

INFRASTRUCTURE

Computer Centre

Activities have been concentrated around developing software, creating scientific computing infrastructure, doing development for better operations, communication services, networking with internet and intranet services and training etc. Major achievements of Computer Centre and tasks completed during last six months include the following:

1. 8-node High Performance Computing Cluster

8-node High Performance Computing Cluster was upgraded and released to users. Each node is upgraded to 2.6 GHz Intel Pentium-4 processor with 1 GB memory. All nodes are connected for collective operations and standard communication services. OSCAR is being used as clustering software.

Necessary scientific libraries along with MPI communication libraries are installed for parallelization of scientific applications. Aggregate computing power of cluster is 8 x P4 2.6 GHz Hyper Threading processors for processing, with 8 GB RAM and 320 GB Secondary storage.



8 Node High Performance Computing Cluster

2. Parallelization of scientific application

Parallelization of sequential program for computation of the second order hyperpolarizabilities (Beta) of a quantum system was taken up by Computer Centre and completed successfully.

The calculation of second order hyperpolarizabilities of a given quantum system is a computationally demanding task. Parallelization is done using MPI library on 8-node cluster. Sequential program used to take 13 days to produce final results. After parallelization it takes only 2.3 days for producing final results on 8-node cluster.

3. Commissioning of Mathematica 4.1

Graphic Interface (VNC) of the computing server

Omega has been upgraded and Mathematica 4.1 has been released on CATNet for all computing users. VNC enables users to view graphical outputs on respective desktops.

4. Commissioning of OFC

OFC helps in carrying information at high speed (1Gb approx). In Phase I of Commissioning of OFC various buildings and labs were connected to Gigabit Ethernet. These included A, D Blocks, ADL, Indus-1, IMA, and LMD etc.

Phase II of Commissioning of OFC is in progress. The labs covered in phase II include SSLD, C Blocks, and Indus-2 etc.

5. Information management software for quadrupole magnets

Assembly of quadrupole magnets is done in Magnet Development Section, which are used in Indus-2. The calculation of tolerance etc. manually may have human errors and the details regarding the coil at an instance, if required may not be available.

Software has been developed using client server technology in Oracle and Developer 2000 for maintaining information related to magnet assembly, coil dimension and electrical parameters for wound coil and encapsulated coil. The software is used to generate various Magnet Assembly Inspection Reports.

6. Information management software for CMPS jacks

In Indus-2 for the positioning of magnets some jacks are required which are called CMPS - Compound Motion Precision System Jacks. Each Jack assembly contains components with standard shape and size. The components are inspected and an inspection report of Jack assembly with details regarding backlash and tolerance is produced.

The calculation of tolerance etc. if done manually may have human errors and the details regarding the Jack at an instance, if required may not be available. Software was developed using client server technology in Oracle and Developer 2000 for maintaining dimensional details of components of jack, Quality Control details and Jack assembly information. The software provides Inspection report of Jack assembly and Queries related to components and Jacks.

7. Software for LHC computing grid project at CERN

Development and implementation of POOL-RDBMS Backend Prototype project, which is a part of the LHC computing grid project at CERN was successfully completed. This is under the DAE-CERN software collaboration. This

software is being developed as a Component of the POOL project. The project provides a common persistency framework for LHC experiment data.

The work included the design of the prototype as a plug-in in the POOL framework, finding out a solution for remote database connectivity, implementation of various interfaces of the POOL storage manager for the Relational back-ends and finally testing the cross technology referencing concept of the POOL storage manager.

8. Telephone exchange

Installation and commissioning of Omni PCX 4400 was completed in plant area and residential area. This will support the voice communication network for growing CAT campus and its Residential colony. These exchanges, identical in nature, provide digital and analog lines. They are interconnected through PRI line, which gives 30 channels.



Omni PCX 4400 Exchange

Omni Pcx4400 is a very advanced communication server with various features like voice mail, auto attendant, centralized call accounting, centralized NMS, name based dialing, public address system, voice guide etc. These exchanges are connected to BSNL, Indore by two 2 mbps PRI (2 X 30 channels) links.

9. Enhancements to CAT Intranet

Many new features have been added to CAT Intranet, which include CAT seminar management, Committee details, training school feedback form, PC-AMC details etc.

10. CAT Web site

Development and enhancement of CAT web site with a new look and feel was carried out. The main page of CAT Web

site is recreated and a new feature for tender archiving is added. The web site now uses latest technological trends in the field of web site creation and maintenance.

11. Software for CAT Training School

For Training School all types of information related to the TSOs is to be maintained. A software package is developed for maintaining information regarding the complete training cycle.

12. Payroll for BRIT Mumbai

Payroll package developed by Computer Centre, which is being used in CAT, has been implemented at BRIT, Mumbai. This software has been customized as per the requirement of the unit and is in regular use at BRIT Mumbai. The same software is also used in DAE-HO and AERB, Mumbai.

13. Telephone billing software

Enhancement to web based software for Telephone data management and billing as per the requirement of new telephone exchange was completed.

14. ERNET POP activities

ERNET India has added value to its services by providing Intrusion Detection Services (IDS) and EMS Monitoring of CAT, PoP from ERNET, HQ Delhi. In addition, ERNET CAT PoP has also upgraded the existing link of SGSITS to 256 kbps from 64 kbps and added two new clients – DAVV (512 KBPS) AND PMGBSC (dial-up).

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