SOI-Asia Project

Global Educational Resource Sharing
on the Internet

Keiko Okawa

WIDE Project

February, 2005 — 1

SOI Missions in WIDE Project

- Contents contribution by WIDE
  - By preserving and sharing the valuable educational resources in WIDE/Internet Community.

- Deployment of the Technology from WIDE
  - By using the technology as experimenter in between "researchers" and "users".
  - By demonstrating the social value of the technology.

- Deployment of Internet culture
  - By promoting the Internet as a vehicle of "Higher Education" to the non-or-little internet culture area.

February, 2005 — 2

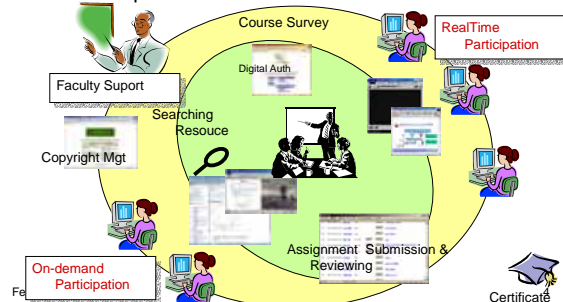
SOI – School on the Internet

- To share the higher educational resources with people *anytime*
  - Researching the method to carry out the educational activities in university on the Internet.

- To share the higher educational opportunity with people *anywhere*
  - Researching the environment and technology to support the real-time educational communication over the Internet.

- To evaluate the concept
  - Using the real university courses and resources
  - Involving ;
    - individuals who want to learn.
    - individuals/parties who are willing to donate the lectures.
    - universities who want to improve their education.
    - individuals/parties who have a motivation to educate people globally.

February, 2005 — 3

SOI Site for anytime
Framework for individuals

- Daily used by over 10000 participants by in/out campus

Course Survey · RealTime Participation · Digital Auth · Faculty Suport · Searching Resouce · Copyright Mgt · On-demand Participation · Assignment Submission & Reviewing · Certificate

February, 2005 — 4

# SOI SITE – Snapshot as of today

- PORTAL SITE
  - SOI SITE: http://www.soi.wide.ad.jp/
  - Since 1997
  - Operated by apache, postgres, realserver, etc.

- USERS
  - Over 16,700 Registered participants
  - From high school students to retired business man
  - adult percentage : 60%

- Contents
  - In 250kbps realvideo and synchronized materials by SMIL technology
    - About 2000 hours of IT related lectures.
    - About 60 University courses.
    - About 100 special lectures and tutorials.

- CONTRIBUTSION
  - About 10 universities
  - Over 60 individual contributors from worldwide.

February, 2005 — 5

SOI Global Studio for anywhere

- Prototyping in 2002
  - Maryland, USA (Joint effort with FLA)
  - California, USA (Joint effort with NTT MCL)

- Standardization and Challenge in 2004
  - California, USA (Joint effort with eXchange)
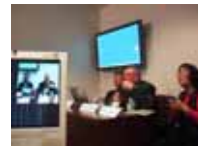
February, 2005 — 6

SOI Asia

- Focusing on educational sharing in Asia
  - Easy collaboration because of small time-differences (0 ~ 3hr)
  - High demand on the international cooperation in higher education.
  - High demand on the internet deployment
  - High value of educational sharing among multi-lateral and multi-culture countries.
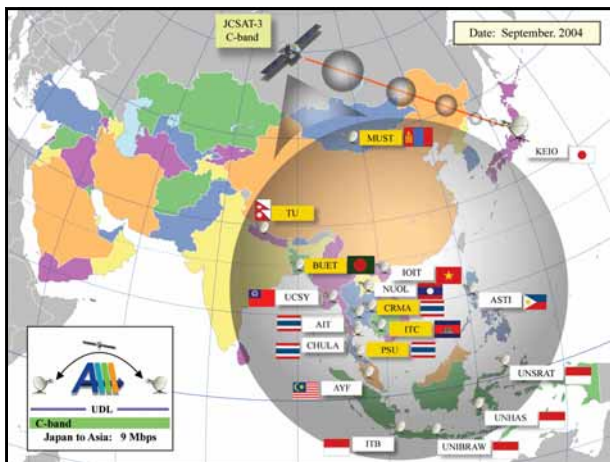- Focusing on Universities as entity

February, 2005　　　　　　　　　　　　　　　　7
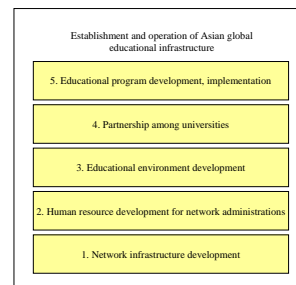

SOI Asia - Project At a Glance

- Since August 2001
- Established educational consortium with 11 institutes in 7 countries in Asia
  - Thailand(2), Lao P.D.R, Myanmar, Indonesia(4), Malaysia, Viet Nam, The Philippines
  - Soon to be 17 partners in 11 counties in Asia
- Implemented educational contribution platform for Asia
  - From Japan - Tokyo University of Marine Science and Technology, Tohoku University, Japan Advanced Institute of Science and Technology, Keio University, The Japanese society of Fish Pathology, WIDE Project
  - Individual contributors worldwide
- Carried out educational programs
  - University, Graduate school level course x 8 (about 40 lectures)
  - Special sessions x 24
  - Network Operator's Workshops x 4
  - 3 month research stay x 2
  - Exchange students to Japanese graduate schools x several students
  - MoU between Universities x 2
  - Ph.D co-advisory program x 1

February, 2005　　　　　　　　　　　　　　　　8

Activity overview

Establishment and operation of Asian global educational infrastructure

- 5. Educational program development, implementation
- 4. Partnership among universities
- 3. Educational environment development
- 2. Human resource development for network administrations
- 1. Network infrastructure development

February, 2005　　　　　　　　　　　　　　　　10

COUNTY	TLD	ORGANIZATION	ABBR	TIMEZONE
NEPAL	.np	Tribhuvan University	TU	GMT+5h45m
BANGLADESH	.bd	Bangladesh University of Engineering and Technology	BUET	GMT+6h
MYANMAR	.mm	University of Computer Studies, Yangon	USCY	GMT+6h30m
THAILAND	.th	Asian Institute of Technology	AIT	GMT+7h
		Chulachomklao Royal Military Academy	CRMA	
		Chulalongkorn University	CU	
		Prince of Songkla University	PSU	
CAMBODIA	.kh	Institute of Technology of Cambodia	ITC	
LAOS	.la	National University of Laos	NUOL	
VIETNAM	.vn	Institute Of Information Technology	IOIT	
INDONESIA	.id	Institut Teknologi Bandung	ITB	GMT+8h
		Brawijaya University	UNIBRAW	
		Hasanuddin University	UNHAS	
		Sam Ratulangi University	UNSRAT	
MALAYSIA	.my	Asian Youth Fellowship	AYF	
MONGOLEA	.mn	Mongolian University of Science and Technology	MUST	
PHILIPPINES	.ph	Advanced Science and Technology Institute	ASTI	
JAPAN	.jp	KEIO University	KEIO	GMT+9h
		Tokyo University of Marine Science and Technology	TUMST	
		Tohoku University	TOHOKU	
		Japan Advanced Institute of Science and Technology	JAIST	

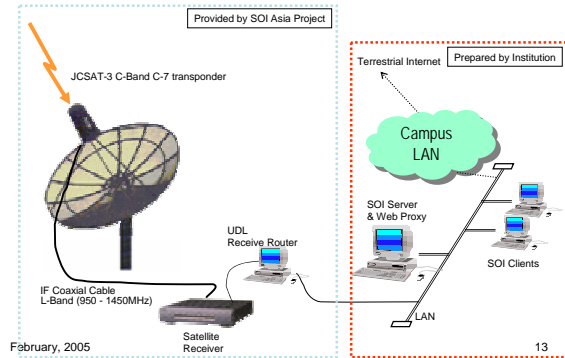February, 2005　　　　　　　　　　　　　　　　11

---

1. Network infrastructure development

- Achievement
  - Establishing the pseudo broad band Internet environment in by utilizing receive only satellite equipment and UDLR technology.
    - 9 Mbps downlink shared by RO sites
    - IPv4/IPv6 multicast enable to the RO sites
  - Implementing the sites in low coat and in short period
    - About $1000 for setting up for 1 site.
    - About 3 months for everything.

- Future
  - Enhancing monitoring technology for stable operation
  - Expanding the countries and increasing the sites.

February, 2005　　　　　　　　　　　　　　　　12

Partner site equipment

Provided by SOI Asia Project

JCSAT-3 C-Band C-7 transponder

Terrestrial Internet | Prepared by Institution

Campus LAN

SOI Server & Web Proxy

UDL Receive Router

SOI Clients

IF Coaxial Cable L-Band (950 - 1450MHz)

LAN

Satellite Receiver

February, 2005

13

Brawijaya University, Indonesia

Hasanuddin University, Indonesia

Sam Ratulangi University, Indonesia

Asian Institute of Technology, Thailand

Laos National University, Laos

University of Computer Studies, Yangon, Myanmar

Asian Youth Fellowship, Malaysia

Chulalonkorn University, Thailand

Advanced Science and Technology Institute, Philippines

Institute of Information Technology, Viet Nam

Institute of Technology, Bandung, Indonesia

Keio University Shonan Fujisawa Campus, Japan

February, 2005

14

---

2. Human resource development for network administrations

- Achievement
  - Program development to develop tech staff who maintain and operate SOI Asia network
  - SOI Asia Operators Workshop
    - September, 2002 @ Keio SFC (21 participants)
    - February, 2003 @ AIT, Thailand (21 participants)
  - Operators Team Building by Monthly Meeting
  - Expanding the program with local site initiative and trainers training
    - in Indonesia
    - in Thailand
  - Short Training Sessions utilizing Monthly Meeting

- Future
  - Standard carriculum

February, 2005

15

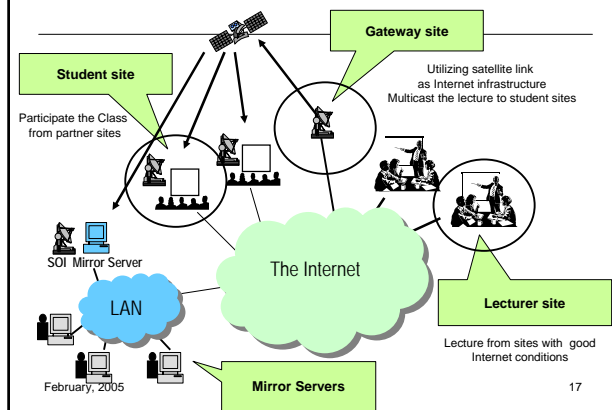## 3. Educational environment development

Absorbing various network conditions

- Achievement
  - Designing lecturer site, gateway site and student site for lecture site portability and stable operation.
  - Designing the standard environment for classes.
  - Documentation
  - Technology development
    - Multicast tree mirroring system
    - Network monitoring tool
- Future development
  - Improving the audio quality in limited bandwidth
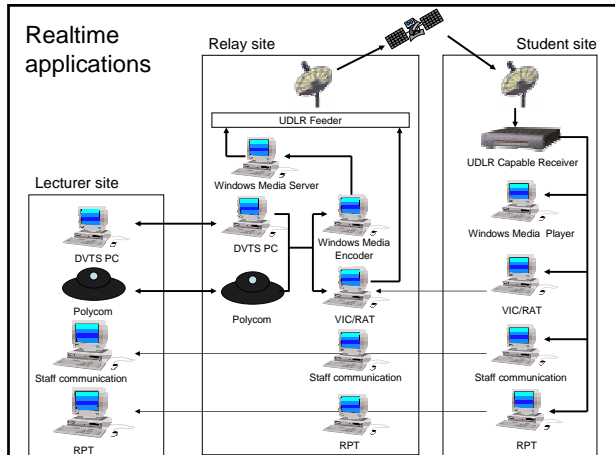 - Improving the interactivity in limited bandwidth

February, 2005

16

Overview

Gateway site

Utilizing satellite link as Internet infrastructure Multicast the lecture to student sites

Student site

Participate the Class from partner sites

SOI Mirror Server

The Internet

LAN

Lecturer site

Lecture from sites with good Internet conditions

February, 2005

Mirror Servers

17

Realtime applications

Relay site

Student site

UDLR Feeder

Windows Media Server

UDLR Capable Receiver

Lecturer site

DVTS PC

DVTS PC

Windows Media Encoder

Windows Media Player

Polycom

Polycom

VIC/RAT

VIC/RAT

Staff communication

Staff communication

Staff communication

RPT

RPT

RPT

3

Standard Environment For Courses

---

4. Partnership among universities

Establishment of multi-lateral partnership and self-operating organization

- Achievement
  - Steering committee meeting twice a year, tele-conference when needed
  - Procedure to share the curriculum
    - Gathering requests for educational contents
    - Agreement on schedules
  - New site policy
  - Steering Committee, Academic Committee, Operators Committee, Research Committee
- Future
  - Credit transfer
  - Fix the approval guideline

SOI Asia - Achievement as of today

- 17 partners in 11 countries
- Partners since 2001 (11)
  - Brawijaya University / Indonesia
  - Hasanuddin University / Indonesia
  - Sam Ratulangi University / Indonesia
  - Institute of Technology, Bandung / Indonesia
  - HELP Institute & AYF / Malaysia
  - University of Computer Studies, Yangon / Myanmar
  - National University of Laos / Laos
  - Asian Institute of Technology / Thailand
  - Chulalongkorn University / Thailand
  - Institute Of Information Technology / Vietnam
  - Advanced Science and Technology Institute / Philippines
- New Partners joining in 2004 (6)
  - Prince of Songklang University / Thailand
  - Chulachomklao Royal Military Academy / Thailand
  - Institute of Engineering, Tribhuvan University / Nepal
  - Bangladesh University of Engineering and Technology (BUET) / Bangladesh
  - School Of telecommunications and Information Technology / Mongol
  - Institute of Technology of Cambodia(ICT) / Cambodia

Certificate award

Student presentation from Brawijaya University, Indonesia

Participants from Thailand (with certificate)

Participation from Indonesia and Malaysia universities

Professors at SFC

July 30, 2002 Social Science lecture series certificate award ceremony

---

5. Educational program development, implementation

Lecture development and sharing based on partner site requests

- Achievement
  - Shared 7 courses and 70 lectures on   and fisheries More than 1000 students have participated altogether
    - Global topics
    - Topics which gained much request
  - Certificate awards to students who submitted the assignments
  - Lecture from Asian partner sites
  - Various communication programs
- Future
  - Credit transfer and approval following the guidelines
  - Application to exchange student programs
  - Global lecture development from each site

Multi-point realtime seminar

- Panel discussion with multi-point
- Proved to work as active discussion able environment

AIT, THAILAND

University of Computer Studies, Yangon MAYNMAR

Keio University SFC, JAPAN

(Event was held with help by Japanese embassy in Myanmar with ASEAN countries)

Multi-point realtime communication

- July 3rd, 2003
- Prime minister Koizumi and other cabinet people inspects SOI Asia environment

February, 2005

SOI ASIA Project: Interactive discussion on Interactive Distance Education"

Advice and interview for future exchange students

- Communication program before coming to Japan
  (Communication affiliating university and a program which supports students who will take Japanese master/doctoral courses in a few years)
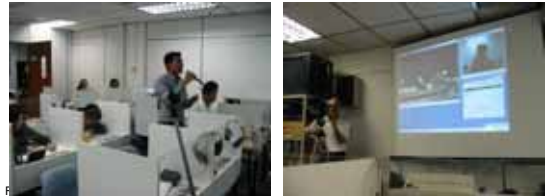
2004/2/12 NAIST - AYF Communication

2004 research and activities

- SOI
  - Mobile environment
  - Improving Interactivity
  - Better Navigation
  - Better lecture archiving method
  - Better student support system

- SOI-Studio
  - Standard Spec
  - Trial of Advanced Features
  - Operational Model
  - Phase-I Operation by End/Sept
  - Phase-II Operation by End/Nov
  - Phase-III Operation by End/Feb

  - France ?

- SOI-ASIA
  - Courses for accreditation
    - Internet Operation (WIDE)
    - Advanced Technology of Marine Science and Technology (Tokyo University of marine science and technology)
    - Bio-technology (Tohoku University)
  - Collaboration for establishing the master course in Laos (Keio Univ)
  - Phd co-advisory (Keio Univ)
    - UCSY Myanmer
  - Support program for exchanging studnets
    - AYF Malaysia
  - Operational Technology
    - Monitoring
    - Training
  - New site implmentation
    - Npal/Mongol/Cambodia/Bangladesh

February, 2005

27

Contact

- soi-asia@soi.wide.ad.jp
- http://www.soi.wide.ad.jp/soi-asia/
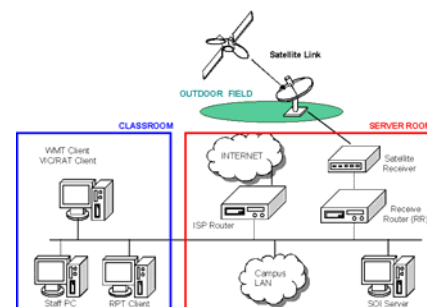

February, 2005

28

SOI Asia Site Setup Manual

- Chap0 – SOI Asia Site Setup/Verification Guide
- Chap1 – SOI Asia Network Setup
- Chap2 – SOI Asia Server Setup : Internet Services
- Chap3 – SOI Asia Server Setup : SOI Asia archived lecture server
- Chap4 – SOI Asia Archive Content Creation
- Chap5 – SOI Asia Realtime Lecture and Audio Setup
- Chap6 – SOI Asia Network monitoring setup

- CDs
  - FreeBSD 4.9
  - Fedora Core 1
  - Routing related software
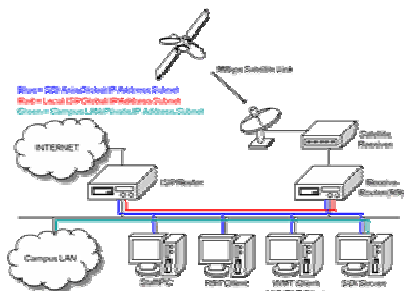 - Client Communication
  - SOI Server

February, 2005

29

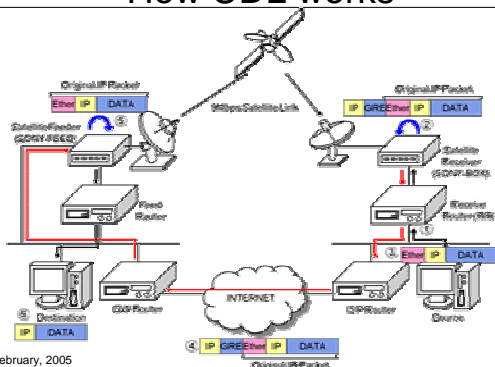## Client Site Physical Setup
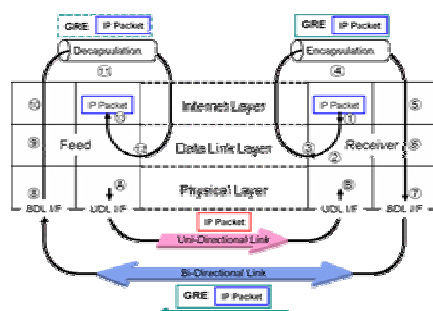

February, 2005

30

5

Client Site Network Segment

31

How UDL works

32

33
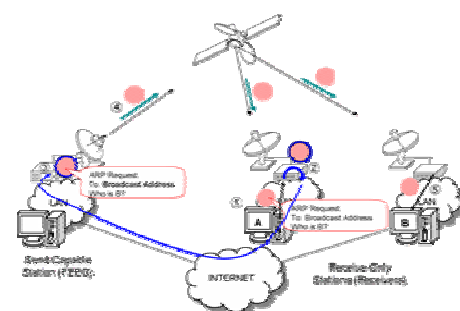
34

SOI Server

- DNS
- SMTP
- DHCP
- File Transfer service installation
- Web Server installation
- Web Cache Proxy installation
- MTM

35

Network Monitoring

- SNMPD installation on RR
- SNMP Proxy installation on RR
- MRTG installation on SOI server
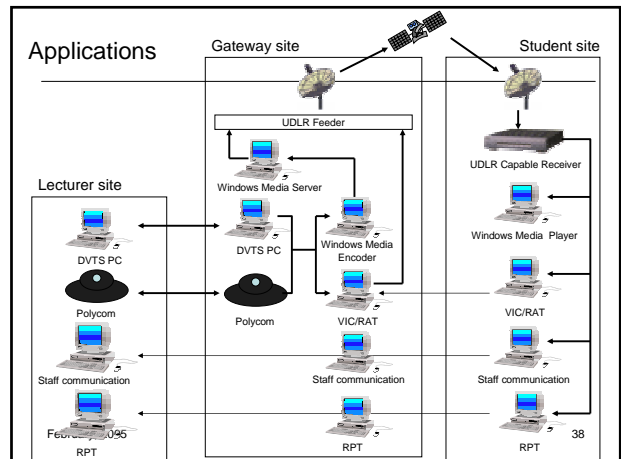- Looking Glass installation on SOI server

36

Realtime

- Student Site
  – VIC/RAT (multicast)
  – WMT (multicast)
- Lecturer Site
  – DVTS
  – Polycom
  – WMT

February, 2005   37

Applications

Gateway site   Student site

UDLR Feeder

Windows Media Server

Lecturer site

DVTS PC

DVTS PC

Windows Media Encoder

UDLR Capable Receiver

Windows Media Player

Polycom

Polycom

VIC/RAT

VIC/RAT

Staff communication   Staff communication   Staff communication

February, 2005   38

RPT   RPT   RPT

Portable Lecturer Sites
Giving lectures

- KEIO SFC
- KEIO MITA Campus
- JAIST
- NAIST
- Tohoku University
- Otemachi Office
- AIT
- US Studio (California)
- US Studio (Maryland)
- SONY CSL office in California
- MieSci

etc

February, 2005

Gateway Site at KEIO SFC

February, 2005   40

Student Sites in Asia
Joining the lecture together

Asian Institute of Technology, Thailand

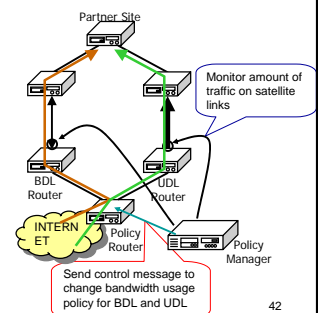Institute of Technology, Bandung Indonesia

National University of Laos, Laos

Asian Youth Fellowship Malaysia

February, 2005   41

Policy Routing

- Optimize satellite link utilization for a site that has two links
- Flow-based policy

Partner Site

Monitor amount of traffic on satellite links

BDL Router

UDL Router

INTERNET

Policy Router

Policy Manager

Send control message to change bandwidth usage policy for BDL and UDL

February, 2005   42

7

Administration

- 3 committees
  - Steering
  - Academic
  - Operators
- Guidelines
  - New site procedure
  - Content usage guideline

SOI ASIA Project
SOI Asia Sharing Knowledge Across Borders
- Tsunami: Lessons Learned and Universities' Role –

Date & Time
Feb 24, 2005 16:30 2030(JST)

Program
16:30 17:00 Keynote- Prof. Jun Murai
17:00 17:30 Report from Japan(1)
17:30 18:00 Reports from Thailand
18:10 18:40 Report from Japan (2)
18:40 19:10 Report from Indonesia (1)
19:10 19:20 Report from Indonesia (2)
19:20 20:10 Panel Discussion
20:10 20:30 Closing

Panelist Sites
- Keio University, Japan
- Tohoku University, Japan
- Asian Institute of Technology (AIT), Thailand
  (by Dr. Anat in Chulalongkorn University
- Institut Teknologi Bandung (ITB), Indonesia
- Brawijaya University, Indonesia

Multicast on Satellite Link
(9Mbps)

Tohoku Univ
DV
Keio
DVTS (35Mbps)
Keio Univ

(128kbps   1.5Mbps)

AIT

Panelist site
Partner sites

ITB

UNIBRAW

Damaged Area by Tsunami

Other SOI ASIA Partner Sites (Total: 11 countries 17 sites)

Chulalongkorn University (Thailand)	University of Computer Studies, Yangon (Myanmar)	Institute of Technology of Cambodia (Cambodia)
Prince of Songkla University (Thailand)	Sam Ratulangi University (Indonesia)	Bangladesh University of Engineering
Chulachomklao University	Hasanuddin University (Indonesia)	and Technology (Bangladesh)
Academy (Thailand)	Institute Of Information Technology (Vietnam)	Mongolian University of Science and Technology (Mogolia)
National University of Laos (Laos)	Advanced Science and Technology Institute (Philippines)	Tribhuvan University (Nepal)