

§1. Reconstruction of Network for LHD Experiment Remote Participation System

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The Remote Participation System through the high-speed network, Super-SINET, has been built from 2002. The High Temperature Plasma Center, Univ. of Tokyo was connected to NIFS to perform collaboration for superconductivity study by MPLS (MultiProtocol Label Switching) 1Gbps in March 2002. In order to perform collaboration for LHD experiment, the Dep. of Energy Engineering & Science of Nagoya Univ. was connected in April 2003, the Institute of Advanced Energy of Kyoto Univ. in October 2003, and the Art, Science and Technology Center of Kyushu Univ. in April 2003 by MPLS method with 1Gbps, respectively. There was a schedule which connects three universities (Dep. of Quantum Science and Energy Engineering of Tohoku Univ., Research Laboratory for Nuclear Reactors of Tokyo Institute of Technology, and Dep. of Mechanical System Engineering of Hiroshima Univ.).

In this opportunity, the network environment for researchers at a remote place was reconstructed. The Remote Experiment Participation System before reconstruction was closed region connection, as shown in A of Fig. 1. Reconstruction aimed at providing the researcher of a remote station with the same network environment as being in the Control Building of NIFS. That is, from the host of remote station;

- 1) Access to all the servers in LHD-LAN is enabled.
 - 2) The server in NIFS-LAN can be accessed with permission.
 - 3) Internet connectivity is possible.
- And in a remote station;
- 4) Limit the connection terminal and keep security.

The reconstructed network composition is shown in B of Fig. 1. Access and packet flow control is performed by the edge routers and the FireWall. In the edge router of NIFS, access to LHD-LAN will be accepted if the IP address of a requiring host is from a remote station. When an access address is except LHD-LAN, the edge router passes a packet to the FireWall. In the FireWall, if an access address is a host in the Research Information Cluster of NIFS-LAN and the permission is granted, access to the host will be allowed. As an access address is except NIFS-LAN, a packet is passed to the Internet. Access from the internet and the Research Information Cluster of NIFS-LAN to a host in remote station is forbidden by the FireWall. For researchers in remote station, the same network environment as being in the Control Building of NIFS was provided by this reconstruction.

The network problems of remaining for utilizing the Remote Experiment Participation System effectively are realization of multicasting communication, and improvement in effective transmission speed.

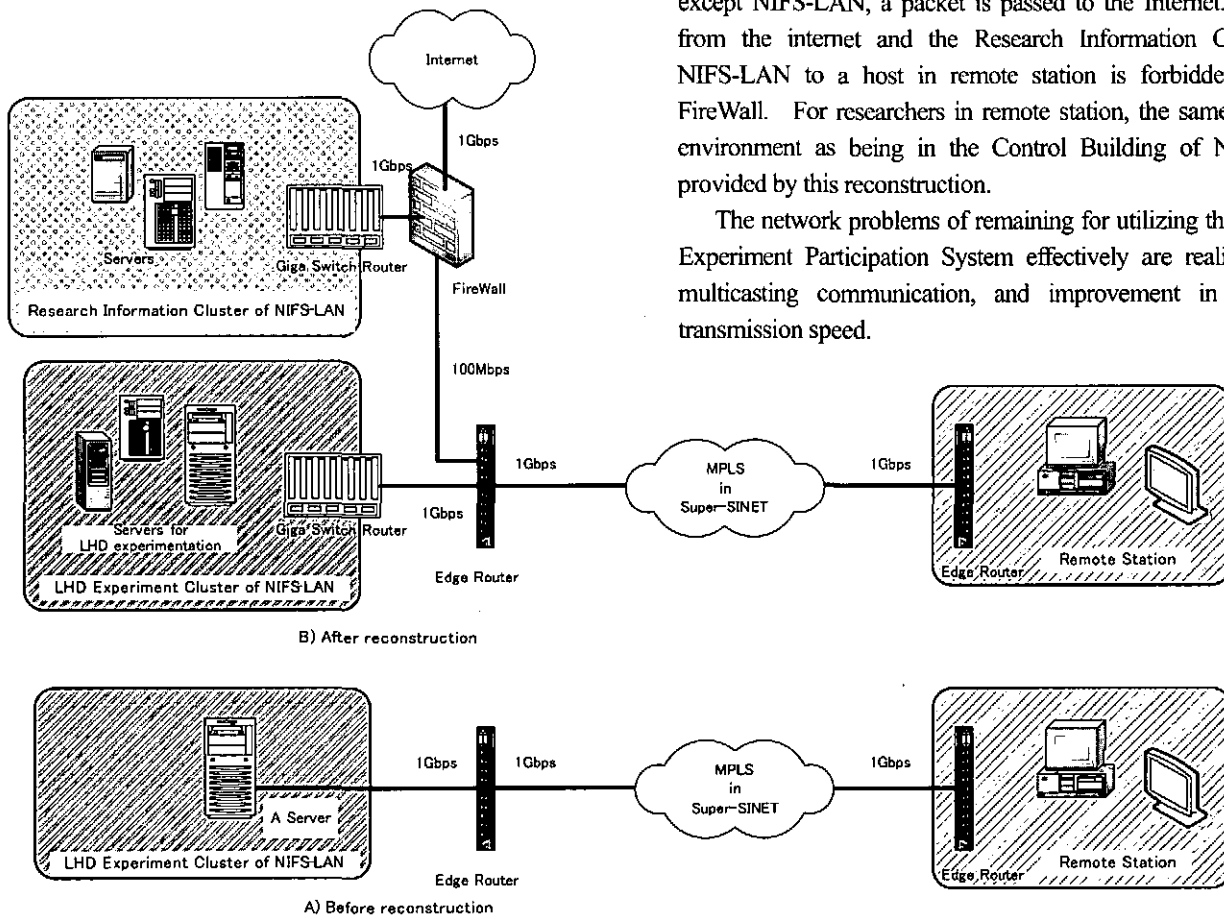


Fig. 1 Schematic view of LHD Experiment Remote Participation System