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TITLE: **Impact of Same pair ISDN noise on reach figures**

PROJECT: **ADSL**

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STATUS: For discussion/decision

Abstract

This contribution analyses the importance of same pair ISDN noise on the performance figures calculated for all ADSL over ISDN configurations. It then proposes a way to specify test cases in order to maintain realistic test processes based on the ETSI ADSL TS.

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1. Background

FTW has made intensive work to build up a model including the results and decisions of an important amount of off-line and meeting work of TM6. These simulations have led to the contribution TD31 that contain the performance figures.

As an informative exercise, the same set of simulations has been carried for ADSL over ISDN cases only, with the same pair ISDN noise turned off. Table 1 summarizes the reach reduction that is caused by the presence of the same pair ISDN noise. A XX_YY_ZZ character string labels the cases, where XX is either EC or FDD for frequency overlapping or non-frequency overlapping ADSL systems, YY refers to either upstream (US) or downstream (DS), and ZZ refers to the noise models (A to D).

The maximum and averages are taken over the different loops and reference bit rates for which the performance numbers have been calculated. Also, the correspondent indicative length is given

Table 1: Reach reduction summary

Case reference	Average Reach reduction		Maximum Reach reduction	
EC_US_A	0.00 %		0.04 %	< 1 m
EC_DS_A	0.08 %	2 m	0.24 %	7 m
EC_US_B	0.00 %		0.04 %	< 1 m
EC_DS_B	0.32 %	10 m	1.05 %	27 m
EC_US_C	0.00 %		0.04 %	< 1 m
EC_DS_C	0.00 %		0.07 %	< 1 m
EC_US_D	0.00 %		0.03 %	< 1 m
EC_DS_D	1.31 %	49 m	2.52 %	95 m
FDD_US_A	0.00 %		0.04 %	< 1 m
FDD_DS_A	0.11 %	3 m	0.36 %	9 m
FDD_US_B	0.01 %		0.07 %	< 1 m
FDD_DS_B	0.41 %		1.17 %	31 m
FDD_US_C	0.01 %	12 m	0.07 %	< 1 m
FDD_DS_C	0.00 %		0.04 %	< 1 m
FDD_US_D	0.60 %	24 m	3.27 %	81 m
FDD_DS_D	1.29 %	47 m	2.60 %	96 m

2. Proposal

The fact that the reach reductions as illustrated in Table 1 are all very small is a sign that contributions of this noise is not a major contributor to the system performance. The absolute value of the reach reduction is has to be compared to achievable precision of loop simulators commonly available on the market.

Therefore, it seems unduly costly to have an additional injection device to perform the injection of this noise, and this contribution proposes that the “same pair ISDN” noise be injected by the same noise injection device as used for the cross-talk noise. This will have the nice to have advantage of reducing the amount of calibration that needs to be performed by a factor of 2.

Another argument in favor of this is that performance figures have been produced with this model, and do not include possible effects alternative injection methods could have.

Though, the intention of this contribution is not to minimize the impact of this noise. It is proposed that a number of tests involving a more complex setup be defined to tackle this problem. This could be associated to higher tolerances on the nominal performance if needed. It is the perception of the authors that further study is needed to have a stable test definition, as the ISDN signal might be poorly modeled by the current proposals. This could be transferred to the work item dealing with splitter requirements in order not to interfere with the approval of the WI RTS-TM006025.

3. Summary

Proposal 1: Same pair ISDN noise shall be injected together with the crosstalk noise, following the same calibration procedure.

Proposal 2: Impact of injection of same pair ISDN noise shall be performed by a specific test set, involving the needed splitter components and possibly an ad-hoc calibration method and ad-hoc performance figures tolerance.