ADSL Forum
Technical Report
TR-024

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Working Text
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DMT Line Code Specific MIB

For Network Management Working Group

June 1999

Abstract:
This technical report defines a standard SNMP MIB for the DMT line code. Configuration, statistics, performance and history count elements are defined elements for DMT coded lines. These elements cover use during normal operation of ADSL lines as well as detailed measurements for fault prediction and location.

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1. Introduction

This technical report details the elements of a Line Code Specific (LCS) MIB for ITU G.992.1 and G.992.2 (and referenced regional standards) based Discrete Multi-Tone (DMT) ADSL lines including formal object definitions in ASN-1. Configuration profiles and current performance statistics are defined. This LCS MIB text fills the space in the ADSL line MIB defined by the ADSL Forum in TR-006 where line code specific details for ATU-C and ATU-R are left for future definition. The DMT LCS MIB detail is presented in ASN-1 format at the end of the document.

2. DMT LCS MIB Structure

The following additions are made to the generic ADSL Line MIB:

- To facilitate a general purpose LCS architecture, the adslLCSMib element is added to the adslMibObjects structure. All LCS MIB tables are based off this element, including adslDMTMibObjects.
- LCS tables are added under this new structure for each LCS type. These tables are organised identically to the elements under adslMibObjects. These tables perform the same functions as the tables under adslMibObjects; only their scope is limited to LCS parameters.
- The LCS tables use the INDEX clause, allowing them to be indexed as logical extensions of the generic line MIB tables.

Figure 1 shows the DMT LCS MIB structure and how it extends the ADSL Line MIB. Although the MIB structure is in place to add LCS tables that correspond to all tables in adslMibObjects, not all are required for DMT. As shown in Figure 1, the DMT LCS MIB only requires the following LCS tables:

- DMT line table (i.e. actual configuration) for the line.
- Physical tables (i.e. actuals) for both ATU-C and ATU-R.
- Line configuration profile table.

Following the precedent of ADSL Forum reports TR-005 and TR-006, this MIB definition assumes that the SNMP agent is located at the ATU-C and acts as a proxy for the ATU-R. The mechanisms by which the ATU-C controls and monitors the ATU-R is mainly through standard DMT ADSL exchanges and the mechanism specific to each object in the DMT LCS MIB is identified in the attached ASN-1 code. Because the DMT LCS MIB resides at the central office and the SNMP agent proxies the ATU-R, some ATU-R elements may not be correctly reported when the link is not in steady state.

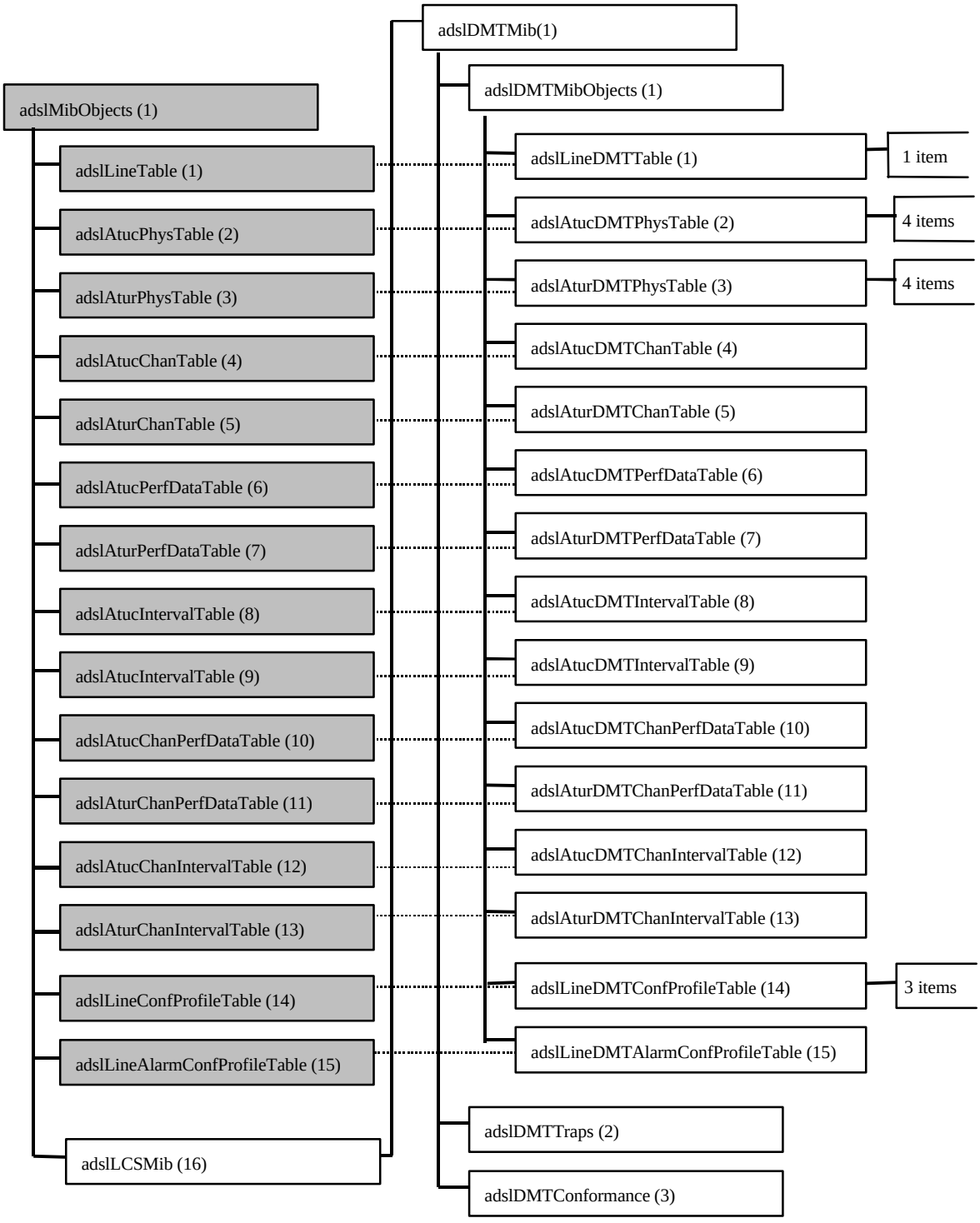

Figure 1. DMT Line Code Specific MIB

3. DMT LCS MIB Tables

To facilitate a general purpose LCS architecture, the adslLCSMib object is added to the adslMibObjects structure in TR006. All LCS MIB tables are based off this element, including adslDMTMibObjects.

3.1 DMT Line Table

The DMT physical line table, **adslLineDMTTable**, reports the following elements common to the line that result from a successful line initialisation and training process:

- Report whether autonomous data streaming[1] is allowed on the eoc or only transaction based data exchanges using the adslLineDMTEOC object. See ITU recommendation G.997.1 and 994.1 for further details.

3.2 DMT Physical Tables

The **adslAtucDMTPhysTable** and **adslAturDMTPhysTable** tables contain DMT specific operating status information. This includes ATU state as well as per bin information for bit loading, SNR and attenuation.

Both ATU-C state and ATU-R state are reported by the relevant physical tables (objects adslAtucDMTState and adslAturDMTState) and will change dynamically. The ATU-R status may not be current and depends on having an operating link to be reported because the SNMP agent proxies the ATU-R.

During start-up each ATU determines the SNR in each bin. In addition an approximation of the signal attenuation at that frequency is calculated. This information is used to calculate the bit loading (bits and gain) to achieve the configured rate. Once in SHOWTIME each ATU continues to monitor the SNR and uses this information to suggest bit swaps (or dynamic rate changes if this optional procedure is implemented) which causes the bit loading (bits or gain per bin) to change. Up to 32 bins may be used in the upstream direction and up to 256 bins in the downstream direction. Only instantaneous (or raw) versions of these objects are available in this MIB. The ATU-R SNR and Attenuation status may not be current and depends on having an operating link to be reported because the SNMP agent proxies the ATU-R. Note that all per bin objects are optional.

3.3 DMT Channel Tables

The DMT LCS MIB includes placeholders for the **adslAtucDMTChanTable** and **adslAturDMTChanTable** tables, which are not currently used.

3.4 DMT Physical Performance Tables

The DMT LCS MIB includes placeholders for the **adslAtucDMTPerfDataTable** and **adslAturDMTPerfDataTable** tables, which are not currently used.

[1] The autonomous data streaming mode is sometimes known as eoc clear channel mode. Autonomous data streaming is a mandatory function defined in ITU G.992.1 and G.992.2. The transport of SNMP messages over the clear eoc channel has been identified by G.997.1 as optional and is indicated during initialization by messages defined in Recommendation G.994.1.

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