ANNUAL REPORT
2016-17

ERNET INDIA

An autonomous Scientific Society under Ministry of Electronics and Information Technology, Government of India

Contents

PREFACE

ERNET India is an Autonomous Scientific Society under Ministry of Electronics and Information Technology (Govt. of India). ERNET has made a significant contribution to the emergence of networking in the country. At the inception time, it brought the Internet to India and has supported in building up national capabilities in the area of net-working, especially in protocol software engineering and tools for collaboration. Over a period of years, it has successfully built a large network that provides various services to the intellectual segment of Indian society i.e the research and education community and also supported creation of pool of strongly trained manpower.

Underpinning this growth is a set of new technology levers that have redefined how services are being organised, delivered and consumed. These technology levers are helping address key imperatives presented by the current and evolving demands of a digital consumer. Focus of ERNET India is not limited to just providing connectivity, but to meet the entire needs of the academic and research institutions by providing IT consultancy, project management, training and other value added services such as video conferencing, domain registration, CUG services. Further to keep pace with the developing technology and enhancing innovation, ERNET focuses in research and development in newer areas like Internet of Things (IoT). ERNET has been working with various Ministries to see how IoT can improve efficiencies across. Additionally, to keep pace with the latest technological directions in new methods of networking, it is also supporting research plans in the area of Software Defined Networks (SDN). ERNET has also been pioneering research work in the area of using 'TV White Space' for last mile connectivity in the remote areas. ERNET is also carrying out research work in the area of Li-Wi in collaboration with industry and IIT Madras.

With International circuits, now connecting countries across the globe at Gigabits per second and national e-infrastructure facilities being rolled out in several countries, it becomes imperative to create awareness among the target user community about the emerging cyber-infrastructure. Towards this, ERNET India has been hosting several workshops and conferences. In February 2017, ERNET India hosted the 43rd Asia Pacific Advanced Network (APAN) meeting in New Delhi. This 5-day event hosted by ERNET India included tutorials, technical presentations and demonstrations covering advanced network technologies and applications. For the Global Improvements benefits to educational & research community. In India, ERNET being National Roaming Operator of eduroam- free global wi-fi roaming services has been provided to all National and International users at APAN.

ERNET worked with MeitY in taking the IoT concept at the policy level and Organized IoT Ideation workshop, Interim IoT framework report and Draft IoT policy. To support Entrepreneurship in the area of IoT, a Centre of Excellence (CoE) was launched in Public Private Partnership (PPP) mode with NASSCOM. The CoE is supporting the government initiatives in the social areas

such as agriculture, healthcare, water, transportation, energy, security and privacy of data. As a part of this project, NASSCOM has setup a Internet of Things (IoT) lab at Diamond District facility, and it was formally inaugurated by Shri. Ravi Shankar Prasad (Minister of Electronics & IT) and Shri. Priyank Kharge (IT Minister in Govt of Karnataka) in July 2016. The lab is being used by start-ups to work on technical design to product prototyping by way of democratising innovation in collaboration with academic/ industry partners. Total of 9 startups incubated at CoE and all of them have prototypes and under which 4 patents have been filed. Under academic engagement plan, IoT curriculum group has been formed for active development of courseware for IoT.

Further, CoE organized the tech-talks from academia/ industries, academic community meet between academic community and industry partners, IoT innovation challenge for engineering colleges, workshops on current trends for academia/start-ups. Also, "Hack2Build" an IoT hackathon was organized for industry/ academia at Hyderabad in November 2016 along with ICANN for start-ups to work on the theme of "Smart Cities/ Smart Villages". The 4 start-up teams were selected as winners and they were felicitated by Hon'ble Minister, Shri Ravi Shankar Prasad and ICANN Chairman Shri Steve Crocker.

To become a global hub for innovation in digital technology, 'Digital India' program with the vision to transform India into a digitally empowered society and knowledge economy. The vision is centered on three key areas : Digital Infrastructure as a Utility to Every Citizen, Governance & Services on Demand & Digital Empowerment of Citizens. To realize the same, a need has been felt to Wi-Fi enable all the Higher learning Institutions/universities in the country as a part of 9th pillar (Early Harvest programs) under Digital India program as Wi-Fi has become a universal expectation among Universities/institutions students, faculty & staff as well as visitors/guests. For achieving the same, MeitY in consultation with MHRD identified five universities and directed ERNET India for setting up Wi-Fi enabled Campus Networks at Allahabad, Pune, Osmania, NEHU & Utkal University. ERNET has also been supporting educational institutions with 'eduroam' implementation added to the Wi-Fi, to provide global roaming to students and academicians across the institutes covered worldwide by 'eduroam'- one world –one connectivity.

ERNET has implemented a project titled as "Enabling Schools with Smart Virtual Class Room Facility" under the Digital India initiative launched by MeitY. The project is aimed at enabling a virtual Classroom teaching through establishment of ICT enabled smart virtual classroom facility in 3204 schools plus 50 DIETs spread across 7 states of the country. A Centralized control system has been established in Delhi at ERNET's data centre which hosted the MCU, Streaming/ Recording server and other associated component for multiparty audio/ video interaction and also offline access of classroom sessions round the clock for learning / collaboration between all the stakeholders. The basic aim of the project is to create a technology enhanced classrooms that foster opportunities for teaching and learning by integrating learning technology, such as computers, electronic white boards, projectors, specialized software, interactive audio-video systems, etc

ERNET India contributes as a nodal agency for IPv6 Applications, consultancy, educational Services in many domains and Domain Registration under ***ac. in, res.in and edu.in.*** ERNET India has successfully hosted several workshops and IPv6 hands-on trainings, and continues to provide it at various locations. ERNET has also geared up consultancy service in field of IPv6 infrastructure development and implementation.

ERNET is doing a project of providing connectivity and infrastructure to 204 schools of Srikakulam, Andhra Pradesh. Under the Project, ERNET created a test bed for using 'White Spaces' in the TV band, which was successfully tested for connecting 5 different schools in the Srikakulam, district of Andhra Pradesh.

ERNET India has earlier executed MeitY funded R & D project "Prototype a 6LoWPAN network towards managing utility based Wireless Sensor Networks" and demonstrated with Agriculture use-case. Currently, ERNET is extending the project outcomes to Smart Metering prototype using LoRA. The architecture includes STM32-Nucleo, Arduino compatible board with ultra-low power MCU ARM Cortex-M with LoRA RF expansion board is interfaced through Serial communication to DLMS protocol compliant energy meter.

Under Accessibility India Campaign, one of the target is to make all Govt./State Govt websites accessible to all. For this, Department of Empowerment of Persons with Disabilities (DEPwD) has funded ERNET India to make Govt. websites accessible as per GIGW and WCAG2.0 (A, AA level). ERNET has been given 917 websites across 20 states and 3 UTs of the country to make them accessible and responsive.

Governing Council, ERNET India

01.04.2016 to 31.03.2017

1	Shri Ravi Shankar Prasad Hon'ble Minister of Electronics & IT Ministry of Electronics & Information Technology, New Delhi	Chairman 1.4.16 to 31.3.17
2	Shri P.P. Chaudhary Hon'ble Minister of State Law & Justice, Electronics & Information Technology	Deputy Chairperson 23.11.16 to 31.03.17
3	Dr. Aruna Sharma Secretary Ministry of Electronics & Information Technology, New Delhi	Vice Chairman 1.4.16 to 29.7.16
	Mrs. Aruna Sundararajan Secretary Ministry of Electronics & Information Technology, New Delhi	 29.7.16 to 31.3.17
4	Dr Ajay Kumar Additional Secretary Ministry of Electronics & Information Technology, New Delhi	Member 23.11.16 to 31.03.17
5	Ms Anuradha Mitra Addl Secretary & Financial Adviser Ministry of Electronics & Information Technology, New Delhi	Member 1.4.16 to 31.3.17
6	Shri Rajiv Kumar Joint Secretary (ABC Division) Ministry of Electronics & Information Technology, New Delhi	Member 1.4.16 to 31.3.17
7	Shri Sanjiv Mittal Joint Secretary & Group Coordinator (e-Infra) Ministry of Electronics & Information Technology, New Delhi	Member 1.4.16 to 31.3.17
8	Shri Rajiv Bansal Joint Secretary & CEO NIXI, New Delhi	Member 1.4.16 to 22.11.16

9	Shri Shashi Prakash Goyal Joint Secretary (Tel) & Mission Director (NMEICT) Ministry of Human Resource Development, New Delhi	Member 1.4.16 to 22.11.16
	Shri Vinay Sheel Oberoi Secretary (Higher Education) Ministry of HRD, New Delhi	23.11.16 to 28.2.17
	Shri Kewal Kumar Sharma Secretary (Higher Education) Ministry of HRD, New Delhi	1.3.17 to 31.03.17
10	Shri R S Sharma Chairman Telecom Regulatory Authority of India, New Delhi	Member 23.11.16 to 31.3.17
11	Shri Ali R Rizvi Joint Secretary Ministry of Health & Family Welfare, New Delhi	Member 1.4.16 to 22.11.16
	Shri C.K. Mishra Secretary Ministry of Health & Family Welfare, New Delhi	23.11.16 to 31.3.17
12	Shri Virender Kumar Director Department of Space, Bangaluru	Member 1.4.16 to 22.11.16
	Shri K. Sethuraman Outstanding Scientist & Director Deptt. of Space, Bangaluru	23.11.16 to 31.3.17
13	Dr. Swati Basu, Scientific Secretary Office of the Principal Scientific Adviser to the Govt. of India New Delhi	Member 1.4.16 to 22.11.16
14	Shri Sanjay Bahl Director General Indian Computer Emergency Response Team Ministry of Electronics & Information Technology, New Delhi	Member 1.4.16 to 31.3.17

15	Prof. Huzur Saran (Representative of Director) Indian Institute of Technology, New Delhi	Member 1.4.16 to 22.11.16
	Prof. V Ramagopal Rao Director Indian Institute of Technology, New Delhi	23.11.16 to 31.3.17
16	Shri R. Chandrasekhar President NASSCOM NOIDA	Member 23.11.16 to 31.3.17
17	Ms. Neeta Verma Director General NIC, New Delhi	Member 1.4.16 to 22.11.16
18	Shri R.M. Aggarwal DDG (NT) Department of Telecommunication dealing with IPv6, New Delhi	Member 1.4.16 to 22.6.16
	Shri Rajiv Sinha DDG(NT) Department of Telecommunication dealing with IPv6, New Delhi	23.6. 2016 to 22.11.16
19	Dr. Rameshwar Singh Project Director Directorate of Knowledge Management in Agriculture Indian Council of Agricultural Research, Krishi Bhawan, New Delhi	Member 1.4.16 to 22.11.16
20	Dr. Neena Pahuja Director General ERNET India	Member Secretary 1.4.16 to 31.3.17

General Body of ERNET India

01.04.2016 to 31.03.2017

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KEY HIGHLIGHTS

Financial Highlights for 2016-17

- Total Revenue grew by 48% to reach at ₹ 106.65 crores from ₹ 71.98 crores in previous Financial Year. This is first time in the history of ERNET that it has crossed revenue of ₹ 100 crores.
- Surplus grew by 29% to reach at ₹ 9.94 crores from ₹ 7.69 crores in previous financial year.
- Corpus has reached to ₹ 94.54 crores.

New Research Directions

- ERNET supported MeitY in policy formulation on Internet of Things (IoT). ERNET and NASSCOM worked in Public Private Partnership (PPP) mode to setup a Center of Excellence in IoT to nurture and promote startup culture and jumpstart innovation in India. It was formally inaugurated by Shri. Ravi Shankar Prasad (Minister of Electronics & IT) and Shri Priyank Kharge (IT Minister in Govt of Karnataka).
- ERNET India hosted the 43rd Asia Pacific Advanced Network (APAN) meeting in New Delhi. APAN represents consortium of education research networks (ASIA and OCEANIA region).It also represents a high speed network which interconnects education research networks in Asia & OCEANIA regions.
- Under Accessibility India Campaign, one of the target is to make all Govt./State Govt websites accessible to all. For this, Department of Empowerment of Persons with Disabilities (DEPwD) has funded ERNET India to make Govt. websites accessible as per GIGW and WCAG2.0 (A, AA level).
- ERNET continued the work on using 'White Spaces' in the TV band, which was very successfully tested for connecting 5 different schools in the district Srikakulam.
- ERNET India has initiated internally funded LiFi pilot project to be executed jointly with IIT Madras to carry out visible light communication (VLC) experiments helping towards field deployments in LiFi use case scenarios such as Transport, Health and Smart City.
- With the government thrust on promoting e-payments, ERNET

organised training to educate staff in the use of e-payment applications such as Internet banking, Paytm, credit/debit cards along with the safety precautions one need to take while using such payment systems.

Connecting India as part of Digital India Initiative

- As part of Digital India initiative, a project was initiated to provide Virtual class room teaching facility in 3204 schools and its corresponding 50 DIETs in 7 identified states in phase - I. 01 central infrastructure facility has been created under the project to act as a central repository for accessing all previous sessions in an offline mode. The installation and commissioning of 2852 Schools and 50 DIETs have been completed. SVC infrastructure can be of great use towards communicating various messages of social importance and providing trainings to the society like training on disaster management etc.

- Under Digital India program as Wi-Fi has become a universal expectation among Universities/institutions students, faculty & staff as well as visitors/guests. For achieving the goal, MeitY in consultation with MHRD identified following five universities and directed ERNET India for setting up Wi-Fi enabled Campus Networks at Allahabad, Pune, Osmania, NEHU & Utkal University. MeitY desired that ERNET India should setup Model Wi-Fi enabled Campus Network as a Proof of Concept at all these five Universities so as to enable on campus students, faculty, teachers, staff, guests to have entry to cyber world having intelligent Wi-Fi devices such as Tablets, smartphone, Laptop Computer to access, retrieve and post information on any-time-any-where basis across Wi-Fi enabled Campuses.

  - In, Allahabad University, Wi-Fi network with state-of-the-art technologies in conformity with international standard is installed, commissioned & is fully operational. As on date, more than 7000+ Wi-Fi users have been using Wi-Fi Network.

  - At Savitribai Phule Pune University (SPPU), Pune, Project Implementation is completed, made operational and in use by the Users of SPPU.

  - Setup & operationalized Gigabit OFC based Wi-Fi enabled Campus Network with tier-3 architecture at Osmania University, Utkal University & norther-Eastern Hill University through upgrading the existing network. Procurement, delivery & installation of major active items have been done as per release of fund by MeitY.

- ERNET added over 200 Indian institutes in the list of globally connected institutes using 'eduroam'. This service realizes the objective of **'one world one connectivity'** by providing a secure, seamless world-wide roaming access service over shared virtual Wi-Fi campuses to researchers and academicians.

- The eduroam facility has been successfully availed by Indian and foreign participants in the APAN43 held in India. eduroam session was also organised in conference.

- ERNET is an exclusive Registrar for Domain Services for the education and research under .in registry – edu.in, res.in and ac.in. The registration was automated and over ***6020*** domains were processed. ERNET is also registering विद्या.भारत (vidya.bharat) domains.

- ERNET India operates a VSAT network in C-Band using GSAT satellite for providing Internet & Intranet access to education and research institutions located all over the country. The Master Earth Station (MES) which is also functioning as the Network Operations Centre (NOC) is located at Bengaluru. During the year, the technology of the VSAT network has been upgraded to provide latest and state-of-the-art VSATs. The network provides three types of VSAT links, viz., DVB-S2 ACM / MF-TDMA based Broadband VSATs; Normal SCPC VSATs and High Capacity SCPC VSATs.

- ERNET has connected remote educational institutes in North East States and Lakshadweep Islands.

- ERNET also supports information hubs and VSAT based e-Linkage of Krishi Vigyan Kendras (KVKs) of Indian Council of Agricultural Research (ICAR) and implemented ICT infrastructure in over 200 KVKs & ZPDs.

- A project to provide IT infrastructure and connectivity in 204 schools at Srikakulam district in Andhra Pradesh was initiated and ICT labs in all schools are commissioned & operational.

New Research & Technology

- ERNET India in collaboration with Central Power Research Institute (CPRI), autonomous society under the Ministry of Power is looking at

in real-time integrated approach of electrical network and IoT devices in Smart Grid system and related studies in Cyber Physical System Security.

- ERNET India is currently in discussion with Indian Institute of Science (IISc) in evaluating LPWAN technologies for operational IoT network and develop a Network Management System to help in smart city application development.
- ERNET India is a leader in IPv6 and provides Consultancy, Training and Turnkey Implementation services to organizations for IPv6 (Future Internet Protocol) implementation.
- ERNET has a world class Testing and Training facility providing hands-on experience to participants in the latest networking technologies.
- About 200 plus staff of Central & State Governments have been trained for hands-on use of future network protocols across the country.
- Live IPv6 session was organized for Indian and foreign participants in the APAN43 held in India

About ERNET

ERNET India, an autonomous scientific society under the administrative control of the Ministry of Electronics & Information Technology is functioning under the overall control and guidance of its Governing Council. The Hon'ble Minister for Electronics & Information Technology is the Chairman of the Council and the members have been chosen from premier academic & research institutions, government organizations and professional bodies.

ERNET India is serving academic and research institutions in the country by innovatively connecting them on Intranet and Internet using appropriate state-of-the-art technologies. Institutions anywhere in the country can now be connected to ERNET network. ERNET India provides services through its following 06 Points of Presence (PoPs) located across the country, which help in rapidly responding to the needs of the institutions in the country:

- ERNET India HQs, New Delhi
- Indian Institute of Technology (IIT), Guwahati
- University of Rajasthan, Jaipur
- National Informatics Centre, Salt Lake City, Kolkata
- VSAT Hub at Software Technology Parks of India (STPI), Bengaluru
- Indian Institution of Technology-Madras, Chennai

All PoPs are equipped to provide access to Intranet, Internet and Digital Library through terrestrial leased circuits and radio links to the user institutions. These PoPs also provide technical support and hand-holding to user sites. The PoP at STPI Bengaluru provides Intranet and Internet access through Satellite.

In addition to 06 PoPs, ERNET India has setup regional centers at following 2 locations:-

- Bengaluru
- Chennai

ERNET Network Architecture

The ERNET network is a judicious mix of terrestrial and satellite based wide area network. The satellite Wide Area Network (WAN), using Very Small Aperture Terminal (VSAT) technology, has facilitated reliable and quick access to remote areas. The ERNET terrestrial WAN provides backbone links between the PoPs. The ERNET Network is connected to pan-European Education and Research Network (GEANT) and Trans Eurasia Information Network (TEIN3) through NKN. ERNET PoPs have one or more routers depending on the number of users connected to the PoP. Following are the salient features of the ERNET backbone:

- MPLS Enabled
- Dual stack support- Both IPv4 and IPv6
- High Capacity Backbone
- Scalable, Secure and Guaranteed QoS
- Support for IPv4 / IPv6 MPLS VPN services
- Multicast enabled VPN for running Multicast applications

The ERNET Backbone has been overlaid on National Knowledge Network (NKN) with backbone bandwidth of 100 Mbps (upgradable to 1 Gbps)

IPv6 Enabled Network

ERNET network supports IPv4 and IPv6 Internet Protocol in native mode with dual stack, unicast and multicast. IPv6 routing protocol OSPFv3, end-to-end Ethernet services, QoS (DiffServ), video conferencing, authentication and authorization have also been implemented on ERNET Network.

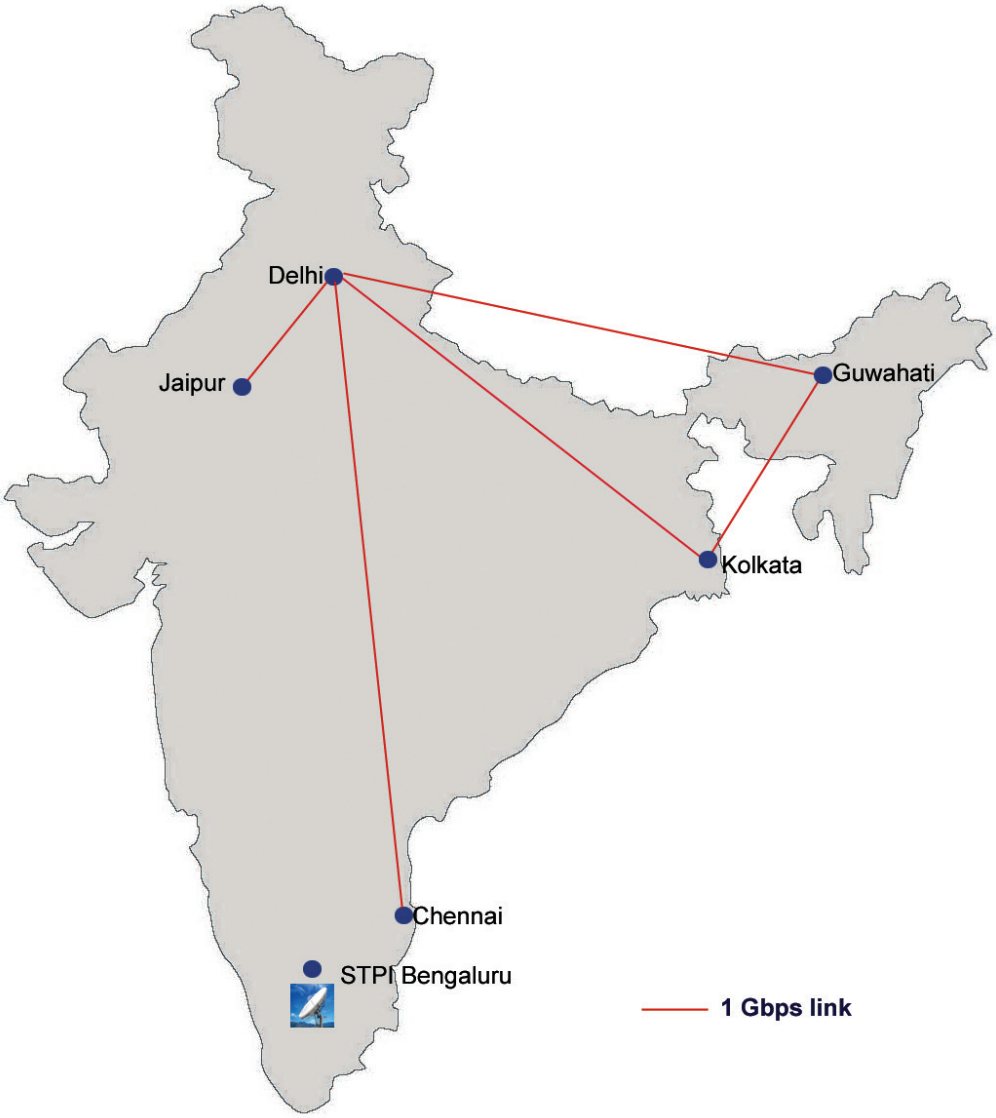


Fig. 1: IPv6 Enabled MPLS Backbone

ERNET VSAT & LEASED LINE USERS

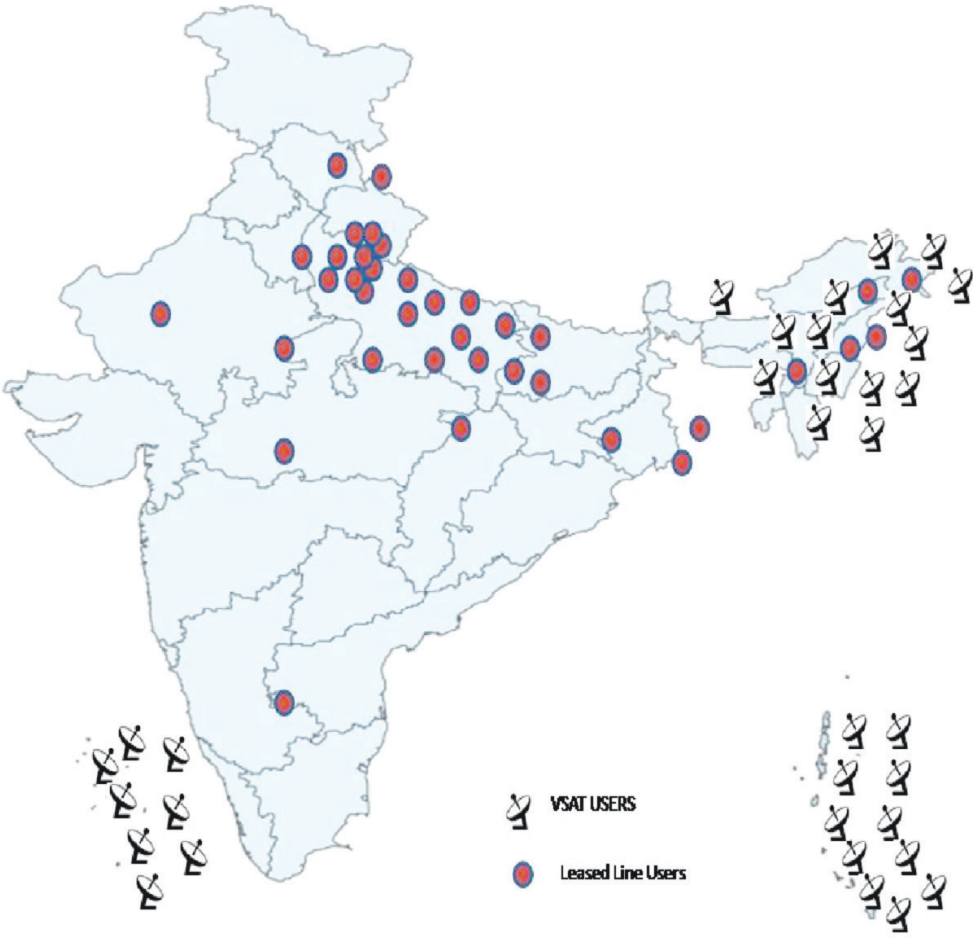


Fig. 2 : Leased line & VSAT users

eduroam- Golbal wi-fi users

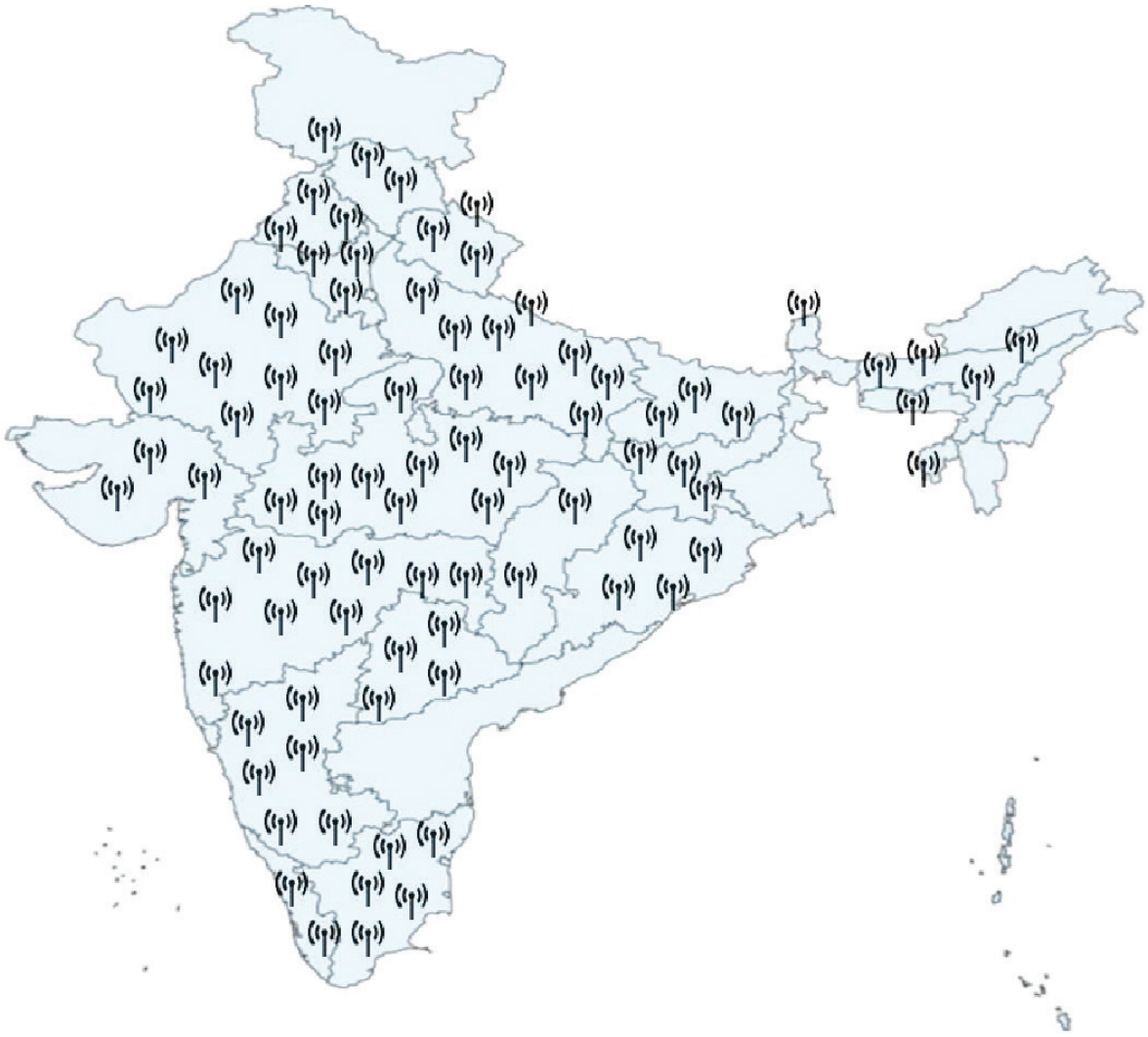


Fig. 3: eduroam Users

VSAT Network

ERNET India operates a VSAT network in C-Band using GSAT satellite for providing Internet & Intranet access to education and research institutions located all over the country. The Master Earth Station (MES) which is also functioning as the Network Operations Centre (NOC) is located at Bengaluru. The MES is equipped with 9.2 meter antenna and is connected to ERNET terrestrial backbone through a dedicated high speed link at Bengaluru. During the year, the technology of the VSAT network has been upgraded to provide state-of-the-art VSATs. The network provides three types of VSAT links, viz., DVB-S2 ACM / MF-TDMA based Broadband VSATs; Normal SCPC VSATs and High Capacity SCPC VSATs.

Fig. 4 : The Master earth station (MES) at ERNET India, Bengaluru

Distinguishing feature of VSAT links provided by ERNET India: ERNET VSAT Network operates in C-band of satellite transponder space segment, therefore VSAT links provided by ERNET India are least affected by rain and other weather conditions. These VSAT links provide a high degree of reliability and continuous operation all over the country. They work efficiently even in difficult and far-flung areas of Andaman and Nicobar Islands, Lakshadweep Islands and North-Eastern states of the country in all weather conditions.

Network Traffic Growth

ERNET increased its upstream bandwidth to reduce network utilization problem. Most of the customers have increased their bandwidth requirement and the demand is rising continuously.

At present, ERNET PoPs provide four types of services, namely, Access Services, Application Services, Hosting Services and Operations Support Services.

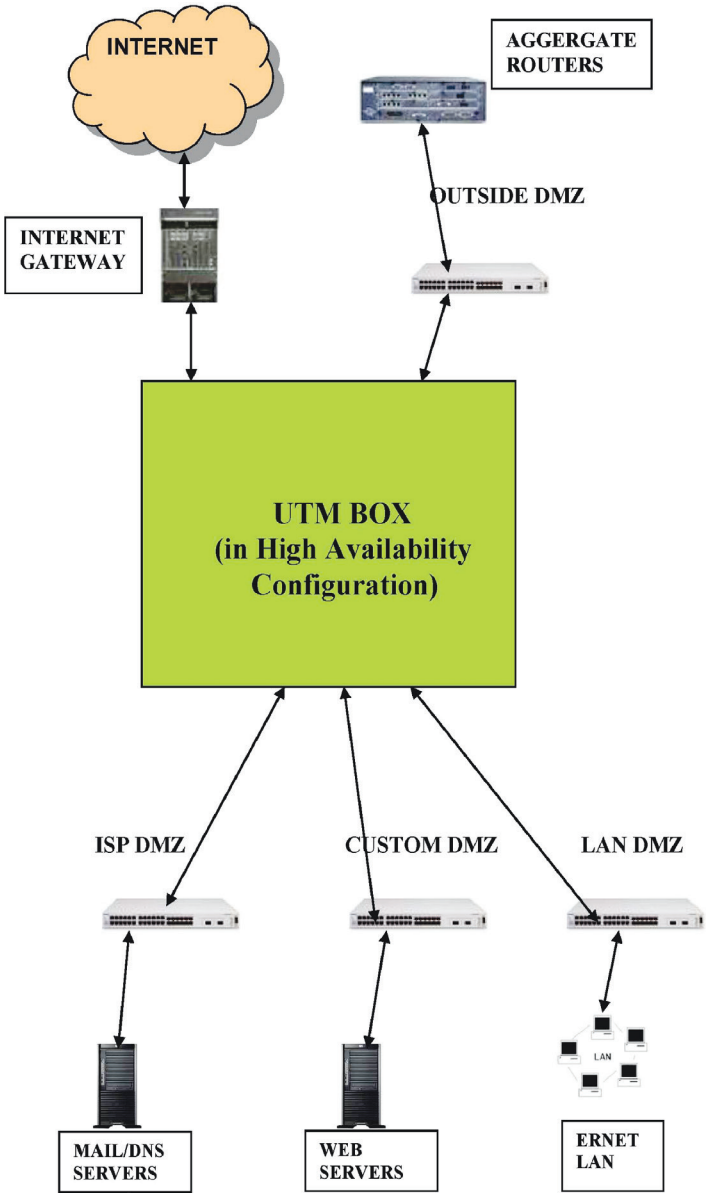


Fig. 5 : POP Infrastructure

Access Services

Access Services at the ERNET PoP comprise of services that provide access to the ERNET network. Subscribers use leased terrestrial lines, radio links and VSATs with bandwidth varying between 128 Kbps to 45 Mbps to connect their networks to ERNET.

Terrestrial Leased Link

Leased lines are typically symmetric and use two wire local loops upto local exchange and hence to the customer end. This kind of connectivity is suitable where telecom network is well developed and dedicated leased line can be hired from basic service providers. Such links are primarily for nX64Kbps and nMbps speeds. ERNET is also delivering Internet bandwidth to its users through MPLS cloud in local loop. ERNET users are connected to MPLS VPN created on the telecom service provider's network. The telecom service providers aggregate such user and bring them to ERNET PoP to deliver Internet bandwidth.

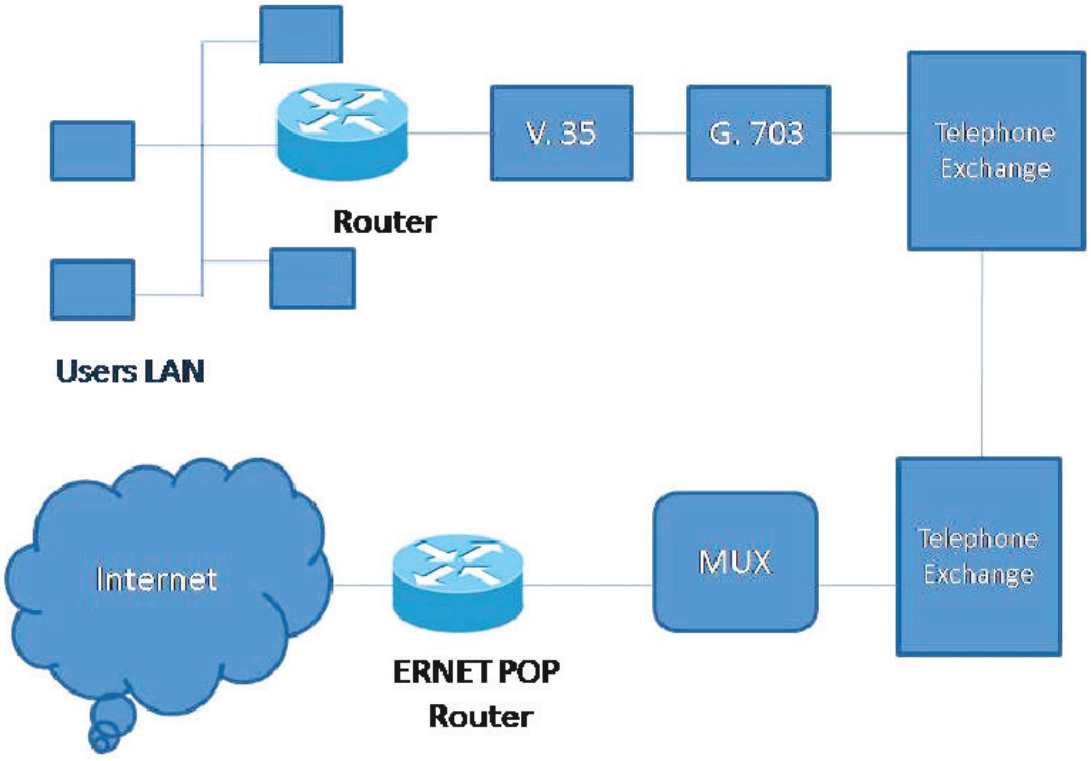


Fig. 6

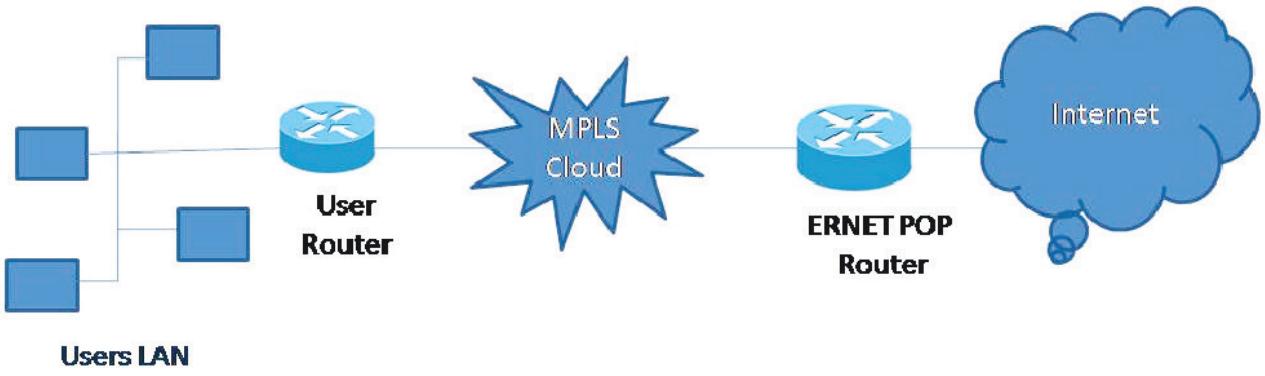


Fig. 7 : Access Through MPLS Cloud

Radio Link and 802.11

This kind of connectivity requires line of sight clearance from the network node to the concerned user site. Such types of networks have distance limitation of 30 to 40 Kms

DVB-S2 ACM/ MF-TDMA based Broadband VSAT

ERNET's DVB-S2 ACM /MF-TDMA based Broadband VSAT network architecture is a two-way star topology. The Broadband VSAT links have common Outbound capable of reaching up to 110 Msps. It supports all standard IP applications such as Internet/Intranet, VoIP, video conferencing, etc. These VSATs are cost effective and capable to provide data rate upto 4Mbps.

Normal SCPC VSAT

ERNET's Single Channel Per Carrier (SCPC) VSAT provides Point-to-Point connectivity in star topology by configuring SCPC modems. Both Outbound and Inbound carriers are dedicated in SCPC VSAT for bandwidth assignment to the institute. The normal SCPC VSAT is capable of providing data rate upto 8 Mbps which is suitable for institutions having large LAN and running critical applications requiring high uptime.

High Capacity SCPC VSAT

ERNET's high capacity SCPC VSAT provides Point-to-Point connectivity in star topology. These high capacity SCPC VSATs are suitable for delivering high data rates in the range of around 40Mbps with uptime of more than 99%. These are suitable for institutions having large LAN and running critical applications requiring high uptime.

Applications Services

Network Application Services comprise of applications provided for ERNET subscribers. Domain name service, video multicasting and hosting services are the basic and most required services provided for ERNET customers.

Web Domain Name Registration under ac.in, edu.in, res.in and vidya.bharat

ERNET India is an exclusive domain registrar for education and research domains; registering the domains under **ac.in, edu.in & res.in** from 2005. The domain registration, renewal & modification process has been fully automated with online payment facility for registering and renewing domain names on just a click. The automated website is GIGW compliant and runs on dual stack IPv4 and IPv6. In automated system, customer can modify online their DNS entries and other permissible information related to their institution. ERNET has also started registering domain names under विद्या.भारत under Internationalized domain names (IDN).

During the financial year April16-March 2017, ERNET had registered/renewed 6020 academic domains and Total 12682 domains have been registered.

Hosting Services

ERNET India is providing web hosting services to the various Educational/ Academic & Research Institutes, Departments / Organizations. ERNET India has a huge web hosting infrastructure in its state of the art IDC(Internet Data Centre) which includes a large number of performance tuned, hi-end and secured servers The Data Centre is connected to Internet on a high speed/bandwidth. Web Hosting services are offered on Linux & Windows Platforms and the servers are powered with the state-of-the-art web technologies such as CGI, Perl, PHP, ASP, ASP.NET, JSP, Tomcat etc. Popular Databases like MS SQL, MySQL are also supported.

ERNET India mandates to get the website audited by a certifying agency for any security vulnerability. To ensure utmost security, no website can be hosted on the ERNET web servers without undergoing the mandatory Security Audit. ERNET India also facilitates remote access facility that allows to update and maintain the sites from customer's office or any other remote location through VPN (Virtual Private Network) or through E-Mails.

About 40 websites are hosted at ERNET India web platform. Snapshot of some hosted websites are placed below:

- National Institute of Finance Management
  http://www.nifm.ac.in
- Maharaja Surajmal Brij University, Bharatpur (Raj.)
  http://brijuniversity.ac.in
- G.B Pant Engineering College, Puri Garwhwal
  http://www.gbpec.ac.in/
- Hemwati Nandan Bahuguna Garhwal University
  http://www.hnbgu.ac.in

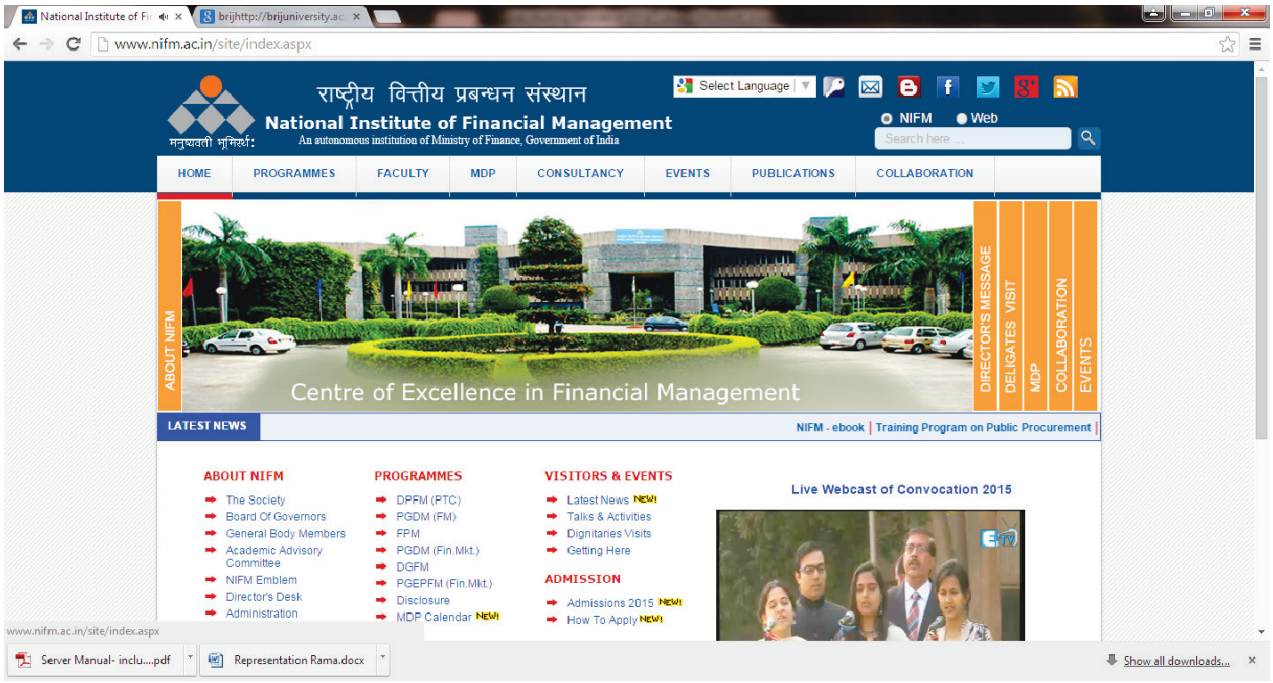


Fig. 8: Hosted Websites

Operations Support Services

These services have been evolved at our PoPs by way of development of tools needed to monitor the operational elements of PoP effectively.

Service Monitoring and Reporting

ERNET PoPs continuously monitor the performance of peering, backbone and user links. The measurements include:

- Link availability
- Link utilization
- Break up of traffic generated by respective sites

The services for which we measure the performance metrics include web, ftp, e-mail, etc. The web download session throughputs obtained by the users at the user site are measured. A Service Level Report (SLR) is sent to the users every month. ERNET India generates monthly statistics for:

- e-mail traffic
- Spams
- Infected mails

Network Operation Centre

ERNET India is using combination of open source softwares such as MRTG customized to ERNET requirement for traffic monitoring, link performance monitoring and to generate alerts which is integrated with the messaging system to generate instant alerts. The Network Operation Centre is being managed by skilled professionals to provide all necessary support to ERNET users. A round the clock helpdesk provides efficient resolution of customer problems.

User Support/Help Desk

Centralized service desk with trouble ticket generation has been set up for logging complaints related to DNS, Dialup, RF and VSAT users of ERNET. A toll free number (1800-112436) service is provided for complaint logging on 24x7 basis. Network alarms and monitoring system at ERNET NoC helps the team in taking proactive measures in case of any inconsistency in the NoC.

ERNIC (ERNET Network Information Centre)

ERNIC provides Internet Protocol (IP) address space (both IPv4 and IPv6) and *in-addr.arpa* domain delegations to its customers. The various activities performed by ERNIC include:

1. Assign IP Addresses to various PoPs & users (terrestrial as well as SATWAN).
2. Collect information about administrative and technical contact person from each customer location and create NIC handle for them.
3. Update Information about inetnum objects (the range of IP address space described by the object) in the APNIC database.
4. Co-ordinate with various PoPs for creating reverse DNS zones on name servers and register the reverse domains with APNIC.
5. Take appropriate actions on the complaints received regarding any illegal usage of ERNET resources.

6. Creating and specifying IRT objects for all the Internet resources allocated to ERNET India and its customers.

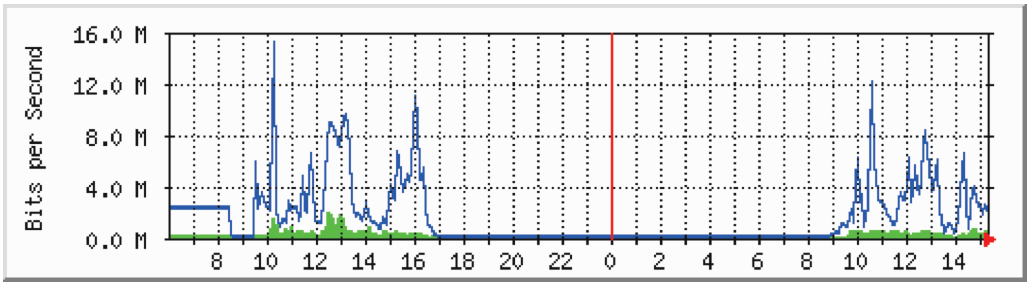
Graphical Representation of user traffic

ERNET website http://www.eis.ernet.in apart from providing general information about the PoPs also provides the following information regarding users Internet usage:

- Online service-wise usage.
- Status of the link (up/down time)
- The amount of non-standard traffic (for the users to check for unwanted traffic hogging their Internet access link)

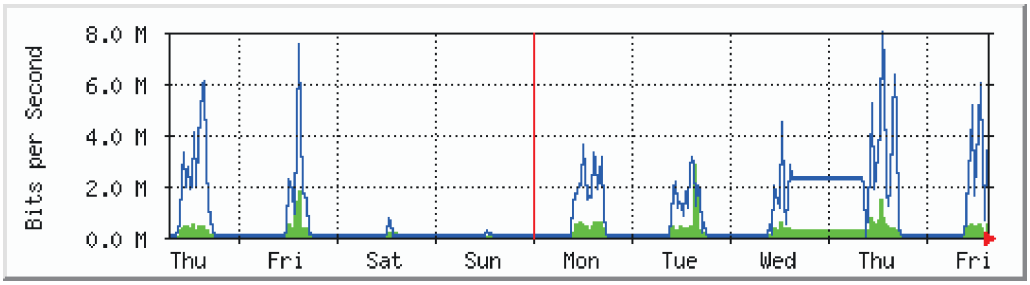
Traffic Analysis for User Link

Daily Graph (5 Minute Average)



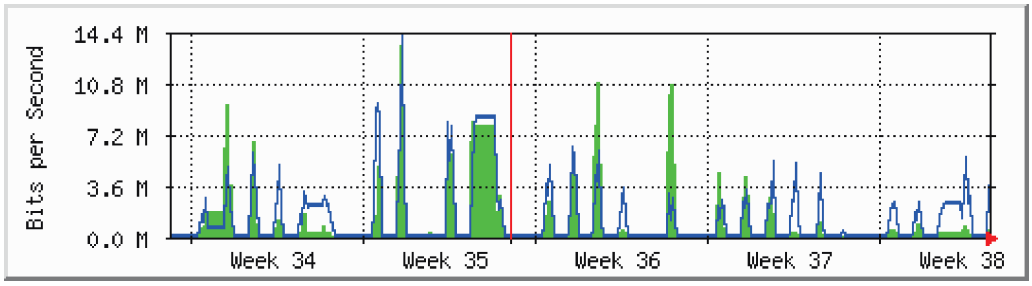
	Max	Average	Current
In	1933.4 kb/s (1.9%)	248.4 kb/s (0.2%)	516.6 kb/s (0.5%)
Out	15.2 Mb/s (15.2%)	1587.4 kb/s (1.6%)	2287.3 kb/s (2.3%)

Weekly Graph (30 Minute Average)



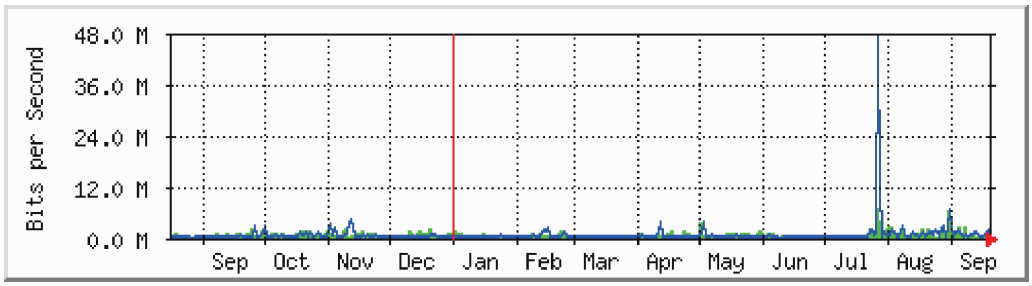
	Max	Average	Current
In	2801.2 kb/s (2.8%)	181.6 kb/s (0.2%)	484.1 kb/s (0.5%)
Out	7997.7 kb/s (8.0%)	830.1 kb/s (0.8%)	2930.7 kb/s (2.9%)

Monthly Graph (2 Hour Average)



	Max	Average	Current
In	13.5 Mb/s (13.5%)	883.8 kb/s (0.9%)	397.2 kb/s (0.4%)
Out	14.0 Mb/s (14.0%)	1131.5 kb/s (1.1%)	4047.0 kb/s (4.0%)

Yearly Graph (1 Day Average)



	Max	Average	Current
In	6795.4 kb/s (6.8%)	660.9 kb/s (0.7%)	246.0 kb/s (0.2%)
Out	47.5 Mb/s (47.5%)	585.5 kb/s (0.6%)	1460.6 kb/s (1.5%)

GREEN Incoming Traffic in Bits per Second
BLUE Outgoing Traffic in Bits per Second

Fig :9 Traffic Analysis for User Link

Hosting of Asia Pacific Advanced Network (APAN) Meeting in India

Asia Pacific Advanced Network (APAN) represents consortium of education research networks (ASIA and OCEANIA region). It also represents a high speed network which interconnects education research networks in Asia & OCEANIA regions. The APAN Ltd is the not-for-profit association that is the legal entity created to undertake activities on behalf of APAN members. APAN members are the entities representing research and education network interests in the countries of Asia and Oceania. **ERNET India is primary member of APAN**.

APAN coordinates developments and interactions among its members and with peer international organizations, in both network technology and applications, and is a key driver in promoting and facilitating network-enabled research collaboration, knowledge discovery, telehealth, and natural disaster mitigation.APAN organizes two meetings each year where its members and other interested participants come together in working groups, committees, plenary sessions, and other meetings to review progress, demonstrate advances in technology and application, and make plans for the future activities. The meetings venues are various APAN members.

ERNET India hosted the 43rd Asia Pacific Advanced Network (APAN) Conference/Meeting 2017 during February 12-17, 2017 at India Habitat Centre, New Delhi co-hosted by CII.

Outcome of 43rd APAN Meeting

- The event promoted network technology developments and advances in network-based applications and services across India that will:
  - Lead to significant improvements in educational outcomes by providing the foundation for a knowledge-based economy.
  - Allow educators and students in India to share knowledge and to discover and learn remotely.
  - Enhance the ability of Indian educational and research community in global collaborative innovation through unprecedented access to digital resources, instrumentation and expertise for education, research and societal benefit.
  - Provide access to scarce or expensive educational and research resources around the Asia Pacific region and across the globe.
  - Lead to the saving and improvement of lives and property as a result of implementing advanced communications that support the well-being of the populations.
  - Catalyse and stimulate the information economy by demonstrating new network enabled services, by acting as an incubator for technology transfer to industry, and as a springboard for innovation.
- The event provided an opportunity to Indian researchers for working closely with relevant organizations, institutions, groups and individuals around the world to further enhance the adoption of and research into advanced network applications and technologies.

- The event provided a forum for promoting yoga amongst the international participants in general and participants from Asia Pacific Region in particular. To promote yoga amongst the international participants, a Yoga session was organized by ERNET India in APAN 43.
- High lights of some of the sessions of APAN43 were captured in still and some of them are placed below:-
- A total of approximately 350 people attended the APAN43 Meeting. Out of these, there were172 International & 107 domestic registered Delegates. In addition to registered delegates, there were 75 complementary registrations.

Fig:10


Ministry of Electronics and Information Technology Government of India
Co-Sponsor
CISCO
Associate Sponsors
Asi@Connect
National Knowledge Network
Confederation of Indian Industry
ASIA PACIFIC ADVANCED NETWORK MEETING
February 12-17, 2017; New Delhi
APAN

Fig:11

Fig:12


ASIA PACIFIC ADVANCED NETWORK MEETING
ASIA PACIFIC ADVANCED NETWORK MEETING
February 12-17, 2017, New Delhi
ASIA PACIFIC ADVANCED NETWORK MEETING
February 12-17, 2017
ASIA PACIFIC ADVANCED NETWORK MEETING

Fig: 13

PROJECTS AT ERNET INDIA

NASSCOM – MeitY – ERNET Center of Excellence (CoE) for Internet of Things (IoT)

NASSCOM-MeitY-ERNET CoE for IoT was setup in June 2015 with the overall objective of enabling India as technology hub for emerging technologies. In addition the CoE will support the government initiatives in the social areas such as agriculture, healthcare, water, transportation, energy, security and privacy of data. The CoE is funded 50:50 on Public Private Partnership (PPP) model between DeitY and NASSCOM through its industry partners.

As a part of this project, NASSCOM has setup a Internet of Things (IoT) lab at Diamond District facility, and it was formally inaugurated by Shri. Ravi Shankar Prasad (Minister of Electronics & IT) and Shri Priyank Kharge (IT Minister in Govt of Karnataka) in July 2016. The lab is being used by start-ups to work on technical design to product prototyping by way of democratising innovation in collaboration with academic/ industry partners. Total of 9 startups incubated at CoE and all of them have prototypes and under which 4 patents have been filed. These start-ups are at various stages of commercialization namely – alpha trial with customers, beta trial with customers and field deployments and few received funding. Some of these start-ups were selected under various international programmes like ZF pitching session at Germany and ITAC/CEATAC Japan (2016). Also, meetups were organized between start-ups and investors. Currently signed up with 12 strategic and 6 technology partners.

Under academic engagement plan, IoT curriculum group has been formed for active development of courseware for IoT. MoU has been signed for collaboration with Georgia Tech University, GIIC Guiyang China, IIC and with ICRISAT for demonstration of agricultural technology benefits.

Further, CoE organized the tech-talks from academia/ industries, academic community meet between academic community and industry partners, IoT innovation challenge for engineering colleges, workshops on current trends for academia/start-ups. Also, hackathon was organized at Hyderabad in November 2016 along with ICANN on the theme of “Smart Cities/ Smart Villages” and winners were felicitated by Shri Ravi Shankar Prasad and ICANN Chairman Shri Steve Crocker.

Fig 14 : Inauguration of "CoE-IoT" by Shri. Ravi Shankar Prasad, Union Minister for Electronics & IT, Law & Justice and Shri. Priyank Kharge(Minister of IT/BT &Tourism, Karnataka)

Fig 15 : Announcing of "IoT in India" by Ms. V. Manjula (Chairman – KBITS), Shri R. Chandrashekhar (President – NASSCOM), Shri Ravi Shankar Prasad (Union Minister for Electronics & IT, Law & Justice), Shri Priyank Kharge (Minister of IT/BT & Tourism, Karnataka) Dr. Ajay Kumar (Additional Secretary, MeitY) and Dr. Neena Pahuja (DG, ERNET India) – from Left to Right

Fig 16: Hackathon was organized at Hyderabad

IoT Network deployment and Real-Time simulation in Smart Grid

ERNET India in collaboration with Central Power Research Institute (CPRI), autonomous society under the Ministry of Power, has been evaluating a real-time integrated approach of electrical network and IoT devices in Smart Grid system and testing the integrated approach by combining both power systems and IoT network.

ERNET India has experimented with the real-time simulation platform connecting to IoT networks. The simulation platform here is OPAL-RT, a real-time simulator that supports characteristics development of electrical model in software and hardware. OPAL-RT simulator is used in this experiment to model a Medium Voltage (MV) / Low Voltage (LV) electrical network connected with corresponding loads to the IoT devices. We have used TelosB motes for the evaluation of the IoT network. The evaluation of IETF 6TiSCH protocol is being carried out using the OpenWSN implementations with single channel and channel hopping communication scenario. Based on our experiments, it was found that TSCH mode channel hopping scenario exhibits closer to 100 % packet delivery ratio and it is suited to meet the reliability requirements of smart grid communication.

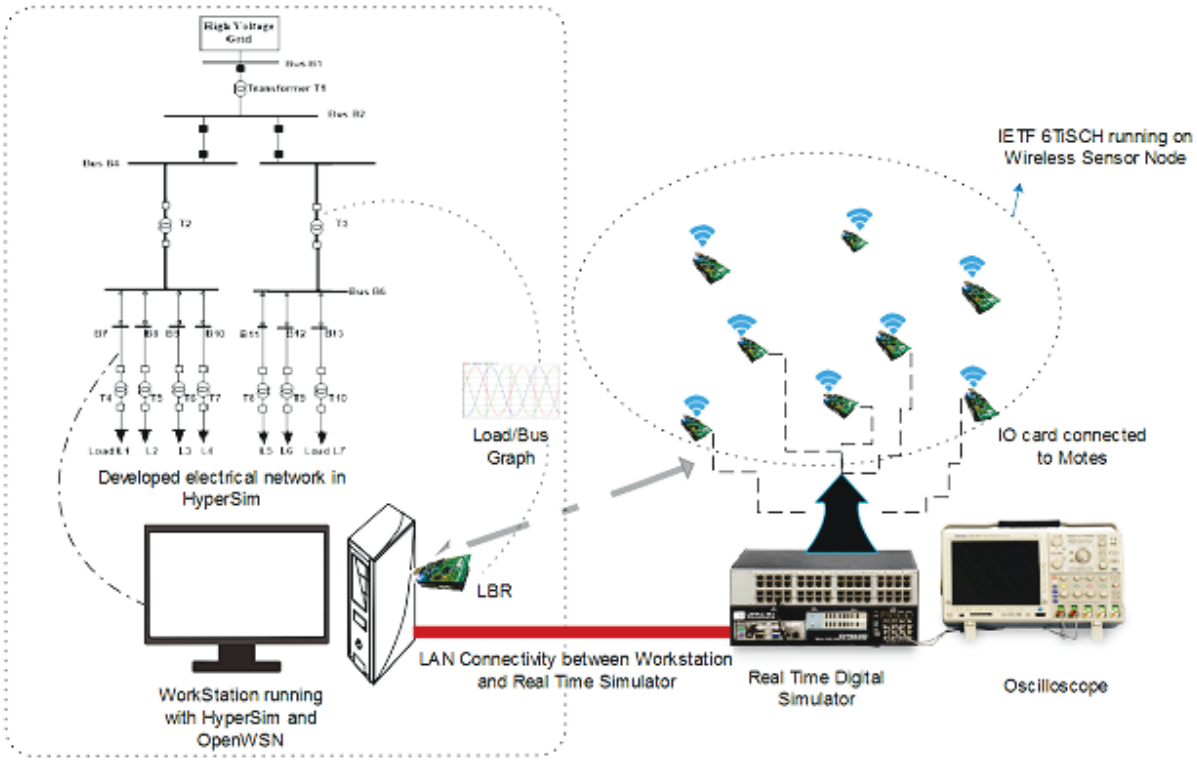


Fig 17: Conceptual Architecture for evaluating IoT deployment Scenario.

Setting up the eduroam services in India

eduroam stands for education roaming. It is the secure, world-wide roaming access service developed for the international research and education community. It allows students, researchers and staff from participating institutions to obtain Internet connectivity across campus and when visiting other participating institutions by simply opening their laptop and working on local Wi-Fi network.

ERNET acts as the National eduroam operator for India and is the central point for connecting all the universities/institutes with access to the Indian eduroam national federation service. ERNET facilitates through this service, eligible students, researchers and staff from participating institutions access to Internet connectivity at eduroam institutions globally. eduroam Project is funded by MeitY, therefore, In India, ERNET is providing free services and support for enabling eduroam services in institutes. The eduroam was formally launched in India on 5th September 2013 and from then onwards appx 200 premier institutions including IITs & IIMs have hooked on eduroam network. Various awareness workshops have been hosted globally.

Fig 18: eduroam awareness workshop at NIELIT Kolkata

Fig 19: eduroam awareness workshop at PEC Chandigarh

Enabling Schools with Smart Virtual Class Room Facility

The objective of the project is to set-up smart virtual class room facilities in 3204 Govt. owned / controlled schools plus 50 DIET in seven pilot states of Himachal, Gujarat, Rajasthan, Tripura, Haryana, Andhra Pradesh and Tamil Nadu with the focus to improve the quality of education to students from remote/ rural part of the country. Also a Centralized control system would be established in Delhi at ERNET's data centre which will host the MCU, Streaming/ Recording server and other associated component for multiparty audio/ video interaction and also offline access of classroom sessions round the clock for learning / collaboration between all the stakeholders. The basic aim of the project is to create a technology enhanced classrooms that foster opportunities for teaching and learning by integrating learning technology, such as computers, electronic white boards, projectors, specialized software, interactive audio-video systems, etc.

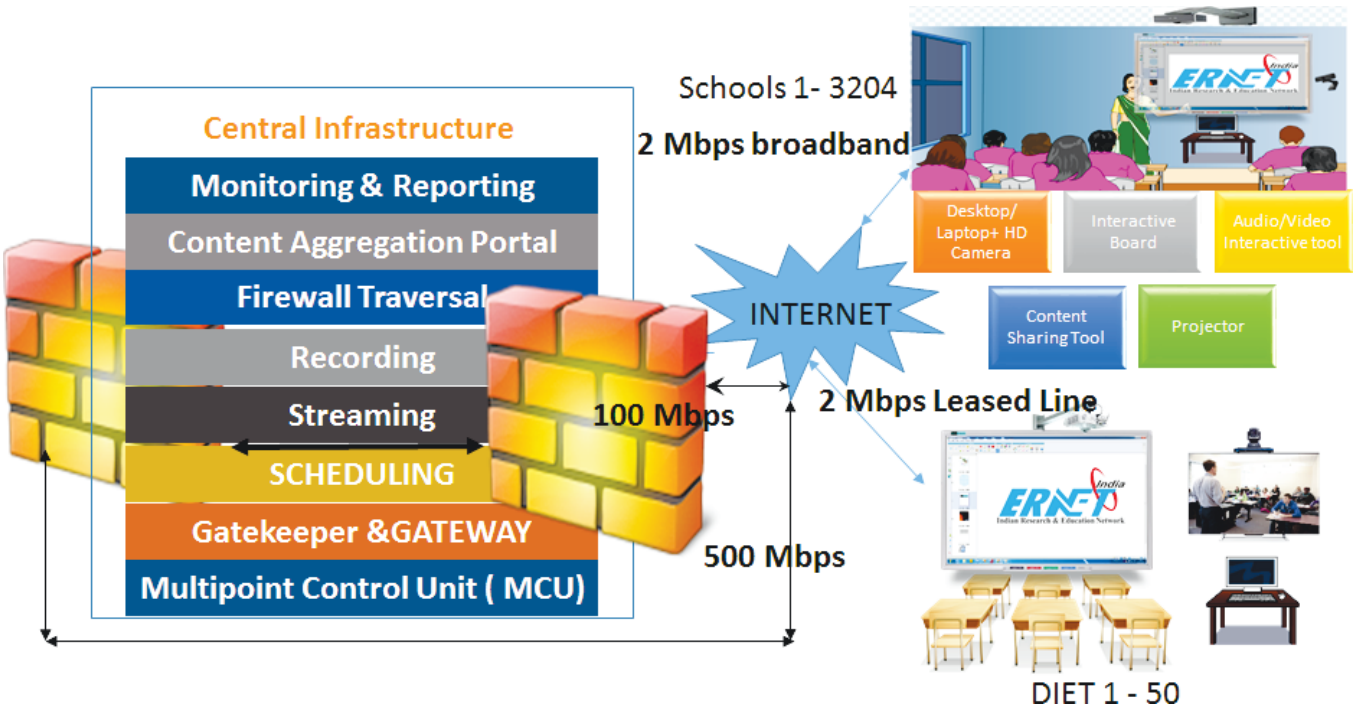


Fig 20: Enabling Schools with Smart Virtual Class Room Facility

The detailed scope of project includes:

- Creating Smart Virtual Class Rooms with Two-way Audio / Video Interaction Facility at 3204 Remote School locations by installing Software based Video Conference Equipment, PC, Electronic white board, projector, UPS, etc.
- Creating Smart Virtual Class Rooms with Two-way Audio / Video Interaction Facility at 50 DIET locations (District Level centre) by installing HD Video Conferencing End

points/ Codec along with Display screen, PC, Electronic white board, projector, UPS, etc.

- Establishing Central Location for Hosting MCU and Recording/ Streaming Solution by installing MCU, Recording / Streaming server, Scheduling software, etc.
- Configuration of scheduling software for managing and providing information on the schedule of classes to be transmitted from various central / DIET locations. The application can be accessed over the internet on 24x7 through the ERNET's web portal / project portal.
- Formulation and Preparation of training manual in hard as well as soft form and making it available online. The manual will have detailed step-by-step description of the operational procedures of the installed system as a whole and also have operational steps for each supplied equipment.
- Imparting training for operational Staffs/ Teachers on the installed equipments/ software and preparing a training manual for the help of trainees.

Fig 21: Enabling Schools with Smart Virtual Class Room Facility

Achievements till date:

The installation and commissioning of 2852 Schools and 50 DIETs have been completed till date. The Centralized control system has been established and running since last 14 months in Delhi at ERNET's data centre which is hosting the MCU, Streaming/ Recording server and other associated component for multiparty audio/ video interaction and also offline access of classroom sessions round the clock for learning / collaboration between all the Schools and DIETs.

Project usage statistics

- ❖ The live virtual classroom sessions are being conducted through multiple DIETs since last 10 months and total 1256 such sessions conducted till date.
- ❖ More than 64,368 teachers have been trained till date under the project for operational skill set.
- ❖ More than 20,04,920 students attended the live sessions till date and increasing on daily basis.

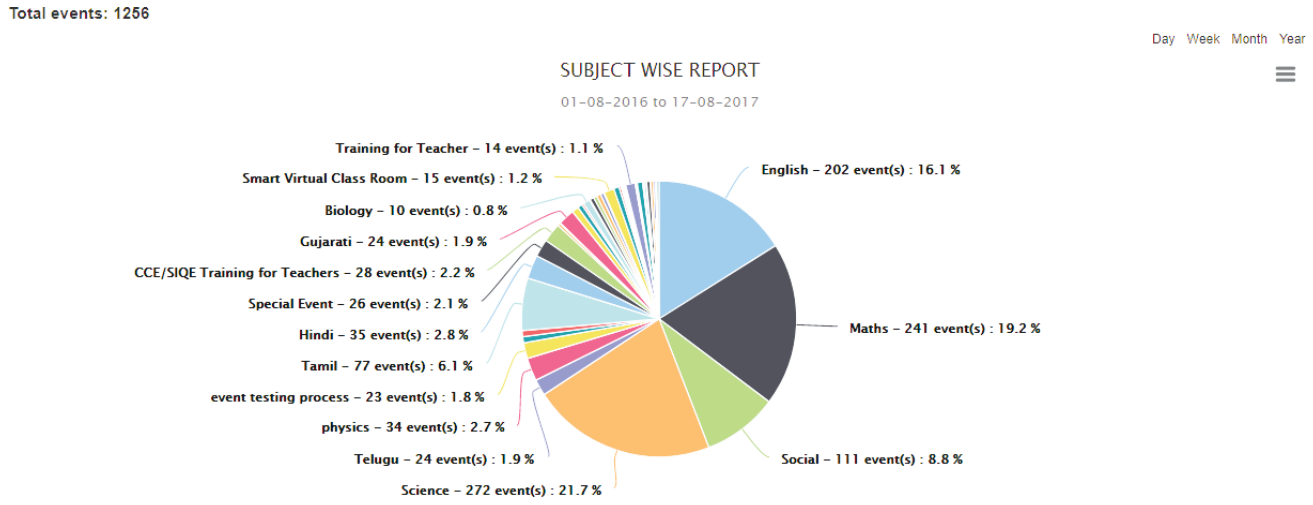


Fig 22: Project usage statistics

LiFi Experimental Testbed

The Radio frequency Spectrum is getting exhausted and seeing severe congestion due to contention and interference. Light Fidelity (LiFi) is emerging as a complementary technique using intensity modulating LED lights to realise networked wireless system, a light-based WiFi.

There are various compelling LiFi application use cases that can combine the lighting needs and data communication in applications such as indoor broadband access to augment WiFi bandwidth, VLC hotspots in smart home environment, secure communication that is free from eavesdropping, mobile phone assisted indoor navigation in shopping malls or airports, signboards, traffic signals, hospitals, vehicle to vehicle and event of advertisement/display etc.,

ERNET India has initiated internally funded LiFi pilot project to be executed jointly with IIT Madras for the duration of 2 years. The objective is to study LiFi as an alternate communication technology and perform visible light communication experiments and explore LiFi opportunities in various deployment scenarios such as smart city application.

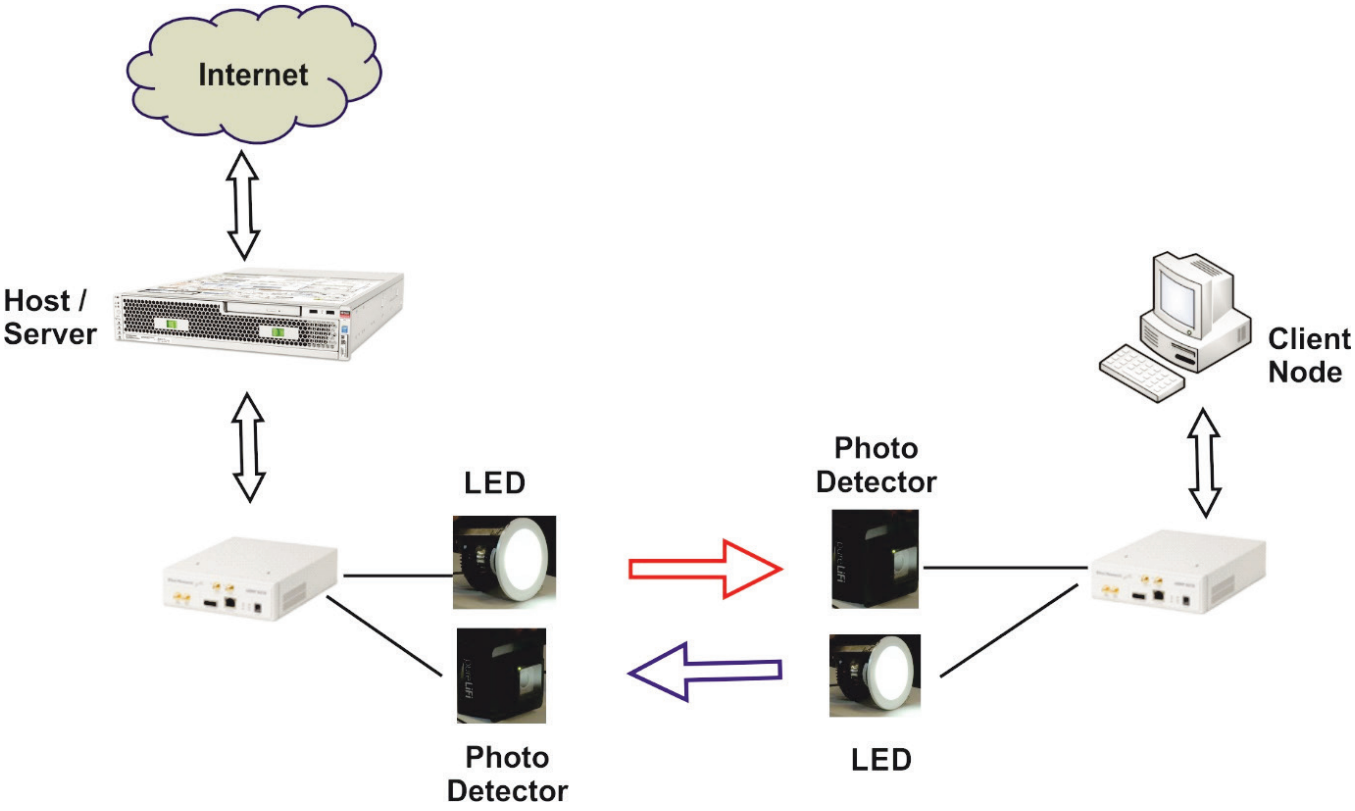


Fig 23

Information Security Education & Awareness (ISEA)-Phase II

Information Security Education & Awareness (ISEA) is a MeitY funded project with an objective for capacity building in the area of Information Security to address the human resource requirements, training to govt. Officials and organizing mass information awareness programs. This project envisages training of 1.14 lakh persons through formal/non formal courses & 5200 Govt. officials through direct training programs.

ERNET India is one of the implementing agencies for Government Officials training for the duration of 5 years (2015-2020). During 2016-17, ERNET India has organized three training programs (21-22nd Oct'16 & 21-22nd Feb'17 & 23-25th Mar'17) at Chennai & One two day training program at NIT, Tiruchirappalli on 20-21st Jan'17. The training focused on topics of Information & Network Security and Smart grid security for the benefit of Govt. officials working in the security domain i.e. EDI, Tamilnadu Electricity, CSIR Madras, TN Arasu cable TV & Airport Authority. During 2016-17, ERNET India trained 93 Govt. officials and overall 165 Govt. officials have been trained under this project. ERNET India is expected to give training to around 600 Govt. officials over the period of 5 years.

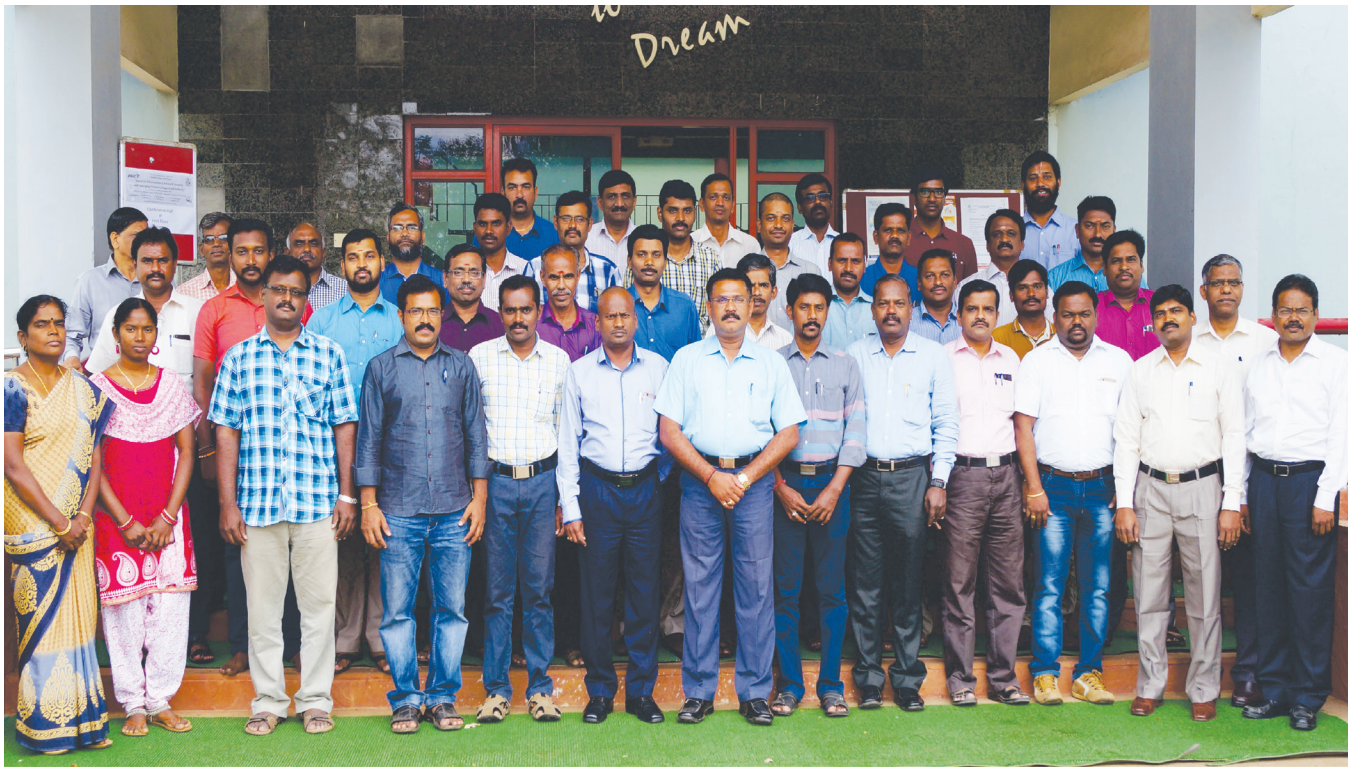


Figure 24(a): Training session @ERNET Chennai, 24(b): Participants at NIT, Tiruchirappalli

Model Wi-Fi enabled Campus Networks at five Universities

Government of India has approved 'Digital India' program with the vision to transform India into a digitally empowered society and knowledge economy. The vision is centered on three key areas:

1. Digital Infrastructure as a Utility to Every Citizen
2. Governance & Services on Demand
3. Digital Empowerment of Citizens

To realize the same, a need has been felt to Wi-Fi enable all the Higher learning Institutions/ universities in the country as a part of 9th pillar (Early Harvest programs) under Digital India program as Wi-Fi has become a universal expectation among Universities/institutions students, faculty & staff as well as visitors/guests. This is one of the steps for achieving goals set under visionary Digital India program of Govt. of India for India Tomorrow.

For achieving the same, DeitY in consultation with MHRD identified following five universities and directed ERNET India for setting up Wi-Fi enabled Campus Networks at Allahabad, Pune, Osmania, NEHU & Utkal University. DeitY desired that ERNET India should setup Model Wi-Fi enabled Campus Network as a Proof of Concept at all these five Universities so as to

enable on campus students, faculty, teachers, staff, guests to have entry to cyber world having intelligent Wi-Fi devices such as Tablets, smartphone, Laptop Computer to access, retrieve and post information on any-time-any-where basis across Wi-Fi enabled Campuses. Accordingly, detailed site surveys were conducted at all these five universities to do the feasibility study and subsequently provide a suitable solution. The project proposals for each university have been created through assessing & finalizing the requirement separately through feasibility site surveys of each Campus & submitted to DeitY. The projects had been approved by DeitY for implementation by ERNET India. The salient features of the solution architecture are:

- Wi-Fi LAN created through powerful combination of wired & wireless network technologies enable flexibility, resiliency, ease of access to information, data & services by any Wi-Fi enabled device.
- Highly available, secure, scalable & redundant Centralized Wireless Controller, Management & Authentication systems at Central site named as Core.
- Cost-effective network setup with centralized Wireless controller for better management, ease of configuration, dynamic environments & with increased flexibility
- Enabling high speed wireless access to Internet & Intranet resources to campus employees, staff, faculty, teachers, students, official visitors, guest on any-time anywhere basis University campus.
- Improvement of delivery of student-centric services, employee performance & efficiency and real-time access to information, learning material & data. Enable faster and more efficient decision-making at all levels.

Provide freedom of work on the move, faster & efficient delivery of services, easy access to teacher/student related information & services, ease of deployment and access, business continuity, increase in productivity and reduction in day to day cost.

i) Setting up Wi-Fi enabled Campus Network at Allahabad University, Allahabad:

ERNET India has set up Wi-Fi enabled campus network at University of Allahabad, Allahabad, U.P. The project is a powerful combination of wired & wireless network technologies enable flexibility, resiliency, ease of access to information, data & services by any Wi-Fi enabled devices across the campus. It enables high speed wireless access to Internet/Intranet resources to campus staff, faculty, teachers, students, visitors on any-time any-where basis across the AU campus.

The Wi-Fi network with state-of-the-art technologies in conformity with international standard is installed, commissioned & is fully operational. As on date, more than 7000+ Wi-Fi users have been using Wi-Fi Network.

The installed Wi-Fi network is highly available, secure, scalable & redundant with Centralized Wireless Controller, Management & Authentication systems.

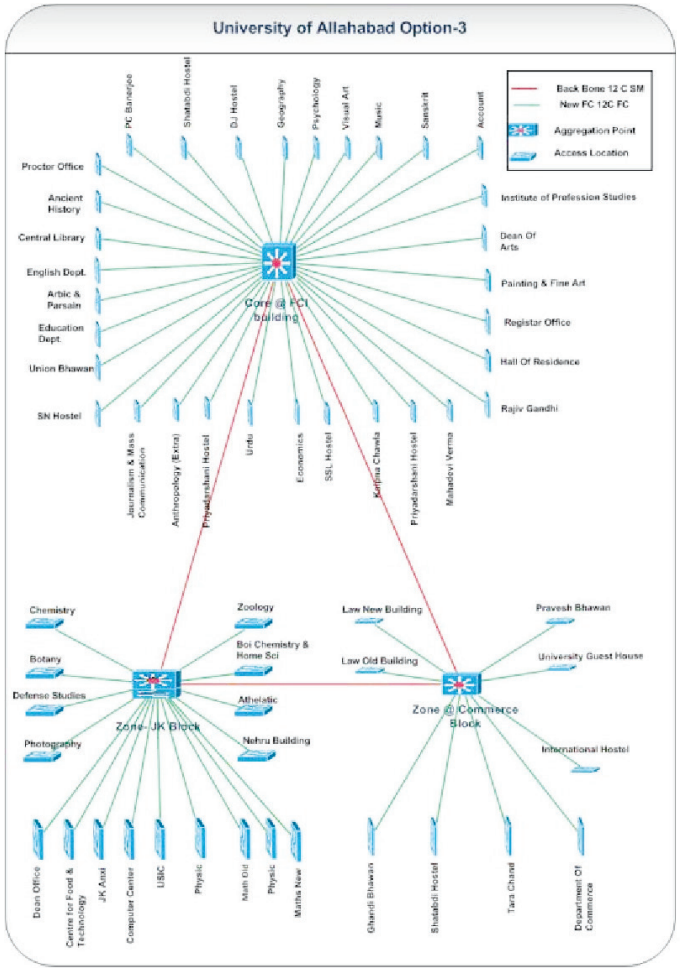


Fig 25: Wi-Fi enabled Campus Network at Allahabad University

ii) Augmentation of Wi-Fi enabled Campus Network at Savitribai Phule Pune University (SPPU), Pune

ERNET India has set up Wi-Fi facility in the building, departments, hostels which were not connected or were not Wi-Fi enabled areas and integrated with the existing Campus network. Project Implementation is completed, made operational and in use by the Users of SPPU. The Augmentation of Wi-Fi enabled campus network at SPPU has improved the Wi-Fi coverage in the campus and facilitate connecting the leftover building to the campus network.

The state of the art components (Access Switch, Wireless LAN Controller, Wireless Access points and Servers, etc.) have been installed to improve Wi-Fi coverage in the SPPU campus network. These are deployed and integrated in the existing network of SPPU. Servers (Microsoft Windows 2012 Server and Linux Server) under the augmentation project have

been configured to facilitate SPPU to deploy various applications and services in their running network.

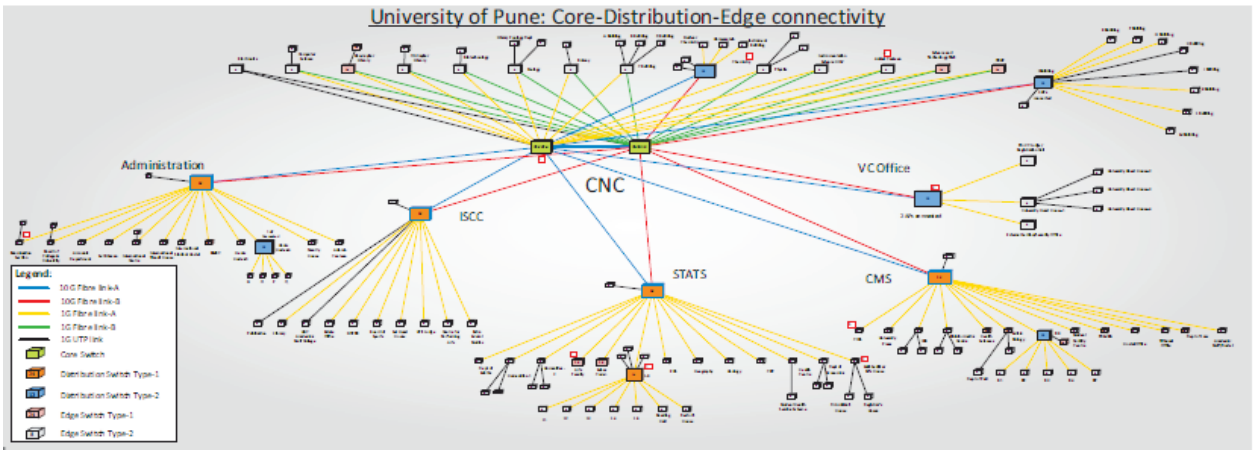


Fig 26: Wi-Fi enabled Campus Network at SPPU, Pune

Fig 27 : Wi-Fi Access Point at SPPU, Pune

Fig 28: Outdoor Wi-Fi Coverage at SPPU, Pune

iii) Setting up Wi-Fi enabled Campus Network at Osmania University, Hyderabad, Utkal University, Bhubaneswar & North-Eastern Hill University, Shillong:

Setup & operationalized Gigabit OFC based Wi-Fi enabled Campus Network with tier-3 architecture at Osmania University, Utkal University & norther-Eastern Hill University through upgrading the existing network. Procurement, delivery & installation of major active items have been done as per release of fund by MeitY. Procurement, delivery & installation of remaining items like Access Points, Servers etc. would be done after release of Balance fund from MeitY.

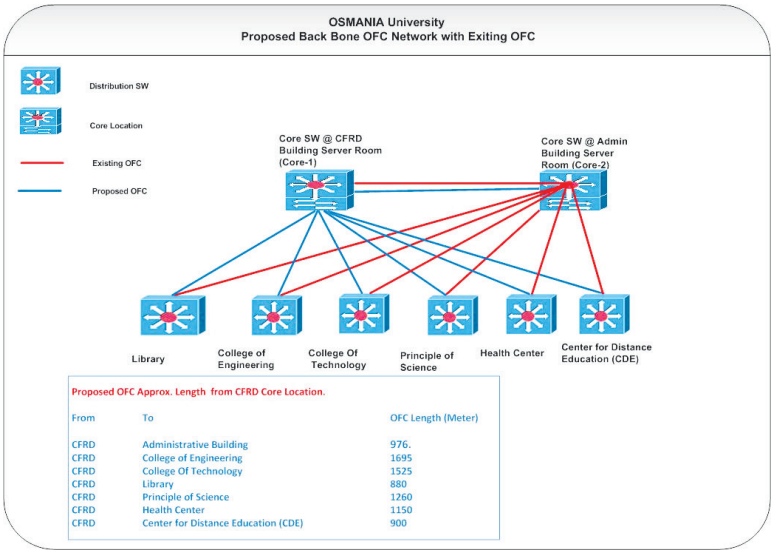


Fig 29:Wi-Fi Network at Osmania University, Hyderabad, Telangana State

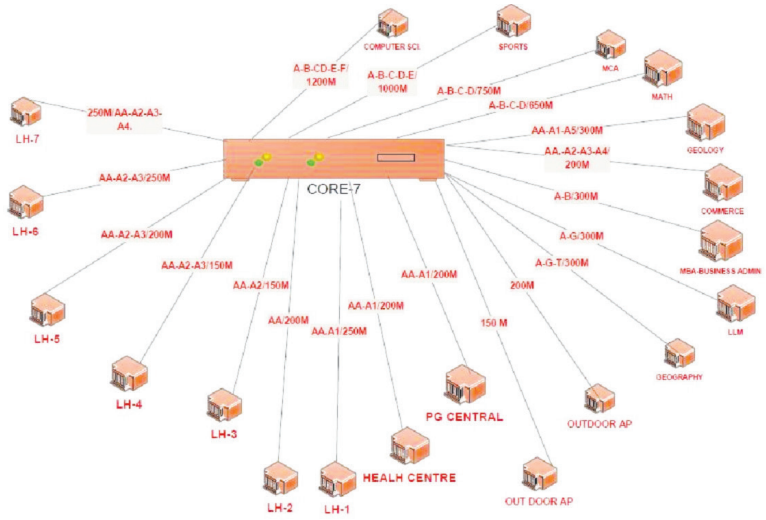


Fig 30:Wi-Fi Network at Utkal University, Bhubaneswar

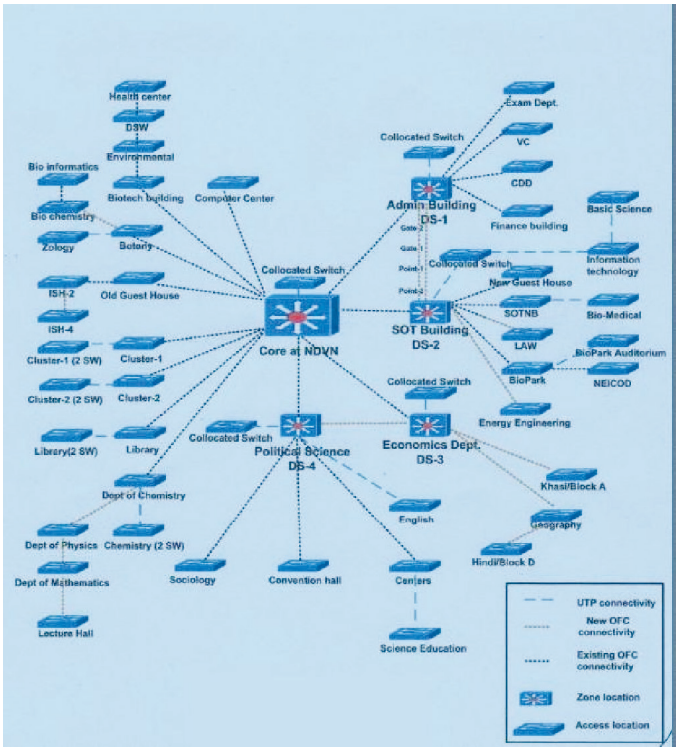


Fig 31:Wi-Fi Network at NEHU

Campus Network for National Institute of Food Technology Entrepreneurship & Management (NIFTEM), Sonepat, Haryana

ERNET India had signed a Memorandum of Understanding (MOU) with NIFTEM for setting up the Network and other IT Infrastructure at NIFTEM campus. Accordingly, a state-of-the-art high speed fiber optic based Campus Network connecting buildings/blocks spread across the campus has been setup. The network architecture is based on Star Topology with two Core locations each connecting to Zonal locations with redundant architecture over 10/1 Gigabit single mode fiber optic backbone. The project has been implemented with redundant 10Gigabit Fiber optic backbone with 3-tier hierarchical architecture having Core, Aggregation and Access layer connecting all the buildings/blocks/academics, Hostels, Guest House and residences spread across the campus. These locations are Wi-Fi enabled enabling Internet & Intranet access by Wi-Fi enabled devices as smart phones, Tablets, laptops, etc. on any where any time basis across the coverage area. UTP nodes have also been provided in the hostels. The network has been made secure through deployment of Firewall, IPS and centralized Wireless controllers for protection from outside as well as inside of the network. The network can be managed & monitor from central point through Network Management System provisioned for the same. The Wi-Fi network is being used extensively, by NIFTEM faculty, staff and students.

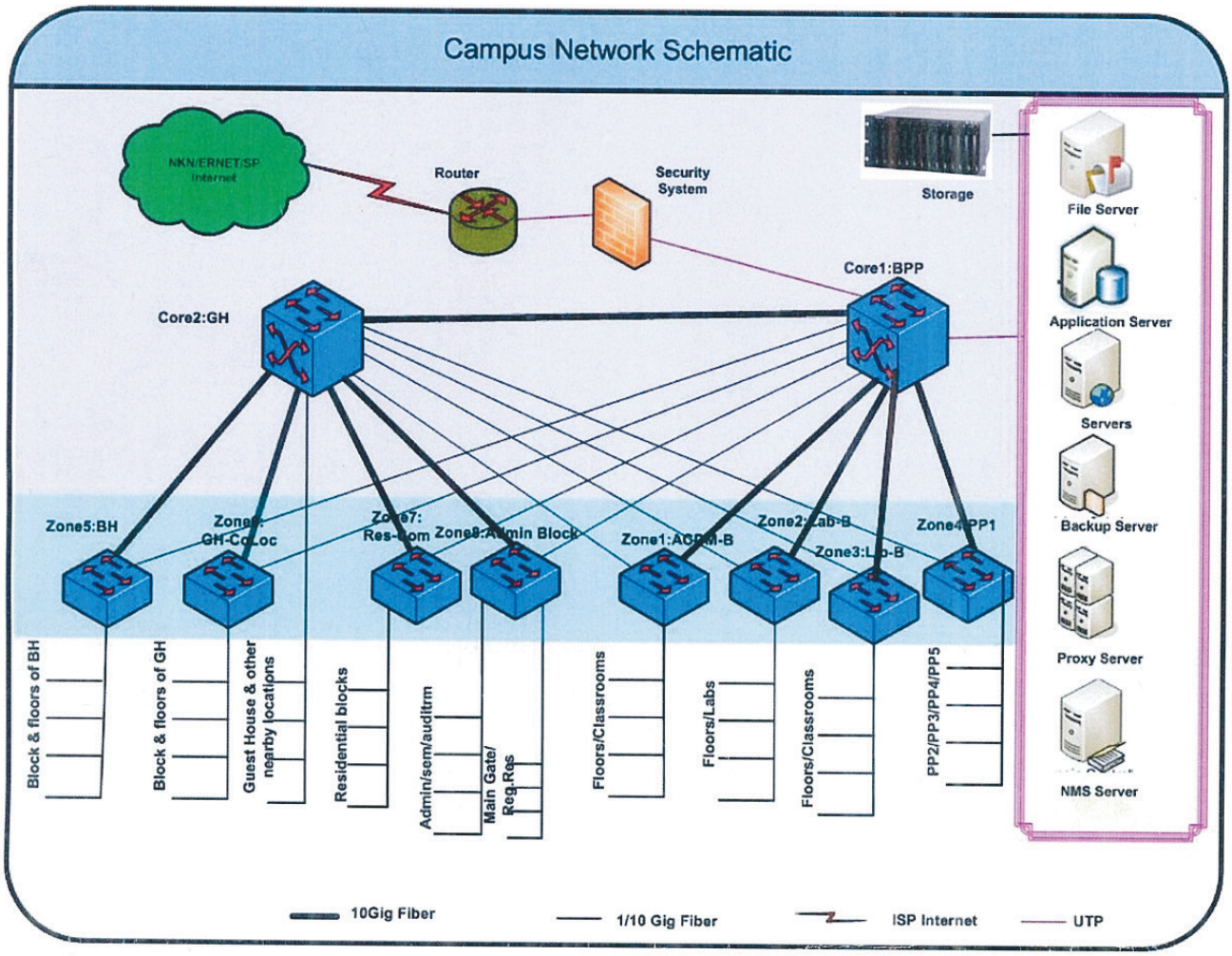


Fig 32:Wi-Fi Enabled Campus Network at NIFTEM

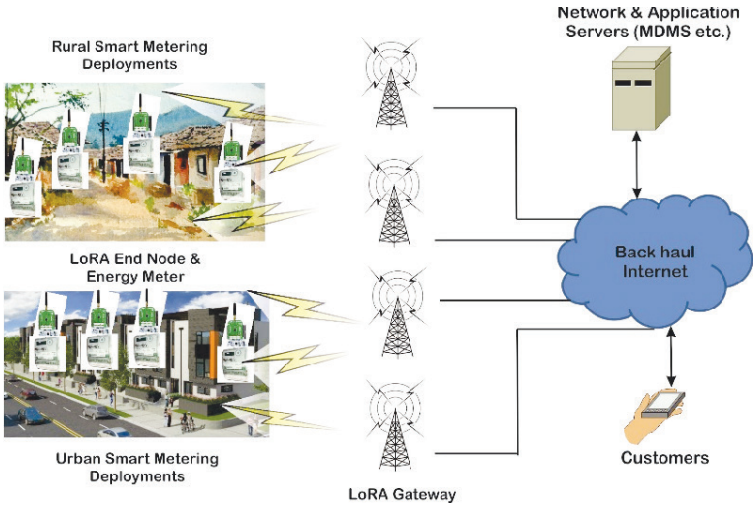
Set up of Project ICT Scheme in the schools under DoE, U.T. of Daman & Diu and DoE, U.T. of Dadra Nagar Haveli

ERNET India has signed a separate Memorandum of Understanding (MoU) with Directorate of Education, Daman & Diu (DD) and Directorate of Education, Dadra Nagar Haveli (DNH) to set up state-of-the-art ICT infrastructure in their schools. As per MoU, 64 ICT labs (i.e. 39 in DNH & 25 in DD) has been setup in both the UTs. The project is fully operational and is being used by the students of the concerned school.

Fig: 33

Smart Metering Prototype using LoRA

ERNET India has earlier executed MeitY funded R & D project "Prototype a 6LoWPAN network towards managing utility based Wireless Sensor Networks" and demonstrated with Agriculture use-case. Currently, ERNET is extending the project outcomes to Smart Metering prototype using LoRA. The architecture includes STM32-Nucleo, Arduino compatible board with ultra-low power MCU ARM Cortex-M with LoRA RF expansion board is interfaced through Serial communication to DLMS protocol compliant energy meter.



LoRA end node communicates to the meter using DLMS protocol to query energy consumed (kwh) and other useful parameters relating to voltage, current, frequency etc. by sending appropriate OBIS code. Since LoRA can support long range communication the end node will reach the gateway in single hop and the LoRA gateway connects to multiple LoRA end nodes on the customer side and to the backhaul IP internet for connectivity to utility data servers. Considering the sparse rural deployment where households are far and apart and in sparse urban settlements, LoRA operating in unlicensed free spectrum of 868 MHz is attractive.

SDN for Smart Grid and security challenges

ERNET India in collaboration with Central Power Research Institute (CPRI), autonomous society under the Ministry of Power, has been evaluating the security aspects of using Software Defined Networking in Smart Grid applications.

Considering that Smart Grid has a large-scale communication network that consists of network of networks with thousands of devices such as Intelligent Electronic Devices, Phasor Measurement Units (PMUs), routers, switches and computers. The complexity of these heterogeneous networks/devices and its interoperability as well as network management becomes a problem. Using SDN in this case will help the Smart Grid systems management/configurations in real-time. Smart Grid Control Centre will collect data through communication network from consumers, field devices such as PLCs, PMUs, IEDs at substations in real-time and do control decision at the control center in terms of reliability and quality of the power.

Development/renovation of Government / State Govt. websites to make them accessible for Persons with Disabilities (PwD) as per GIGW /WCAG. 2.0 (A, AA level)

Under Accessibility India Campaign, one of the target is to make all Govt. websites accessible to all. For this, Department of Empowerment of Persons with Disabilities (DEPwD) has funded ERNET India to make Govt. websites accessible as per GIGW and WCAG2.0 (A, AA level) standards.

ERNET has been given 917 websites across 20 states and 3 UTs of the country to make them accessible and responsive. Accessibility of all websites will be achieved by making them responsive, CMS based and compliant as per Guidelines for Indian Govt. Websites (GIGW) & Web Content Accessibility Guideline (WCAG) 2.0 (A,AA level).

IPv6 Activities – ERNET leads the way to the Future Internet

Internet Protocol version 6 is the new protocol on which the Internet will expand since it offers nearly unlimited number of IP addresses to connect devices to the Internet. However being a very new technology, adoption has been really slow, while number of internet connected devices due to the IT and Telecom revolution has exploded many folds in India.

ERNET India which spearheads the research in network and related technologies was one of the few organizations in India to have implemented IPv6 in its networks and application in collaboration with International partners and consortiums about a decade ago. It has full IPv6 enabled infrastructure not only at its core but also reaching IPv6 connectivity to its customers wherever technically feasible and required.

Some of the initiatives and activities undertaken by ERNET India in the area of IPv6 are:

- Operation of an IPv6 enabled Pan-India Network across the country.
- Setting up an IPv6 Lab for demonstrating IPv6 applications and imparting hands-on training facility to organizations wanting to use IPv6.
- Participation in global IPv6 experimentation and research

Capacity Building & Skill Development

With the aim of churning out competent technical resource in the area of ICT and IPv6 networking apart from other areas, ERNET has embarked on the process of designing courses and creating central training infrastructure to expose participants to hands-on live environment. These courses would help in capacity building and enhancing the skillsets required for propagating ICT knowledge and experience. It aims at creating pol of trained technical resource manpower for managing and advancing its Information technology infrastructure in terms of operating the existing computer network / WAN network and on the same time keeping the pace of advancement as per latest technological needs.

IPv6 Training Program for Staff of Government / Ministries and Institutions

- The project is aimed at creating skill set in IPv6 usage and benefits to make the country IPv6 enabled and will create a pool of IPv6 trained workforce resources to take up the challenges that the future Internet will pose to the country in the age of cyber war.
- ERNET has also created a physical Training Infrastructure at Delhi, Chennai & Bangalore to cater to above need which is available across the Internet. Users will able to experience real life hands-on experience to IPv6 configuration and practice on DNS, mail server, proxy, web-server using virtual machines.
- About 500 staff of Central & State Governments trained hands-on on use of IPv6 across the country

An exclusive IPv6 portal having Test tools hosted on the Internet for the general public wanting to test their IPv6 environment

Fig :34

IPV6 Consultancy & Turnkey Implementation Services

The IPv6 task force formed by the Govt. of India envisages that all Government Departments and Organisations should become IPv6 enabled in 2017.

Based on the same and to ensure that technically competent organisations should only act as Consultants and implementers for Government bodies, DoT formally went through a rigorous evaluation process and empanelled ERNET India for providing consulting service and act as implementer to Government Organizations. This was further endorsed by DeitY by nomination ERNET as the nodal agency for IPv6 implementation in DeitY and its organisations.

YETI DNS Project – A live root DNS system test bed

"One World, One Internet, One Namespace" is the essence for the success of today's Internet. The top level of the unique identifier system, the DNS root system, has been operational for 25+ years. It is pivot to make the current Internet useful and make changes in the current Internet Infrastructure which is considered somewhat ossified for stability reasons at present. It is hard to test and implement new ideas evolving to a more advanced level to counter challenges like IPv6-only operation, DNSSEC key/algorithm rollover, scaling issues, etc. In order to make the test more practical, it is also necessary to involve users' environment which is highly diversified, to study the effect of the changes.

ERNET as part of this global initiative is hosting in India 3 of the 25 root servers and 3 out of the 7 root resolver systems operating worldwide under this DNS root server test bed

Fig :35

E-Learning ICT Centers in 204 schools of Srikakulam, Andhra Pradesh

ERNET India had signed a Memorandum of Understanding (MOU) in January 2014 with Department of School Education, Andhra Pradesh Government to establish e-Learning Information & Communication Technologies (ICT) Infrastructure in 204 Schools located in rural/ tribal areas of Srikakulam, Andhra Pradesh with the objective to deliver state-of-art e-Learning ICT infrastructure model in schools.

The project is intended to achieve "freedom from distance" and bridge the gap between the increasing demands of education for all and the inability of existing educational systems to meet such demands without support of ICTs especially in the terms of access, equity, and resources due to urban-rural divide.

These ICT centers not only involve IT infrastructure but a combination of IT technologies, educational contents, communication system, training of teachers, support & maintenance, and develop wide collaborative system among student and teachers to produce, store, process, distribute and exchange information. The ICT infrastructure consists of standalone desktop PC's with speaker, webcam, microphone, laser printer cum scanner, Projector, UPS, LAN & Electrical cabling, Computer software (OS, Antivirus, MS Office), Computer Furniture, Educational Contents and internet connectivity. The management and control of these ICT Centers is transferred to the Department of School Education, Andhra Pradesh Government.

The ICT Centers are commissioned, operational and functional in all the 204 schools. These ICT centers are being used by school students & teachers for inculcating computer literacy and enhancing education through use of ICT labs. ERNET India had also conducted basic level training for 408 nos. of teachers on ICT.

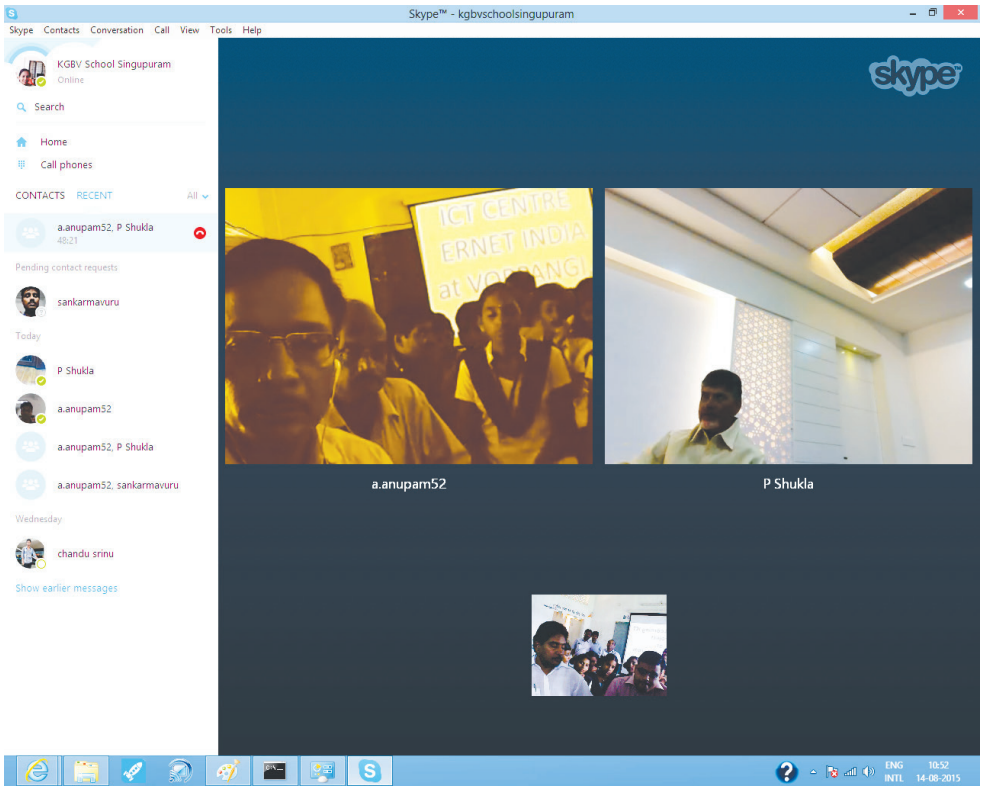
ERNET had provided broadband internet connectivity in 36 schools from BSNL. In remaining 168 schools ERNET leveraged internet through APSFL considering its wider presence & sustainable infrastructure. Also carried out experiment on TV Whitespace Technology first time in India through which provided internet connectivity in 05 schools.

ICT Centers at Srikakulam, A.P.

Z.P.H School, Santhavurity

Z.P.H School, Teppalavalasa

Fig: 36 Chief Minister (A.P) interacting with children of KGBV Singupuram & ZPHS Voppangi using skype over TVWS links



Chief Minister (A.P) &Dist. Collector Srikakulam interacting with children of KGBV Singupuram & ZPHS Voppangi using skype over TVWS links

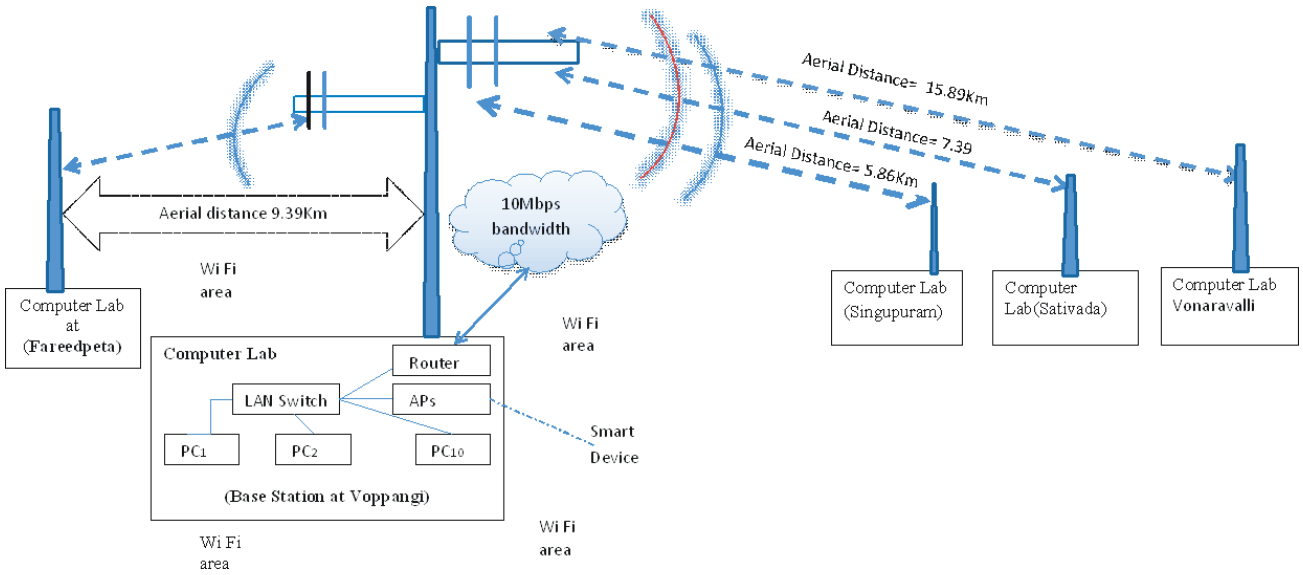
Fig :37

Pilot Project of White Space TV

The Government of India (GoI) had a vision to connect the rural masses to the national mainstream by creating Digital Highways through National Optical Fiber Network (NOFN) up to Gram Panchayats. So, ERNET India had initiated a research experiment on emerging technologies; an attempt to use the available White Spaces("defined as the frequencies allocated to a broadcasting service but not used locally") for low cost connectivity in remote areas. The research experiment proposes to effectively use channels in TV band for internet connectivity while continuing to allow TV transmission unhampered.

ERNET India had applied for necessary licenses in Wireless Planning & Coordination (WPC)/ Department of Telecommunication (DOT) for experimentation. As ERNET India is already implementing project for establishing e-Learning ICT Centers in schools located in rural & tribal area of Srikakulam, Andhra Pradesh &internet connectivity is an important part of project; ERNET desires to carry out experiment on TV White Space by setting up of Proof of Concept (PoC) test bed for these schools located in remote/ tribal belt of Srikakulam A.P. After obtaining experimental licenses from WPC, the PoC has been carried out by connecting 05 schools with backbone of 10 Mbps during July 2015-June 2016, the experiment benefited to identify whether TV Whitespace will be effective mode of last mile connectivity beyond NOFN termination at Gram Panchayats. A Working Group Committee formed by DeitY and the committee is working on framing policy for use TV whitespaces after gaining the experience by various experimenters. ERNET had obtained experimental License from DOT of 60 MHz in the frequency range of 500-510 MHz&518-568 MHz. The setup of PoC is presented below:

Setup of TV Whitespace at 5 locations



S. no.	School Name	Building Height	Pole height on Building rooftop	Distance from Base station	Remarks
1	ZPHS VOPPANGI (Base Station)	12 Ft.	40 Ft.	-	02 Radios mounted on pole: 1st at 40Ft. Height 2nd at 20 Ft. Height.
2	ZPHS FAREEDAPETA	12 Ft.	20 Ft.	9.39Km	Client
3	KGBV SINGUPURAM	20 Ft.	20 Ft.	5.86 Km	Client
4	Z.P.H.S VAMARAVALLI	20Ft.	20 Ft.	15.9Km	Client
5	Z.P.H.S SATIVADA	12 Ft.	20 Ft.	7.39Km	Client

Fig: 38

A 10 Mbps lease line (fiber) was terminated at ZPH SchoolVoppangi, Srikakulam, A.P. From this location, the Internet was extended to four client locations in a non-line of sight topography. During the experiment carried out, the achieved link speed observed in Point-to-Point architecture and Point-to-Multipoint architecture is mentioned below.

The link speed achieved over various distances

Client Sites	Connected to Base Stations at ZPHS Voppangi school	Approx . distance by Road from Voppangi Base (Km)	Aerial Distance (Km)	Point to Point (Performance of Individual link)				Point to Multi Point (Performance of Multiple links)			
				Avail Bandwidth (DL in Mbps)		UL Avail Bandwidth (UL in Mbps)		Avail Bandwidth (DL in Mbps)		Avail Bandwidth (UL) Mbps)	
				Min	Max	Min	Max	Min	Max	Min	Max
Singupuram	Base 01	14.9	5.86	2.05	11.38	0.25	10.12	1.37	5.20	0.44	4.69
Sativada	Base 01	7.5	7.39	2.27	4.87	0.70	2.39	0.70	5.02	0.13	3.58
Vomaravalli	Base 01	18.3	15.89	1.36	3.31	0.25	0.35	1.37	4.57	0.09	2.48
Fareedupeta	Base 02	13	9.39	0.69	4.10	0.25	2.48	0.69	1.37	0.69	1.42

ERNET had carried out video conferencing through Skype over TV-Whitespace setup flawlessly; Mr. Satya Nadella, CEO Microsoft had interacted with school children of Kasturba Gandhi Balika Vidyalaya (KGBV) Singupuram, Srikakulam (A.P) & school located in **Kenya** on 29.07.2015.

CM, AP interacted over VC with various schools.

A very special Moment-Just before the Skype Call with the School in Kenya and with Satya Nadella on July 2
Fig: 39

e-Linkage to Krishi Vigyan Kendras under ICAR

Under an MOU with ICAR, ERNET India had established a dedicated VSAT Hub and deployed ICT Infrastructure at 200 KVKs/ZPDs in April 2010 under an ICAR Project & developed them as information Hubs. During the year and upto July 2016, ERNET India has provided operations, maintenance and management support services to the captive VSAT network of ICAR for VSAT based Internet/ Intranet connectivity and related applications to 200 KVKs/ ZPDs. A dedicated team of engineers was deputed for 24x7 operations of the facility. The facility has provided Internet Access, E-mail and VoIP for Voice Communication on 24x7 basis, including video streaming on demand.

Establishment of VSAT connectivity for Internet/Intranet access in the North-Eastern States of the country

ERNET India has been entrusted to establish VSAT connectivity for Internet/ Intranet access at 60 educational institutes/ schools in the North-Eastern states of India by MeitY, GoI. The objective of this project is to connect schools and institutes located in the remote parts of North-Eastern states of the country through satellite based VSAT links where reliable terrestrial connectivity is not available for promoting equitable and sustainable development of these remote areas. The connectivity has been established at around 65 % sites by March 2017.

Establishment of a high capacity SCPC VSAT link at Kavaratti, the U.T. of Lakshadweep Islands

ERNET India has established a high capacity SCPC VSAT link at Kavaratti, the U. T. of Lakshadweep Islands for NKN project of MeitY. The link has been installed & commissioned on 01.03.2017 and is operational.

Fig 40 : High Capacity SCPC VSAT at Kavaratti, the U.T. of Lakshadweep Island for NKN Project

Organizational Matters

Organizational Structure

ERNET India is functioning under the overall control and guidance of the Governing Council. Minister of Electronics & Information Technology is the Chairperson of the Council. Members of the Council are from various organizations such as IIT Delhi, Ministry of Health & Family Welfare, Ministry of Human Resources Development, Department of Space, Ministry of Electronics & Information Technology, TRAI, I-CERT, NASSCOM etc.

Human Resources of the Society

There are 48 sanctioned posts in various categories. Out of which 33 are filled and 15 are vacant. To meet the additional requirement of manpower for various ongoing projects, ERNET India has engaged 13 scientific & technical employee and 12 non technical employees on contract. In addition, 57 persons have also been engaged in various categories through outsourcing agencies.

Right to Information Act

In order to promote transparency and accountability in the working of the society, mandatory provisions under the Right to Information Act have been implemented in the society. A Central Public Information Officer and Assistant Public Information Officer are functioning in the society. The mandatory information has been hosted on the website of the society.

Vigilance Activities

The vigilance activity in ERNET India is headed by a part time Chief Vigilance Officer. The vigilance activities of ERNET India are the preventive measures to provide transparent system and to create a healthy working environment.

Status of Sexual Harassment Cases

No complaint of sexual harassment was received during the financial year 2016-17. One complaint of sexual harassment is under investigation/ disposal process.

Official Language Implementation

Official Language Implementation committee has been set up to monitor the usage of Hindi in the society. The Committee under the Chairmanship of Director General monitors the usage of the official Language from time to time.

Hindi Pakhwada was organized during September 2016 in ERNET India, Shastri Park, New Delhi. Competition in Hindi noting/drafing, Essay & Poem recitation were held and employees were awarded.

Quarterly Hindi workshops have also been organized for the officers and staff of ERNET India. During these workshops staff members are apprised various provisions in the law for effective implementation of Hindi.

Swachhta Bharat Pakhwada

ERNET India organized Swachhta Bharat Pakhwada during 1st to 15th November 2016 as per instructions and orders of Government of India. The main motive/ objective of Swachhta Bharat Pakhwada is to sensitize maintain cleanliness of the office premises, reduce consumption of resources by promoting energy efficient lighting, dispose of old records/ files etc.

Fig 41

Shifting of Office

ERNET India has shifted its new office, from Jeevan Prakash Building, KG Marg, New Delhi to 5th Floor, Block I, DMRC IT Park, Shastri Park, Delhi on 17th September 2016. The space has been hired on lease from Delhi Metro Rail Corporation.

Fig 42

Visit of Parliamentary Committee on Papers laid on the Table, Rajya Sabha

The Committee meeting on Papers Laid on the Table, Rajya Sabha held at Mumbai , Kozhikode, Thiruvananthapuram and Bengaluru from 23rd to 30th September 2016 . The Committee comprising of Dr.C.P.Thakur, M.P. Rajya Sabha (Chairman), Sh. Joy Abraham M.P., Rajya Sabha (Member), Sh. Santiues Kujur M.P. Rajya Sabha and officials from the Rajya Sabha Secretariat participated to discuss on the issues relating to "Preparation/Laying of Annual Reports viz-a-viz Audit Mechanism available in the organization" As per the requirements a "Background Note on ERNET India" was submitted for consideration of Committee. Note consisted mainly:-

- Activities undertaken by ERNET India
- Reply to a questionnaire consisting of questions pertaining to organisation structure and audit processes.
- Details of audit observations during last 5 years and their replies and status.

A team consisting of Sh. Meharban Singh, Sr. Director, Sh.Vipin Aggarwal, Director (Finance) and Sh. Narendar Namrani, Deputy Director (Finance) from ERNET India alongwith the team lead by Sh. Dipak Singh, Sr. Director, MeitY visited Calicut during 26th to 29th September, 2016 to interact with the Hon'ble members of Committee and gave brief presentation about ERNET India and replied to the queries of Hon'ble Members of Parliament. The Meeting was successfully concluded and members appreciated the overall conduct of the meeting.


MEHARBAN SINGH, SR. DIRECTOR
ERNET INDIA
DEEPAK SINGH, DIRECTOR
MEITY
VIPIN AGARWAL, DIRECTOR
ERNET INDIA
PREMIER

Fig 43

Social Initiatives Undertaken by ERNET through Smart Virtual Classroom (SVC)

Virtual classroom is a massive medium for creating general awareness about the initiatives taken by the government. This infrastructure can be of great use towards communicating various messages of social importance and providing trainings to the society like training on disaster management etc. It is potentially reaching a minimum audience of 20,000 students daily with a total reach till now of 20,04,920 Students and 64,368 teachers.

1) SWACHHA BHARAT PAKHWADA

Government of India celebrated **"Swachha Bharat Pakhwada"** during 01.08.2017 to 15.08.2017 creating awareness of personal cleanliness and cleanliness of the surroundings. We celebrated **Swachha Bharat Pakhwada** with the smart virtual classroom medium by prominently displaying the Swachh Bharat slogan "हम सब का एक ही नारा। साफ सुथरा हो देश हमारा" in all the sessions conducted. It was also displayed in regional languages like Tamil, Telugu, Gujarati etc., to have a localized impact.

SVC session at DIET in Gujrat

SVC session at DIET Tiruvannamalai

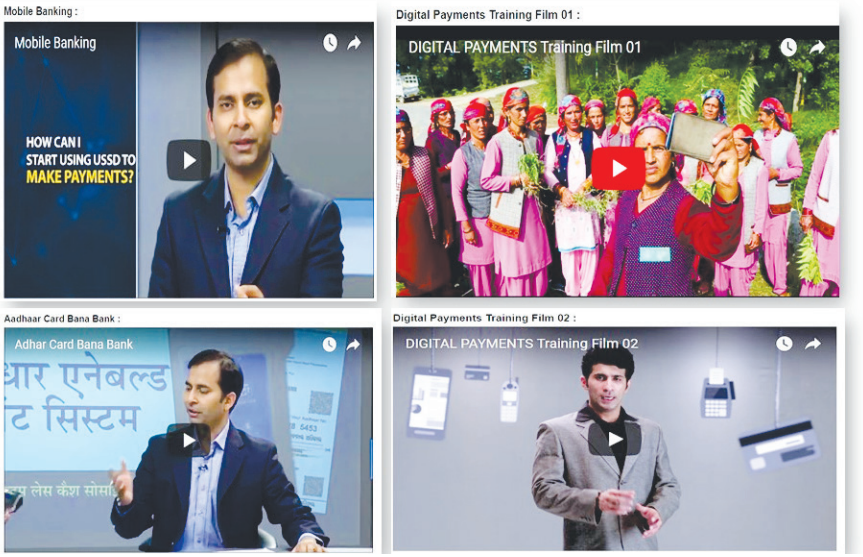
SVC session in different states

Fig: 44

2) BOOSTING DIGITAL PAYMENTS & CASHLESS ECONOMY

In order to promote the use of digital payments & cashless economy during the demonetization, we showed training videos on different modes of cashless payments in every SVC session from 15th December 2016 to 30th January 2017 to create a general awareness among students and teachers in DIET's/schools.

Video being played by DIET Chennai in one of the sessions



Videos being played by DIET Centers

Fig: 45

PoP Coordinators	Node	Address
	ERNET, Delhi	Shri Dilip Barman Director ERNET India Electronics Niketan 6, C.G.O. Complex, Lodhi Road New Delhi – 110 003
	IIT, Guwahati	Prof. D. Goswami Head Department of Computer Science & Engineering, Indian Institute of Technology Guwahati – 781 031
	UoR, Jaipur	Dr. Shalendra Kumar Gupta Director Infonet Center,New CDPE Building University of Rajasthan, JLN Marg Jaipur – 302004
	NIC,Salt Lake, Kolkata	Shri Dilip Barman Director ERNET India Electronics Niketan 6, C.G.O. Complex, Lodhi Road New Delhi – 110 003
	VSAT Hub at STPI, Bangalore	Shri Avanindra Singh Additional Director ERNET India New Delhi
	ERNET PoP at IIT Madras, Chennai	Dr. A. Paventhan, Additional Director Regional Center, Chennai, ERNET India

GOEL MINTRI & ASSOCIATES

CHARTERED ACCOUNTANTS

JD-18B, 1st Floor, Near Ashiana Chowk, Pitampura, New Delhi -110034

Phones : 29813333, 29814444, Mobile : 9810286498

E-Mail : sanjaygoelca.com

INDEPENDENT AUDITOR'S REPORT

The Governing Council

ERNET India

New Delhi

We have audited the accompanying financial statements of **ERNET India ("the society")**, which comprise the Balance Sheet as at March 31, 2017, and the Income and Expenditure Account for the year ended March 31, 2017, and a summary of significant accounting policies and other explanatory information.

MANAGEMENT'S RESPONSIBILITY FOR THE FINANCIAL STATEMENTS

Management is responsible for the preparation of these financial statements that give a true and fair view of the financial position and financial performance of the Society in accordance with the applicable Accounting Standards and Societies Registration Act 1860. The responsibility includes the design, implementation and maintenance of internal controls relevant to the preparation and presentation of the financial statements that give a true and fair view and are free from material misstatement, whether due to fraud or error.

AUDITOR'S RESPONSIBILITY

Our responsibility is to express an opinion on these financial statements based on our audit. We conducted our audit in accordance with the Standards on Auditing issued by the Institute of Chartered Accountants of India. Those Standards require that we comply with ethical requirements and plan and perform the audit to obtain reasonable assurance about whether the financial statements are free from material misstatement.

An audit involves performing procedures to obtain audit evidence about the amounts and disclosures in the financial statements. The procedures selected depend on the auditor's judgment, including the assessment of the risks of material misstatement of the financial statements, whether due to fraud or error. In making those risk assessments, the auditor considers internal control relevant to the Society's preparation and fair presentation of the financial statements,

in order to design audit procedures that are appropriate in the circumstances. An audit also includes evaluating the appropriateness of accounting policies used and the reasonableness of the accounting estimates made by the management as well as, evaluating the overall presentation of the financial statements.

We believe that the audit evidences we have obtained during the course of audit are sufficient and appropriate to provide a basis for our audit opinion.

OPINION

In our opinion and to the best of our information and according to the explanations given to us, The financial statements give the information required by the Act in the manner so required and give a true and fair view in conformity with the accounting principles generally accepted in India:

i) in the case of the Balance Sheet, of the state of affairs of the Society as at 31st March, 2017; and

ii) in the case of the income and Expenditure Accounts, of the excess of Income over Expenditure for the year ended on that date.

EMPHASIS OF MATTER :-

Attention is drawn to:

1) **EARMARKED FUNDS FOR NETWORK RESEARCH SCHEMES-** We observed that separate bank accounts are not maintained for the grants received for the specific projects. The summary of grants received and other utilization are incorporated in the Annual Accounts and shown in Schedule 2 and 2A.

2) **OFFICE PREMISES TAKEN ON LEASE AT DMRC IT PARK, DELHI-** Society has taken office space ad measuring approx. 20,000 sq ft DMRC IT Park on lease w.e.f. 10.2.2010 which has been occupied only after 19.09.2016.

3) **FIXED ASSETS** - We observed that the fixed assets at multiple locations in the same city have not been segregated. We were informed that physical verification of the assets at all the locations have been carried out in FY 2014-15 and their reconciliation as per record is need to be carried out and may take time due to various complexities involved due to fire incidents in the past. Therefore; no cognizance of report of physical verification of fixed assets has been taken in the financials.

4) **INTERNAL CONTROLS AND AUDIT SYSTEM**- The internal controls relating to booking of the expenses on accrual basis are weak. We have ensured provision of all the expenses in all such cases which came to our notice during the course of our audit. Society has booked prior period expenses to the tune of ₹ 56, 32,447/- in the current financial year due to non-provisioning of the same in previous periods.

5) **CURRENT LIABILITIES** -We observed that Sundry Creditors for goods and service amounting to ₹ 379.62 Lacs payable to MTNL/BSNL charges for leased line users, were lying unchanged since last few years and the same has been adjusted by reversing debtors amounting to Rs. 156.65 Lacs pertaining to this liability and Rs. 1936.87 lacs by crediting to Miscellaneous income.

REPORT ON OTHER LEGAL AND REGULATORY REQUIREMENTS

a) We have obtained all the information and explanations, which to the best of our knowledge and belief were necessary for the purposes of Audit.

b) In our opinion, proper books of account as required by law have been kept by the society so far as appears from our examination of those books.

c) Balance Sheet and Income & Expenditure Account dealt with by this report are in agreement with the books of account.

d) In our opinion, the Balance Sheet, Statement of Income and Expenditure Account comply with the applicable Accounting Standards.

e) The society has provided requisite disclosures in its financial statements as to holdings as well as dealings in specified bank notes during the period from 8 November, 2016 to 30 December, 2016 and these are in accordance with the books of accounts maintained by the society.

For GOEL MINTRI & ASSOCIATES
Chartered Accountants
FIRM Reg. No. 013211N

(Gopal Dutt)
Partner
Membership No.520858
CAG Reg. No. DE2218

Place: New Delhi
Dated: 08.08.2017

REPLIES OF POINTS RAISED IN AUDITOR'S REPORT FOR THE FINANCIAL YEAR 2016-17

S. No.	AUDITOR'S COMMENTS	REPLIES
1	**EARMARKED FUNDS FOR NETWORK RESEARCH SCHEMES -** we observed that separate bank accounts are not maintained for the grants received for the specific projects. The summary of grants received and their utilisation are incorporated in the Annual Accounts and shown in Schedule 2 and 2A.	Society is maintaining separate project wise ledger in the books of accounts. Agenda for giving power for opening separate bank account was put up to Executive Committee and the Committee suggested that instead of opening separate bank accounts for every project, single account should be maintained and books should be maintained separately for every project.
2	**OFFICE PREMISES TAKEN ON LEASED AT DMRC IT PART, DLEHI –** Society has taken office space ad measuring approx. 20,000 sq. ft at DMRC IT Park on lease w.e.f. 10.02.2010 which has been occupied only after 19.09.2016.	Amount of work done by M/s Woodfun Interiors and NBCC Services Ltd. have been capitalized and depreciation provided on the same as per the accounting policies of ERNET India.
3	**FIXED ASSETS -** We observed that the fixed assets at multiple locations in the same city have not been segregated. We were informed that physical verification of the assets at all the locations have been carried out in FY 2014-15 and their reconciliation as per record is need to be carried out and may take time due to various complexities involved due to fire incidents in the past. Therefore; no cognizance of report of physical verification of fixed assets has been taken in the financials.	Observations made by auditors have been noted. The process is on and it is expected to be closed in this financial year.

4	**INTERNAL CONTROLS AND AUDIT SYSTEM-** The internal controls relating to booking of the expenses need to be further strengthened. We have ensured provision of all the expenses in all such cases which came to our notice during the course of our audit. Society has booked prior period expenses to the tune of Rs.56, 32,447/- in the current financial year due to non-provisioning of the same in previous periods.	Accounting Systems are being made more stringent and every effort is being made to book all the income & expenditure in the relevant financial year to avoid booking them as prior period in later years.
5	**CURRENT LIABILITIES** -We observed that Sundry Creditors for goods and service amounting to Rs. 379.62 lacs payable to MTNL/BSNL charges for leased line users, were lying unchanged since last few years and same has been adjusted by reversing debtors amounting to Rs.156.65 lacs pertaining to this liability and Rs. 193.87 lacs by crediting to Miscellaneous income.	These entries were more than 8-10 years old and in last F&A Committee meeting this matter was discussed and a commitment was given that these entries will be settled in the FY 2016-17. Thereafter, ERNET India followed up with BSNL/MTNL to confirm the amount due to them but they failed to provide any supporting documents in this regard and entries in the books of accounts have been reversed. The same has been detailed in point no.10 of"Schedule 14 – Notes on Accounts forming part of Balance Sheet."

ERNET INDIA
BALANCE SHEET AS AT 31.03.2017

(Amount in ₹)

CORPUS/CAPITAL FUND AND LIABILITIES	Schedule	Current Year	Previous Year
Corpus/Capital Fund	1	1,16,14,70,505	1,08,14,44,396
Equipment Replacement Fund		22,88,47,891	22,88,47,891
Earmarked Funds for Network Research Schemes	2	27,50,71,977	77,81,38,039
Current Liabilities and Provisions	3		
Other Current Liabilities		39,03,26,009	46,41,42,173
Provisions		57,10,26,364	54,96,08,802
TOTAL		**2,62,67,42,746**	**3,10,21,81,301**
ASSETS			
Fixed Assets	4	19,87,69,648	19,60,68,036
Current Assets, Loans, Advances etc.	5		
Inventories		72,926	7,46,234
Sundry Debtors		3,90,99,380	5,97,51,724
Receivables under Earmarked Network Research Schemes		13,66,52,598	9,23,65,625
Bank Balances with Scheduled Bank		2,01,20,78,831	2,51,56,40,243
Loan and Advances		24,00,69,362	2,376,09,440
TOTAL		**2,62,67,42,746**	**3,10,21,81,301**
Significant Accounting Policies	13		
Notes on Accounts	14		

For and on behalf of ERNET India

(Vipin Aggarwal)
Director (Finance)

(Bhupal Singh)
Registrar & Director (P&A)

Dr. Neena Pahuja
Director General

Place : New Delhi
Date : 08.08.2017

Auditor's Report

In terms of our separate report of even date annexed
M/s Goel Mintri & Associates
Chartered Accountants
FIRM Reg. No.013211N

Gopal Dutt
Partner
M.No.520858
CAG Reg. No.DE2218

ERNET INDIA
INCOME AND EXPENDITURE ACCOUNT FOR THE YEAR ENDED 31.03.2017

(Amount in ₹)

INCOME	Schedule	Current Year	Previous Year
1. Income from Subscribers	6	7,88,19,112	8,92,68,319
2. Sales of Equipment		38,304	-
3. Network Research Receipt	2A	79,12,56,915	45,79,69,511
4. Net Interest Earned	7	15,75,94,208	17,06,54,515
5. Other Income	8	3,94,67,629	18,77,395
6. Increase/(Decrease) in Inventories	9	(6,83,124)	-
TOTAL (A)		**1,06,64,93,044**	**71,97,69,740**
EXPENDITURE			
1. Operative Expenses	10	6,16,03,579	6,26,30,184
2. Purchase of Equipment		31,800	-
3. Network Research Expenditure	2A	79,12,56,915	45,79,69,511
4. Establishment Expenses	11	5,65,65,448	5,41,15,600
5. Administrative Expenses	12	5,29,65,171	6,62,91,649
6. Depreciation	4A & 4D	46,30,333	18,90,610
TOTAL (B)		**96,70,53,245**	**64,28,97,554**
Balance being excess of Income over Expenditure (A-B)		9,94,39,799	7,68,72,186
Profit Before Tax		**9,94,39,799**	**7,68,72,186**
Provision For Tax		**-**	**-**
NET Profit / (Loss) After Tax		**9,94,39,799**	**7,68,72,186**
Significant Accounting Policies	13		
Notes on Accounts	14		

For and on behalf of ERNET India

(Vipin Aggarwal)
Director (Finance)

(Bhupal Singh)
Registrar & Director (P&A)

Dr. Neena Pahuja
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Place : New Delhi
Date : 08.08.2017

Auditor's Report

In terms of our separate report of even date annexed
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Gopal Dutt
Partner
M.No.520858
CAG Reg. No.DE2218

ERNET INDIA
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2017

(Amount in ₹)

SCHEDULE 1 - CORPUS/CAPITAL FUND		Current Year	Previous Year
Balance as at the beginning of the year		84,59,73,262	76,91,01,076
Add : Excess of Income over Expenditure		9,94,39,799	7,68,72,186
Balance of Corpus Capital Fund	**(A)**	**94,54,13,061**	**84,59,73,262**
CAPITAL GRANT IN AID (DIT)			
Balance as at the beginning of the year		20,58,04,586	22,16,61,783
Less : Depreciation on Grant in aid Assets		1,38,38,783	1,58,57,197
Less : Loss on Grant in aid Assets		9,12,500	-
	(B)	**19,10,53,303**	**20,58,04,586**
Capital Fund (GIA) Fire Accident		2,96,66,548	3,50,04,850
Less : Depreciation on Grant in aid		46,62,407	53,38,302
	(C)	**2,50,04,141**	**2,96,66,548**
TOTAL BALANCE TRANSFERRED TO BALANCE SHEET (A+B+C)		**1,16,14,70,505**	**1,08,14,44,396**

ERNET INDIA
SCHEDULES FORMING PART OF BALANCE SHEET AS ON 31.03.2017

(Amount in ₹)

SCHEDULE 2 - EARMARKED FUNDS FOR NETWORK RESEARCH SCHEMES (In Progress)		Smart Virtual Classroom	GIA - Setting Up the Eduroam Services in India	GIA Srikakulam District.(E-Learning ICT centre in 204 school of srikakulam, District Andhra Pradesh)	GIA inform security Education & Awarness-Ph-II	GIA-Ministry of Social Justice & Empowerment	Project ICAR E-Linkage to 200 KVKs	GIA-NASSCOM-ERNET Centre of Excellence	GIA-Setting up of WIFI Campus network in 4 universities	Sub-Total A
a) Opening balance of the projects		43,29,06,768	3,91,036	50,34,956	13,81,850	-	(82,23,135)	3,30,68,808	12,79,60,409	59,25,20,692
b) Additions to the projects:										
(i)	Grant in aid Received	-	-	-	-	10,47,58,080	-	-	-	10,47,58,080
(ii)	Grant in aid Returned/ Adjustment	-	-	-	-	-	-	-	-	-
(iii)	Interest	1,44,85,002	-	81,518	37,850	10,46,916	-	11,23,687	32,65,151	2,00,40,124
iv)	Penalty recovered credited to the project	3,39,00,465	-	-	-	-	-	-	-	3,39,00,465
	TOTAL (a+b)	48,12,92,235	3,91,036	51,16,474	14,19,700	10,58,04,996	(82,23,135)	3,41,92,495	13,12,25,560	75,12,19,361
Expenditure Incurred (c)		47,95,17,113	8,91,338	1,31,64,586	8,85,061	1,92,502	1,27,66,250	1,46,32,407	12,97,58,005	65,18,07,261
NET BALANCE AS AT THE YEAR-END (a+b)-(c)		17,75,123	(5,00,302)	(80,48,112)	5,34,639	10,56,12,494	(2,09,89,385)	1,95,60,088	14,67,555	9,94,12,100

ERNET INDIA
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2017

(Amount in ₹)

SCHEDULE 2 - EARMARKED FUNDS FOR NETWORK RESEARCH SCHEMES (In Progress)		GIA-Setting up of WIFI Campus Allahabad university	GIA-VSAT at North Eastern State of the country	Project -Directorate of Edu, Silvasa UT Dadar & Nagar Haveli	Project Dir of Education Daman & Diu	Project SCPC VSAT Link at Port Blair A&N, L.Island	Project- Tea Research Board	Sub Total B	CURRENT YEAR	PREVIOUS YEAR
a) Opening balance of the projects		2,15,97,430	8,24,01,871	59,43,577	78,53,534	2,39,94,300	7,00,000	19,57,90,712	78,83,11,404	79,18,71,302
b) Additions to the projects:										
(i)	Grant in aid Received	-	-	3,38,25,311	4,95,41,745	-	-	8,33,67,056	18,81,25,136	34,43,31,098
(ii)	Grant in aid Returned/ Adjustment	-	-	-	-	-	-	-	-	-
(iii)	Interest	4,80,445	32,00,207	-	-	-	-	36,80,652	2,37,20,776	3,70,55,909
iv)	Penalty recovered credited to the project	-		-	-	-	-	-	3,39,00,465	-
	TOTAL (a+b)	2,20,77,875	8,56,02,078	9,30,68,888	5,73,95,279	2,39,94,300	7,00,000	28,28,38,420	1,03,40,57,781	1,17,32,58,309
Expenditure Incurred (c)		1,71,14,767	1,49,71,951	9,29,82,045	22,43,648	90,46,084	3,57,846	13,67,16,341	78,85,23,603	40,82,62,550
NET BALANCE AS AT THE YEAR-END (a+b)-(c)		49,63,108	7,06,30,127	86,843	5,51,51,631	1,49,48,216	3,42,154	14,61,22,079	24,55,34,178	76,49,95,759
		ADD: Excess Excess Amount -Spent under projects (Transferred to Schedule 5)							2,95,37,799	1,31,42,280
		Total Earmarked Network Research Schemes (Transferred to Balance Sheet)							27,50,71,977	77,81,38,039

ERNET INDIA
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2017

(Amount in ₹)

SCHEDULE 2 A - EARMARKED FUND FOR NETWORK RESEARCH SCHEMES COMPLETED	IPV 6 Training Programme for staff of Govt./ Min. / Inst.	GIA - Testing of IPV6 Application & Equipment	GIA - Setting Up of Digital Archival Facility for Outcomes of Various Language	Current Year	Previous Year
a) Opening balance of the schemes	62,22,606	(49,19,145)	75,194	13,78,655	18,40,376
b) Additions to the schemes:					
(i) Grant-in-aid Received	-			-	4,30,31,000
(ii) Receipts Transferred from Scheme in Progress	-			-	-
(iii) Interest	1,51,612			1,51,612	12,01,799
(iv) Grant in aid Returned/Adjustment	(50,06,407)			(50,06,407)	-
(v) Grant Transfer to Receivable A/c (Refer Schedule 5 Amount Receivable under projects)	-	54,59,452	7,50,000	62,09,452	51,64,000
TOTAL (a+b)	**13,67,811**	**5,40,307**	**8,25,194**	**27,33,312**	**5,12,37,175**
c) Expenditure towards projects	13,67,811	5,40,307	8,25,194	27,33,312	4,97,06,961
(i) Balance Amount Transfer to Advances Received.	-				15,30,214
(ii) Expenditure Transferred from Scheme in Progress(Schedule 2)	-			78,85,23,603	40,82,62,550
TOTAL (c)	**13,67,811**	**5,40,307**	**8,25,194**	**79,12,56,915**	**45,94,99,725**
Earmarked Fund for Network Research Schemes Completed	13,67,811	5,40,307	8,25,194	79,12,56,915	45,94,99,725
Less: Amount transferred to advance under other Current Liabilities (Rfer Schedule-3- Advances Received from Others)	-			-	15,30,214
	13,67,811	5,40,307	8,25,194	79,12,56,915	45,79,69,511

ERNET INDIA
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2017

(Amount in ₹)

SCHEDULE 3 - CURRENT LIABILITIES AND PROVISIONS		Current Year	Previous Year
A	**CURRENT LIABILITIES**		
1	Sundry Creditors for Goods and Services	12,59,13,548	29,73,27,117
2	Advances Received for Projects and Other Business Operations	12,63,79,021	13,96,56,757
3	EMD and Other Misc. Receipts	37,46,129	39,66,103
4	Amount Payable to Transit Nodes	46,78,367	56,42,405
5	TDS Payable	1,05,33,765	86,20,530
6	Service Tax Payable	37,37,014	37,69,062
7	Expenses Payable	12,91,682	7,59,868
8	Contributory Provident Fund	14,37,006	41,91,554
9	NPS Contribution	92,784	-
10	Sales Tax Payable	49,83,804	28,372
11	Retention Money	10,75,32,888	1,80,405
	TOTAL (A)	**39,03,26,009**	**46,41,42,173**
B	**PROVISIONS**		
1	Gratuity	88,88,991	71,62,337
2	Accumulated Leave Encashment	1,92,16,703	1,55,58,709
3	Provision for Tax	35,60,00,000	35,60,00,000
4	Provision for impairment of Fixed Assets	88,63,742	88,63,742
5	Sundry Creditor payable	16,10,58,737	16,20,24,014
6	Misc. Liabilities (Transline Balance on hold under Srikakulam project)	1,69,98,191	-
	TOTAL (B)	**57,10,26,364**	**54,96,08,802**
	TOTAL (A+B)	**96,13,52,373**	**1,01,37,50,975**

SCHEDULE 4 - FIXED ASSETS

(Amount in ₹)

ASSETS	Schedule	Current Year	Previous Year
Fixed Assets Acquired From Capital Fund	4A	6,40,33,991	4,34,56,735
Fixed Assets Acquired From Grant-in-aid	4B	13,11,19,570	14,58,87,342
Fixed Assets Acquired to rebuild the infrastructure destroyed in fire	4C	2,42,83,402	2,73,24,826
Fixed Assets- Intangibles	4D	16,21,052	16,87,500
Total (4A+4B+4C+4D)		**22,10,58,015**	**21,83,56,403**
Less : Provision for Assets lost in fire		(2,22,88,367)	(2,22,88,367)
Total		**19,87,69,648**	**19,60,68,036**

FIXED ASSETS (CAPITAL FUND)
(As per Income Tax Act , 1961)
2016-17

(Schedule 4A)

S. No.	Particulars	Rate	Opening WDV as at 01.04.2016	Addition During the Year		Deletion	Total	Depreciation During the Year	Closing WDV as at 31.03.2017
				Before 01.10.2016	After 01.10.2016				
I	**Computer & Accessories**								
	Additional PC Accessories	60%	2,041	14,873	5,040	-	21,954	11,660	10,294
	Computer & Servers	60%	3,69,312	4,27,700	69,750	-	8,66,762	4,99,132	3,67,630
	Printers	60%	79,850	39,900	78,000	-	1,97,750	95,250	1,02,500
	Software	60%	1,91,012	1,15,710	-	-	3,06,722	1,84,033	1,22,689
II	**Electronic Equipments**								
	Cables & Connectors(Sub. Fund)	15%	15,306	-	-	-	15,306	2,296	13,010
	CISCO Routers(Sub. Funds)	15%	95,194	-	-	-	95,194	14,279	80,915
	Hubs(Sub Fund)	15%	4,07,555	-	-	-	4,07,555	61,133	3,46,422
	Modems/ Radio Modems	15%	1,58,873	-	-	-	1,58,873	23,831	1,35,042
	Multimeters	15%	586	-	-	-	586	88	498
	Multiplexer	15%	6,896	-	-	-	6,896	1,034	5,862
	Radio Antenna (Sub. Fund)	15%	4,530	-	-	-	4,530	680	3,851
	Testing Instruments	15%	22,942	-	-	-	22,942	3,441	19,501
	VSAT Antenna (Subs. Fund)	15%	9,697	-	-	-	9,697	1,455	8,242
	VSAT(SCPC)(Subs. Fund)	15%	2,21,598	-	-	-	2,21,598	33,240	1,88,358
	Networking Equipment (Sub)	15%	5,16,196	-	-	-	5,16,196	77,429	4,38,767
	Air Conditioning System (DMRC)	15%	-	48,89,159	-	-	48,89,159	7,33,374	41,55,785
III	**Furniture & Fixture**								
	Misc. Furniture Items	10%	1,31,976	12,811	1,98,446	-	3,43,233	24,401	3,18,832
	Furniture & Fixture	10%	-	1,09,22,028	-	-	1,09,22,028	10,92,203	98,29,825
IV	**Office Equipments**			-					
	D.G. Sets/Generator	15%	32,360	-	-	-	32,360	4,854	27,506
	Misc. Office Equipment	15%	1,73,497	1,74,571	1,18,512	-	4,66,580	61,099	4,05,481
	Projector (OHP)(Sub Fund)	15%	1	-	-	-	1	0	1
	UPS & Batteries	15%	4,87,815	-	-	-	4,87,815	73,172	4,14,643
	Telephone & EPABX System (Sub)	15%	88,531	-	33,600	-	1,22,131	15,800	1,06,331
	Electrical equipments (DMRC)	15%	-	56,69,541	-	-	56,69,541	8,50,431	48,19,110
V	**Building**								
	Building	10%	3,59,067	-	-	-	3,59,067	35,907	3,23,160
	Civil work at DMRC	10%	-	18,97,597	-	-	18,97,597	1,89,760	17,07,837
VI	**Land at Bangalore on lease**		4,00,81,900	-	-	-	4,00,81,900	-	4,00,81,900
	Total		**4,34,56,735**	**2,41,63,890**	**5,03,348**	**-**	**6,81,23,973**	**40,89,982**	**6,40,33,991**

FIXED ASSETS (GRAND-IN-AID)
(As per Income Tax Act , 1961)
2016-17

(Schedule 4B)

S. No.	Particulars	Rate	Opening WDV as at 01.04.2016	Addition During the Year		Deletion	Total	Depreciation During the Year	Closing WDV as at 31.03.2017
				Before 01.10.2016	After 01.10.2016				
I	**Computer & Accessories (GIA)**								
	Addl. PC Accessories(GIA)	60%	11,526	-	-	-	11,526	6,916	4,610
	Computer Pheripherals (Cards)	60%	46	-	-	-	46	28	18
	Computer & Servers(GIA)	60%	2,49,426	-	-	-	2,49,426	1,49,656	99,770
	Printers & Printing Devices	60%	19,120	-	-	-	19,120	11,472	7,648
	Softwares(GIA)	**60%**	**73,474**	**-**	**-**	**-**	**73,474**	**44,084**	**29,390**
II	**Electronic Equipment (GIA)**								
	Access Control System (GIA)	15%	65,394	-	-	-	65,394	9,809	55,585
	Active & Passive Components A/c	15%	35,185	-	-	-	35,185	5,278	29,907
	Air Pro Gold Router	15%	42,275	-	-	-	42,275	6,341	35,934
	Attenuator	15%	1,335	-	-	-	1,335	200	1,135
	Auto Sensing Switch	15%	11,680	-	-	-	11,680	1,752	9,928
	Base Band Hub	15%	69,95,107	-	-	-	69,95,107	10,49,266	59,45,841
	Beacon Receiver	15%	51,830	-	-	-	51,830	7,775	44,056
	C Band ODU/LNA/LNB	15%	2,43,343	-	-	-	2,43,343	36,501	206,842
	CISCO Router	15%	2,96,39,875	-	-	-	2,96,39,875	44,45,981	2,51,93,894
	CISCO Switch	15%	9,26,893	-	-	-	9,26,893	1,39,034	787,859
	EMS Hardware & Software	15%	5,65,624	-	-	-	5,65,624	84,844	480,780
	High Power Amplifier	15%	17,49,849	-	-	-	17,49,849	2,62,477	14,87,372
	Hubs A/c	15%	2,33,902	-	-	-	2,33,902	35,085	1,98,817
	Interface Convertors	15%	1,62,954	-	-	-	1,62,954	24,443	1,38,511
	Intrusion Prevention System (IPS) (GIA)	15%	3,07,478	-	-	-	3,07,478	46,122	2,61,356
	ISDN Modem	15%	1,380	-	-	-	1,380	207	1,173
	ISDN Simulator	15%	1,04,938	-	-	-	1,04,938	15,741	89,197
	Modems/Radio Modem (GIA)	15%	10,77,422	-	-	-	10,77,422	1,61,613	9,15,809
	Networking Equipments (GIA)	15%	4,959	-	-	-	4,959	744	4,215
	NMS Hardware	15%	9,71,610	-	-	-	9,71,610	1,45,742	8,25,869
	NMS IT Software	15%	9,23,459	-	-	-	9,23,459	1,38,519	7,84,940
	Protocol Analyser	15%	2,28,902	-	-	-	2,28,902	34,335	1,94,567
	Radio Anttenna	15%	1,12,563	-	-	-	1,12,563	16,884	95,679
	Radio Link Installation (FA-GIA)	15%	1,33,555	-	-	-	1,33,555	20,033	1,13,522
	Raid Array3000 With Controller	15%	1,51,670	-	-	-	1,51,670	22,751	1,28,920
	Redundant Power Systems (RPS)	15%	48,260	-	-	-	48,260	7,239	41,021
	SMPS Power Plant	15%	20,918	-	-	-	20,918	3,138	17,780
	Splilter	15%	13,563	-	-	-	13,563	2,034	11,529
	Video Encoder	15%	2,05,833	-	-	-	2,05,833	30,875	1,74,958

FIXED ASSETS (GRAND-IN-AID)
(As per Income Tax Act , 1961)
2016-17

(Schedule 4B)

S. No.	Particulars	Rate	Opening WDV as at 01.04.2016	Addition During the Year		Deletion	Total	Depreciation During the Year	Closing WDV as at 31.03.2017
				Before 01.10.2016	After 01.10.2016				
	VSAT Anttena	15%	3,19,515	-	-	-	3,19,515	47,927	2,71,588
	VSAT (SCPC)	15%	12,93,826	-	-	-	12,93,826	1,94,074	10,99,752
	Misc. Electronic Equipment (GIA)	15%	2,80,70,260	-	-	-	2,80,70,260	42,10,539	2,38,59,721
III	**Office Equipment (GIA)**								
	Air Conditioner(GIA)	15%	10,98,049	5,97,217	-	-	16,95,266	2,54,290	14,40,976
	DG Set	15%	3,10,106	-	-	-	3,10,106	46,516	2,63,590
	Misc. Office Equipments(GIA)	15%	16,20,421	6,41,151	-	-	22,61,572	3,39,236	19,22,336
	Projectors (OHP)	15%	68,662	-	-	-	68,662	10,299	58,363
	Telephone & EPABX System	15%	5,19,364	-	31,297	-	5,50,661	80,252	4,70,409
	UPS & Batteries (GIA)	15%	30,30,835	-	-	-	30,30,835	4,54,625	25,76,210
	Video Conferencing Equipment (GIA)	15%	5,56,910	-	-	-	5,56,910	83,537	4,73,374
	Misc Items (GIA)	15%	1,51,664	-	-	-	1,51,664	22,750	1,28,914
	Misc. Office Equipments (GIA- Fixed Assets)	15%	28,923	-	-	-	28,923	4,338	24,585
IV	**Office Furniture & Fixtures (GIA)**								
	Fitings,Flooring & Partitioning	10%	8,032	8,02,288	-	-	8,10,320	81,032	7,29,288
	Furniture & Fixture	10%	13,54,055	38,46,121	-	9,60,286	42,39,890	4,23,989	38,15,901
	Misc. Furniture & Fixture(GIA)	10%	2,42,069	-	-	-	242,069	24,207	2,17,862
	Fittings, Floorings & Partioning - IITM R P Chennai	10%	31,16,777	-	-	-	31,16,777	311,678	28,05,099
	Fittng ,Flooring & Partioning - Bangalore Centre	10%	19,28,327	-	-	-	19,28,327	1,92,833	17,35,494
	Office Furniture & Fixture (Grant in Aid)	10%	4,59,055	-	-	-	4,59,055	45,906	4,13,150
	Racks	10%	4,20,118	-	-	-	4,20,118	42,012	3,78,106
V	**Misc. Assets (GIA)**	10%	3,487	-	-	-	3,487	349	3,138
VI	**Building A/c (GIA)**	10%	14,762	-	-	-	14,762	1,476	13,285
VII	**Land on Lease at Bangalore**		**5,00,00,000**	**-**	**-**	**-**	**5,00,00,000**	**-**	**5,00,00,000**
VIII	**Capital WIP (DMRC)**		**58,86,777**	**-**	**-**	**58,86,777**	**-**	**-**	**-**
	Total		**14,58,87,342**	**58,86,777**	**31,297**	**68,47,063**	**14,49,58,353**	**1,38,38,783**	**13,11,19,570**

FIXED ASSETS (GRAND-IN-AID FIRE)
(As per Income Tax Act , 1961)
2016-17

(Schedule 4C)

Particulars	Rate	Opening WDV as at 01.04.2016	Addition During the Year		Deletion	Total	Depreciation During the Year	Closing WDV as at 31.03.2017
			Before 01.10.2016	After 01.10.2016				
Electronics Equipments								
CISCO ASR1002 Chassis 4 Built in GE	15%	10,33,486	-	-	-	10,33,486	1,55,023	8,78,463
CISCO WS-C2960S-24TS -L/ catalyst 2960S	15%	3,45,816	-	-	-	3,45,816	51,872	2,93,945
CISCO WS- C3750X-24T-S/ Catalyst	15%	1,13,451	-	-	-	1,13,451	17,018	96,433
CISCO ES C26960S-24TD-L/ Catalyst Switch	15%	52,381	-	-	-	52,381	7,857	44,525
CISCO 1941 Security bundle	15%	3,42,468	-	-	-	3,42,468	51,370	2,91,098
VMW are Virtualization Software	60%	7,69,690	-	-	-	7,69,690	4,61,814	307,876
CISCO Switch	15%	1,99,56,331	-	-	-	1,99,56,331	29,93,450	1,69,62,881
CHECK POINT	15%	40,57,117	-	-	-	40,57,117	6,08,568	34,48,549
CISCO ASR1002 Router	15%	-	16,20,984	-	-	16,20,984	2,43,148	13,77,836
Office Equipments		-	-	-	-	-	-	-
Air conditioner	15%	-	66,357			66,357	9,954	56,403
Misc Office Equipment	15%	-	71,239			71,239	10,686	60,553
Office Furniture & fixture								
Fitings, Flooring & Partitioning	10%	-	89,143			89,143	8,914	80,229
Furniture & Fixture (DMRC)	10%	-	4,27,347			4,27,347	42,735	3,84,612
Capital WIP		6,54,086			6,54,086			
TOTAL		**2,73,24,826**	**22,75,070**	**-**	**6,54,086**	**2,89,45,810**	**46,62,408**	**2,42,83,402**

INTANGIBLE ASSETS (Schedule 4D)

(As per Income Tax Act , 1961)

2016-17

Particulars	Rate	Opening WDV as at 01.04.2016	Addition During the Year		Deletion	Total	Depreciation During the Year	Closing WDV as at 31.03.2017
			Before 01.10.2016	After 01.10.2016				
Licenses Fee for ISP	25%	16,87,500		-	-	16,87,500	4,21,875	12,65,625
E-Office Implementation	25%	-	4,73,903	-	-	4,73,903	1,18,476	3,55,427
TOTAL		**16,87,500**	**4,73,903**	**-**	**-**	**21,61,403**	**5,40,351**	**16,21,052**

ERNET INDIA
SCHEDULES FORMING PART OF BALANCE SHEET AS AT 31.03.2017

(Amount in ₹)

SCHEDULE 5 - CURRENT ASSETS, LOANS, ADVANCES ETC.		Current Year	Previous Year
A	**CURRENT ASSETS**		
1	Inventories:		
	a) Stores and Spares	42,551	32,035
	b) Inventories	-	6,83,124
	c) Sodexo Coupons in Hand	30,375	31,075
	TOTAL (A)	**72,926**	**7,46,234**
2	**Sundry Debtors**	11,95,14,967	15,16,78,136
	Less Provision for Doubtful Debts (Connectivity)	(8,04,15,587)	(9,19,26,412)
	TOTAL (B)	**3,90,99,380**	**5,97,51,724**
3	**Receivables under Earmarked Network Research Schemes**		
	a) Amount receivable under Projects	10,71,14,799	7,92,23,345
	b) Earmarked Network Research Schemes (Schedule 2)	2,95,37,799	1,31,42,280
	TOTAL(C)	**13,66,52,598**	**9,23,65,625**
4	**Bank balances with Scheduled Banks**		
	a) Fixed Deposit Accounts	1,86,85,73,031	2,43,92,29,226
	b) Savings Accounts and Current Account	14,35,05,800	7,64,11,017
	TOTAL(D)	**2,01,20,78,831**	**2,51,56,40,243**
	TOTAL (A+B+C+D)	**2,18,79,03,735**	**2,66,85,03,826**
B	**LOANS, ADVANCES AND OTHER ASSETS**		
	Advances and other amounts recoverable in cash or kind or for value to be received:		
	a) Security Deposits	1,81,68,510	2,45,50,108
	b) Prepaid Expenses	3,71,237	1,55,64,047
	c) Misc. Advance	42,312	1,14,432
	d) Income Tax Refund Due	5,28,90,413	3,70,73,225
	e) Service Tax Credit	-	22,55,093
	f) Income Tax Deposited and Refund Adjusted Against Various Demands	13,94,59,653	13,94,59,653
	g) Amount Receivable from Transit Nodes	5,06,809	5,06,809
	h) Advances/Recoverables	2,85,99,944	1,80,55,588
	i) Value Added Tax (VAT)Credit A/c	30,485	30,485
	TOTAL (B)	**24,00,69,362**	**23,76,09,440**

ERNET INDIA
SCHEDULES FORMING PART OF OF INCOME & EXPENDITURE FOR THE YEAR ENDED 31.03.2017

(Amount in ₹)

SCHEDULE 6 - INCOME FROM SUBSCRIBERS		Current Year	Previous Year
1	**Services**		
	a) VSAT/SCPC	2,72,18,533	4,71,73,446
	b) Leased Line	1,18,53,673	1,65,86,192
	c) Radio Link	37,32,815	39,12,401
	d) E-mail and Web Hosting	43,49,363	38,43,660
	Total (1)	**4,71,54,384**	**7,15,15,699**
2	**Domain Registration**	86,61,640	1,00,43,843
3	**Professional Charges on projects**	2,18,99,723	69,95,807
4	**Income From Training**	11,03,365	7,12,970
	Total (1+2+3+4)	**7,88,19,112**	**8,92,68,319**

ERNET INDIA
SCHEDULE FORMING PART OF INCOME & EXPENDITURE
FOR THE YEAR ENDED 31.03.2017

(Amount in ₹)

SCHEDULE 7 - NET INTEREST EARNED		Current Year	Previous Year
1	**On Term Deposits:**		
	a) Bank of India	87,67,557	1,30,00,228
	b) State Bank of Travancore	11,894	98,554
	c) Vijaya Bank	-	20,29,828
	d) Nainital Bank	63,67,380	93,49,190
	e) Punjab & Sind Bank	2,07,82,948	2,54,45,308
	f) IDBI Bank	10,18,15,394	6,28,62,633
	g) State bank of Hyderabad	1,20,94,139	5,56,90,918
	h) Indian Overseas Bank	40,32,258	-
	Total (1)	15,38,71,570	16,84,76,659
2	**On Saving Accounts**		
	a) Saving Bank Account	11,62,367	7,07,181
	b) Bank of India Saving Plus and Current Account	25,60,271	14,70,675
	Total (2)	**37,22,638**	**21,77,856**
	Total (1+2)	**15,75,94,208**	**17,06,54,515**

ERNET INDIA
SCHEDULE FORMING PART OF INCOME & EXPENDITURE
FOR THE YEAR ENDED 31.03.2017

(Amount in ₹)

SCHEDULE 8 - OTHER INCOME		Current Year	Previous Year
1	Misc. Receipts	3,94,13,580	13,85,469
2	Misc. Recovery	54,049	57,696
3	Sundry Creditors written back	-	4,34,230
	TOTAL	**3,94,67,629**	**18,77,395**

SCHEDULE 9 - INCREASE/(DECREASE) IN INVENTORIES		Current Year	Previous Year
a)	Closing Inventories	-	6,83,124
b)	Less : Opening Inventories	(6,83,124)	(6,83,124)
	NET INCREASE /(DECREASE) (a-b)	**(6,83,124)**	**-**

ERNET INDIA
SCHEDULE FORMING PART OF INCOME & EXPENDITURE
FOR THE YEAR ENDED 31.03.2017

(Amount in ₹)

SCHEDULE 10 - OPERATIVE EXPENSES		Current Year	Previous Year
1	Local Loop Charges	3,46,223	3,45,360
2	International Gateway Access/Backbone Charges	59,29,029	1,02,40,166
3	Transit Node Expenses	9,11,001	47,30,258
4	Transponder Lease Charges	3,58,72,132	2,83,58,966
5	WPC Licence Fee	78,40,722	73,60,880
6	Hub Management & Repair & Maintenance charges	71,72,916	77,41,004
7	Registration charges - Domain	35,31,556	38,53,550
	TOTAL	**6,16,03,579**	**6,26,30,184**

ERNET INDIA
SCHEDULE FORMING PART OF INCOME & EXPENDITURE
FOR THE YEAR ENDED 31.03.2017

(Amount in ₹)

SCHEDULE 11 - ESTABLISHMENT EXPENSES		Current Year	Previous Year
1	Salaries and Allowances		
	a) Regular employee	3,52,83,957	3,49,67,808
	b) Contract employee	1,22,96,165	85,37,193
2	Staff Welfare Expenses	22,38,513	41,83,254
3	Expenses on Employees' Retirement & Terminal Benefits	53,28,431	50,65,944
4	Medical Reimbursement to employees	14,18,382	13,61,401
	TOTAL	5,65,65,448	5,41,15,600

ERNET INDIA
SCHEDULE FORMING PART OF INCOME & EXPENDITURE
FOR THE YEAR ENDED 31.03.2017

(Amount in ₹)

SCHEDULE 12 - ADMINISTRATIVE EXPENSES		Current Year	Previous Year
1	Accommodation Charges	3,72,40,823	4,88,82,670
2	Advertisement and Publicity Charges	2,04,563	2,73,548
3	Audit Expenses	22,340	59,625
4	Auditors Remuneration	79,472	1,50,000
5	Bank Charges	69,575	7,20,289
6	Books & Periodicals	36,341	57,012
7	Honoraruim	75,600	-
8	Meeting Expenses	1,44,156	2,47,641
9	Membership & Subscription Fee	3,24,879	13,82,832
10	Postage & Courier Charges	33,830	73,556
11	Printing and Stationery	4,55,537	6,98,753
12	Misc. Expenses	4,45,009	2,74,238
13	Professional Charges	12,73,731	25,24,849
14	Repairs and Maintenance	2,73,662	6,56,034
15	Recruitment expenses	58,294	85,216
16	Registration Charges	95,121	49,393
17	Telephone Charges	9,08,206	10,07,717
18	Training, Seminars, Workshops, Exhibition & Conference Exp	6,65,092	1,25,293
19	Travelling, Conveyance & Taxi Hiring charges	49,26,494	35,10,115
20	Prior Period Expenses	56,32,447	54,21,145
21	Balance due to diff in NIXI	-	91,723
	TOTAL	**5,29,65,171**	**6,62,91,649**

SCHEDULE – 13: SIGNIFICANT ACCOUNTING POLICIES FORMING PART OF FINANCIAL STATEMENTS

1) **Accounting Convention**

The Financial statements are prepared on the basis of historical cost convention and on accrual method of accounting in accordance with the Generally Accepted Accounting Principles. The accounting policies have been consistently applied by the Society and are consistent with those used in the previous year.

2) **Use of estimates**

The preparation of financial statements in conformity with generally accepted accounting principles requires management to make estimates and assumptions that affect the reported amounts of assets and liabilities and disclosure of contingent liabilities at the date of the financial statements and the results of operations during the reporting year end. Although these estimates are based upon management's best knowledge of current events and actions, actual results could differ from these estimates.

3) **Fixed Assets**

Fixed Assets are stated at cost of acquisition inclusive of freight duties & taxes and all attributable expenditure required to bring the assets to the condition required for its intended use and costs incurred up to the date of putting the assets to use.

Fixed assets are disclosed at cost less depreciation and impairment, if any.

4) **Depreciation**

(i) Depreciation is provided on Written Down Value Method., the rates of depreciation prescribed as per IT Rules are considered as the rates for charging depreciation..

(ii) In respect of additions / deductions from fixed assets during the year depreciation is considered on pro-rata basis.

(iii) The capital assets having the value of less than ` 5,000/- is charged to the income and expenditure account in the year of purchase.

(iv) Rates of depreciation are tabulated below-

S.No.	Category of Asset	Rate of Depreciation
a.	Building	10%
b.	Computer & Accessories	60%
c.	Software	60%
d.	Electronic Equipment	15%

S.No.	Category of Asset	Rate of Depreciation
e.	Cables and connectors	15%
f.	Testing Instrument	15%
g.	Office Equipment	15%
h.	Furniture & fixtures	10%
i.	Intangible Assets	25%

5) Government Grants

The grant received is accounted for on cash basis in the utilisation certificate issued. The balance of un-utilised grant at the year-end is shown as Current Liability.

Expenditure for Network Research schemes spent during the current year are accounted for on accrual basis are shown in the Income and Expenditure Account as Network Research Receipts and Expenditure as a contra item. The unspent amount of Grant in Aid relating to Programs/Projects in progress have been shown under the head Earmarked Network Research Funds in the Balance Sheet and the excess amount spent have been shown as Receivable in the Balance Sheet.

6) Revenue Recognition

Revenue is recognized as and when services are provided and where no significant uncertainty exists for the ultimate collection thereof.

7) Retirement Benefits

i) Retirement Benefits to employees like Gratuity, Leave Encashment etc are provided based on Actuarial Report for valuation as on 31.03.2017 in terms of Accounting Standard (AS) 15 issued by Institute of Chartered Accountants of India.

ii) Provision for accumulated leave encashment and gratuity benefits to the employees is accrued and computed on the assumption that the employees are entitled to receive the benefit as at the each year end.

8) Inventory

a) Consumables stores are valued at cost.

b) Stock in trade is valued at lower of cost or net realizable value.

9) Leases

Finance leases, which effectively transfer to the Society substantially all the risks and benefits incidental to ownership of the leased item, are capitalized at the lower of the fair value and present value of the minimum lease payments at the inception of the lease term and disclosed as leased assets. Lease payments are apportioned between the finance

charges and reduction of the lease liability based on the implicit rate of return. Finance charges are charged directly against income. Lease management fees, legal charges and other initial direct costs are capitalized.

Leases where the lessor effectively retains substantially all the risks and benefits of ownership of the leased term are classified as operating leases. Operating lease payments are recognized as an expense in the Profit & Loss Account on a straight-line basis over the lease term.

10) Provisions

A provision is recognized when an enterprise has a present obligation as a result of past event; it is probable that an outflow of resources will be required to settle the obligation, in respect of which a reliable estimate can be made. Provisions are not discounted to its present value and are determined based on best estimate required to settle the obligation at the balance sheet date. These are reviewed at each balance sheet date and adjusted to reflect the current best estimates.

11) Provision for Bad & Doubtful Debts

Provision on the Bad and doubtful debts have been made in respect of current users who have not paid the dues for more than three years and for the users who are not availing the services; provision is made if dues are more than one year old.

12) Interest

As per directives of IFD from administrative ministry i.e. MeitY; in current FY interest has been provided for at the rate equivalent to saving bank interest on monthly balance in all those projects wherein payment of interest is stipulated (in MoU/ Sanction Order/ Agreement etc.) on the amount received in advance.

13) Unidentified receipts related to domain registration

From current financial year, it has been decided to book receipts pertaining to domain services as "Income from Domain" after receiving confirmation of users' details. Pending confirmation of user details, these receipts have been credited to suspense account. Balance lying in suspense account at the end of the month has been treated as Miscellaneous Receipts (inclusive of applicable taxes).

Final reconciliation of these receipts has been done at the end of financial year; and all those receipts which have been identified as pertaining to domain registration have been transferred to respective income head.

14) Utilization of accumulated surplus for the purpose of compliance with provision of Section 11 of the Income Tax Act

The amount of surplus of "Income over Expenditure" is being accumulated over a period of time.

Last years' accumulated surplus shall be first utilized to meet the expenses of current year on FIFO basis, balance left out of accumulated surplus is being utilized against the expenses of subsequent years till the time it get fully exhausted up to the expiry of five years.

For and on behalf of ERNET India

(Vipin Aggarwal)
Director (Finance)

(Bhupal Singh)
Registrar & Director (P&A)

Dr. Neena Pahuja
Director General

Place : New Delhi
Date : 08.08.2017

Auditor's Report

In terms of even
our date annexed for
M/s Goel Mintri & Associates
Chartered Accountants
FIRM Reg. No.013211N

Gopal Dutt
Partner
M.No.520858
CAG Reg. No.DE2218

SCHEDULE – 14: NOTES ON ACCOUNTS FORMING PART OF BALANCE SHEET

1. **Undertakings/Guarantees**

   i. As of 31.03.2017there were four bank Guarantees that were outstanding (which were got issued by ERNET India as an applicant) amounting to ₹4.10 crores (Previous Year ₹4.30 crores) to DoT for performance/observance of various conditions of ISP lease agreement (in total 3 BGs).

   ii. BG amounting to ₹ 30,00,000/- to DOT given on behalf of ICAR towards Capacity CUG VSAT services of ICAR, was invoked by DoT during the year.

2. Exercise towards physical verification of assets was done in FY 2014-15 and their reconciliation is getting carried out by Admin. Division and is not yet over. Therefore, no cognizance of report of physical verification of assets has been taken in the financial statements.

3. As per the terms and conditions contained in the sanction and release of the Grant in Aid received by the society amounting to ₹ 59.35 crores, ₹ 3.48 crores and ₹ 6.52 crores permanent, semi-permanent assets acquired solely or mainly out of the DIT grant shall be property of the DIT and should not without prior sanction of DIT, be disposed off or encumbered or utilized and DIT will be free to sell or otherwise dispose off assets. Accordingly, these permanent, semi-permanent assets acquired solely or mainly out of the DIT have been shown as "Fixed Assets Acquired from the Grant In Aid" in the financial Statement of the society.

4. During the financial years 2011-12, 2012-13, 2013-14, 2014-15 and 2015-16 Income Tax Department had raised following demands by denying the claim of exemption of being a charitable institution registered u/s 12AA :

A.Y.	Assessment Order Date	Income Tax Demands (₹)	Amount Deposited (₹)	Refund adjusted against Demand (₹)	Total amount deposited and refund adjusted (₹)	Current Status
2009-10	21.12.2011	14,88,98,033/-	5,95,55,613/-	84,86,100/- (Refund for the AY 2011-12 Rs 26,33,990/- and for AY 2012-13 Rs 58,52,110/- adjusted)	6,80,41,713/-	Decision of CIT (A) was in favour of ERNET India. Income tax department has moved to ITAT against decision of CIT (A).

A.Y.	Assessment Order Date	Income Tax Demands (₹)	Amount Deposited (₹)	Refund adjusted against Demand (₹)	Total amount deposited and refund adjusted (₹)	Current Status
2010-11	28.03.2013	8,03,14,300/-	4,01,57,150/-	3,12,60,790/- (Refund for the AY 2013-14 adjusted)	7,14,17,940/-	-do-
2011-12	24.03.2014	6,11,15,150/-	Nil			Decision of CIT (A) was in favour of ERNET India.
2012-13	10.03.2015	3,74,54,690/-	Nil			Decision of CIT (A) was in favour of ERNET India.
2013-14	30.03.2016	9,66,47,210/-	Nil			ERNET India has preferred an appeal with CIT (A) against the Assessment Orders.
2014-15	25.11.2016	13,79,06,430/-	Nil			
Total		**56,23,35,813/-**			**13,94,59,653/-**	

(a) As a prudence measure, provisions towards tax liability for the year Assessment Year 2009-10 to Assessment Years 2013-14 (in the year ended 31st March 2013) amounting to ₹ 35.60 crores was created in the financial year 2012-13.

Decision of CIT (A) was in favour of Society for appeal preferred against the order of Assessing Officer for the A.Y. 2009-10, 2010-11, 2011-12 and 2012-13, therefore, no further provisions have been created from the financial year 2013-14 onwards.

(b) For A.Y. 2014-15 a rectification Application u/s 154 has been filed with AO for rectifying prima facie mistakes regarding Assessed Income & Consequent Demand.

(c) On the recommendation of F&A Committee, an agenda item was passed in the EC meeting for taking up the matter by Secretary, MeitY with Ministry of Finance; regarding giving Income Tax exemption to ERNET India. Accordingly, a letter dated 20.06.2017 has been sent by Secretary, MeitY to Secretary. Department of Revenue, Ministry of Finance.

5. **Network Research Schemes**

i) Network Research Receipts and Expenditure amounting to ₹ 79,12,56,915/- (previous year ₹ 45,79,69,511/-) has been declared as a contra item in the Income & Expenditure

Account against the funds received from sponsors for the respective project.

i) Balance of funds received for Network Research Schemes which are in progress have been shown in Schedule – 2 appearing in the Balance Sheet.

6. **Foreign Currency Transactions**

i) **Value of Imports**

Particulars	2016-17 (₹)	2015-16 (₹)
Purchase of finished goods	NIL	NIL
Capital goods	1,84,89,559/-*	NIL

*Note: Advance paid towards capital goods during the financial year. Goods have been received but were yet to be put to use as on the Balance Sheet date.

ii) **Expenditure in Foreign Currency**

Particulars	2016-17 (₹)	2015-16 (₹)
Membership Fees	6,89,347/-	13,82,832/-

7. **Remuneration to Auditors***

Particulars	2016-17 (₹)	2015-16 (₹)
Statutory Audit Fee	1,50,000/-	1,50,000/-
Certification Fees (TRAI)	85,000/-	85,000/-

*The above fees are exclusive of out-of-pocket expenses and govt. levies.

8. **Contingent Liabilities (to the extent not provided for)**

Claims against the Society not acknowledged as debts for ₹ 91,92,720/- is towards amount claimed by M/s Wood fun Interiors which is under dispute. The matter is under arbitration.

9. **Interest Income**

Disclosure of Interest income in Income & Expenditure A/C has been made after adjusting interest credited to projects.

10. **Settlement of current liability lying unclaimed**

There were some very old entries (more than 10 years) appearing in the books of accounts totaling to Rs 3,79,61,871/- standing to the credit of MTNL/BSNL charges. We understand that due to fire incident, no records pertaining to these entries were available. There were adverse audit remarks for these old outstanding entries, in the audit reports. In the F&A committee meeting held on 18.10.2016; commitment was given that these old entries will be disposed off at earliest. Accordingly follow-up was being done with BSNL/MTNL to confirm the amount due to them; but they failed to provide any supporting document in this regard and accordingly it was decided to reverse these entries as follows:

Amount lying as outstanding (₹) (1=2+3+4)	Amount adjusted by reversing debtors pertaining to this liability *(₹) (2)	Amount reversed by crediting to Miscellaneous Income (₹) (3)	Service Tax component deposited to Govt. Treasury (₹) (4)
3,79,61,871/-	1,56,64,904/-	1,93,88,666/-	29,08,301/-

*As provision for these debtors was already made in previous years; therefore the entire amount has been booked as Miscellaneous Income by reversal of provision existing for these debtors.

11. The figures for the previous period/year have been re-grouped/re-arranged wherever necessary to make them comparable with the current period's figures.

For and on behalf of ERNET India

(Vipin Aggarwal)
Director (Finance)

(Bhupal Singh)
Registrar & Director (P&A)

Dr. Neena Pahuja
Director General

Place : New Delhi
Date : 08.08.2017

Auditor's Report

In terms of even
our date annexed
M/s Goel Mintri & Associates
Chartered Accountants
FIRM Reg. No.013211N

Gopal Dutt
Partner
M.No.520858
CAG Reg. No.DE2218