

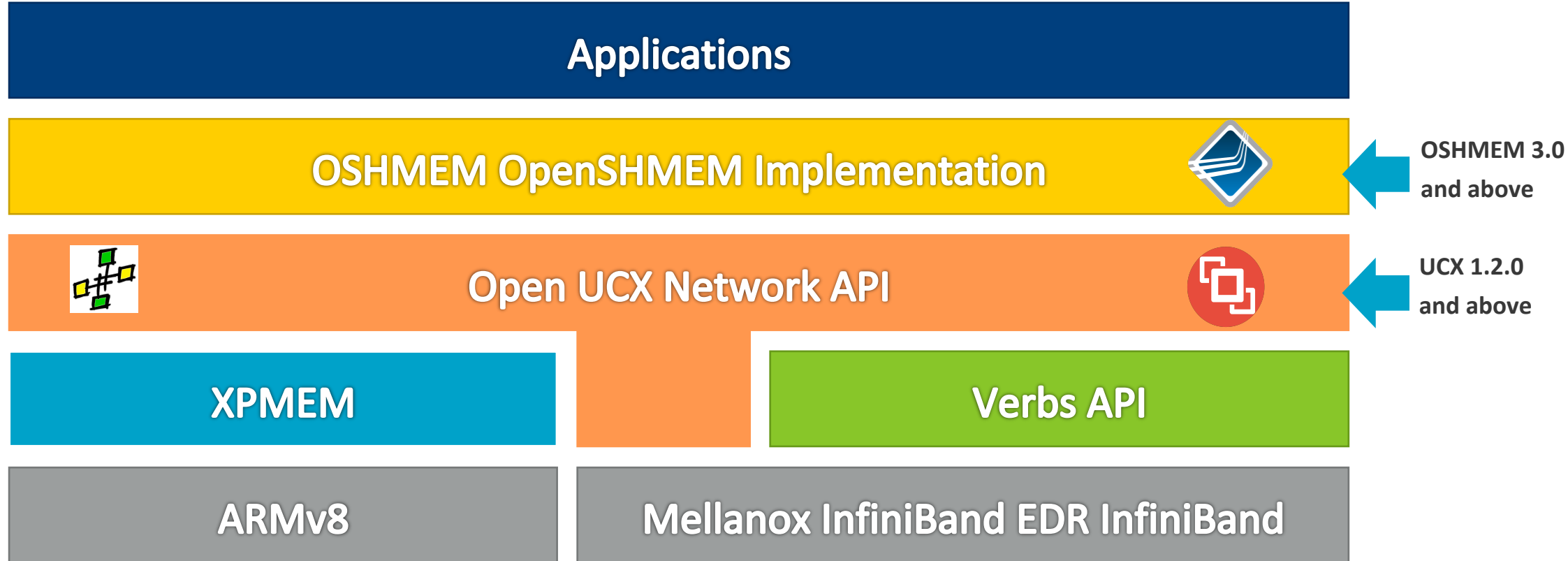


arm

OpenSHMEM on ARM

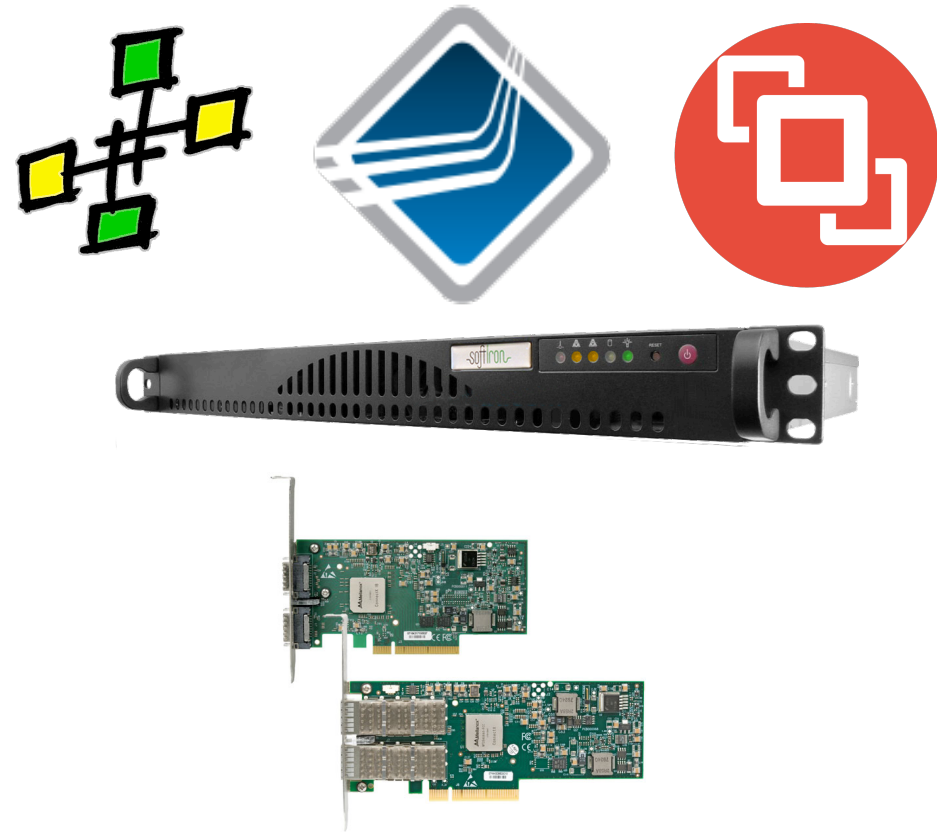
Pavel Shamis/Pasha
Principal Research Engineer

OSHMEM



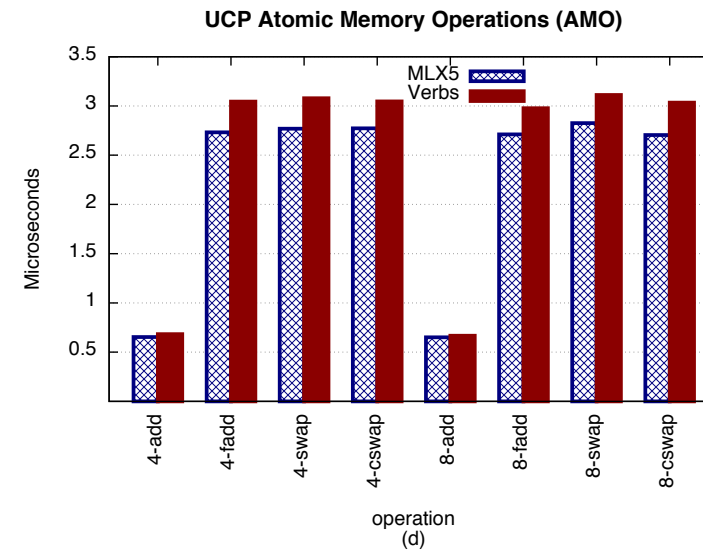
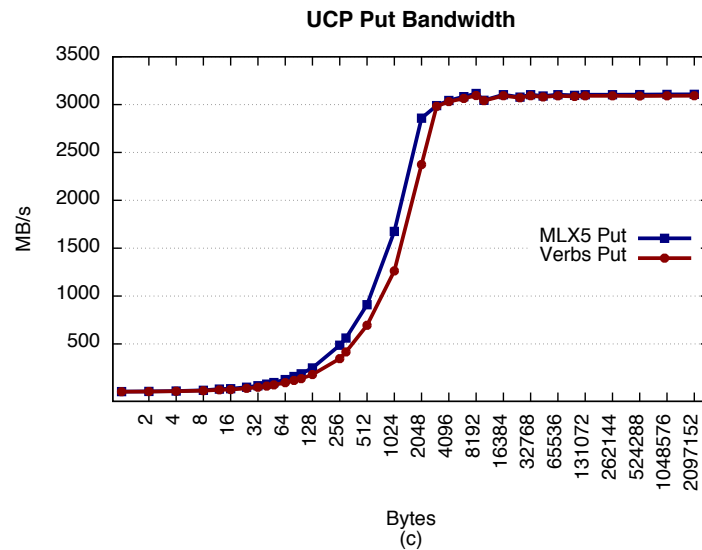
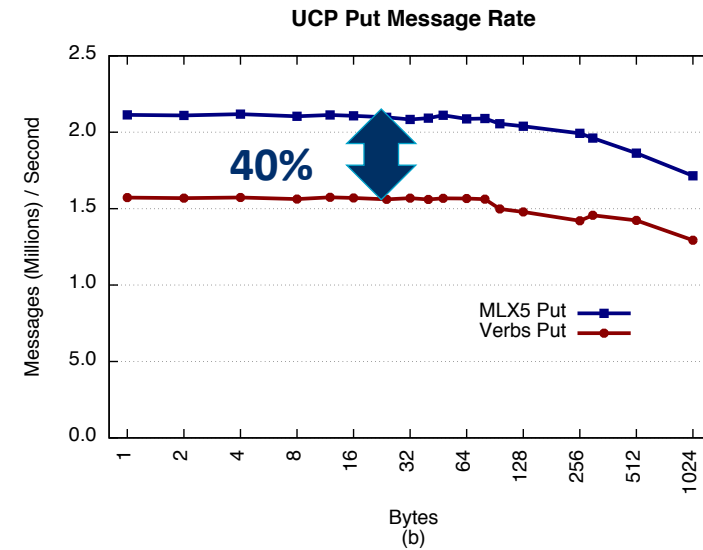
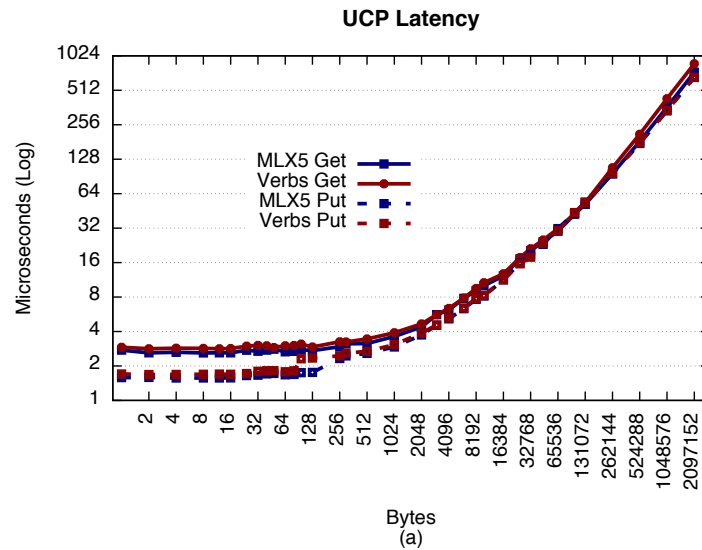
Testbed

- 2 x Softiron Overdrive 3000 servers with AMD Opteron A1100 / 2GHz
- ConnectX-4 IB/VPI EDR (PCIe gen2 x8)
- Ubuntu 16.04
- MOFED 3.3-1.5.0.0
- UCX [0558b41]
- XPMEM [bdfcc52]
- OSHMEM/OPEN-MPI [fed4849]



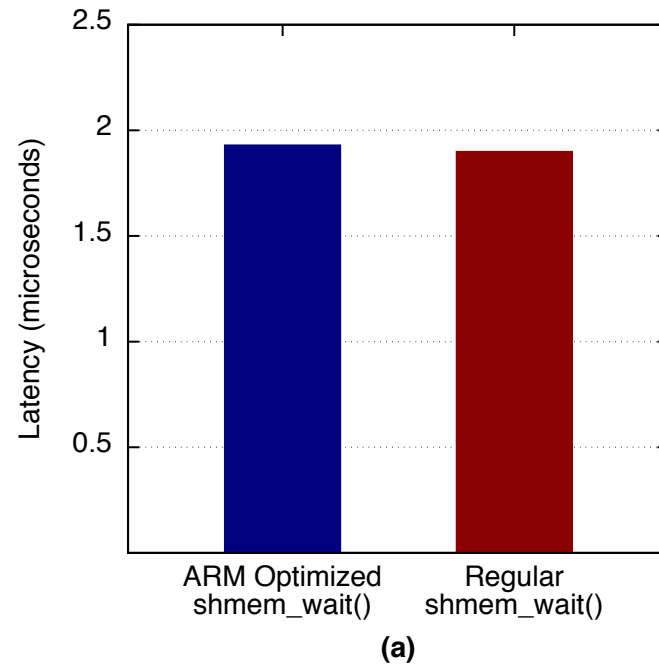
Pavel Shamis, M. Graham Lopez, and Gilad Shainer. "Enabling One-sided Communication Semantics on ARM"

OpenUCX IB: MLX5 vs Verbs

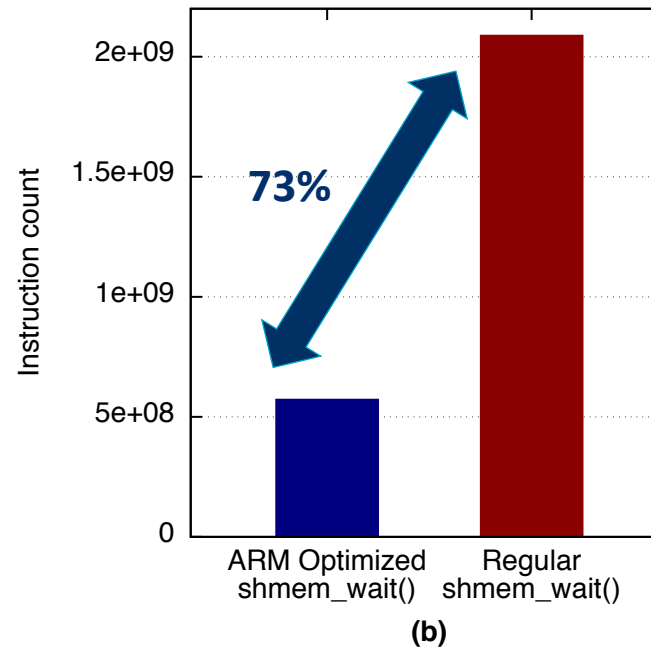


SHMEM_WAIT()

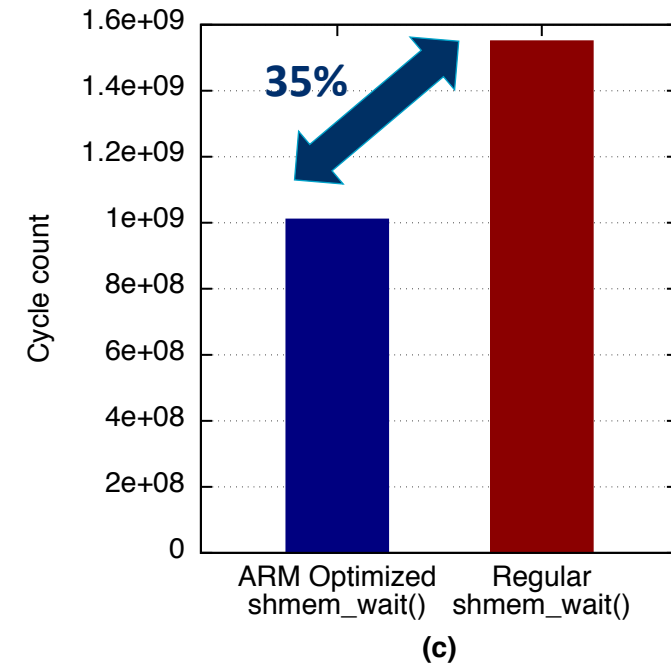
Latency of 'put' ping-pong
with shmem_wait()



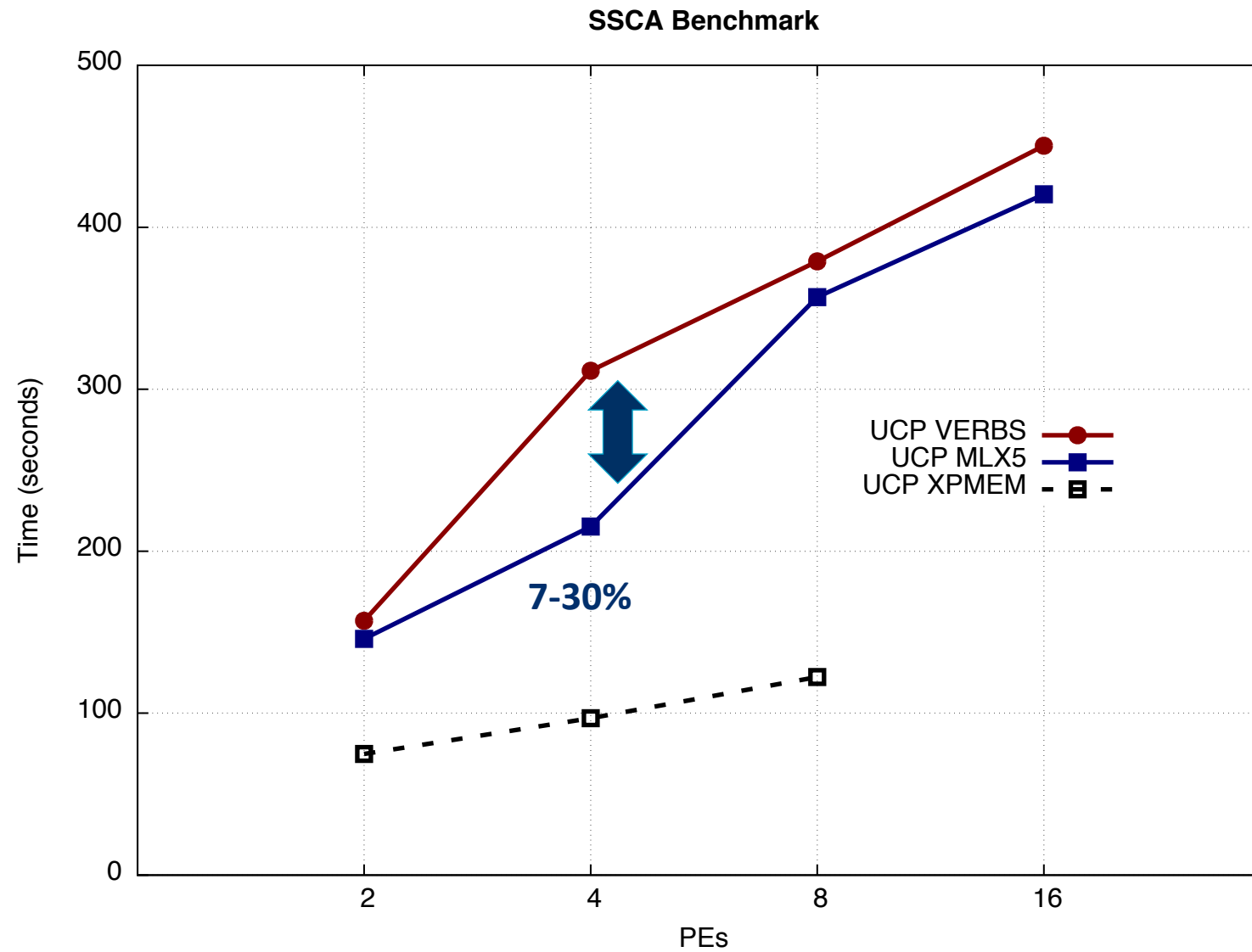
Total Benchmark
Instruction count



Total Benchmark
Cycle count



OpenSHMEM SCA



Summary

Open UCX over Mellanox InfiniBand reaches 90% of practical bandwidth with a single 2Ghz ARM core

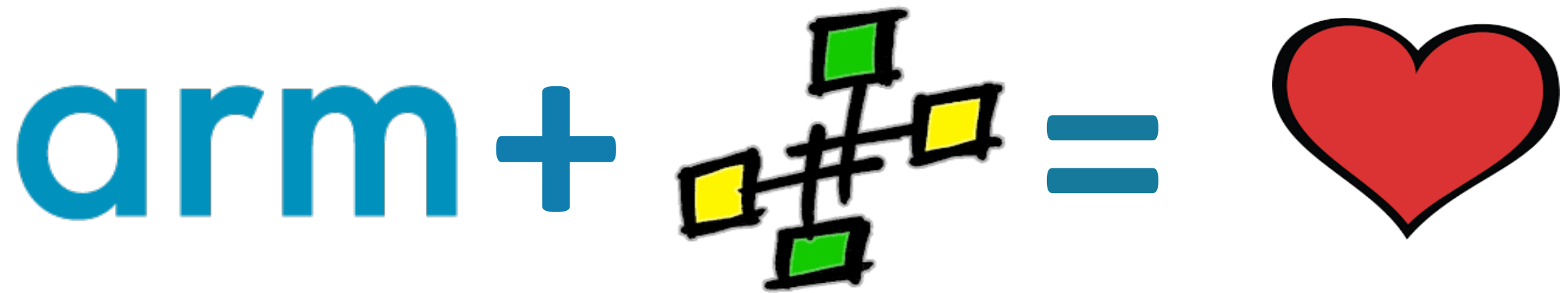
Open UCX with MLX5 transport on Arm demonstrate 40% increase in message rate when compared to Verbs transport

OpenSHMEM shmem_wait demonstrate 35% decrease in number of cycles using ARM WFE instruction

GUPs and SSCA OpenSHMEM codes demonstrate between 7-35% acceleration in execution time using Open UCX MLX5 transport

Arm Forge OpenSHMEM Status

Implementation	Caveat	Debugging	Profiling
Cray XC/XE/XK, CS300		Yes	Yes
OpenSHMEM reference implementation	Use MPI as transport layer	Yes	Yes
OpenSHMEM native in Open MPI distro		Yes	Yes
SGI MPT		Yes	Yes



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Thank You!

Danke!

Merci!

谢谢!

ありがとう!

Gracias!

Kiitos!

arm