GLIF Control Plane meeting

Chair: Gigi Karmous-Edwards and
Secretary: Licia Florio

September 11th and 12th, 2006

Tokyo

Sept 11ᵗʰ and 12ᵗʰ Control Plane Agenda

- **Monday, 11 September 2006 (16:00-18:00)**

  * Opening and Welcome - Gigi Karmous-Edwards, MCNC

  * GEANT2/JRA3 efforts in the Control Plane Area - Victor Reijs, HEAnet

  * Ethernet over the WAN - John Graham, ULCC

  * G-Lambda and Enlightened Middleware and Control Plane interactions - Tomohiro Kudoh, AIST

- **Tuesday, 12 September 2006 (08:30-13:00)**

  * Liaison with GGF GGHP working group - Gigi Karmous-Edwards, MCNC

  * InterDomain Peering and Provisioning via Web Services and (G)MPLS - Tom Lehman, USC-ISI

  * Control Plane Strategy - NLR (speaker TBC)

  * Control plane Strategy - Rick Summerhill, Internet2

  * Inter-domain progress between US and Japan - Tomohiro Otani, NICT

  * Discussion about future actions

  * Conclusion

Why is the Control Plane important to GLIF?

Today

End-to-end Optical connections between two laboratories across the Globe:

- takes "lots of phone calls"
- takes "lots of emails"
- tens of people
- connection becomes relatively static
- over three weeks!!!!
- Failed link may result in days of out-of service

We want to…

- applications/sensors/end-users/instruments to initiate an end-to-end connection

- Resources for short periods of time or long depending on application

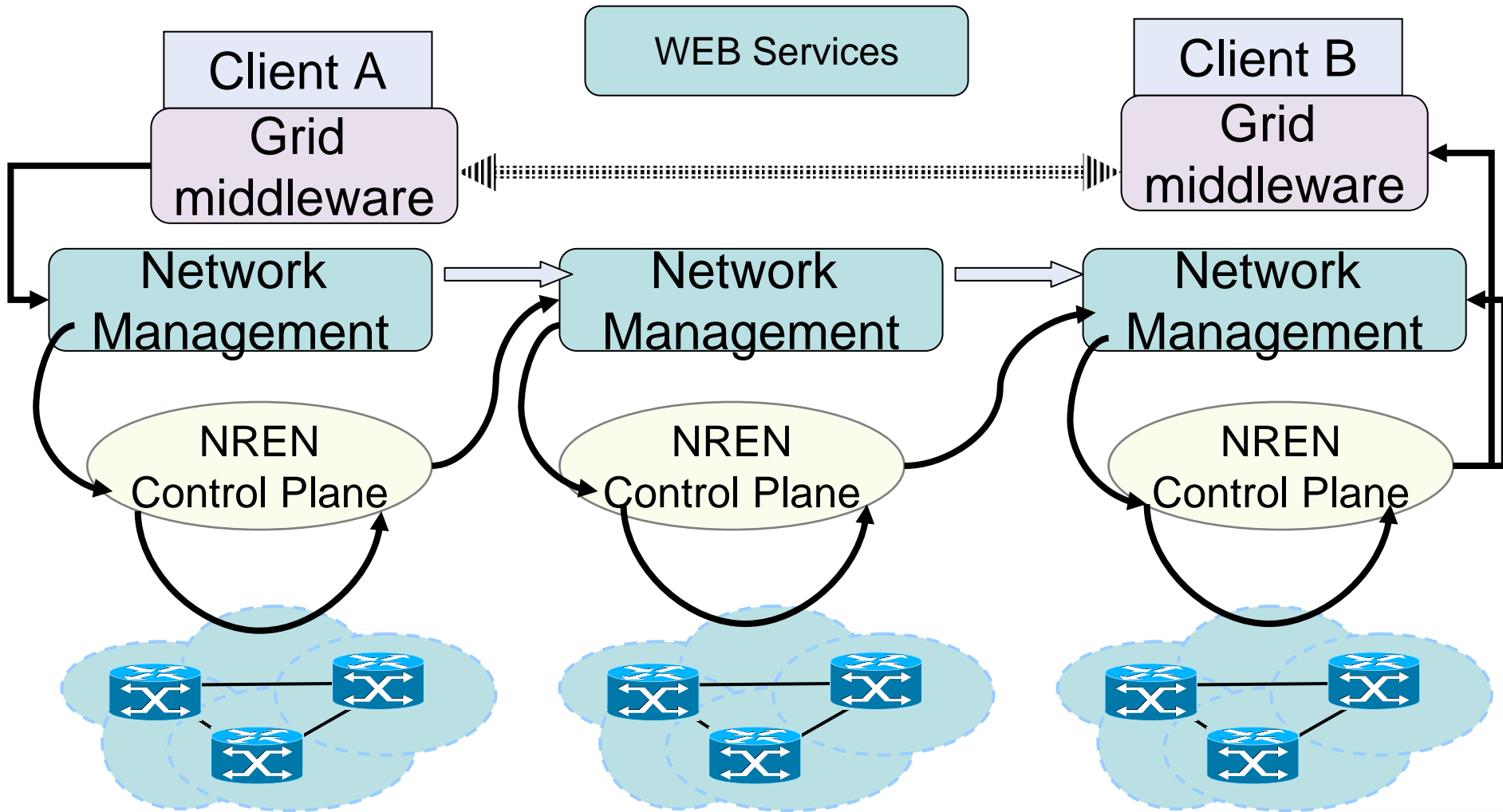- We want automatic recovery - restoration/protection

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- How do we as a community go from where we are today to what we really want?

- We need to use the Morphnet concept in the GLIF community….

- (Part of the infrastructure for vertical integration research and other part as production)

GLIF Automation?

Control Plane Challenges For GLIF Migrating towards Automation….

Taking one baby step at a time …

- **CIM - Common Information Base - translation of repository to machine based**
- **Common Services repository**
- **WEB services based services towards automation**
- **Translation of administrative policy to low-level policy for automation**
- **Scheduling services**
- **Automated Testing and monitoring**
- **Control plane protocols (GMPLS, SIP)**
- **Policy and Security**
- **Interdomain routing**

GLIF Control Plane and Grid Middleware Integration

<u>Mission</u>**: To agree on the interfaces and protocols to automate and use the control planes of the contributed Lambda resources to help users on a global scale access optical resources on-demand or pre scheduled.**

several key areas we need to focus on:

- Define and understand real operational scenarios
- Defining a set of basic/common services:
  - Precise definitions
  - Developing semantics the whole community agrees to for machine to machine communications
- Interdomain exchange of information for both control planes and management planes
  - Determine what information needs to be monitored
  - How to abstract monitored information to share
- Determine what existing standards are useful vs. where Grid requirements are unique and new services and concepts are required
  - How do we standardize mechanisms and protocols that are unique to the Grid community
- Define a Grid control plane architecture
- Work closely with E-science applications to provide vertical integration

One Definition of Control Plane

"**Infrastructure and distributed intelligence that controls the establishment and maintenance of connections in the network, including protocols and mechanisms to disseminate this information; and algorithms for engineering an optimal path between end points.**"

Draft-ggf-ghpn-opticalnets-1

Control Plane Functions

- **Routing** - Intra-domain and Inter-domain
    - 1) **automatic topology and resource discovery**
    - 2) **path computation** (*How do we use the infrastructure*)

- **Signaling** - standard communications protocols between network elements for the establishment and maintenance of connections

- **Neighbor discovery** - NE sharing of details of connectivity to all its neighbors (*very powerful tool*)

- **Local resource management** - accounting of local available resources

Control Plane

"Planes"

**Management
Plane**
Operations Support
System (OSS)

Control Plane
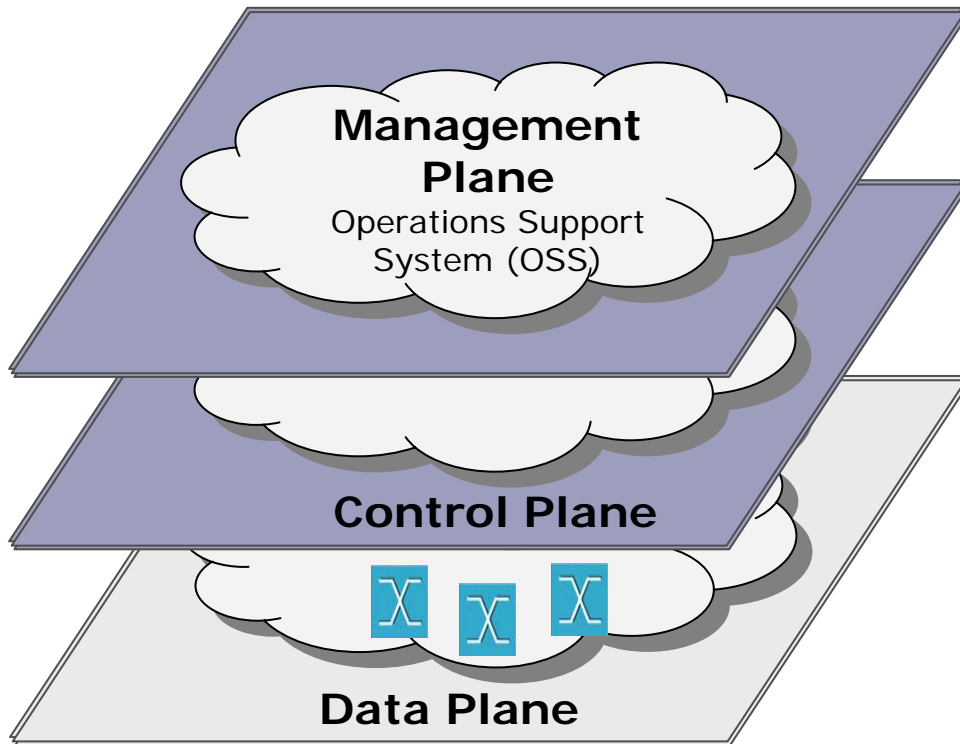
Data Plane

- Global

- Distributed and resilient

- Non-manual, i.e., automated

- Separated from the data plane

**Network-wide, global, comprehensive, distributed,
automated software system
that enables interoperability, responsiveness, flexibility,
enhanced access to network resources, and, speed and efficiency gain**

September 11 and 12

Previous Talks and Discussions

- iGrid 2005 San Diego, Ca 9/30/05
  - First Control Plane meeting

- Joint session w/ Tech group
  - Explored means of collecting and administrating GLIF repository
  - Repository - three talks
    - DNS approach
    - database and maps
    - RDF meta-data approach

- Control Plane working group session
  - Defining Common Service definitions
  - Monitoring and testing for verification of services.
  - We also explored SOA as a means for automation

Previous Talks and Discussions

- **Common Service Definitions**
  - Common Service Definition that describes what a service should deliver detailed parameters, ie.
  - The same model should be used by users to indicate what they have received - verify service
- **UCLP and SOA**
  - UCLP web services allows end users to self provision and dynamically reconfigure optical networks
  - Service Oriented Architecture, (SOA) :
    - Utilizing a concept known as Google Mash-ups
- **Testing and Monitoring**
  - For end-2-end connections
  - Some requirements for verification
  - Automation

What have we done? ……This first year

- **What did we do right? And how can we do it better?**

- **What have we accomplished?**
  - **Open forum to discuss control plane issues and plans for moving forward**
  - **List discussions**
  - **Sharing of ideas and sometimes software and specifications**

- **What should we do in the near future?**
  - **More GLIF documents written by the community?**
  - **WIKI**

- **Collaboration with the GHPN group**
  - **We will work towards a common document for both groups on**
    - **Service Definitions**

- **Moving Forward…**
  - **Links to open source software to be shared with the community**