

# Research & Education Network Business Models



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# 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



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# Presentation Topics

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



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# Participants

## Organization - Headquarters

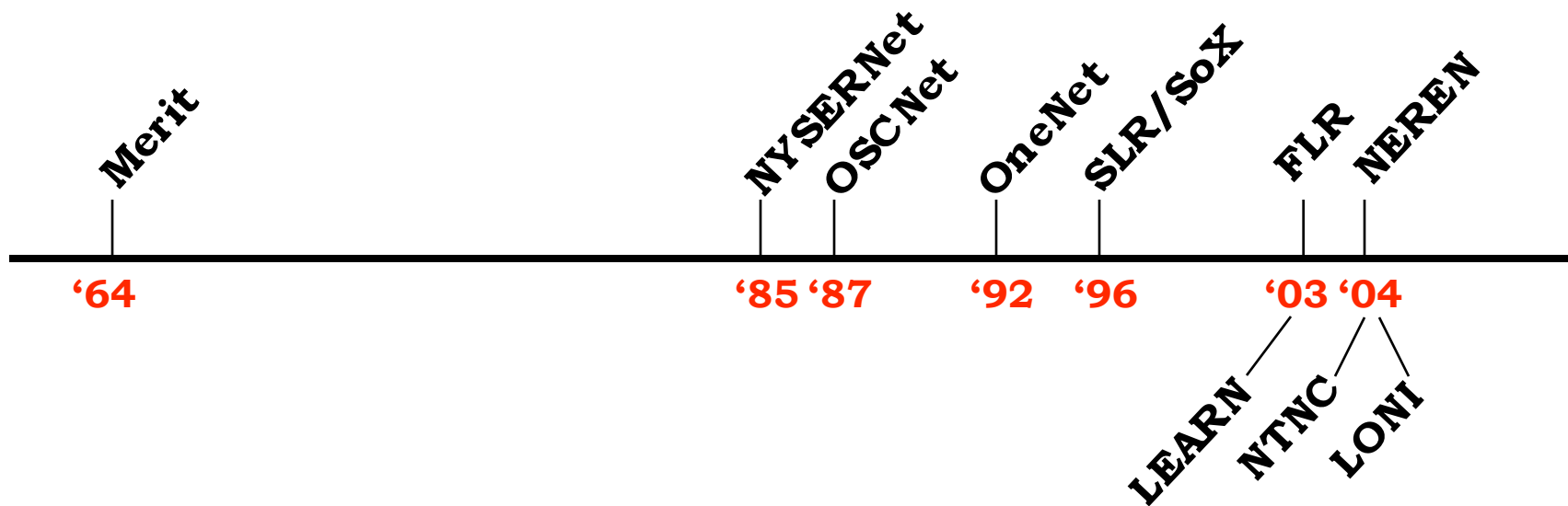
- 3ROX - Pennsylvania
- FLR - Florida
- FRGP - Colorado
- GPN - Kansas
- LEARN - Texas
- LONI - Louisiana
- MAX - Maryland
- Merit, Inc. - Michigan
- MOREnet - Missouri
- NCREN - North Carolina

## Organization - Headquarters

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



# History



# 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



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# 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



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# Summary Findings

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



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# 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



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# 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



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# 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.



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# 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



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# 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



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# 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



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# 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



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# 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



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# 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



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# 'Membership' Base

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



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# 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



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# 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



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# 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



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# 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



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# 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



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# 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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