perfSONAR Deployment Update and Possible Collaborations

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Agenda

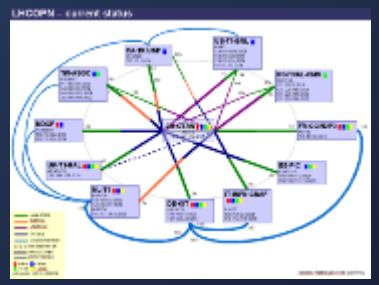
- Background
- Overview of perfSONAR
- Deployment in Japan
- Use Case
- Possible Collaborations

Background

- Increasing research projects and experiments over global scale network
  - eVLBI
  - Telemedicine
  - Digital Cinema
  - LHC

eVLBI antennas

- Providing multi-layer network service
  - Layer1(SONET/SDH)
    - Dedicated circuit, DCN
  - Layer2 (Ethernet)
    - VLAN, L2VPN over MPLS, DCN
  - Layer3 (IP)
    - Internet
  - Layer4~ (Overlay network)
    - PlanetLab, PIAX



LHCOPN

perfSONAR

- Making it easier to solve end-to-end performance problems on paths crossing several networks
- Collecting and publishing network performance data of each layer by using well-defined protocols.

Overview of perfSONAR

Overview

perfSONAR is an Interoperable measurement infrastructure for network performance monitoring, making it easier to solve end-to-end performance problems on paths crossing several networks. (http://www.personar.net)

- Architecture

–Interoperable network measurement middleware (SOA):

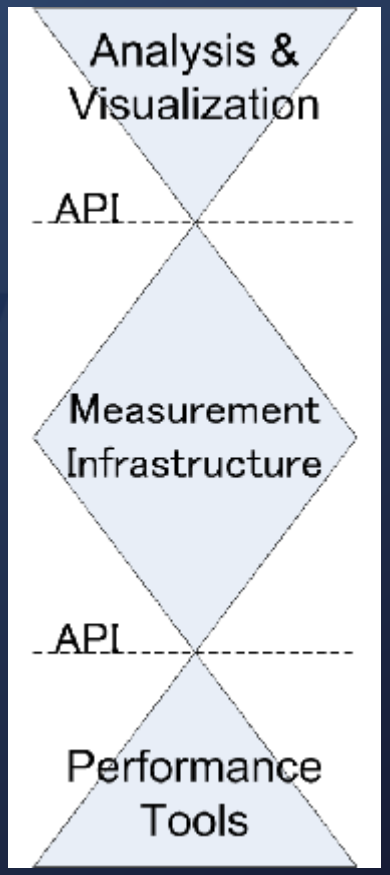
- Web services-based. SOAP API
- Decentralized

–Integrates:

- Network measurement tools and data archives
- Data manipulation

–Based on:

- OGF Working Group
  - Data : NM-WG (Network Measurements Working Group)
  - Protocol : NMC (Network Measurement & Control Working Group)
  - Network Topology :Network Markup Language WG



- Project

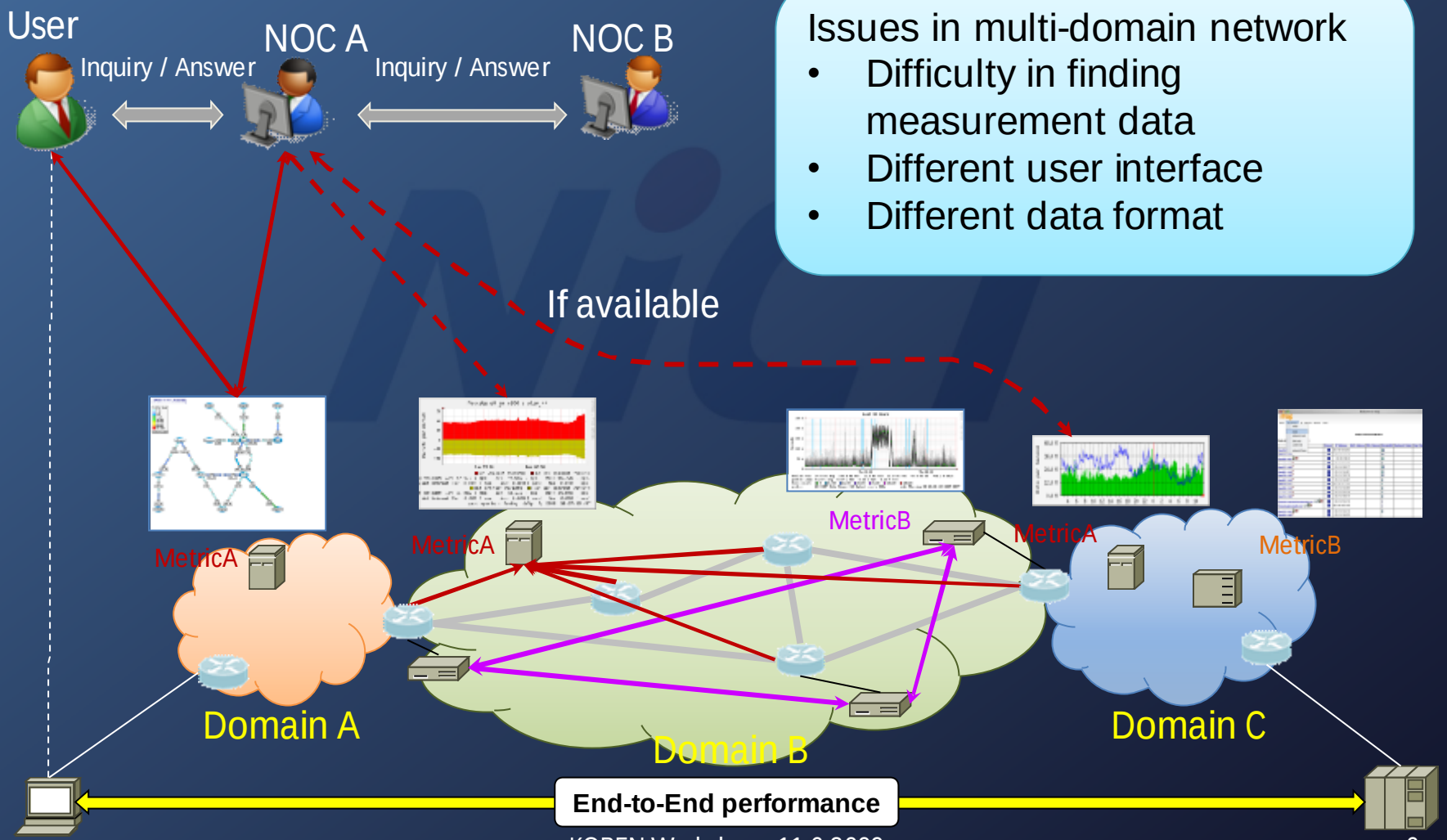
–Joint project among ESnet, GEANT, Internet2 and RNP

–Current participants

- http://www.perfsonar.net/partners.html

perfSONAR

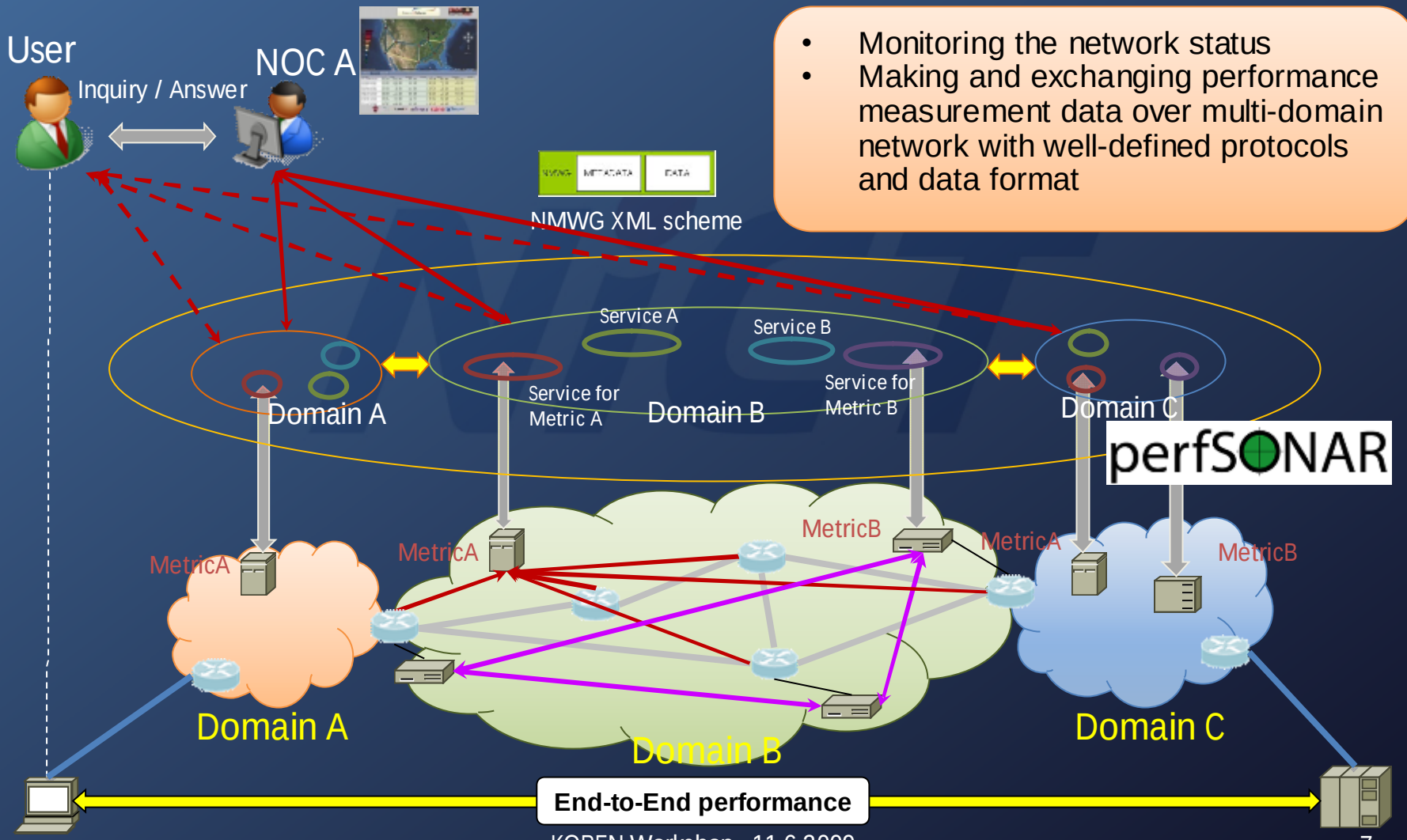
Current Measurement System



Issues in multi-domain network

- Difficulty in finding measurement data
- Different user interface
- Different data format

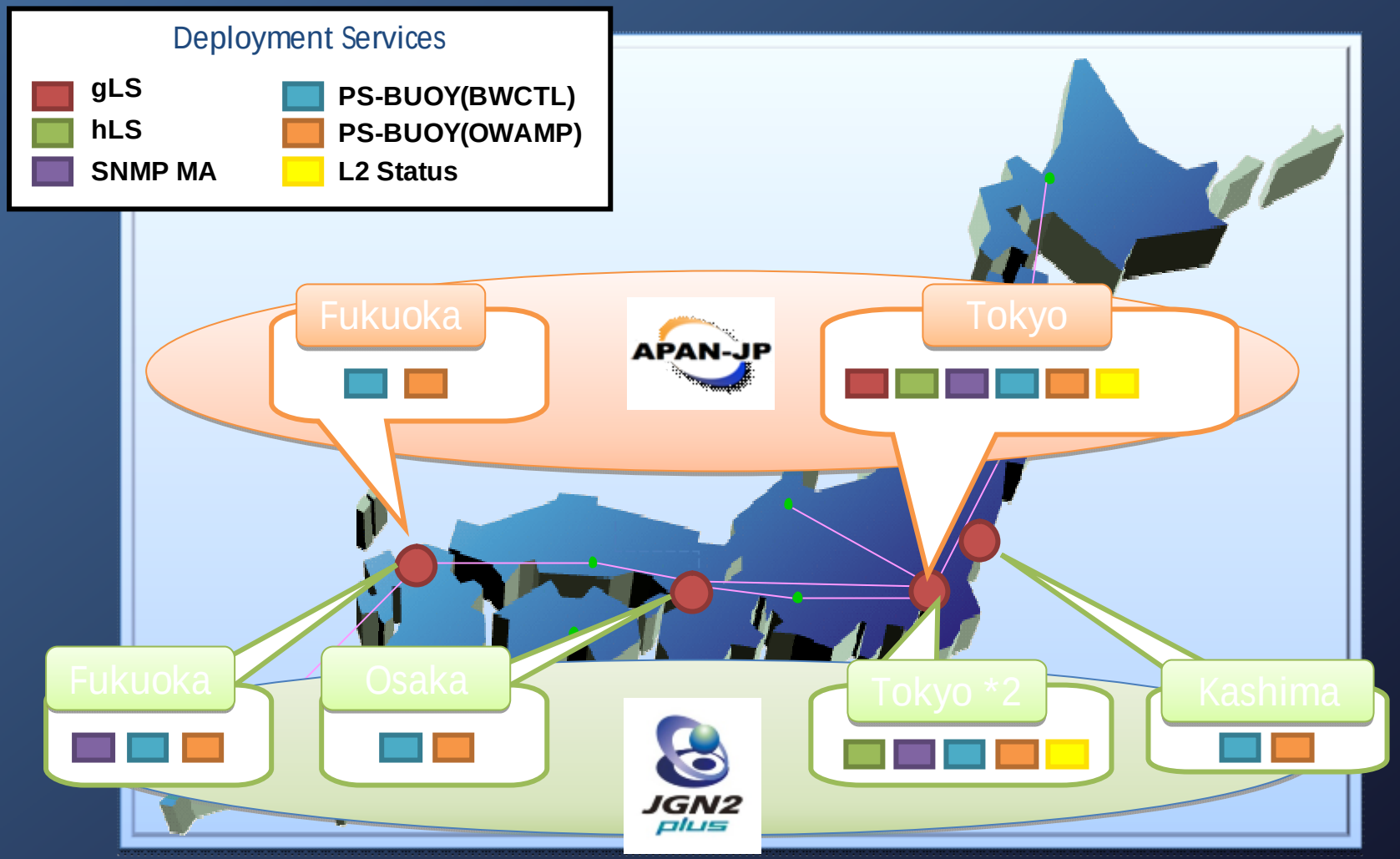
perfSONAR



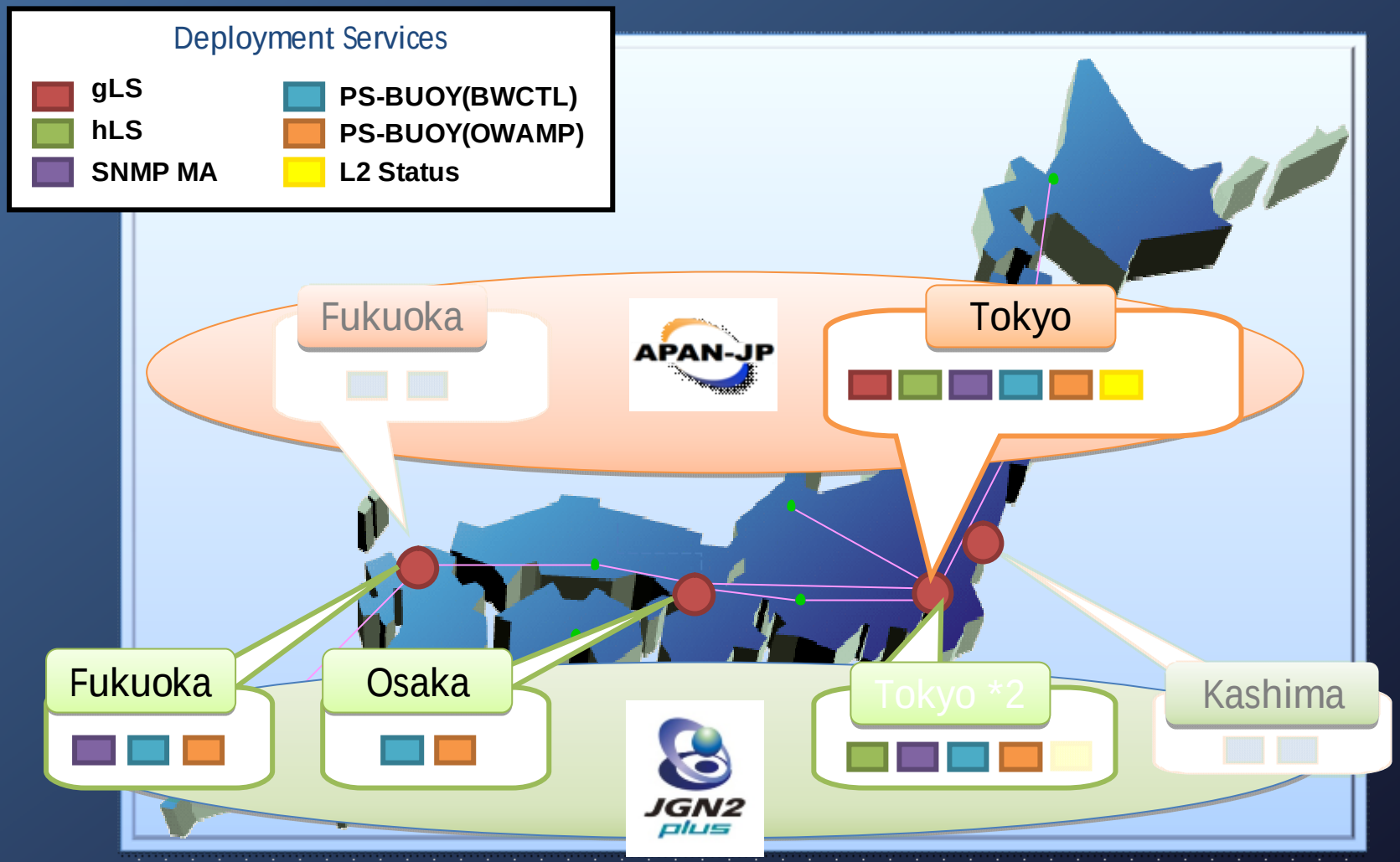
- Monitoring the network status
- Making and exchanging performance measurement data over multi-domain network with well-defined protocols and data format

Deployment in Japan

Node and Services (Plan)



Node and Services (2009.10)



Specifications (JGN2plus)

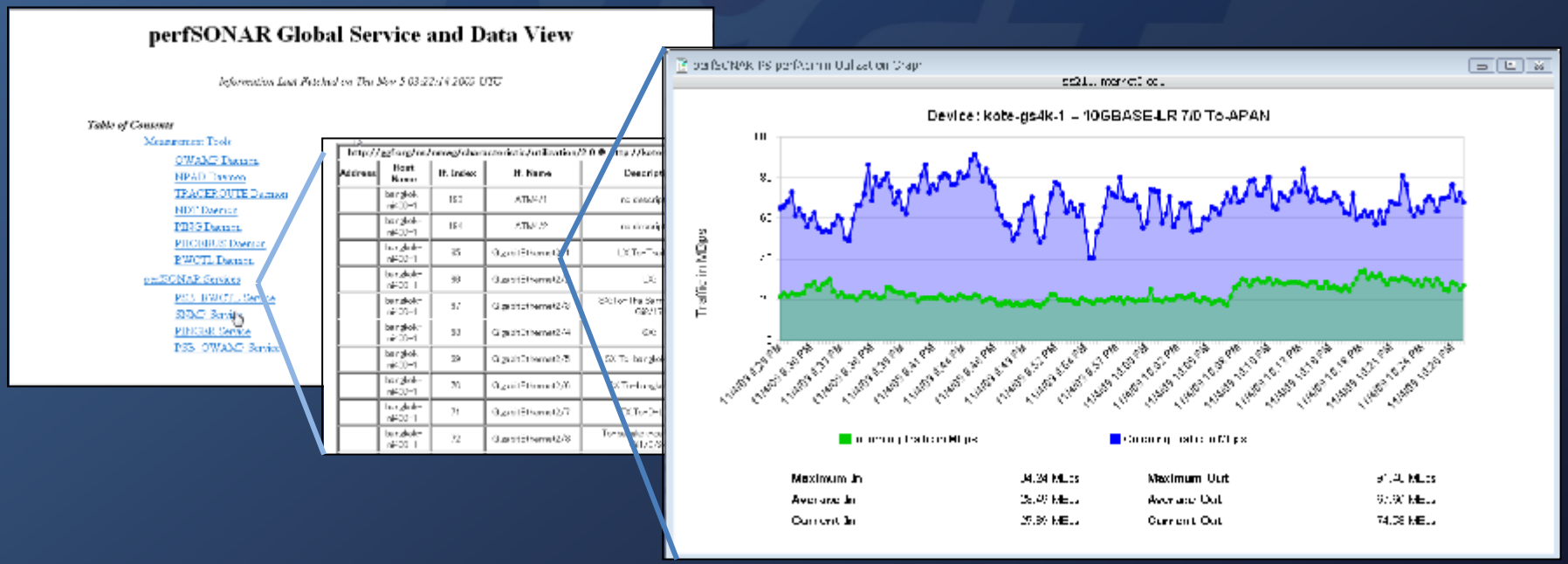
Hardware	Model	HP ProLiant DL360 G5
	CPU	Intel Xeon X5260 3.33GHz DualCore
	Memory	DDR2-667 2GB * 2
	Disk	SAS146GB*2 (RAID1)
	NIC	On-board 10/100/1000 base-T * 2
Software	OS	Redhat Enterprise Linux 5.3
	Kernel	2.6.18-128.2.1.el5
	perfSONAR	perfSONAR-PS v3.1 -Lookup Service -SNMP MA -perfSONAR BUOY

Available measurement data

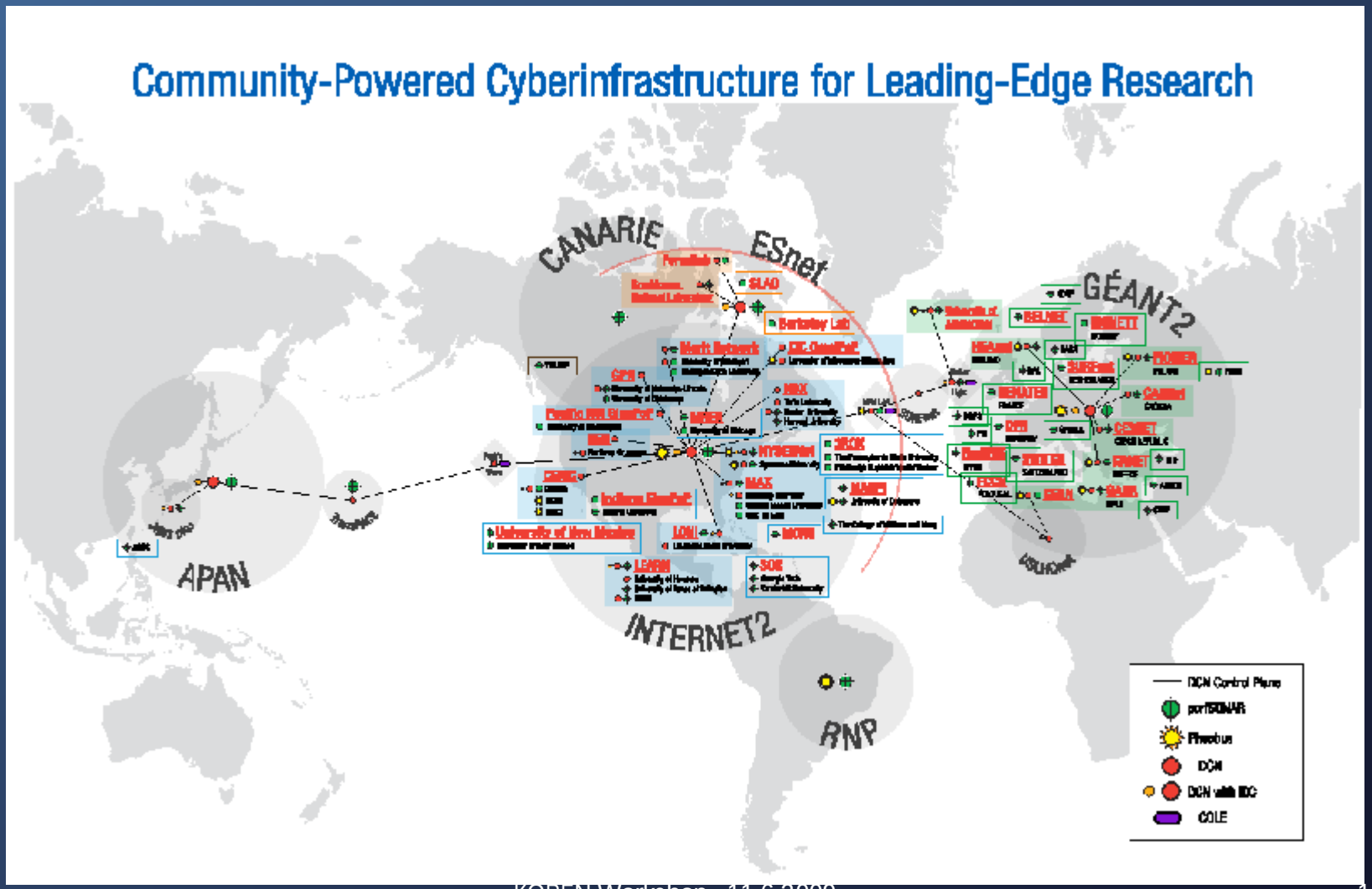
	JGN2Plus	APAN-JP
Interface Usage (SNMP MA) - interval : 10s	JGN2plus domestic nodes	APAN-JP nodes
Throughput (perfSONAR BUOY) - measured by iperf	TCP : Domestic nodes	TCP : APAN Tokyo XP <-> TransPAC2 LA node
Delay (perfSONAR BUOY) - OWAMP	Domestic nodes (estimated error : 0.1ms)	APAN Tokyo XP <-> TransPAC2 LA node (estimated error : 1ms)

DataView

- perfSONAR Global Service and Data View
  - http://dc211.internet2.edu/cgi-bin/perfSONAR/serviceList.cgi



Deployment in the world (2008/11)

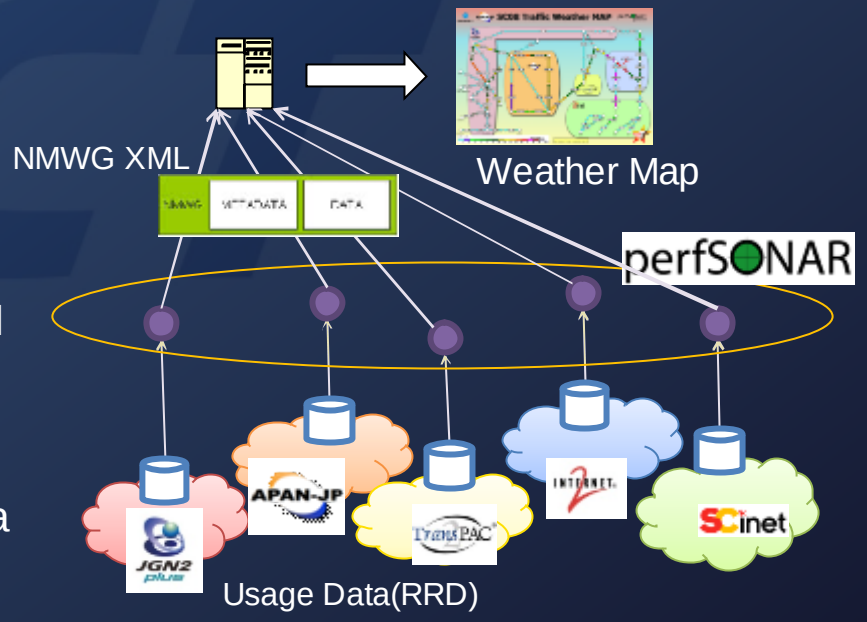


Use Case

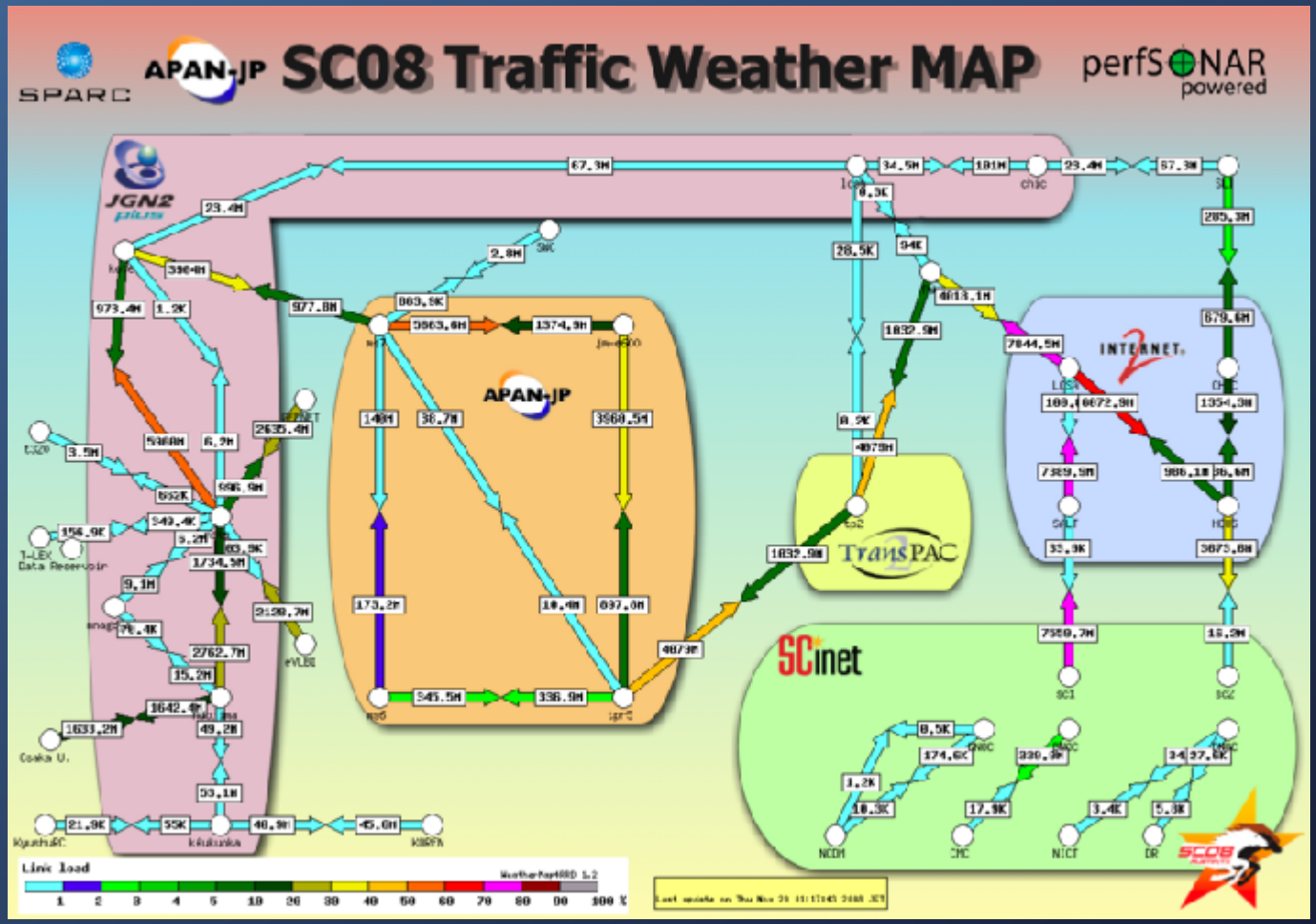
Traffic Weather Map for SC08

Display the usage of the end-to-end link between Japanese R&E networks and SC08 venue.

- Network
  - Japan：JGN2Plus,
    APAN Tokyo XP
  - U.S.：TransPAC2,
    Internet2,
    SCinet (Venue)
- Software
  Modified WeatherMAP4RRD-PHP-1.2final to support perfSONAR.
- Behavior
  - Each network publishes the usage data by perfSONAR snmpMA
  - The weather map software collects the data described in NMWG XML format from all networks
  - The software makes traffic weather Map



Traffic Weather Map for SC08

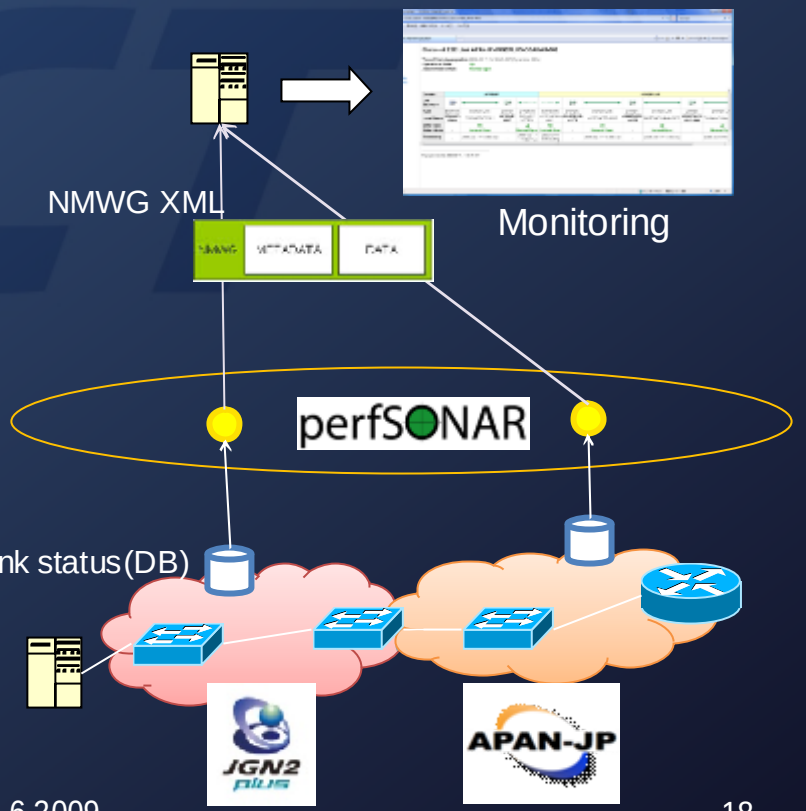


http://ps1.jp.apan.net/ps-map/ **(Demo Version)**

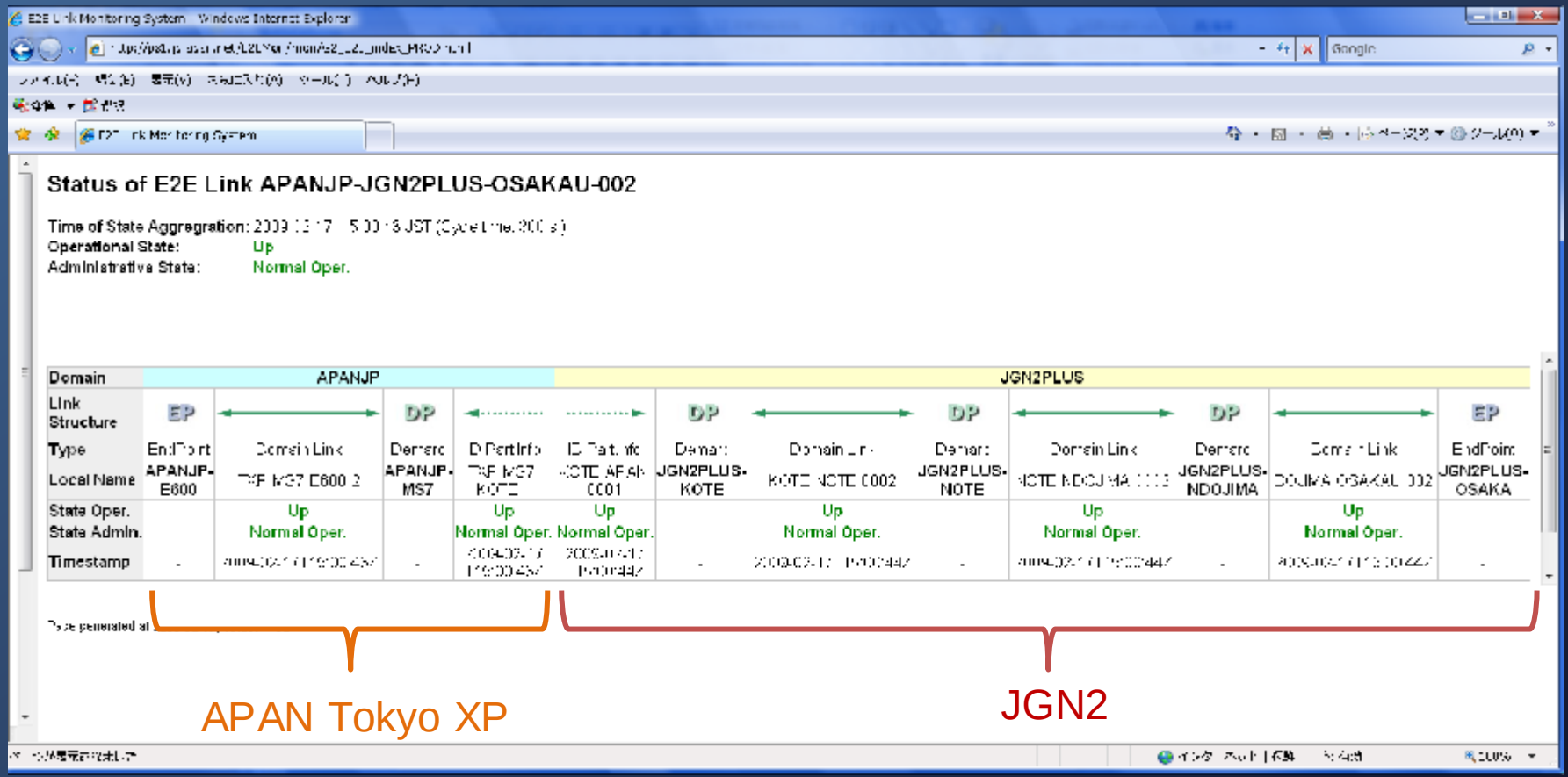
End-to-End Path Monitoring

Monitoring the L2 VLAN path across several domain networks.

- Network
  - JGN2Plus
  - APAN Tokyo XP
- Software
  - Geant2 E2E Monitoring System
- Behavior
  - Each networks publishes the status of the L2 paths
  - The software monitors the end-to-end path by collecting the data from all networks



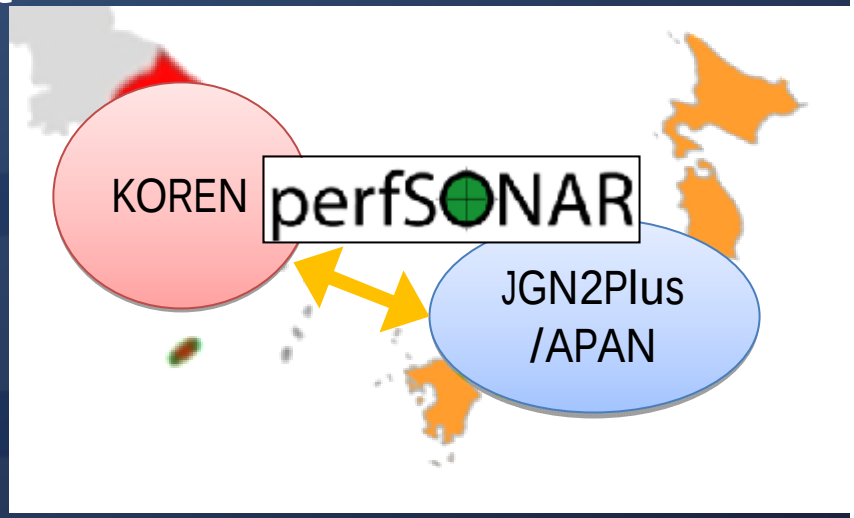
End-to-End Path Monitoring



Possible Collaborations

Possible collaborations

- Performance measurement
  - Throughput
    - TCP,UDP
    - Periodical, On-Demand
  - Delay
    - One-way, RTT
  - Other metrics
    - Tools developed by each network project.
- End-to-End Path Monitoring
  - Static path
  - Path created by DCN



Refference

- perfSONAR
  http://www.perfsonar.net/
- perfSONAR-Wiki
  http://wiki.perfsonar.net/jra1-wiki/index.php/PerfSONAR_Wiki
- perfSONAR-PS
  http://www.internet2.edu/performance/pS-PS/
- perfSONAR Topology schema
  http://anonsvn.internet2.edu/svn/nmwg/trunk/nmwg/schema/
- APAN-JP PerfSONAR
  http://www.jp.apan.net/noc/perfSONAR/
- DCN Software Suite
  - https://wiki.internet2.edu/confluence/display/DCNSS/Home
- OGF
  - NM-WG
    http://nmwg.internet2.edu/
  - NML-WG
    http://forge.gridforum.org/sf/projects/nml-wg

Thank you!