

Northern Lights GigaPop (NLGP) Update

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Office of Information Technology

UNIVERSITY OF MINNESOTA

What we do

- R&E connectivity and Local Peering
 - For All NLGP Participants
 - Peering at 511 Building and MICE
- Full Internet transit and Commercial Peering
 - Limited to UMN, MinnState, and State of MN
 - Internet2 Peer Exchange I2PX (national footprint)
 - WiscNet Regional Peering Service WRPS (Chicago only)
- DDOS Detection and Scrubbing
 - 40Gb On-Site Scrubbing Capacity



What we don't do

- E-Rate
 - MN.IT does this for those that want it
- Compete with ISPs
 - Especially for K12
 - The Minnesota Legislature provides per Pupil Aid for Internet connectivity for our Independent school districts (Isds)
 - We want ISPs to see the NLGP as a Strategic Partner
 - Not a Competitor for local K12 & library business

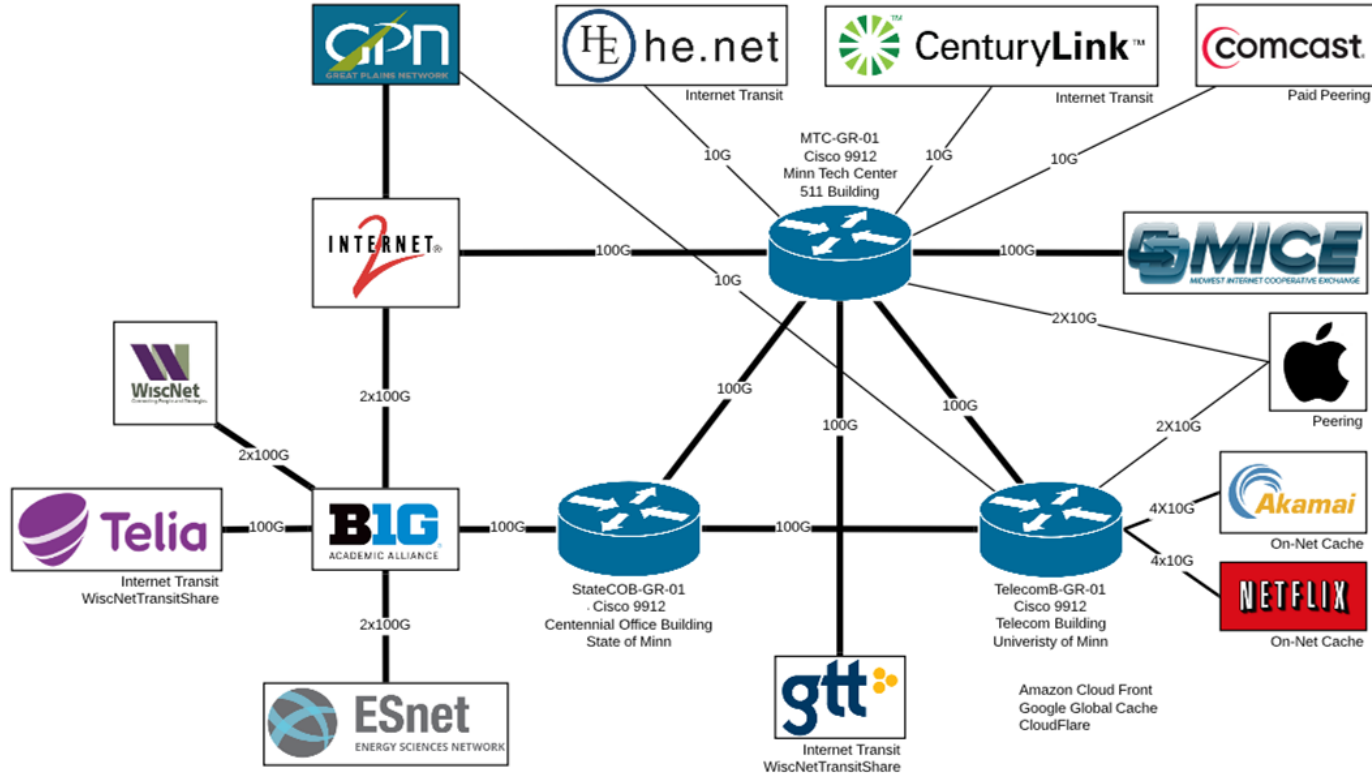


NLGP Infrastructure

- Twin Cities PoPs
 - 511 Building - Major Carrier Hotel
 - Telecom Building - UMN East Bank Campus
 - Centennial Office Building - State Capitol Campus
- 100G Dark Fiber Interconnects
 - Over 400 strands of fiber between 511 and UMN campus
 - BOREAS-Net Collocated at each site
 - Internet2 Collocated at 511
- Reinforcing tie-cable to the meet-me room, adding 288

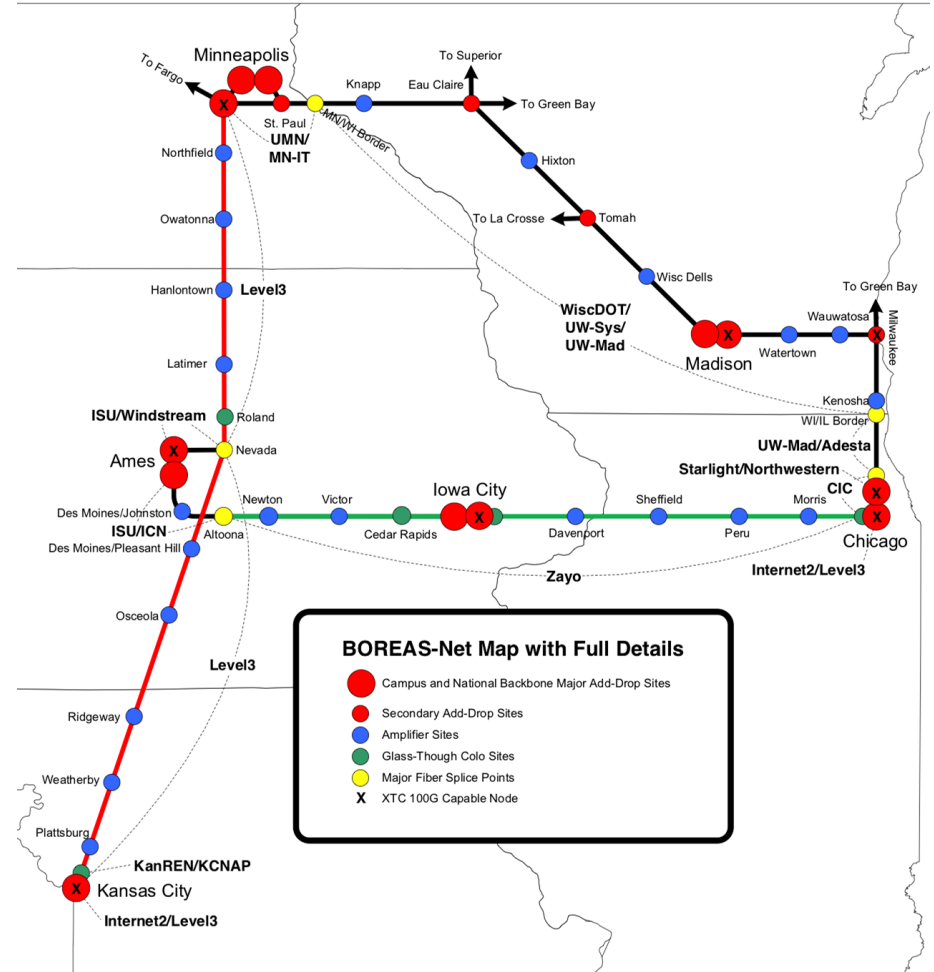


NLGP Infrastructure



BOREAS-Net

- 1.2 Tb Ring to Chicago with Spur to Kansas City
- Collaboration of Iowa, Minnesota, and Wisconsin

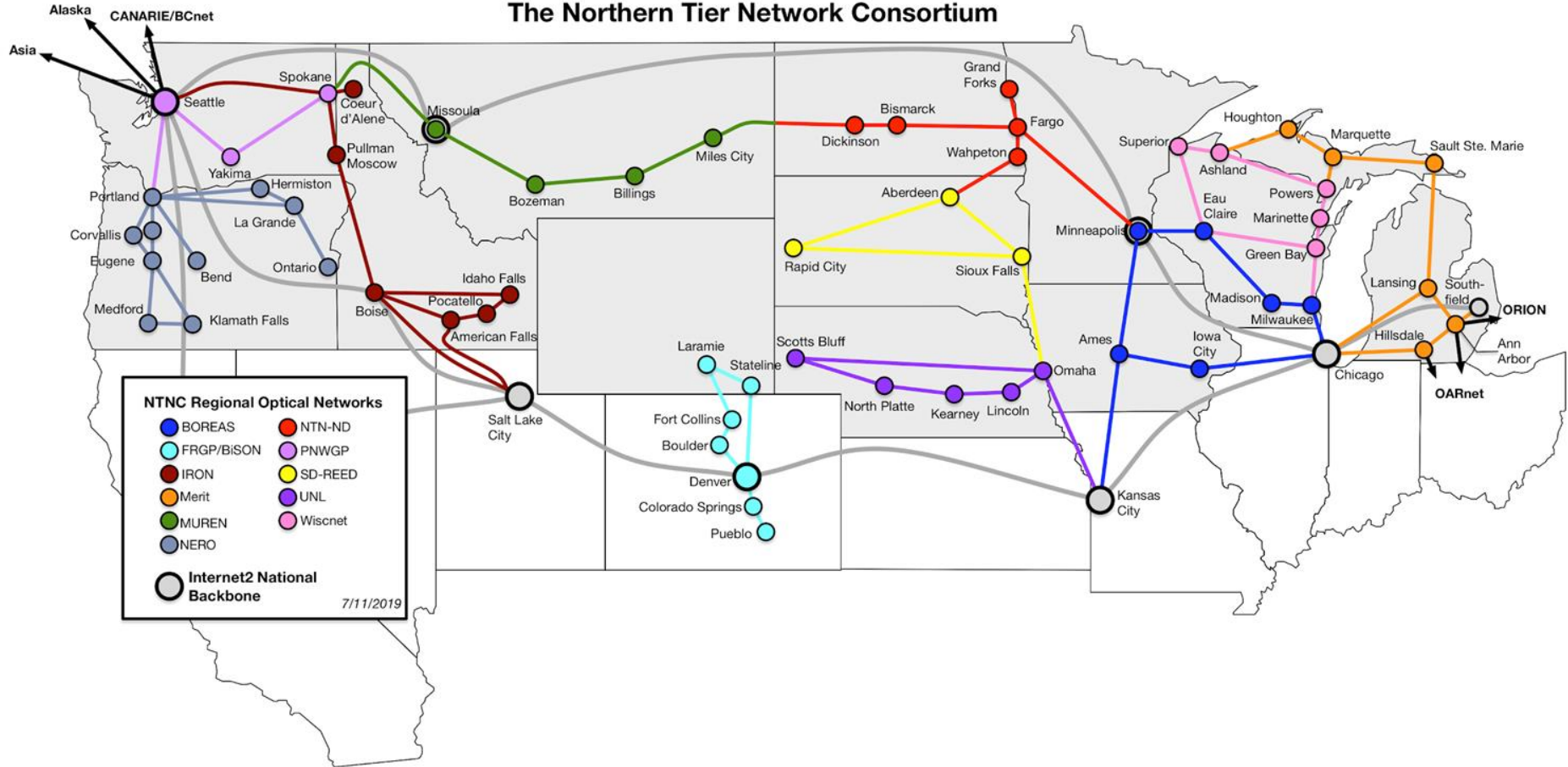


Northern Tier Network Consortium

- Collaboration of 13 States
 - Those pictured and Alaska
 - Initially focused on the lack of connectivity within the Northern Tier
 - Now focuses on coordination and collaboration
- NLGP uses BOREAS-Net and Northern Tier for transport
 - NLGP provides the higher Layer Services



The Northern Tier Network Consortium



NLGP Participants & Partners

Primary Participants

UMN - 5 campuses

MinnState - 54 campuses

MN.IT - all state agencies & some K12

Mayo

11 other private colleges

2 regional K12 consortiums

NDSU, UND, and StageNet

Partners or Secondary Participants

BTAA OmniPoP

GPN

Iowa State, Ulowa, & ICN network

SD-BOR & SD-REED network

UNL & Network Nebraska

UWisc-SysNet

WiscNet



Local Peering & Caching

Content

Akamai - peering & cache

Amazon - Cloudfront

Apple

Cloudflare

Facebook

Fastly

Google

Limelight

Netflix - peering & cache

ISPs

Charter

Consolidated (North)

DCN

SDN

TDS Telecom

Zayo

Over 50 other regional & local ISPs
covering MN, ND, SD, NE, IA,

WI



What is Coming (12 - 18 months)

- 100Gb Fargo Router
 - 100G Internet2 Connection
 - 100G or more to Minneapolis
 - 100G through SD & NE to Kansas City
- Upgrading NTNC-ND Aberdeen, SD through Fargo, ND to Grand Forks, ND and Crookston, MN
- BOREAS-Net Ring Upgrade more 2Tb
 - Resilient 100G to Chicago for NLGP
 - Shared 100G to Kansas City for NLGP



What is Coming - Peering & Routing Security

- Microsoft has announced Azure Front Door and ExpressRoute coming to Minneapolis
 - Front Door is their CDN and other Edge Service
- Full Peering with Amazon in Minneapolis
- Commercial Peering (I2PX & WRPS) for other NLGP Participants
- Facilitate CAs connecting via MICE connected providers
- Mutually Agreed Norms for Routing Security (MANRS)
- IRR Filtering and RPKI



Questions?

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