SC23 Network Research Exhibition: Demonstration Preliminary Abstract

Global Research Platform (GRP)

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Abstract

The Global Research Platform (GRP) is an international scientific collaboration that is creating innovative advanced ubiquitous services that integrate resources around the globe at speeds of gigabits and terabits per second, especially for data-intensive science research. GRP focuses on design, implementation, and operation strategies for next-generation distributed services and infrastructure to facilitate high-performance data gathering, analytics, transport, computing, and storage among multiple science sites at 100 Gbps or higher (e.g., 400 Gbps WAN streams0. GRP community partners are located in North America, Asia, Europe, and South America and work together to customize international fabrics and distributed cyberinfrastructure to support optimal data-intensive scientific workflows. Essentially, the GRP is a worldwide Science DMZ, a distributed environment for data-intensive research. The GRP leverages optical circuits and open exchange facilities provided by its collaborators.

The GRP focuses on recent and emerging advances in architecture, services, technologies, and infrastructure, specifically recent innovations that can directly support global large-scale data-intensive science research via: (a) Large Scale Global Science; (b) Next-Generation Research Platforms; (c) Orchestration Among Multiple Domains; (d) Large-Scale Data WAN Transport; (e) High-Fidelity Data Flow Monitoring, Visualization, Analytics, Diagnostics, Event Correlation, AI/ML/DL; (f) Data-Intensive Science, Programmable Networking, and Automation; and, (g) International Testbeds for Data-Intensive Science.

Goals

1 In part the GRP interconnects various continental and national research platforms, including the US National Research Platform, the Asia Pacific Research Platform and the Korea Research Platform. GRP is supported by research and education network professionals, NREN network engineers, computer scientists, and computational scientists who are developing new computing paradigms and cyberinfrastructure, based on programmable network services and resources, to enable international multidisciplinary teams to collaborate and communicate optimally.

Techniques will be demonstrated that dynamically create powerful, distributed, integrated systems of computers, data storage, visualization displays and instruments at collaborating sites around the globe, making it easier for researchers to share resources, innovations, information, and knowledge.

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5 6 iCAIR has developed and is experimenting with a prototype model for an integrated SDN/SDX/DTN 7 Enhancements include additional capabilities for slicing resources across the exchange to segment different science communities while using a common infrastructure.

8 This initiative is also developing capabilities for interoperability among other RNC SDXs.

Resources

Required resources from SCinet WAN are 1.2 Tbps E2E WAN services from the StarLight International/National Communications Exchange Facility in Chicago to the SC23 venue, between StarLight and the JBDT Facility in McLean, between the JBDT Facility and the SC23 venue and among all sites. Another resource is the 100 Gbps Global Research Platform Network (GRPnet) between the Pacific wave in Seattle and the StarLight Facility.

Involved Parties

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- Metropolitan Research and Education Network
- StarLight International/National Communication Exchange Facility and Consortium
- The Global Research Platform Consortium
- SC23 SCinet