



NSF Campus Cyberinfrastructure PI and Cybersecurity Innovation for Cyberinfrastructure PI Workshop

September 24 – 26, 2018 | University of Maryland, College Park, MD

NSF Program (either CC or CICI): CC

Program Area: Integration Award Number: 1827116

PI: Brian Bockelman / University of Nebraska

co-PIs: Shawn McKee / University of Michigan, Rob Gardner /
University of Chicago

Project Title: *Service Analysis and Network Diagnosis (SAND)*



Brian Bockelman

Research Associate Professor
University of Nebraska
Computer Science &
Engineering
bockelman@unl.edu



Shawn McKee

Research Scientist
University of
Michigan Physics
smckee@umich.edu



Rob Gardner

Senior Scientist
University of Chicago
Physics
rwg@hep.uchicago.edu



NSF Campus Cyberinfrastructure PI and Cybersecurity Innovation for Cyberinfrastructure PI Workshop

September 24 – 26, 2018 | University of Maryland, College Park, MD

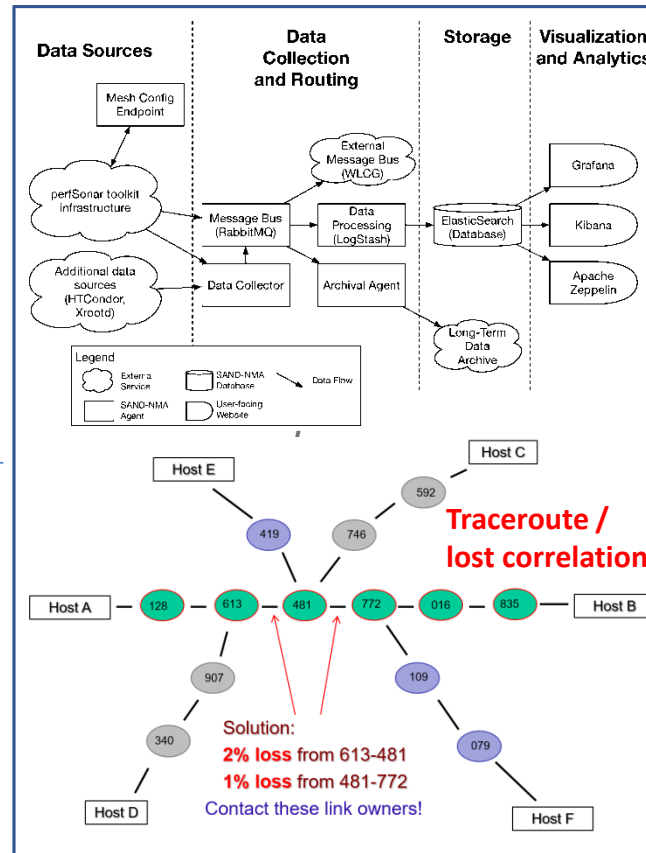
Quad Chart for: *Service Analysis and Network Diagnosis (SAND)*

Challenge / Approach:

- **Challenge:** Making networks more effective for data-intensive science
- **Approach:** This project focuses on techniques that better combine, visualize, and analyze disparate network monitoring and service logging data, providing a comprehensive picture critical to the engineers and scientists relying on the network.

Deliverables:

- Improve network monitoring archive solution. Refine data pipeline.
- Analytics platform to help correlate the disparate data sources.
- Investigations into anomaly detection



Scientific Impact:

- Allow science stakeholders, such as LHC, to make intelligent network usage decisions from network monitoring.
- Provide a diverse dataset of network performance measurements specific to worldwide R&D
- Provide platform for near-realtime analytics of network data.

Metadata tag:

- <https://sand-ci.org/>
- *Project starting up!*
- *Gathering data!*
- *Interested in more data sources!*
- *Growing out dataset!*



NSF Campus Cyberinfrastructure PI and
Cybersecurity Innovation for Cyberinfrastructure PI Workshop
September 24-26, 2018 | Albuquerque, New Mexico

NSF Program (either CC or CICI): CC

Program Area: CC-DNI

Award Number: 1541442

PI: Byravamurthy Ramamurthy

co-PIs: Brian Bockelman, David Swanson

Project Title: CC*DNI Integration: Innovating Network Cyberinfrastructure through Openflow and Content Centric Networking in Nebraska



Byravamurthy Ramamurthy

Professor
Computer Science & Engineering
University of Nebraska-Lincoln
ramamurthy@unl.edu



Brian Bockelman

Research Associate Professor
Computer Science & Engineering
University of Nebraska-Lincoln
bockelman@unl.edu



David Swanson

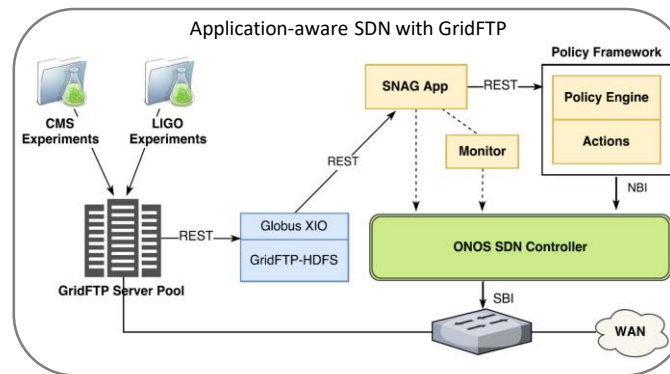
Research Professor
Computer Science & Engineering
University of Nebraska-Lincoln
david.swanson@unl.edu



Quad Chart for: CC*DNI Integration: Innovating Network Cyberinfrastructure through Openflow and Content Centric Networking in Nebraska

Challenges:

- Integration of research and campus networking
- Improve performance and manageability of GridFTP transfers
- Bridge CMS data caching model with NDN distribution architecture
- Openflow hardware support

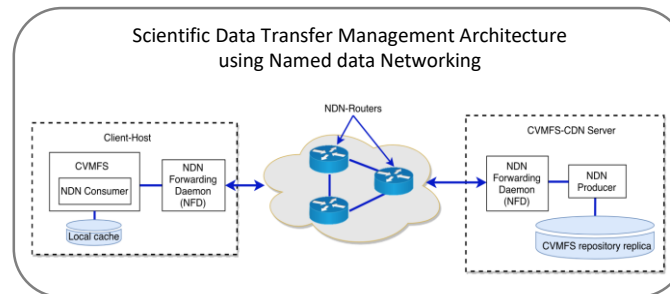


Scientific Impact:

- Application aware networking
- Policy driven resource management
- Improved flexibility enabling campus and research networks to coexist securely
- Improved data caching architecture for CMS and CernVM-FS projects

Solutions:

- Globus XIO plugin enabling SDN approach to GridFTP transfers
- Combining CernVM-FS filesystem with Named Data Networking
- Framework for large-scale data-intensive science using SDN and NFV



Metadata tag:

- *Conference paper published: **SNAG: SDN-managed Network Architecture for GridFTP Transfers***
- *Need continual collaboration with campus network team to benefit researchers end-to-end*