SC22 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 and Chicago to Dallas.

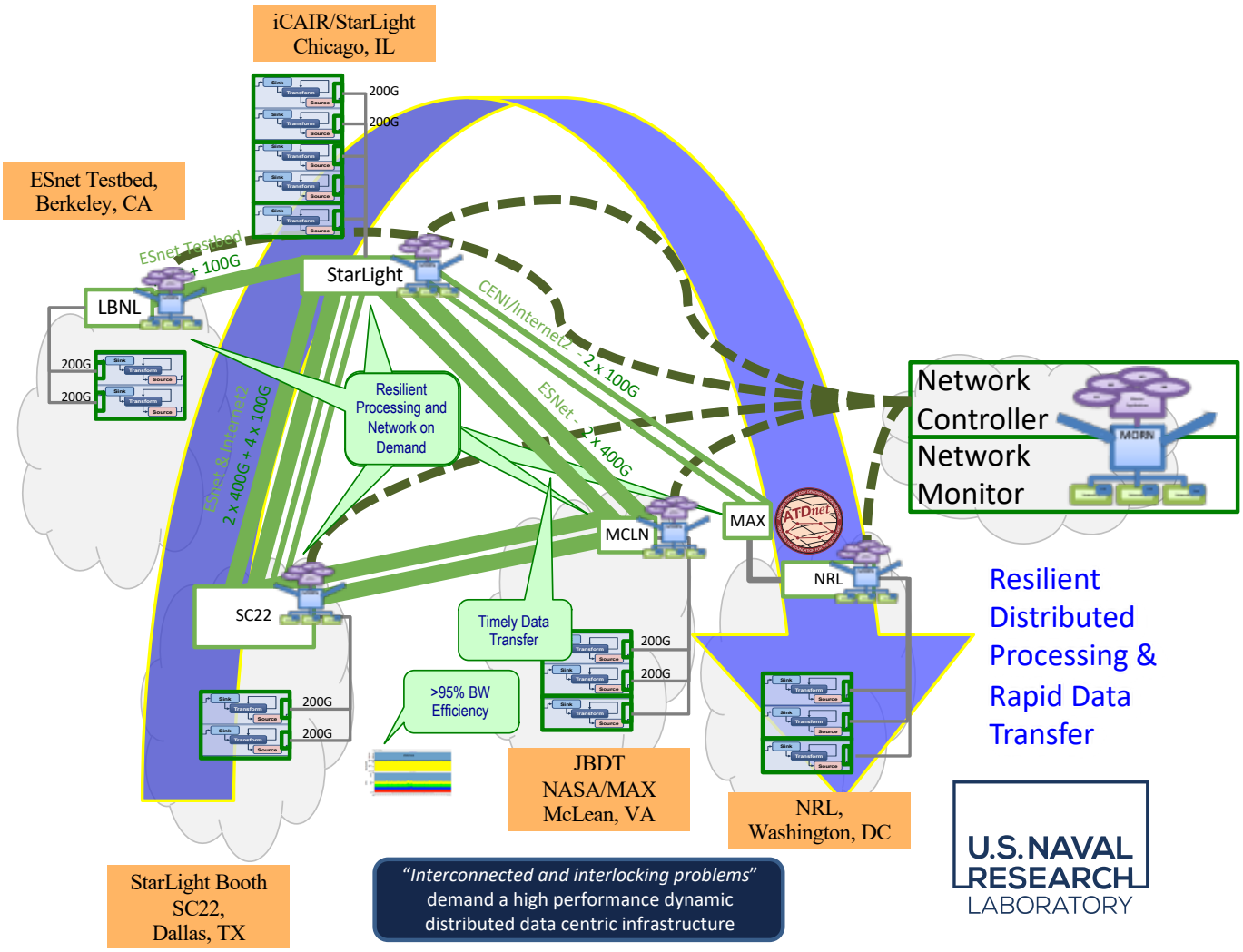
We plan to show rapid deployment and redeployment, real-time monitoring and QOS management application data flows with very different network demands. Technologies we intend to leverage include SDN, RDMA, RoCE, NVMe, GPU acceleration and others.

Goals

Planned SC22 focus is on RDMA enabled data movement and dynamic network control.

1. RDMA Tbps 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 of WAN/MAN:



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