Research & Education
Network Business Models
Project Overview

- Spring of 2007, The Quilt and MIDnet launched a collaborative effort to collect case studies of R & E network organizations

- Goals of the project:
  - Enrich and deepen the content of the original Quilt business model review
  - Reduce number of surveys and redundant data requests by collaborating with Quilt-StateNets Financial Focus Group
  - Share the history, knowledge and experience of R&E optical network organizations with the broader R&E community

- Methodology for collecting information

- Project Principles:
  - Carol Farnham, MIDnet
  - Jen Leasure, The Quilt
Presentation Topics

• History of Organizations
• Summary
• Commonalities
• Organizational Structure
• Management & Operations
• Funding Models
• Service Offerings & Pricing Strategies
Participants

Organization - Headquarters
- 3ROX - Pennsylvania
- FLR - Florida
- FRGP - Colorado
- GPN - Kansas
- LEARN - Texas
- LONI - Louisiana
- MAX - Maryland
- Merit, Inc. - Michigan
- MOREnet - Missouri
- NCREN - North Carolina

Organization - Headquarters
- NEREN - Connecticut
- NTNC - Montana
- NYSERnet - New York
- OneNet - Oklahoma
- OSCnet - Ohio
- SoX/SLR - Georgia
- WiscNet - Wisconsin
History

- **Merit**
- **NYSERNet**
- **OSCNet**
- **OneNet**
- **SLR/SoX**
- **FLR**
- **NEREN**

Timeline:
- '64
- '85 '87
- '92 '96
- '03 '04

Branches:
- LEARN
- NTNC
- LONI

MIDnet

THE QUILT
Summary Findings

- Seventeen case studies completed
- No single business model, no single recipe for success
- Mission statements are unique, but have similar elements:
  - Supporting research and education
  - Enabling research and education
  - Providing advanced network technologies and applications
- 60% are structured as 501(c)(3)s or are consortiums under a 501(c)(3)
- The remaining are organized as a project of the Board of a university system or are university-based consortiums
Summary Findings

- Of the 16 operational networks
  - 83% offer services beyond Layer 1
  - 50% outsource some or all of NOC services
  - 56% outsource some or all of remote hands
  - Staffing levels ranged from 1 to 110
  - All of them own the fiber asset
  - Majority own rather than lease equipment
Summary Findings

- Commonalities in the following program areas:
  - Outreach and community building
  - Lessons learned
  - Future directions
Outreach & Community Building

- Community workshops
- Staff dedicated to outreach
- Newsletters
- Annual member meeting/community days
- Word of mouth
- Showcase special projects to promote network capabilities
- Technical staff is responsible for education
Lessons Learned

• The common themes from lessons learned
  – Community building is important
  – There is value in just meeting and bringing folks together
  – Add value by providing leading-edge services no one else can or does
  – Be an enabler for research and education
  – Do what is in the best interest of your clients
  – Leverage opportunities
Future Directions

• Expand fiber footprint
  – Focus on ‘last mile’
• Evaluate existing services
• Develop new services
• Investigate peering relationships that provide cost effective solutions
• Expand beyond the realm of the physical network
• Research new ‘market’: K-12, libraries, health care, etc.
Organizational Structures

- Organizational Structure Determines Governance
  - Advantages of Various Organizational Structures
  - Governance
    - The majority of interviewed organizations are governed by a Board of Directors with both financial and strategic responsibilities
    - University board projects or university-based consortiums are commonly governed by a Board of ‘Regents’ or member advisory committee respectively
    - Two organizations are managed by Executive Directors along with Executive Committees
    - One organization is managed by an Executive Director with member advisory committee recommendations
Management/Operations

• Administrative (Back Office) Functions
  – University-based organizations
  – 501(c)(3)

• Staffing
  – Size of organization is determined by:
    • Back Office functions
    • Network design and geography
  – Staffing solutions include direct hires and contract employees.
    • Informal understanding in many of the contract hires
Management/Operations

- Owned versus Leased Network Assets
  - Majority have IRU on the fiber
  - Majority own equipment
- NOC
  - Network monitoring is 24 x 7
  - Staffed, 24 X 7 NOC in 69% of organizations
  - For those that outsource, the majority outsource to a member organization
    - May outsource all or some of NOC services
    - One organization outsourced in-bound calls to a third party, but resolution is done in-house
  - Two organizations outsource to a third party provider
Management/Operations

- Remote Hands
  - Redundant network enables the majority of organizations to perform remote hands activities in-house and/or rely on member institutions to assist in the performance of these activities.
  - Very few organizations have outsourced agreements for remote hands network support to third parties.

- Sparing Policies and Maintenance Agreements
  - Reliability of network hardware
  - Just in-time inventory practices
  - Sparing vs. maintenance agreements
Startup Funding

- Funding for the original fiber acquisitions
  - Founding members
  - The state’s governor or legislature
  - Loan from the Regents or a member
  - Membership
  - Cash from reserves
  - Industrial Revenue Bond issue and low-interest loan
  - Federal grants
Service Offerings

- All active R&E networks interviewed provide transport services and all but two provide layer 2 services.
- 71% of organizations are also offering layer 3 services
- In addition to network access, other service offerings include:
  - Peering
  - Video Services
  - VoIP
  - Business continuity/disaster recovery
  - Promotion of research collaboration among members
  - Security
  - Email
  - Web-hosting
  - Collocation
  - Multi-cast
  - Ruckus
‘Membership’ Base

- University community makes up the majority
- Other organizations:
  - K-12
  - Research Hospitals
  - State government entities
  - Libraries
  - Federal laboratories
  - Museums
  - Other healthcare entities
Service Pricing Strategies

Breakdown of Service Cost Components

- Program Management/Administrative Costs
- Operational and Network Costs
- Opt-in Services
- Access to National R&E Networks
- Capital Investment Project
- Equipment Replacement
- Research and Development
Service Pricing Strategies

Program and Administrative Cost Recovery Methods

- Include in total operational budget
- Collect as a % mark-up on services
- Recover through annual membership fees
- One-time allocation from state
Service Pricing Strategies

Operational and Network Cost Recovery Methods

• State-Funded Networks
  – Funding is requested and approved on an annual basis
  – Institutions receive annual appropriation for services

• Member-Funded Networks
  – Members share equally
  – Member tiered pricing
  – Affiliates pay base level cost plus standard
Service Pricing Strategies

Opt-In Service Cost Recovery
- Based on network design – i.e. priced from POP to POP
- Based on actual costs to provide services
- Based on an algorithm which factors in actual costs and market rates

Access to National R&E Network Cost Recovery
- Included in annual membership fees or member allocation for services
- Opt-in and shared equally among participating members
Service Pricing Strategies

Capital Investment Cost Recovery
- Funded by existing reserves
- Funded by grants or state program funds
- Funded by increased member dues

Equipment Replacement Cost Recovery
- Included in the annual operational budget
Service Pricing Strategies

Research and Development

- One organization has dedicated R&D director with staff for network research
- One organization’s R&D division is primarily funded through research grants
- Dedication of a 10G lambda to each member for network research purposes
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