

EFI Device Tree Fixup Protocol

Heinrich Schuchardt

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Motivation

Linux device-trees tend to be neither forward nor backwards compatible.

E.g. commit `bbc4d71d6354`,

`“net: phy: realtek: fix rtl8211e rx/tx delay config”`

- Broke booting with old device-trees on boards with Allwinner 64bit SoCs.
- New device-trees are not compatible with existing U-Boot drivers.

Solution Idea

- GRUB has a 'devicetree' command but lacks fixups.
- Linux kernel distribution packages contain kernel image and device-trees.
- grub-mkconfig already updates grub.cfg concerning kernel binary and initial RAM disk.
- Let grub-mkconfig manage the device-tree too.
- /model node can be used to identify board specific dtb.
- Let 'devicetree' command call an EFI protocol for fixups.

EFI Device Tree Fixup Protocol

```
typedef EFI_STATUS (EFIAPI *EFI_DT_FIXUP) (  
    IN EFI_DT_FIXUP_PROTOCOL *This,  
    IN VOID                    *Fdt,  
    IN OUT UINTN               *BufferSize,  
    IN UINT32                  Flags  
);
```

Flags:

- EFI_DT_APPLY_FIXUPS Add nodes and update properties
- EFI_DT_RESERVE_MEMORY Reserve memory
- EFI_DT_INSTALL_TABLE Install the device-tree as configuration table

Status

- A draft specification is available at https://github.com/U-Boot-EFI/EFI_DT_FIXUP_PROTOCOL
- The U-Boot v2021.04 tree contains the implementation.
- Next steps
 - Patch GRUB
 - Include in EBBR