Telescience WG

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PRAGM 36@Jeju

- 4 presentations
  - Using UAV images to monitor rice paddy with artificial intelligence (NCHU)
  - AI & ML for Disaster management (ASTI)
  - High-Resolution Streaming Functionality in SAGE2 Screen Sharing (Osaka U.)
  - Sentiment Analysis (USM)
- Collaboration
  - All members will attend SEAIP, SCSE & PRAGMA
  - SAGE2 ready for all members (sharing minimum system spec) – UF, Osaka U., NCHU, NCHC, ASTI*, USM*
  - SAGE2 applications on Environmental Monitoring based on platform similar to Jason's work. - USM
  - Use UAV image to monitor sugar cane plantation – ASTI, NCHU, NCHC
  - Optimization of traffic routing in cities – USM, HKU, NCHC
  - SEAIP Data Mover (NWU, SEAIP)

SEAIP Community

Thailand

1. Prince of Songkhla University
2. National Electronics and Computer Technology Center NECTEC (Tailand)
3. Walailak University
4. Thammasat University
5. Chiang Mai University
6. King Mongkut's Institute of Technology North Bangkok
7. Hydro and Agro Informatics Institute
8. King Mongkut University of Technology Thonburi
9. Asian Institute of Technology

Philippines

1. Advanced science and technology institute (ASTI), DOST
2. University of Philippines
3. Nationwide Operational Assessment of Hazards (NOAH)
4. Mapua Institute of Technology
5. Philippine Council for Health Research and Development

Vietnam

1. Hue University
2. Tourism Information Technology Center (TITC), VNAT
3. Ministry of Construction Vietnam (MCV)
4. Ministry of Natural Resources & Environment
5. Ministry of Science and Technology (MST)
6. Vietnam Centre for Science and Technology Communication
7. National Centre for Technological Progress (NACENTECH)
8. Information Technology Centre
9. Vietnam National University, Hanoi
10. HANOI U. of Tech.
11. Vietnam National University, Hanoi
12. Hanoi University of Science and Technology
13. Space Technology Institute
14. FIMO Center Vietnam National University of Engineering and Technology
15. Ho Chi Minh City University of Technology
16. Institute of Marine Environment and Resources
17. Danang U. of Tech.

31 Da Nang University
32 Graduate University of Sci & Tech
33 Institute of Information Technology
34 Vietnam National University of Ho Chi Minh city
35 Can Tho University
36 Institute for Computational Science and Technology
37 Vietnam Academy of Science and Technology
38 Vietnam National Inst of Software & Digital Content Industry

Malaysia

39. MIMOS
40. Universiti Tunku Abdul Rahman
41. Universiti Sains Malaysia
42. Universiti Kebangsaan Malaysia
43. Universiti Malaya
44. Kinabalu Park, Sabah Malaysia
45. Universiti Teknologi Malaysia
46. Universiti Teknologi Petronas.
47. Global Diversity Foundation, Sabah, Malaysia

Indonesia

48. Universitas Padjajaran
49. Syiah Kuala University
50. Bogor Agriculture Institute
51. U. of Inonesia University
52. Cipto Mangunkusumo National Hospital
53. University of Yarsi
54. Syiah Kuala University

Laos

55. National University of Laos
56. Ministry of Science and Technology Laos
57. UNDP Lao PDR CO / Ministry of Planning and Investment

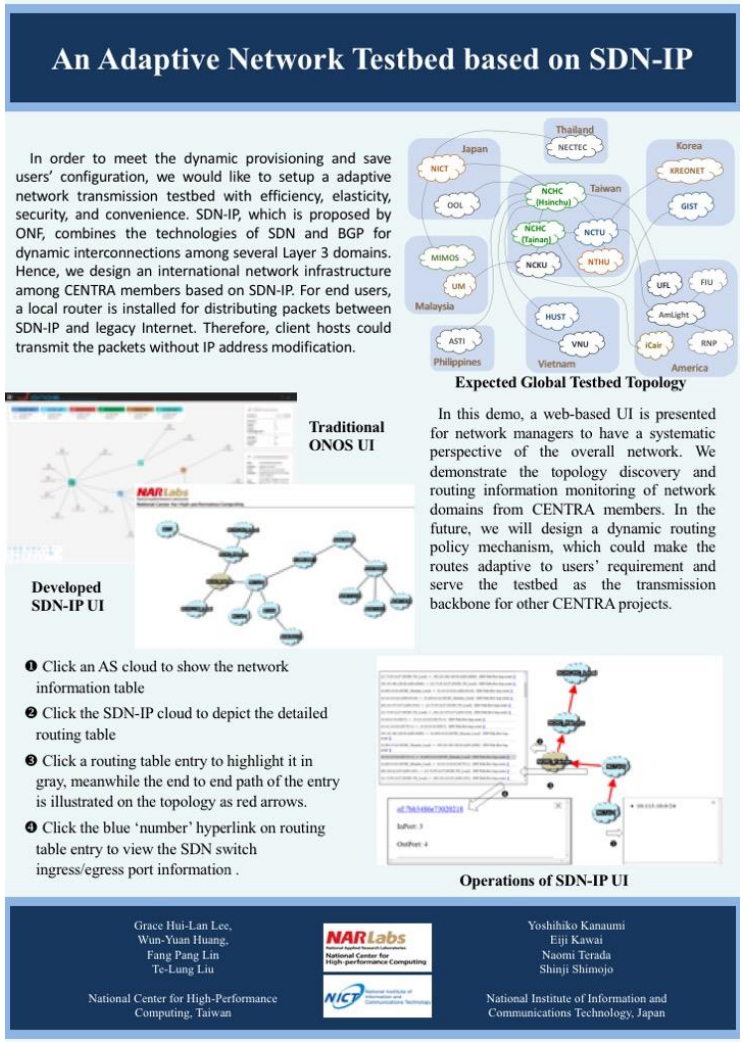
India

58. C-Dac
59. Media Lab Asia
60. Nalanda university
61. University of Hyderabad

Myanmar

62. University of Computer Studies (Taunggyi)
63. University of Technology (Yat Anarpon Cyber City)
64. University of Computer Study Yongon

SDN-IP connection between JP and Taiwan is up and running



An Adaptive Network Testbed based on SDN-IP

In order to meet the dynamic provisioning and save users' configuration, we would like to setup a adaptive network transmission testbed with efficiency, elasticity, security, and convenience. SDN-IP, which is proposed by ONF, combines the technologies of SDN and BGP for dynamic interconnections among several Layer 3 domains. Hence, we design an international network infrastructure among CENTRA members based on SDN-IP. For end users, a local router is installed for distributing packets between SDN-IP and legacy Internet. Therefore, client hosts could transmit the packets without IP address modification.

Expected Global Testbed Topology

Traditional ONOS UI

Developed SDN-IP UI

In this demo, a web-based UI is presented for network managers to have a systematic perspective of the overall network. We demonstrate the topology discovery and routing information monitoring of network domains from CENTRA members. In the future, we will design a dynamic routing policy mechanism, which could make the routes adaptive to users' requirement and serve the testbed as the transmission backbone for other CENTRA projects.

❶ Click an AS cloud to show the network information table

❷ Click the SDN-IP cloud to depict the detailed routing table

❸ Click a routing table entry to highlight it in gray, meanwhile the end to end path of the entry is illustrated on the topology as red arrows.

❹ Click the blue 'number' hyperlink on routing table entry to view the SDN switch ingress/egress port information .

Operations of SDN-IP UI

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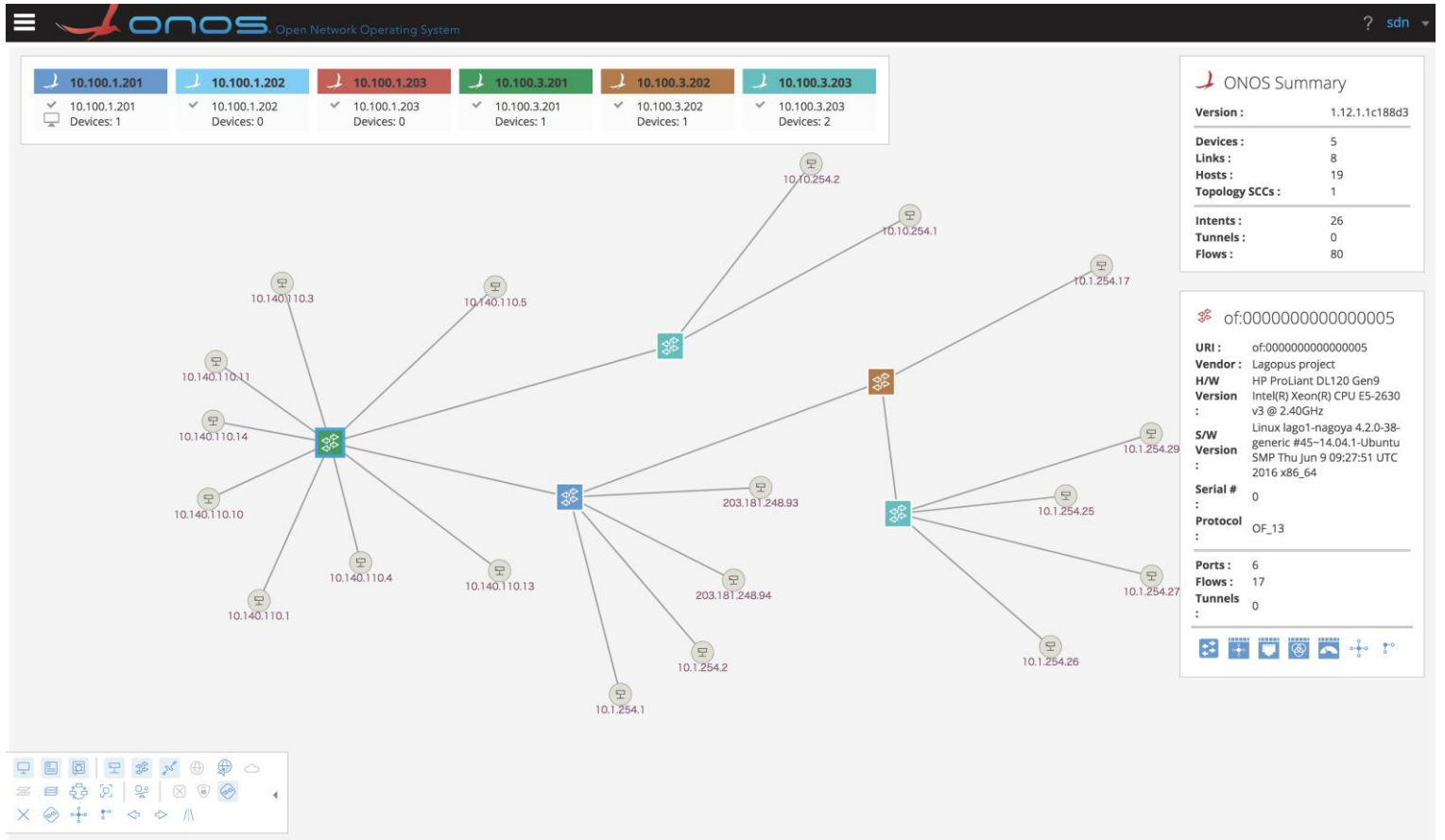
National Center for High-Performance Computing, Taiwan
Yoshihiko Kanaumi, Eiji Kawai, Naomi Terada, Shinji Shimojo
National Institute of Information and Communications Technology, Japan

Poster at CENTRA3

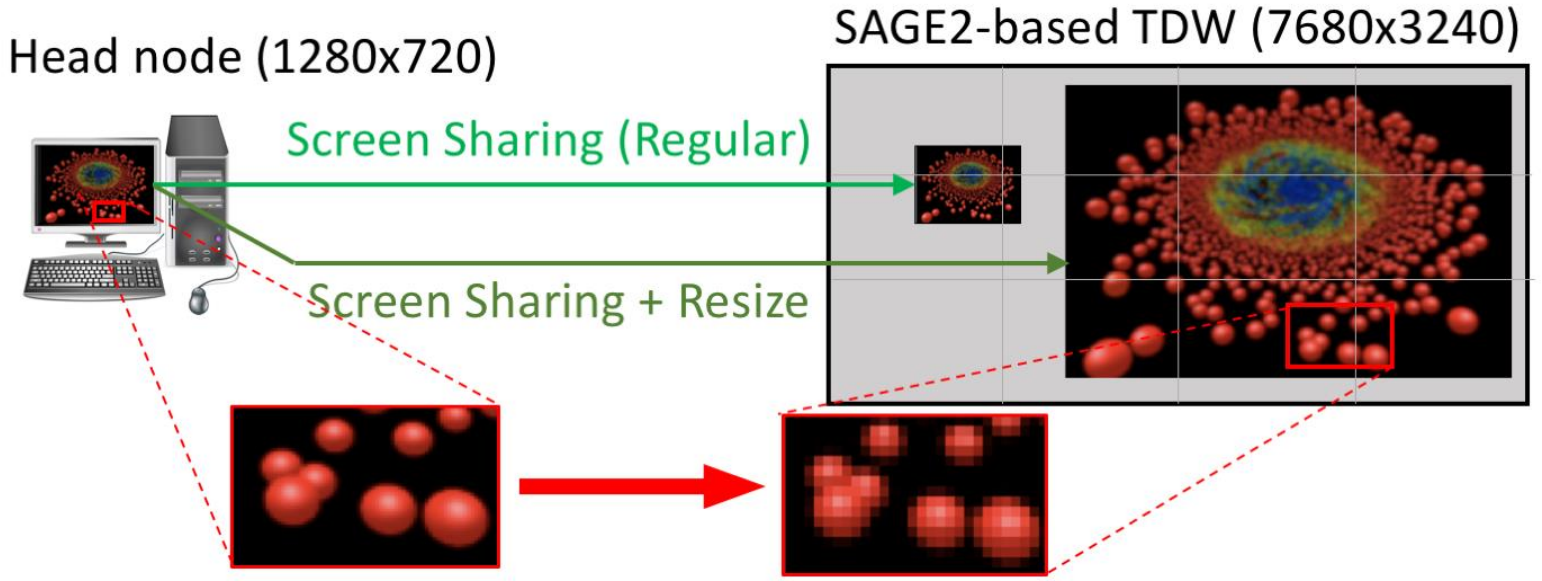
SDN-IP network



High-Resolution Streaming Functionality in SAGE2 Screen Sharing

- **SAGE2** (popular visualization middleware) provides **Screen Sharing**, which is the function to stream user's desktop contents to a TDW.
  - Screen Sharing allows users to **display a wide range of desktop application on a TDW without redevelopment**.

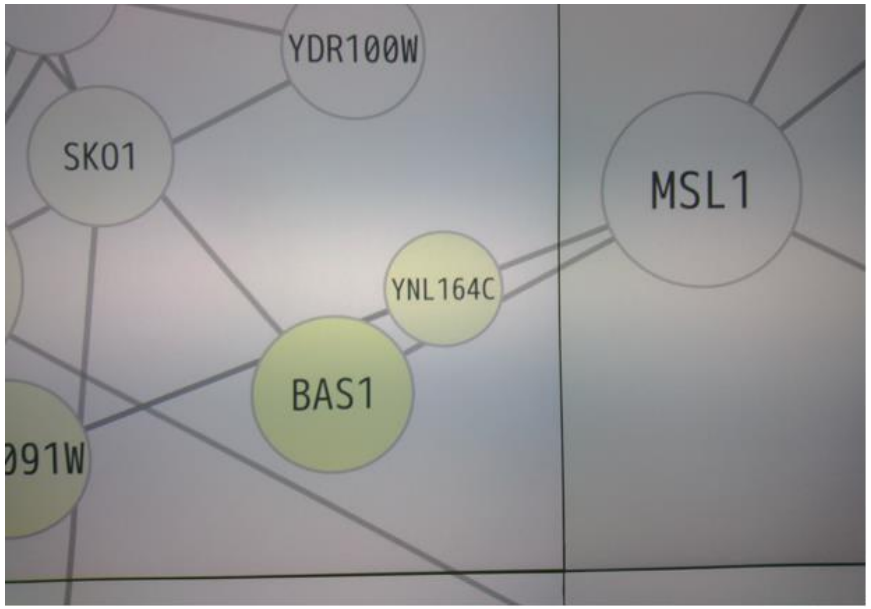
- <u>Problem: Resolution constraint</u>
  - Screen Sharing displays the desktop contents **at the same resolution as the monitor of the head node**.
  - Large difference in the screen resolution between the head node and the TDW will **deteriorate the visibility of desktop applications**.



Proposal Method: Xvnc and Pipeline streaming

- **Xvnc** creates **the virtual desktop screen at an arbitrary resolution on the head node** regardless of the specifications of its monitor.
- To improve the frame rate in the high-resolution streaming, **the streaming process is pipelined**.

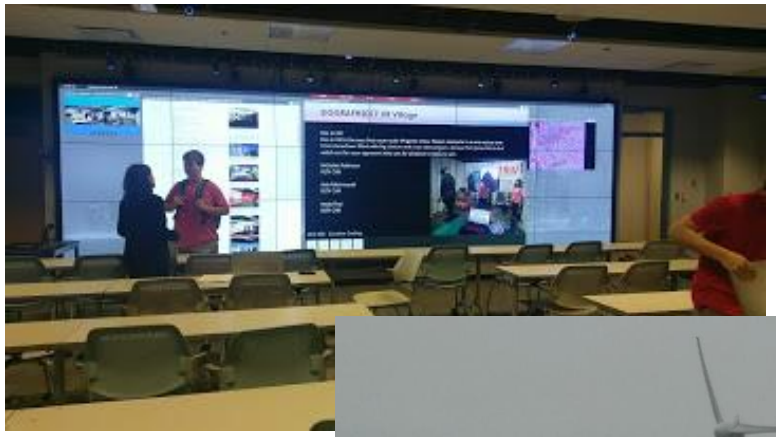
Without our approach (blurry)

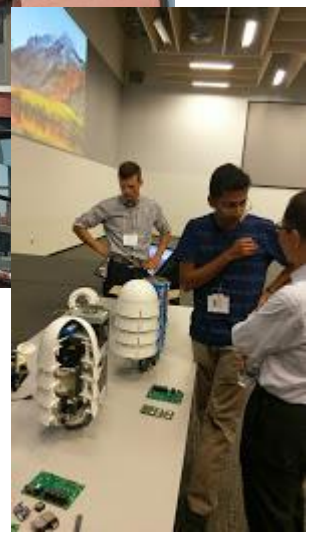


With our approach (precise)

Applications

- Distributed & Collaborative Visualization
- System and Analytics on Green Energy
- Monitoring & computing on Smart Cities/Bays/Museums
- BIM & Cultural Heritage
- Auto-Drone & GIS in Agriculture





Meetings

- MBBW 2018, Penhu 26-28 Oct. (Congress of The Most Beautiful Bay in the World)

  (Oct, Toyama Bay, JP)
- SEAIP 2018, Tamsui 26-30 Nov.
- (500+ students &100 particpatns)
- 2019 Smart Cities Summit & Expo, 26-29 March, Taipei.

  (300+ participants from 33 countries Joint booth demo w/ NCHC, NECTEC & MIT)