

University of Delhi
Delhi-110007

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CORRIGENDUM No. 001

Bid Number: GEM/2021/B/1671974: VPN/Multi-Protocol Label Switching Service (MPLS service)

1. The EMD exemption shall be subject to revised rule 170 (i) of GFR – 2017. The bidders are required to produce the supporting documents for seeking EMD exemption.
2. The values under technical specification parameter 'License of MPLS Service' be read as **Unified Access Service License (UASL)/Unified License (UL)** instead of Unified Access Service License (UASL) only.
3. Last date for submission of e-bids is extended till 20.12.2021 at 09:00 a.m.
4. Rest of the contents remain same.

Annexure-II

Additional Terms and Conditions (ATC)

Broad Requirements:

- 10 Gbps link (1:1) between North and South Campus
- 200/250 Mbps to all 45 locations (colleges) in mesh/ring architecture- As per the slabs on GeM Portal
- 24x7 monitoring and help desk
- Traffic logs of all 49 location (for min. 180 days)
- SMS and email-based alerts and notification of any link failure/issue.
- Provision for scaling up the link bandwidth (within 60 minutes in slab of 100 Mbps) for any number of locations, in case of specific need and duration
- NOC support and NMS/Monitoring Software (Cloud/web based) to both North and South Campus
- To configure North and South campus in a active failover setup for internet/intranet.
- Provisioning of a dedicated technical manpower (8x7) for each campus
- All devices (active and passive) and related accessories to be provided by the bidder including installation and commissioning (digging, laying of fiber cable)
- The bidder shall provide detailed MPLS VPN architecture documentation in Soft and Hard Copy.
- Provision of dynamic allocation from the available bandwidth to any location(s)
- The university may increase the number of locations during the contract period and such increase shall be governed by same terms & conditions.

Details:

Delhi University wishes to have services from a reputed & eligible Bidder for providing required WAN Connectivity through MPLS VPN infrastructure for all the colleges under the Delhi University. The list of Colleges/ Locations with address is available in 'Annexure I'.

- Bidder would have complete ownership of bandwidth provisioning, management and sustenance of connectivity services. Tools for monitoring, remote monitoring through Bidder's NOC, monthly reporting and SLA adherence.
- Bidder would take a back to back SLA, in line with the requirements.
- Bidder would provide the required MPLS Bandwidth for WAN Connectivity across the various College Locations.
- The last mile connectivity would be provided through Fibre on "MPLS any-to-any Layer-3 VPN" based on RFC-2547bis standard.

➤ The required MPLS bandwidth will be as follows:

North Campus	:	1 G dedicated for NOC operations (backbone)
South Campus	:	1 G dedicated for NOC operations (backbone)
All College	:	250 MB (each College) (with 10 G termination each at North & South Campus/s)
Pt to Pt connectivity (Between North and South)	:	10 Gig (Dedicated)

- Bidder shall Procure, Supply, installation and commissioning of CPE equipment and accessories including UPS etc. required for the uninterrupted connectivity across the Delhi University Colleges/locations.
- Procurement, Supply, installation and commissioning of links (on Fibre redundant ring) at all Delhi University College locations under the scope of work.
- The proposed WAN connectivity would be capable to support the requirements of Data, Video conferencing and IP telephony.

Scope of Work

- **Equipment (CPE) Supply & Installation:** The CPE Equipment like Router etc. required for the WAN connectivity at all the Colleges/Campus under this project scope would be provided by Bidder. Fiber Cable will be laid to the Premises and the Fiber equipment will be placed. The Fiber Cable would be laid in ring-based architecture with automatic failover mode, and the required Equipment will be installed by the bidder at the respective Location.
- **Fiber Laying:** The respective Pops are already selected which would be used to connect the colleges under this project. Fiber would be laid from the nearest POP on ring-based architecture to keep maximum uptime.
- **Router's Configuration:** After the physical installation of the equipment, the routers at Colleges will be configured according to the plan finalized with DU team. WAN configurations will be done by Bidder's Engineers and will also be managed by Bidder only. At the same time the configuration will also be done on the Bidder connect equipment.
- **VPN Provisioning:** Two separate VPN would be provisioned as desired by the University in the Bid document, separately for North Campus & South Campus.
- **Bandwidth Provisioning:** Bandwidth is to be provisioned as per the requirement in the Bid document.
- **Link Testing:** After installation of the links the complete connectivity will be tested for Jitter, Latency, Backup and Routing.
- **Link Monitoring:** The links will be then handed over to Bidder's NOC for monitoring and maintenance. The NOC will be the first point of contact for any problem related to links. Each DU site will be given admin user name & password for web access to monitor all the link with separate admin privileges to view all the links.
- **Managed service:** Bidder would also provide managed services for the offered solution, with 3-year comprehensive service and support.
- **Reporting:** The NOC will be providing Weekly/Monthly reports to the customer for SLA acceptance and billings.
- **Training:** Bidder would provide training to min 3 persons of 2 working days per site. Training would consist of VPN Operations at the respective site.
- **Dedicated & Secure Bandwidth:** All links would be provided with 1:1 dedicated & secure bandwidth. All sites would always get guaranteed bandwidth that is subscribed at given site.
- **Manpower Provisioning:** One dedicated technical manpower on 8x6 basis to each campus onsite (North and South).

Network Topology for Delhi University

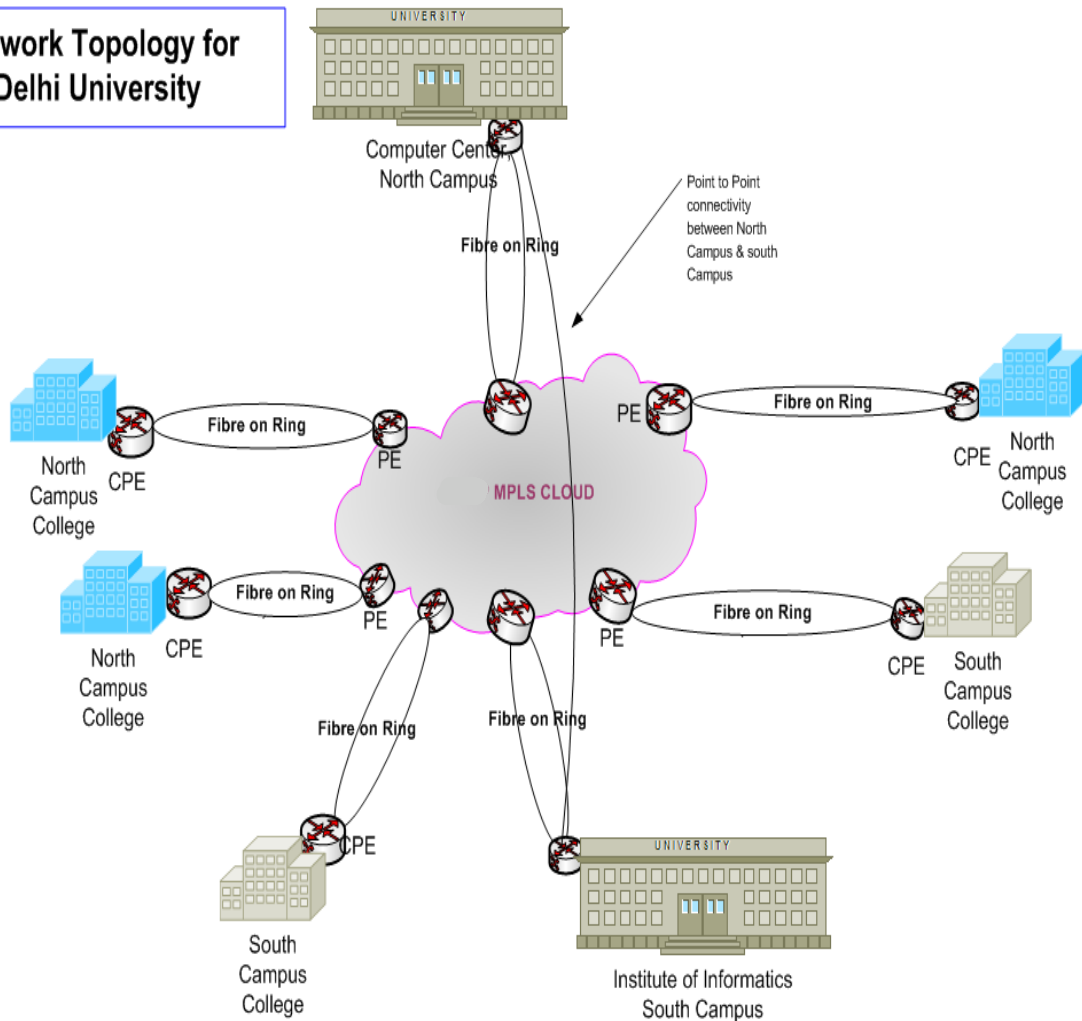


Figure-1: Schematic MPLS Connectivity of Delhi University

The Access Network:

In view of the University requirement & highest uptime (as per SLA), Bidder would be providing the last mile on a Fiber based ring with auto failover. Ring at last mile would insure highest uptime to the colleges & the both the Campus connected to the Bidder MPLS Backbone. The Router proposed should be capable to handle the bandwidth required & the future up gradation.

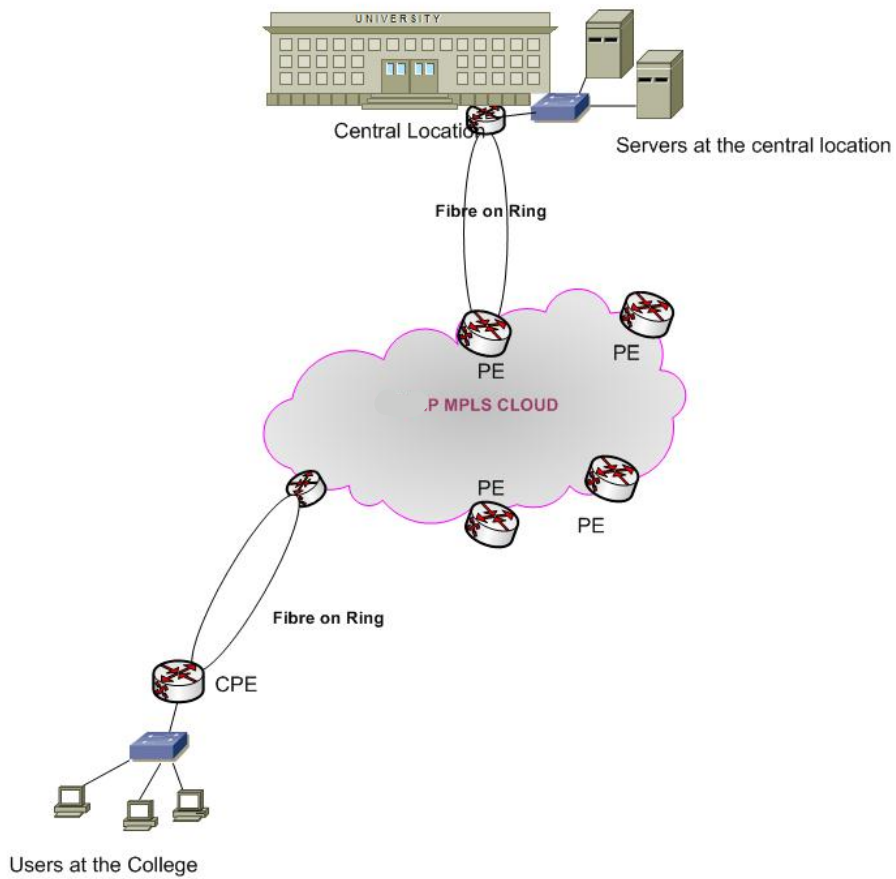
Last Mile Connectivity

Bidder must provide last mile on self-healing Fibre mesh/ring architecture.

Bidder shall be providing last on Fibre based Ethernet Connectivity at the DU Colleges. The Fibre last mile would provide Ethernet termination / hand-off on the router (provided by Bidder).

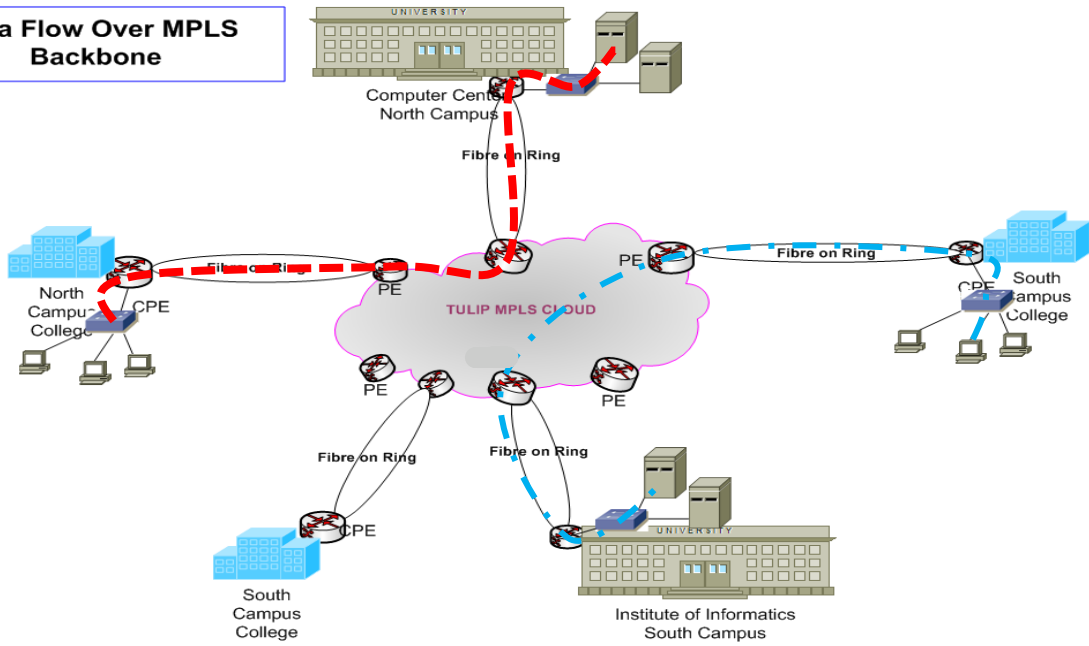
For the Central site, Bidder also offer self-healing Ring based OFC connectivity to avoid any single point of failure and avail desired service availability. The same is depicted in MPLS connectivity diagram.

Last Mile Connectivity for Delhi University



The CPE equipment at the colleges and the central sites would use this Pure IP communication infrastructure to communicate with all other colleges. The diagram shown below depicts end to end communication across MPLS communication backbone.

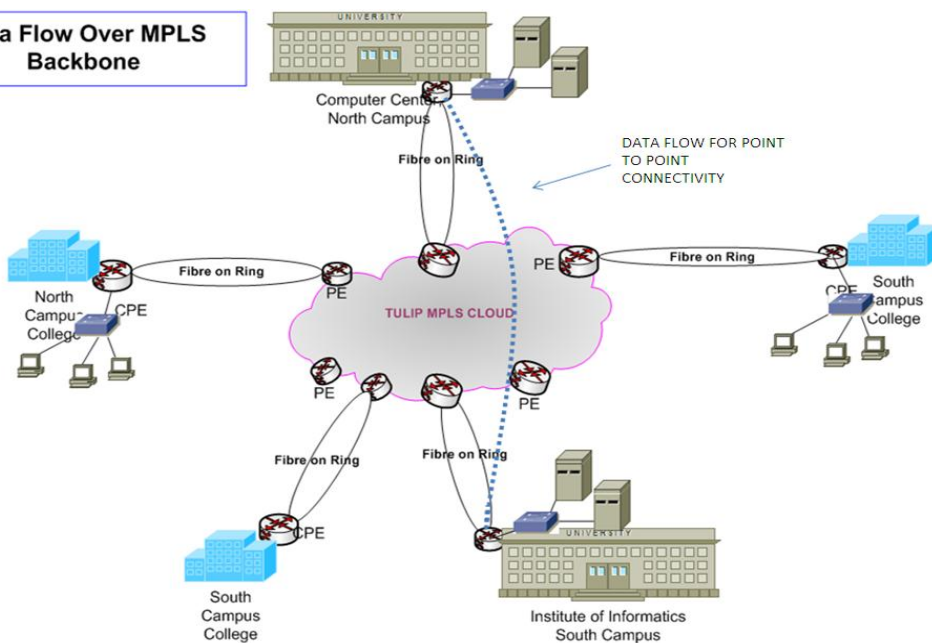
Data Flow Over MPLS Backbone



Representative Data Flow diagram for Delhi University

The diagram below depicts the data flow for the point to point connectivity between computer centre & South Campus (IIC); this point to point connectivity is used only for the data between these two sites.

Data Flow Over MPLS Backbone



Data Flow diagram for point to point connectivity between South & North Campus

Key Factors

Redundancy: To achieve this, fiber with self-healing ring to be provided at each location

Capacity: The capacity and sizing for active components to be scalable for future growth in mind.

Scalability: The network design should be carried out to accommodate future scalability. Routers and access equipment to be used to ensure future scalability at the equipment level as well.

Interoperability: The system must be capable of connecting with other systems or sub-systems. The proposed solution should conform the design using industry standards keeping interoperability in mind.

The interoperability will assure optimal reliability and interoperability of wireless, wire line, satellite, cable and other public data networks. This includes facilitating the reliability, robustness, security and interoperability of communication networks including emergency communication networks. The interoperability will ensure the security and sustainability of communication networks throughout the Network.

Performance Considerations: The equipment selected ensures that there is adequate backplane capacity to route under peak load to prevent any performance issues. Performance of the network will be periodically monitored using Network Management tools and capacity will be upgraded proactively. Also, adequate memory should be provisioned for, on all routers to accommodate future performance and scalability.

Manageability: Bidder must have 24*7 centralized NOC (Network operation centre) for Monitoring & Managing the Devices & the Links.

Support for Voice, Data and Video: The network will primarily be used to carry data voice and video. The Network & the proposed equipment are capable enough to support data, voice & Video.

Integration with existing network and ISP for Intranet/Internet access will be responsibility of the service provider.

List of Locations:-

Sr. No.	Site Details	Site Address	Service Required	BW Required
1	Delhi South	P.G.D.A.V. College, Nehru Nagar, Ring Road, Delhi-110065	VPN/MPLS	250 Mbps (Morning)
			VPN/MPLS	250 Mbps (Evening)
2	Delhi North	Kalindi College, East Patel Nagar, New Delhi-110008	VPN/MPLS	250 Mbps
3	Delhi North	Aditi Mahavidyalaya, Delhi Auchandi Bawana, Delhi	VPN/MPLS	250 Mbps
4	Delhi South	Dyal Singh College, Lodi Road, New Delhi-110003	VPN/MPLS	250 Mbps (Morning)
			VPN/MPLS	250 Mbps (Evening)
5	Delhi North	Maharaj Agrasen College, Pocket-IV, Phase-I, Mayur Vihar Delhi-110091	VPN/MPLS	250 Mbps
6	Delhi North	Shyama Prasad Mukherjee College, Punjabi Bagh (West), Road No. 57, New Delhi-110026	VPN/MPLS	250 Mbps
7	Delhi North	Indraprastha College for Women, Sham Nath Marg, Delhi-110054	VPN/MPLS	250 Mbps
8	Delhi North	Satyawati College, Ashok Vihar, Phase-III, Delhi-110052	VPN/MPLS	250 Mbps (Morning)
			VPN/MPLS	250 Mbps (Evening)
9	Delhi North	Bhim Rao Ambedkar College, Main Wazirabad Road, Yamuna. Vihar, Delhi-110094	VPN/MPLS	250 Mbps
10	Delhi North	Janki Devi Memorial College, Sir Ganga Ram Hospital Marg, New Delhi-110060	VPN/MPLS	250 Mbps
11	Delhi North	Shivaji College, Raja Garden, Ring Road, New Delhi-110027	VPN/MPLS	250 Mbps
12	Delhi North	Rajdhani College, Mahatma Gandhi Marg, Raja Garden, Ring Road, New Delhi-110015	VPN/MPLS	250 Mbps
13	Delhi South	Lady Shri Ram College for Women, Lajpat Nagar-IV, New Delhi-110024	VPN/MPLS	250 Mbps
14	Delhi South	Kamla Nehru College, Khel Gaon Marg, New Delhi-110049	VPN/MPLS	250 Mbps
15	Delhi North	Mata Sundri College for Women, Mata Sundri Lane, New Delhi-110002	VPN/MPLS	250 Mbps
16	Delhi South	College of Vocational studies, Sheikh Sarai, Triveni Phase-II, New Delhi-110017	VPN/MPLS	250 Mbps
17	Delhi North	Lakshmi Bai College, Ashok vihar, Phase-III, Delhi-110052	VPN/MPLS	250 Mbps
18	Delhi North	Maharishi Valmiki College of Education, Geeta Colony, Delhi-110031	VPN/MPLS	250 Mbps
19	Delhi North	Shaheed Sukhdev College of Business Studies, PSP Area IV, Dr. K.N. Katju Marg, Sector 16, Rohini, Delhi 110089	VPN/MPLS	250 Mbps
20	Delhi North	Deena Dayal Upadhyaya College, Sector-3, Dwarka, New Delhi 110078	VPN/MPLS	250 Mbps

Sr. No.	Site Details	Site Address	Service Required	BW Required
21	Delhi North	Vivekanand College, Vivek Vihar, Delhi-110032	VPN/MPLS	250 Mbps
22	Delhi North	Lady Irwin College, Sikandara Road, New Delhi-110001	VPN/MPLS	250 Mbps
23	Delhi South	Maitreyi college, Bapudham Complex, Chankyapuri, New Delhi-110021	VPN/MPLS	250 Mbps
24	Delhi South	Delhi College of Arts & Commerce, Netaji Nagar, New Delhi-110023	VPN/MPLS	250 Mbps
25	Delhi South	IGIPSS, Vikas Puri, New Delhi	VPN/MPLS	250 Mbps
26	Delhi North	Zakir Husain College, Jawaharlal Nehru Nagar, New Delhi-110001	VPN/MPLS	250 Mbps (Morning)
			VPN/MPLS	250 Mbps (Evening)
27	Delhi North	Guru Nanak Dev Khalsa College, Dev Nagar, Karol Bagh, New Delhi-110005	VPN/MPLS	250 Mbps
28	Delhi South	Shaheed Bhagat Singh College, Sheikh Sarai, Phase-II, New Delhi-110017	VPN/MPLS	250 Mbps (Morning)
			VPN/MPLS	250 Mbps (Evening)
29	Delhi South	Institute of Home Economics, F-4, Hauz Khaz, Behind Laxman Public School, New Delhi-110010	VPN/MPLS	250 Mbps
30	Delhi South	Gargi College, Siri Fort Road, New Delhi-110049	VPN/MPLS	250 Mbps
31	Delhi North	Shyam Lal College, G.T. Road, Shahdara, Delhi-110032	VPN/MPLS	250 Mbps (Morning)
			VPN/MPLS	250 Mbps (Evening)
32	Delhi South	Sri Aurbindo College, Malviya Nagar, New Delhi-110017	VPN/MPLS	250 Mbps (Morning)
			VPN/MPLS	250 Mbps (Evening)
33	Delhi South	Jesus & Mary College, Chanakyapuri, New Delhi-110021	VPN/MPLS	250 Mbps
34	Delhi North	Keshav Mahavidyalaya, H-4-5 Zone, Road No. 43 Pitam Pura, New Rani Bagh/Sainik Vihar, Delhi	VPN/MPLS	250 Mbps
35	Delhi North	Sri Guru Gobind Singh College of Commerce, Pitampura, Near T.V. Tower, Delhi-110088	VPN/MPLS	250 Mbps
36	Delhi North	Bharti College, C-4, Janakpuri, Delhi-110058	VPN/MPLS	250 Mbps
37	Delhi South	Bhagini Nivedita College, Kair Village, Near Najafgarh, Delhi-110043	VPN/MPLS	250 Mbps
38	Delhi North	Swami Shardhnand College, Alipur Village, Delhi-110036	VPN/MPLS	250 Mbps
39	Delhi North	Raj Guru College of applied sciences, Jhilmil colony, Vivek Vihar, Delhi-110095	VPN/MPLS	250 Mbps
40	Delhi South	Acharya Narender Dev College, Govind Puri, Kalkaji, New Delhi-110019	VPN/MPLS	250 Mbps
41	Delhi South	Deshbandhu college, Kalkaji, New Delhi-110019	VPN/MPLS	250 Mbps (Morning)
			VPN/MPLS	250 Mbps (Evening)
42	Delhi South	Bhaskraycharya College of Applied Sciences, Sector-2, Phase-1, Dwarka, New Delhi-110075	VPN/MPLS	250 Mbps

Sr. No.	Site Details	Site Address	Service Required	BW Required
43	Delhi South-CO	Delhi University South Campus, Benito Juarez Road, New Delhi-110021	VPN/MPLS	10 G
44	Delhi North-CO	Delhi University North Campus, Computer Centre, Delhi-110007	VPN/MPLS	10 G
45	Delhi North-Co	Delhi University North Campus, Computer Centre, Delhi-110007	VPN/MPLS	1 G
46	Delhi South-CO	Delhi University South Campus, Benito Juarez Road, New Delhi-110021	VPN/MPLS	1 G
47	Delhi South	School of Open Learning, South Delhi campus, Delhi	VPN/MPLS	250 Mbps
48	Delhi North	Dhaka Hostel Complex	VPN/MPLS	250 Mbps
49	Delhi North	Campus of Open Learning, Keshav Puram, Delhi	VPN/MPLS	250 Mbps