

Tiled Display Activity Report in Osaka Research Center



JGN2 research center , Osaka
YANG SHUO



About JGN2

network-related technologies

NICT (National Institute of Information and Communications Technology)

core research

expanded by

JGN 2 (Japan Gigabit Network) is an open testbed network environment for research and development

Collaboration

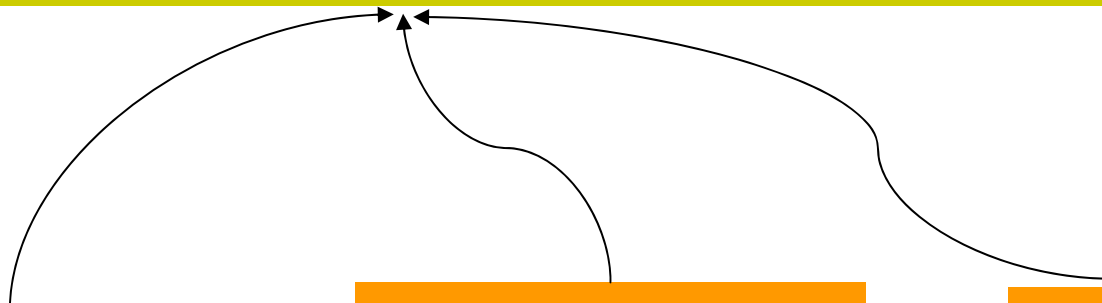
Industry, academia, government

Aim

Promoting a broad spectrum of research and development projects

Centers

seven own research centers for research and development



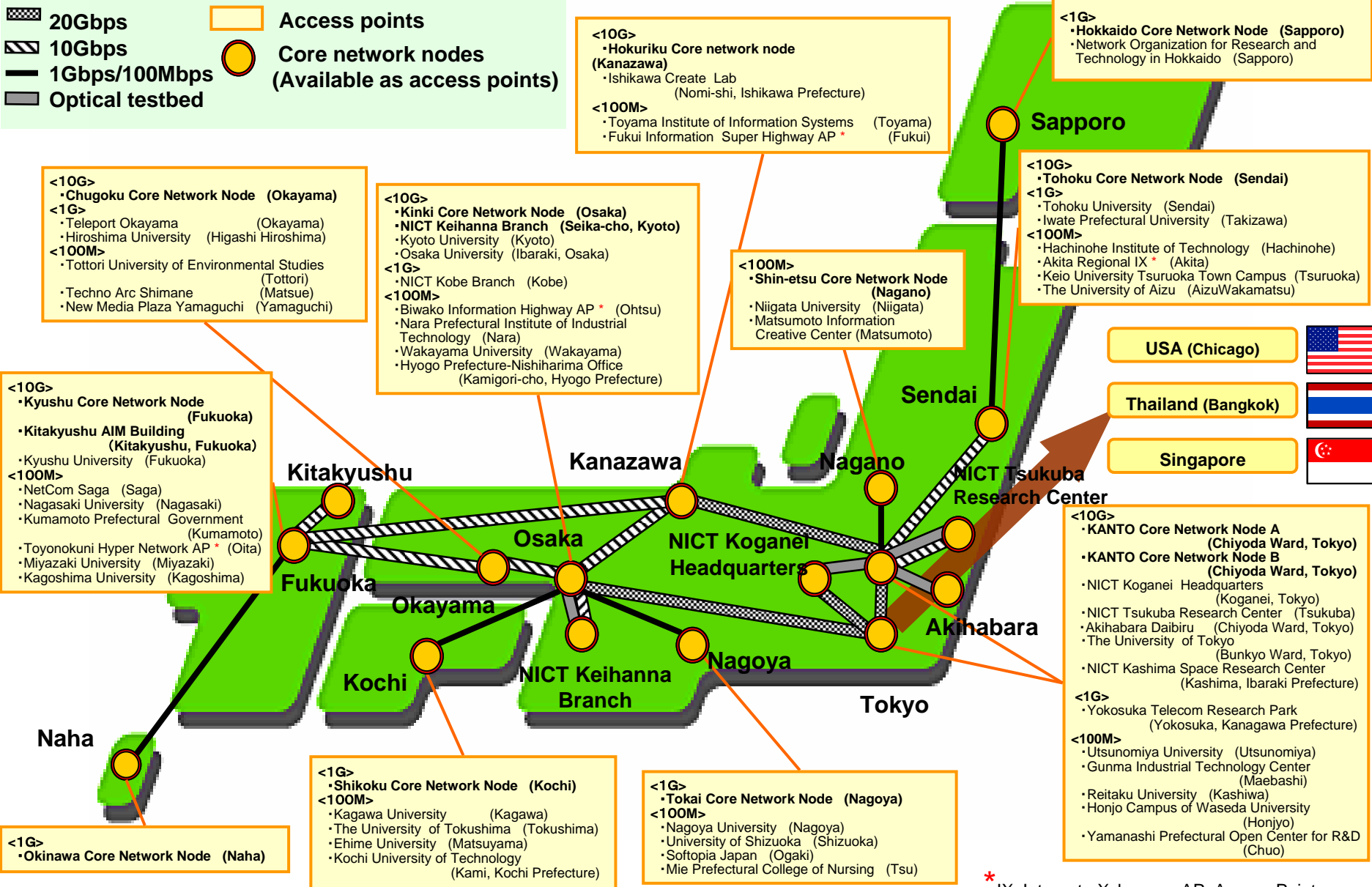
Outline of JGN2 Network



Aug. 31, 2006 **JGN2**

[Legends]

- 20Gbps
- 10Gbps
- 1Gbps/100Mbps
- Optical testbed
- Access points
- Core network nodes (Available as access points)



- <10G>**
- Hokuriku Core network node (Kanazawa)
 - Ishikawa Create Lab (Nomi-shi, Ishikawa Prefecture)
- <100M>**
- Toyama Institute of Information Systems (Toyama)
 - Fukui Information Super Highway AP* (Fukui)

- <1G>**
- Hokkaido Core Network Node (Sapporo)
 - Network Organization for Research and Technology in Hokkaido (Sapporo)

- <10G>**
- Tohoku Core Network Node (Sendai)
- <1G>**
- Tohoku University (Sendai)
 - Iwate Prefectural University (Takizawa)
- <100M>**
- Hachinohe Institute of Technology (Hachinohe)
 - Akita Regional IX* (Akita)
 - Keio University Tsuruoka Town Campus (Tsuruoka)
 - The University of Aizu (AizuWakamatsu)

- <100M>**
- Shin-etsu Core Network Node (Nagano)
- <1G>**
- Niigata University (Niigata)
 - Matsumoto Information Creative Center (Matsumoto)

- <10G>**
- Kinki Core Network Node (Osaka)
 - NICT Keihanna Branch (Seika-cho, Kyoto)
- <1G>**
- Kyoto University (Kyoto)
 - Osaka University (Ibaraki, Osaka)
- <100M>**
- NICT Kobe Branch (Kobe)
- <100M>**
- Biwako Information Highway AP* (Ohtsu)
 - Nara Prefectural Institute of Industrial Technology (Nara)
 - Wakayama University (Wakayama)
 - Hyogo Prefecture-Nishiharima Office (Kamigori-cho, Hyogo Prefecture)

- <10G>**
- Chugoku Core Network Node (Okayama)
- <1G>**
- Teleport Okayama (Okayama)
 - Hiroshima University (Higashi Hiroshima)
- <100M>**
- Tottori University of Environmental Studies (Tottori)
 - Techno Arc Shimane (Matsue)
 - New Media Plaza Yamaguchi (Yamaguchi)

- <10G>**
- Kyushu Core Network Node (Fukuoka)
- <1G>**
- Kitakyushu AIM Building (Kitakyushu, Fukuoka)
- <100M>**
- Kyushu University (Fukuoka)
 - NetCom Saga (Saga)
 - Nagasaki University (Nagasaki)
 - Kumamoto Prefectural Government (Kumamoto)
 - Toyonokuni Hyper Network AP* (Oita)
 - Miyazaki University (Miyazaki)
 - Kagoshima University (Kagoshima)

- USA (Chicago)
- Thailand (Bangkok)
- Singapore

- <10G>**
- KANTO Core Network Node A (Chiyoda Ward, Tokyo)
 - KANTO Core Network Node B (Chiyoda Ward, Tokyo)
- <100M>**
- NICT Koganei Headquarters (Koganei, Tokyo)
 - NICT Tsukuba Research Center (Tsukuba)
 - Akihabara Daibiru (Chiyoda Ward, Tokyo)
 - The University of Tokyo (Bunkyo Ward, Tokyo)
 - NICT Kashima Space Research Center (Kashima, Ibaraki Prefecture)
- <1G>**
- Yokosuka Telecom Research Park (Yokosuka, Kanagawa Prefecture)
- <100M>**
- Utsunomiya University (Utsunomiya)
 - Gunma Industrial Technology Center (Maebashi)
 - Reitaku University (Kashiwa)
 - Honjo Campus of Waseda University (Honjo)
 - Yamanashi Prefectural Open Center for R&D (Chuo)

- <1G>**
- Shikoku Core Network Node (Kochi)
- <100M>**
- Kagawa University (Kagawa)
 - The University of Tokushima (Tokushima)
 - Ehime University (Matsuyama)
 - Kochi University of Technology (Kami, Kochi Prefecture)

- <1G>**
- Tokai Core Network Node (Nagoya)
- <100M>**
- Nagoya University (Nagoya)
 - University of Shizuoka (Shizuoka)
 - Softopia Japan (Ogaki)
 - Mie Prefectural College of Nursing (Tsu)

* IX: Internet eXchange AP: Access Point

background

Last year's research Result of JGN2

- access control technology for dynamic site corporation
- QoS control technology for large-scale data transfer

Research of basic grid technology

theme: Grid technology is important to E-science

- The platform of large-scale data processing, sharing, and making to visible is important
- standardization is necessary through coordination and experiment with international community

Visible technology under network environment

Key role To next generation E-science

Correspondence
method

using Tiled display and make a internal activity with researchers at other country

What is the Tiled Display

Tiled Display...The multi display monitors which are arranged in Tiled

Feature

- Large high-resolution and increased physical size
- Extend the using field of broadband network
 - cooperate with cluster computers
 - Sharing of data
 - Sharing of image

Use of grid, QoS technology

As a base of Tiled Display

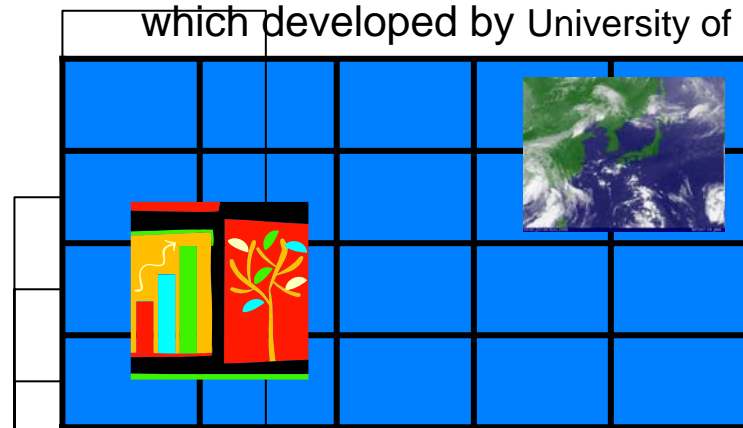
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SAGE



SAGE and Tiled Display

SAGE: Scalable Adaptive Graphics Environment (<http://www.evl.uic.edu/cavern/sage/index.php>)

which developed by University of Illinois at Chicago. Electronic Visualization Laboratory



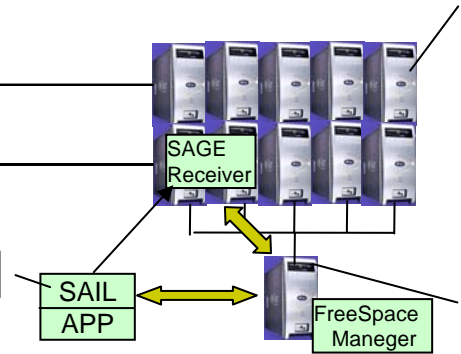
feature

- distribute technology
- heterogeneous and scalability
- range from a single computer to the cluster computer.

Display control server
each sun workstation control two LCD displays. SAGE Receiver receive the stream from Sail and indicate in tiled display

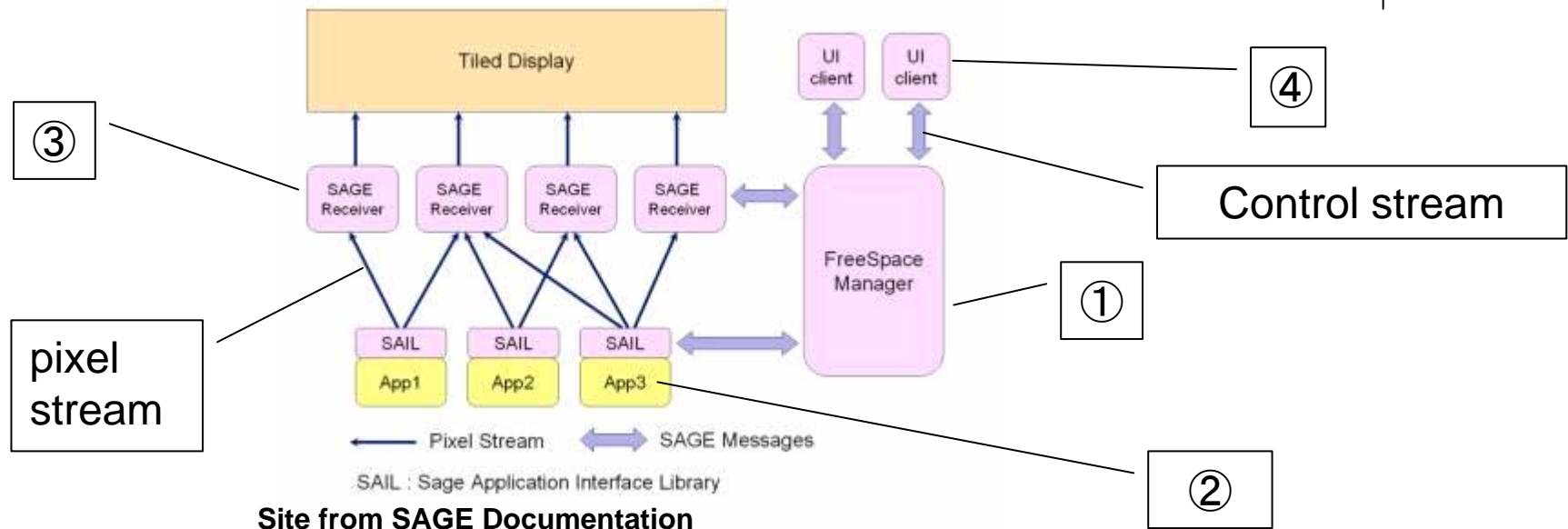
Management server...control the all of system
FSManager in Management server control the all components of system

Caputring the drawing



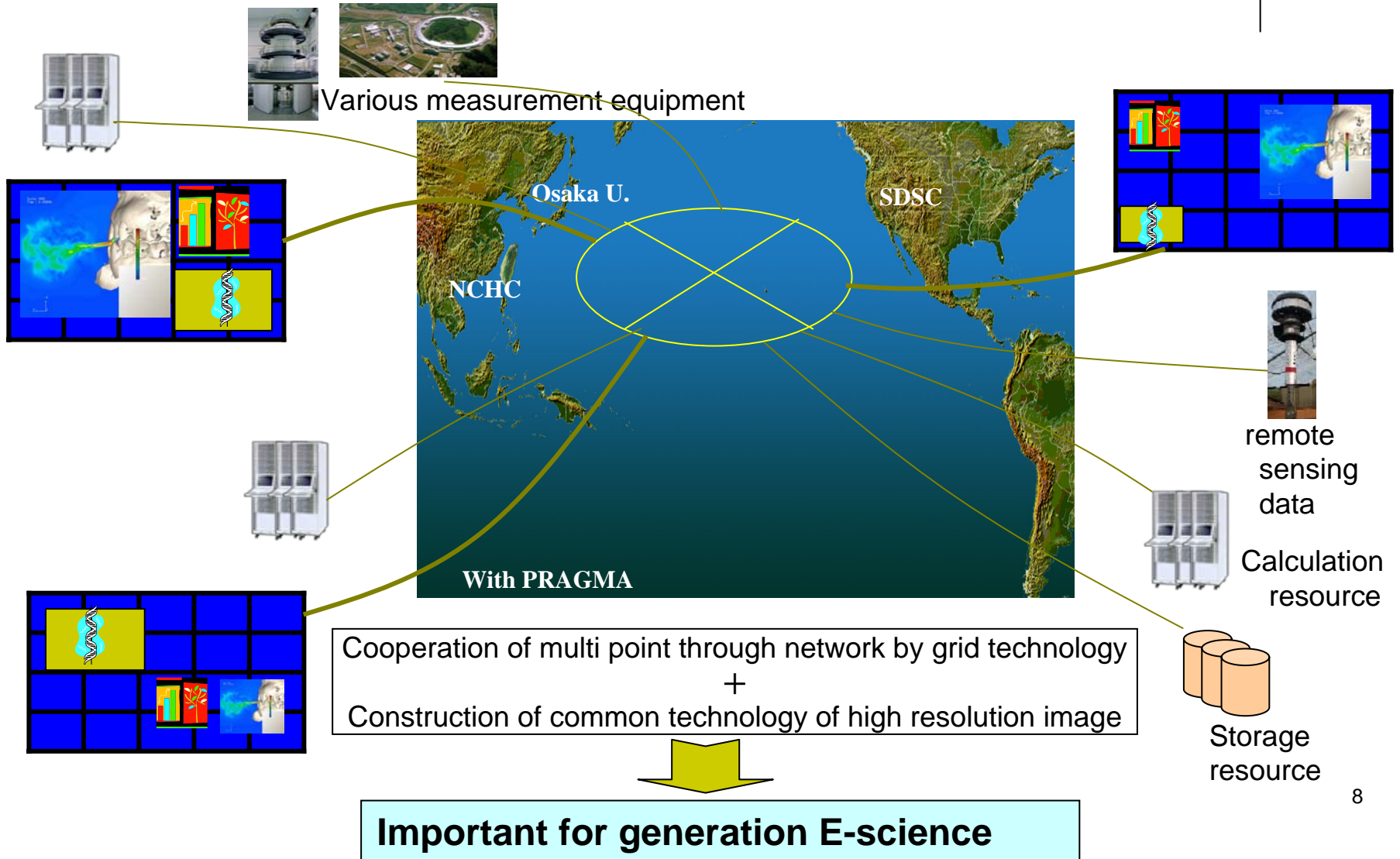
SAIL: Sage Application Interface Library

SAGE components



FreeSpace Manager	Control pixels streams between SAIL and SAIL Receiver and displaying positions and size of streamed images on the Tiled Display	①
SAIL	Capture application images and streams to appropriate SAGE Receivers	②
Sage Receiver	Gets multiple pixes streams, and displays streamed images on the tiled display	③
UiClient	Sends user messages to control FsManager and receiver SAGE messages. which inform users of the current status of SAGE	④

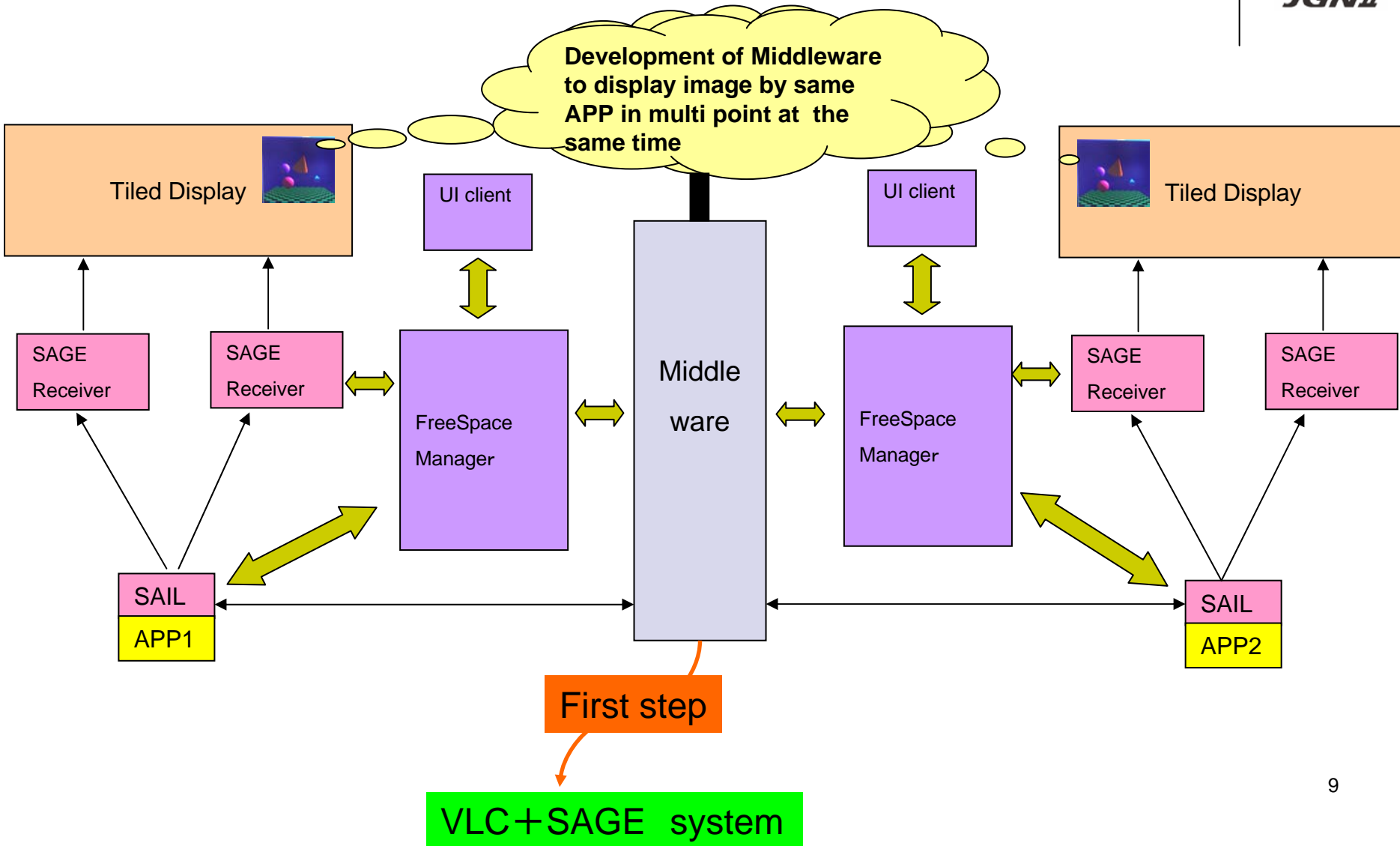
Use of visible high resolution system



Proposal of Tiled Display by SAGE

—Cooperation of multi point—

Development of Middleware
to display image by same
APP in multi point at the
same time



VLC and SAGE

- VLC:VideoLAN Client

- media player

various audio and video formats(MPEG-1, MPEG-2, MPEG-4, DivX, mp3, ogg, ...) as well as DVDs, VCDs, and various streaming protocols.

- Stream server

It can send stream in unicast or multicast in IPv4 or IPv6 on a high-bandwidth network.

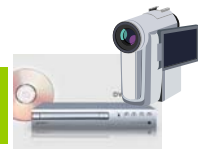
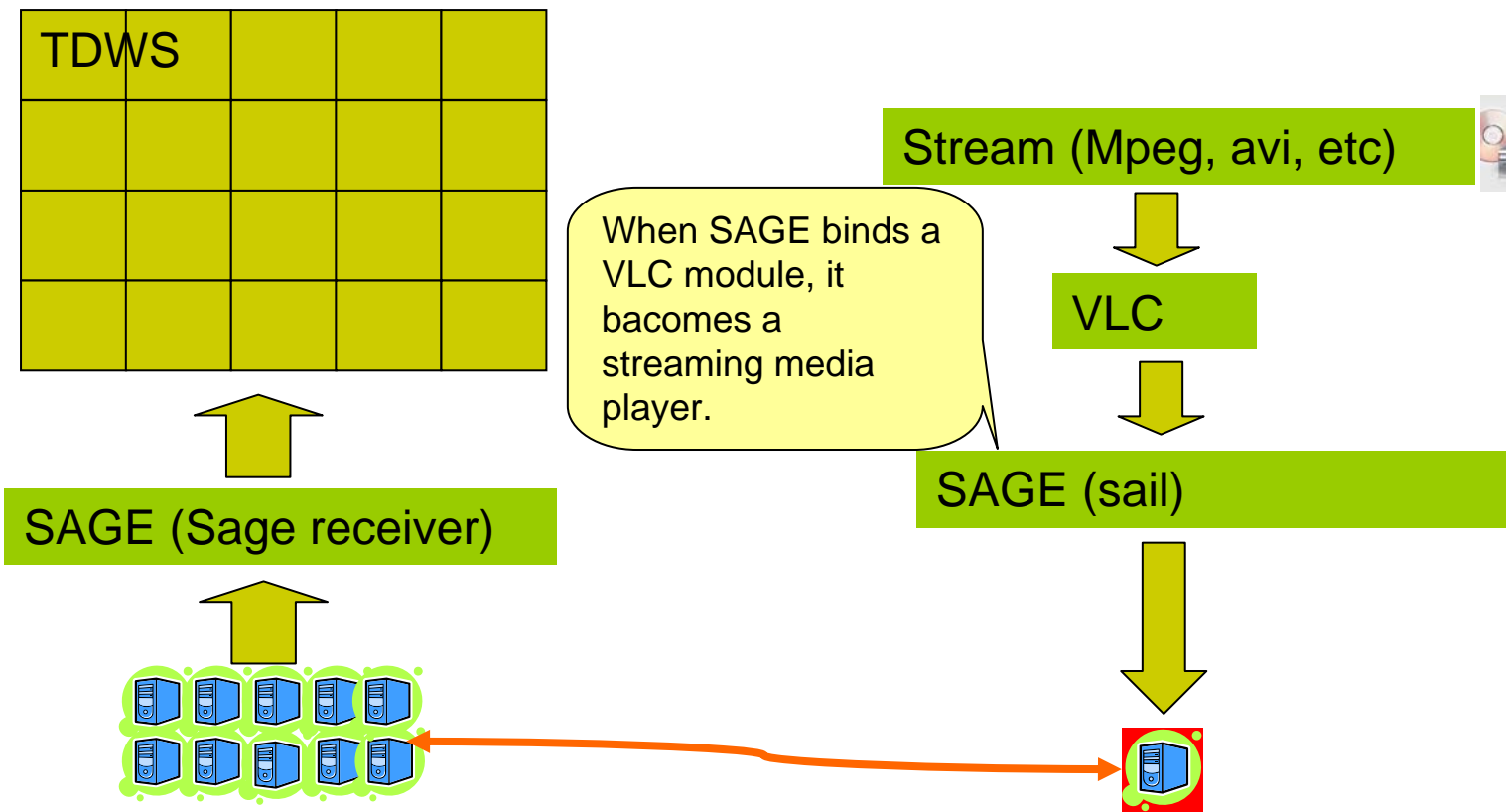
<http://www.videolan.org/>

- VLC on SAGE

- VLC can be easily modified to pass its output to SAGE by intercepting the framebuffer that VLC creates with its output module

http://research.calit2.net/gems/vlc_sage/VLC_SAGE.html

Local sage+vlc system

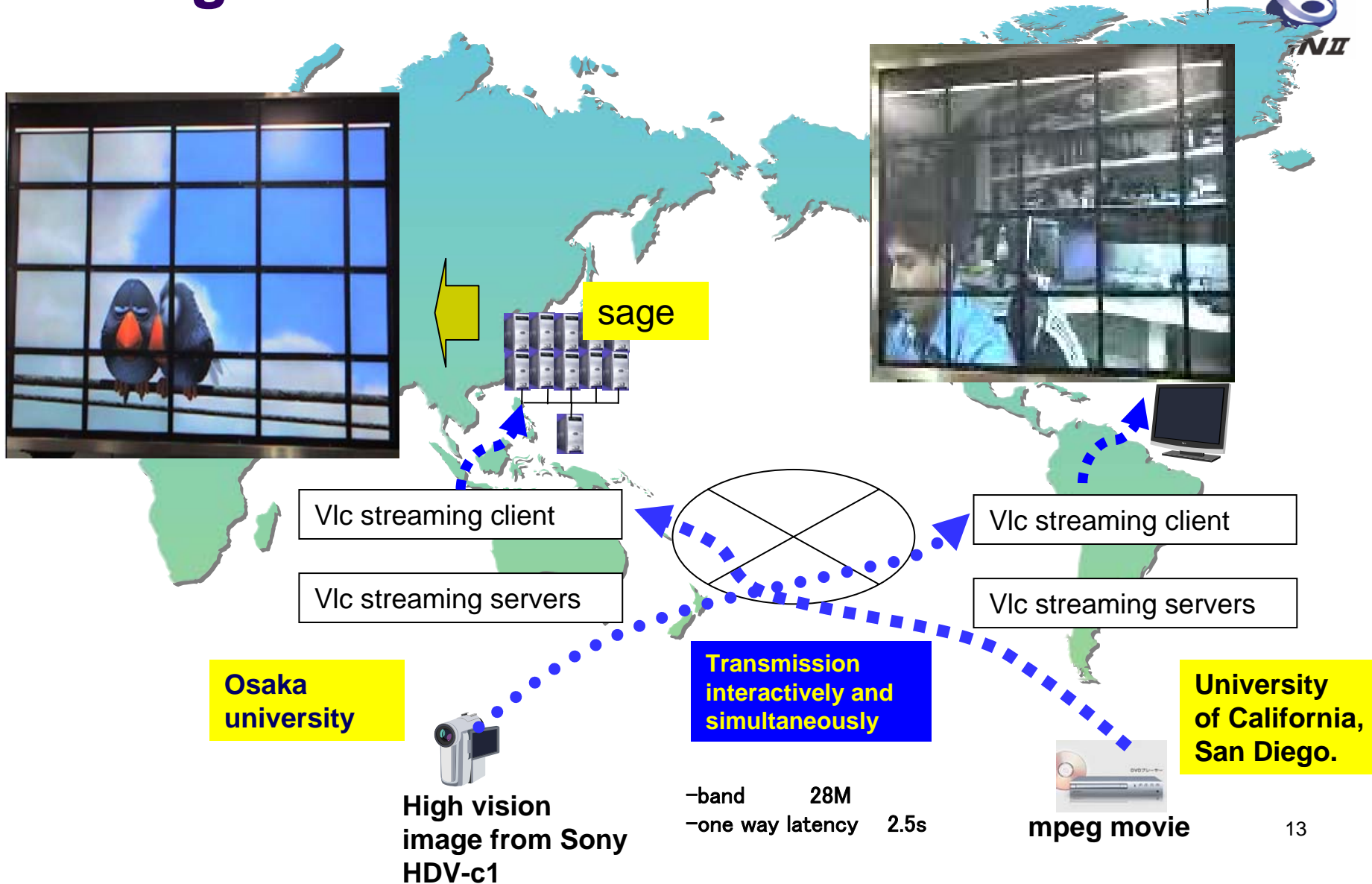


Our Works

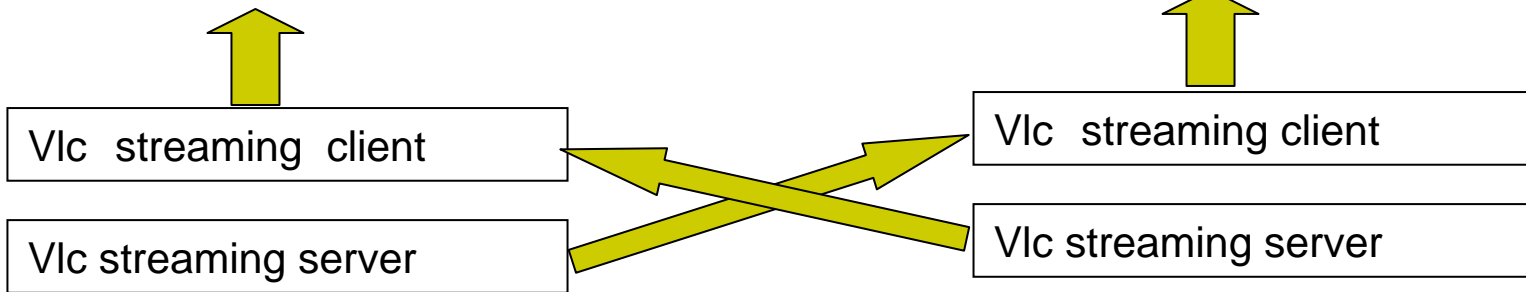
- Build two Tiled Display Systems
 - Location Osaka Univ.
 Toyonaka Campus(JGN2 Research Center)
 Suita Campus(IST)
 - HW Sun Java Workstation x 11
 Display SXGA(1280x1024), 5x4 displays
 - OS CentOS 4.x
 - SAGE v1.4
- achievement
 - Build a Streaming system with SAGE+VLC
 - Work an Inter-campus connection test
 - Work an oversea connection test(U.S., Taiwan, Thailand)
- We have a plan to demonstrate the tiled display system on SC06.



The test UCSD ↔ Osaka (9/21 JST) Using VLC+SAGE



Experiment between NCHC and Osaka Univ.

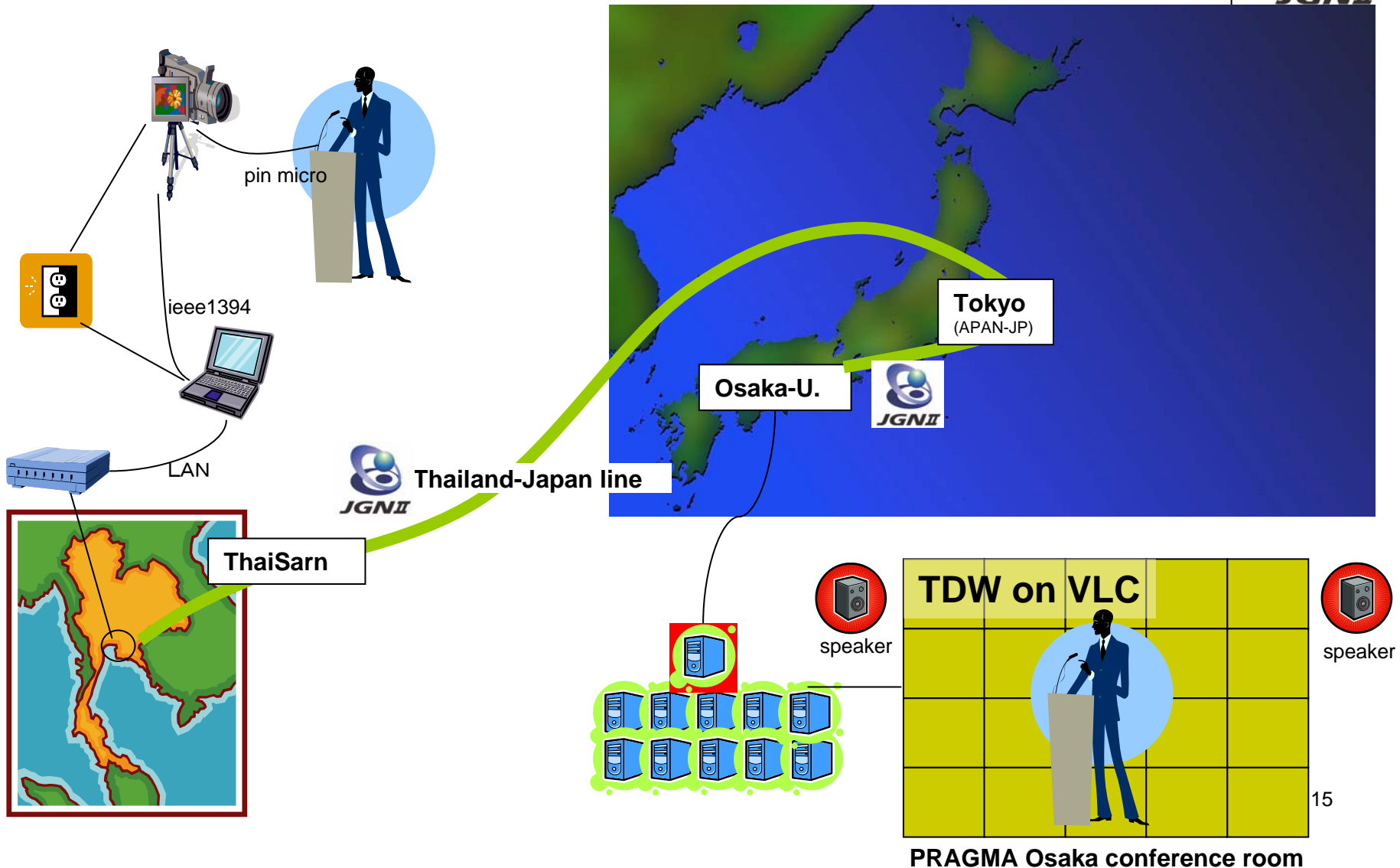


National center for high-performance computing of TaiWan (NCHC)

Osaka university



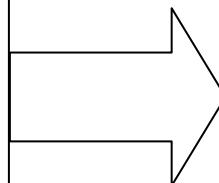
Forwarding a PRAGMA Greeting Message by Osaka Univ. President from Thailand USING JGNII TH-JP line.



Problem and future

Make a common foundation for e-science

- Resolve the difficulty setting problem and user interface problem
command → GUI
- Attestation and security
Setting by manager of each access point → single sign on
- Promotion of standardization
Various TWD system → Achievement of cooperation through standardization
- Efficient use of network (QoS)
Network traffic problem caused by cooperation → find and resolve the problem



The role of JGN2

Contribute to the cooperation with international related organization and the Promotion of experiment

JGN2/Osaka-U.

SDSC



NECTEC

NCHC

THANK YOU !