14. Network Management Office

Network Management Office (NMO) has been established on April 2009 by the merging of the former Network working group in Department of Simulation Science and the LHD LAN management group.

The information network is fundamental for the research activity. The advanced NIFS campus information network named "NIFS-LAN" is the information infrastructure which contributes to the development of nuclear fusion research. NIFS has 300 staffs and the number of their PC is near 3,000. "Network Management Office" (NMO) provides 100Mbps / 1Gbps bandwidth to users. NIFS-LAN consists of three autonomous clusters which have their own purposes and usages as follows;

1. *Research Information Cluster* is the network of general use, and covers the campus whole region.
2. *LHD Experiment Cluster* is provided for LHD experiment, and covers the building relevant to LHD experiment.
3. *Large-scale Computer Simulation Research Cluster* is provided in order to support the large-scale computer simulation research efficiently.

NIFS-LAN is connected to Science Information Network 4 (SINET4) managed by National Institute of Informatics. The block diagram of NIFS-LAN is shown in Fig. 1.
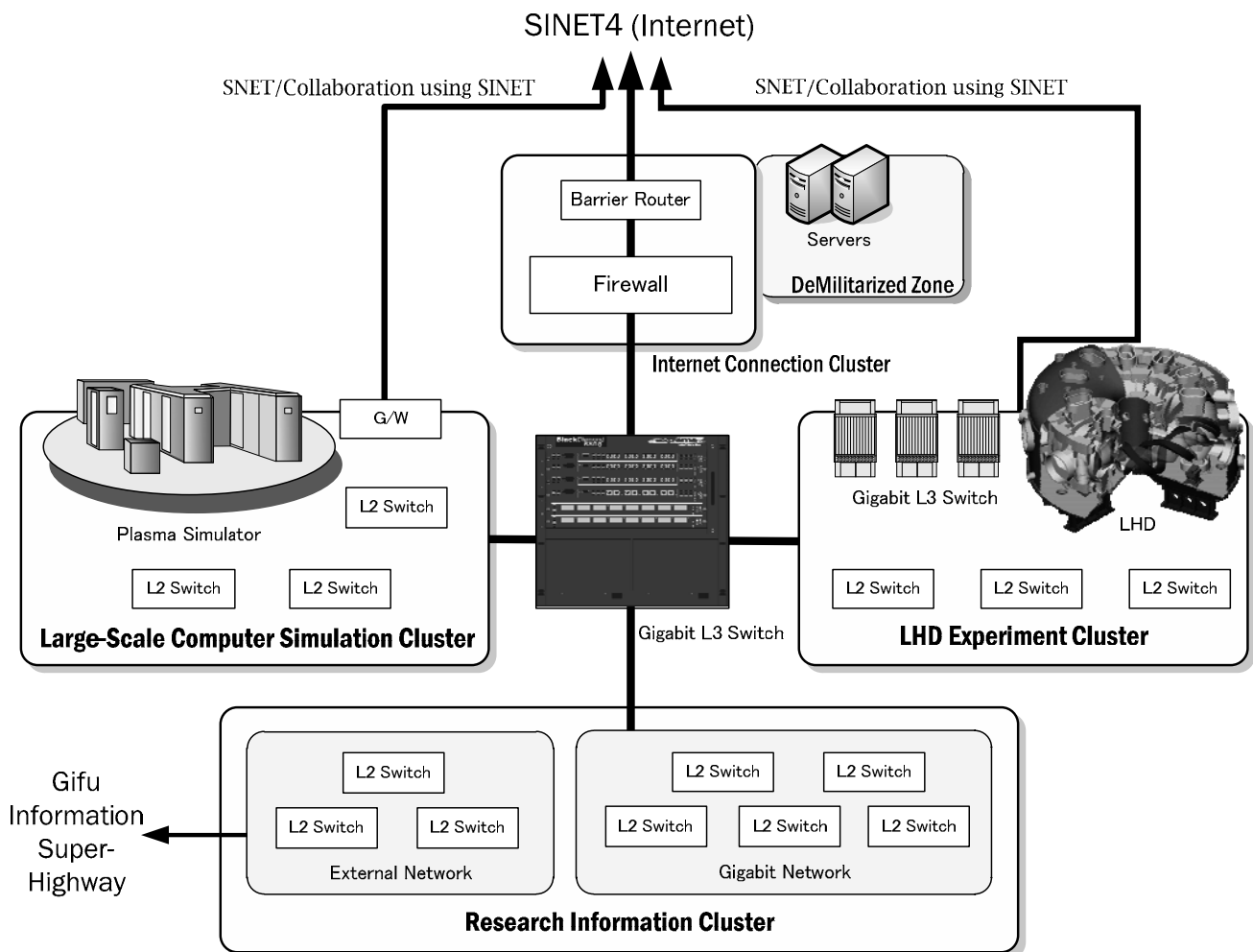

Fig.1. Block Diagram of NIFS Campus Information Network (NIFS-LAN)

NMO has performed following three activities in FY2011.

1) Operations and administrations of information network

a) The e-mail is a basic communication tool for the research activities. NGW has operated the mail server for NIFS to realize the effective communication. 55 new accounts (e-mail address) were created and 52 accounts were deleted in FY 2011. The mailing list service has also provided. 47 lists ware created and 54 lists were deleted in FY 2011.

b) To manage the network, NMO has administrated the following information system;

　* Mail, SSL-VPN, DNS and DHCP servers
　* Routers and Layer 2 / Layer 3 switches.

For example, 142 hosts were added to DNS server and 134 hosts were deleted on Research information cluster in FY 2011. NMO also guides the staff of NIFS on information network and information systems.

c) TV conference system is a common tool for the remote conference. NMO has assisted 52 events with TV Conference in FY 2011.

2) Security improvements

To keep the high-level security, NIFS-LAN has introduced the firewall and other security equipments. In FY 2011, the following activities were performed to maintain the network security.

a) Owners of PCs who bring them from outside of NIFS are requested to make a security check before connecting them to NIFS network. The quarantine network room was offered for such a security check and supports of quarantine processing to be sanity. This room was used more than 116 times in FY 2011.

b) Secure Socket Layer-Virtual Private Network (SSL-VPN) is a kind of VPN, which uses web browser as a client's software. The SSL-VPN in the NIFS has also the function to check the security level of the client before VPN connection is established. User is needed to use the One-Time Password (OTP) token as the authentication. 16 accounts were newly created, 129 accounts were renewed, and 14 accounts were removed in FY 2011. The number of accounts for NIFS is 98 and the number of accounts for research collaborator is 31.

c) Eight security incidents were treated by NMO in FY2011.

- Virus infection at PC by browsing malicious web site … 5
- Detection of virus on old-used PC … 1
- Detection of virus on co-researcher's PC … 1
- SSH dictionary attack … 1

Most virus infections could not be prevented by the vaccine software even with latest virus definition file, because the number of malformation virus, such as spyware and adware, is very large and the time to change is very short. More attention is needed to prevent to virus infection. The malware uses not only the flaws of OS and the Web application but also its plug-in software, such as the flaws of Acrobat Reader, Acrobat flash, Java Runtime Environment, and so on. We need to pay more attentions to the update of the plug-ins.

3) Notable activities in FY 2011

a) Lecture for information network and its security

Six lecture classes on the subject of the campus network of NIFS, information security and how to register the MAC address were delivered in FY2011 and 222 staffs joined. This lecture was held under "Information Security Policy" with the Information Security Committee. Only the attendance of this lecture can be the MAC address registrar (175 members) who can register MAC address of PC to DHCP system in NIFS.

b) Renewed the SSL-VPN server and the related system

The SSL-VPN server has been replaced with F5 EdgeGateway. The new SSL-VPN server supports the new OS, such as Mac OS 10.7 (Lion), and the new releases of anti-virus software. The OTP authentication server has also been replaced.

c) Replaced the firewall system

The firewall system has controlled the network connections between the Internet and NIFS-LAN. The configuration of the firewall is reflected with the security policy. The configuration for the firewall rule had been reconfirmed before this replacement. No major trouble was there during the replacement.

d) Replaced the network devices for the Helicon Club

The network of the Helicon Club, NIFS guest house, has been replaced with 1Gbps switch. The optical link between the Helicon Club and the network room has also been changed from 100BASE-FL to 1000BASE-SX.

e) Others

- Provided and supported the network infrastructure for ITC-21
- Renewed the Anti-SPAM appliance.
- Updated the software of ISC BIND for fixing the security hole.

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