



**TelstraClear Limited**

**Response to Telecom Submission to the Commerce Commission on the proposed price and non-price terms for access to and interconnection with Telecom's fixed PDN and access to Telecom's fixed PDN backhaul ("Wholesale Bitstream")**

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**PUBLIC VERSION**

**(Note: There is no Restricted Version)**

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## 1. EXECUTIVE SUMMARY

### 1.1 Service Description and Parameters

1. In TelstraClear's view, the Commission should reject Telecom's asserted "tight link" between its retail Jetstream services and the bitstream access service for the following reasons:
  - a. the service description for the designated bitstream access service makes no express reference to a retail service, in contrast to the resale designated services where the Commission has applied a "tight link". By providing for a maximum 128kbps upchannel speed and specifying other service parameters, the service description creates a fixed reference point independent of the retail Jetstream products;
  - b. a "tight link" between retail and designated access would not be in the long-term interests of end-users. Instead, a "tight link" would inhibit competition and service innovation by limiting the scope for access seekers to compete on their own merits. Telecom currently offers no Jetstream products with downchannel speeds above 516kbps which also have 128kbps upchannel speeds, but does offer products that couple higher downstream speeds with higher upchannel speeds;
  - c. a "tight link" would provide gaming opportunities for Telecom. If Telecom withdrew all retail variants with a 128kbps upchannel speed by moving to a slightly higher upchannel speed, Telecom's "tight link" approach could foreseeably mean that there were no designated bitstream access services at all, only end-to-end resale versions;
  - d. the only evidence produced by Telecom in support of its call for a "tight link" comes from the Initial Pricing Principles (IPP). Telecom's argument ignores the very important words of "imputed by the Commission" and "having regard to any comparable service" in the IPP. While the wholesale bitstream price may be derived from a retail price, there are too many steps involved in arriving at that price to say, as Telecom does, that a "tight link" exists between the retail price and the wholesale price.
2. TelstraClear considers that Telecom misconstrues TelstraClear's proposed service parameters, and Telecom's own data shows that it can meet those

service parameters:

- a. TelstraClear's proposed latency, jitter and packet loss parameters would be measured on a one way basis, not two way as Telecom seems to assume;
  - b. Consistent with international standards, the performance of the bitstream access service would be measured on an uncongested line (i.e. where end-user data demands are below the contracted service rate). Most of the issues relating to delay, jitter and packets in Telecom's examples are attributed to line congestion or techniques to manage traffic;
  - c. Telecom's examples are misleading also because they calculate latency and jitter in relation to services such as email which, as they are not sensitive to packet delay, use large packets. TelstraClear proposes measuring performance based on a small packet such as 64bytes;
  - d. TelstraClear is not seeking to revisit or circumvent the 128kbps upchannel limitation. However, neither should a technical constraint designed to distinguish between non-NGN and NGN services operate in a manner that limits access seekers competing against Telecom in services which clearly are not NGN services. On Telecom's own data, interleaving can account for more than three quarters of latency in the upchannel. Interleaving has limited impact on Telecom's competitive position because it can offer higher speed channels to end-users who want to use services which are sensitive to packet delay; and
  - e. With the above adjustments to Telecom's examples, the total latency for 64 byte packets would be 8.2ms, well within the 50ms parameter sought by TelstraClear. Even with interleaving on, the latency would still be no more than 36.2ms.
3. Further, TelstraClear considers that Telecom's argument that there are significant practical difficulties in providing bitstream access services with downchannel speeds which do not match the Jetstream services is not technically sound:

- a. Telecom already offers a range of retail services with different combinations of upchannel and downchannel speeds. As the same features and capabilities of the DSLAM and the BRAS are used, adding wholesale services with a new combination of upchannel and downchannel speeds should be no more difficult at the DSLAM level than adding a new retail variant; and
- b. Telecom's assertion that it would have to establish a new virtual pathway to its 1,500 DSLAMs for each new wholesale variant seems to be a problem of Telecom's own creation. TelstraClear's technical advice is that the bitstream service can be feasibly implemented without using any virtual paths, just as Telecom appears not to use virtual paths for the different variants of its retail services.

## **1.2 Backhaul**

4. As TelstraClear noted in our Initial Submission, it has existing facilities connecting some of the Telecom Unbundled Regional Service Area (**URSA**) gateway locations. TelstraClear's primary concern with Telecom's commercial backhaul offer was that it seemed to be on an "all or nothing basis": that is, the access seeker either had to build to all URSA gateways or buy Telecom backhaul service to all of them. There are some URSAs where TelstraClear anticipates the traffic levels will not justify the investment required to establish its own backhaul. Telecom's Initial Submission indicated that "the all or nothing basis" was not the case, suggesting access seekers could, for example, use Telecom's other data services or the access seekers own facilities for some URSAs. If this is correct, TelstraClear would be prepared to withdraw its request for a determination of the terms of supply for backhaul.
5. TelstraClear has written to Telecom requesting clarification of its commercial offer, but has not received written confirmation from Telecom to date. However, our discussions with Telecom suggest that there may be an "all or nothing" application of a 10G per end-user monthly usage allowance across all URSAs when backhaul is only purchased at a subset of URSAs, which TelstraClear considers would be anti-competitive. We consider that technical backhaul issues should be put on the agenda for the technical workshop.

## **1.3 Market Definition and Competition**

6. In TelstraClear's view, the information which Telecom provides about

broadband pricing offered by other operators<sup>1</sup> confirms that there is a national market:

- a. Entrants, such as TelstraClear and Woosh, which have networks in pockets across the country, still price on a uniform basis across all the geographic regions they address;
  - b. Whether competitors are head-to-head in the same or even different markets, there is no difference in their pricing based on geographic presence: e.g., Watchdog's wireless service offered in the regions of Auckland, Pukekohe and Hamilton is priced at \$35.51 and Woosh's wireless service offered in Greater Auckland, Metro Wellington and Christchurch is also priced at \$35.51;
  - c. Irrespective of whether there are 1, 2 or 3 operators present in a geographic area, retail prices offered by suppliers are the same between areas; and
  - d. Telecom itself has recently strengthened its uniform national pricing approach by reducing its XTRA Wireless service from \$109.95 to \$59.95 (for XW 1000) to align its rural pricing with the national pricing for DSL services.
7. Telecom overstates the extent of the product market and therefore of the competition it faces:
- a. Telecom includes symmetrical services delivered over high capacity fibre or microwave links in the same market as ADSL services. As Telecom itself acknowledges, "the focus of the regulatory framework for the UBS service designations is enhanced competition in markets for residential and SME retail broadband internet access". Symmetrical broadband services are generally targeted at large business customers and, as Ofcom has in the UK, the Commission should define the product market in these proceedings as asymmetric broadband access services;

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<sup>1</sup> Such as in Table 1 of Telecom's Initial Submission as set out at Figure 3 of this submission.

- b. Telecom is the only provider offering broadband access services on a national basis other than Iconz (Ipstar), a satellite-based service. As Telecom itself acknowledges, satellite provides a weak competitive constraint on Telecom; and
- c. As the Commission concluded in the Unbundling Report, wireless is unlikely to provide a significant competitive constraint on Telecom, including because of its technical and service limitations compared to DSL.

#### **1.4 Pricing**

- 8. TelstraClear broadly agrees with the Commission's preliminary view as to the interpretation and application of the IPP<sup>2</sup>:
  - a. on its literal wording, the IPP requires the retail price to be imputed before benchmarking, and not as part of the benchmarking process. The retail price against which the benchmark discount is applied is not the retail price of the comparable retail service but the price imputed having regard to any comparable service. Thus, the IPP requires the comparable retail and bitstream services to be first aligned to establish an "apples with apples" comparison and then the avoidable costs are subtracted through benchmarking the discount;
  - b. treating the components of the retail service that are not part of the bitstream access service as an avoidable cost would distort the wholesale price, particularly given the limited competition Telecom has faced to date. Subtracting the components not included in the wholesale service based only on the costs Telecom avoids would, in effect, shift the excess rents for the whole of the end-to-end retail Jetstream services onto the components which are part of the wholesale service; and
  - c. there are challenges in using benchmarking to make the adjustments from a retail service to an unbundled service. The overseas retail services significantly vary between each other and Telecom's Jetstream services own data usage caps and channel speeds. The

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<sup>2</sup> Commerce Commission letter dated 18 January 2005.

higher speed overseas bitstream services tend to have upchannel speeds above 128kbps.

9. However, TelstraClear believes the Commission's proposed methodology should be adjusted as follows:
  - a. the \$10 retail price Telecom charges for the XTRA residential Internet service does not fully reflect the costs and value of the Internet service. The Commission is currently investigating allegations of price squeezing by Telecom;
  - b. averaging the imputed business and residential retail prices to produce a wholesale price will skew the competitive focus to SME customers, whereas the Commission recognized in its Unbundling Report that broadband penetration amongst residential customers was especially poor in New Zealand. If the Telecom residential and business Jetstream services are technically equivalent, any differential downstream retail pricing by Telecom between customer segments reflects Telecom's retail pricing strategy, which should not influence wholesale pricing for its competitors; and
  - c. Alternatively, if the Telecom residential and business retail Jetstream pricing does reflect different service parameters, such as contention ratios, the appropriate approach would be to provide for separate wholesale products with wholesale pricing imputed having regard to the relevant residential or business retail price. Consistent with those products being wholesale inputs to the downstream retail markets, access seekers should be able to supply either wholesale product into either retail market. This would be a decision by the access seekers trading off wholesale price against service quality.

## **1.5 OSS**

10. TelstraClear considers that Telecom's argument that the Standard Access Principles only allow the Commission to specify the "what" of OSS and not the "how" is artificial: as OSS is all about day-to-day processes and procedures, involving interaction between the parties at many steps along the way, the "how" is crucially important. Telecom's decisions about the design and implementation of interfaces will shape the processes on the TelstraClear side of the interface, raising its costs in competing against Telecom.

11. If Telecom considers that the OSS requirements proposed by TelstraClear are unrealistic, Telecom should put forward an alternative wholesale IT systems implementation plan. The close involvement of major users such as TelstraClear in the development of the plan and system specifications would be consistent with best practice for major IT projects.

#### **1.6 Service Levels**

12. TelstraClear considers that the fact that Telecom chooses not to offer service levels to retail end-users or monitor its own performance to be beside the point. The Standard Access Principles impose an independent legal obligation on Telecom to provide the bitstream service at an equivalent level of service as it supplies to itself, and the issue is then how to identify, measure and enforce those service levels to ensure access seekers are supplied with an equivalent service.

13. Committed and transparent upstream service levels are important to competition in downstream markets for two reasons:

- a. Telecom has built and operates its DSL network to performance levels known only to it. Telecom counts on those network performance levels in designing its downstream retail products and in planning and resourcing its customer service and support functions. Unless access seekers have some knowledge and certainty about the network performance, they will be impaired in designing, marketing and supporting competing downstream products; and
- b. commitment to service levels and service rebates may be one of the bases on which access seekers propose to compete against Telecom at a retail level and to develop innovative service offerings for end-users.

14. Requiring the incumbent to report on comparative service performance between retail and wholesale services is now international best practice.

#### **1.7 Static IP Addresses**

15. In TelstraClear's view, Telecom's argument that there will be additional costs associated with the bitstream access service supporting static IP addresses is not technically sound. As Telecom's own UBS service literature states, because the bitstream access service is a layer 2 service, the access seeker is responsible for addressing. This would include assignment and management of static IP addresses. TelstraClear is only requesting that Telecom do nothing

in the configuration of the service which impedes static IP addressing.

### **1.8 Part Month Billing**

16. TelstraClear considers that Telecom's argument that Telecom's billing systems will not support part month billing when retail customers reassign to wholesale services is belied by the fact that Telecom currently does so in relation to wholesale line rental services.

## 2. INTRODUCTION

17. This submission responds to Telecom's *Submissions in respect of the TelstraClear UBS and backhaul application* of 16 December 2004 (**Telecom's Initial Submission**).
18. The submission is structured as follows:
  - a. Part 3 critiques the key elements of Telecom's approach to the supply terms for the bitstream services, including its proposal for a "tight link" between retail Jetstream and the bitstream access service;
  - b. Part 4 responds to the technical and operational hurdles raised by Telecom;
  - c. Part 5 responds to Telecom's views that there are sub-national markets based around alternative fixed and wireless networks and that Telecom no longer faces limited competition in those markets;
  - d. Part 6 responds to Telecom's view of how the discount should be set and comments on the Commission's preliminary view on the approach to calculating the IPP;
  - e. Part 7 responds to Telecom's views on non-price terms, including backhaul, OSS, service levels and static IP addresses;
  - f. Annex A sets out an analysis by AAS of the technical issues raised by Telecom; and
  - g. Annex B sets out TelstraClear's detailed response to the technical arguments raised in Appendix A of Telecom's Initial Submission.

### 3. GENERAL PRINCIPLES

19. Telecom’s Initial Submission argues that TelstraClear’s application should not be granted by the Commission as the requested access is for “services [that] have no close retail parallel”.<sup>3</sup> In Telecom’s view, it should not be required to provide the bitstream access service if there is no equivalent Jetstream service for the type of bitstream access requested.

20. In support of this “tight link” between retail services and designated bitstream access, Telecom argues that the designated bitstream access service:

*“contemplates at least some equivalence between the service requested [by TelstraClear] and Telecom’s retail offerings.”<sup>4</sup>*

21. Telecom also argues that:

*“The Commission and the Government have clearly accepted that the long term interests of end-users are best promoted by a regime that permits providers and seekers to compete on their merits in contestable markets and as such the history of the UBS designation has been one which has contemplated the closest possible fit between the service being made available by Telecom at retail and the wholesale service sought to be regulated.”<sup>5</sup>*

22. TelstraClear submits that Telecom is incorrect on each of these points:

- a. the designated service set out in the Telecommunications Act 2001 (**the Act**) does not logically or necessarily require a “tight link” between the designated bitstream access service and Telecom’s retail Jetstream services;
- b. a “tight link” between retail Jetstream services and the bitstream access service would not be in the long-term interests of end-users. Instead, a “tight link” would inhibit competition and service innovation by limiting the scope for access seekers to compete on their own merits; and

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<sup>3</sup> Telecom’s Initial Submission, para 9.  
<sup>4</sup> Telecom’s Initial Submission, para 10.  
<sup>5</sup> Telecom’s Initial Submission, para 38.

- c. the Commission and the Government have never accepted that such a “tight link” is in the long-term interests of end-users and the “history” of UBS instead shows that the terms of supply would provide scope for downstream services which were differentiated in terms of price, speed configuration and service features.

### **3.1 The Designated Services as set out in the Act**

23. In this section TelstraClear submits that Telecom’s argument that there should be a “tight link” between the designated bitstream access service and Telecom’s existing retail products is not supported by the Act as a matter of statutory interpretation. Part 4 discusses the technical aspects of Telecom’s “tight link” argument and Part 6 discusses the pricing aspects of the argument.

#### ***Service Description***

24. The service description for the bitstream access service in Schedule 1 of the Act makes no reference to a retail service with which to compare requested access under the designated service. Instead, the service description makes it clear that this service is intended to be more than a simple resale version of existing Telecom retail services by referring to the service as “access to, and interconnection with” Telecom’s fixed PDN.
25. The service description for the designated bitstream access service goes to some length to set out technical parameters such as downstream throughput rates without reference to any comparison to an existing Telecom retail service. In addition, by recommending a maximum 128kbps upchannel speed for the wholesale service, the service description creates a fixed reference point independent of the retail Jetstream products.
26. Further, if Telecom’s “tight link” argument was correct, the 128kbps upchannel and the tight link would have the cumulative effect of narrowing, if not potentially eliminating, the set of retail services which are passed through (on an unbundled basis) to the wholesale level. Telecom currently offers no Jetstream products with downchannel speeds above 516kbps which have 128kbps upchannel speed but does offer products that couple higher downstream speeds with higher upchannel speeds (e.g. Jetstream Swift has a 2Mbps downchannel and a 192kbps and higher upchannel speed). Telecom would have to provide a resale version of a service such as Jetstream Swift under the Wholesale Determination, but not a bitstream service with an equivalent downchannel speed.

27. If Telecom withdrew all retail variants with a 128kbps upchannel speed, moving to a 192kbps upchannel, Telecom’s “tight link” approach would mean there were no bitstream services at all, only end-to-end resale versions.

### **Pricing Principles**

28. The only evidence produced by Telecom in support of its call for a “tight link” between requested services and existing Telecom retail services in the terms of the Act comes from the IPP for the bitstream access service:

*“Telecom believes that the retail minus formulation adopted in the initial pricing principle effectively requires equivalence or at least reasonable comparability between the retail service used as the comparator and the service to which access is sought”.<sup>6</sup>*

The initial and final pricing principles for the bitstream access service provide that the price for the bitstream access service is calculated as a discount from the “retail price (as imputed by the Commission having regard to any comparable service)...”.

29. Telecom’s argument ignores the very important words of “imputed by the Commission” in the IPP . The IPP does not require that the requested access service has an exact retail equivalent. Rather, the Act requires that the Commission “imputes” a retail price to be comparable for the purposes of the initial and final pricing principle. Further, the retail price is not necessarily directly derived from the retail price of any comparable service, but is to be imputed “having regard” to any comparable service.
30. Schedule 1 of the Act uses the same language of “imputed retail price” in relation to the designated service of “[r]etail services offered by means of Telecom’s fixed telecommunications network as part of a bundle of retail services”. As Telecom may not offer a retail equivalent of the individual service separate from the bundle, the “imputed retail price” is required to determine the retail minus price for the individual service under the

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<sup>6</sup> Telecom’s Initial Submission, para 38. It is not clear why Telecom has limited its argument here to the Initial Pricing Principle when the relevant wording is identical in both the initial and final pricing principles for the designated bitstream access service. For the avoidance of doubt, TelstraClear’s argument applies to the wording of both the initial and final pricing principles for the bitstream access service.

designated part of a bundle access services.

31. In contrast, those designated services which are intended to be based on exact equivalent Telecom retail services calculate their retail minus initial and final prices as a discount directly against Telecom's actual retail price or an "average or best retail price".<sup>7</sup> Thus, there is no need for the Commission to "impute" a retail price.
32. In any event, TelstraClear notes that the relevant wording of "comparable service" in Schedule 1 of the Act is only used in relation to the price of the designated bitstream access service. As noted above, there is no reference to an actual retail service in the service description of the designated bitstream access service in Schedule 1 of the Act, unlike the case with the service descriptions for price capped and non-price capped retail services.

### **3.2 "Tight link" not in the long-term interests of end-users**

33. TelstraClear submits that a "tight link" between retail services and designated bitstream access services would not be in the long-term interests of end-users as such a link would inhibit competition and prevent service innovation by access seekers.
34. Telecom's "tight link" would mean that competitors seeking designated bitstream access services could only obtain wholesale services within the technical parameters of Telecom's existing retail services: in effect, bitstream would be reduced to being "half a resale service". This would mean that, despite the designation of access under the Act, Telecom would retain control over the type of services to which it could be required to provide regulated access through control of its own retail product suite. Simply by limiting its own retail products (or by offering services with upchannel speeds higher than 128kbps), Telecom would be able to forestall any competition.
35. In this way Telecom's proposed "tight link" would also prevent service innovation by competitors. If regulated access were only available on the terms of Telecom's retail products, competitors would be unable to offer

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<sup>7</sup> Retail services offered by means of Telecom's fixed telecommunications network; Residential local access and calling service offered by means of Telecom's fixed telecommunications network; and Bundle of retail services offered by means of Telecom's fixed telecommunications network.

services with different technical features (e.g. upstream/downstream capabilities within the terms of the service description). Under Telecom's "tight link" requirement, competition would be limited to price with the margin for price competition set by the retail minus discount determined by the Commission.

36. In this context, TelstraClear also refers the Commission to the cost benefit analysis conducted as part of the Unbundling Report showing significant consumer welfare gains as a result of bitstream access in the terms now designated in the Act.<sup>8</sup>

### **3.3 The "history of UBS"**

37. Telecom's Initial Submission does not elaborate on what is meant by the "history of the UBS designation"<sup>9</sup> or what parts of the process leading to the designation of the bitstream access service are thought to indicate the Commission and the Government intended a tight link between the designated service and Telecom's retail product. TelstraClear submits that the Commission should dismiss Telecom's claims in this regard as unsubstantiated.

38. Further, TelstraClear submits that Telecom's claims are incorrect and that the history of UBS indicates the contrary is true: neither the Commission or the Government intended a tight link be necessary between the designated service and Telecom's retail products. After the rigorous analysis in the Unbundling Report, it is difficult to believe that the Commission or the Government's decisions to incorporate the designated bitstream access service into the Act was intended to only require Telecom to make available the simple resale of part of its retail services. The Commission's Unbundling Report indicates that it had something more than simple resale in mind when it recommended designation of the bitstream access service to the Minister and was mindful of the economic efficiency gains of service innovations that the broader bitstream service would make possible:

*"Compared with reselling an access provider's end-to-end retail service, such a service [bitstream access] would allow access seekers increased*

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<sup>8</sup> Unbundling Report, para 647.

<sup>9</sup> Telecom's Initial Submission, para 38.

*flexibility to offer different product types e.g. products with unlimited download caps.”<sup>10</sup>*

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<sup>10</sup> Unbundling Report, para 806.

## 4. TECHNICAL ISSUES

### 4.1 General Issues

39. By throwing out a barrage of alleged technical and operational issues, Telecom seeks to obscure the simple fact that, as Telecom continues to control and operate the DSLAM, bitstream is one of the most straightforward unbundling services to implement. As the Commission noted in its Unbundling Report:

*“The Commission does not consider that there are significant practical or technical difficulties involved in an access provider providing access to an ADSL bitstream access service. Experience in the UK and Australia suggests that ADSL bitstream access can be provided in a reasonably short space of time”.*<sup>11</sup>

40. A DSL service “in the raw” is an unconstrained or full speed service to the maximum capability of the DSLAM. A network operator such as Telecom has a high degree of flexibility in relation to the shape, speed and quality levels of that “raw” DSL stream through “throttling” the service using the DSLAM and the BRAS. The dispute between the parties over technical issues comes down to whether Telecom should be required to program or “throttle” the DSLAM and the BRAS for wholesale services in a different way to which Telecom does for retail Jetstream services.
41. TelstraClear is not seeking to revisit or circumvent the 128 kbps upchannel limitation. However, neither should a technical constraint designed to distinguish between non-NGN and NGN services operate in a manner which limits access seekers competing against Telecom in services which clearly are not NGN services. Access seekers should be able to realise the full capability of the 128 kbps upchannel.

### 4.2 The technical basis of Telecom’s “Tight Link” Argument

42. Telecom asserts that “technical and operational practicability issues ... arise if Telecom is required to provide configurations of upstream and downstream speeds nominated by TelstraClear where Telecom does not have a comparable

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<sup>11</sup> Unbundling Report, para 808.

retail service”.<sup>12</sup> Telecom’s assertions do not square with basic DSL engineering principles.

43. The same features and capabilities of the DSLAM and the BRAS are used to configure channel speeds for retail services as are used for wholesale services. Telecom already offers a range of retail services with different combinations of upchannel and downchannel speeds. Adding wholesale services with a new combination of upchannel and downchannel speeds should be no more difficult at the DSLAM and BRAS level than adding a new retail variant.
44. As stated, upchannel and downchannel speeds are separately configured for each individual customer. It is our understanding that Telecom’s system is fully automated to accommodate this required configuration and no manual input is needed – throttling to speed levels requires a “couple of keystrokes” as AAS has put it.<sup>13</sup>
45. The Telecom retail Jetstream services represent a menu of standardised upchannel/downchannel speed combinations from which end-users can choose. Telecom can expand or reduce the list of standardised combinations. There is also no reason why Telecom could not, if it so chose and given the required technical parameters, set the upchannel and/or downchannel speed for a Telecom retail customer at a non-standard combination of upchannel/downchannel speeds. The number of variants on Telecom’s standard retail menu and whether Telecom is prepared to offer non-standard settings is not technically constrained by the DSLAM (other than by the maximum speed setting), but is a commercial decision by Telecom.
46. Accordingly, as the combination of upchannel and downchannel speeds is set on an end-user by end-user basis, adding a wholesale variant with a combination of upchannel and downchannel speeds which differs from Telecom’s existing retail variants should not present difficult technical problems. Rate limiting within Telecom’s network is, in effect, “color blind” between retail and wholesale customers.
47. Telecom also argues that “[i]f traffic from different variants of the service is

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<sup>12</sup> Telecom’s Initial Submission, Appendix A, para 12.

<sup>13</sup> AAS Report, Annex B, TelstraClear Initial Submission, page 12.

mixed together, it is difficult to deliver consistent service characteristics”.<sup>14</sup> Telecom must be referring to aggregation of DSL traffic within the Telecom network beyond the DSLAM. TelstraClear understands that Telecom already “mixes together” traffic from the half dozen or more variants of upchannel/downchannel speeds in its retail product set. TelstraClear fails to see why adding traffic from wholesale variants should present fundamentally different or more difficult technical issues to those currently being managed by Telecom for its own retail product set.

48. Telecom argues that “each additional tailored solution will require Telecom to configure a new virtual path for each of Telecom’s approximately 1,500 DSLAMs”.<sup>15</sup> Telecom seems to be saying that the virtual pathway is required to avoid the problem of mixing traffic from different variants. However, as far as TelstraClear is aware, Telecom does not establish a separate virtual pathway for each variant of its retail services. If it does not have to do so to manage traffic from different retail variants, it is unclear why wholesale variants that do not match retail variants need a separate virtual pathway.
49. The requirement to establish new virtual paths for wholesale services seems to be a problem of Telecom’s own creation. In TelstraClear’s view, the bitstream service can be feasibly implemented without using any virtual paths. TelstraClear considers that Telecom should be required to explain the technical basis for its approach. AAS accords with this view and notes:

*“At the DSLAM level and in the capacity to the first ATM switch, implementation of a new wholesale service with a different speed to retail services is little different to the implementation of a new retail service with different speeds to the existing retail services. If Telecom asserts that there are differences, it should be required to describe those differences so that the Commission is in a better position to evaluate their relative difficulty and cost and, as importantly, whether the solution being implemented by Telecom is the technical solution which an efficient wholesale provider would implement.”*

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<sup>14</sup> Telecom’s Initial Submission, Appendix A, para 12(b).

<sup>15</sup> Telecom’s Initial Submission, Appendix A, para 12(b).

*For example, Telecom says “each new solution will require Telecom to configure a new virtual path for each of Telecom’s 1,500 DSLAMs”. How difficult is that to do? Would Telecom be doing this anyway? What is the likely cost? Telecom hasn’t presented any facts relating to this.”<sup>16</sup>*

50. Where a wholesale service could be technically implemented in different ways, the Commission should insist on the architecture which best promotes downstream competition. This should still be the case where the most pro-competitive solution would be less convenient for the incumbent to implement. The incumbent designed and built its network to solely service the interests of its own downstream retail business. The purpose of access regulation is to require the incumbent to open its bottleneck facilities to competing downstream providers. Allowing the incumbent to implement technical solutions which are most convenient for it but which impair downstream competition will undermine the purpose of access regulation.
51. Lastly, if there are technical complexities in having wholesale variants that are different to retail variants, these difficulties presumably would be substantially reduced if there was only one wholesale variant, an unrate shaped downchannel service, which is TelstraClear’s preferred approach. The range of downstream variants based on the unrate shaped service would be created on the access seeker’s side of the PoP within its network, not Telecom’s.

#### **4.3 Service Parameters (e.g. Latency, Jitter etc.)**

52. Telecom misconstrues TelstraClear’s proposed service parameters on latency, jitter, packet loss and the contention ratio.
53. First, TelstraClear’s proposed service parameters apply separately to the upchannel and the downchannel. For example, latency should not exceed 50ms in the upchannel and another 50ms in the downchannel. Thus, the total latency on a roundtrip basis should not exceed 100ms<sup>17</sup>, which, even without making the necessary adjustments discussed below, still falls within the total

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<sup>16</sup> AAS report “Comments on Telecom’s Submission in respect of UBS”, January 2005, clause 3.1.4.

<sup>17</sup> 200ms if jitter is counted as well, which is not to exceed latency on TelstraClear’s proposed service parameters.

packet delay range in Telecom's examples.

54. Second, Telecom mixes up **expected performance levels** for an uncongested service with the **actual performance problems** of a congested service. It is standard practice to measure service parameters on an uncongested access link (DSLAM to end-user): that is, when the end-user is sending or receiving data below the maximum specified channel speed for the service.<sup>18</sup> If the end-user is trying to send or receive more data than can be "pushed through the size of pipe" supplied to the end-user (i.e. the service is congested), the network provider can apply traffic management techniques to conform the data stream to the "size of the pipe". This can be done by either:
- a. holding packets in a buffer ("rateshaping buffer") at the BRAS to slow down the rate at which packets are fed into the pipe, the effect of which is to increase latency; or
  - b. reducing the volume of data to be sent through the pipe by discarding a proportion of the packets (called "policing"), which has the effect of increasing packet loss.
55. Obviously, these traffic management techniques will degrade service quality, potentially below the service parameters proposed by TelstraClear. However, as this is a result of the excess data demands of the end-user, the network provider cannot fairly be held to the same service parameters which would apply if the end-user's data demands were within the channel speed which the network provider has committed to provide that end-user. Accordingly, packet delays attributable to traffic management should not be counted in assessing whether Telecom is in compliance with service parameters.
56. A number of the examples given by Telecom in support of its argument that it cannot physically meet TelstraClear's proposed service parameters include delays which are attributable to traffic management procedures which apply if the service is congested. For example, 500ms of the maximum 720.8ms of jitter which Telecom says can be experienced in the upchannel is attributable

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<sup>18</sup> ITU recommendation Y1541 states that "the network performance objectives may no longer be applicable when there are packets submitted in excess of the capacity agreement or the negotiated traffic contract".

to a rateshaping buffer.<sup>19</sup> Similarly, Telecom also says “delay variation less than the mean packet delay could not be achieved [in the downchannel] for any bitrate unless the **rateshaping buffers** were reduced to below 50ms”.<sup>20</sup>

57. Third, Telecom correctly points out that packet size affects packet delay, but it is erroneous of Telecom to use packet delays applicable to large packets to demonstrate that TelstraClear’s service parameters are not practicable. While all packets, large or small, travel at the same speed, large packets are subject to higher latency, and therefore services which are delay-sensitive (such as interactive gaming) tend to use small packets. As the purpose of latency and jitter service parameters is to ensure that the bitstream service can support delay-sensitive services, it is inappropriate to measure packet delay based on large packets. The size of the packets is essentially driven by the application and its requirements. “Point and shoot” instructions in a game, which need to be transmitted in quick response, will utilise small packets to reduce latency. Further the example Telecom uses of an email attachment of 1471bytes that can withstand significant packet delays without noticeably affecting customer perceptions of the service is not an accurate example in this context as email is extremely insensitive to latency/jitter, unlike the services being discussed. Thus, benchmarking packet delay against email services is not an appropriate measure.
58. On Telecom’s own calculations, latency and jitter for smaller packets would be well within TelstraClear’s requested service parameters. Using Telecom’s data, Figure 1 sets out the latency calculations for a number of packet sizes with interleaving on and Figure 2 sets out the latency with interleaving off. TelstraClear proposes that packet delay service parameters should be measured on the basis of 64 byte packets. This takes a conservative approach (i.e. favorable to the access provider) because, as Figure 1 illustrates, the latency for this packet size is well within the 50ms performance level proposed by TelstraClear even with interleaving on.<sup>21</sup>

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<sup>19</sup> See Telecom’s Initial Submission, Appendix A, para 68.

<sup>20</sup> Telecom’s Initial Submission, Appendix A, para 73(b), emphasis added.

<sup>21</sup> A scale of committed service levels could be developed to specify the maximum latency for other packet sizes, along the lines of Figures 1 and 2. However, TelstraClear proposes keeping the initial approach simple by specifying parameters only for 64 byte packets. If the service performance for other packet sizes is substantially worse than would be expected

Figure 1: Latency calculations with Interleaving On

Packet size	Latency attributable to:			Total latency (interleaving on)
	Interleaving	Traversing network	Nominal	
64bytes	28ms	3.2ms	5ms	36.2ms
128bytes	28ms	6.4ms	5ms	39.4ms
256bytes	28ms	12.8ms	5ms	45.8ms
512bytes	28ms	25.6ms	5ms	58.6ms
1024bytes	28ms	51.2ms	5ms	84.2ms

TCL proposed benchmark packet size

TCL latency QoS

Figure 2: Latency calculations with Interleaving Off

Packet size	Latency attributable to:		Total latency (interleaving off)
	Traversing network	Nominal	
64bytes	3.2ms	5ms	8.2ms
128bytes	6.4ms	5ms	11.4ms
256bytes	12.8ms	5ms	17.8ms
512bytes	25.6ms	5ms	30.6ms
1024bytes	51.2ms	5ms	56.2ms

TCL proposed benchmark packet size

TCL latency QoS

#### 4.4 Interleaving

59. Telecom argues that “Telecom could not enable TelstraClear to turn off interleaving without conducting extensive trials to assess the implications of this on the particular copper line connecting the end-user to the DSLAM and Telecom’s network as a whole”.<sup>22</sup>
60. TelstraClear acknowledges that turning interleaving off may affect the quality of the DSL service to TelstraClear end-users located further away from

extrapolating from the 64 byte latency QoS, then it may be necessary to consider more extensive QoS in the future.

<sup>22</sup> Telecom’s Initial Submission, Appendix A, para 77.

Telecom exchanges. However, the trade off between latency, service reach and service reliability is one which TelstraClear (and its retail customers) should make, not Telecom. Telecom end-users serviced by the same DSLAM will be unaffected by TelstraClear's decision.

61. Telecom's own calculations demonstrate the effect that interleaving can have on delay-sensitive services. On Telecom's own calculations, interleaving accounts for approximately 77% of total latency for a 64 byte packet. With interleaving on, latency for a 64 byte packet accounts for over 70% of the maximum latency service parameter proposed by TelstraClear but with interleaving off, latency for that packet size falls to 16% of that service parameter.
62. Interleaving has limited impact on Telecom's competitive position because it can offer higher speed channels to end-users who are sensitive to packet delay. As Telecom notes, it is easier to meet tighter latency and jitter objectives required for delay sensitive services at higher channel speeds. The bitstream service description limits the upchannel to 128 kbps, while Telecom offers higher upchannel speeds in its retail DSL products (192 kbps to 600 kbps).<sup>23</sup>
63. Accordingly, having interleaving "on" tightens the impact of the 128 kbps upchannel restriction. If interleaving is on, services which Telecom can offer with higher speed upchannels cannot be matched by competitors in a 128 kbps upchannel. If interleaving is "off" for the bitstream access service, the access seeker will be able to compete in the provision of services offered by Telecom in the higher speed upchannels (with interleaving on). TelstraClear, for example, has identified gaming as one of the services it wishes to offer using bitstream. Telecom describes its Jetstream Swift, with a 2Mbps downchannel and a 192 kbps upchannel, as "the ultimate games experience".<sup>24</sup> The services which can be offered in a 128kbps upchannel with interleaving "off" could not be described as NGN services.
64. As discussed above, Telecom's own calculations suggest that it could meet a 50ms latency requirement for a 64 byte packet even with interleaving on. For

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<sup>23</sup> On Telecom's tight link approach, the downchannel speed of the bitstream service also would be limited to 512 kbps because Telecom does not offer a 128 kbps upchannel retail product with a higher speed downchannel.

<sup>24</sup> <http://www.telecom.co.nz/chm/0,5123,203071-202470,00.html>.

the purposes of measurement of service parameters, TelstraClear will accept interleaving being “on” or “off” during the measurement period as optional, as long as the 50ms latency parameter is achievable. However, TelstraClear still seeks the right to require interleaving to be turned off for particular customers, although without different (and tighter) service parameters when interleaving is “off”.

#### **4.5 Minimum Speed**

65. The second limb of the limits on the bitstream access service require that the downstream throughput rate must be not less than 32kbps and have an average of not less than 256kbps.
66. Telecom proposes that the 32kbps minimum should be measured on an average basis and suggests a 30 minute interval.
67. TelstraClear agrees that measurement over a time interval is a practical way of applying the minimum 32kbps requirement. However, the longer the time period, the less like a minimum the requirement becomes. TelstraClear proposes that the downchannel speeds should be measured as follows:
  - a. Throughput measured every minute;
  - b. The 32kbps minimum should be calculated as a 5 minute average of those 1 minute measurements; and
  - c. The 256kbps requirement should be calculated as a 60 minute average of those 1 minute measurements .

## 5. MARKETS AND LIMITED COMPETITION

### 5.1 General Issues: Legal Framework

68. As a general matter, TelstraClear notes that Telecom's Initial Submission fundamentally misconstrues the nature of these proceedings and the Commission's role in them.<sup>25</sup> The Commission is not a court of law and these are not judicial proceedings. Accordingly, Telecom's submissions as to "the normal civil standard" of proof to be applied<sup>26</sup> and "the burden of positively proving"<sup>27</sup> matters are misconceived and irrelevant to these proceedings. As an administrative body empowered to make a decision under the Act the Commission is entitled to exercise its discretion within the broad limits permitted by administrative law. A test of Wednesbury unreasonableness<sup>28</sup> circumscribes the limits of the Commission's discretion to consider or discount any matter, but this is substantively different to the burdens of proof applicable to a court of law.

### 5.2 Telecom's Workshop Proposal

69. TelstraClear is of the view that it is not appropriate nor necessary for competition and market issues to be the subject of a workshop held by the Commission. However, as previously submitted in its letter dated 17 January 2005, TelstraClear proposes that the Commission should convene a workshop with representatives from both parties and an expert from the Commission to resolve any remaining technical issues. There are good reasons why a workshop is appropriate for technical issues but not for competition issues.

70. Competition and market issues are within the Commission's core competency. Whilst the parties may disagree over the facts and their interpretation relating to market definition and competition, TelstraClear believes there is sufficient agreement between the parties on the basic principles and tools to be able to address each of the relevant competition issues through the Commission's

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<sup>25</sup> TelstraClear does not intend to comment on each of the "Legal Framework" issues associated with market analysis in paragraphs 48 to 67 of Telecom's Initial Submission. TelstraClear's Initial Submission addresses many of the issues raised by Telecom. TelstraClear's failure to comment in this response should not be construed as agreement with any of the arguments made by Telecom in this section of TelstraClear's Initial Submission.

<sup>26</sup> Telecom's Initial Submission, para 57(a).

<sup>27</sup> Telecom's Initial Submission, para 65.

<sup>28</sup> Associated Picture House Limited v Wednesbury Corporation [1948] 1KB 223 of 230.

established processes of exchanging submissions and the conference.

71. In Telecom's Initial Submission, Telecom refers to the need to involve third parties in its proposed workshop on the basis that those third parties may also be affected as market participants. TelstraClear does not agree and cannot see how this current dispute is any different to previous determinations where third party market participation has also been relevant to the assessment of the state of competition but a workshop was not considered necessary.
72. By contrast, addressing and resolving technical issues is not a core competency of the Commission. The set of technical issues raised are new to the Commission as such detailed technical characteristics of the bitstream service were not canvassed under its consideration in the Unbundling Report. Indeed it is also the first time the parties themselves have had to consider and address the meaning and implications of the limits on access principles set out in the bitstream access service description, such as the 128 kbps upchannel maximum throughput limitation.
73. The apparent lack of agreement between the parties on certain basic technical principles leads to a concern by TelstraClear that the lack of understanding of each other's positions may explain much of the apparent dispute. TelstraClear believes that in order to resolve these technical issues the parties must develop a common language to enable the parties to debate the technical issues. Holding a workshop on technical issues would be the most effective way of achieving this.

### **5.3 Product Dimension**

74. TelstraClear disagrees with Telecom's view that the product dimension of the relevant wholesale or retail markets can be defined as broadly as "broadband internet access services".<sup>29</sup>
75. Telecom tries to have it both ways. On the one hand, it argues for a stringent application of the 128kbps upchannel restriction to prevent the bitstream service being used to supply downstream products which would be competitive with NGN services. On the other hand, Telecom argues for a broad product market which appears to include broadband services with much

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<sup>29</sup> Telecom Initial Submission, para 97(b).

higher speeds and symmetrical capabilities, such as broadband services offered by fibre and satellite.

76. TelstraClear disagrees with Telecom’s view that the metropolitan markets are “clearly competitive”<sup>30</sup> and that Telecom faces a “multitude of competitors in metropolitan markets who offer alternatives to Telecom’s broadband services . . .”<sup>31</sup>. In support of these claims, Telecom relies in part on the contents of Table 1 in Telecom’s Initial Submission, set out below (as reproduced from Telecom’s Initial Submission).

Figure 3: Competitors in the retail broadband markets (Telecom’s Table 1)<sup>32</sup>

Product	Customer type	Technology	Retailer (wholesaler)	Example price (excl GST)
Sub 1 Mbps broadband	Residential	ADSL	Telecom	\$44.40
		Wireless	Watchdog (Wired Country)	\$35.51
		Wireless	Woosh	\$35.51
		Wireless	Iconz (BCL)	\$93.33
		Wireless	ThePacific.net	\$62.22
		Satellite	Iconz (IPstar)	\$99.00
	Business	ADSL	Telecom	\$59.95
		Wireless	Packing Shed (Wired Country)	\$75.00
		Wireless	Woosh	\$99.00
		Wireless	Iconz (BCL)	\$93.33
		Wireless	ThePacific.net	\$97.78
		Satellite	Iconz (IPstar)	\$99.00
Over 1 Mbps broadband	Residential	ADSL	Telecom	\$48.84
		Wireless	Watchdog (Wired Country)	\$62.18
		Cable	Paradise	\$35.51
		Wireless	Inspire.net	\$100.00
	Business	ADSL	Telecom	\$79.11

<sup>30</sup> Telecom Initial Submission, para 123.

<sup>31</sup> Telecom Initial Submission, para 127.

<sup>32</sup> Telecom Initial Submission, para 118.

Product	Customer type	Technology	Retailer (wholesaler)	Example price (excl GST)
		Wireless	Wave (Wired Country)	\$104.89
		Fibre	Actrix (Citylink)	\$176.89
		Wireless	Inspire.net	\$100.00

77. A closer look at Telecom's Table 1 at Figure 3 shows that the market is not competitive in the way Telecom insists. Figure 4 below sets out the same information in Telecom's Table 1, together with some additional information on these services:

Figure 4: Range of Broadband Services in New Zealand Market

Product	Customer type	Technology	Retailer (Wholesaler)	Downchannel	Upchannel	Data Cap (Gbytes)	Example price (excl GST)	Comment
Sub 1 Mbps broadband	Residential	ADSL	Telecom	256 kbps	128 kbps	1	\$44.40	
		Wireless	Watchdog (Wired Country)	256 kbps	128 kbps	1	\$35.51	
		Wireless	Woosh	250 kbps	150 kbps	1	\$35.51	
		Wireless	Iconz (BCL)	256 kbps <sup>33</sup>	128 kbps	1	\$93.33	Covers two voice and one fast internet connection.
		Wireless	ThePacific.net	2 Mbps	2 Mbps	100 MB	\$49.99 <sup>34</sup>	Symmetric
		Satellite	Iconz (IPstar)	256 kbps	256 kbps	1	\$99.00	High CPE (\$2000)/ installation costs (\$500-\$3000)
	Business	ADSL	Telecom	256 kbps	128 kbps	1	\$59.95	
		Wireless	Packing Shed (Wired Country)	256 kbps	256 kbps	2	\$75.00	
		Wireless	Woosh	350 kbps	350 kbps	2	\$99.00	
		Wireless	Iconz (BCL)	256 kbps <sup>35</sup>	128 kbps	1	\$93.33	Covers two voice and one fast internet connection.
		Wireless	ThePacific.net	2 Mbps	2 Mbps	100 MB	\$49.99 <sup>36</sup>	

<sup>33</sup> Burstable to 256 kbps and will never go below 128 kbps.

<sup>34</sup> Website price for the provider's service in this category differs to that in Telecom's Table 1 at Figure 3.

<sup>35</sup> Burstable to 256 kbps and will never go below 128 kbps.

Product	Customer type	Technology	Retailer (Wholesaler)	Downchannel	Upchannel	Data Cap (Gbytes)	Example price (excl GST)	Comment
		Satellite	Iconz (IPstar)	256 kbps	256 kbps	1	\$99.00	High CPE (\$2000)/ installation costs (\$500-\$3000)
Over 1 Mbps broadband	Residential	ADSL	Telecom	1 Mbps	192 kbps	1	\$48.84	
		Wireless	Watchdog (Wired Country)	1 Mbps	512 kbps	2	\$62.18	
		Cable	Paradise	2 Mbps	512 kbps	1	\$35.51	
		Wireless	Inspire.net	1 Mbps	1 Mbps	5	\$100.00	
	Business	ADSL	Telecom	Full speed (2-8 Mbps)	600 kbps	600 MB	\$79.11	
		Wireless & Fibre	Wave (Wired Country)	1 Mbps	1 Mbps	600 MB <sup>37</sup>	\$118 <sup>38</sup>	Price includes some web services.
		Fibre	Actrix (Citylink)	1 Mbps	1 Mbps	1	\$97.73 <sup>39</sup>	
		Wireless	Inspire.net	1 Mbps	1 Mbps	5	\$100.00	Price includes some web services.

78. First, in TelstraClear's view, Telecom's Table 1 incorrectly mixes both symmetrical and asymmetrical services as being in the same market. In the UK, Ofcom has found that demand side factors strongly point to symmetric and asymmetric services being in different retail product markets:

*"Ofcom considers that, in the UK, the evidence on relative costs and results from customer surveys support the finding that asymmetric and symmetric broadband internet access are in separate markets. Ofcom considers that symmetric broadband internet access does not constrain the price of asymmetric broadband internet access and therefore should not be included in the same market. On the demand side, the large difference in relative costs of these two services suggests a similarly large difference in their respective competitive price levels. Hence a 10% rise in the price of*

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<sup>36</sup> Website price for the provider's service in this category differs to that in Telecom's Table 1 at Figure 3.

<sup>37</sup> Data cap applies to international traffic only. No limit on local and national data.

<sup>38</sup> Website price for the provider's service in this category differs to that in Telecom's Table 1.

<sup>39</sup> Website price for the provider's service in this category differs to that in Telecom's Table 1.

*asymmetric services would not result in a sufficient number of its customers switching to symmetric services to make this price rise unprofitable.*

*In addition to the difference in costs of providing asymmetric and symmetric internet access services, they are also likely to be used by different customers for different purposes. For example, asymmetric access may be preferred over symmetric access because the customer does not have high upload requirements and so is unwilling to pay the price premium for symmetric services.”<sup>40</sup>*

79. The price differentials set out in Telecom’s Table 1 would seem to show a similar story in New Zealand. For example, the price of the symmetrical service offered by Actrix over fibre is over 20% higher than the price of Telecom’s asymmetric service, although the downchannel speed of the Telecom service is significantly higher (2-8Mbps compared to 1Mbps). The other major differences between the two services are the slower 600kbps upchannel and lower data usage cap of the Telecom service (600MB vs 5Gbyte).
80. While symmetric networks technically could be used to supply Internet and other IP services also supplied by asymmetric access service suppliers, Ofcom also considered that supply side factors pointed to separate products markets:

*“On the supply side, it is technically feasible for symmetric service providers to offer asymmetric services using their existing infrastructure and existing wholesale product. But it would involve them in using their capacity inefficiently, i.e. offering an asymmetric service over symmetric capacity. This exacerbates the cost disadvantage that symmetric services face relative to asymmetric services. Therefore, such supply is likely to be unprofitable and supply side substitution would not provide a competitive constraint.”<sup>41</sup>*

81. Given the existence of a separate retail product market for asymmetric end-to-

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<sup>40</sup> Review of the Wholesale Broadband Access Markets, Identification and Analysis of Markets, Determination of Market Power and Setting of SMP conditions, Final Explanatory Statement and Notification, 13 May 2004, (Ofcom Broadband Market Review), at paras 2.85 and 2.91.

<sup>41</sup> Ofcom Broadband Market Review, para 2.91.

end broadband services, Ofcom found that it followed there was a separate upstream input market for asymmetric broadband origination. TelstraClear proposes that the Commission should adopt a similar wholesale product market in New Zealand.

82. Second, Telecom's Table 1 further distorts the picture by not accounting for the technologies used to provide particular services and the significant retail price differential that arises from these services i.e. satellite services. As is evident from Table 1 at Figure 3, the retail costs of using satellite services are far higher than that of ADSL or wireless. The Iconz (Ipstar) satellite service retails for \$99 in both the residential and business market in the sub 1Mbps broadband category whilst Telecom's ADSL services in the same categories are priced significantly lower (between 40%-50% lower). Satellite services cannot be considered to be a competitive threat to Telecom on the basis that not only the equipment, but also the installation (depending on the package acquired) is considerably more expensive than any ADSL modem for ADSL services, as illustrated above. The satellite services are also distinguishable in that they are targeted at a particularly niche market such as hotels, clubs or resorts. On this basis, it is TelstraClear's view that satellite services, as depicted in Telecom's Table 1 at Figure 3 only represent a weak competitive threat to Telecom, if at all.<sup>42</sup>
83. Telecom suggests delineating the market along product lines of over and under 1Mbps. TelstraClear does not agree with this subdivision of the market and does not consider it assists in illustrating the competitive nature of the market. TelstraClear considers other critical factors such as data cap capacity or the provision by a third party of additional services such as voice connections further explain the price differential between the Telecom services and those of third parties in Telecom's Table 1 at Figure 3. A comparison of certain services from Telecom's Table 1 illustrates these various points:
- a. Data caps critical to pricing: For example, when you compare the Telecom Business 256/128kbps ADSL service with a **data cap of 1 Gbytes** retailing at \$59.95 with:

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<sup>42</sup> Telecom itself notes that satellite services provide a weak competitive constraint on it: Telecom's Initial Submission, para 128.

- (i) Wireless Woosh service with a **data cap of 2 Gbytes** retailing at \$99.00; or
  - (ii) Packing Shed (Wired Country) service with a **data cap of 2 Gbytes** retailing at \$75.00.
- b. Additional service offerings: The Iconz (BCL) wireless service retails at a higher price as the service offered is a symmetric service (therefore should not be included in the same market) and covers the price of 2 voice connections.

#### 5.4 Customer Markets

84. TelstraClear agrees that there are separate downstream retail residential and business markets for bitstream services. TelstraClear disagrees with Telecom's view that it follows there must be separate wholesale markets for supply of bitstream services for re-supply to residential and business customers.

85. As Ofcom concluded:

*"On the issue of residential and business customers, Ofcom notes that the wholesale market will include both business and residential customers regardless of whether they are in the same or separate markets at the retail level. This is because Ofcom considers that these services currently depend on the same asymmetric broadband origination input such that a common pricing constraint exists between asymmetric broadband origination for business and residential customers at the wholesale level. ... Therefore, Ofcom concludes that residential and business customers are included in the same market at the wholesale level and that there exists a wholesale market for asymmetric broadband origination."*<sup>43</sup>

86. Telecom's primary argument for customer segmentation of the wholesale market is that "broadband services when provided over fixed networks are provided in relation to telephone lines, where the Commission has already accepted that there should be a distinction made between residential and business customers".<sup>44</sup> However, TelstraClear considers that the analogy

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<sup>43</sup> Ofcom Broadband Market Review, paras 2.172 and 2.173.

<sup>44</sup> Telecom's Initial Submission, para 109.

Telecom seeks to draw is not soundly based for the following reasons:

- a. the market for bitstream services is further upstream from end-users than the market for end-to-end resale services, such as resale of local telephony lines. Bitstream is an input to the end-to-end services supplied in the intermediate resale and final retail residential and business markets. A more accurate analogy can be found in the relationship between interconnection and downstream telephony markets. While there are separate retail markets for telephony supplied to business and residential end-users and separate intermediate resale markets reflecting those retail markets, the market in which PSTN interconnection services are supplied is not itself segmented into PSTN interconnection for residential end-users and business end-users. Bitstream is the broadband equivalent of switched origination for PSTN services (and hence Ofcom's description of the product market as "asymmetric broadband origination") and a similar approach should be taken to define the upstream market in which bitstream is traded as being unsegmented by retail customer type; and
  - b. as the downstream broadband services offered by the access seeker must be sold together with a Telecom access line (either by Telecom Retail or as an end-to-end resale service), the differential residential and business pricing continues to apply to the line service. While different market definitions apply, this reflects the different character of the bitstream service as an input or component of a final service and the line service as a rebadged final service.
87. TelstraClear further understands that BCL, as another provider of wholesale services in the market, does not price its services to wholesale customers on the basis of a downstream business/residential customer split.
88. For these reasons, TelstraClear considers Telecom's subdivision of the market into residential and business is, in theory and practice, not relevant to the competition argument.

## **5.5 Geographic Markets and Limited Competition**

89. Telecom's views about sub-national markets and limited competition are intertwined because Telecom believes that the presence of a single alternative network both triggers a separate market and requires a finding that Telecom no longer faces competition in that market. Accordingly, TelstraClear will

address these issues together.

90. TelstraClear agrees with Telecom's view that the market analysis adopted in the Unbundling Report does not bind the Commission in this determination because "[a] market analysis to determine whether Telecom should be required to wholesale a service in a particular market is a quite different task to the market analysis required to be undertaken in a context such as the [Unbundling] Report where the Commission was considering whether a recommendation [for designation] should be made ...".<sup>45</sup>
91. One of the biggest differences between the two exercises is the timeframe over which the market developments are analysed. The Commission considered market developments over a 5 year timeframe in the Unbundling Report, but the timeframe to be used for the purposes of this determination is much shorter and more immediate, being the next 12-18 months. The Commission might reach the view that within the next 5 years, given future market trends and technological developments, separate competitive sub-national markets for asymmetric broadband services will emerge, but that as competition from alternative providers is currently nascent, separate geographic markets have not yet emerged or if they have, that Telecom still faces limited competition in all of them.
92. This is consistent with the approach that Ofcom took in the UK. While Ofcom found that currently there were national retail markets for asymmetric broadband services in the UK, it did acknowledge that this could change in the future as competition in localised areas gained greater traction:

*"Given that competition is continuing to develop and that this development is not uniform across geographic areas, it could be expected that operators' pricing policies might change resulting in divergence of pricing on a geographic basis to reflect the differing levels of competition. However, it is far from certain that this will happen within the timeframe of this market review and it would be premature of Ofcom to define local*

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<sup>45</sup> Telecom's Initial Submission, para 57(c)(i).

*geographic markets faced with this lack of definitive evidence that such markets exist.”<sup>46</sup>*

93. Ofcom found that national markets existed in the UK although BT had lower market share in the pockets of localised competition than TelstraClear believes Telecom has in the 4 URSA<sup>47</sup> referred to in TelstraClear’s Initial Submission and in the other areas in which Telecom says competing networks have been deployed:<sup>48</sup>
- a. in areas where cable networks had been deployed, BT’s ADSL service only accounted for 32% of broadband customers while cable operators’ accounted for 68%. TelstraClear believes that Telecom has a market share of more than 70% of broadband customers in Wellington and Christchurch; and
  - b. BT’s market share on a national basis was 60% while the cable operators accounted for 39% of all asymmetric broadband services. TelstraClear believes Telecom’s national market share is above 95%.
94. The market and the actions of the operators in the New Zealand market, in TelstraClear’s view, clearly indicate a national market. If the areas of head to head competition were separate markets, differential regional pricing would be expected based on the intensity of competition in that geographic area compared to other geographic areas with fewer competitors. However, in TelstraClear’s view this is not the case, for various reasons:
- a. Telecom is engaging in uniform national pricing. This is supported by the recent price reduction by Telecom of its XTRA Wireless service (from \$109.95 to \$59.95 (for XW 1000)) to align its rural pricing for wireless services with the pricing for DSL services;<sup>49</sup>

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<sup>46</sup> Ofcom Broadband Market Review, para 2.117. The Ofcom analysis covered an 18-24 month period.

<sup>47</sup> The 4 URSA<sup>s</sup> are Auckland Central, Eastern, Counties and Wellington Central.

<sup>48</sup> Market shares assessed at the wholesale level for both BT and Telecom.

<sup>49</sup> Telecom media release dated 4 June 2004 “Broadband more accessible than ever” ([http://www.telecom-media.co.nz/releases\\_detail.asp?id=3042&page=index](http://www.telecom-media.co.nz/releases_detail.asp?id=3042&page=index)).

- b. Entrants, such as TelstraClear, which have networks in pockets across the country still price on a uniform national basis;<sup>50</sup>
- c. Where competitors are head-to-head in the same or even different markets, there is no difference in price based on geographic presence. An example of this taken from Telecom's Table 1 is the parallel between the Wireless Watchdog service offered in the regions of Auckland, Pukekohe and Hamilton priced at \$35.51 and Woosh wireless service offered in Greater Auckland, Metro Wellington and Christchurch, also priced at \$35.51; and
- d. In markets where 1, 2 or 3 operators are present, retail prices are the same.

95. Figure 5 below sets out the broad geographic regions addressed by the suppliers in Table 1 of Telecom's submission. All suppliers listed offer standard prices across all geographic regions that they address.<sup>51</sup>

Figure 5: Standard price usage by Suppliers Across Broad Geographic Region

	Telecom	Iconz (IPStar)	Iconz (BCL)	Woosh	Watchdog (Wired Country)	Actrix (Citylink)	Paradise (TCL)	Packing Shed (Wired Country)	Wave (Wired Country)	ThePacifi c.Net	Inspire. net
Auckland CBD	Y	Y		Y	Y	Y					
Auckland South	Y	Y	Y								
Bay of Plenty	Y	Y	Y								
Christchurch/ Canterbury	Y	Y	Y	Y			Y				
Counties	Y	Y			Y			Y	Y		
Franklin	Y	Y	Y								
Hamilton/ Waikato	Y	Y	Y		Y			Y	Y		
Invercargill/ Southland	Y	Y	Y	Y							
Kapiti	Y	Y					Y				
Manawatu	Y	Y	Y								
Nelson	Y	Y								Y	
Northland	Y	Y	Y								

<sup>50</sup> This was a factor in Ofcom's decision that the market was a national market: Ofcom Broadband Market Review, para 2.116. Ofcom Broadband Market Review, para 1.20.

<sup>51</sup> As noted above, TelstraClear does not believe that all these suppliers are within the same market.

	Telecom	Iconz (IPStar)	Iconz (BCL)	Woosh	Watchdog (Wired Country)	Actrix (Citylink)	Paradise (TCL)	Packing Shed (Wired Country)	Wave (Wired Country)	ThePacifi c.Net	Inspire. net
Otago	Y	Y	Y								
Palmerston North	Y	Y									Y
Taranaki	Y	Y	Y								
Wairarapa	Y	Y	Y								
Wellington CBD	Y	Y		Y		Y	Y				
Westport	Y	Y								Y	
Other	Y										
All prices are standard across geographic regions addressed by broadband suppliers.											

96. In any event, the networks identified in Telecom’s Table 1 are either not relevant to the retail markets for asymmetric broadband services or provide only a weak competitive constraint on Telecom. In relation to wireless networks, the Commission concluded in the Unbundling Report that “FWA technology is unlikely to represent a sufficient competitive constraint on Telecom in terms of customer access during the next five years, the period under consideration”.<sup>52</sup> The Commission’s view was based not only on the immature state of competition from fixed wireless operators, but also on the ongoing cost advantages that Telecom would derive from provision of broadband services over its ubiquitous copper network:

*“... going forward, the sunk costs of Telecom’s fixed access network should not affect its pricing decisions in terms of any response to emerging competitive infrastructure such as FWA. Given the existence of Telecom’s copper loops, it is likely that pricing that access down towards marginal cost will ensure that fixed access will retain a cost advantage over FWA.”<sup>53</sup>*

97. Ofcom reached a similar view about the limited competitive constraints which fixed wireless had on BT’s provision of asymmetric broadband services:

*“The main alternative technologies (to ADSL and cable modems) capable of providing asymmetric broadband origination, including fixed wireless access, and satellite, tend to be broadband specific access technologies, i.e. they are not based on the broadband enabling of an existing narrowband*

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<sup>52</sup> Unbundling Report, para 411.

<sup>53</sup> Unbundling Report, para 384.

*platform ... These technologies require the creation of new (broadband) access methods. As such they do not need to incur the broadband enabling costs associated with DSLAMs or cable modems. However, these operators will need to make considerable sunk investments in the development of these technologies, and the building of the access and backhaul networks... BT is able to benefit from considerable economies of scale that will not be available to many new operators. In particular, large economies of scale are present in both the DSLAM and backhaul elements of asymmetric broadband origination services. These scale economies are due to the nature of DSLAM and backhaul investments. For example, this means that the greater number of end users at the concentrator level the lower the unit costs per line. The concentrator level supports only a finite number of customers, only a proportion of whom may be broadband customers. Thus a supplier of broadband services would need to secure a significant number of the broadband customers in order to achieve low and efficient unit cost per line. This effect acts to create a further entry barrier into the market for new Altnets [facilities based entrants] ...”<sup>54</sup>*

98. If the Commission considered that fixed wireless will not be a sufficient competitive constraint on Telecom over the next five years, it follows that fixed wireless is even less likely to justify a conclusion that Telecom no longer faces limited competition over the next 12-18 months. This is borne out by the Commission’s analysis of Telecom’s initial competitive response to the entry of competing fixed wireless providers:

*“the emergence of two FWA platforms does not appear to have initiated a significant competitive reaction from Telecom. This is compared to its previous response to local fixed access network competition, for example in Wellington and Christchurch.”<sup>55</sup>*

99. Telecom asserts that “the broadband market available today is quite different to that of 12-18 months ago”.<sup>56</sup> However, notwithstanding Telecom’s claims about the entry and expansion of competition from wireless operators in some regions of New Zealand, Telecom continues to price on a nationwide

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<sup>54</sup> Ofcom Broadband Market Review, paras 3.58 and 3.61.

<sup>55</sup> Unbundling Report, para 396.

<sup>56</sup> Telecom’s Initial Submission, para 116.

basis.

100. Telecom seeks to explain away this mismatch between its uniform national pricing and competition in limited geographic pockets on the basis of the non-geographic nature of wireless competitors.<sup>57</sup> The edges of radio cells may be less delineated than the edges of fixed networks. The “fuzzy” zone may be between a couple of hundred meters up to a kilometer or so and even within this “fuzzy” zone there may be additional impediments preventing the customer from receiving the service such as line of sight limitations e.g. buildings obscuring a base station antenna. However, the deployment of wireless operators in isolated “fuzzy edged” pockets across New Zealand does not explain national pricing by Telecom or make for a national market. Further, as the Commission has noted, Telecom has been able to price at a street-by-street level in the past and if it considered that there were sub-national markets matching the deployment areas of competing wireless networks, it would have little difficulty mapping out differential pricing zones in its network, including covering the “fuzzy” boundaries of wireless networks.<sup>58</sup>
101. The Commission’s assessment in the Unbundling Report that the 5 Auckland-Wellington ESAs should be treated as competitive was based on the concentration of fixed networks in those ESAs, not on the presence of wireless networks (which, in effect, the Commission discounted for the reasons set out above). These alternative fixed networks were designed and are primarily used to supply higher bandwidth, symmetrical data services (and switched voice telephony). The Commission noted these networks were “based around fibre and HFC access”.<sup>59</sup>
102. The presence of these alternative fixed networks might well have been relevant to the decision on whether to designate LLU because the copper connection could be used to supply symmetric services (e.g. SHDSL such as offered by Request DSL in Australia). However, as Ofcom found in the UK, these alternative networks have limited relevance to competition in

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<sup>57</sup> Telecom’s Initial Submission, para 143.

<sup>58</sup> After all, Telecom draws “network stretch” boundaries around competitor fixed networks which involve a degree of “fuzziness” at the outer boundaries of the geographic markets.

<sup>59</sup> Unbundling Report, para 431.

asymmetric services, which are targeted at residential and SME customers.<sup>60</sup> Even if symmetric networks technically can be used to provide asymmetric services, revenues generated from those lower priced asymmetric services are unlikely to justify the higher connection costs associated with the local infrastructure required to connect symmetric networks.

103. The customer profiles presented in TelstraClear's Initial Submission show that there is a high proportion of residential and SME customers in those ESAs areas where alternative networks have been deployed (the 5 Auckland-Wellington ESAs):
- a. TelstraClear estimates that over 70% of the buildings in the 5 Auckland-Wellington ESAs (with the exception of Mt Wellington); and
  - b. 66% of all commercial buildings in the 5 Auckland-Wellington ESAs, are occupied solely by SMEs or small branches of corporate customers.
104. This customer profile suggests that the existence of alternative fixed networks may not be relevant to the assessment of market competition in asymmetric services in the 5 Auckland-Wellington ESAs and, even more so, in the URSAs which incorporate them.
105. Finally, even if the Commission does decide to adopt sub-national markets, it does not follow, as Telecom asserts, that a sub-national market should be treated as competitive if end-users "have a choice of at least one other broadband network".<sup>61</sup> The Commission in its Unbundling Report noted that while alternative networks had been deployed in other areas, it was "the concentration of network competition in the main CBDs, where up to 4 competing fixed networks have been deployed",<sup>62</sup> which formed the basis of the Commission's decision that the 5 Auckland-Wellington ESAs would be competitive over the 5 year time horizon.
106. The Commission has never endorsed Telecom's argument that "Telecom plus

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<sup>60</sup> In its market analysis, Ofcom disregarded the competitive impact of LLU operators "because LLU operators do not provide a significant competitive constraint in the provision of broadband services". Ofcom Broadband Market Review, para 3.41. Ofcom noted that LLU was mainly used to deliver higher speed, symmetrical services.

<sup>61</sup> Telecom's Initial Submission, para 25.

<sup>62</sup> Unbundling Report, para 419.

one” constitutes “enough competition” to withdraw regulation. Other regulators, such as the FCC<sup>63</sup> in the US and OFTA<sup>64</sup> in Hong Kong, have required, at a minimum, the presence of the “incumbent plus two” connecting a building before regulated access in respect of that building is withdrawn. The ACCC noted the presence of 7 to 10 alternative networks, in major CBDs in Australia which were in addition to the continued availability of LLU, in reaching its decision to withdraw local services resale in those CBDs.<sup>65</sup> A decision not to impose some form of regulated access because of the presence somewhere in the same geographic region of just one competing network would be without precedent.

## 5.6 Relationship between Resale, Bitstream and Market Assessment

107. Telecom argues that the Commission should take into account Telecom’s commercial UBS service when assessing Telecom’s market power.<sup>66</sup>
108. However, as Ofcom has pointed out, the incumbent’s wholesale offerings logically should not be taken into account in defining markets and market power for the purposes of deciding whether the incumbent should be required to supply wholesale products:

*“The purpose of Ofcom’s market definition exercise is to inform its assessment of market power and identify appropriate remedies in the relevant market. It is therefore important that, at the wholesale level, markets are defined using the assumption that there is no regulation in any market. This approach ensures that the assessment of market power at the wholesale level does not depend on a retail market definition that is influenced by wholesale remedies. The method avoids the potential problem of circularity which could arise in market definition.”<sup>67</sup>*

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<sup>63</sup> Federal Communications Commission, Report and Order and Order on Remand and Further Notice of Proposed Rulemaking, *Review of the Section 251 Unbundling Obligations of Incumbent Local Exchange Carriers*, CC Docket Nos. 01-338 et al., FCC 03-36, 18 FCC Rcd 16978 (Aug. 21, 2003) (“Order”).

<sup>64</sup> Statement of Telecommunications Authority “Review of Type II Interconnection Policy”, 6 July 2004.

<sup>65</sup> Future scope of the Local Carriage Service, Final Decision, July 2002, pages 25-26.

<sup>66</sup> Telecom’s Initial Submission, para 103.

<sup>67</sup> Leased Lines Market Review, at paragraph 2.15. Ofcom went on to say that, for the purposes of deciding whether retail regulation was needed in addition to wholesale regulation, “the market definition used in any assessment of market power in downstream markets must be

109. Ofcom, therefore, considered that its market power assessment must be made on the basis that BT, and its facilities based competitors, compete on a vertically integrated basis. Ofcom dismissed BT's argument that wholesale services which BT decides to offer commercially should not be disregarded, because Ofcom considered that the threat of regulation is usually a key motivating factor in BT's decision to make wholesale services available commercially:

*"In the absence of regulation, it is quite possible that a wholesale product would not be made available at all ... it is true that BT had provided a DataStream service prior to the ATM Direction that required BT to provide a new version of this product on a non-discriminatory basis. Thus, it might be argued that in the absence of regulation, a wholesale product would have been provided. However, in such a scenario, BT would have no obligation to continue to make such a product available or to ensure that it was commercially viable. Moreover, it is unclear whether BT would have made such a wholesale product available in the absence of the potential for a regulatory obligation being imposed on it. For both of these reasons, it would be inappropriate to conduct the market analysis on the assumption that BT would provide a viable wholesale product in the absence of regulation."*<sup>68</sup>

110. Any competitive constraint from regulated resale Jetstream services or Telecom's commercial UBS service also occurs in markets that are downstream from the wholesale market in which bitstream is supplied. There is still no entry, and therefore no competitive constraint on Telecom, in that crucial upstream market. In the absence of upstream access regulation, Telecom continues to control the downstream market. As Ofcom commented:

*"In response to the December consultation, BT argues that there are many sources of entry into the market. BT identifies amongst other things, competition developing downstream from service providers who might integrate higher in the supply chain through commercial relationships with*

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concluded in the presence of any proposed regulation in markets that are further upstream, since the presence of any such regulation may provide a constraint at the retail level by removing barriers to entry". New Zealand, of course, only has wholesale and resale regulation and so this next step in Ofcom's analysis is not relevant to New Zealand.

<sup>68</sup>

Ofcom Broadband Market Review, para 2.147.

*Altnets or by creating a new service. However, Ofcom believes that this does not show that there is competitive entry at the wholesale level. Commercial relationships with Altnets are reliant on the Altnets being able to access relevant wholesale products from BT. In addition, creating a new service is reliant on the use made of existing wholesale broadband inputs. Neither of these show that competitive entry is occurring in broadband origination. In fact it seems to suggest that Altnets will be able to compete for ISP business and new products will be able to be created wholly or mainly because of the existence of wholesale broadband access products.”<sup>69</sup>*

111. Accordingly, the Commission should disregard the availability and take up of resale Jetstream and commercial UBS services in its market analysis.

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<sup>69</sup> Ofcom Broadband Market Review, para 3.53.

## 6. PRICE TERMS

### 6.1 Telecom's Pricing Tight Link

112. Telecom asserts that there should be a “tight link” between retail and wholesale prices”.<sup>70</sup> As discussed in Part 3 of this submission, Telecom’s argument is inconsistent with the nature and purpose of the designated bitstream access service set out in the Act.

113. While all of the retail-minus designated services may start with a retail price, it does not follow that if a “tight link” is required for some designated services it is necessarily required for all of them. Figure 6 compares the “tightness of the link” between the designated service and the pricing principles:

- a. the link is tightest in relation to the price-capped residential local access and calling services: the designated service and the service which provides the retail prices used to calculate the wholesale price are the same end-to-end services and the baseline retail price used to calculate the discount is an actual or “real world” retail price offered in the market for the designated service;
- b. non-price capped retail services involve a “loosening” of the “tight link” because, while the retail service and the wholesale service are still the same end-to-end service, the baseline retail price does not have to be an actual Telecom retail price but can be an average of actual prices;
- c. the “tight link” loosens further when moving to the designated retail services offered as part of a bundle. While the designated service is still an end-to-end retail service, the retail price is imputed from the retail pricing for an entirely different product, being the bundle. Hence, the need to impute a retail price which is not an actual price; and
- d. the pricing principles for the bitstream service involves yet further steps away from the “tight link” applied to the pure resale services: the baseline price is not only derived from a retail price for a different service than the designated service (the same for the designated retail

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<sup>70</sup> Telecom’s Initial Submission, para 188.

service offered as part of a bundle ), but the service providing the retail prices is an end-to-end service while the designated service is only a component of an end-to-end service and with a set of technical parameters defined independently of the retail service (unlike in the case of the designated retail services offered as part of a bundle).

Figure 6: Designated Services and Pricing Principles: The “tightness of the Link”

Designated service	Base retail price for wholesale discount	Is the designated service a retail service?	Is the service providing the retail prices the same as the designated service?	Is the baseline price an actual retail price?
Price capped residential local access and calling service	“standard price”	Yes	Yes	Yes
Non-price capped retail services	IPP: “retail prices” FPP: “average or best retail price”	Yes	Yes	Average of actual retail prices.
Retail services offered as part of a bundle	“imputed price”	Yes	No	No. But imputed price is based on bundled retail price relative to total retail price of services offered separately.
Bitstream	“imputed price”	No	No	No. Retail price is price of a comparable retail service.

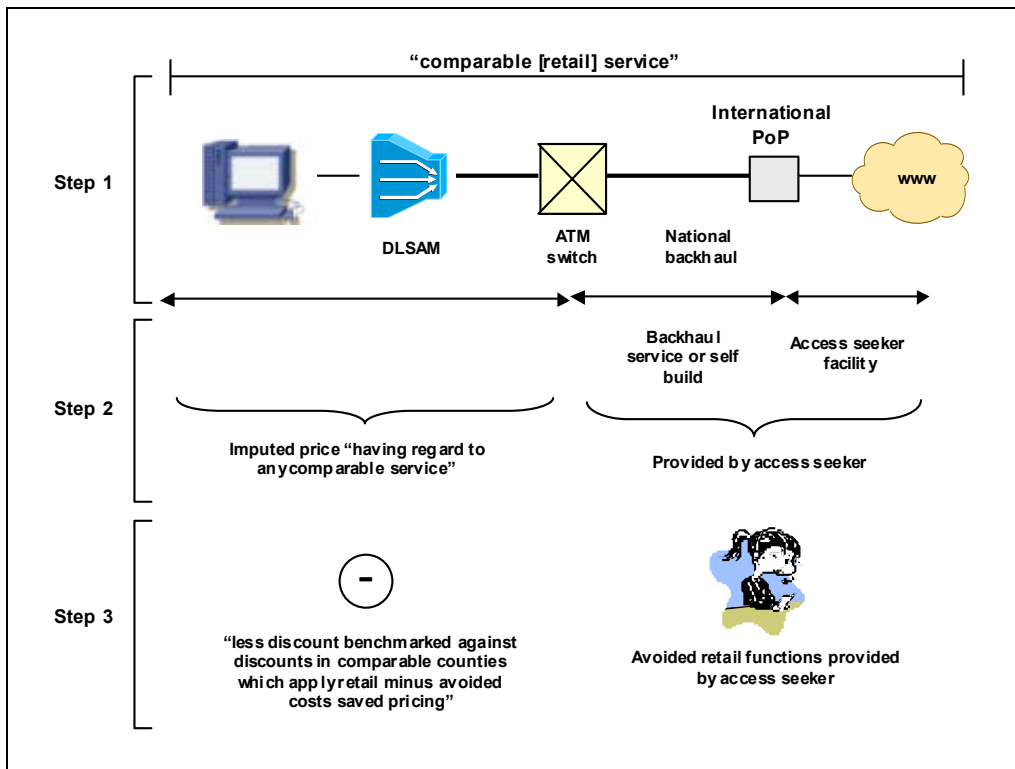
114. Thus, while the wholesale bitstream price might be derived from a retail price, there are too many steps involved in deriving that price to say, as Telecom does, that a “tight link” exists between the retail price and the wholesale price.

## 6.2 The Appropriate Approach to Calculating the Initial Price

115. To derive the wholesale bitstream price, the Commission needs to do two separate things:
- a. as the retail prices are for an end to end service and the wholesale price is for an unbundled component of the retail service, the wholesale pricing has to “back out” the retail pricing which is attributable to the components of the retail service not included in the wholesale access service; and

- b. the wholesale pricing also has to exclude the costs of the avoided retail functions in respect of those components of the retail service that do match the unbundled wholesale access service.
116. The wholesale price could conceivably be calculated in one of two ways:
- a. the retail price of a retail Jetstream service could be “broken down” to derive an imputed retail price for the components of the retail service which form part of the wholesale bitstream service. This would allow an “apples with apples” comparison from which the avoided retail costs could be subtracted using international benchmarking of discounts for such costs; or
  - b. overseas wholesale prices for the unbundled bitstream service could be calculated as a discount off the overseas retail prices for the end to end retail DSL services, on the basis that this “apples with oranges” comparison would capture both deductions outlined in paragraph 113.
117. The key difference between these two approaches is that the former “backs out” the components of the retail service not part of the wholesale service before applying the benchmarking while the latter counts on that being done as part of the benchmarking.
118. The Commission’s preliminary view on the approach to calculating the initial price follows the first approach outlined above. TelstraClear agrees that this approach is both the most consistent with the IPP and the most practical.
119. First, on its literal wording, the IPP requires the retail price to be imputed before the benchmarking, and not as part of it. The retail price against which the benchmark discount is applied is **not** the retail price of the comparable retail service but the price imputed having regard to the retail price of the comparable service. The purpose, of course, of imputing a price having regard to the comparable service is to produce a retail level price for that part of the retail service which is comparable to the wholesale service: that is, to align the Telecom retail price to an “apples with apples” comparison before proceeding to the benchmarking. Figure 7 depicts how TelstraClear believes the IPP should be interpreted and applied.

Figure 7:



120. Second, treating the components of the retail service that are not part of the wholesale service as an avoidable cost would distort the wholesale price. The proportion of Telecom’s retail pricing that is fairly attributable to the components not included in the wholesale service is likely to be substantially above cost, particularly given the limited competition Telecom has faced to date. Subtracting the components not included in the wholesale service based only on the costs Telecom avoids would, in effect, shift the excess rents for the whole of the end to end retail Jetstream services onto the components which are part of the wholesale service. This will limit the scope for entrants to compete out those excess rents since they will have to “make up” the loading of excess rents attributable to the components that they are substituting. The wholesale pricing for bitstream will embed the same excess rents as the resale product but on “half” the retail-equivalent service.
121. Third, there appear to be practical difficulties in using international benchmarking to subtract both the components not included in the wholesale product and its avoidable costs. As noted in TelstraClear’s Initial Submission, TelstraClear engaged Network Strategies to examine the feasibility of this form of benchmarking. Two elements are involved in such an approach:

- a. identify overseas retail DSL and bitstream products which are sufficiently comparable to the New Zealand retail products and the Commission's bitstream service description; and
  - b. calculate discounts by comparing overseas bitstream pricing against retail DSL pricing.
122. Our study encountered the following challenges with this approach to benchmarking:
- a. overseas retail DSL services differ significantly from each other and Telecom retail Jetstream services. A number of countries have retail services offering faster downchannel speeds and, in particular, no or higher data usage caps;
  - b. there tends not to be a "tight link" overseas between retail DSL and wholesale bitstream services. In many countries, the upchannel and downchannel speeds do not match and access seekers have significant scope to determine different service characteristics of the wholesale service, such as through selecting the capacity of the link between the DSLAM and the first ATM;
  - c. the higher downchannel bitstream services overseas tend to have upchannel speeds which are substantially higher than the 128kbps maximum under the Commission's bitstream service description; and
  - d. some countries do not apply a retail minus approach to bitstream.
123. As TelstraClear considers the Commission's preliminary view is the more appropriate approach, we have not progressed this benchmarking exercise any further.

### **6.3 Commission's Preliminary View**

124. The Commission set out its preliminary view as to the interpretation and application of the IPP for the bitstream access designated service in a letter to the parties to this determination on 18 January 2005. TelstraClear broadly agrees with this approach, subject to the following comments.

#### ***Comparable Services***

125. The comparable retail Jetstream services should only be those services with an upchannel speed of 128kbps. Otherwise, retail pricing of Jetstream services

with higher upchannels will need to be adjusted to impute a price which is comparable with the bitstream access service.

### ***Tolls Discount***

126. TelstraClear agrees with the Commission's suggested approach that a standalone Jetstream retail price should be derived from Telecom's retail Jetstream packages. Telecom's residential packages include a \$10 discount if the customer also purchases Telecom home line and calling services.

### ***ISP Charge***

127. TelstraClear agrees with the deduction of the component of the retail price for ISP charges, but believes that the \$10 retail price Telecom charges for the residential XTRA Internet service does not fully reflect the costs and value of the Internet service. A greater proportion of the total price for Jetstream and XTRA should be allocated to XTRA. As the IPP provides that the Commission is to impute a price, the Commission is not bound by the \$10 figure Telecom puts on the residential XTRA service.
128. TelstraClear notes that the Commission is currently investigating complaints from ISPs that they face a price squeeze from Telecom pricing. TelstraClear believes that the Commission should not accept the \$10 charge without further supporting data from Telecom, and reviewed by the industry, justifying that price.

### ***Data Usage Caps***

129. TelstraClear endorses the Commission's approach of comparing pricing of services with and without data caps in order to "back out" from the retail price the international and national capacity not included in the bitstream access service. Telecom's own data from Telecom's Table 1 of its Initial Submission (replicated in Figure 3) is consistent with the Commission's methodology.
130. In the sub 1Mbps 'Business' category, the retail pricing is also consistent with the Commission's approach. For example, the Telecom 256kbps service with a data cap of 1 Mbps at a price of \$59.95 is cheaper than the Packing Shed

256kbps service with a data cap of 2Gbytes at \$75.00.<sup>71</sup>

131. In the over 1 Mbps 'Residential' category, the retail pricing is also consistent with the Commission's approach, with both Watchdog and Inspire.net having higher data caps and higher prices than the Telecom service listed in this category. In the over 1 Mbps Business category, Inspire.net, with a data cap capacity of 5Gbytes at a price of \$100 (further distinguished as a symmetrical fibre service) is significantly more expensive than the Telecom full speed service with a 600MB data cap at \$79.11. This example (and in fact, Telecom's Table 1 as a whole) suggests that the data usage caps may have a greater influence on retail price than the downchannel speed.

### ***Averaging Retail and Business Imputed Prices***

132. TelstraClear disagrees with the Commission's proposal to separately calculate an imputed price for residential and business Jetstream services and then to average those prices to produce a single baseline price against which to apply the wholesale discount.
133. If the Telecom residential and business Jetstream services are technically equivalent (we have no information suggesting otherwise), any differential downstream retail pricing by Telecom between customer segments reflects its retail pricing strategy. Competitors might well take a different approach to the pricing relativities between business and residential services, preferring to structure their charges around other criteria, applied consistently across all end-user groups, such as downstream and upstream speed or data caps. For example, as set out in Table 1 in Telecom's Initial Submission<sup>72</sup>, Inspire.net charges \$99 to both business and residential users for its 1Mbps service with a 5Gbyte data cap.
134. Averaging the higher business charges with the lower retail charges will reduce competitors' margins in supplying residential services. Figures 8, 9 and

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<sup>71</sup> Other services in Telecom's Table 1 with low data caps, such as Iconz (IPstar) satellite service, Pacific.net and BCL, but with higher retail prices may be distinguished from the above examples based upon the technology used to provide the service (such as expensive satellite equipment and installation fees) or the provision of additional services such as extra voice connections with the primary service. Higher costs reflect the technology used to provide symmetric service plus the additional 2 voice connections.

<sup>72</sup> See Figure 3 above.

10 provide simplified examples calculating a wholesale price using the Commission's averaging approach and separately based on residential Jetstream pricing only (as TelstraClear proposed in its Initial Submission) and on business Jetstream pricing (which as discussed below may be appropriate if it turns out that there are differences in the service parameters between business and residential Jetstream services).

Figure 8: Imputed from Residential Jetstream Price

Price Elements	Deductions	Imputed Price
Jetstream Go 1GB 256/128 kbps (incl GST)		\$49.95 <sup>73</sup>
<b>Retail Deductions</b>		
Tolls Discount	\$10	\$39.95
Xtra ISP	\$10	\$29.95
Traffic Usage Charges (est. via comparison with Jetstream Explorer 3GB 256/128kbps plans)	\$5	\$24.95
Less GST	\$2.77	\$22.18
<b>Avoidable Costs</b>		
Avoidable Retail Costs (marketing/sales/bad debt/customer support)	16%	<b>\$18.63</b>

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<sup>73</sup> Note that whilst for the purposes of the above analysis TelstraClear has used Telecom's current published monthly retail price as a starting point, this starting point needs to be adjusted to take account of discounts to the published price provided by Telecom to its end use customers. This is further discussed in paragraph 142 of this submission.

Figure 9: Imputed from Business Jetstream Price

Price Elements	Deductions	Imputed Price
Venture 1GB 256/128 kbps (excl GST)		\$59.95 <sup>74</sup>
<b>Retail Deductions</b>		
Tolls Discount		N/A
Xtra ISP	\$8.89	\$51.06
Traffic Usage Charges (est. via comparison with Venture 3GB 256/128kbps plans)	\$10	\$41.06
Less GST		N/A
<b>Avoidable Costs</b>		
Avoidable Retail Costs (marketing/sales/bad debt/customer support)	16%	<b>\$34.49</b>

Figure 10: Imputed from Weighted Average Jetstream Prices

Price Element	Deductions	Imputed Price
Assumed res weighting	50%	
Assumed bus weighting	50%	
Weighted average price		\$31.62
<b>Avoidable Costs</b>		
Avoidable Retail Costs (marketing/sales/bad debt/customer support)	16%	<b>\$26.56</b>

135. Using the Commission's averaging approach, the wholesale price is an effective discount of 57% off the retail business Jetstream price but only 35% off the retail residential Jetstream price (less tolls). If the wholesale price is calculated using the residential Jetstream pricing, as TelstraClear proposes, the discount off retail Jetstream pricing is 54%.

136. As a result, TelstraClear considers that the Commission's proposed averaging

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<sup>74</sup> Refer previous footnote.

approach is likely to skew access seekers' focus towards SME customers because they will be more profitable.

137. Alternatively, Telecom's differential residential and business retail pricing might well reflect underlying differences in the service levels and service quality of the Jetstream services targeted at those market sectors. As the speeds and data caps are similar between Telecom residential and business services, it is likely that the main service difference would be in the contention ratios. Residential Jetstream services may have a higher contention ratio, such as 50:1, and therefore a lower service quality than business Jetstream services which may have, for example, a contention ratio of 20:1.
138. If the Telecom residential and business retail Jetstream pricing does reflect such differences in the service parameters, TelstraClear believes that the appropriate approach would be to provide for separate wholesale products with wholesale pricing imputed having regard to the relevant residential or business retail price. Consistent with those products being wholesale inputs to the downstream retail markets, access seekers should be able to supply either wholesale product into either retail market: that is, an access seeker should be able to supply a bitstream service with the lower contention ratio to residential end-users or a bitstream service with the higher contention ratio to business end-users. This would be a decision by the access seekers trading off wholesale price against service quality.
139. In the UK, access seekers are able to determine their own contention ratios for downstream services supplied to residential and business customers. There are 3 wholesale end-user options: 576kbps, 1152Mbits and 2272Mbits per second, all with an 288kbps upchannel. The access seeker then selects the size of virtual pathway between the DSLAM and the ATM switch, which then drives the contention ratio of its services. BT pricing varies by the size of virtual pathway selected by the access seeker and by this means, the access seeker pays a higher wholesale price for a lower contention ratio. There are no end-user restrictions in the BT wholesale terms aligning contention ratios of wholesale services to downstream retail segments.<sup>75</sup>

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<sup>75</sup> In its imputation modelling, Ofcom separately modelled wholesale pricing of services with a contention ratio of 50:1 and 20:1. Ofcom described the 50:1 services as "Home" and 20:1

140. TelstraClear believes that the UK virtual path approach is preferable because it provides greater scope for innovation and competition. However, during the initial stages of implementing bitstream, TelstraClear proposes taking the simpler approach of establishing separate wholesale services that mirror the contention ratios of the Telecom residential and business services (assuming this is the explanation for the price differences).

### ***Avoided Costs Saved Benchmark Value***

141. The Commission has indicated that it plans to use previous avoided costs saved reports as set out in Decisions 497 and 525 to deduct the avoided costs saved. TelstraClear considers that the 16% discount used in those decisions was too conservative and based on a low 25<sup>th</sup> percentile benchmark value.

### ***Adjustment Mechanism***

142. As the retail prices of the comparable services can be expected to change, particularly as competition increases as a result of the bitstream access service, the wholesale price will need to be correspondingly adjusted. Telecom also may be offering a range of prices for the comparable services, which represent discounts to the published price, or may waive certain charges, such that the published price is not the “true” price for the comparable service. TelstraClear proposed in its Initial Submission<sup>76</sup> that the Commission use the best (lowest) retail price offered in each three month period as the baseline retail price for the calculation of the wholesale connection charge. TelstraClear proposes that the Commission take a similar approach to the calculation of the monthly charge for the comparable service as this is the most straightforward approach and best protects access seekers against a price squeeze. If the Commission decides to use the Average Modal Price (AMP) methodology developed for resale services, the AMP methodology will need to be modified for this purpose. For example, if the service identified as the comparable service has a range of pricing options<sup>77</sup>, the AMP calculation for resale services would treat each of these options as a separate “service” and calculate a separate resale price, whereas the calculation of the starting retail

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services as “Office”, but only to reflect its assessment of the primary customer target for the services and not as a regulatory restriction on supply.

<sup>76</sup> TelstraClear’s Initial Submission, para 150.

<sup>77</sup> Pricing options include “no strings” pricing and different pricing for various contract terms.

price for the bitstream access service would seem to require a single retail price to be calculated from these pricing options, such as by using a weighted average approach. The Commission also will need to consider procedures to deal with the withdrawal and replacement of comparable services and safeguards to address the risks of gaming, such as if Telecom were to introduce a new retail service with more favorable pricing while formally leaving the comparable service in an attempt to avoid the new service providing the starting price for calculating the bitstream access service price.

#### **6.4 “Costs uniquely incurred”**

143. In Telecom’s Initial Submission, Telecom argues that:

*“... costs uniquely incurred to meet TelstraClear’s unique requests should be borne by TelstraClear and, where appropriate, these should be priced on a retail minus basis.”<sup>78</sup>*

144. TelstraClear reiterates the views set out in its Initial Submission that the statutory definition of avoidable costs expressly provides that wholesale supply is common to the factual (mixed retail and wholesale supply) and the counterfactual (wholesale supply) and, therefore, the costs of wholesale should not offset the avoidable cost discount. This approach is consistent with:

- a. the commercial benefit Telecom derives from wholesale supply. These benefits include not only the commercial wholesale margins implicit in a retail minus approach, but the reduced risks from multiple supply channels and greater economies of scale Telecom realises;
- b. the benefits which all consumers, including Telecom’s own end-users, derive from more intensive competition which results from bitstream access services; and
- c. the objects of the Act by safeguarding against Telecom raising its rivals’ costs of business through high cost wholesale systems. If Telecom bears its own costs of wholesale systems, it has an incentive to deploy more efficient systems.

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<sup>78</sup> Telecom’s Initial Submission, para 42.

## 6.5 Reassignment and other support service charges

145. Telecom argues that TelstraClear’s proposal to take a cost-based approach to reassignment charges while new connection charges are set on a retail minus basis is inconsistent. TelstraClear considers its approach to be consistent with the IPP and Commerce Commission Decisions 497 and 525.
146. First, reassignment between Telecom Retail and an access seeker is not a process with a comparable retail function, unlike new connection of a bitstream access service which is a comparable process to retail. Reassignment is necessary to support resupply to retail customers but it is a process which is specific to wholesale supply. Accordingly, there is no equivalent retail charge.
147. Telecom states in Telecom’s Initial Submission that it applies “an internal charge to XTRA when it converts a UBS user to Jetstream which is the retail connection charge”.<sup>79</sup> However, the fact that Telecom decides to set an internal transfer price for a wholesale-specific function equal to a retail price for a retail function does not convert the wholesale function into a retail function.
148. Second, the retail connection service is very different to the wholesale reassignment process. As TelstraClear explained in our Initial Submission, the work and costs associated with installing a new Jetstream service or bitstream access service as the first DSL service provisioned over the line are much greater than the costs associated with “converting” the service from Jetstream to bitstream or vice versa. The initial installation of a DSL service requires physical jumpering of the line. But once the line is set up for a DSL service, converting backwards and forwards between retail and bitstream access services can be done electronically.
149. Accordingly, setting the wholesale reassignment charge at the level of the retail connection charge would allow Telecom to substantially overrecover its costs. As the XTRA charge is an internal transfer price, Telecom is not materially affected by setting a high reassignment charge (e.g. equal to the new connection charge), but it is a cost of business which access seekers have

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<sup>79</sup> Telecom Initial Submission, para 220.

to recoup. TelstraClear anticipates that an existing Jetstream customer is unlikely to agree to pay a new connection charge to convert to an alternative provider's DSL service as he or she will think that this is "paying twice" for something he or she already has.

150. As reassignment does not have a retail equivalent, it is appropriate for the Commission to take the same approach as it took in the Wholesale Determination to set those charges based on incremental costs.
151. Telecom seems to accept in its Initial Submission that there would be no wholesale charges for MACs as long as there are no retail charges.<sup>80</sup>

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<sup>80</sup> Telecom Initial Submission, para 221.

## 7. NON-PRICE TERMS

### 7.1 General Approach

#### Clause 6

152. Telecom submits that “many of the non-price terms requested by TelstraClear are inconsistent with the general access principles in that they are not technically or operationally practicable having regard to Telecom’s network”.<sup>81</sup> TelstraClear does not agree that the requested non-price terms are inconsistent with the general access principles. This is discussed in more detail below in relation to specific non-price terms. TelstraClear notes here that Telecom appears to have misconstrued clause 6 of Subpart 2 of Schedule 1, which provides that:

*“Principles 1 to 3 set out in clause 5 [the Standard Access Principles] are limited by the following factors:*

*(a) reasonable technical and operational practicability having regard to the access provider’s network.....”*

153. Clause 6 expressly applies to limit the three Standard Access Principles in clause 5, namely:

- a. timely delivery;
- b. service standards of international best practice; and
- c. non-discriminatory terms and conditions.

154. Read together, clauses 5 and 6 mean that Telecom cannot be required to provide a service of a standard consistent with international best practice if that international best practice is not technically or operationally practicable with regards to Telecom’s network.

155. Telecom may be permitted to provide the service on discriminatory terms and conditions if this was the only way to do so with regards to Telecom’s network for reasonable technical and operational practicability reasons. Telecom’s

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<sup>81</sup> Telecom’s Initial Submission, para 33.

interpretation of clause 6 is significantly wider than this. Telecom is not arguing that meeting international best practice in service standards is impracticable or that its discrimination terms and conditions are the only practicable way of providing the service. Telecom instead argues that it should be excused under clause 6 from providing service standards required under the Act (without reference to whether these service standards are of international best practice or not) because it would impose a financial burden on Telecom or require changes to the ways in which Telecom conducts its operations. Such a reading of clause 6 is unsupported by the terms of the Act.

### ***High-end principles***

156. Telecom also argues that given the complexity of the issues involved in the non-price terms, the Commission “should consider setting high level principles to guide parties as to non-price terms”.<sup>82</sup>
157. TelstraClear submits that Telecom’s recommended approach is incorrect. Proceedings have been commenced under section 20 of the Act as a result of the failure of negotiations between the parties. The Commission’s determination in these proceedings must include “the terms on which the service must be supplied”.<sup>83</sup> Setting “high-end principles” for future negotiations rather than setting the terms on which the service must be supplied is not an option given to the Commission under the Act.
158. Telecom also has taken a strict view of the Commission’s power to revisit determinations under sections 58 and 59. If the Commission only sets general principles in anticipation that the parties will negotiate detailed implementation terms after the determination in accordance with those general principles, the Commission may not have power, on Telecom’s view, to resolve any disputes over implementation. While TelstraClear takes a broader view of the meaning of “clarification” under section 59, TelstraClear notes that the Commission expressed reservations about the scope of its section 59 jurisdiction in the Residential Wholesale proceedings.
159. For these reasons, the Commission should determine the non-price issues at the detailed level requested by TelstraClear.

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<sup>82</sup> Telecom’s Initial Submission, para 36.

<sup>83</sup> Telecommunications Act 2001, section 30(a).

## 7.2 Backhaul

160. As TelstraClear noted in its Initial Submission, TelstraClear has existing network facilities connecting some of the Telecom URSA gateway locations, although TelstraClear will need to install ATM equipment and upgrade links to provide its own backhaul.
161. TelstraClear's primary concern with Telecom's commercial backhaul offer was that it seemed to be on an "all or nothing basis": that is, the access seeker either had to build to all URSA gateways or buy Telecom backhaul service to all of them. There are some URSA where TelstraClear anticipates the traffic levels will not justify the investment required to establish its own backhaul. Not reaching these URSA would have, under "an all or nothing" approach, required TelstraClear to buy backhaul duplicating the infrastructure it will have to most URSA.
162. However, paragraph 209 of Telecom's Initial Submission describes access seekers as having a choice between the three backhaul options listed in that paragraph. The wording of the paragraph suggests that backhaul is not offered on an "all or nothing" basis but that access seekers can "mix and match" between options, including other sources of supply.
163. If that is the case, TelstraClear is prepared to withdraw its request for backhaul services and to acquire Telecom's commercial backhaul services on those routes where TelstraClear does not have its own suitable infrastructure.
164. TelstraClear has written to Telecom seeking clarification but has not received a written response confirming the position with respect to backhaul. Our understanding from various discussions suggest that, under Telecom's commercial UBR backhaul offer, TelstraClear would be able to use its own infrastructure to provide backhaul where TelstraClear has directly connected to an URSA gateway and purchase backhaul only at the URSA where this is not the case.
165. However, Telecom has indicated that in that scenario the 10G per end-user monthly usage allowance would apply to all end-users, including those in URSA where TelstraClear has directly connected to the URSA gateway and is backhauling traffic using its own infrastructure.
166. TelstraClear considers that the application of the 10G limit across all URSA, whether the access seeker is using its own facilities or acquiring UBS backhaul

from Telecom, is anti-competitive and represents a leveraging of Telecom's power from those routes where it is not economic to build.

167. TelstraClear reserves its position on backhaul pending clarification from Telecom. We consider that the workshop scheduled to discuss technical issues may be a good forum for understanding the technical options for backhaul and the technical rationale for Telecom's application of the monthly usage allowance.

### 7.3 OSS

168. Telecom argues that "... the level of detail sought by TelstraClear as part of the determination goes beyond simply specifying **what** Telecom must provide, which is adequately covered by the standard access principles, and extends to **how** OSS is actually provided".<sup>84</sup>
169. Even if it is accepted that the SAPs only address the "what" and not the "how" of OSS, the reason TelstraClear's requested OSS terms are detailed is because Telecom has failed to outline its view of the "what" and say "when" it is planning to get there. Telecom states that "for some processes and systems, electronic interfaces or automation are unlikely to ever be built because the volume and/or the complexity make doing so uneconomic".<sup>85</sup> We have no idea what processes Telecom considers to be feasible candidates for automation; if Telecom has actually made its mind up; what criteria Telecom applies to determine whether it is economic to automate; in what sequence Telecom proposes to automate or the basic characteristics and functions of the electronic interface to which TelstraClear will have to build systems on its side of the interface.
170. Our concern is that, in the absence of a more transparent process, Telecom will only take into account its own costs and convenience in determining what processes are economic to automate. The risk is that the "what" for automated OSS is "what Telecom thinks best".
171. In any event, the distinction Telecom makes between "what" and "how" is

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<sup>84</sup> Telecom's Initial Submission, Appendix A, para 15, emphasis added.

<sup>85</sup> Telecom's Initial Submission, Appendix A, para 18.

artificial.<sup>86</sup> As OSS is all about day-to-day processes and procedures, involving interaction between the parties at many steps along the way, the “how” is crucially important. Telecom’s decisions about the design and implementation of their electronic interface will shape the processes on the TelstraClear side of the interface. As TelstraClear explained in its Initial Submission, how Telecom has chosen to implement the current version eOR actually increases the amount of manual work on the TelstraClear side of the interface because of double keying. Significant prejudice to the timeframes and/or costs faced by wholesale customers such as TelstraClear, vis a vis Telecom retail, would amount to a breach of the non-discrimination access principle.

172. In the absence of adequate information from and consultation by Telecom on eOR, TelstraClear is left to make its own best estimates of functionality for and timing of electronic OSS. If Telecom considers that the OSS requirements proposed by TelstraClear are unrealistic, Telecom should put forward an alternative wholesale IT systems implementation plan which:

- a. identifies the interoperator processes which are planned to be automated, or a process and criteria by which this decision will be made;
- b. sets out the high level time frame over which eOR will be progressively implemented;
- c. defines the high level technical specifications or meaning of the “automation” which Telecom proposes to achieve by eOR, including the extent to which that will involve real time interworking with access seeker systems; and
- d. defines a process for major users to be involved in the design and implementation of eOR.

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<sup>86</sup> While Telecom seems to suggest that the SAPs only cover the “what” and not the “how”, Telecom seems to later concede that the “how” is “part of the terms and conditions of supply”: Telecom’s Initial Submission, Appendix A, para 21.

The preparation of such a plan, and the close involvement of major users such as TelstraClear to provide their perspectives, is consistent with best practice for the design and implementation of major IT projects.

173. In the absence of a transparent, externally verifiable commitment to electronic OSS, Telecom will have no incentives to make available within a reasonable time-frame electronic interfacing with wholesale customers which allows them to match the customer service levels provided by Telecom's own retail operation.

### **Service Levels and Service Reporting**

174. Telecom argues that it should not have to provide the service levels requested by TelstraClear because "Telecom does not provide minimum service specifications, service levels, rebates, individual licence outages of the kind requested by TelstraClear in relation to its Jetstream or commercial UBS services".<sup>87</sup>
175. That Telecom chooses not to offer service levels in the downstream retail market is beside the point. The relevant benchmark is the level of service at which Telecom provides the equivalent of the bitstream service to itself, and the issue is then how to define, measure and enforce those service levels to ensure access seekers are supplied with an equivalent service.
176. Equivalent, committed and transparent upstream service levels are important to competition in downstream markets for two reasons:
  - a. Telecom has built and operates its DSL network to certain performance levels only known to it. While Telecom may not choose to externally reveal service levels as part of its retail offering, Telecom internally knows and counts on a level of service in designing its downstream retail products and in planning and resourcing its customer service and support functions. Telecom's approach to service levels for access seekers is little more than "take it as you find it". However, unless access seekers have some knowledge and certainty about the service performance of the wholesale products, they will be impaired in designing, marketing and supporting downstream products; and

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<sup>87</sup> Telecom's Initial Submission, Appendix A, para 81.

- b. commitment to service levels and service rebates may be one of the bases on which access seekers propose to compete against Telecom at a retail level and to develop innovative service offerings for end-users. Telecom asserts that “the service levels requested by TelstraClear are similar to those Telecom provides in relation to Constant Bit Rate (“CBR”) point to point business grade services such as Frame Relay, Dedicated Data Service, Megalink and ATM Committed Bit Rate Services”<sup>88</sup>. In TelstraClear’s view, the restricted scope of Telecom’s retail service level offerings to CBR services only serves to illustrate the lack of competition in DSL services compared to competition in traditional symmetrical services.

177. Telecom argues that TelstraClear’s proposal for comparative monitoring of retail and wholesale performance levels is inappropriate because Telecom “does not provide these services for its Jetstream UBR service”.<sup>89</sup> It seems improbable that Telecom does not undertake some recording and monitoring of its DSL network and service performance levels. In any event, service monitoring is required to measure whether the service levels being monitored are non-discriminatory between retail and wholesale services, whether or not Telecom provides similar monitoring to itself is irrelevant.

178. TelstraClear’s proposed service quality monitoring requirements are, in effect, the non-price equivalent of the Average Model Price (“AMP”) auditing process used for price terms. The service monitoring would determine the average or standard performance level, much like the AMP is calculated, and use that as a base to compare the wholesale price level. Much as with the wholesale price calculated from the AMP, the wholesale service level needs to “minus” that part of the supply chain which is attributable to the functions which the access seeker assumes. A wholesale performance level which is equivalent to Telecom’s retail performance level would be just as inappropriate as a wholesale price equal to AMP.

#### **7.4 Static IP Addresses**

179. TelstraClear requested that the bitstream service be configured in a way which

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<sup>88</sup> Telecom’s Initial Submission, Appendix A, para 82.

<sup>89</sup> Telecom’s Initial Submission, Appendix A, para 85(a).

enabled TelstraClear to provide static IP addresses for end-users because this would facilitate provision of more innovative and advanced services, such as VPN, and would be consistent with a layer 2 bitstream service.

180. In its Initial Submission, Telecom implies it would support static IP addresses but says that there are additional costs involved compared to dynamic IP addressing and that, as with its retail service, a separate wholesale charge should apply:

*“Telecom currently provides static IP addresses to a limited number of residential and SME end-users. However, these end-users pay a monthly levy for their static IP addresses, which is commensurate with the fact that such addresses are typically only provided to business customers. ... There are issues around address management and address extinction which need to be considered by the Commission. However, if the Commission determines that static IP addresses should be included in the designated bitstream service, then there is a value attributable to them over and above the price of the designated bitstream service.”<sup>90</sup>*

181. However, Telecom appears to be confusing how static IP addresses can be managed in a resale (layer 3) service with how IP addressing should be managed, and how Telecom’s own UBS service materials appear to contemplate it will be managed, in a layer 2 product.
182. When an end-user logs onto a retail Jetstream service, the end-user is authenticated by the Telecom BRAS sending a RADIUS authentication request to Telecom’s RADIUS authentication server. If the end-user is a customer of a resale (layer 3) service, the Telecom RADIUS server sends an authentication request to the reseller’s (e.g. TelstraClear’s) RADIUS server. When authenticating the end-user, the reseller also determines whether or not a static IP address is to be used.
183. If the reseller wishes to support a static IP address, the reseller responds by loading that address in its RADIUS authentication response to Telecom. Telecom then uses a static IP address in routing the end-user’s traffic rather than assigning a dynamic IP address.

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<sup>90</sup> Telecom’s Initial Submission, Appendix A, paras 27 and 28.

184. If a static IP address is not assigned to that end-user, the reseller leaves the relevant data field blank in the RADIUS authentication response and Telecom assigns a dynamic IP address to that end-user from a pool of access seeker IP addresses.
185. TelstraClear agrees that, in the case of layer 3 services (e.g. Jetstream retail services), supporting static IP addresses can involve additional network resources on the part of the network operator, although this will depend on the particular architecture of the access provider's network. Static IP addressing, for example, may require the establishment of different routing in the access provider's network if the network otherwise uses dynamic IP addressing.
186. However, with a true layer 2 service, such as bitstream, management of end-user IP addressing, including the choice between assigning a static or dynamic IP address, is a function entirely carried out within the access seeker's network. The addressing role of the access provider's network is essentially limited to addressing necessary to create the "tunnel" between the end-user's modem and the access seeker's layer 2 network server. A network address is assigned to each of the access seeker's layer 2 network servers. The access provider's network uses these addresses to route all traffic from the access seeker's end-users to the access seeker's layer 2 network servers, thereby creating the tunnels. This is done by affixing or attaching the network address of the relevant access seeker's network server to the end-user packets. Once the tunnel is established, the access provider does not need to either assign or "look at" individual IP addresses (whether static or dynamic) of packets traveling through the tunnel. The assignment of IP addresses is done at the other end of the tunnel by the access seeker for the purposes of routing traffic into and out of the tunnel.
187. In summary:
- a. in the case of a layer 3 service, the access provider assigns a dynamic IP address or, if instructed by the access seeker, a static IP address and then the access provider manages the IP address in much the same way as its own dynamic or static IP addresses (as the case may be); and
  - b. in the case of a layer 2 service, the access provider uses an overlay addressing scheme mapped against the access seeker's network (and not individual end-users) to create the tunnel through which the

access seeker then “projects” its own end-user IP addressing functionality in substitution for that of the access provider’s. As the addressing and routing functions undertaken by the access provider are a necessary part of creating the tunnel which distinguishes layer 2 bitstream services from layer 3 resale services, there is no additional network resources of the access provider utilised when the access seeker wants to use a static IP address compared to a dynamic IP address for an individual end-user.

188. Consistent with a layer 2 approach, Telecom’s UBS technical information pack provides that IP addressing issues would be the access seeker’s responsibility:

*“Because a Service Provider terminates the PPP session themselves, they are in control of IP Addressing, Rating, Speed Restrictions (appreciating the service is already limited to 256/128kbps), Routing and Access Control UBS delivers access to DSL end-users. The initial protocol delivery is L2TP over UDP over IP over ATM. Service Providers will need to terminate multiple LT2P tunnels (i.e. will require multiple LNS instances), with a minimum of at least one L2TP tunnel per USAP served. Service Providers are responsible for authentication of users. ATM delivery is via STM-1 ATM NNI or UNI.”*

*“Tunnels will be established by the LAC when an incoming call is detected for the appropriate Tunnel-Server-Endpoint provided the tunnel doesn’t exist. By using the Tunnel-Client-Auth-ID attribute in RADIUS, we will direct particular sessions down specific tunnels (related to the URSA to which the customer is associated) and more importantly: updates the hostname provided to the remote LNS.”*

*“Authentication of individual subscribers will be the responsibility of the Service Provider. Because any username/password provided by a Subscriber will result in an Incoming-Call-Request (ICRQ), the Service Provider should implement RADIUS authentication using either proxy Authentication attributes or after renegotiation LCP. ... The Tunnel-Server-Endpoint IP address must be a globally unique Internet Address allocated by the likes of APNIC or another RIR to the Service Provider.”<sup>91</sup>*

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<sup>91</sup> Unbundled Bitstream Service, Technical Information Pack, November 2004, pages 2, 8 and 10.

189. If the access seeker is responsible for addressing, TelstraClear is puzzled by Telecom's assertion in its Initial Submission that additional network resources would be required of Telecom to support TelstraClear's static IP addresses for the bitstream access service. TelstraClear suggests that this issue is one of the technical issues which could usefully be clarified at the proposed technical workshop.

#### **7.5 Availability of DSL services in new areas**

190. Telecom argues that TelstraClear's proposal that Telecom make available wholesale DSL services in new areas where there are at least 35 end-users requesting services (whether wholesale or retail or both) would "require Telecom to build new network components to service TelstraClear customers".<sup>92</sup>

191. Telecom appears to make an assessment about whether its retail Jetstream services should be made available in a geographic region taking into account the number of pre-registered potential retail end-users. Telecom's website states:<sup>93</sup>

*"You can register your interest if Xtra Jetstream is not available to you. This helps us identify the demand for Xtra Jetstream in your area and we can let you know when Jetstream does become available."*

192. The purpose of TelstraClear's requested non-price terms is only to ensure that Telecom takes into account both retail and wholesale demand in making this assessment. This is consistent with Telecom Wholesale treating its downstream retail arm and wholesale customers on a comparable basis, as required by the standard access principles. The circumstances in which Telecom commences to first supply itself with DSL services in a geographic area represent part of the non-price terms of supply to Telecom's downstream retail arm. If it is accepted that wholesale supply should commence simultaneously from the first availability of retail services, it should follow that the circumstances in which the network business agrees to open DSL service in an area should apply equally between retail and wholesale services.

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<sup>92</sup> Telecom's Initial Submission, Appendix A, para 29.

<sup>93</sup> <http://www.telecom.co.nz/chm/0,5123,202905-202470,00.html>

193. TelstraClear nominated the figure of 35 as the minimum number of end-users which would trigger wholesale supply based on our understanding of Telecom's practice. If Telecom uses a different number for retail services, then that same number should be used for wholesale supply. If Telecom uses no fixed number, Telecom should outline the process by which it assesses opening retail supply and that same process should apply to wholesale services (i.e. the process should be "colour blind" as to whether the requesting end-users are customers of Telecom Retail or of wholesale customers).
194. Telecom argues that it would face the risk of stranded investment if it deployed DSL services for wholesale customers which subsequently withdrew from the market. In June 2004, Telecom announced some initiatives which they said "would increase Telecoms overall broadband coverage to more than 95% on New Zealand lines" by the end of that year<sup>94</sup>. They have also already stated their goal is to achieve 90% penetration in rural areas by June 2005. The same DSL infrastructure is used to supply both retail and wholesale services and Telecom's planning assumes that Telecom Retail will account for the majority (at least 70%) of all DSL services. Accordingly, there is minimal risk of Telecom facing stranded investment because it treats wholesale customer requests on an equal basis to its own retail arm's requests.
195. Thus, whether a geographic area is opened for DSL service seems largely to be an issue of timing between the priorities of Telecom's retail business and the priorities of the downstream retail businesses of wholesale customers. It is not appropriate that competitors' marketing plans should be driven by Telecom's retail marketing strategy.

### **Part Month billing**

196. Telecom asserts that it is not "operationally practicable" to co-ordinate retail and wholesale billing cycles to ensure that there is not a double recovery of monthly charges over part of the first billing period following service transferal between a wholesale bitstream service and a retail Jetstream service.<sup>95</sup>

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<sup>94</sup> Telecom media release dated 4 June 2004 "Broadband more accessible than ever ([http://www.telecom-media.co.nz/releases\\_detail.asp?id=3042&page=index](http://www.telecom-media.co.nz/releases_detail.asp?id=3042&page=index))

<sup>95</sup> Telecom's Initial Submission, Appendix A, para 32.

197. Telecom argues that TelstraClear's proposal would "mean radically altering the type of billing service from a monthly subscription to a daily one" and would be inconsistent with Telecom's current approach when end-users terminate other retail services offered by Telecom and other providers (such as Sky Television)<sup>96</sup>. However, these are retail level pricing decisions and competing providers may well decide to offer different retail pricing fee structures, such as "no strings attached" pricing plans found in the mobile sector. The scope of competition is reduced if Telecom retail pricing strategies are transposed to wholesale.
198. The other difference to the examples given by Telecom is that Telecom is on both sides of the transaction – it may be the losing retail provider but it is still the wholesale provider. The justification usually given for minimum monthly charges is to help recoup fixed costs which will not be avoided by the customer canceling part way through the month. The pricing principle for the wholesale services is avoidable cost. Under Telecom's approach, it will be collecting a total amount for the first billing period which exceeds its retail charges by an amount equal to the wholesale charge, although Telecom should avoid some costs even for the part month during which it is not the retail provider (e.g. reduced demands on Telecom call centres).
199. In Australia, TelstraClear charges access seekers for bitstream services on a pro-rata basis, with a "wash-up" in the month following the connection or disconnection of services part way through the monthly billing cycle. Similarly, if BigPond broadband retail customers who do not have fixed term commitments cancel their service part way through a month, including to reassign to a competitor's service provided by bitstream, they are credited with a pro-rata amount representing the unused portion of the month.
200. Lastly, the part month billing problem would not arise if Telecom operated OSS which would be expected of an efficient operator. As Telecom itself says:

*"Telecom's IS transformation includes its billing systems. As part of the IS plans, a billing system that provides the ability for pro-ration is due for implementation in mid 2005. At the time that Telecom provides pro-ration*

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<sup>96</sup> Telecom's Initial Submission, Appendix 1, para 34.

*to its retail customers it will also provide it to wholesale services including the commercial UBS service (and any designated bitstream service”).<sup>97</sup>*

201. As both the standard access principles and the pricing principles assume an efficient supplier of wholesale services, it is not appropriate that Telecom collect retail or wholesale charges which would not be payable if Telecom had a more efficient OSS.
202. TelstraClear believes that an interim solution could be implemented to cover the initial wholesale supply period until Telecom introduces its OSS modifications. Adjustments to individual end-user accounts could be calculated and manually imputed to the customer's Telecom account. Carrier billing systems typically allow adjustments to be entered on customer bills on an ad hoc basis. Alternatively, a lump sum adjustment could be calculated for the relevant end-users, credited against TelstraClear's wholesale charges and which TelstraClear would agree to pass through to the end-user, identifying the payment as a rebate against their Telecom charges.
203. TelstraClear notes that Telecom currently provides TelstraClear with a credit for wholesale line rental payments where TelstraClear cancels the service part way through a month. TelstraClear also understands that retail customers receive a credit if they cancel their Telecom retail telephone service part way through the month and TelstraClear assumes, in compliance with the SAPs, that this also applies where cancellation is to reassign to a TelstraClear resale service.

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<sup>97</sup> Telecom's Initial Submission, Appendix A, para 33. The delays and uncertainties of the manually-based service transferal process also makes it difficult for end-users and wholesale customers to the service requests to coincide with the end-user's retail billing cycle.

**ANNEX A**  
**AAS TECHNICAL REPORT**

**ANNEX B**  
**RESPONSE TO APPENDIX A OF TELECOM INITIAL SUBMISSION**

This table sets out TelstraClear’s detailed responses to Telecom’s technical arguments in Appendix A of Telecom’s Initial Submission.

Telecom Appendix A para no.	Telecom claim	TelstraClear response
4	TelstraClear’s request to rate shape to configure combination of upstream and downstream speeds it considers appropriate is outside the scope of designated service because it is not constrained by the maximum upstream throughput rate of 128 kbps.	<ul style="list-style-type: none"> <li>• TelstraClear clarifies that its request for an unconstrained service applies only to the downchannel and that Telecom can, consistently with the bitstream service description, rate limit the upchannel to 128 kbps;</li> <li>• It is technically feasible for Telecom to rate limit the upchannel to 128 kbps while providing the downchannel on an unconstrained or full speed basis. A full speed or unconstrained downchannel is, in a sense, the default if no rate limiting is applied to reduce its speed.</li> </ul>
6	Telecom is withdrawing its unconstrained service. To provide an unconstrained service to a moderate to large number of end-users requires a significant amount of “additional network resources” which would make the service unattractive to residential and SME users.	<ul style="list-style-type: none"> <li>• Telecom’s decision to withdraw its unconstrained service is a strategic decision about the retail products it chooses to make available, and is not a technical issue. There is no technical constraint in the access network which would make supply of an unconstrained service to a “moderate or large” group of subscribers more difficult than its supply to a small number of subscribers, with the possible exception of a limited number of mini-DSLAMs (see below). There will, in fact, be network economies in offering unconstrained services to a larger number of end-users. In TelstraClear’s view, the real costs of offering higher speed or unconstrained services are not in the access network, but in the core, domestic and international networks provided by the access seeker.</li> <li>• The impression Telecom gives that capacity constraints would be a general issue across its 1600 DSLAMs is misleading. As discussed in Part 4 of this submission, there may be some capacity constraints in certain types of Telecom DSLAMs, mainly Conklin mini-DSLAMs typically used in rural areas to support relatively small user populations. TelstraClear would be prepared to agree procedures to deal with these capacity-limited DSLAMs: for example, the availability of unconstrained services could be capped where the contention</li> </ul>

Telecom Appendix A para no.	Telecom claim	TelstraClear response
		ratio exceeded certain limits.
7	<p>Unclear if TelstraClear is using rateshaping to mean:</p> <ul style="list-style-type: none"> <li>• upstream/downstream throughput rate; or</li> <li>• traffic management.</li> </ul> <p>Telecom uses it in the latter sense.</p>	<p>The distinction Telecom seeks to make is confusing and ultimately of limited value in addressing the issues before the Commission. Traffic management is the overall objective and rateshaping is one of the tools that can be used. CISCO defines traffic management as:</p> <p><i>“a technique for avoiding congestion and shaping and policing traffic. It allows links to operate at high levels of utilisation by scaling back lower-priority delay-tolerant traffic at the edge of the network when congestion begins to occur”<sup>98</sup></i></p> <p>“Rateshaping” involves holding back packets in a rateshaping buffer when the end-user utilises more capacity than he or she has paid for (which increases latency).</p> <p>“Policing” is an alternative method to constrain actual use to contracted capacity by dropping packets (which increases packet loss).</p> <p>The function which TelstraClear seeks to undertake, instead of Telecom, can also be described as “rate limiting”.</p>
9	<p>The list of “rate shaping options” in TelstraClear’s application (256kbps/128kbps to 8Mbps/128kbps) is unclear in its meaning and Telecom cannot determine if it is within the service description.</p>	<p>This request is intended as a fallback if the Commission rejects TelstraClear’s request for unrateshaped service and these are speed combinations of services TelstraClear proposes Telecom should be required to supply. It may be clearer to refer to these as the requested range of “rate limited” products.</p>

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<sup>98</sup> [http://business.cisco.com/glossary/tree.taf-asset\\_id=92889&word=99420&public\\_view=true&kbns=2&defMode=.htm#](http://business.cisco.com/glossary/tree.taf-asset_id=92889&word=99420&public_view=true&kbns=2&defMode=.htm#)

Telecom Appendix A para no.	Telecom claim	TelstraClear response
11	Telecom ADSL technology is currently only capable of approximately 7.6Mbps downstream and not 8Mbps as requested by TelstraClear.	Telecom’s own website describes its full speed products as having downchannel speeds which range from 2Mbps to 8Mbps. The request for highest speed should be read as “full speed” or “unconstrained speed”, whatever speed that is.
11	Maximum speed profile can only be achieved by less than 20% of users who are in close proximity to exchange.	TelstraClear acknowledges that proximity to exchange does affect speed. However, this trade off should be a matter between individual end-user and access seeker. Telecom’s end-users are not affected.
11	Impossible to achieved an upstream/downstream speed profile of 8Mbps/128kbps because level of asymmetry makes service unstable.	TelstraClear disagrees. TelstraClear’s experience and its inquiries of DSLAM manufacturers confirm that an 7.6Mbps/128kbps speed profile is technically feasible and stable. Telecom is requested to provide technical substantiation, including from its DSLAM suppliers.
12	<p>Technical and operational practicability issues arise if wholesale service does not have comparable retail service:</p> <ul style="list-style-type: none"> <li>• implementation would be complex and costly and require significant amount of planning and testing;</li> <li>• each additional tailored solution would require a new virtual path to each of Telecom’s 1,600 DSLAMs; and</li> <li>• if traffic from different variants are mixed together, hard to maintain consistent service standards.</li> </ul>	<p>As discussed in Part 4 of this submission, adding a new product with different upchannel/downchannel speeds to an existing product range should be no more complex depending on whether the product is a wholesale or retail product. The rate limiting is done on an individual end-user basis and the throttling exercise is the same whether the end-user is a wholesale or retail customer.</p> <p>There are technically feasible architectures for wholesale bitstream products which do not require a separate virtual path to each DSLAM for each TelstraClear end-user (or TelstraClear end-users in aggregate). Telecom’s decision to implement an architecture which relies on virtual pathways creates a problem which could be avoided with a different architecture. Telecom needs to explain why it has adopted this approach.</p> <p>There is no technical reason why mixing traffic from different variants should be any more difficult between different wholesale and retail variants than between the different variants of the retail Jetstream services Telecom currently offers.</p> <p>If there are complexities with wholesale variants differing from retail variants, they should be</p>

Telecom Appendix A para no.	Telecom claim	TelstraClear response
		reduced by TelstraClear's preferred option a single wholesale variant being an unratelshaped downchannel service.
15 to 26	OSS	See Part 7 of main body of TelstraClear's Response.
27 to 28	Static IP addresses.	See Part 7 of main body of TelstraClear's Response.
29 to 31	Availability of DSL in new areas.	See part 7 of main body of TelstraClear's Response.
32 to 34	Part month billing cycle.	See Part 7 of main body of TelstraClear's Response.
40	"Jitter" and "delay variation" are terms used to define the same performance attribute and so TelstraClear has requested 2 different service specifications for the same performance attribute.	TelstraClear agrees that jitter and delay variation are interchangeable and the listing of both in the requested QoS in the TelstraClear UBS Application was a drafting error.
41	Use ITU definition of "jitter" and "delay variation".	<p>TelstraClear do not agree with Telecom's interpretation in this paragraph. TelstraClear consider the manner in which this is explained by Telecom to be misleading.</p> <p>TelstraClear agrees to use the general definitions in Y1540 and Y1541 for IP packet transfer delay ("latency") and IP packet delay variation ("jitter"). However, these specifications DO NOT (as Telecom states) specify "in the presence of 1472 byte packets with randomly arriving times." Appendix II of Y1540 actually states:</p> <p><i>"A point that must be made clear in all variation parameter specifications is the effect of packet length. Since insertion time is included in transfer delay (first-bit to last-bit), packets with varying size have an inherent delay variation. Network specifications and tests should use packets with a single size to simplify interpretation of the results (and the</i></p>

Telecom Appendix A para no.	Telecom claim	TelstraClear response
		<p><i>size must be reported).</i>”</p> <p>And Y1541 states:</p> <p><i>“Packet size influences the results of most performance parameters. A range of packet sizes may be appropriate since many flows have considerable size variation. However evaluation is simplified with a single packet size when evaluating IPDV, or when the assessment target flows that support constant bit rate sources, and therefore a fixed information field size, is recommended.”</i></p> <p>Further, RFC3393 states:</p> <p><i>“The packets of Type P packet stream from which the singleton ipdv metric is taken MUST all be of the same length.”</i></p> <p>Essentially, TelstraClear agree with the definitions set out in ITU-T Y1540 and Y1541 and has been following these recommendations, but without the additional requirements Telecom seeks to add.</p>
42	<p>TelstraClear request unclear because it does not specify:</p> <ul style="list-style-type: none"> <li>• points between which measurement made.</li> <li>• time interval.</li> </ul>	<p>TelstraClear proposes that the measurement should be between the ADSL modem on the test ADSL lines and an agreed point on the Telecom network which is as near as practicable to the PoP interface with TelstraClear. Any practical issues or performance measures may be further discussed in a workshop.</p> <p>1 minute.</p>

Telecom Appendix A para no.	Telecom claim	TelstraClear response
	<ul style="list-style-type: none"> <li>size of packet.</li> </ul>	<p>TelstraClear proposes 64 bytes. It is appropriate to use a smaller packet size as the benchmark than the packet size Telecom implies should be used (1472 bytes equivalent to an email attachment). Services which are not delay sensitive, such as email, tend to use large packets and so are not appropriate as a benchmark for measuring latency and jitter. On Telecom's own calculations, TelstraClear's proposed 50 ms service parameter for latency could be achieved with interleaving on.</p>
	<ul style="list-style-type: none"> <li>type/characteristics of any rate shaping.</li> </ul>	<p>TelstraClear is assuming that Telecom's current rate shaping architecture is in place (ADSL modulation and BRAS rate shaping).</p>
	<ul style="list-style-type: none"> <li>specific conditions under which measurement to be undertaken, including random packet arrival.</li> </ul>	<p>It is standard practice to measure service parameters on an uncongested access link (DSLAM to end-user): that is, when a test modem is sending or receiving data below the maximum specified channel speed for the service (see ITU-T recommendation Y1541).</p>
	<ul style="list-style-type: none"> <li>percentage of time for which measure to be achieved.</li> </ul>	<p>99.9%</p>
44	Use ITU-T definition of latency.	Agree.
45	TelstraClear request unclear as to:	
	<ul style="list-style-type: none"> <li>points between which latency measured.</li> </ul>	<p>TelstraClear proposes that measurement between the ADSL modem on the test ADSL lines and an agreed point on the Telecom network which is as near as practicable to the PoP interface with TelstraClear.</p>
	<ul style="list-style-type: none"> <li>size of packet.</li> </ul>	<p>TelstraClear proposes 64 bytes.</p>
	<ul style="list-style-type: none"> <li>application of interleaving.</li> </ul>	<p>Optional from a measurement perspective, but TelstraClear continues to seek the right to have interleaving turned "on" or "off".</p>

Telecom Appendix A para no.	Telecom claim	TelstraClear response
	<ul style="list-style-type: none"> <li>percentage of time for which measure is to be achieved.</li> </ul>	99.9%
47	Use ITU packet loss definition.	<p>Agree. However, the following requirement stated by Telecom is not part of ITU Y1540:</p> <p><i>“The population of interest is defined as the sample of packets measured over a 15 minute interval for all flow bandwidths above 64kbit/s and on 30 minute intervals for all bandwidth of 64kbit/s and below. The populations are sampled regularly and averaged over a period of one month.”</i></p> <p>TelstraClear is of the view that sampling the packet loss over 30 days is too long a duration. TelstraClear consider that these kind of parameters be defined in a workshop with Telecom to develop an agreed language for these parameters.</p>
48	TelstraClear request unclear as to:	
	<ul style="list-style-type: none"> <li>points between which packet loss measured.</li> </ul>	TelstraClear proposes that the measurement should be between the ADSL modem on the test ADSL lines and an agreed point on the Telecom network which is as near as practicable to the PoP interface with TelstraClear.
	<ul style="list-style-type: none"> <li>time interval over which measured.</li> </ul>	1 minute.
	<ul style="list-style-type: none"> <li>size of packet.</li> </ul>	TelstraClear proposes 64 bytes.
	<ul style="list-style-type: none"> <li>type and characteristics application of any rateshaping.</li> </ul>	TelstraClear is assuming that Telecom’s current rate shaping architecture is in place (ADSL modulation and BRAS rate shaping).
	<ul style="list-style-type: none"> <li>percentage of time for which measure is to be achieved.</li> </ul>	99.9%

Telecom Appendix A para no.	Telecom claim	TelstraClear response
51	Contention ratio definition.	<p>The ratio between the sum of the data speeds going into the DSLAM to the total bandwidth coming out of the DSLAM to the backhaul network.</p> <p>or</p> <p>The ratio between the sum of the data speeds going into the DSLAM to the total bandwidth allocated between the DSLAM and the first ATM switch. The ratio must be monitored on an ongoing basis and the DSLAM to first ATM switch capacity augmented in order to ensure that the maximum ratio is not exceeded.</p> <p>Telecom states in this paragraph:</p> <p><i>“The number of end-user services of defined peak bandwidth for each megabit per second of allocated bandwidth between the DSLAM and the first ATM switch during the peak busy hour of any day. The peak busy hour is normally defined as the busiest hour of a given year and is typically adjusted annually based on actual measurement.”</i></p> <p>Adjusting annually is too coarse. Peak does not really make sense since ADSL is an always on service.</p>
52	TelstraClear’s request unclear because it does not define:	
	<ul style="list-style-type: none"> <li>reference point for contention.</li> </ul>	DSLAM to first ATM switch.
	<ul style="list-style-type: none"> <li>type and characteristics of rateshaping.</li> </ul>	We assume that Telecom’s current rate shaping architecture is in use (ADSL modulation and BRAS rateshaping).
	<ul style="list-style-type: none"> <li>percentage of time for which contention ratio to be achieved.</li> </ul>	99.9%

Telecom Appendix A para no.	Telecom claim	TelstraClear response
53	<p>Latency, delay variation, packet loss and contention are interrelated.</p> <p>Trade off to be made: consumers prefer regular slight delay in packets (e.g. web page) than retransmission of information due to packet loss.</p>	<p>Telecom’s discussion of performance levels confuses performance on an “uncongested” end-user link, which provides the benchmark measurement, with actual performance that might be expected on a congested end-user link (when the performance criteria would not apply).</p> <p>TelstraClear’s proposed service parameters are intended to apply only when the service is being used by the end-user at a speed that is below the contracted speed for the service. If the end-user does download data in excess of the contracted down channel speed (or sends data in excess of the 128kbps up channel speed), Telecom would not be held to the performance standards.</p> <p>TelstraClear’s proposal to use uncongested links for measurement purposes accords with the ITU-T recommendation Y1541 as it states:</p> <p style="text-align: center;"><i>“The network performance objectives may no longer be applicable when there are packets submitted in excess of the capacity agreement or the negotiated traffic contract.”</i></p> <p>In other words, the measurements must occur on uncongested links.</p>
54	<p>The asymmetry of service means that latency, delay variation, packet loss and contention ratio should be defined separately for upchannel and downchannel.</p>	<p>TelstraClear’s service parameters are stated on a one-way basis: that is, a maximum latency and jitter (together) of no more than 100ms in each of the upchannel and the downchannel (for a total roundtrip delay not to exceed 200ms).</p>
59	<p>Telecom physically cannot achieve latency of less than 50ms in upstream channel of 128kbps:</p> <ul style="list-style-type: none"> <li>• interleaving = 28ms;</li> <li>• network latency varies depending on packet size; and</li> </ul>	<p>As discussed in Part 4 of this submission, Telecom’s own calculations show that TelstraClear service parameters can be met in a 128 kbps up channel <u>even</u> with interleaving, for a 64 byte packet, turning interleaving off provides more “headroom” for Telecom to meet the latency requirement.</p>

Telecom Appendix A para no.	Telecom claim	TelstraClear response
	<ul style="list-style-type: none"> <li>nominal latency = 5ms.</li> </ul>	
64	Minimum one way upstream latency ranges from 35-107ms.	Agree. One-way upstream latency will be in the range of 34.6 – 106.6 ms (for 32 – 1472 byte packets) with interleaving turned on. One-way upstream latency will be in the range of 6.6 – 78.6ms (for 32 – 1472 byte packets) with interleaving turned off.
68/70	Telecom cannot physically achieve a delay variation of less than the mean packet delay in an upchannel of 128kbps.	<p>Same principles apply as for latency.</p> <p>Telecom’s example is misleading because:</p> <ul style="list-style-type: none"> <li>inclusion of the 500ms buffer for rateshaping assumes that performance is being measured under congested conditions. As TelstraClear is only proposing to measure under non-congested conditions, traffic management techniques such as buffers are not used and so should be excluded from the calculation;</li> <li>Telecom’s calculation is based on large packets which generally are used only in services which are not delay sensitive; and</li> <li>It assumes short and long packets are intermixed, whereas TelstraClear is proposing a fixed packet size in accordance with RFC3399 which states: <p style="text-align: center;"><i>“The packets of Type P packet stream from which the singleton ipdv metric is taken MUST all be of the same length.”</i></p> </li> </ul> <p>On Telecom’s own calculations, the jitter for a 64 byte packet would be 8.2ms.</p> <p>The measurements must occur on uncongested links.</p>
71	For contention ratio of 1:20 and delay variation of less than mean packet latency, requirement for packet loss of less than 0.1% should be achieved 95% of the time.	Telecom is basing this comment on use of “delay buffers”. That is, not an uncongested link.

Telecom Appendix A para no.	Telecom claim	TelstraClear response
73	Latency of less than 50ms can only be achieved in downstream channels of more than 512kbps.	<ul style="list-style-type: none"> <li>As TelstraClear is asking for an unconstrained service, not applicable; and</li> <li>Even in respect of constrained services, 50ms is readily achievable for a 64 byte packet at speeds of 512kbps or less.</li> </ul>
73	Delay variation less than mean packet delay could not be achieved unless rate shaping buffers used were reduced to below 50ms. But then with a 1:20 contention ratio, packet loss would exceed 0.1% more than 10% of time.	As service parameters are only being measured on an uncongested link, the rate shaping buffers are not relevant. If rateshaping buffers need to be used, the service parameters are inapplicable.
74	Telecom does not provide service levels requested by TelstraClear and to do so would require more network resources and substantially increase cost.	See above.
77	Turning interleaving off would require significant testing and add complexity.	Telecom should provide further details of the work involved.
82	Service levels requested by TelstraClear are similar to those provided for Telecom CBR services, which deliver real time services.	See part 7 of the main body of the TelstraClear Response.
88	Colocation unnecessary under the UNI, NNI and shared cost NNI options.	Correct, but colocation required to address the 5km limitation.
98	Lifting the backhaul per end-user caps would present operational and safety	End-user cap is a rough measure for managing backhaul capacity.

Telecom Appendix A para no.	Telecom claim	TelstraClear response
	issues for the Telecom network. Telecom network could be flooded. Way of sending price signals to higher capacity users.	Backhaul should be managed on peak hour basis.
103	If interface was Ethernet (PPPOE) instead of ATM (PPPOA) the customer modems would need to be changed.	TelstraClear not proposing Telecom shift to Ethernet (or at least that it be compelled to do so). TelstraClear will do conversion in its own network from ATM to Ethernet. But PPPOA raises problems of 5km and need for colocation.
104	TelstraClear request that ATM backhaul be provided on standard Telecom QoS not appropriate as retail services are higher grade business services and not appropriate to backhaul for Internet grade.	See Part 7 of the main body of the TelstraClear Response.