DFID Internet Costs Study

Appendix G: Regulating Internet Interconnection

Contents

1 Introduction

This paper's main sections:

- Outline why there is currently little regulation of Internet interconnection, and why more regulation could be needed in future;
- Provide an overview of current practices and trends in global Internet interconnection (both peering and transit);
- Identify the potential for anticompetitive practices in this arena, and possible legal remedies for any anticompetitive practices that could take place.

The paper is based on two pieces of work undertaken for this study:

- A review of the relevant legal and regulatory frameworks in different parts of the world and internationally;
- A review of template peering and transit agreements. (Actual agreements are confidential).

The study did not include a competition review of the market for Internet interconnection.

Three Appendices support the body of the paper:

- Appendix GA provides some background explanation of Internet terminology for the reader who is new to the subject,
- Appendix GB provides full details of the review of legal and regulatory frameworks,
- Appendix GC explains and discusses the terms commonly occurring in peering and transit agreements.

2 Trends in Internet interconnection

To date there has been very little regulatory intervention in Internet interconnection and wholesale traffic carriage, because:

The degree of competition in the market for carrying Internet traffic has been reasonably significant, alleviating concerns about bottlenecks;

The supply of bandwidth for Internet traffic has generally outstripped demand, leading to reduced prices for bandwidth.

This state of affairs may continue, but it cannot be taken for granted that it will do so[1]. Recent trends can be summarised as follows:

Internet Backbone Providers (IBPs) are reducing in number due to consolidation (viz BT/AT&T, GTE/Bell Atlantic, MCI/WorldCom, and the failed WorldCom/Sprint mergers). Market power issues have already been evident in merger reviews, including the last three of these and also AT&T/TCI, and Telstra/OzEmail[2].

[1] The following extract on regulatory issues from a WTO secretariat background paper on Telecommunication Services (S/C/W/74, December 1998) put the position well. (Our bold highlight).

"… Moreover, in the future the importance of competition policy and interconnection guarantees might not be limited to concerns over the control of fixed, wireline infrastructures. As cellular network operators assume larger market shares, it is possible that other service suppliers may find that access to a major cellular operator's network, to terminate customers' communications, to be inordinately costly, potentially as a result of the operator's market position rather than competitive forces. **Also, as the Internet matures, larger internet access providers are buying smaller ones and large incumbent telecom operators are acquiring internet access providers to supply these services. There is a prospect that the largest Internet access providers may dispense with the mutual fee-less peering arrangements devised when Internet was more a non-profit endeavour rather than a commercial activity. In this, there is a risk that that large access providers could gain a market position permitting them to dictate terms, conditions and prices of access by smaller providers. Finally, as more telecom providers become global companies, it is increasingly likely that some of their activities may fall outside the jurisdiction of any single national competition body or other relevant government authority. In such situations, enhanced bilateral and multilateral cooperation on competition policy may have an important role to play."**

[2] See Appendix GB for a full discussion of the more relevant of these cases and their implications for this study.

The differences between IBPs and ISPs are growing[3].

IBPs are becoming less inclined to peer[4] with smaller ISPs, and more inclined to offer a paid transit agreement instead.

Internet interconnection agreements generally are becoming more complex and more likely to include provisions for some form of mutual compensation or "settlement".

Increasingly often, the terms for peering by IBPs are kept private, and when ISPs do peer with IBPs they are often forced to sign non-disclosure agreements.

The termination of a peering agreement by an IBP can require very little notice in advance; and finally

The technical dialogue that takes place among IBPs themselves and between IBPs and larger telecommunication networks can be regular and private, often to the exclusion of smaller ISPs.

The movements away from peering towards paid transit and the inclusion of settlement terms in interconnection agreements are of particular importance for this study, and in the following sections we discuss them in more detail.

The study reviewed relevant regulatory frameworks to identify how intervention might be exercised should it become necessary. Three main issues could in principle warrant intervention from regulators, particularly in the US, Japan and the EU:

Increasing concentration on certain international routes dominated by a few large IBPs, where the cost of international leased-line connectivity remains high;

Potential abuse of market power by dominant backbone operators in the transit market. They could collude in structuring peering and transit agreements either to limit new entry at a regional level or to push up transit charges.

Large vertically integrated operators unduly favouring affiliated ISPs.

[3] See Appendix GA for an outline of the roles of these and other market participants.

[4] To peer – to exchange traffic at a point of interconnection free of charge to either party (see also Appendix GA for a fuller discussion).

3 The move to paid transit and settlements

3.1 Limited applicability of peering terms

This section summarises the main terms that would commonly be found in peering agreements[5]. This discussion makes it clear that peering relationships with IBPs cannot generally be available to small ISPs, who will instead be offered paid transit agreements.

Each of the large global backbone providers has peering and transit policies. Some of these are published, and they all share a group of common principles. Peering between a global IBP and a smaller backbone or ISP will generally take place if and only if:

Peering is cost effective, which means that the peering policy will contain terms on minimum network-to-port speed, minimum at-port speeds, minimum traffic flow between peers, and a minimum number of route announcements advertised for significant hosts

Peering distributes the costs and benefits equitably within the geographic coverage of the peering agreement, which means that peers must demonstrate a presence of substantial traffic sources near all points of interconnection, and minimum outbound to inbound ratios of traffic;

Peering provides each of the partners with similar network infrastructure with respect to both geographical coverage and network quality, which means that the peers must agree on a minimum aggregate network capacity between interconnect points, a number of diverse interconnects (different cities or different countries or at a minimum agreed essential points of presence), and a manned network operating centre that can handle faults reliably;

Peering partners agree on symmetrical technical rules, which means the use of similar protocols, filters for non pre-registered routes, default routes of last, and a requirement to announce only their own customer routes;

Peering agreements contain flexibility to change peering points when reasonable notice is given, and also violation procedures and corrective measures.

[5] Appendix GA gives more information on the meaning of peering and transit, including an outline of the advantages of transit agreements over peering agreements.

In addition, peering may not be offered to other ISPs or IBPs hosting a high proportion of *content providers,* on the grounds that the expense of providing capacity will fall inequitably upon the other partner.

The alternative to a peering agreement, for ISPs which cannot meet these requirements, is a paying transit agreement.

3.2 A move towards paid transit

As mentioned above, larger IBPs increasingly want to interconnect at private peering points rather than at the larger public Network Access Points (NAPs)[6]. This is due to:

the increased flow of traffic over the Internet as Internet penetration increases worldwide;

the increased revenues that the larger IBPs can earn from increasingly sophisticated settlement mechanisms at private peering points. Settlement mechanisms are discussed below.

The larger the market share of an IBP, the more important it will be for any ISP to interconnect with the IBP so as to reach the latter's customers. IBPs can therefore hold a dominant position in the relevant market for backbone connectivity.

Smaller ISPs argue that:

there is a need for greater transparency and guidelines on interconnection in the industry.

one large competitor, or a small group of large operators, could raise the costs of others for a service element needed by all competitors and supplied by one or few operators.

a large competitor could use various techniques for degrading the quality of interconnect.

The fear that a large IBP or a number of IBPs could abuse their dominance in the market for backbone services proved to be effective in helping block the WorldCom/Sprint merger discussed in Appendix GB.

Appendix GC to this paper contains a detailed analysis of terms commonly found in peering, transit and settlement agreements. This

[6] For example, UUNet announced its withdrawal from MAE-East and MAE-West in mid-1997, and AGIS followed in the same year.

analysis highlights possible problem areas for smaller ISPs. These include:

A 'refusal to deal', which is an attempt to drive a competitor out of business or to raise the costs of doing business.

A price squeeze, i.e. an attempt to raise competitors' costs by increasing the cost of an essential facility, bottleneck or service element needed by the smaller ISP to provide a complete end-to-end service.[7]

Predatory pricing and/or using deliberate below cost rates.

Extracting from smaller ISPs agreements not to compete in certain service or geographical markets.

Setting a price floor on the service offered by the smaller ISP.

Linking the smaller ISP's access to a desired service to purchase of another service; e.g. long-haul backbone trunks.

Forcing a commitment to buy or lease less desirable and/or less competitively provisioned services.

3.3 Settlements

Many ISPs in the developed economies are now offering a wide range of high-speed digital applications such as IP telephony, on-line video games and web hosting. Further, ISPs who are also infrastructure providers may offer switched co-location for Internet access, private line services (dedicated data and voice), Virtual Private Networks (VPNs) and non-switched IP telephony. Such varied services lead to an increasing need for settlement mechanisms to achieve appropriate compensation for both parties to an interconnection agreement.

Settlements for interconnecting circuit-switched networks are commonplace, and through the years many forms of interconnect pricing have emerged, with most operators settling on a form of Long Run Incremental Cost as the basis for pricing interconnect services. Settlements between circuit-switched networks are determined mainly on the basis of the volume of traffic flowing across the Point of Interconnect (POI), with the traffic being measured through the use of servers at the

[7] A margin squeeze was a concern of the UK regulator OFTEL in its recent determination of an Internet interconnection dispute between BT and WorldCom on unmetered Internet access in the UK.

POI and the basis of billing dependent on the processing of Call Detail Records (CDRs). Customers are identified for billing purposes through the exchange of Calling Line Identification numbers and provisions are agreed for bad debts.

In the IP networks, however, there are no similar arrangements, although some commentators have argued for some form of standardised record of usage similar to the CDR to help with interconnection payments and billing systems[8].

Settlements for specialised or general Internet traffic would radically alter the current economic model of the Internet. At present backbone networks generally sell connectivity based on leased-line capacity rather than actual usage, although other models for payment also exist. Variations on forms of settlement based on traffic flows include:

- Supplier-customer model;
- Sender keeps all;
- Bilateral settlement;
- Multilateral settlement; and
- Discounted settlement.

Some of these allow more scope than others for anticompetitive practices such as margin squeezing and bundling.

[8] See the "IP Detail Record Initiative", Dr Matthew Lucas, Billing World, July/August 1999 pp 30-32.

4 Implications

We have seen that few ISPs will qualify for peering status and that most will have to accept paid transit terms for interconnection.

Refusing to provide transit, or squeezing out smaller rivals, would be unlikely in a competitive backbone market where IBPs competed with each other to win transit customers. However, the possibility remains[9] of an artificially high floor for transit prices that does not reflect actual cost. This could occur where, as at present, there are no regulatory controls, and where the more popular IP links (or "strings") are controlled by one or more backbones with market power.

A preliminary understanding of transit costs is necessary to enable regulators to make informed assessments of whether transit prices may be too high or too low. The likelihood of any countervailing buying power emerging, or new transit providers entering the market, would also need to be considered. Only then can sensible judgements be made as to whether market failure or abuse of a dominant position is occurring, and whether regulatory intervention is required.

Actual determination of cost is a complex matter, as regards both the network elements to be included and the methodology to be employed:

> Network elements to be considered include routers, nodes, customer backhaul, the capacity and number of customer-facing ports, and the cost of provisioning capacity on network rings. A reasonable share of joint and common costs must also be included.
>
> Costing methodology will also need to be determined. For example, in telecoms regulation, there is a trend to use the Long Run Incremental Cost of network elements.

Another, not unlikely, scenario is that of developing country backbone providers, and smaller developed country ISPs, obtaining terms for transit that are not as favourable as those provided to the global IBP's own affiliate ISPs. Commercial reality dictates that preferential terms for peering and transit for global IBP affiliates exist, in the absence of any legislation that would impose an obligation on global IBPs for transparent and non-discriminatory access to their networks.

[9] In the absence of a full competition investigation of the relevant market, no evidence is available about the actual incidence (if any) of anticompetitive behaviour.

From the above discussion we conclude that:

- There are good reasons at present for transit to be priced competitively, but
- The trends towards paid transit and settlements entail increasing potential risks of anticompetitive behaviour.

Appropriate intervention in case of anticompetitive behaviour occurring would be:

a *transparency requirement* allowing regulators to view IBPs' peering and transit agreements;

a *cost accounting requirement* that would allow regulators access to the cost base of each IBP's network.

Appendix GB below sets out how planned or existing law could be used to introduce such requirements on global IBPs. The time is now right for regulators to consider this complex issue, as the global IBPs themselves are addressing costs when reviewing their own peering policies.

Appendix GA: Introduction to the Internet and its interconnection

GA1 Internet Protocol and the public telephony network

The Public Switched Telephone Network (PSTN) is a circuit-switched network. Circuit-switched technology dedicates a fixed amount of capacity in both directions for the duration of a call. Internet Protocol (IP) networks split the information into discrete packets. For certain kinds of traffic (especially data, as opposed to voice, traffic), IP technology thereby makes much more efficient use of capacity. Hence moving information through an IP network can be much cheaper than moving information through a circuit-switched network. When data traffic grows to be much greater than voice traffic, economies of scale and scope can be achieved by combining the voice network with the data network and carrying voice over IP.

The case for basing future networks on IP rests principally on these economies and on the revenues offered by new services (which typically use IP). In developing countries the case for carrying voice over IP, particularly on international routes, is strengthened by:

The greater ease with which voice can be compressed (to reduce capacity requirements) in an IP network.

The ability to use cheaper (but much lower quality) computing equipment, instead of carrier-grade telecommunications equipment, in a low-volume IP network.

An increased ability to by-pass the incumbent network operators, which will typically adhere to international settlements rules and demand high prices for international voice calls.

GA2 Players in the Internet market

The Internet is the interconnection of a range of public and private packet-switched networks. Participants in the Internet include:

End users of all sizes, who contract with an ISP on a retail basis;

Internet Service Providers (ISPs), who allow end users to access IBPs.

Internet Portal Companies like Yahoo and Internet Commerce Companies like Amazon, together with other content providers; we do not discuss these further in this study.

Internet Backbone Providers (IBPs). IBPs route traffic between other service providers, and interconnect with other IBPs[10].

In general, participants in the global market can be very roughly divided into 60+ IBPs, the majority of whom will have entered into private peering or transit agreements with each other; somewhere around 6000 ISPs; millions of content providers and hundreds of millions of end users.

GA3 Internet peering and transit

Peering and transit agreements allow smaller ISPs to extend their reach into regions where they lack infrastructure, and keep traffic on IP networks for longer before it reaches a gateway to the Public Switched Telephone Network (PSTN), where the call may be completed. Such interconnections are vital for smaller ISPs since only by interconnecting can the IP traffic travel furthest and the cost benefit of using the net be maximised.

Most larger ISPs maintain peering and/or transit agreements with local ISPs at the various public Internet exchanges, as well as peering and/or transit with one or more service providers or clearing houses in the US. Many of the smaller ISPs in developing economies (and even developed economies) rolling out a service therefore need to consider what network architecture they wish to adopt and to what extent interconnection qt these various exchanges will be sufficient to provide a narrowband service initially.

In particular, each ISP needs to consider whether it should be party to a multilateral peering agreement at public Internet exchanges or whether it should make its own bilateral arrangements with other ISPs at private peering points. The latter often has the advantage of guaranteed levels of service through a Service Level Agreement (SLA) with the IBP, although the terms of the SLA are often set by the more dominant player.

[10] Here we use the term IBP in a broad sense, to include what is often referred to as a Transit Service Provider or TSP. The main difference between them is that a TSP is less likely to have invested in international infrastructure such as International Private Leased Circuits or Indefeasible Rights of Use on submarine cables or satellite links.

GA3.1 Peering

Service providers interconnect with one another through what is called a peering agreement. Peering may be defined as:

> An interconnection of two public networks that provide connectivity to hosts whose routes are advertised on the global Internet, on a settlement-free basis that allows customers of one network to exchange traffic to customers directly on the second ISP's network.[11]

In a peering arrangement, two service providers agree to exchange traffic that originates from an end user connected to one provider and terminates with an end user connected to another. The Australian Competition and Consumer Commission's (ACCC) consultation paper on Internet interconnection defines peering more simply as 'the establishment of a connection between computers and/or networks.'[12] It leaves out the basis of peering as being settlement-free.

The ACCC in its detailed examination of the Australian Internet industry believes that peering has moved on from a straightforward settlement-free basis and considers that the financial and other administrative arrangements governing peering should be referred to separately as 'settlement arrangements'.[13] This is probably the correct approach, although in this Appendix, and for the sake of simplicity, peering is described as an arrangement that has two main characteristics.

> First, in general, peering is settlement-free i.e. the service providers do not charge each other for terminating traffic. This will normally be the case where the two networks are of roughly the same size, size being defined by the number of customers that each provider has on their respective networks, backbone capacity, and traffic volume.
>
> Second, one peer will not allow traffic from another peer to transit its network to a third IBP.

[11] See the report by Dr. Sam Paltridge of the OECD's Directorate for Science, Technology and Industry entitled Internet Traffic Exchange: Developments and Policy (1998). See also the reference to peering in the article by Kenneth Neil Cukier: "Peering and Fearing: ISP interconnection and regulatory issues" at http://ksgwww.harvard.edu/iip/iicompol/Papers/Cukier.html

[12] Internet Interconnection: Factors affecting commercial arrangements between network operators in Australia (ACCC paper), Sydney: ACCC, 2000, http://www.accc.gov.au/media/mediar.htm.

[13] See ibid at p.33 of the ACCC.

GA3.2 Transit

The alternative to peering is a paying transit relationship. A transit arrangement differs from peering in two respects:

First, in contrast to peering in which service providers generally exchange traffic without charge, in a transit arrangement one provider pays the other to carry its traffic. The amount of this charge generally depends upon the capacity of the connection or the volume of traffic flowing across the Point Of Interconnection.

Second, in contrast to peering in which service providers only terminate each other's traffic, in a transit arrangement a provider agrees to deliver all Internet traffic that originates or terminates on the paying provider regardless of the destination or source of that traffic.

It is important to appreciate that, with packet-switched networks, traffic could be coming onto the paying provider's network from anywhere in the world. Likewise traffic could be leaving the network for onward transmission to any point. In other words, to avoid traffic congestion and also put in place a framework for revenue generation, peering agreements permit delivery of packets only to the address space controlled by the network concerned, whereas transit agreements generally guarantee delivery not only to this address space but also to the remainder of the global Internet address space. This is one of the main advantages of a transit agreement, and is why a settlement is required.

Negotiations for peering do not just occur horizontally between ISPs but also vertically between `small local ISPs' and `large national IBPs'. In the latter case, the large national IBPs have a stronger bargaining position because they not only provide access to their customer and content base, but also act as a gateway to the rest of the Internet.

Appendix GB: Internet interconnection law

There are many useful lessons for developing countries from the legislation, draft legislation and case law affecting Internet interconnect. These lessons could inform policy changes in developing countries or the remedies which are available if legal action seems appropriate. The following material discusses the more important and interesting lessons, under the following headings:

WTO

The EU

USA

Australia

Overall, we see that:

There is already a significant body of relevant law and precedent to guide future proceedings, and various "hooks" on which actions in support of developing countries' interests might be hung.

However, important concepts such as the WTO's "major supplier" and the EU's "market dominance" (for an ISP) have yet to be clarified in the context of Internet interconnection.

GB1 WTO

GB1.1 Reference Paper and Internet interconnection

What is the relevance to the Internet of the interconnection model under the Fourth Protocol's Reference Paper[14], particularly for developing nation ISPs?

It is important to note that packet-switched services are one of the categories of service listed in the Schedule of Specific Commitments of both the US and the EU to the WTO's Basic Agreement on

[14] At least 72 Member States, representing 93% of world-wide telecoms turnover have taken out Specific Commitments known as the Fourth Protocol or Basic Telecoms Agreement, which came into force on the 5 February 1998. Part of the Basic Telecoms Agreement includes a Reference Paper which details, as part of a legal framework for liberalisation, specific rules on interconnection.

Telecommunications[15]. Packet-switched services are thus classified as basic telecommunications services, which attract all the obligations of the Reference Paper that both the EU and the US have each accepted as an Additional Commitment in their Schedule of Specific Commitments. The relevant commitments are full: using all modes of supply covered under both the US and the EU's Specific Commitments, i.e.: (1) cross-border supply (2) consumption abroad (3) commercial presence and (4) presence of natural persons, both the US and EU Member States have placed no restrictions on market access or national treatment.[16]

It is plainly arguable that Internet transport (TCP/IP) service can be classed as a packet-switched service. If this were accepted, then the Reference Paper interconnection obligations would apply to all **major suppliers**[17] of TCP/IP services in both the US and EU.

The scope of the interconnection obligation on major suppliers is set out in Article 2.1 of the Reference Paper:

> 2.1 This section applies to linking with suppliers providing public telecommunication transport networks or services in order to allow the users of one supplier to communicate with users of another supplier and to access services provided by another supplier[18].

The critical issues are:

> firstly, whether or not an ISP is a provider of public telecommunication transport services so as to take advantage of the interconnection obligations;
>
> secondly, whether peering and/or transit can be classed as "interconnection", or "linking" as used in 2.1.

As to the first, in some jurisdictions, ISPs will be classed as providers of public telecommunication services, particularly if such ISPs also hold individual telecommunication service licences as opposed to a class licence for the provision of data services only. Many ISPs will also as a matter of plain fact be providing Internet transport services.

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[15] See GATS/SC/90/Suppl.2 and GATS/SC/31/Suppl.3 respectively.

[16] With certain exceptions however reserved for Luxembourg, Greece, Spain, Ireland and Portugal. See the WTO's Trade in Services paper GATS/SC/31/Suppl.3 11 April 1997.

[17] The definition of major supplier is given and discussed below.

[18] The US Additional Commitment also includes the following wording at the end of this clause: ..where specific commitments are undertaken.

As to the second, it is clear that the wording of the Article does not differentiate between "access" on the one hand, and "interconnection" on the other, and only applies to the "linking" of suppliers of public telecom networks or services. By contrast, under European law (specifically the Interconnection Directive 97/33) the distinction between access and interconnection leads to different categories of rights, with those operators holding interconnection rights (generally as a consequence of holding individual telecommunication licences) enjoying non-discriminatory, transparent and cost-orientated rates, particularly when interconnecting with a major supplier[19].

The word "linking" is of a general nature, and is not defined in the text of the Additional Commitments of either the EU or the US. However, one obvious meaning of the term "linking" as suggested by Article 2.1 is to allow suppliers to access each other's services. Peering and/or transit clearly allow ISPs to access the packet-switched services offered by a backbone operator. It is clearly arguable that peering and/or transit would be a type of linking as envisaged in Article 2.1, so long as both parties to the linking were providing public telecommunication transport networks or services.

In this case, the next article, Article 2.2 Reference Paper, will place an obligation on major suppliers of packet-switched services to "link" (or interconnect) with ISPs (including ISPs licensed in developing countries who are member states of the WTO) in accordance with WTO guidelines in the following way:

> At any technically feasible point in the network;
>
> On non-discriminatory terms, at rates and with a quality no less favourable than for the major supplier's own supply;
>
> In a timely fashion and on terms that are transparent and reasonable;
>
> At cost-oriented rates; and
>
> On an unbundled basis so that a buyer does not pay for unnecessary services.

In other words, IBPs who are classed as major suppliers of packet-switched services (a service covered by EU and US specific commitments) could be required in the name of transparency to publish

[19] Access and interconnection are more fully discussed in the section below under EU law.

or release their terms on peering and transit to the National Regulatory Authority in their jurisdiction.

GB1.2 Use of dispute resolution procedures

In addition, an ISP with foreign stakeholders could complain to the WTO if it has a grievance, for example:

> if an IBP refuses to structure its peering or transit arrangements on non-discriminatory terms with all its downstream customers, regardless of whether or not those customers are the IBP's own affiliates;
>
> if price-lifting of IPLCs by rich-end telcos is believed to be taking place (this is discussed more fully under the EU heading).

The fact remains however that most developing country governments lack the necessary resources and technical skills to frame a complaint through the WTO[20]. In fact most recent WTO complaints have been by the USA. For example, in the telecoms industry in general, there has been more widespread take up of potential referrals to the WTO's Dispute Resolution

[20] They could however frame a complaint as a collective, possibly with a regional regulator or regulatory institution, such as the Telecommunications Regulators' Association of Southern Africa (TRASA), leading the action. A collective action in telecommunications would be ground breaking as far as WTO case law is concerned given that the first WTO case in telecommunications between the US and Mexico only commenced last year. As the Fourth Protocol is an intergovernmental agreement between nation states (and not private companies), the first port of call for an aggrieved developing nation ISP or backbone would be to their own governmental trade representative's office. Under the Dispute Resolution Understanding of the WTO, negotiations would then begin (in the event of a dispute with the US) between the USTR and the developing nation state's trade office. A collective complaint could also be framed against the USTR. WTO case law precedent does exist for collective actions, for example in the collective action brought against the EU by the US and various Latin American states in the *Bananas* case.

Body (DSB) by the US in recent months[21]. A decision to go to the WTO's DSB would depend to a large extent on the value of the Internet interconnection agreements in dispute, which is likely to increase rapidly.[22] Another important factor would be the willingness of the DSB to involve itself in areas that, some would argue, might be better handled by national regulatory authorities.

GB1.3 "Major supplier" and "dominance"

As we have seen, the obligation under the Reference Paper to interconnect on non-discriminatory and transparent terms would appear to cover only major suppliers. In accordance with competition law, a major supplier is defined in the Reference Paper as:

> A supplier which has the ability to materially affect the terms of participation (having regard to price and supply) in the relevant market for basic telecommunications services as a result of control over essential facilities, or its position in the market.

There is an important difference between the WTO's definition of 'major supplier' and the term 'dominance' proposed by the European Commission that is to form its new threshold for Significant Market Power (SMP) under the draft Framework Directive. Under art. 13(2), draft Framework Directive, SMP is defined in the following way:[23]

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[21] See, e.g., the entries in Total Telecom at http://www.totaltele.com/results.asp : 'US slams BT over DSL access' (17 April 2000); 'US threatens to take Mexico to WTO' (4 April 2000), 'U.S. threatens South Africa's Telkom with WTO complaint' (3 April 2000), 'US threatens Japan with WTO action' (30 March 2000). Issues at local access level have even proved worthy of potential referral to the WTO. For example in the UK, due to the delay by BT in accepting Condition 83 which Oftel proposed to add to its Licence to require BT to unbundle its local loop, U.S. operator Covad Communications complained to the U.S. Office of Trade (USTR) of breach of the UK's specific commitments under the WTO's Fourth Protocol citing delay and discrimination on the part of BT in implementing local loop unbundling. See the article in Communications Week International CWI (17 April 2000) for further details. In March 2001, the EU "sounded" possible action against Japan to the WTO over failure by the Japanese government to introduce greater competition in its telecoms market, the second largest in the world (CWI 13 March 2001). A month later, the US said that it was seeking action by Colombia, Mexico, South Africa, and Taiwan to improve compliance with trade agreements on telecommunication services or those countries would potentially face cases before the WTO (CWI, 3 April 2001).

[22] Market researchers from IDC predict ten million users of VoIP by year-end 2001. The Internet hardware provider, Networks, estimates that more than 25% of the world-wide voice traffic will be voice over IP by 2010. See Klaus-Jurgen Kraatz, Voice over IP - a Challenge to Regulation, International Business Lawyer (May 2000).

[23] Art. 13(2), COM (2000) 393 July 2000.

> An undertaking shall be deemed to have significant market power if, either individually or jointly with others, it enjoys a position of economic strength affording it the power to behave to an appreciable extent independently of its competitors and ultimately consumers.

It is quite clear that the WTO's 'major supplier' term refers to the concept of control of an essential facility, which would seem to cover only those operators who were 'super-dominant'[24], i.e those operators who enjoyed special or exclusive rights before the 1998 liberalisation in Europe, and who therefore had the time and resources to develop dominant local loop access networks, the local loop being the classic example of an "essential facility". However, the term 'dominance' used by the Commission in the draft Framework Directive is based on an economic analysis test,[25] where dominance could include any operator who could consistently keep prices high independently of competitors regardless of whether or not that operator controlled an essential facility.[26]

Also, the WTO's definition of major supplier refers to an operator's "position in the market". This is fairly vague wording and it is not entirely clear whether such a definition would in competition law terms fall squarely within the definition for SMP (dominance) as proposed by the Commission. If the draft Access and Framework Directives are adopted with their current wording intact, possibly sometime in 2002, this distinction between 'major supplier' under the WTO Reference Paper and 'dominance' under the new EU directives could become crucially important.

[24] This would be particularly relevant given the high threshold test for the interpretation of an 'essential facility' given by the European Court of Justice in the case of Oscar Bronner v. Mediaprint Case C-7/97 (1998).

[25] The definition for dominance under Community case law was originally seen in Case 27/76 United Brands vs Commission ECR (1978).

[26] However in the earlier version of the draft Framework Directive, the Working Paper on a new regulatory framework published by the Commission in April 2000, the term for dominance included a reference to an essential facility. Following criticisms that the Commission was trying to create a new level of 'super-dominance' that would catch only those operators who would have enjoyed special or exclusive rights before the 1998 liberalisation watershed, this reference was eventually dropped.

GB2 The EU

GB2.1 The new regulatory framework and the Internet

The EU has yet to make law its proposals for interconnection and access as set out in its April 2000 Communication[27], and the series of Working Papers that the Commission published in readiness for its public hearing in Brussels on a new regulatory framework for electronic networks and services in May 2000. Early in 1999, there was talk in Brussels that the subject of access to Internet infrastructure was to be covered by an inquiry into competition and infrastructure issues regarding the Internet in the last quarter of 1999.[28] However when the Commission published its 1999 Review (the "November Communication")[29], it did not raise the issue of a specific inquiry.

In its November Communication, the Commission did make clear that it planned to merge the ONP leased line, TV Standards and Interconnection Directives into one overall Access & Interconnection Directive. The document states vaguely that ISPs would be covered under this generic directive with ISPs entitled to fair and non-discriminatory treatment from other ISPs and operators, enforced by the National Regulatory Authorities.

However, the November Communication did not lay out any specific principles for interconnection between ISPs. For example, the Commission envisaged commercial negotiation of interconnection requests for operators with SMP, and cost-orientation obligations to interconnect from dominant operators.[30]

However in the EU's draft directives on "Access to, and interconnection of, electronic communications networks and associated facilities" (the draft 'Access Directive') (COM (2000) 392), and "A common regulatory framework for electronic communications networks and services" (the

[27] The results of the public consultation on the 1999 Communications Review and Orientation for the new Regulatory Framework (referred to in this Appendix as the "April Communication") COM 2000/239 Final.

[28] IIR Conference speech by Herbert Ungerer (DGIV) Brussels February 1999: Competition Law in Telecoms.

[29] The 1999 Communications Review (referred to in this Appendix as the "November Communication") COM (1999) 539.

[30] Following publication of the April 2000 communication, the Commission has now abandoned plans for a 'two-tier' test for market power. Instead the Commission is to impose obligations only on those operators who are judged as having Significant Market Power, which does not accord with the old test as set out in art.4(3), ICD (i.e. 25% of the relevant market), but with a new test of dominance as defined by European competition law (specifically the case of United Brands).

draft 'Framework Directive') (COM (2000) 393), both published in July 2000, the Commission set out a more detailed treatment for the interconnection of Transmission Control Protocol/Internet Protocol (TCP/IP) networks. Unlike the ICD, the application of which is restricted to narrowband networks, the recitals to the Framework Directive make clear that the new regulatory framework is to apply to a range of broadband communications networks, including the Public Switched Telephony Network (PSTN), TCP/IP networks, cable TV, mobile and terrestrial broadcast networks.

For the regulation of all these types of networks, the Commission found widespread support for sector-specific rules on interconnection and access continuing alongside competition rules, until such time as there was full and effective competition in all segments of the market. There was also widespread support for the Commission's view that call origination, transit, and termination should be regarded as separate markets, with differing levels of competition in each. Under Article 4, draft Access Directive, every operator - not merely those with SMP - will have to abide by the primary interconnection rule, which states that:

> All undertakings authorised to operate electronic communications networks for the provision of publicly available communications services shall have a right and, when requested by other undertakings so authorised, an obligation to negotiate interconnection with each other for the purpose of providing the services in question in order to ensure provision and interoperability of services throughout the Community.[31]

GB2.2 Interconnection rights and obligations

Article 4 sets out three clear tests that an ISP must satisfy in order to enjoy interconnection rights with other licensed operators. It must (first) be authorised to (second) operate electronic communications networks for (third) the provision of publicly available communications services.

As to the first condition, the term "authorisation" will presumably apply to holders of both "individual" telecommunications licences and "class" licences, although this is not made clear in the wording of the draft directive. Generally it used to be the case that only holders of "individual" licences would enjoy interconnection rights, whereas most ISPs hold class licences to provide data services only. However, clearly the spirit of the draft directive (and also of the current Licensing Directive) is to move away from the need to own an individual licence to a more general class

[31] Art. 3(3) imposes an obligation on National Regulatory Authorities (NRAs) to ensure that they encourage and secure 'adequate network access and interconnection….'

licence. In fact Article 3 draft Access Directive requires Member States to remove measures that link interconnection charges paid by new entrants to their level of investment in infrastructure. Recital 5 to the draft Access Directive also refers specifically to the interoperability of services (including IP) over electronic communications networks.

As to the second condition, the draft Framework Directive defines an electronic communications network as "a transmission system, and where applicable switching or routing equipment …which permit the conveyance of signals…including packet-switched …including Internet…." Clearly an ISP that owns its own routing equipment that permits the conveyance of TCP/IP packets will fall under this definition.

As to the third condition, the draft Framework Directive defines an electronic communications service as a service provided for remuneration which consists wholly or mainly in the transmission and routing of signals on an electronic communications network. Again, ISPs will satisfy this condition if they charge end-users for providing a transit service for users' IP traffic. The question of whether the ISP is providing a service wholly or mainly to the public will depend on just that, whether the ISP has a number or even one Point of Presence, through which the ISP offers various internet services such as e-mail, file transfer etc., to the public[32].

To fully examine the issue of ISP interconnection rights, we also need to look at some definitions. For example, access is defined in the draft Access Directive as:

> The making available of facilities and/or services to another undertaking under defined conditions on either an exclusive or non-exclusive basis for the purpose of providing electronic communications services.

Interconnection however is defined in the same draft directive as:

> The physical and logical linking of public electronic communications networks used by the same or a different undertaking in order to allow the users of one undertaking to communicate with users of the same or another undertaking *or to access services provided by another undertaking* (my emphasis). Services may be provided by the parties involved or other parties who have access to the network.

We can see therefore that interconnection is a specific type of access implemented between public network operators. Internet peering/transit

[32] Neither the draft Access or Framework Directives define a "publicly available electronic communications service."

clearly involves the physical connection of two networks in order to ensure provision and interoperability of TCP/IP services across the point of interconnect (or Network Access Point).

However, can an ISP be classed as a public network operator? The definition of a public network operator is set out in the draft Access Directive:

> Operator means an undertaking providing or controlling a publicly available electronic communications network…by which it can restrict or deny service providers access to the end-user or the end-users choice of services.

The right for an ISP to enjoy interconnection rights (as opposed to the lesser form of access right) will depend on whether it has control over the IP addresses that identify its customers and therefore whether the ISP can restrict/deny access to its customers[33]. Some ISPs, certainly in Europe, have a system of access that will give the ISP control over who has access to its customers. This will be down to the fact that the ISP will have allocated a dedicated IP address to its customer rather like a telco assigning a telephone number (and Calling Line Identification for the purposes of billing) to one of its customers. However for those ISPs who offer only dial-up access (as opposed to dedicated access), where users are allocated dynamic IP addresses that change with each user session, the degree of control required for access by others to the user may not be sufficient for the ISP to be granted interconnection rights. In addition, there will be some requirement for the ISP to either own or lease IP routing infrastructure.

In summary therefore, and under the current wording of the draft Access directive, so long as the ISP is "authorised" to operate an electronic network for the provision of a publicly available communication service, it will enjoy interconnection rights with IBPs and other similarly authorised ISPs as set out under Article 4 draft Access Directive. A number of ISPs

[33] This is a similar concept to that of "access to a bottleneck" that is found in Annex II of the Interconnection Directive 97/33/EU. Annex II sets out the conditions that operators must satisfy in order to enjoy interconnection rights with other licensed operators and incumbents. One such condition is control over the means of access to a customer's Network Termination Point at the customer's premises. Control of the means of access to a network termination point means the ability to control the telecommunications services available to the end-user at that network termination point and/or the ability to deny other service providers access to the end-user at the network termination point. Control of the means of access may entail ownership or control of the physical link to the end-user (whether wire or wireless), and/or the ability to change or withdraw the national number or numbers needed to access an end-user's network termination point.

in Europe, who already hold individual licences, currently enjoy interconnection rights with telcos.

Article 4 therefore has the potential to catch any Internet interconnection arrangement between *operators* of electronic networks offering *publicly available* services within the Community, and therefore any peering or transit connection, whether a private bilateral arrangement or interconnection at any of the European public Internet exchanges, where interconnecting parties are offering publicly available communication services. Interconnection obligations (and rights) will not apply to those ISPs who are not authorised to operate electronic communications networks and who do not provide publicly available communications services.

GB2.3 International commitments

Even interconnection with third country operators not authorised or licensed in the EU may be caught, as under Article 8(2) draft Access Directive, NRAs may impose obligations on undertakings (including those without Significant Market Power) to comply with Member States' *international commitments.*

Although the term "international commitments" has not been defined in the draft Access directive, it is not difficult to envisage that it must include obligations that the EU has taken at the level of the WTO, and specifically the interconnection obligations set out in Section 2 of the Reference Paper to the Fourth Protocol, which include obligations on transparency and non-discrimination. The obligations set out in Section 2 only apply to major suppliers of basic telecommunications services (which in the case of the EU includes packet-switched services). Presumably then, those backbones who fit the WTO's definition of "major supplier" under the Reference Paper, and who are licensed in the EU, will have an obligation to transparency and non-discrimination in interconnecting with operators when supplying packet-switched services both within the EU, and in countries with whom the EU is bound by international commitments (e.g. other WTO Member States).

It is also important to note that in 1998 the Commission issued a statement referring to the Fourth Protocol[34], in which it said that EU Member States should accord to operators of (non-EU) WTO countries treatment no less favourable than they accord to their own like services and service suppliers. As a result, where the physical point of interconnection is within its territory, an EU SMP operator should provide

[34] Note to Member States DGXIII-IS2/PLO/FM;A1/PS/MS dated 14 July 1998.

interconnection for terminating international calls to any such third country operator on the same basis as it supplies to EU operators[35].

The Commission's proposals have therefore the potential to change in a crucial way the treatment of both domestic European Internet interconnection agreements and third country agreements. In the past, the larger IBPs could impose virtually any terms that made commercial sense, often requiring as a condition of interconnect that smaller ISPs sign non-disclosure agreements. Under the Commission's new proposals on access and interconnect, Internet interconnection agreements negotiated between ISPs (who are authorised to operate electronic communications networks) could fall under the jurisdiction of the NRA in the region where interconnection takes place (at least in the EU). The NRA could also have powers to hear disputes on third country interconnection, where international commitments are alleged to have been breached.

This in turn could mean that the larger IBPs could be required to submit their Internet interconnection (peering and transit) agreements to the NRAs for inspection, as a commitment to transparency and verification that the principle of non-discrimination continues to apply. As with conventional circuit-switched (voice) interconnect agreements, Internet interconnection agreements could then be made available for public inspection (albeit with the commercial schedules blacked out).

There is one further important point on *cost-orientation*. Currently some EU Member States, specifically the UK, treat certain types of Internet interconnection agreements between ISPs, who are included under Appendix II of the current Interconnection Directive 97/33, as *standard* interconnection agreements. This means that those Appendix II operator ISPs (i.e. public service providers who are infrastructure-based) are entitled to cost-oriented interconnection rates when interconnecting with Appendix I operators (i.e. those operators who have Significant Market Power). Although the Interconnection Directive is eventually to be replaced by both the draft Access and draft Framework Directives, this

[35] It is arguable whether the statement in referring to international calls meant only voice, or voice *and* data.

cost-orientation obligation will continue, as under Article 13 of the draft Access Directive, operators who are dominant could still be caught[36].

These provisions have important implications for *backbones*. Cost-oriented rates for Internet interconnection with dominant carriers will generally force down market prices for Internet interconnection, which will have a knock-on effect for any developing country ISP either interconnecting in the EU (by terminating an international leased line at a public exchange or bilateral private peering point) or possibly, depending on the scope of EU jurisdiction, interconnecting with an European-based backbone outside the EU. At a minimum, European backbones (and US backbones licensed in the EU) could be restricted in their ability to offer special peering rates to their smaller ISPs in the EU.

To enforce any of the provisions of the draft Access and Framework Directives when they come into force (and particularly the international commitments obligation under Article 8 of the draft Access Directive), the developing country ISP or backbone would frame a complaint to the NRA in the European Member State where interconnection takes place.

GB2.4 Price Lifting on IPLCs

This section considers the possible legal remedies in the EU if "price lifting" on IPLCs was found to occur. By "price lifting" we mean any tendency of telcos in "rich-end" countries to raise their IPLC prices by more than a reasonable margin above cost on smaller and less competitive routes.

In economic terms, price lifting would be an attempt by the rich-end telco to increase its share of the joint monopoly profits being made on the route. It would be possible for the rich-end telco to do this only if the route were indeed a joint monopoly. There may in practice be a degree of competition at the rich end to supply the half-circuits, even to developing countries.

[36] Also under Article 8 of the same draft directive, the NRA has the power to impose cost-orientation obligations on *any* operator regardless of whether or not that operator has SMP (i.e. dominance). This rather onerous looking condition is further clarified in Recital 9 draft Access Directive: "exceptionally, in order to comply with international commitments or Community law, it may be appropriate to impose obligations for access or interconnection on all market players, as is currently the case for conditional access systems for digital television services. In all cases, ex-ante regulation is only justified where the remedies available under competition rules cannot achieve the desired results quickly."

As far as we know, no legal remedies against excessive IPLC pricing have been invoked in the EU by non-EU operators to date. The reason for this may be that under current EU law it would be difficult to establish a remedy. For example, the Interconnection Directive in current EU law draws a distinction between interconnection and network access - interconnection attracts cost-orientation obligations whilst network access does not; and IPLC service provision could fall somewhere between interconnection and network access.

In the following paragraphs we sketch out the lines of the legal arguments that could possibly be used by developing countries or their telcos if price lifting were occurring. In general, our view is that the chances of such action succeeding would be higher if the draft EU Access Directive is passed into law in substantially its present form, although even then taking action would not be straightforward. We look at these arguments under the following headings:

EU Interconnection Directive

EU Leased Lines Directive

Draft EU Access Directive

Non-discrimination principle

EU Interconnection Directive

The first remedy to consider arises from the EU *Interconnection Directive* (ICD)[37]. This obliges a fixed operator with Significant Market Power to provide cost-oriented leased line interconnection services to other operators for the purposes of providing end-to-end leased line services in the context of a liberalised environment and internal market principles (Annex 1 Part 2). These services should be provided under transparent, non-discriminatory, and cost-oriented conditions, and subject to regulatory approval (Articles 6 and 7).

It is not immediately clear from the wording of the Directive whether these provisions include developing country operators unless such operators were also licensed or authorised in the EU. Any Member State could license a developing country telco providing the telco met the conditions laid down in its domestic legislation. However this would result in the developing country telco incurring extra costs for authorisation or in obtaining a licence.

[37] Directive 97/33 EC.

As a fall-back position, developing country operators should be covered under Art 4(2) ICD which says that organisations with SMP must meet **all** reasonable requests for access to their networks. This should cover access requests by developing country operators for IPLCs.

Under Art 7(2) ICD, SMP operators are obliged to offer cost-oriented rates for *interconnection* on transparent and non-discriminatory terms. The ICD does not make it immediately clear whether the cost-orientation obligation also applies to *network access*, but it could be argued that IPLC service provision does include interconnection services, and that IPLC service provision should therefore also be cost-oriented. The point however has not been decided.

If a developing country operator wished to complain that EU telco IPLC pricing was not in line with costs, it would simply file a complaint to the relevant National Regulatory Authority (NRA) authorising the EU telco, citing the relevant breach under Article 9(5) ICD. Even if the chances of success were not high, it would be a cheap route for a developing country telco to follow.

Such a complaint would probably be welcomed by the Commission. It instigated a competition investigation into leased lines (Case No IV/37.638-Sector Inquiry Leased Lines) under Art. 12, Regulation 17 EC Treaty, which culminated in a final Recommendation C(1999) 3863 on leased line interconnection pricing in 1999. Unfortunately, the Commission was lobbied so effectively that the scope of the final Recommendation was reduced to cover leased lines up to 5 km in length only, imposing a set of benchmark prices with ceilings and floors.

EU Leased Lines Directive

The developing country could also file a complaint under the *Leased Lines Directive* (LLD)[38]. Under Article 8(2) LLD, "when telecommunications organizations use leased lines for the provision of services not covered by special/exclusive rights, the same type of leased lines must be provided to other users on request and under equal conditions".

Under Article 12 LLD, users who have suffered a breach of the LLD can appeal to the NRA by way of written notification. If the matter is not resolved at a national level, the complaint can be escalated to the ONP Committee at the level of the EU. However, the report for the European Commission in 2000 cited above points to various difficulties in this route - for example, the chairman of the ONP Committee has discretion not to

[38] Directive 92/44 as amended by Directive 97/51.

pursue the complaint if he does not believe that all reasonable steps to resolve the matter have been taken[39].

Draft EU Access Directive

If the developing country operator failed to frame an effective complaint under point 7 above because network access to rich-end telco IPLCs could not be classed as an interconnection service, then an alternative remedy might lie under Article 13 draft Access Directive, if the draft directive came into force with the current wording intact. Under Art 13(1) draft Access Directive, a NRA can impose an obligation for cost-orientation of prices for *network access* in situations where a market analysis indicated that a potential lack of effective competition means that the operator concerned might be capable of sustaining prices at an excessively high level, or applying a price squeeze to the detriment of end-users.

The developing country operator might therefore complain under Art 5(2) draft Access Directive to the NRA licensing or authorising the rich-end telco that the rich-end telco was pricing its IPLCs excessively (even if rich-end prices had been falling). It would then be left to the discretion of the NRA as to whether or not to conduct a market analysis to prove excessive pricing. The NRA might not undertake such an analysis unless it were also persuaded that there was a potential lack of effective competition for rich-end telco half circuits to the developing country in question.

Developing country operators could also complain to the NRA that the EU telco had breached Article 8 draft Access Directive. This Article would empower the NRA to impose obligations on EU operators to comply with *international commitments*. As discussed in more detail earlier in this section, such international commitments will include the EU's interconnection commitments under the WTO's Fourth Protocol or Basic Agreement on Telecommunications, including the telecommunications regulatory Reference Paper.

Non-discrimination principle

It is important to note that in 1998 the Commission issued a statement referring to the WTO's Fourth Protocol[40], in which it said that EU Member States should accord to operators of (non-EU) WTO countries treatment no less favourable than they accord to their own like services and service suppliers. As a result, where the *physical point* of interconnection is within its territory, an EU SMP operator should provide interconnection for

[39] op cit, p128.

[40] Note to Member States DGXIII-IS2/PLO/FM;A1/PS/MS dated 14th July 1998.

terminating international calls to *any* such third country operator on the same basis as to EU operators[41]. While the Commission statement does not have the force of law, it is certainly an authoritative interpretation, and could influence NRAs and courts in Member States if they were asked to consider interconnection of IPLCs between an EU SMP operator and a developing country operator.

GB3 USA

In the United States, State Public Utility Commissions (PUCs) are allowed to regulate interconnection agreements among inter-exchange carriers and local exchange carriers (LECs) under s.251 of the US. Telecommunications Act 1996.[42] Under the current policy of the Federal Communications Commission (FCC), however, ISPs are *not* classified as common carriers under the Telecommunications Act 1996 when they provide Internet services using the packet transmission service of a common carrier affiliate. Instead, such services are classed as information services and therefore do not attract the rights and obligations normally associated with common carriers.[43]

The reason why information services are not regulated as common carrier services is that, soon after their introduction, the FCC determined that the computer-based services market should remain competitive (as part of its computer services policy), and therefore unregulated, so long as an essential input to such services – telecommunications capability – was available to providers of such services on a non-discriminatory basis. The FCC decided that it was not necessary to impose common carrier regulations on the users of those telecommunications services (ISPs) as well as the providers (the telcos). Thus interconnection between ISPs providing information services remains unregulated.

Further useful insights into US attitudes are afforded by the following detailed analyses of three important specific cases:

MCI/WorldCom merger

Sprint/WorldCom merger

[41] It is arguable whether the statement in referring to international calls meant only voice calls, or voice *and* data calls.

[42] See §251 (d)(3) Part II (Development of competitive markets), Telecommunications Act 1996. Although under this section the FCC will not preclude the enforcement of any regulation or order by a State Commission on Local Exchange Carrier (LEC) obligations for access and interconnection, the FCC has also reserved a power for itself to act under Section 251(g) of the Act.

[43] See s. B(5), AT&T v. City of Portland, 216 F, 3d 871 (9th Cir. 2000), rev'g, 43 F. Supp. Ed 1146 (D.Or, 1999).

AT&T v Portland

GB3.1 MCI/WorldCom

The key test as to whether the FCC should involve itself in the regulation of Internet interconnection agreements came in the merger case of MCI/WorldCom[44]. The concern in MCI/WorldCom was that if a single backbone were to become dominant, it would be able to harm the public interest by engaging in a number of anti-competitive actions.

This generated a great deal of press attention. There was strong opposition in the industry, and commentators to the MCI filing argued that the merged entity, taking advantage of its increased size, would increase the costs of interconnection, by either charging for peering, or eliminating peering altogether and converting peers into transit customers, which would ultimately increase end-user prices. In addition, commentators claimed that MCI would degrade the quality of interconnection with rivals in order to induce their rivals' customers to migrate to the MCI/WorldCom network. Finally, commentators suggested that MCI/WorldCom could exploit their ISP customers without fear of reprisal because of the difficulty of changing IBPs.

Perhaps one of the most interesting aspects of the case was the way in which regulators on both sides of the Atlantic worked together. The European Commission has generally avoided disputes on jurisdiction where American undertakings are concerned by making use of the co-operation agreements between the EU and the U.S. on the application of their respective competition laws.[45] As a condition of the merger, MCI agreed to sell its entire Internet business (both retail and wholesale) to the British telecommunications operator Cable & Wireless. Both the US Department of Justice and the European Commission approved the merger.[46]

[44] Application of WorldCom, Inc. and MCI Communications Corporation for Transfer of Control of MCI Communications Corporation to WorldCom, Inc. CC Docket No. 97-211. See also the European Commission's decision of 8 July 1998 [Case IV/M--WorldCom/MCI].

[45] Agreement between the Government of the United States of America and the Commission of the European Communities regarding the application of their competition laws [1995] O.J. L95/47. See also the Agreement between the European Communities and the Government of the United States of America on the application of positive comity principles in the enforcement of their competition laws [1998] O.J. L173/28.

[46] Case IV/M.1069, WorldCom/MCI [1999] O.J. L116/1. The divestment ordered by the Commission was at the time the largest divestment ever to result from antitrust action. See the article by Vajda and Gahnstrom: E.C. Competition law and the Internet: [2000] E.C.L.R. at note 19.

In MCI/WorldCom, the market definition used by the Commission was crucial. The Commission had to decide whether the merger of the two parties' Internet businesses would create or strengthen a dominant position, the result of which could lead to effective competition in the internal market being weakened.

The Commission decided that the market structure was hierarchical or pyramidal, with different characteristics at different levels. At the lower levels there was generally a range of suppliers and a few barriers to entry, whereas at the top of the pyramid, the industry was much more concentrated with only four dominant suppliers of backbone connectivity: Sprint, GTE, WorldCom and MCI (the 'big four').

The Commission distinguished between backbone networks and other lower level networks by defining a market for the provision of top-level Internet connectivity. The Commission argued that the relevant geographic market was the global market for backbone connectivity. Further, the Commission concluded that the big four were the only networks able to provide transit to all parts of the Internet, and that a rise in prices for access to the top-level networks would therefore affect consumers world-wide.

Commentators argue that much of the EU's decision dealing with the impact of the proposed concentration on competition is *a priori* assertion with very little factual evidence to support it.

The U.S. Federal Communications Commission (FCC) also examined the case to determine whether the sale would raise any further issues regarding the Internet. It found that the merger would not have any anti-competitive effects on condition that the divestiture was carried out. The important thing to note however is that the FCC did hold back on imposing any further conditions on the merger by not requiring MCI/WorldCom to adopt non-discriminatory peering criteria.

The FCC did note the difficulties new entrants were having in interconnecting with IBPs, and said that peering was likely to remain an issue that warranted further monitoring. But the FCC also said: 'the MCI/WorldCom merger proceeding is not the appropriate forum to address these concerns'.

It should also be stressed that in objections to the merger received by the FCC, the Australian carrier Telstra argued that the pricing arrangements negotiated between US backbones and Asian carriers "appear to be

unjust and unreasonable in violation of Section 201(b) of the Communications Act."[47]

In response to Telstra's specific claims, in the MCI/WorldCom Order, the FCC did not agree that the merging backbones' practices violated section 201(b) of the Communications Act. The FCC found that "the record does not demonstrate that WorldCom or MCI provides services subject to Title II regulation on rates, terms, and conditions that are unjust or unreasonably discriminatory, in violation of the Communications Act." [48]

GB3.2 Sprint/WorldCom

Perhaps following on from the mixed success of the FCC in the MCI/WorldCom merger, the DoJ blocked the WorldCom/Sprint merger. In a press release issued on 27 June 2000, the DoJ briefly set out its position arguing if 'WorldCom were allowed to acquire Sprint large and small businesses and millions of individual consumers would have to pay higher prices and accept lower service quality and less innovation.' This seems a bit steep, but in its press release, the DoJ summarised the key markets where the proposed merger could give rise to anti-trust concerns. The markets of key interest to this Appendix's discussion on Internet interconnection include:

> Internet backbone services providing top-level connectivity throughout the U.S. Here the DoJ argued that WorldCom operated the largest Internet backbone network, which carries approximately 37% of all Internet traffic. Sprint operated the second largest network with 16% of Internet traffic.
>
> International private line services between the US and more than 60 foreign countries; the DoJ argued that in each of these markets, the combined share of WorldCom and Sprint is at least 37%, and a combined share (including AT&T making up the "Big 3") is at least 82%.
>
> Data network services to large business customers in the U.S. This market includes inter-LATA[49] data services for large businesses over

[47] Section 201(b) states in part that "all charges, practices, classifications, and regulations for and in connection with [interstate or foreign communication by wire or radio], shall be just and reasonable…." U.S.C. § 201(b). Telstra MCI/WorldCom Comments at 8.)

[48] MCI/WorldCom Order, 13 FCC Rcd at 18117, para. 159.)

[49] The term 'inter-LATA' means telecommunications services that originate in one and terminate in another Local Access and Transport Area or LATA. Each LATA typically includes no more than one metropolitan area.

private lines, X.25, Asynchronous transfer Mode (ATM), and frame relay data networks. The DoJ argued that each of these markets, and the market for data network services combined, are again dominated by the 'Big 3'.

The DoJ also covered other markets of concern, including custom network services, long distance services to residential customers in the US, and international long distance services.

A day after the DoJ issued its press release, the European Commission followed suit and acted swiftly to end the hopes of WorldCom and Sprint merging. In a decision published on 28 June, the Commission issued a press release setting out its objections to the merger.[50] The Commission identified three specific markets where the merged entity could exert a dominant position, and behave independently both of its competitors and customers:

The market for top-level universal Internet connectivity (the backbone Internet market);

The market for the provision of global telecommunications services to multinational companies; and

The market for international voice telephony in the US retail and wholesale long distance markets.

Following the Commission's objections to the merger, the parties offered to divest Sprint's Internet business from Sprint's other activities. However, the proposal failed on grounds that Sprint's Internet business was too closely intertwined with its traditional telecoms activities for the divestiture to have any real effect. The Commission was also concerned that together with BT's Concert and BT's alliance with AT&T, the merged entity and BT/AT&T would control the majority of the market for global telecommunications services to multinational companies.

GB3.3 AT&T/Portland case

Another U.S. case that concerns the access rights of ISPs to infrastructure is AT&T/TCI v City of Portland[51] Whereas the MCI/WorldCom/Sprint cases involve competition issues with regard to access to Internet backbone infrastructure, the AT&T case is about access to cable infrastructure.

[50] IP/00/668 28 June 2000.

[51] 43 F. Supp. 2d 1146 (D.Or. 1999), rev'd, 216 F. sch 871, (9th Cir. 2000).

The AT&T case provides useful pointers as to how local US courts view access to infrastructure for Internet services. Given that the US often acts as a regulatory model for other parts of the world, and that cable infrastructure is likely to lead to increased access to the Internet in developing countries, such as India (see the Indian country case study), the case is interesting from a regulatory perspective.

In the AT&T case, AT&T appealed a decision by the U.S. District Court of Oregon upholding the City of Portland's condition for the transfer of TCI's cable licence to AT&T that AT&T must open up its cable network in Oregon to other ISPs - in short, that AT&T grant non-discriminatory access to its cable modem platform.

The District court's decision would therefore have allowed other operators such as US West and GTE to have their ISPs connect directly to AT&T's cable modem platform, thus bypassing @Home, AT&T's proprietary cable ISP. AT&T successfully appealed and this holding was reversed by the U.S. 9th Circuit Court of Appeal[52].

The AT&T case is also important from a policy context because it describes a conflict between a new breed of ISP, @Home, and the more typical ISPs that connect with the Internet via leased lines, which subscribers access through dial-up connections over ordinary telephone lines. @Home by contrast operates both a broadband cable infrastructure (which it owns) and a proprietary national backbone that connects with other backbone networks at multiple network access points.

@Home's ability to restrict its subscribers from purchasing alternative cable broadband access separately from unaffiliated ISPs was something that local competitors, such as common carrier US West and other ISPs, thought worth litigating over. In the ruling of the U.S. District Court, Judge Thomas cites some of the arguments presented by US West and other ISPs at the various public hearings that formed part of the case material.

"US West and the Oregon Internet Service Providers Association called for open access to TCI's cable broadband network, citing--in addition to consumer welfare--the need for "a level playing field" with US West's common carrier obligations and a very real potential that consumer (Internet) access businesses could go out of business."

[52] AT&T v. City of Portland, 216, F. 3d 871 (9th Cir. 2000), rev'g, 43 F. Supp. 2d 1146 (D.Or. 1999)

In the end, the U.S. Circuit Court of Appeals rejected this plea and AT&T won[53]. However, following the Circuit Court ruling, the then FCC Chairman, William E. Kennard, issued a press release proposing that "the FCC begin a formal proceeding on the issue of multiple Internet service providers gaining access to a cable company's platform",[54] noting that the decision from the Circuit Court confirmed the FCC's role in establishing a national broadband policy for the country. Chairman Kennard also agreed with the City of Portland on the goal of an open cable platform, saying that 'there are powerful marketplace incentives that will move the cable platform to an open platform,' but questioned how that goal should be achieved, whether by government intervention or market forces.

The US political situation has, since the publication of Kennard's statement, changed with the entry into power of the Bush administration. Michael Powell, the son of Secretary of State Colin Powell, is now the head of the FCC and his views are known to be less interventionist, with a greater reliance being placed on competition law and market forces as opposed to the use of sector specific legislation for regulating telecommunications.

The important points however to take away from the AT&T v. Portland case are that:

Cable broadband access, under current US law, is not a cable service.

ISPs who own their own cable broadband infrastructure and run proprietary content over that infrastructure offer both information (unregulated) and telecommunication (regulated) services.[55]

Cable broadband operators, however, are not yet classed as common carriers subject to obligations to interconnect under U.S. law (even though they may offer telecommunication services, and even though DSL operators, competitors to cable broadband operators, are subject to common carrier obligations[56]).

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[53] However, in a bizarre twist to the tale, AT&T has announced that it will be willing to open up its cable lines to other ISPs as part of an experimental test in Colorado. AT&T is still operating under an exclusive ISP agreement with Excite that is expected to expire in 2002. See: Cable Biz agrees to open access (3 July 2000) at http://www.wired.com/news.

[54] See FCC press release (30 June 2000): FCC Chairman to launch proceeding on "cable access" at http://www.fcc.gov/Bureaus/Cable/News_Releases.

[55] However, as far as the FCC is concerned, the FCC has not yet determined whether high speed Internet access over cable is a '"telecommunications' service, which the U.S. 9th Circuit Court's decision seems to imply. See the FCC press release, supra.

[56] See GTE Operating Companies Tariff No.1, 13 F.C.C.R. 22466 (1998).

The AT&T v. Portland case (for now) sets a precedent that lets cable broadband operators off the hook as regards 'forced access'.

In summary, taking account of recent case precedent, the US position on Internet interconnection is likely to be a "hands off" approach. This is particularly so given that the FCC's Office of Plans and Policy (the FCC's economic research arm) published last September a White Paper discussing Internet interconnection. In that paper, the author concludes that Internet interconnection should remain unregulated, although there might be a case for introducing some form of control on those operators who were perceived as being dominant, particularly where there was a threat of operators leveraging their market power from the local access market into the IP long distance market.

Another implication of abuse of a dominant position is where the FCC paper cites the example of a new or existing backbone developing a proprietary technology that makes it either more efficient or more attractive to end-user customers. If the technology is a new service, for example, the backbone may choose not to interconnect with other backbones for the provision of the new service.

In these specific cases, the FCC paper argues that industry-specific regulation of the dominant backbone provider may be in the public interest. The FCC paper says "other network industries such as telephony also have warranted industry-specific regulation, and the resulting regulations may provide a template for the regulations that could be imposed on a dominant backbone provider. Such regulations could include, for instance, interconnection obligations that would govern the peering and transit relationships offered by the dominant backbone provider."

The FCC paper also argues however that such intervention would be relatively unusual, as there is little precedent for the regulation of networks such as the Internet, where there are low entry barriers on the cost-side.

In addition, regulatory intervention would be a notable shift in United States policy. The 1996 Telecommunication Act states that it is the policy of the United States to "preserve the vibrant and competitive free market that presently exists for interactive computer services, unfettered by Federal or State regulation."[57] As a result, any calls to intervene in the Internet market would require a correspondingly high burden of proof.

[57] U.S.C. § 230 (b)(2).)

The FCC has acknowledged that the transmission facilities leased by backbone operators are telecommunication services, but that backbone carriage itself is an information service. The FCC also argues, however, that certain IP services that can be classed as *direct substitutes* for telecommunication services, such as VoIP (or over the PSTN, Voice over Internet), may be designated as telecommunication services (common carrier services) in the future.

GB4 Australia

The Australian Competition and Consumer Commission (ACCC) has increased its attentions on Internet interconnection as national incumbents enter the market. In 1998, the ACCC issued a competition notice on the Australian national incumbent Telstra for pricing arrangements that Telstra had put in place for charging downstream ISPs for traffic volumes.[58] The notice resulted in Telstra concluding peering agreements with Optus (Cable & Wireless) and Connect.com in addition to its existing agreement with OzEmail.com, despite the fact that these ISPs were not facilities-based. The ACCC also put pressure on Optus to conclude similar peering arrangements with the same parties.

In February 2000, the ACCC also issued a very useful discussion paper on Internet interconnection. The ACCC's paper examines varying approaches to the problem of Internet settlements and poses questions on how best the industry should distribute the costs for peering between end-users, ISPs, and IBPs. The paper is probably one of the most comprehensive discussion documents yet released by a national regulator on the issue of peering. It suggests a number of options for a model for Internet interconnection that could be applied to negotiations and the attendant settlement arrangements. Options include building an interconnection model on the principles set out in the WTO's Reference Paper and the APEC Framework for Interconnection[59]. In brief, the principles are:

Negotiation in good faith;

Interconnection under non-discriminatory and transparent terms;

Interconnection at cost-oriented rates; and

Making agreements or reference interconnection offers public.

[58] ACCC competition notice issued pursuant to s.151AL, Trade Practices Act 1974, issued 17 June 1998, available from the ACCC public register.

[59] APEC Framework for Interconnection at http://www.apii.or.kr/telwg/interTG/principl.html

The ACCC also raised the possibility of designating Internet interconnection as a *declared service*, under the Australian Telecommunications Act, which would fall under specific regulatory obligations for mandatory provision.

Appendix GC: Overview of peering and transit terms

Terms that both parties will need to look at carefully before signing a peering and/or transit agreement will include:

a) *Provisions prohibiting transit traffic:* Definitions of transit traffic (sometimes called third party traffic) vary by agreement, but generally transit traffic is defined as traffic between destinations where neither of the destinations is a subscriber (or the customer of a subscriber) of the other party. Limiting transit traffic is important, as excessive traffic will lead to congestion on the network, which in turn will affect the quality of service to existing customers. The only way of limiting transit traffic is to define carefully the class of end-users and customers belonging to each of the negotiating parties to the agreement. However, some backbones may attempt to restrict an ISP's dealings with third party operators in order either to restrict the territorial coverage of that ISP's operations or to prevent competitors from contracting with the ISP - in other words, using a transit traffic clause to create an exclusive dealing arrangement or a restrictive trade practice, both of which could fall foul of conventional competition law principles. But without a requirement to lodge the peering or transit agreement with a regulator, such practices remain unregulated.

b) *Third party routing:* Each party will want to put restrictions on connectivity to ensure that other multi-user networks do not gain unauthorised access to the other party's network through:

   I. The placement of third party routers that are not agreed.

   II. The placement of any computer in the network path that is capable of IP routing thereby diverting third party traffic to the other party's facility.

   III. The use of a proxy server to redirect unauthorised traffic. A proxy server is a form of a computer that is assigned the specific task of administering a network's internal IP addresses. It can also act as an efficient copier of web pages and as a firewall to the World Wide Web.

   IV. Firewalling, i.e. making use of a firewall to divert unauthorised traffic.

As with provisions prohibiting transit traffic, restrictions on third party routing could be open to abuse and lead to anti-competitive practices.

c) *Any term establishing a peer as a last resort:* A route of last resort is often a default route. Usually a party to a peering agreement will want to restrict the other party from establishing a default route directed at the other party's Internet network by rewriting nexthops (a hop being a specific route taken across public and/or private interconnection points) or modifying third-party routing information. Generally both parties will agree to a list of specific routers in a schedule to the peering agreement. Any traffic then exchanged under the peering agreement will only be accepted from the routers listed in the schedule. Breaching an agreement on restricting default routes will often allow the innocent party to impose filtering techniques on third party traffic, such as route filtering, packet filtering, rate limiting and other measures to limit traffic exchange.

d) *Provisions dealing with operational matters* (maintenance, network upgrades, bandwidth requests, etc): Sometimes at private peering points, the more powerful IBP can degrade the quality of interconnection at the POI by implementing slow-roll increases in capacity, only agreeing to interconnect at congested Network Access Points (NAPs), or being very slow in installing the interconnect link in the first place. The smaller ISP will try to guard against such anti-competitive behaviour by seeking specific provisions on operational matters.

e) *Restrictions on monitoring or capturing customer data:* Each party will want to restrict the other's ability to monitor customer data, except for control data required for operational use. Normally each party will be able to monitor and use IP headers (addressing information in a packet), transport headers and packet characteristics for its own operational needs. In some jurisdictions, particularly the EU, legislation protects privacy of information, and controls the manipulation of data. In other jurisdictions, the agreement may not contain any protection for customer data, which can make marketing easier.

f) *Liability for content of information passing across the POIs:* Content liability clauses and the warranties and indemnities that go with them are standard features of any peering agreement. U.S. law is far more developed than most other regimes as regards the liability of ISPs and carriers. Potential losses (for damages) in the U.S. relate mainly to copyright, trademark infringement, defamation, pornography, and dissemination of viruses and international torts.

g) In the EU, Articles 12-15 of the E-Commerce Directive (June 2000) cover the liability of ISPs. ISPs can be classed as mere conduits of information and not subject to liability for the content of information transmitted so long as the ISP conforms to specific conditions on initiation of the transmission, selection of the receiver of the transmission, and modification of the content of the transmission (Article 12). Article 13 exempts liability for caching, and Article 14 for hosting if specific conditions are met. Under Article 15, there is no general obligation on the ISP to monitor the information that the ISP transmits or stores.

h) As far as the contractual provisions on liability are concerned, often in financially valueless peering agreements both parties will attempt to restrict their liability to zero, but in other agreements each carrier will attempt to make the other carrier liable to pay it significant sums if certain events occur.

i) The content of data that will cross a point of interconnect (POI) can include files, news group postings, on-line contracts, e-mails, confidential information, software, websites, intellectual property rights, obscene material, pornography and defamatory content - quite a nasty cocktail. The content is likely to be even more varied when a backbone exchanges traffic with its peering and transit partners around the world. Depending on the contractual provisions it has with these partners, the backbone may have to accept liability for any damage caused by its own customers' content.

j) To limit its liability therefore, a global backbone will quite often seek an unlimited liability indemnity from its customers that will include smaller backbones, ISPs and transit providers. The indemnity will cover all of the global backbone's losses in connection with any content supplied by its customers across the POI. The seeking of unlimited liability indemnities is becoming increasingly common in the Internet industry and particularly in the U.S., where the party seeking the indemnity is likely to be a larger player, such as an IBP. Whether the smaller backbones will accept such an onerous condition depends entirely on the commercial value of the agreement and the bargaining positions of the parties concerned.

k) Also because of the potential hazards, to minimise the global backbone's liability the peering or transit agreement may require smaller players to include certain terms in their own agreements with their customers. The terms may relate to content responsibility, warranty and liability limitations, the exclusion of liability for consequential loss, the obligations of customers to comply with local laws (particularly export laws if there are restrictions on the export of

software as in the U.S.), and the obligation for customers to relinquish IP addresses on termination of services. If the smaller player should fail to include such terms in its agreements with its own customers, then any loss suffered by the global backbone as a result of such breach could result in a claim for damages from the smaller player.

l) *Acceptable Use Policy (AUP).* Another term frequently seen in peering and transit agreements is a reference incorporating each of the parties' AUP into the agreement. For example, to minimise a the liability of a global backbone (B) for carrying the content of a smaller ISP (A), B may ask A to comply with any AUP in force by A or with B's own AUP. Besides covering the guidelines on the transmission of content, the AUP will also contain provisions on damaging material, such as viruses, e-mail forging, usernet spamming, and creating congestion on networks through the use of chain letters. The AUP can be a lengthy document, which in itself may contain restrictive trading or exclusive dealing practices that raise competition concerns. Alternatively if the parties are peering at *public peering points* such as the London Internet Exchange (LINX) in the UK or MAE-West and MAE-East in the U.S., both parties will need to conform to the Acceptable Codes of Practice of the public Internet exchanges.[60]

m) *The AS reference numbers for the peering or transit routes sought*. Each ISP network advertising its routes is assigned an Autonomous System (AS) number. The AS number is included in all IP packet headers, and so is relatively easy to track. IP headers also contain source and destination addresses, allowing tracking of which domains are sending/receiving traffic. For example ASxxxx might refer to the link of A's network between New York and Hong Kong. If A suggests that it intends to peer on this route on a settlement-free basis with B, then B may check the traffic patterns on this route and determine that the traffic flowing across the route is so negligible that it does not warrant peering on a settlement-free basis. In this case, B may demand to peer on the complete A network, including all of A's more profitable routes and not just the ASxxxx route that A had originally selected. Therefore A must have a good idea of the traffic flowing across its different peering routes (sometimes called "strings") before entering into negotiations with B, and decide on a bottom-line position on peering routes sought and offered.

n) *Packet loss.* This should be defined carefully, as some peering partners like to impose a penalty if its network sustains a packet loss

[60] But these Codes of Practice are quite often published on the World Wide Web and therefore open to public inspection.

of say 5% over a period of one to three months. The penalty might be to purchase transit from the peering partner instead of peering on a settlement-free basis. Therefore if the use of A's network leads to packet losses of 5% or more, *the injured party B may demand that A purchases transit*. A, however, may prefer to terminate the agreement or seek a transit agreement with a provider of its own choice. Penalties can give rise to competition concerns in the EU.

o) *Performance standards.* Each of the parties will need to define terms on latency (time for a packet to reach a destination), redundancy, network downtime, etc.

p) *Any terms restricting caching.* Web caching allows ISPs to store frequently requested Web pages on their own servers (often closer to the customer requesting the pages) to speed users' connection times. In effect, caching reduces load on transit networks because a web page is stored much closer to the requesting user. The server is often located at the terminating ISP's premises and can be programmed to download the original page only when it has been updated, or at periodic intervals. A proxy server performs the same role, while mirror sites are copies of entire sites that may be updated overnight.

A cache can reduce international traffic to the point where the cache accounts for up to 40% of total traffic. This represents major savings in time for a web page to be returned from a remote host. Caching is often used by ISPs and smaller IBPs to reduce traffic volumes from the U.S. and the attendant payments to U.S. and domestic backbones. As such, caching in developing countries should be positively encouraged by regulators. Technical assistance should be sought from institutional funding authorities such as the World Bank's InfoDev programme or through the UNDP or WTO on assisting developing country backbones in setting up local caches. As a long shot, as a concession to allowing global backbones access to international gateways (which in many developing countries will be limited in number), the peering or more probably transit agreement could include a technology transfer clause that would require the global backbones to assist with the setting up of local caches or mirror sites, although this would very much depend on the bargaining positions of the parties concerned, and the importance of the market to the global backbone as regards infrastructure investment.