

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

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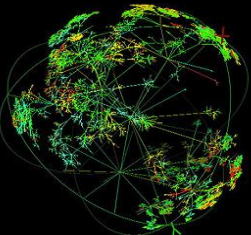
PI: StarLight SDX, Co-PI Chameleon, PI-iGENI, PI-OMNINet

Innovating the Network For Data Intensive Science

**Co-located IEEE/ACM International Conference On High Performance
Computing, Networking, Storage, and Analytics**

Dallas Texas

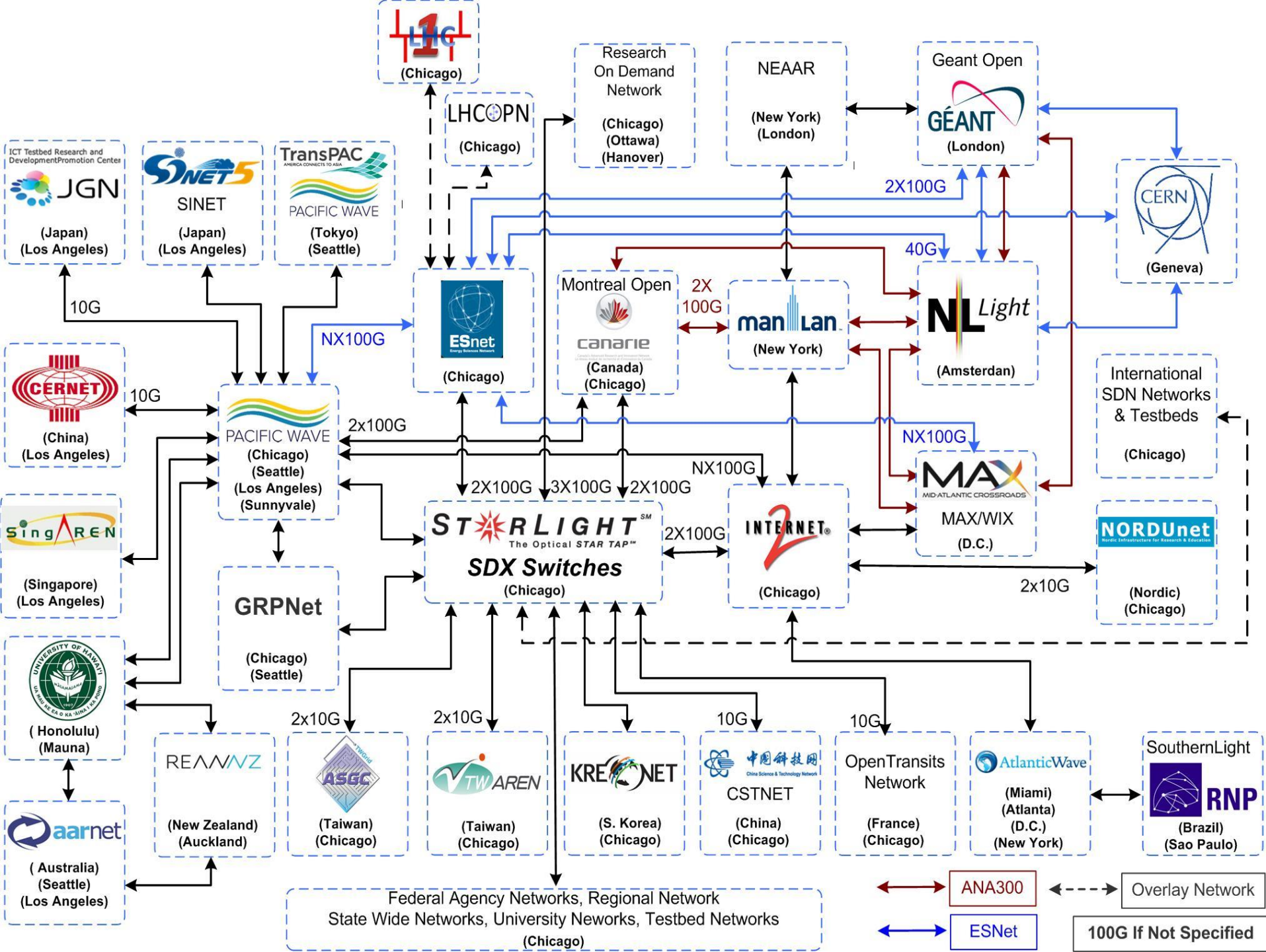
November 13, 2022



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**
- **The StarLight Communications Exchange Facility Supports ~ 25 Network Research Testbeds (Instruments For Computer Science/Networking Research)**
- **StarLight Supports Two Software Defined Exchanges (SDXs), An NSF IRNC SDX & A Network Research SDX**



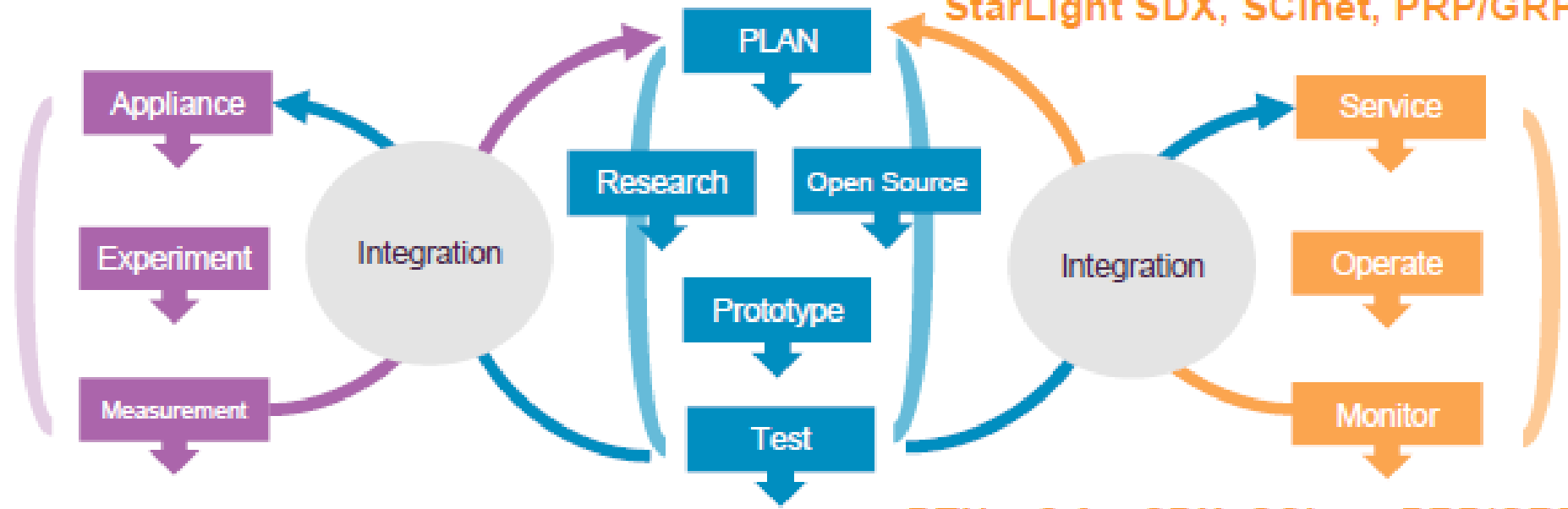


StarLight Software Defined Exchange

StarLight Software Defined Exchange (SDX) CD/CI/CD Innovation Workflow

StarLight Testbeds

StarLight SDX, SCinet, PRP/GRP



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

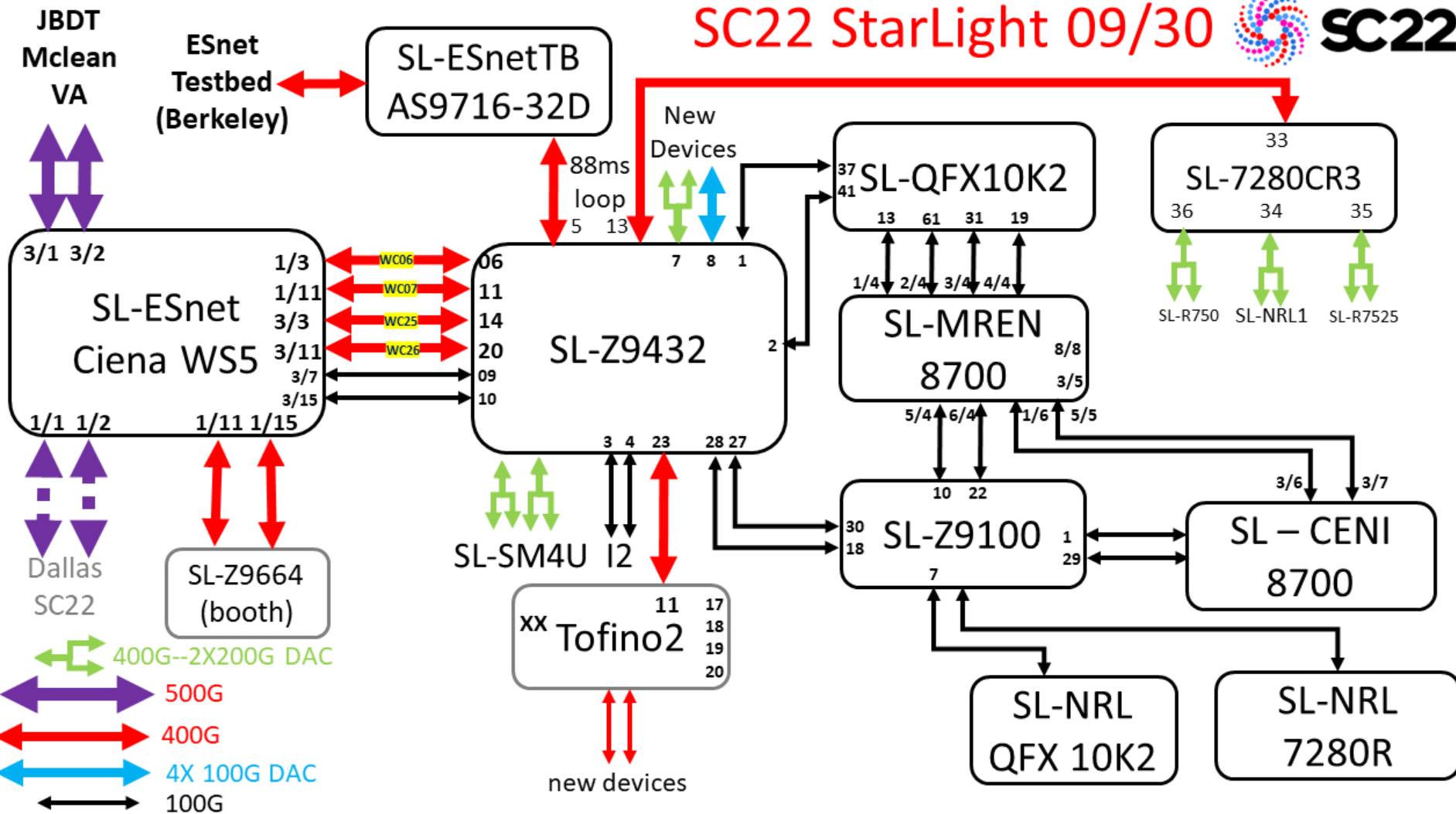
iCAIR

STARLIGHTSM SDX

Source: Jim Chen

STARLIGHTSM

SC22 StarLight 09/30



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**