

## INFRASTRUCTURE

### Computer Centre

#### High performance computing cluster

High performance computing cluster comprising of 32 nodes was commissioned. Each node has 2.8 GHz Intel Pentium IV processor and 1 GB RAM. These nodes are connected through Gigabit Switch for collective operations and standard communication services. OSCAR is used as clustering software and Red Hat Linux 9 as operating system. Various compilers and packages like LF95 v 6.1, g77/ f77 3.2.2, PVM v 3.0, LAM-MPI v 7.0.6, MPICH 1.2.6, Intel Fortran Compiler v 8.1, Intel Math Kernel Library v 7.2, SCALAPACK v 1.0, ATLAS, CBLAS, BLACS, IMSL are configured on this cluster.



**Fig. 1** 32 Node high performance computing cluster

#### Parallelization of program for calculation of optics parameters for the off-momentum particles matching of parameters in the lattice for Indus-2

Parallelization of program was done, which performs various tasks for the lattice (Linear), such as amplification factors for closed orbit distortions, beta-beat, tune shift scanning of quadruple, obtaining the stable area of quad and calculation of the optics parameters for the off-momentum particles matching of parameters in the lattice.

Original sequential program was written by scientists working in Beam Diagnostics Section. Parallel version of program is tested with various input data sets. Time required to complete the job when executed reduces approximately by a factor of number of nodes used for computation when used in parallel mode. The parallel version of software is implemented on 8-node cluster.

#### Installation of Intel based backup server

The backup facility for scientific computing users is strengthened by addition of a new backup server. This new server is equipped with two 36 GB and two 140 GB hard disks & 40/80 GB DLT drive. Red Hat Enterprise Linux AS3 operating system is deployed on this server.

#### Enhancements to the Email setup

Email setup was enhanced, by upgrading the internet side email servers with latest SPAMCONTROL packages. This allows filtering out of more number of unwanted emails at the first point of entry to the CATNet. Another enhancement was carried out to allow automated delivery of any of the inter DAE unit emails over the internet in case of Anunet failure.

#### Planning, expansion and upgradation of CATNet

Phase-III of OFC commissioning was started. This phase is intended to increase the reliability of network by making provisions for redundant links to each and every building and replacing the old CORE switch and other edge switches with latest state of the art switches. Also, it will provide backbone connectivity to New Admin, ATDL, HPL, CRYOGENICS and the IT buildings. It will also include the internal cabling of 370-node network of Indus-2. Also, new buildings like BDL, IT building and G-Block, were provided temporary CATNet connectivity using ADSL connectivity option. Backbone connectivity of central complex network was also upgraded from 100 Mbps to 1 Gbps.

#### Internet access setup

For increasing the reliability of 512Kbps leased link for internet connectivity, physical media was changed from existing radio link to OFC.

#### Enhancements to CAT Intranet

Budget monitoring module on CAT Intranet has been enhanced. Only the project coordinators can access information related to their respective projects. The Project coordinators can view the component-wise (M&E, M&S etc) sanction, financial year-wise budget and revised estimate, expenditure and balance.

Expertise details related module has also been

integrated. Individual employees can enter their expertise details like Field of Working, Area of Expertise, Area of Interest, Work done. This has to be approved by the section or division head before it is available for viewing on Intranet.

### Software for security section

Development of client server based software for security section is completed, which facilitates storing and printing of visitors entry pass. The photographs of the visitors are captured through a webcam and stored and printed on entry pass permit. This software is integrated with Personnel Information System of CAT and will be implemented soon.

### CAT Web site enhancements

Web pages related to laser program were designed and developed according to the new design template of CAT website.

### Expansion of the telecommunication network

The telecommunication network was expanded to few buildings which includes G-Block, BDL and IT building. In all 60 new telephones were commissioned in laboratory and residential area.

### Replacement of old telephone distribution boxes

To increase the reliability of telecommunication services, approximately 20 major distribution boxes in residential area have been replaced with fresh krone modules.

### OFC based connectivity to BSNL

To increase the reliability of external connectivity, PRI links between BSNL exchange and CAT end exchange have been installed using a ring network of BSNL, to have reliability at physical media level.

### Commissioning of DSLAM

To provide high-speed connectivity to remote buildings and buildings without OFC connectivity, ADSL technology based DSLAM has been commissioned. This option can provide high speed CATNet connectivity to any location inside CAT campus, where a simple phone line can be extended.

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### Civil & Services Division

Construction work of building for RF and Microwave technology has commenced and is in progress in full swing towards target. First pour of slab was done on 24.06.2005 whereas, preparation of second pour which is targeted to be cast by second week of August, is in progress.

Order for construction of building for LCW Plant extension and Alignment lab was placed. Efficient planning to mitigate stringent environmental conditions is the special feature of this building. This includes construction of underground lab utilizing existing slopping terrain and connecting access corridor from existing beam diagnostics lab.

Training School Building is a single storied RCC framed structure with plinth area of 1300 Sqm. The building houses three laboratories, three small lecture halls of area 57 Sqm each and a big lecture hall of 132-seat capacity with emergency exit. The work is in progress and 25% of the work has been completed.

Training School Hostel Building is a three-storied RCC framed structure with plinth area of 1310 Sqm. The building houses 24 single bedrooms, 12 double bed rooms, and lecture halls, library, computer room etc. for trainee students. The work is in progress and 75% of the work has been completed. The building is likely to be handed over by the end of this year.

Construction of Laser lab, Target lab and Power Conditioning system lab buildings and construction of 18 Type IV-D houses, 48 Efficiency Apartments, control room for water supply automation have just commenced and are in progress.

Tenders for Agricultural Radiation Processing Facility building and building for Cryogenics and MOVPE lab are in process of award of work. Tenders for Yoga and Observatory building are on sale.

Electrical works for power supply to new 600TR (2 nos. of 300TR) water-chilling machine has been completed. Electrification of IT building & 18 of type "C" quarters are completed. As horticulture activity landscape development around Indus-II lab, R&D Block "C" extension building, Plasma development lab have been completed. Open pocket in colony near Sukhniwas lake has been covered under tree plantation.

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