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We improved NIFS-LAN(National Institute for Fusion Science - Local Area Network) to get more stability, reliability and connectivity, which are described here. To make NIFS-LAN stable and reliable, a barrier segment in Nagoya-site LAN was established. The role of this segment is to separate the inside and outside of NIFS network and to reduce the packet which is unnecessary to the inside network. To get good connectivity to the domestic collaborative researchers by network, the connection path with SINET was changed and the transfer rate of the circuit was sped up.

1)Barrier Segment Established in Nagoya-site LAN

NIFS-LAN consists of a backbone FDDI(100Mbps) in Toki-site and a lot of Ethernet lines which are connected with the FDDI. The block diagram of NIFS-LAN is shown in Fig.1. LAN in Nagoya-site is also connected with FDDI in Toki-site via high-speed digital circuit(1.5Mbps). Some networks outside NIFS are connected at in Nagoya-site; SINET(Science InterNETwork: NACSIS) to link domestic collaborative researchers, ESNET(Energy Sciences Network, USA) to link researchers in USA and NICE(Nagoya university Integrated Communication Environment) to link Nagoya university. RIP(Routing Information Protocol) has been adopted to communicate with networks all over the world. By this RIP, routing informations are exchanged to get connection paths for every 30 seconds between neighbor routers. This routing information becomes to exceed 2000 (80 packets) over, as the number of domestic networks are going to increase rapidly.

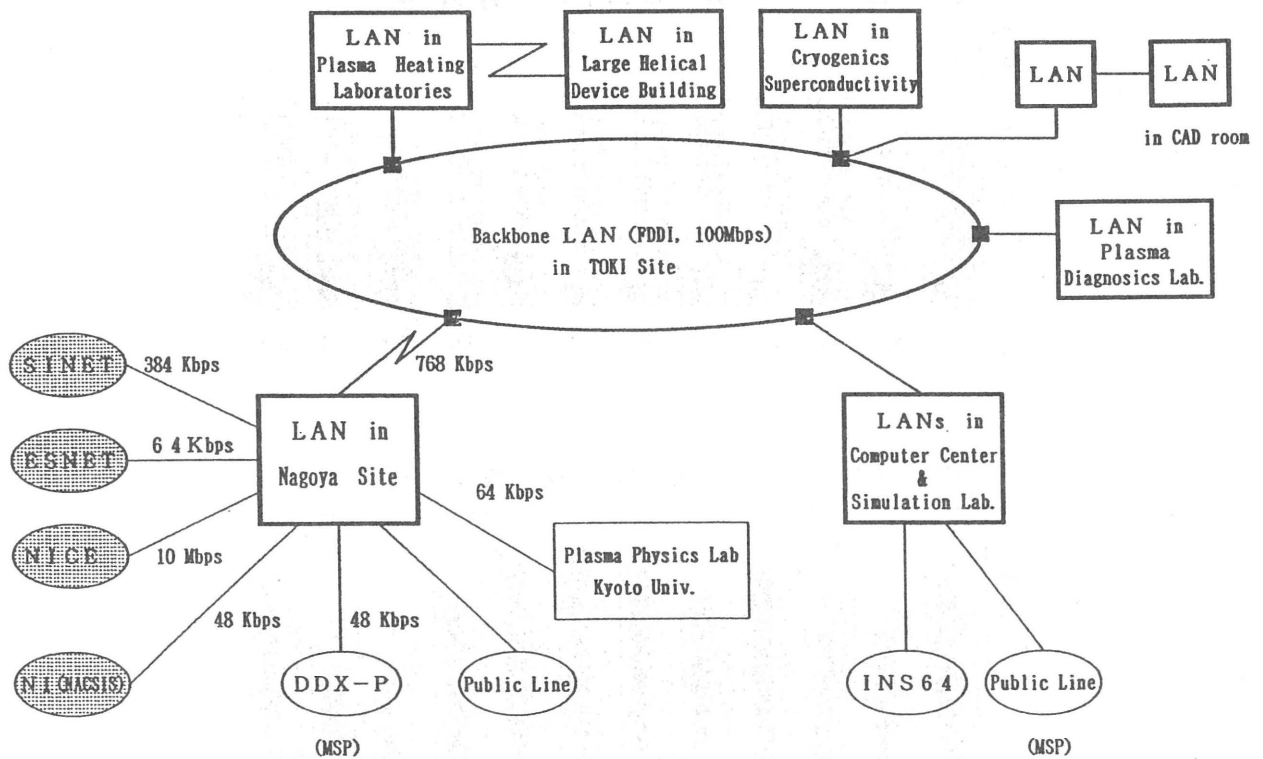


Fig.1 Block Diagram of NIFSnet

As all the packet of routing information was passed through NIFS-LAN, routers and workstations connected to NIFS-LAN got the packet from LAN, thus became overloaded and the NIFS-LAN fell into the unstable status often. A new segment, which called a barrier segment of NIFS-LAN, was established at Nagoya-site LAN so as not to become such a situation. Two routers for communicate with outside networks were moved to this barrier segment from a main Nagoya-site LAN. A new router was installed between a barrier segment and a main LAN in Nagoya-site. Moreover, using the filtering function of a new router, we restrained to pass unnecessary routing packets through NIFS-LAN. IP routing control at each routers in NIFS-LAN was shown in Fig.2. By this routing control, routers and workstations in NIFS-LAN have a correct understanding of communication path with any hosts/networks.

As a result, approximately 2800(about 112 packets) routing information passed through the barrier segment every 30 seconds, but only 29 passed through the other segments as shown in Table 1. With these, the network became a stable situation and the reliability of network was improved.

2)Connectivity Improved for SINET

To improve connectivity with the domestic collaborative researchers, the connection path between NIFS-LAN and SINET was changed. The old path was connected with SINET via the barrier segment of Nagoya university(NICE), the new one was directly connected with the router of SINET. And the transfer rate became 384Kbps which was three times faster than the old one. The connectivity between NIFS network and domestic networks was substantially improved by the change of connection path and transfer rate.

Table 1 Routing Information on NIFS-LAN

Segment	# of Routing Informations		
Barrier segment	2,768	ESnet	1
		NIFS-LAN	27
		SINET	86
		Domestic	2,654
Other Segment	29	Default	1
		NICE	1
		NIFS-LAN	27

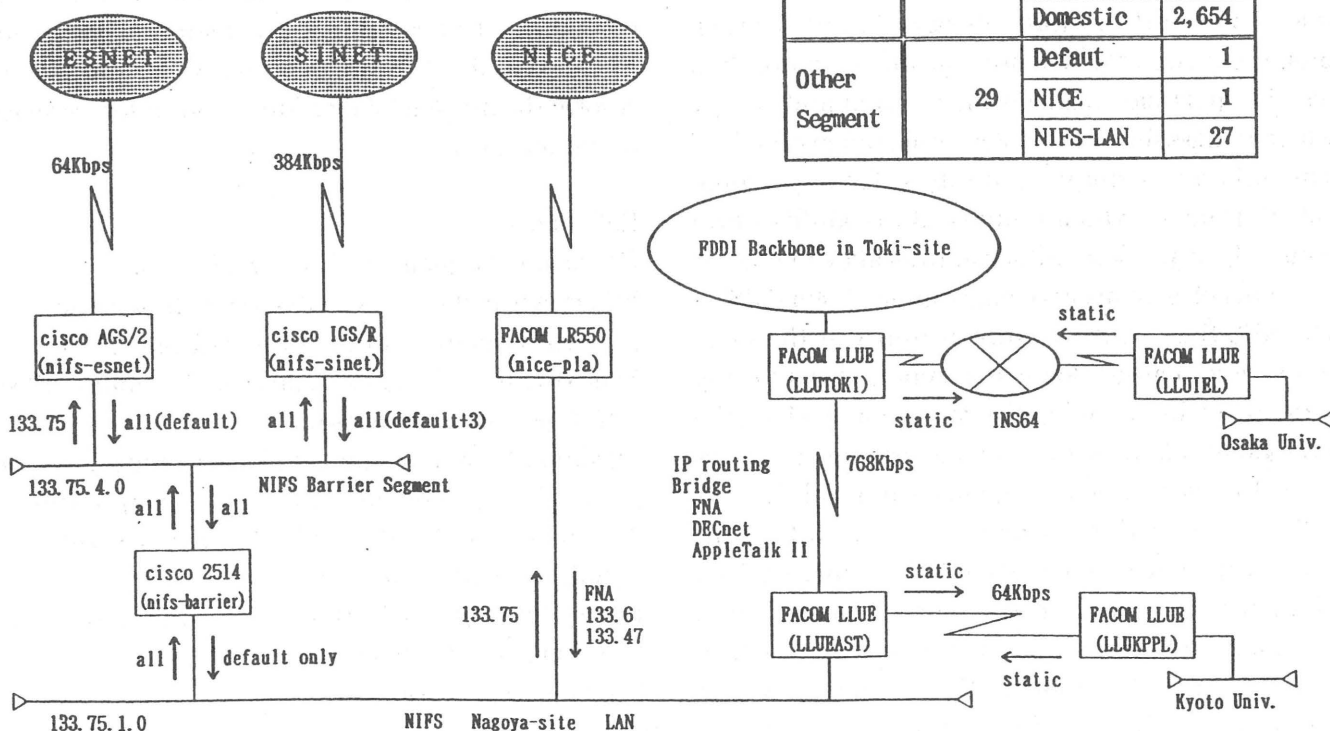


Fig.2 NIFSnet IP routing in Nagoya-site LAN

□ : Router (Brouter)