



16 August 2005

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Commerce Commission
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By EMAIL

Dear Osmond,

TelstraClear Wholesale Bitstream Workshop – Additional Information requested

1. We refer to the Commission's letter of 3 August 2005, requesting further information from TelstraClear and Telecom following the technical and OSS wholesale bitstream workshop.

Technical Issues

2. The Commission sought the following information from TelstraClear in respect of technical matters:
 - (a) The underlying modeling assumptions on information corresponding to TelstraClear's submissions used for slides 8, 9, 10 & 11;
 - (b) Confirmation of TelstraClear's position in respect of service parameter measurement and its relationship with service standards;
 - (c) Details of how Telstra in Australia measures SIR averages across its network;
 - (d) A description of how, under TelstraClear's technical proposal, a change of the average SIR would be implemented; and
 - (e) TelstraClear's view on the question of how to achieve the best possible achievable service characteristics on the L2TP part of the bitstream transmission.
3. TelstraClear's responses on the above technical matters are set out below:

Underlying Modeling Assumptions

4. The plots of rate versus range in slides 8 to 11 are based on ACIF's agreed conditions for modeling crosstalk in Australian access cables as described in Code 559 (2005) and ACMA Standard 043-2 (2005). Links to those documents are given below:
http://www.acif.org.au/documents_and_lists/codes/C559
http://www.acif.org.au/documents_and_lists/standards/S043.2_05
5. The ACIF assumptions are addressed below in turn with references to the Code and the Standard:

1. Cable type

The cable type used for ACIF calculations is 0.40mm paper insulated unit twin cable with attenuation of about 13.8 dB/km at 300 kHz and 26.2 dB/km at 1024 kHz. When the ranges resulting from the calculations are converted to dB at a suitable reference frequency, the results are applicable with reasonable accuracy to network situations based on other cable types with the same total attenuation of the access line. For this application ACIF uses a reference frequency of 300 kHz because it is about the centre of the ADSL downstream spectrum used by systems on longer access lines. Telecom uses 1024 kHz, which is at the upper end of the ADSL downstream spectrum. The detailed parameters for 0.40mm PIUT cable are given in Section 5.1 of Part 2 of C559.

2. Cable Crosstalk

ACIF uses cable crosstalk assumptions based on measured data from the Australian access network. Because the dominant crosstalk interference in almost all cases is NEXT at the customer end of the access line, ACIF has chosen to use the 10-pair cable binder unit prevalent in distribution plant as the basis for its crosstalk models. For that cable unit size the calculations are based on groups of 4 disturbers within the 10-pair cable unit. For a group of n disturbers, the 99th percentile of the power sum crosstalk is given in Section 5.2 of Part 2 of C559. The basic formulae are:

NEXT Power Sum Attenuation (NEXTPSA) is the ratio in dB of one of the n identical disturbing PSDs to the total NEXT noise from those disturbers at the NEAR end of the disturbed pair.

$$NEXTPSA = 40.5 - 6 \log\left(\frac{n}{4}\right) - 15 \log(f) \quad (5)$$

FEXT Power Sum Ratio (FEXTPSR) is the ratio in dB of the far end received PSD of the n identical disturbing systems to the total FEXT noise from those disturbers at the FAR end of the disturbed pair.

$$FEXTPSR = 36 - 6 \log\left(\frac{n}{4}\right) - 10 \log(f^2 l) \quad (6)$$

where n is the number of disturbers from a 10-pair subunit, l is the coupling length of 0.4mm PIUT cable in km, and f is in MHz.

When the 99th percentiles of the power sum crosstalk from 4 disturbers in a 10 pair unit above are compared with the 99th percentiles of the power sum crosstalk from 24 disturbers in a 50 pair unit as used in ATIS T1E1.4 standards, the results are within a few dBs. This reflects the fact that the worst

disturbance is caused by surrounding pairs that remain closely packed around the disturbed system in both cases.

3. Summation of Crosstalk

The method of combination of crosstalk and other noise sources is based on the FSAN approach and is given in Section 5.2.3 of Part 2 of C559.

4. Power Spectra of Crosstalk disturbers

The power spectra used for the crosstalk disturbers are provided in the Appendices of both C559 (for exchange end disturbers) and ACMA Standard 043-2 (for customer end disturbers). These spectra are intended to be representative of real systems and are drawn from the relevant ITU-T standards or from the T1E1.4 Spectrum Management Standard. Details of the spectra used in the simulations are given in 6 below.

5. Receiver Model for the ADSL Basis System

The ADSL Basis System is described in Section 5.3.1 of Part 2 of C559. This is an ideal receiver based on the reduced NEXT frequency division duplex mode of operation, with coding gain of 3 dB. The model produces a downstream payload rate equal to the actual line rate minus 192 kbit/s overhead. ATM and packetisation overheads making up approximately 20% of this payload must also be removed to obtain the actual data throughput.

6. The ACIF Benchmark Curve

The ACIF Benchmark for the ADSL Basis System appears in each of the slides 8 to 11. That Benchmark is calculated according to the ACIF Spectral Compatibility Determination Process described in Part 2 of C559. In that process all possible combinations of 4 ADSL disturbing systems and 4 systems of any permissible deployment class are used to calculate rate versus range curves, and the minimum rate over all combinations at each range is used as the Benchmark. For the longest lines the limiting performance comes from the combination of ADSL (both FEXT from downstream signals and NEXT from upstream signals), and ISDN Basic Rate (NEXT from upstream signals, FEXT from downstream ISDN signal is negligible) disturbers, along with the assumed background interference of -140 dBm/Hz.

7. Disturber sets for the simulations

The other curves in figures 8-11 are based on selections from the following disturbers in the crosstalk calculation:

- a) An ISDN Class 4a disturber based on the template in Table A2 of Appendix A of S043-2 interfering through both FEXT and NEXT paths.
- b) A full power, full spectrum downstream ADSL disturber interfering through the FEXT path. The downstream signal is as described for Class 6a in Table C3 of Appendix C of Part 3 of C559.
- c) A reduced power, full spectrum downstream ADSL disturber interfering through the FEXT path. In this case the transmitted power is one quarter of that in (a) or 6 dB lower.
- d) A full power full spectrum upstream ADSL disturber. In order not to bias the results with excessive NEXT from the upstream ADSL signal using the fairly conservative template in Class 6a in Table D2 of Appendix D of ACMA Standard 043-2, the simulations were performed with a template based on measured upstream transmitted PSD on a real ADSL system. That template is given in Appendix 1 of this letter.

- e) A background noise of -140 dBm/Hz.
- f) A background noise of -169 dBm/Hz corresponding to the minimum possible Boltzmann noise in the terminations.

The specific usage of these disturbers is as follows:

Slide 8

ACIF Benchmark –	as described in 6.
ADSL + ISDN	(a), (b), (d), (e)
ADSL FEXT	(b), (d), (e)
FEXT 1/4pwr	(c), (d), (e)
-140 dBm/Hz only	(e)

Slide 9

ACIF Benchmark –	as described in 6.
ADSL + ISDN	(a), (b), (d), (f)
ADSL FEXT	(b), (d), (f)
FEXT 1/4pwr	(c), (d), (f)
-169 dBm/Hz only	(f)

Slide 10

ACIF Benchmark –	as described in 6.
ADSL + ISDN	(a), (b), (e)
ADSL FEXT	(b), (e)
FEXT 1/4pwr	(c), (e)
-140 dBm/Hz only	(e)

Slide 11

ACIF Benchmark –	as described in 6.
ADSL + ISDN	(a), (b), (f)
ADSL FEXT	(b), (f)
FEXT 1/4pwr	(c), (f)
-169 dBm/Hz only	(f)

Service Parameter Measurement

6. TelstraClear is seeking service parameter measurement for the purposes of demonstrating non-discrimination or equivalence.
7. TelstraClear originally sought defined service standards for latency, jitter and packet loss for two reasons:
 - (a) As a way to determine that equivalence with the service offered by Telecom to other access seekers and itself was met; and
 - (b) As an objective measure of the service delivered to customers.
8. The values originally proposed by Telecom for latency, jitter and packet loss in its commercial UBS offering were so broad as to offer no useful measure of adequacy or equivalence and TelstraClear sought more realistic values.

9. Under the proposal discussed at the technical workshop, Telecom and TelstraClear traffic would share the same virtual path between the DSLAM and the L2TP Access Concentrator (LAC). This means that rather than seeking specific service standards for jitter, latency and packet loss, we are seeking measurement of any aspects of service provision where there is a possibility of wholesale and retail customers being treated differently – for example, the % of wholesale and retail customers connected to each DSLAM type.¹
10. However, also in line with the principle of consistent treatment between wholesale customers and Telecom's retail arm, TelstraClear should be provided with the information about the access service that is necessary to assess what can be provided at retail on an end-to-end basis. We consider that this would include setting and monitoring a consistent maximum utilisation level on the shared virtual path (for instance, 80% of maximum for Alcatel (and similar) DSLAMs and 50% for Conklins). The service parameter measurement should report the 99th percentile of the busy hour load, measured using 5-minute samples. This figure is easily measured by polling the counter maintained by the Juniper ERX for each virtual path (to each DSLAM) every five minutes (which would be normal operating practice) and calculating the 5-minute load, from which 99% of the maximum for the reporting period can be calculated. Any additional technical information about the bitstream access component of the broadband DSL service that is made available to Telecom retail should also be provided at the same time to TelstraClear.

Telstra Measurement of SIR averages

11. Because the network design must be based on busy hour usage, Telstra measures SIR averages in the worst busy hour for the month. For each shared VP, Telstra measures the average data throughput rate in kbit/s on the VP in every 15-minute interval for the month. From the recorded average data throughput rates in all 15-minute intervals, Telstra derives the Rubas Peak, which is about equal to the 99th percentile (over all 15 minute intervals) of the 15-minute average data throughputs. Telstra also extracts from its records the total number of ADSL services assigned to that VP. The busy hour average SIR per customer for that link is the quotient of the Rubas peak busy hour data throughput and the total number of ADSL services assigned to that VP.

Implementation of a change in average SIR

12. TelstraClear considers that a change to the average SIR to be applied to TelstraClear traffic within the shared Virtual Path could be implemented by a Profile change only. Telecom's average SIR should be reviewed quarterly and TelstraClear's average SIR updated based on the Telecom measurement information.
13. The Juniper ERX, which we understand Telecom uses to police the SIR, uses labeled profiles:

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ip rate-limit-profile "UBS-rate" one-rate
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¹ See TelstraClear comments on Proposed Refinement Service Proposal, provided at the technical workshop on 22 July 2005.

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committed-rate 512000
committed-burst 8000000
ip policy-list "UBS"
classifier-group *
traffic-class ubs
rate-limit-profile "UBS-rate"
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14. The above profiles are applied to each customer virtual circuit. A one-line change of the committed-rate will automatically ripple through to all virtual circuits labeled with the policy list.

L2TP service characteristics

15. TelstraClear understands that the wholesale bitstream service will be delivered to the access seeker at each UBS Regional Service Area (URSA) over an ATM STM-1 connection.² In its commercial UBS service, Telecom has specified 24kbps per subscriber as the Peak Cell Rate (PCR).
16. If the average SIR method is adopted as proposed, then TelstraClear considers that this would need to be substituted for Telecom's proposed 24kbps. This would also need to allow for the encapsulation overhead of the L2TP tunnel, since the SIR is that of the encapsulated traffic. The PCR must also be at least the PIR of the service (plus allowance for overheads), which may be greater than *SIR x number of subscribers* for small numbers of subscribers. However, since the entire STM-1 is dedicated to the access seeker, and the cost of the pipe is borne by the access seeker, TelstraClear considers that there is no reason why the PCR should not be set at the maximum possible value, and in any case not less than 50kbps per subscriber.

OSS Issues

17. The Commission sought the following information from TelstraClear in respect of operational support:
 - (a) A review of TelstraClear's request for changes to *eOR for broadband* (items a – j) as its proposed interim online solution presented at the technical workshop and clarification as to whether there is agreement on the interim solution;
 - (b) A review of TelstraClear's request in respect of its request for specific longer-term B2B requirements following the workshop discussion and further consideration of Telecom's roadmap; and
 - (c) A view on whether an independent facilitator/mediator/arbitrator in respect to OSS would be appropriate, and how such a mechanism would operate.
18. TelstraClear's responses on the above OSS matters are set out below.

² Telecom's March 2005 UBS Technical Information Pack.

Agreed Terms for Interim Online and B2B Solutions

19. TelstraClear has sought to agree terms with Telecom around the Interim Online and B2B solutions that could then be determined by the Commission as part of the final Determination, in much the same way as the agreed terms were incorporated into the Wholesale Determination. We have sought to agree terms to ensure that the determined obligations can as far as possible reflect the views of both parties, rather than to seek to withdraw OSS from the determination. The parties are continuing to have discussions on those terms.

Interim Online Solution

20. Following the OSS discussion at the technical workshop, TelstraClear has clarified that there are three key modifications it feels are necessary for *eOR for Broadband* to be an acceptable interim online solution for TelstraClear. These are:
 - (a) The addition of a time/date status change field;
 - (b) The use of agreed reject codes and free text fields; and
 - (c) The provision of multiple user logins for audit and security reasons.
21. TelstraClear's requirements with respect to the interim online solution are set out in the attached document. This paper was provided to Telecom as a starting point for discussions on the agreed terms on OSS. The parties have not reached final agreement on the interim solution, but are continuing to have discussions.

B2B Solution

22. TelstraClear's specific longer-term B2B requirements are also set out in the attached paper, provided as a starting point for discussions on the agreed terms on OSS.
23. The dates in the attached document are in line with those in the Roadmap provided by Telecom. However, as well as a commitment to the Roadmap we are seeking processes for consultation and agreement over the system design and implementation.
24. We consider that, consistent with best practice in IT design, we should be consulted (as a major user) on the design of the system. We accept that as the wholesale OSS supports other access seekers that no one access seeker or Telecom should have a "veto" over changes in the system. However, we believe there should be a process to objectively resolve differences over the requirements for an efficient wholesale interface. For example, an expert could report on matters such as feasibility and costs of disputed functionality and make a recommendation to which the parties will then give their reasonable consideration. We believe it is reasonable to have some regulated assurances around what modifications and functionality will be delivered by when and an escalation pathway in the event of a dispute.

25. We see OSS functionality as a key part of ensuring that an equivalent service can be delivered as between retail and wholesale customers. Both the interim OSS and the B2B solutions have real cost implications for us.
26. As set out in our submissions, TelstraClear also considers that Key Performance Indicators should be established and measured for OSS, such as provisioning and fault repair to ensure that equivalence is being achieved.

Independent Facilitator

27. TelstraClear considers that an independent facilitator in respect of OSS would be appropriate and constructive. We consider that the facilitator should be an expert in the design and implementation of large IT projects. TelstraClear believes that such expertise exists in the Australasian market, such as in the large consulting firms, both generally and in relation to large OSS projects in the telecommunications industry.
28. The facilitator's role would be to work with the joint project team comprising Telecom and TelstraClear personnel by:
 - (a) providing an independent perspective on key issues such as proposed adjustments to the timing and sequencing of development and release, the feasibility and resource implications of functionality requested by TelstraClear and Telecom's responding views on feasibility;
 - (b) being an independent source of information and advice on overseas developments and their applicability in New Zealand;
 - (c) identifying for discussion by the parties key issues of difference between them and the possible design or other solutions which allow the parties to resolve disputes;
 - (d) providing a trustworthy method of verifying Telecom's progress against the roadmap and each party's views, requirements and constraints without each party having to disclose confidential information to the other party;
 - (e) providing an independent perspective on whether the proposed OSS design does meet the Commission's principle of equality of customer experience; and
 - (f) serve as an independent channel for the views of other industry participants.
29. The facilitator would not chair the joint project team as TelstraClear believes that should be the joint responsibility of the parties but the facilitator would work with and provide a support function for the joint project team. Each party would agree, subject to the facilitator entering into appropriate undertakings, to provide access to its systems and to relevant confidential information. This would work in both directions. Telecom would have the assurance that TelstraClear's views about the impact of the inter-carrier OSS on its own

processes could be independently assessed. Conversely, TelstraClear would have the assurance that any technical difficulties identified by Telecom are reasonably based.

30. The parties' would not be bound by the facilitator's views. However, if they were unable to resolve a dispute and the dispute was escalated to the Commission for resolution (as TelstraClear has proposed), the facilitator would provide an independent report to the Commission.
31. TelstraClear proposes that:
 - (a) the facilitator would be selected by a committee comprising representatives of the parties and chaired by the Commission;
 - (b) TelstraClear would be prepared to pay half the costs of the facilitator, although we propose that other industry participants who use the new system developed with the assistance of the facilitator should make a reasonable contribution when they begin using the system (much as occurs with the IPND); and
 - (c) much as with the DSPL auditor, the facilitator would sign terms with the Commission.
32. In the draft Determination, the Commission raised the possibility of the inter-operator OSS issues being referred to a TCF committee. In its response to the draft Determination, TelstraClear expressed concern that this may cause further delay if this applied to an interim electronic solution³. TelstraClear proposed that the interim solution should be addressed bilaterally and the longer-term solution should be addressed by a TCF committee.
33. The use of independent expert parties to support TCF committees has proven to be highly successful in relation to various number portability projects and provides a good model. TelstraClear proposes that the same facilitator be used across the interim solution and the longer-term solution if TelstraClear's approach is adopted.

Conclusion

34. TelstraClear would be happy to provide any further detail on the above that the Commission considers necessary. We look forward to receiving the draft non-price terms for comment.

Yours sincerely,

³ TelstraClear Response to draft determination, 20 May 2005, paragraph 106.



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