SURA Optical Networking Cookbook: A practical resource

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Southeastern Universities Research Association
www.sura.org

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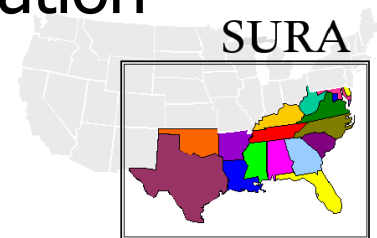
Background

- Inspiration: NSF-funded Optical Networking workshop hosted by SURA & MCNC, December 2001
  - http://www.sura.org/events/2001/optical.html
- Why?
  - What is "optical networking"?
  - What can you do?
  - Specific needs and issues for R&E community

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Why a 'cookbook'?

- Aim for developing a practical resource: ingredients and "good recipes"

- Target audience: university campuses, GigaPops, decisions makers looking at implementations...

- Via case studies: what to avoid, what may work

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The sous-chefs'…major content contributors

- Kathy Benninger, Pittsburgh Supercomputing Center
- Leo Donnelly, Harvard University
- Mark Johnson, North Carolina Research & Education Network
- Ron Hutchins, Georgia Institute of Technology/Southern Crossroads (SoX)
- Sarah Morford, Grant County Public Utility District
- John Nichols, Virginia Tech
- Ana Preston, University of Tennessee
- John Streck, North Carolina State University
- Troy Travis, University of South Carolina
- Bill Wing, Oak Ridge National Laboratory
- Advance Fiber Optics, Inc.
- Corning Cable Systems
- RACO, Inc.

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Acknowledgements

Project Leads:

- Kathy Benninger, Pittsburgh Supercomputing Center
- John Nichols, Virginia Tech
- Ana Preston, University of Tennessee
- Troy Travis, University of South Carolina
- Mary Fran Yafchak, SURA

Feedback and Review:

- Gary Crane, SURA
- Beth Davidson, University of South Carolina
- Joel Dunn, University of North Carolina at Chapel Hill
- Doyle Friskney, University of Kentucky
- SURA Crossroads Architecture Working Group

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What is in Version 1.0?

- 1st version released late October 2002
- Optical Technology Overview
  - Basics: architecture of optical system, the "physics" of fiber optics, illustrations and techniques
- Guidelines for Building Fiber Optic Cable Plant
  - Additional depth on the basic (and critical) fiber infrastructure
  - Resources for gathering more information if building

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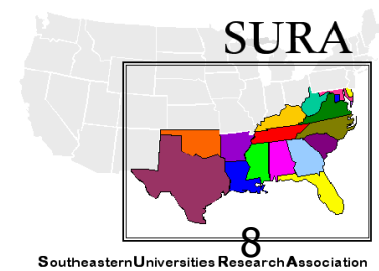
What is in Version 1.0?

- ## Implementation Examples
  - How optical networking is extending and enhancing networking capabilities today
  - Implementation case studies
  - Scenarios: metro, state – regional …

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A closer look...

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Optical Technology Overview

- Geographical context: Campus, Metro, Regional, Long haul

- Basic optical networking terminology & concepts, with references for ongoing study

- Understanding and compensating for the limiting factors of fiber

- Fiber optic transport

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Optical Technology Overview

Future Topics:

- Enabling protocols
- IP and optical integration
- Equipment
- 40 GigE, 100 GigE: what truly in this space
- Industry Primer on equipment and what to ask

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Building a Fiber Optic Cable Plant

- Why Fiber Optic infrastructure?
- Major steps in planning and building
- Implementation, system design and management tools
- Generic cost information
- Quality assurance checklist
- Sources for further study and information

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Implementation

- ## Oak Ridge National Laboratory:
  - Regional high-speed wavelengths to Atlanta
  - Bill Wing

- ## Harvard University:
  - Joint Trench Conduit & Fiber Build
  - Leo Donnelly

- ## NCREN:
  - NCREN3: North Carolina Research & Education Network
  - Mark Johnson

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Implementation – cont.

- Virginia Tech:
  - e-Corridor Initiative
  - John Nichols
- Southern Crossroads (SoX)
  - Metropolitan Extension
  - Ron Hutchins
- Grant County Washington Public Utility District
  - Sarah Morford

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Next Steps

Continue to focus on community need and interest

- Present and seek input - like this conference!
- Invite contributions

Develop process to incorporate contributions

- Implementation Example guidelines – see web pages
- Other sections TBD
- IF you are interested in having your implementation "in", please let us know
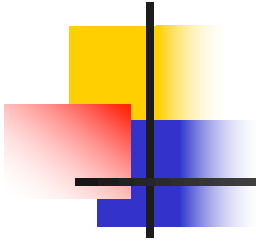- Editorial/Review process under development

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Next steps, cont.

Seek a way to sustain the effort

- Current team proceeding for now
- Future resources? Suggestions welcome!

More information:

- http://www.sura.org/opcook
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Thank you!

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