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TELSTRA CORPORATION LIMITED

**RECTIFICATION PROPOSAL  
FOR NEW ADSL PROFILES  
FOR CONSULTATION BY THE ACCC**

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# RECTIFICATION PROPOSAL – FOR CONSULTATION

## 1. Background

Telstra has identified that two ADSL profiles which are applied and operate at Layer 2 of ADSL broadband services (the **New Profiles**) were not added to the existing common 'menu' of ADSL profiles equivalently available for retail ADSL and wholesale ADSL services.

Profiles are applied to retail and wholesale ADSL services to, among other things, control the signal to noise ratio on the copper line between the CPE and the DSLAM and therefore assist in managing lines with noise problems. End users or Wholesale Customers can choose to apply the profiles. Alternatively, suitable profiles can be applied by Telstra as part of its service assurance process. Set out in Attachment 1 is a fact sheet provided to Wholesale Customers on ADSL profiles (**TW Fact Sheet**).

Telstra offers a common 'menu' of ADSL profiles which are identical for retail and wholesale ADSL services. There is a standard profile, which is the default setting to which retail and wholesale ADSL services will be provisioned. The menu includes an additional 10 ADSL2+ profiles and five ADSL profiles available for use by retail and wholesale ADSL services on ISAMs, ASAMs, CMUX and AMX platforms which Retail Customers or Wholesale Customers can choose to apply and change from time to time. The full list of profiles is set out in the TW Fact Sheet.

On older technology DSLAMs (e.g. ATM subscriber access multiplexer or **ASAMs**), the setting of ADSL profiles can involve a trade off where greater noise control results in slower broadband speed. However, newer generation DSLAMs (intelligent service access manager or **ISAMs**) will support most ADSL profiles without a trade-off between noise control and speed. Table 1 illustrates the different speed outcomes on ASAMs and ISAMs for some of the more commonly used ADSL profiles on the common menu.

**Table 1: Common menu of ADSL profiles for retail and wholesale services**

Profile	ISAM	ASAM
Standard	Impulse noise profile: 0.5/0.5 Spectrum profile: 6/6 db Speed: 24/1*	Impulse noise profile: 0.5/0.5 Spectrum profile: 6/6 db Speed: 24/1*
NP1	Impulse noise profile: 2/1 Spectrum profile: 6/6 db Speed: 24/1*	Impulse noise profile: 2/1 Spectrum profile: 6/6 db Speed: 7.5/1*
NP2	Impulse noise profile: 4/2 Spectrum profile: 6/6 db Speed: 24/1*	Impulse noise profile: 0.5/0.5 Spectrum profile: 6/6 db Speed: 16/1*
Stability	Impulse noise profile: 0.5/0.5 Spectrum profile: 12/12 db Speed: 21/1*	Impulse noise profile: 0.5/0.5 Spectrum profile: 12/12 db Speed: 21/1*

The New Profiles (set out in Table 2) provide a level of noise control above the standard ADSL profile in the common menu:

- the standard New Profile is comparable in the level of noise control to the NP1 profile that is already available in the common menu; and
- the assurance New Profile is used for the more problematic lines.

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**Table 2: New Profiles**

Profile	Detail
Standard	Impulse noise profile: 2/0.5 Spectrum profile: 12/6 db Speed: 20/0.8*
Assurance	Impulse noise profile: 8/1 Spectrum profile: 12/12 db Speed: 10/0.7*

The New Profiles differ from the profiles in the common menu in relation to the setting for the impulse noise profile in the up-channel and are designed to provide a better assurance of sufficient capacity in the up-channel to support at least five telephone 'lines' as part of the digital voice offering while maintaining the required level of noise control. Multiple lines that do not use this profile adjustment would still be able to support multiple VoIP 'lines' in the up-channel. However, the New Profiles provide a better level of assurance (noise control) while maintaining the multi-line feature.

Like many of the profiles that are already available in the common menu, the New Profiles are only offered on ISAMs.

Telstra has identified that when wholesale ADSL services are provisioned on ISAMs, Wholesale Customers cannot choose to use a New Profile because they are not included on the common menu of ADSL profiles available to them.

## **2. Rectification**

This Rectification Proposal is intended to provide an effective means of remedying the potential equivalence issue Telstra has identified.

### **2.1 Proposed steps**

#### **(a) Publish list of available ISAM ports on the Telstra Wholesale website**

Telstra has published on the Telstra Wholesale website an up-to-date list of available ISAM ports in ESAs. The relevant report is ADSL capacity and it can be found at the following link:

<http://www.telstrawholesale.com.au/products/broadband/adsl/adsl-reports-plans/index.htm>

This step has been taken to ensure that Wholesale Customers are aware of the areas where ISAM ports are available and will therefore provide them with greater certainty if they wish to market products that may make use of the enhanced profiles.

Standard notification of changes to these reports is given within the report cover sheet which has been updated accordingly. The report will be updated on a monthly basis.

#### **(b) Add New Profiles to existing common 'menu'**

Telstra is implementing a solution to add the New Profiles to the existing common 'menu' of profiles. This will ensure that Wholesale Customers with compatible ADSL services will be able to select these New Profiles. The New Profiles will be available for use with all connected Wholesale ADSL services that have been provisioned on an ISAM.

We estimate that this fix will be completed by no later than the end of October 2013 (and earlier if possible). We will advise the Commission by close of business 24 May 2013 of the planned date for the system change to occur. Telstra is unable to implement an interim fix as, prior to deployment of the above system changes, any application of the New Profiles to ADSL services would need to be made at a network level. This would require considerable manual

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effort. Also, changes made at a network level are difficult to track which could lead to a lack of synchronicity between the network and IT systems. At a systems level, this would result in a lack of visibility of what profile had been applied to the service and if changes were made to the service at a system level, the profile settings could be lost. There are also potential unknown consequences as a result of mismatch between the network and IT systems that could lead to loss of service and delay restoration.

It is intended that as a result of the two fixes listed in (a) and (b) above, Wholesale Customers will be able to utilise the New Profiles by selecting them for existing ADSL services that are provisioned on an ISAM, as well as the following:

- i. By using the list published on the Telstra Wholesale website, Wholesale Customers will be able to tell their end users with some certainty where ISAM ports are available and will be able to market products that may make use of the New Profiles.
- ii. Wholesale Customers will then place the order using the standard provisioning process.
- iii. After the order has been provisioned, the Wholesale Customer will be able to self-select one of the New Profiles (provided they have been provisioned on an ISAM).

Telstra believes that by providing the process above, it will address any potential equivalence issue.

## **(c) Customer Communication**

Telstra will communicate the above changes to Wholesale Customers by close of business on 27 May 2013. A copy of Telstra's communication will be provided to the ACCC at the time it is deployed.

## **2.2 Timeline**

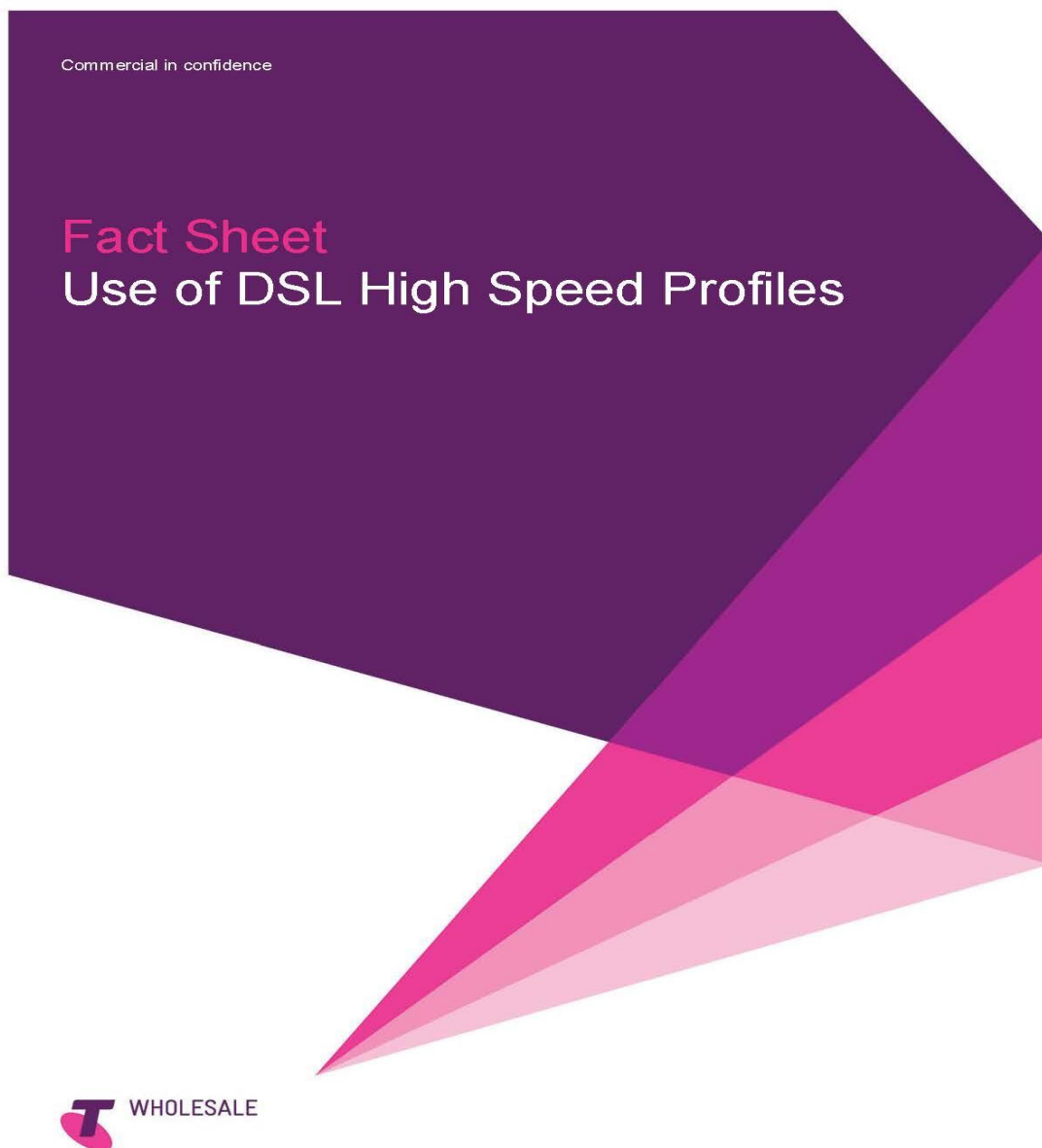
This Rectification Proposal expires 12 calendar months after the date that it is accepted by the ACCC.

## **3. Conclusion**

Telstra believes that by undertaking the steps set out above, it has addressed any potential equivalence issue that has arisen.

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ATTACHMENT 1 – Telstra Wholesale Fact sheet on profiles



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## INTRODUCTION

With the increased use of streaming video over the internet, some end users' applications are more sensitive to error rate and drop outs (spontaneous reinitialisations) on the ADSL access. While some errors and drop outs are unavoidable (being caused by interference from outside the telecommunications network), it is possible to use profiles with enhanced stability to reduce the occurrence of errors and drop outs caused by that interference.

These profiles provide improved stability by improving the error correction capability of High Speed ADSL (ADSL2+ and ADSL 8Mbps) services and in some cases by lowering the data rate to reduce the line error rates. Service providers and their end users need to understand that stability is generally a more important requirement than access rate for streaming services and that it may be necessary to sacrifice access rate to obtain a more stable service.

To enable better service assurance on lines with errors due to impulse noise, Telstra offers an additional 10 ADSL2+ profiles and 5 ADSL profiles for use with existing services on ISAMs, ASAMs, CMUX and AMX platforms. Those profiles give improved impulse noise protection (INP) against errors that may result in drop outs, slowed downloads or degradation of video services from time to time on some lines with customer premises interference. Due to the limited capabilities of older DSLAM technologies, not all profiles are available on some DSLAMs.

## LIMITATIONS TO EFFECTIVENESS

While these new profiles generally provide large reduction in error rate where error rates are high, they are only effective in reducing drop outs when those drops are caused by high error rate resulting from bursts of interference. Unfortunately in only about half of lines with drop outs, the cause is error bursts. The remaining drop outs are caused by step-change events such as occur with missing or incorrectly installed filters, bad connectors (e.g. on the modem lead), bad joints in customer wiring, and joint problems in access network cabling. For all of these step-change causes, profile changes will not improve stability. Service providers are strongly advised to identify and fix the large proportion of such step-change problems that occur within the customer premises (beyond the NBP) before deploying the profile changes. Otherwise it would be necessary to fix those step-change issues after the profile change process has proved ineffective.

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## GENERAL DESCRIPTION OF THE PROFILES

The expanded profile sets extend the Impulse Noise Protection (INP) capability of the standard ADSL2+ interleaved profile from INP=0.5/0.5 (down/up) to INP=2/1 and INP=4/2 options.

These profiles are more effective in reducing error rates and spontaneous reinitialisations than, and should be preferred to, the standard 12 dB margin stability profiles currently in use. These profiles do not improve the reported ADSL2+ net data rates, but may improve the real download rates available to customers in cases where a high error rate is slowing the TCP/IP throughput.

The application of the stability profile with 12 dB instead of 6 dB target margin results in a reduction of up to 3.6 Mbit/s in downstream rate for all modem types. When an INP=2 or 4 High Speed Profile is used, the rate reductions are much smaller for modern ADSL2+ modems meeting the requirements of Amd 1 of G.992.5. The 12 dB stability profiles will remain for existing services that use those profiles; no mass migrations of profiles will occur. All of the expanded profiles are coupled in the systems with a standard 6 dB margin spectrum profile.

Some High Speed profiles reduce the target data rate (with or without increased INP) to further enhance stability and reduce error rates. Such data rate reduction has more predictable stability improvements than the previously used 12 dB margin stability profiles, which tended to be “hit or miss”, with the stability enhancement dependent on the interference level at the time of training.

The expanded profiles do not increase the interleave delay beyond the 16ms currently in use with the standard ADSL2+ interleaved profile. Instead, they extend the forward error correction capability of the line, causing only a minor reduction in data rate. Since the high speed profiles depend on interleaving for their effective INP, customers such as gamers who prefer a FAST profile with very low delay must be prepared to accept the 16 ms interleave delay before they can take advantage of these profiles.

### INP=2/1 Profile

All of the characteristics of this profile are the same as the current standard interleaved profile for ADSL2+, except for the change from INP=0.5 to INP=2 in the downstream and INP=1 in the upstream channel. The target noise margins remain at 6 dB in each direction.

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## **INP=4/2 Profile**

All of the characteristics of this profile are the same as the current standard interleaved profile for ADSL2+, except for the change from INP=0.5 to INP=4 in the downstream and INP=2 in the upstream channel. The target noise margins remain at 6 dB in each direction.

## **Profiles with reduced rate only**

Further profiles have reduced downstream target data rate without any increase in the INP. Such profiles are intended for use on DSLAMs that cannot support the higher INP features of ADSL2+ (such as older ADSL DSLAMs and some early ADSL2+ capable DSLAMs). The profiles are also useful for those customers who have older ADSL or ADSL2 modems, or ADSL2+ modems that do not support the latest Amd 1 framing requirements of the ADSL2+ recommendation G.992.5. If higher INP is applied to those older ADSL2+ modems, the downstream net data rate cannot exceed 7.5 Mbit/s with INP=2 or 3.7 Mbit/s with INP=4.

## **Profiles with increased INP and reduced rate**

Where the increased INP does not completely stabilise the line, there is the further option of reducing the target data rates in the profile. Those profiles with higher INP and reduced rate may be useful on some lines with very high error rates due to impulse noise.

## **RISKS OF APPLICATION**

### **1. Rate reduction**

Application of these INP=2 and INP=4 profiles can result in downstream ADSL2+ net data rate reductions which are minor or severe depending on the prior rate and on the type of ADSL2+ modem used by the customer.

#### **Early ADSL2+ modems meeting the requirements of the original ITU G.992.5 (Jan 2005)**

For early ADSL2+ modems, the application of INP=2 (or INP=4) usually results in a ceiling on the downstream rate of 7.552 Mbit/s (or 3.7 Mbit/s for INP=4). For ADSL2+ services operating at around or below the respective rate, there would be minimal rate reduction of typically less than 0.5 Mbit/s on application of INP=2 or 4. Modems operating at above that rate will usually suffer a rate reduction to 7.552 Mbit/s (or 3.7 Mbit/s for INP=4).

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## **Modern ADSL2+ modems meeting the requirements of ITU G.992.5 Amendment 1 (July 2005)**

For modern ADSL2+ modems meeting the requirements of Amd. 1 (July 2005) of G.992.5, the application of INP =2 or 4 typically results in a small reduction of less than 0.5Mbit/s in the downstream rate. The ceiling rate remains above 20 Mbit/s.

Therefore it is recommended that ISPs determine the modem type used by the customer before requesting a change to INP=2 or 4, unless the customer's current rate is already below the relevant ceiling rate. Telstra cannot provide details of modem types from its systems to wholesale customers (nor is that information provided to other Telstra business units).

## **2. The cause of the reinitialisations may not be high error rate resulting from impulse noise**

About half of all lines with more than 2 reinitialisations per day do not experience improved stability when these higher INP stability profiles are applied. This is because the cause of the reinitialisation is a step-change event rather than a noise event causing errors. Such step-change events result from a sudden change in the ADSL transmission path or in the continuous interference environment. Common causes are missing, incorrectly installed or poorly designed inline filters (step-change occurs when the phone goes off or on hook), and poorly made connections in the customer premises (e.g. on the modem lead or in the premises wiring).

Another cause of reinitialisations that are not rectified by profile changes is when customers turn off their modems after use each day; after they switch them on again, one or more reinitialisations may be required in order to adapt to the worst time of day continuous interference on the line. Those reinitialisations would be avoided if the line were left connected and powered up at all times. In some cases degraded joints in the access network cabling can result in a step change when loop current is applied and removed.

High error rates may be observable in the performance page on the modem URL or via remote modem management systems operated by the service provider. Particularly where reported ADSL errored second rates are low, it is recommended that the service provider check for and eliminate all potential customer premises filtering and wiring causes before attempting the profile change process.

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## THE PROFILE SET

As some types of DSLAM cannot support ADSL2+, or can only support earlier ADSL2+ standards, some profiles cannot be supported on those DSLAMs and it is necessary to substitute alternative profiles that only reduce the rate and do not increase the INP. Note that the use of rate reduction to improve stability is superior to the previous stability profiles with larger margin; previously used 12 dB stability profiles may or may not reduce the rate by an adequate step, depending on the continuous interference spectrum at the time of training.

	ISAM	AMX	ASAM	
NAME	(DOWN/UP, INP)	(DOWN/UP, NO INP)	(DOWN/UP, INP)	CHANNEL CODE
Standard	24/1, 0.5/0.5 (High Int)	24/1, (High Int)	24/1, 0.5/0.5 (High Int)	H
Fast	24/1, 0/0 (No Int)	24/1, (No Int)	24/1, 0/0 (No Int)	N
NP1	24/1, 2/1	16/1	8/1, 2/1 (Note 1)	R
NP2	24/1, 4/2	12/7.5	16/1, 0.5/0.5	U
NP3	16/1, 0.5/0.5	8/7.5	12/7.5, 0.5/0.5	I
NP4	12/7.5, 0.5/0.5	4/5	4/5, 2/1	J
NP5	16/1, 2/1	1.5/5	1.5/5, 2/1	S
NP6	12/7.5, 2/1	1.5/5	1.5/5, 2/1	T
NP7	16/1, 4/2	1.5/5	1.5/5, 2/1	V
NP8	12/7.5, 4/2	1.5/5	1.5/5, 2/1	W
NP9	8/7.5, 4/2	1.5/5	1.5/5, 2/1	X
NP10	4/5, 4/2	1.5/5	1.5/5, 2/1	Y
NP11	1.5/5, 4/2	1.5/5	1.5/5, 2/1	Z

Note 1: It should be understood that all ASAMs with ADSL2+ hardware are pre-G.992.5 Amendment 1; setting INP=2/1, as in NP1 for ADSL2+ profiles, results in a maximum downstream rate of 7.5 Mbit/s.

Note 2: Use of G.992.5 pre-Amendment 1 ADSL2+ modems with INP=2 (4) profiles on ISAM results in a ceiling of 7.5 Mbit/s (3.7Mbit/s) on the downstream rate.

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	ISAM	CMUX or AMX or ASAM (ADSL HW)	ASAM (ADSL2+ HW)	
NAME	(DOWN/UP, INP)	(DOWN/UP, NO INP)	(DOWN/UP, INP)	CHANNEL CODE
Standard	8/.384, 0/0	8/.384, 0/0	8/.384, 0/0	H
NP1	8/.384, 0.5/0.5	4/.384, 0/0	8/.384, 0.5/0.5	A
NP2	8/.384, 2/1	1.5/.384, 0/0	8/.384, 2/1	B
NP3	8/.384, 4/2	1.5/.384, 0/0	4/.384, 2/1	C
NP4	4/.384, 4/2	1.5/.384, 0/0	1.5/.384, 2/1	D
NP5	1.5/.384, 4/2	1.5/.384, 0/0	1.5/.384, 2/1	E

## SUGGESTED PROCESS FOR APPLICATION OF PROFILES WITH ENHANCED STABILITY

1. Eliminate all potential causes of the instability such as missing filters and poor customer cabling and connectors.
2. Determine, via remote monitoring or the modem URL, whether the instability relates to high error rates (ES or CV) on the line or to a step-change process. If high error rates are not observed, changing profiles is likely to be ineffective.
3. Determine whether the line profile for the service corresponds to an ADSL2+ or ADSL product, and whether a stability profile is currently applied (older 12 dB margin type).
4. If an ADSL profile, then select the profile from the ADSL set above based on the following rules for CMUX, AMX or ADSL ASAM.
  - a. First apply and wait up to 2 weeks to see if instability recurs
  - b. If the selected rate reduction to 4 Mbit/s on older DSLAMs is unacceptable, then revert and either accept the instability or search further for interference or other cause.
  - c. If instability recurs, apply NP2 and wait up to 2 weeks to see if instability recurs
  - d. If rate reduction to 1.5 Mbit/s on older DSLAMs is unacceptable, then revert and either accept the instability or search further for interference or other cause.
  - e. Failure to stabilise after NP2 would usually be indicative of a significant step-change cause which cannot be rectified by profile changes.

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5. If an ADSL profile, then select the profile from the ADSL set above based on the following rules for ISAM or ADSL2+ ASAM.
  - a. Apply NP2 and wait up to 2 weeks
  - b. If instability recurs, apply NP3 and wait up to 2 weeks
  - c. If instability recurs, apply NP4 and wait up to 2 weeks
  - d. If rate reduction to 4 Mbit/s is unacceptable, then revert and either accept the instability or search further for interference or other causes.
  - e. Failure to stabilise after NP4 would usually be indicative of a significant step-change cause which cannot be rectified by profile changes.
6. If an ADSL2+ profile, determine whether the line is currently operating in ADSL2+, ADSL2 or ADSL mode. Note that many end users on ADSL2+ profiles still have modems that are only capable of ADSL or ADSL2 operation.
7. If the operating mode is ADSL2+, then identify the customer modem type and ascertain if it supports the newer Amendment 1 (July 2005) framing. If it does, or if the service provider is prepared to accept the risk of rate reduction on an earlier ADSL2+ modem, then:
  - a. First apply NP1 and wait up to 2 weeks
  - b. (If rate reduction to 7.5 Mbit/s on older modems is unacceptable, then revert to INP=0.5/0.5 and select the next profile from NP4, NP5 or NP9 to NP11 with a rate below the current ADSL2+ net data rate. Continue to step to lower rates if instability recurs. Alternatively if the level of rate reduction becomes unacceptable, accept the instability and search further for interference or other causes.)
  - c. If instability recurs, apply NP2 and wait up to 2 weeks
  - d. (If rate reduction to 3.7 Mbit/s with INP=4 on older modems is unacceptable, then revert to INP=2 and select from NP5, NP6 and NP9 to NP11 the next profile with a rate below the current ADSL2+ net data rate of the line. Continue to step to lower rates if instability recurs. Alternatively if the level of rate reduction becomes unacceptable, accept the instability and search further for interference or other causes.)
  - e. If instability recurs, then select from NP7 to NP11 the profile with a rate below the current ADSL2+ net data rate (e.g. if the modem reports 15 Mbit/s, select the INP=4/2, 12 Mbit/s profile). Continue to step to lower rates if instability recurs.

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8. If the line has an ADSL2+ profile, but the modem is only capable of ADSL2 or ADSL operation, then the profile changes can still be made as above and the higher INP is effective.

Failure to stabilise after 3 profile changes would usually be indicative of a significant step-change cause which cannot be rectified by profile changes.

## RECOMMENDED USE

These profiles are only recommended for end user services over High Speeds which have critical requirements for low error rates (such as for high rate streaming video with small receive buffers) due to the above listed risks of application. The vast majority of applications over ADSL2+ internet services work well with the standard ADSL2+ interleaved profiles and do not require these profiles with enhanced stability.

The INP=2 profile may be applied as a provisioning measure. ISPs must assess the relative risks of service degradation against the risks of rate reduction due to application to the older ADSL2+ modem types.

As there is the potential for additional rate reduction with older modems, it is recommended that the INP=4 Stability Profile only be used for assurance, after the INP=2 Profile has been tried.

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