

Peru:

IP Telephony and the Internet

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1 Introduction

An advertisement appearing in *Caretas* magazine and offering reduced tariffs for long-distance national and international calls using “APLIO” equipment resulted in the entity responsible, the Red Científica Peruana (RCP) (literally: Peruvian scientific network), receiving a notification from OSIPTEL, the Peruvian regulatory body, informing it that it had been officially reported to OSIPTEL for offering long-distance national and international telephone service without having the necessary authorization. The complaint was made by the principal telecommunication operator Telefónica del Perú (TdP), which hitherto had been the sole operator for local and long-distance fixed telephony. TdP argued that RCP’s provision of such services without having a long-distance licence from the Ministry of Transport and Communications constituted unfair competition to TdP’s detriment.

“APLIO” is an apparatus that facilitates the transmission of telephone calls via the Internet, using the Internet Protocol (IP) suite.¹ While both the calling and called parties must have a telephone line and active Internet connection, a computer is not necessary. Rather, APLIO allows the caller to use an ordinary telephone. The telephone is plugged into the APLIO device, which itself is plugged into a standard telephone jack. Thus, any telephone subscriber who also has Internet access can make long distance and international calls via IP telephony. At the time of the complaint, however, RCP was only authorized to provide value-added services, Internet access being one of them. It had no legal authorization to offer long-distance or international telephone service.

Several months after the complaint was made, OSIPTEL issued a ruling stating that no licence was required for marketing the APLIO device, and that RCP, like other bodies marketing the same equipment, was not contravening any regulations or the terms of any existing licences by doing so. In addition, marketing the equipment could not be deemed to be equivalent to providing the long-distance telephone service.

At this time, the subject of IP telephony was the focus of heated discussions in various forms outside telecommunication circles. A pronouncement from a state body, in this case OSIPTEL, was necessary since even limited awareness of this new service was giving rise to all sorts of comments. Some opinions emphasized the tariff advantages for the user, who would now have a much cheaper alternative to traditional long-distance telephony. Others discussed the subject of quality in voice transmission and the possibility of putting switched telephony in its place, while others ventured to discuss the legality or otherwise of offering such a service in Peru.

Even though the ruling issued by OSIPTEL in the APLIO case gave an early hint of the direction which state policy might follow on the matter of IP telephony in the future, TdP successfully pursued a legal strategy to nullify its effect. This prevented the establishment of a legal precedent on the matter. Regrettably, therefore, the various opinions about IP telephony are still circulating a year later, and there is no expectation of an explicit, formal pronouncement from any telecommunication authority in the near future.

In spite of this, the situation has changed somewhat since the time the complaint was made, in that there are now numerous other companies offering voice over IP (VoIP) services, or planning to do so soon.² A large group of those firms are new licence holders for long-distance or local telephony. Thus, although the subject has not been defined in legal terms, the companies have opted to play it safe by obtaining licences to provide the service. The emergence of many new licensees, especially for long-distance telephony, has been made possible by the Ministry of Transport and Communications’ sensible policy of granting licences since the full liberalization started in August 1998. Under the new license policy adopted since then, practically any applicant can obtain a long-distance licence without incurring substantial monetary or transaction costs.

TdP’s monopoly in local and long distance telephony ended officially in August 1998. However a set of TdP’s dilatory practices have effectively delayed the beginning of the operation of new local and long-

¹<http://www.aplio.com/>>. See also section 5, and Box 4 below .

² In this paper, it is important to differentiate between the VoIP service and voice by Internet. The first term is general and refers to voice transmission using the IP protocol and the second term refers to voice transmission using the IP protocol but via the Internet. The main difference is that in the first case, transmission can be performed in a private network (to provide public or private services), where it is possible to ensure the quality of transmission, while when the Internet is used, it is not generally possible to guarantee transmission because there may be congestion generated outside the sphere of operation of interlinked companies

distance carriers. For instance, the first new long distance carrier began operation more than a year after liberalisation of the market. Local exchange carriers are still delaying their network deployment until the interconnection charge for local termination/operation is lowered from its current rate of 2.9 US cents a minute. As of May 2000, OSIPTEL, which has stated that it will issue an interconnection mandate, will set the new rate for local interconnection.

The subject of IP telephony relates closely to other aspects of the Peruvian telecommunication market. For this reason, a more detailed analysis of IP telephony in Peru is required, including the accelerated development of telecommunications in recent years, the appearance of new players in the market – Internet service providers (ISPs), new long-distance competitors, etc. – legal aspects, and the regulatory framework. Appendix A to this study covers more general aspects of telecommunications in Peru.

2 The Internet in Peru

As in other countries, the Internet started off in Peru as a network linking the country's scientific community (universities, research centres and non-profit organizations). The Red Científica Peruana (RCP), a non-profit organization, coordinated efforts within the academic and scientific communities, and first enabled academic Internet access services in December 1991. The government of the time granted RCP the right to use an international satellite gateway, through which it could connect with the global Internet.

Until 1994, basic telecommunication services in Peru were provided exclusively by two public companies: the Compañía Peruana de Teléfonos (CPT) and the long-distance company Entel Perú. In 1994 the two companies were privatized and merged into a single company, Telefónica del Perú S.A. (TdP). As part of its licensing package, TdP was granted exclusive rights over a set of basic services such as local telephony and leased circuits, which both happen to be key ingredients in the provision of Internet services. Exclusivity was agreed for the period 1994-1999, but, in fact, liberalization went ahead a year before the terms of that agreement expired.

During this period of exclusive rights over basic services, if any organization or firm wished to provide Internet services, they had to lease the required basic services from TdP. RCP, for example, had to lease all of its dedicated or switched lines and circuits from TdP, with the exception of access to the international gateway granted by the Government.. Other services or equipment, such as external routers and international circuits, however, were provided by RCP or sub-contracted to other companies

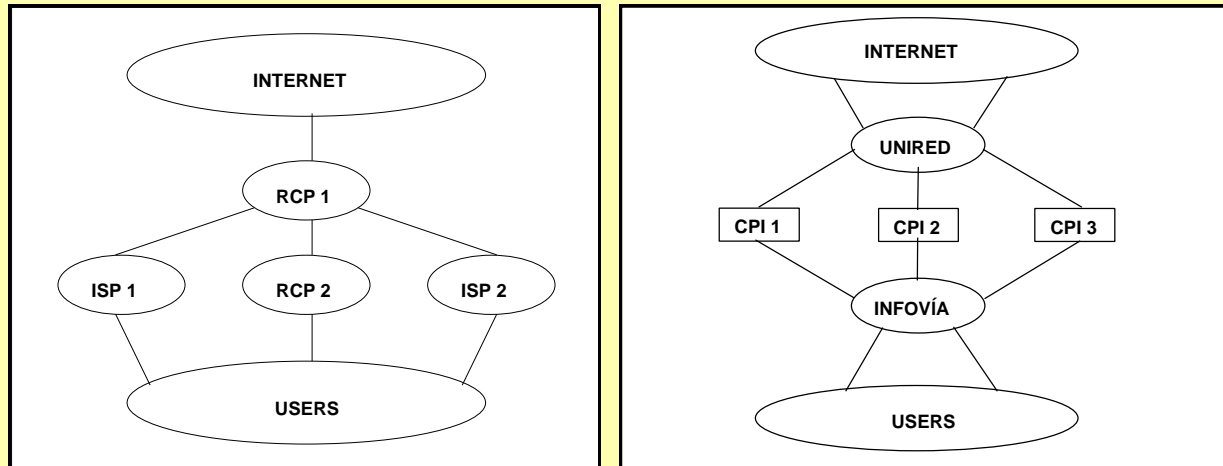
As early as 1994, RCP started selling commercial Internet services. These services are now commercialised in two ways:

- As a retailer, RCP delivers services directly to Internet subscribers.
- As a wholesaler, RCP sells Internet access to other service providers, which in turn sell Internet services to subscribers. (see figure 1)

2.1 The beginning of competition

At the outset, RCP was the only ISP in Peru. Before 1996, IBM had also begun to offer services, but chiefly to commercial clients. The high tariffs IBM charged for metered use discouraged private dial-up users from signing up. By contrast, RCP imposed a flat-rate monthly charge for unlimited access. In both cases, the user had to add on the cost of telephone line use - also charged according to time spent on the line - or the monthly rent, in the case of dedicated (leased) lines.

In 1996, TdP decided to enter the field of Internet service provision. Its licensing agreements enabled TdP to convert itself into a fully integrated telecommunication operator, without any restriction relating to share ownership or lines of business. The only competitive safeguards imposed were accounting separation, in addition to general regulations concerning the legal framework, and the licensing agreements themselves, in which it was laid down that competition should be fair and non-discriminatory.

Figure 1: Packaging the Internet

Business strategies of Telefónica del Perú (TdP) and Red Científica Peruana (RCP).

CPI refers to an ISP that markets TdP's Internet services (called Centro Proveedor de Información or "CPI").

The commercial name given by TdP to its dedicated access service was Unired. The feature of this service was to provide Internet access solely via dedicated lines and to have, in common with RCP as a wholesale provider (RCP1 in Figure 1), a long-distance international connection or gateway to the Internet. TdP did not directly enter the dial-up market, but rather encouraged the entry of a large number of companies which subsequently marketed TdP services. To this end, TdP launched its wholesale service, named "InfoVía," through which it leased the necessary infrastructure to smaller firms in exchange for predefined payments.

InfoVía is a national data network based on frame relay technology. All of its points of presence (POPs) are interconnected so that users can exchange information with any other user. In addition, each POP has a bank of modems enabling it to receive telephone calls originating from any telephone subscriber in the country. Any subscriber who has a computer and free software provided by TdP can access InfoVía by dialling the abbreviated code 155. Users of InfoVía do not need to subscribe to an ISP that markets TdP's Internet services (called Centro Proveedor de Información or "CPI"), or any other ISP, to have access to InfoVía. This national presence enables InfoVía to offer access to the network for the price of a local call from anywhere in Peru. However, a user of InfoVía can also access the global Internet through subscription to a CPI of TdP, which provides Internet access in exchange for a subscription payment and monthly fixed payments.

Firms that wish to have a presence on InfoVía, including those that want to provide Internet access to final users, must be connected to the network by leasing a circuit (dedicated or frame relay) which links the firm with an InfoVía POP and by paying the tariffs for the InfoVía service itself (see Table 1). This allows users to have access to the information offered by these firms, always for the price of a local call, from any point in the country. Hence, the firms that sign up for the InfoVía service can offer connectivity to their users without needing to set up a national network or having to acquire modems to receive calls from their users, because all of the InfoVía infrastructure is provided by TdP. This is particularly important for smaller firms which, instead of making major investments to establish a national network, can lease facilities from InfoVía and offer their Internet service like any other ISP.

Charges for the InfoVía service are based on the bandwidth of each firm's link to the InfoVía network, and maximum tariffs have been laid down by OSIPTEL (Table 1).

Thus, TdP opted for a different commercial set-up from that of RCP. While RCP provides just the Internet connectivity – and each ISP must have its own infrastructure to serve its users – TdP provides infrastructure and information services in an Intranet of associated CPIs.

Table 1: Tariffs for InfoVía services

Transmission speed	Monthly tariff (US\$)
64 Kbps	990
128 Kbps	1 570
256 Kbps	2 045
512 Kbps	2 655
1024 Kbps	3 450
2048 Kbps	4 485

Source: Telefónica del Perú

However, the increased competition engendered by the emergence of many TdP CPIs resulted in a significant reduction in retail Internet access tariffs. Average tariffs of CPIs were US\$ 13 per month, with substantial variations among them, ranging from US\$ 10 to US\$ 18 per month. This forced RCP to reduce its tariffs to US\$ 19 per month from the US\$ 35 to US\$ 40 which it was charging two years previously. Faced with the impossibility of continuing to reduce its tariffs, and with the lower tariffs offered by the CPIs, RCP decided also to offer access to the Internet as a CPI, that is, through both the Unired network, as well as TdP's InfoVía. As a CPI, RCP could offer tariffs that were competitive with those of other CPIs belonging to TdP, and at the same time continue to offer the other services which it provided previously.

The introduction of competition into the Peruvian Internet market has been accompanied by a series of administrative and judicial disputes between operators. For example, the entry of TdP into the Internet market was marked by anti-competitive behaviour towards RCP. Because TdP controlled the "essential resources" of dedicated telephone lines and circuits for the provision of Internet services in the country, thereby occupying a dominant position, which led to TdP being accused of acting in a discriminatory manner towards competitors.³

The first legal action involving operators was initiated by RCP in February 1996, and this was handled by the dispute settlement service of the regulatory body OSIPTEL. From this time on, a series of other administrative and judicial disputes arose between telecommunication operators and Internet service providers (Table 2).⁴

2.2 Impact of opening up telecommunications via the Internet

As previously stated, TdP's licensing agreements gave it exclusive rights over basic services for a five-year period (1994-1999). However, an agreement between the State and TdP made it possible to conclude the exclusivity period a year before the planned expiry date. Hence the telecommunication sector became liberalized as regards the granting of licences for offering long-distance and fixed telephone services in 1998. As at January 2000, a total of 28 companies had been licensed to offer long-distance services, while in the case of fixed local telephony, two licences have been granted in addition to the rights held by TdP.

Competition in local services can generate the maximum positive impact for the further development of Internet services. The fact that users have to pay per-minute telephone charges, in addition to ISP charges, currently constitutes a significant barrier to Internet use.⁵ The local carrier service, through which circuit leasing is offered, was always open to competition, but it was only recently with the opening-up of the

³ For a detailed analysis, see Briceño, Arturo, "Regulating anticompetitive behaviour in the Internet market: an applied imputation model for Peru", in Sharon Gillet and Ingo Vogelsang, eds., *Competition, regulation and convergence: current trends in telecommunications policy research*, (1999), Lawrence Erlbaum Assocs., Mahwah, NJ, USA.

⁴ During the dispute over APLIO, RCP accused TdP of using certain activities to drive it from the market. This supposed hostility originated from the time when RCP acquired a licence to offer long-distance services. RCP denounced untimely failures in many of the circuits that it leases for periods of various hours. In addition, TdP had allegedly been suspending the PRI ISDN line service which RCP was using to terminate long-distance calls in the TdP network. RCP proved that from the time that RCP had a licence, it was authorized to terminate such calls but that TdP was blocking its services in order to avoid the entry of competitors into the market.

⁵ As at January 2000, the local telephone tariff was US\$ 0.027 per minute of use.

market in August 1998 that the market became more dynamic. At the time of liberalization, three companies in addition to TdP held licences to offer local carrier services, (which included rights to provide local telephony services and bearer services such as dedicated circuits), but only TdP was operating in the market. The opening up of the other services to competition had an indirect impact on the local carrier service market, as borne out by the fact that seven additional companies have applied for licences for this market. This is due to the fact that many firms, which have applied for a long-distance carrier service licence, have also requested a licence for local carrier services. Any increase in the number of companies holding the rights to offer leased circuits can only have a positive impact on the Internet providers, since competition should result in lower leased line prices, which will enable them to reduce operating costs.⁶

A number of operators have also emerged with a regional concentration in Latin America and in business markets. For example, the company FirstCom, now a subsidiary of AT&T in Latin America, has begun long-distance operations and Internet access services – for the time being only via dedicated lines - and it plans in the short term to enter the local service sphere, for which it already holds a licence. It has a fibre optic network operating with ATM transmission in Lima and has its own international gateway. FirstCom's target market is principally business clients.⁷

The appearance of FirstCom as a provider of Internet services and of dedicated lines resulted in strong competition in this segment of the market. FirstCom's presence had a noticeably dynamic effect on competition in prices for Internet services. In the first few months of 1999, tariffs for dedicated Internet access fell by an average of 30 per cent, forcing TdP to reduce the Unired tariffs in order to compete and stay in the market (Table 3). Tariffs relating to the installation of dedicated circuits also fell by as much as 50 per cent and discounts of between 5 and 15 per cent were applied, depending on the amounts of monthly bills. A few months after its arrival on the scene, FirstCom succeeded in capturing about 50 major firms in the country, many of which were drawn away from TdP or RCP.⁸

3 Market profile

The estimated number of internet users in mid-1996, (dial-up and dedicated) has been put at around 30'000, while by the end of 1999, this figure was around 500'000 – close to a 15 fold increase in less than three-and-a-half years. Internet user penetration grew from 0.1 per cent to 1.9 per cent during the same period (Figure 2).⁹

As regards the number of companies in the Internet market, it is interesting to observe that owing to favourable market conditions, the situation has changed from a duopoly, existing until July 1996, to as many as 54 ISPs two years later (Table 4 and Box 1). The services provided by these ISPs have generated a rapid expansion in Internet traffic, which grew by nearly 80 per cent during 1998/99. This meant that the share of Internet traffic in all local switched traffic rose from 5 per cent in 1998 to 9 per cent in 1999.

⁶ Although there were four companies at the time of liberalization of the market with the capacity to offer the circuit-leasing service, there was no sign of any real competition between the firms, with TdP being the main one. This was borne out in November 1998 when OSIPTEL rejected TdP's request to end regulation in the local carrier service. At that time OSIPTEL held the view that there was no "healthy competition" in this service, an argument that was used by TdP for requesting deregulation of the service.

⁷ Boosting the effective growth in competition, BellSouth announced that it would start supplying Internet access services, probably via dedicated lines and via its cable television network, in the first six months of 2000.

⁸ Before the arrival of FirstCom, the company Tele 2000 (now BellSouth of Peru) was operating as a provider of dedicated and switched (dial-up) circuits. However, it was only recently, with the arrival of FirstCom, that real competition in the circuit-leasing service and in dedicated Internet access began to take shape.

⁹ The figures for dial-up users correspond to information supplied by the leading firms involved in the business. In the case of dedicated users, the number of users corresponds to estimates supplied by the same firms. It should be emphasized that it is very difficult to estimate the number of users who have access to public Internet centres since there is no need to be registered to use the latter. No official estimates of Internet market share are available. However, RCP is still considered to be a major presence with almost half the market. In October 1999, the general manager of RCP told a leading American business magazine that "RCP controls 56% of the market. The rest is shared between TdP and IBM" (in *Business Week*, 25 October 1999).

Table 2: A network of disputes*Principal administrative and judicial proceedings relating to the Internet market in Peru, 1996-1999*

Start date	Plaintiff	Defendant	Grounds	Outcome
February 1996	Red Científica Peruana	Telefónica del Perú	Various (alleged) abuses of dominant position in market and discriminatory treatment. ¹⁰	The complaint was deemed well-founded, with TdP being required to (a) fulfil outstanding obligations and (b) cease the perceived discriminatory treatment. TdP was fined the maximum amount. It appealed against the ruling, which was upheld at second instance. TdP then appealed to the judicial authority. The outcome is still pending.
August 1996	Telefónica del Perú	Red Científica Peruana	Alleged acts of unfair competition in form of public defamation campaign.	The complaint was deemed to be well-founded in part. RCP was fined US\$ 25 000. It appealed against the first-instance ruling, which was upheld at second instance.
March 1998	P.C. Company S.A. (*)	Telefónica del Perú	Alleged abuses of dominant position	It was combined with the dispute opened in October 1998 and both were examined together.
October 1998	P.C. Company S.A.	Telefónica del Perú	Alleged non-compliance with standards of fair competition	In June 1999, P.C. Company abandoned the action, thereby terminating the dispute.
November 1998	P.C. Company S.A.	Telefónica del Perú	Alleged charges for services not supplied and at higher tariffs than the maximum approved by OSIPTEL	The complaint was declared unfounded, thereby terminating the dispute.
February 1999	P.C. Company S.A.	Telefónica del Perú	Alleged abuse of dominant position in the form of discriminatory treatment	The action was terminated owing to the fact that P.C. Company did not refute an exception claimed by TdP within the time limit.
March 1999	Telefónica del Perú	Red Científica Peruana	Alleged provision of long-distance services without licence using APLIO equipment.	Complaint was declared null and void at first instance, with the finding that RCP activities did not require a licence. TdP appealed against the ruling but subsequently abandoned the action.
September 1999	Red Científica Peruana	Telefónica del Perú	Seeking injunction to make TdP refrain from improperly interrupting the service involving circuits leased to RCP.	The dispute came to a head in December 1999 when RCP failed to present all the documents needed for imposing the injunction. RCP claimed to have abandoned the proceedings to avoid wrecking the negotiations for interconnection between TdP and RCP.

(*) P.C. Company S.A. is TdP's CPI.

Source: OSIPTEL

¹⁰ Grounds for the legal action initiated by RCP include the following: (*) Alleged non-provision by TdP of a 2 Mbps dedicated line between RCP sites in Miraflores and Monterrico for more than a year, as well as constant and intermittent faults. (*) Alleged failure by TdP to meet RCP's request for connection to Venezuela with a 256 Kbps channel via Panamsat, the property of a Venezuelan entity, requested by letter dated 15 December 1995. (*) Alleged failure by TdP to meet RCP's request for connection to Chile with a 256 Kbps channel via Panamsat, the property of a Chilean entity. (*) Failure to meet request for increasing speed from 128 to 256 Kbps in the international circuit to the United States taken out with TdP. (*) Alleged failure to meet requests for connection to Lima from various institutions and universities throughout the country grouped in 14 provincial consortia. (*) It is alleged, in many cases, that TdP offers more favourable conditions to those consortia. (*) Alleged unnecessary withdrawal and non-provision of all capacity under equal conditions with services provided by TdP. (*) Apparent use by TdP of confidential information to confuse, misinform, mislead and misrepresent, in order to divert competitors' clients, i.e. RCP clients. (*) 30 dedicated lines allegedly awaiting installation, but agreements on this impossible owing to failure to meet RCP requests. (*) Prices allegedly bundled and/or distorted and/or involving dumping with the clear suspicion of cross-subsidization in some cases. (*) Alleged failure by TdP to perform fibre optic installation requested more than a year before complaint was lodged. (*) Alleged delaying tactics by TdP to obstruct installation of Internet access. (*) Alleged failure by TdP to install frame relay connection requested by RCP two months before complaint was lodged. (*) Alleged failure by TdP to solve problems of basic telephony and access hunting by users.

Table 3: The irresistible virtues of competition

Monthly rent for dedicated Internet access before and after the opening up of the telecommunication market in August 1998

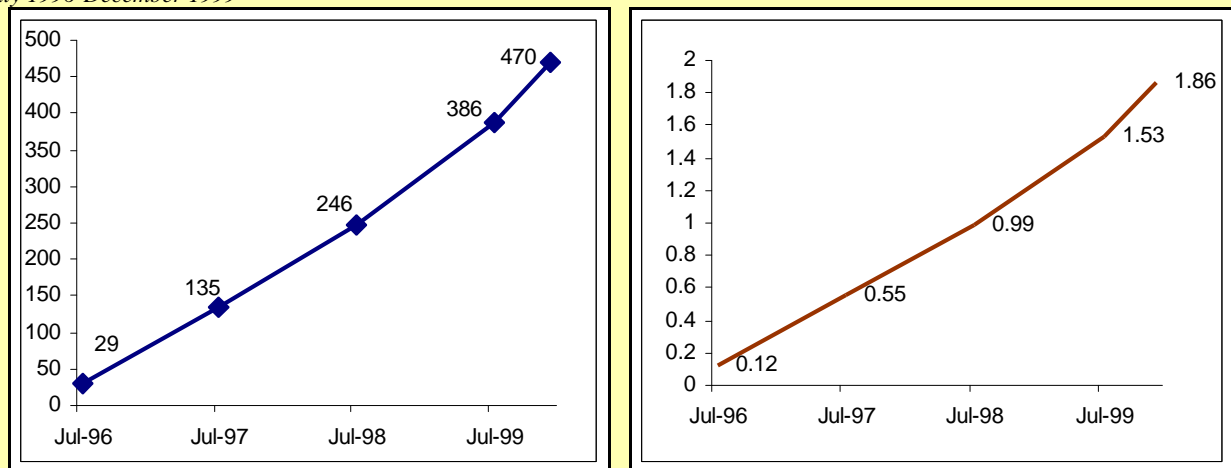
Speed of circuit	TdP: Unired (1) Before FirstCom	TdP: Unired After FirstCom	Variation % (2)/(1)	FirstCom
64 Kbps	650	455	-30%	450
128 Kbps	1040	728	-30%	720
256 Kbps	1665	1166	-30%	1150
512 Kbps	2665	1866	-30%	1840
1024 Kbps	4260	2982	-30%	2950
2048 Kbps	6815	4771	-30%	4720

(1) Tariffs charged before the entry of FirstCom, equivalent to the maximum approved by OSIPTEL

Source: Telefónica del Perú and FirstCom

Figure 2: The growth explosion

Evolution in the estimated number of users and proportion of Internet users relative to the total population
July 1996-December 1999



Source: Telefónica del Perú, OSIPTEL

As mentioned above, the first ISP to start operating in Peru was RCP. RCP currently has an average of between 9'000 and 10'000 users. It offers its services via three different tariff plans: "Gold," "Silver," and "Copper." The Gold and Silver plans cost US\$ 25 and US\$ 19 per month respectively. The Copper plan costs US\$ 10 per month and just allows Internet access via InfoVía, while in the other cases access is via RCP's own line hunting. The main difference between these services lies in the speed of end-user access, with a maximum downstream speed of up to 56 Kbps possible under the Gold and Silver schemes, while the maximum downstream speed for the Copper scheme is 33.6 Kbps, owing to the fact that this is the maximum permissible speed for InfoVía. RCP also offers dedicated Internet access at US\$ 310 for 64 Kbps access, while 128 Kbps costs US\$ 540 per month.¹¹

¹¹ In the case of dedicated Internet access, it is necessary to sign up separately for a dedicated circuit with a company that has a licence to offer this service.

Box 1: Cultivating the ISPs

Principal factors in the rapid growth in the number of CPIs (ISPs) in Peru since 1996

The rapid growth in the number of ISPs since the second half of 1996 was based on at least four major factors:

First, TdP's active policy to enter the Internet market, both dedicated and dial-up. TdP encouraged the setting up of ISPs, known as "information provider centres" (CPIs), which could not only be pure Internet service providers catering for end users but also content providers in the InfoVía network.

Second, the TdP CPIs were able to provide their dial-up users with an Internet access service at a local-call tariff, irrespective of the point of access in the country, via the abbreviated dialling code 155, and this facilitated the emergence of CPIs in various places in the country. In addition, all the CPIs followed the same price scheme, fixed by TdP.

The third important element was the first significant reduction in leased circuit tariffs, which occurred in December 1996 on the initiative of OSIPTEL. The average reduction ranged from 19 to 35 per cent. For example, the monthly tariff for a 2 Mbps local digital circuit fell from US\$ 1 950 to US\$ 1 268. It was thus possible to reduce the high circuit tariffs prevalent until then.

The fourth factor was the growth in telephone penetration which accompanied the TdP tariff rebalancing programme. Established in the TdP licensing agreements, this made provision for specific rates for basic telephony services, including the installation tariff. In real values or in US dollars, the telephone network installation or connection tariff started at a high level, far above its actual cost, and gradually decreased towards the end of the fifth year of rebalancing. From the operator's viewpoint, it was more advantageous to add a new subscriber to the telephone network as early as possible since it would thus gain a greater revenue per connection, and this implied an additional incentive for TdP to expand telephone penetration rapidly at the start of the rebalancing programme.

Table 4: A market showing constant growth

Indicators for Peruvian market in telephone access to the Internet, December 1999

		InfoVía traffic ('000 minutes)	Variation	Dial-up users	Dedicated users	Total	Variation	Number of ISPs
1998	I	68528		48200	160000	208200		54
	II	91280	33%	66500	180000	246500	18%	54
1999	III	120288	32%	83400	201700	285100	16%	42
	IV	139804	16%	83600	218000	301600	6%	37
	I	144998	4%	92000	255200	347200	15%	42
	II	175850	21%	99000	287000	386000	11%	42
	III	203469	16%	108000	317000	425000	10%	46
	IV	225463	11%	120000	380000	500000	18%	56

Source: OSIPTEL

The first company to enter the Internet market as a CPI (using InfoVía and Unired) was Cosapidata, which was operating until early 1997 as a specialist provider of hardware, software and network solutions for companies. The dial-up access tariff of this company was US\$ 13 per month, which has been falling since then to an average of US\$ 5 per month under a one-year contract. These tariff reductions enabled it to capture clients rapidly, achieving a total of around 10 000 users in the second half of 1999, thus becoming, together with RCP, the largest Internet provider in Peru. It should be pointed out that Cosapidata only offered dial-up access to the Internet, not dedicated access. In general, hardly any CPI offered access via dedicated lines.

Since July 1998, the number of ISPs has been falling owing to a consolidation of the industry in the hands of TdP via the bigger CPIs affiliated to it (Box 2). Nevertheless, in the last quarter of the year growth has been apparent in the number of companies authorized to provide this service.

Box 2: Terra Networks, Terra Nostra*International telephony strategy in the Internet markets*

The strategy followed by Terra Networks with regard to the Peruvian Internet market can be better understood by analysing the strategy devised by its parent company, Telefónica de España. The latter's Internet access services were launched at virtually the same time in all countries where the company has a major presence: Spain, Chile, Argentina, Peru, and recently Brazil.

Since 1998 Telefónica de España made fresh moves to boost its Internet presence in Latin America, using two complementary strategies: gaining an adequate Internet market share in each country by the purchase of other major ISPs; and consolidating international business in Latin America into a single new company: Terra Networks.

Hence, during 1998, Telefónica de España bought three major ISPs in Argentina and incorporated them into the main ISP business of Telefónica de Argentina. At around the same time, it purchased a major share in two leading ISPs in Brazil and a main gateway called Zaz. In July 1999, it bought the ISP Infosel in Mexico. In September 1999, Telefónica bought the Internet business of CTC in Chile, in addition to two ISPs in Argentina, and then purchased TdP's Internet business in Guatemala which converts them into InfoVía de Guatemala. All these acquisitions were to be used in the creation of a multinational company called Terra Networks, which would control all Telefónica de España Internet business in Latin America.

The purchase of the domestic Internet business from TdP by Telefónica de España was preceded by a separate consolidation of CPIs. During September 1999, the CPI Telefónica Servicios Internet (a subsidiary of TdP) acquired the client portfolios of various other CPIs at an average cost of US\$ 58 per user. A total of 58 000 users were acquired by this means, thereby making Telefónica Servicios Internet the market leader, reaching 120 000 dial-up users to date. Then, on 29 October, 1999, TdP approved the purchase of shares in Terra Networks S.A., worth some US\$ 30 million. Following the acquisition of the portfolios of various CPIs, TdP transferred all those users to Terra Networks S.A., under an exclusivity contract giving the latter the operating rights and the rights to develop the Internet domestic customer segment. The most significant outcome of this agreement is that Terra Networks can only use TdP telecommunications services. The dynamism and variety of Terra Networks' activities ought to result in an increase in local traffic for TdP. Dial-up Internet access calls have been to date the principal source of revenue for TdP in Internet related business.

TdP bought 2.6 million of shares of Terra, equivalent to a share of 0.83 per cent in the total capital of Terra.¹² On 28 January 2000, the value of TdP's stock in Terra was US\$ 229 million at market prices.¹³ With this deal, TdP consolidated its strategy of not participating as a direct provider of Internet access services in the domestic segment, but continuing to specialize in the business and corporate segment, while Terra takes care of the dial-up market.

The plans of Terra Networks Perú are also said to include stimulating the public Internet centre market. Terra is negotiating with the operators of various existing public Internet centre services to assist them in their functioning. At the same time it is planning to set up new public centres with the aim of expanding Internet access. It is already operating 25 public centres, and any new centres would be run by third parties.

The traditional form of Internet access requires a computer, a telephone line and software. However, in Peru, the number of people having the first two items is very low. At the end of 1998, the penetration of the basic fixed telephone service was less than seven lines per 100 inhabitants. And in 1997, only 20.1 per cent of urban households had a computer. Consequently, the potential number of dial-up Internet users is very low. (Table 5)

¹² This option was also used by Telefónica de Chile (CTC), which is understood to own 1.1 per cent of the firm (US\$ 40 million) and also sold in a similar way the administration of its domestic Internet clients to Terra.

¹³ TdP Quarterly Report, October-December 1999. See <<http://www.tp.com.pe>>.

Table 5: Partially Isolated

Percentage of households with various communication services, Peru 1997, and percentage of households in metropolitan Lima with various communication services, 1993-1999

Service	Percentage of households
Telephone	67.40 %
PC	20.10%
Fax	8.60%
Cable TV	8.30%
Cellular telephone	6.5%
Internet	3.30%

Service	1993	1999
Television	89%	95%
Radio	90%	90%
Telephone	17%	51%
Cable TV	2%	18%
PC	5%	11%
Internet	0%	4%

Source: INEI, National household survey, 2nd quarter 1997 and market support and opinion, socio-economic levels in metropolitan Lima, July 1999

On the other hand, the total cost in 1999 for the various items required for Internet access (numbered 1 to 5 below) was far above the average income of the vast majority of the population.

1. Computer (US\$ 1'000-2'000: single payment)
2. Telephone line (US\$ 150: single payment)
3. Internet provider (US\$ 5 per month)
4. Monthly telephone rental (irrespective of use) (US\$ 16 per month)
5. Telephone calls (US\$ 0.027 per minute).

Per capita GDP in Peru for 1999 was US\$ 2 676.¹⁴ With the aim of removing some of these limitations of infrastructure and cost, RCP developed the public Internet centre project, through which users are provided with computers and relatively cheap Internet access. This initiative has partially removed the limitation whereby it was necessary to own a PC and telephone line to be able to access the Internet (Box 3).

On the other hand, in its 1998 guidelines for opening up the market, the Government laid down a substantial increase in Internet access as an objective for 2003. By means of the projects of the telecommunication investment fund (FITEL), it is hoped to issue a call for tenders in 2000 so that the private sector can take responsibility for providing Internet service in over 2000 rural localities.¹⁵

The difference in the cost of Internet access from a public centre compared with individual dial-up access explains the great boom in the former. It is estimated that 70 per cent of total Internet users gain access via public centres while the remaining 30 per cent log on using a dial-up line or from their place of work. Most of the latter have leased circuits.

The advent of new technologies is another way in which Internet access costs can be reduced or different tariff systems created. TdP, for example, already offers the Internet service via the cable TV network (Web TV – WorldGate) at a flat rate of US\$ 30 per month. In addition, this company announced the implementation of ADSL technology, which would also have a flat-rate tariff irrespective of use.

The WorldGate service offered by TdP may be a good alternative for users without computers to access the Internet, since only a TV set is required. Even though it is not possible to access all Internet services using a TV, it may be an alternative for avoiding the initial cost of gaining access to the network. Regrettably, this service, costing US\$ 35 per month, is only available if it is subscribed to together with the cable TV service. Thus, users would have to pay a total of US\$ 65 per month to make use of the Internet, which may mean that many users decide against it, especially if they are only interested in the Internet access and not in the cable TV service.

¹⁴ Since privatisation, reductions have occurred in relation to items 2, 3 and 5 above, while item 4 has seen significant increases. Thus, the main obstacle to access is the cost of the computer, while users still consider that telephone costs are too high, since Internet use necessitates prolonged use of a telephone line.

¹⁵ All public telecommunication service companies (except the value-added ones) must contribute 1 per cent of their gross revenue to FITEL. The aim is to bring those telecommunication services to rural areas, where it would not be economically viable for the private sector to make the corresponding investments.

4 IP telephony in Peru

4.1 Private VoIP networks

The development of private VoIP networks in Peru has basically been spearheaded by large private companies, such as banking institutions, industries or firms involved in natural resource extraction with multiple points of presence in the country, such as mining and oil companies, etc. The construction of private communication networks took place chiefly to reduce costs, the only other alternative being to use public networks, which were still under a monopoly until 1998, as is the case with local fixed telephony.

Currently many companies such as Banco Continental, Banco Latino and Banco Interbank use voice over frame relay internally to supply voice and data services between their regional offices. The migration to an IP platform is said to be recent, largely because, at the time voice over frame relay was chosen, IP technology had not yet gained the full confidence of these companies.¹⁶

Box 3: Public and cheap

General outlines of the RCP public Internet centre initiative

It is estimated that a total of 580 public Internet centres are currently operating in Peru, most of them in Lima. RCP directly runs about 30 and has helped other companies with the setting up of another 470. Each of them has a variable number of computers, between 10 and 20 per centre. The centres are generally connected to the Internet through a dedicated line of a fixed bandwidth, which is shared among all the computers.

The tariff for use of a public centre depends on its location, the quality of services on offer and the distance from other centres, but the average is around US\$ 1 per hour of use. By contrast, a dial-up subscriber to an ISP has to pay around US\$ 1.65 per hour for telephone use alone. To this it would be necessary to add the Internet access charges imposed by the provider.

In 1999, RCP became the first company in Peru to export the public Internet centre model to other countries. This multinational expansion occurred after the World Bank declared the public Internet centre model established in Peru to be “the most viable for developing countries”. In 1999, RCP initiated the project for the installation and management of 100 public centres nationwide in El Salvador. Other countries are understood to have requested the establishment of the public centre model following the Peruvian format – namely, Colombia, Uruguay, Togo and Mauritania.

As regards universal access, a telecommunication investment fund (FITEL) is evaluating pilot projects to bring Internet access to places of preferential social interest. RCP has submitted a project to the Fund in which it would provide the IP voice service via public centres, in addition to access to the Internet network.

Although the guidelines for funding these projects have not yet been fully laid down, aspects under consideration include the following:

- The obligation to train potential users of the service;
- The obligation to create and maintain content of interest to inhabitants of the area;
- The obligation to provide institutions and authorities in the area with e-mail accounts.
- With the aim of meeting these requirements, some companies interested in the pilot projects have announced that their centres might have the following features: touch screen, voice-activated, and equipped with software for translation from Quechua into Spanish, and *vice versa*.

¹⁶ For example, the Banco Latino decided to integrate its voice and data networks into a single platform at the end of 1997. The platform used was frame relay because the IP platforms had still not been fully tested for this company. See the report of Pyramid Research, “Voice-over-packet services and technology in Latin America”, *Database Qualitative Review*, 1st Quarter, 1999.

4.2 Public VoIP networks

There are basically three means of providing the VoIP service: between two computers, between a computer and a telephone, and between two telephones. The simplest case is communication between two users who, using a computer and an Internet connection, use software which enables them to transmit voice across the public Internet. The most widespread example is the NetMeeting software, which is supplied free of charge by Microsoft, bundled with its Windows operating system. Callers are not usually charged for using the service, as it is simply an application facilitated by the Internet. Users incur costs for the use of the telephone line (to connect with their ISPs) and for ISP charges, but they do not pay separate charges for the transmission of their voices over the Internet. Thus two users in different parts of the world can enjoy long-distance communication at minimal cost.

Internet telephony and VoIP services are being offered by some of the country's leading telecommunication operators, ISPs and new commercial entities. A brief description of the main players is given below.

Telefónica del Perú: This is the dominant telecommunication company and the top company in terms of revenue in the country. It has total vertical integration of its operations. Since 1996/97, it has been implementing an IP network in Peru, in the same way as the other subsidiaries of Telefónica de España have been doing elsewhere. Various sources say that TdP is already using an IP network for routing part of its long-distance and international traffic to other countries in the region.¹⁹

FirstCom: This is a company with North American and Latin American (mainly Chilean) capital which began commercial operations in Peru in 1999. It also has operations in other Latin American countries (Chile, Brazil, Colombia). It constitutes what is known in other countries as a competitive provider of basic telecommunication services and its target clientele is business users. In early 2000, it concluded a strategic merger with AT&T, creating the company AT&T Latin America. The new company plans to compete in the Peruvian telecommunication market for long-distance (national and international) services, fixed telephony, wireless services and Internet access.

Investments proposed by FirstCom in Peru total US\$ 200 million, and to date US\$ 70 million has been invested in the fibre optic network and in network support equipment. In June 1999, its infrastructure consisted of a 760 km fibre optic ring in Lima and Callao, 25 131 km of fibre installed, 22 ATM nodes, 140 buildings wired, one long-distance exchange and one teleport.²⁰ Its basic transmission platform is ATM with IP overlaid. The company offers integrated services for the high-speed transmission of voice, data and video (including LAN interconnection, frame relay, access to remote terminals and dedicated Internet channels). It commenced long-distance operations in November 1999 and also supplies dedicated Internet access. In June 1999, it had 147 clients with dedicated Internet access. This year it plans to enter the local service segment, for which it already holds a licence.

BellSouth Perú, S.A.: This is the second mobile service operator in the country after TdP. In 1999, it also obtained licences for long-distance and local services. In the short term, it is understood to have plans to provide Internet access via dedicated lines and eventually via cable TV.

¹⁷ All public telecommunication service companies (except the value-added ones) must contribute 1 per cent of their gross revenue to FITEC. The aim is to bring those telecommunication services to rural areas, where it would not be economically viable for the private sector to make the corresponding investments.

¹⁸ For example, the Banco Latino decided to integrate its voice and data networks into a single platform at the end of 1997. The platform used was frame relay because the IP platforms had still not been fully tested for this company. See the report of Pyramid Research, "Voice-over-packet services and technology in Latin America", *Database Qualitative Review*, 1st Quarter, 1999.

¹⁹ No official data are available to confirm this. However, at least the following aspects suggest that some level of international traffic is being transmitted over IP to reduce costs. First, Globus, in Chile, a subsidiary of CTC, launched voice and fax services over IP to certain countries in April 1999. The experiment appears to have had mixed results, but the feasibility was proven of offering such services through IP networks. Second, TdP is said to have contracted with Lucent for the implementation of its IP network. Third, a number of publications specializing in telecommunication subjects mention that 4 per cent of international traffic carried by conventional telephony operators is carried over the Internet as a way of cutting costs in comparison with traditional switched telephony. (See "To VoIP or not to VoIP" in *Latincom*, 22 April 1999).

²⁰ FirstCom Corporation, Quarterly Report. See <<http://biz.yahoo.com/e/990816/fclx.html>>

Currently, it offers dedicated services, the public telephone service and cellular telephony. BellSouth acquired most of the shares of the cable company Tele2000, but it withdrew from the cable TV service offered by the latter, a service marketed as TeleCable. At present TeleCable is still operating but BellSouth states that it has only withdrawn from the cable TV service provision, not from the coaxial cable network covering the whole of Lima. Through this extended network it should be able to provide Internet access, telephony, data transmission and other services. This would explain the obtaining of licences for long-distance and local services in 1999 and, it is already offering a long-distance international service to its mobile phone customers. In the short term, it is said to be planning to provide Internet access via dedicated services and eventually via the cable TV network. Although its plans for using IP (apart from the Internet) are not yet known, it is possible that this will be used for voice transmission when it enters the local telephony market.

Red Científica Peruana: As stated above, RCP started to provide Internet access services from the beginning of the last decade. In 1999, total revenue was believed to have exceeded US\$ 6 million, which constituted an increase of around 40 per cent over the previous year. During the same year, RCP acquired licences for the provision of long-distance and local services. At the end of the same year, RCP formed a partnership with a United States investment fund, Westphere, in order to develop its investments as a telecommunication operator. It announced an investment plan of between US\$ 50 million and 60 million in the next two years, with RCP providing 52 per cent of the funding. The aim of the new company, called Red Uno Corporation, is to provide not only Internet services but also to bring together others such as long-distance telephony and television.²¹

Initially it will provide long-distance national and international IP telephony, initially through prepaid cards. The commercial name of this service will be “Tarjeta Rojo y Blanco” (red and white card) and tariffs will be 40 to 50 per cent less than those of TdP for long-distance international calls. It is hoped that the product will be launched on the market during March 2000.

RCP plans to continue with the development of public Internet centres by installing an additional 400 public centres in the country. Likewise, it will start a new project for the implementation of a network of several “mono-centres” for access to integrated Internet and VoIP services. A “mono-centre” is a multimedia centre open to drop-in users giving access to the full range of media: TV, radio, Internet and telephony. The project also envisages the development of a major information network supporting urban management in commercial circles, sharing and backing up State administrative management. Covering the 23 departments of the country, the project will be implemented in the next three years, it will have its own satellite network and will require investment of US\$ 12 million.²²

Net2Phone: This is one of the world leaders in Internet telephony, its market being retail end users. Net2Phone Perú has been operating in the country since September 1999. Gateways have been installed in Peru for connections with the public telephone network, and this will make it possible to originate and terminate telephone calls via the Internet.

Table 6 below shows tariffs for long-distance international calls between Peru and the United States of America via two methods: from PC to telephone and from phone to phone. In the first case, the tariff per minute for a call from Peru to the United States is US\$ 0.15 via Net2Phone, which is quite attractive compared with the TdP tariff of US\$ 0.66. It should be emphasized that the settlement rate (which is the equivalent of half the international accounting rate) that TdP has to pay to the United States carriers is currently US\$ 0.31 per minute. This indicates that the settlement rate that Net2Phone Perú pays to Net2Phone USA must be much less than the rate paid by TdP, probably somewhat less than the peak tariff. A call from the United States to Lima has a tariff of US\$ 0.21 per minute, while if the call is to a city outside the department of Lima, it has a significantly higher tariff (Table 6).

An interesting aspect to note is that with the Net2Phone tariffs, it is cheaper to call the USA from Peru than *vice versa*, unlike with traditional international telephony tariffs. For example, it was mentioned that

²¹ The Westphere fund plans to invest US\$ 400 million in two years in various Latin American countries, including Peru, with the aim of developing public centres.

²² Plans are also said to have been made to supply broadband Internet access (up to 45 Mb) using the satellite link.

currently the TdP tariff for a call to the USA is US\$ 0.66 per minute, which has fallen considerably from much higher levels owing to the rebalancing programme and ultimately to liberalization of the sector. Traditionally tariffs from the USA to Peru have always been lower than from Peru to the USA.

Net2Phone's phone-to-phone method is only available for calls from the USA to Peru and tariffs are between 50 and 60 per cent greater than those for the computer-to-phone method.

Net2Phone announced publicly that it does not have a licence or a value-added authorization to provide this service, since, in its view, the Telecommunication Act allows this service to be offered without any kind of authorization or licence. Accordingly, the company has also said that it has received communications stating that, to offer the long-distance service, it would require a licence and it has announced publicly its decision to take legal action against any legal or natural person, whether in the public or private sector, who imposes any kind of limitation on the service which it is offering, and has also mentioned the possibility of taking the matter to the international courts.

When considering the question of demand, it should be emphasized that the Net2Phone service has been one of the most widespread among Internet users. In the first half of 1999, there were many complaints, some of which were aired in the press, that clients using TdP's Internet service were unable to count on access to Net2Phone's services from one day to the next.

It was argued that the Net2Phone equipment was at fault, unable to cope with such high levels of demand. However, in a counter claim, RCP published a complaint claiming that TdP had been blocking access to IP numbers identifying the Net2Phone servers, so that Internet users could not route calls via the Internet and were obliged to use TdP's services.

RCP argued that, according to its tests, access to Net2Phone was possible when the Internet was accessed other than through TdP. But it should be borne in mind that TdP (via Unired) is the dominant Internet service operator, providing even RCP with access. This was the reason why RCP lodged an official complaint against this situation, since many of its users were unable to make use of Net2Phone when the route to the Internet was via Unired.

Nevertheless, Net2Phone was not the only case where allegations arose of apparent blockages by TdP to prevent long-distance communications using this method. In addition, some users who had acquired APLIO appliances also began to have problems with using them. Some CPIs (Internet providers which use only TdP services: Unired and InfoVía) had begun to sell APLIO equipment, just like RCP and other firms. Nevertheless, none of these CPIs was denounced by TdP for offering long-distance services as had been the case with RCP. After a time, the CPIs that had marketed APLIO equipment stopped promoting them and subsequently stopped selling them.

Some users complained publicly that they had acquired this equipment from a CPI but that it had stopped working after a time. These users mentioned that when they complained to the CPI where they acquired the APLIO equipment, they were informed that the equipment only worked if an Internet service other than the Unired service was used.

Table 6: Other voice routes

Net2Phone tariffs for calls between Peru and the United States of America, February 2000, in US\$ cents per minute.

Origin of call	Destination of call	Net2Phone tariff	Time of day
a. PC-to-phone			
Peru	USA	15 (*)	Peak (7am-7pm)
		10 (*)	Off-peak (7pm-7am)
USA	Peru (Lima)	21 (**)	Any time
	Peru (outside Lima)	30 (**)	Any time
b. Phone-to-phone			
USA	Peru (Lima)	31 (**)	Any time
	Peru (outside Lima)	49 (**)	Any time

(*) Minimum prepayment of US\$ 25. (**) Minimum purchase US\$ 5.95

Source: Net2Phone Perú S.A.

Despite these complaints, the existence of blockages in access to the services of Net2Phone or of APLIO could not be proven, owing to the fact that such blockages subsequently began gradually to disappear without any pattern being found, nor was it possible to prove that they were caused by anyone in particular. At present, no further complaints have come to light regarding the alleged blockages in the use of Net2Phone. Even so, it resulted in RCP promoting its Internet service as being free of blockages and offering the unlimited possibility of using Net2Phone or similar services.

Cosapidata: This is the TdP CPI with the largest number of clients, but it is also engaged in offering integrated telecommunication solutions to major corporations. These solutions include implementation of internal company networks for voice and data transmission, using frame relay technology in some cases and IP in others. The companies using these internal networks for voice and data transmission include AFP Horizonte, AFP Profuturo, Cía de Petróleos Shell, Grupo Daewoo and AFP Integra.

IBM: Like Cosapidata, IBM not only acts as an ISP but also creates internal networks to interconnect various subsidiaries of companies, whether at the national or international level. The networks created allow the transmission of voice and data, mainly using IP.

Other companies: In this group of providers, there is huge variety in the size of the companies. Many have obtained long-distance carrier licences and their main business revolves around the possibilities of making profits from the international accounting rate system, which is still being used. Since the opening up of telecommunications in Peru to competition in August 1998, the Ministry of Transport and Communications has granted 30 new long-distance licences and applications from 10 to 15 more firms are in the pipeline. The objective of many of the new licence-holders is to make profits in the still lucrative business of international long-distance calls. The main business will be to obtain revenue from call termination in Peru, the traffic for which greatly exceeds outgoing international traffic by a ratio of three-to-one, i.e. three incoming minutes for each outgoing minute.

The current settlement rate (equivalent to half the accounting rate) that TdP pays or receives from generating or receiving international traffic with the United States is US\$ 0.31 per minute. Many new entrant long-distance companies have commercial agreements for the termination or origination of international traffic at significantly lower rates than those of TdP.

For example, it is known that commercial agreements exist whereby every international minute terminated in Peru receives a minimum payment of US\$ 0.06. The new long-distance licence-holders negotiate such termination agreements with external resellers. A little under two thirds of these companies are understood to charge between US\$ 0.06 and 0.15 per minute for the termination of traffic in the country, while 40 per cent of companies receive a rate of less than US\$ 0.10 (Table 7).

The termination rate is related to the costs involved in “bringing down” the international signal and terminating it in TdP’s local fixed network. In other words, a low rate, for example, would probably imply that the licensee incurs a low cost, as might be involved in terminating calls routed via the Internet. This might suggest that at least 40 per cent of companies which receive a payment of less than US\$ 0.10 per minute use IP telephony. These are the rates mainly quoted in the United States spot markets for IP telephony traffic to Peru, in which various international traffic resellers reach commercial agreements with the new entrant companies in Peru.²³ In addition to the cost represented by payment of the termination rate, a company established in Peru must add a margin to cover its other operating costs and its profit margin.²⁴

²³ Resales of IP telephony international traffic are growing. More and more companies are selling batches of international traffic in an increasingly spot-oriented market. For example, there are “middlemen” currently engaged in mediating between supply and demand for such traffic, such as Pulver, Arbinet, etc. See for example <<http://www.pulver.com>> and <<http://www.arbinet.com>>.

²⁴ For example, if the company is interconnected with TdP, it has to pay the latter an interconnection charge equivalent to US\$ 0.029 per minute.

Table 7: Diversification in termination charges

Rate variations for traffic termination in Peru (US\$ cents per minute)	Proportion of new long-distance companies
Less than 10	40%
Between 10 and 20	20%
More than 20	40%

Sources: New long-distance licence-holders and OSIPTEL

5 Legal aspects of the VoIP service

Peruvian legislation on telecommunications does not cover the Internet service specifically. To date, the Ministry of Transport and Communications has regarded it as a value-added service. This involves the addition of some feature or facility to the basic service (carrier or final services). The apparent justification for classifying the Internet under this heading is that it uses carrier and final services (telephone lines and circuits) adding an additional feature (IP connectivity).

As explicitly stated in the Telecommunication Act, all value-added services are covered by a regime of free competition, which means that OSIPTEL cannot, in principle, regulate tariffs for such services.

The specific name used by many of the Internet service providers is “packet-switched data service”. A peculiarity of the legislation is that it excludes real-time voice traffic from being classified as a value-added service. Apparently, at the time when this classification was carried out, it was already known that value-added companies might be able to carry voice traffic, but to do so in real time it would be necessary to hold a licence. As a result, discussions on the subject of VoIP have focused on whether VoIP transmission is performed in real time or not. Regrettably, the legislation does not give a satisfactory definition of what “real time” means, giving rise to a variety of opinions on the matter.

5.1 The controversial APLIO equipment

The first dispute over the provision of VoIP services in Peru arose in 1999 from legal action brought by TdP against RCP. In March 1999, TdP started proceedings against RCP for alleged “acts of unfair competition”. (Table 2) According to TdP, RCP was supplying a long-distance national and international service, for which it did not hold a licence, using so-called APLIO equipment (Box 4). The APLIO equipment is a small computer designed specifically for voice transmissions via the Internet. Accordingly, it removes the need for a PC to perform voice transmissions via the Internet.²⁵

TdP argued that offering the national and international long-distance service through the APLIO equipment without having a licence allowed RCP to obtain an illegal competitive edge over the companies which were legally authorized to provide that service.

Two things were certain: first, a licence was required to offer the long-distance service; and second, at the time of taking the legal action, RCP only had a licence to supply value-added services, including the Internet service.

The CCO (“ordinary collegiate body”) charged with settling the dispute resolved that if RCP had been supplying the long-distance service without a licence, then the competent body to resolve the dispute would be the Ministry of Transport and Communication. However, the key conclusion of the CCO was that use of APLIO did not constitute a long-distance public service because no payment had to be made for the communication service.²⁶ According to the CCO, RCP did not require a licence for marketing the APLIO

²⁵ The functioning of APLIO requires that both users have access to the Internet through an ISP. Thus, the APLIO can be conveyed from one place to another and be used whenever the user has Internet access, irrespective of which ISP is involved.

²⁶ National legislation states that public communication services, unlike private ones, are those that are supplied in exchange for payment (“economic compensation”).

equipment since its authorization for offering Internet services was sufficient for the functions it was performing.²⁷

TdP appealed against the CCO first instance ruling. According to OSIPTEL provisions regarding disputes between operators, a company has the right to appeal against the first instance ruling issued by a CCO nominated by OSIPTEL. The second administrative instance is the chairperson of OSIPTEL. However, at around the same time as the appeal, RCP received its licence for supplying long-distance services. Before the second instance issued its ruling (upholding the first instance ruling or accepting TdP's accusation), TdP dropped the proceedings and thus, in line with the administrative framework for disputes, no precedent or ruling that the first instance had issued previously was recorded. In other words, TdP avoided a virtually certain ruling against it on the subject of Internet telephony being established as a legal precedent, thereby preventing unlicensed companies from using that ruling to provide VoIP services.²⁸

5.2 Debating the legality of IP telephony

The ruling on the APLIO dispute was the first and, so far, the only formal pronouncement from a Peruvian State body on the subject of voice over the Internet. Even though it was limited purely to resolving whether the marketing of APLIO constituted offering long-distance services, it clarified certain doubts on that subject.

The fact that it could not be known *a priori* which would be the competent body to resolve the dispute (the Ministry or OSIPTEL) compounded the lack of clarity on the matter. Here, there were three different positions. The first held that the fact that Peruvian legislation made no mention of the subject of VoIP implied that there was no regulation on it and therefore these services could be offered freely. A second position argued that the VoIP service only implied the transmission of data, not voice, therefore it could not be considered to be telephony and so to offer that service it was only necessary to have an authorization for providing value-added services. According to the third viewpoint, the VoIP service was regarded as the equivalent of telephony and therefore regulations covering the field already existed. In this last case, it would be necessary to have a State licence to offer this service.

These three possible scenarios for the provision of VoIP – free access without regulation, value-added service or licensed service – hold various implications regarding the obligations faced by a company offering that service (Table 8).

The global trend is to regulate services consistently irrespective of the technology used to provide them. If this is applied to the case of Peru, it would be necessary to determine whether the VoIP service constitutes a telephone service, a value-added service or another, different service, in order to determine the appropriate extent of regulation. As can be seen from the table below, the existing regulation for value-added services is lighter than for the telephone service, which is subject to tight regulation.

²⁷ For the final first instance ruling and further material, see <<http://ekeko.rcp.net.pe/rcp/controversia/EXP-9902/index.shtml>>

²⁸ In legal terms, the dropping of the proceedings by TdP implies that the first instance ruling on the APLIO dispute has no legal validity, and so, strictly speaking, no formal pronouncement has yet been made by any authority on the subject of VoIP.

Box 4: APLIO – An innovation in equipment

APLIO is a new type of equipment with software and a modem for voice communication via the Internet. It contains a DSP (digital signal processor) which performs the following functions: (i) voice compression and decompression (according to ITU standard G.723.1 for 5.3 and 6.3 Kbps); (ii) coding and decoding into/from TCP/IP packets; and (iii) the process of Internet connection via an Internet access provider, having a modem chip for this purpose.

APLIO began to be sold in Peru for US\$ 295 each, with discounts available for bulk purchases.

As in the case of voice communication using a PC, the user must have a telephone line and an Internet access account, which can be supplied by any ISP. APLIO makes the connection, makes the call to the ISP and sends the IP addresses of the parts which will be communicated to the so-called “global management centre” to establish the Internet link. There are various methods for making a voice communication over the Internet using APLIO:

- A first minute of long-distance international telephony and the rest via a voice communication using APLIO. Prior coordination must exist between both parties via a conventional long-distance international call. When the called party answers the call, both the caller and called party press a key on the APLIO equipment which disconnects them from the international call (as if both parties had hung up) and begins the connection to the Internet access provider (at both ends of the communication). Once they are in communication, both are connected automatically to the Internet via their ISPs, after which they are connected to the APLIO “IP-number-searching server”, being able to locate via this server the IP number assigned to the number called for locating it on the Internet. When the connection of both IP numbers on the Internet is displayed, both APLIO terminals ring so that the respective users pick up their phones and continue the conversation via the Internet.
- A voice communication using APLIO mechanically (manually), the “100 per cent free mode”, as the manufacturer calls it. This second alternative makes it possible to do without the prior coordination via an international telephone call, proposing a different method for prior coordination. Both the caller and called party must perform coordination from the moment they communicate. Hence, the called party will access the Internet at the agreed moment and will connect his APLIO, putting it in “standby” mode. Once the caller is connected to the Internet, he or she will dial the unique serial number of the APLIO terminal called.
- A voice communication using APLIO automatically, in “free mode without appointment”, as the manufacturer puts it. This third alternative avoids the need for any kind of prior coordination, programming the called APLIO to connect with the Internet and go into “standby” mode only if it receives a predetermined number of ringing tones after which the calling attempt stops. The called APLIO will connect automatically to the Internet and will go into “standby” mode. After the called APLIO has connected, the calling APLIO will be able to locate it through its unique serial number after a reasonable time (approximately a couple of minutes). At present, APLIO only allows voice communication via Internet with another APLIO or from a PC to an APLIO. After the connection between the two users (called party and caller) is established, each user uses his or her APLIO for voice transmission, with voice being transformed into data since, as mentioned above, the APLIO equipment has the function of performing voice compression and IP packet coding. Packets of data are transmitted from the APLIO to the ISP, the same as for any other data packet to the ISP. The function of the ISP is to transmit the data packets to the specified IP address or number. The data packets are sent to the other end – the called party’s end – and it is only via the APLIO of the called party that the IP packets are decoded and voice decompression or transformation occurs again.

²⁹ In legal terms, the dropping of the proceedings by TdP implies that the first instance ruling on the APLIO dispute has no legal validity, and so, strictly speaking, no formal pronouncement has yet been made by any authority on the subject of VoIP.

Table 8: The advantages of being marginal*Differences in regulatory requirements for providers of long-distance and value-added basic services*

Long-distance services	Value-added services
Obligated to hold a licence	Obligated to have an authorization only
Granting a licence takes 50 days, which may be extended up to a total of 70 days.	Registration takes approximately 5 days
Obligated to make a one-off payment of 0.25 per cent of forecast initial investment	No obligation
Presentation of a technical/economic profile	No obligation
Obligated to contribute 1 per cent of gross annual revenue to FITEL	No obligation
Universal service fee. Obligated to pay 0.5 per cent of gross annual revenue for commercial operation of telecommunication services.	No obligation
Regulatory supervision fee. Obligated to pay 0.5 per cent of gross annual revenue for regulatory supervision	Obligated to pay 0.5 per cent of gross annual revenue for inspection
Obligated to have own infrastructure, in 24 months, in at least 5 cities and have at least one switching centre	No obligation to expand. Does not have to own infrastructure
May be subject to tariff regulation	No tariff regulation
Obligated to meet quality parameters	No obligation
Obligated to interconnect networks with other public service operators	Interconnection is optional, depending on whether the regulatory body requires it
Obligated to contribute towards cost of preselection system	No obligation

Source: General regulations of Telecommunication Act. Guidelines for liberalization of telecommunication market

6 Conclusion

IP telephony in Peru is in its infancy. Major providers exist with capacity to supply the service, such as TdP, FirstCom and RCP. With the last two of these, the platforms for the transmission of their services consist of integrated frame relay and IP networks, respectively.

An important feature of the development of telecommunications in the country since 1994, and which undoubtedly must affect the development of voice over IP in Peru, is the promotion of vertically integrated companies, as in the case of TdP, which enjoyed temporary monopoly conditions until 1998, or the case of FirstCom. This has often given rise to anti-competitive practices to the detriment of other more specialized, non-vertically-integrated competitors, such as RCP. A clear example of this can be seen from the events which took place after 1996, when TdP decided to enter the Internet access business; or in the alleged blocking by TdP of the use of software (e.g. Net2Phone) or hardware (e.g. APLIO) enabling the use of IP telephony in Peru.

Consequently, it is highly likely that the development of IP telephony in Peru will continue to be closely tied to the market power of the leading telecommunication operator in the country, TdP. Hence, it is the regulatory aspects, in particular anti-trust aspects – more than technological or market aspects – that will continue to dictate the terms of the agenda for the development of IP telephony in the country.

It is also to be hoped that the possible use of IP technology by firms entering the long-distance telephony market might result in a reduction in tariffs paid by users. In the face of this threat, the leading operator may speed up its migration towards this new platform.

Other localized, more appropriate work in the form of specific projects such as the FITEC projects to install public Internet access centres in rural areas, or further development of existing public centres, will doubtless help to increase the long term prospects of both the Internet and of IP telephony penetration in Peru.

The commercial activities of the operators in the market and the one-off projects to promote the Internet and its associated technologies would, however, be given a real boost if the competent national authorities issued a clear pronouncement on the national policy to be adopted with regard to this new challenge of the communication era. The situation in Peru is not unique: the majority of countries all over the globe are moving forward slowly and cautiously, trying to avoid any major mistakes in the handling of a technology which raises high hopes but also presents great challenges.

APPENDIX A

Telecommunications in Peru

The situation under the State monopoly

Until 1990, development of the telecommunication market in Peru was based on a State monopoly model. At that time, the government decided to transfer responsibility for the development of telecommunications to the private sector, maintaining only a regulatory function for itself. The planning then started for privatization of the sector, and this was put into practice in 1992.

Until 1994, the telecommunication market was practically stagnant; teledensity was 2.9 lines per 100 inhabitants; the average waiting time to obtain a telephone line was approximately nine years and connection costs were US\$ 1500 (see Table 10 below).

The two State entities – Compañía Peruana de Teléfonos (CPT) and Empresa Nacional de Telecomunicaciones (Entel) – had no investment capacity owing to chaotic business management, inappropriate tariff policy and the economic crisis in the country.

The privatization process

From June 1992, a strategy began to be devised to privatize both State entities, CPT and Entel, and this was implemented in 1994. The main aspects of this privatization strategy were as follows:

- Approval of the merger of CPT and Entel;
- Minimum investment commitments of approximately US\$ 1'000 million;
- Provision of fixed local and long-distance (national and international) telephone services under monopoly conditions for five years;
- Commitment to implement a pre-established tariff rebalancing programme;
- Granting of 20-year licence, extendable for 5-year periods.

The base price of the sale by tender was fixed at US\$ 546 million, and a significantly larger amount was actually obtained, as shown in the following table. The winning company was Telefónica del Perú (TdP), a subsidiary of Telefónica de España.

Development of the sector

The next five years showed a substantial improvement in the development of the telecommunication sector in Peru (see Table X). In August 1998, through an agreement between TdP and the Peruvian State, it was agreed to speed up liberalization of the services which would be provided exclusively by TdP – in other words, liberalization took place a year earlier than forecast. Since then, 27 licences for supplying long-distance telephone services and three licences for the fixed telephony service have been granted. In the first part of 2000, the band corresponding to the PCS service has been awarded to STET (Italy) in a public tender, which will further develop competition in the mobile sector. Another source of competition in the mobile sector is the provision of trunking services by Nextel (US), whose services are competing at some degree with cellular services.

Table 9: Relative values

Bids for the acquisition of 35 per cent of CPT and Entel Perú

Bidding consortium	Bid (in million US\$)
Telefónica del Perú	2 002
Peruvian Telecommunications Holding Limites	857
Telecomunicaciones Peruanas	803

Source: OSIPTEL

Table 10: Indicators for the telecommunication sector in Peru

	1993	1999
Average waiting time for a fixed telephone line	118 months	2 months
Fixed telephony one-time connection charge	US\$ 1 500	US\$ 150
Fixed telephone lines installed	670 400	2 007 000
Fixed telephony penetration rate (lines per 100 population)	2.70	6.50
Public telephones	8 000	55 002
Cable TV users	30 000	350 000
Internet users	-	470 000
Network digitization	33%	92%
Fibre optic	200 km	6 652 km
Localities with telephone service	1 450	3 000
Urban centres with cellular telephony	7	117
Cellular telephony lines	36 000	850 000
Penetration rate for cellular telephony (lines per 100 population)	0.15	3.33
Licences granted	16	193
Authorizations for value-added services	-	129
Employment in sector (number of persons)	13 000	34 000

Source: OSIPTEL

Public centres

Tariffs for the use of public centres vary greatly, ranging from US\$ 0.45 to US\$ 3 per hour. The differences in tariffs can be explained in various ways, but the principal factors affecting how they are fixed include the cost of dedicated lines, the location of the public centre, the services on offer, and the proximity of other centres. Each of these factors is considered below.

Cost of dedicated lines

Internet access via a dedicated line incurs a fixed monthly cost irrespective of the extent of use. Generally, it represents the highest operating cost incurred by the centres, so each centre has to evaluate the bandwidth required to meet traffic demand, as well as the number of computers needed to equip the centre.

This generates a trade-off in the pattern of the needs of each centre, since for a specified speed, average costs fall as the number of computers increases, which means that the centres can offer their users a lower price. However, surfing speed also falls for each additional computer which is connected to the dedicated line.

The quality of service offered by a public centre can be measured in terms of the ratio “speed per PC”, which measures the average surfing speed available to centre users if all the computers are being used at the same time. The following table shows the average values for this ratio for a sample of centres from various districts of Lima (sample of 20 public centres):

Table 11: Speed/PC ratio(Kbps)

Bellavista	10.67
Chorrillos	2.13
Jesús María	7.58
La Molina	4.77
La Victoria	3.20
Cercado de Lima	7.24

Source: FirstCom

As can be seen, as with the tariffs charged by the centres, the ratio varies greatly, ranging from 3.2 to 10.67 Kbps. It should be noted that this speed is the minimum available to centre users at any given time with all PCs being used simultaneously for Internet surfing. Since this situation is unlikely in practice, the surfing speed available to users is frequently greater.

Location of public centres

Another factor influencing prices charged by a public centre is location. In districts where average income of the population is low, profit margins are bound to be smaller. In other districts, tariffs are higher, mainly because users are frequently tourists who need the Internet as a means of communication. This is the case with the district of Miraflores or with centres located in commercial centres such as Jockey Plaza or Larco Mar, or the airport, where costs for using the centres are higher.

From a sample of 158 centres in Lima, Table 12 has been drawn up, showing each district's percentage share of the total number of centres covered by the sample.

An important aspect is that the highest concentration of centres is found in the districts of Miraflores and Cercado de Lima. This shows that use of the centres does not depend exclusively on the economic level of the population of the district, since the two districts show marked differences with respect to the average per capita income.

Services on offer

Many of the public centres not only offer Internet surfing but also additional services as a means of being different from other centres. Additional services on offer are photo scanning, printing, provision of personal e-mail accounts, resale of the voice service over Internet, cameras for videoconferencing, etc. Some of these services are free of charge, while others incur an additional charge.

Proximity of other centres

An important aspect for setting the tariff to charge the user is the level of existing competition. When there are other centres fairly close by, prices tend to fall or extra services such as those mentioned in the paragraph above are offered.

This may be the case with the centres located in Cercado de Lima, where, along with Miraflores, there is a high concentration of centres, but it is noteworthy that many of them are located on a single road - the Avenida Wilson - block 12 of which is a prime example, it alone having around 18 public centres with an average of 8 computers on each premises.

Table 12: Location of public centres
(percentage of total number is shown for each district)

District	Category (*)	Percentage share
Miraflores	A	13%
Cercado de Lima	B	13%
Lince	M	8%
Surco	A	8%
La Molina	A	7%
Pueblo Libre	M	6%
Jesús María	M	5%
Rímac	B	5%
San Isidro	A	5%
Los Olivos	B	4%
San Borja	A	4%
San Martín de Porres	B	4%
San Miguel	M	4%
Ate Vitarte	M	3%
Others		11%

(*) A = High income, M = Medium income, B = Low income

Source: RCP