SC19 Network Research Exhibition: Demonstration Preliminary Abstract

Global Research Platform: A Distributed Environment for Science Research and New Knowledge Discovery

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Abstract

An international collaboration has been established to design, develop, implement, and operate a highly distributed environment – the Global Research Platform (GRP) for large scale international science collaborations. These demonstrations showcase the capabilities of the GRP to support large scale data intensive world-wide science research.

Goals

1 A motivation for this initiative is the recognition that large scale world-wide collaborative science, especially data intensive science research cannot be well supported by traditional commodity networks. Instead, specialized networks that address the demanding requirements of science applications and data workflows must be implemented, particularly services for high capacity individual data streams transported thousands of miles over multi-domain networks.

2 One inspiration for this approach has been the ESnet "Science DMZ" architecture. Another has been the National Science Foundation's Campus Cyberinfrastructure. The Pacific Research Platform demonstrated the utility of extending local science DMZs to long distances across regions and nations. Currently, the Asia Pacific region is creating an Asia Pacific Research Platform and the US has implemented a prototype National Research Platform.

3 Essentially, the Global Research Platform is a world-wide Science DMZ. It is notable that these demonstrations extend beyond showcasing high performance networking (e.g., almost all paths are 100 Gbps). They also showcase close integration of WAN paths with edge devices, including compute resources, data repositories, instruments, and storage systems.

4 An indication of the utility for such a platform was recently demonstrated by the Data Mover Challenge staged by the Asia Supercomputing Conference in March 2019.

5 These demonstrations will showcase multiple components of the GRP, including orchestrators, resource discovery mechanisms, specialized middleware, integration with edge devices, and performance measurements.

Resources

Required resources from SCinet are use of some portion of 10*100 Gbps circuits SCinet has been asked to provision from the StarLight facility in Chicago to the StarLight booth on the SC19 showfloor and to the SCinet DTN-as-a-Service facility.

Involved Parties

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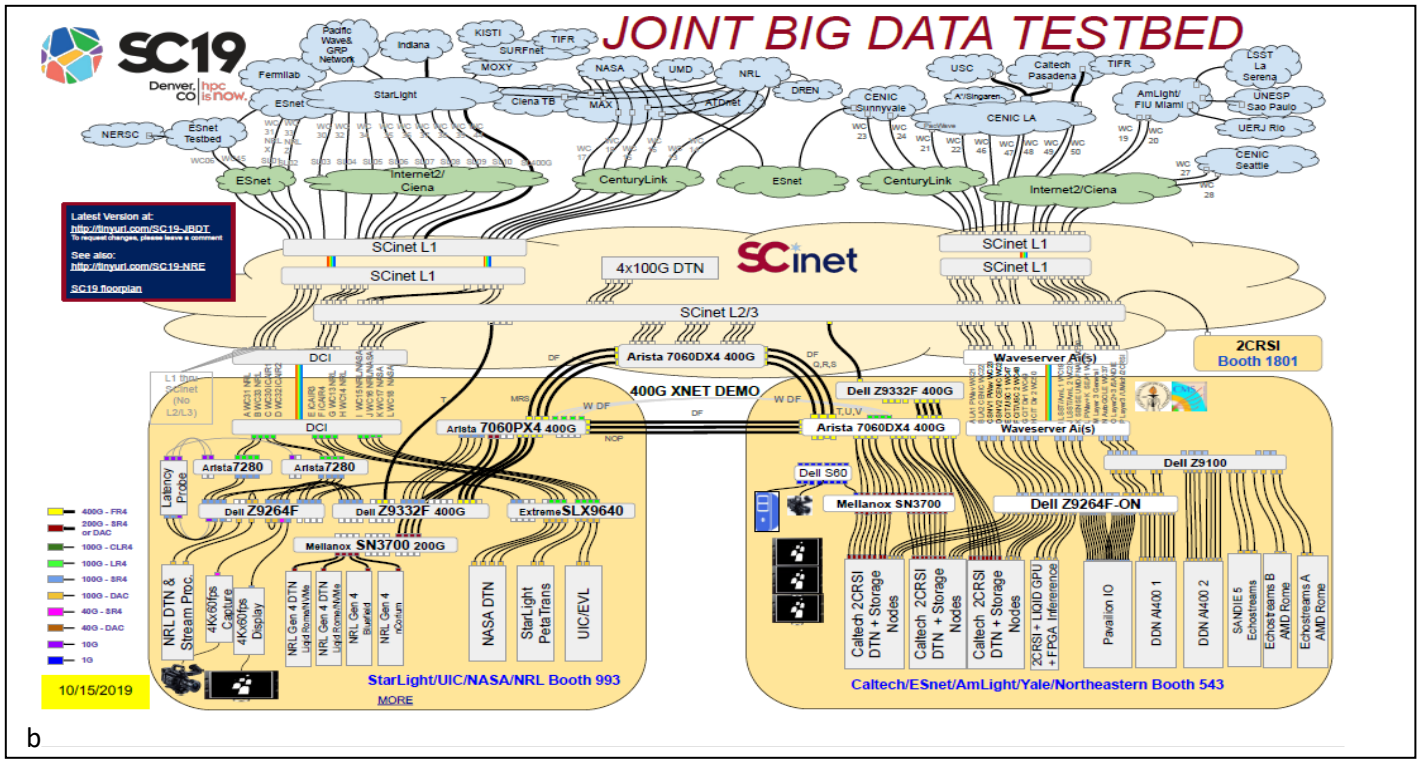
- Metropolitan Research and Education Network
- StarLight International/National Communication Exchange Facility and Consortium
- SCinet
- CenturyLink


JOINT BIG DATA TESTBED
SC19
Denver, CO | hpc is now.
Pacific Wave& GRP Network
Indiana
KISTI
SURFnet
TIFR
MOXY
Fermilab
ESnet
StarLight
Ciena TB
NASA
UMD
NRL
MAX
ATDnet
DREN
USC
Caltech Pasadena
TIFR
LSST La Serena
AmLight/ FIU Miami
UNESP Sao Paulo
UERJ Rio
CENIC Sunnyvale
A*/Singaren
CENIC LA
CENIC Seattle
NERSC
ESnet Testbed
ESnet
Internet2/ Ciena
CenturyLink
ESnet
CenturyLink
Internet2/Ciena
Latest Version at:
http://tinyurl.com/SC19-VBDT
To request changes, please leave a comment
See also:
http://tinyurl.com/SC19-NRE
SC19 floorplan
SCinet L1
SCinet L1
4x100G DTN
SCinet
SCinet L1
SCinet L1
SCinet L2/3
DCI
Arista 7060DX4 400G
400G XNET DEMO
Dell Z9332F 400G
Waveserver Ai(s)
2CRSI
Booth 1801
L1 thru SCinet (No L2/L3)
DCI
Arista 7060PX4 400G
Arista 7060DX4 400G
Waveserver Ai(s)
Latency Probe
Arista7280
Arista7280
Dell Z9100
Dell S60
Mellanox SN3700
Dell Z9264F_ON
Dell Z9264F
Dell Z9332F 400G
Extreme SLX9640
Mellanox SN3700 200G
400G - FR4
200G - SR4 or DAC
100G - CLR4
100G - LR4
100G - SR4
100G - DAC
40G - SR4
40G - DAC
10G
1G
NRL DTN & Stream Proc.
4Kx60fps Capture
4Kx60fps Display
NRL Gen 4 DTN Lgld Rome/NVMe
NRL Gen 4 DTN Lgld Rome/NVMe
NRL Gen 4 Starlord
NRL Gen 4 Horizon
NASA DTN
StarLight PetaTrans
UIC/EVL
Caltech 2CRSI DTN + Storage Nodes
Caltech 2CRSI DTN + Storage Nodes
Caltech 2CRSI DTN + Storage Nodes
2CRSI + LIQID GPU + FPGA Inferenence
Pavalion IO
DDN A400 1
DDN A400 2
SANDIE 5 Echostreams
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