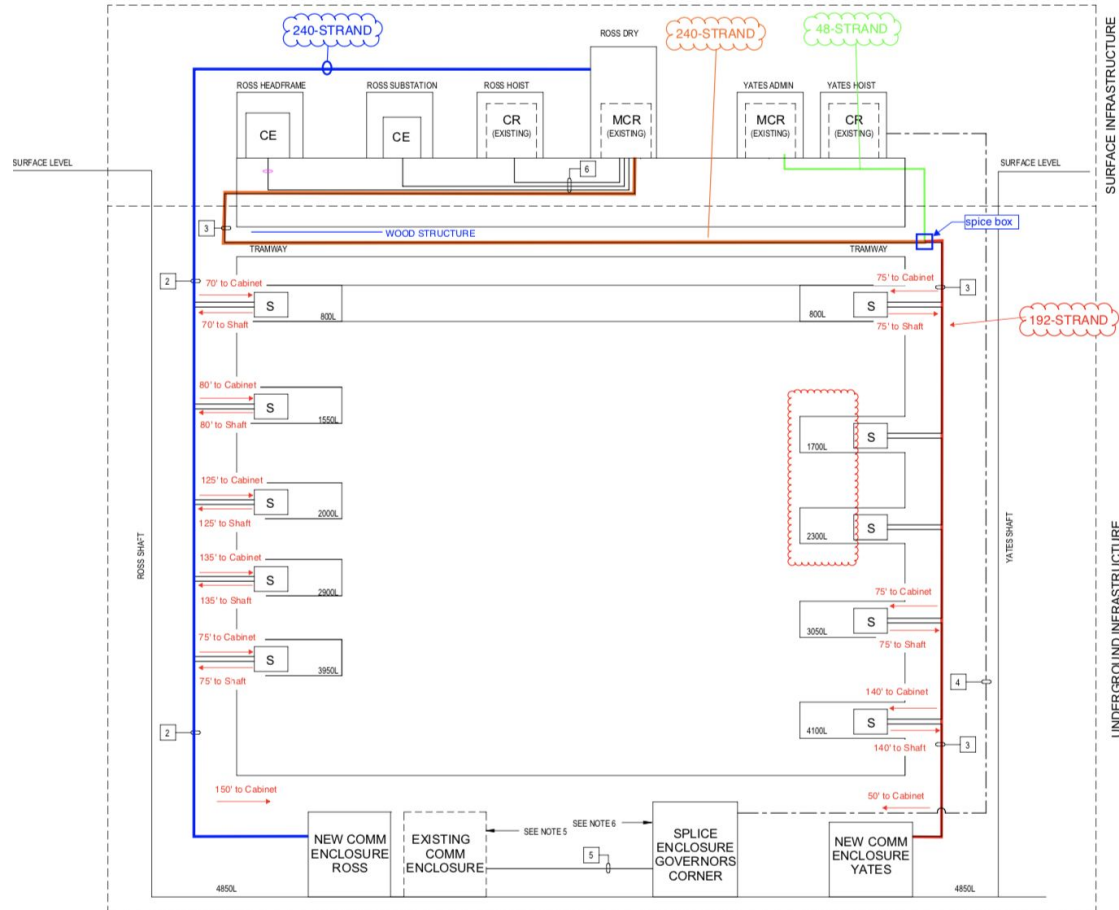
- Preferred for WAN
- Redundant hosting for CCD services (VM cluster):



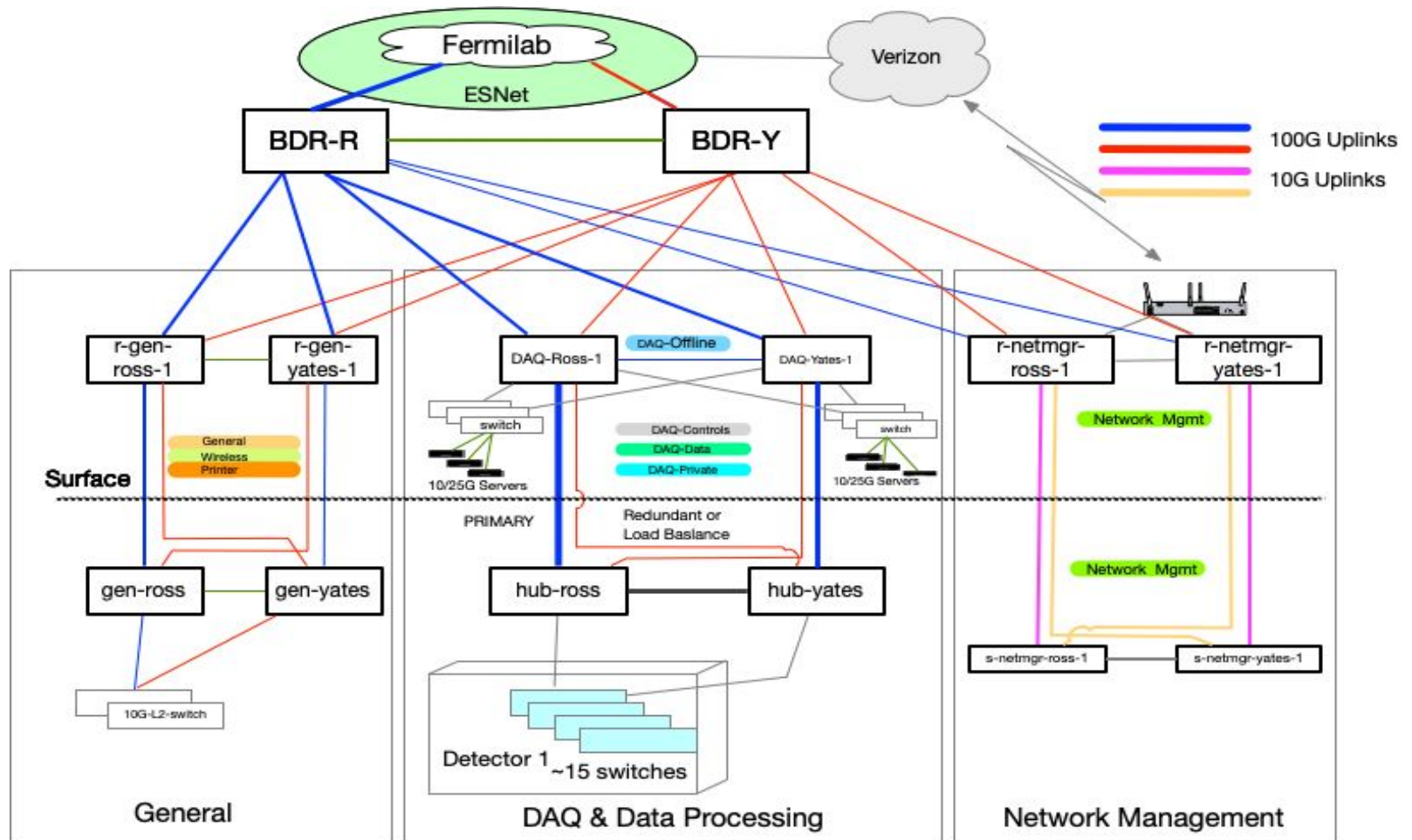
Equipment spread across two racks – total 14U per rack to accommodate cables

* This includes PDU's if they are not already provided.

Shaft Fibers



DUNE FD Network from CCD

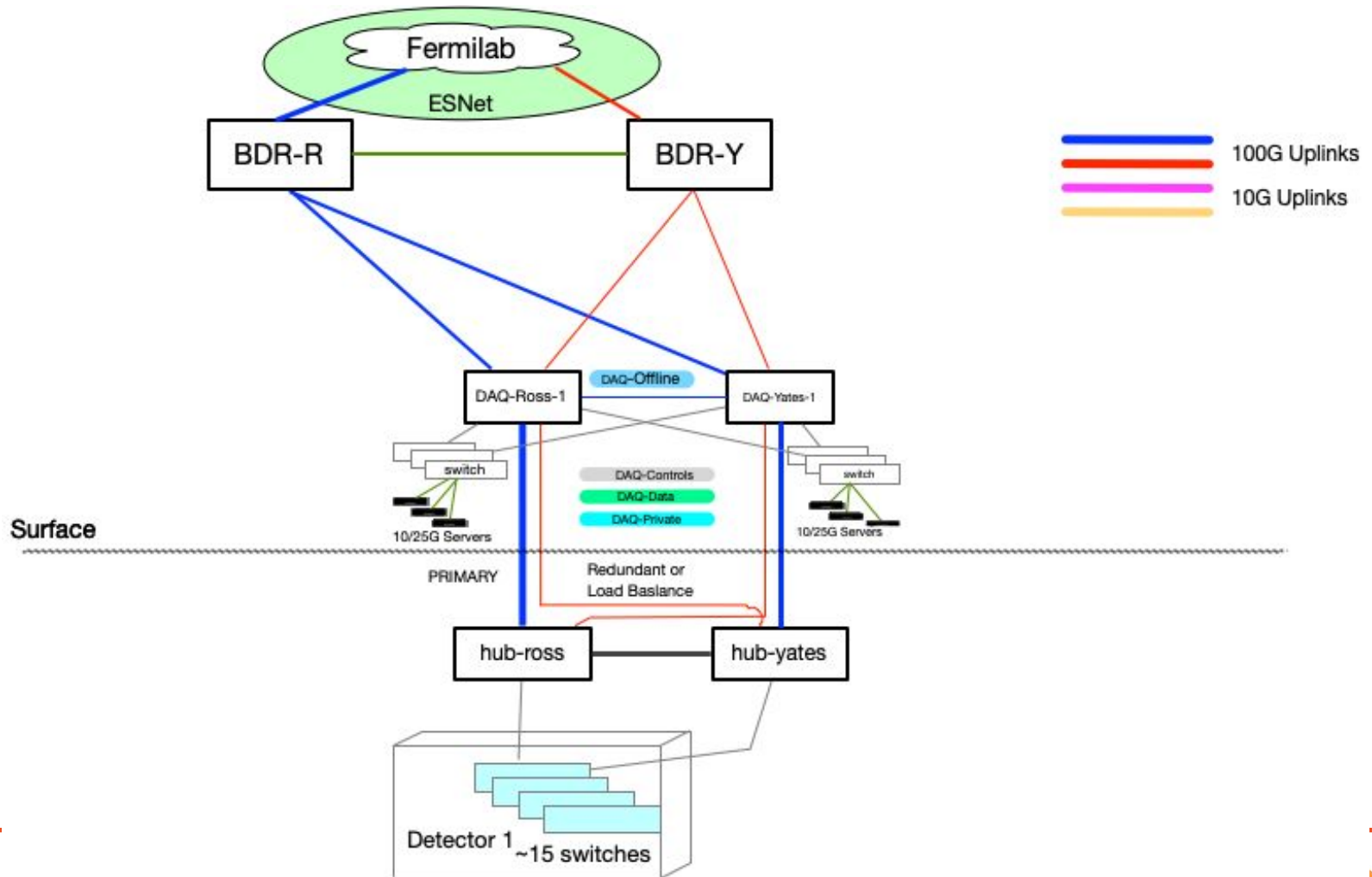


DUNE FD Network from CCD

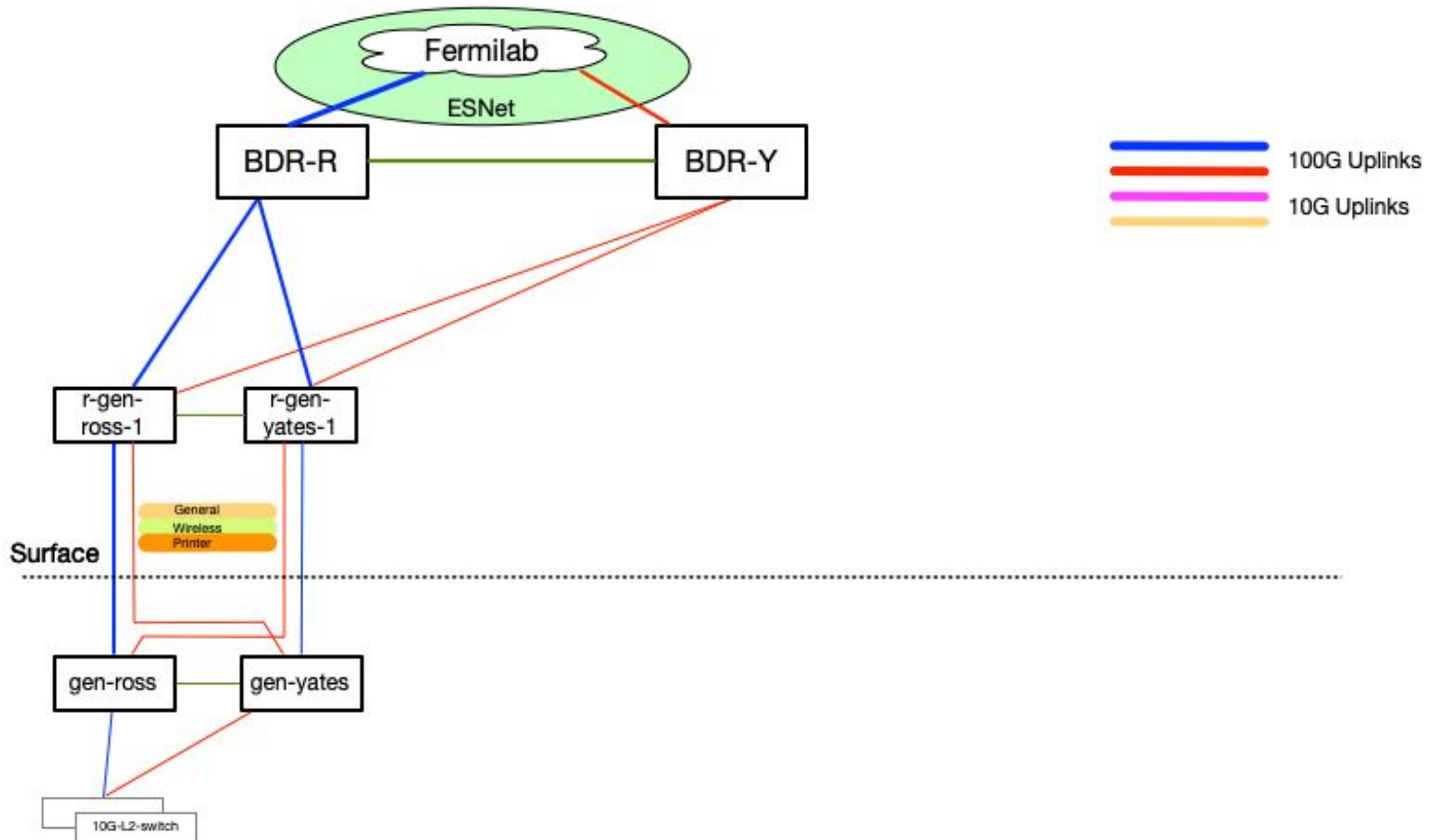
- Four aggregation 10/100G routers (HUBs)
- Full meshed topology
- Aggregations are common for all detectors, all subnets
- Aggregation HUBs are scalable chassis



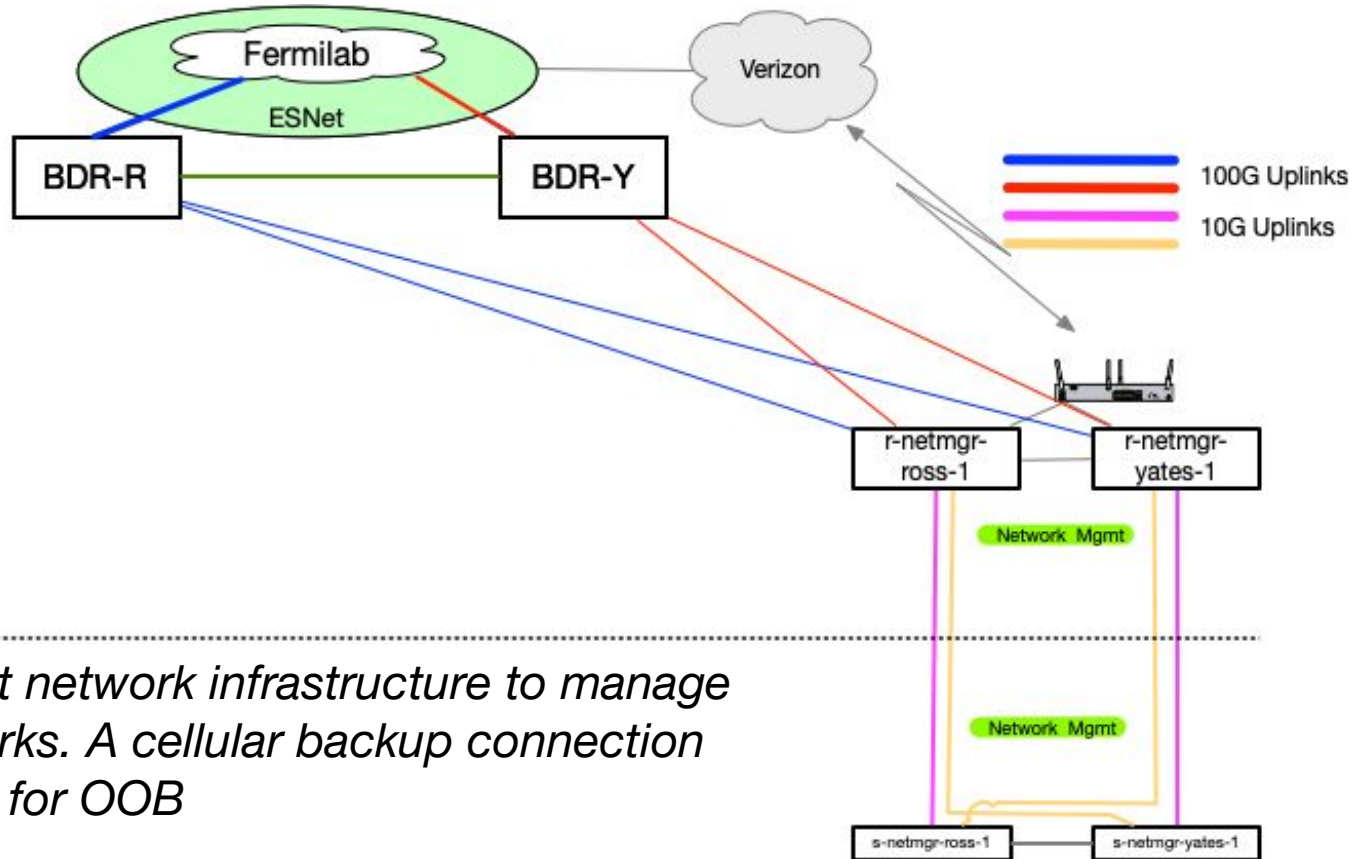
DUNE FD DAQ Network



DUNE FD GP Network



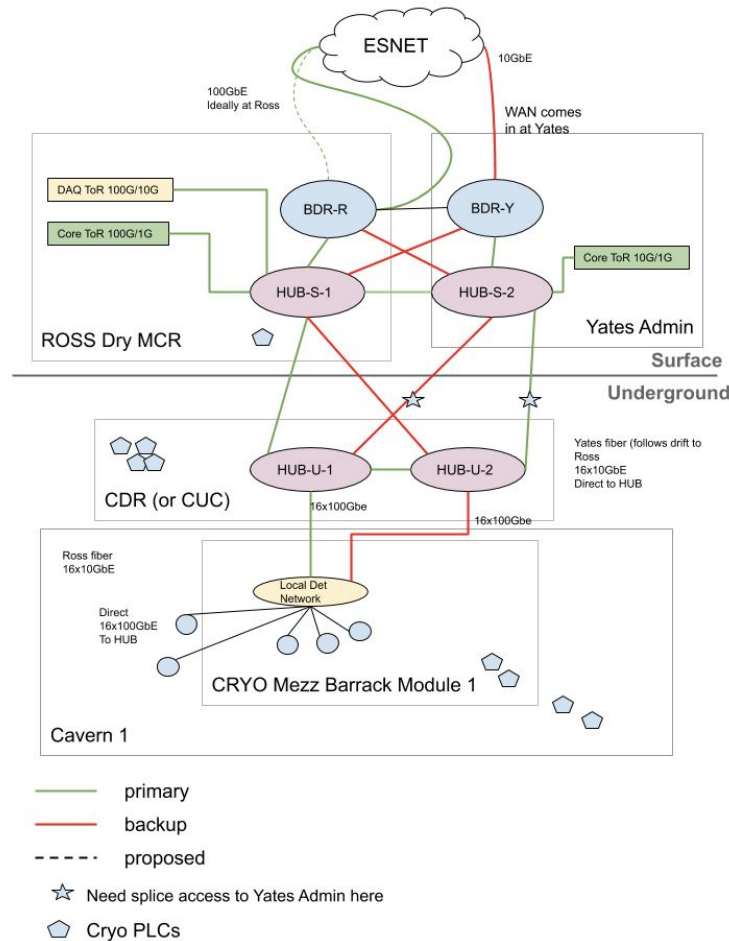
DUNE FD MGMT Network



Surface

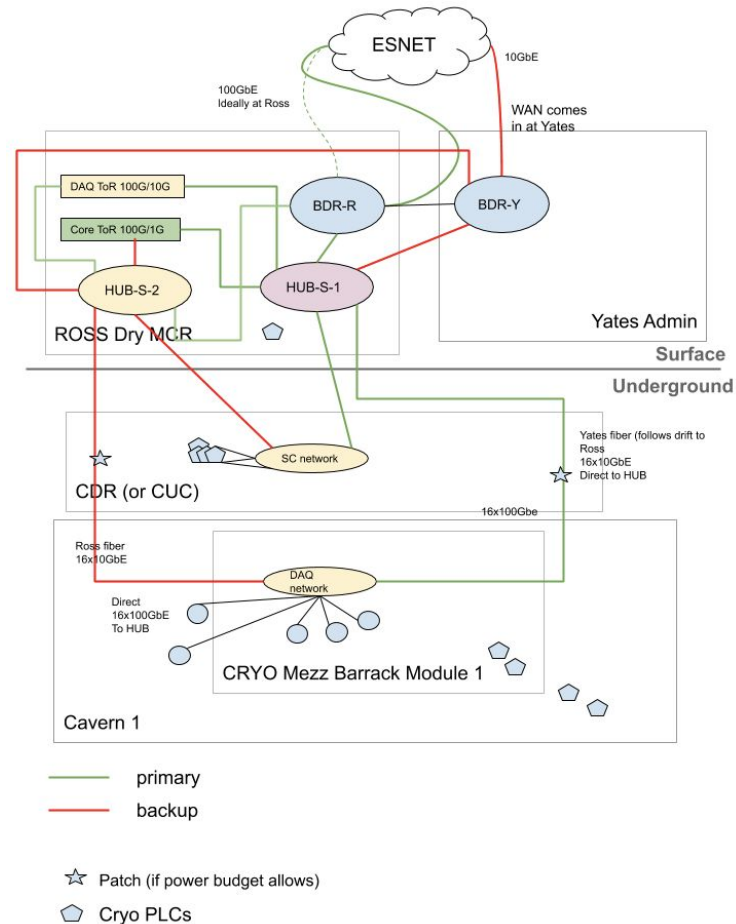
Independent network infrastructure to manage other networks. A cellular backup connection will be used for OOB

DUNE FD Network CCD simplified



DUNE FD Network DAQ proposal

- Access switch uplinks direct to Ross HUBs (redundant)



FNAL proposal costs

Perimeter	\$400,000
Aggregation Surface	\$425,000
Aggregation Underground	\$160,000
ToR underground	\$290,000
General Purpose	\$70,000
Network Management	\$70,000
Cabling	\$100,000
Total	\$1,515,000