Open Access – AT&T Specs

OCP Telco Engineering Workshop 05.15.2017

OPEN Compute Project

Architecture & Planning
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AT&T Specifications Overview

Common Characteristics for all Specs

Disaggregation and SDN Enablement:
Minimal software and state in the box.
Separation of access from aggregation and subscriber management.
Ability to Re-compose into various deployment scenarios for different carriers and services.

Hardware Design Strategies:
Reduced memory – because there is less firmware to support
Removed flash – load the SOC OS from the cloud, so there is no flash maintenance, no minutes of downtime from re-flashing, less power and heat
Remove/reduce local aggregation – placed into whitebox switch. This supports engineering the oversubscription and redundancy. Pick 1 or 2 uplinks.
Add BMC – provides ability to reset individual SoCs, gain console, and manage whole box items like fans, power supplies, thermals.
Run control and management software in a separate computer. By using containers and micro-services in cloud compute, we reduce the times that the hardware needs to be rebooted in order to upgrade software or firmware.

NOTE: some designs still include an optional CPU module for times and places where onboard software is desired or required.
G.Fast Specifications

16 Port DPU
8 Port DPU
4 Port DPU
Single Port DPU
MDU applications

Design one common “logic board”
Create multiple media adapters to fit various deployment scenarios.
Media includes:
- Coax and twisted pair
- Reverse power feed option
- Triplexers to mix video signals over coax
G.Fast 8 Port DPU

MDU Applications

Similar to 16 port unit except half the scale
Design one common “logic board”
Create multiple media adapters to fit various deployment scenarios.

Media includes:
- Coax and twisted pair
- Reverse power feed option
- Triplexers to mix video signals over coax
SFU Applications

Design two common “logic boards?”
Still evaluating options
Media includes:
- Twisted pair
- Reverse power feed option
Aggregation switch removed or partly supported through PON uplink silicon.
G.Fast Single Port DPU

SFU Applications
Design two common “logic boards?”
Still evaluating options

Media includes:
- Coax and twisted pair
- Reverse power feed
PON Specifications

XGS-PON 24 port pizzabox
XGS-PON 16 port pizzabox
XGS-PON 4 port clamshell
XGS-PON single port SFP+
XGS-PON 24 Port 1RU Device

Pizza box
24 XFP PON Ports, 6 100G QSFP28 Ports
FPGA PON MACs
Redundant Hot Swap AC/DC power modules, Hot Swap Fan Modules
ComE CPU
BMC

Still Under Consideration
ASIC or NPU for aggregation
Can we run the driver firmware externally, like the Open GPON OLT? (making the CPU optional)
Functional Block Architecture

*PON ports per FPGA is exemplary
XGS-PON 16 Port 1RU Device

Pizza box
Previously presented.

Updates
BMC device
Com Express Type 7 Host Module, with access to control and data planes.
PCIe changes

Still Under Consideration
Can we eliminate the PCI Switch (not needed for some Com Express CPUs.) (Dual host?)
Can we run the driver firmware externally, like the Open GPON OLT? (making the CPU optional)
AT&T Specifications Overview

XGS-PON 4 Port Clamshell

Environmental Box
Previously presented.

Updates
BMC functions incorporated in processor.

Open Issues
PCIe switch vs. CPU choice.
Is ComExpress suitable for OSP deployment, and if not, then which single processor is best choice?
Can we run the driver firmware externally, like the Open GPON OLT? (making the CPU a BMC only)
XGS-PON Single Port SFP+

Pluggable Optic
Previously presented

Updates
VOLTHA software support.

Open Issues
None at this time.
Open Software Stack

ONOS

VOLTHA
Access Software Architecture

Develop high level features and functions rapidly and independent of underlying access media type.

VOLTHA is a software layer that acts as an isolator between an abstract (vendor agnostic) access management system and access media adaptation (MA) hardware.

SDN controller contains a distributed scale-out set of operational control plane network state.

Access manager is a common manager for all access devices that will manage the device capabilities implemented in VOLTHA. It is intended for Access manager to be modular, extensible, vendor agnostic and access technology independent.
Open Source Driver

- Uses pipeline and configuration models in the Core
- Accepts extensions for protocol-specific models.
- Uses Protocol Buffers to “compile” northbound protocols.
- Allows Drivers (like SAI) to provide capabilities to the model, and also allows exposing extensions.
- Work underway for PON
- G.Fast and aggregation Si in planning stage