Changing Scenario: UGC - Infonet

What is UGC Infonet?

- It's Wide Area Network (WAN) connecting more than 170 universities, R&D institutes, UGC HQ, UGC Regional Centres, IUCs etc.
- Will also provide Internet access to all these institutes

Benefits of UGC Infonet

- Sharing of library resources
- Peer level interaction/ communication
- Collaborative Research
- Training
- Distance learning
- Multimedia applications
- Broadband Intranet/ Internet access

Why UGC Infonet?

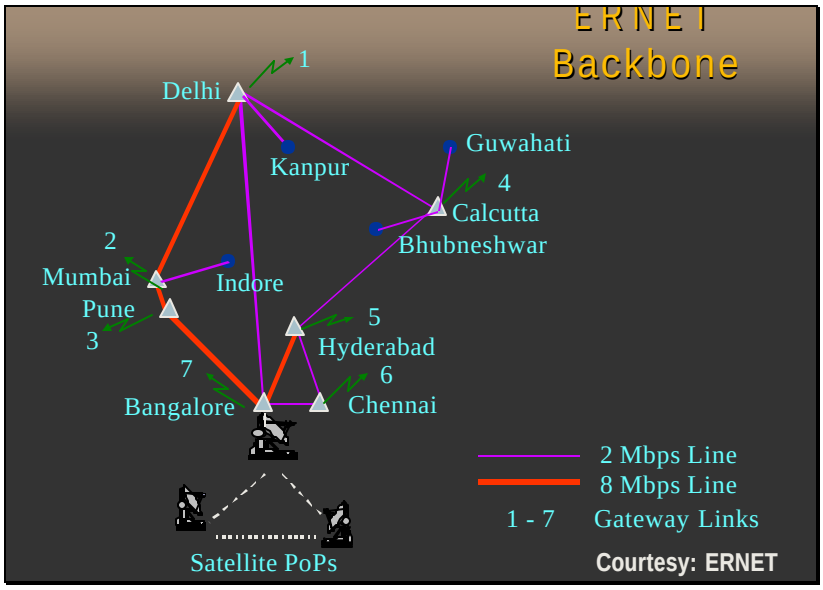
- UGC funding universities for library automation & networking
- Most universities/ libraries have only dial-up connectivity obtained through local ISPs
- Very few universities have leased line Internet connectivity
- Due to low data speeds, most are unable to get benefits listed earlier
- Usage mostly limited to e-mail only
- Browsing and down loading very difficult
- A dedicated network of own, giving high data speeds required
- **UGC-Network is the answer**

Who will establish it?

- UGC signed MOU with ERNET India in April, 2002
- Turn-key project for ERNET India
- ERNET to supply equipment, install, monitor and maintain it
- UGC to decide type of connectivity, data speed to be provided to each university/ institute
- Each university to place order with ERNET individually

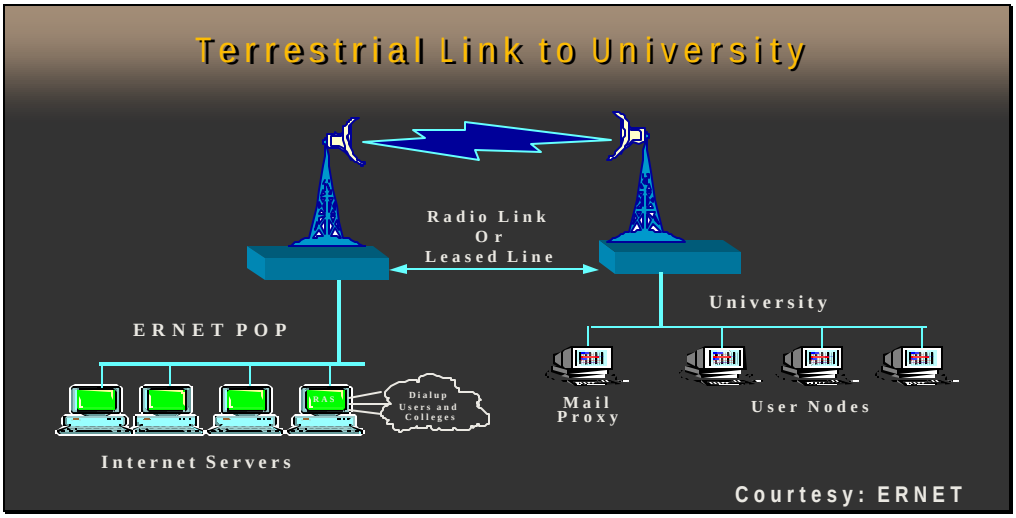
Network Topology

- Mix of terrestrial and satellite technologies
- ERNET has eleven PoPs, (Points of Presence) in the country
- Out of these, seven are satellite gateways
- All PoPs interconnected by 2 Mbps/ 8 Mbps fibre optic lines
- ERNET backbone diagram shown in next transparency



How will Universities connected?

- Universities in vicinity of PoPs to be provided connectivity through Radio Links or Leased Lines
- Connectivity to all other locations to be provided by V-SATs



Radio Link Connectivity

- For universities located up to 35 kms from PoP
- 64 kbps to 2 Mbps data speeds

Leased Line Connectivity

- For universities located more than 35 kms and up to 100 kms from PoP
- Will use lines hired from BSNL or other Basic Service Providers
- 64 kbps to 2 Mbps data speeds

What is V-SAT?

- Very Small Aperture Terminal
- A small earth station used to communicate with other earth stations via a satellite
- Can be mounted on ground, roof tops
- Has two main parts viz. Outdoor Unit (ODU) and Indoor Unit (IDU)

Out Door Unit (ODU) of V-SAT

- Consists of antenna, feed, Block up-converter, Low noise Block down-converter (LNB)
- Block up-converter converts incoming I.F. (from IDU) to R.F. transmitting frequency, amplifies it and passes it to feed

- LNB amplifies incoming R.F. from feed using low noise amplifier, converts it to I.F. and passes it to IDU
- Antenna size varies from 50 cms to 3.7 m depending on R.F. band and type of VSAT i.e. TDMA or SCPC

In Door Unit (IDU) of V-SAT

- On receiving side, converts I.F. from ODU to base band signals which may be data, video or voice
- On transmitting side, converts baseband signals to I.F. and passes them to ODU
- I.F. is generally in L band
- R.F. can be in C, Ku or Ka bands. In UGC-Network R.F. will be in C band
- ODU and IDU connected by an Interface cable, which carries I.F. and also power supply (dc voltage) for energizing ODU

Type of V-SAT

- UGC-Network to have two types of VSATs
- Broadband (TDMA) VSATs
- SCPC VSATs

TDMA V-Sats

- Time Division Multiple Access
- A group of VSATs use same transmit frequency
- Each VSAT transmits signals in bursts in time slot allotted to it
- In UGC-Network, operating in C band, VSAT antenna will be of 2.4 m
- Due to small antenna size (low gain) and low transmit power, these VSATs can not communicate with each other directly
- They do so via a big central earth station called Hub
- Network Management Centre (NMC) collocated with Hub
- NMC manages and monitors entire VSAT network
- These VSATs good for asymmetric traffic (low out going and high incoming)

SCPC V-SAT

- Single Channel Per Carrier
- Each VSAT allotted a specific frequency to transmit
- Antenna size in UGC-Network will be 3.7 m
- Due to high antenna size (high gain) and high transmit power, two VSATs can directly communicate with each other without going through Hub
- Hub used only for establishing links
- Used mostly for high density, symmetric traffic.

Role of UGC, EERNET AND INFLIBNET IN UGC-INFONET PROJECT

UGC has signed an MOU with ERNET India giving them the responsibility to establish and operate UGC-Infonet on turn key basis. UGC is the owner of this network and will provide grants for universities for this purpose. ERNET will design, commission, operate and maintain the entire network. ERNET will also conduct training courses at its HQ in New Delhi and at University sites for the university network managers. INFLIBNET will be responsible for the for execution and monitoring of the network as per JTTC guidelines. INFLIBNET will conduct training courses for university library professionals in use of this network for providing variety of services including E-Journals to the academic and research community .IT will release money to ERNET for training purposes. Content creation will be a major responsibility of INFLIBNET