

In The Name of Allah, The Most Beneficent, The Most Merciful



PAKISTAN TELECOMMUNICATION AUTHORITY

Headquarters, F - 5/1 Islamabad

www.pta.gov.pk

F. No. 15-08/06(CA)/PTA

April 17, 2006

CONSULTATION PAPER ON INTERNATIONAL BANDWIDTH TARIFFS

This paper intends to seek opinion of all stakeholders including the ISPs, Call Centres & LL/LDI operators. The stakeholders are urged to look into these issues and send their comments and observations in writing within 15 days. This paper does not convey in any sense a decision of the Authority in respect of the issues discussed in this paper. Your response, queries and clarifications may be addressed to Ms. Fatima Khusnud, Assistant Director (fatima@pta.gov.pk) and Mr. Aadil Umar Khalil, Assistant Director (aadil@pta.gov.pk) PTA Building, F-5/1 Islamabad Fax: 2878133

INTRODUCTION

The Pakistan Telecommunication Reorganization Act:

The Pakistan Telecommunication Authority (The Authority) is responsible for the regulation of the telecom sector, which is being highlighted in the following sections of the Telecommunication (Re-organization) Act 1996:

Sections 4(c) and 6(e)

The Authority is required to promote and protect the interest of users to telecommunication services as well as to encourage fair competition in the telecommunication sector.

Section 4(d)

The Authority shall promote the availability of wide range of high quality, efficient, cost effective and competitive telecommunication services throughout Pakistan.

Section 26

The level of tariffs for telecommunication services including basic telephone service shall be regulated by the Authority in accordance with the following general principles:

- (a) The regulations shall be made with a view to achieving the greatest possible degree of pricing flexibility and stability compatible with safeguarding and protecting the interest of consumers.
- (b) The regulations shall apply to comparable providers or users of any regulated telecommunication service.

- (c) Tariffs shall be at a level, which provides a reasonable rate of return on investments taking into account the cost of operation.

Broadband Policy 2004

The Broadband Policy asserts:

- (a) Spreading of an affordable, 'always on', broadband high speed internet service in Pakistan in the corporate / commercial and residential sectors across Pakistan
- (b) Encourage the entry and growth of new service providers while stimulating growth of existing ones at the same time.
- (c) Encourage private sector investment in local content and broadband services.

The policy has defined a roadmap to proliferate broadband in the country and has set the target of 500,000 broadband users within five years. The broadband policy has suggested some measures (such as hosting of content in Pakistan, Reduction in prices of domestic as well as international IP bandwidth and establishment of national and regional peering points), which could help in the promotion of broadband growth.

Telecom Rules 2000

It is pertinent to mention that the Authority vide its determination dated August 25, 2004 has already declared Pakistan Telecommunication Company Limited (PTCL) as SMP in the leased line market as per section 17 of Pakistan Telecommunication Rules 2000 elaborated below:

Section 17

An operator shall be presumed to have significant market power when it has a share of more than 25% of a particular telecommunication market. The relevant market for these purposes shall be based on sectoral revenues.

Fixed-Line Tariff Regulations 2004

In continuation to the above, the fixed-line tariff regulations 2004 states:

Section 11

The tariffs for leased line services of an operator, who is determined to have SMP status in the leased line market by the Authority, shall be on cost. Until the determination of cost, the Authority may take into account the international benchmarks of comparable countries while setting/approving tariffs of leased lines.

The operator may set the tariffs of leased lines below the approved tariffs provided they shall inform the Authority about their proposed tariffs thirty (30) days before the applicability of new prices.

BRIEF OVERVIEW ABOUT LEASED CIRCUITS

In today's world, the competitiveness of any economy heavily relies on the availability of advanced telecommunication infrastructure. Leased lines form the critical building blocks used by service providers as the basic infrastructure upon which their services are built. The availability of leased lines, thus, can be considered as the foundation of new economy. With the expansion of the internet and data related services, leased lines are used by internet service providers to build backbone networks thus becoming crucial for the availability and affordability of the networks.

In Pakistan, full liberalization of telecom sector started in 2002 with the award of new local loop, long distance international and mobile cellular licenses. The Authority has adopted open licensing regime and has also awarded VAS (value added services) Licenses, which include payphone, internet service providers and Audiotex (Premium Rate) services.

Leased Line

Leased line services provide a defined transmission capacity between termination points in a communications network. Leased lines can span short or long distances. They maintain a single open circuit at all times, as opposed to traditional telephone services that reuse the same lines for many different conversations through a process called switching. These lines are used for applications such as private network/Intranet (voice and data), dedicated Internet access and data downloads.

Leased lines are one of the most important network elements appropriately termed as backbone infrastructure, which enable the telecom operators and service providers to offer telecommunication services. In addition to corporate customers, software exporters and educational institutions; LL/LDI, ISPs, DNOPs and cellular mobile operators are the major users of leased lines in Pakistan.

In general, the leased lines can be segmented as follows:

Analogue leased lines: These provide voice and data traffic at speeds up to 56Kbps.

Digital leased lines: These can be used to carry voice, video, and data traffic, at speeds between 9.6 Kbps to 155Mbps and above. Digital leased lines are divided into four bandwidth categories:

- Up to and including 64 Kbps
- Greater than 64 Kbps but less than 2Mbps
- 2Mbps
- Greater than 2Mbps

Domestic Private Leased Circuits (DPLC)

DPLCs are dedicated, fixed, point-to-point digital transmission channels between two points within a country. DPLCs can carry data, digitized voice, video or any other form of digital transmission at bandwidths ranging from 64kbps to 155 Mbps.

PTCL has been reducing its domestic leased line charges since 1999. These charges were first reduced by 15% on July 1, 1999 and again on December 1, 2000 by 50% for cellular mobile operators and 40% for other users. The domestic leased line charges were further reduced by 16% – 48% for local loop and long distance operators at the time of finalization of PTCL RIO through a determination by PTA summarized in the following table:

Table 1
DPLC Charges for LL/LDIs

Fig in Rs.

Capacity	0-100KM If exceeds 25 Km	0-200KM If exceeds 100 Km	0-600KM If exceeds 200 Km	0->600KM If exceeds 600 Km
2Mb	4,000	3,318	3,047	2,800
8Mb	13,552	11,613	10,664	9,800
34Mb	46,464	39,816	36,564	33,600
155Mb	162,624	139,356	127,974	117,600

In order to promote information technology and data related services, the charges for ISPs, corporate and other private sector data customers have been subsidized and PTCL is charging Rs. 2,536 per km per annum for 2 Mbps.

International Private Leased Circuits (IPLC)

IPLC forms the basic building blocks for international communications, providing raw bandwidth for global communications networks. These point-to-point private line services are dedicated to the customer's exclusive use, reliable digital transmission, seamlessly

integrating data, voice and imaging services. A wide variety of applications are supported by IPLC including internet access, LAN-to-LAN connectivity, telemedicine, video and teleconferencing.

IPLC enables operators with a global reach into over 200 countries to serve their international requirements by an extensive range of bandwidth options.

At present, PTCL is providing IPLC services through SMW-3, SMW-4 and Flag to call centers, educational institutions, ISPs and LL/LDI operators. The charges for IPLC vary for different categories of different service providers.

Internet Protocol (IP) Bandwidth offered by PTCL

The growth of internet and its related applications demand new requirements for different telecommunication networks capacity and bandwidth. Moreover, the rapid growth of IP based networks have resulted in significant changes and telecom operators are now making significant investments in IP-based infrastructures.

In Pakistan, PTCL is also offering IP bandwidth to ISPs, Call centers and software exporters at higher discounts than incase of other services. IP bandwidth or commonly known as internet bandwidth is a shared facility where bandwidth providers offer capacities to multiple users. As the bandwidth is shared with multiple operators and it is not specifically linked to any geographical station on the other end, it has certain QoS related deficiencies that make it relatively less reliable. Although bandwidth providers try to ensure the amount of bandwidth at their end, it is difficult to manage the bandwidth on the overall network, as it is open to multiple users internationally.

Managed Bandwidth

Keeping in view the demand characteristics, bandwidth providers are introducing new products that offer combination of prioritization, bandwidth reservation and other management features, which allow control over their networks. This in turn helps the operators to deliver multiple service quality levels.

Managed bandwidth refers to providing connections between two specific points with guaranteed bandwidth. The connection is usually established between routers on the network.

PTCL is offering managed bandwidth services to ISPs and Call Centers via Flag Telecom. The tariffs are summarized below:

Table 2
Managed Bandwidth Tariff for ISPs offered through FLAG

Destinations: London, Paris, New York and Hong Kong	
Speed	Charges per Month USD
E-1	8,910
DS-3	98,010
STM-1	196,603

Countries	Monthly Price USD		
	E-1	DS-3	STM-1
Tokyo	10,710	117,810	235,620
Seoul	10,710	117,810	235,620
Taiwan	10,710	117,810	235,620
San Francisco	11,700	128,700	257,400
Singapore	11,610	127,710	255,420
Rest of Europe	9,810	107,910	215,820

Table 3
Managed Bandwidth Tariff for Call Centers

Speed	Monthly Charges for E1 (USD)
London, Paris, New York and Hong Kong	6,500
Los Angeles & San Francisco	10,000

GLOBAL IMPORTANCE OF BROADBAND

The access to bandwidth at globally competitive prices is not only a vital determinant of competitiveness in knowledge-based economy but also makes important contributions to the quality of life, in terms of education, health services and social inclusion.

Broadband connections can also allow businesses to develop new e-commerce activities that are not feasible over bandwidth constrained dial-up services. E-commerce is becoming an

increasingly integrated and important component of business. Presently this has been predominately carried out through narrowband connection using either PSTN or ISDN technologies. E-Commerce allows businesses to restructure their supply chains and distribution systems by removing intermediaries between suppliers and customers thus facilitating reduction in costs.

Another important aspect which tends to stimulate broadband is whether the network of incumbent operator is bundled or unbundled. The local loop unbundling of incumbent operator plays an important role in providing competition in the broadband segment.

Market Overview of International Bandwidth segment in Pakistan & its current status

IPLC that offers global connectivity through submarine cable or Satellite is a critical input for provision of Broadband and Internet services, International Long Distance Voice Telephony and for a number of key industries like information technology services. The cost of IPLC forms a substantial portion of the total cost of the user industries. The competitiveness of these industries in the global market to a large extent is dependent on the prices they pay for IPLC. In addition, Internet Service Providers (ISP) also use IPLC for their upstream connectivity abroad and high cost of IPLCs get reflected in the tariff which has an adverse effect on the growth of broadband in the country.

Current scenario

The prevalent market structure of IPLC in Pakistan is such that presently there is only one active player i.e. PTCL. It is offering international bandwidth through SMW-3 (South East Asia Middle East and Western Europe) SMW-4 and Fiber Optic Link around the Globe (FLAG). Each of these communication media is briefly discussed below:

SMW-3 & SMW-4

Submarine Cable is an integrated high capacity fiber optic-system linking South East Asia to Europe via Middle East. PTCL has an available capacity of 1.2 and 1.28 terabit in SMW-3 and SMW-4 respectively. Both SME-3 and SMW-4 are also being used as back up to each other.

SMW-3, with a total length of 39,000 km has 40 landing points in 34 countries and 4 continents from Western Europe (including Germany, England and France) to the Far East (including China, Japan and Singapore) and Australia. There are 92 parties in this project, which are licensed International Carriers and have signed the Construction and Maintenance Agreement. The use of Wavelength Division Multiplexing provides an unprecedented connectivity between the various landing points. The backbone is equipped with two fiber pairs operated at 8 times 2.5 Gbit/s. The two wavelengths have been further upgraded to 10Gbps.

SMW-4 with a total length of 20,000 km is the fourth project in the SMW series. It has 16 landing points in 16 countries, linking South East Asia to Europe via the Indian Sub-continent and Middle East with Terminal Stations in Singapore, Malaysia, Thailand, Bangladesh, India, Sri Lanka, Pakistan, United Arab Emirates, Saudi Arabia, Egypt, Italy, Tunisia, Algeria and France.

Pak UAE Submarine Coaxial Cable System

This is an analogue cable around 1,178 Km long linking Karachi and Fujairah (UAE).

FLAG [Fiber Optic Link around the Globe]

FLAG offers an alternate physical optical fiber route out of Pakistan for Internet access and point-to-point international corporate data networks.

Satellite Connectivity

PTCL is a signatory to the INTELSAT and INMARSAT satellite consortia that allows it to use their capacity to establish direct connections with telecommunication carriers around the world. As of June 30, 2004, PTCL has access to a total capacity of 7,278 channels connected to the International Gateway Exchanges (IGEs).

ISSUES HIGHLIGHTED BY THE INDUSTRY

The industry has been approaching PTA for quite some time requesting the Authority to regulate the bandwidth tariffs. They have been emphasizing that the tariffs charged by PTCL are abnormally high and thus do not give them any competitive advantage in the International Market. Moreover, some investors have also contested that the current tariff structure is discouraging them to make investment in Pakistan as it is cheaper to acquire

these facilities from other Asian countries. The issues highlighted by the industry have been summarized as under:

- a. Bandwidth tariffs are un-regulated. They should be regulated by PTA to remove tariff anomalies and bring them down to a reasonable range comparable to other countries in the region.
- b. PTCL's IPLC tariffs in the region are not competitive. The tariffs offered by PTCL to ISPs for higher capacities are several times higher than similar and advanced countries i.e. it is offering USD 3,950, whereas South Korea and Japan are offering USD 2,462 for the same capacity.
- c. Similarly PTCL is offering IP tariff at USD 2,000 whereas the same is available at USD 650 in Philippines.
- d. The multiples for higher capacities offered by PTCL are inconsistent with the international standards (as shown in Table 8 & 9) and thus result in competitive disadvantage.
- e. Tariffs charged by PTCL for domestic leased circuits are also not competitive as compared to other countries. The same is illustrated in Table 6.
- f. Although PTCL's tariff for E-1 capacity is relatively lower, however, for DS-3 and STM-1 capacities the tariffs are much higher when compared with regional countries. The comparison can be viewed in Table 9.
- g. The charges of IP & IPLC, which serve as the backbone of a call center, are exorbitant in comparison to other countries such as Philippines, Argentina and India. (See Table 11)
- h. *For* managed bandwidth via Flag Telecom, PTCL is charging USD 10,000 per E1 for destination of USA (full circuit) whereas in India, the ceilings for half circuit rates for the same capacity, irrespective of any cable system is fixed at USD 2,462.

COMPETITION IN THE INTERNATIONAL BANDWIDTH SEGMENT

Effective competition has not yet emerged in the bandwidth business segment. At present, PTCL is the only provider of bandwidth in Pakistan, and is likely to maintain its dominance in the market for the next few years.

Monopoly of PTCL

PTCL has a market monopoly over the provision of international and domestic leased lines. Over the years, PTCL has been reducing the leased line charges and the following table gives a glimpse of reductions since 1998.

Table 4
Reduction in IPLC Tariff
(2 MB Half Circuit charges)

Date of tariff review	Bandwidth charges (USD)	Reduction (%)
01-07-1998	56,333	-
01-07-1999	47,883	15%
01-01-2000	32,325	32%
01-05-2001	20,000	38%
01-09-2000	15,000	25%
24-12-2001	9,900	34%
June 2002	6,000	39%
June 2003	5,400	10%
2004 to date	3,950	27%

Although the prices of IPLC have significantly reduced worldwide, the benefit of reduction has not been passed on to the operators, which has necessitated regulatory intervention.

New Entrants

Transworld Associates (a joint venture of Saif Group and Orascom) is in the process of laying submarine cable for international connectivity to Pakistan that will be operational in July 2006. This would lead to increase in availability of bandwidth and would result in increasing competition in the bandwidth segment.

Need for Regulation

PTA has generally observed forbearance regarding regulation of IPLC tariffs keeping in view the other sectoral priorities. It has also been observed that during the past few years, there has been major decline in the cost of building submarine cables. In the Trans-Atlantic region, the STM1 prices decreased by 70% in 2,000, 65% in 2001, 26% each in 2002 and 2003 and 25% in 2004. In the Trans-Pacific region, the price of STM-1 fell by 56% in 2003

and 40% in 2002. In the Europe-Asia region, the STM1 dropped by 42% in 2003. The STM-1 prices in Asian region dropped by 50-60% in 2003. Keeping in view the worldwide trends of tariffs, PTA has decided to review IPLC tariffs of PTCL in order to bring them in line with the international benchmarks.

In this regard, several countries were analyzed in order to examine regulation regarding IPLC. Different countries have adopted different approaches concerning regulation of IPLC. The countries which are considered competitive regulated IPLC tariffs through Price-Cap / ceilings. For example in Singapore, their dominant operator Singtel is required to submit its IPLC tariffs for approval. The IDA (regulator) on April 12, 2005 exempted Singtel from the requirement of filing tariffs for IP transit and Satellite IPLC. However, Singtel was retained as dominant operator in the backhaul and terrestrial international private leased circuits markets. IDA assessed that while competition is developing in the IPLC market, Singtel still controlled the essential infrastructure and inputs for these services. Similarly, in Taiwan & Vietnam, the regulator / ministry is regulating IPLC tariffs in the form of price ceilings.

Disparity

The Authority has received several submissions by the users that the bandwidth capacity provided by PTCL is extremely high priced. In their representation, they have stated that while the price for E-1 link is higher than international norms, this differential increases significantly for higher capacities i.e. DS-3 and STM-1. Moreover the international bandwidth prices have significantly declined and similarly tariffs in several countries across the region have also decreased substantially. However the benefit of reduction in international bandwidth cost has not been passed on to the users by PTCL. Thus the industry has requested the Authority to intervene and regulate the international bandwidth prices of PTCL.

COMPARISON AND ANALYSIS OF IPLC & IP

IPLC

PTCL is offering IPLC services to ISPs, Call Centers, and other operators. The tariffs are recapitulated below:

Table 5
IPLC Tariffs offered through SMW-3 & SMW-4

Capacity	ISPs and Others	Call Centers
E1 (2Mbps)	3,950	3,500
DS3 (45 Mbps)	67,150	57,150
STM1 (155 Mbps)	184,950	-

Fig in USD

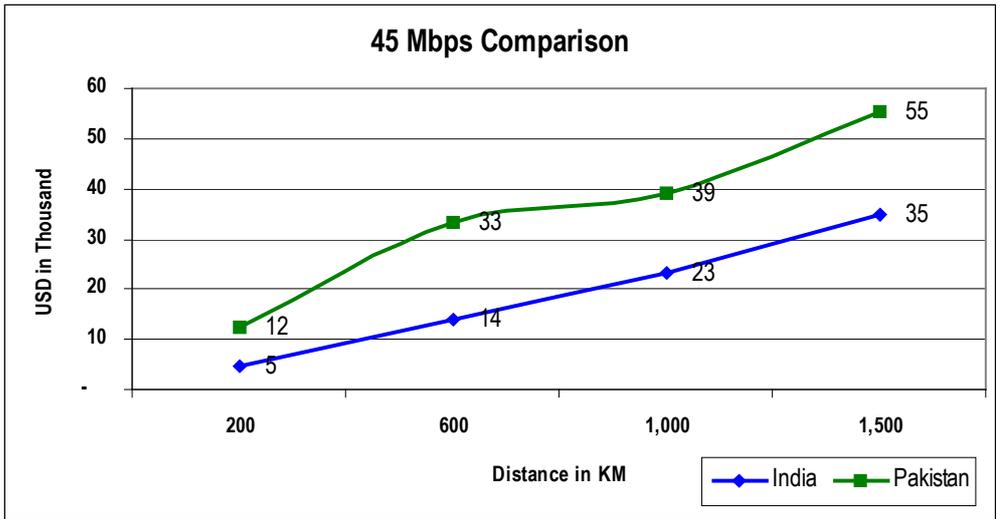
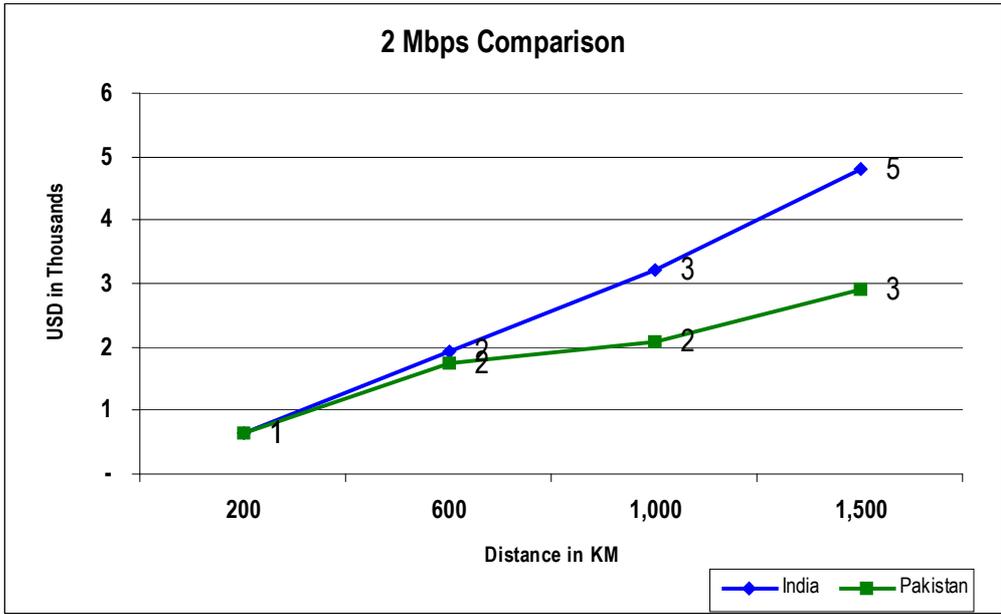
As evident from the above table, PTCL is offering discount to call centers for E-1 & DS-3 capacity. However, the tariffs for higher capacities are same for all operators. The multiple of price for E1:DS3: STM1 turns out to be “1:14:47” which is substantially higher than international benchmarks.

The above-mentioned tariffs are inclusive of domestic leg charges for the destined area/city. However, if, any operator decides to connect its service from that exchange onward to any other point within the same city or another, it has to pay leased line charges (local leg) depending upon the distance /capacity.

The industry has submitted that in addition to IPLC, the domestic leased line charges for higher capacities are also overpriced when compared with India.

Comparison of Domestic Leased Circuit Charges with India

Following graphs show the comparison of domestic leased circuit tariffs between India and Pakistan. Analysis of DPLC tariffs depicts that Pakistan’s tariffs are more competitive for lower capacities such as 2 and 8 Mbps. But as we move on to higher capacities, the situation is vice versa (For higher capacities tariffs of Pakistan are almost 2.5 times higher than that of India).



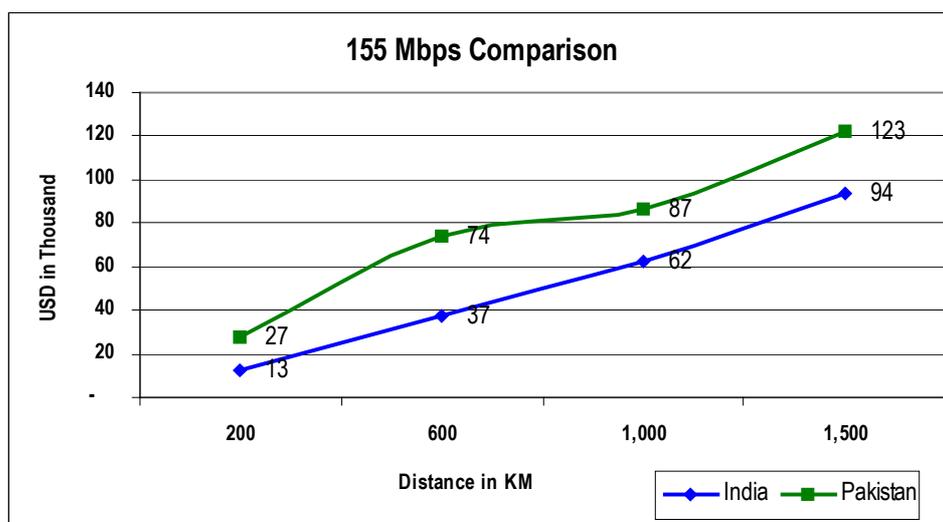


Table 6
Comparison of DPLC Tariffs

Fig in USD

Distance	Country	KM	KM	KM	KM
		0 - 200	0 - 600	600 - 1,000	1,500 (Above 1000)
2 Mbps	India	652	1,928	3,213	4,820
	Pakistan	648	1,753	2,067	2,917
8 Mbps	India	2,281	6,748	11,246	16,870
	Pakistan	2,333	6,312	7,440	10,500
34 Mbps	India	4,171	12,339	20,565	30,847
	Pakistan	7,777	21,040	24,800	35,000
45 Mbps	India	4,783	13,970	23,283	34,924
	Pakistan	12,313	33,313	39,267	55,417
155 Mbps	India	12,826	37,471	62,451	93,676
	Pakistan	27,218	73,640	86,800	122,500

Internet Protocol (IP)

PTCL is also offering IP bandwidth to ISPs and DNOPs. The IP bandwidth is shared among multiple operators. Due to high charges of IPLC, ISPs are forced to use for IP bandwidth. The tariffs for the same are summarized below:

Table 7
IP Tariffs offered

Fig in USD

Capacity	Prices for ISPs/DNOPs/Call Centers
E1 (2Mbps)	2,000
DS3 (45 Mbps)	61,913
STM1 (155 Mbps)	123,826

For cities other than Karachi, Lahore and Islamabad, the Local Media charges are also applicable ranging from Rs. 2,333 to Rs 58,800 (depending upon the distance and capacities). Although, PTCL has waived the charges up to 2 Mbps in these three cities, it acts as a barrier for operators who intend to acquire higher capacities for enhancing their network.

PTCL announced different IP bandwidth tariffs for LL/LDI operators for provision of data services and the same were contested by them. Upon intervention of the Authority, PTCL agreed that under the ambit of broadband policy, the tariffs for internet bandwidth available to ISPs shall also be applicable to local loop operators for providing ISP/data related services and the same was implemented.

IPLC & IP bandwidth Tariffs for Voice Services

PTCL is offering following IPLC and IP bandwidth tariffs to LL/LDI operators:

Table 8

Fig in USD

Capacity	IPLC (Voice Services)	IP tariff for LL/LDI (Voice Services)		
		KHI	LHR	ISB
E1	2,852	3,500	9,373	10,842
DS3	-	42,000	114,743	132,929
STM1	-	133,000	387,602	451,252

Due to segmentation of bandwidth in terms of voice and data, many anomalies exist in PTCL’s bandwidth tariff structure. Incase of E-1 capacity, PTCL is offering IPLC bandwidth at USD 2,852 to LL and LDI operators for voice services, whereas for data services, the ISPs and call centers are paying USD 3,950 and 3,500 respectively.

It has also been observed worldwide that IP bandwidth tariffs tend to be lower than IPLC but in case of Pakistan, PTCL is charging higher tariffs for IP bandwidth (See Table 11). In addition to the above-mentioned IP bandwidth tariffs, last mile charges ranging from Rs. 2,333 to Rs.58,800 (depending on the distance and capacity) are also applicable.

Comparison of IPLC Tariffs with regional countries

As indicated in the foregoing paras, in the absence of cost, the fixed-line tariff regulation empowers the Authority to use benchmarks while fixing ceiling of IPLC. The Authority is

in the process of awarding consultancy on cost based fixed and mobile interconnection charges, whereby the consultant would also determine cost of domestic as well as international private leased circuit. Until the determination of cost, it becomes imperative upon PTA to gather tariffs of similar countries for fixation of IPLC tariffs.

Another justification for comparing IPLC tariff with similar or advanced countries is that these countries are offering competitive tariffs in order to grasp more market share for business process outsourcing and information technology services.

Table 9

Fig in USD

Capacity	Pakistan	India	Japan	China	Hong Kong	Malaysia	Singapore	South Korea
E-1	3,950	2,462	1,916	2,300	2,000	1,408	2,750	1,196
DS-3	67,150	20,000	8,333	11,500	10,000	16,469	14,166	8,333
STM-1	184,950	56,666	16,666	27,416	25,000	40,737	25,000	16,666
Ratio	1:17:47	1:8:23	1:4:8	1:5:12	1:5:11	1:12:29	1:5:11	1:4:8

As evident from the above table, Pakistan's IPLC tariffs are not only much higher than other countries but are also exorbitant for higher capacities. The cost of DS-3 and STM1 in Pakistan is 3 times higher than India and around 4.5 times higher than Malaysia. In China, although all the three operators are government owned, the IPLC tariffs are fixed by the government and are very competitive. In Malaysia, the incumbent operator (Telecom Malaysia) is offering restorable and non-restorable IPLC via eight different routes. The tariffs of these routes are also lower than those of Pakistan.

Analysis of global multiples reveals that the price differential of E1 to DS3 ranges between 4-7 times, and that of E1 to STM is between 8-17 times. This is illustrated in the following Table.

Table 10

	E1:DS3:STM1
High	1:7:17
Low	1:4:8

Source: Telegeography

However, price differential of different capacities in Pakistan is 1:17:47, which is not in line with the benchmark. On the contrary Japan & South Korea are offering 1:4:8 while Malaysia has a differential of 1:12:29. Keeping in view the internationally prevalent tariff

level and structure, it becomes imperative that the IP/IPLC tariffs of PTCL should be rationalized in order to bring the price differential in accordance with the rest of the world.

Comparison of IP Tariffs with regional countries

Analysis of PTCL’s IP tariff with regional countries reveals that for E-1 capacity, all the regional countries are offering IP tariffs below USD 1000 whereas PTCL is charging USD 2,000. The tariffs of IP bandwidth are tabulated as under:

Table 11

Fig in USD

IP Tariffs	Pakistan	Philippines	India	Argentina
E1	2,000	650	900	700

Similarly, the price differential charged by PTCL prior to the issuance of the Broadband Policy for E-1: DS-3: STM-1 was 1:16:31 but despite reduction in IP bandwidth tariffs, the differential for E1 to STM1 increased by 7 times as shown in the table given below:

Table 12

Fig in USD

Capacity	Before Policy	Present Scenario
E-1	3,950	2,000
DS-3	61,913	31,348
STM-1	123,826	76,000
	1:16:31	1:16:38

INTERNATIONAL SCENARIO

Case Studies

India

In India, the international long distance segment was liberalized in 2002. In 2005, Telecom Regulatory Authority of India (TRAI) initiated consultation on Domestic as well as International Leased Circuits. TRAI reduced the prices of domestic leased circuits for DS-3 and STM1 by 67% and 70% respectively. Regarding international private leased circuits, TRAI observed that only VSNL (the incumbent operator) had landing station facilities in Mumbai, Cochin and Chennai. The other two operators Bharti Info Tel and Reliance Infocomm were in the process of establishing cable landing facilities. Based on cost methodology submitted by VSNL and on the basis of benchmarking, TRAI has substantially reduced IPLC tariffs. It is pertinent to mention that the IPLC tariffs would be applicable to all kinds of services i.e. voice as well as data.

Japan & South Korea

In Japan, the dominant operator was required to take prior approval of their tariffs and the ministry was regulating IPLC tariffs in the form of price ceilings. In April 2004, all the regulations were abolished as the DPLC and IPLC markets were considered competitive. Independent International report on broadband has revealed that Japan, Taiwan and South Korea markets are the most competitive in the Asian region whereas the Indonesia and Malaysia are least competitive markets. In South Korea alone, there are 14 broadband service providers. The following table presents the number of bandwidth providers in different locations:

Table 13

Location	Number of Bandwidth Providers
London	33
USA-NY	32
Germany	32
France	24
Pakistan	1

Singapore

In Singapore, the IDA has published the Code of Practice for Competition through which a dominant licensee is required to take prior approval of tariffs. Singtel an incumbent operator has been declared as dominant operator in Singapore and has regularly filed tariffs with IDA

for approval. In April 12, 2005, the IDA partially exempted Singtel from dominant license obligations for provision of International IP transit, Leased Satellite Bandwidth, Satellite IPLC and VSAT. For these services, Singtel was no longer required to file tariffs and was given the flexibility in packaging and bundling different services. In IDA's opinion, the above-mentioned markets were fully competitive and Singtel did not have the significant market power to impede competition. However, for terrestrial IPLC and backhaul, singtel was still required to file its tariffs for prior approval.

Hong Kong

In April 2001, OFTA (Office of the Telecommunications Authority) imposed ceilings on dominant operators. Reach was declared the dominant operator in international private leased circuit. However, in March 2002, OFTA declared that Reach was no longer dominant and removed the price ceilings.

CONCLUSION

Based on the analyses, following conclusions are drawn:

- i. PTCL is differentiating its bandwidth tariffs among different business segments, which needs to be reviewed and corrected.
- ii. The tariff structure (voice & data) and different multiples of PTCL's international bandwidth are inconsistent with international norms.
- iii. PTCL IPLC tariffs for data services offered to ISPs and DNOPs are twice as compared to IP bandwidth.
- iv. The telecommunication market has been fully liberalized since 2002. However, the gestation period for completing backbone infrastructure project is relatively high, therefore, it will take some time for broadband penetration to increase.
- v. Lack of competition and high international bandwidth tariffs are holding back consumers and other businesses from fulfilling their communication needs, including the optimum utilization of broadband services.

Recent Steps taken by Authority:

Keeping in view the importance of the issue, PTA has decided to regulate IPLC /IP tariffs. In this regard, PTCL has been directed to review and rationalize its international bandwidth

prices, remove the distortions and submit a comprehensive proposal for all categories of international bandwidth rates.

This consultation paper is an additional step in order to involve the industry in rationalizing IPLC/IP tariffs. The Authority will take certain decisions to improve the situation based on stakeholders feedback, PTCL's tariff proposal and international benchmarks. If PTCL's tariff proposal and feedback from all stakeholders is either not received or is not helpful enough in improving the broadband situation in Pakistan, PTA will issue a determination on in accordance with the relevant provisions of the Act, Policy, Rules and Regulations.

Table 1
DPLC Charges for LL/LDIs

Fig in Rs.

Capacity	0-100KM If exceeds 25 Km	0-200KM If exceeds 100 Km	0-600KM If exceeds 200 Km	0->600KM If exceeds 600 Km
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Managed Bandwidth Tariff for ISPs offered through FLAG

Destinations: London, Paris, New York and Hong Kong	
Speed	Charges per Month USD
E-1	8,910
DS-3	98,010
STM-1	196,603

Countries	Monthly Price USD		
	E-1	DS-3	STM-1
Tokyo	10,710	117,810	235,620
Seoul	10,710	117,810	235,620
Taiwan	10,710	117,810	235,620
San Francisco	11,700	128,700	257,400
Singapore	11,610	127,710	255,420
Rest of Europe	9,810	107,910	215,820

Table 3
Managed Bandwidth Tariff for Call Centers

Speed	Monthly Charges for E1 (USD)
London, Paris, New York and Hong Kong	6,500
Los Angeles & San Francisco	10,000

Table 4
Reduction in IPLC Tariff
 (2 MB Half Circuit charges)

Date of tariff review	Bandwidth charges (US\$)	Reduction (%)
01-07-1998	56,333	-
01-07-1999	47,883	15%
01-01-2000	32,325	32%
01-05-2001	20,000	38%
01-09-2000	15,000	25%
24-12-2001	9,900	34%
June 2002	6,000	39%
June 2003	5,400	10%
2004 to date	3,950	27%

Table 5
IPLC Tariffs offered through SMW-3 & SMW-4

Fig in USD

Capacity	ISPs and Others	Call Centers
E1 (2Mbps)	3,950	3,500
DS3 (45 Mbps)	67,150	57,150
STM1 (155 Mbps)	184,950	-

Table 6
Comparison of DPLC Tariffs

Fig in USD

Distance	Country	KM	KM	KM	KM
		0 - 200	0 - 600	600 - 1,000	1,500 (Above 1000)
2 Mbps	India	652	1,928	3,213	4,820
	Pakistan	648	1,753	2,067	2,917
8 Mbps	India	2,281	6,748	11,246	16,870
	Pakistan	2,333	6,312	7,440	10,500
34 Mbps	India	4,171	12,339	20,565	30,847
	Pakistan	7,777	21,040	24,800	35,000
45 Mbps	India	4,783	13,970	23,283	34,924
	Pakistan	12,313	33,313	39,267	55,417
155 Mbps	India	12,826	37,471	62,451	93,676
	Pakistan	27,218	73,640	86,800	122,500

Table 7
Internet Protocol Tariffs

Capacity	Prices for ISPs/DNOPS/Call Centers
E1 (2Mbps)	2,000
DS3 (45 Mbps)	61,913
STM1 (155 Mbps)	123,826

Table 8
IPLC & IP Tariffs

Fig in USD

Capacity	IPLC (Voice Services)	IP tariff for LL/LDI (Voice Services)		
		KHI	LHR	ISB
E1	2,852	3,500	9,373	10,842
DS3	-	42,000	114,743	132,929
STM1	-	133,000	387,602	451,252

Table 9
Comparison of IPLC Tariffs

Fig in USD

Capacity	Pakistan	India	Japan	China	Hong Kong	Malaysia	Singapore	South Korea
E-1	3,950	2,462	1,916	2,300	2,000	1,408	2,750	1,196
DS-3	67,150	20,000	8,333	11,500	10,000	16,469	14,166	8,333
STM-1	184,950	56,666	16,666	27,416	25,000	40,737	25,000	16,666
Ratio	1:17:47	1:8:23	1:4:8	1:5:12	1:5:11	1:12:29	1:5:11	1:4:8

Table 10
Capacity Benchmarks

	E1:DS3:STM1
High	1:7:17
Low	1:4:8

Table 11

Fig in USD

IP Tariffs	Pakistan	Philippines	India	Argentina
E1	2,000	650	900	700

Table 12

Fig in USD

Capacity	Before Policy	Present Scenario
E-1	3,950	2,000
DS-3	61,913	31,348
STM-1	123,826	76,000
	1:16:31	1:16:38

Table 13

Location	Number of Bandwidth Providers
London	33
USA-NY	32
Germany	32
France	24
Pakistan	1