

OPEN

Compute Project

Enterprise Edge Gateway Specification

1.0

Base Hardware Specification Template

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1.2 Acknowledgements

The Contributors of this Specification would like to acknowledge the following companies for their feedback:

List all companies or individuals who may have assisted you with the specification by providing feedback and suggestions but did not provide any IP.

Jeff Catlin, Celestica
Target
Starbucks
Amazon

2. Compliance with OCP Tenets

2.1. Openness

This base specification is fully open sourced through the Open Compute foundation. This specification is being contributed to Open Compute to stimulate additional open design and /or product specifications applicable to the Enterprise market

2.2. Efficiency

The Enterprise Edge Gateway specification calls out the minimum requirements for a cost-conscious Enterprise POE /Gateway switch. These minimal requirements will lead to the most cost effective and power efficient design(s) for this type of product.

2.3. Impact

The Enterprise Edge Gateway is a Base specification contributed to the Open Compute Enterprise Connectivity Solutions Group. This specification contribution is expected to result in follow on design and/or product contributions stimulating an ecosystem of consumers and suppliers working on follow on projects for the Enterprise market in Open Compute.

2.4. Scale

The Enterprise Edge Gateway specification describes the requirements for a high-volume Ethernet Gateway switch that can be used for numerous use cases by a wide range of customers. It envisioned that the resulting products from his specification will be widely deployed in the market.

2.5. Sustainability

The Enterprise Edge Gateway is strategically built to maximize performance while accounting for reuse and recyclability so the user does not have to accept performance or functional degradation at any point in the product's lifespan.

The Enterprise Edge Gateway incorporates modularity into the product design, delivering sub-design and individual component reuse across multiple applications. The switch allows ease of serviceability with standard tools without damaging the components. Higher value components are designed to be easily separated for reuse while maintaining desired system functionality. Upgrading the of the most common failure components is modularized allowing extended lifecycle of the product.

3. Version Table

Date	Version #	Author	Description
28-Feb-2023	0.2	Michael Lane	Base Specification Draft
10-Mar-2023	1.0	Michael Lane	Include edits from other contributors

4. Scope

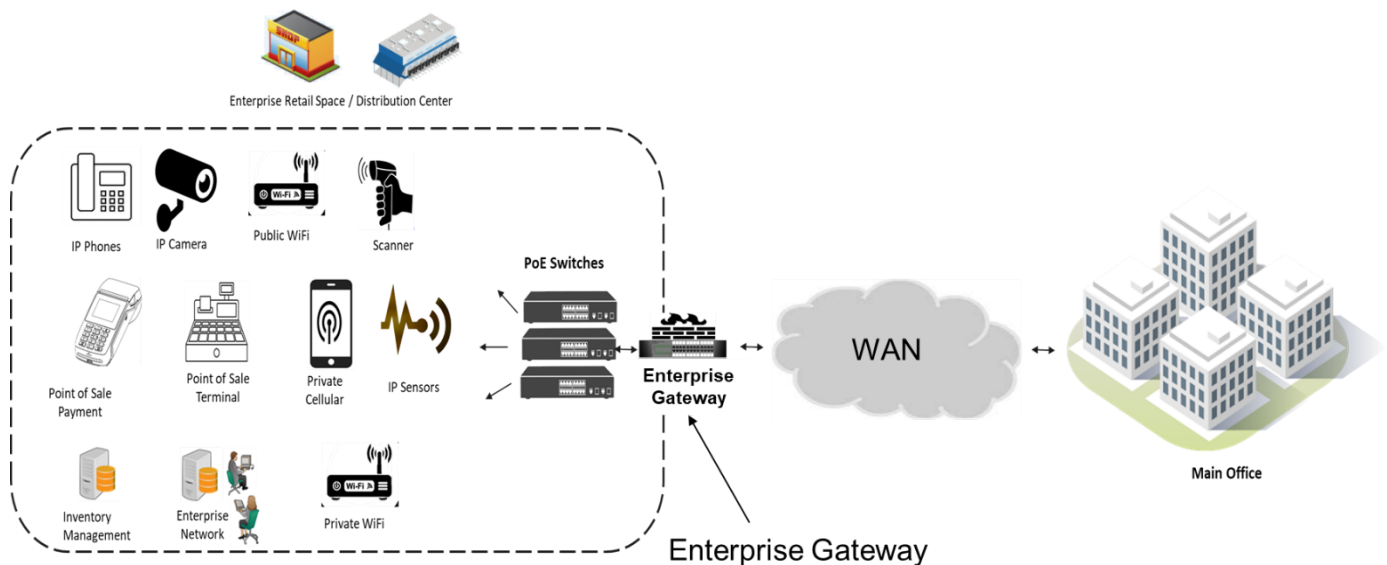
This document defines the technical details for the Base Specification of an Enterprise Edge Gateway.

Any supplier seeking OCP recognition for a hardware product based on this Specification must be 100% compliant with any and all features or requirements described in this Specification.

5. Overview

The Enterprise Edge Gateway is a Networking device that is intended to sit at the Edge of an Enterprise remote network. This remote network will be connected to the main corporate or campus network through some type of Wide Area Network (WAN) connection. Through this WAN connection the Enterprise Edge Gateway will be capable of performing SASE / SD-WAN functions such as, Firewalling, Zero Trust Network Access, Secure Web Gateway, Anti-Virus protection and others. The WAN connections could be from standard Ethernet interfaces, optical, or cellular backhaul connections.

On the Local Area Networking (LAN) side the Enterprise Edge Gateway will provide connections to additional network infrastructure devices (switches, Wi-Fi APs, sub-GHz gateways), a larger number of IOT devices located in the edge network, and end users. These IOT devices could include card readers, environmental sensors, weight sensors, control systems, cameras, and many other types of devices. Connectivity to users/devices in the local area network can be from wired connections supporting Power Over Ethernet or Wi-Fi connections.



6. Rack Compatibility

The Enterprise Edge Gateway will be rack mountable in a standard EIA-310 rack. Rack mounting will be accomplished by standard rack mounting “ears” and/or a rack mounting rail kit.

7. Physical Specifications

The Enterprise Edge Gateway will be a 1 RU device with the following estimated mechanical dimensions

Length	~300+ mm
Width	~440mm
Height	~44mm

8. Thermal Design Requirements

Airflow Direction

The Enterprise Edge Gateway will support Front to Back airflow with the system fans drawing air into the unit from the front (port side) with the heated air exiting from the rear of the unit (power side).

Cooling System

The Enterprise Edge Gateway will support redundant modular system fan modules. These fan modules will be field replaceable.

Thermal Monitoring

The Enterprise Edge Gateway will support sufficient internal on-board and component thermal sensors that are readable from the system CPU. The system fan speed can be adjusted based upon reading of this thermal sensor(s).

Environmental:

The Enterprise Edge Gateway must support the following minimum requirement for operating and storage temperatures:

Operating: 0-45C @6000ft, 10% - 95% (non-condensing)

Storage: -20C – 60C, 5%-90% (non-condensing)

9. I/O System

Optional Functionality Overview

The Enterprise Edge Gateway starts with two base SKUs being a 28-port and a 52-port version (including uplink ports). Additional functionality can be added to these base designs at build time.

	<u>CPU Module</u>	<u>Wi-Fi</u>	<u>LTE/5G</u>	<u>PoE</u>
Base Model 24 Ports	Build Option	Build Option	Build Option	Build Option
Base Model 48 Ports	Build Option	Build Option	Build Option	Build Option

The Enterprise Edge Gateway will support the following I/O options

Network ports

The Enterprise Edge Gateway will support two different orderable port configuration options

Option 1

24 ports of standard 2.5Gb (10Mb, 100Mb, 1Gb, 2.5Gb full/half duplex capable) RJ45 Ethernet. These ports will optionally (separate orderable SKU) support Power over Ethernet (PoE). Power over Ethernet support for these ports will support 802.3 AF/AT/BT type 4 class 8. Reference PoE table below.

Option 2

32 ports of standard 1Gb (10Mb,100Mb,1Gb full/half duplex capable) RJ45 Ethernet plus 16 ports of 2.5Gb (10Mb, 100Mb, 1Gb, 2.5Gb full/half duplex capable) RJ45 Ethernet. All of these 48 ports will optionally (separate orderable SKU) support Power over Ethernet (PoE). Power over Ethernet support for these ports will support 802.3 AF/AT/BT type 4 class 8. Reference PoE table below.

Ethernet Uplink Ports

The Enterprise Edge Gateway switch will support four SFP28 ports capable of 10Gb/25Gb operation. These ports will support any MSA compliant SFP28 module.

	Type 1	Type 2	Type 3	Type 4
Name	PoE	PoE+	PoE++ UPoE	High Power PoE
PoE Standard	IEEE 802.3af	IEEE 802.3at	IEEE 802.3bt	IEEE 802.3bt
Max. Power Per Port	15.4W	30W	60W	100W
Power to PD	12.95W	25.5W	51W	71.3W
Twisted Pair Used	2-Pair	2-Pair	4-Pair	4-Pair
Supported Cables	Cat5e	Cat5e	Cat6A	Cat6A
Typical Application	IP Phone	Video Phone	MGMT Device	LED Lighting

Power Over Ethernet Overview

Management Port

The Enterprise Edge Gateway will support a RJ45 and an SFP 1Gb management interface connecting to the system CPU.

Serial Console Port

The Enterprise Edge Gateway will support a RJ45 serial console port for system management

USB Port

The Enterprise Edge Gateway will support at least one USB 3.0 type A port connecting to the system CPU

Wireless Connectivity Options

The Enterprise Edge Gateway will support build options (orderable SKUs) for wireless connectivity options including:

Wi-Fi Connectivity

The Enterprise Edge Gateway will have the ability to support an optional embedded Wi-Fi access point. The Wi-Fi circuitry will need communication to the internal Enterprise Edge Gateway CPU for configuration, management, and connecting user traffic to the Local Area Network as well as the uplink ports. It is envisioned that this SKU may/will need external antennas to provide adequate Wi-Fi signal coverage. This Wi-Fi network could be used to connect local users/devices to the LAN/WAN. Wi-Fi standards such as 802.11ax and 802.11be will be supported.

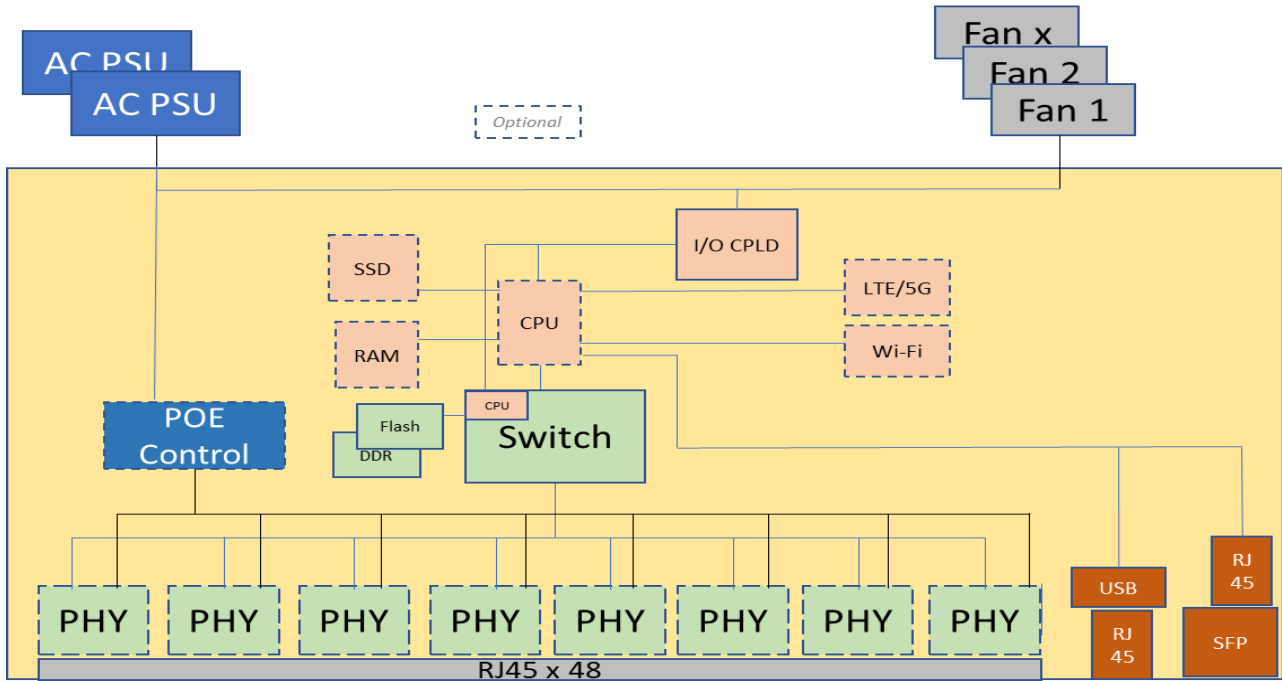
Cellular Connectivity

The Enterprise Edge Gateway will have the ability to support optional cellular connectivity. This cellular connectivity could be used as an out of band management channel and/or a backup WAN link should the primary connectivity fail. Cellular options such as LTE and/or 5G will be supported. It is envisioned that this SKU may/will need external antennas to provide adequate cellular signal coverage.

CPU Module

It is envisioned that the Enterprise Edge Gateway will support networking switching silicon that may/will support an embedded CPU. This embedded CPU (if provided) could be used to run the “Standard” Network Operating System.

The Enterprise Edge Gateway will support an optional CPU module (orderable SKU) that can support higher performance CPU options. This optional CPU module if installed can run more advanced Network Operating Systems and/or advanced functions such as functions found in SD-WAN / SASE implementations



Concept Enterprise Edge Gateway with 48 x Ethernet ports, LTE/5G, Wi-Fi, Modular CPU

LEDs

The Enterprise Gateway will support the following LEDs:

System Status LEDs	Four bi-colored LEDs on the front of the unit to indicate overall system status
RJ45 Network Ports	Each port will support two LEDs to indicate link, traffic, PoE status
SFP 28 Uplink ports	Each port will support two bi-colored LEDs to indicate link and traffic status
RJ45/SFP Management ports	Each port will support two LEDs to indicate link and traffic status
PSU	Each power supply will support a single LED to indicate status

10. Rear Side Power, I/O, Expansion Board and Midplane Subsystems

The rear side of the Enterprise Edge Gateway will support the following:

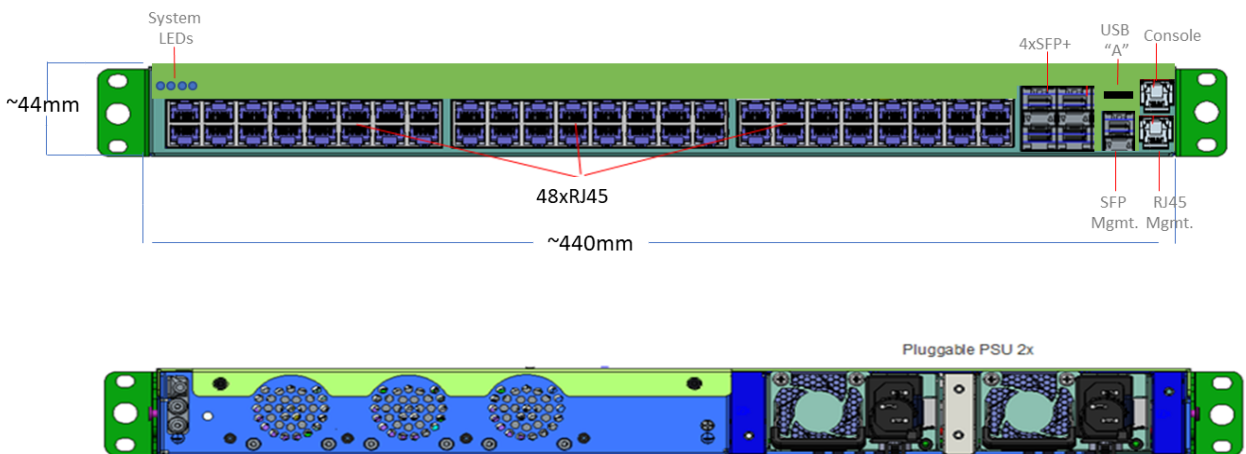
System power supplies

The Enterprise Edge Gateway will support redundant field replaceable AC power supply modules. The power supply modules will support input voltage from 90V-264V. Multiple power supply wattage options may be offered to match the desired Power Over Ethernet requirement of the end user.

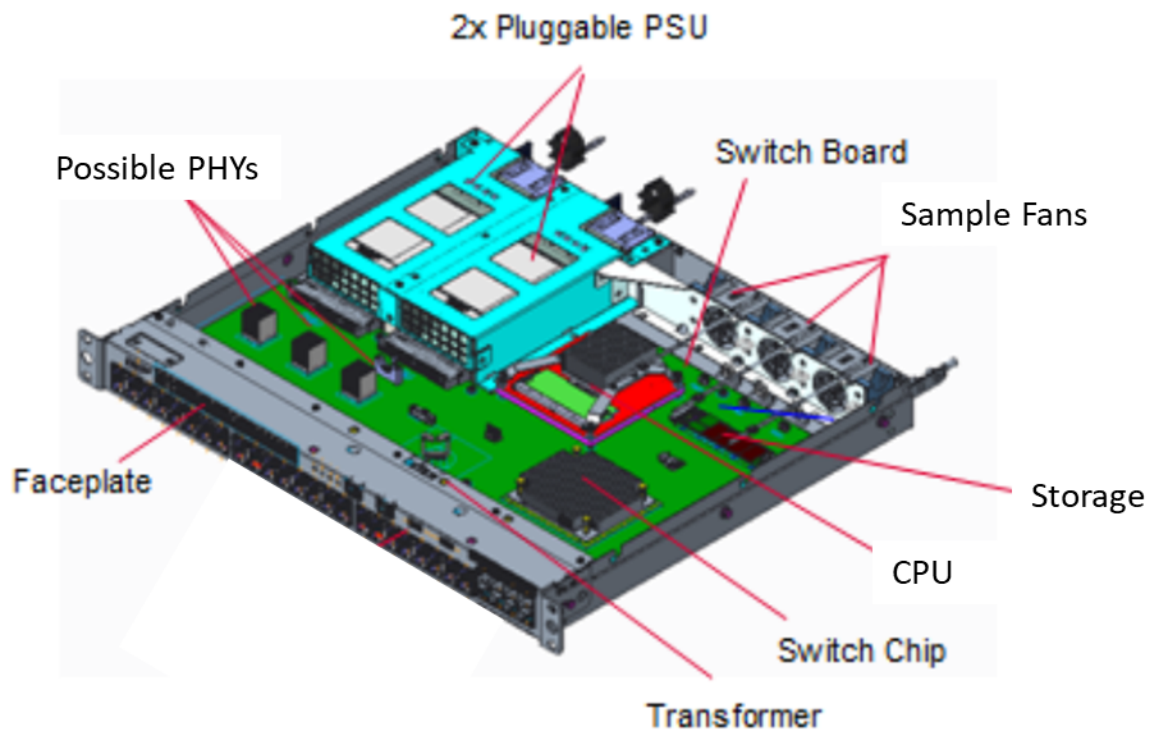
System Fans

The Enterprise Edge Gateway will support redundant system cooling fan assembly.

11. Mechanical



Concept Enterprise Edge Gateway with 48 x Ethernet ports, 4 x SFP28, USB A, SFP Management, RJ45 Management, Serial Console Management



Concept drawings Enterprise Edge Gateway

12. Onboard Power System

The Enterprise Edge Gateway's on-board power system will convert the power received from the system power supplies to the necessary voltages needed by the system components. A Power over Ethernet (PoE) controller will be responsible for controlling the Power Over Ethernet output for each of the networking ports.

13. Environmental Regulations/Environmental Requirements

The Enterprise Edge Gateway may be placed in areas where human contact is near by therefore the following regulations must be met

FCC Class B

Operating: 0-45C @6000ft, 10% - 95% (non-condensing)

Storage: -20C – 60C, 5%-90% (non-condensing)

The Enterprise Edge Gateway may be deployed directly in areas where people may be located, such as a retail environment, therefore the following are the acoustical requirements:

100% load at 40 C ambient < 46 dBA SPL

Spectrum: 20 Hz to 20 kHz no tones > 20 dB over 1/3rd octave smoothed

Spectrum: 750 Hz to 7.5 kHz no more than five tones > 12 dB over 1/3rd octave smoothed

14. Software Support

The Enterprise Edge Gateway will be capable of supporting the following software:

Open Network Install Environment – ONIE

Open Networking Linux – ONL

Software for Open Networking In the Cloud – SONiC

Distributed Enterprise operating System - DENT

15. System Firmware

The Enterprise Edge Gateway will support commercial BIOS from AMI or similar offering.

16. Hardware Management

The Enterprise Edge Gateway will be capable of supporting the Open Compute Baseline Hardware Management Profile.

17. Security

The Enterprise will support the following security functions:

Trusted Platform Module (TPM)

The Enterprise Edge Gateway will support a TPM 2.0 Module

Secure Boot

The Enterprise Edge Gateway will support Secure Boot.

MACSec

The Enterprise Edge Gateway will be capable of supporting MACSec on all of the RJ45 and SFP28 networking ports

Appendix A

Complete all the checklist items in the table with links to the section where it is described in this spec or an external document .

Item	Status or Details	Link to detailed explanation
Is this contribution entered into the OCP Contribution Portal?	Yes	If no, please state reason.
Was it approved in the OCP Contribution Portal?	Yes	If no, please state reason.
Is there a Supplier(s) that is building a product based on this Spec? (Supplier must be an OCP Solution Provider)	N/A	This is a Base Specification
Will Supplier(s) have the product available for GENERAL AVAILABILITY within 120 days?	N/A	This is a Base Specification