SEBA White Box Access: XGS-PON and Beyond

Jeff Catlin
Edgecore Networks
Where do SEBA “White Box” devices reside?
What are SEBA White Box devices?

• Disaggregated hardware designs
  • Preferably an open design through OCP or TIP but not mandatory

• Ability to run various NOS options including Open-OLT driver/adapter
  • XGS-PON/GPON today future EPON, G.Fast, etc.

• Participation in ONF SEBA group
SEBA Whitebox device software

- Base software package used for SEBA devices
  - ONIE (OCP)
  - Open Network Linux (OCP)
  - Redfish baseline management profile (OCP)
  - OF-DPA and/or Stratum (Trellis Switches) (ONF)
  - Open OLT adapter and driver support for PON devices (ONF)
SEBA White Box designs

Without embedded switch silicon

With embedded switch silicon
Today’s view of SEBA White Box options

- Celestica / AT&T design – Initial specification for Open GPON OLT drafted by AT&T 6/9/2015 in OCP Telco group.
  - Resulting product produced by Celestica
  - 48*SFP GPON ports + 24*10G uplink ports ( housed in 6*QSFP connectors)
  - Does not support switch silicon in design each SOC has 2*10G uplinks
  - Design based upon Micorsemi PAS5211 GPON SOC *12
Today’s view of SEBA White Box options

- Edgecore / AT&T design: Initial specification produced by AT&T 3/3/2016 in OCP for a 16 port Open XGS-PON OLT
  - Resulting product produced by Edgecore Networks
  - 16*XFP XGS-PON ports
    - HW Capable of 10G EPON
  - 4*QSFP28 100G Uplinks
  - Includes internal switch silicon
    - Broadcom Qumran-AX
    - Broadcom “Maple” XGS-PON SOC
Today’s view of SEBA White Box options

- Edgecore/Deutsche Telekom Design: Initial specification produced by DT 9/14/2017 in OCP for an Open GPON-OLT
- Resulting product produced by Edgecore Networks
  - 64*SFP GPON Ports
  - 2*QSFP28 100G Uplinks
  - 8*SFP28 25G Uplinks
  - Includes internal switch silicon Broadcom Qumran-AX
  - Broadcom “Maple” GPON SOC
Today’s view of SEBA White Box offerings

- CIG - FPGA Based XGS-PON OLT
- 24 * XFP XGS-PON Ports
  - HW Capable of 10G EPON
- 6 * QSFP28 100G Uplinks
  - Includes internal switching silicon
- X86 Control plane processor
Today’s View of SEBA White Box offerings

• TiBiT Worlds first pluggable OLT!
  • Support for XGS-PON
  • HW capable of 10G EPON
• Can be used in any White Box 10G Ethernet Switch
Today’s View of SEBA White Box offerings

- TiBit - Pluggable XGS-PON/EPON ONU
- CIG - Pluggable XGS-PON/EPON ONU
- Other ONUs – Alpha Networks, Celestica, Iskratel, MoviStar
View of future SEBA White Box offerings

- Future products utilize SFP+/28 ports for high speed PON connectivity compared to XFP in use today.
- Future products support various PON options in HW including GPON, EPON, XGS-PON, 10G-EPON, NG-PON2, 25G-EPON.
- Coexistence mode is supported on single physical PON port.
View of future SEBA White Box offerings

- AT&T Draft specification in OCP for Open Programmable-PON OLT
  - Specification has standard 19” rack and OCP CG19 form factors
  - 32 * SFP+/28 PON Ports 8* QSFP28 100G Uplinks
  - Specification calls for FPGA based PON SOC
    - Support for 25G PON with reduced operational port count
  - Specification does not require (although optional) internal switching silicon
  - Specification does not require (although optional) control plane CPU
View of future SEBA White Box offerings
View of future SEBA White Box offerings

- Next generation silicon based XGS-PON OLT
  - Support for Broadcom BCM68650 “Aspen” PON SOC
    - Aspen supports 16 * XGS-PON ports
  - OLT Support for 32 * SFP+/28 physical PON ports
  - Each SFP28 PON port can support “Coexistence Mode” with two PON trees (GPON and XGS-PON) simultaneously
    - Quadplexer SFP+ module provides different wavelengths for each PON tree
  - Support for 25G PON with reduced operational port count
  - Reduced port count OLT versions for outdoor plant compliant environment
View of future SEBA White Box offerings

- Timing
- FANs
- CPU
- BMC
- PSU

Switch Silicon

Aspen

SFP+/28 PON Ports

Aspen

N*QSFP28 100G

Aspen

SFP+/28 PON Ports

- XGS-PON
- GPON
Other possible SEBA White Box offerings

• Numerous G.fast specifications approved in OCP Telco group and awaiting follow on products

• Introduction of EPON VOLTHA adapter for devices capable of EPON/XGS-PON (GPON)

• Introduction of 25G-EPON operational mode
Next Steps

• If you’re a carrier get involved in ONF and OCP and specify your product needs!

• If you’re a vendor participate and contribute your designs and resources to OCP and ONF!

• If you are an integrator choose products for your solution that carry the OCP Logo and run ONF software solutions!

https://www.opencompute.org/products?refinementList%5Bcategory%5D=&refinementList%5Bsolution_provider%5D=&page=1
Thank You