Technical Board and Roadmap

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Jerin Jacob
DPDK Technical Board History

• DPDK has a technical board to allow trusted contributors to the project to make technical decisions on behalf of the whole community

• The 9 current members of techboard@dpdk.org are:
  • Bruce Richardson
  • Ferruh Yigit
  • Hemant Agrawal
  • Jerin Jacob
  • Konstantin Ananyev *
  • Maxime Coquelin
  • Olivier Matz
  • Stephen Hemminger
  • Thomas Monjalon

* Current Tech board representative in DPDK Governing board (Quarterly Rotation basis)
What Does DPDK Tech-Board Do?

The Tech-board meets every two weeks (approx.) for the purposes of:

- Approving the inclusion of new functionality, libraries or device classes, into DPDK
- Approving any new sub-trees or staging trees for DPDK project work
- Approving the appointment of committers/maintainers for those trees
- Approving any subprojects on DPDK
  - Once created – subprojects get their own technical board
- Providing technical input on contributions when requested
- Making technical decisions when consensus cannot be reached on-list
Release process

- 4 major releases per year (.02, .05, .08, .11)
- 1 new LTS branch per year (17.11, 18.11, ....)

Maintainer’s role
- answer questions
- make sure patches are reviewed

Committer’s role
- easy: apply patches
- medium: ask for review to trusted people
- hard: reject patches when they are not mature enough

local patch → patchwork → sub-sub-tree → sub-tree → main tree → stable tree
Repositories – maintainers (https://git.dpdk.org/)

- Main trees
  - dpdk.git  Ferruh, Thomas
  - dpdk-stable.git  Luca, Kevin

- Tools
  - dpdk-web.git  Thomas
  - dpdk-ci.git  Thomas
  - dts.git  Yong
  - stable-scripts.git  Luca

- Apps
  - pktgen-dpdk.git  Keith
  - nff-go
  - spp.git  Ferruh
  - dpdk-burst-replay

- Sub-trees
  - dpdk-next-crypto.git  Akhil
  - dpdk-next-eventdev.git  Jerin
  - dpdk-next-net.git  Ferruh
    - dpdk-next-net-intel.git
    - dpdk-next-net-mlx.git
    - dpdk-next-virtio.git
    - dpdk-next-pipeline.git
  - dpdk-next-qos.git

- Draft trees (temporary)
  - dpdk-draft-cli.git  Keith
  - dpdk-draft-windows.git

Main tree also available at: https://github.com/DPDK
Tools

- Patches → Patchwork
  - http://dpdk.org/dev/patchwork
  - per-patch community CI integration

- Performance → Community Lab
  - Provide a monitoring dashboard

- Bugs → Bugzilla
  - http://dpdk.org/tracker

- Static Code Analysis → Coverity

- Features → Roadmap
  - dev@dpdk.org
  - http://dpdk.org/dev/roadmap

DPDK Survey: Live for your feedback

http://goo.gl/qZUgxB
Or,
https://forms.office.com/Pages/ResponsePage.aspx?id=eVIO89IXqktTbEipm1YTcwgJ8pXytOnArCkHeZSZUREdIN09QOEVSUJWN0I2TzNYUTk5STVJRC4u

DPDK Community Survey
We would love to hear your thoughts and feedback on how we can improve your experience in DPDK community

1. Please provide your sign-off email ID used for DPDK patches
Build System migration – Meson (http://mesonbuild.com)

- DPDK build system is currently based on “make” by default
  - Static configuration only - no dynamic configuration at build time
  - Custom build system with many complicated makefiles

- New build system using “meson” was introduced.
  - Open source build system meant to be both extremely fast, and, even more importantly, as user friendly as possible.
  - Very popular with open-source projects, e.g. Xorg, system

- Meson advantage:
  - support for detecting dependencies on the system, compiler features, including functions, defines.
  - faster builds using ninja - especially in the delta or nothing-has-changed case.
  - pkg-config support
  - dependencies in each lib can be moved back to being tracked in the libs files themselves, not up a level

DPDK will migrate to meson in 19.08 and discontinue Makefile in 20.02

· Objective and scope
  · Identify any regression in DPDK performance/function.
  · Identify any regression in the performance of DPDK-enabled application.
  · Demonstrate any new feature performance of DPDK.
  · May be used as a training or demo lab for DPDK events.

· Host: University of New Hampshire InterOperability Lab (UNH-IOL)

· Existing Test Hardware in Lab
  · Intel Ethernet Converged Network Adapter 82599ES 10 Gbps
  · Intel Ethernet Converged Network Adapter XL710-QDA2 40 Gbps
  · Mellanox ConnectX-5 100 Gbps
  · Mellanox ConnectX-4 Lx 25 Gbps
  · Mellanox ConnectX-4 Lx 40 Gbps
  · NXP LS2088ARDB in the process of setting up with the Lab
Memory hotplug

- DPDK can now allocate hugepage memory as needed
- DPDK can also release memory that is unused
- Small page sizes and virtio are not enemies anymore!
- (18.08+) DPDK no longer requires a hugetlbfs mountpoint

- Memory is no longer guaranteed to be IOVA-contiguous
- what if you need IOVA-contiguous memory
  - you may actually not need it with VFIO
  - Ask for it - Memzone has a flag
  - Use legacy mode
- External memory is also supported.
event driven model – no more 100% polling

Enqueue(queue, flow, schedule_type, event)

Rx Packet event
Crypto completion event
Timer expiry event
Event from Devices
Core(SW) event

Flow 0
Flow 1
Flow n
Event Queue 0

Flow 0
Flow 1
Flow n
Event Queue 1

Flow 0
Flow 1
Flow n
Event Queue n

Event Port 0
Event Port 1
Event Port 2
Event Port n
An Event device

Link(queue, port)

(queue, flow, schedule_type, event) = Dequeue(port)
Latest DPDK releases (19.02 & 18.11)

• General:
  • ability to use externally allocated memory
  • new hotplug features, including multi-process and PCI failure handler
  • extendable table and lock-free r/w concurrency in hash library
  • traffic pattern aware power management
  • JSON interfaces for power policy example and new telemetry library

• Networking:
  • MAC swap, MPLS encapsulation and metadata matching in rte_flow API
  • new networking drivers for Aquantia Atlantic, Marvell Armada and NXP ENETC
  • postcopy live-migration in vhost-user
  • vDPA sample application
  • classification, metering and crypto in SoftNIC (using Packet Framework)
  • virtio packed ring (19.02)

• Cryptography:
  • new crypto drivers for Cavium OCTEON TX and NXP CAAM JR
  • PDCP in security library
  • library for Ipsec (19.02)

• Event mode:
  • eventdev Tx adapter, Eventdev Crypto adapter
  • new event driver by Ericsson: DSW (distributed software eventdev PMD)

• Applications:
  • noisy VNF forward mode in testpmd
  • FIPS validation application
  • IPSEC GW updated for rte_ipsec library

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Roadmap – to 19.05 and beyond!

- Initial windows support with meson and clang
- New device specification (devargs) syntax
- Documentation for device management
- DMA mapping API for external memory
- Relaxed memory ordering in spinlock and rwlock
- ticket-lock
- RCU library
- lock-free extended bucket in hash library
- TCP SEQ and ACK offload with rte_flow API and mlx5 implementation
- ICMP ping offload with rte_flow API and mlx5 implementation
- New mlx5 steering flow engine for high (millions/sec) insertion rate
- Failsafe support in multi-process
- AF_XDP poll mode driver
- baseband device turbo PMD
- NXP DPAA multi process application support
- NXP DPAA split Mac driver to split incoming traffic between kernel and DPDK.
- QAT compression PMD support for large scatter-gather lists
- QAT asymmetric crypto with support for modexp and modinv
- additional crypto/auth algorithms in the IPsec library
- Octeontx2 poll mode drivers
DPDK Adoption in Open Source Projects

Open Source Projects Leveraging DPDK

- ANS
- BESS
- Butterfly
- MoonGen
- mTCP
- OPNFV
- OvS
- Packet-journey
- Pktgen-dpdk
- Ruru
- SPDK
- TRex
- WARP17
- YANFF
Questions?