



# DPDK on Arm64 Status Review & Plan

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19/03/2018

# DPDK Overview



- Data Plane Development Kit
  - A set of libraries and drivers for **fast packet processing**
  - Runs mostly in Linux **userland**
  - The first supported CPU was Intel x86 and it is now extended to IBM POWER and **ARM**.
- Major members and contributors
  - Several active members on Arm platforms
  - Arm is one of the golden members



**CAVIUM**



**redhat**

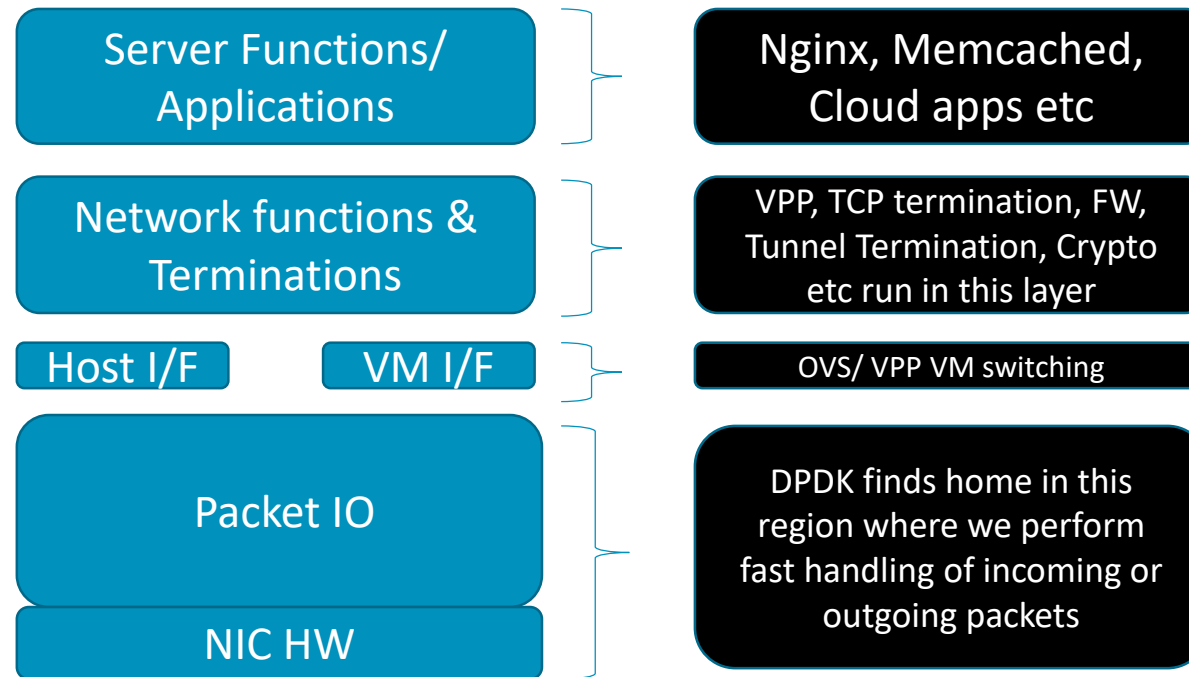
**ZTE**

**arm**



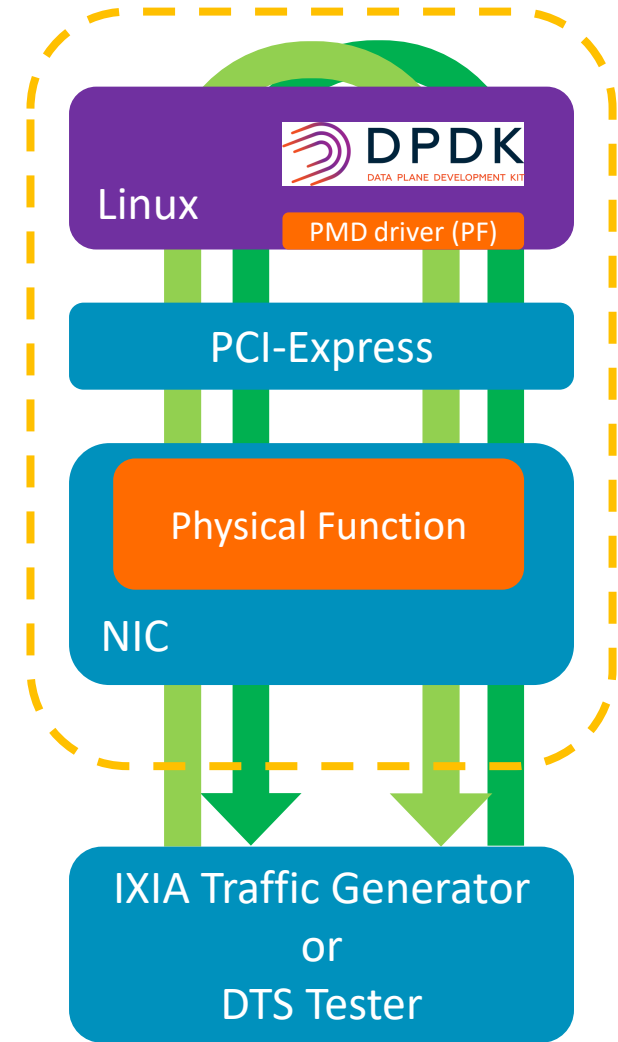
# DPDK usage modes

- DPDK framework provides components on which Network applications can be built
- Stack below shows application stack and locations where DPDK is used.



# DPDK on Arm64 Status

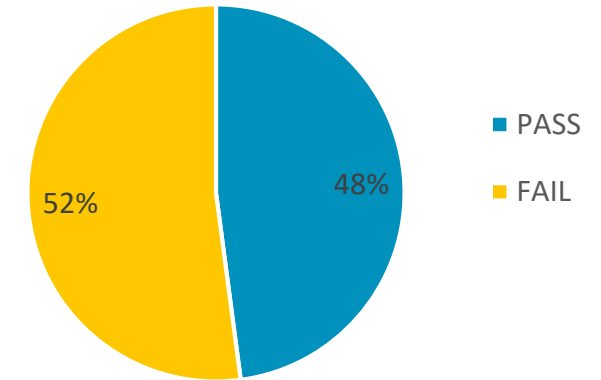
- Multiple active members on Arm platforms
- ARM platform porting & optimization
  - Many thanks to Cavium
- Functional verification / enabling
  - DTS (DPDK Test Suite) test in bare-metal & virtualization
  - Several platforms / NICs selected
- DPDK performance on Arm platforms
  - Throughput/Latency perf test on multiple ARM64 platforms and NICs
  - x86 platform for reference & cross check
- Use cases setup
  - DPDK in container, Nginx with DPDK + mTCP, etc.



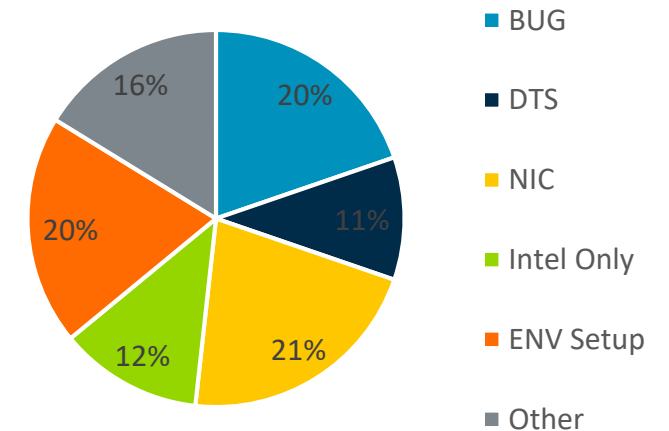
# DTS & Functional Enabling

- DTS test suites verification & investigation
  - All test suites were executed (incl. virtualization suites)
  - 60+ patches sent upstream for DPDK/DTS fixes
- Our goal – Identify a set of DTS test cases suitable for Arm
  - Ensure DPDK is properly supported on Arm
  - But NOT fix all DTS issues
  - Use the selected test suites for CI setup on Arm64
- 206 of 432 test cases passed, 226 failed
- Notes:
  - Test results retrieved by DPDK 17.11, on Platform Y

DTS Cases Pass Rate



Failure Analysis



# Arm Internal DPDK CI Setup

## Purpose

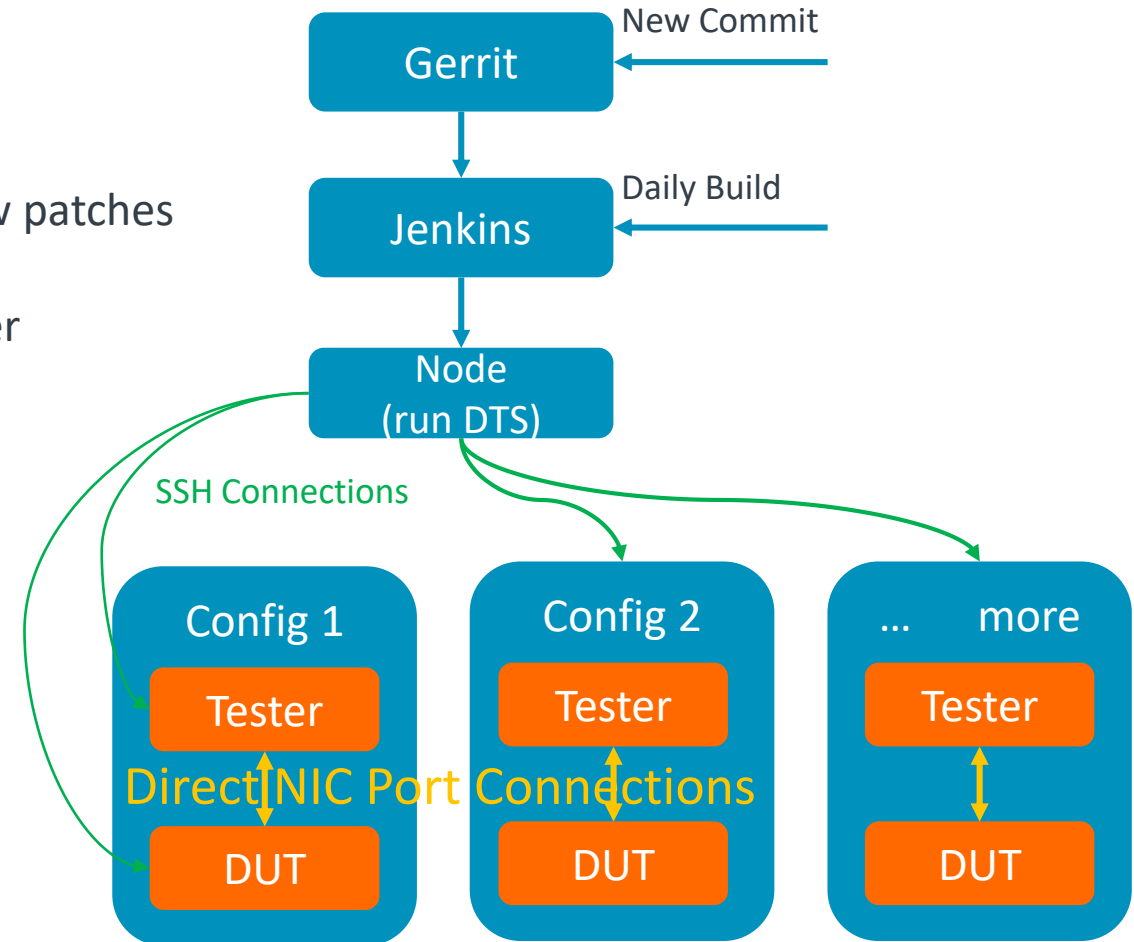
- Get ready for upcoming public DPDK Lab
- Internal Patch review -- Automatic sanity check for every new patches
- Daily build -- to early detect code/functional broken in master

## Status

- 2 Selected platforms with 3 type of NICs
- All DTS Unit test suite cases at beginning

## Next plan

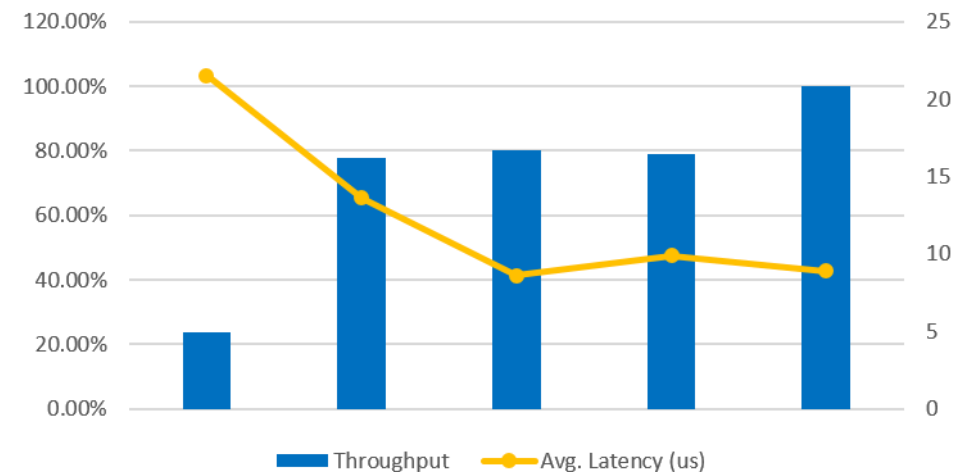
- Add more test suites (may need to fix some issues first)
- Copy setup to Linaro lab (with proper HWs)



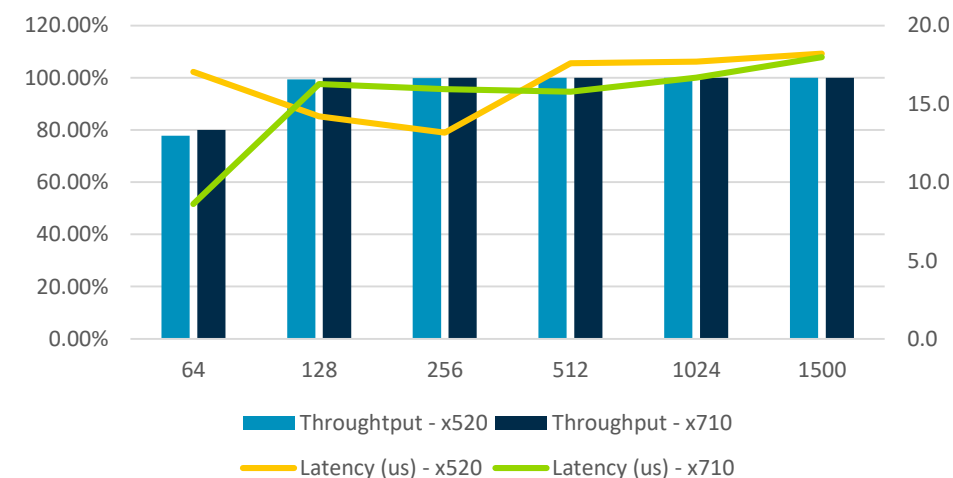
# Performance summary

- RFC-2544 test
  - Single core, bare-metal
- Several factors impacting DPDK performance
  - TxD/RxD number
  - Glibc & GCC version – newer is better
- Some ARM64 platforms shows better performance than x86 on some sub-system unit test
  - Memcpy, OpenSSL AES
- Profiling – CPU cycle hotspots show notable difference between different ARM64 platforms

64-bytes RFC-2544 testing (2\*10Gbps)

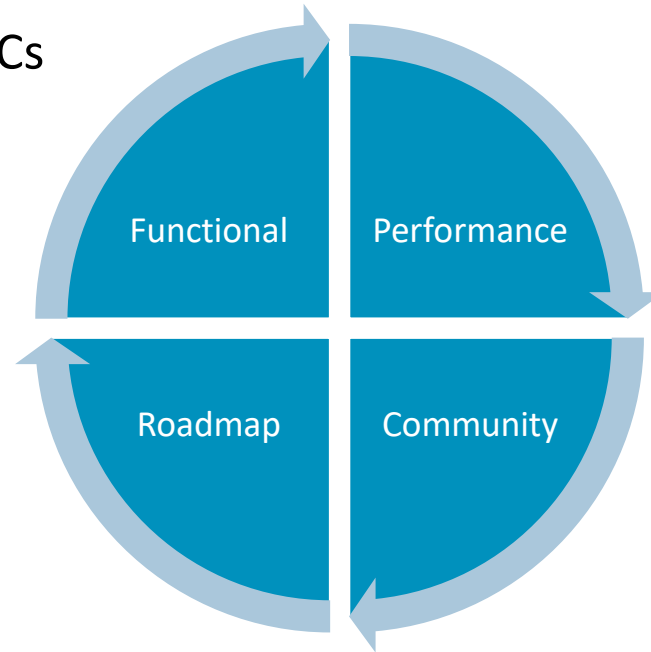


Platform Y RFC-2544 testing (2\*10Gbps)



# Our plan

- Use case & Virtualization scenarios investigation
- CI setup with selected platforms, NICs & DTS test suites
- Architectural enhancements
- Define DPDK on Arm roadmap with partners



- Continue with the bare-metal performance investigation & optimization, e.g. PMD, Crypto drivers, etc
- Investigate performance in virtualization & multi-core scenarios
- Co-work with Linaro on DPDK
- Build up connections with DPDK community and Arm partners



# Community Collaboration

- CI setup (LEG, need proper platforms)
- Regular sync up inside Linaro (LEG weekly meeting, etc.)
- Contact channel/mailer (e.g. [dpdk@linaro.org](mailto:dpdk@linaro.org)?)



Thank You

Danke

Merci

谢谢

ありがとう

Gracias

Kiitos

감사합니다

धन्यवाद

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