Project:	TM6
Title:	Active DSL Resource Management – A New Work Item?
Source:	FTW
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Abstract:	This paper wants to open up a discussion on the need for a new work item on what we suggest to be called "Active DSL Resource Management"
Distribution:	ETSI STC TM6 working group members
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## Introduction

It seems that there is an opportunity for ETSI TM6 to start a work item with the aim to support more active DSL management. Rephrasing the preface of the Muse report [2]: the intent of active DSL resource management (ADRM) is to enable a substantial improvement in data rates, reliability, and symmetry mixtures of Digital Subscriber Line (DSL) systems with respect to conventional static network management approaches.

Typically, DSL service and associated equipment configurations are fixed and are based on service profiles, with a different profile for each category of customer lines. These configurations are usually set at or before the DSL installation on the basis of the characteristics of a particular line, and normally do not change subsequently.

More dynamic behavior is provided in "best-efforts" services, where a customer's service employs lower than expected noise levels to provide higher data rates, although with the lower quality of service guarantees. These services operate autonomously without intensive collaboration with the network management system.

Another kind of dynamic behavior is provided by modems with a politeness mode, that causes transmit power to be reduced on short lines where otherwise there would be substantial excessive noise margin. This has the effect of generally reducing the crosstalk noise in the plant, but is usually not exploited in network management.

ADRM goes further. Currently, at least two forms of ADRM are foreseen. In the first, the transport potential of each line is balanced against a "fair" distribution of service across the population of customers. Service and equipment configurations are managed on a line-by-line basis to optimize the utilization of the plant through enhanced spectrum management procedures. The variety of these techniques is known as Dynamic Spectrum Management (DSM). In the second form of ADRM, each line is optimized to maximize its service potential by adopting the coding used, in particular error correction coding, to the given local noise environment, that may be dominated by variable extrinsic noise. This is known as Dynamic Line Coding Management (DLCM). ADRM is supposed to combine the mentioned two forms. It may be largely autonomous, under network management supervision, or involve detailed intervention on a per-line basis. A key issue is the need to deliver network-wide service stability and per-line service reliability, despite varying noise conditions arising from the dynamic nature of line parameters.

## Task at hand for ETSI

Some of the tasks an ETSI TM6 work item on active DSL resource management (ADRM) could include:

Summarize all (and add new?) ADRM methods applicable to existing and future upgraded xDSL technologies and new network operational conditions.

Define the roles and interfaces between entities in a network that uses ADRM. At least the entities: DSL modem, DSLAM, and an active DSL resource management "center" (ADRMC) need to be defined.

For each ADRM method define the DSL link information needed to implement a certain level of ADRM functionality.

Define the needed control signals (e.g., PSD to be used) that an ADRMC would apply. Additional DSL system functionality, like synchronization, should also be described.

Define tests needed to ensure that modems and DSLAMs are supporting the ADRM interfaces and functions described in this work. Define tests to ensure correct function of the ADRMC.

## References

[1] NIPP-NAI, "Dynamic Spectrum Management Report", T1E1.4/2003-018RF, Dec. 2004.
[2] Muse, "TF2.2 – Position paper on Dynamic Spectrum Management (DSM) and Dynamic Line-Code Management (DLCM), Jan. 2005