

This Quarter's Highlights Include:

[DPDK in 2017](#)
[DPDK 17.11 Released](#)
[F5 Networks Join DPDK](#)
[DPDK Summit USA](#)



As 2017 comes to a close I wanted to take a moment to reflect on the accomplishments that we, the DPDK Project, have made this year. Our community continues to grow in many ways. With four major releases this year (17.02, 17.05, 17.08, and 17.11) we continued to enhance the capability, features, and performance of DPDK. We formalized our project governance and moved into The Linux Foundation with project membership spanning Gold (10), Silver (6), and Associate (5) tiers. We hosted four DPDK Summit events worldwide gathering audiences of developers and network engineers in Bangalore, Shanghai, Dublin, and San Jose. We added additional maintainers to increase our project's code development/review efficiency while also distributing the workload across the technical experts within our community. We also started working on an open DPDK lab to perform automated performance testing of new patches, which will become operational early next year. Our project reach continues to expand through our ISV/OSV ecosystem, with other open source projects consuming DPDK and including our high performance packet processing code into their own projects. A simple "DPDK in a Box" solution was created and is now [available from Netgate](#), providing the perfect starter platform for university students and others to get started with DPDK. Overall it's been a great year of growth and accomplishment.

On behalf of the Governing Board, I'd like to thank everyone who played a role in making all of this happen. We have a great project and a great community! I'm looking forward to even greater progress and exciting advancements in 2018. Enjoy your holidays, and thank you all.

Open Source Project

[Open source website](#)
[Source code](#)
[Documentation](#)
[Mailing lists](#)
[Roadmap](#)

2018 Events

Planning for 2018 DPDK Summit events is in progress, and details will be communicated when these plans have been finalised.

The first proposed event of 2018 will be in Bangalore with a target date of mid March. Further details will be communicated when a date and venue have been confirmed.

Meet-Ups

Out of the Box Network Developers Meet-Ups are now taking place in the following locations:

- [Santa Clara](#)
- [Portland](#)
- [Dublin](#)
- [Phoenix](#)
- [Bangalore](#)

[Boston Software Networking](#)

Videos

[DPDK 101: Introduction to DPDK](#)
[DPDK 201: New Features Deep Dive](#)

Jim St. Leger
DPDK Project, Governing Board Chair



DPDK 17.11 Released

DPDK 17.11 was successfully released live at the DPDK Summit USA on Wednesday November 15th, and is now available for [download from dpdk.org](http://download.dpdk.org). The release contains a number of significant enhancements, including:

Network Interface Controller PMDs:

- New PMDs were added for:
 - DPAA: This supports the inbuilt NIC found in the NXP DPAA SoC family.
 - MRVL: This supports the Marvell PPv2 (Packet Processor v2) 1/10 Gbps adapter.
 - OCTEONTX: This supports the inbuilt network device found in the Cavium OCTEONTX SoC family as well as their virtual functions (VF) in SR-IOV context.
 - SoftNIC: This is a virtual device which provides applications with software fallback support. The current implementation supports traffic management, but other capabilities will be added in future.
- Updates were made to the BNXT, IXGBE, MLX4, MLX5 and NFP PMDs. See the [Release Notes](#) for details.

New APIs:

- Security Acceleration: A new API (rte_security) has been created to manage accelerations for security protocols such as IPsec. Support for this has been added to the DPAA2_SEC and IXGBE PMDs.
- Generic QoS Metering & Policing: A new API (rte_mtr) has been created to provide a generic interface for QoS metering and policing.

Cryptodev Enhancements:

- Support for the DES CBC and DES DOCSIS BPI algorithms has been added to the AESNI_MB PMD. Support for the DES CBC and AES CCM algorithms has been added to the OpenSSL PMD.
- New crypto PMDs were added for DPAA2_SEC and MRVL.

Eventdev Enhancements:

- Added the Event Ethernet Adapter library. This library provides APIs for eventdev applications to configure the ethdev for eventdev packet flow. Support has been added to the SW, DPAA2 and OCTEONTX event PMDs.

New Libraries:

- Generic Segmentation Offload (GSO): The Generic Segmentation Offload (GSO) library enables applications to split large packets (e.g. MTU of 64KB) into small ones (e.g. MTU of 1500B). Supported packet types are: TCP/IPv4, VxLAN (must have an outer IPv4 header and

[DPDK 16.04 New Features](#)

[DPDK 2.2 New Features](#)

[Accelerating Your Cloud & Enterprise with DPDK](#)

[DPDK Setup and Configuration](#)

[Testing VNF Performance](#)

[Using Data Plane](#)

[Performance Demonstrator](#)

[Maximising NFV](#)

[Performance on IA](#)

[Setting up DPDK on Different Operating Systems](#)

[DPDK Sample Applications](#)

[Writing a Simple DPDK](#)

[Forwarding Application](#)

[DPDK Packet Framework](#)

[Testing DPDK performance and features with TestPMD](#)

[Building and Installing Vector Packet Processing \(VPP\) with Vagrant](#)

[DPDK-in-a-Box - The DPDK Starter Kit](#)

[DPDK 16.11 & 17.02 New Features](#)

[DPDK 16.04 New Features](#)

[DPDK 16.07 New Features](#)

[Enabling the Storage Transformation with SPDK](#)

[Building Blocks for Scalable, High Performance Storage](#)

[Open vSwitch with DPDK in OVS 2.4.0](#)

[Open vSwitch with DPDK in OVS 2.5.0](#)

[Open vSwitch with DPDK in OVS 2.6.0](#)

[Accelerating Your Cloud with DPDK](#)

[Intel Software Defined Infrastructure: Tips, Tricks and Tools for Network Design and Optimization](#)

[IP Flow Analytics Enabled by Saisei and DPDK](#)

[Ubuntu 16.04 + Intel:](#)

contain an inner TCP/IPv4 packet), GRE (must contain an outer IPv4 header and inner TCP/IPv4 headers).

- **Membership:** The Membership Library is an extension and generalization of a traditional filter (for example Bloom Filter) structure that has multiple usages in a wide variety of workloads and applications. In general, the Membership Library is a data structure that provides a "set-summary" and responds to set-membership queries on whether a certain member belongs to a set(s). There are many potential uses, one of which is to load-balance flows to worker threads while preserving packet order within a flow.
- **Flow Classification:** The Flow Classification library provides an API for DPDK applications to classify input packets by matching them against a set of flow rules. The flow rules can be defined using hashing (`librte_hash`), access control lists (`librte_acl`) or longest prefix match (`librte_lpm`). The sample application shows how the library can be used to provide to implement an IPFIX (IP Flow Information Export) Observation Point.

Other Enhancements:

- **Support 4K Page Size with VFIO:** 4K pages can now be supported when using VFIO. This helps to reduce DPDK's memory footprint (compared to having to use 2M or 1G huge pages), which makes DPDK more suitable for use in containers and micro-services. Further memory subsystem enhancements are planned for future releases.
- **Per-Core Turbo Boost:** This provides the ability to enable turbo boost on a per-core basis. An example of when this could be used would be when distributing packets across a number of worker cores. Enabling turbo boost on just the distributor core can significantly increase overall performance without any changes to the worker cores.
- **Policy-Based Power Management:** This adds the ability for a guest VM to send a policy to the host that will allow the host to scale up/down CPU frequencies depending on the policy criteria independently of the DPDK app running in the guest. This allows a policy-based approach to power management to be implemented.
- **IOVA Awareness:** Some data types, structure members and functions related to physical address handling are deprecated and have new aliases with IOVA wording (e.g. `rte_mem_virt2phy` can often be replaced by `rte_mem_virt2iova`).
- **vHost IOMMU Support:** Implemented device IOTLB in the Vhost-user backend, and enabled Virtio's IOMMU feature. The feature is disabled by default, and can be enabled by setting `RTE_VHOST_USER_IOMMU_SUPPORT` flag at vhost device registration time.

The release contained 1376 patches from 141 different authors. The full feature list is available in the [Release Notes](#).

Thanks to everybody who contributed to making this another successful DPDK release!

[Expanding the Possibilities of Data Center Networking](#)

[Intel® Multi-buffer Crypto for IPsec on DPDK - Get Started](#)

[DPDK Crypto - Get Started with Intel® QuickAssist Technology](#)

Blogs/Articles

[Data Plane Development Kit \(DPDK\): Getting Started](#)

[Using Open vSwitch with DPDK on Ubuntu](#)

[QoS Configuration and usage for Open vSwitch with DPDK](#)

[vHost User Multiqueue for Open vSwitch with DPDK](#)

[Profiling DPDK Code with Intel® VTune™ Amplifier](#)

[DPDK Packet Capture Framework](#)

[Build Your Own Packet Generator - DPDK-in-a-Box](#)



F5 Networks Join DPDK

The latest DPDK project member is [F5 Networks](#), who joined the project recently at the Gold level.

"F5 would like to thank everyone for a very warm welcome into the community! We look forward to successful and effective collaboration focused on value delivered to the operators and maintainers of the networks we serve. Through greater adoption of DPDK, we expect to see increased deployment of extremely reliable network functions that are faster and easier to maintain."

The DPDK project is still actively looking for new members. If anybody is interested in joining, they should contact [Trishan de Lanerolle](#) (Linux Foundation Program Manager) or [Jim St. Leger](#) (Governing Board Chair) for an initial discussion on this.



DPDK Summit USA

The fourth annual DPDK Summit USA was held on November 14th and 15th at Club Auto Sport in San Jose. The major topics that were covered included:

Improving Consumability of DPDK

A presentation on [Reducing Barriers to Adoption - Making DPDK Easier to Integrate into Your Application](#) by Bruce Richardson compared the current level of DPDK consumability to broccoli, and described enhancements that would help to improve that to level of carrots, then carrot cake, with the eventual goal being chocolate cake. Consumability was also addressed in various other presentations, including [Enhanced Memory Management](#) by Laszlo Vadkerti and Jiangtao Zhang (Ericsson) and [Integrating and Using DPDK with Open vSwitch](#) by Kevin Traynor and Aaron Conole (Red Hat). Another presentation related to making DPDK easier to use was [New CLI for DPDK](#) by Keith Wiles (Intel).

Support for Smart NICs

There were smart/programmable NIC presentations from multiple vendors, including: [Flexible and Extensible Support for New Protocol Processing with DPDK Using Dynamic Device Personalization](#) by Brian Johnson and Andrey Chilikin (Intel) [DPDK Support for New Hardware Offloads](#) by Alejandro Lucero (Netronome) [Open vSwitch Hardware Offload over DPDK](#) by Rony Efraim (Mellanox) [Accelerating Packet Processing with FPGA NICs](#) by Boris Pismenny (Mellanox) [Serverless DPDK - How Smart NIC Resident DPDK Accelerates Packet Processing](#) by Nishant Lodha (Cavium). This presentation also answered the question of what clouds are made of:



Hardware Acceleration APIs

A lot of work is being done at the moment to extend the DPDK framework to accommodate additional accelerators. This started in 2016 with the creation of the cryptODEV API to support hardware and software acceleration of symmetric crypto algorithms. Presentations on accelerators included:

[Enabling Hardware Acceleration in DPDK Data Plane Applications](#) by Declan Doherty (Intel)

[Rte_security: Enhancing IPsec Offload](#) by Declan Doherty (Intel), Boris Pismenny (Mellanox) and Hemant Agrawal (NXP)

[Rte_raw_device: Implementing Programmable Accelerators Using Generic Offload](#) by Hemant Agrawal and Shreyansh Jain (NXP)

Support for DPDK on Windows

A joint presentation by Manasi Deval (Intel) and Jason Messer (Microsoft) on [Making Network Apps Scream on Windows with DPDK](#) described the collaborative effort that's been taking place to port DPDK to Windows. This provides a new networking acceleration capability for Windows applications, and expands the reach of DPDK into new use cases. This complements the work that's already been done to support DPDK-enabled Linux applications on Azure, which was [announced at Microsoft Ignite 2017](#), and [presented by Stephen Hemminger at the DPDK Summit Userspace event](#) in Dublin.

Containers and Micro-Services

A number of presentations focused on making DPDK easier to use in containers and microservices. These included:

[DPDK as Microservices in ZTE PAAS](#) by Yong Wang and Songmin Yan (ZTE)

[Accelerate Clear Container Network Performance](#) by Jun Xiao (CloudNetEngine)

[The Path to Data Plane Microservices](#) by Ray Kinsella (Intel)

VMware Enhanced Networking Stack

A joint presentation by Jin Heo (VMware) and Rahul Shah (Intel) on [Accelerating NFV with VMware's Enhanced Networking Stack \(ENS\) and Intel's Poll Mode Drivers](#) described the collaborative effort that's been taking place to accelerate the vSphere networking stack. While this doesn't use DPDK directly, the work is heavily based on DPDK learnings and concepts.

Slides and videos from all of the presentations at the summit are available on the [DPDK Summit Past Events](#) page.