Technical Report
TR-001

ADSL Forum System Reference Model

May 1996

Abstract

This technical report presents an ADSL-based System Reference Model and defines all relevant interfaces present in an ADSL Access Network.

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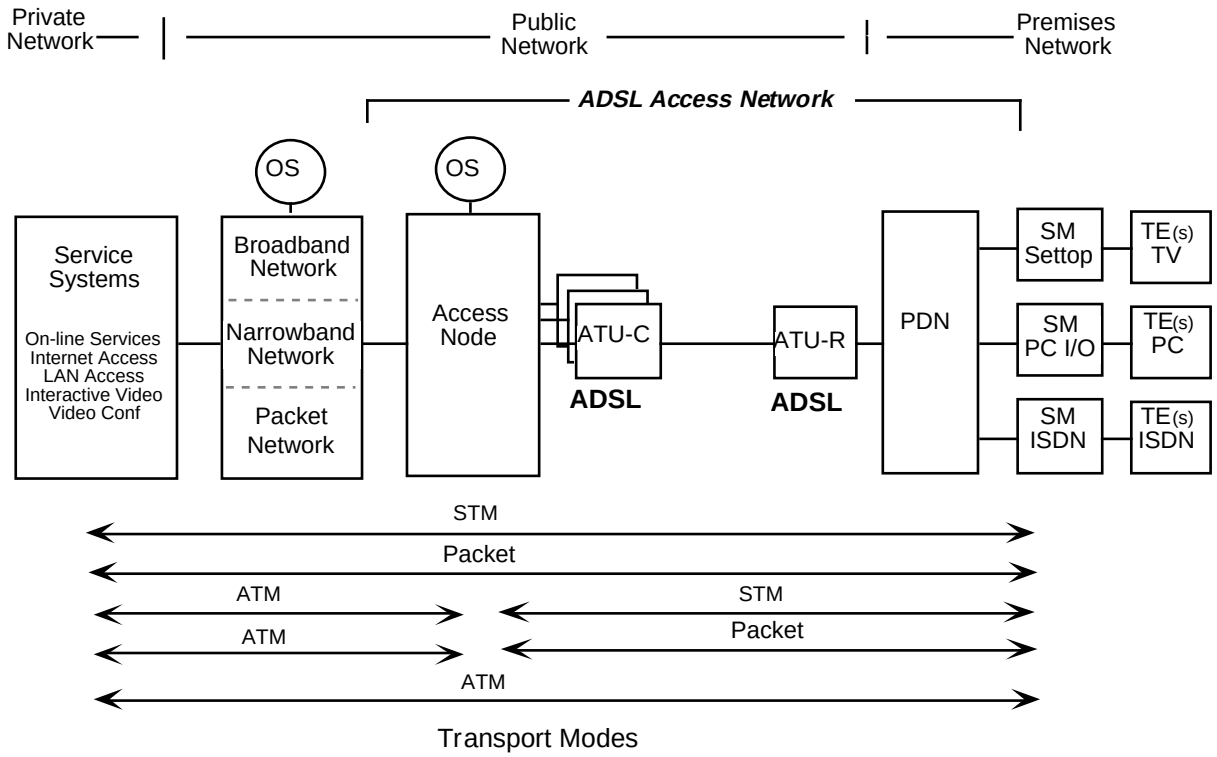
1.0 Overall Network and ADSL

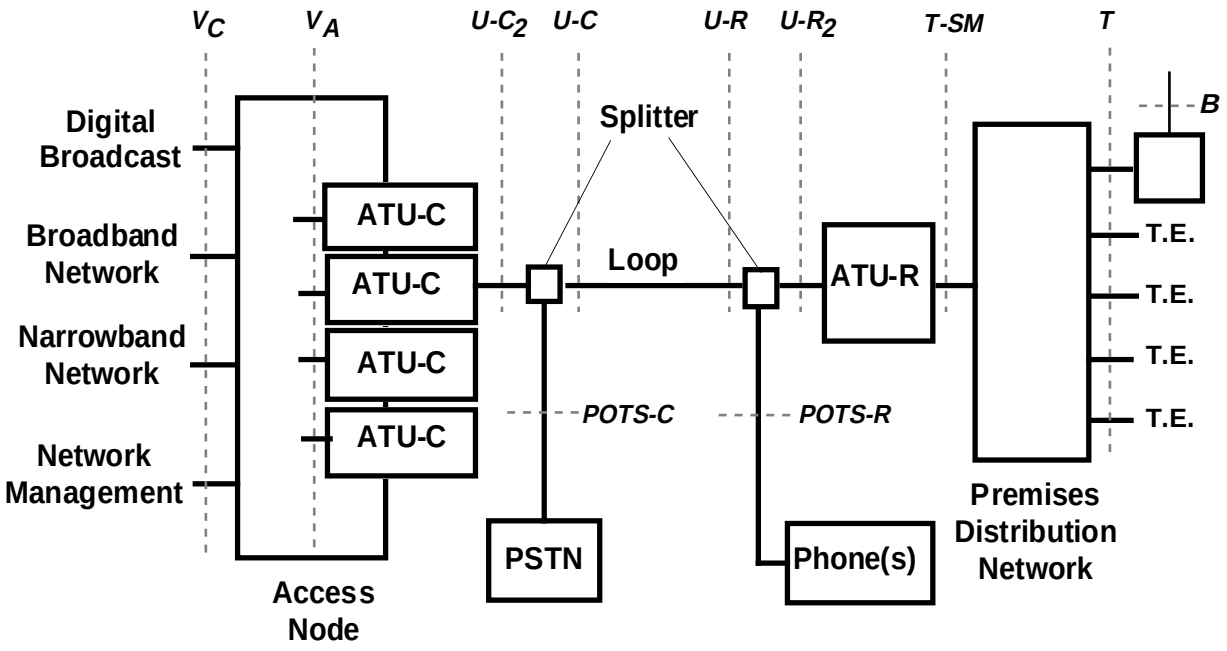
The ADSL Forum develops technical guidelines for architectures, interfaces, and protocols for telecommunications networks incorporating ADSL transceivers. The overall network diagram below describes the network elements incorporated in multimedia communications, shows the scope of the Forum's work, and suggests a group of transport configurations ADSL will encounter as networks migrate from Synchronous Transfer Mode (STM) to Asynchronous Transfer Mode (ATM).



Transport Modes

ADSL	Asymmetric Digital Subscriber Line	STM	Synchronous Transfer Mode
ATM	Asynchronous Transfer Mode	TE	Terminal Equipment
OS	Operations System		See System Reference Model for reference point definitions
PDN	Premises Distribution Network		
SM	Service Module		

2.0 System Reference Model



Definitions

ATU-C: ADSL Transmission Unit at the network end. The ATU-C may be integrated within an Access Node.

ATU-R: ADSL transmission Unit at the customer premises end. The ATU-R may be integrated within an SM.

Access Node: Concentration point for Broadband and Narrowband data. The Access Node may be located at a Central Office or a remote site. Also, a remote Access Node may subtend from a central access node.

B: Auxiliary data input (such as a satellite feed) to Service Module (such as a Set Top Box).

Broadcast: Broadband data input in simplex mode (typically broadcast video).

Broadband Network: Switching system for data rates above 1.5/2.0 Mbps.

Loop: Twisted-pair copper telephone line. Loops my differ in distance, diameter, age, and transmssion characteristics depending on network.

Narrowband Network: Switching system for data rates at or below 1.5/2.0 Mbps.

POTS: Plain Old Telephone Service.

POTS-C: Interface between PSTN and POTS splitter at network end.

POTS-R: Interface between phones and POTS splitter at premises end.

PDN: Premises Distribution Network: System for connecting ATU-R to Service Modules. May be point-to-point or multipoint; may be passive wiring or an active network. Multipoint may be a bus or star.

PSTN: Public Switched Telephone Network.

SM: Service Module: Performs terminal adaptation functions. Examples are set top boxes, PC interfaces, or LAN router.

Splitter: Filters which separate high frequency (ADSL) and low frequency (POTS) signals at network end and premises end. The splitter may be integrated into the ATU, physically separated from the ATU, or divided between high pass and low pass, with the low pass function physically separated from the ATU. The provision of POTS splitters and POTS-related functions is optional.

T-SM: Interface between ATU-R and Premises Distribution Network. May be same as T when network is point-to-point passive wiring. An ATU-R may have more than one type of T-SM interface implemented (e.g., a T1/E1 connection and an Ethernet connection). The T-SM interface may be integred within a Service Module.

T: Interface between Premises Distribution Network and Service Modules. May be same as T-SM when network is point-to-point passive wiring. Note that T interface may disappear at the physical level when ATU-R is integrated within a Service Module.

U-C: Interface between Loop and POTS Splitter on the network side Defining both ends of the Loop interface separately arises because of the asymmetry of the signals on the line.

U-C2: Interface between POTS splitter and ATU-C. Note that at present ANSI T1.413 does not define such an interface and separating the POTS splitter from the ATU-C presents some technical difficulties in standardizing this interface.

U-R: Interface between Loop and POTS Splitter on the premises side.

U-R2: Interface between POTS splitter and ATU-R. Note that at present ANSI T1.413 does not define such an interface and separating the POTS splitter from the ATU-R presents some technical difficulties in standardizing the interface.

V_A: Logical interface between ATU-C and Access Node. As this interface will often be within circuits on a common board, the ADSL Forum does not consider physical V_A interfaces. The V interface may contain STM, ATM, or both transfer modes. In the primitive case of point-to-point connection between a switch port and an ATU-C (that is, a case without concentration or multiplexing), then the V_A and V_C interfaces become identical (alternatively, the V_A interface disappears).

V_C: Interface between Access Node and network. May have multiple physical connections (as shown) although may also carry all signals across a single physical

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