



Debian on ARM

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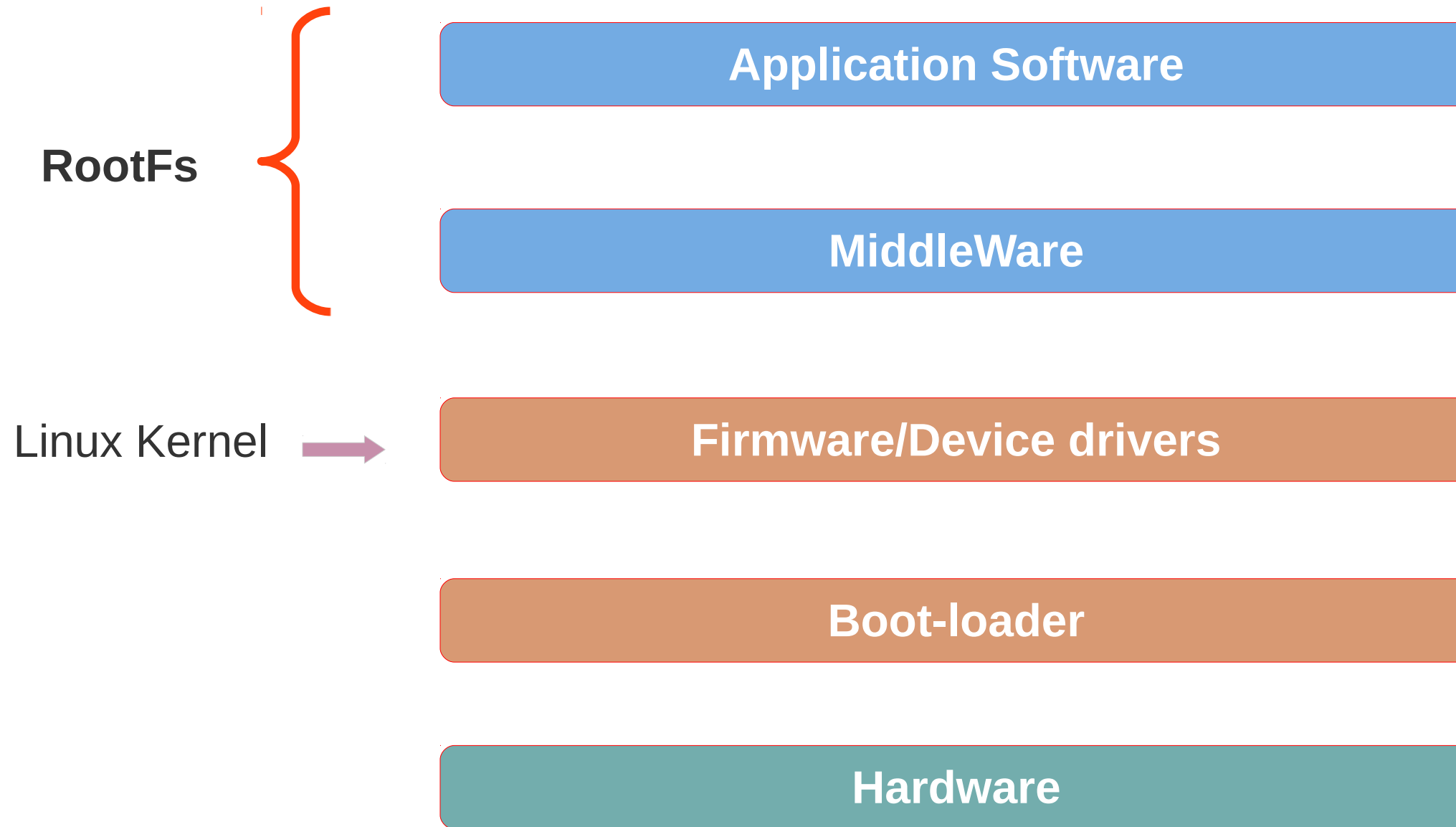
Overview

- Open Hardware Concept
- Open Source Embedded operating systems and architecture
- A quick Introduction -ARM
- Debian ARM ports
- Debian on Open Hardware
- Workshop/Hands-on

Open Hardware Concept

- Open hardware mechanical diagrams
- Schematic & circuit diagrams
- Components/material list
- PCB Layout diagram
- BSP (board support packages) -Uboot, Kernel, Rootfs
- Software api's

Embedded OS- Architecture



Embedded OS -Overview

OpenWrt
Wireless Freedom

Ångström



maemo.ORG

webOS

TIZEN™



ME LABS

Why debian on ARM

- It is maintained by its users.
- Unparalleled support
- The best packaging system in the world
- Incredible amounts of software
- Bug tracking system
- Easy Build
- Easy to install update package
- Supports 32/64 bit architectures
- Supports Headless images

ARM-Introduction

- Arm is RISC Architecture originally created for the Acorn Archimedes and subsequent desktop machines.
- Architecture Profiles -
 - A-profile, the "Application" profile: Cortex-A series
 - R-profile, the "Real-time" profile: Cortex-R series
 - M-profile, the "Microcontroller" profile: Cortex-M series
- Architecture
 - ARMv3 - ARM6, ARM7
 - ARMv4 – ARMv4
 - ARMv6 – ARM 11
 - ARMv7-A - ARM Cortex-A5, ARM Cortex-A7, ARM Cortex-A8, ARM Cortex-A9, ARM Cortex-A12, ARM Cortex-A15, ARM Cortex-A17

Debian ARM Ports

Port	Architecture	Description	Status
arm	OABI v3 2000	Potato	Discontinued 2011
armel	EABI ARM	Debian's fully supports a port	released
armhf	Hard Float ABI ARM	Supports floating-point unit (FPU) The Debian armhf port requires at least an ARMv7	released
arm64	V8	V8	2013

arm-linux ABI

- Old and the first port, using the "old" (now obsolete) ABI (OABI)
- For the arm v3 instruction set
- First released with 2.2 (Potato), last released with 5.0 (lenny).
- GNU Triplet: arm-linux-gnu

Triplet : Target Triplets describe a platform on which code runs and are a core concept in the GNU build system. They contain three fields: the name of the CPU family/model, the vendor, and the operating system name.

armel (ArmEabiPort)

- Newer port using the "new" ABI (EABI)
- Supported on ARM v4t and higher.
- First released with 5.0 (lenny)
- GNU Triplet: arm-linux-gnueabi
- Can be run on ARMv4t and any newer systems where a Linux kernel exists and enough memory (32MB+) and storage space (1GB+).

EABI is the new "Embedded" ABI by ARM Ltd. EABI is actually a family of ABIs and one of the "subABIs" is GNU EABI, for Linux.

armhf (ArmHardFloatPort)

- The latest 32-bit port
- Using the hard-float version of the "new" ABI (EABI)
- Targeting ARM v7 and up.
- First released with 7.0 (wheezy).
- GNU Triplet: arm-linux-gnueabi
- For ARM boards and devices ship with a floating-point unit (FPU)

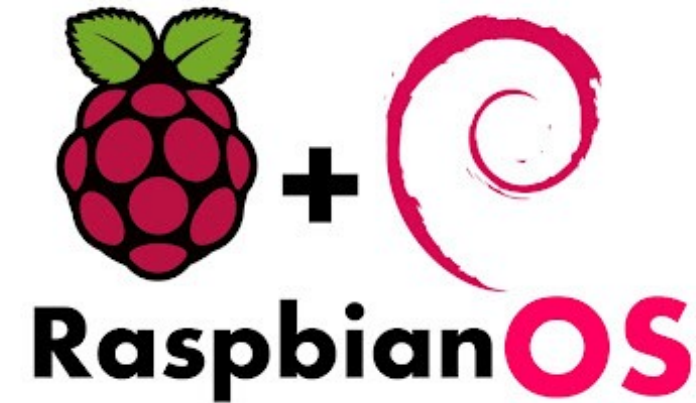
arm64 (Arm64Port)

- The latest port
- For the 64-bit ARMv8 architecture.
- Will be released with 8.0 (jessie).
- GNU Triplet: aarch64-linux-gnu

Debian on RPi

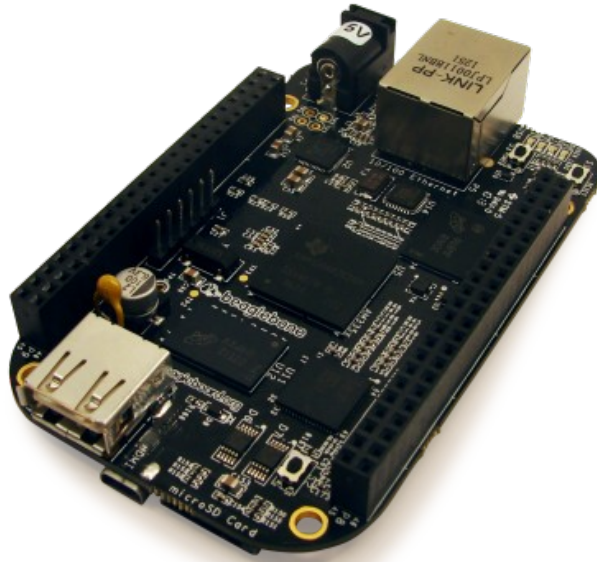


- CPU : ARM11, 700 MHz, RAM -256MB/512MB/
- HDMI/TV out, USB ports -2, LAN-1
- Rpi 2 -ARM 7, RAM -1 GB



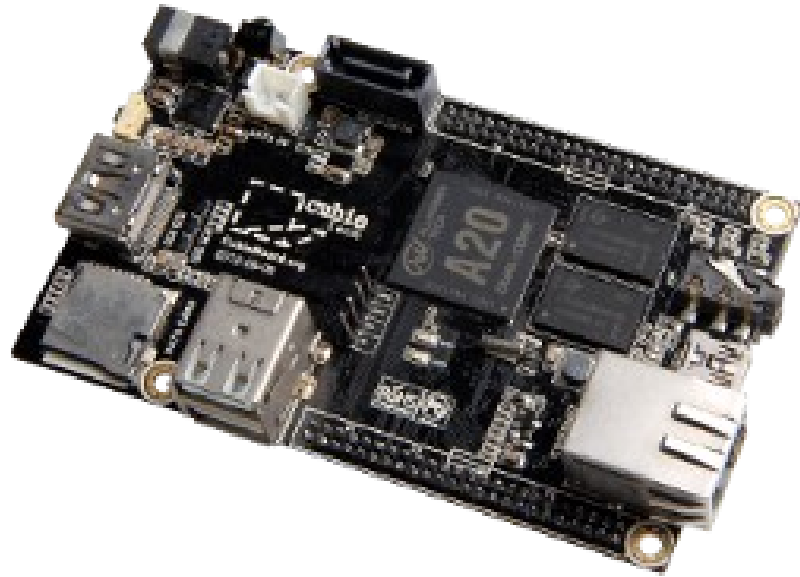
- Optimised Debian for RPi
- 35,000 packages, pre-compiled software bundled
- <http://www.raspbian.org/>

Debian on BBB



- TI's AM335x 1GHz ARM® Cortex-A8
- RAM - 512MB
- HDMI, USB ports -2, LAN-1
- BBB officially shipped with Debian
- Supported by Debian, TI and Linaro
- <http://beagleboard.org/latest-images>
- <https://wiki.debian.org/InstallingDebianOn/TI/BeagleBone>

Debian on Cubieboard



- AllWinnerTech SOC, ARM Cortex-A8 ARM
- RAM - 1GB
- HDMI/TV out, USB ports -2, LAN-1

- Cubian -Debian on Cubieboard
- <https://wiki.debian.org/CubieBoard>
- www.cubian.org

Contact

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Project ARA -Seminar

Seminar on Project ARA - An Open Modular Smart Phone

Date : 17th Feb, 2015 , 12:30 to 3:30

Venue : IIT Bombay

Register : <http://fossee.in/activities/seminars/project-ARA>