

The Terminating Traffic Dispute

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Introduction

Chairman Jorge Garcia, a telecommunications regulatory commissioner in the country of Pendet, had served as a commissioner for one year. Although he and his two fellow commissioners were not the first commissioners for the Telecommunications Commission of Pendet (TCP), they had spent most of the past year getting the commission on its feet -- hiring and training staff, meeting with legislators and ministry officials, meeting with industry and customer representatives, meeting with the press, and setting up office procedures. Today promised to be a day that would test how well they had done building the TCP's expertise, credibility, and independence.

At 8:00 am, Chairman Garcia was already reviewing the briefing materials on the case the TCP was to address at 2:00 pm today. On its face, the case was a technical issue: How should two competing telephone companies compensate each other for the calls that they exchanged through their interconnection arrangement? The companies -- the incumbent, Pendet Communications Corporation (PCC), and an entrant, Future Teleco (FT) -- have an interim interconnection agreement that had specified that there would be no payments from each company to the other. This arrangement is known as "bill and keep" or "sender keeps all", in which each company bills retail customers, and keeps all resulting revenues. However, the agreement did not define which types of traffic were considered "interconnection" nor how the traffic was to be measured. FT believed that it should be compensated for calls from PCC's

customers to Internet Service Providers (ISPs) that were connected to FT's network. PCC believed that these were not really telephone calls and so should not be part of an interconnection agreement.

Now that PCC and FT were disagreement on this issue, other weaknesses of the agreement were becoming evident. The agreement had no process for changing the sender-keeps-all arrangement. FT had responded by withholding other payments it owed to PCC, but PCC then disconnected the interconnection circuits between the two companies. FT quickly resumed making payments to PCC and PCC reconnected the circuits, but the payment problem showed how FT viewed the interconnection agreement part of a larger business arrangement between the two companies while PCC viewed the interconnection agreement as separate and distinct from everything else. PCC said that it would not complain if FT disconnected the interconnection circuits because of PCC's refusal to pay, but FT knew that, without interconnection, its business would be destroyed.

As Chairman Garcia read the details of the disagreement, he listed the decisions he and his fellow commissioners had to make that day. Fortunately, they did not have to make a final decision on the dispute, although they could if they wanted to. The dispute had been brought to the TCP only a few days ago and there was a lot about the dispute that the TCP did not know. Foremost on the chairman's mind was the role that the TCP should play. The Telecommunications Law gave the TCP authority to resolve interconnection

disputes, but because the commission and its staff were inexperienced in such technical matters, and because PCC and FT were both using their political connections to pressure the TCP, the chairman thought he would prefer that the companies resolved their differences without involving the TCP. He wondered if he could devise a way to encourage or force the companies to resolve this on their own. If the TCP was going to be involved, the commission would have to decide what procedures to use. There were no established practices for such disputes and the law was silent on process. He also wondered how he would prepare his staff. The companies possessed all of the technical telecommunications expertise in the country and the chairman felt uncomfortable asking the companies to provide training materials to the staff. As to the substance of the issue, he was uncertain which company was telling him the truth about the intent of the original agreement, or if either was telling him the truth. If the companies were both sincere in their claims, did this mean that the sender-keeps-all arrangement was invalid because the companies had not really agreed upon which calls the agreement would cover? Also if the TCP became involved in the issue, should it make any interim decisions on traffic, prices, or payments to ensure that the system continued to work?

Background

Formed just two years ago, the TCP was one of the centerpieces of Pendet's new Telecommunications Law. Competition was the other centerpiece and one of the TCP's primary responsibilities was to ensure that competition was robust. The three original TCP commissioners had lasted only one year because a national election had brought in a new president and new legislature within a year after the TCP had been formed. The new president had not asked the original commissioners to resign, but they resigned because they felt the president should be allowed to appoint his own commission, and because they were uncertain how much

support they would receive from the president if there were difficult decisions to make. Chairman Garcia and his two fellow commissioners were quickly appointed by the president to fill the empty seats. Although none of the new commissioners were politically powerful, they were politically astute and well educated. The president had told them that he expected them to carry out the responsibilities of the TCP with minimal disruption to the smooth operation of the country.

But telecommunications competition is full of controversy. In order to provide ubiquitous service, each competing carrier must have the ability to terminate calls from customers it serves to customers served by other competing carriers. There is some resource cost for the terminating carrier to terminate calls, therefore, in most situations, the terminating carrier is compensated by the originating carrier. But how should the compensation be calculated? Should the same compensation method be used for all traffic? Should internet-bound traffic be considered "calling"? Should these methods be implemented under tariffs or by individual contracts between carriers?

PCC was a large carrier, which had for a long time held the monopoly franchise for provision of telephone service throughout the country. Since it had never been a government-owned operator, PCC had avoided the difficult privatization processes that other companies around the world were going through. Regulated for the past forty years by the Communications and Utility Ministry, PCC has developed its network to serve almost the entire country, and was capable of serving almost every customer in that area. From the Ministry's perspective, PCC's job had been to ensure that customers had little to complain about. Because PCC had generally succeeded in this, the Ministry had given PCC freedom to earn as much profit as it could without causing complaint and to extend its markets. Given this profit incentive, PCC had developed local networks and trunking to maximize efficiencies in the use of switching and

trunking technologies.

To serve larger metropolitan areas, PCC had deployed a mixture of "end office switches" and "tandem switches". An end office switch is one to which a telephone subscriber is connected. This switch is capable of switching calls from one subscriber to another also served by that switch. If the call is destined to another area, the switch routes that call to the appropriate connecting trunk, which the call transits to a tandem switch (or another end office, via direct trunking). A Tandem switch is an intermediate switch between the originating and terminating points of a call. A Tandem switch connects trunks. A "trunk" is a communication line between two switches.

PCC's metropolitan network architecture incorporates end office switches to serve customers, direct trunking (end office to end office) for routes with high calling volumes, and trunking to a tandem switch to handle calls destined outside the area, and to handle calls for low volume routes within the area.

FT is a new competitor seeking to provide telecommunications services similar to PCC, which also will incorporate technological, price, and marketing advances. However, FT is not a fledgling competitor. Rather, FT is an operating subsidiary of a global telecommunications corporation that has substantial resources. FT has placed telecommunications facilities in the metropolitan area it is serving, which include a single switch, capable of performing both tandem and end office switching functions, and fiber optic trunking and distribution facilities. FT has also aggressively and successfully sought and marketed services to ISPs. FT has been able to promise and provide better and faster service to ISPs than has PCC, which views the ISPs as competitors. As a consequence, a significant portion of traffic terminated on its network is "Internet-bound".

Before significant amounts of traffic began to be interchanged between PCC and FT, the companies

had agreed as an interim arrangement to assume that calling volumes each direction would be roughly equal, that each company would incur essentially the same costs, and that therefore there would be no payments from each company to the other. This arrangement is known as "bill and keep" or "sender keeps all", in which each company bills retail customers, and keeps all resulting revenues.

The carriers have been negotiating to reach a permanent arrangement regarding compensation for terminating call volumes. FT is no longer satisfied with a "bill and keep" arrangement, and is negotiating to institute a compensation mechanism that pays each direction on a per minute of use basis. PCC is not willing to agree to this mechanism, and if a change is going to be made will agree only to employ a non-measured approach, whereby each carrier pays the other on a flat-rated basis for trunk capacity necessary to terminate the calling volumes. In the alternative, PCC would agree to pay one per-minute compensation rate for voice calling, and a much lower rate for "calls" bound to Internet providers. PCC does have a measuring and billing system used for other lines of business that could be adapted to the compensation mechanism proposed by FT, but the measurements occur at the originating end of the call. Thus the system would be an imperfect solution to the proposed inter-carrier compensation mechanism proposed by FT.

Nine months ago, FT sent PCC a notice stating that "Bill and Keep" was no longer appropriate, and that the interim arrangement was no longer valid. Also as of that date it would begin billing PCC for terminating traffic at 5 US cents per minute. FT has sent monthly bills to PCC as of that date. PCC has refused to pay the bills.

The carriers have reached an impasse and FT has filed a complaint with the TCP. Under the Telecommunications Law, TCP is obligated to reach decisions that are fair and that best promote the development of competition. The regulator's

decision here will set precedent for later cases involving similar issues.

Issues

Chairman Garcia's first concern is determining the role that the TCP should play in this dispute. Even though the TCP has the legal authority to be involved, he is not sure that it is necessary. A 1998 survey by the Public Utility Research Center (PURC) at the University of Florida shows that there is a wide range of options for roles that regulators play in interconnection. (Exhibit 1)

According to the briefing materials provided by the staff, the issues for the commission are:

1. *What terminating traffic should be subject to interconnection compensation requirements? Should separate rates be employed for voice calling, versus data transmissions? Should separate rates be employed in reliance upon any retail service definitions?*

PCC contends that Internet-bound traffic does not fall within the calling scope and retail price structures associated with traditional voice telephony, and so is not the type of traffic for which interconnection compensation is intended. According to PCC, interconnection compensation is intended to ensure that when a competitive carrier gains a customer, that customer can call other subscribers on the incumbent's network, without subjecting the competitive carrier to discriminatory charges or practices. PCC states that Internet-bound traffic is inherently one-way and it would be unfair for it to be required to pay terminating compensation on these substantial and growing volumes.

FT responds that there is no cost basis for distinguishing between a transmission for a voice conversation versus one for a data exchange. FT claims that it costs FT the same

amount whether its circuits and switches are occupied by a telephone call, or a data transmission. Treating this traffic differently from a terminating compensation perspective would provide perverse economic incentives, and distort network investment, according to FT. FT asserts that its customers also originate Internet-bound traffic to PCC. FT states that it has won substantial business from ISPs by virtue of its higher quality of service, better rates, and fast response to customer needs. FT also states that it is unknown what the customer is doing with the ISP-bound calling, and such transmissions could be for voice calling purposes.

PCC suggests that FT can offer better rates to ISPs because PCC would be paying FT uneconomically high termination compensation for ISP-bound traffic.

2. *What cost measurements and price structures should be used? What are the implications of charging on a per minute of use basis, versus a flat-rated per trunk basis?*

PCC is satisfied with continuation of the interim "bill and keep" method of compensation for termination of traffic. PCC contends that over time, as FT gains regular retail customers, the exchange of traffic will come into balance, and it is unnecessary to impose additional administrative measurements and methods to "count" minutes. In addition, there is a significant cost to instituting traffic measurement practices, which can approach 50% of the direct facilities and expense costs of terminating the call. In the alternative to "bill and keep", PCC is willing to pay the economic costs of trunks to terminate its traffic to FT.

FT's position is that it should be compensated for every minute of calling that is terminated on its network because it incurs a resource cost

to terminate calling volumes on a volume sensitive basis, and therefore it should be compensated on that basis. According to FT, the fact that each carrier must incur costs to measure and bill for usage, and to administer and audit that process is not relevant since calling volumes cause investment costs and expenses for switching and trunking. FT has established a 5 US cent per minute rate for terminating traffic that it claims compensates it for all associated costs.

FT states that it developed this cost and rate by considering the costs of end office switching, local area trunking between end office and tandem switches, and tandem switching. FT used the cost estimations for these functions that had been developed by PCC from its accounting records that had been given to the TCP as required by the Telecommunications Law.

PCC considers this proposal to be particularly egregious. FT has only one switch in the area, and has chosen to model costs based on PCC's network. PCC states that the rationale for this is obvious -- it serves to inflate the compensation that would be paid to FT. PCC is vehemently opposed to this proposal of FT.

While not willing to accept even this level of compensation, PCC notes that the only compensation FT would be entitled to under its flawed method would be compensation for the end office. FT has no tandem switching or local area trunking beyond its interconnection trunks to PCC.

FT responds by noting that the costs are intended to be representative of PCC's network, because the same rate will be applied to compensate PCC for termination of traffic.

3. *What cost estimation method should be used?*

FT has proposed per minute costs based on accounting costs taken from PCC's accounting records. The costs and proposed prices are derived from capital investment and expense figures, along with necessary assumptions. A 5 US cent per minute rate is the result of FT's calculations.

PCC states its accounting books and records are accurate, but their use in this instance will overcompensate FT and other carriers, since they do not have the extensive facilities that PCC possesses. PCC states that the correct method to use, that would also promote fair competition, would be the calculation of economic costs. PCC defines economic cost as the forward-looking costs of installing the most current and most efficient currently available technology. PCC states that economic cost is the cost that is ultimately faced by all efficient providers in a competitive market. Competition works by eliminating or inflicting losses on less efficient carriers. It would be economically inefficient, and damaging to the development of competition, to provide compensation for terminating traffic at levels above economic cost.

In response to FT's 5 US cent per minute rate proposal, PCC has calculated the economic cost of end office switching to be 8 tenths of a US cent per minute of use, costs of measurement to be half a US cent per minute of use, and the combined cost of tandem switching and trunking to be 6 tenths of a US cent per minute of use. In support of its own proposal, PCC has calculated the monthly cost for terminating traffic at the DS-3 level to be US\$725 per DS-3.

FT criticizes PCC's calculations by suggesting that they are totally hypothetical, and no one really knows what "economic costs" are. PCC

responds by stating that its modeling assumptions are clear and directly stated, and that its pricing inputs were obtained directly from vendors for current products.

According to the 1998 PURC survey, choosing a costing method provides predictability in interconnection prices, but countries have very mixed results in the costing methods they choose and the resulting interconnection prices. (Exhibits 2 and 3) Also, according to a recent PURC study, the relationship between interconnection prices and competition is unclear. Higher interconnection prices encourage entrants to target Internet Service Providers (ISPs) as customers, while lower interconnection prices encourage more market entry. (Exhibit 4)

4. *How should compensation for termination of traffic be implemented? Should there be filed tariffs to state compensation rates and terms applicable to all carriers, or should individual contracts between carriers be used?*

Tariffs may have the benefit of promoting even and fair application of rates and terms to all carriers, and thus help the regulator achieve non-discrimination goals. There are administrative costs to this approach. Contracts may have the advantage of being more direct and efficient, and more consistent with an ultimately completely deregulated market. But abuses can happen if the negotiating power of the parties is uneven.

Exhibit 1. Results of 1998 PURC Survey on Regulator's Roles in Interconnection

Regulator sets	Australia	Canada	Chile	Columbia	Croatia	Czech Republic	Denmark	Finland	France	Germany	Hong Kong	Indonesia	Japan	Korea	Malaysia	Mexico	Nepal	Netherlands	New Zealand	Pakistan	Peru	Philippines	Singapore	Sweden	Switzerland	Taipei	Thailand	Uganda	UK	USA	Venezuela
Regulator resolves disputes																															
Standard agreement																															
Regulatory standards																															
Regulator advises																															
Commercial agreement																															

Exhibit 2. Results of 1998 PURC Survey on Costing Methods on Interconnection

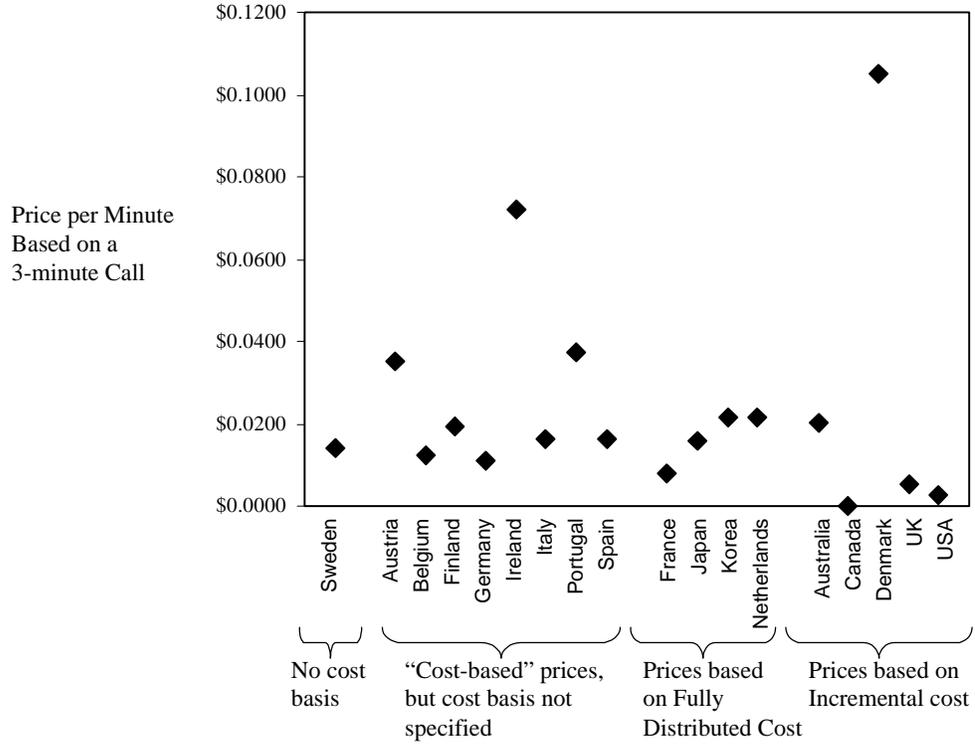


Exhibit 3. Results of 1998 PURC Survey on Interconnection Prices

Country	Per minute price for a 3-minute call US Dollars
Sweden	\$0.0143
Austria	\$0.0350
Belgium	\$0.0121
Finland	\$0.0193
Germany	\$0.0109
Ireland	\$0.0719
Italy	\$0.0164
Portugal	\$0.0373
Spain	\$0.0161
France	\$0.0077
Japan	\$0.0160
Korea	\$0.0215
Netherlands	\$0.0217
Australia	\$0.0201
Canada	B&K
Denmark	\$0.1050
UK	\$0.0053

Note: B&K means Bill and Keep

Exhibit 4. Results of 2000-2001 PURC Study of Competition in the US

Interconnection and Competition in the US

		Interconnection and Competition in the US					
Company	State	Per minute price for a 3-minute call US Dollars	Market Share of New Entrants	Company	State	Per minute price for a 3-minute call US Dollars	Market Share of New Entrants
Ameritech	Illinois	\$0.0083	1.50%	GTE	California	B&K	1.35%
Ameritech	Indiana	\$0.0012	0.97%	GTE	Florida	\$0.0093	0.97%
Ameritech	Michigan	\$0.0034	1.19%	GTE	Hawaii	B&K	1.93%
Ameritech	Ohio	B&K	1.42%	GTE	Illinois	B&K	0.00%
Ameritech	Wisconsin	\$0.0089	0.80%	GTE	Indiana	\$0.0050	0.16%
Bell Atlantic	Washington, D.C.	B&K	1.04%	GTE	Kentucky	B&K	0.21%
Bell Atlantic	Delaware	\$0.0019	0.55%	GTE	Michigan	\$0.0034	0.00%
Bell Atlantic	Massachusetts	\$0.0204	2.00%	GTE	North Carolina	\$0.0110	2.07%
Bell Atlantic	Maryland	\$0.0032	0.65%	GTE	Ohio	B&K	0.00%
Bell Atlantic	Maine	\$0.0197	0.64%	GTE	Oregon	B&K	2.25%
Bell Atlantic	New Hampshire	\$0.0197	0.72%	GTE	Texas	B&K	0.95%
Bell Atlantic	New Jersey	\$0.0036	0.46%	GTE	Virginia	\$0.0069	0.75%
Bell Atlantic	New York	\$0.0073	1.94%	GTE	Washington	B&K	1.25%
Bell Atlantic	Pennsylvania	\$0.0028	1.25%	GTE	Wisconsin	\$0.0198	0.04%
Bell Atlantic	Rhode Island	\$0.0197	0.87%	SBC	Arkansas	B&K	0.79%
Bell Atlantic	Virginia	\$0.0049	0.55%	SBC	Oklahoma	\$0.0120	0.87%
Bell Atlantic	Vermont	\$0.0283	0.57%	SBC	Texas	B&K	1.43%
Bell Atlantic	West Virginia	\$0.0082	0.00%	SBC	California	\$0.0075	1.80%
BellSouth	Alabama	\$0.0100	0.64%	US West	Arizona	B&K	1.40%
BellSouth	Florida	\$0.0013	0.91%	US West	Colorado	B&K	1.59%
BellSouth	Georgia	\$0.0100	1.87%	US West	Iowa	B&K	0.03%
BellSouth	Kentucky	\$0.0036	0.82%	US West	Idaho	\$0.0045	0.49%
BellSouth	Louisiana	\$0.0016	0.24%	US West	Minnesota	\$0.0032	1.30%
BellSouth	Mississippi	\$0.0031	0.21%	US West	Montana	\$0.0066	0.28%
BellSouth	North Carolina	\$0.0130	2.43%	US West	North Dakota	\$0.0043	0.04%
BellSouth	South Carolina	\$0.0028	0.49%	US West	Nebraska	\$0.0056	0.95%
BellSouth	Tennessee	\$0.0190	1.65%	US West	New Mexico	\$0.0008	1.20%
				US West	Oregon	B&K	1.49%
				US West	South Dakota	\$0.0051	0.07%
				US West	Utah	\$0.0043	1.81%
				US West	Washington	B&K	1.64%
				US West	Wyoming	B&K	0.00%

Note: B&K means Bill and Keep

Summary of Study Findings, by Mark A. Jamison:

This study examines how regulation affects entry and entrant market share in US local telephone markets. It finds that lower prices for incumbents and entrants exchanging traffic and for entrants leasing network facilities from incumbents encourage more entry. However, if the prices are so low that incumbents make higher profits on retail services than on leasing facilities to entrants, then the number of entrants is decreased, possibly because incumbents discourage entry to protect profits. Lower prices for leasing facilities to entrants and higher prices for exchanging traffic assist entrants in gaining market share, presumably because entrants are successful in marketing to Internet Service Providers. Surprisingly, reforming the subsidies that have traditionally been built into regulated telephone prices does not encourage entry.

Source: Mark A. Jamison, "Network Interconnection and Telecommunications Competition: The Case of the US," Discussion paper, December 2000.