Intel Unveils Infrastructure Processing Unit Roadmap; 2nd Generation to Ship in 2022

May 10, 2022 — Intel today introduced its latest infrastructure processing unit (IPU) roadmap extending through 2026. With this roadmap, Intel continues to deliver on its commitment to create end-to-end programmable networks, transparently outlining its full portfolio of FPGA-based and ASIC-based IPU platforms and open software frameworks designed to better serve customer needs with improved data center efficiency and manageability.

About the IPU: An IPU is a programmable networking device designed to enable cloud and communication service providers, as well as enterprises, to improve security, reduce overhead and free up performance for central processing units (CPUs). With an IPU, customers better utilize resources with a secure, stable, programmable solution that provides greater security and isolation to both service provider and tenant.

About IPDK: An open ecosystem is the best way to extract the value of the IPU. Intel's IPUs are enabled by a powerful open-source software foundation, including the infrastructure programmer development kit (IPDK), which builds upon the company's rich history of open engagements with SPDK, DPDK and P4, working with the community to simplify developer access to the technology and help customers build leading-edge cloud orchestration software and services. The IPDK allows customers to focus on their applications not on the underlying API, or on the hardware.

Intel's Upcoming IPU Roadmap

2022: 2nd Generation IPU

- Mount Evans, Intel's first ASIC IPU, and Oak Springs Canyon, Intel's second-generation FPGA IPU shipping to Google and other service providers.

2023/24: 3rd Generation IPU

- 400 GB IPUs, code-named Mount Morgan and Hot Springs Canyon, expected to ship to customers and partners.

2025/26:

- Next-generation 800GB IPUs expected to ship to customers and partners.

200GB

Mount Evans

Mount Evans is the code name for Intel's first ASIC IPU, architected and developed with Google Cloud. It integrates lessons from multiple generations of FPGA SmartNICs and the first-generation Intel FGPA based IPU.

- Hyperscale-ready, it offers high-performance network and storage virtualization offload while maintaining a high degree of control.
- Provides a best-in-class programmable packet processing engine enabling use cases like firewalls and virtual routing.
- Implements a hardware accelerated NVM storage interface scaled up from Intel Optane technology to emulate NVMe devices.
- Deploys advanced crypto and compression acceleration, leveraging high-performance Intel® Quick Assist technology.
- Can be programmed using commonly deployed, existing, software environments, including DPDK, SPDK; the pipeline can be configured utilizing P4 programming.

- Shipping is expected to begin in 2022 to Google and other service providers; broad deployment is expected in 2023.

Oak Springs Canyon

Oak Springs Canyon is the code name for Intel's 2nd generation FPGA-based IPU platform built with the Intel® Xeon® D and the Intel® Agilex™ FPGA, the industry's leading FPGA in power, efficiency, and performance, . Oak Springs offers:

- Network virtualization function offload for workloads like open virtual switch (OVS) and storage functions like NVMe over fabric and RoCE v2
- Standard yet customizable platform that enables customers to customize their data path and their solutions with FPGA and Intel Xeon-D with software like Intel® Open FPGA Stack, a scalable, source-accessible software and hardware infrastructure
- Programmable using commonly deployed existing software environments, including DPDK and SPDK, which have been optimized on x86.
- A more secure, high speed 2x 100 gigabit Ethernet network interface with the hardened crypto block
- VirtIO support in Hardware for Native Linux support

400GB

Mount Morgan

Mount Morgan is Intel's next-generation ASIC IPU.

- Shipping is expected in 2023/2024.

Hot Springs Canyon

Hot Springs Canyon is Intel's next-generation FPGA-based IPU platform

- Shipping is expected to start in 2023 with broader deployment expected in 2024.

Next Generation 800GB IPU

- Shipping expected for 2025/26