



20 Years of Research Networking in New England

NANOG On The Road in Boston, MA

Tuesday, April 21, 2015.

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Agenda



Item	Topic
1	The Founding
2	The Members
3	vBNS to Abilene to Internet2 to ?
4	Current Footprint
5	The MGHPCC
6	Q&A

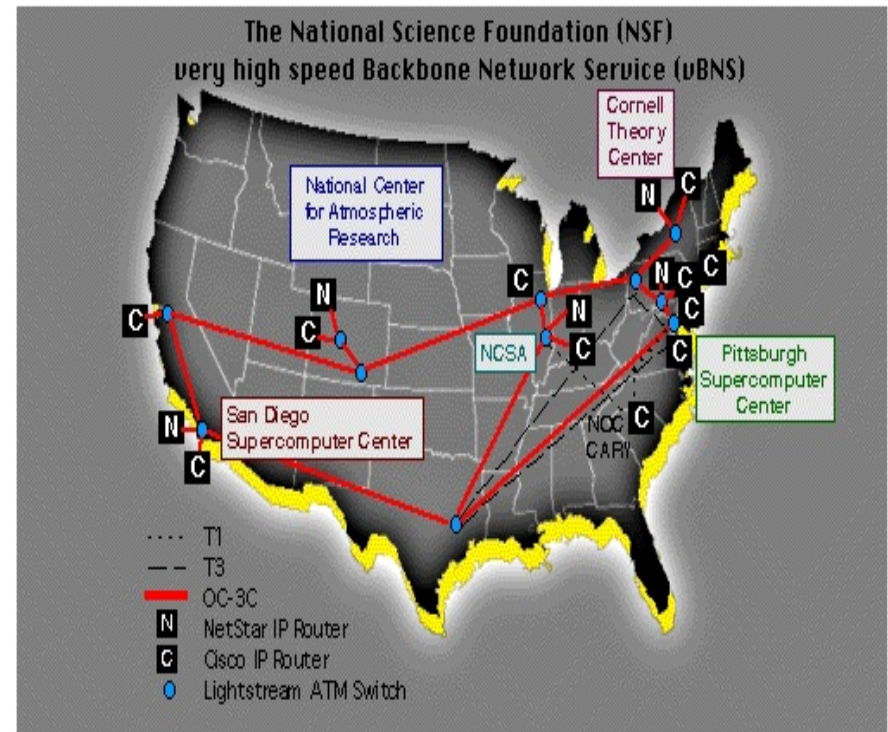
The Founding – Remember vBNS and MCI

NEARnet 1988 - 1990

NEARnet was a high-speed network of academic, industrial, government, and non-profit organizations centered in Cambridge and Boston, Massachusetts. NEARnet was the precursor to New England's regional Internet, established by Boston University, Harvard University, and MIT late in 1988. Those relationships provided the basis for the next step.

vBNS - Research Communities in New England had the goal of connectivity to the NSF funded vBNS network run by MCI. Goal to interconnect Super Computing Centers and Research Centers. vBNS was roughly 1995.

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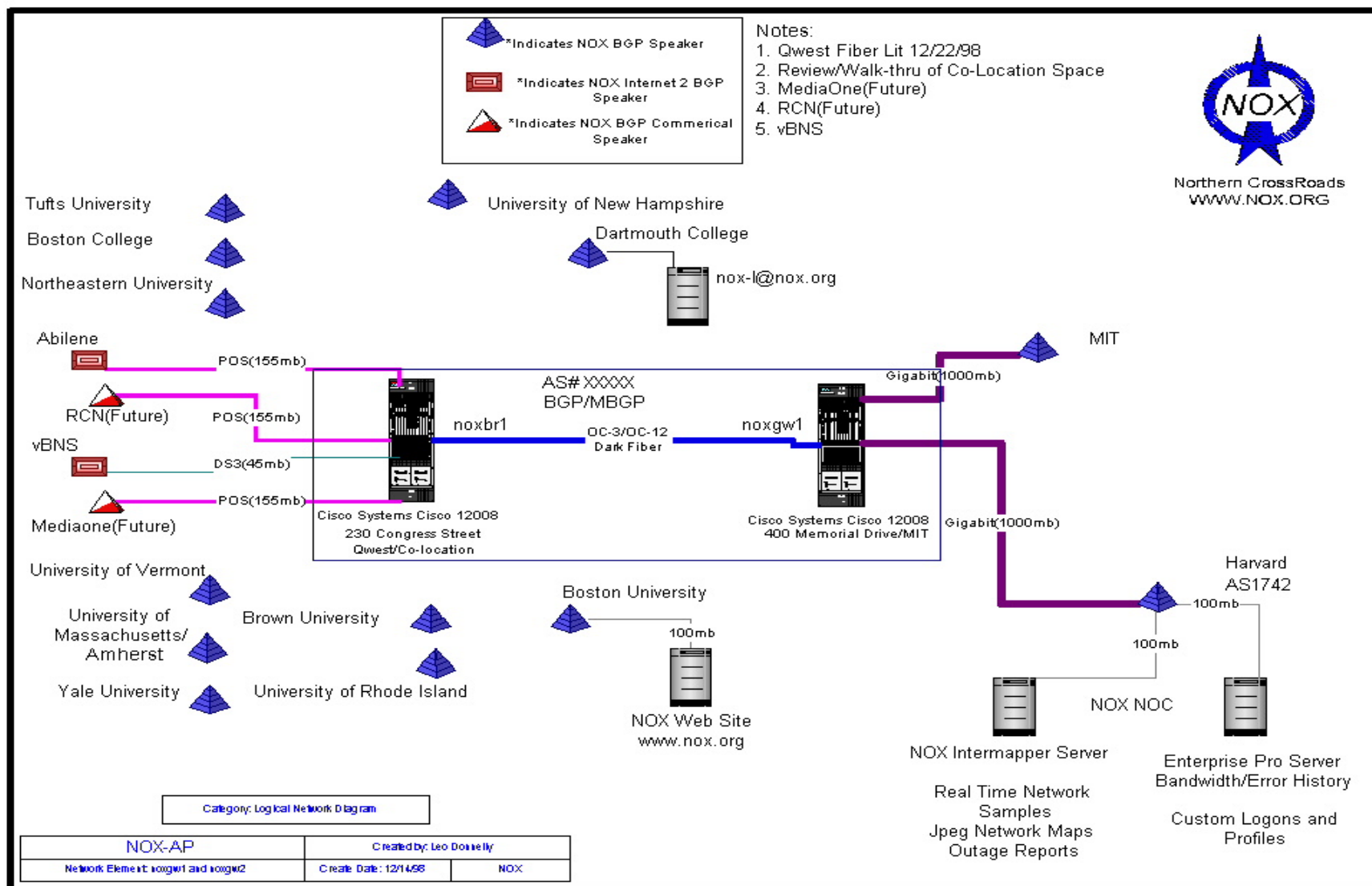
*Individual and Institutional Relationships and Flexibility are key to our model



The Founding – 1998

- A common theme built on existing relationships.
- NEARnet had more members. Today more aggregation.
- Apply lessons learned and key principles.
- The Northern Crossroads would exist without Internet2 or other research networks
 - We don't compete with commercial carriers.
 - We don't resell bandwidth.
 - Sub Set of members have own projects
 - NEREN
 - MGHPCC
 - We share expertise, fiber and personnel on occasion
 - Flexibility - Some members connected to I2 or other networks
- Harvard was the NOC for over a decade, now MIT.
- We provide transport, aggregation and interconnection
 - Not services....
- Setting the stage for the next 20 years

The Network – 1998



NOX - 2015



Today – MIT is the Network Operations Center and operates a regional optical network that the NOX utilizes.

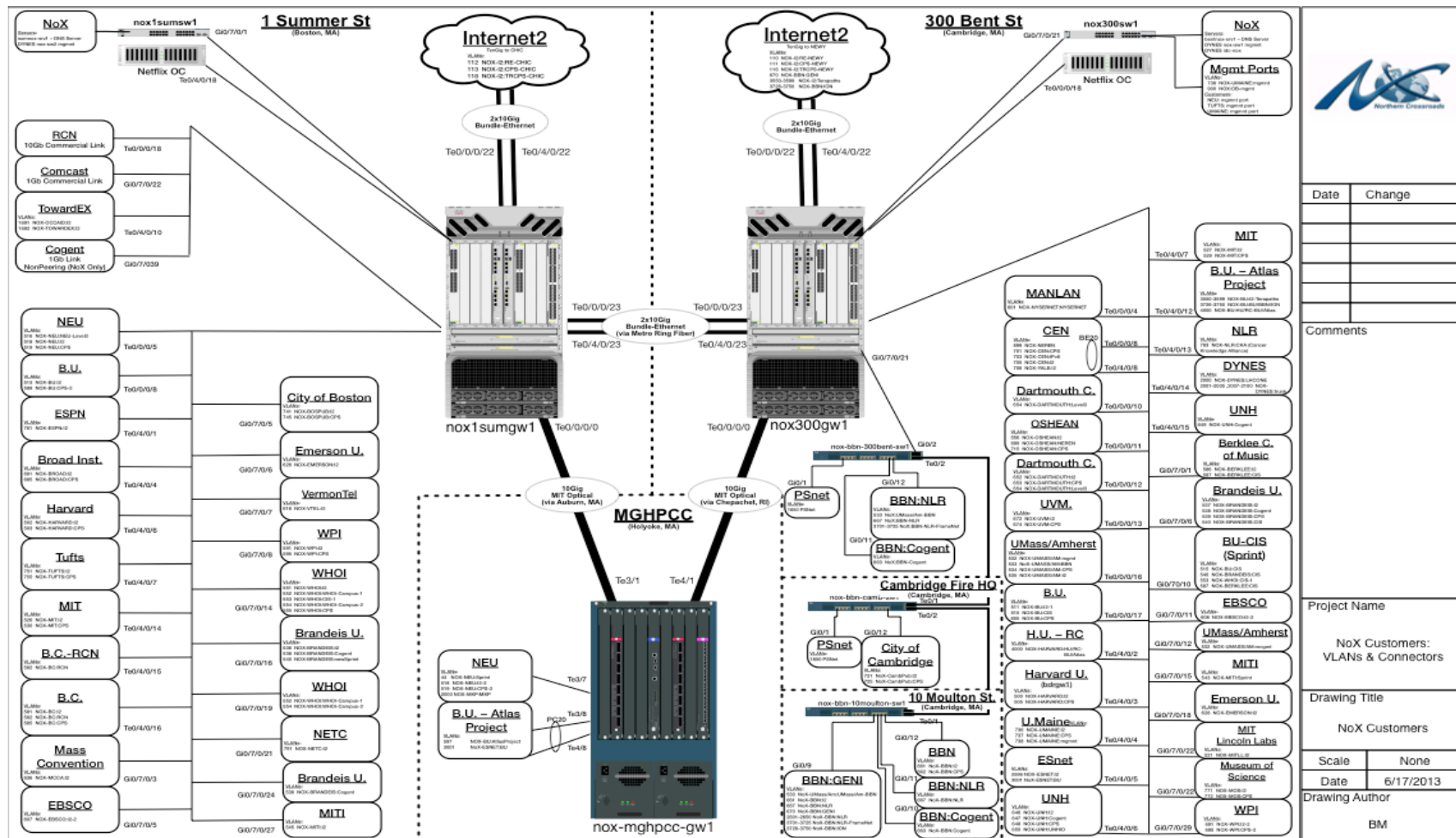
The Northern Crossroads (NOX) facilitates advanced networking among research Institutions in New England. Participants include institutions of higher education and

Partner organizations that support research, education, and economic development.

The goals of the NoX are to:

- Foster advanced networking in support of research and education in New England;
- Share intellectual capital and material resources to further the development and delivery of advanced network services and applications to our communities;
- Aggregate services to benefit from economies of scale;
- Encourage collaboration among participating institutions and our respective Academic communities;
- Consolidate regional representation of our interests to the larger national and international community, and;
- Collaborate with other organizations pursuing advanced networking.

NoX Today



MGHPCC (mghpcc.org)



90,000 sq. ft. data-center on an 8.6 acre site in Holyoke, MA. Core/shell fit-out for 680 racks, 10MW compute, 15MW total. Initially: 388 racks, 5.9MW compute, 9.4 MW total. Facility online in 2013. Built out capacity for 10,000 high end computers, and expansion capacity in building for a further 10,000 high end computers.





Operations

- Operated as a joint venture of Boston University, Harvard University, the Massachusetts Institute of Technology, Northeastern University and the University of Massachusetts.
- Open for use by any research organization.

Collaborative Research

- Millions of virtual scientific experiments per month, serving thousands of researchers in Massachusetts and around the world.
- University-sponsored research seed grant program, funding 13 cross-university projects.
- National Science Foundation support for a multi-university team pursuing both scientific research and new software infrastructure to accelerate scientific research.
- Jointly operated computer system dedicated to Life Sciences research sponsored by the Massachusetts Life Sciences Center.

MGHPCC – LEED Platinum Certification



Green Technologies

- Electricity supply -- Energy supplied by Holyoke Gas and Electric, a municipal utility that derives more than 70 percent of its energy from local hydroelectric and solar resources.
- Facility design -- First university research data center to receive LEED Platinum Certification, the highest level possible. Certification recognizes the MGHPCC's use of energy-efficient power distribution, advanced cooling techniques, low- impact storm water management, and recycled building materials, among other measures



Q&A



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