

OGF Network Service Interface

GLIF Automated GOLE Pilot Project

A demonstration of the NSI Connection Service protocol over the global fabric of Open Lightpath Exchanges at Supercomputing 2011

The Demonstration:

At Supercomputing 2011 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.

This demonstration will feature the NSI Connection Services (NSI CS) protocol version 1.0 in service across a global fabric of Open Lightpath Exchanges. The Participating GOLEs are Ethernet-switching

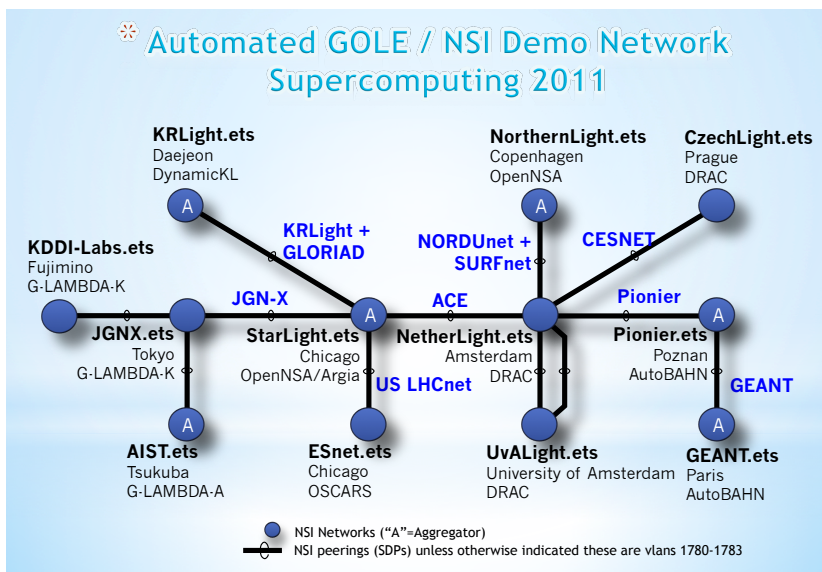
performance characteristics guaranteed between the two end points.

The NSI Framework, standardized with 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 (broadly construed) 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" (*.ets) 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

VLANs. The demonstrated service transports basic Ethernet frames along a dynamically selected path between the end points.



nodes that use the NSI protocol to re-configure the GOLE switches along a selected path to establish a dedicated VLAN between the two end points. This VLAN can be reserved in advance for a specified time, and is provisioned with dedicated capacity and

The NSI Software:

The OGF NSI framework and the CS protocol standard have been independently implemented in software by several of the organizations participating in this demonstration. The software packages and the developing organizations are:

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

establishment of GOEs (GLIF Open Lightpath Exchanges) around the world and the partner contribution of high capacity transport links to interconnect the GOEs. This distributed pool of switching and transport resources provides a global “expressway” for emerging hybrid technologies such as NSI. This global fabric of GOEs 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**

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

(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 participating Automated-GOLE Pilot + NSI Demonstration participants and supporters are:

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

