

Integration of Yocto and Jupyter Lab into the MSK Firmware Framework for MPSoCs

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Why Embedded Linux? Why System on Chip (SoC)?

- Many of the AMCs at DESY have a System on Chip (SoC) which integrates **programmable logic** with **hard processor cores** (Example. Fig 1).
- AMCs with embedded Linux are suitable for handling hardware/software solutions (with better performance).
- Provide computing tools for system control purposes (e.g. ChimeraTK), and data analysis (e.g. Jupyter Lab) on an AMC.

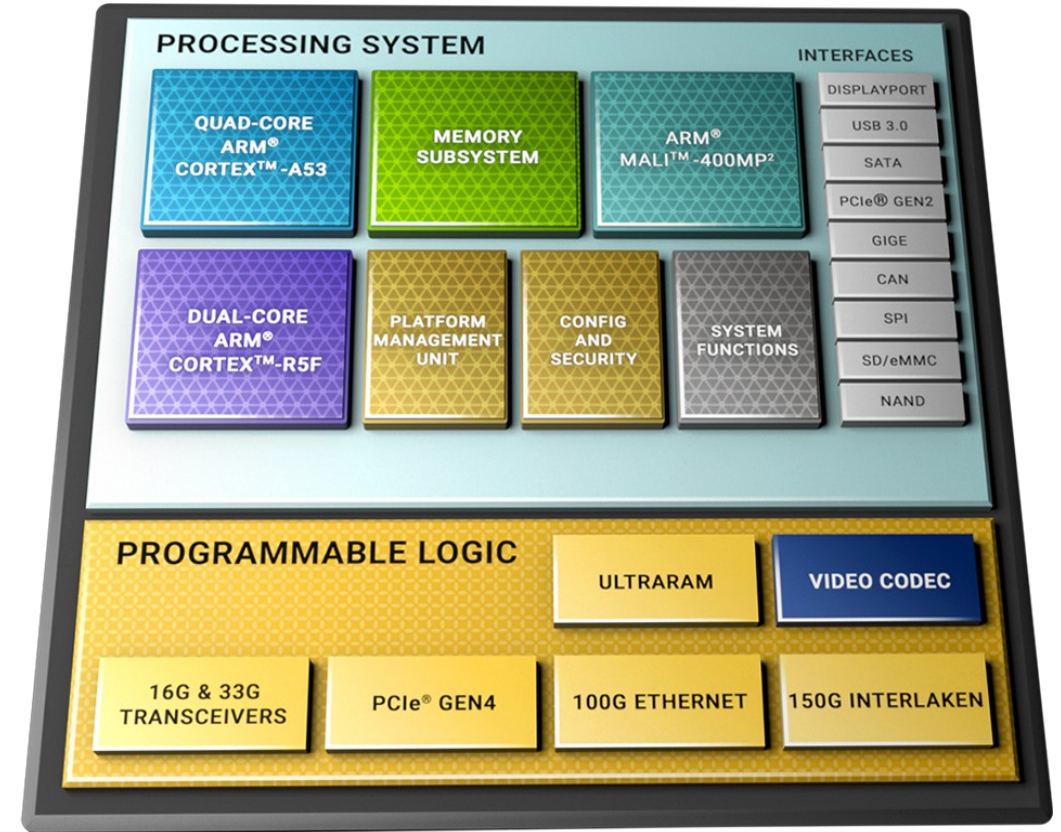


Fig 1: Xilinx Zynq UltraScale+ MPSoC diagram [1]

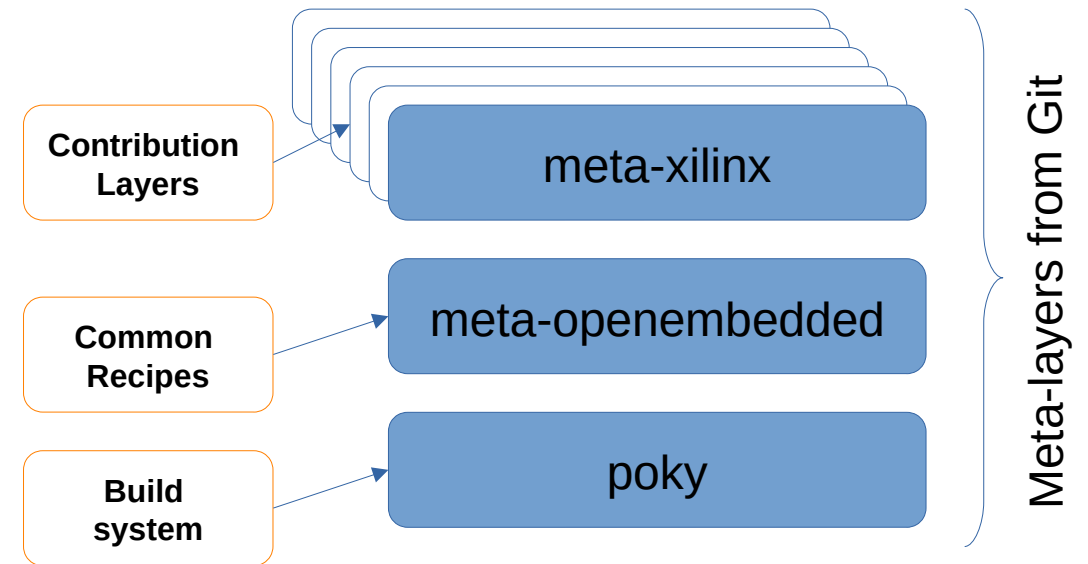
What is the Yocto Project?

“It's not an embedded Linux Distribution, It creates a custom one for you.” [2]



- A large open-source collaboration of industry members. (ARM, Xilinx, Intel, BMW, Microsoft ...)
- Structured in meta-layers and recipes.
- Final output of build process is an **OS image** ready for deployment on SoCs (e.g. FMC2ZUP board).

Example Layer Configuration



Integration into the MSK Firmware Framework

meta-msk-fwk-proj

⇒ Yocto images for specific projects (e.g.: Motion controller)

meta-msk-fwk-app

⇒ Collection of application and middle-ware software (e.g. : recipe-chimera-tk)

meta-msk-fwk-bsp

⇒ Board specific software

meta-msk-fwk-util

⇒ Build tool and utilities

yocto-scripts

⇒ External build scripts

Thank you!

For further information about the firmware framework project, please scan the QR code!



References:

- [1] Xilinx, Zynq UltraScale+ MPSoC website, accessed 30. August 2022, <www.xilinx.com/products/silicon-devices/soc/zynq-ultrascale-mpsoc.html>
- [2] Yocto Project, Yocto Project website, accessed 30. August 2022, <<http://www.yoctoproject.org>>