Cisco Prisma D-PON Optical Network Terminal

Fiber-to-the-Home PON Solution for DOCSIS-Based Operators

The Need for Bandwidth

In today's cable environments, bandwidth-intensive content combined with advanced video, voice and data services consume the great majority of bandwidth in most broadband networks. To support continued bandwidth growth, you need innovative design solutions based on proven technologies that alleviate the need for costly overbuilds, support rapid service velocity, and allow for flexible and scalable networks.

The Need for HFC Migration

As services continue to expand and consumer demand continues to grow, cable operators are challenged to deliver cable-centric/cable-friendly fiber-to-the-home (FTTH) technology that does not require the significant changes to network management necessary with earlier FTTH cable architectures.

Cisco Prisma D-PON Solution

The Cisco® Prisma D-PON solution delivers an industry-leading, FTTH option for DOCSIS-based service providers that is fully compatible with the RFoG standard.. Our solution provides the benefits of a FTTH passive optical network (PON) while maintaining the existing HFC back office systems, such as the billing support system (BSS), operations support system (OSS), broadcast video, narrowcast video, switched digital video (SDV), video-on-demand (VoD), DOCSIS data, DOCSIS voice over Internet protocol (VoIP), and video over DOCSIS (VDOC).

The Cisco Prisma D-PON solution is the ideal union of ubiquitous HFC systems and the powerful potential of an all-fiber network. More importantly, the D-PON solution allows for incremental FTTH growth on a future-flexible, low-maintenance architecture while using the existing back office infrastructure

The Cisco Prisma D-PON solution utilizes a pay-as-you-grow philosophy based on the Cisco Prisma II platform.
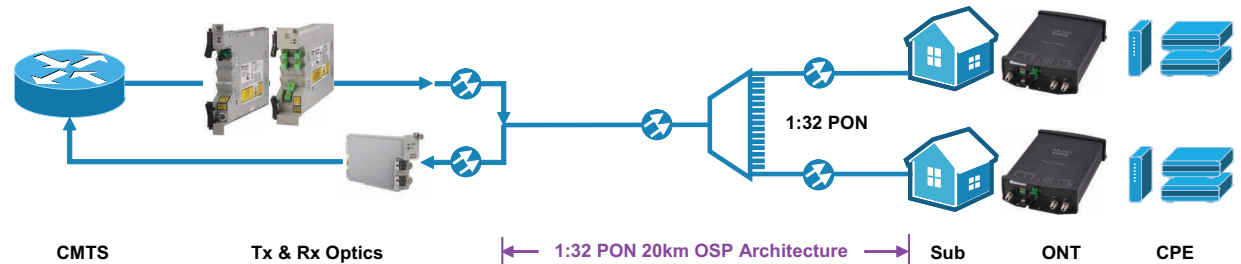
Figure 1 - D-PON System Architecture

Future Proof Value

· Use D-PON to provide video service to xPON commercial customers
· Use xPON to market symmetric bandwidth to residential D-PON customers
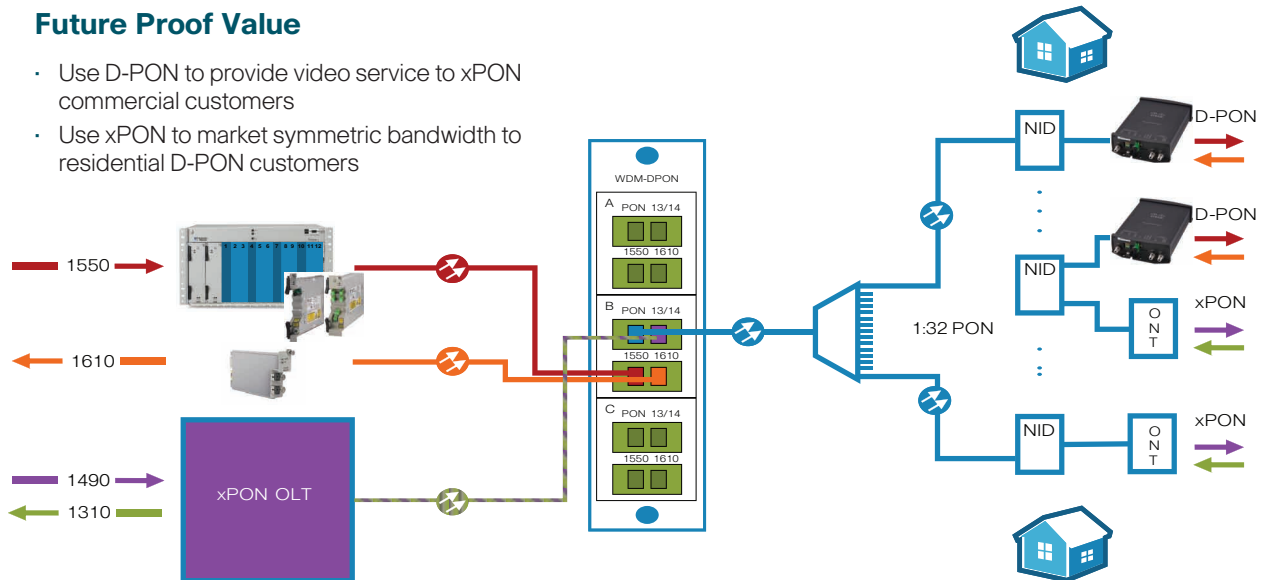
Figure 2 - Wavelength Migration

The transmitter erbium-doped fiber amplifier (EDFA) and receiver modules are designed for FTTH deployments and include:

· Industry-leading, low-power solution
· 1GHz spectrum (78 analog channels and 75 QAMs)
· Full DOCSIS 3.0 upstream bonding
· Reduce service group size without a truck roll

The Cisco Prisma D-PON Optical Network Terminal (ONT) provides:

· 17dBmV output
· Multiple powering options
· 1310 or 1610nm return paths
· Supports DOCSIS 3.0 four-channel 64 QAM upstream channel bonding

Figure 3 - Virtual 512 Home Node (1 Service Group of 16 PONs)

Figure 4 - Virtual 256 Home Nodes (Two Service Groups of Eight PONs)

Figure 5 - Virtual 128 Home Nodes (Four Service Groups of Four PONs)

Benefits of the Cisco Prisma D-PON Solution

The primary benefits of the Prisma D-PON solution are:

- Ideal low-cost solution for master planned community (MPC) and greenfield growth
  - Provides cable operators with a transparent operating transition from HFC networks to FTTH while maintaining existing OSS and BSS systems
  - Scales better than GPON or EPON for incremental growth
- Industry leading performance… it's RFoG+!
- No Back Office Change Required
  - Uses existing DOCSIS control; can share same CMTS shelf with existing HFC plant
  - Does not require modification of video delivery infrastructure
  - Service is provisioned just like HFC
- Future Flexible Network
  - Implement bandwidth upgrades without a truck roll; incrementally reduce service group sizes from 512 to 256 to 128 homes in the headend without having to make any changes or upgrades to the OSP
  - ITU and IEEE compatible 1:32, 20km PON OSP architecture allows low-cost future upgrade path to any industry standard FTTH solution (architecture not proprietary)
  - Clean plant helps ensure simple upgrade to DOCSIS 2.0, 3.0, and/or VoIP services

- Robust Bandwidth
  - 1GHz downstream (supports standard CATV 78 Analog / 75 QAMs); capable of supporting DOCSIS 3.0 data rates and 48 CNR at the home
- Industry Leading Reverse Path Performance
  - Patent pending reverse path technology provides 28dB of link budget with 48dB CNR
  - Provides DOCSIS 3.0 channel bonding of four 64 QAM channels over a 20km link with a 1:32 PON splitter
  - True PON architecture reduces operating expense and ingress concerns over traditional HFC

Why Cisco?

- The Cisco Prisma D-PON architecture provides a truly passive, migratable solution to FTTH deployments for cable operators. The Cisco Prisma D-PON is especially beneficial for operators who need to deliver FTTH service for greenfield deployments. Using a 32-way split PON infrastructure, Cisco enables you to create an effective optical budget in both directions.

- The downstream transport optics utilize 1550nm technology to provide cost-effective transport to get to the side of the home. For the upstream traffic, technology developments at the ONT location will provide a cost-effective way to support distances of 20km. This helps avoid having to insert multiple costly actives into the network to amplify signals to compensate for any loss.

- The Cisco Prisma D-PON architecture is a valuable and cost-effective solution for cable operators as they respond to the fiber-to-the-premise requirements that most residential and commercial developers are defining for new planned communities and multi-use facilities.

Figure 6 - Prisma D-PON ONT

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