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INDEM - IIITA Network  
Development, Engineering  
and Management

**INDEM**  
**IIITA Network**  
**Development, Engineering and management**



**INDIAN INSTITUTE OF INFORMATION TECHNOLOGY  
ALLAHABAD**



**INDEMICA**  
**IIITA Network Development, Engineering and Management**  
**Information Center for Assistance**

## Introduction:

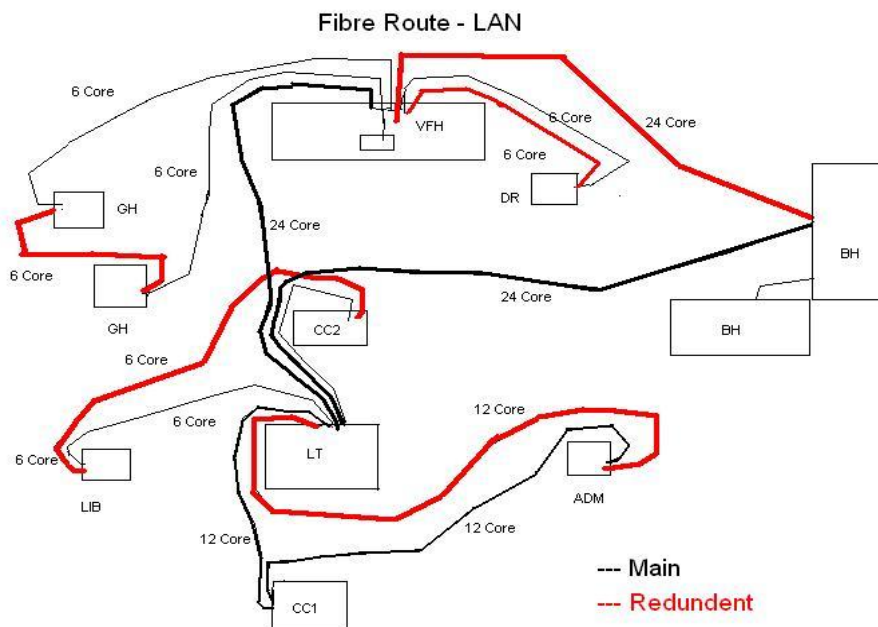
INDEM is a technical group of highly trained students, skilled technical experts under chairmanship of a faculty in-charge. Patron of this group is Hon'ble Director.

Since its inception this group has several technical achievements in its credit. The main responsibility of INDEM includes:

- Network planning, implementation and management
- Installation, configuration and management of central servers
- Experimentation, implementation and monitoring of software services over Internet/intranet
- Research and developments at server technology

## Intranet:

IIITA campus LAN is planned and established for 2000 nodes spread over 150 acres land piece. From management point of view LAN is classified into two categories:



- Academic Area LAN  
Consists of 5 buildings including Administration, CC1, CC2, Lecture Theater, Library
- Residential Area LAN  
Consists of Boys Hostels, Girls Hostels, Guest House, Faculty Hostel and Professors' residence

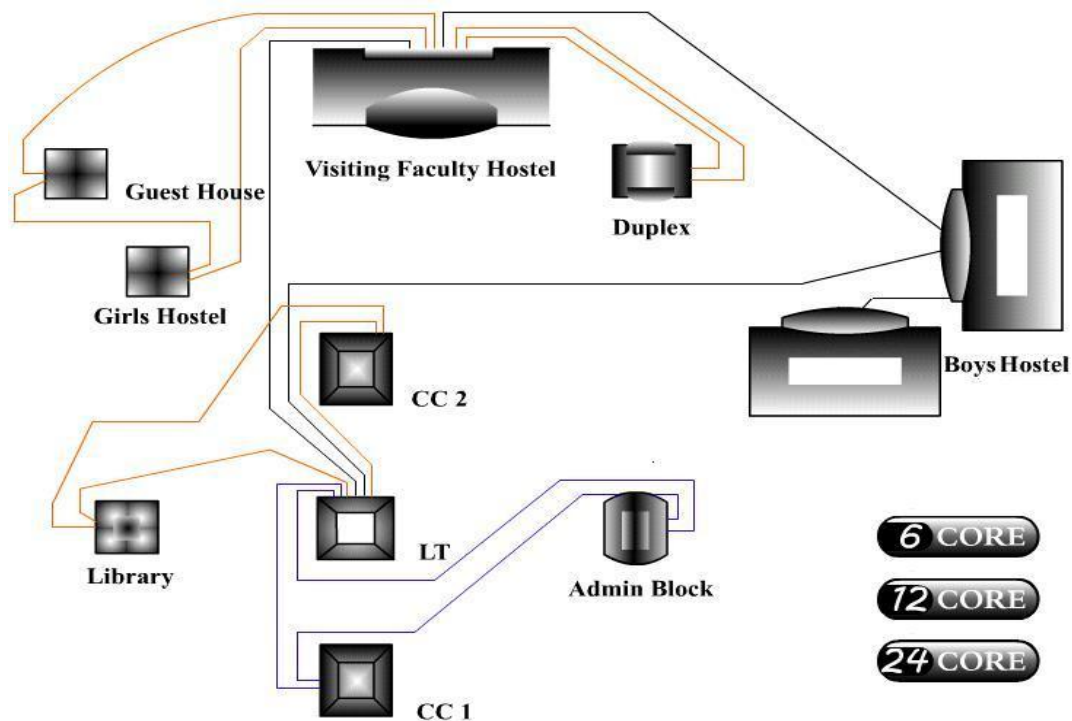
All buildings are connected over 6/12/24 code single mode optical fiber cable. The central server room (INDEMICA) is established in the Lecture Theater along side a 1000 pair 140 MBPS Telephone Exchange. One server room is established in each building to terminate OFC and to install network up linking devices and local servers.

Indoor cabling in each building is done structured using Ethernet CAT 5 to support 100 MBPS client-side network speed. Servers and central switches have been installed to support 1000 MBPS server-side network speed.

At present INDEM is maintaining 50 plus servers and over 1000 personal computers including 30 plus labs.

### Computing Infrastructure:

The Institute has 30+ laboratories for basic and advanced computing as well as specific laboratories for Research & Development, which include Artificial Intelligence, Bio-Informatics, Wireless Communications and Computing, Digital Signal Processing, Robotics, Image Processing, Language Processing, Data Structure and Database Management, Network and Web Technology etc. An excellent computing infrastructure is spread over a Local Area Network of 2000 nodes across the campus connecting all the laboratories and offices as well as residential complex via single mode Fiber Optic cable of Gigabit transmission capacity.



IITA LAN consists of 60+ high end dual processor Intel Xeon servers and over 1000 P IV computers, operates on Gigabit server interfaces and 100 MBPS network speed. All network switches used are CISCO and D-Link products to support reliable round the clock uptime of network services. A CISCO 4000 central switch with fiber and Ethernet interfaces serves as backbone for connectivity of all buildings.

Institute maintains most of the Internet services for its academic communities to name a few are DNS, WWW, Mail, Proxy, Firewall / Gateway, LDAP etc. out of which LDAP is very rare and high-tech implementation for centralized user authentication on any institutional LAN. Internet access is established through 5 MBPS leased lines and CISCO 3600 routers for secure and optimum performance. Users' computers are very much protected from any kind of external threats such as virus / worms / hacking by implementing a central Virus Scanner and Spam filter software services at the gateway to the network. To cater the storage need of data generated by students and faculties out of their academic / computing activities, Institute provides a central storage server of capacity in Terabytes (at present 8 TB, scalable up to 36 TB).



Network being maintained mostly by UG and PG students under guidance of technical experts and faculties, has a successful implementation of Live Multimedia Streaming service to its credit. Streaming service is maintained using high-end servers and sophisticated audio / video equipments for live web cast of events take place in the campus.

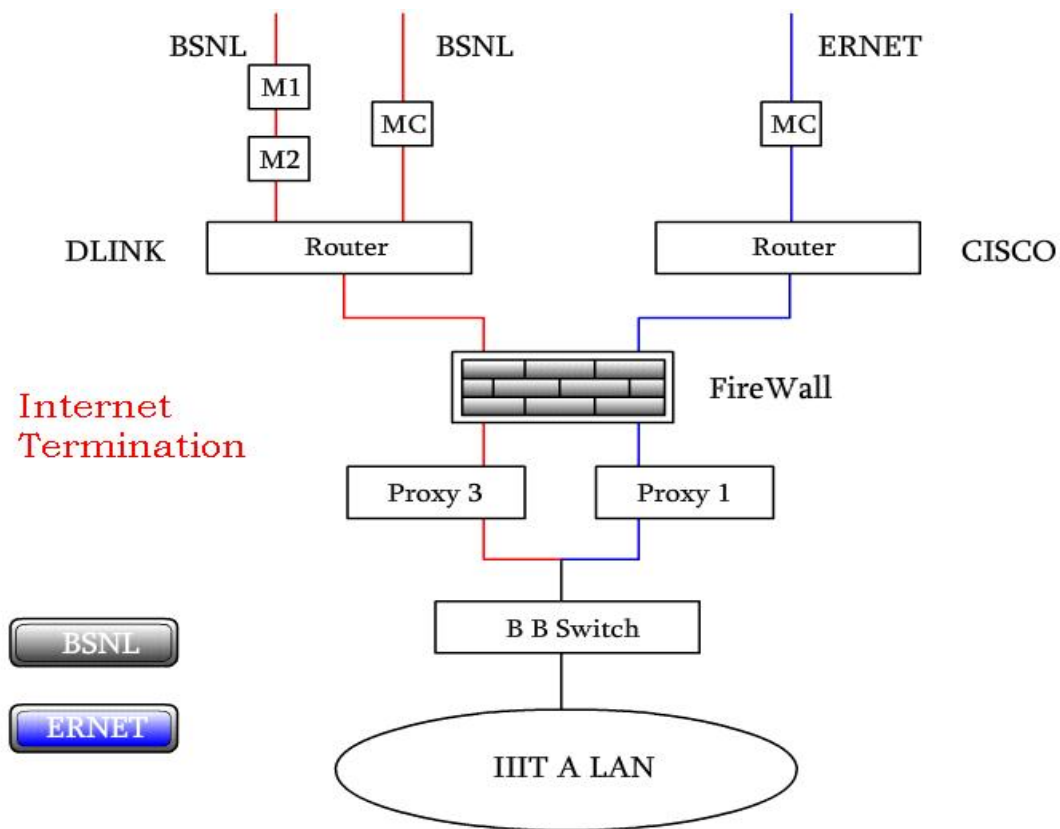
Institute has also rich repository of software for experimentation and Research & Development activities of the students in their

academic curriculum viz. all software products of Microsoft through MSDNAA, Oracle 8i, 9i, 10g for RDBMS applications, Katia & Igrid for Robot simulation, Rational Rose for Software Engineering and project planning / management, Matlab, Mathematica and Statistica for scientific computations, AutoCAD for product designing, Electronics Workbench for simulation and testing of circuits, 3D StudioMax for 3-D graphics applications and image processing, Solaris, Linux, Windows etc.

**Policies:**

Network policy is formulated to regularize the healthy use of institutional computing resources in the best interest of learning and high-end computations. Some of them are as:

- Email address to all IIITians (under respective group, online registration for students program-wise (ug / is / bi / se / wcc / mba / msc.iiita.ac.in)
- Email address to all groups as group\_id@lists.iiita.ac.in
- Everyone group email service as everyone@lists.iiita.ac.in
- 250 MB inbox size for all students/staff and 500 MB for faculties/officers
- 500 MB space on central storage server to all registered users
- 20 MB space to each registered users for hosting web profiles
- Central authentication for all Internet / intranet services (except from admin, guest house, faculty / staff residences)
- Software repository on a central server for installation / evaluation and experimentations
- Central database server for RDBMS based experimentation
- Mails to everyone circulated after moderation by MailAdmin within office hours only
- Integrated web side of all the programs running by the Institute is integrated with Institute website (www.iiita.ac.in)
- Website for alumni to highlight their status and achievements
- Lifetime email address (without login) to alumni - forwarding emails from IIITA mail server to their current email address
- IIITA forum service and chit-chat rooms
- Highlighting performance of students in campus placements through website
- Highlighting good projects done by students / faculties, paper published by academic communities through website
- Encouraging use of online journals provided by MHRD (INDEST)
- Automated mail / spam filtering at network level
- Internet access through proxy authentication in all labs
- Email address to all clubs, activities, events and visitors



### Central Storage:

Institute provides storage space to faculties/students on a central storage server. Server is running with RAID 5 using Adaptec RAID controller on Fiber channel. This server is used to host inboxes of all IIITA mail users and their web profiles in cyber space. Operating system of this server is Redhat 9.0 Enterprise edition. Windows user accesses this server via Samba service. This server also host scanned material under UDL project.

### Central Authentication:

Access to network resources through various integrated services after proper authentication and authorization is a big technical challenge for any organization operating such a big network for intranet / Internet services. INDEM implemented a service of directory publishing and access through central authentication via LDAP using OpenLDAP software from open source domain. It's a rare implementation at institutional network. At present INDEM maintains around 2000 user accounts on this server.

### Central Anti-Virus Solution:

A Norton Anti-Virus solution with real time file scanning and protection has been implemented by INDEM using corporate edition of Norton Anti-virus 10.0. All networked PCs are registered on this server, which facilitates monitoring and quarantine the malicious programs spreading over LAN.

### **Web-casting Service:**

Started with idea coined by our Hon'ble Director during the 80<sup>th</sup> All India Vice Chancellors Meet organized in Nov, 2005. INDEM took his idea as a technical challenge to implement with all the resources and expertise available in-house.



On successful demonstration of streaming of live audio/video signal on Internet, Hon'ble Director, in appreciation named this exciting service as "TRINETRA". The service is totally managed by INDEM student members.

### **INDEMICA Zones:**

For better management of computing resources by INDEM, INDEMICA has different zones to host different type of services as:

#### **Eureka:**

Research & Development activities by INDEM on Server / Network Technology

#### **Heartbeat:**

Essential services like Router, Gateway, Firewall, DNS, Proxy, SOCKS, LDAP, WINS

#### **Lifeline:**

Required services like SMTP, POP, WWW, NNTP, FTP, Data Archive, Software Repository

#### **BITS:**

Basic Information Technology Solutions like DBMS clients, SQL, C++, Java, .NET, HTML, XML

#### **Byte:**

Bet Your Technical Expertise applications like ORACLE server, MatLab, Mathematica, Statistica, Webots

#### **Gallery:**

Guards At Low Level Execution of Remote Installations

### **Software Repository:**

A rich software repository has been maintained by INDEM. All these software have been purchased with single/multiple user licenses as per need. Students don't need to carry CDs of software for their use instead they can access a software repository server for any software to install on their computer attached to IITA campus LAN.

Software	Version	Media (Qty)	Description
SuSE Linux	7.0, 7.1, 7.2, 7.3, 8.1, 9.0, 9.1	CD (30)	Multi purpose operating system
Red Hat Linux	6.0, 7.0, 7.2	CD (23)	Multi purpose operating system
Visual Studio .Net	Professional	CD (5)	Program development kit useful for students' projects
Drive Image	4, 2002	CD (2)	Hard disk backup tool
Power Builder	6	CD (4)	Front end development kit useful for students' project
Auto CAD	2000	CD (2)	Useful for mechanical design
McAfee	5.0.1	CD (1)	Anti virus tool
Partition Magic	5	CD (1)	Hard disk partitioning tool
Matlab	6	CD (4)	Mathematical programming tool kit
Corel Draw	9	CD (3)	Graphical designing tool
Norton System Works	Professional 2003	CD (1)	Anti virus tool
Visual Studio	6	CD (6)	Program development kit useful for students' project
Norton Enterprise Solution	4	CD (2)	Anti virus tool
Windows NT server	4	CD (3)	Network operating system
Work Bench		CD (1)	Electronic Circuit design tool
Visual Workstation		CD (10)	Silicon Graphics processing tool
Statistica		CD (1)	Statistical programming tool kit
3D Studio Max		CD (2)	Graphics development tool kit
Windows 2000	Professional	CD (1)	PC operating system
Office 2000	Professional	CD (2)	Documentation kit
Windows 98		CD (1)	PC operating system
Turbo C++		CD (1)	General programming language
Microsoft Front Page	2000	CD (2)	Web site development tool kit
SOLARIS	8	CD (10)	Special purpose operating system
Symantec Multi-tier Protection	Corporate Edition	CD (5)	Anti virus tool kit



Software	Version	Media (Qty)	Description
Windows 2000	Server	CD (10)	Network operating system
Oracle	8i	CD (3)	Database management system
Developer 2000		CD (1)	Front end development kit
Office XP	Professional	CD (6)	Documentation kit
Windows XP	Professional	CD (1)	PC operating system
Windows NT	Workstation 4.0	CD (1)	PC operating system
Dragon Naturally Speaking	5	CD (1)	Speech recognition software
Mathematica	4	CD (7)	Mathematical programming kit
Oracle	10g	CD (20)	Database management system

The repository server is maintained for exclusive use of IITA family members and any unauthorized access to this repository is technically prohibited.

#### **Maintenance Cell:**

INDEM also maintains an Innovative and support center for fabricating advanced computers and server for specific use of institutional academic as well as research & development activities. Students get issued hardware on their names in the very first semester of their programme to assemble computer for their own use during the course.

#### **Software Development:**

INDEM has three copyright on software developed for automation of Library, Store & Purchase, Examination Cell and student information. These Information Systems are pure web-based general-purpose solutions.

## **INDEM Group:**

Patron: **Dr. M. D. Tiwari (Director)**  
Chairman: **Dr. U. S. Tiwary, *Dean (Academics)***  
Net Admins: **Mithilesh Mishra**  
**Balwant Singh**  
**Ajay Kumar Tiwari**

### ***Students:***

#### Online Consultants

Alok parlikar, Ankit Rajvansh (Alumnae)

#### Campus Consultants

K. Ashwin Kumar, Rishi Kapoor, B. Srikanth,  
Rajan Arora (Final semester students)

#### Active Members

Pankaj Trivedi, Kotari Vijay, Prabhash Dhyani,  
Chivukula Koundinya (Junior students)

