GLIF Demonstration: International High Performance Digital Media (HPDM) With Dynamic Optical Multicast

An Experimental Architecture and Prototype Optical Digital Media Service – A Cooperative Project Undertaken By an International Consortium of Network Researchers

Overview

- Background
  - Multiple Sites Require HPHD Media Streaming Simultaneously Among All Locations
  - HD Equipment Is Now Inexpensive and Common
  - However, L3 Techniques Cannot Be Used for Many Types of HD Media
  - L1/L2 Capabilities Can Provide Service Solutions
  - Various Architectural Approaches And Technologies Are Being Explored
  - Not All Issues Have Been Resolved – Further Research Is Required

Challenges and Opportunities

- Challenges
  - Digital media standards have been developed independently of WAN/LAN standards
  - Traditional WAN/LAN standards have been developed independently of considerations for many HDDM requirements
  - Consequently, today's communications capabilities do not always meet application requirements
- Opportunities
  - Using existing and emerging technologies several powerful solutions can be designed today
  - However, an optimal approach for meeting unmet current and future requirements has not yet been determined
  - Various options exist for addressing HPDM requirements
  - Current research is exploring these options and experimenting with alternative approaches
  - This demonstration incorporates several promising emerging technological approaches

Communications Technologies

- The technologies include the following:
  - Dynamic L2 and L1 (lightpath) allocation and adjustment is an emerging technique
  - Both persistent and dynamic large scale L1/L2 resources can be allocation, depending on requirements
  - Integrated, addressable WAN and LAN paths can be used
  - High level path control capabilities from an application perspective is a key resource
  - To further enable network optimization, HPDM streams can be “branched” by setting parameters through the device control systems
  - Multiple path options can be individually selected to optimize stream flows

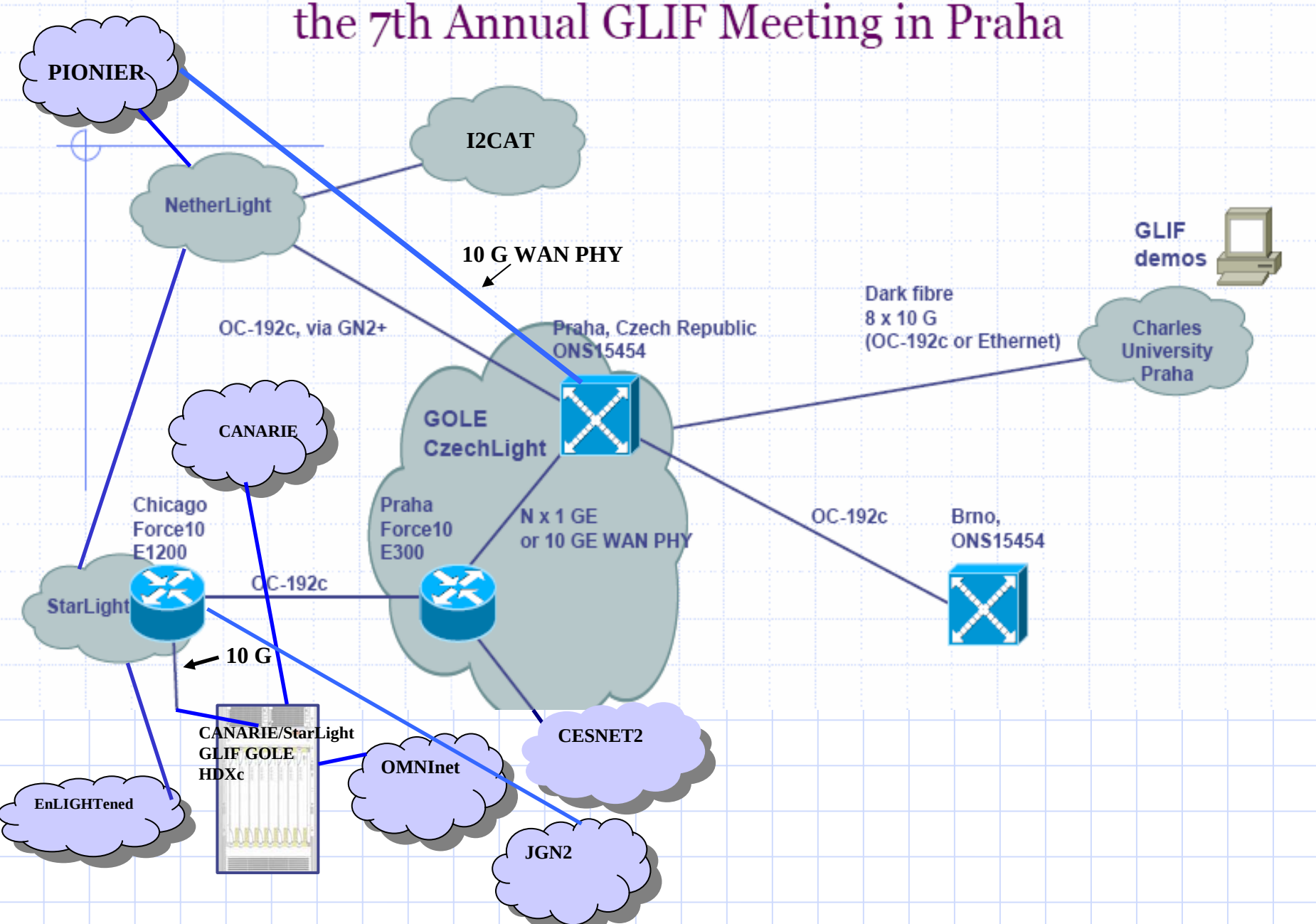
Logical Structure

- Each Site Can Send N_1 and Receive N_2 Streams
- In a Basic Case, Each Site May Send One Stream and Receive As Many As Required (e.g., TX=a*RX=b, Send 1, Receive 4)
- Displays Can Be Individual Monitors Or Composites
- Technology Exists To Stream Multiple HPDM Windows To Tile Displays Simultaneously
- Stream Control Capabilities Can be Mapped to Physical Network Resources

Physical Topology

- Capability Option Selections Can Be Integrated With Physical Topology, e.g., Enabled by UCLPv2
- The Current Testbed Is Implementing a Static Configuration
- The Potential For Designing and Implementing a Highly Dynamic Topology Exists
- The Current Testbed Has a Centralized Control Process
- The Potential For Designing and Implementing Highly Distributed, Multidomain Processes Exists

Infrastructure and Connectivity for the 7th Annual GLIF Meeting in Praha



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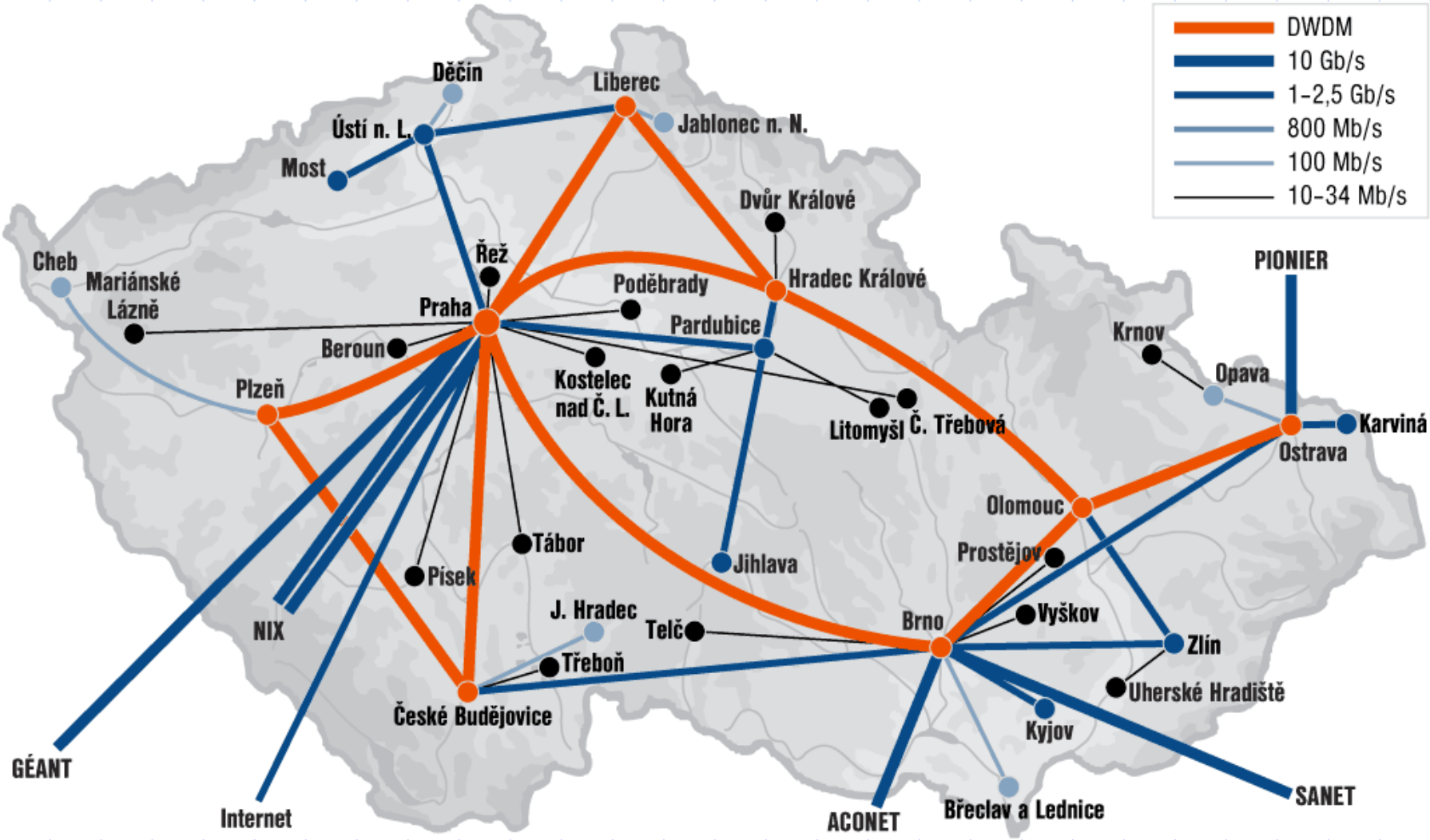
DWDM
10 Gb/s
1–2,5 Gb/s
800 Mb/s
100 Mb/s
10–34 Mb/s
Děčín
Liberec
Jablonec n. N.
Ústí n. L.
Most
Dvůr Králové
Cheb
Mariánské Lázně
Řež
Praha
Poděbrady
Hradec Králové
PIONIER
Pardubice
Krnov
Beroun
Opava
Plzeň
Kostelec nad Č. L.
Kutná Hora
Litomyšl
Č. Třebová
Karviná
Ostrava
Olomouc
Tábor
Prostějov
Písek
Jihlava
J. Hradec
Vyškov
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International High Performance Digital Media With Dynamic Optical Multicast: Demonstration Contributors

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