AXOS®

Solution Brief

DPx: Virtualized DOCSIS Connector for PON that Enables Seamless SDN Transition

DPx: Virtualized DOCSIS Connector for PON that Enables Seamless SDN Transition DPx is a Virtualized DOCSIS Connector that implements a microservices architecture designed to automate service delivery and management on anyPON and anyPHY into DOCSIS back office systems. DPx mediates between DOCSIS OSSI and NETCONF to mimic an HFC network service activation and delivery model, thereby eliminating the need for custom OSS integration.

Calix

AXOS®

AXOS is an open Linux-based componentized Operating System designed for Software Defined Access networks to accelerate Broadband service delivery.

AXOS e3®

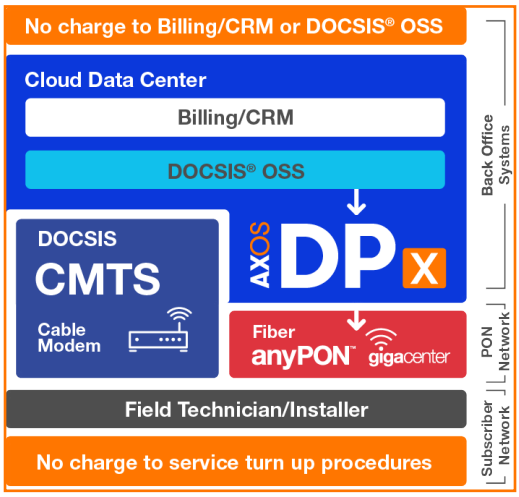
AXOS e7®

The solution combines AXOS powered OLTs, GigaCenter ONUs and a DPx virtualized software. The DPx Virtualized DOCSIS Connector implements DPoE and DPoG conformant interfaces, defined to configure and manage services over DOCSIS. DPx creates virtual cable modems (vCM), virtual cable modem termination systems (vCMTS) and virtual embedded Multi-media terminal adapters (vETMA) emulating the service management interface of an HFC network:

Virtual Cable Modem (vCM): Emulates the OSS interface for configuration (DHCP, TFTP, TOD) and management (SNMP, SysLog) of the Calix anyPON solution set.

Virtual Cable Modem Termination System (vCMTS): Emulates the OSS interface for management (SNMP, Syslog) for the Calix anyPON solution set.

Virtual embedded Multimedia Terminal Adapter (vETMA): Emulates the OSS interface for configuration voice over IP services.



The Calix AXOS DPx solution automates delivery of Gigabit and 10 Gigabit Ethernet high speed data, RF video, IPTV video, and PacketCable voice over IP services without changing back office integration or operational procedures. Calix DPx software, along with AXOS based systems, facilitates migration to SDN on the carrier's timeline. This migration is enabled using standard NETCONF interfaces to enable direct integration to anySDN controller by simply bypassing the DPx VDC. This seamless migration to a programmable access network removes to need to manage millions of configuration files while enabling dynamic service changes programmatically.

DPX Delivers:

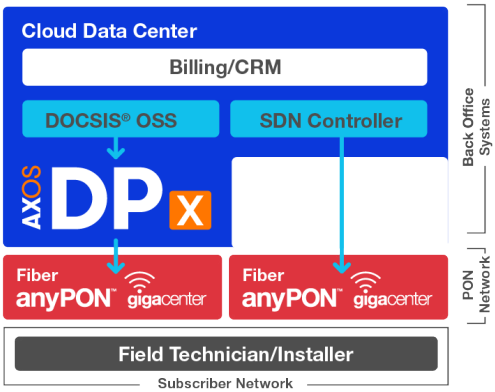
- Gigabit DOCSIS provisioning and 10Gigabit services over anyPON
- Seamless PON integration into a cable provider's operations
- No change to the OSS or DOCSIS provisioning manager
- No change to service turn-up procedures

KEY ATTRIBUTES

The DPx implements virtual components using a containerized Dockerk container architecture leveraging Linux LXCs to implement virtual Cable Modem (vCM) and virtual Cable Modem Termination system (vCMTS) virtualized for deployment on multiple hypervisor platforms:

- vCMTS – virtual Cable Modem Termination System including:
  - Command Line Interface (CLI)
  - Simple Network Management Protocol (SNMP) agent
  - syslog agent
  - NETCONF interface to anyPON system
- vCM – virtual Cable Modem for provisioning and management of ONU services:
  - DPoE/DPoG conformant DHCP client IP addressing.
  - TFTP for configuration file download.
  - Decoding and parsing of DOCSIS configuration file.
- vCM – virtual Cable Modem for provisioning and management of ONU services:
  - DPoE/DPoG conformant DHCP client IP addressing.
  - TFTP for configuration file download.
  - Decoding and parsing of DOCSIS configuration file.
  - Leverages vCMTS for data and video service provisioning.
  - vETMA – virtual embedded Multimedia Terminal adapter (vETMA)
  - Packet Cable 2.0 conformant DHCP client IP addressing
  - TFTP for configuration file download
  - Decoding and parsing of Packet Cable configuration file.
  - Leverages vCMTS for voice service provisioning.

THE DPX SOLUTION SUPPORTS THE FOLLOWING SERVICES ON 10G EPON, GPON, NGPON2:



Voice Services

- Packet Cable 1.0/1.5 MGCP/NCS
- Packet Cable 2.0 SIP

Data Services

- Layer 2 service flows for business services
- Data speeds up to 10 Gigabit per second

Video Services

- RF video
- IPTV

DPx is fully virtualized and supports the following hypervisor operating systems with required compute and store requirements for each vCMTS:

Supported Hypervisors	Resource Requirements
XEN Server 6.5 and 7.0	Virtual RAM (vRAM)—2GB
VMWare ESXi 6.5	Virtual CPU (vCPU)—2
KVM 1.2.1	Virtual Disk (vDisk)—40 GB

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