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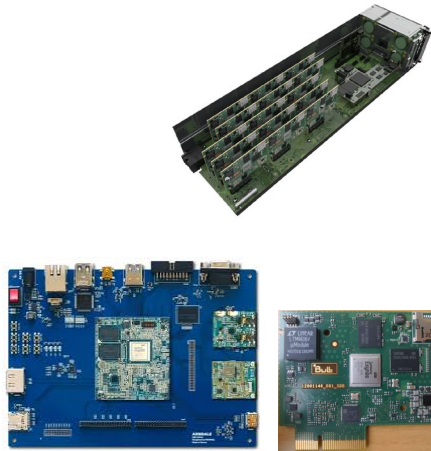
Enhancements to the HPC software stack brought by Mont-Blanc 3

Date: 2018, Sept. 18th

Speaker: Roxana Rusitoru



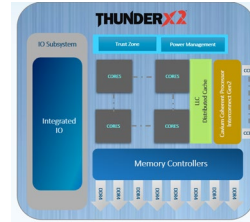
A Retrospective



2011 2012 2013



2014 2015



2016



2017

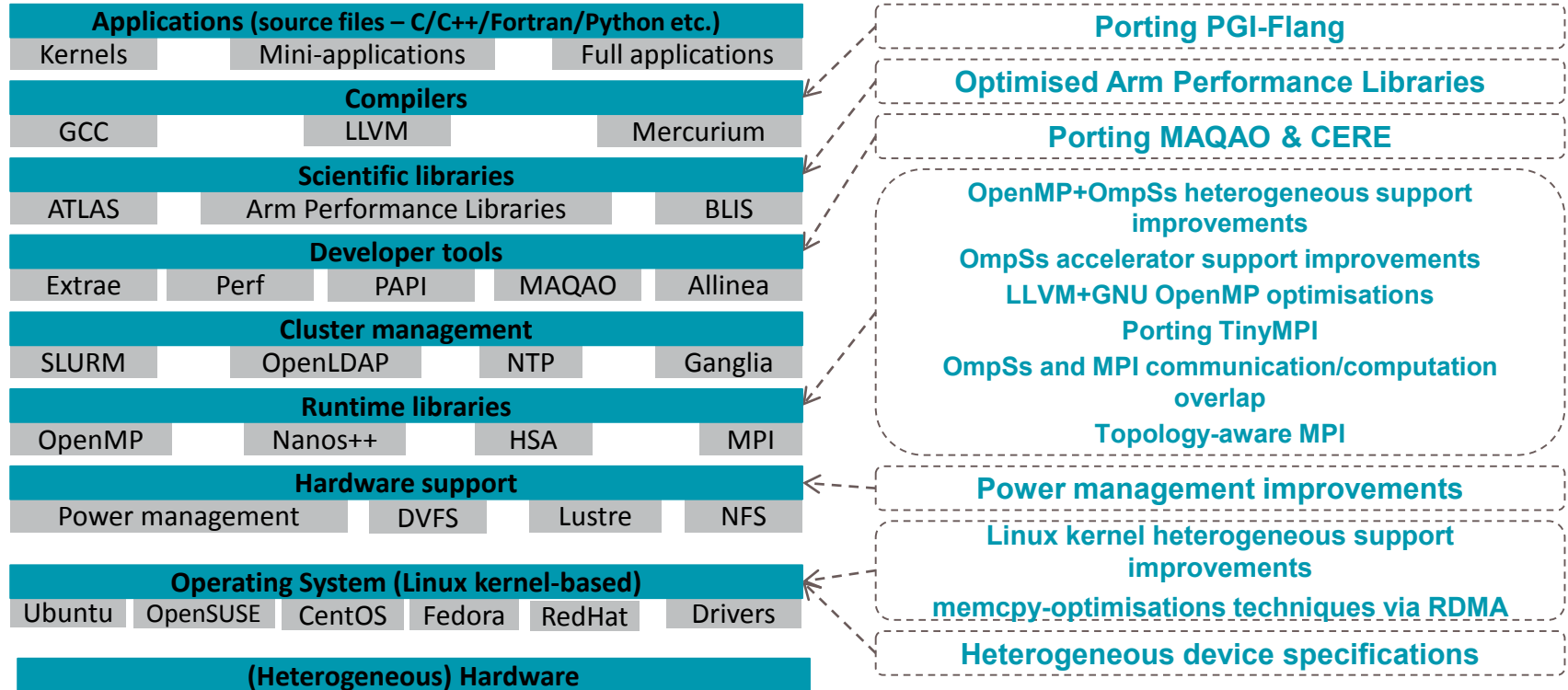


2018

Software improvements

- **Further the state of the Arm HPC software ecosystem**
- **Focus on both tool improvements (incremental) and explore research ideas**
- **Both open source and commercial tools have been developed as part of this project.**

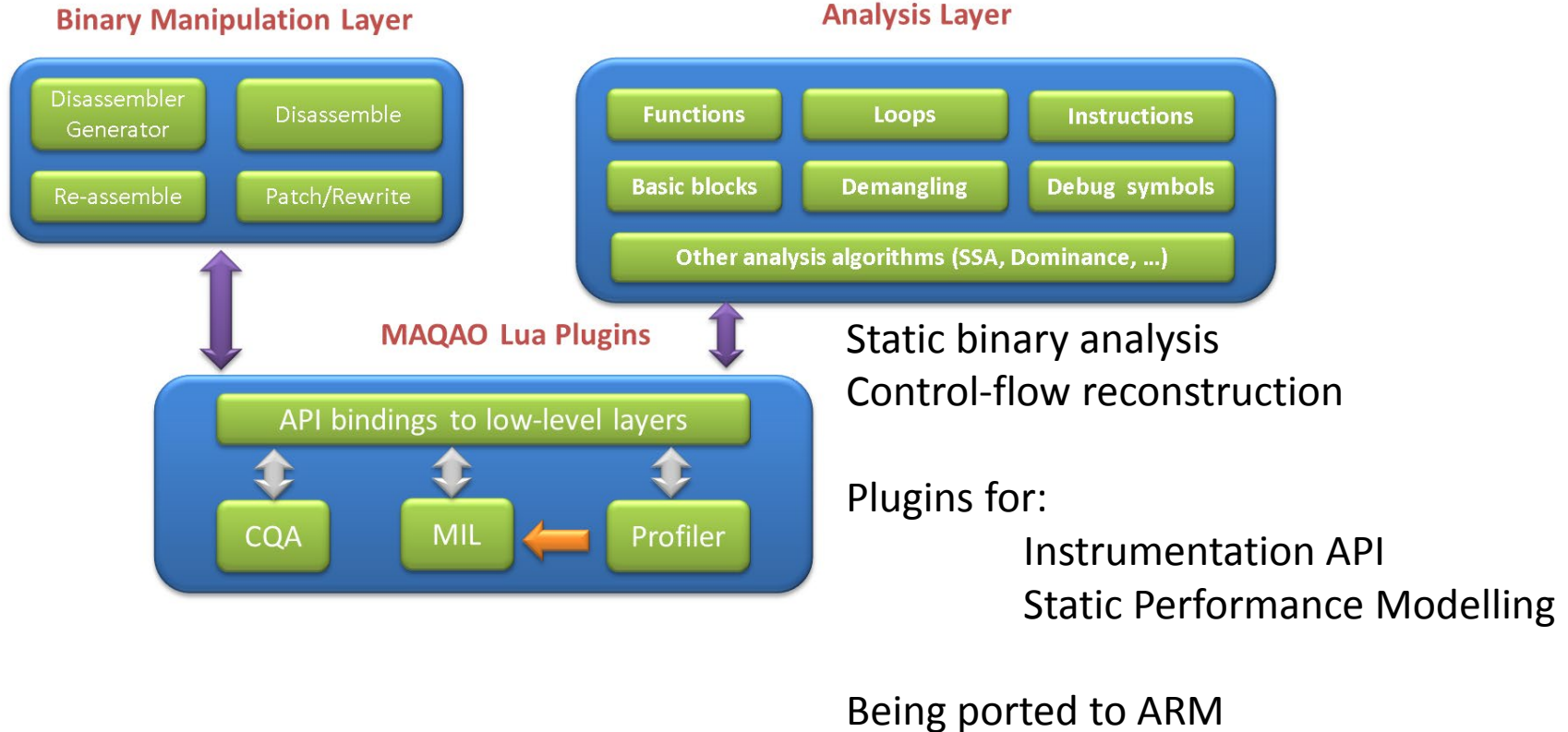
HPC Arm Software Stack

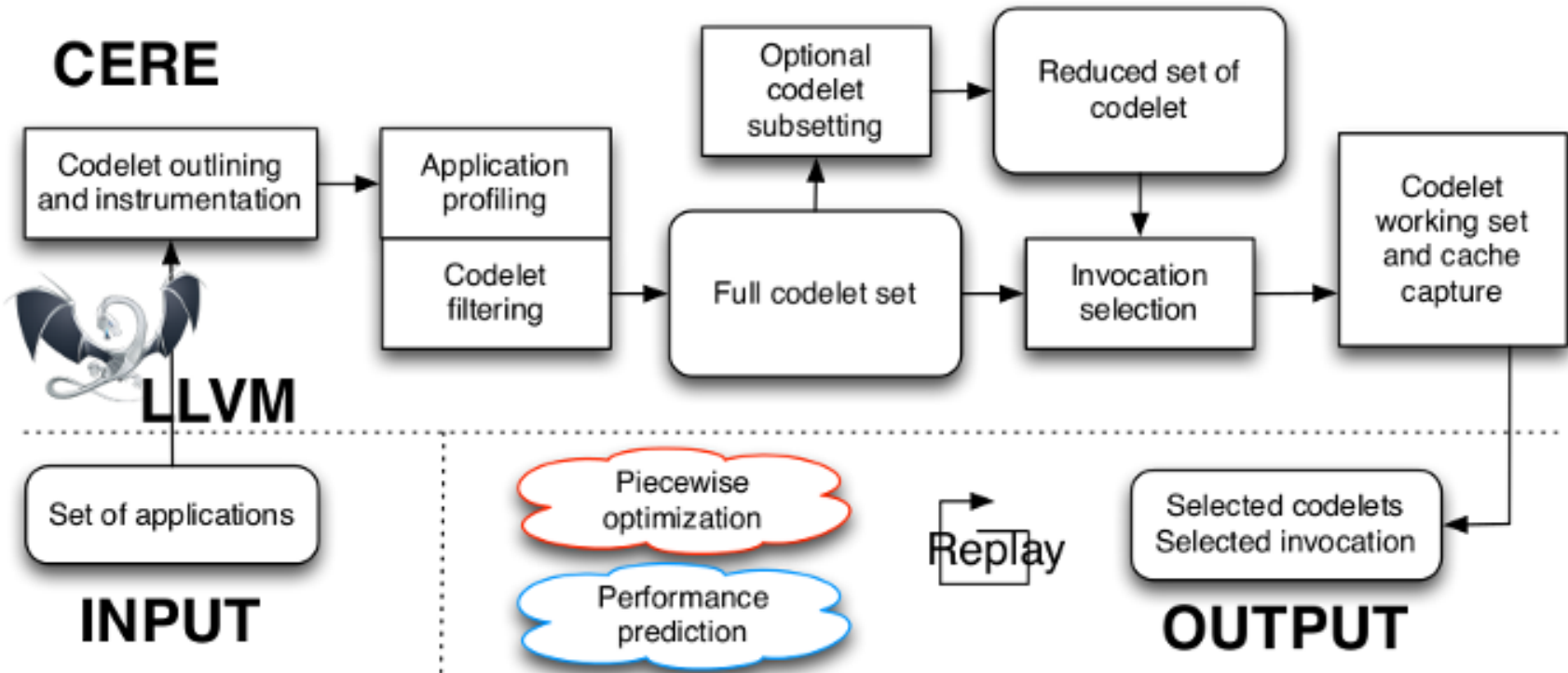


+ Contribution to OpenHPC (from 1.2)

Highlights

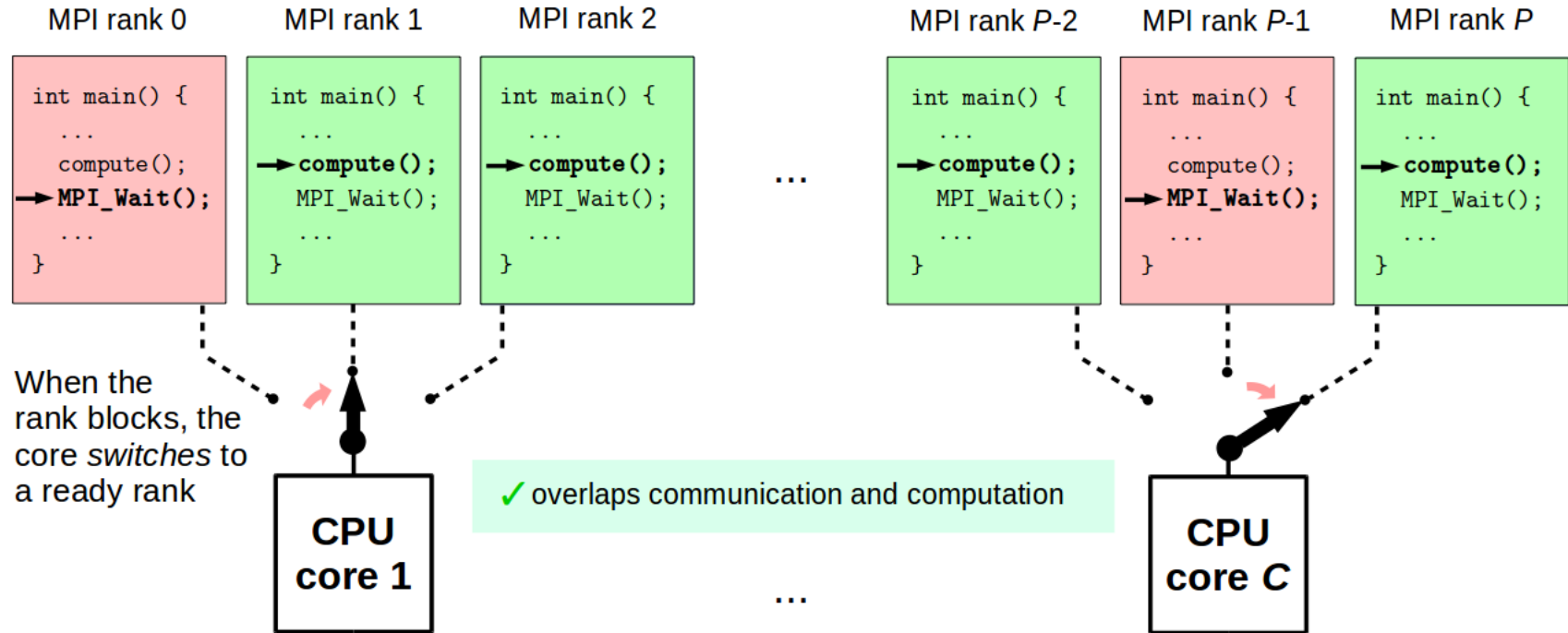
- **Atos Arm Software Stack (commercial offering on Atos' Arm-based Sequana platforms) by Atos**
- **Arm Fortran Compiler by Arm**
- **MAQAO and CERE tools by UVSQ**
- **DAST by BSC**
- **TinyMPI by ETHZ**
- **MPI+OmpSs communication and computation overlap by HLRS & BSC**
- **Heterogeneous hardware scheduling by Arm**





- **Stage 1: Move runtime overhead to an additional thread (task & dependence management)**
- **Stage 2: Distributed DAST**
- **Functionalities**
 - Task and dependence management
 - Task [allocation and] submission within OmpSs
 - Push/pop tasks to/from the task graph, including dependency calculation
- **Evaluated on Arm big.LITTLE (Armv7), Dibona (Armv8), Tasksim & more**
- **Test applications: STREAM, Cholesky, BlackSholes, Fluidanimate & more**

TinyMPI



Conclusions

- **The software ecosystem has advanced both in terms of new software and expanding the capabilities of existing solutions.**
- **Strong focus on open-source software, with some commercial solutions too.**
- **Good coverage of multiple levels of the software stack, however, there's always more we can do!**