



KRLight Updates

Oct 03, 2013


KREONET Center

National Institute of Supercomputing and Networking (NISN),
Korea Institute of Science and Technology Information (KISTI)

Korea Institute of
Science and Technology Information

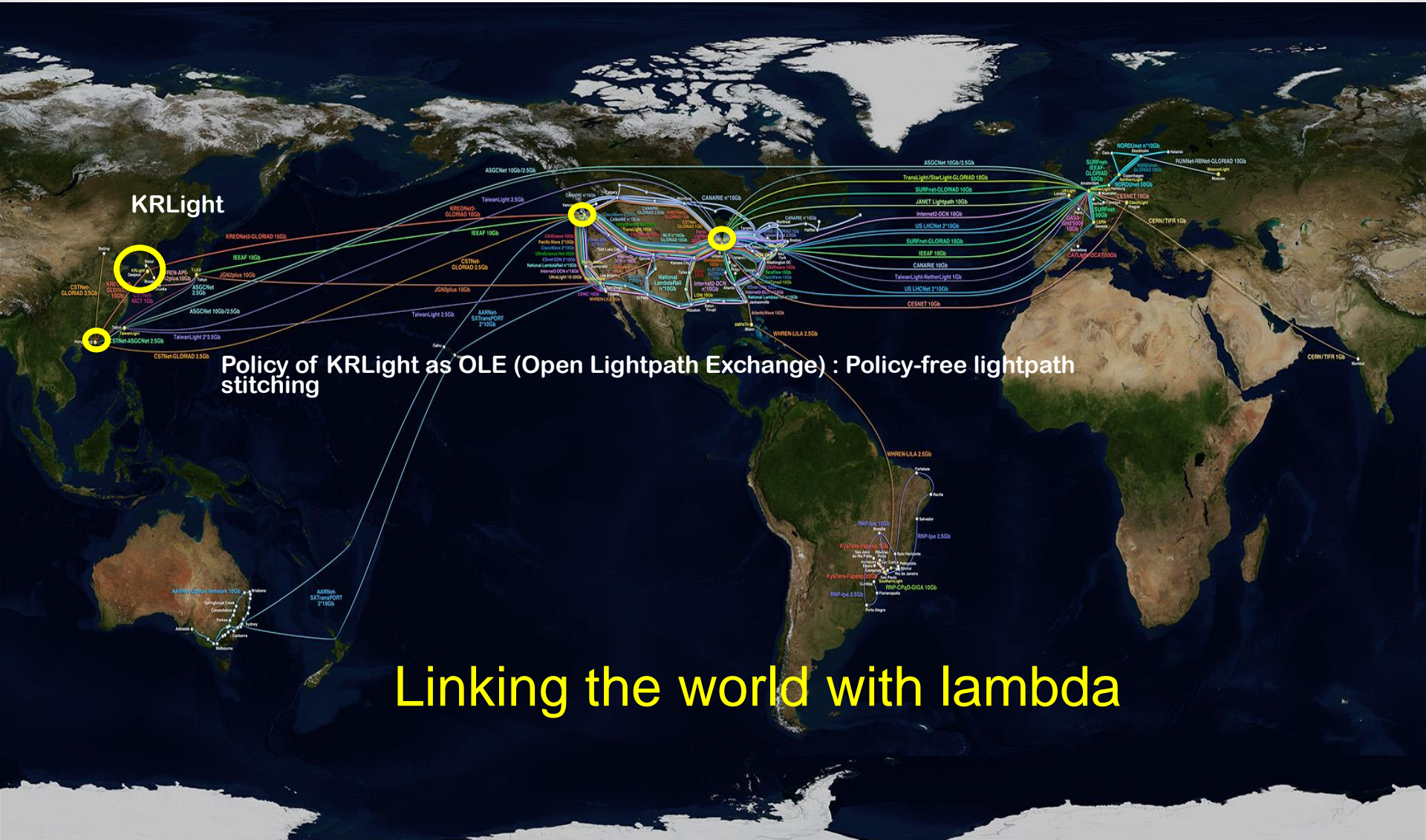


Contents

- I . Changes and Upgrade Issues
 - II . KRLight/GLORIAD-KR
 - III. KREONET
 - IV. Advanced Hybrid Networking Service
 - V. Networking Projects
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- ▣ **Community-based collaborations traffic Increase**
 - HEP, Climate Changes, Astronomy, Medical Science, Supercomputing, Education, Construction, e-culture, ...
 - Requires more than 1G ~ 10Gbps (40Gbps ~ 1000Gbps), Connection
- ▣ **Real time traffic Strongly Service**
 - Video and Audio Conferencing Service
 - Cloud Service
 - AAI, eduroam ...
- ▣ **The volumes of many area traffics rapidly Increase**
 - Content Delivery Network...
- ▣ **Emerging new networking technology : SDN, ...**
- ▣ **100G (or 40G) Transmission Technology**
 - Unlimited-bandwidth, Bandwidth-free Network

GLIF (Global Lambda Integrated Facility)



KRLight

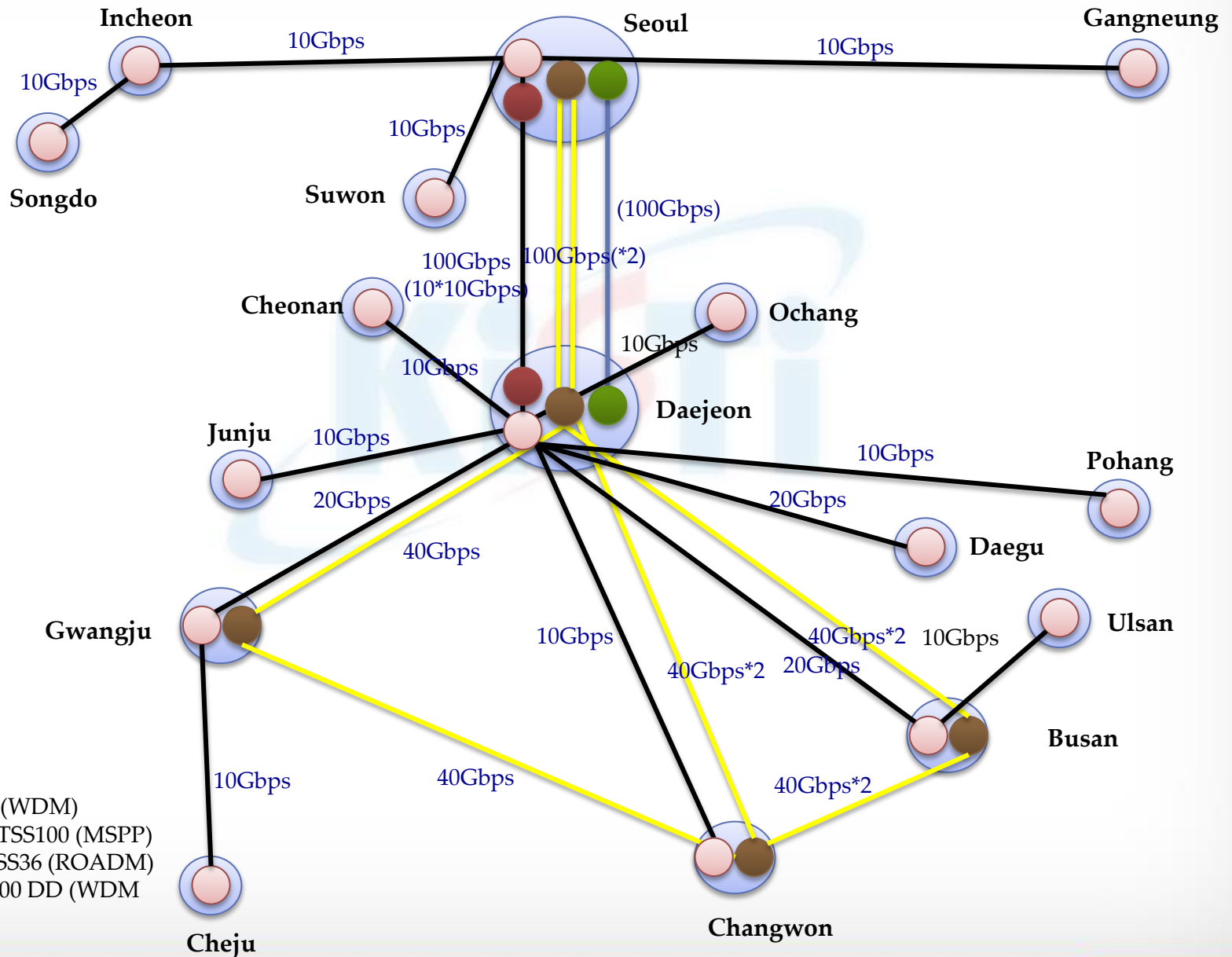
Policy of KRLight as OLE (Open Lightpath Exchange) : Policy-free lightpath stitching

Linking the world with lambda

New Optical Infrastructure

- DF, about 4,000Km
- Coherent Technology
 - C-Band, 88 Channel, Terabit Network
- OTN (Optical Transport Network) based ROADM
(Reconfigurable Optical Add-Drop Multiplexer)
- Alcatel-Lucent PSS1850, Ciena OME6500 DoubleDeck
- L1 GMPLS Control Plane
- Service Integration between L0/L1 and L2
(Carrier Ethernet)

New Optical Infrastructure



Advanced Hybrid Networking Services

▣ IP Networking Service

- Multiple upstream to several commercial Internet eXchanges with about 10Gbps

▣ DynamicKL

- Dynamic circuit reservation system developed by KISTI

▣ OSCARS@KREONET/KREONet2, KRLight

- ESnet's On-Demand Secure Circuits and Advance Reservation System
- Linking with OSCARS@ESnet
- Juniper MX480, MX240, MX80

▣ KREONET DES (Dynamic Ethernet Service)

- Next Generation Carrier Ethernet Technology based on Point-to-Point and Multi-point Service (E-LINE, E-LAN, E-TREE) with bandwidth guaranteed: ~ 10Gbps
- Standardized Services, Quality of Service, Scalability, Reliability, Service Management [MEF Carrier Ethernet]
- Ciena MERS8610, MESU1850, CN5410, CN3960

▣ Lambda/Lightpath Service

- SDH/SONET channeling
- VCAT, LCAS, GFP
- OTN Switching

Dynamic-KL NSIv2.0 Deployment

Guaranteed Networking Performance Reservation allocation Service



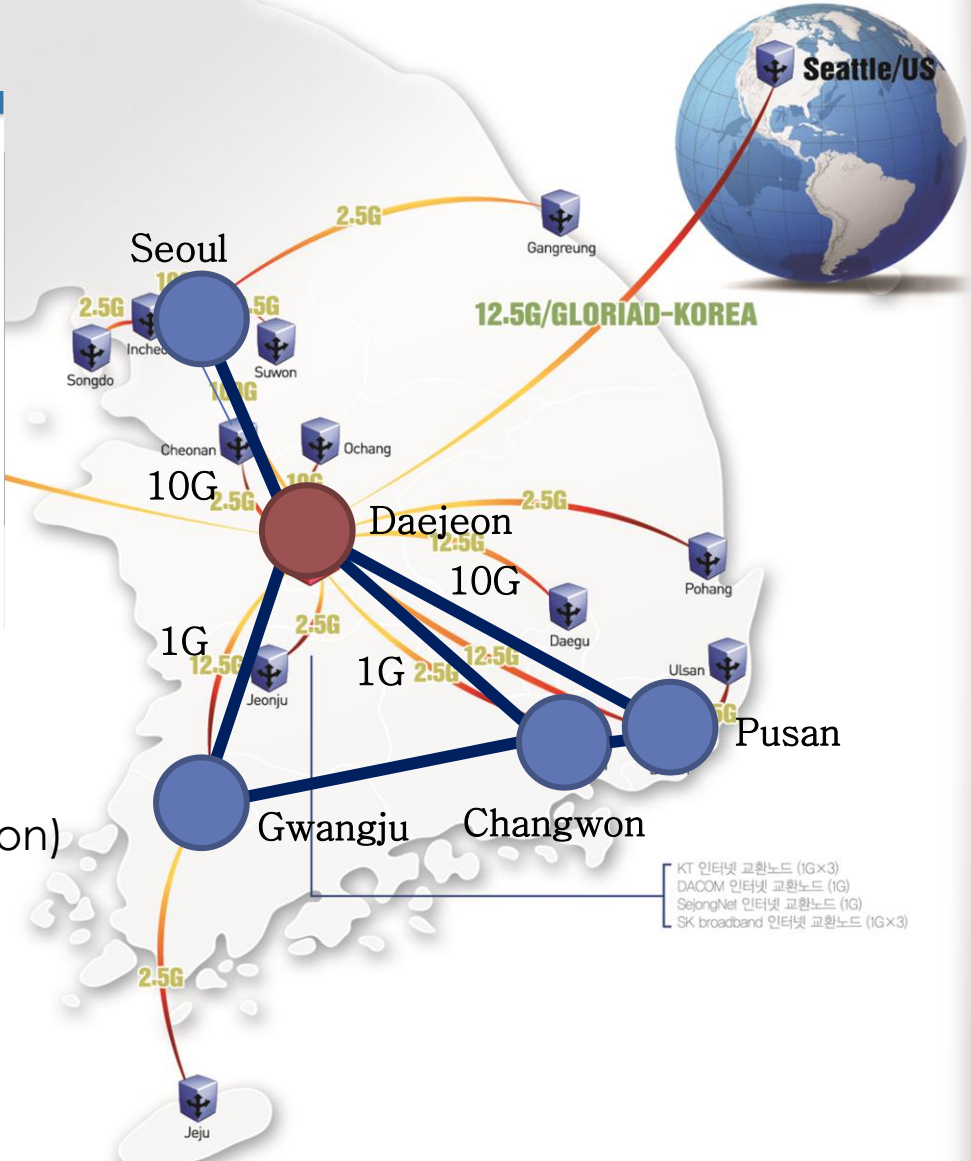
Webportal

Provision, release, termination service

Network resource reservation

Connection ID	urn:1:5eff0a8-a6bc-4b0e-afb4-f96113f65af0
reservation type	inside domain
start time	2012.10.09 10:00
end time	2012.10.12 12:00
source	Seoul
destination	Changwon
bandwidth	100M
status	reserved

Termination



Deploying dynamicKL2.0 for KREONET

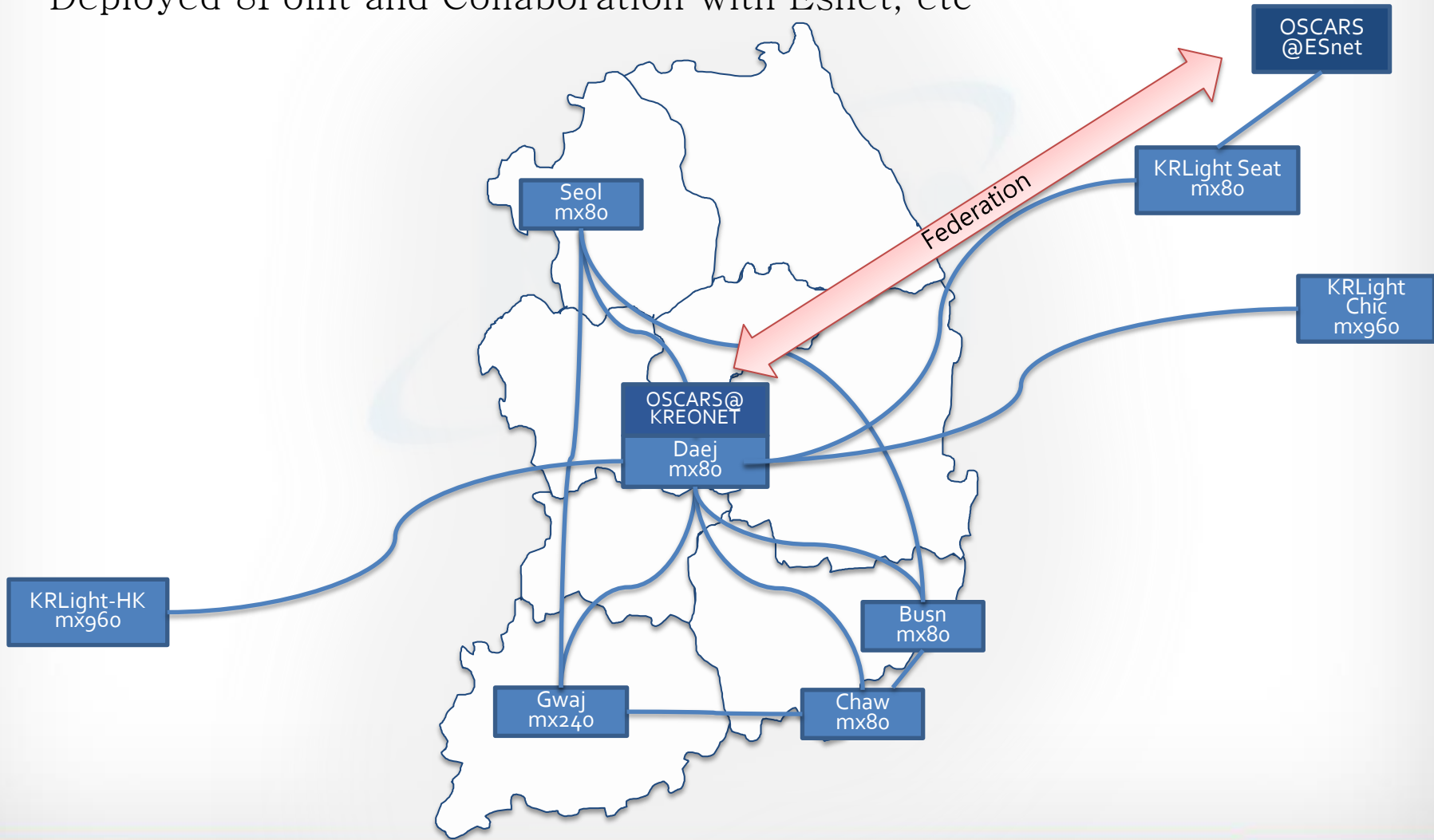
- Juniper switches (MX80, MX240)
- Nationwide topology of 5 points (Seoul, Daejeon, Gwangju, Pusan, Changwon)
- Based on NSIv1.1/2.0
- Applications
 - SDSS Data
 - Weather Data
 - Storage Service (100TB)

KT 인터넷 교환노드 (1G×3)
 DACOM 인터넷 교환노드 (1G)
 SejongNet 인터넷 교환노드 (1G)
 SK broadband 인터넷 교환노드 (1G×3)

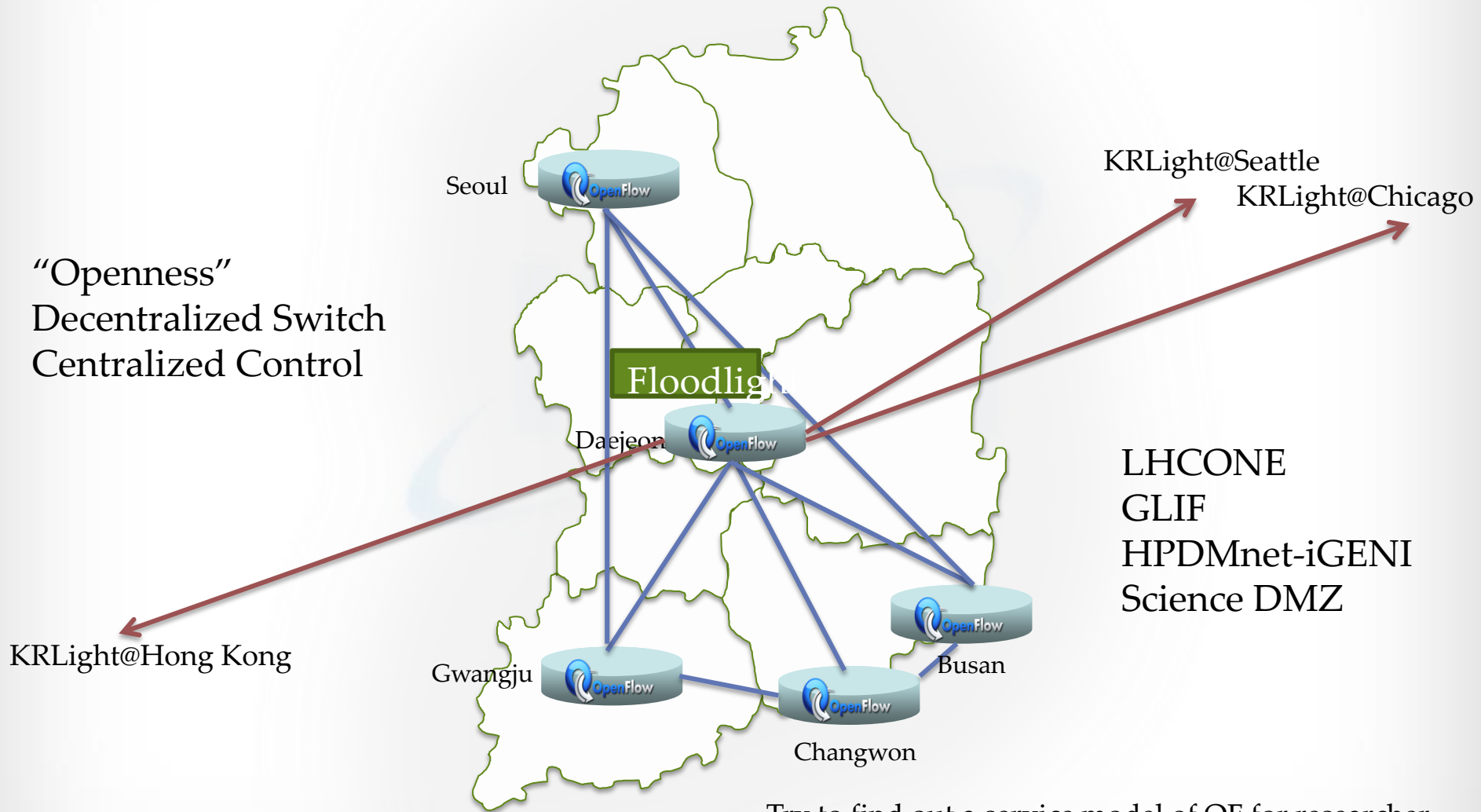
OSCARS, 2013

OSCARS(On-Demand Secure Circuits and Advance Reservation System)

- Guaranteed Network Circuit Reservation Service
- Deployed 8Point and Collaboration with Esnet, etc



OpenFlow@KREONET, 2013



Networking Projects

- GSDC@KISTI Tier1 Candidate Activities
 - GSDC@KISTI ~ CERN E2E Dedicated Network
 - 1Gbps (2012) -> 2Gbps (2013) -> 3Gbps/10Gbps (2014)
 - LHCONE, ... (LHCOPN)
- PerfSONAR@KREONET/KRLight
 - Backbone-scale PerfSONAR Infrastructure (expansion)
- Open Science Rack of KREONET
 - A collaborative platform (service) to KREONET Users
 - Large-scale data transfer platform, Video-conferencing, Cloud Storage for Science Data, ...
- eduroam@KREONET
 - .kr RO (Roaming Operator)
- OpenFlow@KROENET/KRLight
 - Large-scale (backbone-scale) OpenFlow Testbed (rebuilding)

GSDC/KISTI LHC Tier1 Candidate Activity

- End-to-End Dedicated Circuit between KISTI and CERN
1G (2012~2013) -> 2G (2013~2014) -> 3G (or 10G 2014 ~)



10 Strategic R&D Support Programs

Supporting Specialized Private Networks per Scientific R&D
Application as Service-enabled Infrastructure



High Energy Physics



Weather&climate



Education & Collaboration



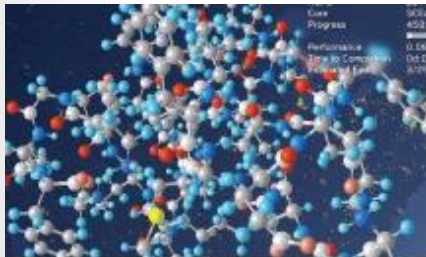
Medical Science



Future Internet



astronomy



New Medicine/Bio



Culture & Art



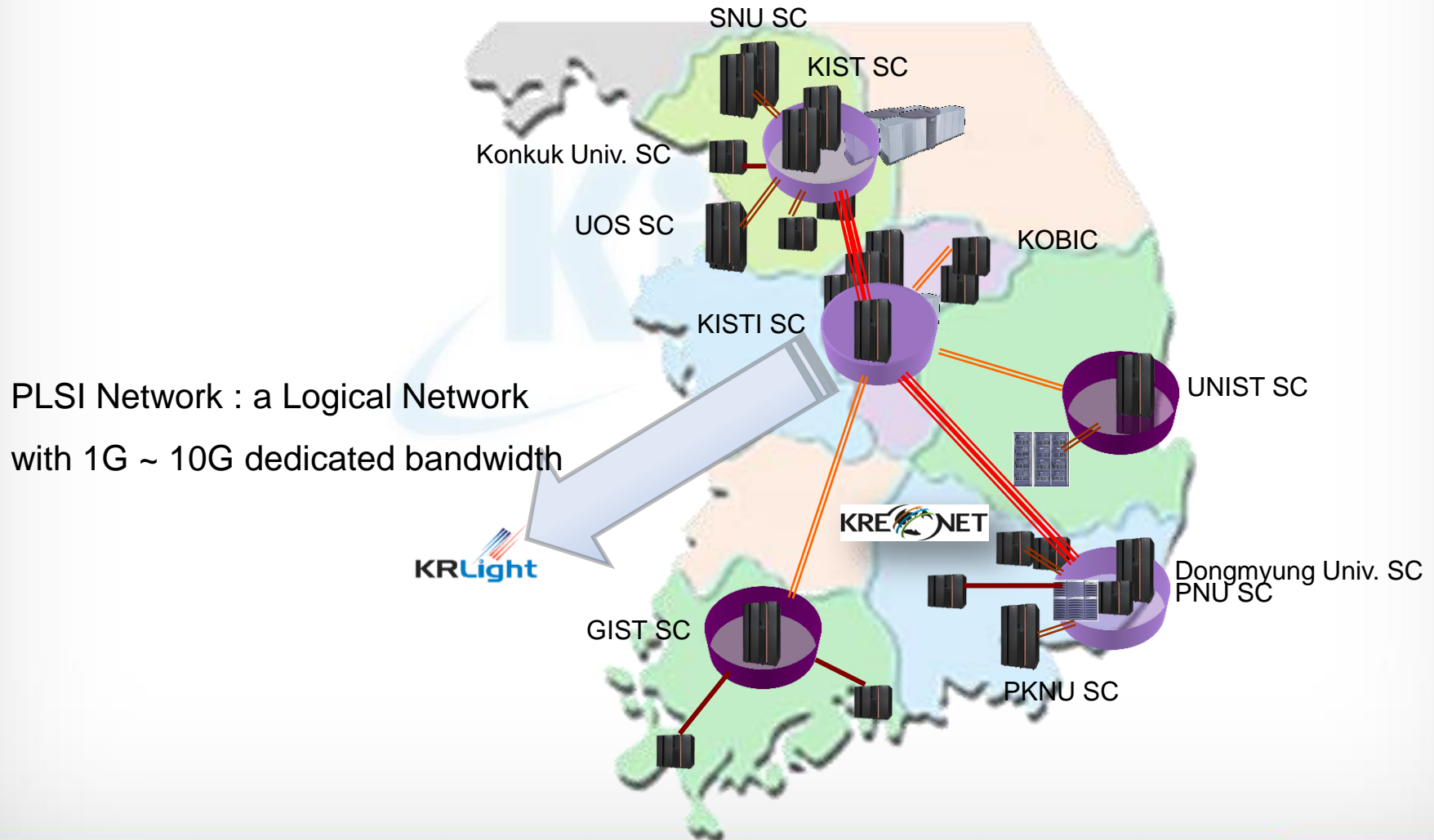
Constructions



Supercomputer

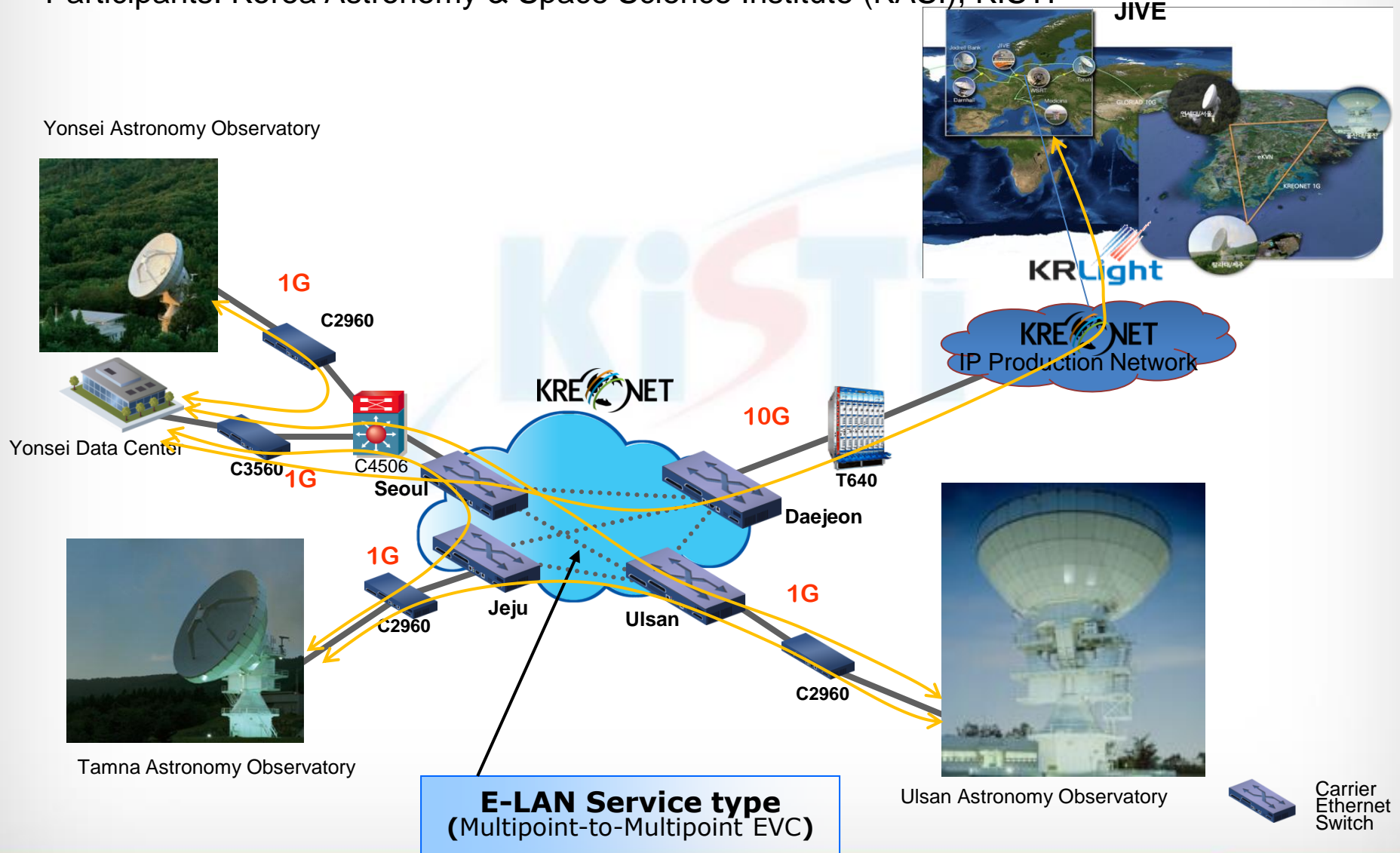
PLSI (Partnership and Leadership for the nationwide Supercomputing Infrastructure)

- Collecting distributed Supercomputing resource and sharing as nationwide Supercomputing Infrastructure over KREONET
- 5 Base (Regional) Centers, 10 SC Partners (Organizations)



e-KVN over KREONET/KRLight

- e-KVN: Korean e-VLBI (electronic Very Long Baseline Interferometry) Network
- Participants: Korea Astronomy & Space Science Institute (KASI), KISTI





dQ13 Dancing beyond TIME

**Three continents networked music and dance performance
Prague(CZ)-Barcelona(ES)-Salvador(BR)-Daejeon(KR)**

APAN e-Culture WG



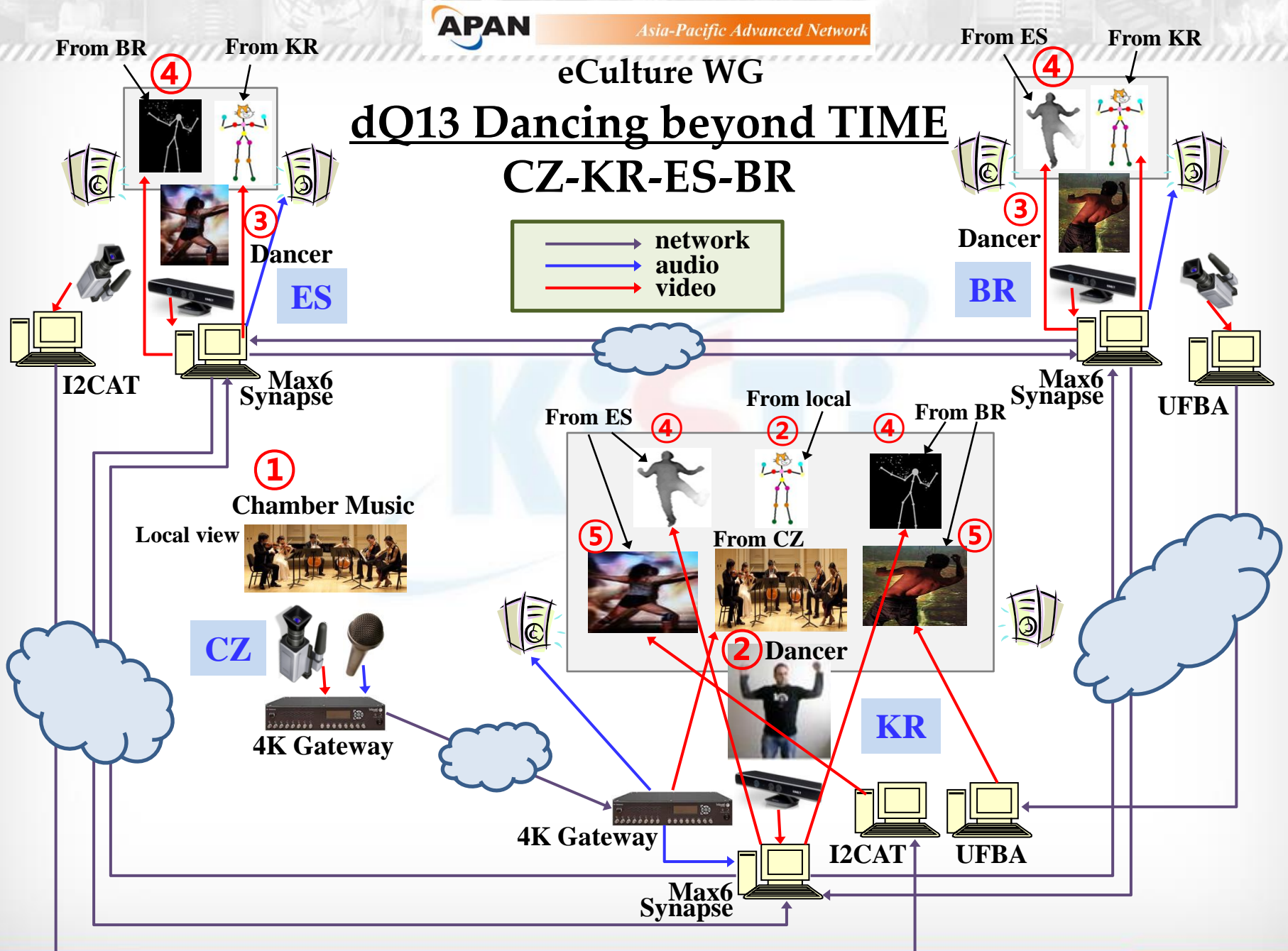
IHAC
INSTITUTO DE HUMANIDADES
ARTES E CIÊNCIAS
PROFESSOR MILTON SANTOS
UFBA



**POÉTICAS
TECNOLÓGICAS**
GRUPO DE PESQUISA - IHAC / UFBA



eCulture WG
dQ13 Dancing beyond TIME
 CZ-KR-ES-BR





dQ2013_Video

...

cyber performance video



Thank you for listening

...

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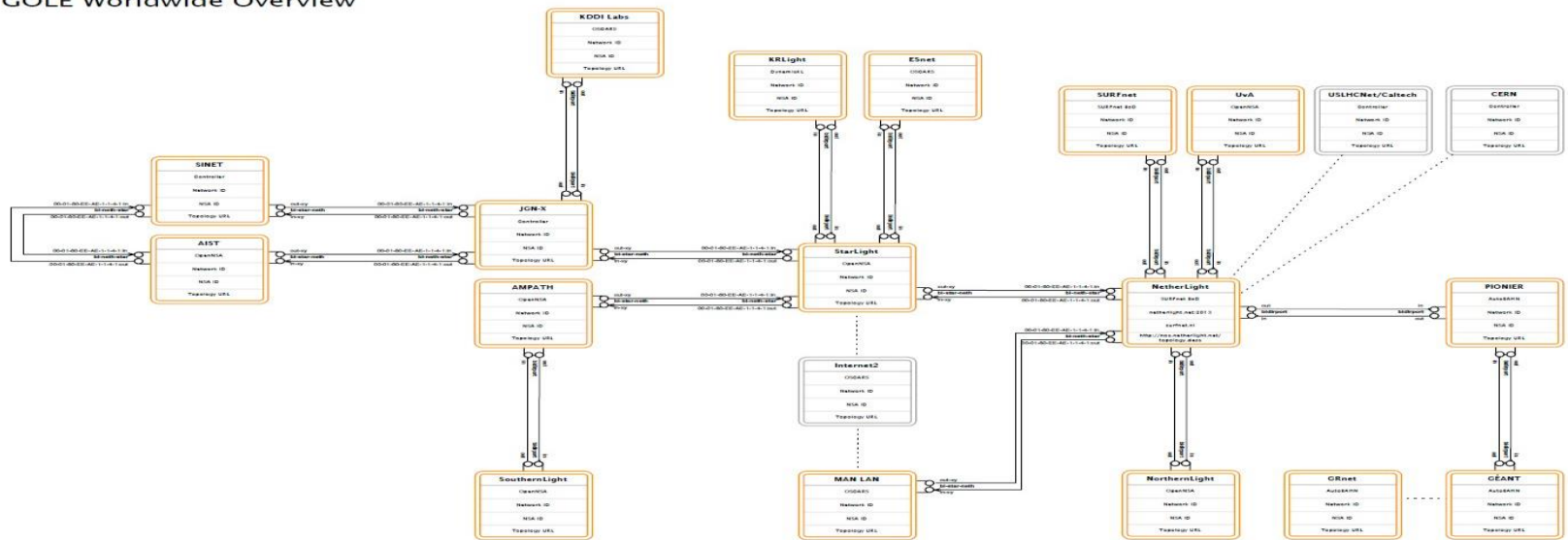


DynamicKL2.0 Development & Collaboration

KRLight development dynamicKL since 2008

- 2008 ~ 2009: Development dynamicKL1.0
 - Deploy for KREONET
 - Connection with FENIUS
- 2009 ~ 2010 : Development NRM & CRM
 - Deploy for KREONET NRM(Network Resource Management) & CRM (Computing Resource Management)
 - Development dynamicKL1.0 & FENIUS
- 2011 : Development dynamicKL1.0 & NSIv1.0
- 2012 ~ 2013 : Development dynamicKL2.0 & NSIv2.0
 - Webportal service based on NSIv1.0/2.0

Automated GOLE Worldwide Overview



GLIF13th NSI Demo Topology

Legend



1GbE
10GbE