What are “Open” hardware designs?

- Open Hardware designs are contributions to an Open Source community
  - Open Compute
  - Telecom Infra Project
- Open Hardware designs can differ in contribution collateral
  - Specification only i.e. OCP inspired
  - Specification and complete design files i.e. OCP Accepted
- ONF has been leveraging Open Hardware designs for ~5 years!
ONF Designs

SEBA

NG-SDN

Trellis

COMAC

ODTN

ONF Connect
ONF Trellis building block

- Trellis is common in most ONF reference designs
- Trellis contains generic Leaf/Spine fabric, Compute nodes, Controller, and networking functions
Where are Open hardware designs used today with ONF Trellis?

- Spine Switches used here
- Network Switches used here
- Compute used here
- Network “Access” devices used here
Network Switches for Trellis today

Switches used for the Leaf/Spine architecture historically following Data Center (OCP Networking group) type of products

“Recommended” Switches

- **1G/10G models (with 40G uplinks)**
  - **OCP Accepted™** EdgeCore AS5712-54X
  - **OCP Accepted™** EdgeCore AS5812-54X
  - QuantaMesh T3048-LY8
  - Delta AG7648
  - Inventec D6254
- **25G models (with 100G uplinks)**
  - **OCP Accepted™** EdgeCore AS7712-32X (with 25G breakout cable)
  - QuantaMesh BMS T7032-IX1/IX1B (with 25G breakout cable)
  - Inventec D7054Q28B
- **40G models**
  - **OCP Accepted™** EdgeCore AS6712-32X
- **100G models**
  - **OCP Accepted™** EdgeCore AS7712-32X
  - QuantaMesh BMS T7032-IX1/IX1B
  - **OCP Accepted™** Inventec D7032Q28B (verified by Inventec)
- **400G models**
  - Future
Network Switches for Stratum

Additional Switch support soon to come!
Network Switch software package

• Base software package used for Trellis Switches
  • ONIE (OCP)
  • Open Network Linux (OCP)
  • Redfish Baseline Management Profile (OCP)
  • OpenFlow implementation to match OF-DPA
  • Support of Stratum (ONF)
Open OCP switches available

- Here is a list of available 35+ switches from the OCP Networking group wiki
  - [https://www.opencompute.org/wiki/Networking/SpecsAndDesigns](https://www.opencompute.org/wiki/Networking/SpecsAndDesigns)
- OCP Marketplace
  - [https://www.opencompute.org/products](https://www.opencompute.org/products)
Network access devices used for Trellis/SEBA

- **OCP Accepted™ Edgecore AS5900-54** – Series of Metro Ethernet Switch(s)
- **OCP Accepted™ Edgecore ASXvOLT16** – OpenXGS-PON OLT
- **OCP Accepted™ Edgecore ASGvOLT64** – OpenGPON OLT
Open OCP Telco access products

- Here is a list of the contributions from the OCP Telco wiki
  - [https://www.opencompute.org/wiki/Telcos#Specs_and_Designs](https://www.opencompute.org/wiki/Telcos#Specs_and_Designs)
- OCP Marketplace
  - [https://www.opencompute.org/products](https://www.opencompute.org/products)
Many OCP choices available depending on workload needs.

- **OCP Inspired™** QuantaGrid D51B-1U server (2x Intel E5-2630 v4 10C 2.2GHz 85W, 64GB of RAM 2133MHz DDR4, 2x 500GB HDD, and a 40 Gig adapter)

- **OCP Server Wiki page**

- Over 40 options available on the OCP Marketplace
  - [https://www.opencompute.org/products](https://www.opencompute.org/products)

Compute used in Trellis
Other product/technology opportunities from OCP

**Data Center Facility**
The Datacenter Facility Project maximizes mechanical performance and thermal and electrical efficiency.

**Hardware Management**
The Hardware Management Project incorporates a set of existing tools and best practices for remote machine management.

**Networking**
The Open Computer Networking Project aims to facilitate the development of network hardware and software - together with trusted project validation and testing.

**Open System Firmware (Incubation)**
The Open System Firmware Project aims to create and deploy, at scale, an open source hardware platform initialization and OS load firmware optimized for web-scale cloud hardware.

**Security (Incubation)**
The Security Project creates designs and specifications to enable software security for all IT gear through collaboration with the wider Open Compute community.

**Server**
The OCP Server Project provides standardized server system specifications for scale computing.

**Teilo**
The OCP Teilo Project enlists the telecom industry and suppliers who are seeking to use datacenter infrastructure to deliver IT services.

**High Performance Computing (HPC)**
The HPC Project is focused on developing a fully open, heterogeneous computing, networking and fabric platform optimized for a multi-node processor.

**Rack & Power**
The focus of the Rack & Power Project Group is on rack standards, integrating into the datacenter infrastructure.

**Storage**
The Storage Project scope is on chassis and sleds, components and peripherals, networked enabled storage and compatibility solutions.
OCP Carrier grade rack

- OCP CG-Open Rack-19
  - Rack and Sled
    - Full and half width sleds
    - Power interconnections
    - In-Rack interconnection of sleds for data plane and management
OCP Datacenters

- Single 90KW Datacenters
- Modular 300KW Datacenters
  - Overall construction, Racks, Cooling, and Power all specified and ready to purchase!
Open hardware devices used in ONF ODTN

- Hardware Contribution TIP
- Software Support
  - ONIE (OCP)
  - Open Network Linux (OCP)
  - Redfish (OCP Baseline)
  - SONiC (OCP)

Edgecore “Cassini” Packet Transponder
Next Steps

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

• If you’re a vendor participate and contribute your specifications and products to Open Compute!

• If you are an integrator choose products for your solution that carry the OCP Logo available on the OCP Marketplace!

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