

Consultation Paper No. – 6/2005



TELECOM REGULATORY AUTHORITY OF INDIA

Consultation Paper
on
Issues Related to
ISP Licence with Virtual Private Network (VPN)

June, 2005

TRAI House
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Index

Preface

1. Background
2. Introduction
3. Present Scenario
4. International Scenario
5. Terms and Conditions for ISP licence with VPN
6. Issues for consultation
7. Annexes

Preface

The development of new techniques for delivering Virtual Private Network (VPN) services over public networks continues to be one of the most active areas of innovation in telecommunications. The last few years have seen the rise in deployment of VPN services and network architectures based on a variety of technologies, including combinations of Time-Division Multiplexing (TDM) leased lines, Frame Relay, Asynchronous Transfer Mode (ATM), Internet Protocol (IP) and more recently Multi Protocol Label Switching (MPLS). The provision of VPNs by ISPs has become one of the contentious issues recently and DoT has decided that this should be treated as a new service, requiring amendment to existing ISP licence.

The Government has sought TRAI's Recommendations regarding issues of entry fee and annual licence fee for provision of VPN services by ISP licencees in the country and this Consultation paper has been prepared to solicit the comments of the stakeholders to frame up the recommendations on these issues.

This paper presents the general introduction to VPN technologies, current national scenario, global scenario regarding VPN and provides the background on various policy/regulatory issues relating to it. The main objective of this paper is to solicit informed views of the various stakeholders including Service Providers, Consumers, Consumer Organizations and others interested in the subject. The gist of comments received will be posted on TRAI's website. Thereafter, the issues will be deliberated upon during the Open House Discussions planned to be held during next month.

Since the Recommendations to the Government are required to be made in a time-bound manner, we would like to have the comments and views on any or all issues raised in this paper on or before 25th July 2005. For further clarifications, Shri S.N. Gupta, Advisor (Converged Network), TRAI may be contacted on telephone number 26167914, fax number 26160822 or e-mail traio9@bol.net.in. This paper is also available on TRAI's Web site (www.traigov.in).

Pradip Baijal
Chairman

New Delhi
24th June, 2005

1. Background

- 1.1** ISPs were known to be providing Internet based VPN services to their leased line customers (mainly corporate), though there is no explicit mention of VPN in the existing ISP licence, which defines SERVICE as "Internet access/ Internet content services including Internet Telephony as mentioned in clause 1.14 of Schedule 'C' ". For this purpose ISPs have also been obtaining leased line resources (last mile) from various access providers.
- 1.2** Various ISPs and ISPAI had represented to TRAI that there has been abnormal delay in provisioning of leased lines by access providers, who have been putting condition that leased circuit will not be used for VPN and it will be used for Internet purpose only.
- 1.3** On receiving representations from ISPAI and some ISPs, TRAI sought clarification from Department of Telecommunication (DoT) as to whether ISPs can provide IP-VPN service under their existing licence. DoT clarified that ISPs cannot be permitted to provide IP-VPN/MPLS/other end-to-end service under their present ISP licence.
- 1.4** DOT allowed provision of VPN services by ISPs with annual licence fee @ 8% of the Adjusted Gross Revenue generated under the licence and one-time entry fee of Rs.10 crore, Rs.2 crore and Rs.1 crore for category 'A', 'B' and 'C' respectively. Further ISPs with VPN licence were also permitted to lay optical fiber cable or use radio licence for provision of service under their licence in their service area, which was permitted to existing ISP licencees only for the purpose of last mile linkage.
- 1.5** ISPAI & other ISPs filed a petition before Honorable Telecom Dispute Settlement Appellate Tribunal (TDSAT) against the decision of Government.

1.6 Honorable TDSAT delivered its judgment in the above case on 3rd May 2005; the relevant portion of the judgment is reproduced below:

" We observed that though VPN is being defined and discussed by both the parties, on access through Internet as well as on direct leased line. The Respondent mentioned that the VPN provided on direct leased line by ISPs is not allowed. This stand of the DOT we accept because by basic definition of ISP, it has to be only Internet based activity. Licence of ISP permits them the activity concerned with access of Internet and use of its content for IT enabled services. As rightly contended by DOT, VPN was not allowed as a part of ISP licence, it is fair for us, therefore, to hold that it becomes a separate service. The quantum of entry fee and revenue share to be charged for a separate service from the service provider would require the recommendations of TRAI as per Section 11(1)(a)(i)(ii) of TRAI Act".

"We believe that four months period will be enough for the Government to take a final decision in the matter. Till then the impugned guidelines will have to be treated as ad-hoc and would acquire final shape only after a final decision of the government after getting recommendations from TRAI. Till then the impugned guidelines dated 16th December 2004 and directive dated 17th January 2005 shall remain in operation".

1.7 In light of the above judgment, the Govt. (DoT) has referred the issue to TRAI vide their letter No. 813-7/03-LR(Pt) dated 20th June 2005, for its recommendations on the following issues (Annex 1)

- i) Entry fee for ISP with VPN licence
- ii) Annual Licence fee to be charged from ISP with VPN licence

1.8 TRAI's recommendations have to be submitted to Govt. by 20th August 2005, i.e. within 60 days of the date of DoT's letter as per provisos of Section 11(1) of TRAI Act, 1997.

2. Introduction to VPN:

2.1 A **Virtual Private Network** (VPN) is a private data network that makes use of the public telecommunication infrastructure, maintaining privacy through the use of tunneling protocol and security procedures. A virtual private network can be contrasted with owned or leased lines, which are end to end (point to point) and are dedicated to one customer. The main purpose of a VPN is to give the customer virtually similar capabilities as private leased lines at much lower cost by using the shared public infrastructure. Telecom companies have provided private shared resources for voice messages since long time. A virtual private network makes it possible to have the same protected sharing of public resources for data. Users today are looking at using a private virtual network for various applications to reduce their cost of connectivity for data services.

2.2 Types of VPNs

International Telecommunication Union (ITU) has defined the various types of VPN services under clause 5 of ITU-T Rec Y.1311 (03/2002) as following:

2.2.1 Layer 1 VPN service

In a layer 1 VPN service the customer edge device is connected to the network provider via one or more links, where each link may consist of one or more channels or sub-channels (e.g. wavelength, or wavelength and timeslot respectively or just timeslot). The customer edge device and the provider edge device are peered to each other only at the physical link layer across the access network.

A link has two end-points:

- a) one on the customer edge (CE) device, known as the port;
- b) one on the provider edge device , known as the provider edge (PE) port.

The scope of a layer 1 service is related to port-based VPNs only.

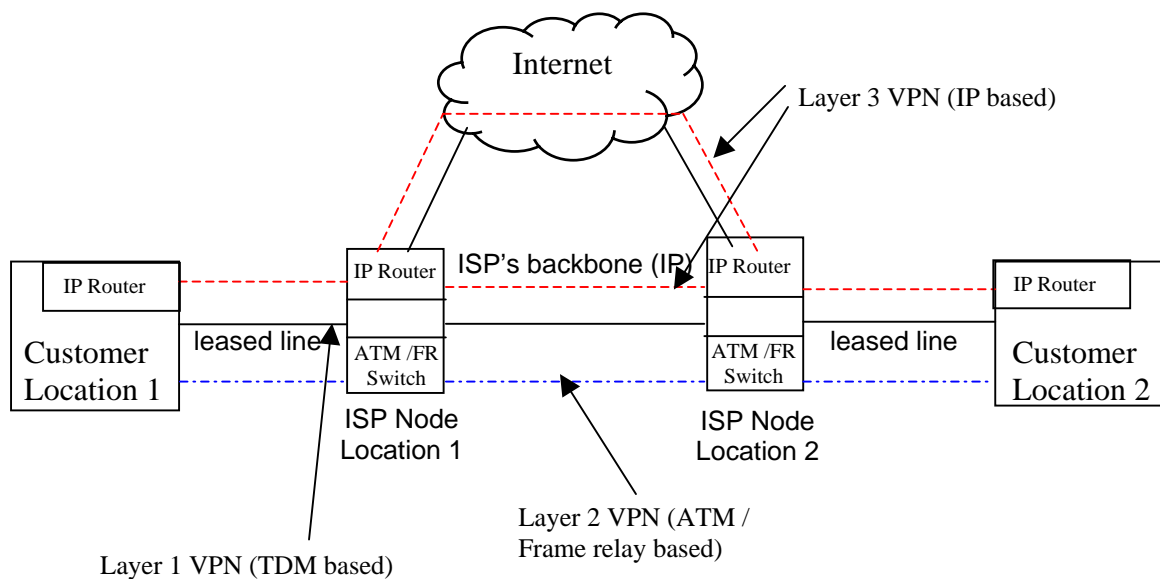
2.2.2 Layer 2 VPN service

In a layer 2 VPN service, customer edge device receives data link layer (i.e. layer 2) service from the network provider. The customer edge device and the provider edge device are peered to each other at the data link layer across the access network. The network performs forwarding of user data packets based on information in the packets' data link layer headers, such as frame relay DLCI, ATM VCC, or 802.1q VLAN tag.

2.2.3 Layer 3 VPN service

In a layer 3 VPN service, customer edge device receives network layer service (typically in the form of IP packets) from the network provider. The customer edge device and the provider edge device are peered to each other at the network layer across the access network. The network performs forwarding of user data packets based on information in the IP layer header, such as an IPv4 or IPv6 destination address. The customer sees the network as a layer 3 device such as an IPv4 or IPv6 router.

2.2.4 Following diagram describes the various types of VPNs:



2.3 As per DoT's decision, which is also considered by Hon'ble TDSAT, the proposal is to permit Layer 2 & layer 3 VPN services by ISPs with VPN licence and not the Layer 1 VPN. Also such VPN are to be configured as CUG only by complying with CUG guidelines prevailing from time to time.

2.4 Major differences between a point to point leased line and Layer 2/ Layer 3 VPN are following:

Leased line is a dedicated end-to-end circuit that can provide a guaranteed throughput of 100% with end-to-end security and QOS.

VPN is a connectionless link extracted from public (shared) infrastructure. It is not a dedicated circuit and its throughput, security and QOS guarantees are always less than 100%.

Therefore, it has to be considered whether VPN is technical equivalent and substitute for a point-to-point leased circuit and hence calls for a similar or differential regulatory treatment vis-à-vis leased lines.

3. Present Scenario for ISPs in Country:

3.1 As per provisions of existing ISP licence, there is no entry fee and revenue share for ISPs. However, there is a nominal licence fee of One Rupee per annum. ISPs are also required to provide a performance bank guarantee of Rs. 2.00 crores for category 'A' Service Area, Rs. 20.00 lakhs for category 'B' Service Area and Rs. 3.00 lakhs for each category 'C' Service Area.

3.2 As per provisions of guidelines of DoT for VPN services (termed as adhoc for 4 months by honorable TDSAT), existing ISPs are required to sign an Amendment to their respective ISP licence agreement to provide Virtual Private Network (VPN) Services in their respective licence area subject to the following additional terms and conditions:

3.2.1 Definition:

VPN service as defined under clause 5 of ITU-T Rec Y.1311 (03/2002);(refer chapter 2)

3.2.2 Scope:

ISP is permitted to provide Layer 2 VPN service and Layer 3 VPN services over its network as defined in ITU-T Rec Y.1311 (03/2002); VPN so configured is to be restricted to its licenced service area. Layer 1 VPN services as defined in ITU-T Rec Y.1311 (03/2002) are, however, not permitted.

3.2.3 Quality of Service

Quality of Service (QOS) shall be as prescribed from time to time by TRAI/Licensor; however, at present QOS is not prescribed.

3.2.4 Tariff / Fees

3.2.4.1 Tariff shall be as prescribed by TRAI from time to time.

3.2.4.2 One time non-refundable Entry Fee of Rs. 10 crores, Rs.2 crores and Rs.1 crore for Category A, B and C ISPs respectively shall be payable.

3.2.4.3 Annual licence fee shall be charged at the rate of 8% of Adjusted Gross Revenue generated under the licence.

3.2.4.4 Initially, Financial Bank Guarantee (FBG) of an amount of Rs. 1 crore, Rs.20 lakhs and Rs.10 lakh for Category A, B and C ISPs respectively shall also have to be submitted. Subsequently, the amount of FBG shall

be equivalent to the estimated sum payable equivalent to licence fees for the two quarters and other dues not otherwise securitized and any additional amount as deemed fit by the licensor.

3.2.5 Other Terms and Conditions

- 3.2.5.1 ISP shall not engage in reselling Bandwidth directly or indirectly.
- 3.2.5.2 ISP shall be permitted to lay optical fiber cable or set up radio links for provision of the services under its licence in its Service Area.
- 3.2.5.3 VPN shall be configured as Closed User Group (CUG) only. ISP shall comply with rules and regulations for CUG networks issued from time to time.
- 3.2.5.4 VPN shall carry only the traffic meant for the internal use of CUG and no third party traffic shall be carried on the VPN.
- 3.2.5.5 VPN shall not have any connectivity with Public Switched Telephone Networks (PSTN) / Integrated Services Digital Network (ISDN) / Public Land Mobile Network (PLMN) except when the VPN has been set up using Internet access dial-up facility to the ISP node. Outward dialing facility from ISP node is not permitted.
- 3.2.5.6 ISPs shall be free to enter into mutually agreed commercial arrangement with authorized telecom service providers for sharing of infrastructure.

3.3 Market Size of VPN Services

3.3.1 Presently, VPN customers are mainly Business Process Outsourcing (BPO) units, multinational companies, and Indian corporates that have offices spread over geographic regions (within the country and worldwide). While ISPs have been providing Internet based IP-VPN, incumbent carriers have been marketing Frame Relay and MPLS based VPN as well as point-to-point leased lines.

3.3.2 According to analysis of IP VPN services by IDC (table-1), the market was around Rs 230 crores in 2003 and is expected reach Rs 500 crores by 2005 and Rs1100 crores by 2008.

Year	2003	2004	2005	2006	2007	2008
Revenue (in Crores)	230.3	362.4	536.4	695.1	890.5	1141.2

Table-1: India IP-VPN Services Market Revenue Forecast, Rs. Crore, 2003-2008 (IDC)

A similar analysis carried out by Frost & Sullivan (Table-2), shows almost similar revenue projections

Year	Revenues (Rs. Crores)	Revenue Growth Rate (%)
2003	226.8	--
2004	281.7	24.1
2005	387.9	37.6
2006	508.5	31.5
2007	672.3	32
2008	894.6	33.1
2009	1198.35	33.9

Table-2: IP VPN Market: Revenue Forecast (India), 2003-2009 (Frost and Sullivan)

3.3.3 In comparison the point-to-point leased line market was of the order of Rs 577 Crores in FY 2002-03 and is expected to reach Rs 1400 Crores by 2006-07, as per the information provided by service providers.

FY	Actual Revenue		Projected Revenue		
	2002-03	2003-04	2004-05	2005-06	2006-07
Revenue (in Crores)	577	783.52	901.05	1081.26	1405.63

Table-3 Revenue on account of Domestic Leased Circuits (Rs in Crores) (Operators data)

3.3.4 From the above it can be made out that the present market size of VPN services is about 40% of domestic leased circuit market but is projected to become 80% during 2007.

4. International Scenario:-

Situation pertaining to regulation of VPN in some of the countries are as following:

4.1 Hong Kong

In Hong Kong companies who wish to provide VPN services need to apply for a Public Non-Exclusive Telecommunications Service (“PNETS”) Licence for VPN services.

According to the PNETS Licence for VPN service, the licensee may provide a VPN service which enables its customer to establish a private network over the VPN service for the purpose of carrying out telecommunications (which may include both telephonic and non-telephonic forms of telecommunications) that are between members of the corporate group or organisation of the customer and made in the course of the business of that corporate group or for the pursuance of the common interest of that organisation.

At present, the annual licence fee for the PNETS licence is \$750 and is payable on the issue or renewal of the licence.

The VPN service does not include the provision of external public telephone service. The PNETS licensee for VPN service is required to make it a condition under a contract between the licensee and its customer that the customer in Hong Kong shall not use the VPN service to provide a public telecommunications service.

4.2 USA

No general regulatory conditions apply to VPNs at the federal level. However, a VPN could fall under State regulatory requirements that apply to competitive telephone companies, depending on its configuration and operations.

Private networks and virtual private networks are not licensed. They interconnect with public networks. No conditions specific to private networks apply. Interconnection charges depend on the nature and configuration of the private network and the manner in which it interconnects with the public network. There may be interconnection charges, especially associated with voice traffic that

terminates on the PSTN; it is also possible that IP-enabled VPNs may interconnect for some purposes without paying any charges.

4.3 Singapore

If an organization intends to operate a Virtual Private Network (VPN) using shared public or private infrastructure for its own use (like CUG in India), no licence is required. However, if an organization intends to provide Virtual Private Network Services to a third party using the public network, then it is required to obtain a Services-Based Operator (“SBO”)(Individual) Licence from IDA (Singapore Regulator).

The Licensee is required to pay a licence fee of S\$5000 per annum for the duration of the Licence Period. However, there is no entry fee for the Licensee.

4.4 Canada

In Canada IP-VPN is being provided as a Data service under the category of Data & Private line Services, which can be provided by a number of service providers including the incumbent carriers, satellite service providers, both facilities and resale-based competitive service providers, cable companies and utility telephone companies. Data & Private line Services are marketed to end-customers in the retail market and to other service providers as wholesale services that are either resold directly or used to construct underlying networks used to deliver products and services to their end-customers in the retail market.

According to a report on Status of Competition in Canadian Telecommunications Markets published in November 2004, IP-VPN service revenues, although a small portion of all data services’ revenues, increased by approximately 74% in 2003,

4.5 Australia

The existing regime does not specifically regulate private networks or virtual private networks. Under the existing Act, there is no restriction on the installation and ownership of telecommunications infrastructure by the Carriers who are providing resources for such networks. However, the Act provides that the owner of a network unit must not use network units, or allow other persons to use network units, to supply carriage services to the public unless the owner holds

a carrier licence or a nominated carrier declaration is in force in relation to the unit or an exemption applies.

4.6 Japan

There are no administrative regulations for operating private networks. However, installing customer-owned and maintained telecommunications facilities is regulated by the following laws:

Wired facilities: Wire Telecommunications Law

Wireless facilities Radio Law

4.7 From the above, it can be seen that in many countries VPN services are lightly regulated, without any entry fee but with nominal annual licence fee.

5. Terms and Conditions for ISP licence with VPN

5.1 Need for New Licence and its Terms & Conditions

The Hon'ble TDSAT in its order on VPN case has upheld that "DOT has tried to introduce a new service provider with different licence fee and entry fee and it was necessary for DOT to meet the mandatory requirements of second provision of Section 11(1)(a) of TRAI Act. TDSAT observed that the guidelines of DOT could not have been enforced till the recommendations of the TRAI were obtained and decision taken thereon by the Government".

Therefore DoT has asked for TRAI's recommendation on these issues.

5.2 Entry Conditions and Annual Licence Fee: -

5.2.1 The entry fee and annual licence fee for providing a service are normally determined with a view to attract new players, deter non-serious players and based upon the revenue generation capability, market size of a particular service and the number of likely players to obtain the licence for that service. Also, the level playing field between the providers of similar or substitutable services have to be kept in mind.

5.2.2 While addressing the issue of level playing field, various parameters, like eligibility, entry fee, Annual licence fee (% revenue share), performance bank guarantee are to be considered.

5.2.3 The licence fee payable for any licence has a fixed component and a variable component.

Fixed component of a licence fee regime is normally operated as an entry fee to establish the bonafide of prospective service providers, and to act as the barrier for keeping out non- serious fly-by-night entities (with inadequate stakes) from entering the sector. Ideally, the entry fee should ensure elimination of non-serious players only and to meet the cost of inducting a service provider. It should also take into account the value of resources a licensee gets from Govt. by virtue of its license.

License fee, which permits the licensee to provide service should not be perceived in the market as deterrent to market entry. The cost of license should be reasonable and fair and should depend upon the level of competition. Any fee

associated with acquiring the licenses will inevitably be reflected in the cost to customers. The policy decision relating to license fee has, therefore, to be evaluated carefully to avoid potentially undesirable consequences.

High license fee could also be for augmentation of Govt's budgetary resources. However, this will reflect in costs of providing services to the consumers thereby defeating the objective of making the VPN service more popular and for being used for the overall development of the ICT in the country.

5.2.4 Variable part of the license fee is charged as the annual license fee and is levied as a certain percentage of share of the applicable revenue (AGR).

The revenue sharing percentage for the annual license fee should be fair and equitable, and determined to serve the overall objective of developing a new generation service and making it affordable in a competitive market and attractive for trade and industry applications. Such annual fee is normally linked to the cost of regulation and enforcement of the license and/or as a contribution to rural development through USO.

One modus-operandi for determining the 'revenue share' is to undertake a viability study of the service segment based on growth projections of the service in terms of revenue generation and costs of essential resources such as capital expenditure, usage of radio spectrum etc., apart from the license fee. The benchmarking of revenue share percentage can also be done by comparing with the existing similar services from level playing field points of view.

5.2.5 The present level of license fee and entry fee payable by existing Service Providers is tabulated below:

Type of Service	Service Area	Connectivity with PSTN	Entry Fee	Annual License Fee (% revenue share)
ILD	International	Full PSTN/PLMN Interconnection	Rs.25 crore	15%
NLD	National	-do-	Rs. 100 crore	15%
Unified Access (Fixed and Mobile) (UASP)	Circle	-do-	Different for each Circle (Based on Bidding)	Type A - 10% Type B - 8% Type C - 6%
Global Mobile Communication by Satellite	International	-do-	Rs. 1 crore	10%
VSAT	National	No Interconnection	Rs. 30 Lakhs	10%
Radio Paging Service Providers	City wise and Circle wise	One Way Interconnection with PSTN		5%
Internet Service Providers	National, Circle wise, SSA wise	-do-	Nil	Rs. 1
Public Mobile Radio Trunked Service	City wise and Circle wise	Limited One way	Nil	5%
Infrastructure Providers Cat I	National	NA	Nil	Nil
Infrastructure Providers Cat II	National	Full PSTN/PLMN Interconnection	Nil	6%

5.3 Entry Fee and Annual License Fee for ISP with VPN license

5.3.1 From existing licensees UASP, NLDO and IP-II are partially comparable with VPN services as these are providing leased lines, which are functionally similar to VPN though not fully substitutable. Also, UASPs are allowed to provide switched voice, NLDOs are allowed to provide carriage for switched voice and IP-2's are allowed to provide layer 1 dedicated bandwidth and full interconnection with PSTN/ PLMN. On the other hand, ISPs with VPN are not permitted to provide layer 1 dedicated bandwidth and are also not allowed to go beyond CUG with no interconnection with PSTN/ PLMN. Also, the revenue generation capability of VPN service is much less than those of UASPs, NLDOs and IP-IIs.

5.3.2 Adjusted Gross Revenue (AGR)

As per provisions of guidelines of DoT for VPN services (termed to be adhoc for 4 months by honorable TDSAT), Annual licence fee shall be charged at the rate of 8% of Adjusted Gross Revenue generated under the licence. The term Adjusted Gross Revenue has not been defined for this service.

As per provisions of existing ISP licence there is no revenue share levied on the gross revenues of ISP for existing service. Therefore, it may be in all fairness that for calculating AGR for levying Annual licence fee for ISPs with VPN, revenue from VPN services only to be considered as AGR.

6. Issues for consultation

1. What should be entry fee for provisioning of VPN services by ISPs?
2. What should be licence fee (revenue share) for VPN services by ISPs?
3. What revenue should be considered as AGR (Adjusted Gross Revenue) for levying Annual licence fee for ISPs with VPN?

Government of India
Ministry of Communications & IT
Department of Telecommunications
(L R Cell)
Sanchar Bhavan, 20 Ashoka Road, New Delhi – 110 001

No.813-7/03-LR (Pt.)

Dated: 20th June, 2005

To,
Secretary,
Telecom Regulatory Authority of India,
A-2/14 Safdarjung Enclave,
New Delhi-110029.

Subject: Final determination of entry fee and licence fee for ISPs
who wish to provide VPN services

Kindly find enclosed a copy of TDSAT judgment dated 3rd May, 2005 (Petition No.7 of 2005) in the matter of Internet Service Providers Association of India (ISPAI) and Others versus Union of India.

2. TRAI is requested to furnish its recommendations at the earliest for consideration of the Government on the issue of entry fee and annual licence fee for their final determination by the Government.

3. It is also brought to the notice of TRAI that as per the judgment, Government has to take a final decision within four months w.e.f. 3rd May, 2005.

Encl: as above

Sd/-

(H. K. GUPTA)
DDG(LR)