

# OGF Network Service Interface

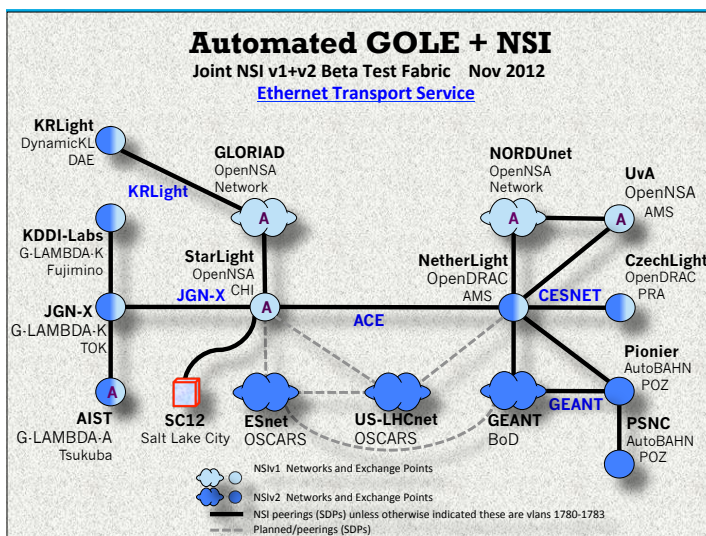
## GLIF Automated GOLE Pilot Project

### A Supercomputing 2012 demonstration: Global inter-domain network capacity provisioning using the Network Services Interface protocols and the emerging Global Open Lightpath Exchange fabric

#### The Demonstration:

At Supercomputing 2012 the GLIF Automated GOLE Pilot Project will be demonstrating the OGF Network Services Interface (NSI) architecture for standardized global inter-domain provisioning of high performance network connections.

between the two end points anywhere in the world. These NSI Connection can set up on demand, or they can be reserved in advance for a specified start time and duration. These connections are provisioned with dedicated capacity and performance characteristics guaranteed end to end.



This demonstration will feature the NSI Connection Services (NSI CS) protocol version 2.0 in service across a global fabric of Open Lightpath Exchanges and Networks. The participating GOLEs provide Ethernet-framed transport services that use the NSI protocol to re-configure the GOLE switching/forwarding infrastructure along a selected path to establish point to point connections

The NSI Framework, standardized within the Open Grid Forum, defines a scalable architecture for inter-domain service interoperability. The NSI Connection Service (NSI CS) protocol defines the messaging exchanged between the NSI domains for managing the life cycle of these connections. The NSI protocol enables users to construct path specific connections, or to allow the Network Service Agents to dynamically select a path that meets the user's performance, scheduling, and authorization criteria.

The NSI demonstration consists of an array of autonomous Ethernet Transport Service domains deployed across the Automated GOLE fabric. Each domain runs a Network Service Agent that interacts with users and peer networks via the NSI Connection Service protocol. The resulting aggregate inter-domain service region can schedule, provision, query, monitor, and ultimately release dedicated point to point Ethernet framed connections. The demonstrated service transports basic Ethernet frames along a dynamically selected path between the end points.

**The NSI Software:**

The OGF NSI framework and the CS protocol standard has been implemented in several software provisioning packages. The software packages and the developing organizations are:

- G-LAMBDA-A** – AIST, Tsukuba, JP
- AutoBAHN** – GEANT Project, Poznan, PL
- OpenDRAC** – SURFnet, Amsterdam, NL
- G-LAMBDA-K** – KDDI Labs, Fujimino, JP
- DynamicKL** - KISTI, Daejeon, KR
- OSCARS** - ESnet, Berkeley, US
- OpenNSA** – NORDUnet, Copenhagen, DK

contribution of high capacity transport links to interconnect the GOLEs. This distributed pool of switching and transport resources provides a global “expressway” for emerging hybrid technologies such as NSI. This global fabric of GOLEs provide “open” peering and cross-connect policies unmediated by the host organizations.

The GLIF **Automated GOLE Pilot Project** leverages these infrastructure resources to provide test bed facilities to support the development of user controlled network services for the scientific research community.



**The OGF:**

The Open Grid Forum was established to bring together the emerging global Grid Computing community to standardize the means by which globally distributed computing, storage, and instrument resources are integrated into effective applications and workflows. The high

performance networking community has engaged with the OGF and is working to standardize the **Network Service Interface (NSI)** Framework as a means for integrating network resources into the grid environment. The NSI will provide users and applications with the ability to dynamically acquire and manage network resources as predictable and deterministic components of the grid infrastructure.

**The GLIF:**

The GLIF (Global Lambda Integrated Facility) is an international community of R&E network service providers and research teams promoting advanced concepts in optical and photonic network services. The GLIF encourages and supports the establishment of GOLEs (GLIF Open Lightpath Exchanges) around the world and the partner

The participating Automated-GOLE Pilot + NSI Demonstration participants at SC12 are:

- NORDUnet + NorthernLight (Nordics)
- NetherLight (NL)
- PSNC + Pionier (PL)
- StarLight (US)
- University of Amsterdam (NL)
- AIST (JP)
- JGN-X (JP)
- KDDI Labs (JP)
- KISTI (KR)
- GEANT (EU)
- ESnet (US)
- CalTech + USLHCnet (US, CH)
- GLORIAD (US)
- CANARIE (CA)
- CERNLight (CH)
- CzechLight + CESNET (CZ)
- i2CAT (ES)
- Internet2(US)

