# SC20 Supercomputing Forum for Experiments and Demonstrations Showcasing Innovations in Large-Scale, Data-Intensive Science Networking

**Organized by the Research Consortium for Data-Intensive Science Networking, et. al.[1]**

November 19, 2020

Held via Zoom, 08:00am – 1:10pm Central Time (US and Canada)
Hosted by the International Center for Advanced Internet Research (iCAIR), Northwestern University

***DRAFT AGENDA***

## Overview

Each year, *ACM/IEEE Supercomputing: The International Conference for High Performance Computing, Networking, Storage, and Analysis*, supports large-scale networking experiments and demonstrations through its SCinet initiative. Many are conducted as part of the SCinet Network Research Exhibition (NRE) program. In past years, to showcase emerging advanced networking services, techniques, and technologies for data-intensive science, an international coalition of researchers partnered with SCinet to design and implement a global networking testbed to support these experiments and demonstrations.

However, given that the SC20 conference is virtual this year and the SCinet network will not be implemented, a research community partnership was formed to design an international networking testbed using existing facilities, with several international extensions. This community plans to stage demonstrations and experiments prior to SC20 and then discuss results during a virtual SC20 Forum.

This *SC20 Supercomputing Forum for Experiments and Demonstrations Showcasing Innovations in Large-Scale, Data-Intensive Science Transport Over WANs* will communicate: (a) the motivation behind these experiments and demonstrations; (b) their design; (c) technologies used; (d) results; and, (e) future research in these areas. This Forum was held via Zoom. Attendance was limited to encourage dialog among participants; individuals who registered for the meeting were sent the Zoom link.

## Agenda/Presentations

- ***Introduction to Forum*** *(10 minutes)* – Joe Mambretti, iCAIR, Northwestern University. (No formal presentation given)
- ***Description of Design, Architecture, and Topology of Testbed*** *(15 minutes)* – Marc Lyonnais, Ciena Research Lab

[1] AARNet; Academia Sinica; AmLight; Asia-Pacific Research Platform (APRP) Consortium; AutoGOLE Consortium; Caltech; CANARIE; CENIC; CERN; Ciena Research Lab; ESnet; Cybera; Fermi National Accelerator Laboratory (FNAL); Global Research Platform (GRP) Consortium; International Center for Advanced Internet Research (iCAIR), Northwestern University; KISTI; LHC Networking Consortium; NASA Goddard Space Flight Center; Metropolitan Research and Education Network (MREN); MREN Research Platform (MRP) Consortium; Mid-Atlantic Crossroads (MAX); National Energy Research Scientific Computing Center (NERSC); National Science Foundation (NSF); Naval Research Laboratory (NRL); Pacific Research Platform (PRP) Consortium; Pacific Wave; RNP; SingAREN; StarLight International/National Communications Exchange Facility Consortium; SURFnet; Towards a National Research Platform (TNRP) Consortium; TWAREN; University of Amsterdam; University of California, San Diego; University of Illinois Chicago; et. al.

- ***NASA Goddard Space Flight Center (GSFC) High End Computer Networking (HECN) Demonstrations*** *(20 minutes)* – Bill Fink and Paul Lang, NASA GSFC.
  Demonstrations of systems and techniques to achieve near 400G line-rate disk-to-disk data transfers between high-performance NVMe servers at NASA GSFC and StarLight by utilizing RDMA technologies that allow CPU process offloading.
- ***Naval Research Laboratory (NRL) Resilient Distributed Processing and Reconfigurable Networks Demonstrations*** *(20 minutes)* – Linden Mercer, NRL.
  Demonstrations that showed the dynamic arrangement and re-arrangement of widely distributed processing of large volumes of data across a set of compute and network resources organized in response to resource availability and changing application demands. (Presentation not made generally available. Contact presenter.)
- ***Global Research Platform*** *(GRP) (20 minutes)* – Joe Mambretti, iCAIR/Northwestern and StarLight.
  A distributed environment for science research and new knowledge discovery.
- ***Kubernetes OpenNSA AutoGOLE Integrations and Federations of Nautilus and the NRP-Nautilus.io Clusters*** *(20 minutes)* – John Graham, University of California, San Diego.
- ***Services and Capabilities of the StarLight Software Defined Exchange (SDX) with GRP*** *(20 minutes)* – Jim Chen, iCAIR/Northwestern and StarLight.
- ***K8s Federation and DTN-as-a-Service Management and Orchestration Integrated with the GRP*** *(20 minutes)* – Shawn Wang, iCAIR/Northwestern and StarLight.
- ***High-Performance Data Transfer Nodes for Petascale Science with NVMe-over-Fabrics with Microservices and Clouds*** *(20 minutes)* – Se-Young Yu, iCAIR/Northwestern and StarLight.
- ***FNAL's Rucio/BigData Express/SENSE Integration Services*** *(20 minutes)* – Wenji Wu, FNAL
- ***Composable Infrastructure*** *(20 minutes)* – Lance Long, EVL/University of Illinois Chicago.
- ***PRP/TNRP/CHASE-CI*** *(20 minutes)* – Tom DeFanti, University of California, San Diego.
- ***Science Networking Requirements, Emerging Solutions, and the Global Network Advancement Data-Intensive Science Working Group*** *(20 minutes)* – Harvey Newman, Caltech.
- ***AutoGOLE*** *(20 minutes)* – Gerben Van Malenstein, SURFnet.
- ***LHC P2P Service*** *(20 minutes)* – Gerben Van Malenstein, SURFnet.
- ***Plans for Future Demonstrations at Other Forums****, e.g, SC21, Supercomputing Asia 2021, GRP 2021 Workshop, etc.* (5 minutes) – Joe Mambretti (iCAIR/Northwestern, StarLight and MREN. (No formal presentation given)
- ***Closing Remarks*** *(5 minutes)* – All (No formal presentation given)