



CHAPTER 10

Digital Subscriber Line “DSL” and Integrated Services Digital Network “ISDN”

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

- [Technology Description, page 10-1](#)
- [Inventory and Information Model Objects \(IMOs\), page 10-2](#)
- [Vendor Specific Inventory and Information Model Objects, page 10-6](#)
- [Network Topology, page 10-7](#)
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Technology Description

xDSL

Digital Subscriber Line (DSL) technology 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/ADSL2), Symmetric DSL (SDSL), High Speed DSL (HDSL), Rate Adaptive (RADSL), and Very High Bit Data Rate DSL (VDSL) for delivering up to 52 Mbps 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 and aggregates them, where they are handed off onto other networking transports. In the case of ADSL, the voice component is also separated at this step, either by a filter integrated in the DSLAM or by specialized filtering equipment installed before it.

ISDN

Integrated Services Digital Network (ISDN) is comprised of digital telephony and data transport services offered by regional telephone carriers. ISDN involves the digitization of the telephone network, which permits voice, data, text, graphics, music, video, and other source material to be transmitted over existing telephone wires.

There are two type of channel in ISDN: A 64 Kbps Bearer (B) channel, which used for data and up to 64 Kbps Delta (D) channel used for signalling and control over the Layers 1 through 3 of the OSI reference model.

With those there are two types of services associated: The 192Kbps Basic Rate Interface (BRI) service, which offers two B channels and one D channel (2B+D) and the 1.544/2.048 Mbps Primary Rate Interfaces (PRI) service, which offers 23/31 B channels and one D channel respectively for the xDSL interface backup.

Inventory and Information Model Objects (IMOs)

This section includes the following tables:

- [Digital Subscriber Line Interface \(IDsl/Ildsl/ISdsl/IShdsl\)](#)
- [Asynchronous Digital Subscriber Line Interface \(IADsl\)](#)
- [Asynchronous Digital Subscriber Line 2 Interface \(IADsl2\)](#)
- [ISDN DSL Traffic Descriptor \(IldslTrafficDescriptor\)](#)
- [Asynchronous DSL Traffic Descriptor \(IAdslTrafficDescriptor\)](#)
- [Asynchronous DSL 2 Spectrum Traffic Descriptor \(IAdsl2TrafficDescriptor\)](#)
- [Synchronous DSL Traffic Descriptor \(ISdslTrafficDescriptor\)](#)
- [Synchronous High Bit Rate DSL Traffic Descriptor \(IShdslTrafficDescriptor\)](#)
- [Integrated Services Digital Network Interface \(IIsdnLayer2\)](#)
- [Integrated Services Digital Network Channel \(IIsdnChannel\)](#)
- [Integrated Services Digital Network Physical \(IIsdnLayer1\)](#)

Digital Subscriber Line Interface

The following Physical layer [Digital Subscriber Line Interface](#), which represents any DSL interface, as well as [Asynchronous Digital Subscriber Line Interface](#) and [Asynchronous Digital Subscriber Line 2 Interface](#) objects, are bound by their Containing Termination Points attribute to a [Port Connector](#) object, and is primarily accessed by only a Data Link Layer [ATM Interface](#) bound by its Contained Connection Termination Points attribute.

Table 10-1 **Digital Subscriber Line Interface (IDsl/Ildsl/ISdsl/IShdsl)**

Attribute Name	Attribute Description
Modulation Type	Modulation type (<i>Null, DMT, CAP, QAM, GLite, GDMT, 2B1Q</i>)
Customer Identification	Customer identification
Traffic Descriptor	Traffic descriptor (DSL Traffic Descriptor)
Same as Physical Layer (<i>IPhysicalLayer</i>)	

Asynchronous Digital Subscriber Line Interface

Table 10-2 Asynchronous Digital Subscriber Line Interface (IADsl)

Attribute Name	Attribute Description
Maximum Reception and Transmission Bandwidth	Maximum reception and transmission bandwidth
Same as Digital Subscriber Line Interface (IDsl)	

Asynchronous Digital Subscriber Line 2 Interface

Table 10-3 Asynchronous Digital Subscriber Line 2 Interface (IADsl2)

Attribute Name	Attribute Description
Spectrum Traffic Descriptor	Spectrum traffic descriptor (Asynchronous DSL 2 Spectrum Traffic Descriptor)
Traffic Descriptor	Traffic descriptor (Asynchronous DSL Traffic Descriptor)
Same as Asynchronous Digital Subscriber Line Interface (IADsl)	

DSL Traffic Descriptor

The following various [DSL Traffic Descriptor](#) objects describe the traffic of various standard DSL Interfaces and are being aggregated by a [Traffic Descriptor Container](#) object (see [Common \(Shared by Several\)](#)).

Table 10-4 ISDN DSL Traffic Descriptor (IldslTrafficDescriptor)

Attribute Name	Attribute Description
Target Bit Rate	Target Bit rate
Name	Traffic descriptor name
Index	Traffic descriptor index

Asynchronous DSL Traffic Descriptor

Table 10-5 Asynchronous DSL Traffic Descriptor (IAdslTrafficDescriptor)

Attribute Name	Attribute Description
Maximum, Minimum and Target Transmission and Reception Noise Margins	Maximum, minimum and target transmission and reception noise margins
Maximum, Minimum and Planned Transmission and Reception Bit Rates	Maximum, minimum and planned transmission and reception Bit rates

Table 10-5 Asynchronous DSL Traffic Descriptor (IAdslTrafficDescriptor) (continued)

Maximum Transmission Power Spectral Density	Maximum transmission Power Spectral Density (PSD)
Transmission and Reception Rate Adaptation	Transmission and reception rate adaptation mode (<i>Null, Fixed, Adapt at Startup, Adapt at Runtime</i>)
Channel Type	ADSL channel type (<i>Null, Fast, Interleaved, Fast or Interleaved, Fast and Interleaved</i>)
Name	Traffic descriptor name
Index	Traffic descriptor index

Asynchronous DSL 2 Spectrum Traffic Descriptor

Table 10-6 Asynchronous DSL 2 Spectrum Traffic Descriptor (IAdsl2TrafficDescriptor)

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

Synchronous DSL Traffic Descriptor

Table 10-7 Synchronous DSL Traffic Descriptor (ISdslTrafficDescriptor)

Attribute Name	Attribute Description
Target and Minimum Bit Rate	Target and minimum line Bit rate
Target Noise Margin	Target noise margin
Name	Traffic descriptor name
Index	Traffic descriptor index

Synchronous High Bit Rate DSL Traffic Descriptor

Table 10-8 Synchronous High Bit Rate DSL Traffic Descriptor (IShdsTrafficDescriptor)

Attribute Name	Attribute Description
Target Bit Rate	Target line Bit rate
Wire Mode	Wire mode (<i>Null, Two Wire, Four Wire</i>)
Spectral Mode	Spectral mode (<i>Null, Symmetric, Asymmetric</i>)

Table 10-8 Synchronous High Bit Rate DSL Traffic Descriptor (IShdsI/TrafficDescriptor) (continued)

Name	Traffic descriptor name
Index	Traffic descriptor index

Integrated Services Digital Network (ISDN) Interface

The following Data Link layer [Integrated Services Digital Network \(ISDN\) Interface](#) object, is bound by its Containing Termination Points attribute to a Physical Layer [Integrated Services Digital Network \(ISDN\) Physical](#) object, and is primarily accessed by [Point To Point Protocol Encapsulation](#) bound by its Contained Connection Termination Points attribute.

Table 10-9 Integrated Services Digital Network Interface (ISdnLayer2)

Attribute Name	Attribute Description
Control Administrative Status	Administrative status (<i>Unknown, Up, Down, Testing</i>)
Operational Status	Operational status (<i>Unknown, Up, Down, Testing, Dormant, Not Present</i>)
Channels Table	Array of Integrated Services Digital Network (ISDN) Channels
IANA Type	IANA type of the sub/layer
Containing Termination Points	Underlying termination points (connection or physical)
Contained Connection Termination Points	Bound Connection Termination Points

Integrated Services Digital Network (ISDN) Channel

The following Data Link layer [Integrated Services Digital Network \(ISDN\) Channel](#) object describes an [Integrated Services Digital Network \(ISDN\) Interface](#) channels table’s entry.

Table 10-10 Integrated Services Digital Network Channel (ISdnChannel)

Attribute Name	Attribute Description
Control Administrative Status	Administrative status (<i>Unknown, Up, Down, Testing</i>)
Operational Status	Operational status (<i>Unknown, Up, Down, Testing, Dormant, Not Present</i>)

Integrated Services Digital Network (ISDN) Physical

The following Physical layer [Integrated Services Digital Network \(ISDN\) Physical](#) object, is bound by its Containing Termination Points attribute to a [Port Connector](#) object, and is accessed by the Data Link layer [Integrated Services Digital Network \(ISDN\) Interface](#) bound by its Contained Connection Termination Points attribute.

Table 10-11 *Integrated Services Digital Network Physical (IIsdnLayer1)*

Attribute Name	Attribute Description
Same as Physical Layer (<i>IPhysicalLayer</i>)	

Vendor Specific Inventory and Information Model Objects

Vendor specific Information Model Objects are implemented only for specific devices of the vendor.

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's HiFocus ADSL Traffic Descriptor](#)
- [Alcatel's ASAM SHDSL Traffic Descriptor](#)

ECI's HiFocus ADSL Traffic Descriptor

Table 10-12 *ECI's HiFocus ADSL Traffic Descriptor (IECIHiFocusAdslTrafficDescriptor)*

Attribute Name	Attribute Description
Discrete Multi-Tone Coding Model	Discrete multi-tone coding model (<i>Null, discrMultiTone</i>)
ATUC Downstream and ATUR Upstream Usage	ATUC downstream and ATUR upstream usage (<i>Null, Yes, No</i>)
ATUC Downstream Fast and Interleave Check Bytes	ATUC downstream fast and interleave check bytes
ATUR Upstream Fast and Interleave Check Bytes	ATUR upstream fast and interleave check bytes
ATUC Downstream and ATUR Upstream Interleaved Depth	ATUC downstream and ATUR interleaved depth (<i>Power of 2, 0, Non</i>)
ATUC Downstream and ATUR Upstream Code Word Length	ATUC downstream and ATUR upstream code word length in symbols per code word
Trellis Coded Modulation Option Usage	Trellis coded modulation option usage (<i>Null, Enabled, Disabled</i>)
Echo Cancellation Option	Echo cancellation option (<i>Null, Enabled, Disabled</i>)
Coding Mode	Coding mode (<i>Null, Automatic, Manual</i>)
Same as Asynchronous DSL Traffic Descriptor (<i>IAdslTrafficDescriptor</i>) - see Table 10-5 on page 10-3 .	

Alcatel’s ASAM SHDSL Traffic Descriptor

Table 10-13 Alcatel’s ASAM SHDSL Traffic Descriptor (*IAIcatelAsamShdslTrafficProfile*)

Attribute Name	Attribute Description
Minimum and Maximum Required Bit Rate	Minimum and maximum required Bit rate
Same as Synchronous High Bit Rate DSL Traffic Descriptor (<i>IShdsITrafficDescriptor</i>) - see Table 10-8 on page 10-4 .	

Network Topology

The Digital Subscriber Line (DSL) Physical layer topology is unsupported and is manually (statically) configured by the system administrator.

Service Alarms

The following alarms are supported for this technology:

- Link Down/Link Up
- Port Down/Port Up

**Note**

For a detailed description of these alarms and for information about correlation see the *Cisco Active Network Abstraction Fault Management User Guide*, 3.6.

