

Internal Service Levels

Jetstream and UBS

TelstraClear Now's Good

Background

- TelstraClear wants equivalence.
- In the absence of suitable mechanisms to guarantee this, TelstraClear requests reasonable minimum service specifications.
- Jitter, Latency and Packet loss matter differently to different applications.

Jitter and Latency

- Let's say you have two packets being sent.
 - P_1 arrives at time t_1
 - P_2 arrives at time t_2 .
- The latency (one-way delay) of the packets is t_1 and t_2 , respectively.
- The inter-packet delay variation is the difference between the arrival times of the packets:
 $j = \text{abs}(t_2 - t_1)$.

Jitter and Latency (Cont.)

- If the maximum latency is 50ms, then that becomes $j = \text{abs}(50 - t_1)$
- Since t_1 can't be negative (a packet can't arrive before it is sent), that means that the jitter *must* always be less than the maximum latency.

Jitter and Latency (Cont.)

- So, it make no sense to specify a latency of 50ms and a jitter of 100ms. In specifying a jitter equal to the latency we are being extremely conservative.
- To put it another way: the UBS service could not have a jitter of 100ms without *also* breaching the 50ms latency requirement.

Packet Loss

- Telecom are claiming that 0.1% packet loss is much better than anything but super-expensive commercial grade circuits. They suggest a goal of <3% for the UBS service.
- The implication is that the Xtra service may experience packet loss of up to 3% in normal operation without being considered degraded.

Packet Loss (cont.)

- In fact even 1% packet loss indicates a network fault.
- 1% packet loss means 1 in a hundred packets are dropped. That's about one every 6-7 seconds on some games. Which means every 6-7 seconds the game 'lurches', and your target suddenly isn't where you were aiming—or your character is *in* the lava, not next to it.

Packet Loss (cont.)

- On a modern system, which isn't congested—and all our delay/jitter/packet loss specifications are for an uncongested system—packet loss should be negligible.
- We are not asking for something better than Telecom's own service.
- However, we wish Telecom to set their standards closer to what they actually deliver right now.

Parameters & Applications

	Jitter	Latency	Packet Loss
Real-time (multimedia)	Important	Not Important	Not Important
Interactive (gaming)	Not Important	Important	Important
Data (Web)	Not Important	Not Important	Important

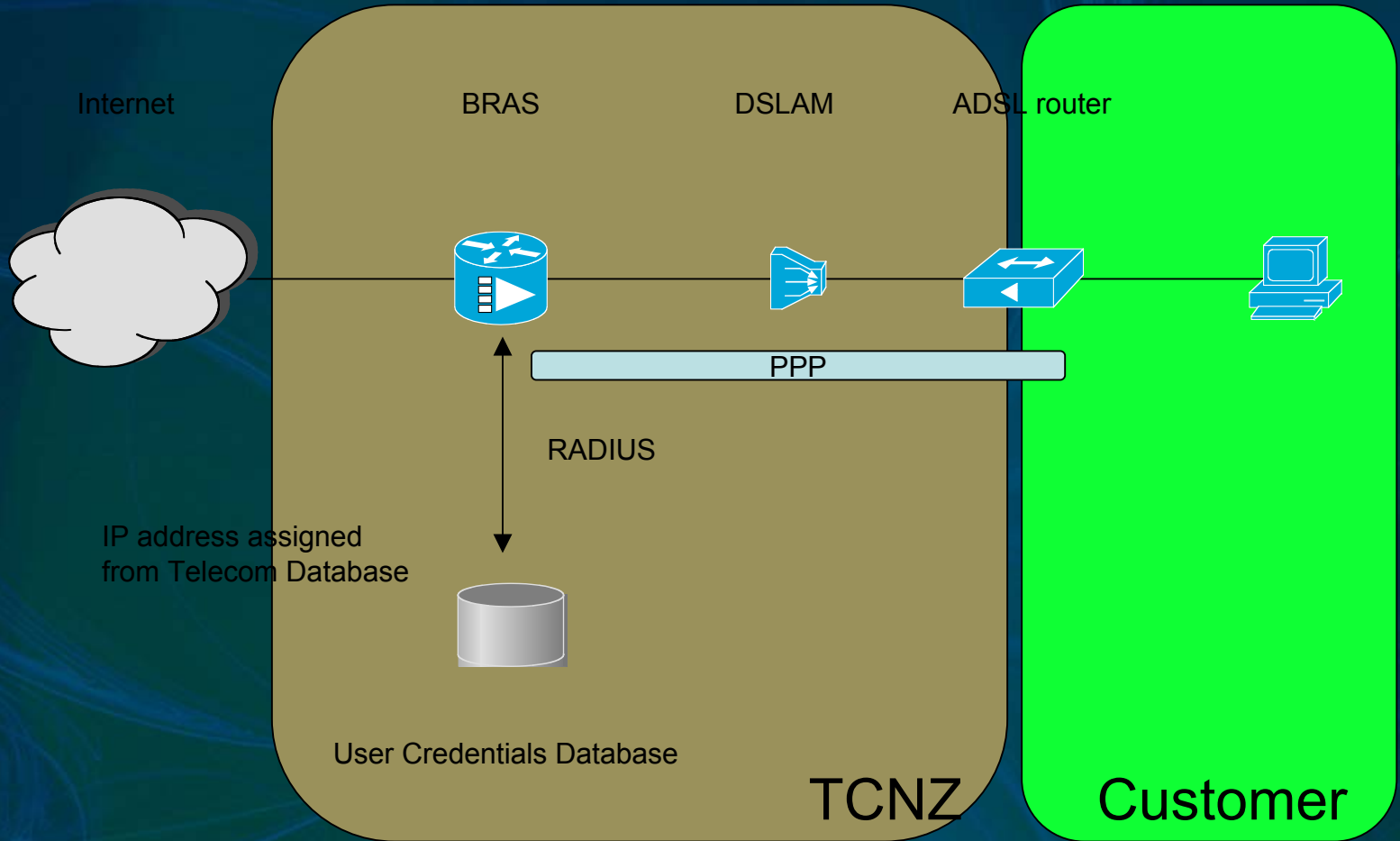
Jitter, Latency, Packet Loss

- Jitter is unimportant to Interactive and Data applications.
 - *However, jitter can't exceed latency.*
- To Interactive applications, “late packets are missing packets”

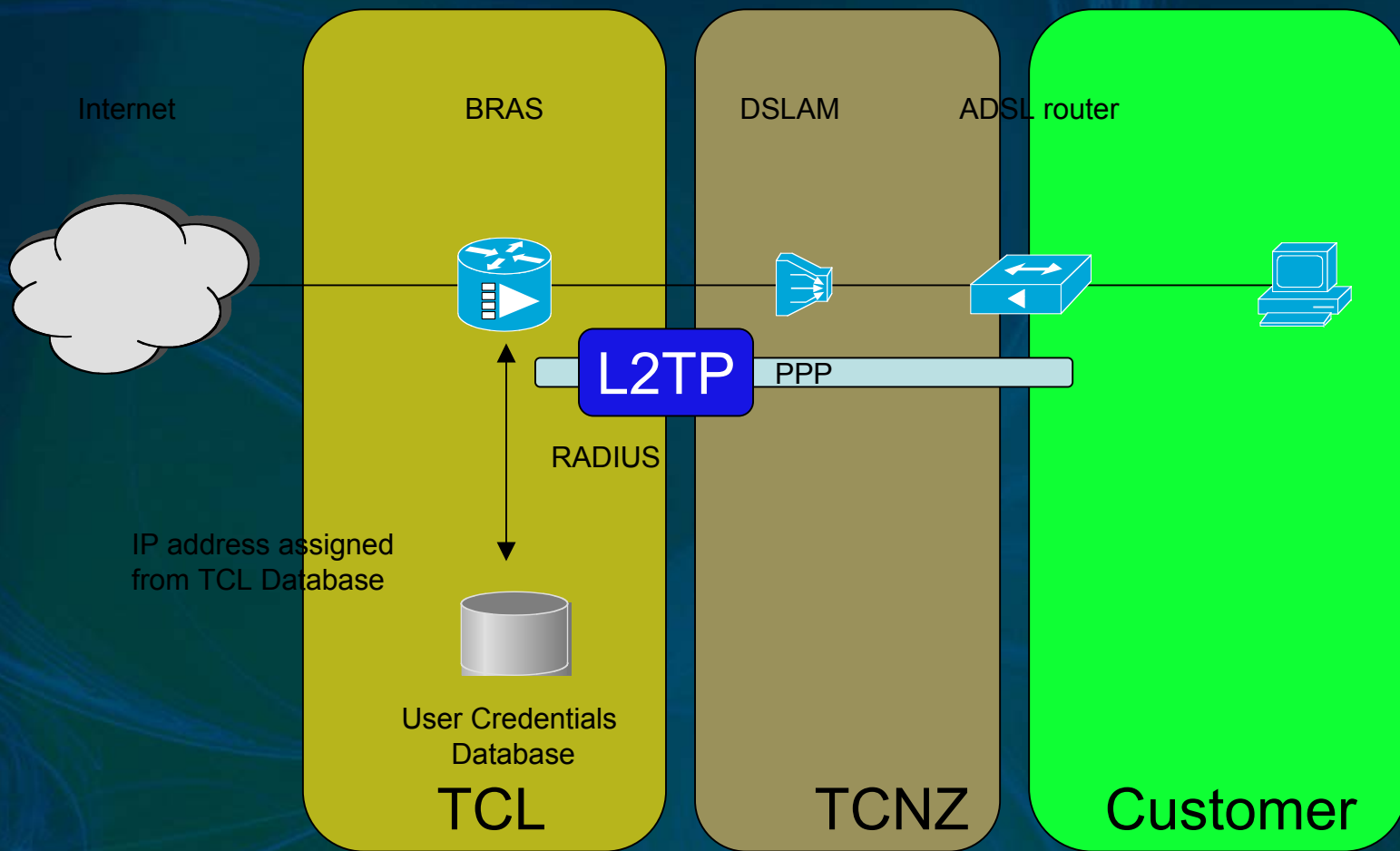
Table 2 – Comparison of TelstraClear's Requested Specifications and UBS JetStream Specifications

Comparison of TelstraClear's Minimum Service Specifications with JetStream and UBS				
Service Specification	JetStream	UBS	TelstraClear's requested service	Notes
Latency	<50ms	<50ms	<50ms	64 byte packet 1 minute average upstream/ downstream
Jitter/delay variation	Contract: Unspecified Design Specification: <100ms for greater than 90% of the time	Contract: Unspecified Design Specification: <100ms for greater than 90% of the time	<50ms for greater than 99.9% of the time	64 byte packet 1 minute average upstream/ downstream
Packet loss ratio	Contract: Unspecified Design Specification: <3% for greater than 90% of the time	Contract: Unspecified Design Specification: <3% for greater than 90% of the time	<0.1% for greater than 99.9% of the time	64 byte packet 1 minute average upstream/ downstream
Contention ratio	Contract: Unspecified Design Specification: <1:50 for active users for greater than 95% of the time	Contract: Unspecified Design Specification: <1:50 for active users for greater than 95% of the time	<1:20 for greater than 99.9% of the time	upstream/ downstream
interleaving	On	On	Off (Optional)	upstream/ downstream

TCNZ



UBS



UBS Nov 2004 Technical Info Pack (pg2)

This document outlines the technical requirements a Service Provider will need to meet to connect to the Telecom Unbundled Bitstream Service (UBS). Telecom has endeavoured to ensure this information is complete and accurate. However UBS is still under development and final design and performance characteristics are yet to be confirmed. In the event of any inconsistency the UBS Service Description and User Guide prevail over this document

UBS will initially offer Service Providers the ability to provide data circuits approximate to the Jetstream SURF product. This service uses Point-to-Point Protocol over ATM to provide subscribers a 256kbps downstream, 128kbps upstream best-effort connection. To facilitate the switching of PPP sessions, Layer Two Tunnelling Protocol (L2TP) is used to connect a Service Provider to Telecom's network, and in turn the subscriber.

Because a Service Provider terminates the PPP session themselves, they are in control of IP Addressing, Rating, Speed Restrictions (appreciating the service is already limited to 256/128kbps), Routing and Access Control

UBS delivers access to DSL end users. The initial protocol delivery is L2TP over UDP over IP over ATM. Service Providers will need to terminate multiple L2TP tunnels (ie will require multiple LNS instances), with a minimum of at least one L2TP tunnel per USAP served. Service Providers are responsible for authentication of users. ATM delivery is via STM-1 ATM NNI or UNI.

A Service Provider can establish a handover point at one or more of the UBS service access points (USAP). Currently the USAPs correspond to Telecom ATM switches. Each USAP is the collection point for a geographic area of DSL lines. These geographic areas are named UBS Regional Service Areas (URSA). There are currently 34 URSA and 34 corresponding USAPs.

The handover point (USAP) may not necessarily be within the URSA it serves. Refer to the UBS User Guide, September 2004, for USAP and URSA details, including URSA boundary maps.

Where a Service Provider does not build a handover point within an URSA Telecom provides a UBS Backhaul service to deliver L2TP tunnels from the respective URSA, if desired.

Thank you

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