

Collaborative activities in GLORIAD

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Updates on GLORIAD

- GLORIAD-CA
 - Deliver the 1st 10G wavelength service to connect Ryerson Univ in Toronto to CineGrid project through Chicago StarLight
- GLORIAD-RU
 - Two Meteorological centers in Moscow and DC established the connections for exchanging of high volume data
 - Russian Research institutions join the international projects, SDSS and iCAIR

Updates on GLORIAD

- GLORIAD-CN
 - Performance test on the link between Beijing to Germany over GLORIAD has been made for China ITER
- GLORIAD-Nordic country
 - GLORIAD MoU is ready for signing (next GLORIAD meeting will be held in May 2007 at Copenhagen)
 - STM4 links from Amsterdam to Helsinki and Helsinki to Moscow are operational

Updates on GLORIAD

- GLORIAD-NL
 - Relabeling their existing links(10G Amsterdam-NY, 10G Amsterdam –Chicago) as GLORIAD links
 - SURFnet and NORDUnet will bring dark fiber extensions of their hybrid networks to Hamburg in Germany where they will be interconnected (10G lambdas will be available in early 2007)
 - Working with RBnet to connect MoscowLight and NetherLight with 10G through NORDUnet link in 2nd quarter of 2007

Updates on GLORIAD

- GLORIAD-US
 - NSF mid-term review in Oct 2006
 - MoU between NLR and GLORIAD was signed for L3 peering
 - New Force10 L2/L3 switch/router is deployed in Chicago
- GLORIAD-KR
 - Upgrading switches(OME and HDXc) in Hongkong and Daejeon to support the global collaborations

Activities in GLORIAD-KR

- High-end application supports with Application Proxy Center
 - Classified by the bandwidth usage
 - Scheduled monthly challenge
 - Visit GLORIAD-KR top users
- Leading GLORIAD Application Working Group
 - demos among GLORIAD partners
 - Monthly conference calls among members

Application Proxy Center

- Supporting various scientific applications like HEP, SDSS, OptIPuter etc.
 - Analyzing requirements of various scientific applications requiring high performance network bandwidth
 - traffic Monitoring Tools using MRTG, MonALISA, and GMON-KR
 - GMON-KR analyzes the traffic data of GLORIAD-KR and shows the statistical information according to each protocol, institution, nation

Application Proxy Center (cont'd)

High Performance Test-bed



PCI-X(133MHz)

4CPU



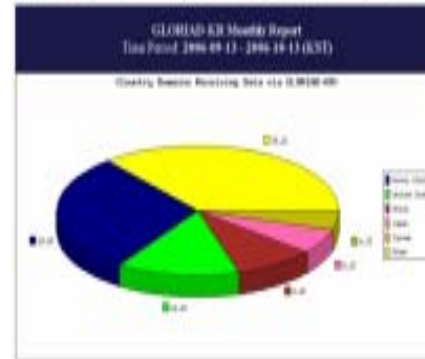
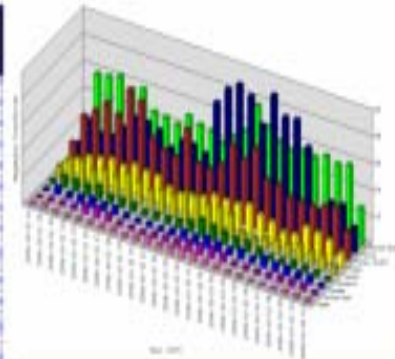
SATA2 Disk Controller

10G NIC(Xframe)

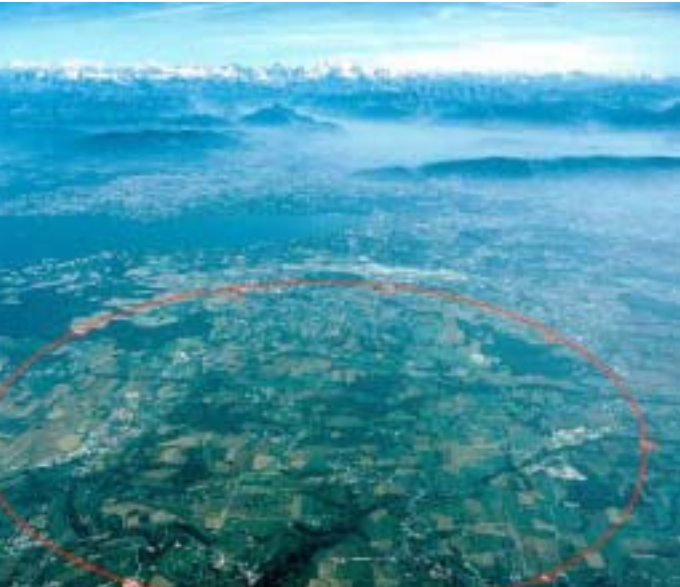
GMON-KR System

Top Countries Receiving Data via GLOBAD-KR
Time Period: 2006.09.11 - 2006.10.11 (KST)

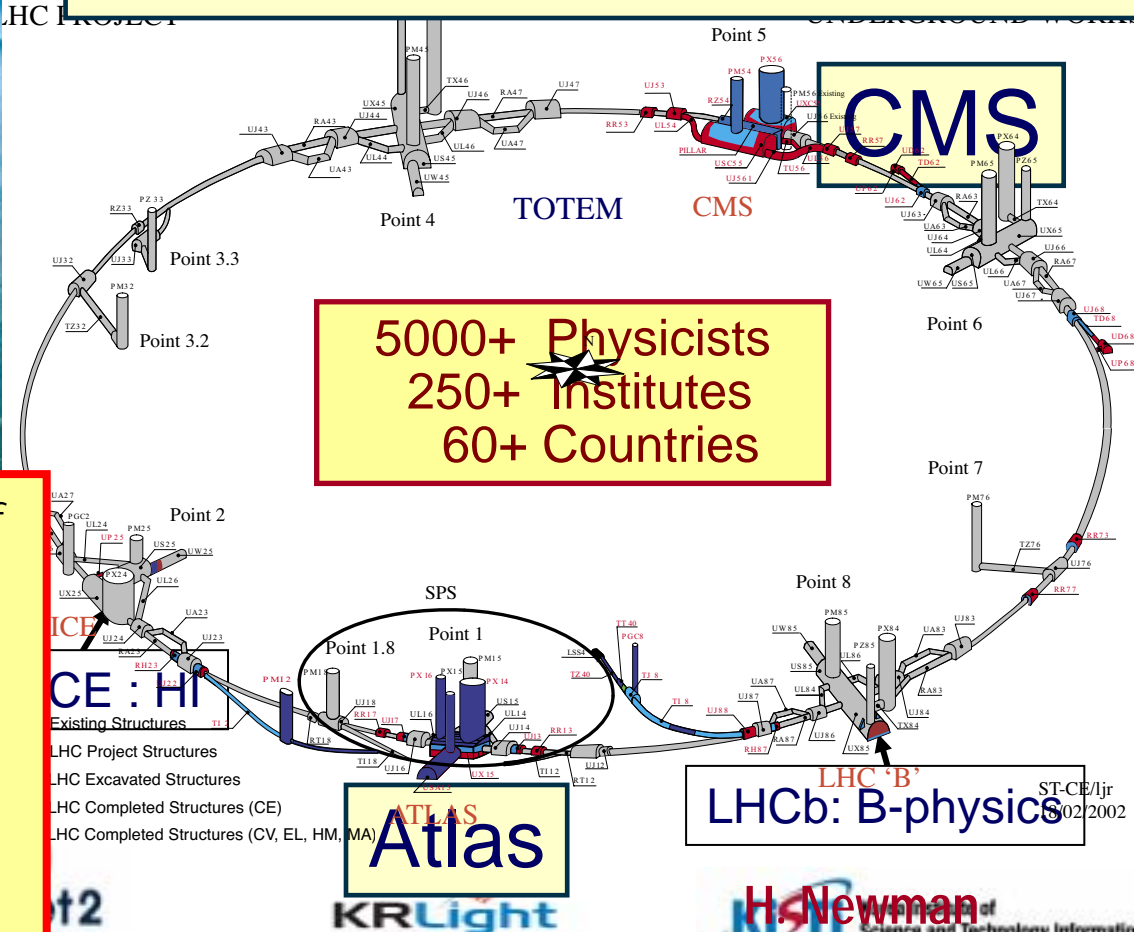
Rank	Country/Region	Volume (KB)	Percentage (%)	Days of Data	Top IP Address
1	USA	1,234,567	35.2	10	192.168.1.1
2	China	987,654	28.5	10	203.191.1.1
3	Japan	765,432	22.1	10	10.0.0.1
4	South Korea	543,210	15.8	10	127.0.0.1
5	Germany	432,109	12.5	10	191.229.1.1
6	France	321,098	9.3	10	193.50.1.1
7	UK	210,987	6.1	10	191.229.1.1
8	Canada	109,876	3.2	10	193.50.1.1
9	Australia	98,765	2.8	10	191.229.1.1
10	India	87,654	2.5	10	193.50.1.1



High Energy Physics



★ $pp \sqrt{s} = 14 \text{ TeV}$ $L = 10^{34} \text{ cm}^{-2} \text{ s}^{-1}$
★ 27 km Tunnel in Switzerland & France

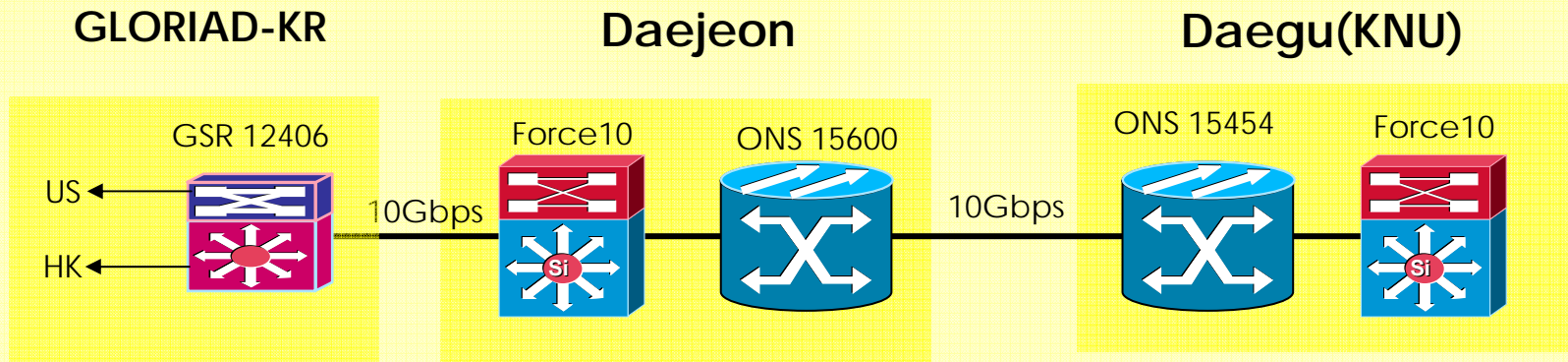


★ 5000+ Physicists
★ 250+ Institutes
★ 60+ Countries

In 2007, huge amount of data sets will be released... Network will be the key issue in near future... We'll support end-users to reach the major Tiers from CERN!

GLORIAD Access Link Support

KNU(High Energy Physics lab): direct 10G Access Link



We are Supporting about 50 Orgs requires High bandwidth network (Grid computing, HD, Earth Science, HEP etc)

SDSS

- The SDSS project has made 4 data releases so far in DR1, DR2, DR3, and DR4. DR5 was just released (July, 2006) => SDSS Phase one has just completed
 - SDSS-I imaged more than 8,000 square degrees of the sky in five bandpasses, detecting nearly 200 million celestial objects, and it measured spectra of more than 675,000 galaxies, 90,000 quasars, and 185,000 stars
- Entered a new phase, SDSS-II, continuing through June, 2008

SDSS data distribution using Sector

- Sector: P2P distributed storage system based on UDT
 - Large data sets need more than a single node
 - Retrieves the requested data from the required node and it means better performance
- Download the SDSS data with a high speed wide area network (ex: entire SDSS BESTDR4 catalog data set, 1.9TB size, in less than five hours)
- KISTI houses the UIC server since Mar. 2006

Electron Microscope, 'Morning Star'

- Realization of 3D structure analysis of new materials
- Imaging filter helps analyzing the structure in detail
- Collaborative Operation in Remote Site

JEM ARM-1300S

Ultra-High Voltage TEM Facility
to be installed at KBSI in 2003



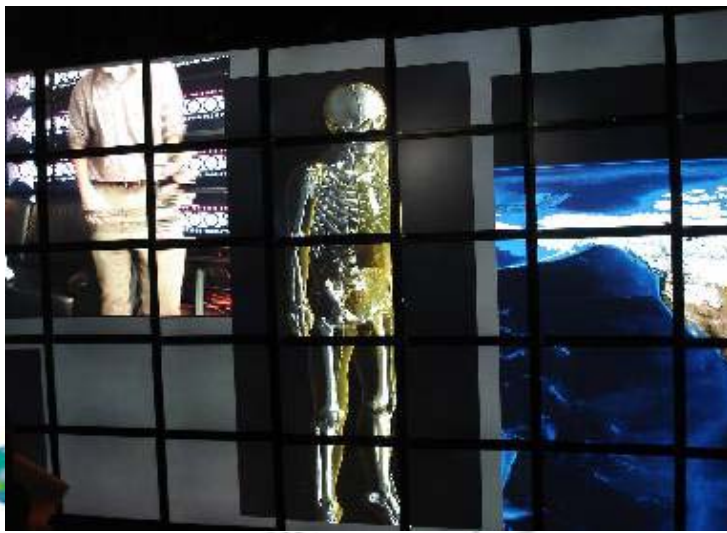
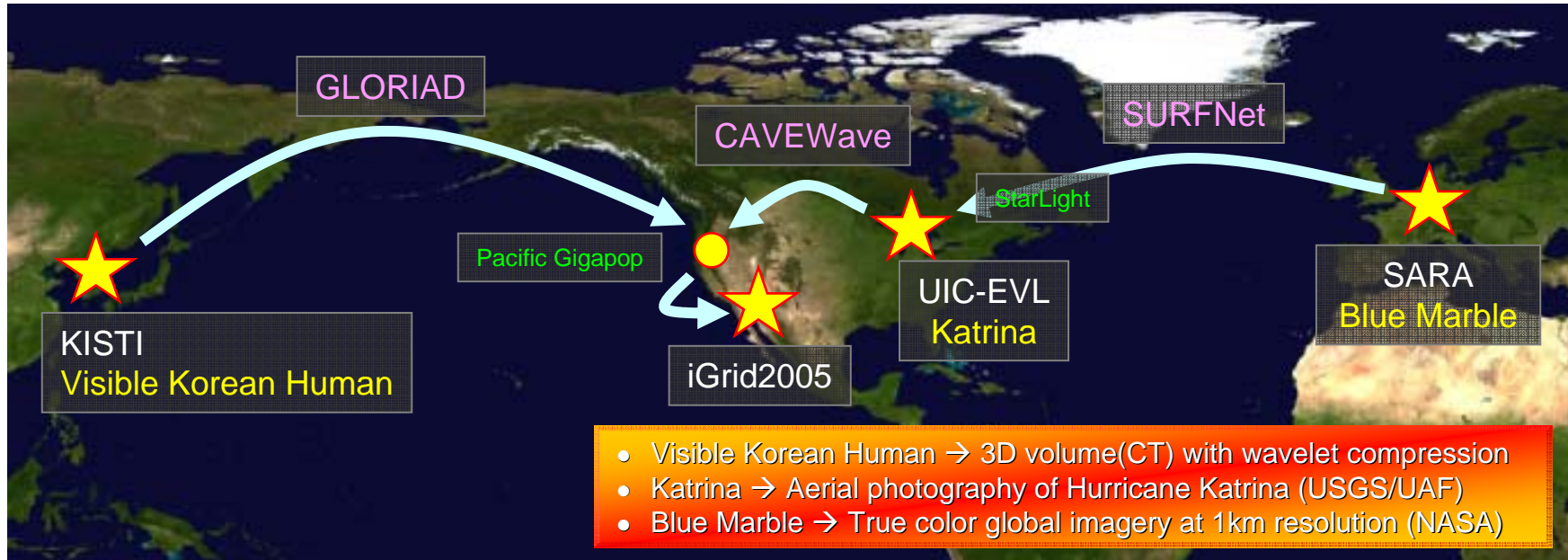
Connecting resources
around the world with high
performance networks!

Optical Networking, Internet Protocol, Computer : Bringing the Power of Lambdas to Users

- Complete the Grid Paradigm by Extending Grid Middleware to Control Jitter-Free, Fixed Latency, Predictable Optical Circuits
- Tightly Couple to End User Clusters Optimized for Storage, Visualization, or Computing
 - Linux Clusters With 1 or 10 Gbps I/O per Node
 - Scalable Visualization Displays with OptIPuter Clusters
- Applications Drivers:
 - Earth and Ocean Sciences
 - Biomedical Imaging
 - Designed to Work with any Discipline Driver

source: L. Smarr

GLVF: Demo at iGrid2005



GLO-KR/KRLight & GOLE Collaborations



*OptIPuter
Demonstration
on Feb 22, 2006*



*Korea, the Netherlands,
the US, and Canada
participated **over 10G**
Lightpath on GLORIAD*

Uncompressed internet HDTV

- **Our goals**

- Develop a **low-cost** system for **uncompressed HDTV** services over high-speed IP networks.
- Combine uncompressed HDTV services with **on-the-edge Lambda technologies** (UCLP, virtual routing, and so forth)
- Provide **actual services** (culture, seminar, or ETC.) and promote **domestic / int'l collaborations**

- **Open-source software**

- (<http://www.gloriad-kr.org/hdtv>)
- **UV-0.3.9** (GLORIAD-KR version), which is based on UltraGrid from USC/ISI



Connecting
researchers with High
Definition Videos...
This will be applied to
Medical society as
well as the commercial
arts

More applications...

- ITER and K*Star for fusion energy research
- Climate/weather research
- Biomedical and bioinformatics
- Geo-science research
- Grid computing
- Advance network engineering ...

SC'06 in Tampa...

- KISTI booth had demos
- Expecting collaborative works with other partners
 - Transmitting HD Video
 - Hyper Challenge in High Energy Physics and SDSS data transfer challenge
 - Virtual Machine Turntable Demo with Nortel and GLORIAD partners

SC'06 in Tampa...



Summary

- Expand GLORIAD WG activities (generate more users and applications)
- Archive teaching materials (“ networks for non-networkers ”)
- Create liaisons with other research groups financially supported by MOST of KOREA and other partner countries
- **GLORIAD Applications with global collaboration**
 - Leading efforts to Expand Global Light-path Environment
 - End User Support for **Advanced Application** with Application Proxy Center

Thank you!

For more information,
please visit <http://www.gloriad-kr.org>
<http://www.gloriad.org>