Science Information Network 3

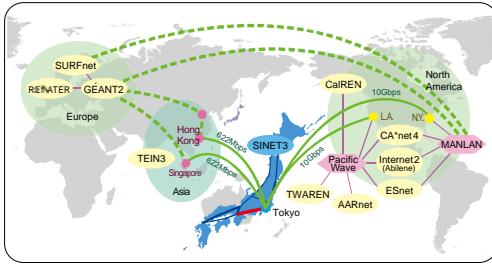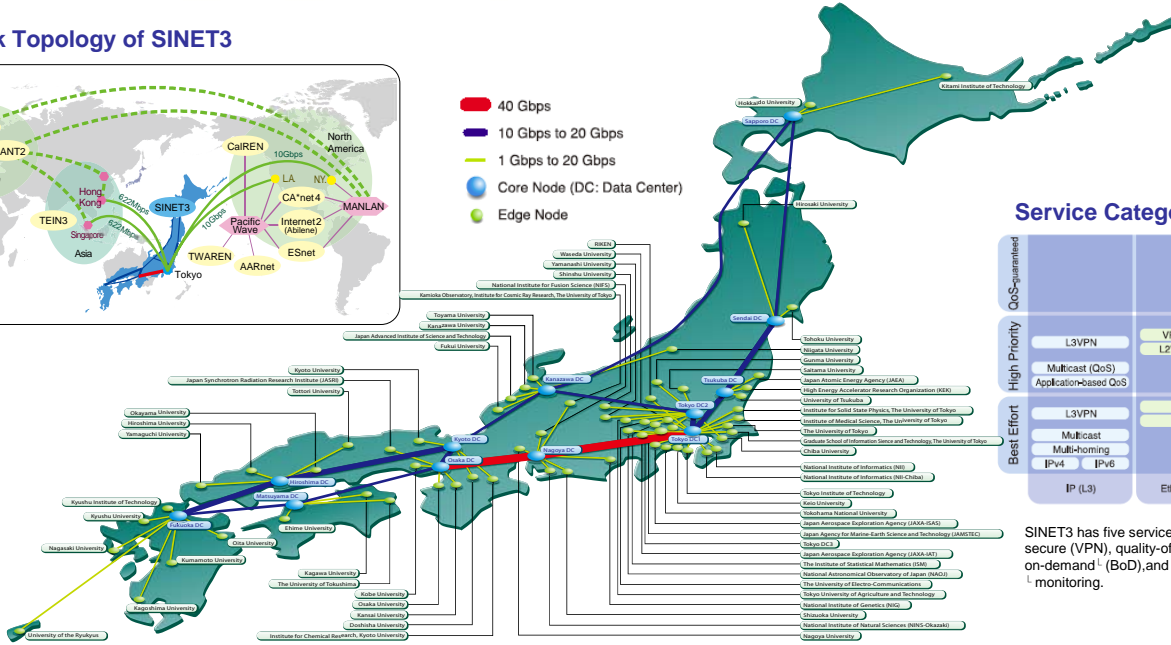**SINET3**

Network Topology of SINET3

Legend:
- 40 Gbps
- 10 Gbps to 20 Gbps
- 1 Gbps to 20 Gbps
- Core Node (DC: Data Center)
- Edge Node

International connections: SURFnet, RENATER — GÉANT2, Europe, CalREN, North America, Hong Kong, 622Mbps, SINET3, 10Gbps, LA., N.Y., CA*net4, MANLAN, Internet2 (Abilene), TEIN3, Singapore, Asia, 622Mbps, 10Gbps, Pacific Wave, ESnet, TWAREN, AARnet, Tokyo

Japan node labels: Kitami Institute of Technology, Hokkaido University, Sapporo DC, Hirosaki University, RIKEN, Waseda University, Yamanashi University, Shinshu University, National Institute for Fusion Science (NIFS), Kamioka Observatory, Institute for Cosmic Ray Research, The University of Tokyo, Toyama University, Kanazawa University, Japan Advanced Institute of Science and Technology, Fukui University, Kyoto University, Japan Synchrotron Radiation Research Institute (JASRI), Tottori University, Okayama University, Hiroshima University, Yamaguchi University, Sendai DC, Tsukuba DC, Tokyo DC2, Kanazawa DC, Kyoto DC, Nagoya DC, Tokyo DC1, Osaka DC, Hiroshima DC, Matsuyama DC, Fukuoka DC, Tokyo DC3, Kyushu Institute of Technology, Kyushu University, Nagasaki University, Kumamoto University, Ehime University, Oita University, Kagawa University, The University of Tokushima, Kobe University, Osaka University, Kansai University, Doshisha University, Institute for Chemical Research, Kyoto University, Kagoshima University, University of the Ryukyus

Tohoku University, Niigata University, Gunma University, Saitama University, Japan Atomic Energy Agency (JAEA), High Energy Accelerator Research Organization (KEK), University of Tsukuba, Institute for Solid State Physics, The University of Tokyo, Institute of Medical Science, The University of Tokyo, The University of Tokyo, Graduate School of Information Sience and Technology, The University of Tokyo, Chiba University, National Institute of Informatics (NII), National Institute of Informatics (NII-Chiba), Tokyo Institute of Technology, Keio University, Yokohama National University, Japan Aerospace Exploration Agency (JAXA-ISAS), Japan Agency for Marine-Earth Science and Technology (JAMSTEC), Japan Aerospace Exploration Agency (JAXA-IAT), The Institute of Statistical Mathematics (ISM), National Astronomical Observatory of Japan (NAOJ), The University of Electro-Communications, Tokyo University of Agriculture and Technology, National Institute of Genetics (NIG), Shizuoka University, National Institute of Natural Sciences (NINS-Okazaki), Nagoya University

Service Categories in SINET3

	IP (L3)	Ethernet (L2)	Lambda/ Dedicated (L1)
QoS-guaranteed			On-demand BW-specified L1VPN Lambda L1VPN
High Priority	L3VPN Multicast (QoS) Application-based QoS	VPLS (QoS) L2VPN (QoS)	
Best Effort	L3VPN Multicast Multi-homing IPv4 IPv6	VPLS L2VPN	

(Network Performance Monitoring)

SINET3 has five service categories: └ transfer layer, secure (VPN), quality-of-└ service (QoS), bandwidth-on-demand └ (BoD),and network performance └ monitoring.
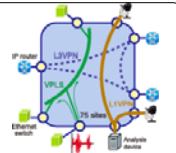
Multiple Layer Services

SINET3 is an integrated network providing all transfer layer services. Users can freely choose the best transfer layer for their applications. SINET3 enables economical service provision and flexible network resource assignment for ever-changing and unpredictable service demands.
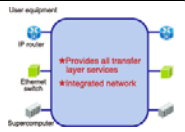
Multiple VPN Services

A closed user group environment (virtual private network: VPN) is essential for ensuring the security of collaborative research. Users can choose from L3VPN (IP), L2VPN/VPLS (Ethernet), and L1VPN.
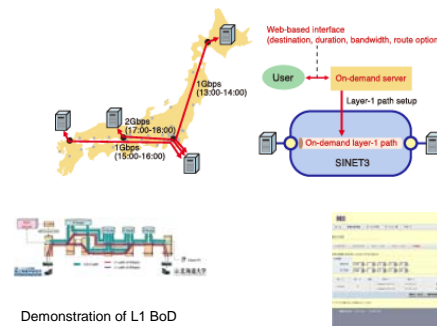

Multiple QoS Services

SINET3 provides QoS by identifying applications, VPNs, and physical/logical ports. Layer-2/3-based QoS has four priority classes: expedited forwarding (EF), network control (NC), assured forwarding (AF), and best effort (BE). Layer-1-based QoS has the smallest packet delay, no delay variance, and no packet loss.

Bandwidth-on-demand (BoD) Services

SINET3 provides bandwidth-on-demand (BoD) services on layer-1. Users can specify destination, duration, bandwidth with a granularity of 150 Mbps, and route option. The BoD server receives reservation requests, schedules accepted reservations, and triggers layer-1 path setup.

Web-based interface (destination, duration, bandwidth, route option)
User — On-demand server — Layer-1 path setup — On-demand layer-1 path — SINET3
1Gbps (13:00-14:00), 2Gbps (17:00-18:00), 1Gbps (15:00-16:00)

Demonstration of L1 BoD (February 1st, 2008)

Confirmation of bandwidth reservation