OCP Future Technologies V2.0

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Welcome : 2021 FTI Kickoff event

1. OCP Future Technologies and **Future Technology Initiative** (FTI), Allan Smith
2. **Discussions** around three **Focus Areas** (status, roadmap, annual objectives)

- **Software Defined Memory**, Manoj Wadekar, Facebook
- **Cloud Service Model**, Murugasamy (Sammy) Nachimuthu, Intel
- **AI HW-SW Co-Design**, Allan Smith, Facebook

We value your expertise and would like to have your input to push forward technological innovations. Join these areas and engage in conversations!

Question box or
Raise your hand

Share thoughts and
discuss on Focus Areas

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OCP Future Technologies and its Evolution

- Objective: Build a future-focused community within OCP to serve as forward-looking funnel for ideas and technologies 3-5 years out
- Started 2019: The **OCP Future Technologies Symposium** has been successful for the past four events (V1.0)
  - Consistent growth, surveyed as value-add
- End of 2020: Time to organize interface with OCP Industry and focus our efforts

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V2.0: Moving forward

- OCP Future Technologies Initiative is now a forum to point this community towards industry priorities and align these efforts with our Technology Roadmap

  - Focuses on building pipelines of talent to work on specific problems, goal to hand off promising efforts to OCP Project(s)

  - Ultimate goal is commercialization

Organizing OCP FTI

OPEN Compute Project ®

Industry
(Developers, Providers, Adopters)

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Academia
Startups
VCs
National Labs

(Anyone else not in OCP today who could help solve the Industry's problems)

Organizing OCP FTI

Organized by:

- Incubation Committee (IC)
  - Comprised of members across functional areas and companies
  - Role: Identifies industry problems for OCP community, build roadmaps
- Projects
  - As problem - solution space matures, these formalize into OCP Projects
- Communities
  - Around broader topic areas (e.g. Storage), OCP Communities form

Operating Mechanism:

- Identify
  - OCP Technology Roadmap opportunities that fit FTI timeframe (3-5 years out)
- Organize
  - For each opportunity, build communication channels, forums, and pipelines of ideas / talent / solutions in the space
- Coordinate
  - Exchange information often across OCP IC, Projects, Communities, and Leadership

FTI Roles and Responsibilities

Core Team

Leads FTI, Primary interface with OCP

Allan Smith - OCP FTI Chair

Also: Facebook Area 404 Lab Manager

Lesya Dymyd - OCP FTS Chair

Also: Strategic Innovation Engineer, 2CRSi

Dirk Van Slyke - OCP VP & CMO

Bill Carter - OCP CTO

Kate Hendle - OCP Events Coordinator

FTI Roles and Responsibilities

Technology Chairs (TCs) per Focus Area

TCs interface with OCP Industry

- Understand and aggregate collaboration opportunities in space
- Establish regular operating mechanisms, develop technology roadmap

TCs build solution pipelines for Focus Area

- Includes research, proof of concept, and talent pipeline via FTI
- We envision this role to be surveying research and relevant communities across national labs, academia, startups, and conferences, and facilitating exchange of information with OCP members
- Will leverage Symposium events to call for papers and exchange information with a broader community

Ultimately, success is curated solutions for OCP adoption in the Focus Area Space

- Mature problem-solution spaces will formalize into OCP Projects, with TC able to evolve their role

FTI Roles and Responsibilities

Technology Chairs

Manoj Wadekar – SDM TC
Also: Facebook HW Storage Architect

Sammy Nachimuthu – CSM TC
Also: Lead Cloud Solutions Architect,
Sr. Principal Engineer, Intel

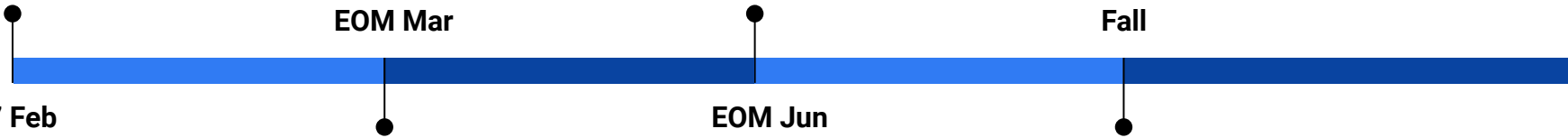
FTI 2021 Roadmap

OCP FTI 2.0 Kickoff

Virtual Invite-only event to organize FTI efforts for 2021

FTI Status Update to IC

Set roadmap / expectations for Fall FTS for each Focus Area



Spend Q1 meeting with Technical Chair (TC) candidates and establishing expectations

Target: Have TCs landed

Spend Q2 identifying community members, building channels / forums

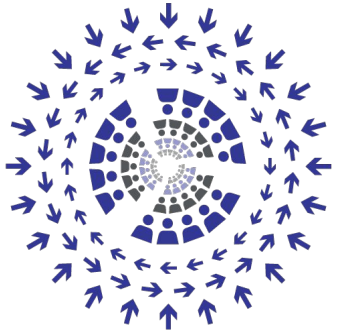
Monthly updates with FTI leadership

OCP FT Symposium

In conjunction with OCP Summit, hold Fall OCP FT Symposium event. Main focus will be 3 Focus Areas, will have broad call for other topics

2021 FTI Focus Areas

- Software Defined Memory
- Cloud Service Model
- AI HW-SW Design Collaboration
- Additional R&D Opportunities / Areas



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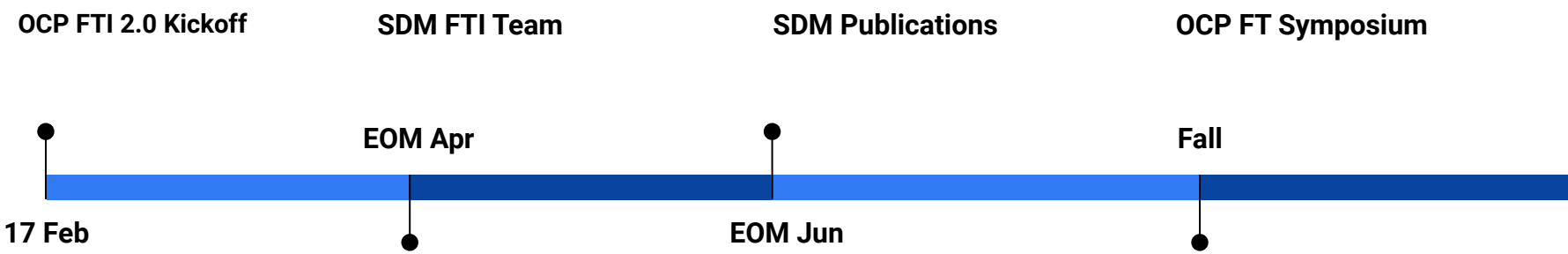
SW Defined Memory (SDM) background

- **Opportunity**:
  - Systems with Hybrid/Converged Memory types with SW and NW innovation
  - Can enable In-memory applications, traditional storage use cases to achieve near-memory performance levels: securely and at lower costs .
  - Sub-topics that are standard (or on the way): PMEM, Non-volatile DIMMs, Interconnects
- **Full-stack solution space**
  - HW (Interface, DIMMs, CPU, ASIC acceleration, could include FPGA)
  - SW (APIs, Drivers, OS, Tools, Benchmarks)
  - Has implications on Server/Network Design
- **Challenging area**
  - Leading/Guiding workload-specific use cases from industry
  - Benchmarks/workloads that enable validation of novel ideas

Consolidate OCP interests and FTI partner approaches

(Idea of) SDM 2021 Roadmap



Cloud Service Model (CSM) background

- **Problem/Opportunity:**
  - Lack of a comprehensive Service Model for cloud-based hardware where all service is done remotely.
    - IT equipment is built from commercial, commodity HW. Each device has different management I/F's (inband, out of band, proprietary side-band).
    - Ideally, all components would support a standardized interface that would allow secure remote access, monitor, service, control and debug.
      - Target components would include compute, memory, storage, I/O, power, security devices and modules.
      - All of these devices should allow out of band access.
        - Today, out of channel lacks data throughput to support OOB mgmt.
  - Lack of comprehensive at scale service model in OCP
    - Lack of data center management control plane for one to many (e.g. 1000's) data center platforms and devices
    - Lack of data acquisition and processing requirements today

Create a new comprehensive platform management architecture that allows remote servicing of the data center at scale

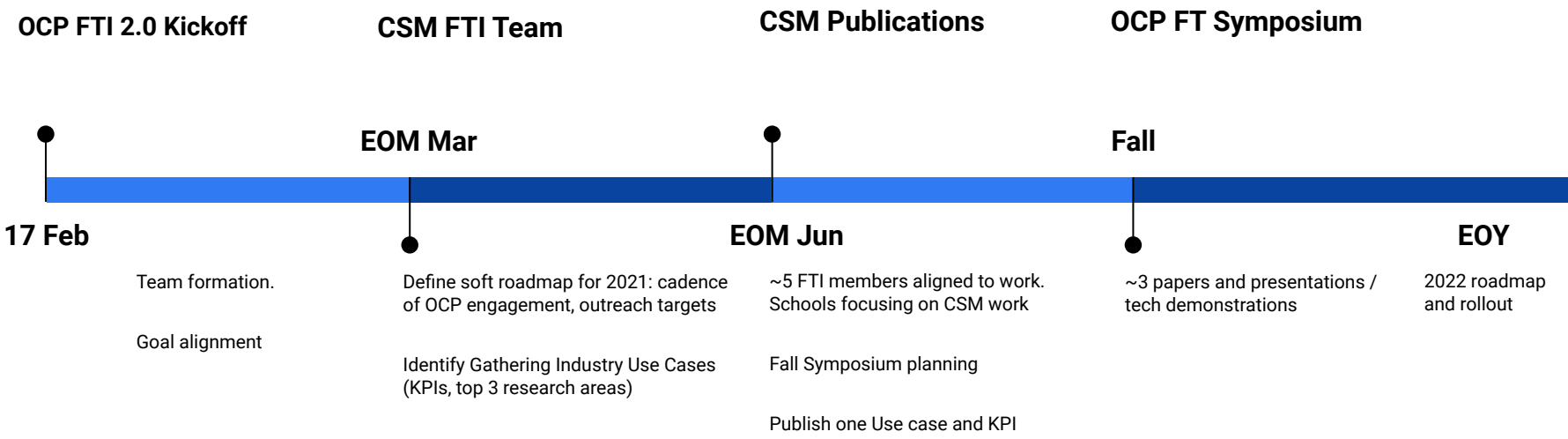
Cloud Service Model (CSM)

- **Solution space**
  - Comprehensive Service Model for cloud-based hardware where all service is done remotely.
  - Target Subsystems
    - HW (CPU, GP/GPU, FPGA, DIMM, HDD, SSD, NVMe, Network, PSU, VRs, ROT, BMC)
    - FW (BMC, Platform FW, CPU FW, I/O Device FW, Memory device FW, Security)
    - SW (remote service management, data acquisition, AI)
    - Standard bodies (OCP sub committees, DMTF, SNIA)

- **Challenging area**
  - BMC as the proxy lacks data throughput and resource access restrictions
  - Converging on key use cases
  - KPIs that will enable base case and validation of novel ideas

Create a new comprehensive platform management architecture that allows remote servicing of the data center at scale

Cloud Service Model 2021 Roadmap



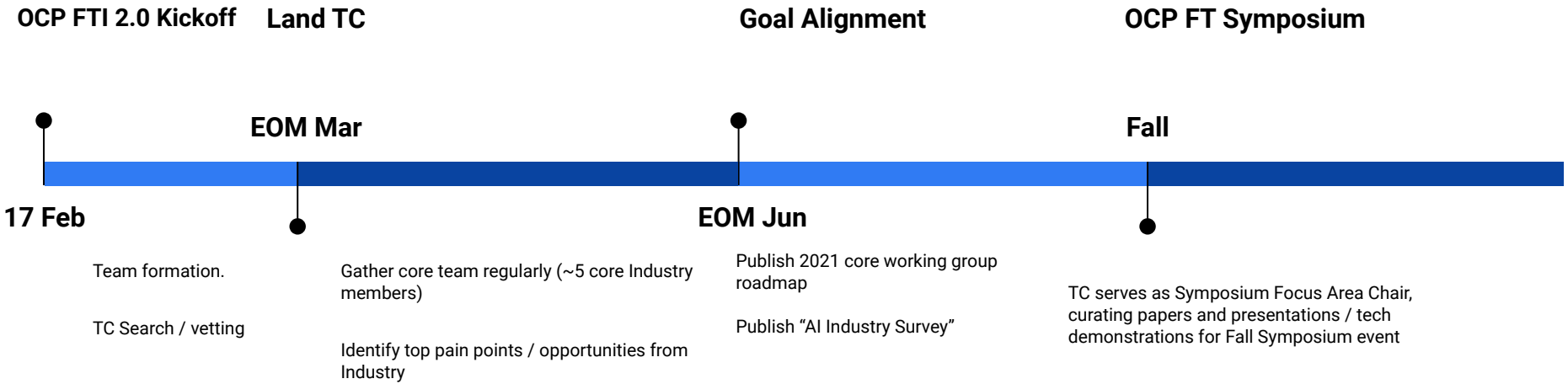
AI HW-SW Co-Design background / status

- Full-stack solution space
  - HW (Generalized Compute with Hosts, GPU and ASIC acceleration, could include FPGA)
  - SW (Workload-specific optimization)
  - Has implications on DC Design (power densities, custom rack configurations, interconnect with accelerators)
- Challenging area
  - Workload-specific use cases from various companies assumed close-hold
- Resources
  - No current OCP Project; Open Accelerator Infrastructure, and High Performance Computing are tangential Projects
  - ISCA, MICRO, MLSys, HotChips, Hot Interconnects, RecSys, Supercomputing, HPCA, ASPLOS, SIAM Conference on Computational Science and Engineering (CSE)

AI HW-SW Co-Design Next Steps

- Goal: Land TC by EOM March
  - Expectations of role
  - Process to select
- Ask: ID candidates, get them to us

AI HW-SW Co-design 2021 Roadmap

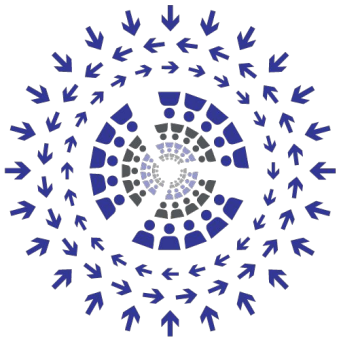


Call to Action: FTI 2021

Three Focus Areas are our priority - ENGAGE IN THESE AREAS AND CONTRIBUTE

- **LinkedIn Group** - Join to see public announcements, talk with community
- **Mailing Lists** - Subscribe, recommend participants, “who should join”?
- **Engage** - connect with the FTI team and the community, advice and contribute
- **Join the OCP Symposium**, Nov 2021 - submit a paper, propose participants, join

Who should join our efforts and help us push forward innovations?
Why not you?



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Thank you for your attention!

Backups

New OCP IC Role

Responsibilities on following 3 front

From Sept 4th, 2019: DJ presentation to incoming OCP IC

- Goal is to inform about expansion of the roles and responsibilities
- Additional activities are not all be evenly distributed across all IC members
- Definition of some of the details such as tracking metrics in works


Metrics/Expectations

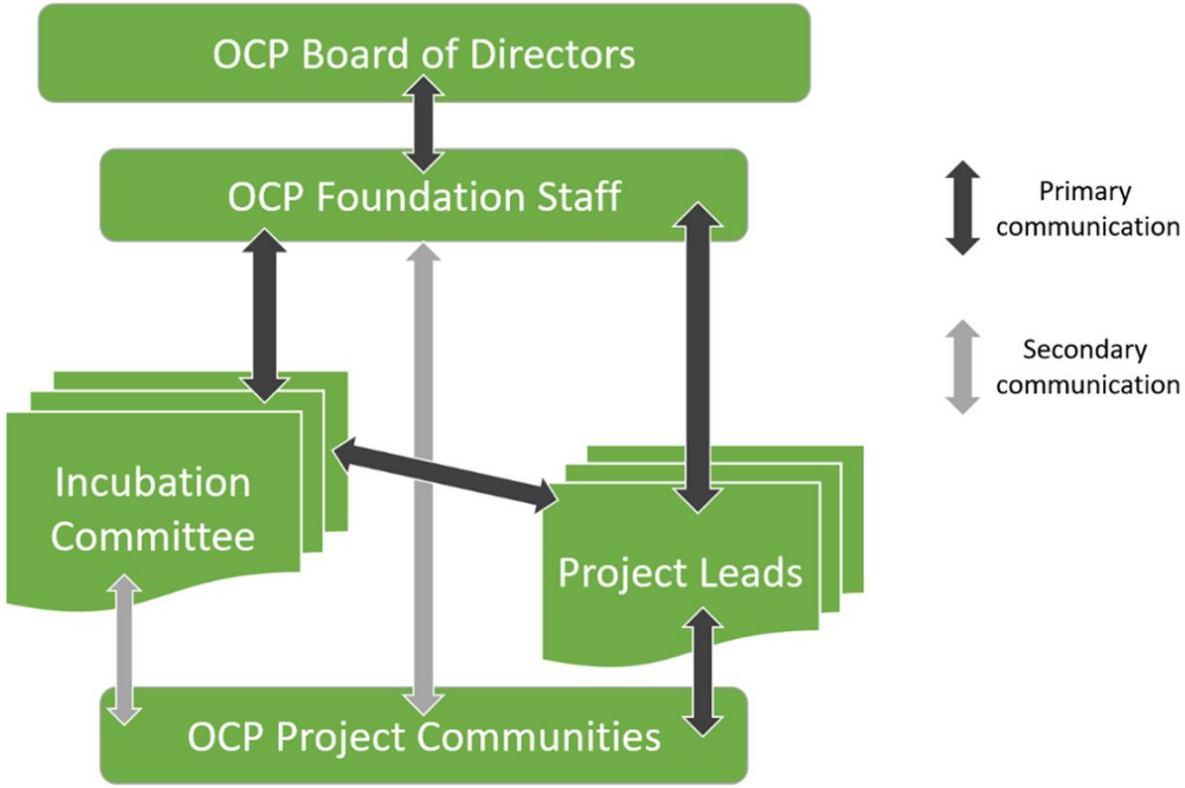
Attendance and Leadership
IC Representatives are expected to attend monthly calls, meetings, any Project Community led-events or workshops.
Monthly call attendance - 90%
Leadership Sprint Attendance - 90%
IC Meeting Attendance - 90% for ALL IC Meetings
Project Event Attendance - 90% (any event led by the Project itself)

Voting
IC Reps are expected to vote on All Contributions, All Votes are tracked.
If less than 90% voting has occurred in one quarter, then IC Rep will be placed on probationary period.
If no improvement is seen, an Automatic Re-Election Process is triggered. The IC Rep will be replaced with the election winner.

Project Health
Charter Review: every year
Project Activity: every 6 months
Adoption Status: every 6 months

Collaboration
With other Industry Organizations outside OCP: every 6 months
With other Project Communities within OCP: every 6 months

OCP Hierarchy



Open Compute Projects Today