

1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
18
19
20
21
22
23
24
25
26
27
28
29
30
31
32
33
34

TELSTRACLEAR USB WORKSHOP
Held on Friday, 11 February 2005
Commenced at 9.05 a.m.

ATTENDEES

Commerce Commission

Chris Abbott
Alan Hamilton
Rachel McLauchlan
Adam Hibbs
Paul Armstrong
Kate Saunders
Wade Goudie (Siemens Australia)
Cameron Dunn (Siemens Australia)
Tibor Gabanyi

TelstraClear

Grant Forsyth
Peter Waters (via audio)
Michael Newberry
Cathie Day
Wendy Dodd
Susan Wells
John Gandy (AAS)
Jamie Atkinson (via audio)

Telecom

Murray Milner
Ralph Chivers
Gerard Linstrom
Mark Corbitt

1 Nik Haden
2 Rebekah Hyde
3 Vanessa Oakley
4 Anne Callinan
5 Jonathan Lowley
6
7
8 MR FORSYTH: Is that Peter?
9 MR WATERS: Yes.
10 MR FORSYTH: Welcome.
11 MR ABBOTT: Are you expecting a technical person to phone in as
12 well before you commence?
13 MR FORSYTH: Do you want to give Jamie a call?
14 MS DAY: We have. He's trying to dial-up.
15 MR FORSYTH: Okay, so any moment. Peter?
16 MR WATERS: Yes.
17 MR FORSYTH: Can you speak normally so we can see what the
18 volume is like here please?
19 MR WATERS: Hello. How are you all?
20 MR FORSYTH: It is a great line you've got there, Peter. You
21 should change to Telco, you're fading in and out but other
22 than that, we can hear you.
23 MR ABBOTT: Peter, can you hear me adequately?
24 MR WATERS: Yes, I can.
25 MR ABBOTT: Okay, good.
26 MR FORSYTH: We are waiting for Jamie to join us, Peter, which
27 I think will be any minute and then we will hand over to
28 Chris.
29 MS DODD: Hi there, is that Jamie.
30 MR ATKINSON: Yes, I'm sorry, I just had some difficulties. I
31 had to dial in on my mobile unfortunately.
32 MS DODD: Okay, no problem. Can you hear us okay?
33 MR ATKINSON: Yes, I can, thank you.
34 MR ABBOTT: Maybe we can kick off. It is Chris Abbott speaking

1 here. Thanks a lot for all coming along. The purposes of
2 today's workshop is to assist Commission staff and inform
3 Commission staff on the technical issues that have arisen
4 from the submissions and cross-submissions on
5 TelstraClear's UBS application.

6 A workshop is done on a more informal basis than a
7 Commission conference. The Commissioners obviously aren't
8 present. How we like to run these is basically question
9 by question we'll run through and both parties can have an
10 opportunity to discuss the point and Commission staff will
11 ask questions. If you need clarification of the questions
12 that we ask you, you may do so, but that's about the
13 extent of the questions you can ask the Commission.

14 We will go round shortly with introductions of staff.
15 We have two consultants from Siemens Australia, Cameron
16 Dunn and Wayne Goudie, assisting the Commission in looking
17 at the technical aspects of this application.

18 I would like to limit the discussion to technical
19 matters. I think it will assist in making an expedited
20 process if we can avoid discussing issues of jurisdiction,
21 markets, initial pricing principles.

22 What we really want to focus on and understand from
23 both parties is the technical aspects about the provision
24 of the UBS service.

25 In respect to confidential information, Telecom has
26 advised it doesn't anticipate the need to discuss any
27 confidential information. How we would like to run it, is
28 if a need arises during the workshop to discuss restricted
29 information, what I would ask you to do is signal it to
30 us, we would prefer to not have closed sessions, so that
31 any restricted information is provided on paper to those
32 parties who have signed a Deed of Undertaking, and we have
33 a list here, and also Commission staff and our
34 consultants.

1 Bathrooms are round the corner and you need an access
2 card from one of the staff.

3 What I suggest we perhaps do is run round the table
4 and introduce ourselves and that will assist Helen who is
5 transcribing today.

6 I am quite sympathetic to Helen in that there will no
7 doubt be a lot of technical discussion and terms used. If
8 you could bear with us, if Helen needs to ask you exactly
9 what the technical term you are talking about is.

10 So, I will maybe start. I am Chris Abbott, a Chief
11 Adviser at the Commission.

12 MS McLAUCHLAN: Rachel McLauchlan, legal service branch.

13 MR HIBBS: Adam Hibbs from the Commission.

14 MR ARMSTRONG: Paul Armstrong, Commission.

15 MS SAUNDERS: Kate Saunders, an investigator to the Commission.

16 MR GABANYI: Tibor Gabanyi, senior investigator.

17 MS HYDE: Rebekah Hyde, Telecom.

18 MR LANGLEY: John Langley Telecom.

19 MR LINSTROM: Gerard Linstrom, Telecom.

20 MS CALLINAN: Anne Callinan, Telecom.

21 DR MILNER: Murray Milner, Telecom.

22 MR CHIVERS: And I am Ralph Chivers from Telecom. Later in the
23 day we will be joined by Martin Corbitt and Nik Haden at the
24 appropriate point. David Freeman-Greene who we advised
25 would be here, sends his apologies for today.

26 MS OAKLEY: Vanessa Oakley, Telecom.

27 MS DAY: Cathie Day, TelstraClear.

28 MS WELLS: Sue Wells, TelstraClear.

29 MR NEWBERRY: Michael Newberry, TelstraClear.

30 MS DODD: Wendy Dodd, TelstraClear.

31 MR FORSYTH: Grant Forsyth, TelstraClear.

32 M GANDY: John Gandy, AAS.

33 MR DUNN: Cameron Dunn, Siemens Australia.

34 MR GOUDIE: Wayne Goudie, Siemens Australia.

1 DR HAMILTON: Alan Hamilton, Commerce Commission.

2 MR ABBOTT: On the audio we have Peter Waters from Arculli in
3 Hong Kong and Jamie from TelstraClear in Australia.

4 Before we get underway in getting to the questions,
5 are there any initial issues that Telecom or TelstraClear
6 want to address before we get into the list?

7 MR CHIVERS: The only point I would raise is the questions are
8 asked in clusters effectively and we propose to answer
9 them in clusters, if that's acceptable.

10 MR ABBOTT: That's fine. Okay. Without further ado then, I
11 guess the first issue relates to the contention ratio,
12 Jitter, Packet Delay and Latency. I notice you've handed
13 out some presentations to us.

14 MR CHIVERS: Yes, we have. At this point I will hand over to
15 Dr Milner who will take us through most of our technical
16 questions.

17 DR MILNER: The questions that have been asked by the
18 Commission relate to how do the parties define these
19 terms, and how are these parameters appropriately
20 measured. In order to answer these questions we will
21 define a number of terms and explain how the various
22 different parameters stand-alone and also interrelate with
23 one another. We will go through some material relating to
24 each of those things and cover the definitions and the
25 measurement procedures as we do so.

26 One of the critical issues that we saw coming through
27 the various different submissions was that there appears
28 to be a slightly different point of view from TelstraClear
29 and Telecom with respect to the sharing of infrastructure.

30 The DSLAM and associated infrastructure is a very
31 complex shared resource. It supports a wide range of
32 services and has many different types of customers
33 connected to it, business customers, retail and wholesale,
34 consumer customers, unbundled customers, whatever it may

1 be, they are all attached to the same DSLAMs.

2 TelstraClear is only one of many users of the shared
3 resource.

4 It is critical that the resource is shared
5 appropriately between the different users and that each
6 contributes appropriately to the costs of deploying and
7 operating such an infrastructure.

8 This means that any consideration of service
9 characteristics needs to take into account the full
10 interaction between all of the different types of users
11 and use; and the resulting attribution of costs to achieve
12 the required service characteristics. This theme will
13 come through throughout the whole day.

14 Telecom is the only party who is in a position to
15 manage the infrastructure in the best interests of all
16 users and uses and it is also natural, we are quite
17 accepting of the fact, that TCL is particularly concerned
18 about their customers and their customers only and that's
19 entirely reasonable.

20 We look at contention ratio, Jitter, Packet Delay and
21 Latency. We will talk through a number of different
22 definitions. From a general perspective, Telecom adopts
23 the ITU definitions for these parameters as a first
24 choice. We acknowledge in some cases there are variances.
25 In particular, there are a number of IETF definitions as
26 well and where either of these are in conflict, we will
27 tend to choose the ITU definition and we will often point
28 out the option that we have chosen from the IETF. So,
29 that's the basic principle.

30 In terms of measurement, again the general principle
31 is that Telecom uses a set of active test probes attached
32 to dedicated ports of selected DSLAMs. Obviously we can
33 only do this on a sample basis.

34 These probes generate packet streams of the

1 appropriate frequency and size, generate and also receive
2 going both ways, which are then collected at a specific
3 point within the network, wherein they are processed to
4 deliver the desired results as we will indicate in the
5 slides which follow.

6 All asymmetrical, uncommitted bit rate services,
7 which include retail Jetstream, the whole range of retail
8 Jetstream services and UBS, are measured by the same
9 probes, distributed evenly across the services and the
10 DSLAMs in fact.

11 Sampling is performed in such a manner as to provide
12 confidence that more than 95% of Jetstream and UBS
13 connections are within Telecom's design performance
14 specifications for more than 95% of the time.

15 Increasing the confidence level beyond 95% would
16 require significant additional investment in probes and
17 the allocation of DSLAM ports, approximately \$2500 per
18 probe and no revenue per measurement port.

19 In terms of -

20 MR ABBOTT: I forgot to mention this, how would you like to
21 handle questions?

22 DR MILNER: We are happy to have them as they come through.

23 MR ABBOTT: I don't want to upset the flow of your
24 presentation.

25 MR CHIVERS: I guess we have a general preference for questions
26 to come at the end but if you need to ask some as we go
27 along, that's fine.

28 DR MILNER: Particularly points of clarification as we go
29 through to make sure there's no confusion.

30 MR ABBOTT: Maybe if you run through and we will try it on the
31 approach that we ask questions at the end.

32 DR MILNER: If we look first of all at contention ratio and the
33 definition, there's a definition there, we put it in our
34 submissions as well, I won't go through these definitions

1 in infinite detail but to just recognise that there is a
2 difference in this definition between a TelstraClear
3 position and a Telecom position, and it relates to the
4 inactive versus active users at any particular point in
5 time.

6 The definition, I think, is similar in terms of
7 making an allocation of band width relative to a set of
8 users with a contention ratio but there is a difference in
9 terms of we use the peak busy hour as being the criteria
10 for defining the contention ratio. The reason for that is
11 that's what defines the use of resource absolutely.

12 The TCL definition will result in the allocation of
13 two to three times the aggregation bandwidth for a given
14 contention ratio and the set of end user connections,
15 which creates a cost which needs to be recovered by some
16 means.

17 That is the fundamental difference between Telecom
18 and TelstraClear in terms of contention ratio.

19 In terms of measurement of contention ratio,
20 contention ratio, I will go through this because I think
21 it is reasonably important to understand the specifics.
22 Contention ratio is established through a set of
23 dimensioning rules for the associated uncommitted bit rate
24 virtual path. That is the virtual path between the DSLAM
25 and the first ATM switch.

26 As more customers - as the measurements used for
27 packet delay variation and packet loss, which we will talk
28 about shortly, are used to determine that a sample of
29 services using a given virtual path is performing within
30 its design parameters. So, we actually use a mix of
31 parameters to define the contention.

32 As more customers are connected to the VP and as the
33 measurements indicate variations in the ratio of active to
34 inactive users, the dimensioning rules are adjusted and

1 reconfiguration of the VPs is executed, typically on a
2 monthly cycle basis per VP. So, during the period of a
3 month there can be some significant variation but it's
4 within the 95% of connections, 95% of the time requirement
5 that we have.

6 Contention ratio will occur, as I say, between these
7 adjustment times.

8 Just a note in terms of, again, a specific request
9 that TelstraClear has made in their cross-submissions,
10 when we look at the interaction between users and
11 services, we find that we end up with this four quadrant
12 picture which is shown on slide number 7. Basically you
13 have the two different situations of the actual user
14 themselves, a single service per access where, for
15 instance, a customer is using a single PC and is doing web
16 browsing or gaming, for example; or you have the situation
17 where we have either multiple users or multiple services
18 being used per access and, for instance, that's when you
19 have simultaneous web browsing and gaming and that creates
20 two different outcomes in terms of user experience.

21 You also have the situation where the network is
22 uncongested and where the network is congested. So, you
23 create effectively four quadrants of different performance
24 for the end user in terms of the end user perspective.
25 TelstraClear has requested that we only consider the
26 single service per access and we will do that through the
27 rest of the discussions. So, that is the context in which
28 the rest of the discussion is put, just to clarify that
29 point.

30 I would like to expand on the definitions of
31 contention ratio a little bit more with an example just to
32 make sure that we all understand what we're saying.

33 If we consider a combined data stream of three
34 typical web browsing users during a busy hour, peak

1 information rate per user is 512kbps.

2 If we simulate 3.9 megabytes of web browsing per user
3 then it provides an average input per user of 8.6kbps and
4 a combined peak data rate of 1100kbps.

5 We have a peak to average ratio of $1100/8.6$ which
6 equals 128:1.

7 That is pretty typical of web browsing traffic. This
8 is a direct simulation of web browsing traffic.

9 So, data networks need to support a high
10 instantaneous peak data rates per user but the average
11 will be considerably less and therefore we can apply
12 contention ratios of any number from 1:1 to something
13 approaching 100:1 and the service will work and people
14 will have different user experience, and we achieve the
15 benefits of statistical multiplexing.

16 If we go into that further. If we look at a specific
17 example of contention ratio. For these three services
18 with a peak information rate of 512 Kbps, if we define a
19 contention ratio of 20:1, then the peak busy hour, using
20 Telecom's definition, we require a minimum allocated
21 bandwidth of $(512 \times 3)/20 = 76.8$ kbps, which is the read
22 line across the graph. So, we need very little bandwidth
23 to support those services.

24 However, because we only have the defined three
25 users, those three users wouldn't achieve their peak
26 information rate if we allocated the bandwidth at the red
27 line.

28 In practice, we need to have a certain number of
29 customers brought together through the same pipe before we
30 can actually apply efficient statistical multiplexing. In
31 this case, with the 512 kbps users and the 250:1
32 contention ratio we would need a minimum of 20 customers
33 to make it work. Allocate a peak information rate of
34 512 kbps and we would be able to achieve a good

1 statistically multiplexed service for up to 20 customers.

2 That's the green line.

3 Network conversion will still occur above that green
4 line as indicated by the spikes on the graph and that
5 occurs even when we only have three customers using the
6 service at a time.

7 We will continue to use that model as we go through
8 the various definitions to make sure we are all clearly
9 aligned as to exactly what we are saying.

10 Jitter or Packet Delay Variation -

11 DR HAMILTON: Just before you move on, if I could ask a couple
12 of questions for clarification. As you say, you're going
13 to go back to this model, so I think it's important we
14 understand. The peak information rates you're referring
15 to are measured layer 2/layer 3?

16 DR MILNER: In this case they are measured in layer 3.

17 DR HAMILTON: When you talked about potential ratio previously
18 you talked about various paths on the ATM network, how do
19 these peak information rates apply to virtual paths?

20 DR MILNER: We typically allow for a 20% overhead for the
21 conversion, the average conversion between IP packets in
22 layer 3 and layer 2.

23 DR HAMILTON: Sitting behind us, there's a formula that turns a
24 layer 3 peak information rate and it's more than an extra
25 wide ratio it has overheads and other things?

26 DR MILNER: That's correct. And of course if you have a
27 particular packet size then the overhead is different for
28 different packet sizes but we have to treat it as an
29 average assuming that customers are using it in an average
30 sense.

31 DR HAMILTON: And you've obviously chosen on a average based on
32 some measurements?

33 DR MILNER: Yes, the typically three points we seek for
34 customers, and obviously that could change over time as

1 customers use services in different ways.

2 MR GABANYI: What we were talking about so far is only the web
3 browsing or something else as well?

4 DR MILNER: The definition applies to all. The example is
5 with respect to web browsing.

6 MR GABANYI: Okay.

7 DR MILNER: The Jitter or Packet Delay Variation, there's a
8 definition there which is directly out of the ITU, i.e. in
9 the documents I didn't sense any difference in opinion
10 between TelstraClear and Telecom on that particular item.
11 And we also have full agreement that Jitter and Packet
12 Delay Variation could be used interchangeably, so I don't
13 see any difference of opinion there either.

14 If we look at the measurement of Packet Delay
15 Variation, there may be some disagreement here but we will
16 test that during the day.

17 Normally the measurement would be achieved by taking
18 one minute samples of a one way Packet Delay Variation,
19 use a packet of defined size, TCL request 64 bytes which
20 is fine, between an end user's modem and a defined point
21 in the network on a continuous basis resulting in a
22 distribution of delay variations from which the maximum
23 and minimum can be calculated over any given 24 hour
24 period.

25 During this 24 hour period it is expected that the
26 peak busy hour will be experienced by users, and hence by
27 the measurement, so providing an approximation to the
28 randomly arriving 1472 byte packets that's used in the
29 definition.

30 For best results the delay variation should be
31 calculated from a daily distribution averaged over a
32 minimum of two weeks, it's preferable to use 8 weeks
33 because you do get quite large cyclic periods,
34 particularly during holiday periods and those sorts of

1 things we've just experienced.

2 If we look at the impact of delay variation and
3 policing. Under policing, any packets above the defined
4 peak information rate of the aggregated data stream, with
5 the defined contention ratio applied, will be dropped,
6 resulting in packet loss, but very little delay variation.

7 So, one approach is to just discard the packets that
8 go above the green line and to have quite low delay
9 variation.

10 Under this regime we rely on the higher layer
11 protocols, such as TCP, to resend the discarded packets
12 and hence to manage the integrity of the end to end
13 communication. The impact of this on the end user
14 experience will be to transfer the delay associated with
15 the resending of the discarded data to the application
16 layer, so you can get a different experience at the
17 application end of the communication link.

18 If we look at delay variation in this regard under
19 shaping conditions, the data packets that fall above the
20 defined PIR of the combined aggregated data stream with
21 the contention ratio applied will be delayed until there
22 is a lull in the data stream and then reinserted.

23 Most of the time this will result in zero packet loss
24 but will increase the delay variation.

25 As you will see in the diagram, we have smeared it
26 across a certain amount of time. Exactly what that's
27 going to be are parameters that we can establish.

28 Under severe conditions, even with delay variation
29 and with a defined buffer size, the buffer can overflow
30 resulting in packet loss. So, we still can get packet
31 loss in the situation but it will be at the end of the
32 buffer, and we'll talk a lot more later on about the whole
33 issue of how you actually dish out delay variation and
34 manage delay variation and packet loss etc. on a fairness

1 basis.

2 Hence, as we can see as well, there is a trade off
3 between buffer size, which determines delay variation, and
4 packet loss ratio. We can trade those two things off
5 against one another.

6 DR HAMILTON: Same question again: when we talk about policing
7 here, are we talking about policing in layer 2.

8 DR MILNER: In that case we are talking about layer 2. In
9 terms of the Jetstream and UBS services that we have at
10 the moment, they are both shaped and if we do it, we don't
11 police at the VC and the VP layer.

12 DR HAMILTON: Right, okay.

13 DR MILNER: We do not do any policing or shaping at the layer 3
14 at this point in time.

15 DR HAMILTON: What has been dropped is not actually a packet,
16 it is a cell.

17 DR MILNER: It is a cell, so it does have an impact.

18 DR HAMILTON: Other impacts as well.

19 DR MILNER: That is why we prefer to shape rather than police.

20 DR HAMILTON: Yep.

21 DR MILNER: If we look at the ITU definition for Latency, the
22 absolute time measured from the first time the IP packet
23 is passed to the source etc., again a standard ITU
24 definition, and I think again no disagreement between
25 Telecom and TCL over the definition.

26 In terms of measurement, the measurement procedure is
27 usually the same as that for delay variation, with the
28 minimum delay variation measurements for a given packet
29 size, e.g 64 bytes, being defined as the Latency. So, we
30 just take the distribution that we get from the delay
31 variation measurement, the minimum of that distribution.

32 In terms of packet loss, again we use an ITU
33 definition and again I think we have no difference of view
34 between TCL and Telecom on the definition that we've used.

1 And, again, the measurement of packet loss is
2 typically combined with that of delay variation by
3 detecting those packets from the source that do not reach
4 the egress destination by identifying missing packet
5 numbers effectively.

6 The number of missing pack numbers per 15 minute
7 sample period are collected and these samples are averaged
8 on a 4 weekly base.

9 Obviously if you're using bit rates below 64 kbps you
10 need to use a longer averaging period but we're not
11 considering that in these discussions, so I haven't showed
12 that situation.

13 As I've shown in the diagrams, there is a trade off
14 between contention ratio, delay variation and packet loss.
15 I want to emphasise that.

16 From the previous discussion, it can be seen that
17 there are trade-offs between those parameters.

18 For example, for a given contention ratio, it is
19 possible to define a delay variation and then this choice
20 will determine the packet loss ratio, all within defined
21 statistical limits because we are only doing these within
22 a statistical basis in measuring or predicting any of
23 these characteristics.

24 Other combinations of these parameters are possible,
25 but in all cases it is difficult to determine all three
26 parameters independently, unless the contention ratio
27 approaches 1. It doesn't have to be exactly 1 but
28 approaching 1.

29 Furthermore, defining the bounds for any one or a
30 combination of these parameters, to a high degree of
31 confidence, such as the 99.9% required by TCL for delay
32 variation and packet loss and in fact contention ratio, is
33 even more difficult to achieve, unless the contention
34 ratio approaches 1.

1 So, again, both of those factors lead us towards the
2 statement that we made in our cross-submission that we
3 have a near committed bit rate service under those
4 conditions.

5 And just emphasise that, we're talking about under
6 these conditions the delay variation and packet loss ratio
7 and contention ratio must be achieved for all but 1.44
8 minutes per day, including during the busy hour at the
9 99.9% limit, very difficult to achieve unless you go
10 towards an almost committed bit rate service.

11 As I said, in order to achieve a contention ratio
12 approaching 1, and meet the defined delay variation and
13 packet loss ratio for more than 99.9% of the time, it is
14 necessary to allocate resources so that the committed
15 information rate is close to that of the PIR for each
16 connection.

17 This defeats the ability to have efficient
18 statistical multiplexing. Once you have a committed bit
19 rate, you don't have statistical multiplexing.

20 In addition, any requirement to establish confidence
21 bounds at the 99.9% level for the delay variation and
22 packet loss ratio would require a much higher sampling
23 rate for the measurement of actual performance than is
24 currently the case.

25 As I said, we've only got sampling in place to
26 achieve 95%. If you want to go to 99.9%, you have order a
27 magnitude increase in sampling that you have to apply.

28 All of the above needs to be put into the context -
29 sorry, that would of course impact on both probes and
30 non-revenue making ports.

31 All of the above need to be put into the context of
32 the Telecom retail Jetstream services where from a design
33 perspective we do not commit to anything in the
34 marketplace; the nominal Contention Ratio is less than

1 50:1 for approximately 95% of the time; the one way Delay
2 Variation is less than 500 milliseconds for more than 95%
3 of the time; and the one way Packet Loss Ratio is less
4 than 3% for more than 95% of the time.

5 DR HAMILTON: Another clarification, sorry Murray.

6 DR MILNER: Not a problem.

7 DR HAMILTON: The Contention Ratio approaching 1, is that on
8 the assumption that the traffic is totally unmanaged on
9 the link?

10 DR MILNER: Yes. If you had a very specific distribution of
11 traffic coming into the port, then you could make other
12 assumptions.

13 DR HAMILTON: Or if you had some kind of shaping functionality?

14 DR MILNER: If you could guarantee the user's port and/or the
15 party that was giving you the traffic gave it to you with
16 a specifics to distribution, yes, you could change some of
17 those characteristics.

18 DR HAMILTON: Right.

19 DR MILNER: Yes, absolutely, but we don't have any control over
20 those things, so we make the assumption they are random.

21 DR HAMILTON: And the assumption is also the Jetstream traffic
22 and the bit stream traffic aren't sharing a VP?

23 DR MILNER: That's correct.

24 DR HAMILTON: So it has no potential control over the
25 activities of the Jetstream customer?

26 DR MILNER: That's correct, absolutely because it is, as I
27 said in my first slide, my first point was it is a highly
28 shared infrastructure.

29 So, if we have a look at in summary in terms of these
30 definitions, Latency I think we're all square on the
31 definition. I think there's not too much difference about
32 the opinion about measurement but we can test that.

33 The TCL requirement is for less than 50 milliseconds
34 using a 64 byte packet with greater than 99.9% of the

1 time. The Telecom position is we can provide less than
2 50 milliseconds with a 64 byte packet with interleaving on
3 for greater than 95% of the time, and the 95% of the time
4 is largely related to our sampling in our uncertainty with
5 respect to the total mix of traffic that we have to deal
6 with.

7 The delay variation, TelstraClear is requesting a
8 mean Packet Delay, the delay to be less than the Packet
9 Delay for 64 byte packets averaged over a 1 minute
10 interval for greater than 99.9% of the time. We would
11 suggest going much below 200 milliseconds for a 64 byte
12 packet averaged over a 1 minute interval for greater than
13 99.9% of the time would be more appropriate specification
14 and even this would come at a cost relative to our
15 existing services.

16 Likewise, packet loss ratio, TelstraClear has
17 requested less than 0.1% for 64 byte packets averaged over
18 1 minute interval for greater than 99.9% of the time. We
19 would recommend that if you want to achieve less than 0.1%
20 for 64 byte packets averaged over a 1 minute interval for
21 greater than 95% of the time, it probably could be
22 achieved but it would have come at a cost because we would
23 have to do some other traders and you'd probably end up
24 with a low Contention Ratio to achieve that.

25 Contention ratio, TelstraClear request less than 20:1
26 for allocated connections for greater than 99.9% of the
27 time. We are suggesting that we can provide 20:1, it is
28 not what we have with our current services but we could do
29 it as measured in the peak busy hour for more than 95% of
30 the time and it would come at a cost.

31 Just some notes associated with those points in that
32 slide. The one way Latency of less than 50 milliseconds
33 can be achieved with a 64 byte packet with interleaving
34 turned on or off.

1 Telecom has strong reasons for requiring interleaving
2 to remain on at this time and we will go into that under a
3 separate item.

4 If the Contention Ratio of 20:1 is to be implemented,
5 then Telecom is of the view that a delay variation of less
6 than 200 milliseconds for more than 95% of the time is
7 inadvisable and even this would have cost implications.

8 Alan's point before with respect to how the traffic
9 was passed to us by all customers could impact on that but
10 it's very, very hard to manage, especially if a packet
11 loss ratio of less than 1% is to be achieved
12 simultaneously for greater than 95% of the time.

13 A packet loss ratio of less than 0.1% cannot be
14 achieved for typical use, together with a Contention Ratio
15 of 20:1 and a short delay variation.

16 With 500 milliseconds of delay variation and 5:1
17 Contention Ratio, it might well be possible to achieve
18 that for 95% of the time with appropriate cost
19 implications.

20 Telecom always deploys Contention Ratios relative to
21 peak busy hour usage to ensure efficient use of resource.
22 We will talk a bit more about that later on in terms of
23 actual cost.

24 A 20:1 Contention Ratio will have a cost impact
25 relative to 50:1.

26 Finally note 5, any requirement to achieve a
27 confidence level of greater than 95% on any of the above
28 parameters will have a direct cost impact for probes and
29 will require further optimisation of the relative values
30 of all of the parameters, particularly reduction in
31 Contention Ratio with resulting cost impacts.

32 That really is our summary of our position with
33 respect to the definition and measurement of those key
34 performance parameters.

1 MR CHIVERS: Any other questions from the Commission, Chris?

2 MR ABBOTT: No, I don't have any.

3 MR GOUDIE: Just one question. When you talk about shared
4 infrastructure, referring back to your submission on a
5 finer point -

6 MS DODD: Would you mind speaking up?

7 MR GOUDIE: Just in reference to your discussion with the
8 shared infrastructure being able to provide a different
9 level of service, in your cross-submission you talk about
10 other services you offer at more of a business level of
11 standard, are they utilising the same network or do you
12 have a separate network providing that service?

13 DR MILNER: They are using the same infrastructure, shared in
14 different ways to provide different characteristics. The
15 next section we've gone into that in a lot more detail, if
16 that would be helpful.

17 MR GOUDIE: Yes, I'll wait for that, thank you.

18 MR ABBOTT: I think that sounds like all the questions from us.
19 Now, in respect to - normally the process for a workshop
20 is that only the Commission gets to ask questions.
21 However, in the past it's always ended up being a three
22 way discussion, in that TelstraClear has been able to ask,
23 in an appropriate manner, questions which might serve to
24 clarify particular points. If you're happy to have those,
25 alternatively if TelstraClear has any questions we can
26 determine whether they're appropriate and ask on
27 TelstraClear's behalf. For matters of efficiency, if
28 you're happy for TelstraClear to ask questions as well but
29 that's up to you.

30 MR CHIVERS: Would that be best done now or after TelstraClear
31 has made their own presentation?

32 MR ABBOTT: What is your preference? Does TelstraClear have a
33 preference?

34 MR FORSYTH: From a process point of view, if you're happy and

1 they're just clarifying questions, I think, Murray,
2 correct me if I'm wrong, it's probably easy to deal with
3 it at this stage but as to whether we have any
4 clarification questions I would defer to Michael on that.
5 Is there anything you want to ask?

6 MR NEWBERRY: No, not at this stage.

7 MR FORSYTH: Okay, that's easy.

8 MR ABBOTT: Perhaps it's most efficient to run it on that
9 basis. If there are any concerns just raise them and we
10 will consider whether or not they should continue in that
11 matter.

12 MR GANDY: Sorry, Murray, this is going to nag at me and I will
13 miss the rest of your presentation unless I get this
14 resolved a little bit. A lot of what you said is
15 contingent upon the DSLAM being a shared resource, which I
16 totally agree with. I can't remember which of your
17 submissions that says that, I'm not going to find it now.
18 You say you need virtual circuits for each of the
19 services, which implies a partitioning of that shared
20 resource, in my head at least. Are you no longer planning
21 to do that? How does that fit with the premises of what
22 you just said are based on?

23 DR MILNER: Every connection on a DSLAM is allocated a virtual
24 circuit. Some virtual circuits are treated as point to
25 point virtual circuits and dealt with independently, and
26 some virtual circuits are combined within a virtual path
27 and treated as an allegation.

28 Obviously, the higher the value of the service, and
29 hence the higher the value of the traffic in the VC, the
30 more they will be treated separately; versus the lower the
31 value of the traffic, and hence the pricing, the more they
32 will be aggregated together and have a distributed
33 characteristic.

34 MR CHIVERS: I think also our next set of questions will

1 substantially go to answering your point as well.

2 MR GANDY: Yeah, okay.

3 MR ABBOTT: If there's no further questions, perhaps if we move
4 on to question 2 regarding the provision of non-shaped
5 downstream speed.

6 MR CHIVERS: You're wanting to go through all questions first
7 or -

8 MR ABBOTT: Sorry, does TelstraClear have a presentation on the
9 first point?

10 MS DODD: We.

11 MR NEWBERRY: In this particular case, I would like to thank
12 Telecom for a very full definition. We are, in fact, in
13 general agreement of the ITU tests and the measurements.
14 We have some concerns over the 95% level and we will
15 address that later and in particular when we get to the
16 Jitter and the Latency specifications, it will come up
17 about point 11 in our submission.

18 So, if it would assist the Commission, we're quite
19 happy to move on at this stage.

20 MR ABBOTT: Okay, I think we should move on. I am aware of
21 time, it's 9.45. I suggest we break at around 10.30 and
22 just plough through for now. We are intending to have
23 lunch but I thought it was most appropriate to leave it
24 flexible to see because the purpose of this is to extract
25 as much benefit as possible for all the parties concerned.

26 MR CHIVERS: If TelstraClear have a concern over the 95%
27 confidence level, we would prefer to hear that now before
28 we continue.

29 MR NEWBERRY: The concern is that you've talked a great deal
30 about how the measurements are made about the statistical
31 measurements, what we are, of course, attempting to do is
32 provide the experience for each individual user and, to
33 put it another way, if you've got a 5% time that this is
34 not available, especially during the busy hour, that

1 equates to a not very good experience for the typical
2 user, be they a Jetstream customer or not.

3 Our position is, in fact, that the Telecom network
4 performs quite well, better in fact than the
5 specifications set out, and we are asking for something
6 much more closely approximating reality than these
7 particular parameters would indicate.

8 MR ABBOTT: I think if there's no more questions surrounding
9 the technical feasibility or the issue of what those terms
10 mean, I think it's fair to say the parties are in
11 disagreement, and perhaps we should move on.

12 MS DODD: I think we would prefer to cover those aspects when
13 we get into the circumstances themselves.

14 MR ABBOTT: Is that okay?

15 MR CHIVERS: Yep.

16 MR ABBOTT: Move on to point 2, which is provision of
17 non-shaped downstream speed, I will pass over to Telecom.

18 MR CHIVERS: Thank you, Chris. Dr Milner is taking us through
19 these again.

20 DR MILNER: The questions on this subject relate to Telecom
21 state "there are certain technical and operational
22 practicability issues associated with providing multiple
23 downstream speed configurations", what are these
24 limitations and if so, can they be feasibly overcome?

25 What are the cost implications for additional network
26 maintenance and resources on Telecom?

27 Can you rate shape the upstream speed without
28 limiting downstream UBS speed?

29 We will try and address all of those issues in the
30 discussion that follows. In order to do so though, we do
31 need to provide a little bit of background. It
32 particularly relates to questions that have already
33 arisen, and that is exactly how the infrastructure is
34 shared between multi uses and multi users, so we will

1 spend a few minutes providing an insight to that because
2 that is the only way you can get the answer to some of
3 those questions.

4 It is clear from the submissions that TCL and their
5 consultants assume that the Telecom DSLAMs and the
6 associated aggregation infrastructure are only used to
7 support the retail Jetstream type services and the UBS
8 type services. This is definitely not the case, as we
9 will illustrate.

10 This infrastructure supports a range of Telecom
11 business and consumer, retail and wholesale services today
12 and will support more in the future.

13 Furthermore, these services share the available
14 resource on a fairness basis and with value based pricing
15 applied in the market.

16 Hence, in order to address the issue of non-shaped
17 downstream speed, we need to consider the following
18 factors: Technical and operational complexity; fairness
19 in the allocation of shared resources; and direct
20 infrastructure costs.

21 Each of these factors will be discussed in turn
22 within the slides that follow. It should also be noted
23 that although Telecom has unconstrained bit rate services
24 in the market today, related to those being requested by
25 TCL, these are being capped in the market for precisely
26 the reasons described in the following slides.

27 We are obviously going through a considerable growth
28 phase within our broadband services today with up to 1,000
29 new connections a day.

30 Provision of non-shaped downstream services relate to
31 the market demand which is growing, as I said, it's
32 growing very rapidly at the moment, it has become
33 increasingly difficult to sustain the unconstrained bit
34 stream services in the marketplace for technical reasons.

1 In order to consider the above factors, it is
2 essential to understand how shaping and policing is
3 applied to the asymmetrical bit stream services. This
4 occurs in three places: On the copper access through rate
5 limiting, it's probably more correctly described as
6 policing; in the ATM aggregation network where it is
7 shaping; and in the L2TP origination to facilitate
8 congestion management and fairness.

9 The impact of all of these components in terms of
10 both cost and performance is discussed. If you go back to
11 a slide which the Commerce Commission staff will recognise
12 as I have used it before in other presentations, basically
13 the very simple view of a DSLAM operating in convention
14 with a NEAX, in our case switch, with a voice traffic and
15 separating out the data traffic going over an ATM IP
16 backbone.

17 If you go over to the next page, we described at a
18 previous conference the way customers A, B and C go across
19 the cross connect and a DSLAM to Fast Internet to
20 Aggregation.

21 That is quite correct in terms of a narrow
22 perspective but is not correct in terms of what actually
23 happens in any particular DSLAM.

24 Telecom has the following types of DSLAMS deployed:

25 Nokia DSLAMS in exchange sites; Nokia remote DSLAM
26 shelves in cabinets; Alcatel DSLAMS in exchange sites
27 (some co-located with the Nokia DSLAMS); Alcatel
28 sub-tended DSLAMS in smaller exchange sites; there are
29 Conklin mini DSLAMS sub-tended off exchange based Alcatel
30 DSLAMS in a number of cabinets around the country. About
31 1,500 DSLAMS changing every day.

32 All of these DSLAMS support a range of Telecom data
33 services.

34 Typically 2 Mbps and below today, with some

1 asymmetrical services being higher.

2 In the future they will probably support services up
3 to 10 Mbps and asymmetrical services up to 20 Mbps will be
4 supported off this infrastructure.

5 This includes data services to meet the needs of
6 business, consumer, wholesale and access seeker customers.

7 All of the main exchange based DSLAMS on page 26 have
8 a single STM-1, 155 Mbps, backhaul transport link.

9 This transport link carries ATM over SDH.

10 This transport link terminates on an ATM aggregation
11 node, which is the first ATM switch.

12 This ATM aggregation node will typically support ATM
13 aggregation from several DSLAMS.

14 Smaller exchange sites and cabinets are served
15 (today) using sub-tended remote line shelves, with 45 Mbps
16 backhaul (Nokia); sub-tended remote DSLAMs, with 45 Mbps
17 backhaul (Alcatel); sub-tended mini DSLAMs, with up to
18 4xE1 backhaul (Conklin); all of the above share the main
19 DSLAM backhaul capacity.

20 If we look at what the picture really looks like, it
21 looks more like the picture on page 27 where we have
22 identified there a number of DSLAMS terminating on the
23 first ATM switch, and on each of those DSLAMS we will have
24 a range of services from our one office products, through
25 private office, frame relay, SBI, UBS, Jetstream services
26 and all sorts.

27 We will also have off that DSLAMS over DSLAMS
28 sub-tended and off those sub-tended DSLAMS there will be a
29 range of the same set of services.

30 And then there will be other DSLAMS again with the
31 same set of services on them. All of those are configured
32 together.

33 In order to create the L2TP tunnels, we use the same
34 box effectively as we use for BRAS for Jetstream and we

1 use it as an L2TP LAC or UBS but effectively the same
2 thing applies for the UBS services, we create a network to
3 network interface at the first ATM switch, whereas all the
4 other services are forwarded into an ATM and IP network.

5 Beginning first with the first issue that we said
6 that we needed to look at in terms of this particular
7 issue, it relates to copper rate limiting. It is a form
8 of policing which is applied on the copper access line
9 connected to the DSLAM in a manner appropriate to the
10 service deployed over that copper line.

11 The copper rate limiting is applied at the DSLAM
12 through a service profile.

13 The rate limiting is independently applied at the PIR
14 of the upstream and downstream bit rates, plus about 20%
15 overhead to accommodate the average packet to cell
16 conversion overheads.

17 The copper rate limiting achieves the following
18 outcomes:

19 It stops the customers using more resource from the
20 DSL modem to the first ATM switch, than their access
21 provider has purchased from Telecom.

22 It reduces the power spectral density for a given
23 service per copper cable pair, within a given cable sheath
24 and hence reduces the impacts of cross-talk in the copper
25 cable network between all of the different services that
26 exist in that copper cable network.

27 It reduces the number of resynchronisation events by
28 improving the noise margins for any given service in the
29 ATM specification.

30 Copper rate limiting can typically be set at 32 Kbps
31 increments from 32 Kbps up to about 80 Mbps for downstream
32 and 32 Kbps to 640 Kbps for upstream.

33 The upstream and downstream values can be set
34 independently.

1 Some DSLAMS can only be configured in 64 Kbps
2 increments. There are a few variations there we need to
3 accept.

4 Hence, it is possible to configure the copper rate
5 limiting to support a service with 8 Mbps downstream and
6 12 Kbps upstream as requested by TCL, so, yes, you can do
7 it.

8 On the other hand, none of Telecom's lines will
9 synchronise to a downstream speed of more than 7.6 Mbps
10 and then only about 20% will achieve this rate.

11 Hence, the actual downstream rate achieved for any
12 given access line will vary considerably, with the
13 majority synchronising between 2 and 4 Mbps, that is
14 assuming that we have a good modem on the end. We don't
15 have control of that, so that will vary dramatically. The
16 biggest problem of all is the in-house premise wiring. If
17 we take 20 faults that we get most of the time claiming
18 low speed, 19 out of those usually prove to be the
19 customer wiring.

20 Unfortunately, it is essential to allocate resource
21 relative to the maximum PIR expected for all lines, as
22 there is no way to tell how the variable PIRs will be
23 distributed across a given DSLAM. I will show you a
24 little more of that later, especially when we use TCL's
25 definition of convention ratio.

26 So, we have a situation where we can set it up okay
27 but we have an awful lot of variability.

28 Now if we look at the issue of fairness, and that is
29 how every different customers get a reasonable crack at
30 the resources that are available so that they're allocated
31 in a fair manner.

32 This is particularly true under congested conditions.
33 Under congested conditions, it is essential that all of
34 the different services using the DSLAM receive an

1 appropriate amount of resource relative to their defined
2 service characteristics.

3 Services with a defined Committed Information Rate
4 will receive sufficient resource to deliver on this
5 guarantee for better than 99.9% of the time.

6 So, yes, we do offer services with guarantees at the
7 99.9% level.

8 These are typically high value business grade
9 services with commensurate prices in the marketplace.

10 Services with a defined PIR, with no defined CIR and
11 a defined Contention ratio (referred to as uncommitted bit
12 rate (UBR) services from here on through) need to receive
13 sufficient resource to deliver the defined Contention
14 Ratio during periods of congestion and the full PIR during
15 periods of no congestion, as we illustrated in one of the
16 previous diagrams.

17 The different PIR services all experience bit rate
18 degradation in proportion to their PIR and Delay Variation
19 and Packet Loss performance is distributed in an equitable
20 manner for all services. So, all services experience
21 roughly the same packet loss and delay variation under
22 congestion conditions.

23 In terms of implementation, the Committed Information
24 Rate services receive a Virtual Circuit which has the
25 characteristics defined to ensure that the defined CIR is
26 achieved for better than 99.9% of the time.

27 This typically means using ATM class of service of
28 CBR, CBR-rt or VBR-nrt in the ATM shaping and in
29 conjunction with the allocation of bandwidth per service
30 approximately equal to the defined CIR. It depends
31 exactly on how you actually drop bits and so on.

32 On the other hand, the UBR services are given a
33 virtual circuit which has a defined PIR and uncommitted
34 bit rate, we do actually use UBR+ ATM shaping.

1 All UBR VCs are combined in a single virtual path
2 from the DSLAM to the BRAS.

3 The fairness of these services is achieved in the
4 broadband remote access server which acts as a BRAS or
5 L2TP LAC.

6 In the BRAS both the aggregated VP and each of the
7 individual VCs is shaped by the Hierarchical Scheduler.
8 The Hierarchical Scheduler can also shape at layer 3, we
9 do not use that function on any of these services at the
10 moment.

11 All retail Jetstream and UBS services in the market
12 today are treated in exactly the same manner from the
13 customer modem through to the output of the BRAS/L2TP LAC
14 function. There's a slight difference once you come out
15 of that because we have to divide out the UBS services
16 from the Jetstream services. So, they're all subject to
17 the same shaping and fairness criteria as that occurs in
18 that box.

19 The next slide shows you a sample as it exists
20 roughly today of the different types of DSLAM services.
21 If you come back tomorrow it will be different, it will be
22 greater.

23 One-offs, the CIR is equal to the PIR and we use
24 VBR-nrt or CBR-rt, one VC per connection. UPC being the
25 unbundled partial circuits. The private office, the frame
26 relay, secure business internet, the full range of our Jet
27 Services and the UBS (commercial).

28 Just to pick up the latter two, they are effectively
29 all defined the same at this point of time, with the PIR
30 defined, Contention Ratio less than 50:1, UBR+ single
31 shared VP, and the UBS commercial is configured in the
32 same way.

33 Then we have the TCL proposed new service, which will
34 have a PIR defined and potentially also unconstrained,

1 Contention Ratio of less than 20:1, UBR+ maybe, some of
2 the characteristics might need different to that, and a
3 separate VP don't know. So, those are the way in which we
4 see the picture at this point in time.

5 MS DODD: Murray, would you mind if I ask a question at this
6 point?

7 DR MILNER: Can do.

8 MS DODD: You say Jetstream and UBS are all subject to the same
9 fairness criteria and you talk about a Contention Ratio of
10 less than 50:1. Your Jetstream residential and business
11 services, are they operating under the same Contention
12 Ratio?

13 DR MILNER: Yes.

14 MS DODD: Is there any difference in the service specs or
15 parameters for them?

16 DR MILNER: Not at this level, no.

17 MS DODD: Thank you.

18 DR MILNER: It's handled differently at different parts of the
19 - in different layers of the service delivery but not at
20 this basic level.

21 MS DODD: So at layer 2 there's no difference?

22 DR MILNER: No.

23 MS DODD: Thank you.

24 DR MILNER: If we look at the backhaul of the DSLAM from a long
25 call perspective, we have effectively a large pipe, which
26 is illustrated there by the grey circle, of an STM-1,
27 155 Mbps pipe. Within that we have point to point Virtual
28 Circuits per Connection for all CIR services, and they
29 will have different characteristics depending on exactly
30 which service it is, so we've shown them in different
31 colours to illustrate that.

32 In addition to that, we have the large red circles
33 which are typically the virtual paths. One of those
34 virtual paths will be the virtual path from the particular

1 DSLAM being considered, others will be virtual paths from
2 intended DSLAMS and they will have VCs in them the same as
3 the virtual circuits per connection in one of those red
4 circles. That's what it looks like and we pack that stuff
5 in there to get, of course, the best economics.

6 Fairness and the BRAS. Fairness is best achieved at
7 the BRAS L2TP LAC as the ATM infrastructure alone is poor
8 at achieving reliable fairness outcomes in a highly
9 contended environment. Even then there is considerable
10 operational complexity to achieve a satisfactory outcome.

11 At the BRAS or L2TP LAC, the Hierarchical Scheduler
12 uses a number of mechanisms to ensure that under
13 congestion conditions each PIR service is speed degraded
14 in proportion to its PIR. All the different PIR services
15 experience a similar delay variation probability
16 distribution and packet loss probability distribution.

17 It uses weighting coefficients associated with each
18 PIR service to achieve this outcome.

19 These weighting coefficients need to be configured
20 for each new service deployed at both their VC and VP
21 levels.

22 Then the interactions between the various services
23 needs to be tested to ensure that the fairness criterion
24 is actually being achieved in practice across all
25 parameters, in terms of speed degradation, delay variation
26 and packet loss.

27 Even then the fairness will vary considerably across
28 different DSLAMs and over time, as customers are connected
29 and disconnected from the DSLAMs.

30 Dimensioning rules are used to keep the fairness
31 outcomes reasonably consistent, but at best, it can only
32 be assumed to apply correctly for 95% of all connections,
33 for 95% of the time.

34 If we look now at the fairness and the unconstrained

1 bit rate services, just to take what we've discussed
2 previously and put it directly into the context of
3 unconstrained bit rate services, given the fairness
4 objective outlined above, it is obviously more difficult
5 to deal with unconstrained bit rate services than those
6 that are constrained.

7 In order to deal with unconstrained bit rate
8 services, they all need to effectively be defined at the
9 maximum PIR possible.

10 This is of course wasteful of resource relative to
11 the constrained bit rate services, unless the full PIR is
12 actually used on all connections, which is not possible as
13 we described earlier because there is a significant
14 distribution of speeds that will occur relative to copper
15 pairs.

16 It also leads to greater variation in fairness across
17 the DSLAMs over time, as it is difficult to determine the
18 actual PIRs that the unconstrained services will actually
19 synchronise to on a particular line.

20 How a given DSLAM will be loaded with low and high
21 PIR traffic, depending on what access line it is connected
22 to at a particular point in time and how churn in
23 connections over time will change this mix.

24 It is these difficulties which have encouraged
25 Telecom to cap its own unconstrained bit rate services.

26 If we move now to looking at the cost equation.
27 We've looked at the issues associated with the copper rate
28 limiting, we've looked at the issues associated with
29 fairness. I will now look at the issues associated with
30 direct cost.

31 The capital cost -

32 DR HAMILTON: Before you move on to a slightly different part
33 of your presentations, I have just a couple of questions
34 for clarification.

1 In your early diagram you show the VCs going through
2 a DSLAM to an aggregated VP, you showed that as an ATM
3 multiplexer; is that the case in Telecom's network?

4 MS DAY: Just so we can get our people on audio, can you speak
5 up for the questions please?

6 DR HAMILTON: Sorry. The question is whether the
7 infrastructure is an ATM multiplexer on the DSLAM or an
8 ATM switching device?

9 DR MILNER: It is effectively an ATM multiplexer because it is
10 combining it all on to a single port.

11 DR HAMILTON: A supplementary question is the business services
12 which use ATM traffic management to provide a high quality
13 link through the DSLAM, how is this managed if it's not a
14 switching environment?

15 DR MILNER: Because we allocate appropriate bandwidth with
16 respect to those and the appropriate ATM class of service
17 characteristics and we dedicate appropriate resource to
18 those services?

19 DR HAMILTON: There is resource capability while it's not
20 straight multiplexing?

21 DR MILNER: It is multiplexing at a VP and VC level but you're
22 right, there is a resource allocation issue in terms of
23 the way in which it performs. So, it's part way between a
24 switch and a multiplexer in that regard.

25 DR HAMILTON: The BRAS device, I picked up from what you said
26 that the BRAS is really, in this environment anyway, for
27 the purposes of traffic management or fairness management,
28 and you mentioned ATM traffic management as poor in this
29 respect; can you elaborate on exactly why a fairness
30 device is required, whereas ATM can achieve that?

31 DR MILNER: The ATM has much more difficulty in actual fact in
32 providing weighting coefficients per VP and per VC, at
33 both the CV and VP level simultaneously. It's hard to
34 distinguish the waiting between the different VCs within a

1 VP and hard to manage that.

2 DR HAMILTON: This is more to do with creating the look and
3 feel of the service, rather than the management of the
4 traffic and the allocation of network resources associated
5 with that traffic?

6 DR MILNER: No, because when you're working with traffic
7 within a VP, you actually have to make sure that all of
8 the services within that VP degrade appropriately as that
9 VP starts to exceed its bandwidth requirements.

10 DR HAMILTON: Once again, it's back to the sharing issues?

11 DR MILNER: Absolutely.

12 DR HAMILTON: All the traffic is in one VP. If that wasn't the
13 case, if there was a separate VP for this UBS service, is
14 the BRAS required?

15 DR MILNER: It would still be required to make sure each of
16 those customers that came in - unless we had guarantees
17 about the way the traffic is passed over to us in terms of
18 shaping characteristics, you would still need to have it.

19 DR HAMILTON: If the traffic was managed, then that fairness
20 issue disappears?

21 DR MILNER: Yes. If we could guarantee the statistical
22 characteristics of the traffic coming into us, yes.

23 DR HAMILTON: Okay.

24 DR MILNER: If we go on to look at the DSL based services
25 relative to costs. In a very simplistic form, and I'm
26 only using a very simple model, the capital cost of the
27 infrastructure incorporated between the copper cable right
28 through to the first ATM switch, has a structure of
29 basically Y plus X , where X is the variable cost per
30 connection and Y is the proportion of the fixed cost of
31 the DSLAM and associated infrastructure (to the first ATM
32 switch) which is attributable to a given service.

33 A typical exchange based DSLAM has the following
34 characteristics:

1 Fixed costs with backhaul and BRAS costs included of
2 about \$Z where Z is typically 100s of thousands of
3 dollars.

4 It supports around 1500 ports, it varies depending on
5 the type of DSLAM but we're using that as a nominal
6 number, with each port costing about \$X for an
7 asymmetrical port and roughly \$2X for a symmetrical port,
8 where X is in the low 100s of dollars.

9 A usable throughput and backhaul capacity of about
10 150 Mbps.

11 If we take a couple of extremes. One example is to
12 load a DSLAM up to 2 Mbps symmetrical services that have a
13 CIR equal to the PIR.

14 Then the DSLAM can only support $150/2 = 75$ such
15 services with its total resource fully utilised.

16 The cost of each service is then the capital cost =
17 $Z/75 + 2X$.

18 As Z is in the 100s of thousands of dollars and X is
19 in the low 100s of dollars, then it is easily seen that in
20 this situation the fixed costs dominate and the total cost
21 of providing such a service is high. Hence we only offer
22 them as business services.

23 All the resource associated with a 1500 port DSLAM is
24 fully used by 75 ports under these conditions.

25 If we take the other extreme where we have UBR
26 services only on the DSLAM, we load it up with UBR
27 services with a Contention Ratio of less than 50:1, all
28 ports active, and for illustrative purposes a PIR of
29 2 Mbps, it makes the arithmetic simpler.

30 The DSLAM can then support services on all 1500
31 ports and only uses some $2/50 \times 1500 = 60$ Mbps of
32 capacity.

33 If the total cost of the DSLAM is allocated to these
34 services, then the cost of each such service is the

1 capital cost = $Z/1500 + X$.

2 As Z is in the 100s of thousands of dollars and X is
3 in the low 100s of dollars, then it is easily seen that in
4 this situation the proportion of fixed costs becomes
5 comparable to the variable costs and the cost of providing
6 each service is relatively low.

7 In this case, 40% of the resource associated with a
8 1500 port DSLAM is used up by all 1500 ports.

9 In practice, a DSLAM like this would have remote
10 DSLAMS sub-tended to it, up to an additional 2000 odd
11 ports, or it would include a mix of CIR and UBR services
12 to ensure that all the resource is used efficiently.

13 So, we can actually make sure all the resources are
14 used and all the ports are used and we distribute the cost
15 across all of the ports in an appropriate manner.

16 Then we come to the issue of active versus inactive
17 ports. We have talked about this a little in relation to
18 the Contention Ratio. This illustrates why we think about
19 this issue quite seriously.

20 In today's environment, even with "always on"
21 connectivity offered by broadband service providers, few
22 customers have their broadband connection running 24 hours
23 of the day, 365 days of the year.

24 Today, we find that there is a ratio of active to
25 inactive users of about 1:3.

26 We expect this ratio to reduce over time, but it is
27 unlikely to ever get much below 1:1, that's active to
28 inactive users.

29 Given this situation, we can further refine the
30 definition of Contention Ratio as we have done typically
31 to relate to active users only.

32 This ensures even better utilisation of the DSL
33 resource and enables further reduction in cost per
34 connection.

1 In the previous example, if this definition of
2 Contention Ratio is used relative to the peak busy hour of
3 usage, then with a ratio of active to inactive users of
4 1:4, the resource used by 1500 ports could be as little as
5 10% of the total, allowing even lower cost per connection,
6 or in actual fact the connection of more than 10,000
7 connections per primary DSLAM.

8 The numbers don't quite add up because each time you
9 create another virtual path you end up with some
10 multiplexing inefficiencies.

11 The more typical situation is to have a mixed service
12 set on a DSLAM. If we consider a relatively simple
13 example, of optimum loading of the DSLAM with a mix of
14 services, we consider a 1500 port DSLAM with a mix of
15 2 Mbps symmetrical services with CIR = PIR and a set of
16 uncommitted bit rate services with PIR = 2 Mbps, with a
17 Contention Ratio of greater of 50:1 and 1 active user for
18 each inactive user during the peak busy hour, then we end
19 up with an optimisation problem in terms of resource and
20 the numbers come out about the way I've shown here, where
21 the number of PIR = 2 Mbps UBR users is 1440 and the
22 number of CIR = PIR = 2 Mbps users is about 60.

23 Under these conditions, each of the services would
24 use the optimum amount of DSL resource and hence be
25 optimal from a capital cost perspective.

26 Of course, the real situation encountered in the
27 field is much more complicated than those illustrated in
28 these examples.

29 There are many more PIR and CIR variants for both the
30 CIR services and the uncommitted bit rate services and the
31 DSLAM may have other DSLAMS sub-tended to it, which in
32 turn may have a complex mix of services associated with
33 them.

34 So, we have to go through and use proper dimensioning

1 rules for all of our DSLAMS to ensure we use the resource
2 efficiently.

3 If we go back and summarise all that I've said
4 against this question, with respect to the technical and
5 operational complexity, copper rate limiting of the
6 downstream can be performed independently of the upstream
7 copper rate limiting and so unconstrained bit rate
8 services can be provided. However, doing so adds the
9 following complexity:

10 It requires the implementation and management of a
11 new service profile on every DSLAM.

12 It increases the power spectral density per copper
13 pair within a given cable sheath and hence increases the
14 impacts of cross-talk in the copper cable network.

15 It increases the probability of resynchronisation
16 events by reducing the noise margins for any given
17 service.

18 Establishing fairness for all services in the
19 presence of non-shaped downstream speed services is
20 complicated. The setting of weighting coefficients in the
21 Hierarchical Scheduler must be established at the maximum
22 PIR, but in practice, the actual PIR per line can vary
23 considerably from this maximum.

24 This leads to the interactions between the various
25 services being difficult to predict, even with nominal
26 test practices, as the interactions will change
27 dynamically over time on a given DSLAM, with customer
28 churn.

29 This results in customer service issues associated
30 with both the unconstrained bit stream services and the
31 other services with which they interact.

32 In terms of the fairness issue and the allocation of
33 resources, the non-shaped downstream speed leads to
34 greater variation in fairness under degradation of

1 performance conditions through congestion.

2 Operationally, it is more difficult to determine the
3 actual PIRs that the unconstrained services actually
4 synchronise on a particular line and therefore how many
5 lines at what speed are connected to a given DSLAM, hence
6 how it's loaded. And that this mix will change over time
7 both as customers are connected and disconnected or
8 changed from carrier to carrier.

9 With respect to direct infrastructure costs, if we
10 set the PIR at 8 Mbps for the downstream for all
11 unconstrained bit rate connections, it will result in the
12 allocation of resources relative to the PIR at 8 Mbps,
13 especially under the TCL definition of Contention Ratio.

14 With that Contention Ratio of 20:1, with all ports
15 active, as defined by the TCL, only 375 such connections
16 could be configured per exchange based DSLAM.

17 As compared to 1500 connections at 2 Mbps PIR with
18 the same Contention Ratio.

19 Hence the costs of these two options will vary by a
20 factor of around 4:1 in favour of the constrained
21 downstream speed service.

22 So, we will perhaps stop there again and ask if there
23 is any questions from the Commission?

24 MR ABBOTT: Does TelstraClear want to make a presentation or
25 ask any questions?

26 MS DODD: I have a couple of questions. I think probably,
27 given we're 5 minutes away from morning tea, I think we'd
28 probably rather break, rather than get one slide in.

29 MR ABBOTT: That's fine. Can I suggest that we are back at 25
30 to the hour?

31 MR FORSYTH: Could I just ask a procedural question here. I
32 have just looked ahead at the slides and if I'm reading
33 the slides correctly, Telecom's slide 58 takes us up to
34 around about the end of is it question 10?

1 MR CHIVERS: It is intended to go through to the end of
2 question 12, in fact.

3 MR FORSYTH: Does Telecom have more slides after that?

4 MR CHIVERS: No - oh for some of the other subjects yes we do.

5 MR FORSYTH: I am just thinking again time-wise.

6 MR ABBOTT: Yes, how do you feel we're going time-wise?

7 MR FORSYTH: I am concerned, I guess, if this is the quantum of
8 responses that we're going to have.

9 MR CHIVERS: I think we've gone through the bulk of our
10 material actually. While the OSS and backhaul is separate
11 subjects in their own right, I expect that our length of
12 answers to these questions is decreasing as we progress.
13 I think we've made good progress considering the amount of
14 material we have to talk to.

15 MR ABBOTT: I guess we will keep a running throughout the day
16 check that we're running to time. I think it's fair to
17 say everybody wants to finish at 5.00 today preferably.

18 MR CHIVERS: Earlier.

19 MR ABBOTT: Earlier would be better. If we break and come back
20 at 20 to the hour.

21 MS DODD: I have a couple of questions if I could ask them
22 before the break.

23 MR ABBOTT: Okay, that's fine.

24 MS DODD: If that would be all right. I just wanted to check,
25 you talked earlier about the contention ratios not
26 differing between business and residential and here you're
27 talking about the difference between TelstraClear's 20:1
28 and the standard 50:1. Would it be fair to say that the
29 difference in the Contention Ratios is a major determinant
30 of the extra resource or sharing issues that you're
31 talking about?

32 DR MILNER: It can be, yes.

33 MS DODD: Okay.

34 DR MILNER: But currently for our UBR services for consumer and

1 business they are treated the same way.

2 MS DODD: And they are all at roughly 50:1?

3 DR MILNER: Yes.

4 MS DODD: Okay.

5 DR MILNER: That might not be the case in the future but it is
6 the case now.

7 MS DODD: Sure. We can cover that off in our presentation.

8 The other thing I wanted to check was it sounds like the
9 backhaul capacity between the DSLAMS and the first ATM
10 switch is, in most instances, 1 STM-1?

11 DR MILNER: That's correct.

12 MS DODD: And that's shared between?

13 DR MILNER: All the Users.

14 MR NEWBERRY: May I have one question following that, which is
15 how much of that 155 meg is typically allocated to the UBR
16 service?

17 DR MILNER: It depends entirely on the mix. It depends
18 entirely on the mix of traffic on a particular DSLAM.

19 MR NEWBERRY: So normal business as usual, planning would vary
20 it up and down as required.

21 DR MILNER: It's done basically on a monthly review basis.

22 MR ABBOTT: Okay. We will break -

23 MR GOUDIE: Just one question. With the STM-1 you say you
24 transport SDH, that is a complete full VC pipe, you don't
25 do anything to limit the ATM?

26 DR MILNER: Not at the overall bit rate, no. It is running at
27 wired speed of 155 megawatt per second.

28 MR GANDY: Can you confirm that 1 STM-1 is the maximum that the
29 DSLAMS you use can handle?

30 DR MILNER: All the of the current DSLAMS that we have, that
31 are main DSLAMS, sub-tended one, can handle only less.
32 All of the main DSLAMS today can only handle 155 Mbps
33 STM-1. There are other things that we could do but we
34 would have to get a return on investment to actually

1 justify it.

2 MR ABBOTT: On that basis we will come back at 20 to the hour.

3 Workshop adjourned from 10.28 a.m. until 10.40 a.m.

4 MR FORSYTH: Peter, are you there?

5 MR WATERS: Yes, I am.

6 MR ABBOTT: And Jamie is back on the line too?

7 MR FORSYTH: Yes, he was.

8 MR ATKINSON: Yes, I am.

9 MR ABBOTT: In which case, perhaps we can restart. We finished
10 the provision of non-shaped downstream speed. The next
11 point is difficulties in providing multiple
12 downstream/upstream speed configurations.

13 MS DODD: Sorry, we wanted to present on the preceding
14 questions.

15 MR ABBOTT: That's fine. Then I'll hand it over to
16 TelstraClear to present on that matter.

17 MR FORSYTH: I will very happily hand over to Michael Newberry.
18 Michael, to my left, I think his role in the company is
19 IP Architect and is responsible in the Architecture Group
20 for our core IP network.

21 MR NEWBERRY: Just to return a little to the measurements and
22 maybe very quickly go over question 1 and the points of
23 disagreement that we had with the 95% measurement.

24 What we have taken is the point of view of a
25 customer, which is they want their network to run, they
26 want their gaming to be available, and that a 5% downtime,
27 if you like, is not acceptable, especially not if it takes
28 8 weeks to measure this. So we run our test and at the
29 end of eight weeks we discuss with the customer, yes, they
30 we're having a problem, well they did know that.

31 What we have referred to with our 99.9% figure is
32 that we're expecting that the customer will - the typical
33 customer will achieve the specifications 99.9% of the
34 time. So, our disagreement with Telecom, I suppose, is

1 exactly how we assure that the customer experience is met.

2 Apart from that, we are very happy with the
3 definitions. We are in agreement. We might have been
4 talking past each other a little bit.

5 The only disagreement is over the question of having
6 Jitter greater than Latency which is not, in our opinion,
7 a sensible thing to specify. Although, to be honest, for
8 a non real-time service, which is what we're dealing with,
9 Jitter doesn't actually matter to any of the services that
10 we would be providing.

11 For gaming and for data transfer, the web, Jitter is
12 something that doesn't have meaning to these applications.
13 My background is from the data side, I had to have the
14 Telco people explain to me what Jitter was because it
15 doesn't actually signify a normal data.

16 In terms of the question on point 2, which is the
17 unspecified downstream, the reason we've asked for this is
18 to give us the freedom, the ability to innovate, to put in
19 new plans without having to go to Telecom and ask them to
20 make lots of changes.

21 However, there is one significant restriction which
22 is imposed, which is there is 128 kbps upstream
23 limitation. We know that, that means that for most of our
24 applications customers aren't going to be able to achieve
25 using TCIP a downstream much in excess of 2 megs because
26 the acknowledgments have to go back up to the system at
27 128K. So, the reason we've asked for this is so we have
28 the ability to set our own plans without having to ask
29 Telecom.

30 The effect on the PIR is that the actual band which
31 has been consumed out the back of the DSLAM will not be
32 anywhere near the Committed Information Rate. It's going
33 to be pretty much what you would expect from a 2 meg
34 service. We know also, and Murray has helpfully pointed

1 out, that most customers aren't going to be able to get
2 the full 7 or 8 members because of wiring concerns and
3 things like that. Certainly if they are a few kilometres
4 away from the network, then we aren't going to be able to
5 get them up at full speed, but for those customers for
6 whom a higher speed is possible, we would like the ability
7 to provide such a service for our customers, preferably
8 without having to wait for Telecom to approve the line,
9 just as Telecom at the moment have the ability on their
10 customers to specify higher speeds.

11 And we also aren't talking about a high rate
12 symmetric server, so it's not going to be assuming huge
13 amounts of band.

14 We think that this is probably cheaper for all
15 concerned, including Telecom, than having to provide lots
16 and lots of different plans.

17 I believe that takes us very close to what I want to
18 say. Telecom have covered an awful lot but they are
19 addressing concerns about what we're trying to do, which
20 are not in fact what we had envisaged, that's not what
21 we're trying to do.

22 MS DODD: I would like to recap a few points before we hand
23 back over to Telecom.

24 I think in terms of question 1, as Michael has said,
25 I think we agree with a lot of the definitions. We will
26 get on to further the particular service specifications
27 that we've asked for and why they're important to
28 customers and for the innovative services that we actually
29 want to offer.

30 But I think your, sort of, theme or a lot of the
31 points in your presentation, Murray, were around fairness
32 and we agree and we acknowledge that. I think the main
33 thing we're after here is equivalence. So, where we have
34 specified service specifications, what we are really after

1 is equivalence in the market with what Jetstream or XTRA
2 is able to offer.

3 In the absence of Telecom informing us what the
4 network or what service levels the network is actually
5 performing at, because we think a lot of the
6 specifications which Telecom have set out are worse case
7 and if they were actually performing to those levels, we
8 feel we would be at a disadvantage in the marketplace.

9 So, on things like contention, we specified a 1:20
10 contention because we have asked Telecom what their
11 Contention Ratio was and haven't been informed of that to
12 date. What we're actually after, as I said, is
13 equivalence, so I think certainly we would be happy to
14 consider Contention Ratios which equate to the Contention
15 Ratios that XTRA is able to achieve.

16 I guess one question that we have, which perhaps
17 Murray can cover in his next thing, is again in terms of
18 fairness, as Michael pointed out, with the 128 K set out
19 in the service, even with an unspecified full speed
20 downstream product there is going to be a limitation to
21 the speed we're able to achieve, therefore we think a lot
22 of the impacts that Telecom is talking about, such as
23 cross-talk, are unlikely to arise.

24 We understand that those cross-talk kind of issues
25 only really arise when you get to about 4 meg and with the
26 128 K upstream limitation we're not sure that we're going
27 to be hitting anywhere near that level.

28 So, one thing that we would like to understand is in
29 terms of the backhaul and the STM-1 capacity that you talk
30 about between the DSLAMS and the ATM, we would like to
31 understand how Telecom allocates that bandwidth per
32 subscriber. So, with a 50:1 contention, there must be
33 some method to allocate the bandwidth per customer, a
34 dimensioning rule, and I guess we'd like to understand

1 that rule to understand in terms of fairness where you're
2 coming from in terms of the service we're asking for
3 having an impact on other customers.

4 I think at that point, perhaps if we hand over for
5 the next session, the next question.

6 MR ABBOTT: Commission staff might have some questions and also
7 if Telecom wishes to respond to the issues that you've
8 raised.

9 DR HAMILTON: One question. You mentioned with the 128 K
10 uplink that TCP would limit the downstream to roundabout
11 2 Mbps. What about streaming and UDP, could you
12 potentially get much higher downstreams in a rate
13 unlimited environment?

14 MR NEWBERRY: The services that we're aiming for are for the
15 interactive things which are gaming. The very nature of
16 interactivity is that it's a handshake response, that's
17 what interactive means. So, you can't really get higher
18 bandwidths of interactivity because the acknowledgment has
19 got to go back.

20 For things like the web, again they're not a
21 streaming function at all.

22 In terms of some of the things that we might like to
23 offer for a video and the like, there just isn't the
24 bandwidth there to begin with.

25 DR HAMILTON: I am thinking of a normal internet user who
26 doesn't necessarily just use the web browsing or the
27 gaming, it may want to stream video onto his desktop. In
28 that situation with the rate unlimited downstream path,
29 why wouldn't the link go well beyond 2 meg?

30 MR NEWBERRY: Because the rate limited would not be at the
31 DSLAM but there would be rate limits that would be applied
32 further up the pipe.

33 DR HAMILTON: In TelstraClear?

34 MS DODD: Yes.

1 DR HAMILTON: Which would manage the traffic into Telecom's
2 network?

3 MS DODD: Yes.

4 DR HAMILTON: The spectrum inefficiency in the access network
5 which occurs when the full downstream rate is implemented,
6 does that - the extent of the cross-talk depends on there
7 being traffic on the line?

8 MR NEWBERRY: Yes.

9 DR HAMILTON: Or does it happen just because it's enabled at
10 that speed?

11 MR NEWBERRY: It depends on there being traffic and indeed we
12 would be subject to the cross-talk about Telecom's high
13 speed services running at full rate.

14 DR HAMILTON: Thank you.

15 MR ABBOTT: Telecom, if you want to provide any closing
16 comments on that -

17 MR CHIVERS: Mr Newberry characterised 95% performance criteria
18 as being 5% downtime, that's not at all what it is. It
19 just means 5% during which the performance or the designed
20 specifications may not be met. It doesn't mean the
21 service is down.

22 One question back to TelstraClear, and that relates
23 to 99.9% of time you've been considering and whether that
24 99.9% of the time is for all times for all links for all
25 customers, including all congestion scenarios?

26 MR NEWBERRY: It is not for all congestion scenarios, no.

27 DR MILNER: In that case, what does it apply to?

28 MR NEWBERRY: We are talking about a sampling here. We
29 understand Telecom doesn't have sufficient equipment in
30 place to measure for all possible customers. For our own
31 cases we would take for any customer, if they complained
32 and said, "I'm not getting what I asked for", we would see
33 whether or not they were within the 99.9% limits, which
34 are not actually very hard to achieve.

1 MR FORSYTH: If I might also note, in our submission to that
2 question I think we have proposed that the service
3 parameters that we're seeking be measured on non-contested
4 ports for exactly the question that you raise there.

5 So, this whole discussion about quality of service
6 and the specification of that quality of service, is
7 obviously a statistical one and -

8 MS DODD: Sorry, I am just reading here. We said that it was
9 on an uncongested link that we're talking about that being
10 measured.

11 MR CHIVERS: Okay. There's been some variability in the way
12 it's been characterised. Obviously the correct
13 interpretation of that has an effect on what you're
14 requesting and the cost.

15 MR NEWBERRY: Precisely. The important thing is we are talking
16 about an uncongested link and the contention ratios are
17 essentially the thing that manages when congestion happens
18 what goes on but for the purposes of actually measuring
19 from an individual customer's point of view what do they
20 get on an uncongested link, well we say that 99.9% of the
21 time they will get these particular services and as we
22 just said, now that we know what Telecom's actual
23 contention ratios are, we are inclined to agree with that
24 a reasonable amount.

25 Murray mentioned earlier the statistical effects you
26 get when you've got three customers but of course you
27 don't provide three customers, it's not economically
28 viable. You have hundreds -

29 MR CHIVERS: Oh yes.

30 MR NEWBERRY: At that point the statistical effects are huge
31 and rather different for packet networks than they are for
32 the traditional Telco networks.

33 DR HAMILTON: To clarify this whole point, what we seem to be
34 hearing here is that TelstraClear and Telecom have two

1 different base scenarios for expressing the quality of
2 service achieved by the customer. Telecom's approach is
3 to look at the busy R performance which is the worse case
4 a customer can achieve. Whereas TelstraClear's approach
5 is to look at an uncongested link and when you say that
6 99.9% of the time - you're saying 99.9% of the time on an
7 uncongested link. When it becomes congested you don't -
8 you know -

9 MR NEWBERRY: That is correct. For instance, a customer can
10 congest their own link.

11 MR CHIVERS: Yes.

12 MR NEWBERRY: And once you do that, because of the queuing
13 problems you just aren't going to achieve that.

14 DR HAMILTON: So the 99.9% refers to packet loss without
15 conversion?

16 MR NEWBERRY: Yes.

17 MS DODD: An uncongested access link.

18 MR GABANYI: Service availability?

19 MR NEWBERRY: Yes.

20 MS DODD: It's summarised in Table 1 of the cross-submission.

21 MR CHIVERS: I think we'll proceed to the next question.

22 MR ABBOTT: Okay.

23 MR CHIVERS: I will hand over to Dr Milner. I would like to
24 welcome Mark Corbitt from our wholesale team who manages
25 technology for them.

26 DR MILNER: The next question, as I understand it, is the
27 difficulties in providing multiple downstream and upstream
28 speed configurations. The Commission's question was what
29 are the technical and operational practicability issues
30 associated with providing multiple downstream and upstream
31 speed considerations?

32 Telecom does support a wide range of downstream and
33 upstream configurations today. Supporting more speed
34 configurations only, that is just changing the upstream

1 and downstream speeds, can be arranged but there is a
2 cost. We have to setup new profiles on the DSLAMs; we
3 have to setup new Hierarchical Scheduler profiles; we have
4 to test them to ensure fairness is being achieved; and the
5 possible requirement for additional active test probes
6 because obviously the performance of a 256k service as
7 measured on a test probe versus an unconstrained 8 megabit
8 service on a test probe could be quite different.

9 Supporting more downstream and upstream speed
10 configurations with significantly different quality
11 characteristics adds additional complexity.

12 This is perhaps where we were getting to just before
13 morning tea where effectively you end up creating new
14 virtual paths per DSLAM in addition to all of the things
15 higher up on the slide, the other four bullets.

16 In addition to that, we do accept a little bit of
17 what TSL was saying a few minutes ago. Any access seeker
18 can create many downstream and upstream speed
19 configurations from the existing Telecom offered service
20 set. You just select a higher downstream speed service,
21 you shape it to the desired upstream and downstream speed
22 combinations that you require, the configurations are
23 constrained within the bounds of the access limits,
24 upstream limited to 128 Kbps maximum, and in this way the
25 access seeker can differentiate their service from those
26 offered by Telecom, and can control their costs associated
27 with doing this within their own business. So, we fully
28 accept that access seekers will take that approach and use
29 it on a wide scale basis.

30 That's really all we wanted to say about changing
31 upstream and downstream speed configurations.

32 MR CHIVERS: In many respects, our answers to the previous set
33 of questions cover a lot of those complexities and issues,
34 in any event.

1 MR ABBOTT: Does TelstraClear wish to raise any points in this
2 regard or ask any questions?

3 MS DODD: Sorry, just one clarification question. You talk
4 about setting up new profiles, we agree that that would
5 require a new profile for each speed upstream/downstream
6 configuration, but testing to ensure fairness is being
7 achieved and a requirement for test probes, are you saying
8 that you would need to have different testing for each
9 speed that you're offering?

10 DR MILNER: Not necessarily but if the speed - if you want to
11 get to 99.9%, but subject to the conversation we've just
12 had, you would need to have probes at the speed that
13 you're working with.

14 And if you have lots and lots of upstream and
15 downstream speed configurations, then you've got to - and
16 you want it to be absolutely perfect, then you need to
17 have them associated with each speed. We don't - again we
18 use that as part of the sample and fairness procedures to
19 determine the actual characteristics.

20 MS DODD: So, a non-rate shaped or a full speed downstream
21 would only require one profile and one set of testing?

22 DR MILNER: Across every DSLAM.

23 MS DODD: Yep, sure. But presumably your profiles are set at a
24 centralised level which are applied to the DSLAMS. It is
25 not a manual entry or anything?

26 DR MILNER: They are in some aspects, and in some aspects
27 they're not. It depends on whether they are affected by
28 the volume of customers and of course we talk about that a
29 little later on when Mark talks about some cases.

30 MS DODD: Thank you.

31 MR ABBOTT: Does TelstraClear have a presentation on this
32 question?

33 MS DODD: We do but perhaps if Telecom wants to continue for
34 the next couple of sections and then we'll -

1 MR WATERS: Murray, can I ask how many profiles you could
2 accommodate in your network?

3 DR MILNER: I don't know exactly the number, no I don't know
4 that answer off-hand. It is quite significant in terms of
5 numbers.

6 MR WATERS: I've read somewhere off the network it could be
7 brought up to 40 or 50 profiles.

8 DR MILNER: That could be right, I don't have that information
9 at hand.

10 MS DODD: Did everyone hear that okay?

11 MR ABBOTT: Is that something that you can provide better
12 information to the Commission?

13 DR MILNER: Yes.

14 MR NEWBERRY: Just making one further point of clarification -
15 MS DODD: Peter?

16 MR FORSYTH: Are you trying to say something, Peter?

17 MR WATERS: How many profiles does Murray currently think
18 Telecom uses in its network for its different services?

19 DR MILNER: I don't know the answer to that either off-hand.

20 MR WATERS: All right. That would be useful if we could get
21 what you think is the maximum and what you currently use.

22 DR MILNER: Remember that in terms of some parameters, for the
23 volume based services they are all combined within the
24 same VP, so we actually - from that point of view we
25 actually get rid of some of the parameters that way. But
26 in terms of the actual speed configurations at the DSLAM
27 inputs, you might say, I don't know, the exact number that
28 we have now or what we can accommodate. I will have to go
29 back and check on that.

30 MS DODD: It would be useful to understand that as a
31 constraint.

32 MR ABBOTT: I agree, from the Commission's perspective it would
33 be useful to understand those two questions as well.

34 DR MILNER: There are of course, as I said before, we can get

1 the numbers but they will be qualified from what we can
2 support in the back end systems behind that. There's a
3 difference between what you can support in any individual
4 device versus what you can support from a business process
5 perspective.

6 MR NEWBERRY: I just have the question, essentially creating a
7 new profile is not an extraordinary event, it is a
8 business as usual, although there is a cost associated
9 with it but if XTRA or one of your wholesale customers or
10 you decide to offer a new product, you'll just have to go
11 through that or decide that you've finally run out of
12 profiles.

13 DR MILNER: And do all of the associated testing with it. I
14 think it's very clear from the history around UBS to date
15 that we do need to go through exhaustive testing to make
16 sure the service works in its own right and that it
17 functions correctly in terms of fairness and interactivity
18 with all the other services that are on the DSLAM.

19 MS DODD: Sure.

20 MR GOUDIE: You say about your configuration on new virtual
21 paths a different configuration, are you saying that for
22 every different type of option you offer you have a
23 virtual path just for that stream?

24 DR MILNER: No, no, not at all. What we're saying is if you
25 wanted to have associated with a different upstream and
26 downstream speed, you also want it to have significant
27 different quality characteristics, then for instance you
28 may need to go from a UBR based virtual path to a VBR-nrt
29 based virtual path.

30 MR GOUDIE: So the actual requirement is more on the quality of
31 service, not the actual requirement -

32 DR MILNER: In terms of the virtual path, that's absolutely
33 true and we can provide a number of other options within
34 the existing path.

1 MS DODD: If we were after equivalence then that need would not
2 arise.

3 DR MILNER: No, equivalence and if you stayed within the
4 existing VP the need would not arise.

5 MS DODD: What do you mean by stay within the existing VP?

6 DR MILNER: Because the equivalence only applies when you are
7 having traffic combined within the same virtual path. If
8 you have a separate virtual path, the equivalence can be
9 quite different.

10 MS DODD: Okay. What would be the driver for a new virtual
11 path?

12 DR MILNER: You mean if we asked for a separate one.

13 MS DODD: If you asked for one, that's all, yeah.

14 MR CHIVERS: Or the technical characteristics that you request
15 make it so different from what we've got that one is
16 required.

17 MR ABBOTT: If there's no more questions I would like to
18 continue on so we can get through the timetable today.
19 You are happy to wait?

20 MS DODD: Yes.

21 MR ABBOTT: Murray, are you happy to continue?

22 MR CHIVERS: What are you proposing we continue down to before
23 you speak again?

24 MS DODD: I note in your slide pack that this goes up to, I
25 think, including 11 and 12, so if we stop there because
26 that's the slide pack and then we could -

27 MR ABBOTT: Telecom, are you happy to do that?

28 MR CHIVERS: I think if we go down to the end of policing. The
29 interleaving is almost a separate subject in its own
30 right.

31 MS DODD: Fine.

32 DR MILNER: The reason for making that choice is that the
33 policing issue, the Commission asked is this necessary and
34 what is the effect on Latency? And to a large extent

1 we've covered the issues associated with policing in some
2 of the previous material.

3 We don't specifically apply policing at anything
4 other than the physical level, and that is the copper rate
5 limiting on the cable. In all other cases we use shaping.
6 The reason we use shaping is because we want to ensure a
7 better end user experience. Policing can be quite hard on
8 TCP sessions and a number of other sessions as well.

9 So, in terms of applications, we think that applying
10 policing other than at the copper rate limiting level is
11 inappropriate.

12 There are other situations where it might apply, so
13 I'm not saying universally we don't apply it but in this
14 context.

15 It's applied - policing is only applied in the form
16 of copper rate limiting on a line-by-line basis at the
17 DSLAM. It's to stop customers using more resource from
18 the customer modem right through to the first ATM switch
19 than they have purchased from their service provider.

20 It reduces the power spectral density per copper pair
21 within a given cable sheath and hence reduces the impacts
22 of cross-talk in the copper cable network.

23 The bits are actually - whether you use all of the
24 carriers in the DSL's spectrum or not, the bits are
25 distributed across those bits. The issue is the amount of
26 power density reduces as you actually reduce the
27 bandwidth. So, the power density in the higher bandwidths
28 do actually reduce when you put the copper rate limited.

29 The other issue is that you create an improved noise
30 margin in those higher spectral components of the waveband
31 and it stops the resynchronisation events by improving the
32 noise margin.

33 The modem will make a decision every now and again as
34 to whether it is actually fully synchronised and when it's

1 not fully synchronised it will resynchronise, creates a
2 10-20 second break, we consider that's not very
3 appropriate to customers so we try to minimise that to the
4 greatest extent possible.

5 Congestion management between the services sharing
6 the same resource is achieved through the use of shaping
7 in the Hierarchical Scheduler within the BRAS L2TP LAC,
8 which ensures optimum performance of TCP sessions; optimal
9 management of Contention Ratio, Delay Variation and Packet
10 Loss Ratio; optimum allocation of resources between the
11 different services to ensure fairness is achieved under
12 congestion conditions.

13 That is essentially all we wanted to say about
14 policing. We don't apply it other than in the form of
15 copper rating.

16 DR HAMILTON: When the Hierarchical Scheduler is managing
17 congestion between services, what types of service in the
18 VP is the Hierarchical Scheduler managing?

19 DR MILNER: The biggest issue at this point in time is the
20 different peak information rates. So, the Hierarchical
21 Scheduler is - most of its work is to one, ensure that as
22 congestion occurs that the peak information rate for a
23 2 meg service degrades in percentage terms at the same
24 rate as a 256k service going through the same VP.

25 The second factor is that when the buffer allocation
26 occurs, again it's only in congested conditions, that the
27 buffer allocation is appropriate to the speeds, the
28 different service speeds, and that the delay variation
29 again, again for a 2 meg service and a 256k service is
30 roughly proportional.

31 And that secondly, thirdly at least, when congestion
32 occurs and the buffers actually overflow, that that's when
33 policing does actually occur and you do have to drop bits,
34 that you drop them in a random fashion relative to all of

1 the different VCs that sit within the VP.

2 DR HAMILTON: So there's an individual VC in each service
3 identified to each customer.

4 DR MILNER: Correct.

5 DR HAMILTON: The Hierarchical Scheduler knows all about that
6 service that that customer has signed up for?

7 DR MILNER: That's correct.

8 DR HAMILTON: Okay.

9 DR MILNER: From a VC and VP level, not from some of the
10 characteristics associated with the DSLAM for instance, it
11 doesn't know anything about that, apart from the fact of
12 the data that's put into it.

13 DR HAMILTON: Right, okay.

14 MS DODD: Jamie and Peter, did you catch that okay?

15 MR WATERS: I had trouble hearing those last few words.

16 MS DODD: Okay. I think the question was related to the
17 Hierarchical Scheduler and the need for that within the
18 same virtual path and I think Telecom's answer was about
19 the PIR of different bandwidth services within the same
20 virtual path requiring the policing to ensure that they're
21 all degraded at the same rate.

22 DR MILNER: Yes, it's all three parameters. One is the
23 degrading of the PIR at a proportional rate relative to
24 PIR purchased; customers notice that really badly if you
25 don't do it right.

26 Secondly, it's to do with the allocation of buffer
27 space and to make sure that the delay variation is
28 proportionately equivalent to the PIR speed.

29 And thirdly, that you get a random dropping of
30 packets if you exceed buffer sizes. All three of those
31 factors are included within the shaping occurring in the
32 Hierarchical Scheduler and you can do a whole lot of other
33 things as well but we don't use any other.

34 MR DUNN: You're talking about optimal performance of TCP

1 sessions, how is that achieved?

2 DR MILNER: Through the fact that we are using shaping rather
3 than policing. We actually make sure that the TCP
4 sessions - well, there are many different TCPs stacks, as
5 you're probably well aware, so it's only an averaging
6 across those different TCP stacks, but we try to make sure
7 TCP performs as best as it can under congested conditions
8 and the clawback capability in TCP functions in a logical
9 manner under normal congested conditions -

10 MR NEWBERRY: I have a question specifically about the L2TP LAC
11 because the service that's been provided to access
12 seekers, what we have, is a layer two service, so how does
13 that actually shape? I can understand your BRAS shaping
14 at layer 3 but how does the layer 2 happen at the L2TP
15 layer?

16 DR MILNER: The BRAS, the L2TP LAC both function for Jetstream
17 services and UBS services only at layer 2, they only shape
18 at the VC and the VP level, and they do the same for the
19 L2TP LAC and the same for the BRAS configuration.

20 Yes, we could if, for instance, we had PPPOE, we
21 could have different sessions at layer 3 per VC per VP
22 that had different characteristics, absolutely. We do not
23 do that at this point in time. So everything, all the
24 services, look the same as layer 2. Access seekers may
25 wish to employ quite different characteristics at layer 3
26 if they so desire.

27 MR NEWBERRY: I suppose my concern is that the multifarious
28 policing and rate shaping all tend to step on each other's
29 toes if you're not a bit careful. So, I was interested to
30 know exactly what you were doing at the interface so that
31 anything that TelstraClear did wasn't going to cause
32 catastrophic effects for our customers.

33 DR MILNER: All we're doing is aiming for that fairness in the
34 allocation of resources between different services,

1 degrade relative to each other.

2 MR NEWBERRY: Are quicker sink times than 30 milliseconds

3 available?

4 DR MILNER: Resynchronisation will be 10-20 seconds. It takes

5 quite a lot of time. If the modem and the DSLAM get out

6 of synchronisation with one another, they will have an

7 outage of 10-20 seconds on that line to resynchronise

8 properly.

9 MR NEWBERRY: And what AVSL protocols are you employing on the

10 DSLAM points?

11 DR MILNER: The CCITC based G92, whatever it is.

12 MR NEWBERRY: But there are nevertheless profiles within those?

13 DR MILNER: That's correct.

14 MR NEWBERRY: Can you tell us what?

15 DR MILNER: Not off-hand.

16 MR NEWBERRY: I think that might be useful to know.

17 DR HAMILTON: The L2TP tunnel, could that be originated

18 anywhere else rather than off the BRAS?

19 DR MILNER: Not in front of the first ATM switch it couldn't.

20 DR HAMILTON: It couldn't come from the back of the DSLAM?

21 DR MILNER: No, no support on the back of the DSLAM.

22 DR HAMILTON: On all DSLAMS?

23 DR MILNER: On all DSLAMS. That might not apply in the future

24 but there are 1500 odd DSLAMS out there not going anywhere

25 in the short-term.

26 MS DODD: You said you didn't have the profiles within the CCI

27 CTG 92 here, would you be able to provide that?

28 DR MILNER: To some level of detail probably. I would need to

29 go back and work through that.

30 MS OAKLEY: Is that something the Commission considers is

31 helpful for the Commission?

32 MR ABBOTT: We will get back to you on that point.

33 DR MILNER: The critical issue should be the current

34 implementation of the G922 standard is compatible with all

1 the modems that are currently out in the marketplace in
2 New Zealand.

3 MR CHIVERS: Shall we move on?

4 MR ABBOTT: Please, yeah. TelstraClear, do you want to respond
5 to questions 5 and 6 and 7 now?

6 MS DODD: Sure.

7 MR NEWBERRY: I believe that in terms of question 5 we have
8 probably already covered that.

9 MS DODD: I think we just wanted to find out the number of
10 profiles available, the point we already covered.

11 MR ABBOTT: Yep.

12 MR NEWBERRY: And we have no problems whatsoever with Telecom's
13 response on policing. We agree wholeheartedly. Policing
14 is something that you can do sort of like mustering the
15 sheep at the gate, with the delay you can either delay
16 your sheep, or if there's too many sheep trying to go
17 through the gate you can shoot them, which is somewhat
18 disadvantageous but ultimately you end up with the same
19 number of sheep in the paddock, only some of them don't
20 have the ear tags you expected.

21 MS DODD: I think what we're after -

22 MR ABBOTT: Nice analogy.

23 DR MILNER: I wouldn't put it quite that way.

24 MS DODD: We are after the performance specifications. We are
25 not really concerned how they're achieved, is I guess the
26 point.

27 MR ABBOTT: In which case, Murray, I guess we get back to you
28 again, I'm sorry.

29 MR CHIVERS: I'm still getting over the sheep.

30 DR MILNER: Are we allowed to interleave sheep as well?

31 The Commission's questions were what are the
32 technical reasons why interleaving is unable to be turned
33 on or off by Telecom at the DSLAM?

34 What impact would interleaving off have on service

1 levels provided by Telecom?

2 Can interleaving be turned off solely for
3 TelstraClear at the wholesale level without affecting the
4 other wholesale/retail customers?

5 We will try and answer all those questions.

6 First of all, I would like to make a clear statement.
7 Interleaving is present for a purpose. The DSL
8 specifications include interleaving to enable carriers to
9 better manage the noise and interference present on copper
10 cables today.

11 This includes noise, like impulse noise, exchange
12 noise from our own exchange equipment, road noise, noise
13 induced from power lines and God knows what; cross-talk
14 from within the cable sheath, that is where there's
15 different signals on different cable pairs which interfere
16 with one another as the signal traverses the length of the
17 copper pair; then interference from external sources such
18 as carriers operating on certain frequencies. We've had
19 problems with microphones and radio systems and goodness
20 knows what else coming in from different external sources.

21 All of these source - in fact another source is the
22 coupling between different cable sheaths, a whole pile of
23 different signals on one sheath covering into another one.

24 All of these sources of interference and noise
25 degrade the performance of DSL when operating on a given
26 cable pair within a defined cable sheath.

27 The noise and interference manifest themselves as
28 packet loss as the signal traverses the copper cable
29 between the customer and the DSLAM.

30 Furthermore, high packet loss can force the DSL modem
31 to resynchronise with the DSLAM, which can cause traffic
32 outages of 10-20 seconds.

33 When I say high packet loss, it is a result of cell
34 loss because it is an ATM transmission, so you're getting

1 a single cell loss which can create significant packet and
2 synchronisation packet loss.

3 Our measurements show that on many copper cable pairs
4 within the Telecom network, the positive impact of
5 interleaving on packet loss ratio and resynchronisation
6 events is considerable (up to 50% and reduces
7 resynchronisation events by around 20%). That varies
8 depending on the population of lines that you're looking
9 at and exactly where you are in the network but those are
10 rough numbers that are pretty typical.

11 The pain called cross-talk. This is re-emphasising
12 the point that there is near end cross-talk and far end
13 cross-talk. It is a well recognised issue within the
14 industry in terms of managing the spectrum within copper
15 cable systems. Basically, the spectrum on one pair
16 interferes with the spectrum carried on the next pair.

17 There are a number of technological advances going in
18 to improve the near end and far end cross-talk
19 characteristics. The issues around better spectral
20 efficiency which we've talked about a little bit already.
21 Future advances in terms of things like very complex
22 interference reduction technologies are actually being
23 proposed for things like VDSL 2. We do not have any of
24 those things in our network today.

25 Cross-talk is always present in multi-pair copper
26 cables, and increases as the spectral power density of the
27 signals carried on the individual pairs in that cable
28 increase in frequency.

29 A couple of examples. For voice signals only, where
30 we were constrained to around 3-3.1 Khz, the problem was
31 minimal.

32 Over the last 20 years we have deployed a wide range
33 of line codes in our copper cables, all of which have
34 substantial power densities up into the megahertz range.

1 ADSL is one of the more recent of these and has some
2 of the greatest interference protection mechanisms, of
3 which interleaving is one of those mechanisms.

4 However, ADSL is still susceptible to interference
5 from other line codes operating in the same cable sheath,
6 such as HDB3, which we use for E1 multiplexes, 2B1Q (ISDN
7 BRA), SHDSL, and in fact ADSL interferes with itself, it's
8 self-interference.

9 Telecom is in the process of removing as many sources
10 of interference from the copper cable network as possible,
11 but this will take many years to complete. Even once it's
12 done, we will still have to deal with the mixture of
13 SHDSL, ADSL and future versions of ADSL, and the
14 interference from ADSL in itself.

15 Every carrier or every owner of a copper cable
16 network in the globe has this problem.

17 In order to properly manage noise and interference to
18 the benefit of all users of the copper cable network,
19 Telecom has implemented a policy of having interleaving
20 always turned on.

21 It's now asked the question, can interleaving be
22 turned off? Interleaving can be turned off at the DSLAM
23 on a line-by-line basis.

24 Today this facility is not included within our
25 automated management capability as Telecom policy is to
26 have interleaving on for all asymmetrical bit rate
27 services.

28 Our objective is to provide as much performance as
29 possible to as many users of the copper cable network as
30 possible, and this is one of the mechanisms that we use to
31 achieve that.

32 At some time in the future, this policy may change as
33 newer versions of ADSL, for example ADSL2+, have improved
34 management features for interleaving and as they are

1 incorporated as standard features within the technology,
2 we will reconsider how we can use them in the network to
3 the best advantage of all users.

4 To better manage - these will enable us to either
5 turn off the interleaving or more likely change its
6 characteristics so that sometimes it has lower impact on
7 Latency, in some cases it has higher.

8 Turning interleaving off or changing its
9 characteristics with existing ADSL will result in highly
10 unpredictable performance, especially for longer cable
11 reach situations.

12 Hence, even if Telecom could provide interleaving as
13 optional for individual lines, Telecom has no means of
14 predicting the resulting performance, and so it would be
15 impossible to offer any assurance around packet loss ratio
16 or resynchronisation events under these conditions.
17 Packet loss ratio and availability being designed by TCL
18 requirements, although we've had a discussion about the
19 definition which is probably a little different to our
20 definition.

21 Let's have a look at experience with interleaving
22 elsewhere in the world.

23 The provision of interleaving on or off is variable
24 across carriers worldwide.

25 The general rule is that it is either applied
26 universally on or universally off, options to choose by
27 line are rare.

28 Those carriers that choose the interleaving off
29 option, generally ensure that the services offered under
30 these conditions have absolutely no service commitments
31 associated with them - the services are purely "best
32 effort".

33 Those carriers that retain the interleaving on
34 option, generally have at least some ADSL based services

1 that do have some form of service commitments and/or are
2 striving to achieve the best possible reach from their
3 copper cable network. Both of these issues are true for
4 Telecom in New Zealand.

5 We are delivering services with long reach and we
6 intend to continue to do so.

7 Some services being sold using ADSL, such as our
8 private office services, are sold with some service
9 commitments and we could not offer those commitments with
10 interleave.

11 Some carriers, such as BT and Belgacom, started off
12 with interleaving off and are now in the process of
13 transitioning to interleaving on.

14 They are doing this for exactly the reasons I've just
15 described, to achieve more predictable performance,
16 particularly on longer cable runs.

17 The bottom line on interleaving from the Telecom
18 perspective is that Telecom policy today is to implement
19 all asymmetrical bit stream services with interleaving on.

20 Interleaving can be turned on or off on a per line
21 basis.

22 Telecom has no automated capability for provisioning
23 services with interleaving as an option so there could be
24 considerable cost to implement this option specifically
25 for TCL.

26 The performance achieved on a per line basis is
27 currently highly unpredictable with interleaving switched
28 off.

29 It is known that many lines would not meet TCL's
30 defined packet loss and availability specifications,
31 subject to the conversation over definition.

32 Telecom could not offer any performance commitments
33 under these conditions.

34 Telecom would have increased difficulty in managing

1 the performance of all of its DSL services, that's TCL,
2 Telecom and any other service providers that are using the
3 facility due to the increased impact of cross-talk in the
4 network.

5 Telecom can meet the Latency specification requested
6 by TCL with interleaving turned on. It is not necessary
7 to turn it off for anything that TCL have asked us for so
8 far.

9 Telecom may change its position on interleaving at
10 some time in the future, due to changes in technology
11 capability, and this would be an appropriate time to have
12 further discussion on this topic.

13 MR GOUDIE: You would have a service that you had interleaving
14 on and you also had a service running at the same DSLAM
15 and you had interleaving turned off, is it your opinion
16 that the service that had it on would be effective to the
17 one having it off, or would it make the services turn on
18 right at the expected result you expect for your service?

19 DR MILNER: The main area of interaction would be in terms of
20 the cable itself and the difference in performance of the
21 cable and the impact of that in terms of cross-talk and so
22 on into other cable pairs.

23 MR GOUDIE: Do you believe having interleaving on is not going
24 to actually save your service apart from another one? If
25 it's off, then the impact across the whole cable sheath or
26 across certain pairs of the cable sheath?

27 DR MILNER: It will vary depending on the adjacency of the
28 cable pairs, that's absolutely right. We can't predict
29 that because the cables are all twisted.

30 MR GOUDIE: I understand. By turning off the circuit will you
31 affect other circuits that have it on?

32 DR MILNER: Yes, you do so.

33 MS DODD: Our understanding is that only becomes an issue at
34 higher bandwidth?

1 DR MILNER: If you - that's another whole question about
2 exactly how DSL works. We could spend an hour doing that
3 if you'd like, Mr Chairman.

4 MS DODD: Sorry, do you agree?

5 DR MILNER: No. Well, it's worse. I agree that it's worse at
6 the higher frequency, higher bit rate, I agreed with that.

7 DR HAMILTON: Does Telecom have any experience with turning on
8 and off interleaving and measuring the impacts on its
9 network?

10 DR MILNER: We have not done a detailed analysis yet. We have
11 one scheduled but it has not had the resource to do it
12 yet. We do want to do that work and it is a piece of work
13 that's being designed but has not been instituted yet.

14 MR GOUDIE: Just a clarification again, do you in your products
15 turn interleaving on into different levels of performance
16 which will impact the Latency at difference points? You
17 can have a higher degree of interleaving and having more
18 Latency compared to having a less version, do you have a
19 set value or can you vary that level?

20 DR MILNER: Currently we have it set at a 16 millisecond level
21 for all services.

22 MR ABBOTT: I think in respect to the presentation and apparent
23 disagreement as to the capabilities of the DSL and the
24 interleaving issue, I think we will set it aside because I
25 don't think we've got time.

26 I don't know, Murray, do you want to continue on, or
27 does TelstraClear have any questions on this section, or
28 is it appropriate now that TelstraClear provides their
29 view on interleaving to move forward?

30 MR NEWBERRY: I have got some comments that I would like to
31 make in brief.

32 Our position is that in terms of provisioning
33 interleaving, it is just another entry in the profile, so
34 we have the upstream bandwidth, we have the downstream

1 bandwidth and we have interleaving turned on or off, or if
2 turned on at a particular level.

3 And so, there is a certain amount of work that would
4 need to be done but actually no more work than would be
5 required to provision a new plan.

6 We particularly want the option of turning the
7 interleaving off to ensure that the interleaving doesn't
8 magnify the impact of the 128 K upstream limit. In
9 particular, it is the gamers who hate interleaving. They
10 really hate it because it causes them to get killed in
11 their games and if you're running at 128 K, the extra
12 16 milliseconds is an issue. So, while we are pleased to
13 hear that Telecom can meet the Latency requirements even
14 with interleaving turned on, we would at least like the
15 option of trying to provide a better service for our
16 customers with interleaving turned off.

17 We contend that at the sorts of speeds we're talking
18 about, the interleaving turned off might affect our
19 customer but that's our problem, it won't affect other
20 customers.

21 We wouldn't envisage running interleaving off for
22 higher speeds either but then at the higher speeds the
23 interleaving is not such an issue. We don't expect to get
24 3 kilometres from the exchange at 8 megabits with
25 interleaving turned off.

26 MR FORSYTH: Jamie, I understand that you have a comment that
27 you think would be useful at this point with regards to
28 interleaving?

29 MR ATKINSON: Yes. TelstraClear doesn't supply interleaving on
30 any of its plans today. We're moving to plans that will
31 be over 3 and 6 megs very shortly and we will be employing
32 interleaving just on those plans and it is as simple as
33 new profile, crediting a new profile for all those plans
34 and having interleaving turned on. It's actually quite -

1 that's the minimal work required in creating a new plan.
2 It really comes down to the number of profiles which you
3 would have available.

4 MS DODD: Thanks Jamie.

5 DR HAMILTON: Just one question for Jamie then. You said
6 TelstraClear have interleaving turned off?

7 MS DODD: As a default.

8 DR HAMILTON: Does TelstraClear provide any service quality
9 guarantees then on services with interleaving turned off?

10 MR WATERS: TelstraClear's internet offering is plastic,
11 however it is generally high grade.

12 MR ABBOTT: Can you repeat that please?

13 MR WATERS: TelstraClear's network even those it is plastic, it
14 is extremely high quality, bordering on business grade,
15 and it has excellent ratio between 30/40 on average across
16 the network. In some instances it's closer to 10:1.

17 So, it all depends on which platforms you're actually
18 employing at the moment. As I said, it is a best efforts
19 service and so I guess your comments regarding having
20 interleaving on and off and impacting over quality based
21 services or business rate services may have an impact. I
22 haven't actually done that research into that, however on
23 a bit service it does not.

24 MS DODD: Thanks Jamie.

25 MR ABBOTT: Does TelstraClear have anything else it wishes to
26 add? Are you intending to present on this matter?

27 MR FORSYTH: I think we have. Is that right?

28 MR NEWBERRY: Yes.

29 MR ABBOTT: Okay.

30 MR CHIVERS: By way of a follow-up comment, I think while we
31 can accept that it might be easy for Telstra in the way
32 they've built and implemented their network, the way
33 they've characterised it doesn't equate to the level of
34 difficulty that would be faced by Telecom in implementing

1 that request because of the way we've currently setup and
2 built our management systems especially.

3 DR MILNER: It should also be noted that Telstra has quite
4 different reach requirements as well and in fact we were
5 having conversations with the Australia on this issue just
6 earlier this week and the reach requirements in Australia
7 that TelstraClear are achieving in Australia are quite
8 different to what they are in New Zealand, what Telecom is
9 achieving.

10 So, as I explained, that is a key difference for the
11 approach taken in Australia versus New Zealand.

12 MR WATERS: What are your reach requirements?

13 DR MILNER: We achieve up to - we synchronise service up to
14 6 kilometres in many cases.

15 MR WATERS: Okay. We achieve - we were going to 4.23, with a 6
16 limit which we introduced we can get all types of reach.
17 It depends on the ground.

18 DR MILNER: Absolutely.

19 MR WATERS: For the retail provider of the service.

20 MS DODD: In terms of the reach.

21 MR WATERS: The reach issue really has a big impact on service
22 and I guess having interleaving on or off, it does impact
23 service and they could be easily addressed.

24 MR ABBOTT: If there are no further questions or comments, then
25 I would like to move on to internal service levels for
26 Jetstream and UBS, and so I'll pass it back again to
27 Telecom. I suggest if everybody is happy we keep going
28 until 12.30 and break for lunch.

29 DR MILNER: The questions around internal service levels, the
30 Commission requested that TelstraClear's application
31 requests certain service parameters for the UBS service,
32 for example Latency, Jitter, Contention Ratio and their
33 effect on the overall service level independently or as a
34 whole.

1 What levels of service are referred internally to
2 Telecom for Jetstream and UBS on these parameters, and are
3 these translatable to wholesale services?

4 How are these measured?

5 Most of these points have been answered pretty
6 substantially under the first question in terms of
7 Contention ratio, Jitter, Delay Variation and Packet Loss.
8 So, we describe the measurement techniques, we've
9 described how we specify the service just the same as
10 TelstraClear does. As explained before, the service is
11 defined as a best service in the marketplace but we do
12 have design parameters around it and we've described what
13 those parameters are and we use a sampling technique to
14 ensure we're within those bounds.

15 The sampling technique, looking at entire periods of
16 time, that is when it's congested and when it's not
17 congested, gives us a sample performance of relative to
18 95% of connections for 95% of the time.

19 In addition to those points, any discussion of the
20 levels of service offered internally to Telecom is
21 somewhat artificial. Telecom operates as an integrated
22 business. It does not have a retail division that is
23 supplied by a wholesale division. Telecom's wholesale
24 division is a channel to market that delivers services to
25 Telecom's wholesale customers; it does not deliver
26 services to Telecom's retail division.

27 Telecom does not currently offer service levels
28 around Latency, Delay Variation, Packet Loss and the
29 Contention Ratio in relation to its Jetstream services.
30 This is because Jetstream services have been pitched to
31 provide a functional best efforts, internet grade service
32 at an acceptable price for the mass market. We have many
33 other services that do have fully defined characteristics.

34 If we go to page 58. For engineering purposes,

1 Telecom does have a set of design parameters around
2 Latency, Delay Variation, Packet Loss and Contention Ratio
3 for its Jetstream services, and these were summarised in
4 Table 2 of Telecom's submission and have been restated
5 earlier in the presentation pack today.

6 The design parameters for Telecom's current Jetstream
7 services have already been translated into Telecom's
8 commercial UBS service. Equivalency is there.

9 Telecom's commercial UBS service is configured and
10 managed so that to the greatest extent possible, it is
11 equivalent to Telecom's Jetstream services. There are
12 minor technical differences between Telecom's UBS and
13 Jetstream services, particularly around how they're
14 actually interfaced. However, these differences are
15 virtually immaterial to the end user experience.

16 Any requirements for additional reporting above that
17 generated for Jetstream and commercial UBS would be at an
18 additional cost.

19 MR CHIVERS: That completes our response on that question.

20 MR ABBOTT: TelstraClear would you -

21 MS DODD: Do you have any questions?

22 MR ABBOTT: No, we're happy.

23 MS DODD: Okay. We're just going to hand out some slides.

24 (Slides distributed).

25 MR NEWBERRY: Are we ready to begin? On slide 2, the
26 background to this is TelstraClear wants equivalence. In
27 the absence of suitable mechanisms to guarantee this,
28 TelstraClear is requesting reasonable minimum service
29 specifications.

30 Again, as background I'd like to give some Jitter,
31 Latency and Packet Loss and what they mean to different
32 applications.

33 If we go on to Jitter and Latency, in particular the
34 service specifications that Telecom have offered, I

1 apologise for the mathematics, if you have two packets
2 being sent at t_1 and t_2 , the one way delay of the packets
3 is t_1 and t_2 respectively.

4 The inter-packet delay variation is the difference
5 between the arrival times of the packets, the absolute
6 value of t_2 minus t_1 .

7 So, on slide 4, if for instance the maximum Latency
8 is 50 milliseconds, then we discover since t_1 can't be
9 negative, the packet can't arrive before it's sent, the
10 Jitter must always be less than the maximum Latency.

11 So, it makes no sense to specify a Latency of
12 50 milliseconds. In specifying a Jitter equal to the
13 Latency we're being conservative. Normally we look at
14 Jitter which is tiny if we're looking at a real-time
15 service, we're not but in terms of consistency we're
16 asking that the Jitter be no greater than Latency. It
17 doesn't make any sense for it to be specified any higher.

18 From packet loss, Telecom have claimed that a 0.1%
19 packet loss is much better than anything else but super
20 expensive commercial grade circuits and suggested a goal
21 of less than 3% for the UBS service.

22 I suspect some of this might come down to the way
23 we've been specifying sampling versus whatever but I took
24 that as an implication that the XTRA service might
25 experience packet loss of up to 3% in a normal operation
26 without being considered degraded. Even one 1% packet
27 loss means the network is broke.

28 1% packet loss means 1 in a hundred packets are
29 dropped. That's about one every 6-7 seconds on some
30 games. Either the game lurches or your target isn't where
31 you're expecting, or you're standing in the lava rather
32 than next to it which is considered a bad thing.

33 I was talking to some gamers this week. On Tuesday I
34 believe they were playing on one of the XTRA servers.

1 Owing to a network fault there was a steady 1% packet
2 loss. They abandoned the game as being unplayable at 1%
3 packet loss.

4 On a modern system, and again which isn't congested
5 and all of our delay Jitter and packet loss specifications
6 are for uncongested systems, packet loss should be utterly
7 negligible. We are not asking something better than
8 Telecom's own service but we do want service parameters
9 that are close to what is being achieved now, rather than
10 3% which we believe is just not realistic.

11 I would like to move on to slide 9 and refer to what
12 matters to different applications.

13 If we take the matrix of the three parameters,
14 Jitter, Latency and Packet Loss verses multimedia type
15 application, an interactive application and a web
16 application, we strike off the first row because that's
17 not something that is allowed under the determination, so
18 we concentrate on the parameters that are important for
19 gaming and for web.

20 Again, you see that for gaming Latency is the cap,
21 it's the thing that really matters. Interactive lives or
22 dies with Latency. Not losing packets is also rather
23 important because those packets represent your bullets or
24 where you were on the screen. If you shot somebody and
25 the bullet didn't arrive you're a little aggrieved.

26 However, for web applications, in fact Latency is not
27 something that matters significantly. It does actually
28 impact on retransmissions because a late packet is a lost
29 packet and it also impacts on the maximum bandwidth which
30 you can get. But for the service that we're requesting,
31 we're saying Jitter is unimportant to interactive and data
32 active applications, but it actually can't in its
33 specifications exceed Latency and to interactive
34 applications late packets are missing packets.

1 The final slide I have is just the comparison of the
2 requested specifications and the UBS Jetstream
3 specifications.

4 So, to reiterate, what we're asking for is service
5 parameters that characterise the sorts of service that are
6 actually being delivered to XTRA and while we do
7 appreciate the fact that there isn't a wholesale service
8 split, what we want is something so that our customers are
9 not disadvantaged.

10 I think you've got something to say as well.

11 MS DODD: Yeah, I mean, as Michael said, the key thing is we
12 would like equivalence. We feel that the specifications
13 set out in Table 2 are pretty much worse case and while
14 XTRA have the advantage of being part of Telecom and able
15 to call someone up internally if there's a problem and the
16 network is not performing at the level they think it
17 should, it is more difficult for wholesale customers to
18 deal with things.

19 So, the service specifications that we've set out are
20 what we believe are reasonable service specifications in
21 the absence of knowing what Telecom's network is actually
22 achieving.

23 If those specifications aren't able to be met, we
24 would at least like some measurement and guarantee of
25 equivalence to the performance levels that the network is
26 actually achieving, rather than some worse case measures.

27 Peter, did you have anything to add? (Inaudible)
28 Sorry Peter, you cut off a bit there. If you could start
29 again.

30 MR WATERS: The standard access requires equivalence and so the
31 task is defined as a means by which to measure it. The
32 fact that Telecom doesn't have a different wholesale and
33 retail business unit really is beside the point. The SAD
34 standards and obligations and really because there is no

1 difference in their organisational structure between
2 retail and wholesale, in fact emphasises the need to have
3 some sort of way of implementing and operationalising and
4 measuring the standard access principle.

5 MS McLAUCHLAN: Peter, it's Rachel McLauchlan here. How does
6 that occur in Australia? How is that measured in terms of
7 compliance with the access principles?

8 MR WATERS: The way that it occurs in Australia and the way it
9 increasingly occurs in other countries is either through -
10 as we set out in the Pricewaterhouse paper, is either
11 through service levels which is traditional retail level,
12 wholesale level and IT method of doing these things, or
13 regulators in Australia and the UK require performance
14 monitoring where you monitor performance against retail
15 and wholesale services so you can show equivalence in that
16 way.

17 In many ways service monitoring or comparative
18 monitoring is a very effective way of ensuring compliance.
19 The transparency itself is a tool of compliance. So in
20 the UK and Australia you see the development of these
21 service monitoring requirements against the retail
22 service. That's very much a work in progress. In both
23 countries the regulators are continuing to expand the
24 service monitoring requirement.

25 MR ABBOTT: Are there any other questions from staff?

26 DR HAMILTON: Just one question on the Jitter. Is this once
27 again a congested network measure of Jitter?

28 MR NEWBERRY: Yes - oh no, Jitter doesn't actually matter
29 for the applications that we're concerned about. What we
30 are asking for is consistency.

31 DR HAMILTON: In one of Telecom's submissions Telecom talked
32 about the impact of buffering in the network in a
33 congestion environment. The Jitter could appear to be
34 much larger than the Latency?

1 MR NEWBERRY: No, in fact the Latency would also go up.

2 DR HAMILTON: Instantaneously?

3 MR NEWBERRY: Yes.

4 MS DODD: We are talking about an uncongested link.

5 MR NEWBERRY: As opposed to an 8 week average which doesn't
6 help you a lot if you're trying to play a game in that
7 time.

8 MR ABBOTT: Does Telecom have any response it wishes to make?

9 MR CHIVERS: Just a couple, Dr Milner would like to make a
10 couple of observations on this paper.

11 DR MILNER: I think we still have a difference of view over the
12 definitions having had this conversation because if you
13 read the definition for Latency, it is the minimum one way
14 delay as measured for a packet. Whereas, the delay
15 variation is from that minimum to a maximum and that's not
16 the way in which you've used that definition here. So, we
17 have a difference of view over definition, so we can do.
18 Your definition is not wrong, it is just different, and
19 until we actually use the same language we will have a
20 difference of view over this subject.

21 The second issue that I'd just like to make sure we
22 are aware of is we are defining a service with a 20:1
23 Contention Ratio, which means at certain points in time,
24 and that could be any time, it would be worst during the
25 peak busy hour but it could be any time at all, there will
26 be congestion. So, when there is congestion, you will get
27 either packet loss or delay variation, there is no option.

28 MS DODD: Again, we're talking about measurement on an
29 uncongested access link. Secondly, as we mentioned
30 earlier, the Contention Ratio that we've specified is in
31 the absence of knowing what contention you are achieving
32 for XTRA. What we are really after is equivalence.

33 DR MILNER: At 50:1 it's going to be even worse. So, you know,
34 the example that was given in terms of a gamer, that may

1 be absolutely perfect during a peak busy hour, that number
2 of packets may well be dropped and still meet the
3 requirements because at 50:1 contention there will be
4 severe congestion for short periods of time and if that
5 particular gamer hit that particular point in time, it
6 could occur.

7 MR CHIVERS: We don't have anything else to say on that, thanks
8 Chris.

9 DR HAMILTON: Just a small clarification to do with the
10 uncongested line issue. We are struggling a little bit
11 with the reasons for defining service quality measures on
12 an uncongested line, rather than the general performance
13 of a line which would include congested periods. If you
14 could give us some philosophy behind it.

15 MR NEWBERRY: Simply because if you were to write an SLA for a
16 customer and say that the line must always meet a packet
17 loss of 0.1% otherwise penalty clauses would apply, a
18 customer can congest their own line and invoke the penalty
19 clauses. I mean, if you try and put a quart into a pint
20 pot it won't go. So, what we're talking about is that the
21 characteristics of the transmission line itself are
22 adequate and subject to the Contention Ratio being
23 adequate, the backhaul is adequate.

24 To reiterate, what we want is an equivalent service
25 to XTRA.

26 DR HAMILTON: Just coming back to the uncongested line.
27 Because you were specifying the service quality of an
28 uncongested line, must you then also identify how often
29 that line becomes congested to identify the overall
30 performance of that line? When you're explaining to your
31 customer, you know, this is your best performance on an
32 uncongested line, the customer will ask you how often will
33 it become congested and I don't get that service?

34 MR NEWBERRY: As much as anything else, that will be determined

1 by the Contention Ratio, in that if you had a one to one,
2 then the minimum would equal the maximum. For 50:1 we're
3 talking about the busy hour performance.

4 DR HAMILTON: There is an ongoing problem here of being able to
5 interpret TelstraClear's requirement or suggested level of
6 quality in light of busy hours and the way it's measured
7 on Telecom's network. Creating that equivalence, it's not
8 clear how to do that.

9 MR NEWBERRY: We chose the uncongested measurement because when
10 we test a line ourselves, if a customer complains we can
11 test a line, it's very easy, we do a quick test and say
12 there is a fault on that line.

13 If, for instance, a customer were to ring up our help
14 desk and say, "I'm getting terrible performance", we can
15 run a test and discover, yes, there's significant packet
16 loss and there's an uncongested line, you have a wiring
17 problem, or there is a problem with the DSLAM or something
18 else. We can go back to Telecom and say there appears to
19 be a problem and we resolve it.

20 Where our focus is, which is when a customer says
21 they have a problem we have a way to test to see whether
22 or not it is within specifications.

23 DR HAMILTON: Okay.

24 MR FORSYTH: Alan and Chris, I guess, not being a technical
25 person here but understanding what it is that we're
26 seeking, I guess I would ask the question, the open
27 question, to Telecom, if they don't see sense in what
28 we're suggesting, is there an alternate specification
29 which presumably turning on this whole question of
30 congestion, how do you specify congestion?

31 If you're going to measure these various parameters
32 in a "congested mode", that only surely leaves the
33 question of what degree of congestion? And so, we all
34 know what uncongested is. What is congested? That's just

1 from an engineering point of view.

2 MR ABBOTT: Does Telecom have a -

3 MR CHIVERS: I guess I might say if equivalence is

4 TelstraClear's main requirement, then the way we've

5 currently built and operate the UBS and Jetstream services

6 gives them exactly that. They will have exactly what

7 every other UBS provider in New Zealand has and they will

8 have what we provide to ourselves.

9 MR ABBOTT: If the constant theme has been equivalence but to

10 me it's not easy to demonstrate how that equivalence is

11 occurring.

12 MS DODD: That's what we're having.

13 MR ABBOTT: The discussion and submissions we have had today

14 didn't talk a lot of equivalence but that's a lot of what

15 I'm hearing but it's the performance measurement that

16 equivalence is being provided appears to me to be the

17 clear issue. That is only an observation, I don't place

18 any weight on that.

19 I think unless either party has anything further they

20 want to discuss, I suggest we move on. I don't think we

21 can probably move this issue much further forward in this

22 forum.

23 MR CHIVERS: No, I don't have anything else to say.

24 MR ABBOTT: Do we want to start on static or dynamic IP

25 addresses now or stop for lunch?

26 MR CHIVERS: It would be better for us to stop for lunch now.

27 The next few questions will go through quickly and I would

28 like to get the people on backhaul to be here. Perhaps

29 reconvene at 1.00?

30 MR ABBOTT: 1 o'clock. 50 minutes. Okay, we'll see everybody

31 then. We will lock this room once everybody departs and

32 you can leave all your things here and it will reopen at

33 1 o'clock.

34 Workshop adjourned from 12.10 p.m. until 1.00 p.m.

1 MR FORSYTH: Hi, are you there Peter?

2 MR WATERS: Yes.

3 MR FORSYTH: You are there Jamie?

4 MR ATKINSON: Yes, I am.

5 MR FORSYTH: And Peter?

6 MR WATERS: Yes, I am here.

7 MR FORSYTH: Peter, I am told to tell you that the Telecom
8 presentations are weaning their way through the
9 uncongested network because it's not busy at the moment I
10 think.

11 MR ABBOTT: In which case I think we should proceed. Peter and
12 Jamie, are you okay to proceed in the absence of those
13 presentations?

14 MR FORSYTH: Before we go to that, can I contribute something?

15 MR ABBOTT: You may.

16 MR FORSYTH: Alan left us with the question, with some
17 puzzlement in his voice, as to what TelstraClear and why
18 TelstraClear were seeking or suggesting that the SLA
19 should be measured on an uncongested circuit, and also we
20 talked a couple of times in our presentation this morning
21 about equivalence and I thought it would be useful to put
22 those two things into context.

23 The first thing with regard to equivalence, is that
24 we are seeking equivalence and evidence of that
25 equivalence on the underlying network service used to
26 support Telecom's DSL/ex-DSL based service, most usually
27 thought of today as Jetstream.

28 And so, that's, I guess, the first technical
29 objective that we have been seeking and what we have asked
30 for is that in evidencing that, that Telecom records and
31 reports that the level of quality that they provide on a
32 network basis to deliver their retail service is the same
33 level of quality that they deliver to us as a wholesale
34 customer.

1 The second point with regard to why we have suggested
2 the measuring of the parameters - well firstly, why have
3 we asked for parameters because maybe if we left our
4 requirement as I've just stated it, then regardless of
5 what the quality of service is that Telecom operates its
6 network by, as long as we get the same, and it's
7 demonstrated to be the same by reporting and measuring, as
8 long as we get the same performance as that underpinning
9 say Jetstream then we should be happy.

10 Well, the reason we have asked for, as it were, an
11 ex ante - (somebody drops off the phone line connection) I
12 must have been boring them - who just left the line or
13 rather who is still there? Are you there, Peter? I'll
14 continue because you've heard this before.

15 MR ATKINSON: I am still here, sorry.

16 MR FORSYTH: Is that you Jamie?

17 MR ATKINSON: Yes, it is.

18 MR FORSYTH: So Peter must have dropped off. Okay. The reason
19 we think it is desirable and necessary for us to have an
20 agreed level of quality defined for the underlying network
21 service is so that we can plan. (Peter Waters rejoins the
22 phone line connection). Are you back, Peter?

23 MR WATERS: Sorry.

24 MR FORSYTH: Okay, welcome back. So, that's why we have sought
25 to come up with some, as it were, ex ante measures of the
26 level of quality of service that we are seeking agreement
27 on with Telecom for our delivery, and obviously one of the
28 elements which through this discussion I think we have
29 reached agreement on, for instance, is the Contention
30 Ratio. We had no idea what Contention Ratio Telecom
31 operated its network at. We now have an idea and we're
32 quite happy to have a service delivered to us with that
33 defined Contention Ratio.

34 Now I come to the question about in defining these

1 measurements why, as we've suggested, they should be
2 defined and measured on an uncongested network. Michael
3 has pointed out that on the customer access portion, that
4 between the customer premise and the back of the DSLAM,
5 that is a single circuit devoted to a customer and it is
6 that part of the network which, in our belief, should be
7 uncongested at the time of measurement because, as Michael
8 has pointed out, they could just flood that network and
9 you would not be able to have any sort of consistent and
10 meaningful measure taken because of that.

11 Because we are actually buying a service from the
12 customer premise not just to the back of the DSLAM but in
13 fact to the back of the ATM, the first ATM aggregation, it
14 leaves in question the quality of service between the back
15 of the DSLAM and the back of the ATM, and again I think
16 our view is that that is best specified in the context of
17 the way Telecom manages its network through the Contention
18 Ratio.

19 So, you put those two things together, we believe we
20 have a set of measures which can be agreed up front and
21 delivered. Have I got that right, Michael?

22 MR NEWBERRY: I believe so.

23 MR FORSYTH: Hopefully that's helpful.

24 DR HAMILTON: Yeah, just to confirm that there is no
25 possibility of congestion through the DSLAM? This is what
26 you're intending, from the customer to the back of the
27 DSLAM is a dedicated piece of - set of wires and a path
28 through the multiplexing which is dedicated and can be
29 congested?

30 MR FORSYTH: If I might turn your question round a little bit.
31 The only reason I talked about the back of the DSLAM and
32 the back of the ATM is because that's where aggregation
33 takes place and what we're talking about is an uncongested
34 access link and a defined Contention Ratio for the

1 aggregation.

2 DR HAMILTON: I would just like to ask Telecom then, can you
3 confirm if you've looked at the back of the DSLAM and the
4 customer's premises that that path can be congested by
5 other traffic on the DSLAM?

6 DR MILNER: It can be congested by other traffic. The only
7 place it's independent and isolated is from the modem to
8 the port and slightly beyond that. Everywhere else it is
9 multiplexed - statistically multiplexed in one way or
10 another and has congestion.

11 MS DODD: Where is the port? At the front of the DSLAM?

12 DR MILNER: Yes.

13 DR HAMILTON: We're really only talking about the dedicated
14 copper lines?

15 MR NEWBERRY: We need to be able to test in terms of
16 determining network faults that the copper access is
17 uncongested but, of course, what we get given by Telecom
18 is not gold copper but a layer two tone and that's - we
19 need to deliver service to our customers and the way to
20 manage that is through an agreed Contention Ratio and a
21 reporting of that contention ratio.

22 DR HAMILTON: I am wondering how you go about measuring quality
23 of service on that component of the network independently
24 of the rest of the network? How Telecom demonstrate that?

25 MR FORSYTH: I don't think we're saying that. All we're saying
26 is that portion, which I am happy to accept if Murray
27 tells us is best defined from the front of the port to the
28 customer premise, all I am saying is in measuring the end
29 to end service that portion is the portion which needs to
30 be uncongested because the rest is aggregation.

31 MR GOUDIE: Murray, in relation to the probes that you use to
32 measure performance, that is at the front of a DSLAM on a
33 pre pore basis?

34 DR MILNER: It is correct but we do not define - the probe

1 measurements are done from there to a point in the network
2 which effectively corresponds to the first ATM switch, the
3 back end of the first ATM switch. So, it's a holistic
4 view.

5 The only other thing available is specific parameters
6 off the port cards of the DSLAMS themselves, which we
7 don't currently get on any other basis than taking
8 measurements, taking readings from time to time through
9 our network management systems.

10 MR GOUDIE: If I ask the question more, in those measurements
11 where you have probes, that would be an uncongested port
12 you are taking measurement through because you're not
13 running traffic through it?

14 DR MILNER: It is uncongested in terms of its self-congestion
15 but it is going through a congested virtual path because
16 it has to, so therefore at any point in time it will be
17 congested or uncongested relative to the entire set of
18 services.

19 MS DODD: We're saying our congestion only relates to the
20 access link. We understand there would be congestion on
21 the virtual path, there may be.

22 MR FORSYTH: Peter, did you have anything else you wanted to
23 add?

24 MR WATERS: I think that it's best discussed about how to
25 measure standard access principle on non-discrimination.
26 The Commission might be interested in the Ofcom Strategic
27 Review Paper that came out a few weeks ago. It actually
28 says that the way to measure these sorts of
29 non-discriminatory issues for wholesale products,
30 especially unbundled products, is to measure the inputs
31 and not to measure the retail output.

32 In other words, the question isn't whether the access
33 seeker can provide an equivalent retail service to the
34 access provider, but rather what can the access seeker do

1 with the same type of network product which the access
2 provider provides to itself, and that creates more scope
3 for innovation.

4 It may well be the access seeker can do more with, or
5 different things with, the equivalent access product than
6 the access provider currently is in its own retail
7 product.

8 The question isn't can TelstraClear do the same as
9 XTRA. Maybe the question is what is the nature of and the
10 service quality levels that Telecom provides itself at a
11 network level and assuring equivalence at that level?

12 MS DODD: And the layer two level, I think the Ofcom Strategic
13 Paper has a very good discussion of these and it also
14 discusses the second point Grant raised about the need to
15 define the service parameters on an ex ante basis because
16 one of the equivalents of inputs is you have to know what
17 the network level product is so the access seeker can
18 design its own retail product. It's not enough to sort of
19 measure it ex-post. You have to actually tell the access
20 seeker what's happening in the network so that it can do
21 an equivalent process of product design.

22 MS McLAUCHLAN: Peter, it's Rachel here. How does this idea of
23 equivalency fit with Telecom's idea of fairness that came
24 through earlier this morning?

25 MR WATERS: Well, I think that the Act says what's there - the
26 Act says that what's there is equivalent. The standard
27 access principle defines what has to be done between the
28 access seeker and the access provider and the access
29 seeker. The Act doesn't refer to the principle of
30 fairness, it refers to the principle of equivalence.

31 MS DODD: Non-discrimination.

32 MR WATERS: The UK interprets that in a very interesting
33 decision as equivalent to input when you're talking about
34 unbundled product.

1 If part 6, the equivalence of input in the Telecom
2 network, is a management strategy between all of these
3 products which are competing for the same band, then
4 that's part of the equivalence of input.

5 MS DODD: So that strategy has to be the same, impact people in
6 the same way?

7 MR WATERS: Yes. So, if there are BPMs between the DSLAM and
8 the first ATM switch, then you have to make sure the BPM
9 capacity made available to access speakers is not smaller
10 than the BPM capacity made available to XTRA. In other
11 words, that the contention ratios in those are the same.

12 MS McLAUCHLAN: When you refer to equivalence, you are saying
13 it's similar but not identical?

14 MS DODD: It's non-discrimination.

15 MS McLAUCHLAN: Non-discrimination.

16 MS DODD: And that's the way the Act defines fairness.

17 MR WATERS: I think that's the nub of the point. If you read
18 the Ofcom paper, if you look at equivalence of output,
19 then people say let's not worry about how you get there as
20 long as it's roughly the same on the output, then the
21 non-discrimination principle is being met. Ofcom actually
22 says, well no, that's not the way to apply the standard
23 access principle to unbundled products; you look at the
24 equivalence of the inputs.

25 So, the question of similarity doesn't arise in the
26 same way that incumbents have traditionally argued the
27 issue of similarity.

28 MS DODD: If you are looking at outputs, what you're doing is
29 limiting the scope of innovation. If you look at inputs,
30 you have non-discrimination and it's up to you what you do
31 with it. Okay.

32 DR HAMILTON: Does Telecom have a set of service level
33 agreements between Telecom and XTRA?

34 DR MILNER: No.

1 MS DODD: I guess the issue is -

2 DR MILNER: They have the same information that I have provided
3 to this conference about how the service performs.

4 MR ABBOTT: Unless there's anything else to discuss, I suggest
5 we move on to the next item on the agenda, which is the
6 static or dynamic IP addressing and I'll pass over to
7 Ralph.

8 MR CHIVERS: We have a very brief answer on this. Obviously
9 the UBS service is a layer 2 service, or more strictly
10 layer 2 type protocol service, which means the layer 3
11 activities are performed by the service provider, either
12 XTRA in our case or another ISP, which includes address
13 management.

14 So, from our perspective, the issues around static IP
15 addresses aren't really related to costing complexity.

16 We have only two real concerns. One is that the end
17 discriminate use of IP addresses would put pressure on the
18 overall IP address space, given we usually get grief every
19 time we ask for more. It is a finite resource and care
20 needs to be taken into managing it in a pre IP6
21 environment.

22 I guess our other point, and it's more related to
23 pricing and we've covered this to some extent in our
24 submissions already, static IP addresses are valued by end
25 users and because of that service that includes static IP
26 addresses attract a premium price and in a retail minus
27 construct which we have here our view is that that should
28 be reflected through into the price of the underlying
29 services.

30 So, for us - we're not exactly answering your
31 questions but for us it's not a cost of costing complexity
32 at all.

33 MR ABBOTT: Are you prepared to answer the question as it
34 stands? I know you've talked about it from a price issue

1 and you've compared it to the service set out in the Act,
2 which is a retail minus approach, but I guess the question
3 we are asking is what are the additional costs that
4 Telecom itself faces in providing one type of IP address
5 over another?

6 DR MILNER: Because we don't actually operate and deal with
7 layer 3, the access seeker can deal with the - actually
8 has control of most of the costs themselves. There's very
9 little that actually flows into our environment on the
10 equivalency basis that we are referring to here.

11 MR ABBOTT: TelstraClear, do you have any questions related to
12 that?

13 MS DODD: No. I think that aligns with our view.

14 MR ABBOTT: Okay. In which case we can, I guess, move on to
15 bullet item 16 which is a resupply of wholesale UBS.

16 MR CHIVERS: The answer is there are no technical reasons why
17 it can't be resupplied and I don't believe we have said
18 there were.

19 MR ABBOTT: TelstraClear, do you have any comments you wish to
20 make?

21 MS DODD: No, I think we agree.

22 MR NEWBERRY: That is our position.

23 MR ABBOTT: We will move to item 17 then, provision of the
24 backhaul service, and we should be finished in about
25 10 minutes.

26 MR CHIVERS: Yes, we have a couple of presentations to handout.
27 Messrs Linstrom and Haden will be addressing this point.

28 (Presentations distributed)

29 MR FORSYTH: Peter or Jamie, have you received the Telecom
30 presentation?

31 MR WATERS: No.

32 MR ABBOTT: Are you happy to proceed, Peter and Jamie, or would
33 you like to wait a few minutes.

34 MS OAKLEY: It might be longer than a few minutes. It's

1 lunchtime in the office.

2 MR FORSYTH: So that's where the contention is.

3 MR CHIVERS: We have asked for them to be sent.

4 MR WATERS: Go ahead.

5 MR CHIVERS: I have asked Gerard along to help us answer this
6 question today. Gerard is Business Development Manager in
7 Wholesale and intimately involved in the development of
8 our backhaul products for UBS so should be able to answer
9 most questions the Commission might have on this.

10 MR LINSTROM: The terms used in this presentation are those
11 described in the Unbundled Bitstream User Guide. Some of
12 these terms sound similar, so if any of these terms are
13 unfamiliar or confusing to anybody, we have attached a
14 glossary at the end of the slide pack to assist in
15 clarifying the various terms. So you can refer to that if
16 you need to at the back of the back.

17 On slide one it is the question which was posed to us
18 regarding backhaul. There is some ambiguity around this
19 question, so we read this question alongside the section
20 of the submissions from TelstraClear dealing with
21 backhaul.

22 Having done that, it's still not completely clear
23 from Telecom what TelstraClear is requesting in respect to
24 backhaul. In their submissions TelstraClear appear to be
25 confusing the various backhaul options for UBS available
26 to the industry.

27 So, in order to clarify the multiplicity of options
28 that are available under our commercial backhaul offers,
29 what we're going to do in this part of the presentation is
30 focus on when UBS backhaul is required, what options are
31 available to service providers, and we will also detail
32 what in particular is available to TelstraClear.

33 Turning our attention to slide 2, the first option is
34 the self provision of backhaul. TelstraClear can leverage

1 their existing network presence in 29 of the nominated 34
2 UBS handover points and arrange their own backhaul.

3 Where TelstraClear does not have a presence in the
4 UBS handover site, they can either build to that site or
5 under option 1b purchase a commercial data service from
6 Telecom under our existing wholesale arrangements for that
7 purpose. This is similar to the existing arrangements
8 that the two companies have between themselves currently
9 for voice interconnect links.

10 In some cases they will build, in some cases they
11 will purchase a commercial service to furnish that link.

12 Under this option, TelstraClear controls both the
13 amount of backhaul that is allocated per user as well as
14 the distance of that backhaul step. So, there is no
15 traffic cap or no additional charge levied by Telecom for
16 UBS traffic volumes passing over the backhaul or USAP/NNI
17 links.

18 Alternatively, TelstraClear can avail themselves of
19 Telecom's commercial flexible backhaul service to meet
20 their backhaul needs. Under this flexible backhaul
21 option, Telecom has accepted the traffic management risk
22 for backhaul, so has therefore placed an average per user
23 limit on the amount of traffic that a service provider can
24 have per month for the fee being charged. This is set at
25 an average of 10 megabytes per user per month which is 10
26 times more than Telecom's typical retail usage.

27 Telecom believes these options meet the needs of
28 service providers across the country, while at the same
29 time giving entrants and small scale service providers the
30 chance to compete in this market.

31 Option 1 is intended for those with infrastructure,
32 while option 2 was specifically developed in response to
33 industry consultation with service providers who had
34 little, if any, infrastructure to leverage.

1 Turning to slide 3. Where did the 10 gigabytes come
2 from? When we asked service providers for feedback on the
3 UBS service, one of their big concerns was around backhaul
4 services and what they requested from Telecom specifically
5 was the same technical backhaul that we provide for
6 ourselves for Jetstream. They wanted national coverage,
7 they wanted this to be able to work with a single handover
8 point, multiple if they could justify them but they didn't
9 want to be forced into having multiple handover points if
10 they didn't need them, and they wanted this to be
11 presented as a variable cost into their business rather
12 than a fixed cost in each geographic area.

13 So, how we set about doing that was to deliver a
14 fixed price per month for a set amount of traffic and what
15 we did was look at setting a level that was 10 times our
16 most popular retail plan.

17 Now, what this does is allow service providers the
18 flexibility to create a range of plans in excess of
19 Telecom's retail 1 GB plans and allowing for retail market
20 service and price differential. A simple example of that
21 is shown on that slide.

22 The fact that we have a 10 gig allowance per end user
23 does not limit a service provider to offering less than
24 10 gigabyte plans.

25 If they're competing at retail level with a 1 gig
26 plan for the same inputs, then they can have a mix of 2,
27 10, 50 and 100 gig plans and still come in under the
28 average 10 gig allowance.

29 So, despite the fact that they may be selling plans
30 to their customers pulling more than 10 gigabytes per
31 month, they won't pay any excess payments to Telecom if
32 they can manage that traffic mix.

33 So, without exception, when we went back with this
34 proposal to the industry, the ISPs congratulated us on

1 listening to what they had to say and giving them what
2 they had requested.

3 Turning to slide 4, Telecom's original proposal for
4 UBS backhaul was developed as a result of observing
5 backhaul services for internet-grade DSL services offered
6 by several overseas Telcos, including Telstra Corp in
7 Australia.

8 Typically, these backhaul links are offered as n x 2M
9 links from the aggregation point (USAP) to the service
10 provider's remote facilities.

11 These backhaul links are typically available with
12 VBR, CBR or UBR transmission characteristics.

13 Then the service provider is free to decide how much
14 backhaul is dedicated to any particular geographic area
15 and they can decide on when, or even if, bandwidth is
16 increased due to growth in that area.

17 As I have just previously stated, Telecom embarked on
18 significant industry consultation at the outset of
19 development of UBS, and backhaul was the one that we got
20 the most feedback on and was the one that we placed a lot
21 of emphasis on.

22 So, we believe that our offerings here cover what the
23 market needs.

24 Turning to slide 5, the discussion about backhaul
25 needs to refer back to the UBS access service. The UBS
26 access service starts at the end customer premise and
27 arrives at a handover point which we describe as a USAP in
28 our network and at that point the service provider can
29 meet us with an NNI.

30 A Service provider with a single point of presence
31 can establish a single NNI within 5 kilometres of that
32 URSA. The URSA is the area marked grey in the diagram
33 with all the connection points in it.

34 The commercial issue they face is how do they get

1 traffic from the remaining URSAs that they wish to service
2 their UBS service if they should want to.

3 TCL state that they believe the access seekers should
4 be able to use a mix of their own facilities and Telecom's
5 data services to provide their own backhaul. On this
6 point, we are in complete agreement.

7 But they then go on to infer a 10 gigabyte per end
8 user monthly allowance applied to backhaul is somehow
9 penalising access seekers who choose not to build using
10 their own assets and is somehow anti-competitive. This
11 might be a concern to the Commission if it were entirely
12 true but it is not.

13 There are two, self provide and flexible backhaul
14 with multiple implementation scenarios. To the casual
15 observer, basically the same technical solution but
16 covered by different pricing constructs and business rules
17 that directly relate to the proper application of those
18 pricing constructs. If you want to see that in detail,
19 turn to slide 6.

20 Our option 1a, which is self provide, in which a
21 service provider would provide their entire backhaul
22 requirements, the service provider chooses the number of
23 UBS regional service areas in which they wish to provide
24 service to their end users. If the service provider has
25 network assets in each of those URSAs, they can establish
26 an NNI in each URSA using their own network to backhaul
27 traffic between their POPs. If they do not have intercity
28 network assets to carry the traffic they can purchase
29 these, as the national transmission market for Data is
30 competitive.

31 TelstraClear can establish NNIs in each URSA they
32 wish to service. If they want to provide a national
33 service, that means 34 of them will be required and
34 TelstraClear would then be able to use their own backhaul

1 network to provide backhaul between these points.

2 We note that TelstraClear have interconnect
3 arrangements corresponding to 29 of the 34 unbundled
4 service aggregation points that we have defined.

5 This would mean TelstraClear would need to develop
6 links to five distant URSAs. We also note only two of
7 these links would require a build in excess of 200 metres
8 to reach a USAP.

9 Under this scenario, Telecom has no part in its
10 decision over size, distance or even a provision of the
11 backhaul links. A service provider makes these choices
12 and provisions the links accordingly.

13 Under this option, TelstraClear controls both the
14 amount of backhaul that is allocated per user as well as
15 the distance of backhaul, so there is no traffic cap nor
16 additional charge levied by Telecom for UBS traffic
17 volumes passed over the backhaul or USAP/NNI links.

18 Service providers can elect to take this option where
19 they have only a regional customer focus. There is no
20 requirement to be present at all 34 handover sites unless
21 the service provider is wishing to offer a national
22 service.

23 In terms of slide 7, in the alternative where
24 TelstraClear wants to meet us at a subset of the 34
25 handover points, they can build out to some of those URSAs
26 and then by data links from Telecom to provide backhaul
27 links from the remaining distant URSAs to any of their
28 established use at handover points.

29 This was the original proposition put before the
30 industry by Telecom in the first round of UBS consultation
31 in June 2004. Telecom considers that this option meets
32 the technical requirements of the designation for UBS
33 backhaul. Again, under this scenario the service provider
34 has total control over the size and length of these

1 backhaul links, so the service provider makes those
2 choices and purchases its links accordingly. Again under
3 this scenario no traffic allowance limit is imposed by
4 Telecom.

5 Turning to slide 8, we explain the flexible
6 commercial backhaul option. TelstraClear can take this
7 option, and this is the revised industry offer we
8 developed in conjunction with ISPs after our extensive
9 industry consultation. What service providers did is tell
10 Telecom as part of that feedback process, that many of
11 them tended to have a regional bias towards their customer
12 location. For example, a Hamilton based ISP has mainly
13 Waikato customers, a Christchurch based ISP has mainly
14 Canterbury customers, but there are some circumstances in
15 which they attract a small number of customers outside
16 their traditional catchment areas. For example, when they
17 sign up a business customer they might have a remote
18 office outside their original catchment area.

19 In that case, smaller providers told us that they
20 just don't have the scale to justify connections to every
21 URSA on the off chance they might attract a customer in
22 that area or one customer might move there. Rather than
23 place these restrictions on their marketing effort and
24 make their offer only a regional one, they asked Telecom
25 to manage the distant and location risk in return for a
26 monthly fee.

27 The service providers pay a monthly fee per UBS
28 connection based on the distance of that end user URSA to
29 the service provider nominated at handover point. Those
30 monthly fees can be as little as zero dollars if the
31 customer is in the URSA in which the handover point is
32 located.

33 From an A step, being an adjacent URSA of 65 cents a
34 month through to \$2.10 and all these prices are listed in

1 the UBS handbook.

2 Under this flexible backhaul option, Telecom has
3 accepted the traffic management risk for backhaul so has
4 placed an average per user limit on the amount of traffic
5 that a service provider can have per month for that fee
6 being charged.

7 In order to allow service providers the opportunity
8 to differentiate the retail offerings from that service,
9 Telecom chose to dimension the backhaul service at more
10 than 10 times Telecom's typical retail usage. And as
11 we've seen in that previous example, this is not a hard
12 limit as has been characterised by some people.

13 And again by way of example, a service provider with
14 five customers has a 50 megabyte limit. That doesn't mean
15 just because there's a 10 gig average that a single user
16 that exceeds 10 gigabytes is going to run up into some
17 hard stock.

18 The pricing that we apply to this service recognises
19 that Telecom is accepting not only geographic risk but
20 also averaging over thick and thin routes from some of
21 these destinations.

22 So, looking at option 2 for flexible backhaul on
23 slide 9, a service provider and TelstraClear has this
24 option. Rather than having a single handover point, can
25 actually decide the optimum number of URSAs to build to.
26 The reason why this makes any difference is because the
27 traffic in each one of those URSAs gets handed over at no
28 charge to the handover point within that URSA.

29 So, effectively the more handover points you build
30 to, the fewer higher price steps you have to pay.

31 The dimensioning of the backhaul for this service is
32 based on the same provisioning rules used for the retail
33 Jetstream service and, further, uses the same physical
34 backhaul links as those used for Jetstream. This gives

1 the service providers purchasing this backhaul service the
2 reassurance that the backhaul service experience is
3 equivalent to that which Telecom delivers to its own
4 Jetstream customers.

5 Under this flexible backhaul option, Telecom has
6 accepted that traffic management risk, as I stated before,
7 and our customers have accepted that there has to be a
8 limit to the amount of traffic that they can have for that
9 modest fee.

10 Turning to slide 10, in addition to those features,
11 the commercial backhaul options that we have put into the
12 market, whether it's self-supply or flexible backhaul,
13 Telecom has also allowed - has chosen to allow aggregation
14 of mixed traffic in those handover points. So, if a
15 service provider is to establish an NNI for the purposes
16 of handover, they can also use that access point to
17 handover committed bit rate traffic for the unbundled
18 partial circuit service that they purchase.

19 A service provider elects to take a commercial access
20 handover point for a UNI, then that access point can be
21 used to aggregate a mix of unbundled and commercial
22 service traffic that they would buy under their wholesale
23 agreement. This is a significant cost benefit to service
24 providers. As to our knowledge, no other Telecom anywhere
25 in the world allows this sort of aggregation to occur.
26 Unbundled services are typically handed over on dedicated
27 handover access points separate from any or all other
28 services.

29 So, Telecom has put a range of options under two
30 separate backhaul proposals to the industry. A
31 significant number of participants in the market signed up
32 to and embraced a significant backhaul service.

33 If TelstraClear is seeking something not covered
34 under these proposals, then Telecom and TelstraClear are

1 able to negotiate a different arrangement, or TelstraClear
2 can seek a regulated solution.

3 With all that in mind, as per the wording of the
4 regulation, the first ATM switch has become the service
5 demarcation point for the access portion of the USB
6 service.

7 This creates a logical geographic service area for
8 each ATM switch in Telecom's network, from which backhaul
9 may be required.

10 Telecom developed the backhaul service that limits
11 remote URSA's to the service provider should such a link be
12 required.

13 And we have offered up an option where service
14 providers can totally provide their own backhaul, they can
15 mix that with purchase of wholesale services, so that
16 encompasses our option one, or if they choose not to build
17 and don't want to take the risk around the volume they
18 require to justify the fixed cost of a fixed link, they
19 could take option two which is our flexible banking
20 service.

21 Turning to slide 12, to recap all of that, under
22 option 1 TelstraClear can self provide backhaul. They can
23 leverage their own existing network presence in 29 of the
24 nominated 34 UBS handover points and arrange their own
25 backhaul. Where TelstraClear does not have a presence at
26 a UBS handover site, they can build to that site or
27 purchase a commercial data service from Telecom for that
28 purpose.

29 Backhaul links can be provided as committed bit rates
30 priced as per their existing WSA/MCSA schedule; or
31 variable bit rate services priced as per their existing
32 MCSA schedule; or unspecified bit rate service priced as
33 per consultation paper of June 2004; and they can buy
34 those links and the available bandwidth steps as indicated

1 on the slide there.

2 Under this option again TelstraClear will control the
3 amount of backhaul that they allocate per user as well as
4 the distance of the backhaul. Telecom do not impose any
5 traffic cap nor additional charge. Given the competitive
6 nature of national backhaul, a service provider could
7 purchase links from a 3rd party to complete their backhaul
8 requirements if they wanted to. Or alternatively, under
9 option 2, TelstraClear can bail themselves of Telecom's
10 commercial backhaul service to meet their backhaul needs.

11 Under the flexible backhaul option, Telecom, as we
12 keep pointing out, accepts the traffic management risk,
13 some quite fairly impose a limit on the amount of traffic
14 being provided for that price, also noting it is 10 times
15 more than the typical Telecom retail service usage.

16 Telecom believes that these options meet the needs of
17 service providers who can leverage existing scale presence
18 across the country while at the same time giving entrants
19 and small scale service providers the chance to compete in
20 this market.

21 MR CHIVERS: Do the Commission staff have any questions?

22 DR HAMILTON: The flexible backhaul service, if I'm correct,
23 is a small monthly charge with some sort of distance
24 dependence as well?

25 MR LINSTROM: Yes.

26 DR HAMILTON: Would it be fair to say that the traffic
27 management risk that you refer to is created because
28 Telecom is effectively charging for a very low capacity
29 bandwidth which may be exceeded?

30 MR LINSTROM: Can you repeat the question?

31 DR HAMILTON: The flexible backhaul service is a low monthly
32 charge which would, if that were a committed bit rate
33 service for example, equate to a very, very small bit
34 rate. I am just trying to get my head around the traffic

1 management risk that you refer to throughout your
2 presentation. Am I correct in thinking the traffic
3 management risk arises because an access seeker could
4 exceed that very small bandwidth that they are paying for?

5 MR LINSTROM: Yes. That's all that we're saying. For a dollar
6 you get this much throughput. If you want unconstrained
7 throughput, there is another arrangement you can make.
8 You buy the links and you manage the traffic and worry
9 about the contention costs of backhaul but we're not going
10 to take that risk for a dollar.

11 MR HADEN: There are other risks in terms of the geographic
12 risk, in that it is one price across the country, it is a
13 distant dependent price but not an URSA specific price.
14 So, we're taking risk in terms of where those customers
15 might be. Some will be in more expensive areas and some
16 will be in cheaper areas and we've averaged across that.

17 MR ARMSTRONG: On your slide 7, Gerard, self provide option 1b,
18 it shows on the left-hand side the purple dotted lines, it
19 looks like traffic up to the NNI, is that correct?

20 MR LINSTROM: The blue dotted lines are the backhaul links. If
21 TelstraClear were to have two handover points, they would
22 arrange the backhaul links between those two NNIs but they
23 want to reach USAP 3 and USAP N, so if they decided that
24 they couldn't build or didn't want to build those distant
25 USAPs, they could buy committed bit rate wholesale service
26 on Telecom's network, which would be handed over on that
27 same NNI.

28 What we're representing there is those wholesale
29 links that they would purchase then become part of their
30 backhaul network but they are just delivered by wholesale
31 supply rather than physically built on their network.

32 MR ARMSTRONG: To carry that dotted purple traffic via
33 wholesale service of Telecom for example.

34 MR HADEN: They buy a dedicated link from Telecom.

1 MR LINSTROM: Option 2 is the flexible backhaul service.

2 MR ARMSTRONG: Okay thanks.

3 MR ABBOTT: I don't think we have any further questions. It

4 would be useful to hear from TelstraClear on this point.

5 I guess the reason being is that TelstraClear have quite

6 limited concerns and it is a cross-submission and one of

7 the concerns seems to have been addressed in the answer to

8 question 17.

9 It was apparent from my cross-examination that there

10 was one outstanding issue in regard to the backhaul

11 designated service, so we could usefully hear from

12 TelstraClear on that matter.

13 MR FORSYTH: Thank you Chris. First let me just say, we

14 welcome this presentation, Gerard. It, I think, provides

15 a great deal of clarity which we have struggled, I guess,

16 to understand ourselves, so thank you for that.

17 Having said that, there are just a couple of points,

18 if I might ask, just to make sure I have it entirely

19 correctly.

20 And that goes to, and it may well just be answered

21 simply in the black and white statement on slide 11, that

22 option 2 cannot be mixed with option 1. I just want to

23 understand I have got that correct. Should TelstraClear

24 choose to utilise its own existing infrastructure to, as

25 you noted, the 29 points, and if we chose to build to some

26 others but still felt for an economic point of view it was

27 desirable to use and to purchase backhaul services from

28 Telecom for the retaining URSAs, one of the options not

29 available to us, we would not be able to buy what you

30 refer to as your flexible service; is that correct?

31 MR LINSTROM: Currently the two offerings in the market are

32 that you self provide. Whether you do that by physically

33 building or by wholesale services from Telecom or another

34 third party -

1 MS DODD: You are saying self provide everywhere?

2 MR LINSTROM: It doesn't have to be everywhere. You don't have
3 to go everywhere in New Zealand. You might choose to only
4 offer services in the North Island. If you are a
5 regionalised IP you may choose only to offer services in
6 Taranaki, in which case you may only meet Telecom in three
7 places. That is the choice of the service provider.
8 That's option 1.

9 Option 2 is to take away the build option and let
10 Telecom handle backhaul for the whole country. Now, if
11 there's something else, a third option to mix those two,
12 that could be the subject of a commercial negotiation but
13 it's not a commercial offer that's on the table today
14 because -

15 MS OAKLEY: Publicly obviously we can't discuss what's being
16 discussed in commercial negotiations or not.

17 MR NEWBERRY: So to put it another way, if there was a small
18 regionalised IP that had, for instance, taken the flexible
19 backhaul service and TelstraClear had taken the
20 self-provide provision service, the option 1, so we have
21 taken the option 1, small regionalise IP takes option 2,
22 if we were to buy option 2, buy the small IP, we would be
23 forced to give up option 2 you're saying.

24 MS DODD: Option 1.

25 MR NEWBERRY: Or 1 because we're not allowed to have both
26 options in operation at the same time.

27 MR LINSTROM: We wouldn't have two separate contracts with
28 Telecom, so you decide what contract you want to operate
29 under.

30 MR HADEN: If you want to run the IP as an independent
31 subsidiary, you can have a one on one option and one on
32 the other, if you want to integrate them into Clear or
33 Paradise you have to choose which option.

34 MR CHIVERS: That option would be putting in IP or existing

1 established links.

2 MR FORSYTH: I have two other technical questions with
3 clarifications, and again I think the first one may be
4 answered, and that is the question under your flexible
5 option, not a question but the requirement under your
6 flexible option whereby you provide a data cap, and you've
7 explained why but where you provide a data cap, because
8 you only offer the second option on a whole of national
9 basis and it cannot be mixed with self-provision,
10 therefore the question of the cap applies on a nationwide
11 basis; is that correct?

12 MR HADEN: The cap applies to all customers who are subject to
13 the flexible backhaul service for that ISP, so yes that
14 would mean across the whole country.

15 MR LINSTROM: What it does do is it means the concern for
16 smaller providers was that they didn't necessarily want to
17 face the decision of a huge fixed cost investment to jump
18 to an adjacent area, or if they themselves went and bought
19 another ISP who happened to be an adjacent, they felt for
20 the way they run their businesses they wanted variable
21 cost inputs not fixed cost inputs.

22 So, that's how we ended up with this service and then
23 they told us that once they reached a certain critical
24 mass, they would then self convert from that variable
25 price structure to a fixed price structure.

26 So, it was really only ever envisaged that it would
27 be of any interest to entrants in the market, not for
28 established players.

29 MR FORSYTH: You had another question?

30 MS DODD: Yeah, I just wanted to clarify that. If we turn to
31 slide 9, I think what you're saying is if an access seeker
32 is at proportion or has a direct link, has built to a
33 proportion of URSAs, if that access seeker chose the
34 flexible option 2, then in relation to the URSAs where you

1 have a direct link, that would be an S charge, so there
2 would be no charge for backhaul, but your 10 gig limit
3 would still apply to the end users in that URSA?

4 MR LINSTROM: The 10 gig limit applies to all traffic handed
5 over those links.

6 MS DODD: Even when it's direct?

7 MR LINSTROM: Regardless of which URSA it comes from.

8 MR FORSYTH: I have one other question, you talked about the
9 5 K limit, I just need to understand that. You raised it
10 when talking about slide 5, can you explain that again?

11 MR HADEN: It is the standard business rule in the
12 interconnection agreement, that shared cost connection has
13 a limit of 5K. You can go further if you want but you
14 have to pay any extra costs beyond the 5K.

15 MR FORSYTH: Can you define the 5K, that is the difference
16 between -

17 MR HADEN: Radial distance between our exchange and the
18 exchange that you want to connect it with.

19 MR LINSTROM: We already had those agreements between us on
20 interconnect, so they were replicated for simplicity in
21 this scenario.

22 MR FORSYTH: Good.

23 MR WATERS: I am having trouble, going back to Wendy's
24 question, understanding why the 10 gig limit applies
25 whether at that fixed solution of our own build and using
26 the other option?

27 MR HADEN: It doesn't.

28 MR FORSYTH: Speak up?

29 MR HADEN: Peter, when you have done your own build, the 10 gig
30 limit doesn't apply.

31 MR FORSYTH: Does not apply?

32 MR HADEN: No, because it's your own network, so you put how
33 much traffic over it as you want.

34 What we have said is that the mixed option, which you

1 may be referring to, doesn't exist, i.e. that we're not -
2 we haven't allowed a mixing of option 1 and option 2. We
3 do allow a mix of Telecom dedicated links and
4 TelstraClear's network, in which case there's no limit,
5 but there isn't a mixing option between flexible backhaul
6 and dedicated links.

7 MR WATERS: Why don't you allow mixing between those two
8 options? For a technical reason?

9 MR HADEN: No, that is - it just relates to the nature of the
10 commercial offer and the averaging that we have done in
11 creating the price structure.

12 MS OAKLEY: Can I direct this back to the Commission and point
13 out again that the things that have been explained today
14 are the two industry offers that have been acceptable to
15 the rest of the industry and Telecom is of course able to
16 negotiate any further or different options with
17 TelstraClear but we are here today obviously to answer the
18 Commission's questions about how to deal with the
19 regulatory application in front of it.

20 MR WATERS: But you're putting forward - your view is that the
21 regulatory proceeding that there shouldn't be an ability
22 to mix the two options. So, I think it is useful to
23 understand what is your rationale for not mixing the
24 options. You said it's not technical, so I think it would
25 be useful to understand what is the commercial rationale
26 because it may be reasonable. We just want to understand
27 what it is.

28 MR ABBOTT: I mean, from the Commission's perspective, at this
29 stage we have before us an application for us to
30 determine, which includes non-priced terms and conditions
31 of backhaul, so issues such as whether or not it is
32 technically feasible to offer a service which may well
33 differ from a commercial service which is currently
34 available of which you've outlined, that is something that

1 it is appropriate for the Commission to explore here. I
2 can appreciate, Vanessa, your point in respect of
3 commercial negotiations, we are not particularly
4 interested in what your commercial negotiations may be and
5 we understand they are commercial in confidence. From our
6 perspective to be able to move this application forward we
7 need to understand what is technically feasible, for
8 example, for the provision of backhaul, as opposed to what
9 might be the commercial construct of the commercial UBS
10 service.

11 So, in that regard I appreciate your comments on your
12 commercial proceedings but I think it is important for us
13 to explore these issues, so I would like to kind of
14 proceed.

15 I think Peter Water's question is relevant about is
16 there any technical reasons why it would be possible to
17 offer these services in a different construct from those
18 you've provided in the commercial UBS backhaul context?

19 MR CHIVERS: Chris, can we just take a 5 minute break to have a
20 chat about that?

21 MR ABBOTT: That's fine.

22 MR CHIVERS: We will develop a response on that question.

23 MR ABBOTT: Do you want 5 minutes off-line now?

24 MR CHIVERS: Can we take 5 minutes off-line now?

25 MR ABBOTT: Yes, certainly.

26 Workshop adjourned from 2.05 p.m. until 2.10 p.m.

27 MR CHIVERS: Your first component of your question was a
28 technical one about whether the services can be mixed and
29 Murray is going to answer that particular question for us.

30 DR MILNER: The services can be mixed technically, technically.
31 However, because you are typically talking about an
32 uncommitted bit rate backhaul that is effectively
33 contended again at whatever rate is agreed, you've got to
34 make sure that any particular service provider or user as

1 part of a service provider can't abuse that particular
2 capacity. So, you have to actually ensure that there are
3 constraints put on the way in which their bandwidth or the
4 resource is allocated.

5 In the case of the current model, it is the
6 10 gigabyte cap but other mechanisms could also be applied
7 but you have to apply something to ensure fairness in
8 terms of the allocation of resource, that's all.

9 MR CHIVERS: So, technically the services are comparable in the
10 sense of depending on the option or the links that the
11 service provider might purchase under option 1, they could
12 purchase something that can be identically delivered to
13 the way we provide option 2, or they could make choices
14 about purchasing other links.

15 So, in terms of the technical mix, I think that
16 answers that question.

17 MR ABBOTT: Yes. You said there were two points.

18 MR CHIVERS: Was there more than one question?

19 MR ABBOTT: No, no, there was just one question.

20 MR CHIVERS: Okay, that's the complete answer.

21 MR FORSYTH: I just have one other clarifying question which
22 has come out of our discussion, again just to confirm I am
23 reading your diagram correctly, I'm looking at slide 10.
24 Gerard, I think you made the point but I just want to
25 confirm that your diagram shows here that a single
26 provisioned link, be it built or purchased, is able to
27 take an aggregate of a variety of traffic streams being
28 UBS, UPC, dial-up and fast IP?

29 MR LINSTROM: What that diagram shows is where you have a data
30 input point unbundled services, a shared price NNI, you
31 can complete UPC and UBS traffic. Where you're purchasing
32 a commercial ATM access, a user network interface, you
33 cannot correct UBS and UPC traffic but other commercial
34 traffic well.

1 MS DODD: Down the same band link?

2 MR LINSTROM: Yes.

3 MR FORSYTH: Presumably if we built to that, you and I, we
4 could similarly collect down the one pipe, our own pipe,
5 the varieties of traffic that you show here?

6 MR LINSTROM: You wouldn't build a UNI, you would buy it off
7 us. We would build it for you, you would pay us a monthly
8 fee for it because that's a commercial service on our
9 network. If you establish an NNI you can collect because
10 for inter-connect services we're interconnecting for the
11 purposes of handing over unbundled services, so you
12 collect UBS and UPC service because that's the sort of
13 traffic we would deliver over a shared cost NNI.

14 MR FORSYTH: Okay.

15 MR ABBOTT: TelstraClear, do you have any other questions or
16 were you intending to provide a presentation on backhaul?

17 MS DODD: No.

18 MR FORSYTH: No. Most useful thank you.

19 MR ABBOTT: Okay. In which case, I think we can move on to the
20 last issue on our agenda for today which is operational
21 support systems and I believe this time we're asking the
22 question of TelstraClear.

23 MR NEWBERRY: No slides and no dead tree. The level of
24 functionality that we are requesting is very simple and
25 that's a business to business, a B2B solution as is
26 appropriate for larger customers.

27 For the number of connections that we are talking
28 about turning up, re-keying of information onto web screens
29 is error prone and far too slow. So, what we are
30 requesting is indeed what we typically have requested in
31 the past from Telecom, and that is a B2B solution so that
32 we can provide orders from our front end systems into
33 Telecom, and that is the short answer.

34 What is being provided by Telecom in terms of

1 functionality -

2 MS DODD: That's really a question to Telecom I think.

3 MR LINSTROM: Was there a question in there?

4 MR NEWBERRY: What is being provided by Telecom in terms of
5 functionality and the degree of automation?

6 MR WATERS: I think it would be useful to indicate what we
7 think we're getting at the moment doesn't need that B2B
8 requirement.

9 MR NEWBERRY: Yeah, what we are getting at the moment is a web
10 front end which is not able to be scaled to the volumes we
11 wish to provide and involves us in significant costs and
12 slowness.

13 MS DODD: We have to key things in manually at the moment.

14 MS WELLS: Basically we have a straight web interface and we
15 have to manually key everything, which would require us to
16 re-key everything in our own systems and there's no ability
17 to sort of track orders and so on through that process.

18 MR NEWBERRY: Furthermore, if Telecom makes, for instance, a
19 simple cosmetic change to the web page, putting some extra
20 text on the web page, if we were to build an automated
21 front end to that it's almost certainly going to break.

22 MS WELLS: What we need is a B2B type link up for the types of
23 volumes that we're anticipating.

24 MR ABBOTT: TelstraClear staff don't appear to have any
25 questions in particular on this matter at this time.

26 I guess the third question will really be answered by
27 Telecom, so perhaps we'll pass it over to Telecom.

28 MR CHIVERS: Questions 19 and 20 will be answered by Mark
29 Corbitt, so I'll hand it over to Mark.

30 MR CORBITT: Thank you. I'm suffering from an ear infection at
31 the moment so my hearing is about 50%, so if I do ask you
32 to repeat the question I apologise in advance for that.

33 I am going to speak to you today, as Ralph said, on
34 operational support systems and the questions are set out

1 on slide 3 and I will just cover some key points, some
2 background from past questions and information on OSS,
3 progress that Telecom has made in the operational support
4 systems area, what we provide today and summarise that at
5 the end.

6 From a key points perspective, answering perhaps the
7 third question first, how easily can this be adopted for
8 other access seekers to use, what Telecom is building,
9 electronic ordering and Telezone as they occur are being
10 built for all access seekers as a matter of course. They
11 aren't specific to any one access seeker.

12 TelstraClear is included in that and we have chosen
13 this path because eOR is low cost therefore to access. It
14 doesn't require an expensive interface, as with other
15 overseas setups, those regulated and those non-regulated,
16 and because New Zealand is large in a small player
17 environment eOR is very easy to get on board with,
18 especially for the smaller industry players. It doesn't
19 need adapting, it's built for all players.

20 As I said, second point, in both the unbundling
21 presentations and residential and business wholesale,
22 Telecom is committed, and remains committed, to making the
23 necessary OSS work for all wholesale services and all
24 customers.

25 While we do our best to cater to the needs of all
26 access seekers, we cannot economically tailor systems to
27 suit all their needs and wants, particularly that of one
28 customer, and certainly not in a very short timeframe.

29 Where we are, as I've said a number of times before,
30 is part way through a large scale, at least 5 year major
31 IS transformation and that impacts all our systems.

32 Progress was made on that at the retail level in our
33 whole of billing replacement. Two key milestones have
34 been met to schedule and a third is on its way.

1 On the fulfil and provisions section is a second
2 example and that says system is used for both retail and
3 wholesale, progress has been made on that. That has been
4 - the first stage of that was implemented some time last
5 year and a second stage similarly, and third and fourth
6 stages are on their way.

7 That system works for both retail and wholesale, the
8 same backing system is used for both.

9 IS transformation isn't just about B2B. It can't be
10 just about B2B because it includes, and has to include,
11 all aspects of what is a worlds best practice
12 architecture. Front interfaces of B2B are only part of
13 that.

14 I have given a high level view of Telecom's
15 enterprise architecture phase. The customers, partners
16 and employees are where B2B commonly lives and accesses
17 into through the network environment through to the
18 service delivery part, the high level part of that.

19 There are a range of systems, control points, access
20 mechanisms, that have to be setup, including security and
21 fit to architecture between that customer and employee
22 access point and the service delivery point.

23 Automation, as is commonly talked about, encompasses
24 the very top of that diagram right to the very bottom,
25 from core business functions right up to customers,
26 partners and employees.

27 The B2B part of things goes basically from the
28 customers, partners and employees into a little bit of the
29 service delivery area.

30 Legacy systems of which we in common with most other
31 incumbent Telcos around the world have a lot of, don't
32 allow a good fit to that architecture. It breaks in a
33 number of places, security being one and fit for purpose
34 being the second.

1 Most Legacy systems are designed for a sole purpose,
2 retail. While we have and continue to fudge them to fit
3 the wholesale, it's messy, costly, time consuming, doesn't
4 occur quickly and, frankly, is best left out for the bulk
5 of it.

6 Moving to my key points slide following on from that.
7 Automation for automation's sake does not make sense.
8 We're not going to automate everything for Telecom retail,
9 never will. Generally processes have to be mature, simple
10 and high volume.

11 As we build automation for retail, we're building it
12 for wholesale because we're using the same systems.

13 The exception at the moment is eOR. Actually
14 wholesale at this stage is ahead of retail.

15 As I've said, our older systems don't automate well,
16 quickly or cost effectively.

17 TelstraClear have requested systems developed solely
18 for them which is quite inefficient and adds unnecessary
19 cost and complexity in our view.

20 LOLO, for example, in Australia is an industry
21 solution. It is not specific to access. It's been
22 5 years in development and is high cost. It's not a web
23 or B2B type, although it's heading in that direction, and
24 we've chosen to go the eOR way because it is simpler, less
25 costly and allows us to offer an industry solution as
26 well.

27 On the background side of things, the submissions
28 made by TelstraClear on this UBS application are
29 substantially a repeat of arguments in both the
30 residential retail and local loop unbundling applications.

31 A couple of key areas of that were overseas
32 regulators have mandated automation, they have not in all
33 jurisdictions. In some places they have and some places
34 they have not. I covered at length in unbundling the

1 difference between the US jurisdiction and Australia.

2 My second point is full automation must be available
3 to ensure efficient processes for the access seeker.
4 Again, it does not have to be full automation.

5 In the UBS submission, TelstraClear repeat their
6 belief that "direct real time interworking" (effectively
7 automation) is simple and can be delivered in six months;
8 and "equivalent access" can be delivered in 12 months;
9 both of these grossly over simplify the transformation
10 necessary to Legacy and back end systems.

11 Referring back to the high level architecture
12 diagram, where effectively customers part as employees to
13 service deliveries where the interface takes place,
14 whereas automation, what could be determined equivalent
15 access, covers the complete area of that architecture
16 diagram.

17 I note in the submissions that TelstraClear "mix n
18 match" the terms electronic OSS, automation, electronic
19 interfaces, B2B, direct real time interworking, equivalent
20 access, which has made it hard to understand in some cases
21 what is required.

22 Telecom already has electronic OSS. We are building
23 automation, we are building electronic interfaces. B2B is
24 where we want to take ourselves as an organisation, we are
25 not there yet but are heading in that direction for retail
26 and wholesale.

27 From the back end systems perspective, I would expect
28 TelstraClear would have their own backing systems that
29 they would use for their own backing purposes, in much the
30 same way as Telecom has their own backing systems.

31 Moving to the process made by Telecom, since
32 March 2004 eOR has been developed through phase 1 and
33 we're currently trialling that with an access seeker.
34 That access seeker is providing a lot of feedback to us,

1 how does it work, what enhancements need to be made and
2 following that a further trial access seeker will be added
3 shortly, and then a full roll out, including to
4 TelstraClear, will then commence.

5 As TelstraClear acknowledges, "eOR is a step towards
6 more efficient inter-operator processes", I would agree
7 with that, it is only a step.

8 An improved reassignment process has been
9 implemented, as has a single service order for
10 reassignment.

11 Telezone, I was informed over lunch, which is the
12 only automated mapping system provided to access seekers
13 of its type in the world, has automated what was
14 previously a manual mapping system. An example of a
15 simple, mature and high volume process where you can use
16 an address and jump straight into the map and identify
17 where this particular customer resides, what zone they're
18 in, that sort of side of things. That wasn't something we
19 had committed to but found it was relatively simple to do
20 and quite cost effective. It makes sense in New Zealand,
21 I have to say, because of the relatively limited size of
22 New Zealand, that's in contrast to most automation where
23 we actually find it's more cost effective to do it in a
24 high volume environment such as those experienced
25 overseas.

26 Another improvement or progress made is that our
27 wholesale bills are now delivered through eBill and we are
28 in discussions with TelstraClear and other access seekers
29 on electronic interfaces, including B2B. It is still on
30 the front end side of things and we still have progress to
31 make in the back end systems and intimation.

32 eOR, according to the table supplied by TelstraClear
33 in their submission, already delivers 5 of the 17
34 functions of LOLO. I have put that diagram on page 10. I

1 note that eOR has been in development for less than a
2 year; whereas LOLO is in its 5th year.

3 Discussions with TelstraClear have identified that
4 the residential reassignment process can be further
5 automated using eOR and further through the back end
6 systems. Volumes, maturity and simplicity of the process
7 make this cost-effective to do so and it is part of eOR
8 phase 2.

9 And we continue those discussions with TelstraClear
10 as to what the requirements are with that.

11 That same process will be available to other access
12 seekers.

13 Phase 2 of eOR will occur or start once phase 1 is
14 rolled out, as well as automating the residential
15 reassignment process, create better order queue
16 management, integrate our price-book, product definition
17 and product tables containing eOR, and create some further
18 automation as our backing systems are enhanced and
19 enhancements to the user interface and administration.

20 I won't go through slide 10.

21 I have covered also slide 11. EOR phase 1, what's
22 provided to Telezone. The functions covered there, you
23 can review those from the table on page 10.

24 EOR is only interim automation. It is not full
25 automation as yet. So, the degree of automation as
26 provided, it is only interim. However, I consider that
27 it's a significant step in the direction towards
28 automation. I would point out again that full automation
29 will never occur for all services and all systems, all
30 transactions for all customers across either retail or
31 wholesale. It's just not economic to do so.

32 We are moving to full automation of some things and
33 residential reassignment process is the first of those.

34 So, in summary, we are progressing, as promised in

1 March last year, with eOR, for all access seekers,
2 including TelstraClear.

3 We are committed to making the necessary OSS work.

4 Wholesale and retail will use the same systems and
5 wholesale is, at the moment, ahead of retail.

6 Automation will continue where it's simple cost
7 effective and mature processes.

8 We have adopted an industry model similar to LOLO but
9 much simpler and much less costly.

10 Systems specific to an access seeker do not make
11 sense economically.

12 I think I've answered certainly number 20. Number 19
13 in terms of functionality and degree of automation, while
14 it's difficult to ascertain the exact degree of
15 automation, in comparative in progress terms I think we
16 are well down the path, while acknowledging there is quite
17 a distance to go.

18 MR ABBOTT: When do you expect phase 1 to be completed?

19 MR CORBITT: Phase 1 is in trial now. We had hoped to put it
20 to the second trialist this month. We are still hoping to
21 do that and full roll out to occur next month, March.

22 MR ABBOTT: My next question, I guess, is your future plans for
23 eOR. Obviously TelstraClear, in their submission, you've
24 got on page 10 here lists 17 items, which is obviously a
25 wish list of what they consider would be appropriate. How
26 many of these items would actually be provided ultimately
27 by eOR once it's fully in force?

28 MR CORBITT: I don't anticipate any of them won't be provided.
29 I don't have a definitive timeframe for all of them at the
30 moment. We have had more issues with eOR phase 1 than
31 anticipated. As is often true with web type interfaces,
32 particularly the security issues related to that, but I
33 don't anticipate any of these being outside of eOR. They
34 may not all be automated to a full level but they will all

1 be included in eOR's present plan.

2 MR ABBOTT: It's very difficult for you to give us a definitive
3 kind of timeframe, even to the nearest half year? We are
4 not looking for specific dates, I am looking for a general
5 indication of what timeframe scale you're looking at for
6 this total project.

7 MR CORBITT: It has at least three phases at this stage.
8 Phase 2 we would aim to implement this year, calendar
9 year. Phase 3 probably next calendar year. That is
10 tentative plans at this stage because clearly there are
11 still economic things to work through. For example, we
12 don't have forecasts in key areas at the moment. We don't
13 have UBS forecasts. Residential reassignments we do have
14 forecasts, so it makes it easy to do that cost efficiency
15 equation.

16 MR ABBOTT: Thanks. Any questions?

17 MR GABANYI: So the fault management will be implemented in this
18 calendar year, this is what you say?

19 MR CORBITT: That is our plan at this stage, yes.

20 MR GABANYI: Okay.

21 MR ABBOTT: I think that's all the questions from staff. Do
22 TelstraClear wish to ask any questions arising out of that
23 presentation?

24 MR FORSYTH: Yes, kind of, Chris. I guess just turning to
25 slide 6, there's an assertion there that we want something
26 developed solely for TelstraClear. In fact, that is not
27 the case. Yes, it happens to be TelstraClear who is
28 raising this matter by way of a determination but I don't
29 think it should be presumed that what we are seeking is
30 any different to what other access seekers would find
31 useful.

32 And I think it's - to explain where TelstraClear is
33 coming from we need to turn to the access principles.
34 There are two key ones which I think guide us here. One

1 is, of course, non-discrimination, and in the case of OSS,
2 it is about ensuring that our costs as an access seeker
3 are not raised by such processes as OSS.

4 The second one, which is actually principle 2, notes
5 that we must have a view to international best practice,
6 and I think that's useful considering some of the
7 suggestions by Telecom that there are access providers in
8 the States who perhaps don't provide the sorts of systems
9 and interfaces which we believe are appropriate. That
10 really isn't a guide at all. It's more what is happening
11 is best practice in the world and that is what is required
12 of the access provider here in New Zealand.

13 The third thing I'd say is that with regards to
14 automation, again I would agree, we're not seeking
15 automation of everything. In our company we don't
16 automate every process and I think our requests have been
17 reasonably put, given the assumed volumes that we're
18 looking to achieve and the volumes which Telecom have
19 committed to the Government, but I would note about
20 automation that under the banner of automation it is quite
21 feasible for Telecom to introduce systems which raise the
22 costs of the access seeker and we've talked about how with
23 regards eOR the way that it requires us to interface to
24 essentially a done web page as opposed an electronic API
25 that we can build to and that, you know, any other ISP can
26 build to because if it is not there, that really does
27 raise our costs.

28 And so, I think automation unfortunately is a term
29 which can be used to frustrate the requirements here but -
30 sorry, the last point is that, again, much of what we have
31 been seeking and have been unable to achieve in our
32 discussions with Telecom is a view going forward and it's
33 the old story, you know, if Nirvana is going to be
34 delivered tomorrow or not, even Nirvana or just gosh the

1 necessities for us to be able to ramp up our offering of
2 the market, if they're going to be offered tomorrow in a
3 manner which we can see we can build to, and therefore be
4 able to go to market, then that is a lot more usable to us
5 and we can work to it, rather than working in the dark
6 which is essentially what we're doing.

7 So, we are very keen for the Commission to work with
8 Telecom through the determination process to actually put
9 out for the industry what are the guidelines and when are
10 these things going to be delivered.

11 MR CORBITT: I would say only two things on that. Firstly, I
12 am surprised to see some of the questions raised in
13 TelstraClear's submission. The feedback we have received
14 from other access seekers, on eOR particularly, has been
15 constructive and we are getting requests to use it, not
16 complaints about it.

17 The second piece to that is we have had discussions
18 with TelstraClear on support systems and the processes
19 required and those discussions will continue. However, I
20 don't believe applications enhance that process from our
21 perspective, certainly not from my perspective with
22 accountability from wholesale IS and linking to retail IS.

23 Secondly, from a world's best practice perspective, I
24 have said we have a world's best practice architecture and
25 we do. I pointed out at length in the unbundling
26 submission the examples from the UK jurisdictions and US
27 jurisdictions and the costs that were implicated there and
28 the consequent costs per transaction and per order. We
29 have no desire to create that here because it's just not
30 cost effective for us to do so. However, we are pursuing
31 automation as it makes sense to do so and interfaces, be
32 they B2B or other interfaces, as they make sense to do so.
33 We will continue further discussions with all access
34 seekers, including TelstraClear, to progress eOR and

1 world's best practice, yes, I think we're getting there.

2 MR ABBOTT: I don't think staff have any further questions. Is
3 there any further dialogue that we need to have on this
4 subject?

5 MS DODD: I don't think so.

6 MR ABBOTT: In which case, I think this concludes the workshop.
7 Two action points arising from the workshop. Two points
8 of information were sought from Telecom this morning about
9 how many profiles can be handled; what are the maximum
10 currently used? We would appreciate receiving that
11 information by this time next week.

12 MR CHIVERS: Sure. Can you put a written request outlining
13 exactly your question on those points? We've heard what
14 you said today obviously, we will take that away and work
15 on it but if you could provide something written.

16 MR ABBOTT: That's fine. We will do that on Monday. Thank you
17 very much for attending. It's been very useful not only
18 for staff as a learning exercise but also for our
19 technical consultants and Alan who understands the
20 idiosyncrasies of networks. I think it's been very
21 productive and has highlighted to me that in respect of
22 the submissions and cross-submissions there's been a
23 little bit of talking at cross-purposes and hopefully they
24 have assisted the parties as well as Commission staff in
25 understanding what we really have at dispute at this time,
26 so thank you very much for your time.

27 MR CHIVERS: Thank you, Chris.

28 MS DODD: Thank you.

29 MR FORSYTH: Yes, thank you.

30

31 Workshop concluded at 2.40 p.m.

32

33

34