EMPOWERING OPEN.

Evolving OCP HW Contribution Process

OCP GLOBAL SUMMIT

Current OCP Contributions and Workflow

Types of Contributions currently accepted by OCP

- Specifications
- Design Files
- Embedded SW
- Products
- Facilities
- Ref. Architecture
- Tested Configs.
- Case Studies
- White Papers
- Requirements Docs
- OCP Centric Content
- Client Testimonials

Specifications
Can be submitted without design files

Design Files
Must be based on a current approved Specification

Embedded Software
OCP Github Process

Products
OCP's Product Recognition Program

Facilities
OCP Ready™ Facility Recognition Program

Reference Architectures
Software validations, certifications, etc.

Tested Configurations

Case Studies

White Papers

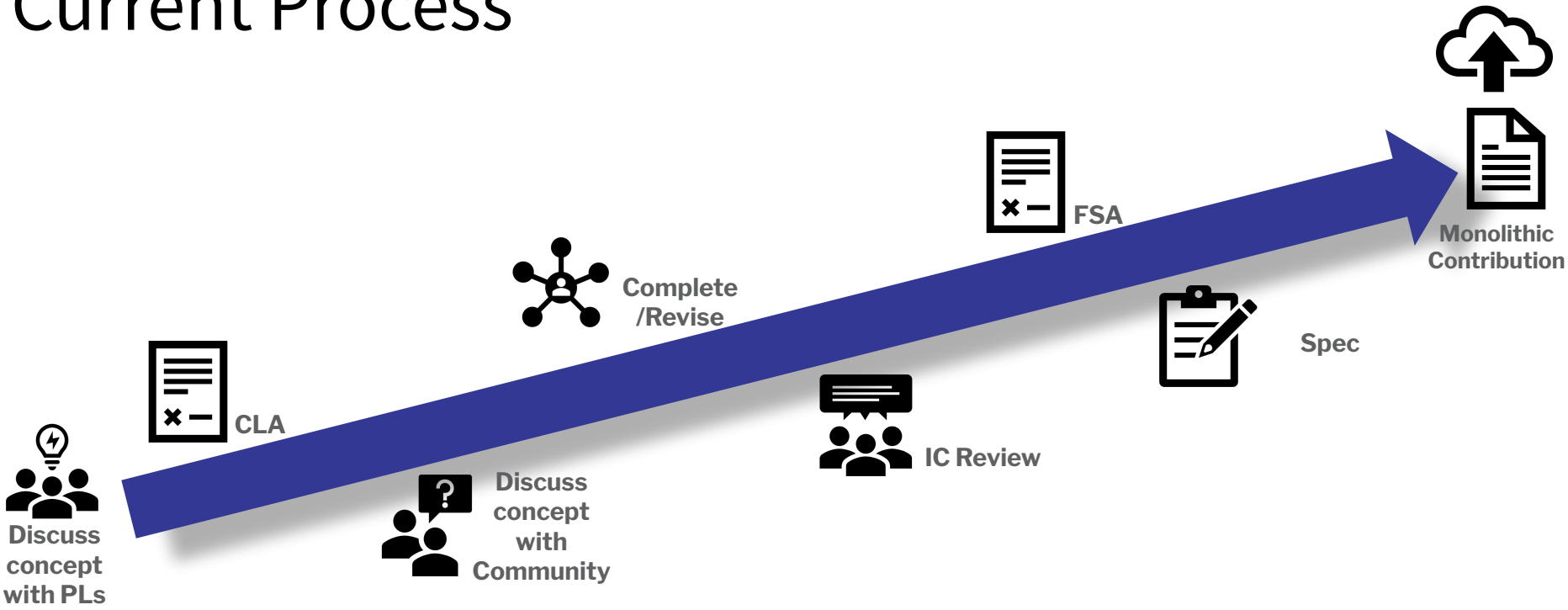
Requirements Documents

OCP-Centric Content
Videos, seminars & plugfests

Client Testimonials

Contributions - how do they happen?

Current Process



1 CLA = 1 Contribution.

Contributions are monolithic, single design described per document

Changed contribution process is for hardware only

- **Specifications**
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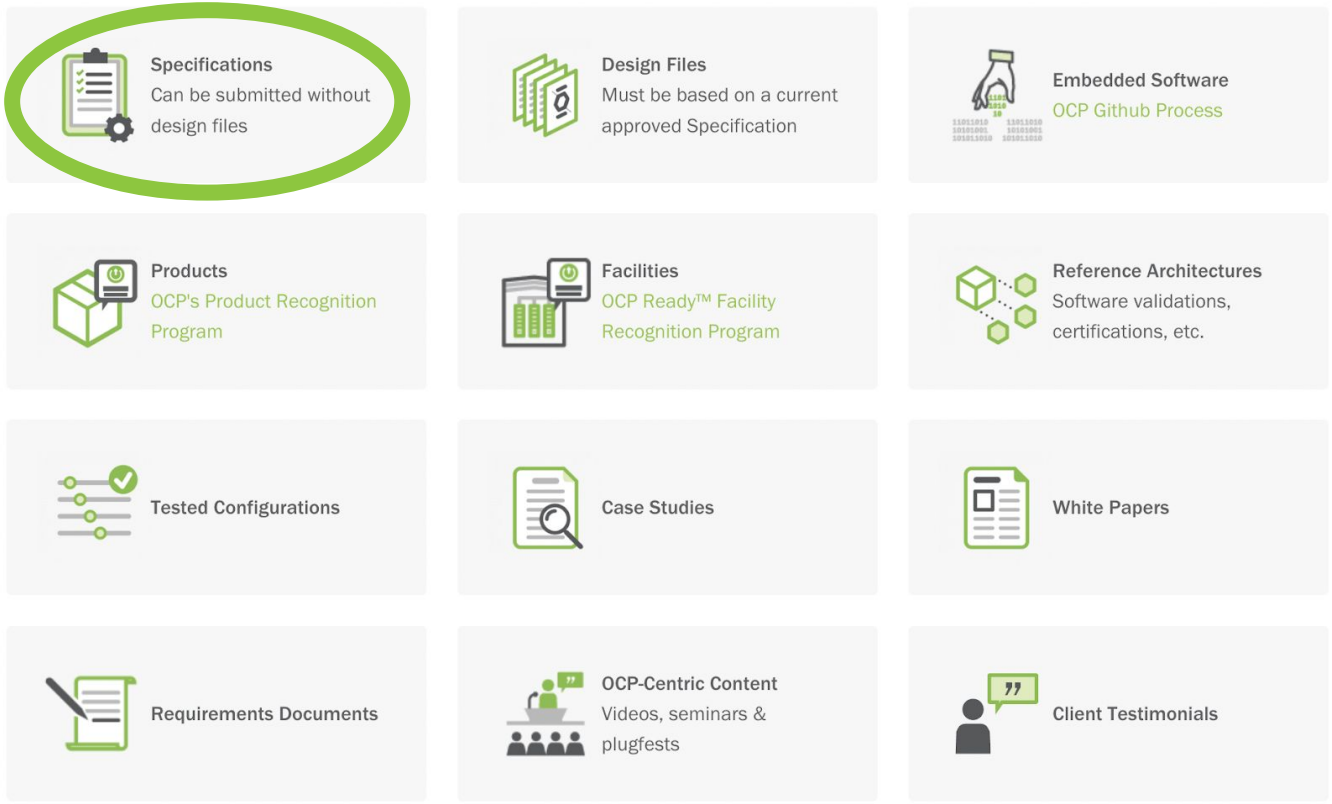


Current Hardware Specification Process - Problems

The existing contribution workflow and hardware specification templates were set up many years ago when the OCP was focused on one type of specification document always leading to product. This mode of operation while still relevant in some cases, does not reflect the OCP of today.

- Does not require HW specs to be [*useful]* to the community.
  - Encourages monolithic contributions which are not easily reused - too specific with compliance.
  - Does not encourage the community to provide feedback and participate.
- CLA best practices not clearly defined or understood.
- Process not formally defined or documented - leads to repetitive training and oversights.
- New versions require equal amount of labor by contributors as the initial contribution.
- Does not encourage multiple parties to come together at different times.
- HW Specs are IP-heavy from the start - potential barrier to participation.
- Not extensible for the diversified needs of products and de-facto standards.
- No clear errata/revision process.

Evolving OCP Hardware Contributions and Workflow

Evolving Hardware Specification Contributions

To encourage the delivery of multi-purpose specifications and products, the OCP staff worked with OCP Incubation Committee members and held a community consultation period in order to codify a formal contribution process that will include:

- *A revised specification architecture with standardized specification templates enabling different types of specifications and facilitate multi-company contributions, with multiple parties coming together at different times*
- *flow charts documenting the contribution process*
- *IP licensing guidance and templates to guide "useful" contributions.*

The revised process and specification architecture is intended to encourage tighter collaboration, early communication, and to discourage inefficient habits.

Evolving HW Contribution Process & Architecture Overview

Key Points

- This new approach *still* allows for monolithic contribution - one contributor can follow the process all the way through.
- By reducing the initial barrier to entry, this approach should encourage more collaboration within project groups. More participating contributors should lead to even more innovation.
  - Not all adopters can write a product spec, but they can participate in creating a base specification
- Splitting contributions into three distinct sections in the new modular approach will help facilitate downstream collaboration and derivative work.

HW Base Specification
Architectural Framework
Coarse Alignment

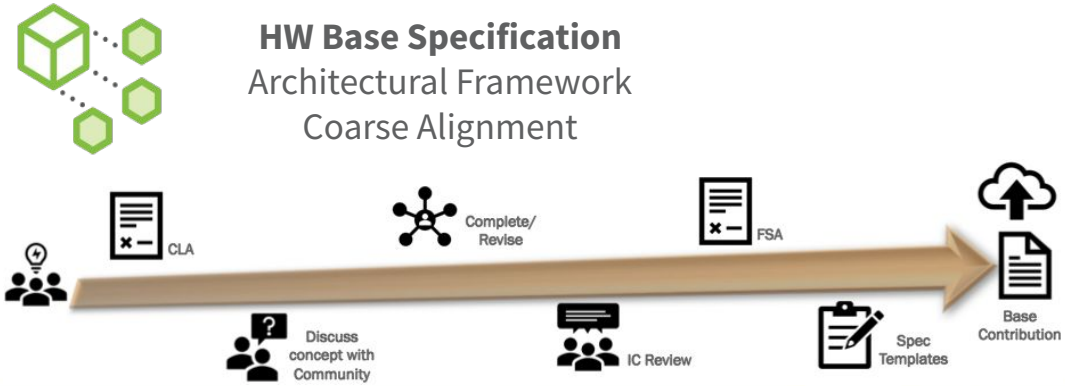
HW Design Specification
Design-specific
Fine Alignment

Product Specification
Implementation-specific

The Hardware Base Specification

To encourage multi-party collaboration which will render more robust and useful contributions, OCP plans to implement a streamlined process framework to produce 3 types of Specifications: **Base Specification**, Design Specification, and Product Specification. This will help yield a modular approach enabling derivative specifications, faster innovation, and more diverse products.

The Base Specification is an architectural framework for **coarse alignment**— a requirements description for flexible hardware and software modules to interoperate. **Market requirements drive Base Specifications.** Without going into much details of a specific design, the Base Specification may be light on IP content. We need companies (including potential competitors) to engage in this phase; **therefore, the IP-content may be light.** For this, we will need a legal agreement such as a Contributor License Agreement (**CLA**) upfront (potentially without knowing the eventual scope of the base specification).



Examples

- OAM V1.0/V1.1
- DC-SCM
- Minipack V1.0
- AT&T GPON Spec (high level)

The Hardware Base Specification Cont'd

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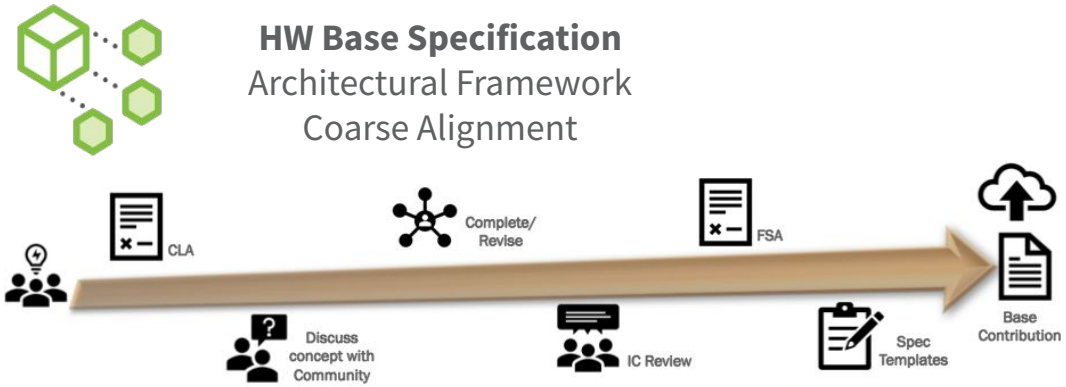
The **Base Spec** shall be generic enough to allow several Designs for each Module (with a generic name). To develop such generic modularity, we need a broad representation from different discipline - often from competing companies with differing viewpoints. But since the discussions are broad, the IP content is light with no secret sauces! By separating the Base Spec into its own section, this allows more representation and collaboration in the development of the **Base Spec**.



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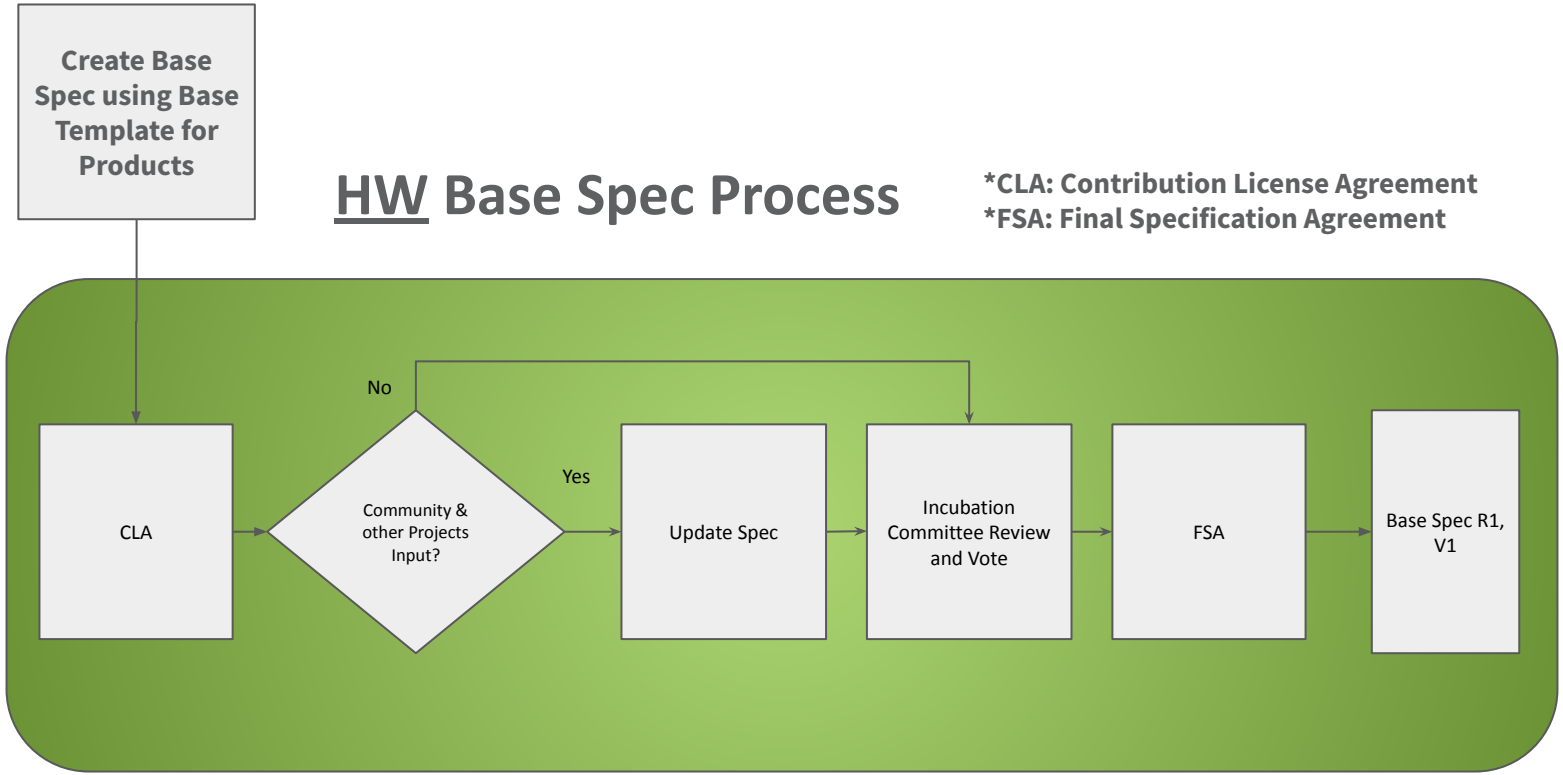
Creating a Base Hardware Specification



The Hardware Design Specification

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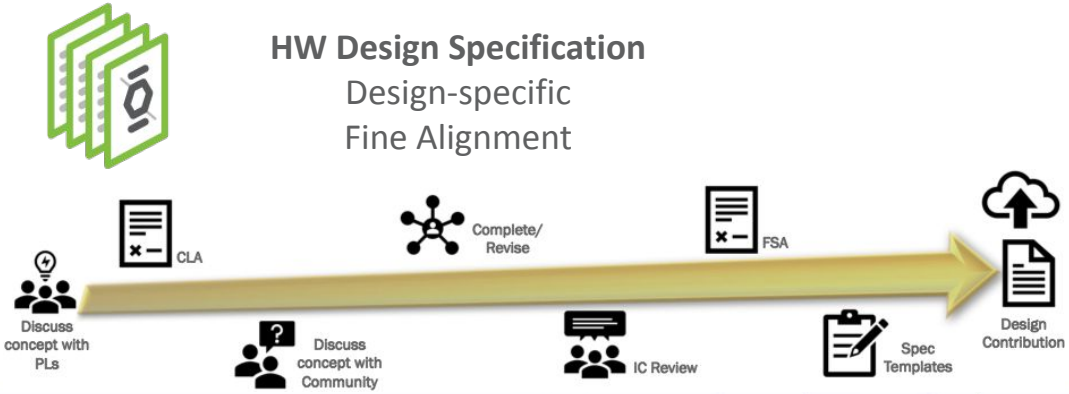
The Design Specification captures customer requirements for **finer alignmen**t by building on the Base Spec. One or more companies will join to develop detailed design specs. Compared to the Base Specification, this effort typically contains significantly more detail such as future roadmaps and IP-related information. This group may have a multi-party NDA on their own (outside OCP umbrella) for the normal practice of developing products. The resulting **Design Spec** would be contributed to OCP (via a Final Specification Agreement: **FSA**).



Examples

- AT&T GPON (base) and Edgecore Spec with specifics on components and interfaces (MRD/PRD)

The Hardware Design Specification Cont'd

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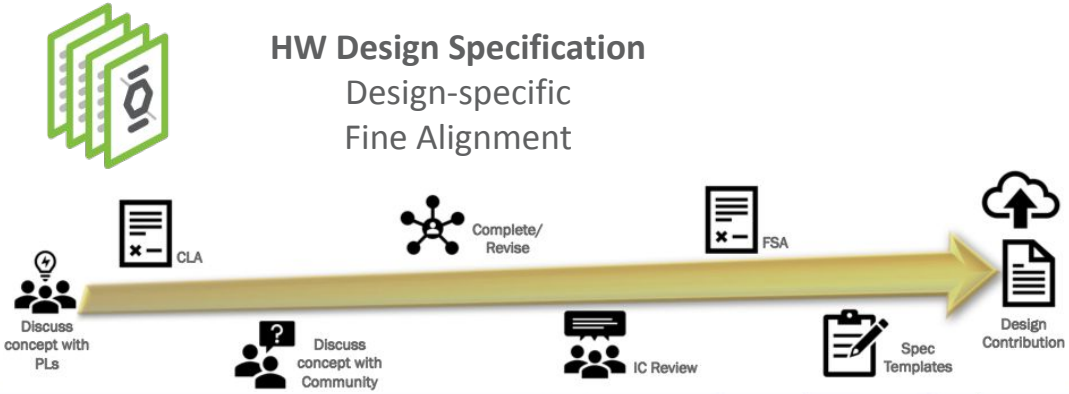
At the Design Phase, it is common for a few companies to engage as a team with limited access list to develop a specific Design optimized around solutions from a few companies who don't compete. In this case, IP content may be rich, and some discussions may happen under NDA (outside OCP). As the **Design Specification** completes, it gets contributed to the OCP with a Final Spec Agreement (FSA).



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The Hardware Design Specification Cont'd

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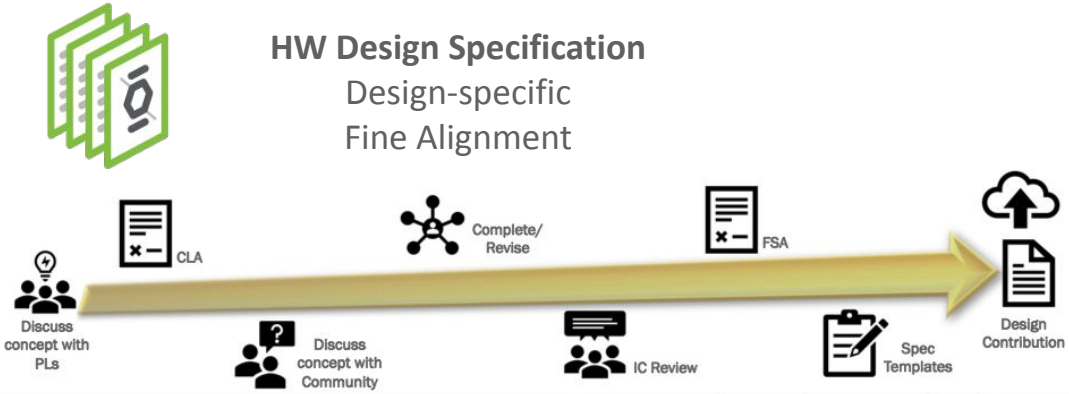
Design Specifications can be reused! I.e., if one contributor uses an indoor design specification, another team could reuse and make an outdoor specification. This flexibility should allow for an increased number of and easier process for, contributions to the OCP Community. Having the same Base Specification for several **Design Specifications** will help increase the commonality on physical and logical interfaces to meet a set of common infrastructure hw/sw/fw requirements while allowing gen-to-gen variations or product differentiation.



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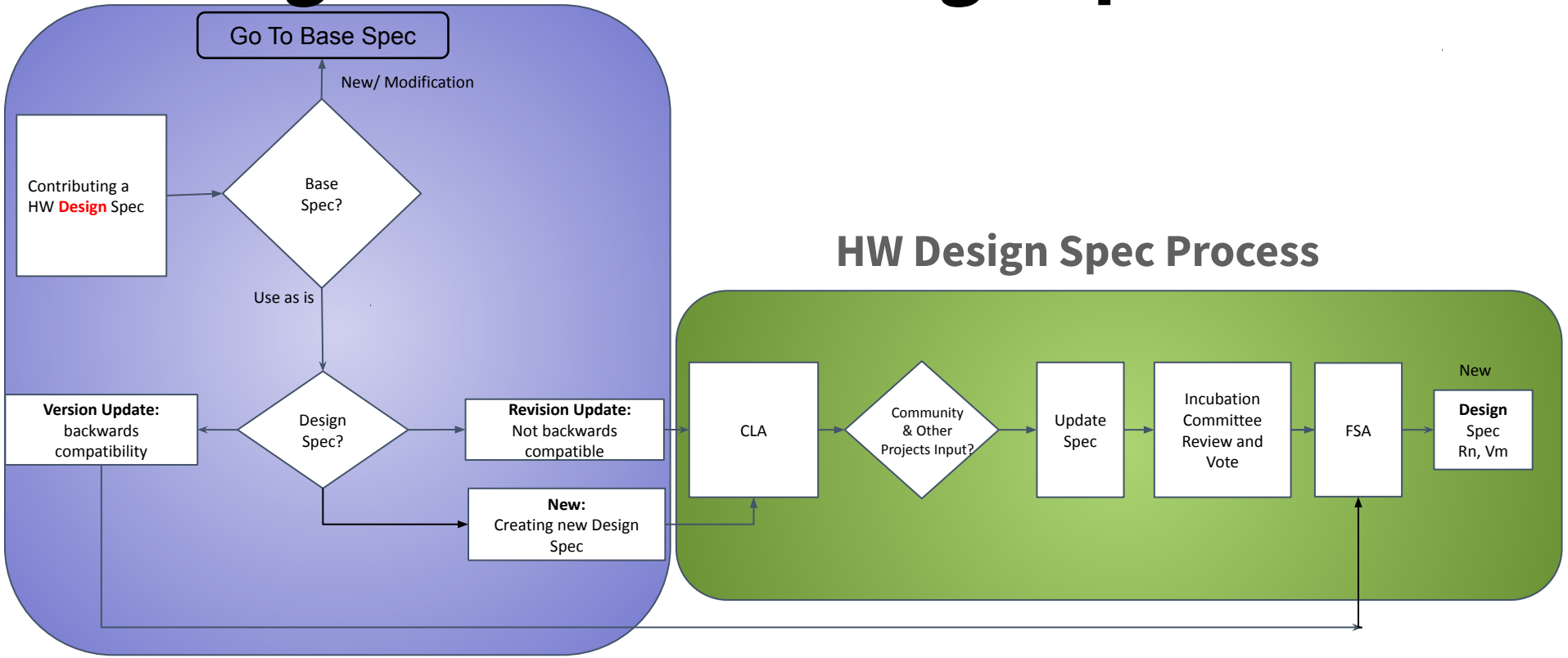
Creating a Hardware Design Specification

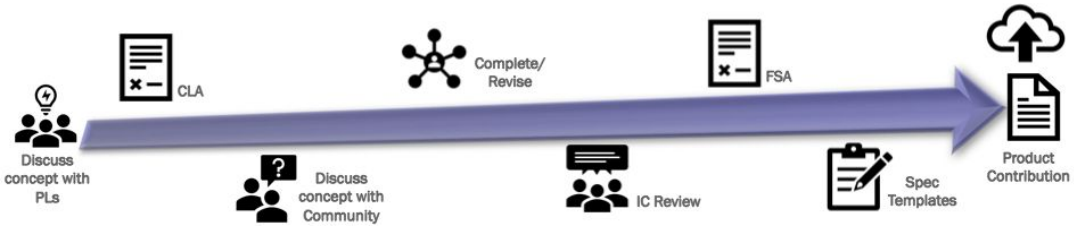


The Hardware Product Specification

To encourage multi-party collaboration which will render more robust and useful contributions, OCP plans to implement a streamlined process framework to produce 3 types of Specifications: Base Specification, Design Specification, and **Product Specification**. This will help yield a modular approach enabling derivative specifications, faster innovation, and more diverse products.

The Product Specification captures manufacturing requirements, building on the Design Specification. Typically even fewer companies will engage to create a single product specification, but the goal is to increase the total number of products that meet a Design Specification (derived from a Base Specification). The resulting **Product Spec** shall be contributed to OCP (via a Final Specification Agreement: **FSA**). A product typically goes through much effort for qualification and mass-production readiness beyond what specified in a typical design spec.

Product Specification
Implementation-specific



Examples

- UFISpace DDC Routing System S9700-23D Specification
- Edgecore AS7315-27X Disaggregated Cell Site Gateway (DCSG) Specification
- Schneider Electric Standalone 90KW Modular Data Center Specification

The Hardware Product Specification Cont'd

At **Product**(ization) Phase, even fewer companies may be involved to develop a specific final product for contribution to OCP. A **Product** may be submitted to OCP for "OCP Accepted™" or "OCP Inspired™" designation (with different levels of collateral such as a Design Package).

Examples

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- Edgecore AS7315-27X Disaggregated Cell Site Gateway (DCSG) Specification
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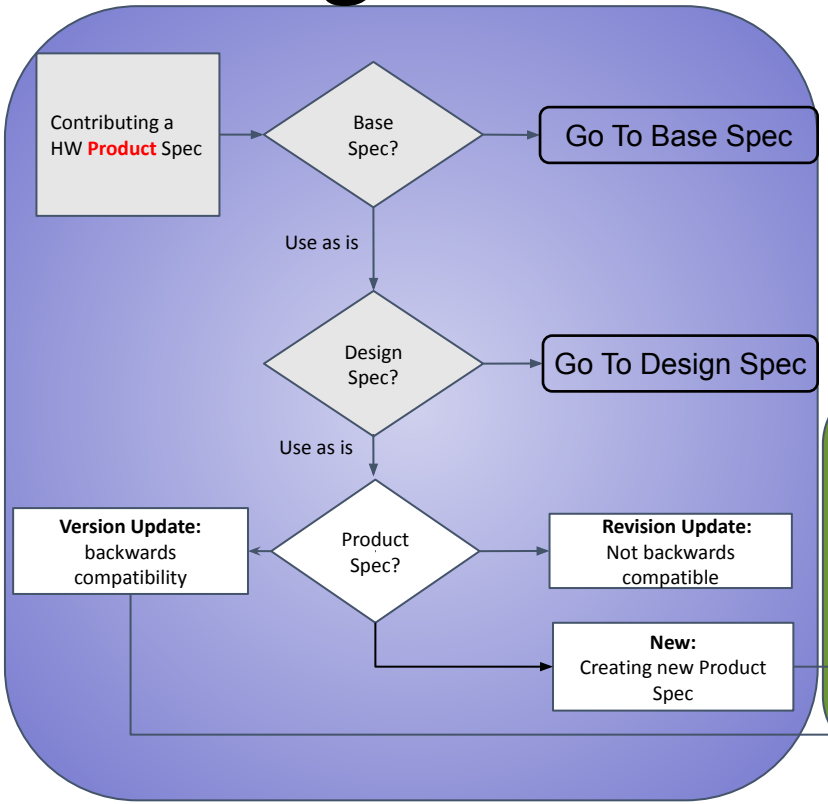
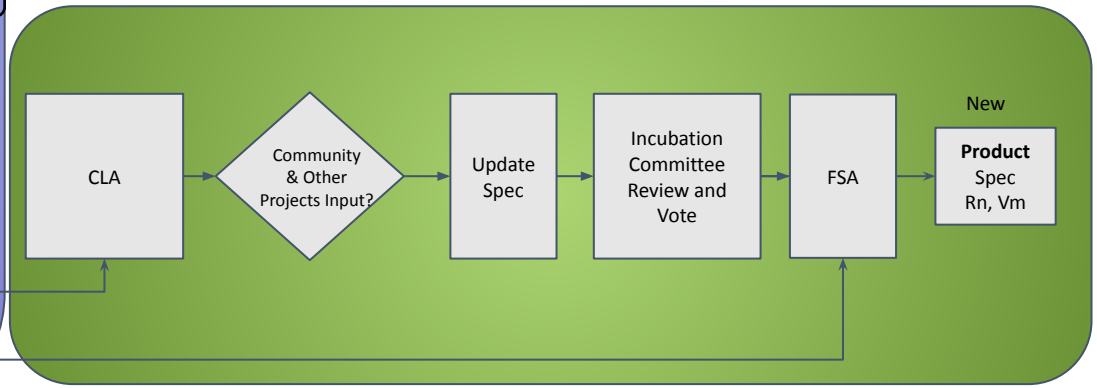
Creating a Hardware Product Specification



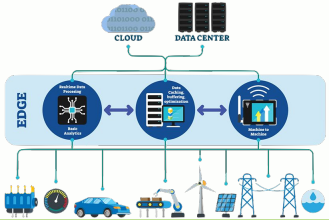
Product Specification Process



What does this look like in practice?

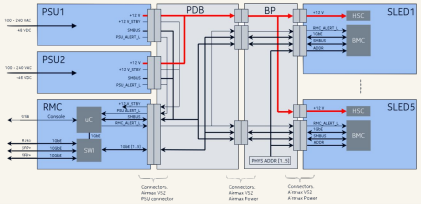
Example of New Spec Architecture

HW Base Specification
Architectural Framework
Coarse Alignment



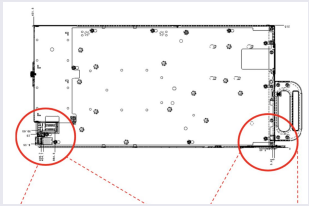
HW Base Specification
Edge Use Cases
High Level Requirements
High Level Architecture

HW Design Specification
Design-specific
Fine Alignment



HW Design Specification
Specific Requirements (MEC)
Detailed Architecture

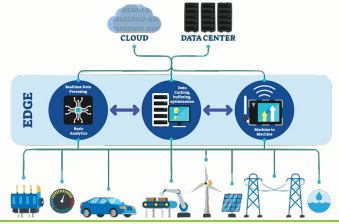
Product Specification
Implementation-specific



Product Specification
Edge Chassis
Detailed Implementation

Examples of New Base Spec

HW Base Specification
Architectural Framework
Coarse Alignment



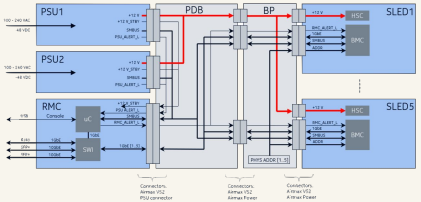
HW Base Specification
Edge Use Cases
High Level Requirements
High Level Architecture

Base Spec with many involved companies with **light IP** produces an architectural framework for flexibility at Modular Level

Example: one generic HPM supporting CPUs from different suppliers, one DC-SCM module supporting BMCs and RoT chips from multiple suppliers, a Power Module allowing flexible choice of suppliers or input voltage, SmartNIC module supporting different implementations

Examples of a Design Specification

HW Design Specification
Design-specific
Fine Alignment

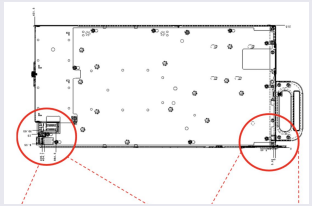


HW Design Specification
Specific Requirements (MEC)
Detailed Architecture

Multiple **Designs** following the same Base Spec with **high IP** content (competing companies may produce different Design Specs for their Module)
Example: an HPM based on one specific generation of CPUs (from one specific supplier). Different Modules may spawn different Designs (HPM designs, DC-SCM designs, SmartNIC designs, Power Module designs, …)

Examples of New Product Specification

Product Specification
Implementation-specific



Product Specification
Edge Chassis
Detailed Implementation

Multiple Products for each Design (a few companies involved for each Product, but many Products are feasible—all following the same Base Spec encouraging firmware and software leverage). At Product(ization) Phase, even fewer companies may be involved to develop a specific final product for contribution to OCP.

Example: a dual-socket server along with all required ingredients for a particular set of CPU, BMC, RoT, SmartNIC, IO, Power/Cooling, etc.)

Vendor encouraged to seek OCP product recognition (Accepted or Inspired)

CLA / FSA Process (Simplified)

- Work with OCP Staff to sign a Contribution License Agreement (CLA)
  - https://www.opencompute.org/contributions/how-to-contribute OCP's recommended CLA is the OWF-CLA.
  - Information Needed (all parties involved will need to agree):
    - Title
    - Any requirements and objectives for the Specification
    - Define what is **in** vs. **out** of Scope

- Present to the project community to get feedback, approval from Project Leads
- Present to the OCP Incubation Committee, sign the OWFa1.0 Final Specification Agreement (FSA)

New Process Implementation

Officially launching in 1H 2023

Contributors encouraged to use the new process now.

- PLs/IC to screen ideas/submissions for modularity.
  - Choose best path for project & advise contributors
- New Templates to be introduced
- Website Updated
- Training Courses for contributors