Saint Anselm College

in Partnership with University of New Hampshire

University of New Hampshire

SAINT ANSELM COLLEGE 1889

Saint Anselm College

- Private institution founded in 1889.
- Total undergraduate enrollment of 1,927.
- Campus size is 400 acres.
- Ranked 115 in 2017 edition of Best National Liberal Arts Colleges.
- Faculty to student ratio 11:1

Operational Design Requirements

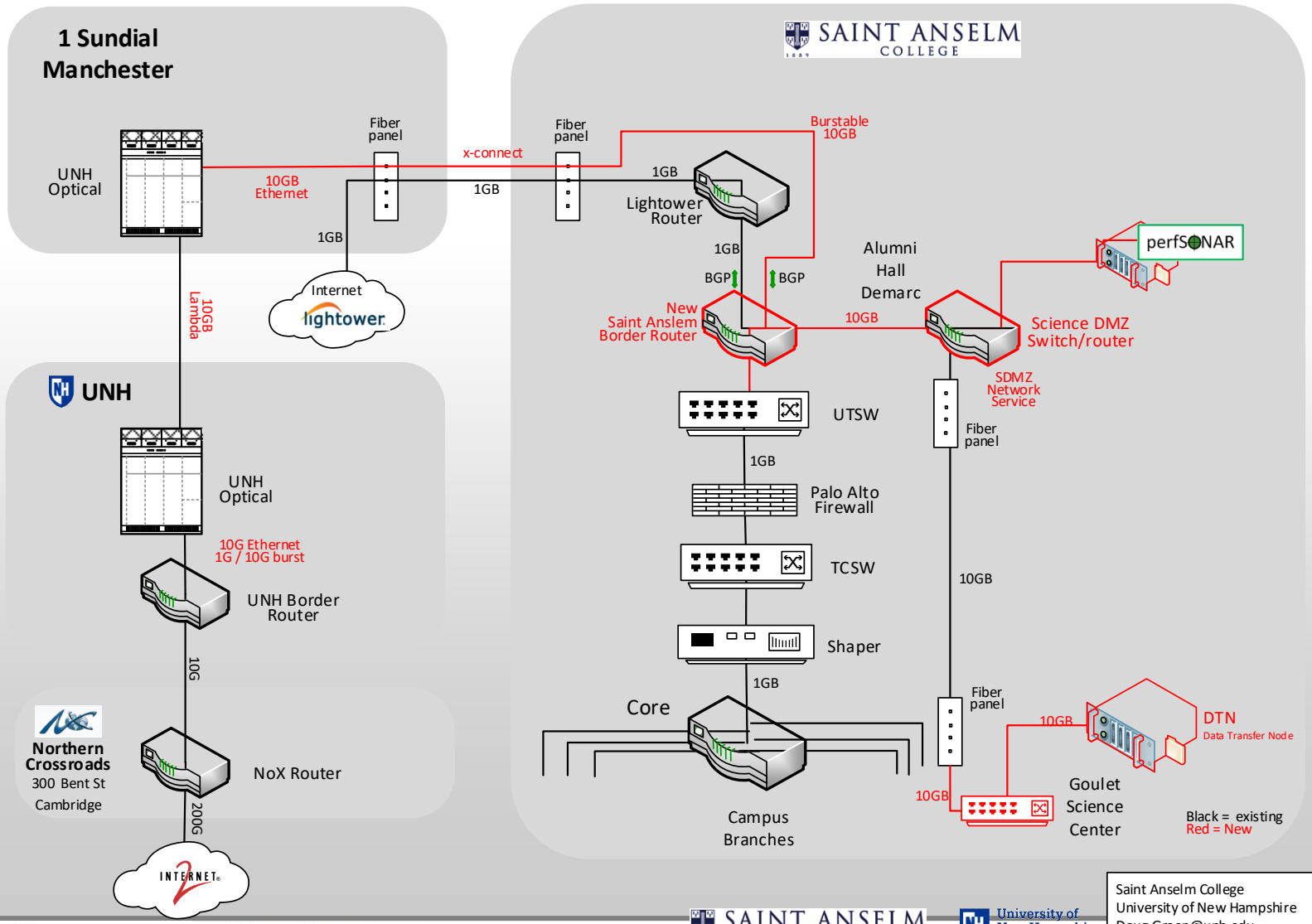
- Enable data-intensive science with unique system, workflow, and network infrastructure.
- A high speed data transfer network for science traffic should be segregated as much as possible from the commodity Internet data flows to provide maximum throughput of data.
- Bandwidth, equipment and operational costs must be sustainable after completion of grant funding.
- The Science DMZ should avoid traditional security technologies or bandwidth management tools that constrain the speed of data transfer.

Science Advisory Council Feedback

- Secondary use of Science DMZ infrastructure for selected commodity Internet traffic during times of non-use can be considered as long as Science DMZ speeds can be maintained when required by the researchers.
- An increase in staffing in Network Services is unsupportable for the long term.
- A Data Transfer Node co-located in the largest Sciences building is acceptable as a first step but researchers want the research labs connected to the DTND.
- 10Gbps is a reasonable goal but a segregated and dedicated connection at speeds lower than 10Gbps is acceptable.

Saint Anselm College - Science DMZ

Internet 2 Access Concept



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University of New Hampshire to Saint Anselm College SDMZ PerfSonar test.

```
[root@perf-unh perfsonar]# bwctl -c 207.89.61.230 -T iperf3 -a 15 -i 10 -t 60 -o
bwctl: Using tool: iperf3
bwctl: 66 seconds until test results available

RECEIVER START
Connecting to host 132.177.100.138, port 5884
Reverse mode, remote host 132.177.100.138 is sending
[ 15] local 207.89.61.230 port 60306 connected to 132.177.100.138 port 5884
[ ID] Interval           Transfer     Bandwidth
[ 15]   0.00-10.00  sec  11.5 GBytes  9866 Mbits/sec
[ 15]  10.00-20.00  sec  11.5 GBytes  9896 Mbits/sec
[ 15]  20.00-30.00  sec  11.5 GBytes  9892 Mbits/sec
[ 15]  30.00-40.00  sec  11.5 GBytes  9896 Mbits/sec
[ 15]  40.00-50.00  sec  11.5 GBytes  9896 Mbits/sec
[ 15]  50.00-60.00  sec  11.5 GBytes  9896 Mbits/sec
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bandwidth       Retr
[ 15]   0.00-60.00  sec  69.1 GBytes  9893 Mbits/sec    0             sender
[ 15]   0.00-60.00  sec  69.1 GBytes  9893 Mbits/sec                  receiver

iperf Done.
```

Saint Anselm College to University of Vermont (I^2) SDMZ PerfSonar test.

```
[root@perf network-scripts]# bwctl -c perfsonar-swick.uvm.edu -T iperf3 -a 15
bwctl: Using tool: iperf3
bwctl: 62 seconds until test results available

SENDER START
Connecting to host 132.198.255.174, port 5748
[ 12] local 207.89.61.230 port 43803 connected to 132.198.255.174 port 5748
[ ID] Interval           Transfer     Bandwidth       Retr  Cwnd
[ 12]   0.00-1.00   sec   698 MBytes  5853 Mbits/sec    0   21.9 MBytes
[ 12]   1.00-2.00   sec  1.04 GBytes  8955 Mbits/sec    0   21.9 MBytes
[ 12]   2.00-3.00   sec  1.05 GBytes  9049 Mbits/sec    0   21.9 MBytes
[ 12]   3.00-4.00   sec  1.05 GBytes  9018 Mbits/sec    0   22.0 MBytes
[ 12]   4.00-5.00   sec  1.06 GBytes  9081 Mbits/sec    0   22.0 MBytes
[ 12]   5.00-6.00   sec  1.04 GBytes  8965 Mbits/sec    0   22.1 MBytes
[ 12]   6.00-7.00   sec  1.04 GBytes  8923 Mbits/sec    0   22.1 MBytes
[ 12]   7.00-8.00   sec  1.04 GBytes  8946 Mbits/sec    0   22.1 MBytes
[ 12]   8.00-9.00   sec  1.05 GBytes  8996 Mbits/sec    0   22.1 MBytes
[ 12]   9.00-10.00  sec  1.04 GBytes  8904 Mbits/sec    0   22.1 MBytes
- - - - - - - - - - - - - - - - - - - - - - - - -
[ ID] Interval           Transfer     Bandwidth       Retr
[ 12]   0.00-10.00  sec  10.1 GBytes  8669 Mbits/sec    0             sender
[ 12]   0.00-10.00  sec  10.1 GBytes  8669 Mbits/sec                  receiver

iperf Done.

SENDER END
[root@perf network-scripts]#
```

Saint Anselm College to University of Vermont (I^2) SDMZ PerfSonar test.

Key Challenges

- Sustaining costs of the Science DMZ after the grant
- Lack of expertise at a small school
- College did not own its own IP Block
- Previous grant provided fiber to a POP – in which UNH was co-located.
- A 2000-student institution has different sense of scale, staffing, and funding compared to the larger early SDMZ awardees institutions.

Benefits of a Mentor Institution

- Expertise and experience
  - Tech day at UNH
  - Periodic conference calls and meetings
  - Design collaboration
  - Navigating NSF grant process
- Existing infrastructure of mentor institution provided critical linkages
- Helps a R1 see the constraints of a small school and the need to be innovative