SC19 Network Research Exhibition: Demonstration Preliminary Abstract

DTNs Closely Integrated with WAN High Performance 100 Gbps Optical Channels

Joe Mambretti, Jim Chen, Fei Yeh, Se Young Yu

International Center for Advanced Internet Research - Northwestern University

j-mambretti, jim-chen, young.yu, fyeh, xiao.wang@northwestern.edu

Marc Lyonnais, Rod Wilson

Ciena, mlyonnai, rwilson@ciena.com

Abstract

Data Transfer Nodes (DTNs) have been demonstrated as key network appliances for supporting large scale LAN and WAN data intensive science worksflows. With its research partners, iCAIR is investigating techniques of optimizing DTNs for services related to such workflows. For example, currently DTNs are primarily used with L3 services, and in a few cases with L2 services. The iCAIR research project is exploring ways to directly integrate DTNs with 100 Gbps and 400 Gbps WAN channels based on optical networking. This project is using several testbeds, including an international 100 Gbps testbed designed, implemented and operated by Ciena. Recent developments showcased through demonstrations at SC19 highlight these innovations.

Goals

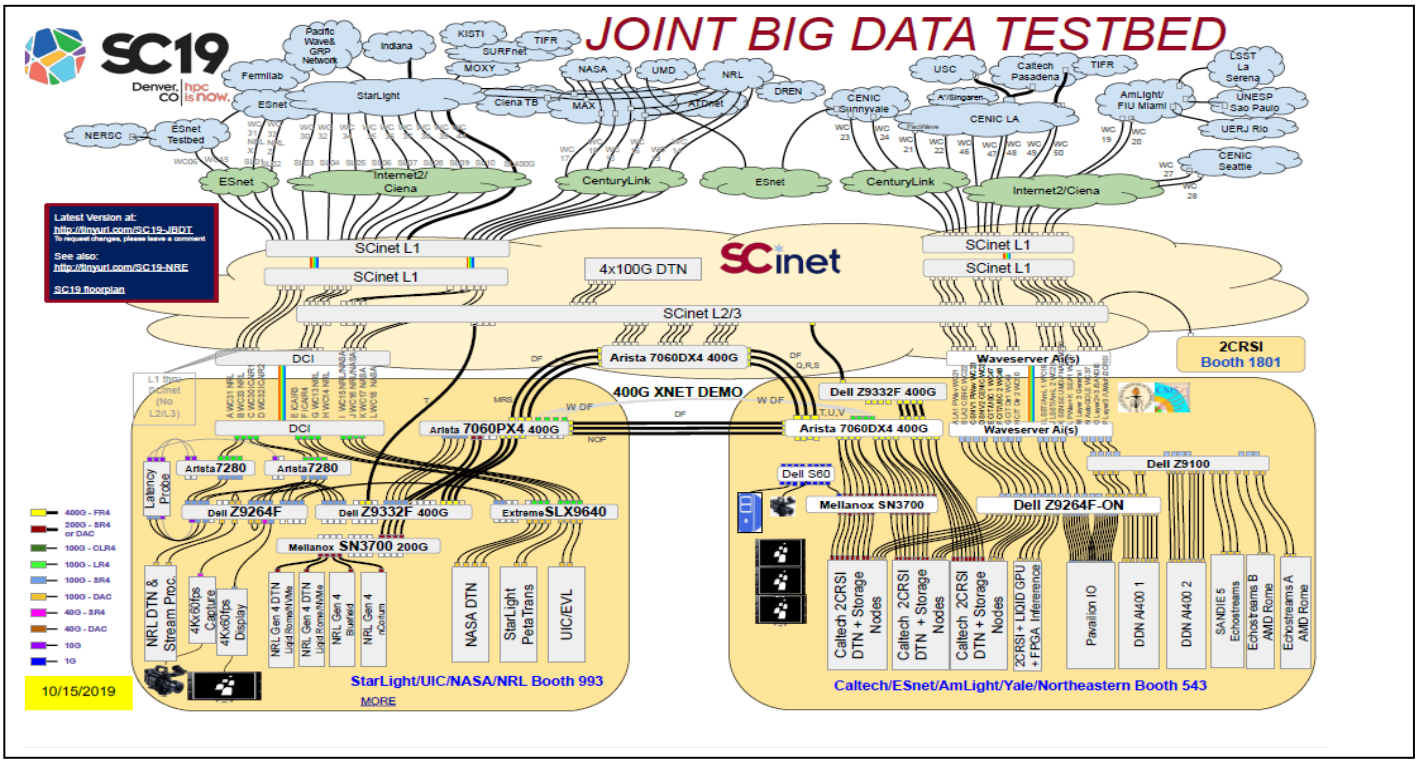
1. Close integration of Data Transfer Nodes (DTNs) with optical channels.
2. Enhanced optical channel utilization.
3. Minimizing EOE conversions.
4. Optimizing E2E performance.
5. Ensuring appropriate DTN middleware.
6. Ensuring optimal DTN hardware configuration
7. Ensuring optimal switch configuration
8. Ensuring optimal DTN software configuration
9. Providing appropriate measurement instruments.
10. Providing capabilities for data flow telemetry.

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 also use of the requested 400 Gbbps path. In addition, this demonstration will use the DTN-as-a-Service facility

Involved Parties

- Joe Mambretti, iCAIR, j-mambretti@northwestern.edu
- Jim Chen, iCAIR, jim-chen@northwestern.edu
- Fei Yeh, iCAIR,fyeh@northwestern.edu
- Se Young Yu, iCAIR, young.yu@northwestern.edu
- Xiao Wang, xiao.wang@northwestern.edu
- Marc Lyonnais, Ciena, mlyonais@ciena.com
- Rod Wilson, Ciena, rwilson@ciena.com
- StarLight International/National Communications Exchange Facility and Consortium
- Metropolitan Research and Education Network (MREN)
- SCinet


JOINT BIG DATA TESTBED
SC19
Denver, CO
hpc is now.
Pacific Wave& GRP Network
Indiana
KISTI
SURFnet
TIFR
MOXY
Fermilab
StarLight
ESnet
Ciena TB
NASA
UMD
NRL
MAX
ATDnet
DREN
CENIC Sunnyvale
USC
Caltech Pasadena
TIFR
A*Singaren
CENIC LA
AmLight/ FIU Miami
LSST La Serena
UNESP Sao Paulo
UERJ Rio
CENIC Seattle
NERSC
ESnet Testbed
ESnet
Internet2/ Ciena
CenturyLink
ESnet
CenturyLink
Internet2/Ciena
Latest Version at:
http://tinyurl.com/SC19-JBDT
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
2CRSI
Booth 1801
DCI
Arista 7060DX4 400G
400G XNET DEMO
Waveserver Ai(s)
DCI
Arista 7060PX4 400G
Dell Z9332F 400G
Arista 7060DX4 400G
Waveserver Ai(s)
Latency Probe
Arista7280
Arista7280
Dell Z9264F
Dell Z9332F 400G
ExtremeSLX9640
Mellanox SN3700 200G
Dell S60
Mellanox SN3700
Dell Z9264F-ON
Dell Z9100
NRL DTN & Stream Proc.
4Kx60fps Capture
4Kx60fps Display
NRL Gen 4 DTN Liqid Rome/NMe
NRL Gen 4 DTN Liqid Rome/NMe
NRL Gen 4 Bluefield
NRL Gen 4 nDohm
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
Echostreams B AMD Rome
Echostreams A AMD Rome
400G - FR4
200G - 8R4 or DAC
100G - CLR4
100G - LR4
100G - 8R4
100G - DAC
40G - 8R4
40G - DAC
10G
1G
10/15/2019
StarLight/UIC/NASA/NRL Booth 993
MORE
Caltech/ESnet/AmLight/Yale/Northeastern Booth 543