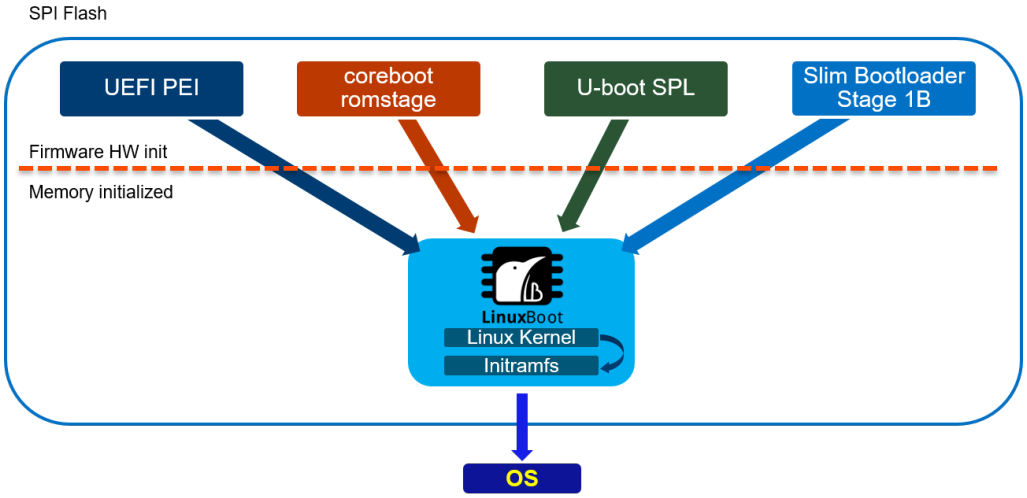
LBBR and LinuxBoot

This document summarizes Arm's efforts in enabling and supporting LBBR and the LinuxBoot firmware, including proof of concepts implementations on both virtual and physical Arm hardware.

LinuxBoot Background.

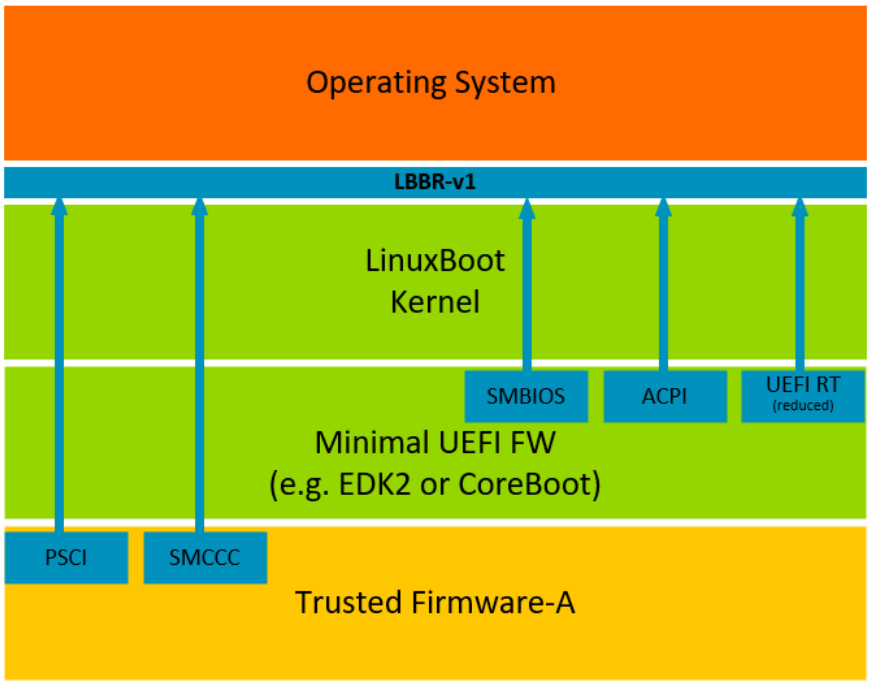
LinuxBoot is an alternative firmware stack that uses the Linux kernel as the normal world firmware component to replace fixed function firmware, such as the UEFI DXE phase. LinuxBoot can be built on top of several Hardware initialization methods, such as UEFI PI/DXE, CoreBoot, U-boot, etc. LinuxBoot is not a standard, but it can be supported on platforms that provide open-source firmware and implement required interfaces. More Info can be found in the Linux Boot Book:
https://github.com/linuxboot/book



Arm LBBR

The Arm LBBR recipe is Arm's effort to define base boot requirements for systems that implement LinuxBoot, allowing compatibility with standard off-the-shelf operating systems. The LBBR recipe is defined in the Arm Base Boot Requirements (BBR) specification, which can be found here:
https://developer.arm.com/documentation/den0044/latest

The system firmware for LBBR-v1 recipe (pictured below) is expected to use a reduced UEFI firmware implementation (such as EDK2), and supply ACPI, SMBIOS, and UEFI runtime interfaces. With this approach, LinuxBoot kernel preserves the OS interfaces footprint supplied by the UEFI firmware, passing them along to be used by the final runtime Linux kernel.



Arm LinuxBoot Resources

Concurrently to developing LBBR, Arm has been working to provide LinuxBoot proof-of-concept implementations on several virtual and physical Arm hardware platforms, with the goal of upstreaming the results of this work for the community. These PoC projects utilize EDK II based firmware, with an embedded LinuxBoot kernel and U-root image, allowing the user to kexec from u-root into the final operating system.

This approach is demonstrated on the following platforms:

- Arm RD-INFRA Fixed Virtual Platform (FVP)
- SBSA-QEMU
- Raspberry Pi4 (using UEFI firmware)

The link below points to a Git repository that contains up-to-date guides, source/reference code, and demos.

Demos, Guides & Code: https://gitlab.arm.com/systemready/linuxboot-resources