Linux on the Zynq Platform

Linux for
Embedded
Objects 2

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Disposition:

- **Motivation**
- **Zynq Platform**
- **Boot Process**
- **Cross Compilation**

Motivation

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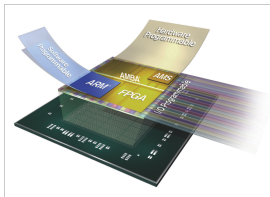
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Disposition

Motivation

Zynq Platform

Boot Process

Cross
Compilation

- Customizability
- Efficiency on a changing platform
- Knowledge about the platform

Zynq Platform

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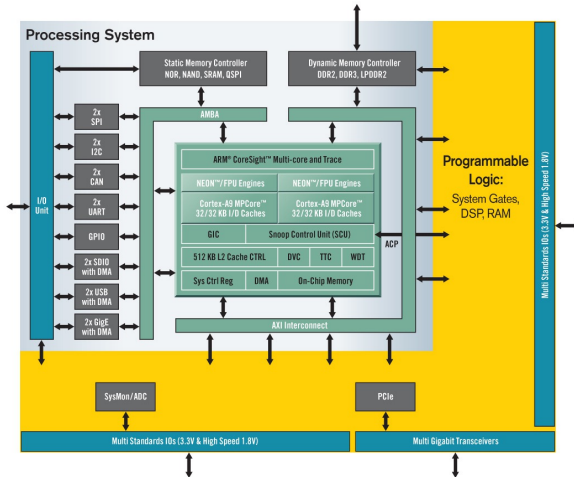Objects 2

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The Zynq Boot Process

Hard-Wired Boot ROM	On-Chip Memory (OCM)	DDR Memory	DDR Memory
Boot ROM	First-Stage Boot Loader (FSBL)	Second-Stage Boot Loader (SSBL)	Linux Kernel
stage-0	stage-1	stage-2	
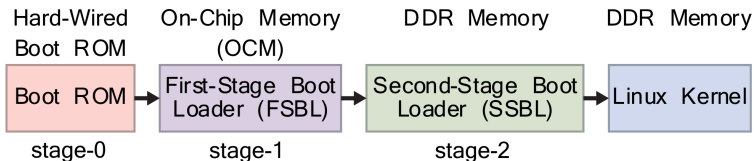
Stage 0 - Boot ROM

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Boot Process

Cross
Compilation

- Hardcoded
- Determines the boot mode
- Loads FSBL into OCM

Stage 1 - First-Stage Boot Loader

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Boot Process

Cross
Compilation

- PS and PL configuration
- Loads SSBL into DDR RAM

Stage 2 - Second-Stage Boot Loader

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Zynq Platform

Boot Process

Cross
Compilation

- Bare-metal application
- U-Boot
- Loads device tree to memory
- Loads the kernel image into memory
- Initialises execution of the Linux kernel

The Boot Image

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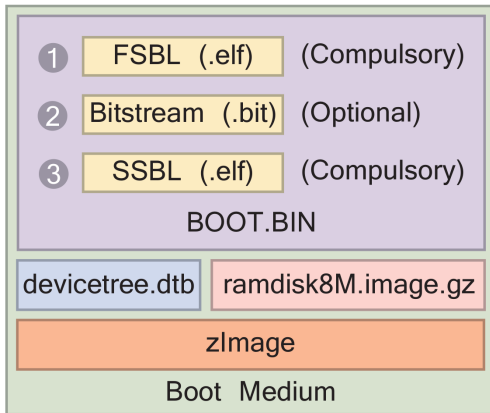Thomas S.
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Cross Compilation

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Cross
Compilation

- Why?
- The cross compilation toolchain
- Compilation of userspace software
- Make!

Cross Compilation of Kernel Modules

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Compilation

```
export ARCH:=arm
export CROSS_COMPILE:=arm-xilinx-linux-gnueabi-

CC=$(CROSS_COMPILE)gcc

obj-m += simple.o

KDIR  := path/to/linux-xlnx-zynmp-dt-fixes-for-4.10
PWD             := $(shell pwd)

default:
        ${MAKE} -C ${KDIR} M=${PWD} modules

clean:
        ${MAKE} -C ${KDIR} M=${PWD} clean
```