Present Status of the Information Network System for SPring-8

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1. Introduction

As construction of the SPring-8 facility has developed, the fourth stage of the network system has been completed and some of the systems have been upgraded during 1996. The Ethernet service area was extended and installed with the Premises Distribution System (PDS) [1] for the Storage Ring (SR) A1, A3, A4, D4, B1 and B2 Zones. They were connected by optical fibers to the main router which was upgraded to a Cisco 7507 in December 1996. The telephone and Personal Handy phone System (PHS) was also extended in December 1996.

2. Optical Fiber and PDS Network

The PDS for the Ethernet and telephone system in the SR building A1, A3, A4, D4, B1 and B2 zones have been set up. As network traffic increased, the yellow cables which had served both the A and D zones in the SR, were divided into two branches. They are linked by optical fibers. The SR outer side Air Blown Fiber (ABF) system was used for this purpose. This ABF system contains sixteen 62.5 micron (GI) and sixteen 10 micron (SM) fibers, which are connected from the SR A to B, C and D zones.

3. Telephone System

A wireless module system (WLM) was temporally adopted for the PHS into the current telephone system (APEX-7400, NEC) which was installed in July 1995. This PHS covers all of the SPring-8 buildings. Sixteen antennae (CS) in the experimental hall and eight in the machine hall were installed for the huge SR (circumference of 1436m). These antennae (CS) were cabled from the Private telephone Branch eXchanger (PBX) - A in the CVCF room, while, sixteen CSs are from the WLM systems in the Linac/Synchrotron (LI/SY).

As a roaming system between each WLM system in the SR and the LI/SY was a preliminary type, the PBX-CS combined type system replaced it in December 1996 in order to achieve multi-functions such as Voice-mail, pick-up or grouping. This new PBX system adopted the optically distributed system. Five remote PBX units were connected by 10 micron SM cables.

4. Computer Network

The PDS boxes of the newly constructed SR zones; A1, A3, A4, D4, B1 and B2, and the guest house were equipped with sixteen 16-port 10Base-T HUBs, three Yellow cable extensions, two Apple Talk getaways (FastPath-V), and two Phone-Net star controllers. The outer network connection, Tokyo University International Science Network (TISN) was replaced by an Inter Ministry Network (IM-Net) through an Osaka NOC on 25 March, 1996 via 512K bps SD (NTT) line, as shown in Fig. 1. The total number of the workstations, personal computers and VME computers became over 300 in March 1996, while the number of SPring-8 staff is 350.

The SPring-8 WWW site was set up in March 1996 to provide information on SPring-8, and the number of hits reached about 38000 during 1996.

A database oriented staff directory and conference room reservation system on the SPring-8 WWW site began in May 1996. Upgrade of the ad hoc Ethernet to Fast-Ethernet (100Mbps) is planned for the increased network traffic expected in the near future due to the whole scale operation of the SPring-8 facility in October 1997. The Fast-Ethernet will be installed all over the SPring-8 buildings and its preparation is under development currently.

Fig. 2 shows a plan for FY 1997. Eight sets of Fast-Ethernet LAN Switchers and 100Mbps Virtual LAN ports will be distributed in the SR building for the SR beamlines group.

Giga-bit Ethernet, 800Mbps Fast Etherchannel or OC-12 ATM switchers will be installed for the central network backbone for the main administration, the SR buildings, and the Structural Biology facility of the Institute of Physical and Chemical Research at Harima in 1998~1999 using the ABS's GI and SM optical fibers.

References
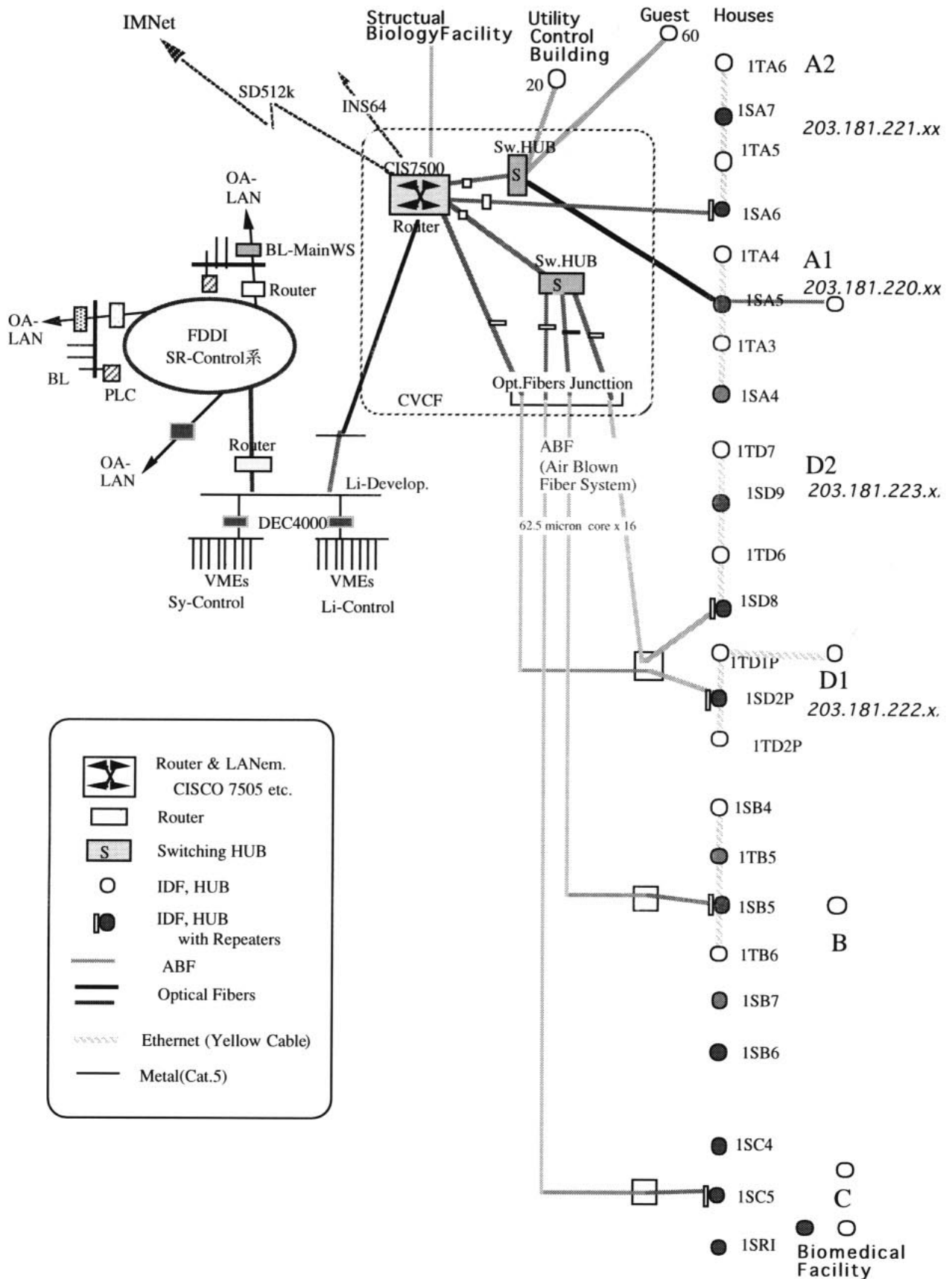[1] Takebe et. al., SPring-8 Ann. Rep. 1995, p.211 (1995).

Fig. 1. The 4th stage of computer network of the SPring-8 (1996).

The following labels appear in the figure:

IMNet

SD512k

INS64

Structural Biology Facility

Utility Control Building 20

Guest 60

Houses

OA-LAN

BL-MainWS

Router

CIS7500 Router

Sw.HUB S

1TA6 A2
1SA7 *203.181.221.xx*
1TA5
1SA6

OA-LAN

BL

PLC

FDDI SR-Control系

Sw.HUB S

1TA4 A1
1SA5 *203.181.220.xx*
1TA3
1SA4

OA-LAN

Router

CVCF

Opt.Fibers Juncttion

Li-Develop.

ABF (Air Blown Fiber System)

62.5 micron core x 16

1TD7 D2
1SD9 *203.181.223.x.*
1TD6
1SD8

DEC4000

VMEs
Sy-Control

VMEs
Li-Control

1TDIP D1
1SD2P *203.181.222.x.*
1TD2P

1SB4
1TB5
1SB5
1TB6 B
1SB7
1SB6

1SC4
1SC5 C
1SRI Biomedical Facility

Legend:

Router & LANem. CISCO 7505 etc.

Router

S Switching HUB

○ IDF, HUB

◐ IDF, HUB with Repeaters
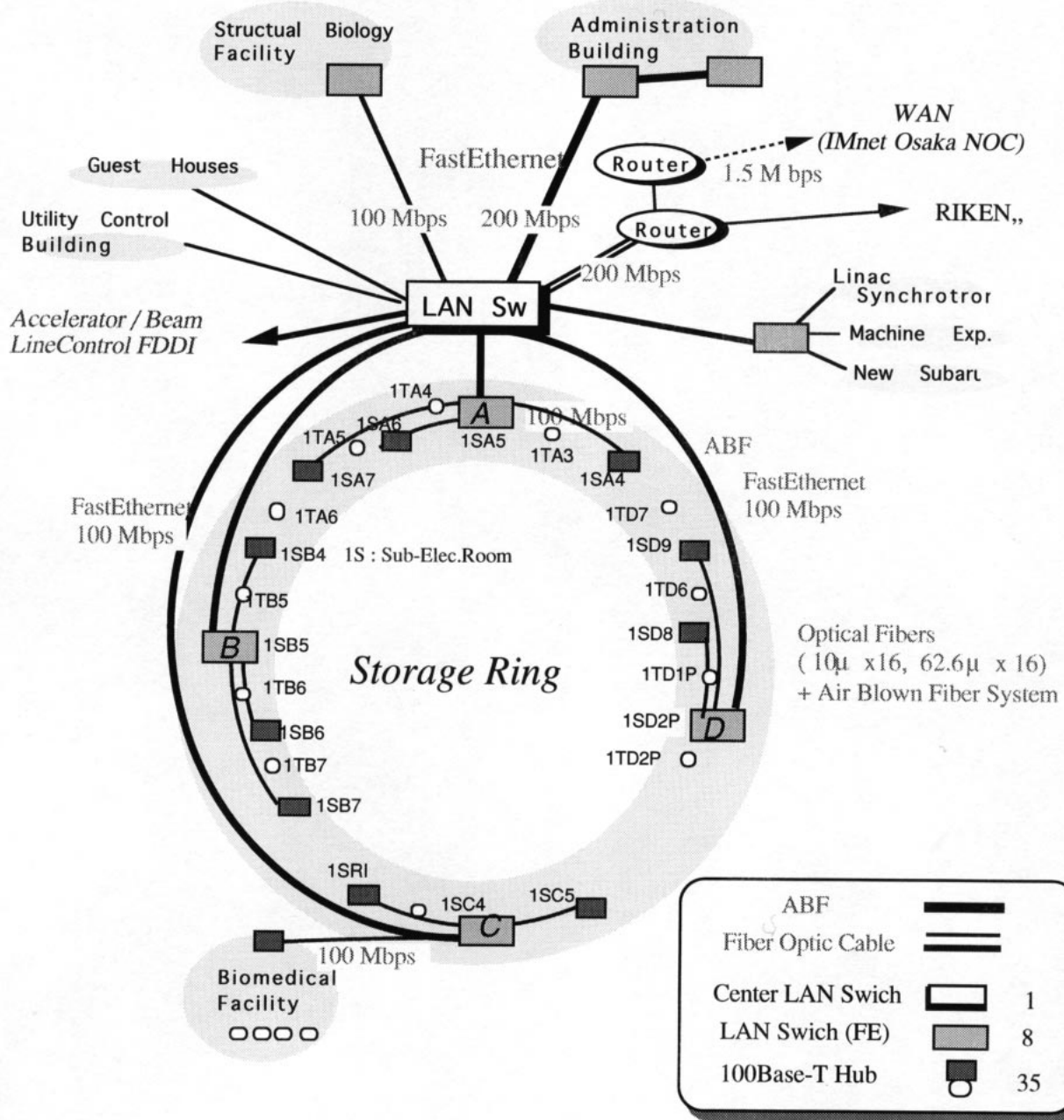
ABF

Optical Fibers

Ethernet (Yellow Cable)

Metal(Cat.5)

Fig. 2. Future plan of the SPring-8 network.