GLIF related activities JP

Jun Murai

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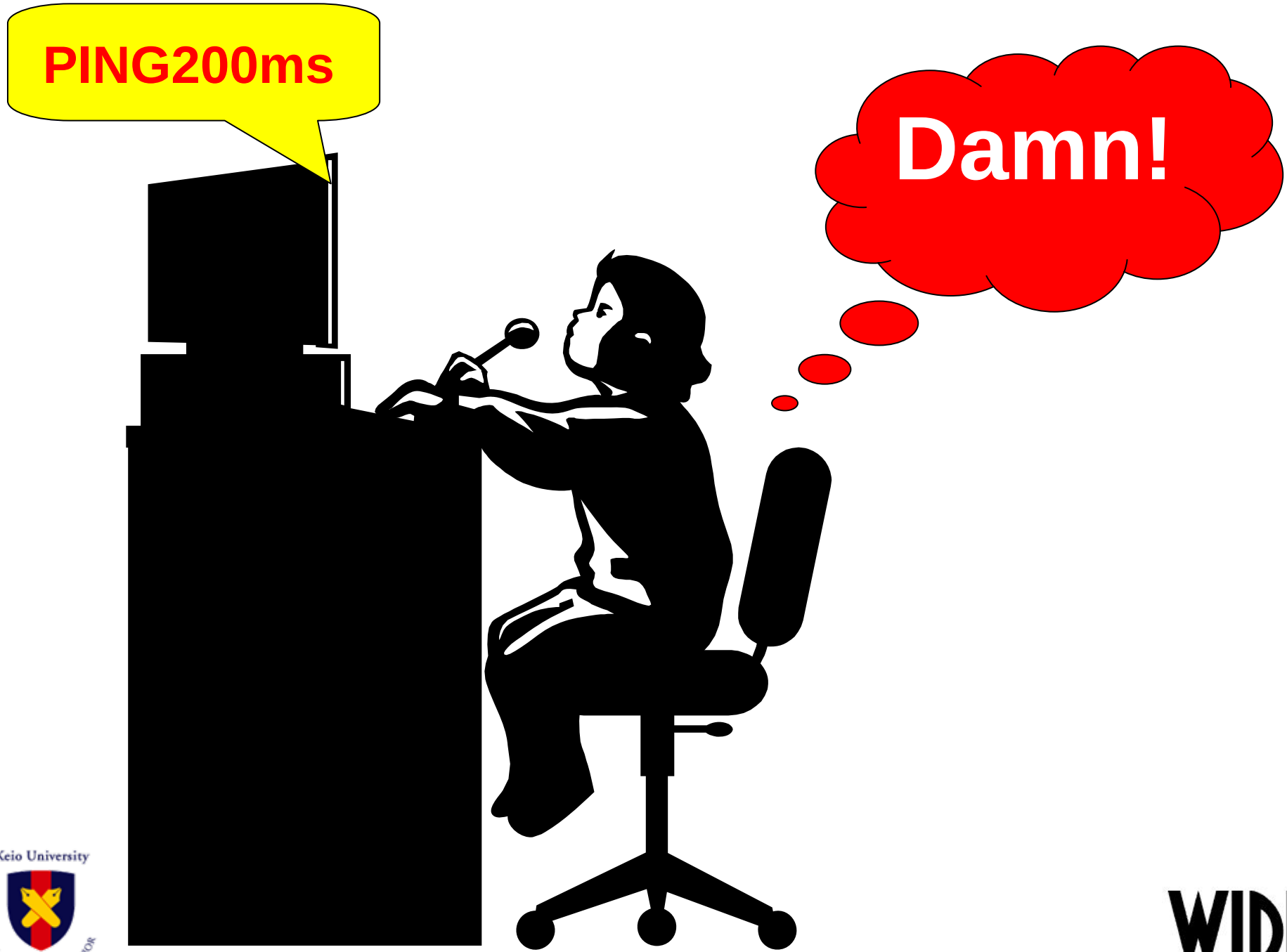
GLADIO
FORTIOR

WIDE

Welcome to Tokyo

- Akihabara:
  - 1950: Radio (tube)
  - 1970: +Electric Appliances (transistors)
  - 1990: +Computers (ICs)
  - 1995: +Electronic Games
  - 2000: +Animation
  - 2005: +Maid (Pop-culture)
  - 2006: +Business (new buildings)



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Prof. Hiraki's LSRs

- Land Speed Records
  - http://lsr.internet2.edu/
  - Partial rule says
    - Distance measured by L3 points
    - Must spawn at least an operational network link
    - IPv4/IPv6 single TCP/multiple TCPs
    - At least 10% greater than previous record
    - Maximum distance is 30,000km
  - A Light Path doesn't contribute LSR by itself
    - It is a layer-1 (or layer-2) service

Data Reservoir LSRs

- Data Reservoir chaired by Prof. Hiraki
  - http://data-reservoir.adm.s.u-tokyo.ac.jp/
- Original motivation
  - Provide a system for efficient data transfer
    - Over a long-fat pipe
    - For scientific applications
    - iSCSI based system was developed
  - Their record in 2003
    - 6.8 Gbps disk-to-disk over 9800 mile
    - 1 DVD per 5 second
    - With a large nunmber of TCP sessions
- How much performance single TCP marks?
  - This because practical as 10GE development

Data Reservoir LSRs

- First LSR approved : Nov 9, 2004
  - CERN to Pittsburgh through Tokyo
  - IPv4 single TCP, TOE
  - 7.21 Gbps over 20,645km, 148.8 Pbm/s

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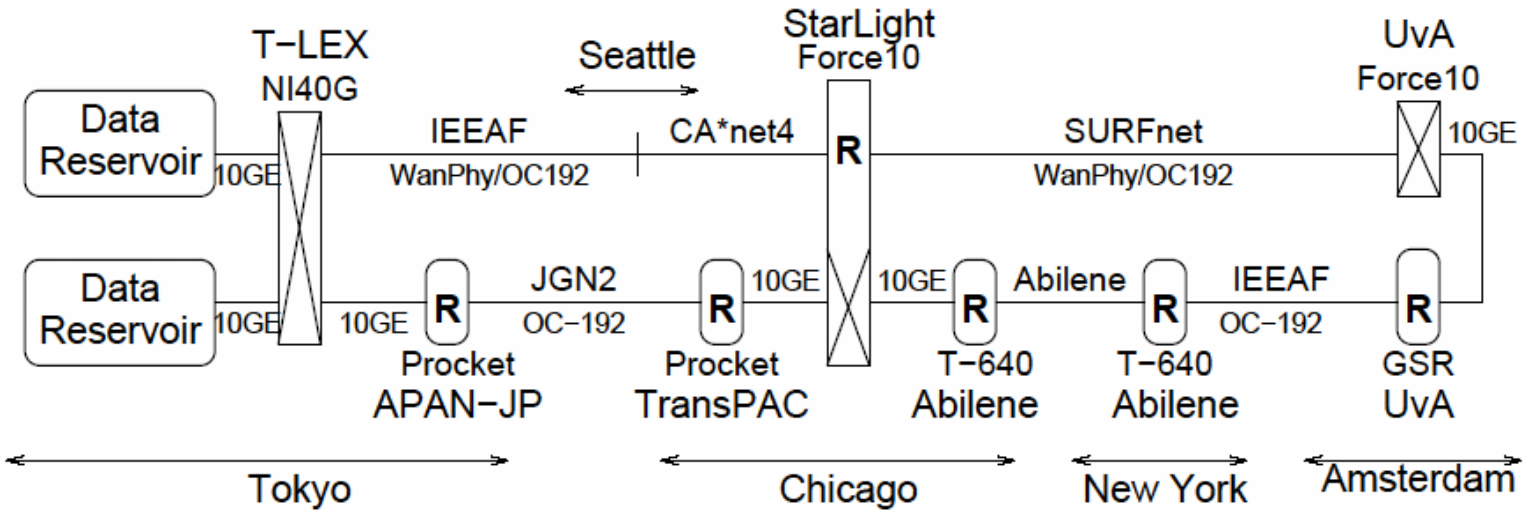
Data Reservoir LSRs

- Second LSR : Dec 24, 2004
  - Tokyo-Chicago-Amsterdam-Chicago-[Seattle]-Tokyo
  - Starlight performed L3 function in one-way
  - 7.21 Gbps over 30,000km, 216.3 Pbm/s
  - Xmas Eve : minimum congestion in Abilene



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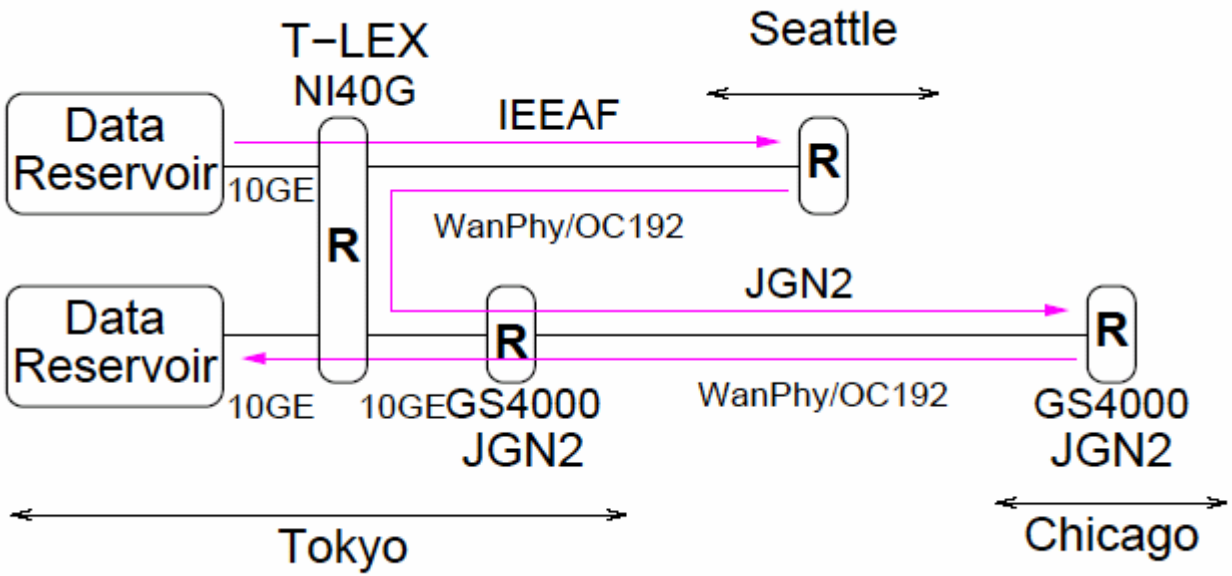
Data Reservoir LSRs

- First IPv6 LSR: Oct 29, 2005
  - Tokyo-Chicago-Tokyo-Seattle-Tokyo
  - 5.58Gbps over 30,000km, 167.4 Pbm/s
  - No TOE was available



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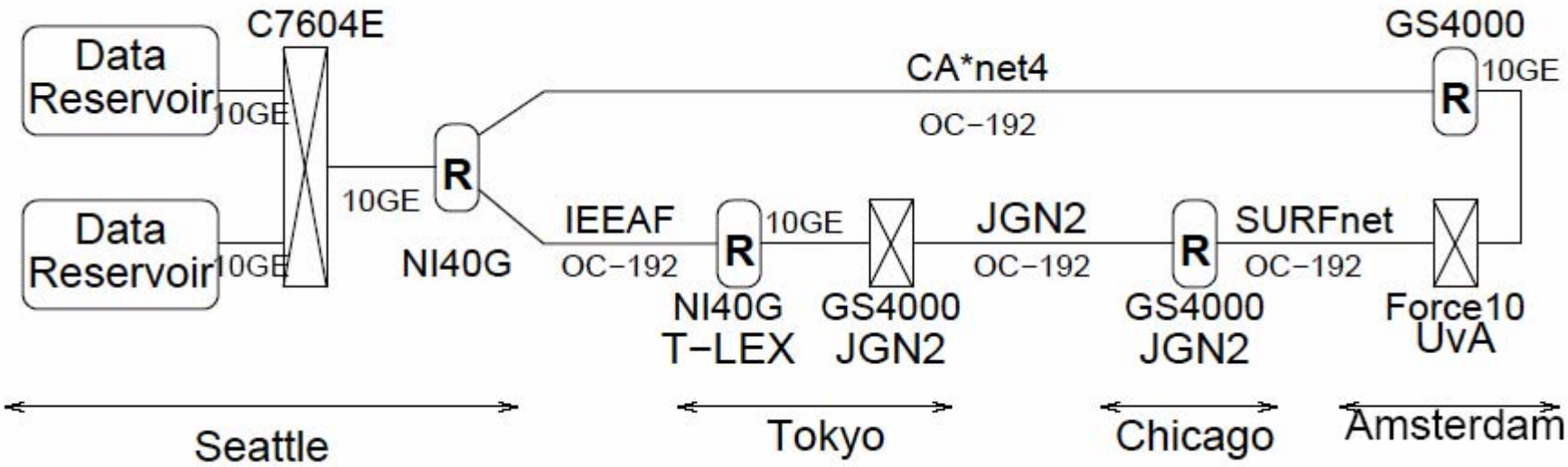
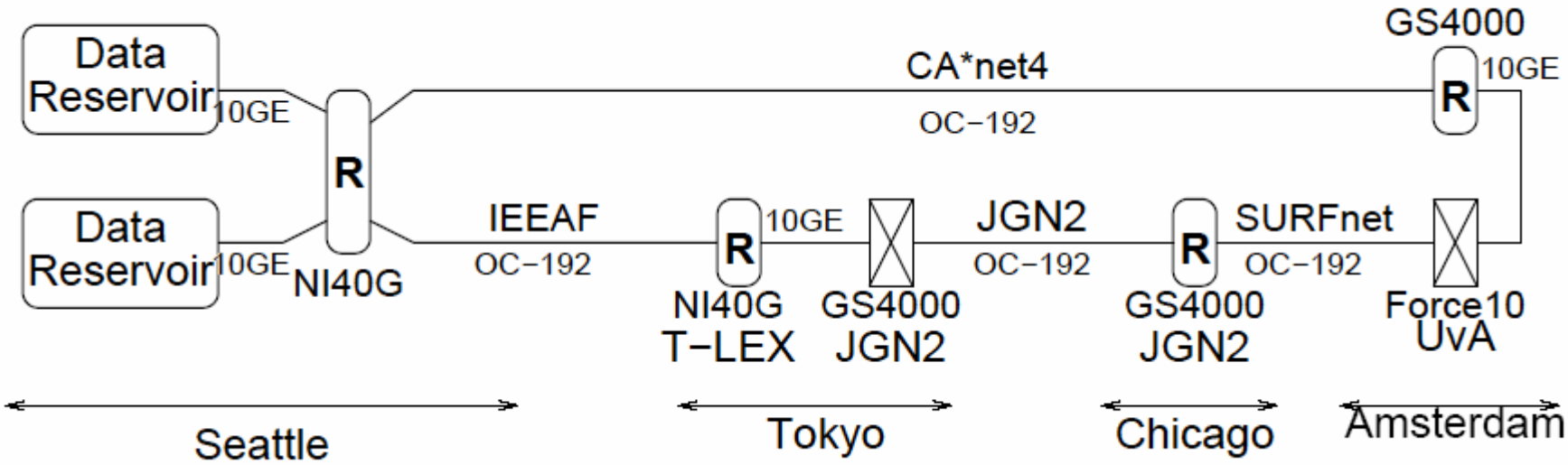
Data Reservoir LSRs

- Second IPv6 LSR : Nov 14, 2005 during SC|05
  - Seattle-Tokyo-Chicago-Amsterdam-Seattle
  - 6.96Gbps over 30,000km, 208.8 Pbm/s
  - No TOE was available



Data Reservoir LSRs

- Latest IPv4 LSR: Feb 20, 2006
  - Seattle-Tokyo-Chicago-Amsterdam-Seattle
  - NIC with PCI-X2.0
    - Bandwidth of PCI-X doubled
  - 8.80Gbps over 30,000km, 264.1Pbm/s



Data Reservoir LSRs

- Latest IPv4 lSR : Feb 20, 2006
  - This was the last LSR single IPv4 TCP
    - 9.68Gbps required to break this
    - It can’t be possible with an OC-192c
- A LSR to be marked
  - IPv6 single TCP
    - 7.66Gbps required to break the last LSR
- After that
  - They will return the original work
    - Efficient disk-to-disk transfer
    - With small systems as much as possible

LSR Trophies presented Apr 2006

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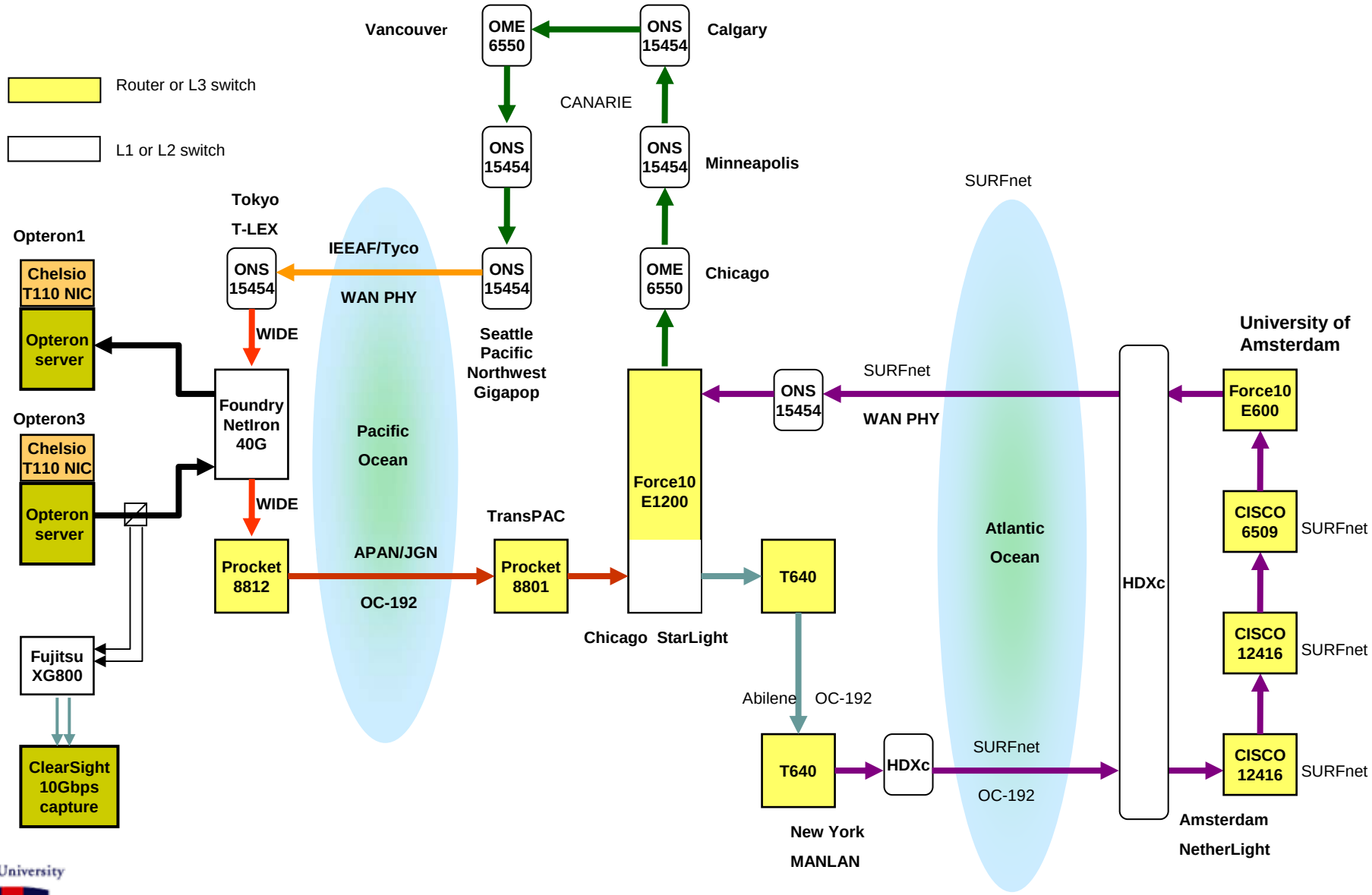
133ms to reach

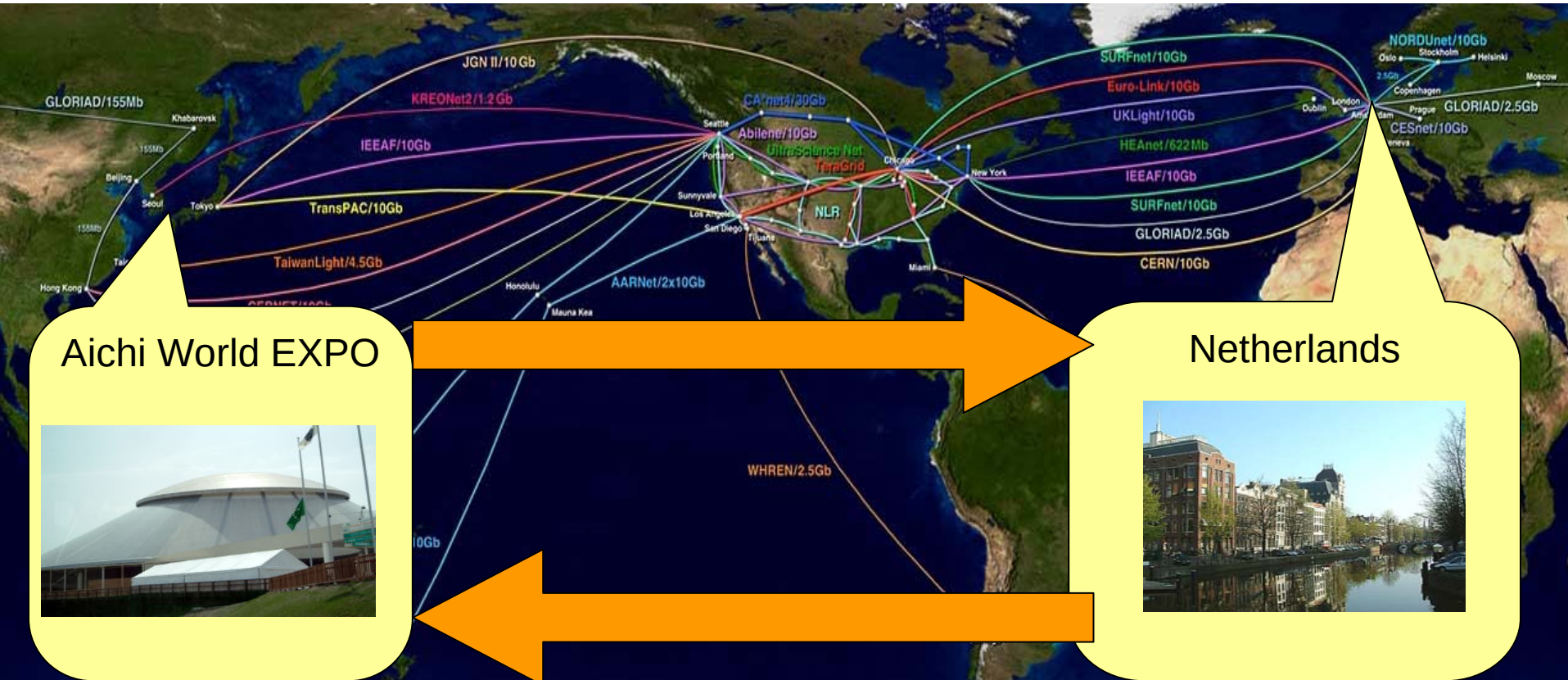
Lambda Internet

Single stream TCP – Tokyo – Chicago – Amsterdam – NY – Chicago - Tokyo

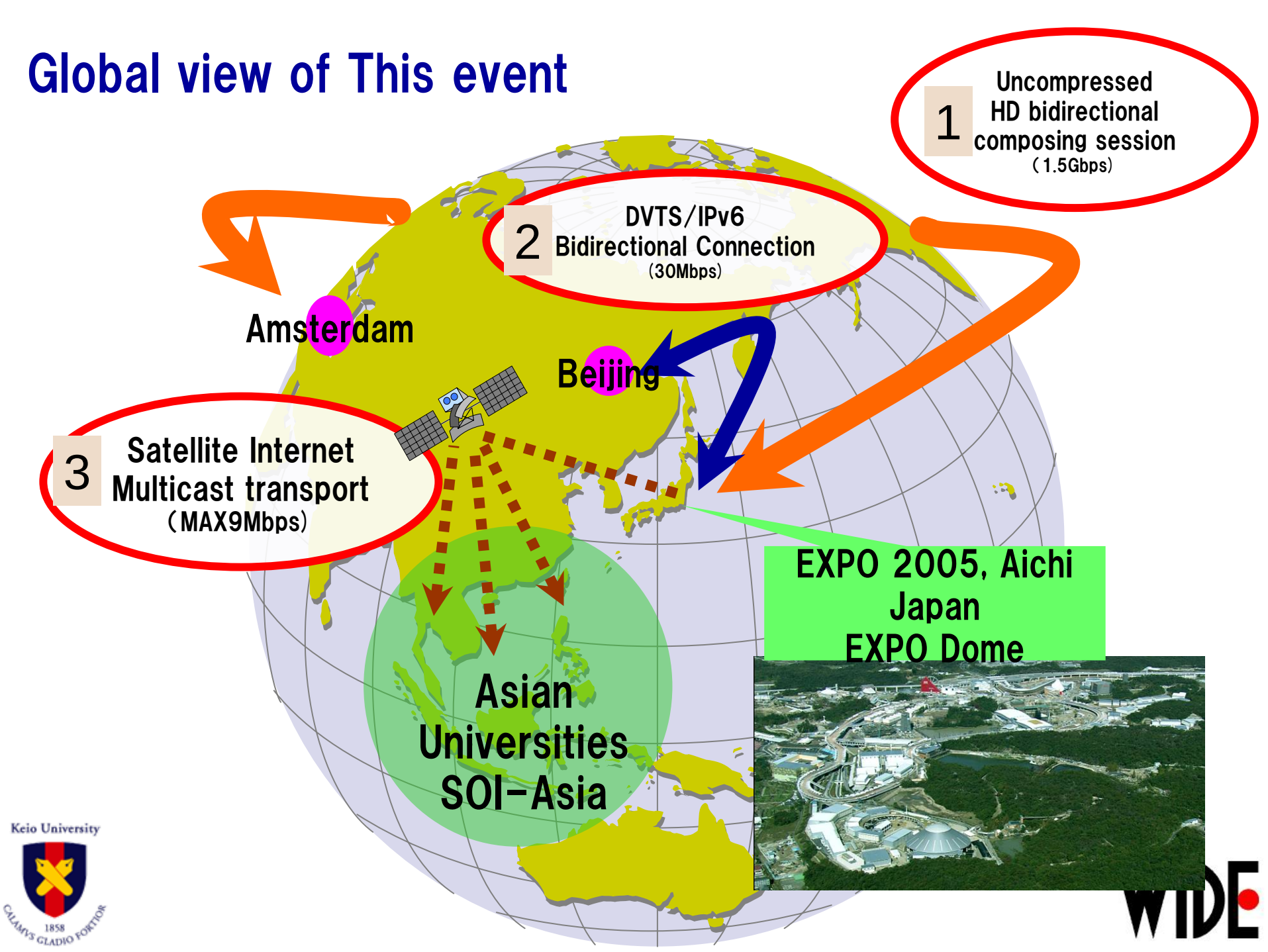


Connecting Worlds by Lambda

- Collaboration over HDTV Real-time Interactive Streaming
- Uncompressed HDTV transfer Technology over the International 10G lambda network
- Date: Sep, 21st, 2005
- Location: Aichi World Expo. and Netherlands



Global view of This event



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Japan:
Internet Jam Session

"Delayed Live Music Session between Aichi and Amsterdam"

Dual Direction Collaboration with Ultra Long Distance Internet HDTV

Aichi

Amsterdam

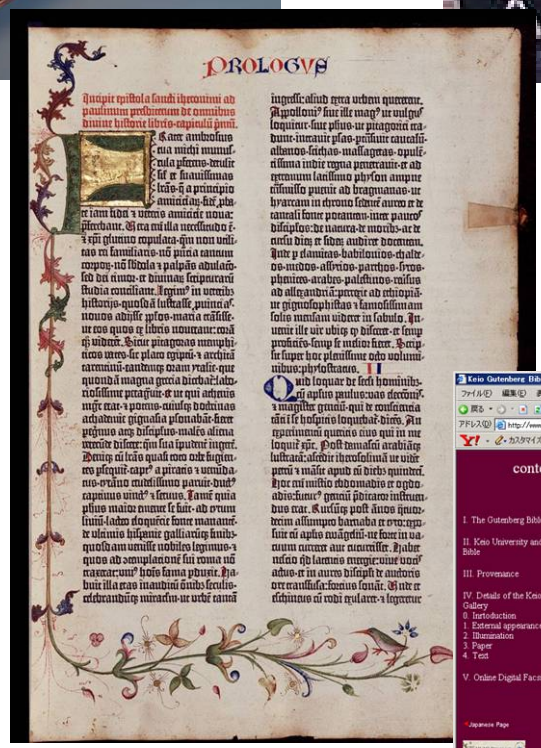
Keio University

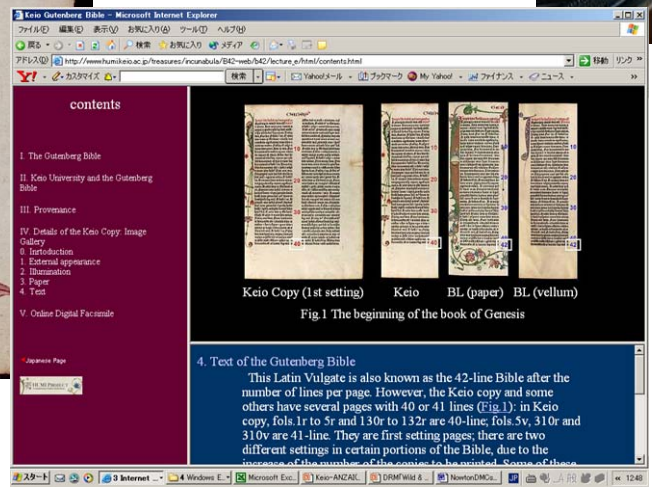
Closing forum "EXPO 2005 International Forums"

HUMI Project: Content Creation

Digitizing the Gutenberg Bible

Keio's Gutenberg Bible





http://www.humi.keio.ac.jp

✓A digital facsimile of the Bury Bible was presented to both the University of Cambridge and the City of Bury.

HUMI Project : International Collaboration

Benefactors of the British Library (at entrance)

ICONOLOGIA
DEL CAVALIERE
CESARE RIPA
PERUGINO
DALL' ABATE CESARE ORLANDI
D. RAIMONDO DI SANGRO
TOMO PRIMO.
IN PERUGIA, MDCCLXIV.
NELLA STAMPERIA DI PIERGIOVANNI COSTANTINI.

Cesare Ripa, Iconologia

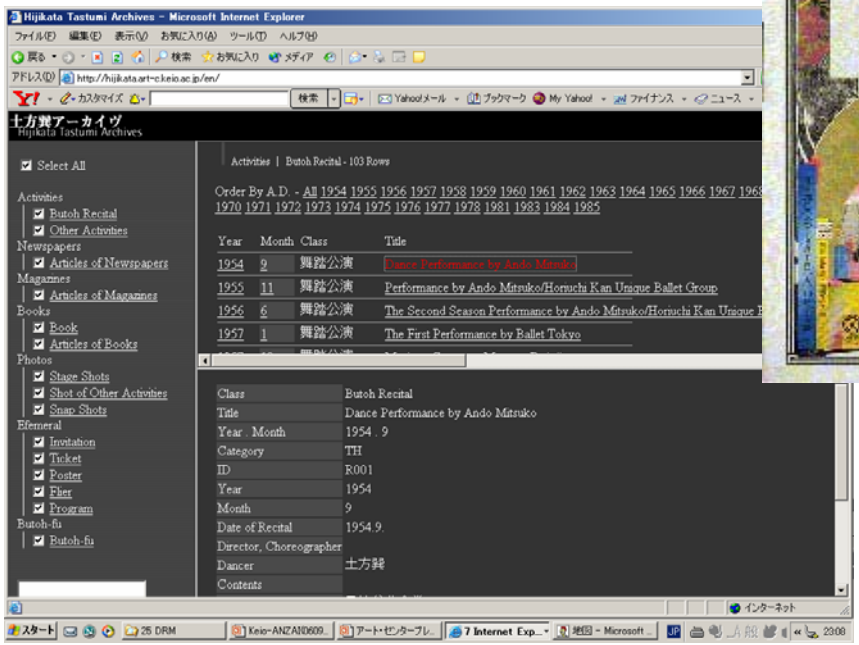
Nara Ehon

15th-century Book of Hours

Digital Preservation of BUTOH Body Movements

Tatsumi Hijikata (1928-1986): Founder of Butoh

Hijikata Tatsumi Archives by Art Center (1998)



Poster by Tadanori Yokoo

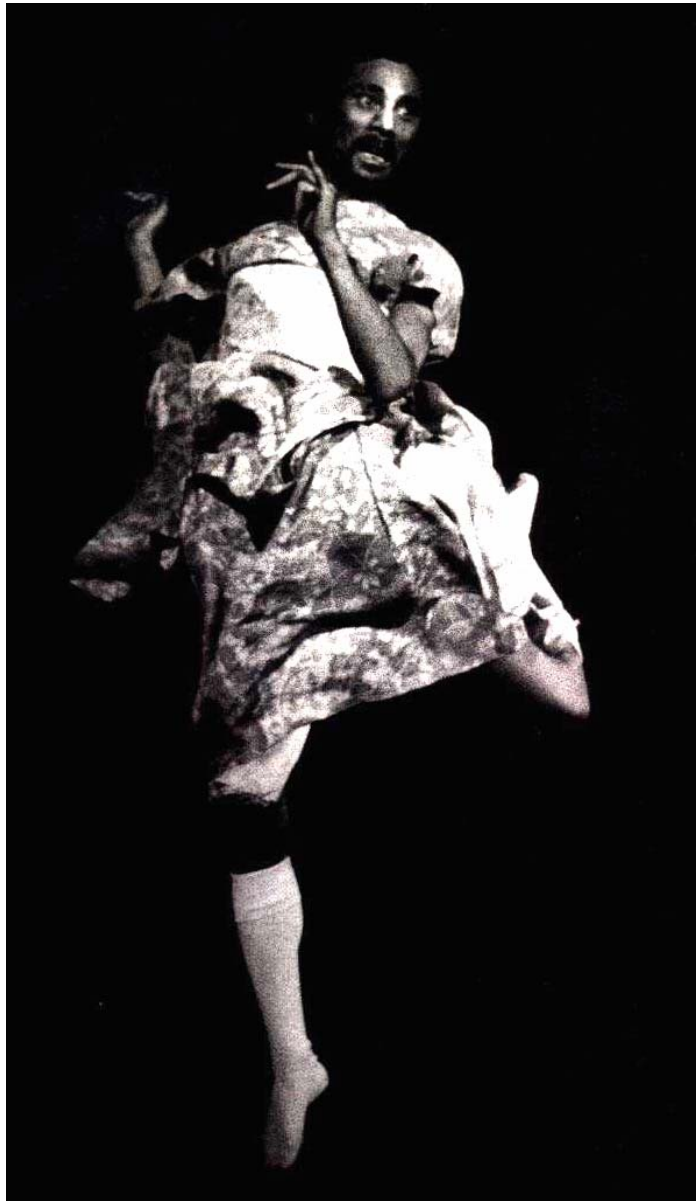
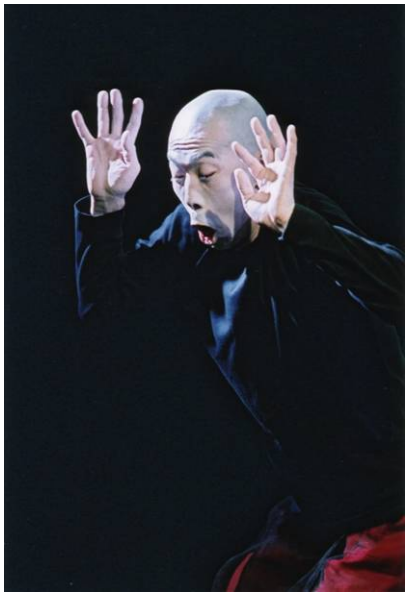


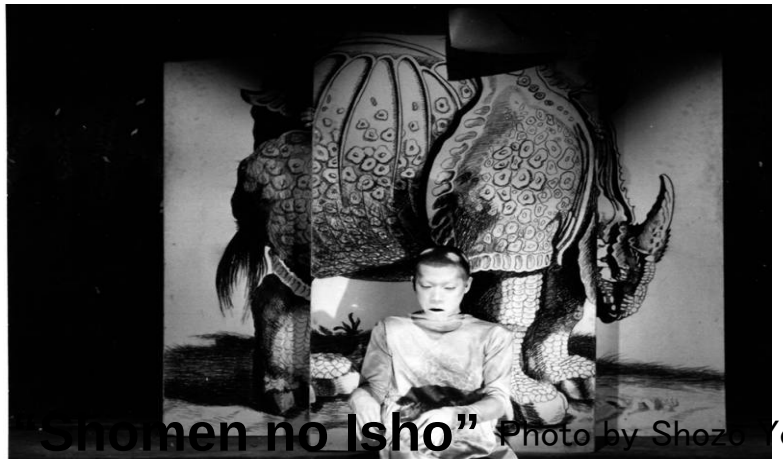
Photo by Tadao Nakatani

http://hijikata.art-c.keio.ac.jp/en/

Digital Preservation of BUTOH Body Movements



Yamamoto Moe
Photo by Hideyo Tanaka



"Shomen no Isho" Photo by Shozo Yoshie
(Costume from the Angle)

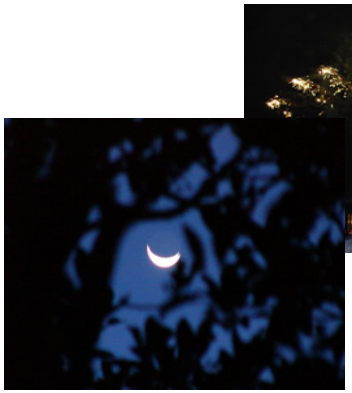
Photo by Makoto Onozuka

- ✓Preserves a visual record of Hijikata's Butoh body movements
- ✓Results of this study should be helpful to field research on the making of body movements in modern dance and on the methods of producing digital media content for the performing arts

- ✓Hijikata's performance is reproduced with the help of Yamamoto Moe

Sound Education

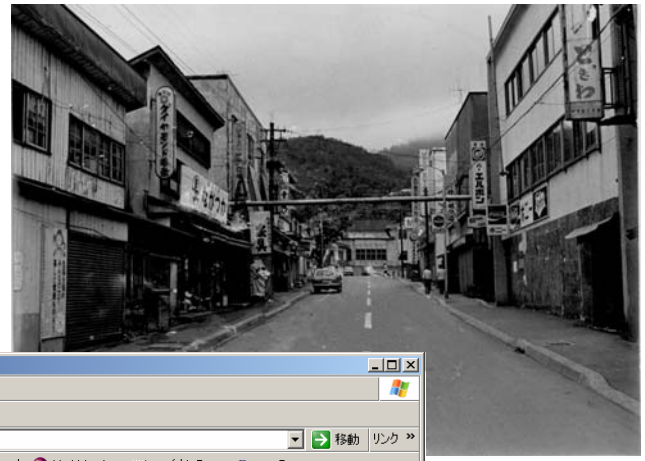
Cultivating aesthetic sensibility in elementary school students through sound



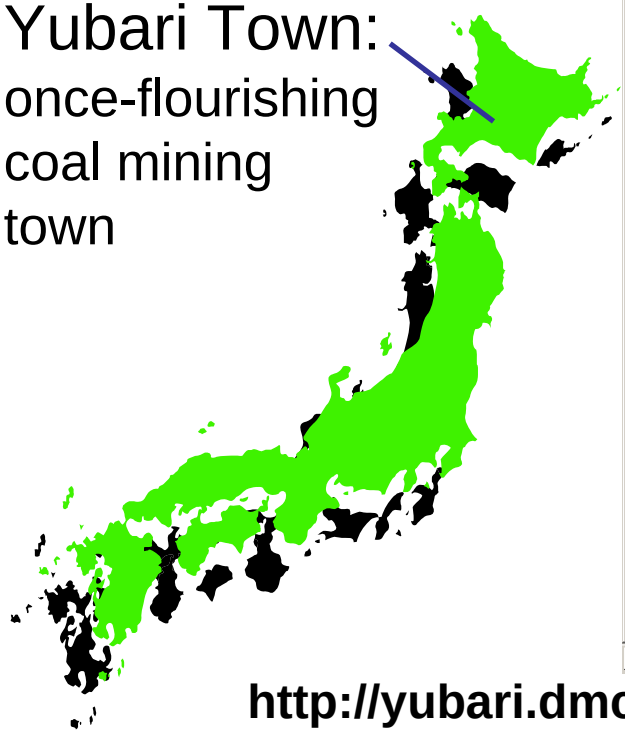
http://sound.yochisha.keio.ac.jp/dmc/

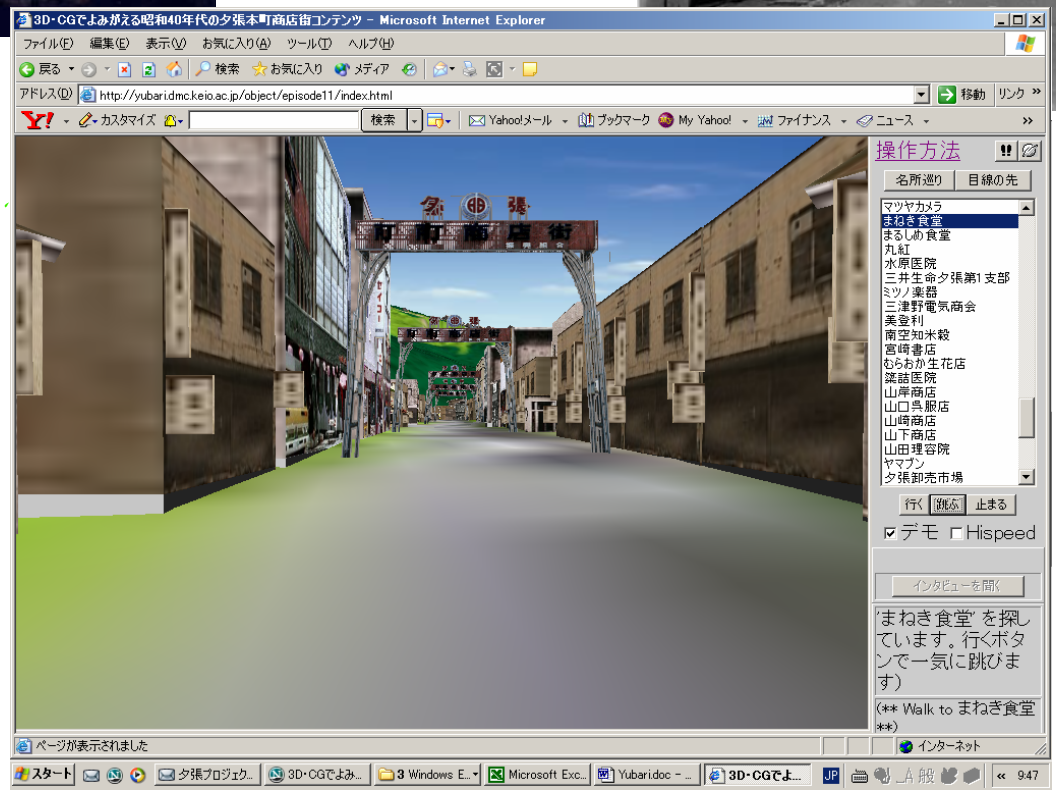
Re-creation and archiving of a 1960's mining town using advanced 3D computer graphics technology

✓Reproduction of Yubari Town in the1960's



Yubari Town:
once-flourishing coal mining town

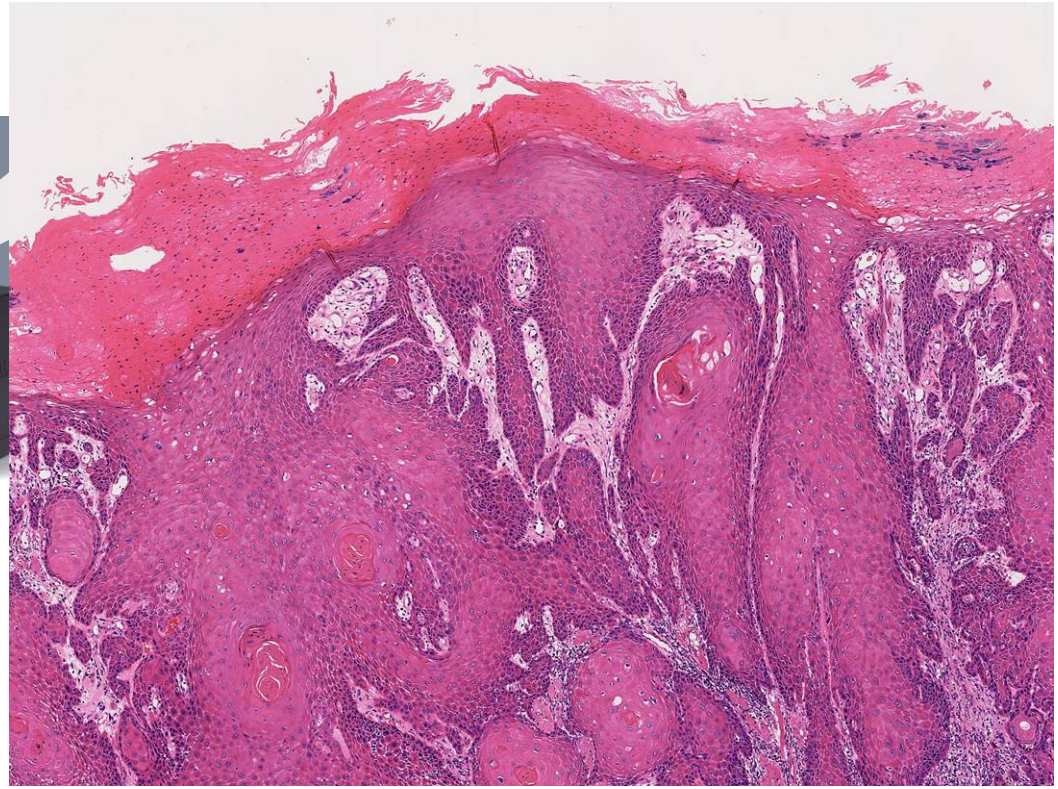




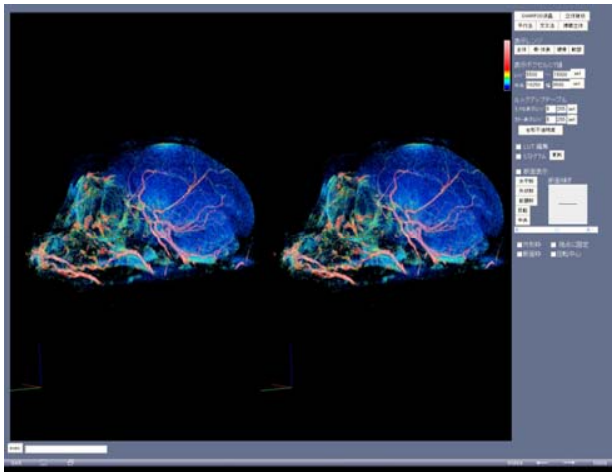
http://yubari.dmc.keio.ac.jp/

IT Revolution in Medical Education

✓Zooming in on organic samples without a microscope



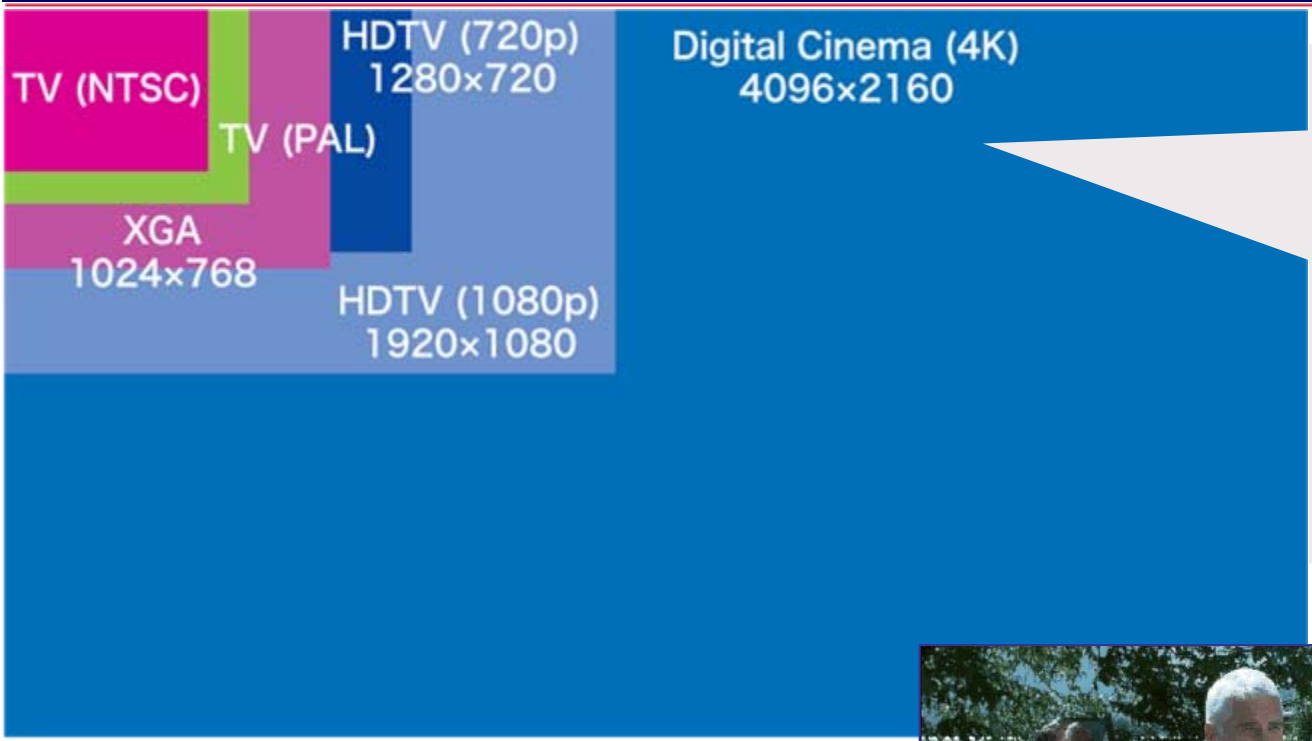
✓Development of an anatomical 3D atlas of the marmoset



✓Digital interactive pathological/anatomical samples are used in medical education at schools, but are also accessible from anywhere via the Internet to promote distance learning

✓This opens up possibilities for the global sharing of medical knowledge, but a solution for intellectual property and privacy issues still needs to be found

4K Digital Cinema – Format

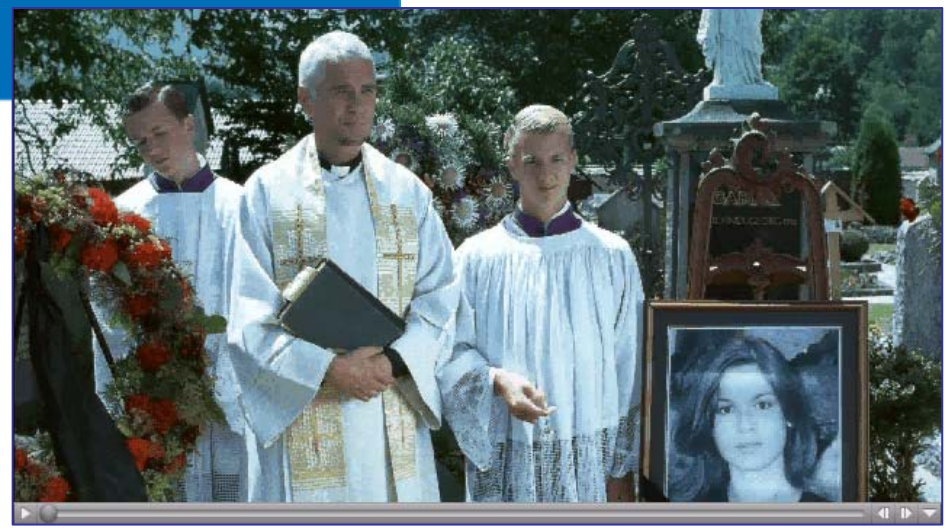


✓Comparison of screen resolutions for TV, computer display (XGA), HDTV and digital cinema

✓The higher the resolution, the clearer and more realistic the picture

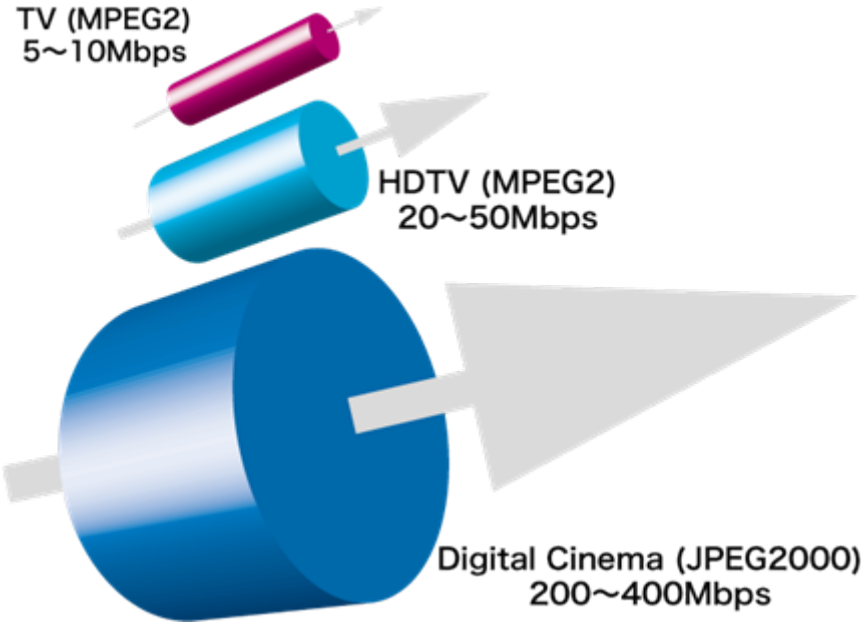
✓The 4K Digital Cinema format has been developed by members of DCCJ (Digital Cinema Consortium Japan) with contributions from DMC researchers

✓The format has been approved as an international standard by DCI (Digital Cinema Initiative)



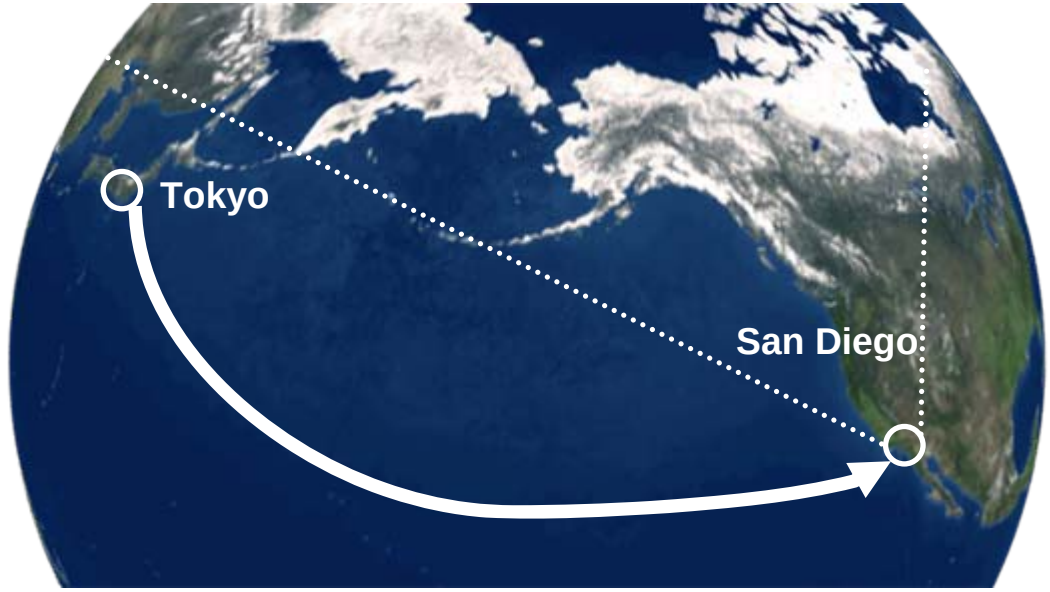
Photographed by Richard Edlund

4K Digital Cinema – Transmission



✓DMC, in cooperation with NTT, UCSD and UIC, achieved the world's first successful transmission of a real-time 4K digital cinema stream across the Pacific Ocean in September 2005

✓This proved that global giga-bit networks can be formed to transmit ultra-high resolution moving images for academic, educational, medical and cultural applications



Next Generation Applications of High Speed Network and Multi-Screens

✓Players in different locations must cooperate by using the 9 floor panels in their room to maneuver a satellite without being hit by meteors

✓DMC, in cooperation with USC, has developed “Andrew Revolski,” an interactive game in which players in remote sites need to cooperate to achieve a common goal

✓This game utilizes global giga-bit networking and multi-screens

What is SOI Asia?

Indonesia
- Brawijaya University, Sam Ratulangi University
- Hasanuddin University, Institut Teknologi Bandung
- Universitas Syiah Kuala

Thailand
- Chulalongkorn University, Asian Institute of Technology, Chulachomklao Royal Military Academy, Prince of Songkla University

Laos
- National University of Laos

Myanmar
- University of Computer Studies, Yangon

Malaysia
- Asian Youth Fellowship, Universiti Sains Malaysia

Vietnam
- Institute of Information Technology

Philippines
- Advanced Science and Technology Institute, University San Carlos

Mongolia
- Mongolian University of Science and Technology

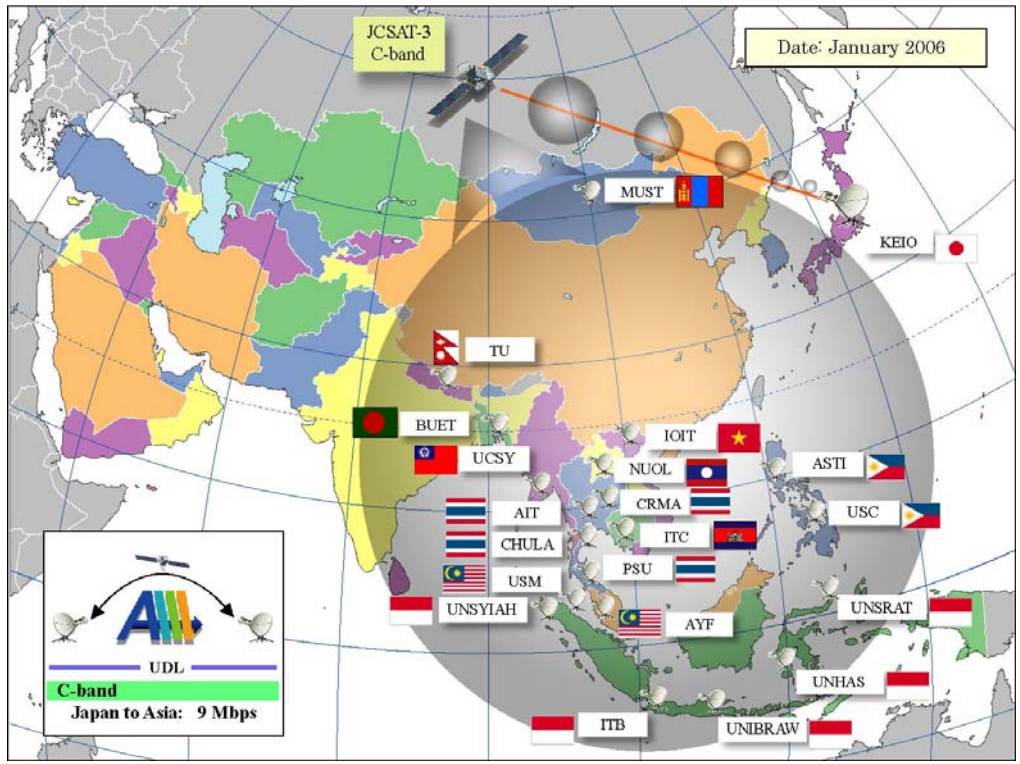
Cambodia
- Institute of Technology of Cambodia

Bangladesh
- Bangladesh University of Engineering and Technology

Nepal
- Tribhuvan University

Japan
- Tohoku University, Tokyo University of Marine Science and Technology, Japan Advanced Institute of Science and Technology, Keio University

24 Partner Universities in 12 Countries



✓SOI (School on Internet) Asia utilizes satellite-based Internet to create Internet environments in a less expensive, easy-to-deploy, and more feasible way for universities located in Asian regions where Internet environments are insufficiently developed

Brawijaya University, Indonesia

Hasanuddin University, Indonesia

Sam Ratulangi University, Indonesia

Asian Institute of Technology, Thailand

National University of Laos, Laos

Advanced Science and Technology Institute, Philippines

University of Computer Studies, Yangon, Myanmar

Asian Youth Fellowship, Malaysia

Chulalonkorn University, Thailand

Institut Teknologi Bandung, Indonesia

Institute of Information Technology,, Vietnam

Universiti Sains Malaysia, Malaysia

Mongolian University of Science and Technology, Mongolia

Prince of Songklang University Thailand

Chulachomklao Royal Military Academy Thailand

Keio University
Shonan Fujisawa Campus,Japan

Universitas Syiah Kuala, Indonesia

University San Carlos, Philippines

Bangladesh University of Engineering and Technology, Bangladesh

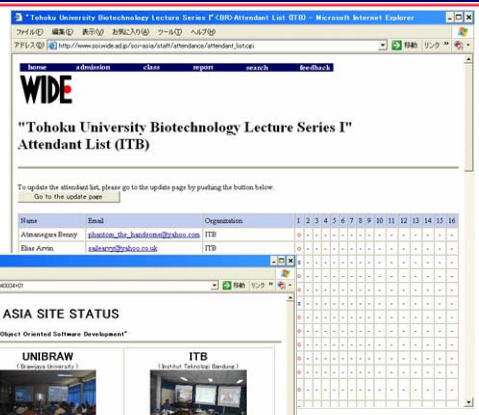
Institute of Technology of Cambodia, Cambodia

Tribhuvan University, Nepal

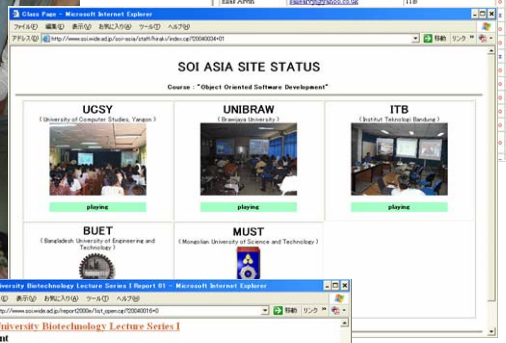
Education Support System

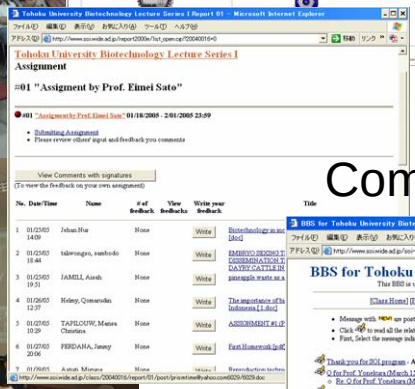
Site status

Assignments



Attendance





Q&A and Communication

Personal activity reports

Feedback

Industry-government-academia collaboration

Satellite Internet Infrastructure

Technology Development
Internet via Satellite
1996~

JSAT

総務省 MIC Ministry of Internal Affairs and Communications

SOI Asia Lecture Platform

Asia IT Training
2004~2005

IBM

Satellite Receiver (Product) and UDLR (Standard)

UDcast

SONY

Technology Development
Satellite and UDLR
2000~

総務省 MIC Ministry of Internal Affairs and Communications

MEXT

Content Development for Digital Media for Asia
2006

MEXT Ministry of Education, Culture, Sports, Science and Technology

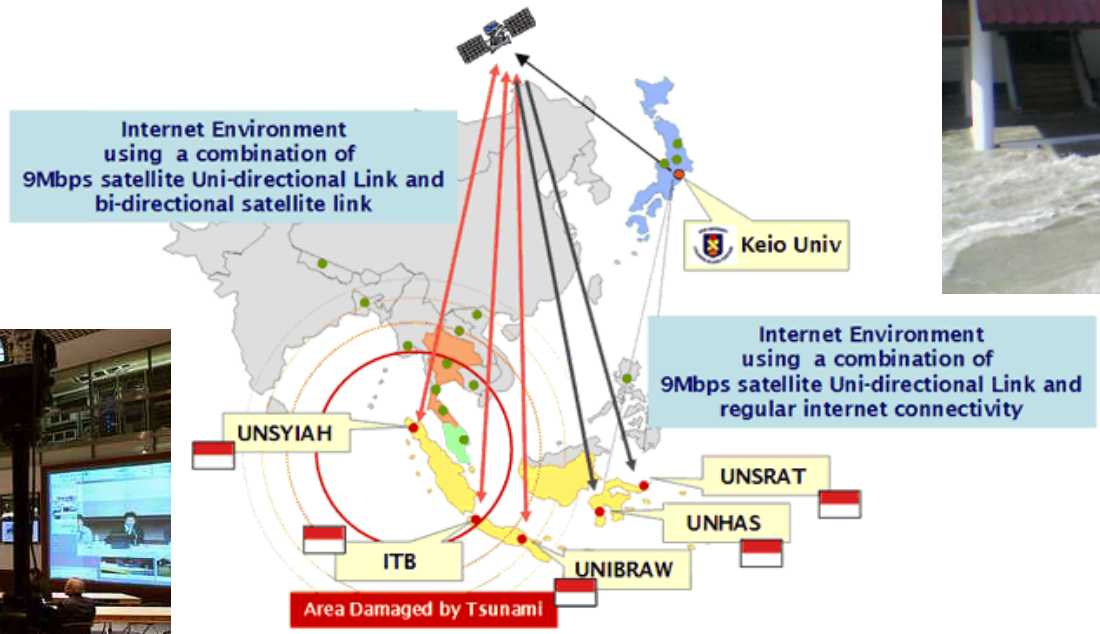
Industry/Government Partners

- Toyota Motor Corp.
- Toshiba Corp.
- NTT DoCoMo, Inc.
- Yokogawa Electric Corp.
- Matsushita Electric Industrial Co. Ltd.
- DENSO Corp.
- Fuji Xerox Co., Ltd.
- Fujitsu Ltd.
- Hitachi Ltd.
- Honda R&D Co., Ltd.
- IBM Japan, Ltd.
- KDDI Corp.
- Microsoft Corp.
- Ministry of Education, Culture, Sports, Science and Technology etc

Tsunami Disaster Recovery Project

Keio University and SOI Asia assisted Universitas Syiah Kuala, the largest national university in Indonesia, by providing distance learning during its recovery from the tsunami

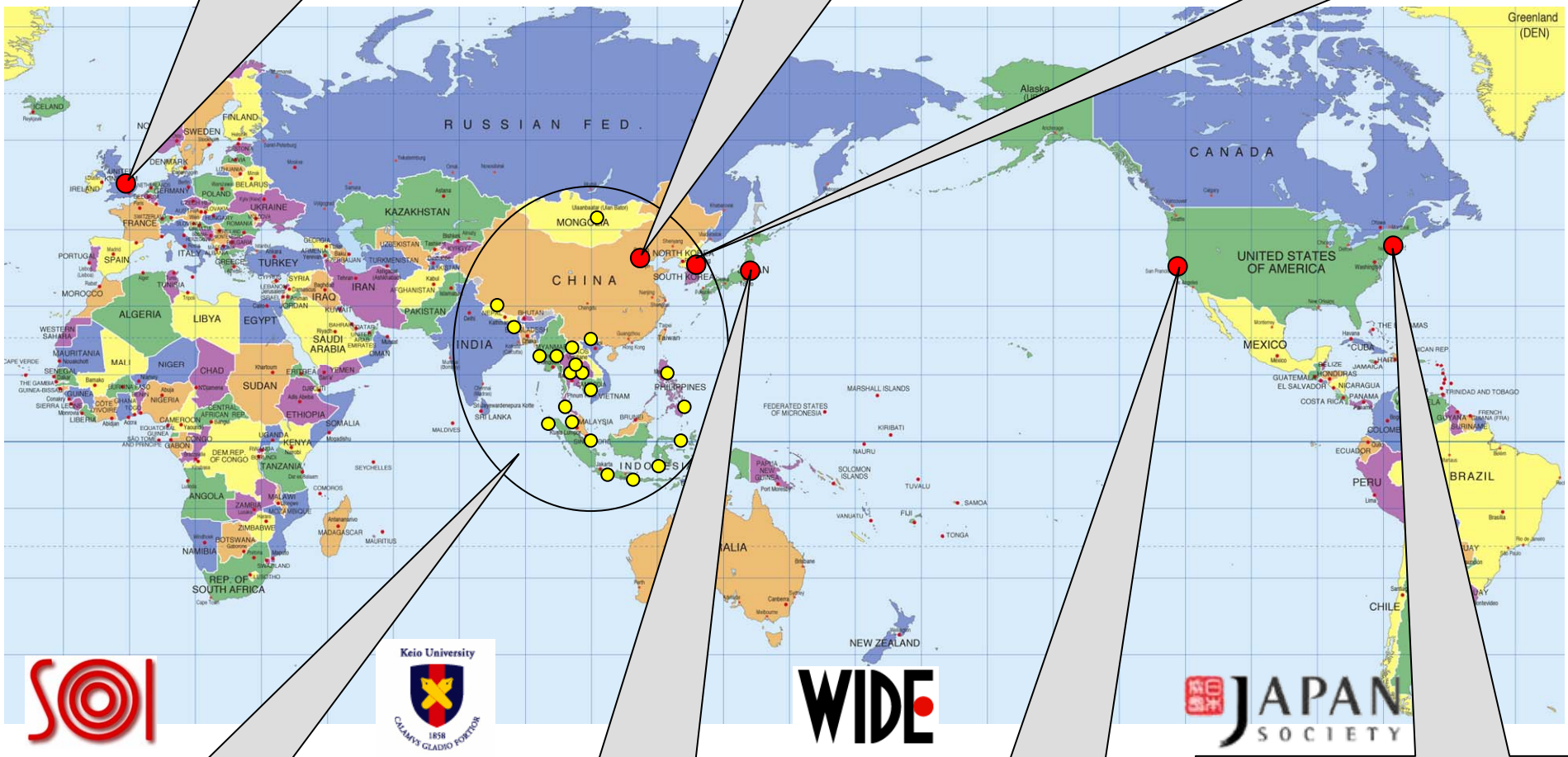
Photos by Chermg Talay Subdistrict Administration Office



Tsunami Symposium

SOI Asia Operators Workshop

Global Digital Studios -locations-



Studio at Keio University

Location: Tokyo, Japan
Operated by: Keio University DMC Institute
DVTS and Polycom / Multipoint capable
IPv4/IPv6
Re-constructed in February 2006

Studio at Japan Society

Location: New York, USA
near United Nations HQ
Operated by: Japan Society
Time difference: 13 hours
To be operable in September 2006

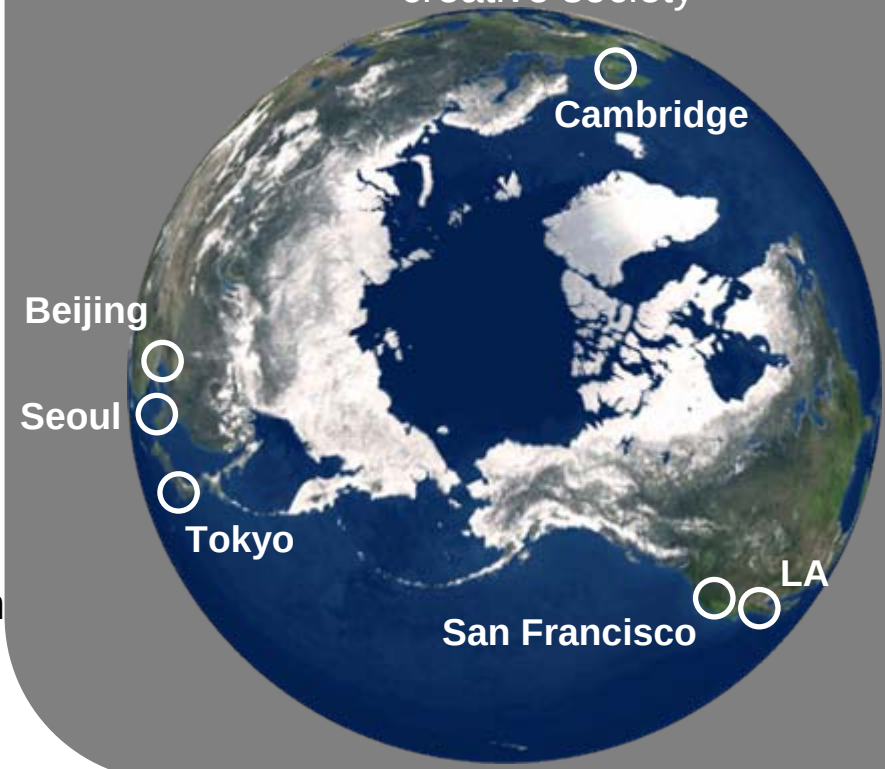
Applications for the Global Studios: DMC Institute International Symposium “Convergence: Towards A New Paradigm for Creative Society”

Intensive Discussion using the Global Studios

Talking Circle 1: Content design

Talking Circle 2: Media convergence in creative society

Talking Circle 3: Distributed and autonomous creative society



✓All operational Global Studio locations participated in our 5th international symposium

✓The symposium concluded with all participants signing the DMC Manifesto towards the Creative Society (online)

T-LEX Update

- T-LEX: Tokyo Lambda Exchange

- Terminates IEE tlle
  - http://www.iee
  - Donation by T
    - New VSNL International
  - Non-protected OC-192c + protected OC-12c
  - Working closely with PNWGigapop/UW

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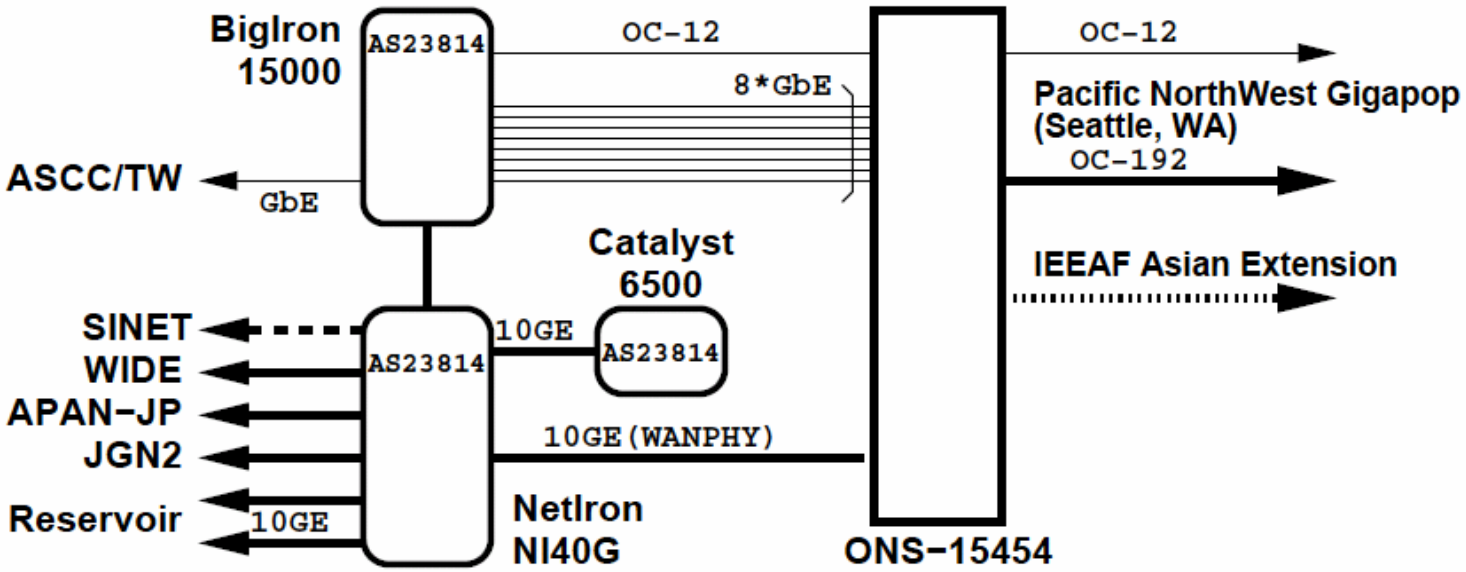
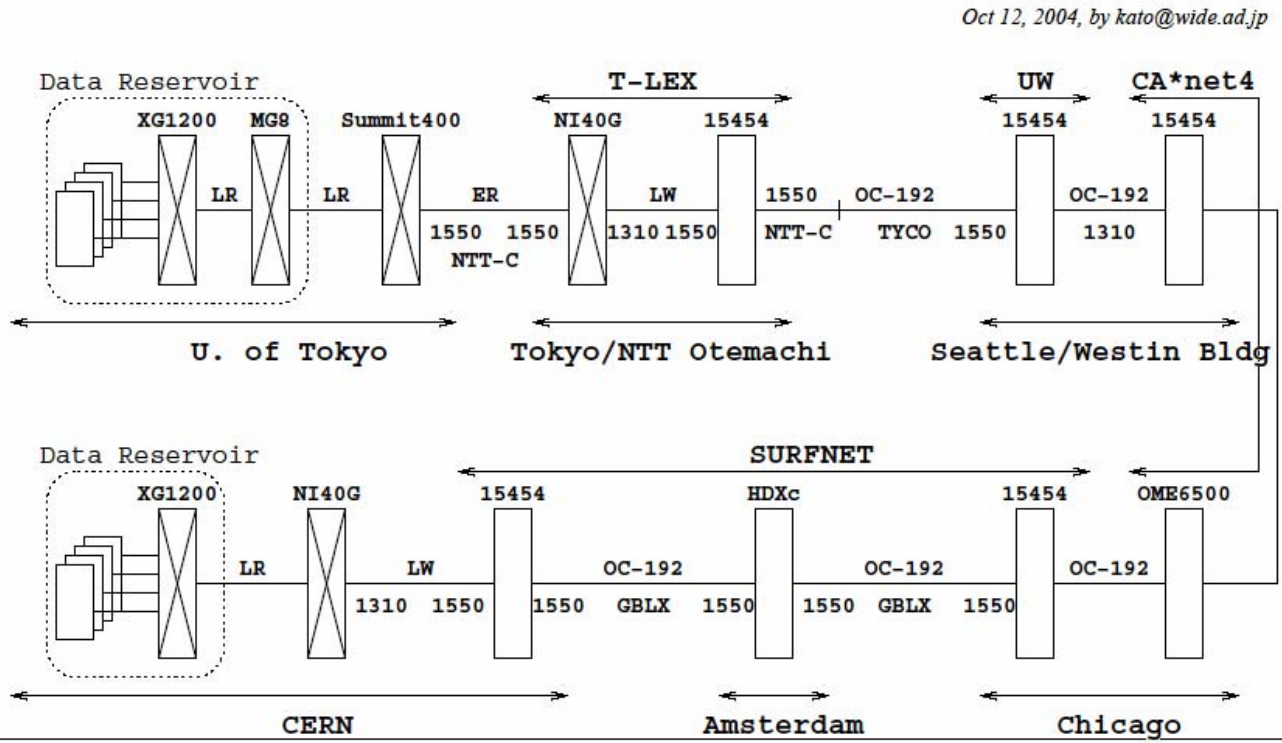
Configuration of T-LEX



- L2 switch converts WANPHY/LANPHY

The first activity in T-LEX

- The first international OC-192c light path
  - Oct 2004, Univ. of Tokyo to CERN
  - 10 GE WANPHY between Tokyok and Geneva



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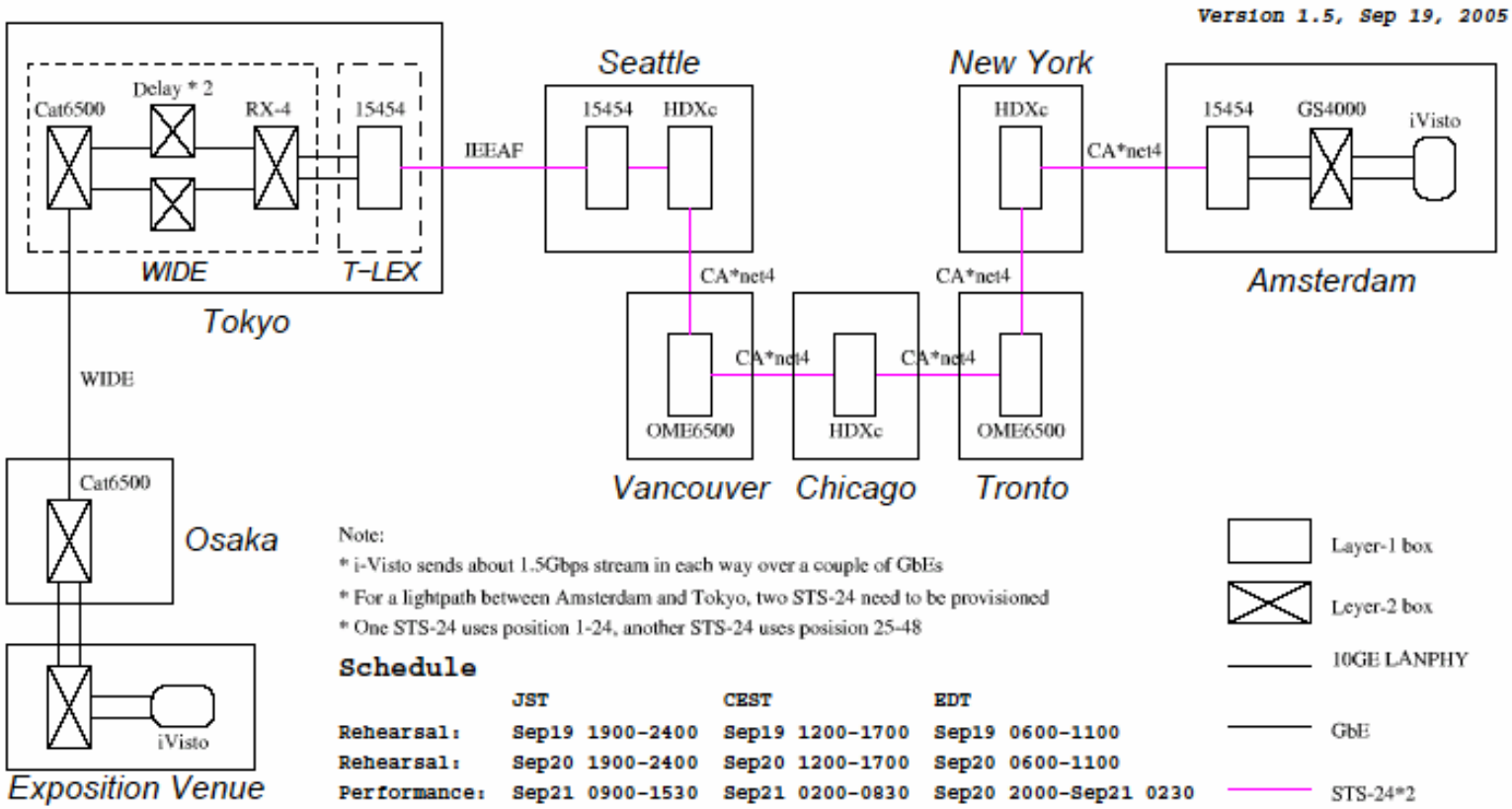
Recent Activities in T-LEX (1)

- Aichi World Exposition Closing Event



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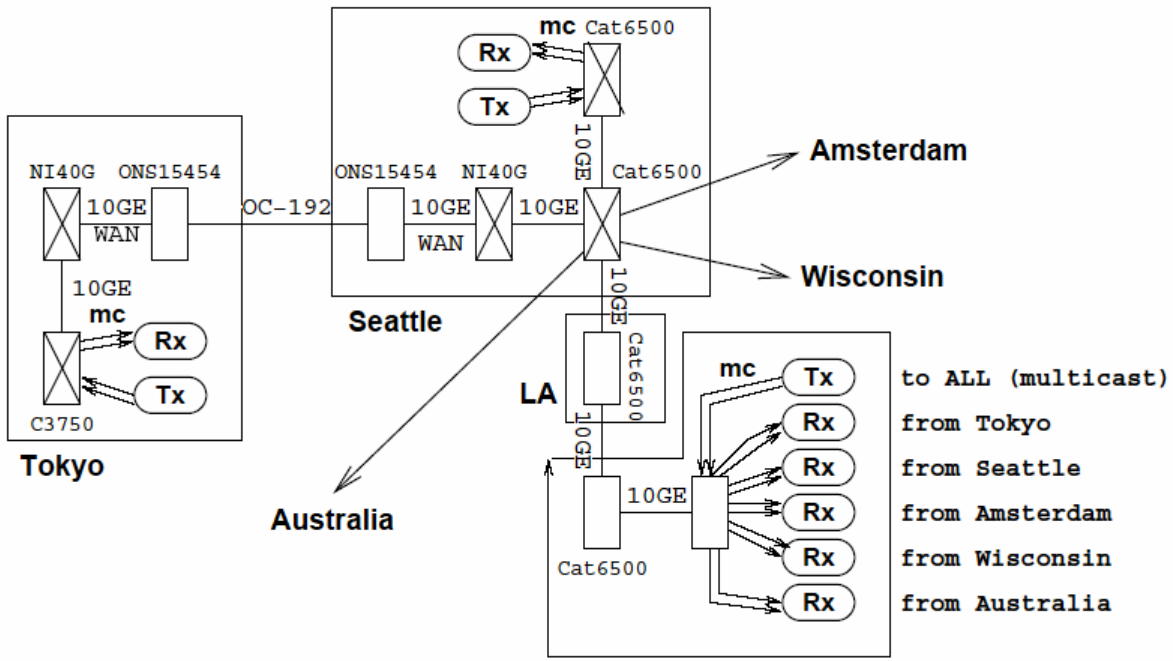
Recent Activities in T-LEX (2)

- iGRID2005
  - US118 N-way uncompressed HDTV transmission
  - Uncompressed HDTV from 5 locations to San Diego
  - Uncompressed HDTV IPv4 Multicast to 5 locations



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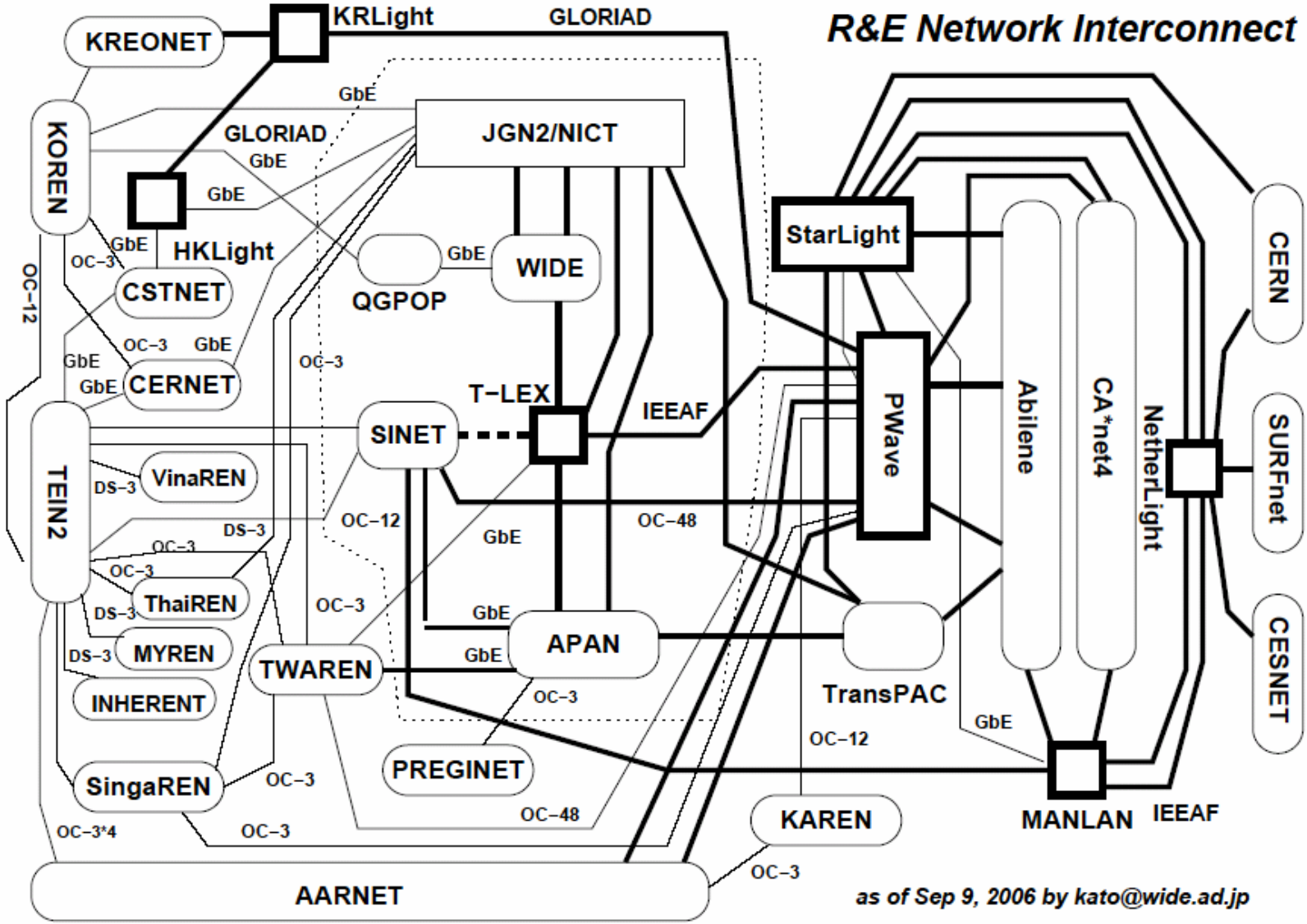
The lessons and things to be done

- DR got several LSRs
  - This is great!
- But the LSRs are still in “art”
  - Reproducibility is low
    - Part of the links is operational network
    - Background traffic cause additional jitter
- Other T-LEX issues
  - ONS-15454 has only 4 high-speed slots
    - Additional capacity might be required
  - Workaround
    - MENS – expensive
    - Inexpensive 1x8 switch
  - Sophisticated control plane
    - USLP? TL1 toolkit though web ?
  - Microscopic traffic monitoring required
    - TGNLE-1: FPGA based box is considered

All Japan (very rare diagram!)



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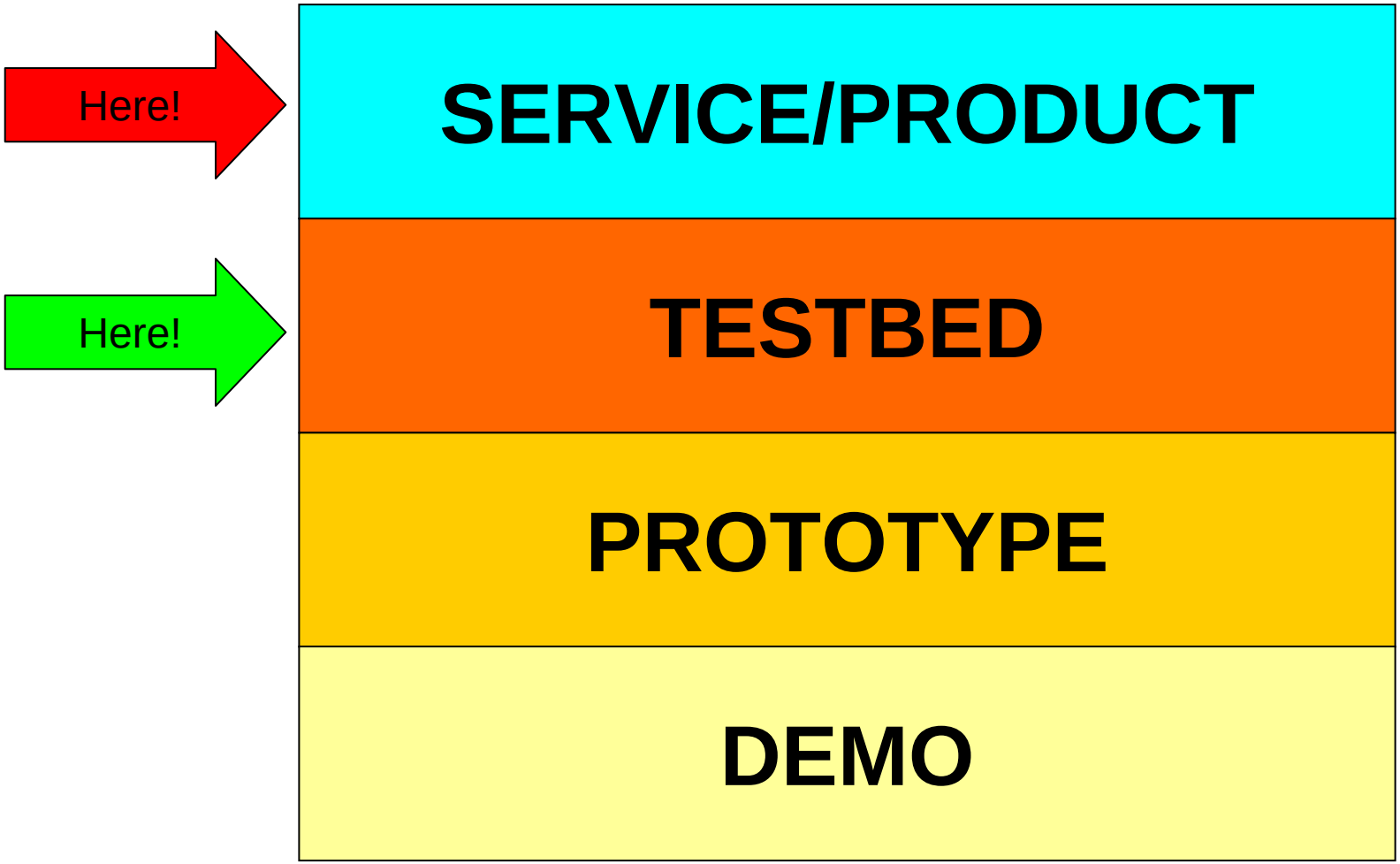
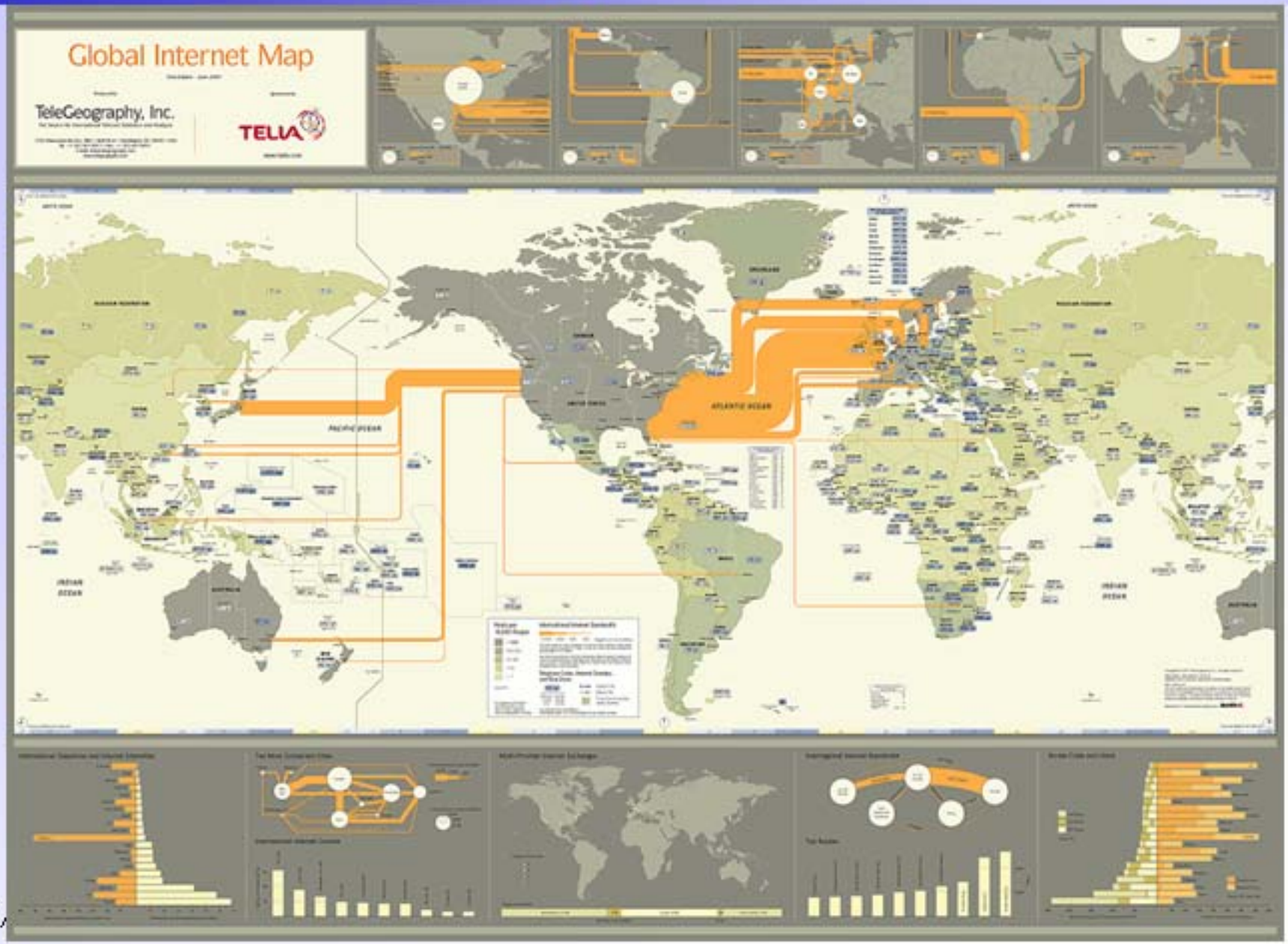

Here!
Here!
SERVICE/PRODUCT
TESTBED
PROTOTYPE
DEMO

2001 InternetTraffic



GLIF 2006

For Future!

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