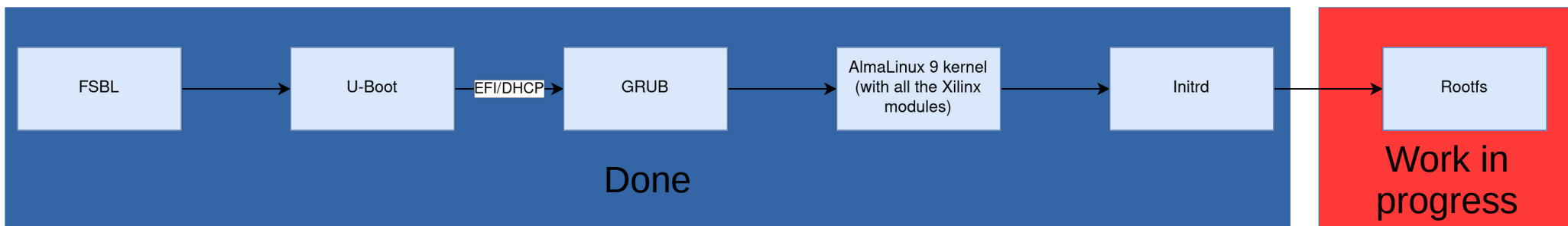# ATLAS Network and Booting

SoC Workshop - October 6th, 2023
ATLAS TDAQ SysAdmins
-
Quentin Duponnois on behalf of ATLAS TDAQ SysAdmins

- The aim of this project is to add the SoC support to the ATLAS TDAQ SysAdmins infrastructure :
  - By following the CERN IT rules and guidelines.
  - Mainly focus on the Xilinx ZynqMP SoC.

Original plan

- Use the FSBL, U-Boot and Grub as the bootload chain
- Load the AlmaLinux kernel recompiled with Xilinx support
- Load AlmaLinux rootfs

FSBL → U-Boot —EFI/DHCP→ GRUB → AlmaLinux 9 kernel (with all the Xilinx modules) → Initrd → Rootfs

Done

Work in progress

Working with users

- We started to work with the atlas-phase2-l0ct-software team, to try to understand more clearly what kind of need can have developers and users of SoC in ATLAS for phase 2.
- That allowed us to improve the list of Kernel modules needed for Xilinx ZynqMP SoC.

RedHat Kernel

- Building the kernel with Xilinx Support from RedHat 9.1 worked without issue.
- Unfortunately, The RedHat 9.2 build does not work, this is because of partial back porting of patches in the RedHat kernel.
- RedHat has already made it clear that they will not add Xilinx support to the EL kernel, nor helping us to do so.

Original Kernel (kernel.org) → Modified by RedHat → RedHat Kernel (Enterprise Linux) → Rebuild by AlmaLinux → AlmaLinux Kernel

New plan

- Use the FSBL, U-Boot and Grub as the bootload chain
- Load the original LTS kernel (from elrepo) recompiled with Xilinx support
- Load AlmaLinux rootfs (RO NFS share with RW overlay)

- That creates new questions:
  - What is the support available from CERN on this kernel ?
  - How much work is needed to support this ? From System Administrator point of view, and from developers.

- Compiling the Kernel, creating the Initrd image (with support for diskless system), and creating the base Rootfs is already automated using Gitlab-CI.
- Next step, add the support of the Xilinx ZynqMP SoC in the ATLAS TDAQ Testbed (Puppet, LDAP using sssd)

- More information about PXE/UEFI intergration: https://indico.cern.ch/event/1277467/contributions/5401719/attachments/2652831/4593609/SoC-Interest-Group-May-2023.pdf