

Estimation Method of Speed Potential ADSL2+ Connections for Grant of Triple Play Service

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Abstract - This paper considers the throughput of ADSL2+ (Asymmetric Digital Subscriber Line) modems, used for high speed data transmission. Digital subscriber line must agree minimum rate performance recommendations for delivery triple play applications through a broadband infrastructure. Estimation method of speed potential ADSL2+ connections is examined in this paper.

Keywords – Digital subscriber line, Speed potential, Triple-play Service.

I. INTRODUCTION

Video, whether broadcast or on demand, voice and best-effort (BE) Internet access together are referred to as triple-play services. Currently, broadband technologies (bonded ADSL2+ and VDSL) seem to be the most economical means of deployment of real-time streamed video services. In the process of development Triple-Play Service on the existent subscriber access network there is a row of problems which are foremost related to the insufficient carrying capacity of subscriber line.

II. STAGE OF RESEARCH

The ADSL systems are based on the DMT modulation. It is possible to derive the theoretically achievable data rates for ADSL2+ systems by computing the bit error rate as a function of the signal-to-noise ratio for DMT modulation scheme. In DMT systems, a discrete Fourier transform (DFT) is used to combine many narrowband QAM signals to form one broadband signal. Therefore, the aggregate data rate using all the narrowband subchannels is the sum of the data rates of the individual subchannels and can be approximated by Eq.1[1]:

$$C = \sum_{k=K_0}^{K_1} C_k = \frac{1}{T} \sum_{k=K_0}^{K_1} \log \left(1 + \frac{SNR_k}{\Gamma} \right) \quad (1)$$

On the first stage of estimation for the set topology, brand and length of cable, amount of the working systems, speed potential of DSL is determined with the help xDSLsimu [2].

On the second stage experimental research of real SL is conducted, for the receipt of insertion loss (IL) and background noises (BN) which are needed for the subsequent estimation of speed potential. Measuring can be conducted by the modern measuring systems, in this case on the base of Sunset MTT platform with the modules of testing xDSL.

On the third stage in the mathematical model of DSL substituted for the blocks of IL and BN, on a value which were got on the previous stage of research. After it the estimation of speed potential of real DSL is conducted for the ADSL2+ standard [3]. A design result for real DSL is given on Fig. 1. Table I includes speed potential for real and theoretical DSL.

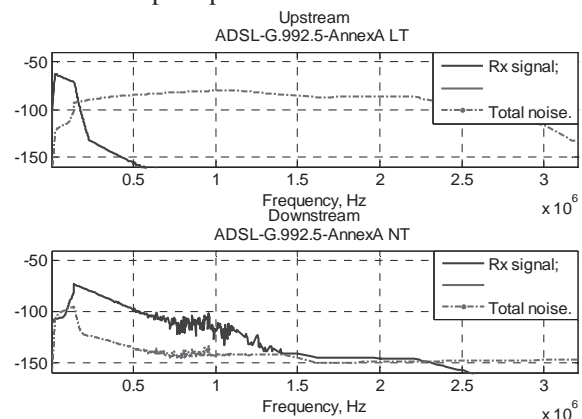


Fig.1 Design results

TABLE 1
SPEED POTENTIAL OF DSL

Upstream for real DSL	1.108
Downstream for real DSL	6.036
Upstream for theoretical DSL	1.216
Downstream for theoretical DSL	6.928

III. CONCLUSION

The feature of the considered method is the complex use of basic estimation methods that allows decreasing measuring operations on problem areas in the process of development and grant of Triple Play Service. Simultaneous combination of experimental researches and mathematical design enables to check up authenticity of the got results and accepted decisions.

REFERENCES

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