The Unified Extensible Firmware Interface (UEFI)

UEFI, the Unified Extensible Firmware Interface, is a specification governing the behaviours of compatible firmware interfaces. It is maintained by the UEFI Forum - http://www.uefi.org/.

UEFI is an evolution of its predecessor 'EFI', so the terms EFI and UEFI are used somewhat interchangeably in this document and associated source code. As a rule, anything new uses 'UEFI', whereas 'EFI' refers to legacy code or specifications.

UEFI support in Linux

Booting on a platform with firmware compliant with the UEFI specification makes it possible for the kernel to support additional features:

- UEFI Runtime Services
- Retrieving various configuration information through the standardised interface of UEFI configuration tables. (ACPI, SMBIOS, ...)

For actually enabling [U]EFI support, enable:

- CONFIG_EFI=y
- CONFIG_EFIVAR_FS=y or m

The implementation depends on receiving information about the UEFI environment in a Flattened Device Tree (FDT) - so is only available with CONFIG_OF.

UEFI stub

The "stub" is a feature that extends the Image/zImage into a valid UEFI PE/COFF executable, including a loader application that makes it possible to load the kernel directly from the UEFI shell, boot menu, or one of the lightweight bootloaders like Gummiboot or rEFInd.

The kernel image built with stub support remains a valid kernel image for booting in non-UEFI environments.

UEFI kernel support on ARM

UEFI kernel support on the ARM architectures (arm and arm64) is only available when boot is performed through the stub.

When booting in UEFI mode, the stub deletes any memory nodes from a provided DT. Instead, the kernel reads the UEFI memory map.

The stub populates the FDT /chosen node with (and the kernel scans for) the following parameters:

Name	Size	Description
linux,uefi-system-table	64-bit	Physical address of the UEFI System Table.
linux,uefi-mmap-start	64-bit	Physical address of the UEFI memory map, populated by the UEFI GetMemoryMap() call.
linux,uefi-mmap-size	32-bit	Size in bytes of the UEFI memory map pointed to in previous entry.
linux,uefi-mmap-desc-size	32-bit	Size in bytes of each entry in the UEFI memory map.
linux,uefi-mmap-desc-ver	32-bit	Version of the mmap descriptor format.
linux,initrd-start	64-bit	Physical start address of an initrd
linux,initrd-end	64-bit	Physical end address of an initrd
kaslr-seed	64-bit	Entropy used to randomize the kernel image base address location.