

# IPDK and its role in enabling

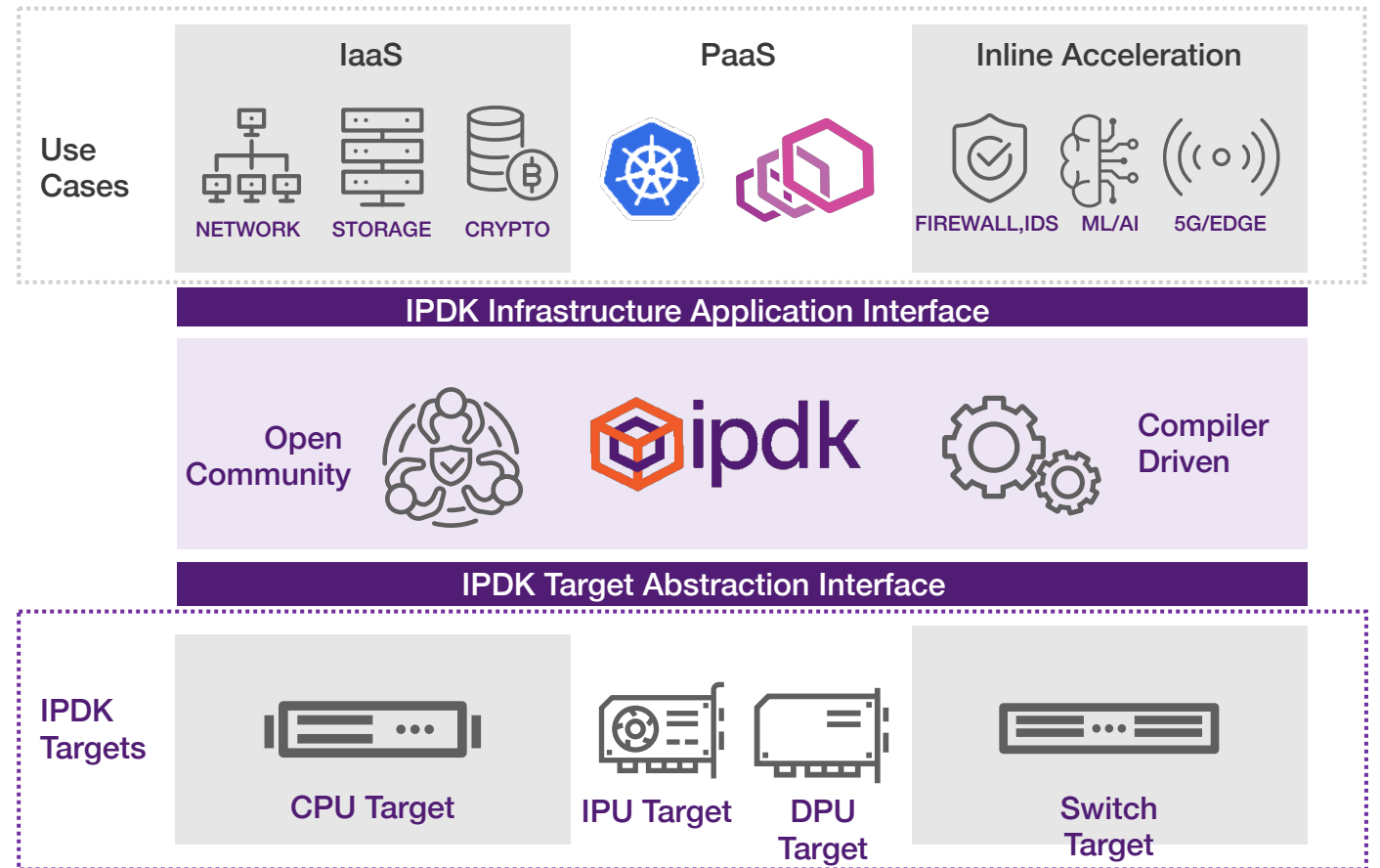
# Open Programmable Infrastructure

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MARCH 15th, 2022

# IPDK Overview

IPDK is a **community-driven target agnostic framework for infrastructure programming** that runs on a CPU, IPU, DPU, or switch.

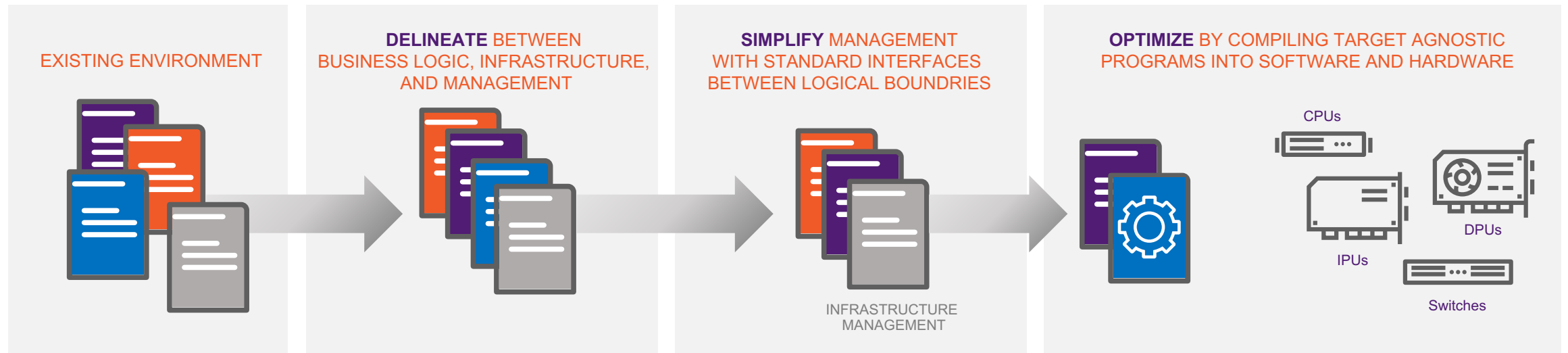


# IPDK + OPI

IPDK as a  
component  
puzzle piece  
for what  
is needed  
for OPI



# IPDK Approach



1. **Delineate** Business Logic vs. Infrastructure
2. **Simplify** Infrastructure Management
3. **Optimize** using a Compiler-Driven Target Abstraction

# Open-Source Development

- **Recipes**

Delineate, simplify, and optimize for each major use case and functional area

- **Open-Source Development & Governance**

New patches, agents, and interface support

Open-Source definitions of interfaces  
Dockerfiles and pre-built containers

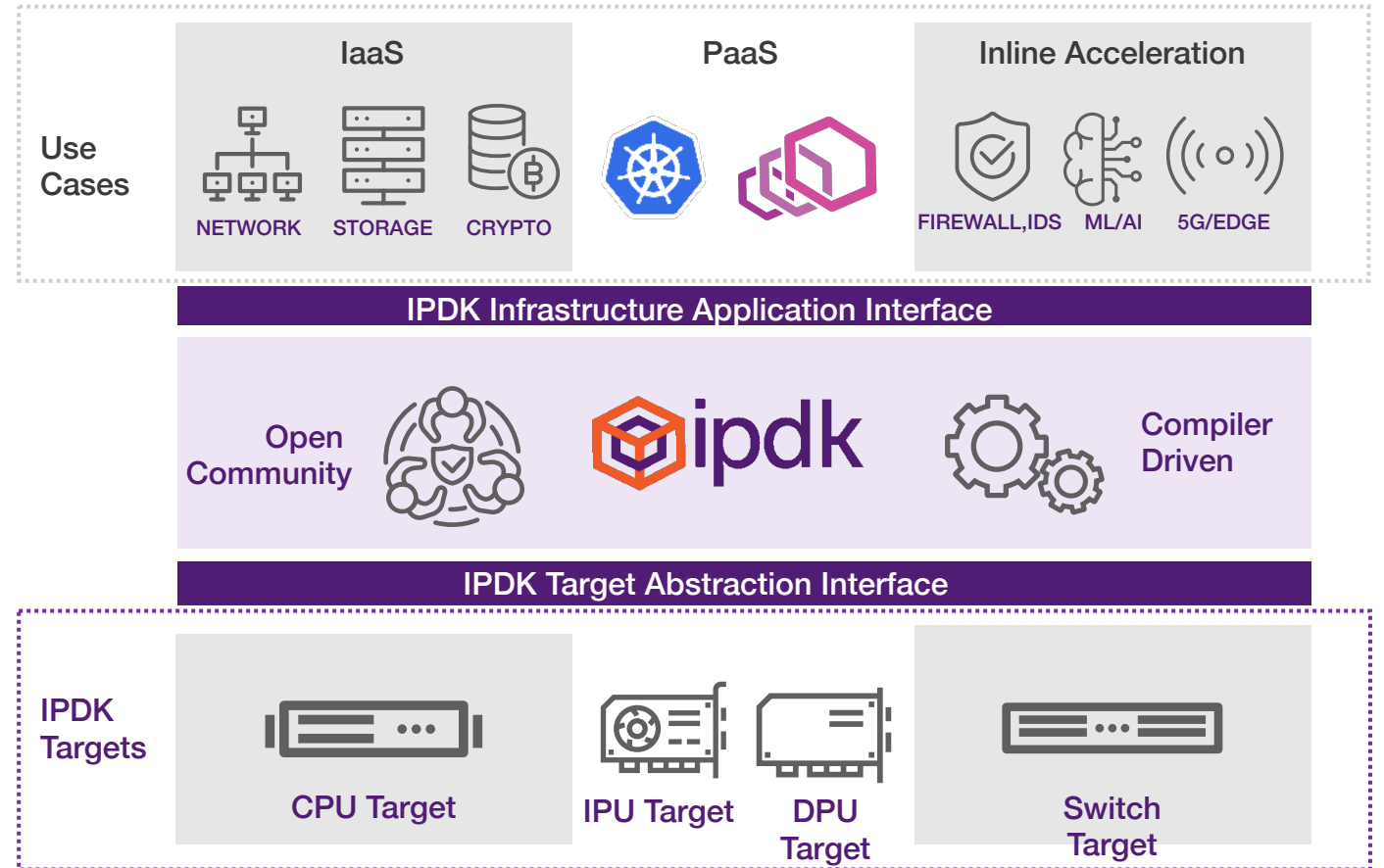
- **Development has started, come join!**

Collaborate on [Slack](#), [Github](#) & [IPDK.io](#)

The screenshot shows the IPDK website homepage. At the top, there is a navigation bar with links for 'DOCUMENTATION', 'DEVELOPMENT', 'COMMUNITY', and 'NEWS'. The main content area features the IPDK logo and the text 'Infrastructure Programmer Development Kit'. Below this, a paragraph describes IPDK as an open source, vendor agnostic framework of drivers and APIs for infrastructure offload and management. It mentions that IPDK runs on Linux and uses tools like SPDK, DPDK, and P4. There are two buttons: 'Get started' and 'GitHub'. To the right, there is a 'Use Cases' section with icons for IaaS, PaaS, and Inline Acceleration. Below that is the 'IPDK Infrastructure Application Interface' section, which includes 'Open Community', the IPDK logo, and 'Compiler Driven'. Underneath is the 'IPDK Target Abstraction Interface' section, which lists 'CPU Target', 'IPU Target', and 'Switch Target'. At the bottom right, there is an 'IPDK.io Calendar' showing events for Tuesday, March 15 and Wednesday, March 16, including 'Open Programmable Infrastructure (OPI)' and 'OVS with P4 feature updates'.

# IPDK Standard Interfaces

- **Infrastructure Application Interface**  
Devices & Services for Workload Apps  
Platform Capabilities  
RPC-based
- **Target Abstraction Interface (TAI)**  
Target Capabilities  
Functional APIs



# Use-Case Driven

## 1. Infrastructure-as-a-Service

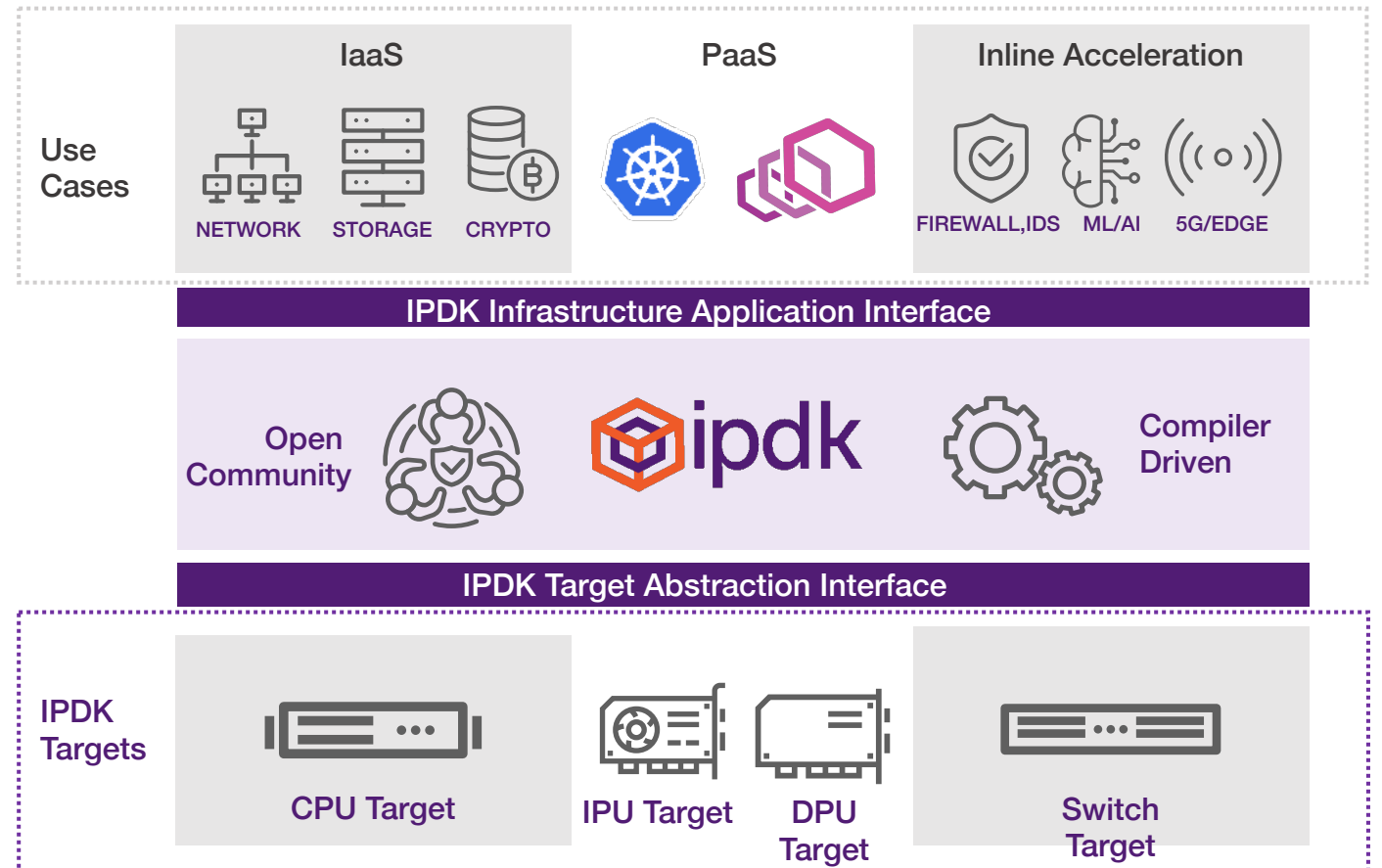
Virtual networking, storage and Crypto across VMs, containers and bare metal

## 2. Platform-as-a-Service

Container Networking (Kubernetes) Sidecars (Envoy, MongoDB)

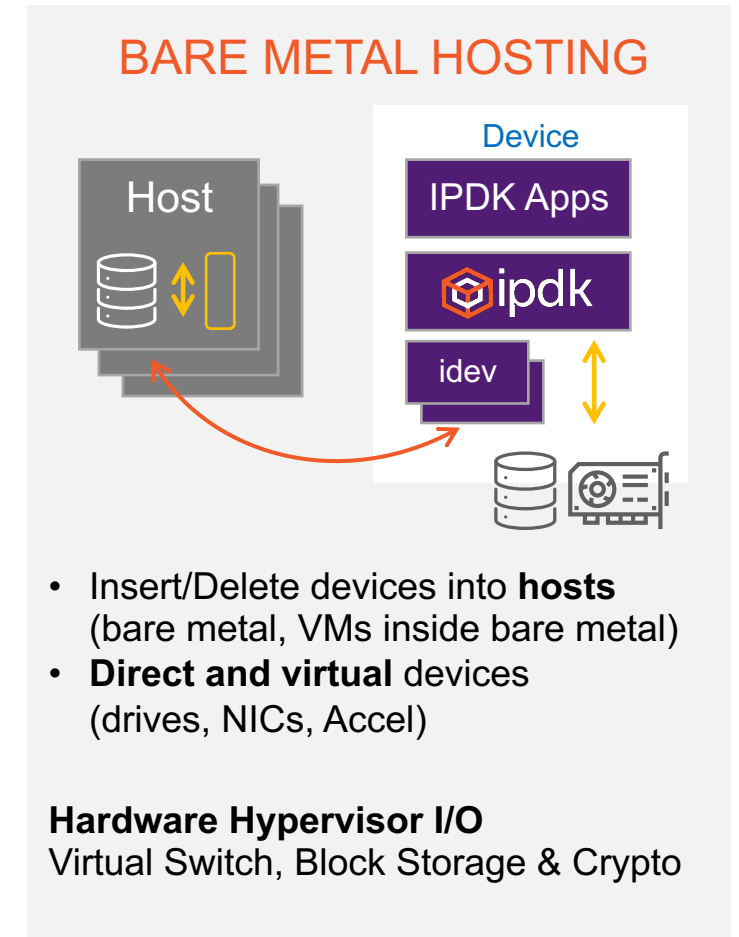
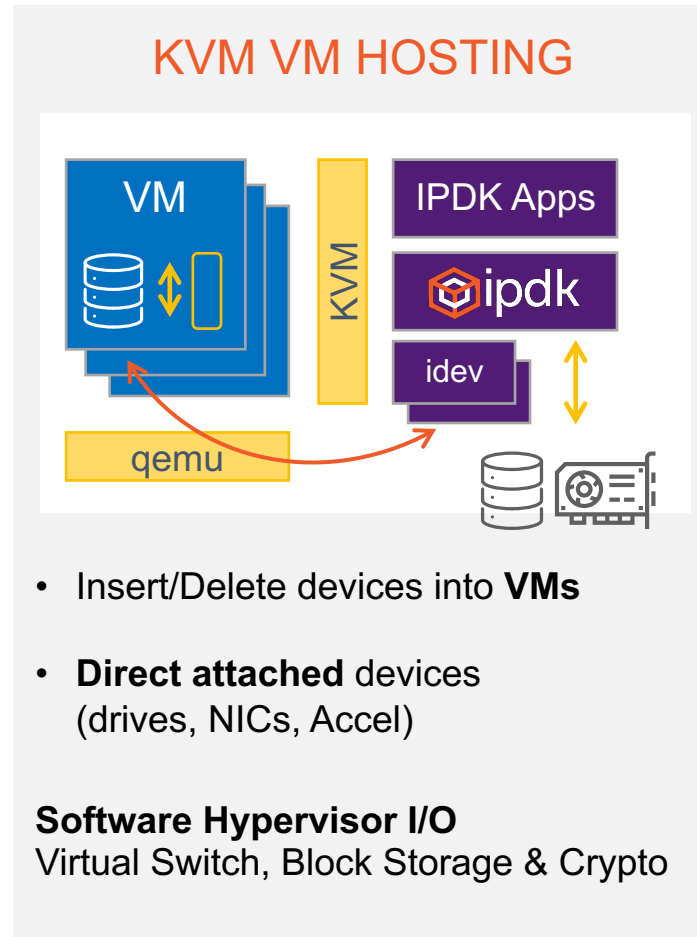
## 3. Inline Acceleration

Firewall, IDS, Network Telemetry 5G/Wireless Infrastructure, AI/ML



# Example Use Case: IaaS

- **Common Control**  
Same IPDK apps in both cases
- **Common Interfaces**  
Same Semantics to connect devices to Hosts & VMs
- **Target Abstraction**  
Same APIs used for KVM Target & Hardware Target







# Intel Contributions

## Intel is Seeding IPDK with:

- Initial Set of Recipes: IaaS, PaaS, Inline Acceleration
- KVM Target w/ P4 DPDK Programmable Pipeline
- Virtual Device OpenConfig
- Simple P4 Programs
- P4 Open vSwitch for contribution to [openvswitch.org](https://openvswitch.org)

## Intel's Future Contribution Plans:

- Agents for IaaS and PaaS usages
- Full feature set networking, storage, and crypto
- Full feature set for each interface
- SONiC (PINS) integration

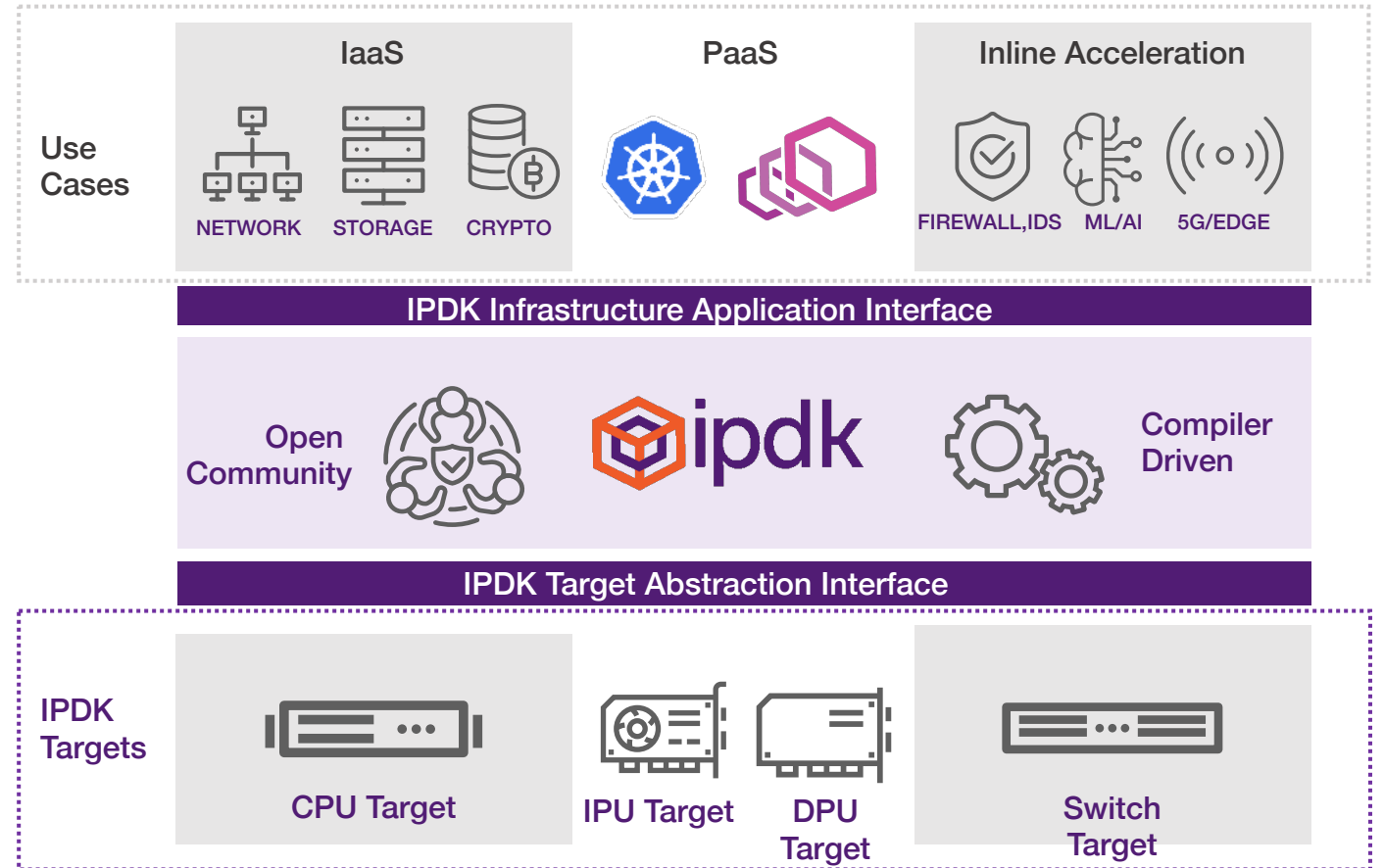
## Separately Intel plans to offer these hardware IPDK Targets:

- Intel® Tofino™ Series, Mount Evans IPU, and Oak Springs Canyon IPU

# Call to Action

## Come Join the Community

- Interface Definition
- New Applications
- New IPDK Targets
  - Software, Switch, IPU, DPU, etc.
- Recipe Development



# Thank you!

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[IPDK.io](#): Infrastructure Programmer Development Kit  
Collaborate with the community on [Github](#) & [Slack](#)