



CHAPTER 28

Digital Subscriber Line

This chapter describes the level of support that Cisco ANA provides for DSL, as follows:

- [Technology Description, page 28-1](#)
- [Information Model Objects \(IMOs\), page 28-2](#)
- [Vendor-Specific Inventory and IMOs, page 28-5](#)
- [Service Alarms, page 28-6](#)

Technology Description

xDSL

DSL is a modem technology that uses existing twisted-pair telephone lines to transport high-bandwidth data, such as multimedia and video, to service subscribers. The term *xDSL* covers a number of similar yet competing forms of DSL, including asymmetric:

- DSL (ADSL/ADSL 2)
- Symmetric DSL (SDSL)
- High-speed DSL (HDSL)
- Rate-adaptive DSL (RADSL)
- Very high bit data rate DSL (VDSL) for delivering up to 52 Mb/s downstream

At the customer end of the connection, a DSL modem converts data from the digital signals used by computers into a voltage signal of a suitable frequency range, which is then applied to the phone line. At the exchange end, a digital subscriber line access multiplexer (DSLAM) terminates the DSL circuits, aggregates them, and hands them off to other networking transports. In the case of ADSL, the voice component is also separated at this step, either by a filter integrated into the DSLAM or by specialized filtering equipment installed upstream.

Cisco ANA does not support discovery of DSL physical layer topology. This topology is manually (statically) configured by the system administrator. However, it is used in conjunction with the data link layer above it, such as ATM, for discovering its physical topology, while further verifying it by matching the traffic signature of these ports using Cisco's confidential scheme, which requires a substantial amount of traffic in order to function correctly.

Information Model Objects (IMOs)

This section describes the following IMOs:

- [DSL Interface \(IDsl/IIdsl/ISdsl/IShdsl\)](#)
- [ADSL Interface \(IADsl\)](#)
- [ADSL 2 Interface \(IADsl2\)](#)
- [DSL Traffic Descriptor \(IIdslTrafficDescriptor\)](#)
- [ADSL Traffic Descriptor \(IAdslTrafficDescriptor\)](#)
- [ADSL 2 Spectrum Traffic Descriptor \(IAdsl2TrafficDescriptor\)](#)
- [Symmetric DSL Traffic Descriptor \(ISdslTrafficDescriptor\)](#)
- [Symmetric High Bit Rate DSL Traffic Descriptor \(IShdslTrafficDescriptor\)](#)

DSL Interface

The following physical layer [DSL Interface](#) (which represents any DSL interface), [ADSL Interface](#), and [ADSL 2 Interface](#) objects are bound by their Containing Termination Points attribute to a [Port Connector](#) object. Each of these objects is accessed primarily by a data link (Layer 2) [ATM Interface](#) bound by its Contained Connection Termination Points attribute.

Table 28-1 *DSL Interface (IDsl/IIdsl/ISdsl/IShdsl)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Modulation Type	Modulation type (<i>Null, DMT, CAP, QAM, GLite, GDMT, 2B1Q</i>)	Product	Configuration
Customer Identification	Customer identifier	Product	Configuration
Traffic Descriptor	Traffic descriptor (DSL Traffic Descriptor)	Product	Configuration

Additional attributes are the same as [Physical Layer \(IPhysicalLayer\)](#)

ADSL Interface

Table 28-2 *ADSL Interface (IADsl)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Maximum Reception and Transmission Bandwidth	Maximum reception and transmission bandwidth	Product	Configuration

Additional attributes are the same as [DSL Interface \(IDsl/IIdsl/ISdsl/IShdsl\)](#)

ADSL 2 Interface

Table 28-3 *ADSL 2 Interface (IADsl2)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Spectrum Traffic Descriptor	Spectrum traffic descriptor (ADSL 2 Spectrum Traffic Descriptor)	Product	Configuration
Traffic Descriptor	Traffic descriptor (ADSL Traffic Descriptor)	Product	Configuration

Additional attributes are the same as [ADSL Interface \(IADsl\)](#)

DSL Traffic Descriptor

The following [DSL Traffic Descriptor](#), [ADSL Traffic Descriptor](#), [ADSL 2 Spectrum Traffic Descriptor](#), [Symmetric DSL Traffic Descriptor](#), and [Symmetric High Bit Rate DSL Traffic Descriptor](#) objects describe the traffic of various standard DSL interfaces. Each object is aggregated by a [Traffic Descriptor Container](#) object.

Table 28-4 *DSL Traffic Descriptor (IldslTrafficDescriptor)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Target Bit Rate	Target bit rate	Product	Configuration
Name	Traffic descriptor name	Product	Configuration
Index	Traffic descriptor index	Product	Configuration

ADSL Traffic Descriptor

Table 28-5 *ADSL Traffic Descriptor (IAdslTrafficDescriptor)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Maximum, Minimum and Target Transmission and Reception Noise Margins	Maximum, minimum, and target transmission and reception noise margins	Product	Configuration
Maximum, Minimum and Planned Transmission and Reception Bit Rates	Maximum, minimum, and planned transmission and reception bit rates	Product	Configuration
Maximum Transmission Power Spectral Density	Maximum transmission Power Spectral Density (PSD)	Product	Configuration
Transmission and Reception Rate Adaptation	Transmission and reception rate adaptation mode (<i>Null, Fixed, Adapt at Startup, Adapt at Runtime</i>)	Product	Configuration
Channel Type	ADSL channel type (<i>Null, Fast, Interleaved, Fast or Interleaved, Fast and Interleaved</i>)	Product	Configuration
Name	Traffic descriptor name	Product	Configuration
Index	Traffic descriptor index	Product	Configuration

ADSL 2 Spectrum Traffic Descriptor

Table 28-6 *ADSL 2 Spectrum Traffic Descriptor (IAdsl2TrafficDescriptor)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Maximum, Minimum and Target Transmission and Reception Noise Margins	Maximum, minimum, and target transmission and reception noise margins	Product	Configuration
Name	Traffic descriptor name	Product	Configuration
Index	Traffic descriptor index	Product	Configuration

Symmetric DSL Traffic Descriptor

Table 28-7 *Symmetric DSL Traffic Descriptor (ISdslTrafficDescriptor)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Target and Minimum Bit Rate	Target and minimum line bit rate	Product	Configuration
Target Noise Margin	Target noise margin	Product	Configuration
Name	Traffic descriptor name	Product	Configuration
Index	Traffic descriptor index	Product	Configuration

Symmetric High Bit Rate DSL Traffic Descriptor

Table 28-8 *Symmetric High Bit Rate DSL Traffic Descriptor (IShdsITrafficDescriptor)*

Attribute Name	Attribute Description	Scheme	Polling Interval
Target Bit Rate	Target line bit rate	Product	Configuration
Wire Mode	Wire mode (<i>Null, Two Wire, Four Wire</i>)	Product	Configuration
Spectral Mode	Spectral mode (<i>Null, Symmetric, Asymmetric</i>)	Product	Configuration
Name	Traffic descriptor name	Product	Configuration
Index	Traffic descriptor index	Product	Configuration

Vendor-Specific Inventory and IMOs

Vendor-specific IMOs are implemented only for specific vendor devices.

The following vendors' DSL Traffic Descriptor objects describe traffic of these vendors' standard DSL interfaces, and are aggregated by a [Traffic Descriptor Container](#) object.

- [ECI HiFocus ADSL Traffic Descriptor \(IECIHiFocusAdslTrafficDescriptor\)](#)
- [Alcatel ASAM SHDSL Traffic Descriptor \(IAlcatelAsamShdslTrafficProfile\)](#)

ECI HiFocus ADSL Traffic Descriptor

Table 28-9 ECI HiFocus ADSL Traffic Descriptor (IECIHiFocusAdslTrafficDescriptor)

Attribute Name	Attribute Description	Scheme	Polling Interval
Discrete Multi-Tone Coding Model	Discrete multitone coding model (<i>Null, discrMultiTone</i>)	Product	Configuration
ATUC Downstream and ATUR Upstream Usage	ATUC downstream and ATUR upstream usage (<i>Null, Yes, No</i>)	Product	Configuration
ATUC Downstream Fast and Interleave Check Bytes	ATUC downstream fast and interleave check bytes	Product	Configuration
ATUR Upstream Fast and Interleave Check Bytes	ATUR upstream fast and interleave check bytes	Product	Configuration
ATUC Downstream and ATUR Upstream Interleaved Depth	ATUC downstream and ATUR interleave depth (<i>Power of 2, 0, Non</i>)	Product	Configuration
ATUC Downstream and ATUR Upstream Code Word Length	ATUC downstream and ATUR upstream code word length in symbols per code word	Product	Configuration
Trellis Coded Modulation Option Usage	Trellis coded modulation option usage (<i>Null, Enabled, Disabled</i>)	Product	Configuration
Echo Cancellation Option	Echo cancellation option (<i>Null, Enabled, Disabled</i>)	Product	Configuration
Coding Mode	Coding mode (<i>Null, Automatic, Manual</i>)	Product	Configuration

All additional attributes are the same as [ADSL Traffic Descriptor \(IAdslTrafficDescriptor\)](#)

Alcatel ASAM SHDSL Traffic Descriptor

Table 28-10 Alcatel ASAM SHDSL Traffic Descriptor (IAlcatelAsamShdslTrafficProfile)

Attribute Name	Attribute Description	Scheme	Polling Interval
Minimum and Maximum Required Bit Rate	Minimum and maximum required bit rate	Product	Configuration

All additional attributes are the same as [Symmetric High Bit Rate DSL Traffic Descriptor \(IShdslTrafficDescriptor\)](#)

Service Alarms

The following alarms are supported for this technology:

- [Link Down, page 41-42](#)
- [Port Down, page 41-51](#)