Monitoring ADSL2+ and VDSL2 Technology Enhancements

This chapter discusses the following technology enhancements in Prime Network:

- ADSL2+
- VDSL2
- Bonding Group

Each of these technologies are discussed in the following topics covered in this section:

User Roles Required to Work with ADSL2+/VDSL2 Technologies

Table 28-1 identifies the GUI default permission or device scope security level that is required to work with Prime Network Vision. Prime Network Vision determines whether you are authorized to perform a task as follows:

- For GUI-based tasks (tasks that do not affect devices), authorization is based on the default permission that is assigned to your user account.
- For element-based tasks (tasks that do affect elements), authorization is based on the default permission that is assigned to your account. That is, whether the element is in one of your assigned scopes and whether you meet the minimum security level for that scope.

For more information on user authorization, see the *Cisco Prime Network 3.10 Administrator Guide*.

By default, users with the Administrator role have access to all managed elements. To change the Administrator user scope, see the topic on device scopes in the *Cisco Prime Network 3.10 Administrator Guide*.

Table 28-1 Default Permission/Security Level Required for ADSL2+/VDSL2 technology enhancements

Task	Viewer	Operator	OperatorPlus	Configurator	Administrator
Viewing the ADSL2+/VDSL2 Configuration details	X	X	X	X	X
Viewing the ADSL/ADSL2+ Physical Inventory details for a device	X	X	X	X	X
Viewing the DSL Bonding Group Configuration details	X	X	X	X	X

Viewing the ADSL2+/VDSL2 Configuration Details

Asymmetric digital subscriber line (ADSL) is a type of digital subscriber line (DSL) technology, a data communications technology that enables faster data transmission over copper telephone lines than a conventional voiceband modem can provide. It does this by utilizing frequencies that are not used by a voice telephone call.

ADSL2+ extends the capability of basic ADSL by doubling the number of downstream channels. The data rates can be as high as 24 Mbit/s downstream and up to 1.4 Mbit/s upstream depending on the distance from the DSLAM to the customer's premises. It is capable of doubling the frequency band of typical ADSL connections from 1.1 MHz to 2.2 MHz. This doubles the downstream data rates of the previous ADSL2 standard (which was up to 12 Mbit/s), and like the previous standards will degrade from its peak bitrate after a certain distance.

Very-high-bit-rate digital subscriber line (VDSL or VHDSL) is a digital subscriber line (DSL) technology providing data transmission faster than ADSL over a single flat untwisted or twisted pair of copper wires (up to 52 Mbit/s downstream and 16 Mbit/s upstream), and on coaxial cable (up to 85 Mbit/s down- and upstream); using the frequency band from 25 kHz to 12 MHz. These rates mean that VDSL is capable of supporting applications such as high-definition television, as well as telephone services (voice over IP) and general Internet access, over a single connection.

Very-high-bit-rate digital subscriber line 2 (VDSL2) is an access technology that exploits the existing infrastructure of copper wires that were originally deployed for traditional telephone service as a way of delivering very high speed internet access. The main high-speed link (e.g. a fibre optic connection) terminates at a hub near the customers' location. The existing copper wire infrastructure is then used to carry the high speed connection for the short remaining distance to the customers. It can be deployed from central offices, from fiber-optic connected cabinets located near the customer premises, or within buildings.

In Prime Network, the ADSL2+ and VDSL2 technologies are grouped under the XDSL Traffic Descriptors node.

To view the XDSL Traffic Descriptors Details:

Step 1 Right-click the required device in Prime Network Vision and choose **Inventory**.

Step 2 Expand the **Logical Inventory** node and choose **XDSL Traffic Descriptors**. The relevant details are displayed in the content pane as shown in Figure 28-1.

Figure 28-1 XDSL Traffic Descriptor Details

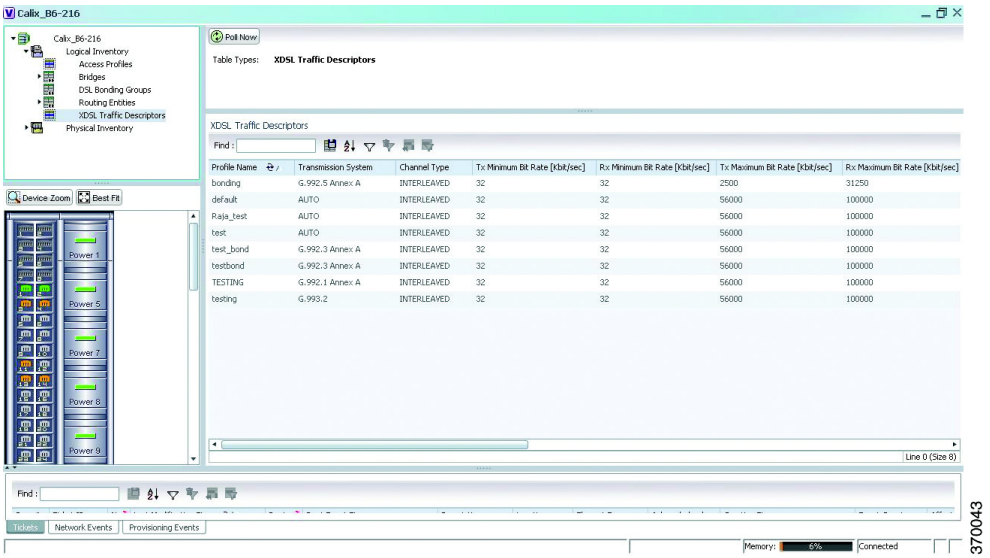

Table 28-2 describes the XDSL Traffic Descriptor details.

Table 28-2 XDSL Traffic Descriptor Details

Field	Description
XDSL Traffic Descriptors	
Profile Name	The name of the ADSL2+/VDSL2 profile.
Transmission System	The operating mode of the transmission system.
Channel Type	The type of physical channel, which can be any one of the following: • Fast • Interleaved
Tx Minimum Bit Rate [Kbit/sec]	The minimum bit rate (in terms of kilobits per second) transmitted for adaptive bit rate.
Rx Minimum Bit Rate [Kbit/sec]	The minimum bit rate (in terms of kilobits per second) received for adaptive bit rate.
Tx Maximum Bit Rate [Kbit/sec]	The maximum bit rate (in terms of kilobits per second) transmitted for adaptive bit rate.
Rx Maximum Bit Rate [Kbit/sec]	The maximum bit rate (in terms of kilobits per second) received for adaptive bit rate.
Tx Target Noise Margin [dB]	The target amount of noise (in decibel) transmitted by XDSL TU-C/TU-R.
Rx Target Noise Margin [dB]	The target amount of noise (in decibel) received by XDSL TU-C/TU-R.
Tx Minimum Noise Margin [dB]	The minimum amount of noise (in decibel) transmitted by XDSL TU-C/TU-R.
Rx Minimum Noise Margin [dB]	The minimum amount of noise (in decibel) received by XDSL TU-C/TU-R.

Table 28-2 XDSL Traffic Descriptor Details

Field	Description
Tx Maximum Noise Margin [dB]	The maximum amount of noise (in decibel) transmitted by XDSL TU-C/TU-R.
Rx Maximum Noise Margin [dB]	The maximum amount of noise (in decibel) received by XDSL TU-C/TU-R.
Transmission System	The operating mode of the transmission system.
XDSL2 Line Profile	The XDSL2 line profile that must be used. **Note** This field is applicable only for VDSL2 technology.
Upstream Band 0 Mask	The XDSL2 upstream band 0 mask. **Note** This field is applicable only for VDSL2 technology.

Viewing the ADSL2+/VDSL2 Details for a Device

The physical inventory details for a device displays the location information as well as the XDSL support details for ADSL2+ and VDSL2 devices,

To view the physical inventory details for a device:

Step 1 Right-click the required device in Prime Network Vision and choose **Inventory**.

Step 2 Expand the **Physical Inventory** node.

Step 3 Choose the port and the following details are displayed in the content pane:

- Location Details—This section displays the Device Type, Location, Port Alias, and Status of the device. It also indicates whether alarms must be sent for any event or alarm.
- ATM on port—This section displays the Asynchronous Transfer Mode details for the port.
- PTM on port—This section displays the Packet Transfer Mode (PTM) details for the port. The PTM section displays the following information:
  - Encapsulation Type
  - TPS-TC Admin Mode—Will be displayed only for VDSL line cards.
  - TPS-TC Oper Mode—Will be displayed only for VDSL line cards.

Note The ATM on Port and PTM on Port sections will not be displayed if the port is bonded to a DSL group or if the **TPS-TC Admin Mode** is specified as **Auto** and the **TPS-TC Oper Mode** is specified as **Unknown.**

- XDSL/ADSL2/2+—This section displays the XDSL support details. These support details include the Administrative and Operating statuses, Operating Mode, Aggregation Group, the various Bit rates and Noise margins.

The **Operating Mode** indicates whether the device is an ADSL2 or VDSL 2 device. The **Aggregation Group** indicates whether the port is associated to a DSL bonding group. This is a link, which when clicked will take you to the relevant bonding group in the **DSL Bonding Group** node.For more information about the attributes in this section, refer to Table 28-2.

Note The name of this section changes based on the value in the **Operating Mode** field. If the value in the **Operating Mode** field is **None**, then this section is titled **XDSL**. If the value in this field refers to a ADSL device (for example **G.992.5 Annex A**), then this section is titled **ADSL Ver 2/2+**. If the value in this field refers to a VDSL device (for example **G.993.2**), then this section is titled **VDSL Ver2**.

Viewing the DSL Bonding Group Configuration Details

Channel bonding is a computer networking arrangement in which two or more network interfaces on a host computer are combined for redundancy or increased throughput. Similarly, multiple DSL lines can be bonded to give higher bandwidth.

A bonded DSL uses multiple DSL connections and aggregates the bandwidth together to increase the speed of upload and download process.

To view the DSL bonding group details:

Step 1 Right-click the required device in Prime Network Vision and choose **Inventory**.

Step 2 Expand the **Logical Inventory** node and choose **DSL Bonding Groups**. The relevant details are displayed in the content pane as shown in Figure 28-2.

Figure 28-2 DSL Bonding Group Node

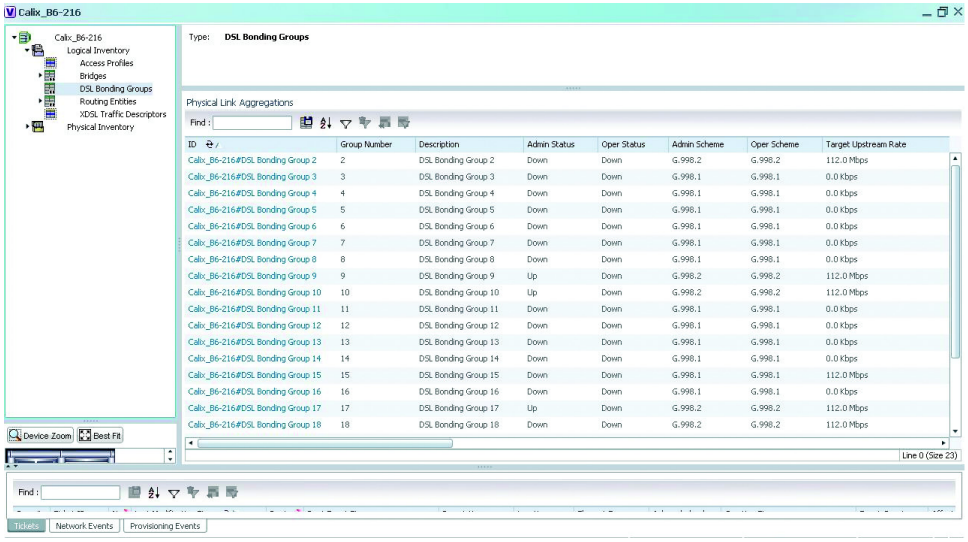

Table 28-3 describes the DSL Bonding Group details.

Table 28-3 DSL Bonding Group Details

Field	Description
Physical Link Aggregations	
ID	The unique identification code of the DSL bonding group.
Group Number	The group number for the DSL bonding group.
Description	The description of the DSL bonding group.
Containing TPs	The termination points associated with the DSL bonding group.
Admin Status	The administrative status of the DSL bonding group, which can be any one of the following: • Up • Down
Oper Status	The operative status of the DSL bonding group, which can be any one of the following: • Up • Down
Admin Scheme	The administrative scheme of the DSL bonding group, which can be any one of the following: • G998.1 • G998.2 • Unknown
Oper Scheme	The operative scheme of the DSL bonding group, which can be any one of the following: • G998.1 • G998.2 • Unknown
Target Upstream Rate	The target upstream rate (in kbps or mbps) of the DSL bonding group.
Target Downstream Rate	The target downstream rate (in kbps or mbps) of the DSL bonding group.
Upstream Rate	The current upstream rate (in kbps or mbps) of the DSL bonding group.
Downstream Rate	The current downstream rate (in kbps or mbps) of the DSL bonding group.
Minimum Upstream Rate	The minimum upstream rate (in kbps or mbps) of the DSL bonding group.
Minimum Downstream Rate	The minimum downstream rate (in kbps or mbps) of the DSL bonding group.
Number of Aggregated Ports	The number of aggregated ports that is configured in the DSL bonding group.
Maximum Aggregated Ports	The maximum number of aggregated ports that can be configured in the DSL bonding group.

Table 28-3 DSL Bonding Group Details

Field	Description
Peer Admin Scheme	The peer administrative scheme of the DSL bonding group, which can be any one of the following: • G998.1 • G998.2 • Unknown
Peer Oper Scheme	The peer operational scheme of the DSL bonding group, which can be any one of the following: • G998.1 • G998.2 • Unknown
Designated End Point	The designated end point of the DSL bonding group.
Maximum Peer Aggregated Ports	The maximum number of peer aggregated ports that is configured in the DSL bonding group.
Discovery Code	The unique 6-octet-long code that is used by the Discovery function of the Generic Bonding Sub-layer port.
G988.2 Properties	
Control Protocol Type	The type of control protocol currently operating on the G.bond port, which can be any one of the following: • BACP • G.HS This field defaults to G.HS. **Note** This field is available only if the **Oper Scheme** for the DSL bonding group is specified as **G.988.2**.
PTM Encapsulation Type	The Packet Transfer Mode-Transport Convergence Layer (PTM-TC) encapsulation type supported by the G.bond port, which can be any one of the following: • 64/65-octet • HDLC **Note** This field is available only if the **Oper Scheme** for the DSL bonding group is specified as **G.988.2**.
Is BACP Supported	Indicates whether the Bonding Aggregation Control Protocol (BACP) is supported y the G.bond port. **Note** This field is available only if the **Oper Scheme** for the DSL bonding group is specified as **G.988.2**.

Viewing Transport Models Supported by ADSL2+ and VDSL2

In Prime Network, the following transport models are supported in the ADSL2+ and VDSL2 technologies:

- N-to-One—In this most commonly used model, a Service VLAN tag (S-Vid) is assigned to a service throughout the network. The destination is determined by the MAC address of the device and the service VLAN at the edge of the network. This transport model is supported on ADSL2+ and VDSL2 line cards.
- One-to-One—In this model, the destination is determined by a pair of VLAN tags, which must be unique throughout the network. This transport model is supported on B6 VDSL2 line cards.
- Transparent LAN Service (TLS) —This model allows transparency to the business customers while transporting business traffic between geographically disperse business endpoints. The traffic that is transported by the infrastructure that interconnects the locations is transparent to the carrier network (including protocols such as STP, unicast and multicast protocols). The traffic can be of any format and often includes VLAN tagged traffic.

Viewing the N-to-One Access Profile

To view the N-to-One access profile:

Step 1 Right-click the required device in Prime Network Vision and choose **Inventory**.

Step 2 Expand the **Logical Inventory** node and choose **N-to-One Access Profiles**. The relevant details are displayed in the content pane as shown in Figure 28-3.

Figure 28-3 N-to-One Access Profile

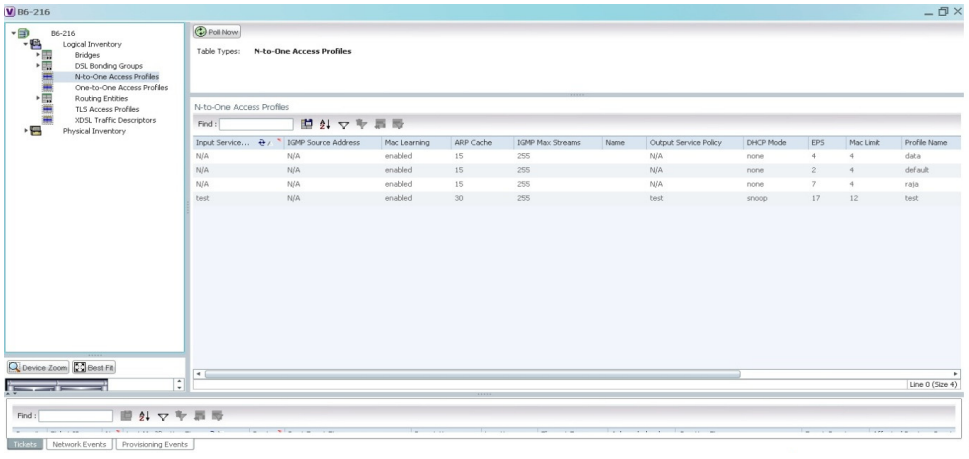

Table 28-4 describes the N-to-One Access Profile details.

Table 28-4 N-to-One Access Profiles

Field	Description
Table Types	The type of access profile, which in this instance is **N-to-One Access Profiles**.
N-to-One Access Profiles	
Input Service	The input service policy applicable to the device.
IGMP Source Address	The Internet Group Management Protocol (IGM) source address.
Mac Learning	Indicates whether the Mac Learning feature is enabled for the device.
ARP Cache	The Address Resolution Protocol (ARP) cache of the device. **Note** ARP converts an IP address to its corresponding physical network address, which is usually implemented in the device drivers of the network operating systems. When a device wants to send data to another device over ethernet, it must first determine the MAC address of the target device. These IP to MAC address mappings are derived from the ARP cache maintained on each device.
IGMP Max Streams	The maximum Internet Group Management Protocol (IGMP) stream value.
Name	The name of the N-to-One access profile.
Output Service Policy	The output service policy applicable to the device.
DHCP Mode	The Dynamic Host Configuration Protocol (DHCP) mode applicable to the device.
EPS	The Ethernet Protection Switching (EPS) VLAN tag assigned to the device. **Note** The VLAN tag numbers can be any value between 2 and 122 when B6 line cards access rings. When the B6-450 is used on aggregation rings, it supports VLAN tag numbers between 2 and 1000.
Mac Limit	The maximum number of MAC addresses allowed for the service.
Profile Name	The name of the access profile.
Input Service Policy	The name of the service policy that is assigned to the access profile as an input policy. This is a rate-limiting policy that controls and limits all unicast incoming traffic from the B6 card to the subscriber.
Output Service Policy	The name of the service policy that is assigned to the access profile as an output policy. This is a rate-limiting policy that controls and limits all unicast outgoing traffic to the B6 card from the subscriber.

Viewing the One-to-One Access Profile

To view the One-to-One access profile details, expand the logical inventory and choose **One-to-One Access Profiles**.

Figure 28-4 One-to-One Access Profile

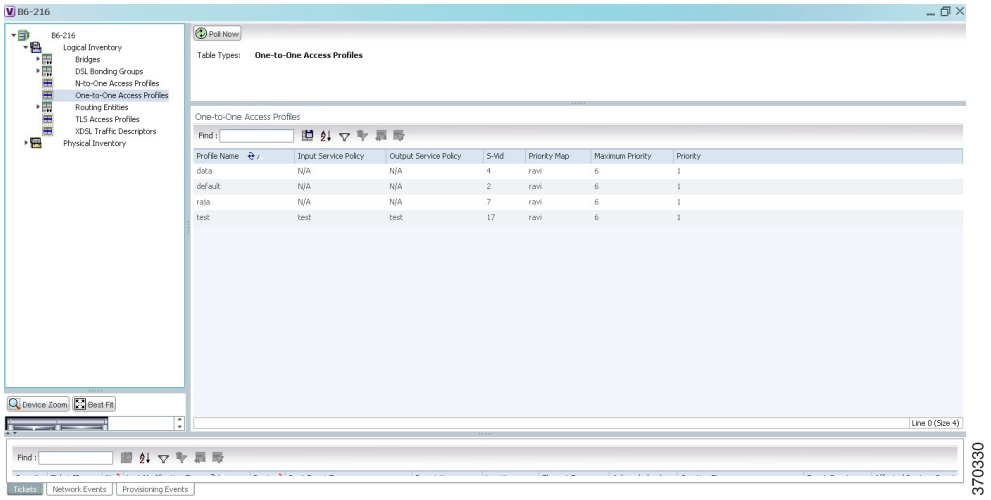

Table 28-5 describes the N-to-One Access Profile details.

Table 28-5 N-to-One Access Profiles

Field	Description
Table Types	The type of access profile, which in this instance is **One-to-One Access Profile**.
One-to-One Access Profiles	
Profile Name	The name of the One-to-one access profile.
Input Service Policy	The name of the service policy that is assigned to the access profile as an input policy. This is a rate-limiting policy that controls and limits all unicast incoming traffic from the B6 card to the subscriber.
Output Service Policy	The name of the service policy that is assigned to the access profile as an output policy. This is a rate-limiting policy that controls and limits all unicast outgoing traffic to the B6 card from the subscriber.
S-Vid	The unique Subscriber VLAN identification code. This code can be any value between 2 and 122.
Priority Map	The name of the 802.1p priority map, which is available in the DSCP-to-DOTP mapping profile.
Maximum Priority	The maximum 802.1 priority level.
Priority	The 802.1 priority level configured and applied to the incoming S-VID packet. This level can be any value between 0 and 6.

Viewing the TLS Access Profile

To view the TLS access profile details:

Step 1 Right-click the required device in Prime Network Vision and choose **Inventory**.

Step 2 Expand the **Logical Inventory** node and choose **TLS Access Profiles**. The relevant details are displayed in the content pane as shown in Figure 28-5.

Figure 28-5 TLS Access Profiles

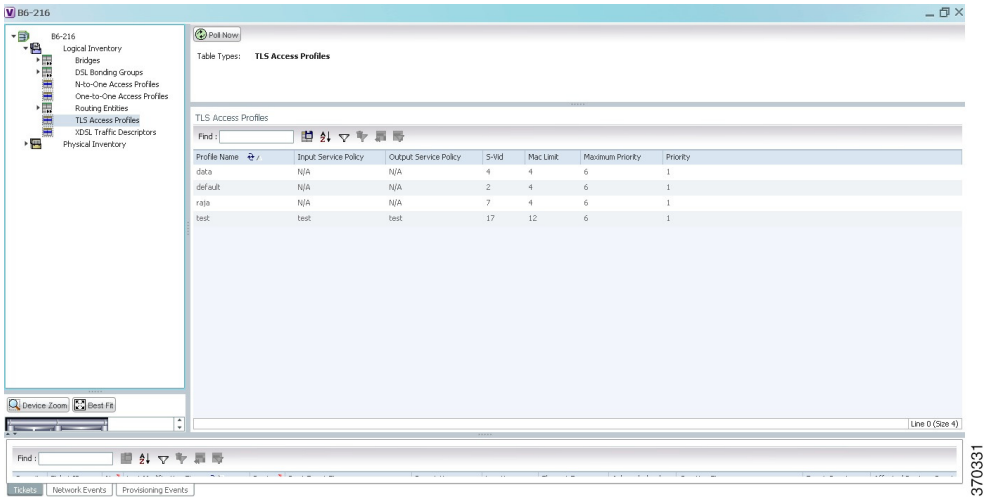

Table 28-6 describes the N-to-One Access Profile details.

Table 28-6 N-to-One Access Profiles

Field	Description
Table Types	The type of access profile, which in this instance is **TLS Access Profile**.
TLS Access Profiles	
Profile Name	The name of the TLS access profile.
Input Service Policy	The name of the service policy that is assigned to the access profile as an input policy. This is a rate-limiting policy that controls and limits all unicast incoming traffic from the B6 card to the subscriber.
Output Service Policy	The name of the service policy that is assigned to the access profile as an output policy. This is a rate-limiting policy that controls and limits all unicast outgoing traffic to the B6 card from the subscriber.
S-Vid	The unique Subscriber VLAN identification code. This code can be any value between 2 and 122.
Mac Limit	The maximum number of MAC addresses allowed for the specific service.
Maximum Priority	The maximum 802.1 priority level.
Priority	The 802.1 priority level configured and applied to the incoming S-VID packet. This level can be any value between 0 and 6.