

GENI Insights from the Great Plains Network



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Collaborators include:

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... and others

Great Plains Network

- A consortium of over 20 universities
 - Arkansas
 - Kansas
 - Nebraska
 - Oklahoma
 - Missouri
 - South Dakota
 - Plus,
 - Iowa State University
 - University of Minnesota
 - Corporate Affiliates
- Initially, partnered for regional advanced networking



Background

- GPN more than a network – a consortium for fostering research collaborations.
- GPN members meet every year for the GPN annual conference.
- Recent GPN initiatives have included
 - Grid and Cluster Computing
 - Middleware and Identity Management

Opportunity

- As a regional entity with expertise in networking operations and management as well as networking research, GPN is poised to play an active role in the NSF GENI initiative.
- GPN member universities share several common network research interests.
- Fiber deployment in the region now common with Kansas City as a GigaPOP for several carriers.

GPN mini GENI enables...

- GPN mini GENI will further the establishment of leading edge research programs in the region:
 - Transparent Optical Transport
 - Control plane and management plane for high speed networks
 - Optical switching and substrate layer design
 - Multi-level network resilience and survivability
 - Heterogeneous internetworking architecture
 - Virtualization of network resources.
 - Cognitive networks
 - Multi-layer security
 - Protocol research: FPGA enabled protocol selection and programming for research on new protocols.

Testbed Configuration

University of Nebraska

- Four initial sites

University of Missouri
Kansas City

- Creative Wide Area Network Solutions : carrier backbone spectrum, dark fiber, private network

- All optical layer 1 with optically switched, multi-protocol, agile wavelengths

Kansas State University

- Programmable Optical Layer

- Evaluate GENI Issues

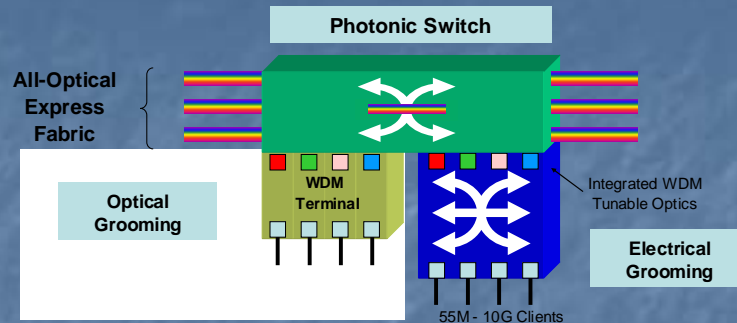
University of Kansas



miniGENI Node Architecture

Designed around a flexible, multilayer switch and grooming architecture

Supports the development of an agile, programmable layer1-2+ node architecture

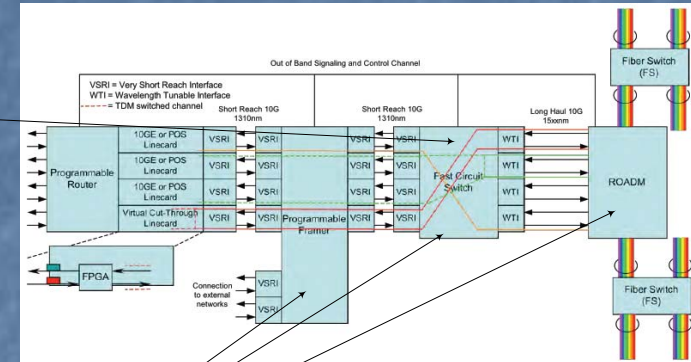
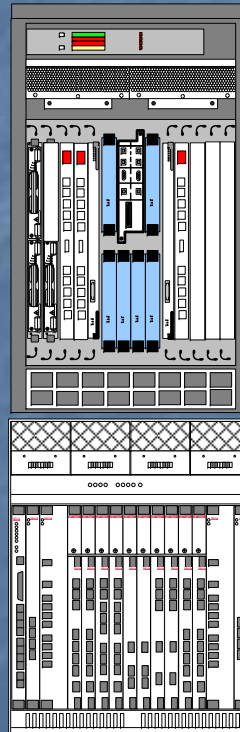


Maps directly into significant blocks of the proposed GENI Node Architecture.

- Wavelength Selective Switch / Fiber Switch
- Sub-wavelength electrical circuit switch
- Programmable Framer

Multiple "PORTALS" for researcher plug in :

- C-band Spectrum
- layer 1 sonet / g709
- layer 2
- FPGA interface



Partners

- GPN mini GENI Initiative is a partnership between
 - Networking faculty and staff, students and researchers
 - Regional universities – Administration
 - US National Science Foundation
 - Leading network vendors
 - Regional network carriers
 - University – Industry Partnership
 - Great Plains Network Consortium

Stay Tuned!

- Great Plains Network consortium
 - <http://www.greatplains.net>
 - <http://collaboration.greatplains.net>