

§1. Network Reconstruction of LHD Experiment Remote Participation System

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The remote experiment participation system using high-speed network, Super-SINET, has been built since 2002. The High Temperature Plasma Center, University of Tokyo was connected to NIFS-LAN to perform collaboration for superconductivity study by MPLS (Multi-Protocol Label Switching) at the speed of 1Gbps in March 2002. In order to perform collaboration for LHD experiment, many remote stations in universities were connected to LHD experiment LAN by MPLS at the speed of 1Gbps, since 2002. The Dep. of Energy Engineering & Science of Nagoya University in April 2002, the Institute of Advanced Energy of Kyoto University in October 2002, the Art, Science and Technology Center of Kyushu University in April 2003, the Research Laboratory for Nuclear Reactors of Tokyo Institute of Technology in February 2004, the Dep. of Mechanical System Engineering of Hiroshima University in February 2004 and the Dep. of Quantum Science and Energy Engineering of Tohoku University in March 2004 were connected. The network for connecting a remote station and the LHD experiment LAN was reconstructed, and network environment of a remote station was made the same as the control building of NIFS in the 2003 fiscal year [1].

Using limited resources, two remote stations (in Kyoto University Yoshida campus and University of Tokyo) were newly economically connected in the 2004 fiscal year.

In the NIFS side, we designed and constructed as follows;

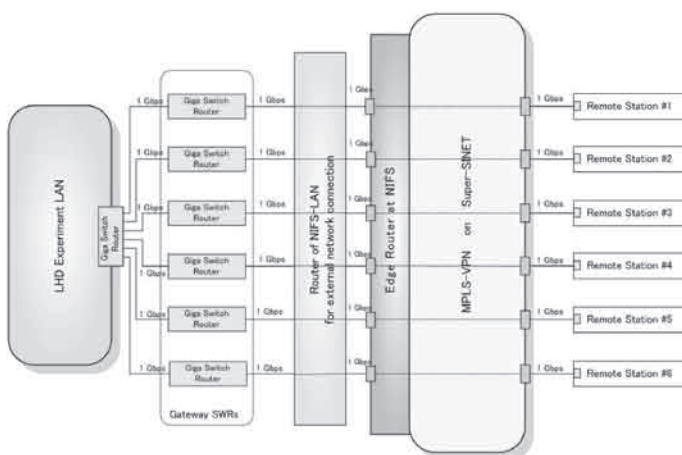


Fig.1 Block diagram of before reconstruction

1) In order to connect with new remote stations, we designed so that one interface port could communicate to two remote stations in MPLS space, because all interface ports of Super-SINET router at NIFS have been used.

2) The LHD-experiment-LAN was directly connected to the Super-SINET router, not through the router of NIFS-LAN for external connection.

3) We designed so that one gateway router can connect with two or more remote stations, and the number of gateway routers was decreased.

In the remote station side;

4) The gateway router which became free was used to establish in the new remote stations.

5) In the Kyoto University campus, VLAN was created on the Kyoto University campus LAN, for there was no optical fiber for connecting with a Super-SINET router at Kyoto University. And the Kyoto University remote station was connected to the LHD experiment LAN through the VLAN.

Since the remote station was combined in consideration of the amount of data which each remote station deals with, the user of a remote station can participate in LHD experiment with reasonable response time.

The block diagram of before and after reconstructing are shown in Fig. 1 and 2.

Reference

1) Tsuda, K., Nagayama, Y., Yamamoto, T., Hasegawa, H. :
Ann. Rep. NIFS (1993-1994) 400.

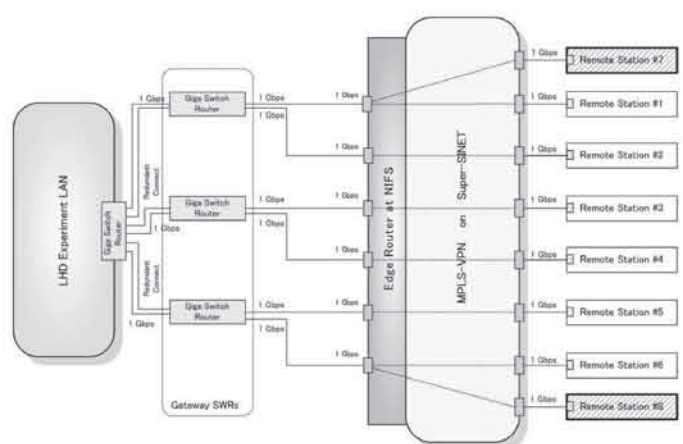


Fig. 2 Block diagram of after reconstruction