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{K2Splitter} With the aim of using telecom as a strategic tool, educational institutions and townships are establishing a robust communications backbone that ensures zero downtime and minimum latency. There is an emphasis on deploying state-of-the-art connectivity mediums as real-time and always-on connectivity is a key requirement.

Campus automation has come a long way from the "insular" deployments of the past, when systems were used in a limited manner within a particular department, usually for a very specific function.Today, technologies such as Wi-Fi, very small aperture terminals (VSATs), virtual private networks (VPNs), integrated services digital network (ISDN) and optic fibre cable (OFC) are common mediums of connectivity.

Campuses are increasingly deploying OFC for last mile connectivity and ISDN for wide area network connectivity. While the former facilitates quick and easy transfer of data at higher bandwidths, ISDN offers fast and easy connectivity, and is easy to set up. Wi-Fi too is making considerable inroads, offering improved access to email, file server connectivity, internet access and library access anywhere within the campus.

Applications such as SAP's Campus Management suite offer a wide range of services for educational institutions. Selfservice portals provide services ranging from electronic registration for classes to fee payment and distance learning. They provide students, faculty and administrators with quick and easy access to student files and administrative, financial and academic records.

Townships have similar requirements, with an emphasis on seamless and flexible communication. Telecom operators have a ready portfolio of applications and services for this segment. Bharat Sanchar Nigam Limited (BSNL) has recently signed a memorandum of understanding (MoU) with infrastructure service provider L&T Arun Excello to set up a telecom network at the Estancia Integrated Township which is being developed near Chennai.According to the MoU, BSNL will offer "total telecom solutions" through a stateof-the-art telecom exchange to be set up inside the township.

BSNL will provide copper optic fibre connectivity with 100 per cent redundancy to all buildings

inside Estancia to deliver voice and data services, high speed broadband, centrex facility, mobile services, Wi-Fi hotspots and multi-protocol label switching (MPLS)-VPN. The operator will also provide each of the 1,900 residents with a deposit-free telephone connection with STD facility as well as a free instrument.

Similarly, Tata Teleservices Limited (TTSL) has signed an MoU with Hirco Developments, a part of the Hirco Group.Under the MoU, TTSL will set up telecom infrastructure at Hirco's integrated township and proposed special economic zone (SEZ) near Chennai. The operator will provide complete telecom solutions including a fibre optic network, Wi-Fi hotspots, broadband services, leased lines and wireless services.

Companies such as broadband service provider O-Zone are also catering to the requirements of townships. The company has signed an exclusive 10-year contract with DLF Commercial to provide a Wi-Fi network across DLF's commercial estates.It also has a nine-year contract with the Ansal Group to provide wireless broadband across the group's shopping centres.

tele.net conducted a survey amongst 14 campuses and townships to assess their telecom needs and solutions. The respondents were asked about their telecom requirements, the main concerns regarding the telecom services provided and the various

kinds of applications being used by them.

The following questions were asked in the survey:

- What are the company's key technology requirements?
- What mix of service providers and vendors is used?
- What are the biggest concerns with respect to the telecom infrastructure?
- What software and enterprise applications have been implemented?
- Which network security tools are used?
- Which redundancy tools are used?
- Which new product or service is the most interesting or relevant for the organisation?

Key technology requirements

The survey revealed that for most campuses and townships, a robust communications backbone that has minimum latency and zero downtime is the top requirement.

To fulfil this need, educational institutes have opted for multiple wide area network (WAN) technologies such as leased lines, ISDN, MPLS and VSAT. Leased lines are used for connecting to the internet and as back-up along with core switching level redundancy and fibre redundancy. ISDN connectivity through primary rate interface (PRI) lines is used in many campuses. The use of IP-VPNs is also gaining traction.

MPLS has been deployed either as a WAN technology or a redundancy option.VSATs are popular for remote education and distance learning programmes.

Townships have similar networking requirements. DLC (local loop) is the primary WAN technology while DLC (NLD) is used for interbranch connectivity.

Companies involved in the construction of townships use ISDN for video conferencing, while VSAT is the preferred medium for connecting construction sites located in remote regions with company headquarters. IPLC is used for international connectivity. The other popular technologies include Ethernet, IP-VPN and MPLS.

For last mile connectivity, optic fibre is the preferred medium for campuses, followed closely by DSL. These technologies provide the high bandwidth needed for applications such as video conferencing on campuses. Wireless technologies, particularly Wi-Fi, have witnessed strong uptake, primarily in conjunction with DSL, optic fibre or metro Ethernet. Radio frequency links are also gaining a foothold in campuses. Management and engineering institutes have set up Wi-Fi hotspots and have placed radio links as back-up for the optic fibre last mile access.

In townships, DSL is the preferred medium of last mile connectivity, followed by optic fibre and wireless. Wi-Fi is popular amongst township construction companies, a number of which also use data cards.

Service providers and vendors

The survey indicated that campuses usually use a mix of service providers for WAN connectivity. BSNL is the most preferred service provider for domestic leased lines (local loop), ISDN services and MPLS.The other key service providers in the leased line segment are Reliance Communications (RCOM) and Tata Communications. Bharti Airtel is the dominant service provider for internet services, followed by RCOM, BSNL and Tata Communications.

For VSAT services, institutes use multiple service providers such as Bharti Airtel, HCL Comnet and the Indian Space Research Organisation. Tata Communications is the most preferred IP-VPN service provider. For optic fibre-based last mile connectivity, Bharti Airtel is the service provider of choice, followed by BSNL and RCOM.

The services of both Bharti Airtel and BSNL are used for DSL in campuses. A few engineering institutes have implemented in-house wireless networks. Many engineering colleges use the services of Bharti Airtel for radio frequency links.

In townships, with regard to last mile connectivity, Bharti Airtel is a key service provider for DSL and wireless last mile access. It is also the key player in the optic fibre space. BSNL is the other important company in the last mile access space, and its services are used for optic fibre, DSL and wireless last mile access.

For WAN connectivity, Bharti Airtel is the service operator of choice providing domestic leased lines (local loop and NLD), ISDN, VSAT and internet. BSNL is the leading player in the IPLC and internet segments.

The services of Tata Communications and Sify are also used by township companies for DLC (local loop), IPLC, ISDN and the internet. Tulip Telecom too, provides DLC (local loop), MPLS and IPVPN services for many companies.

Issues and concerns

Respondents from four out of the seven educational institutions covered in the survey said that they were completely satisfied with their telecom networks. The remaining organisations stated

that their communications infrastructure required some improvement.

List of respondents

- Akruti City Limited, Head, IT
- Ansal Housing and Construction, Frank Thomas, Chief Manager, Systems
- DSC Limited, Pritam Roy Dutt, General Manager, IT
- DSK Group, S.K. Sharma, Chief Operating Officer
- FORE School of Management, Dr Chandrasekhar, Director, IT
- IIT Guwahati, Dr Diganta Goswami, Head, Computer Centre
- IIT Bombay, Dr Jyoti Maharana, Systems Manager
- Indian School of Business, Vishnu Kumar, Head, IT Infrastructure
- Jamia Millia Islamia, Shane Kazim Naqvi, Senior Systems Analyst
- Jawaharlal Nehru University, Dr Indira Ghosh, Dean, IT
- Mahagun India, Aftab Ahmad, Manager, IT
- Marg Construction, Ramadhas Sugandirarajah, Network Administrator
- Lanco Hills Technology Park, Head, IT
- XLRI, S.K. Tiwar, Systems-in-charge

Downtime emerged as the most imPortant network-related concern, followed by network security. Educational institutions face more management-related concerns than technical problems. Technology obsolescence tops the list of management concerns as most of them do not regularly upgrade their communications and IT infrastructure. Many institutions face trouble finding qualified IT staff.

Interoperability, latency, disaster recovery and capacity constraint are not, however, issues of concern.

Four out of the seven township construction companies stated that they were satisfied with their current networks, while the rest felt that their communications infrastructure required some improvement.

As was the case with educational institutes, downtime was rated as the most important network-related concern, followed by security, latency and disaster recovery. Capacity constraints and interoPerability problems are not faced by any of the companies covered.

Software, mobile and enterprise applications

The most popular software application for campuses is enterprise resource planning (ERP). According to the respondents, ERP systems help institutes automate and link processes as well as combine data from several applications. This helps in synchronising the flow of information.

In terms of enterprise applications, apart from email, organisations in the education vertical are increasingly deploying conferencing solutions comprising video, audio and web conferencing.

Telepresence services are used by private management institutes with multiple branches. The other most widely used application is web hosting, which shows that in-house development of websites is still rare amongst educational institutes.Voice over internet protocol (VOIP), instant messaging, and Web 2.0 tools such as social networking are also used.

Township construction companies use software applications such as ERP, customer relationship management (CRM), supply chain management (SCM), business intelligence and inventory management. Of these, ERP and CRM are used extensively, followed by inventory management systems, SCM and business intelligence.

Amongst enterprise applications, video and audio conferencing have caught on, followed by web conferencing. The employees of these companies use instant messaging to communicate with each other, while toll-free services are used for customer care services.

Since the employees of these companies spend a lot of time travelling between sites, enterprise mobility applications are used extensively. Mobile email and mobile data connectivity are the most popular applications, while mobile conferencing is gaining traction. The corporate intranet is accessed from mobiles as well.The other popular applications include push alerts and personal information management systems.

Network security

Firewalls are the preferred network security application for campuses, followed by user authentication, operating system security patches and proxy servers. Penetration testing, denial of service detection and mitigation and virtualised unified threat management (UTM) systems have, however, not caught on yet.

The majority of the township companies have deployed a number of network security solutions including firewalls, proxy servers, UTM systems and access logs. Firewalls are used extensively.

Redundancy options

Most educational institutions covered in the survey have a robust redundancy infrastructure in place. A large number of them use service provider diversity as a redundancy option. Mirror servers are also used in many campuses. For township companies too, service provider diversity and mirror servers are the preferred redundancy options.

New products and services

The global crisis notwithstanding, most of the companies covered in the survey have formed concrete plans for strengthening and expanding their communications networks. Companies in the township space, whose exposure to the economic crisis is greater than that of educational institutes, are relatively more wary regarding the expenses involved.

For example, Aftab Ahmad, manager, IT, at construction company Mahagun India, says, "The turmoil in the global economy has forced consumers, businesses and governments alike to cut back on technology spending. We have not been immune to the trend. The company's current network budget is leaner than what it used to be, say, one year back. But it's only a short-term phenomenon as we are expecting a recovery towards the end of this year."

With regard to the company's plans, he says, "When the need arises in the future, we will

certainly implement advanced software like Microsoft Dynamic, SAP or Oracle. On the hardware front, we have sufficient infrastructure to handle our future demands."

Dr Indira Ghosh, dean, IT, Jawaharlal Nehru University, says, "Investments in IT and telecom actually increase productivity and reduce costs, and are thus beneficial for the organisation. Our network budget will increase in the coming years.

We are looking at deploying Wi-Fi. Our leased lines are already in place, so we aren't looking for infrastructure expansions. We recently received grid lines, which enable connectivity between academic institutes from the Knowledge Commission. These enable extensive broadband connectivity."

All in all, it is evident that campuses and townships have realised the benefits of a scalable and flexible IT and telecom infrastructure, and are pulling out all the stops to deploy the best technologies.