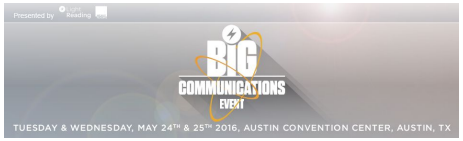
Welcome to the

OCP Telco Engineering Workshop

Hosted by:



Sponsored by:

VECTOR DATA™

Agenda

12:30p.m.- 1:00 p.m. - Welcome - Corey Bell & Rocky Bullock - OCP Co-CEOs & Amber Graner, OCP Operations Director & Community Manager

1:00 p.m. - 2:00 p.m. - How to Participate in OCP. The OCP Contribution Process Explained. What Do OCP AcceptedTM & OCP InspiredTM Really Mean? - Amber Graner, OCP Operations Director & Community Manager

2:00 p.m. - 2:45 p.m. - Telco Charter & Current State of the Project - Bill Carter & Craig White, OCP Telco Project Leads

2:45 p.m. - 3:00 p.m. - Radisys Presentation

3:00 p.m. - 3:15 p.m. - ADLink Presentation

3:15 p.m. - 3:30 p.m. - Break

3:30 p.m. - 4:15 p.m. - OCP Open Rack Presentation - Steve Mills

4:15 p.m. - 4:30 p.m. - OCP Networking Presentation - Omar Baldonado

4:30 p.m. - 5:00 p.m. - Telcom Infra Project (T.I.P.) Presentation - Lynn Comp, Intel

5:00 p.m. - 5:30 p.m. - General OCP Q&A, Project Next Steps & Wrap Up

Overview

and

Getting Started

1. History
2. How OCP is organized
3. The OCP Projects and how you can participate.
4. OCP Regional Expansion
5. How the community is governed.
6. OCP Membership
    a. How become a Tiered Member
    b. Benefits of Tiered Membership
    c. How Time is calculated.
    d. Supporting Documentation
    e. Membership Agreement
    f. Tiered Membership Policy
    g. Bylaws
    h. IP Policy
    i. PR/Media request
7. The specification and design contribution process.
    a. What is a CLA and why do you need to sign it.
        i. CLAs
            1. OWF
            2. OCP
    b. What licenses you can use for your contributions and why it is important.
        i. Hardware Licenses (OWF, OCPHL-P, OCPHL-R)
8. Contribution Classifications
    a. What is OCP-Inspired
        i. Specification and Design
        ii. Product
    b. What is OCP-Accepted
        i. Specification and Design
        ii. Product
9. OCP Solution Provider Program
    a. Current SPs
    b. How to Become an SP
    c. Benefits of Becoming an SP
    d. Supporting Documentation
        i. SP Agreement
10. OCP Component Program
11. Thanks you and Q&A

How it all began

Our History

In 2009, Facebook was growing exponentially, offering new services and giving millions of people a platform to share photos and videos. Looking ahead, the company realized that it had to rethink its infrastructure to accommodate the huge influx of new people and data, and also control costs and energy consumption.

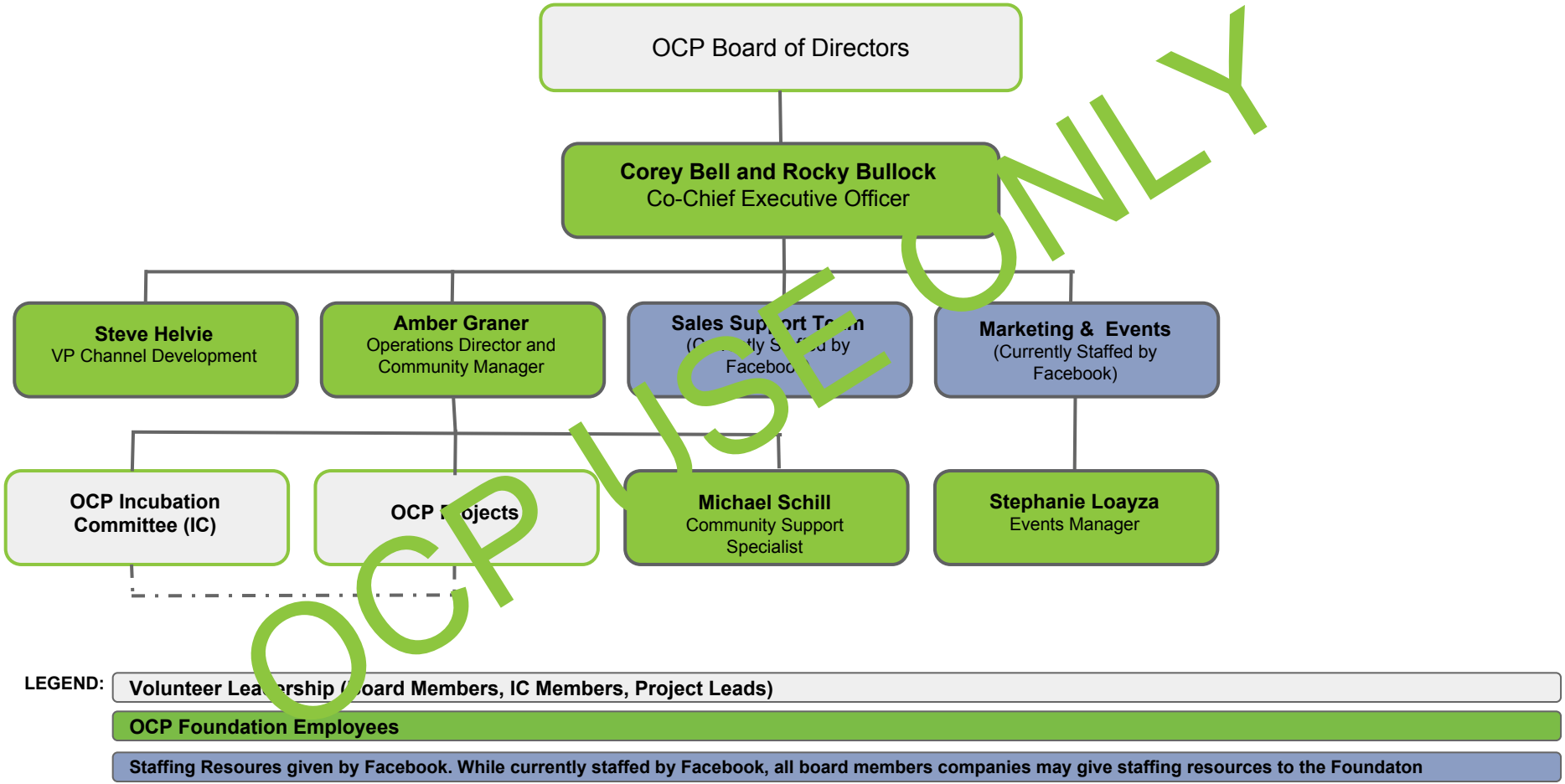
That's when Facebook started a project to design the world's most energy efficient data center, one that could handle unprecedented scale at the lowest possible cost. A small team of engineers spent the next two years designing and building one from the ground up: software, servers, racks, power supplies, and cooling. The result now stands in Prineville, Oregon.

It was 38% more energy efficient to build and 24% less expensive to run than the company's previous facilities—and has led to even greater innovation.

In 2011, Facebook shared its designs with the public and—along with Intel and Rackspace, Goldman Sachs and Andy Bechtolsheim—launched the Open Compute Project and incorporated the Open Compute Project Foundation. The five members hoped to create a movement in the hardware space that would bring about the same kind of creativity and collaboration we see in open source software. And that's exactly what's happening.

OCP Organization

OCP Foundation Structure



OCP Foundation Structure

OCP Incubation Committee

* **Chair:** Andy Bechtolsheim
* **Vice Chair** - Amir Michael (OCP Co-founder)
* Aaron Sullivan (Rackspace)
* William “Bill” Carter (Intel)
* Chilung Wang (ITRI)
* Kushagra Vaid (Microsoft)
* Eran Tal (Facebook)
* Conor Malone (Hyve Solutions)
* Bob Ogrey (AMD)
* Lakshmi Mandyam (ARM)
* Open Telco Seat (TBD)

OCP Foundation Board

* **Chairman/President** - Jason Taylor (Facebook)
* Don Duet (Goldman Sachs)
* Jason Waxman (Intel)
* Bill La[illegible] (Microsoft)
* Mark Roe[illegible]k (Rackspace)
* Andy Bechtolsheim (Individual)
* Frank Frankovsky (Individual)
* Rocky Bullock (non-voting)

Corey Bell and Rocky Bullock
Co-Chief Executive Officer

Amber Graner
Operations Director and Community Manager

Steve Helvie
VP Chanel Development

Sales Support Team**
(Currently Staffed by Facebook)

Marketing & Events**
(Currently Staffed by Facebook)

Michael Schill
Community Support Specialist

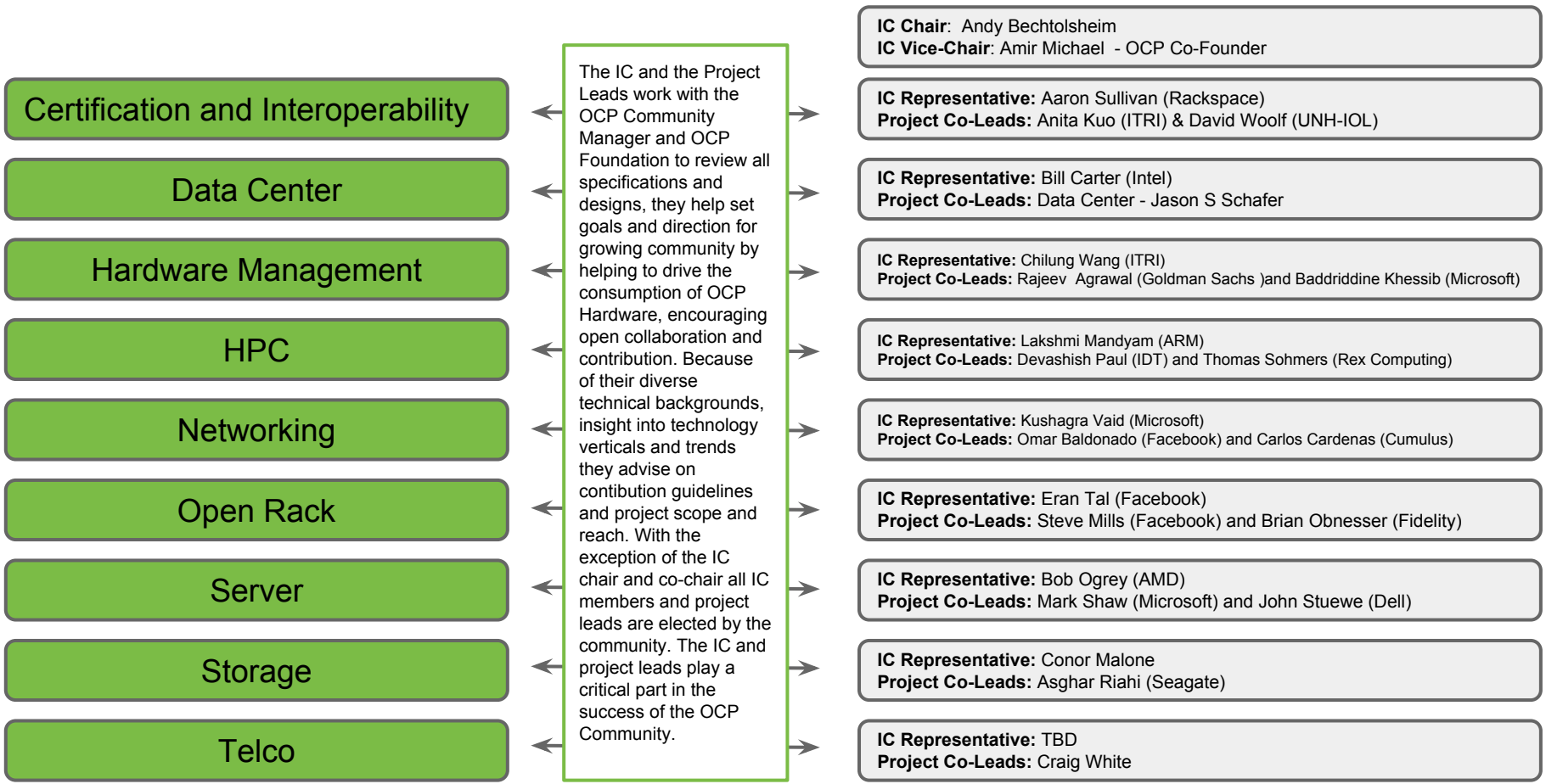
Stephanie Loayza
Events Manager

OCP Projects

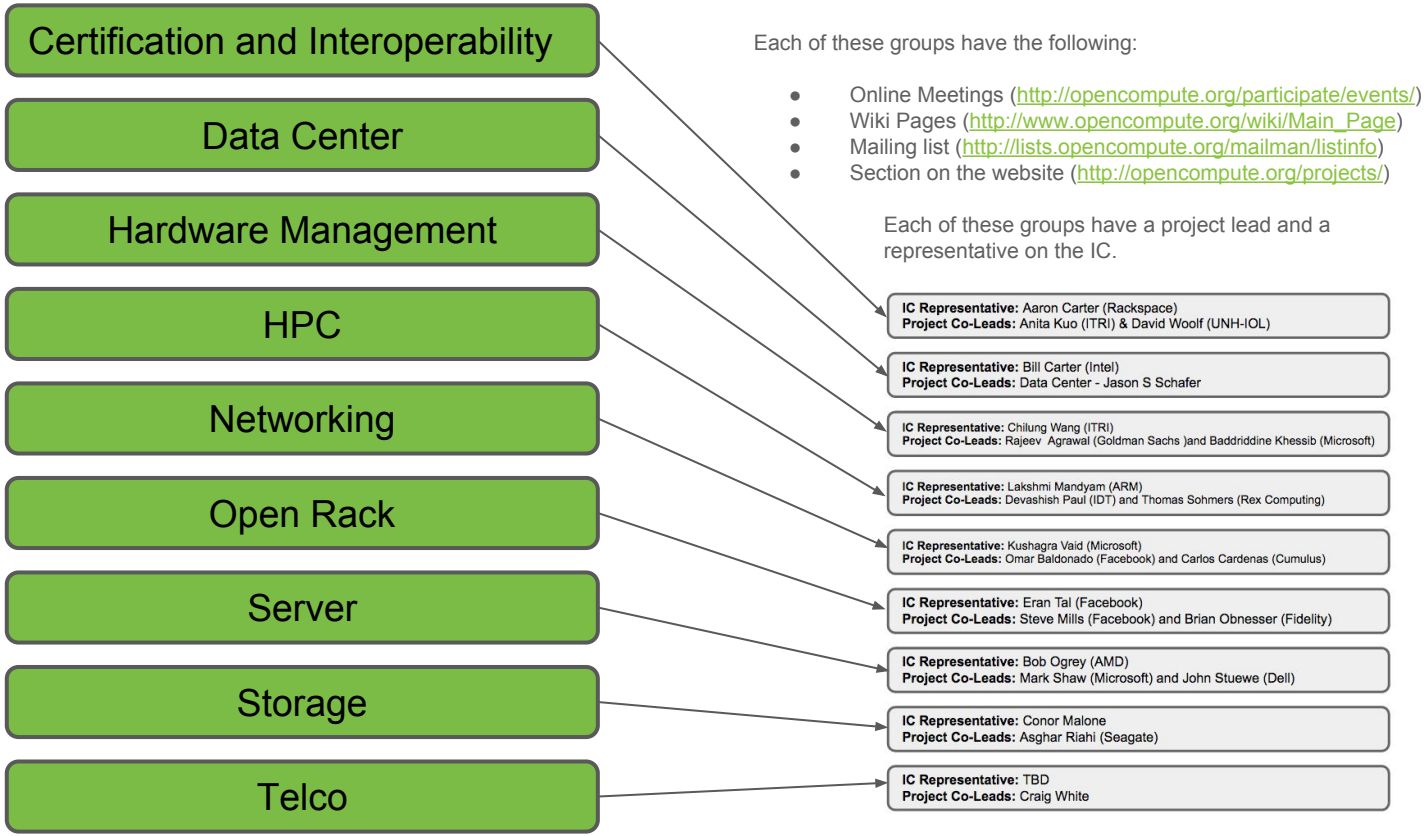
Certification & Interoperability	Data Center	Hardware Management	HPC	Networking	Open Rack	Server	Storage	Telco
David Woolf (UNH) Anita Kuo (ITRI)	Ja[illegible]on S. Sc[illegible]afer -	Raj[illegible]grawala Badriddine Khessib	Devashish Paul Thomas Sohmers	Omar Baldonado Carlos Cardenas	Steve Mills Brian Obnesser	Mark Shaw John Stuewe	Asghar Riahi	Craig White
Project Co-Leads	Project [illegible]ad	Project Co-Leads	Project Co-Leads	Project Co-Leads	Project Co-Leads	Project Co-Leads	Project Lead	Project Lead

*IC Chair and Vice Chair are Board appointed - all other seats will be community elected in 2014 **While currently staffed by Facebook, all board members companies may give staffing resources to the Foundaton,

OCP IC Members and Project Leads



OCP Projects


Certification and Interoperability
Data Center
Hardware Management
HPC
Networking
Open Rack
Server
Storage
Telco
Each of these groups have the following:
Online Meetings (http://opencompute.org/participate/events/)
Wiki Pages (http://www.opencompute.org/wiki/Main_Page)
Mailing list (http://lists.opencompute.org/mailman/listinfo)
Section on the website (http://opencompute.org/projects/)
Each of these groups have a project lead and a representative on the IC.
IC Representative: Aaron Carter (Rackspace)
Project Co-Leads: Anita Kuo (ITRI) & David Woolf (UNH-IOL)
IC Representative: Bill Carter (Intel)
Project Co-Leads: Data Center - Jason S Schafer
IC Representative: Chilung Wang (ITRI)
Project Co-Leads: Rajeev Agrawal (Goldman Sachs)and Baddriddine Khessib (Microsoft)
IC Representative: Lakshmi Mandyam (ARM)
Project Co-Leads: Devashish Paul (IDT) and Thomas Sohmers (Rex Computing)
IC Representative: Kushagra Vaid (Microsoft)
Project Co-Leads: Omar Baldonado (Facebook) and Carlos Cardenas (Cumulus)
IC Representative: Eran Tal (Facebook)
Project Co-Leads: Steve Mills (Facebook) and Brian Obnesser (Fidelity)
IC Representative: Bob Ogrey (AMD)
Project Co-Leads: Mark Shaw (Microsoft) and John Stuewe (Dell)
IC Representative: Conor Malone
Project Co-Leads: Asghar Riahi (Seagate)
IC Representative: TBD
Project Co-Leads: Craig White

How to participate

There are many ways to participate in the OCP Community.

Join the mailing list and add to the conversation and help drive the focus of the projects.

Join the online project meetings and participate in the discussion and provide thought leadership

Participate in-person at the OCP Events - Summit, Engineering Workshops, OCP Days

Participate in Industry events and represent your organization’s interest in OCP

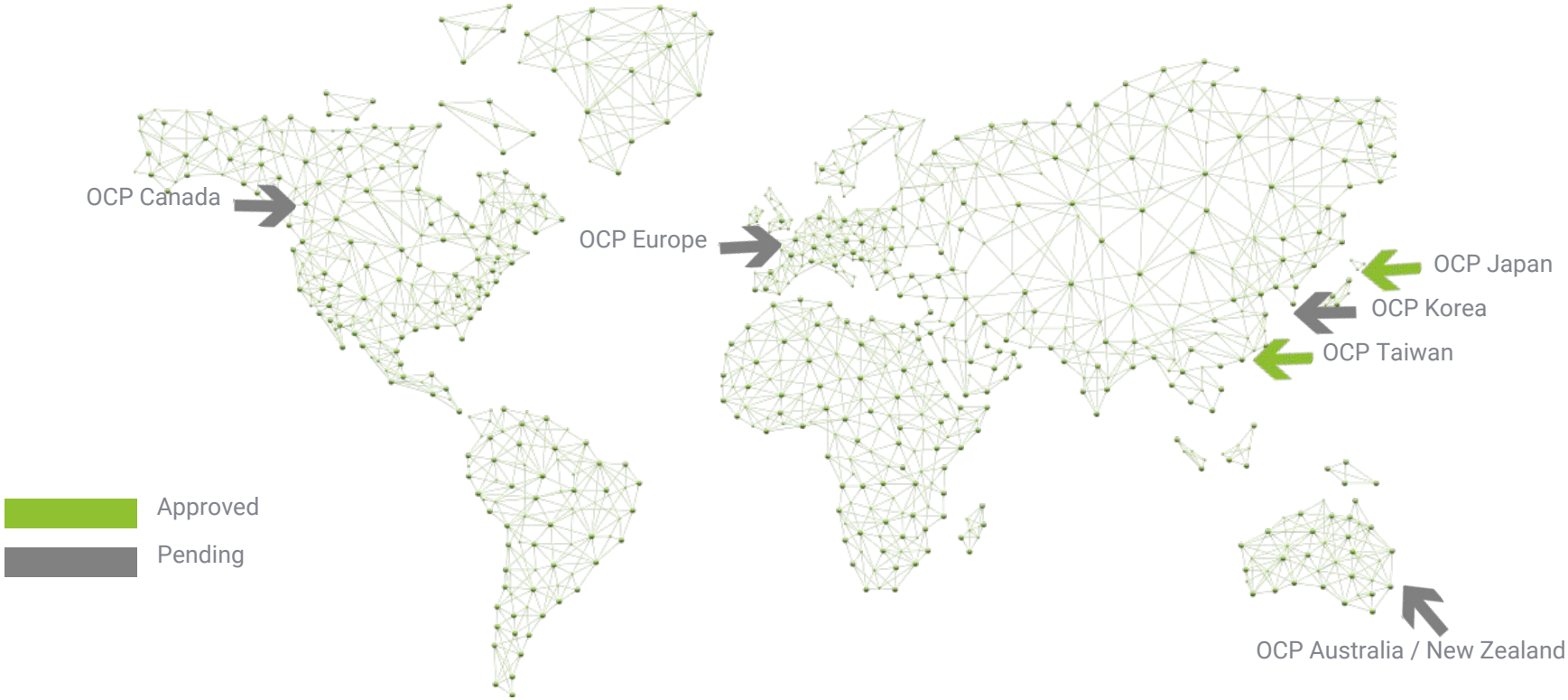
Become an OCP Member

Contribute Hardware specifications and designs

Run for an OCP Leadership Position (Project Lead, IC Member, Regional Community Leader)

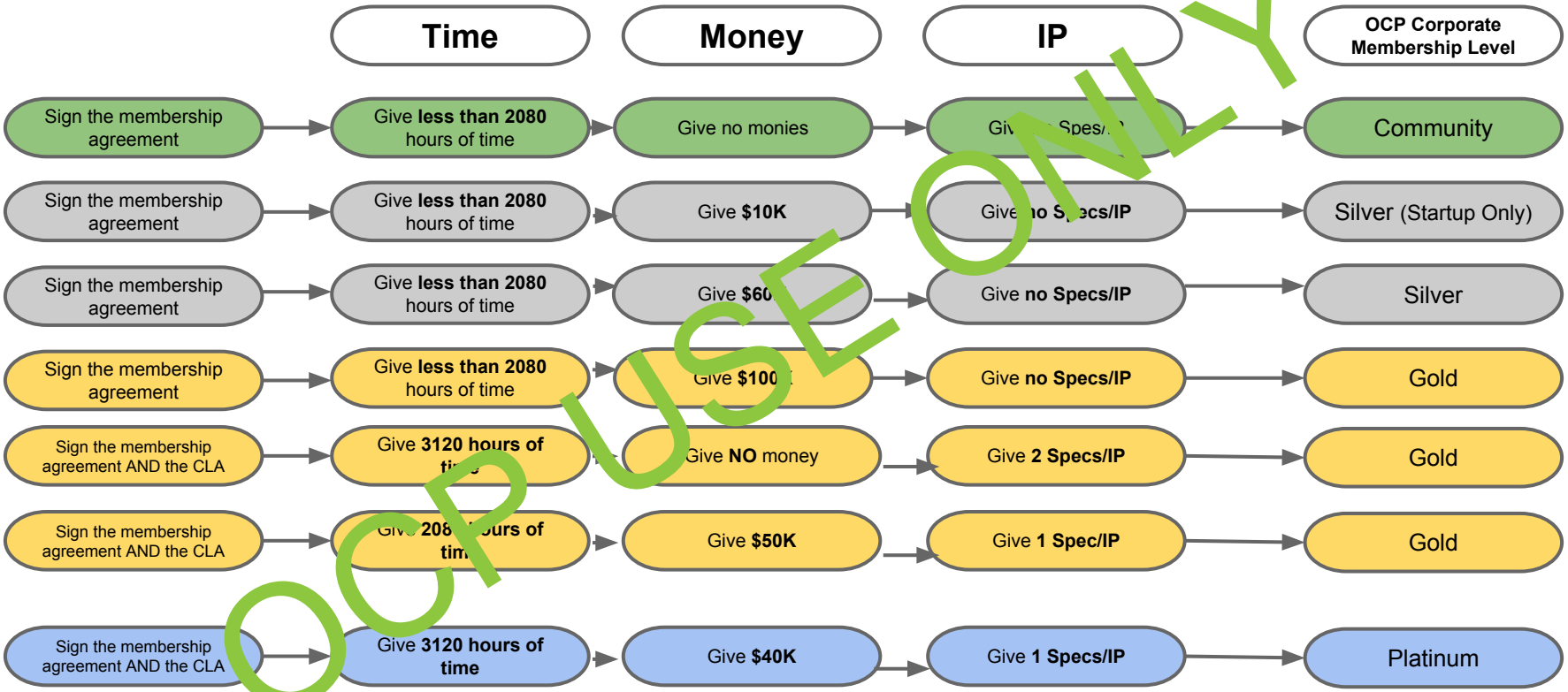
Regional Expansion

OCP Regional Communities



OCP Membership

Ways to reach OCP Tiered Membership



*2080 = 1 full time person per year
*3210 = 1.5 full time people per year

Startup: Less than 3 years old and less than a million per year in revenue.

Benefits: OCP Tiered Membership Level

	Community	Silver	Gold			Platinum
Overview of how to reach each level	Intellectual time (project contribution), No financial contribution or IP (Specs/Designs)	Financial Contribution (Only)	**Financial Contribution** (Only)	**Intellectual time** (project contribution) and **IP** (Specs/Designs) (No Financial Contribution)	**Financial Contribution** and **Intellectual time** (project contribution) and (Specs/Designs)	Financial Contribution and Intellectual time (project contribution) and IP (Specs/Designs)
	Intellectual time (project contribution) only	$60K and you get the following	$10K (startup only) and you get the following	$100K and you get the following	3120 hours of Intellectual time (project contribution) + 2 IP (Specs/Designs) and No Financial Contribution	$50K + 2080* hours of Intellectual time + 1 IP Contribution	$40K + 3120* hours of Intellectual time (project contribution) + 1 IP (Specs/Designs)
Can be nominated for Project Leads/IC Member	Yes/No	Yes/Yes	YesYes			Yes/Yes
Voting Project Leads/IC Members	Yes/No	Yes/Yes	Yes/Yes			Yes/Yes
Discount on Summit Sponsorship	No	0% off	15% off			20% off
Discount on Summit Training	No	10% off	15% off			20% off
Eligible to Become a Solution Provider	No	No	Yes +additional $50K			Yes +additional $30K
Discounts off Submissions for theOCP CertificationProgram	No	No	15% off			20% off

Supporting Documentation

OCP Membership Agreement

OCP Tiered Membership Policy

OCP Bylaws

OCP IP Policy

Certificate of Incorporation

PR/Media Guidelines

If possible please give our PR Team a minimum of 2 weeks lead time for any PR/Media requests.

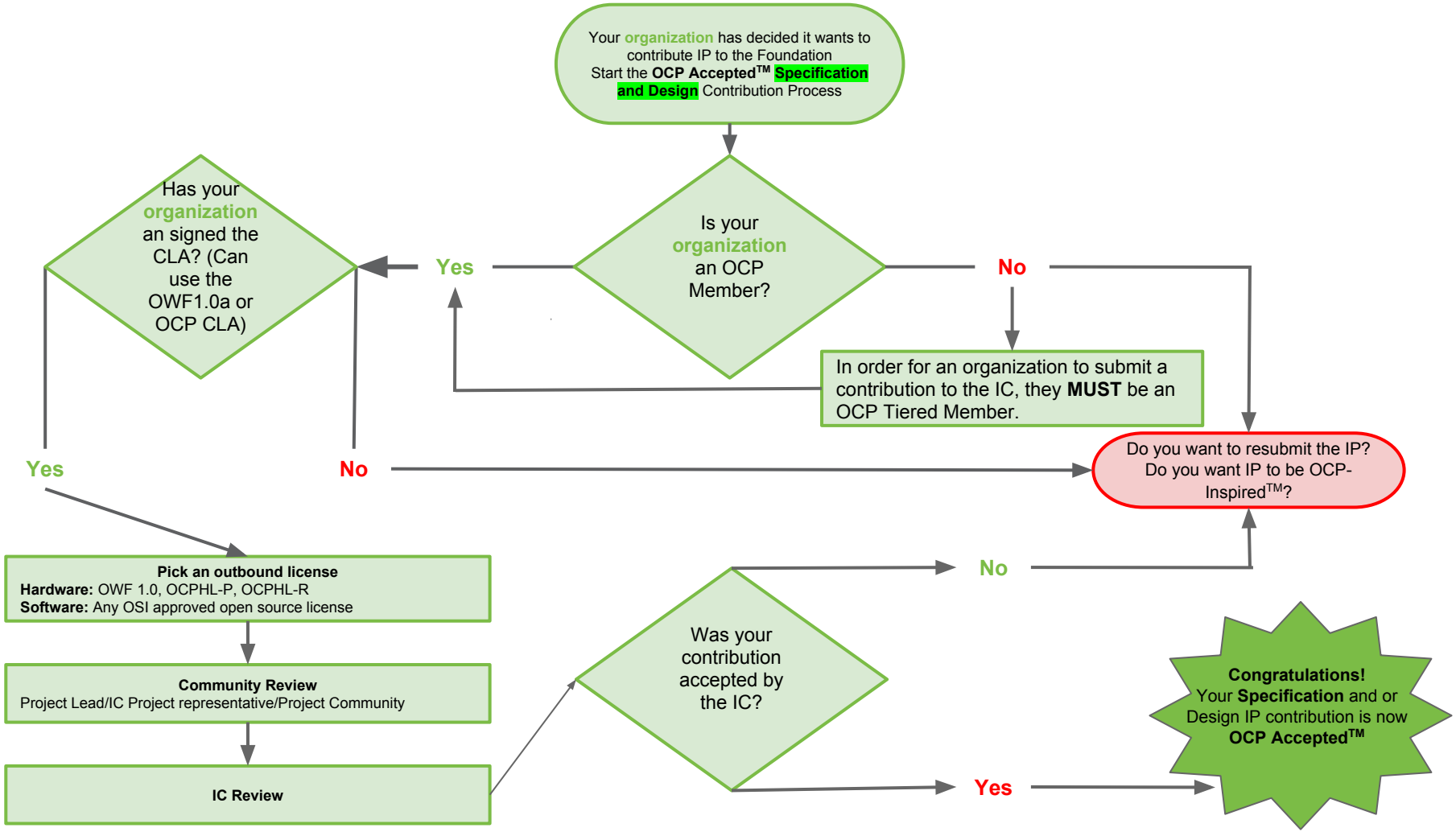
Only Silver, Gold and Platinum Members are eligible for Foundation quotes about membership.

Hardware and software contributors are eligible for Foundation quotes about accepted IP contributions.

Please note: The Foundation does not give quotes about “intended” contributions.
The Foundation does not allow members to use the OCP Logo.
Each Membership tier will be given a logo that corresponds with its membership level.

You can contact our PR Team at press@opencompute.org

Specification,Design and Product Contribution Process


Your organization has decided it wants to contribute IP to the Foundation
Start the OCP Accepted™ Specification and Design Contribution Process
Is your organization an OCP Member?
Yes
No
In order for an organization to submit a contribution to the IC, they MUST be an OCP Tiered Member.
Has your organization an signed the CLA? (Can use the OWF1.0a or OCP CLA)
Yes
No
Do you want to resubmit the IP? Do you want IP to be OCP-Inspired™?
Pick an outbound license
Hardware: OWF 1.0, OCPHL-P, OCPHL-R
Software: Any OSI approved open source license
Community Review
Project Lead/IC Project representative/Project Community
IC Review
Was your contribution accepted by the IC?
No
Yes
Congratulations!
Your Specification and or Design IP contribution is now OCP Accepted™

OCP Membership

Individual

Tiered

- Community
- Silver
- Gold
- Platinum

Contributor License Agreement (CLA)

OWF CLA

OCP CLA

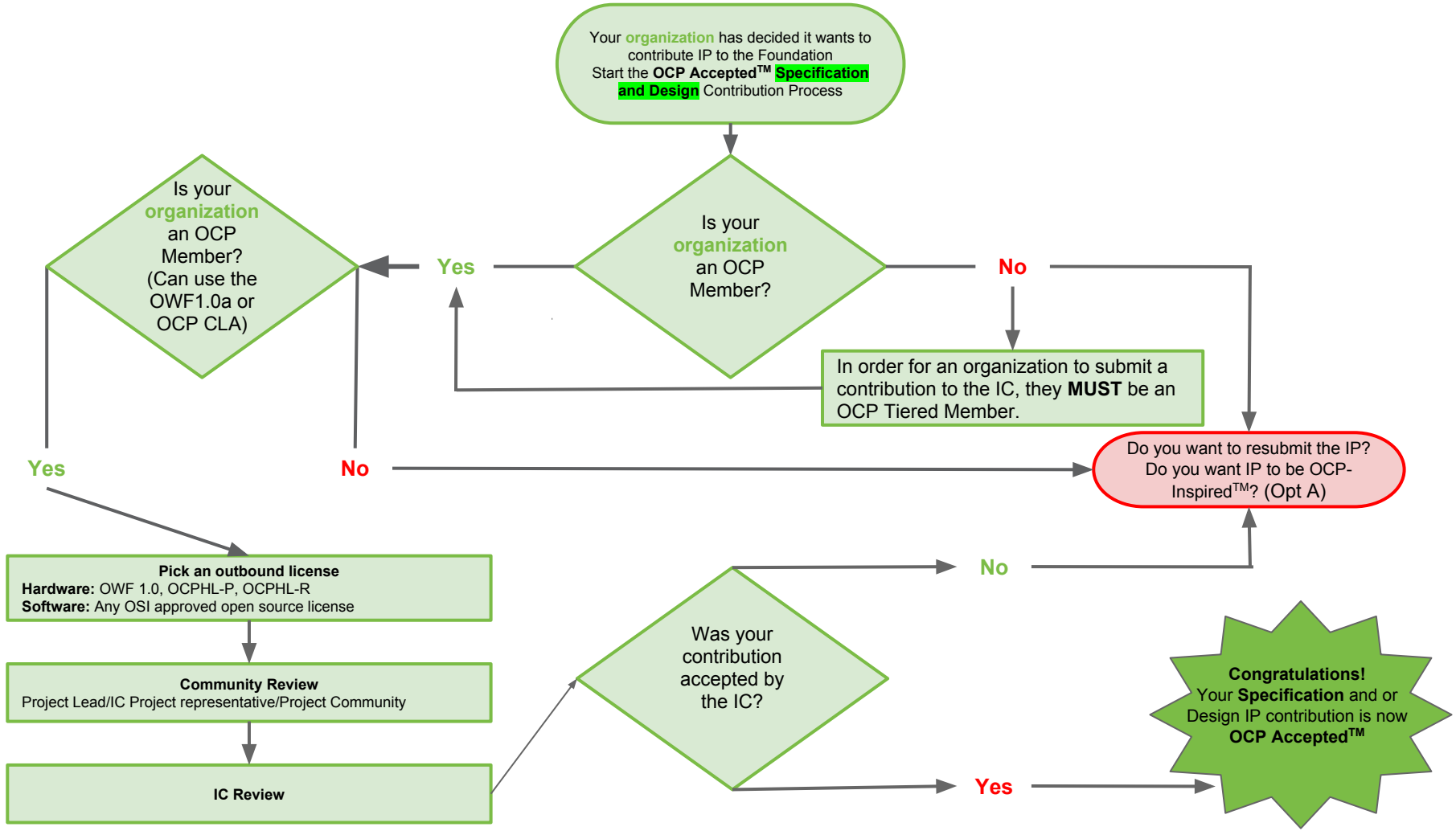
Hardware License

OWFa1.0

OCPHL-R

OCPHL-P

OCP Accepted™
and
OCP Inspired™


Your organization has decided it wants to contribute IP to the Foundation
Start the OCP Accepted™ Specification and Design Contribution Process
Is your organization an OCP Member?
Yes
No
In order for an organization to submit a contribution to the IC, they MUST be an OCP Tiered Member.
Is your organization an OCP Member? (Can use the OWF1.0a or OCP CLA)
Yes
No
Do you want to resubmit the IP? Do you want IP to be OCP-Inspired™? (Opt A)
Pick an outbound license
Hardware: OWF 1.0, OCPHL-P, OCPHL-R
Software: Any OSI approved open source license
Community Review
Project Lead/IC Project representative/Project Community
IC Review
Was your contribution accepted by the IC?
No
Yes
Congratulations!
Your Specification and or Design IP contribution is now OCP Accepted™

OCP Hardware Classifications

Before looking at the criteria for the hardware classifications we need to see what product type of product is it. Below is how we define the following:
Specification(s). Reference and Derivative Implementations

Terminology

- **Specification (aka Spec.)** -- The “on paper” specification. May include a BoM, mechanical files, board files, add on cards, firmware, each of which increase specificity.
- **Reference Implementation** -- A “reference” implementation of the spec. Usually the first to market implementation that was submitted along with the specification.
- **Derivative Implementation** -- Amongst particular implementations, there may still be differences (e.g. different wire runs in the board, different chip placement, etc), even if they follow the general spec. The higher the specificity in the spec (items like board files and BoMs are examples of things that increase specificity), the greater the odds that any given implementation will vary from it.

OCP Accepted™ Specification and/or Design Contribution Process

Step-by-step Guide (with helpful links)

1. Must be an OCP Member. (Either Individual or Tiered Member) If you are not an OCP Member you may not submit a spec/design contribution.

2. Must sign either the OCP CLA (Contributor License Agreement) or the OWF CLA1.0 This is the inbound license. Each contribution must have a signed CLA. If you do not sign the one of the two CLA you may not submit a spec/design contribution.

3. Must pick the outbound license. This is what governs how others can use your contribution. If the contribution is a Hardware contribution you must decide between the OWFa1.0, OCPHL-P or the OCPHL-R license. If the contribution is a software contribution you must pick and OSI approved open source software license. If you do not pick an outbound license for your contribution, the spec submission process will end.

4. Your contribution must now go the OCP Project Lead and the IC Representative which which governs the OCP vertical that your contribution falls under. This would include: Data Center, Certification, Hardware Management, HPC, Networking, Open Rack, Server, Storage and Telco. The spec will be reviewed by the Project Lead, IC Representative and the community. Once the Project Lead and IC Representative determine that the contribution is ready to the next step. If you skip this step the IC will send your contribution back to the Project Lead and your submission process will stall.

5. The contribution must go to the Incubation Committee (IC) for review and acceptance decision. The IC will give the OCP Project Lead and Contributor feedback. Once the Contributor has meet the requirements of the IC the contribution will be accepted and added to the list of OCP accepted specs and promoted as such to the community. If the IP contribution meets the OCP Accepted™ requirements the Foundation will contact the contributor about how to use the OCP Accepted™ trademark. Please note this process just ensures that the specification and or designs meet the OCP Accepted™ requirments. This does not mean that the product can be listed as OCP Inspired™.

OCP Product Classifications

Currently, have two types of classification for hardware:
Accepted™ and Inspired™. Below are the criteria for an OCP Accepted™ **Product**

OCP Accepted™ Product Requirements

All OCP Accepted™ **products** must adhere to the following criteria, which are subject to approval from Foundation staff, Incubation Committee leadership, and relevant Project Lead. A **product** may called **OCP Accepted™** when the following criteria are met:

ALL (4) of the following criteria are first met:

1. **MUST** be a product that has been manufactured
2. **MUST** be available for purchase by any member company before publication on the OCP Accepted™ product page. This will be subject to audit, approval, and, if approval is not met, revocation of OCP Accepted™ status, by OCP Foundation Staff.
3. **MUST** meet all criteria in the spec described as “SHALL” or “MUST” or “WILL” or “REQUIRED”. **NO** exceptions are allowed.
4. The submitter **MUST** complete and submit to the Foundation a self-assessment that attests that the product meets the spec criteria.

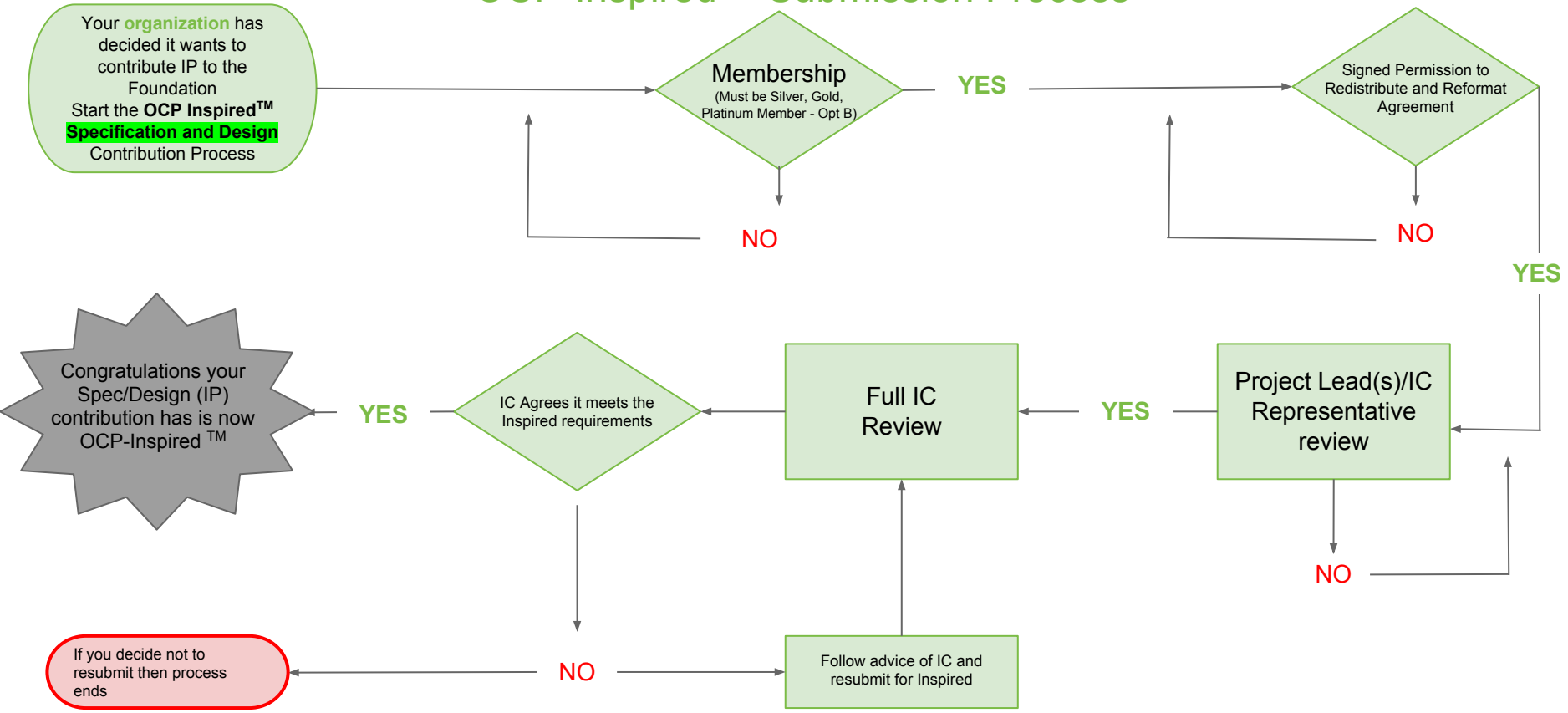
OCP Accepted™ NOTES

If a product does NOT meet the Specification criteria, the submitter is encouraged to either revise or provide an addendum to the original specification. Submitter is encouraged to work with the original author(s).

Once the OCP Accepted™ criteria has been met, the following process is to be followed for publication to the OCP Accepted™ product page and receipt of OCP Accepted™ stickers.

- The submitter **MUST** provide the Foundation with the list of SKUs and orderable part numbers, self-assessment documentation necessary that attests that EACH SKU (orderable part number) meets the specification criteria. Acceptable documentation can be links to public information or documentation sent to the foundation. This will be subject to audit, approval, and, if approval is not met, revocation of OCP Accepted™ status, by OCP Foundation Staff.
- The OCP Foundation will publish the SKUs and orderable part numbers on the OCP Accepted™ product page.
- Upon publication on the OCP Accepted™ product page, the Submitter may use the term “OCP Accepted™” for Product per OCP terms and conditions.

OCP-Inspired™ Submission Process



OCP Inspired™ Specification and/or Design Contribution Process

Step-by-step Guide (with helpful links)

1. Must be an OCP Member. (Either Individual or Tiered Member) If you are not an OCP Member you may not submit a spec/design contribution.

2. Must sign Permission to Redistribute and Reformat Agreement. If you do not sign this agreement then you may not continue with the OCP Inspired™ submission process.

3. Your contribution must now go the OCP Project Lead and the IC Representative which which governs the OCP vertical that your contribution falls under. This would include: Data Center, Certification, Hardware Management, HPC, Networking, Open Rack, Server, Storage and Telco. The spec will be reviewed by the Project Lead, IC Representative and the community. Once the Project Lead and IC Representative determine that the contribution is ready to the next step. If you skip this step the IC will send your contribution back to the Project Lead and your submission process will stall.

4. The contribution must go to the Incubation Committee (IC) for review and decision on whether the spec and design contribution meets the OCP Inspired™ requirements. If the IP contribution meets the OCP Inspired™ requirements the Foundation will contact the contributor about how to use the OCP Inspired™ trademark. Please note this process just ensures that the specification and or designs meet the OCP Inspired™ this does not mean that the product can be listed as OCP Inspired™.

OCP Product Classifications

Currently, have two types of classification for hardware:
OCP Inspired™ and OCP Accepted™. Below are the criteria for OCP Inspired™

OCP Inspired™

All OCP Inspired **products** must adhere to the following criteria, which are subject to approval from Foundation staff, Incubation Committee leadership, and relevant Project Lead. A **product** may called **OCP Inspired™** according to the following criteria.

The Product and spec **MUST** go through the normal contribution acceptance requirements for OCP Accepted™. It will be considered for OCP Inspired™ classification If the either

(1) Product and spec is not accepted. (Opt A)
(2) The up-front intent is to only be OCP Inspired™. (Opt B)

Items classified as OCP Inspired™ can be go back through the contribution acceptance process to achieve OCP Accepted™ classification after the requirements have been addressed.

Criteria for consideration for OCP Inspired™

(1) Product **MUST** follow and adhere to at least one tenet of the OCP Principals list.

(2) At a minimum, there **MUST** be a product specification outlining the feature set, base components and enough evidence to convince OCP leadership that the product meets the tenets of OCP Principals.

(3) The Product **MUST** be associated with IT computing, and/or networking, and/or storage. This association is determined at the discretion of an Open Compute Foundation Staff Member or representative.

(4) The Product **MUST** be manufactured (that is, at least one physically available version of it must exist, even if just a prototype or engineering sample) and **MUST** be available for purchase by any member company within 120 days of receiving OCP Inspired™ classification.

OCP Principles

Efficiency

- Performance
- Cost
- Power Conversion & Delivery
- Cooling

Scale

- Fast, Simple, Robust Tool-less Maintenance
- OCP Compliant Management Tools
- Documentation

Openness

- Open Source
- Open Interfaces
- OCP Compatible

Impact

- Efficiency *Gains*
- New Technology
- Leverage/Empower Prior Contributions
- Supply Chain

- **Efficiency** – A key OCP tenant is efficient design. Aspects that can be considered include (but aren't limited to) power delivery and conversion, thermal efficiency, platform performance (per-W for example), reducing overall infrastructure costs, reducing code weight, reducing latencies and more.

- **Scale** – OCP contributions must be scale-out ready. This means that the technology is designed with the right supporting features to allow for its maintenance in large scale deployments. This includes physical maintenance, remote management, upgradability, error reporting and appropriate documentation. Management tools should strive to adhere to the guideline provided by the OCP Hardware Management Project. Documentation should enable adopters towards a successful deployment, providing guidance on equipment installation, turn on and configuration, as well as physical and remote service.

- **Openness** – OCP encourages as much open source contribution as possible, but understands that in certain cases 100% open source contriution may not be possible. Whether fully open source or not, a contribution should strive to comply with a set of already existing open interfaces, at the very least provide one. Providing a solution compatible with already existing OCP contributions is one way to implement existing (open) interfaces.

- **Impact** – New OCP contributions must create meaningful positive impact within the OCP ecosystem. This can be attained by introducing efficiency gains, introducing new technologies and products that are valuable for scale out computing, creating a multiplier effect by building on top of already existing OCP solutions, and enabling a more robust supply chain by contributing alternative compatible solutions.

Criteria
For a project contribution to become OCP Accepted, it needs to embody three out of the four major OCP principles. An inspired project needs to embody two out of the 4 principals. How a contribution meets these 4 principles will vary based on what it is (i.e. a SW contribution vs. a HW contribution), and so the IC will use its judgment in applying the right criteria in each tenant when evaluating a contribution

OCP Solution Provider Program

Current OCP Solution Providers

Hyve Solutions

Email: sales@hyvesolutions.com
Phone: (855) 869-6873
Web: hyvesolutions.com

StackVelocity

Email: info@stackvelocity.com
Phone: (408) 643-1570
Web: stackvelocity.com

Quanta Cloud Technology

Email: Sales@quantaqct.com
Phone: (510) 270-6111
Web: QuantaQCT.com

Wiwynn

Email: sales@wiwynn.com
Web: http://www.wiwynn.com

Penguin Computing

Email: ocp@penguincomputing.com
Phone: (888) 736-4846
Web: penguincomputing.com

ITOCHU Techno-Solutions Coporation

Email: ctc_ocp@ctc-g.co.jp
Web: http://www.ctc-g.co.jp/ (Japanese)
Web: http://www.ctc-g.co.jp/en (English)

HP

Email: cloudlineocp@hpe.com
Phone: 501-513-7036
Web: http://www8.hp.com/us/en/products/servers/scalable-systems/cloudline/index.html

Nokia

Email: networks.nokia.com/how-to-buy
Phone: (866) 231-0264
Web: networks.nokia.com

Requirements to become a Solution Provider (SP)?

- The capability to deliver and support integrated rack level solutions
- Be a current Gold or Platinum Open Compute Project Member
- Sign the Solution Provider Agreement
- Annual SP program fee
- Local engineering architecture resources for customer engagements
- Establish or maintain relationships with manufacturers of OCP products
- Quarterly business reviews to discuss adoption trends, sales pipeline and marketing efforts
- Actively participate and contribute to the Open Compute Project

Please contact steve@opencompute.org for more information about the Solution Provider program.

Solution Provider - Benefits

SP's receive ***all*** the benefits of a Gold or Platinum OCP member plus the additional benefits listed below.

Up to 50% credit toward tiered membership fee for OCP Marketing Events (toward next year's fee)	Up to 50% credit toward the SP fee for accepted white papers, ref architectures & case studies (toward next year's fee)	Access to Facebook data centre tours for qualified prospects*	Business planning, sales training and sales support including potential leads from OCP events	Dedicated page on OCP website including blog postings and PR profiles for SP's	Assistance in writing/editing end user stories to be posted on OCP website

*Prospects must be qualified according to OCP sales methodology and approved by Facebook for DC tours

Thank you!

Any Questions?