

The 3rd International Workshop on
Network-aware Data Management

in cooperation with ACM [SIGHPC](#), in conjunction with [SC'13](#)
International Conference for High Performance Computing, Networking, Storage and Analysis.



Sunday, November 17th, 2013 (9:00am - 5:30pm)

Room **601**

Colorado Convention Center, Denver, Colorado

In the age of extraordinary advances in communication technologies, there is a need for efficient use of the network infrastructure to address increasing data requirements of today's applications. Traditional network and data management techniques are unlikely to scale to meet the needs of future collaborative data-intensive systems. We require novel data access mechanisms and intelligent network middleware to enable future design principles of network-aware data management. NDM workshop provides a forum for researchers from academia, government, and industry to discuss emerging trends and new technological developments in intelligent data-flow and resource coordination, network-aware application design issues, and 100Gbps network performance problems.



<http://2013.ndm-meeting.com>

Invited Talks:

Challenges and Solutions in Large Scale Data Movement, *Martin Swamy, Indiana University.*
(9:05-9:40)

Abstract: The effective and efficient utilization of networks is a persistent challenge in today's computing ecosystem. The trend towards increasingly distributed computing environments supporting data-intensive applications compounds the issue, making data movement a cross-cutting concern, affecting users of distributed computing and data-intensive science alike. This talk will discuss emerging network approaches and their implications for the future. Two key areas to be explored are Software Defined Networking (SDN) and Remote Direct Memory Access (RDMA) over Ethernet.

Overview of ESnet's 100Gbps Testbed, *Brian Tierney, Energy Sciences Network.*
(9:40-10:00)

Abstract: The ESnet 100G testbed provides network researchers with a realistic environment for 100G application / middleware experiments. This talk will give an overview of the testbed, what research has been done on the testbed, and how to get access to the testbed.

The Changing Face of Network Projects and Funding, *Jennifer M. Schopf, International Networking at IU*
(13:30-14:00)

Abstract: Ten years ago, research and education groups could ask for funding for more capacity based on the simple argument that what was in place simply wasn't enough for researcher, and the argument was generally accepted. Recently, especially in the last 2-3 years, this has changed, and funding agencies are looking more closely to network use and usability as they make awards. This talk will address the changing nature of how network engineers and researchers need to think about their projects, from funding requests to demos, using the IU International Network group as a case study.

Supporting Climate Modeling Over Named Data Networking, *Christos Papadopoulos, Colorado State University.*
(15:30-16:00)

Abstract: Named Data Networking (NDN) is an instance of Information Centric Networking (ICN). Unlike IP, NDN focuses on content (the what) rather than hosts (the where). In NDN users simply request content by name rather than its location, and the network locates and retrieves signed content from anywhere, including the publisher, a network cache or a nearby user. The ability to specify content by name and retrieve the nearest copy is of great benefit to Big Data applications by seamlessly locating related data and speeding up retrieval of large datasets, especially in collaborative environments. In this presentation, I will briefly describe our plans to integrate NDN with the Global Cloud Resolving Model (GCRM) application at Colorado State University's Atmospheric Sciences department.

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Workshop Program

- 9:00 - 9:05 Opening Remarks
- 9:05 - 9:40 **Challenges and Solutions in Large Scale Data Movement**, Martin Swany, Indiana University.
- 9:40 - 10:00 **Overview of ESnet's 100Gbps Tesbed**, Brian Tierney, Energy Sciences Network
- 10:00 - 10:30 Coffee Break
- 10:30 - 11:00 **On causes of GridFTP Transfer Throughput Variance**, Zhengyang Liu, Malathi Veeraraghavan, Jianhui Zhou, Jason Hick and Yee-Ting Li.
- 11:00 - 11:30 **Characterizing the Impact of End-System Affinities On the End-to-End Performance of High-Speed Flows**, Nathan Hanford, Vishal Ahuja, Mehmet Balman, Matthew Farrens, Dipak Ghosal, Eric Pouyoul and Brian Tierney.
- 11:30 - 12:00 **Efficient Wide Area Data Transfer Protocols for 100 Gbps Networks and Beyond**, Ezra Kissel, Martin Swany, Brian Tierney and Eric Pouyoul.
- 12:00 - 12:20 **In-network, Push-based Network Resource Monitoring**, Taylor Groves, Yihua He and Dorian Arnold.
- 12:20 - 13:30 Lunch Break
- 13:30 - 14:00 **The Changing Face of Network Projects and Funding**, Jennifer M. Schopf, International Networking at IU
- 14:00 - 14:30 **Evaluating I/O Aware Network Management for Scientific Workflows on Networked Clouds**, Anirban Mandal, Paul Ruth, Ilya Baldin, Yufeng Xin, Claris Castillo, Mats Rynge and Ewa Deelman.
- 14:30 - 15:00 **Network-Aware Data Caching and Prefetching for Cloud-hosted Metadata Retrieval**, Bing Zhang, Brandon Ross, Sanatkumar Tripathi, Sonali Batra, and Tevfik Kosar.
- 15:00 - 15:30 Coffee Break
- 15:30 - 16:00 **Supporting Climate Modeling Over Named Data Networking**, Christos Papadopoulos, Colorado State University.
- 16:00 - 16:20 **The Practical Obstacles of Data Transfer: Why researchers still love scp**, Hai Ah Nam, Jason Hill and Suzanne Parete-Koon.
- 16:20 - 16:40 **End-to-End Data Movement Using MPI-IO Over Routed Terabits Infrastructures**, Geoffroy Vallee, Scott Atchley, Youngjae Kim and Galen Shipman.
- 16:40 - 17:10 **Network-aware Virtual Machine Consolidation for Large Data Centers**, Dharmesh Kakadia, Nandish Kopri and Vasudeva Varma.
- 17:10 - 17:30 Open-Discussion & Best Paper Announcement