



INDIAN INSTITUTE OF TECHNOLOGY BOMBAY
MATERIALS MANAGEMENT DIVISION
Powai, Mumbai 400076.

RFx No.6100000505

Computer Centre, IIT Bombay (herein after referred to as CC) plans to setup a panel of Internet Service Providers (herein after interchangeably referred to as either ISP or bidder) for sourcing Internet Bandwidth Services.

SCOPE OF WORK

Service Description:

The Internet Bandwidth Service comprises protected circuits carrying telecommunications traffic between CC at one end and any arbitrary point on the worldwide Internet at the other end.

Definitions:

“Protected Circuit” means a exclusive physical communication channel (i.e., multiplexing ratio 1:1) which is established between CC and ISP. This physical channel serves as a conduit to create logical telecommunication channel dynamically between CC and any arbitrary point on the worldwide Internet. This combination of physical and logical structures is exclusively available to CC in terms of the agreed and paid for channel capacities in full duplex mode. In addition, the ISP will have no right to inspect the information flow in terms of contents and other characteristics on this channel.

REQUIREMENTS & SPECIFICATIONS:

Sr. no	Technical Specification for Internet Leased Line Connection	Complied (Yes/No)	Deviations if any
1	The bidder should have a valid Category “A” ISP license from Govt. of India (Attach a copy of license).		
2	The Internet connectivity leased line should have fully dedicated (1:1), unshaped & high quality symmetric bandwidth without any compression factor through optical fiber cable.		



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3	The bidder should have fully resilient and self healing network architecture, on fiber medium, from the international gateway in India upto the international Points of Presence. (Detailed architectural layouts need to be included with the bidder's proposal as annexure.)		
4	All the POPs from where the ILL bandwidth is provided to CC should have redundancy of equipment's, links, power, back-haul IP connectivity etc. In particular, network redundancy has to be built to protect the circuit from cable cuts. (Pl. enclose details for the same.)		
5	The bidder should describe all the key peering/transit arrangements (in terms of ISP names, locations, link capacities, etc).		
6	The connectivity from the POPs of service providers to CC premises shall be through Optical Fiber Media. The landing point for the service will be as determined by CC which may be shifted free of cost by ISP within a radius of 500 meters during the contract period.		
7	All the equipment supplied by the bidder should be capable of handling up to 10Gbps to allow for potential upgrades that may be required during the empanelment period. Further, the end of life of equipment as declared by the manufacturer of such equipments should not be within the empanelment period.		
8	Any software and hardware required for establishing the purchased bandwidth will be provided by bidder to make leased line fully functional.		
9	The bidder must announce and advertise in full the aggregate IP address pool or prefix allocated to CC by APNIC over eBGP and also should be able to provide prefixes in full.		
10	The bidder should be able to provide IPv6 services in dual stack mode.		
11	The bidder should furnish a detailed network schematics diagram of total solution proposed showing connectivity from ISPs Internet PoP to required locations of the CC.		
12	The bidder should submit technical literature explaining the proposed implementation diagram with the technical bid.		
13	The bidder should have direct number to register complaints round the clock (24x7), Maintenance support service (24 hours and 7 days a week) and independent Network Operation Centre with 24x7 supports to take care of the ILL link management requirements.		
14	The service provider network should be backed by availability of		



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	service centers/service personnel in Mumbai to attend faults.		
15	Bidder has to provide facility to CC, to monitor the SLA (Service level Agreement) parameters and log the trouble tickets online. CC should also be able to obtain standard reports on the ILL bandwidth utilization (in Mbps, in frames/sec), errors (frames/sec),discarded (frames/sec), multicast (frame/sec), bandwidth availability, packet loss (in %), latency of links etc. through any network monitoring tool / web browser provided by service provider.		
16	<p>CC will consider the successful provision of the link subject to satisfactory Acceptance Test. The methodology for the test will be at the discretion of the CC. However, the same will be shared with the bidder.</p> <p>Following tests should be adopted :</p> <ul style="list-style-type: none">a. Average round-trip latency up to the ISPs 1st Tier 1 peering point.b. Domestic Latency during peak traffic hours (i.e., from 10:00 hrs. to 12:00 hrs. and 23:00 hrs. to 01:00 hrs. IST).c. International Latency during peak traffic hours (i.e., from 10:00 hrs. to 12:00 hrs. and 23:00 hrs. to 01:00 hrs. IST).d. Packet Loss < 1% <p>For specific criteria and parameters, refer to the SLA parameters and evaluation matrix provided elsewhere in this document.</p> <p>Facilities of testing above parameters will be provided by the bidder.</p>		



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SERVICE LEVEL GUARANTEE:

- A. The Service Provider shall provide the 1:1 round the clock ILL connectivity.
- B. **Packet Losses:** Less than 1 % (average over 1000 ping) at any given point of time to any part of Country / ISP Internet gateway.
- C. **Network Round-Trip Latency:** Less than 100 ms from the Institute to ISP's tier 1 peering point. Latency will be randomly checked on daily basis. In case of non-adherence to the latency limit, the link will be considered as down with effect from time of detection till the time is restored and passes latency tests unflinching for one hour. The test will be conducted every fifteen minutes.

The **latency guarantee conditions** for the protected circuit being purchased are specified in terms of upper limit on **average round-trip transmissions** between a designated hub router located at CC and the following well known websites located in the different geographical locations:

www.google.com

www.monash.edu.au

www.mit.edu

www.berkeley.edu

www.iitg.ac.in

www.nus.edu.sg

Latency shall be measured by using Linux utility 'mtr'. Average sample measurements will be taken randomly during a calendar month between IIT Bombay and the above sites. The measurement interval will be of 10 minutes duration. The observed packet loss should be less than 1% to all the above destinations. Round-trip latencies figures must not exceed 250 ms for any of the above sites. If the latency and packet loss SLA parameters are not honoured during one random measurement events (described above), the measurement will be repeated immediately for 15 minutes. If the SLA parameters are violated again, a 1% penalty on monthly bill will be imposed for every such failure.

- D. **Network Availability (uptime):** More than 99.5 % per calendar month.
- E. National Backbone should be available on the same ISP.
- F. Reports for performance, monitoring / usage to be submitted by the ISP on monthly basis or as per requirement of the Institute.



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G. Uptime Calculation: Uptime over a calendar month shall be calculated as,

(Total Time over a month – Total Down Time over a month) X 100 /Total Time over a month. Deduction in payment will be made for downtime in the monthly bills raised by the ISP.

H. The response time for attending the faults will be 1 hour after they are reported to the ISP. The ISP will rectify the faults within 8 hours failing which, depending on the nature of the fault the ISP will arrange temporary replacements if feasible.

I. Downtime penalty in % on monthly payment:

Sr. No.	Uptime (in %)	Penalty (in %) on monthly bill
1.	≥99.5%	0
2.	> 99 to < 99.5	10
3.	> 98.5% to < 99	20
4.	> 98 to < 98.5	30
5.	> 95 to < 98	50
6.	> 90 to < 95	70
7.	< 90%	100

Downtime due to the following situations will not be considered for the purpose of penalty:

- a. Link down due to power failure / or any situation which are beyond the control of service provider. In any case, the maximum time to repair must be 8 hours during disruptions like cable cuts, etc.
 - b. Due to scheduled maintenance by the Service Provider, with prior approval of Institute. Scheduled Maintenance shall mean any maintenance on the circuit of which CC is notified 48 hours in advance. Notice of Scheduled Maintenance will be provided to CC's designated point of contact by a method elected by telephone, email, or fax.
- J. Maximum Time to Repair (MTTR), Packet loss and Link failover will be calculated using MRTG portal hosted at IITB or through ISP portal.
- K. Service disruption due to on site customer premises equipment (CPE) failures will be counted against the SLA guarantees.



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PROACTIVE MONITORING:

The ISP's proactive outage reporting guarantee is to notify customer within 30 minutes after *the ISP's* determination that the service to IIT Bombay is unavailable. *The ISP's* standard procedure will be to ping the router at IIT Bombay every five minutes. If the router does not respond after two consecutive five-minute ping cycles, *The ISP* will deem the service unavailable and will contact the designated point of contact by a method elected by *the ISP* (telephone, email, or fax).

EVALUATION MATRIX:

In the table given below a set of attributes pertaining to the internet service have been given. ISPs wishing to participate in the empanelment process are required to provide relevant information for each of those attributes. ISPs are expected to be brief and to-the-point while providing such information. The technical evaluation committee at IIT Bombay will work out a scheme of awarding points for each of the attributes. The range of points to be awarded for each of the attributes is shown in the table. The ISPs with higher scores may have a better chance of being shortlisted for empanelment.

Technical evaluation:

If it is discovered that incorrect, inaccurate, or ambiguous information has been provided, the concerned ISP may be disqualified and any service contracts awarded will be automatically canceled.

Attribute	Answers and/or range of points to be awarded
Category of ISP based on 3-Tier model	Zero to 5 points depending on the assessment of IIT Bombay technical team. Best will get maximum marks & rest will get proportionately.
Total number of Submarine Cable Systems Private Ownership.	Zero to 5 points depending on the assessment of IIT Bombay technical team. Best will get maximum marks & rest will get proportionately.
Total number of Submarine Cable Systems Consortium Ownership.	Zero to 5 points depending on the assessment of IIT Bombay technical team. Best will get maximum marks & rest will get proportionately.
Total number of Cable Landing Station Ownership's in India	Zero to 5 points depending on the assessment of IIT Bombay technical team. Best will get maximum marks & rest will get proportionately.
Total Peering Capacity in India	Zero to 5 points depending on the assessment of IIT Bombay technical team. Best will get maximum



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Attribute	Answers and/or range of points to be awarded
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Total International Peering Capacity	Zero to 5 points depending on the assessment of IIT Bombay technical team. Best will get maximum marks & rest will get proportionately.
Total International Bandwidth Owned/Acquired	Zero to 5 points depending on the assessment of IIT Bombay technical team. Best will get maximum marks & rest will get proportionately.
Total International Bandwidth Utilization	Zero to 5 points depending on the assessment of IIT Bombay technical team. Best will get maximum marks & rest will get proportionately.
Total number of India IP POP's	Zero to 5 points depending on the assessment of IIT Bombay technical team. Best will get maximum marks & rest will get proportionately.
Total number of Global IP POP's	Zero to 5 points depending on the assessment of IIT Bombay technical team. Best will get maximum marks & rest will get proportionately.
Total number of Private Peering with Content Providers like Yahoo, Google, Rediff, etc	Zero to 5 points depending on the assessment of IIT Bombay technical team. Best will get maximum marks & rest will get proportionately.
Current aggregate link capacity (bandwidth) from India to the outside world. (Please indicate clearly if the capacity is your own or it is being contracted to another carrier.)	Zero to 5 points depending on the assessment of IITB technical team. Best will get maximum marks & rest will get proportionately.
Please include your top ten clients names and contact addresses with telephone numbers as an annexure.	Zero to 5 points depending on the assessment of IITB technical team. Best will get maximum marks & rest will get proportionately.



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Attribute	Answers and/or range of points to be awarded
<p>(Note: The ISP must have at least 10 clients sourcing a minimum of 200 Mbps on a single circuit of which at least one must be located in the western zone of India. IPLC services are not to be considered as equivalent to a client.)</p>	
<p>Please indicate the round-trip latencies for the following locations on the Internet:</p> <p>Domestic (www.iitg.ac.in)</p> <p>USA (www.mit.edu)</p> <p>USA (www.berkeley.edu)</p> <p>Singapore (www.nus.edu.sg)</p> <p>Australia (www.monash.edu.au)</p>	<p>Maximum 3 points for each location and</p> <p>-1 point for 10% to 30% increase, -2 points for 30% to 70% increase & -3 points for 70% to 100% increase.</p> <p>(<=70 ms) 3 points</p> <p>(<=200 ms) 3 points</p> <p>(<=275 ms) 3 points</p> <p>(<=100 ms) 3 points</p> <p>(<=125 ms) 3 points</p>
<p>Please outline your SERVICE SUPPORT TEAM Structure, features, and policies. If necessary, more details may be given in separate sheets. In particular, the ISP must clearly address the following important aspects in this regard:</p> <p>ISP Support team should be able to monitor link outages and/or performance degradations so as to pro-actively inform CC.</p> <p>ISP should support a MTTR commitment in case of link failures or poor performance.</p>	<p>Zero to 5 points depending on the assessment of IITB technical team. Best will get maximum marks & rest will get proportionately.</p> <p>Zero to 5 points depending on the assessment of IITB technical team. Best will get maximum marks</p>



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	& rest will get proportionately.
System level details for supporting mitigation of different types of network attacks and malicious activity, e.g., DDoS attack, and TCP ack storm attack.	Zero to 5 points depending on the assessment of IITB technical team. Best will get maximum marks & rest will get proportionately.
Facility to provide standard reports on the ILL bandwidth utilization (in Mbps, in frames/sec), errors (frames/sec), discarded (frames/sec), multicast (frame/sec), bandwidth availability, packet loss (in %), latency of links etc. through any network monitoring tool / web browser provided by service provider.	Zero to 5 points depending on the assessment of IITB technical team. Best will get maximum marks & rest will get proportionately.
Experience with major academic institutions (such as IITs, IIMs, IISc, TIFR) serving non IPLC internet bandwidth of 1 Gbps or more. Note: Kindly provide a certificate and contact details of the respective major academic institutions.	Zero to 5 points depending on the assessment of IITB technical team. Best will get maximum marks & rest will get proportionately.