

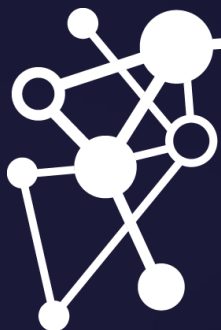


June 13-15, 2023

DoubleTree by Hilton San Jose

SmartNICsSummit.com

THE **LINUX** FOUNDATION PROJECTS



**OPEN
PROGRAMMABLE
INFRASTRUCTURE
PROJECT**

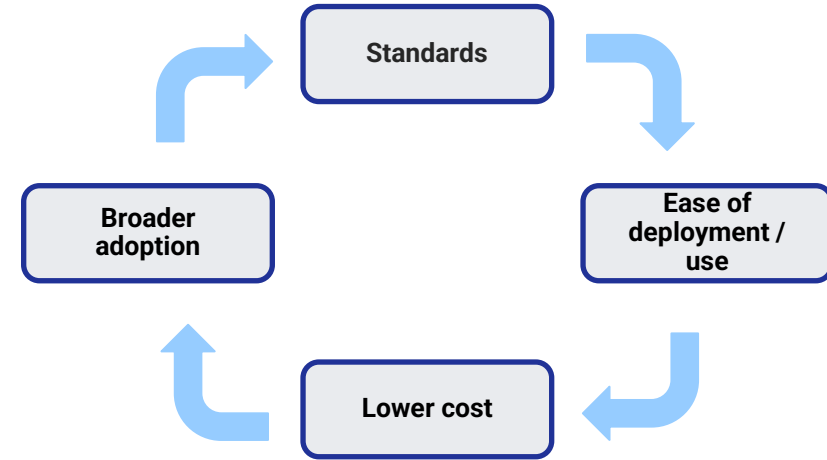
opiproject.org

Open Programmable Infrastructure (OPI) Overview

Dr. Joseph L White, OPI TSC Chair; Fellow @ Dell

Why should you care about OPI for DPU/IPU?

- With Moore's law slowing down, ever increasing demands for compute, and exponential growth in data traffic...
 - We need heterogeneous compute
 - We need composability.
 - Workload specific resources per host
- Hyperscalers deploy DPU/IPUs w/ non-standard frameworks
 - We want Standard APIs for Edge, Telco, Enterprise
- Hardware needs to be abstracted
 - solution providers can focus on deploying services
 - Ease of development & deployment
- Need to drive efficiency in large computing environments > TCO savings
- Standards and common APIs needed to drive broader adoption of DPU/IPUs
 - Flywheel effect



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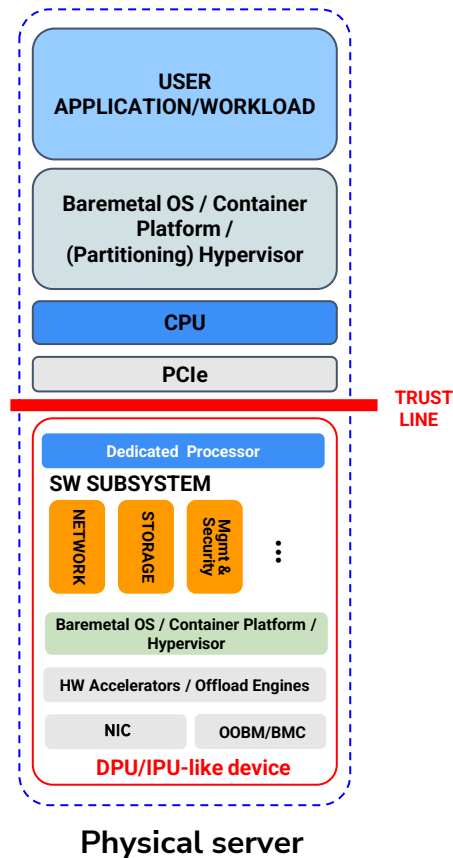
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Project Goals

- Create community-driven standards-based open ecosystem for DPU/IPU-like technologies
- Create vendor agnostic framework and architecture for DPU/IPU-based software stacks
- Reuse existing or define a set of new common APIs for DPU/IPU-like technologies when required
- Provide implementation examples to validate the architectures/APIs



DPU / IPU Use cases

Infrastructure workload isolation

- Control Plane offload
- Host Lifecycle and Provisioning
- Host Offloads

Security

- Security domains (Host and DPU/IPU)
- FW, intrusion detection and prevention

Networking offload and acceleration

- Virtual switch offload, IPSEC , TLS

Storage offload and acceleration

- nvme/tcp offload, compression, and dedupe acceleration

Applies Across:



Edge



Enterprise

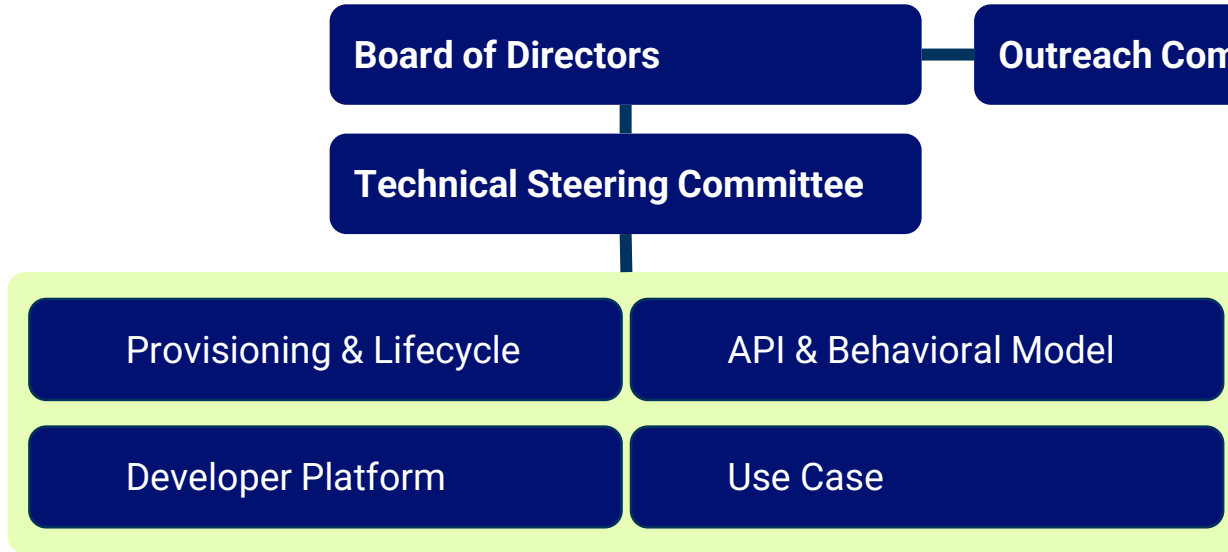


Cloud



Telco Core & Edge

OPI Organizational Structure



OPI Technical Deliverables

- Open-Source Projects
- Specifications/Standards
- Reference Platforms
- Test Suites & Cases
- POC/Prototypes

Scope and Goals of Working Groups

Provisioning & Lifecycle

- Discovery & Provisioning
- Inventory
- Boot sequencing
- Lifecycle & Updates
- Monitoring & Telemetry

API & Behavioral Model

- Object models
- Host & Management facing APIs
- Taxonomy for Services (Networking, Storage, Security)
- Re-use industry standard APIs (OpenConfig, VPP, FRR, etc)
- Reference Orchestration Client

Developer Platform

- Independent testing Lab
- Virtual & Hardware POCs
- Simulation Environment
- CI/CD

Use Case

- Areas of high interest
 - Storage, Security, Networking, AI/ML
- Use cases gathered from end users
 - OVS/OVN
 - NVMe/PCIe to NVMe/TCP bridge
 - Basic Firewall.

OPI Repositories

[opi](#)

OPI Main Repository

[opi-prov-life](#)

Provisioning, Lifecycle and Platform Management

- [Discovery & Provisioning](#)
- [Inventory](#)
- [Boot sequencing](#)
- Lifecycle & Updates
- [Monitoring & Telemetry](#) (OTEL)

[opi-poc](#)

Developer Platform and PoC Work

- Integration Platform Definition
- Software Networking PoC via p4-eBPF
- SPDK based storage device PoC

[opi-api](#)

Open Programmable Infrastructure API and Behavioral Model

Create a Taxonomy for services:

- [Networking](#)
- [Security](#)
- [Storage](#)
- Gateway
- Telemetry
- [AI/ML](#)

SPDK

- [opi-spdk-bridge](#)
 - OPI Storage gRPC to SPDK json-rpc bridge POC
- [opi-nvidia-bridge](#)
 - OPI gRPC to Nvidia bridge third party repo
- [opi-marvell-bridge](#)
 - OPI gRPC to Marvell bridge third party repo
- [opi-spdk-bridge](#)
 - OPI storage gRPC to SPDK json-rpc bridge
- [spdk-csi](#) (Forked from [spdk/spdk-csi](#)) & [spdk](#)
 - CSI driver to bring SPDK to Kubernetes storage through NVMe-oF or iSCSI. Supports dynamic volume provisioning and enables Pods to use SPDK storage transparently.

[godpu](#) A Container Storage Interface (CSI) library, client, and other helpful utilities created with Go for OPI

[pydpu](#) Python library and cli to communicate with DPUs and IPUs

[sessionOffload](#) (Forked from [att/sessionOffload](#))

Open API for IP Applications to Offload TCP/UDP Session Packet Processing to Hardware

[opi-strongswan-bridge](#)

OPI IPSEC gRPC to strongSwan vici API bridge

[opi-smbios-bridge](#)

OPI gRPC to SMBIOS bridge for inventory

[smbios-validation-tool](#) (Forked from [google/smbios-validation-tool](#))

[sztp](#) & [sztpd](#)

Secure Zero Touch Provisioning (sZTP) in OPI

[otel](#)

Common DPU Telemetry definition

[opiproject.org](#)

OPI Hugo Website

[artwork](#)

OPI related logos and artwork.



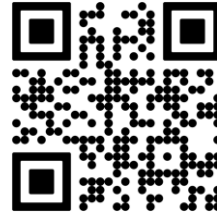
The objective of the Open Programmable Infrastructure Project is to foster a community-driven standards-based **open ecosystem** for next generation architectures and frameworks based on **DPU/IPU-like technologies**.



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github.com/opiproject



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