SC23 Network Research Exhibition:

Resilient Distributed Processing and Reconfigurable Networks

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Abstract

This demonstration will build on our previous SC NRE demonstrations. We aim to show dynamic arrangement and rearrangement 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. We also aim to explore performance limitations and enablers for high volume bulk data transfers. A software-controlled network will be assembled using a number of switches and multiple SCinet 400G/100G connections from DC, McLean, Chicago and Berkeley to SC23 in Denver.

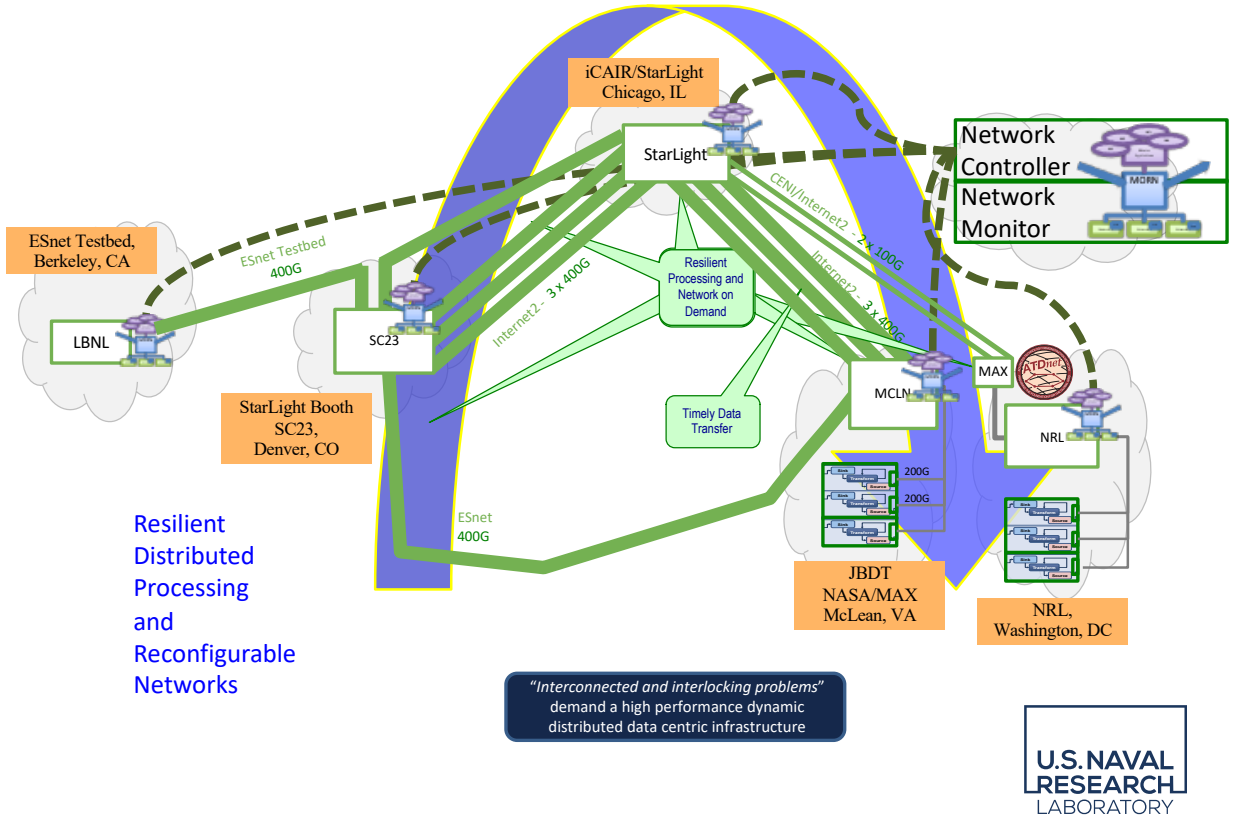
We plan to show rapid deployment and redeployment, real-time monitoring and QOS management application data flows with very different network and compute infrastructure demands. Technologies we intend to leverage include Kubernetes, SDN, RDMA, RoCE, NVMe, GPU acceleration and others.

Goals

Planned SC23 focus is on RDMA enabled data movement and dynamic network control.

1. Tbps RDMA performance over global distance for timely Terabyte bulk data transfers (goal << 1 min Tbyte transfer on N by 400G network).
2. Dynamic shifting of processing and network resources from one location/path/system to another (in response to demand and availability).

Overview:



Involved Parties

- Naval Research Laboratory (NRL)
- StarLight, Joe Mambretti, Jim Chen
- NASA, Bill Fink
- Mid-Atlantic Crossroads (MAX), Dave Diller
- SCinet WAN team
- ESnet Testbed team
- ESnet
- Internet2
- Multiple network equipment vendors