Network Research Exhibition: the Future of Networking and Computing with Big Data Streams

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Innovating the Network For Data Intensive Science  
Co-located IEEE/ACM International Conference On High Performance Computing, Networking, Storage, and Analytics  
Dallas Texas  
November 13, 2022
Themes

- Scientific Computing As Key Beneficiary Of “Deep Programmable Networks” Paradigm, Providing Advanced Processing At Terabits.
- Operational Challenges in Mainstreaming In-Network Computing For Scientific Applications Especially Challenges Deploying Application Code In The Network.
- Co-Location Of Advanced Services In Production Facilities: Testbeds=>Prototyping=>Production.
- StarLight Supports Two Software Defined Exchanges (SDXs), An NSF IRNC SDX & A Network Research SDX.
StarLight Software Defined Exchange (SDX) CD/CI/CD Innovation Workflow

StarLight Testbeds

Appliance → Integration
Experiment → Integration
Measurement → Integration

PLAN

Research → Open Source → Prototype → Test → Integration

StarLight SDX, SCinet, PRP/GRP

Service → Operate → Monitor

DTNaaS for SDX, SCinet, PRP/GRP, SCAsia DMC21

Chameleon Large Flow Appliance

Source: Jim Chen
Persistent Communication Services For Petascale Sciences: Demonstrations At IEEE/ACM Supercomputing Conference – SC22, Dallas Texas
Example SC22 SCinet Network Research Exhibitions

- Global Research Platform (GRP)
- SDX 1.2 Tbps WAN Services
- SDX E2E 400 Gbps WAN Services
- 400 Gbps DTNs & Smart NICs
- Network Optimized Transport for Experimental Data (NOTED) – With AI/ML Driven WAN Network Orchestration
- SDX International Testbed Integration
- StarLight SDX for Petascale Science
- DTN-as-a-Service For Data Intensive Science
- P4 Integration With Kubernetes
- PetaTrans Services Based on NVMe-Over-Fabric
- NASA Goddard Space Flight Center HP WAN Transport Services
- **Resilient Distributed Processing & Rapid Data Transfer**
- PRP/NRP Demonstrations
- Open Science Grid Demonstrations
- N-DISE Named Data Networking for Data Intensive Science
- Orchestration With Packet Marking (SciTags)
- Smart Amplified Group Environment Enhanced with Artificial Intelligence for Global Collaboration (SAGE3)
- JANUS Container Orchestration