

Processor SDK Linux Components

Agenda

- Provide a high-level overview of the different pieces included in the Processor SDK Linux
- Describe how the various SDK components can be used to accelerate and ease application development.

Processor SDK Linux: Kernel

- Based on [kernel.org LTS \(long-term stable\)](#)
 - Provides bug fixes for about 2 years from the community
- Includes [Linaro Stable Kernel \(LSK\)](#) integration
- Move to new LTS annually
 - Allows users to pick up new features and capabilities

Processor SDK Linux

Kernel

SoC

Hardware

Processor SDK Linux: Bootloader

- U-Boot based on denx.org mainline
- Release updated annually

Bootloader

Kernel

SoC

Hardware

Processor SDK Linux

Processor SDK Linux: Filesystem

- Yocto compatible
- Release updated annually
- Everything built from source

Filesystem

Bootloader

Kernel

SoC

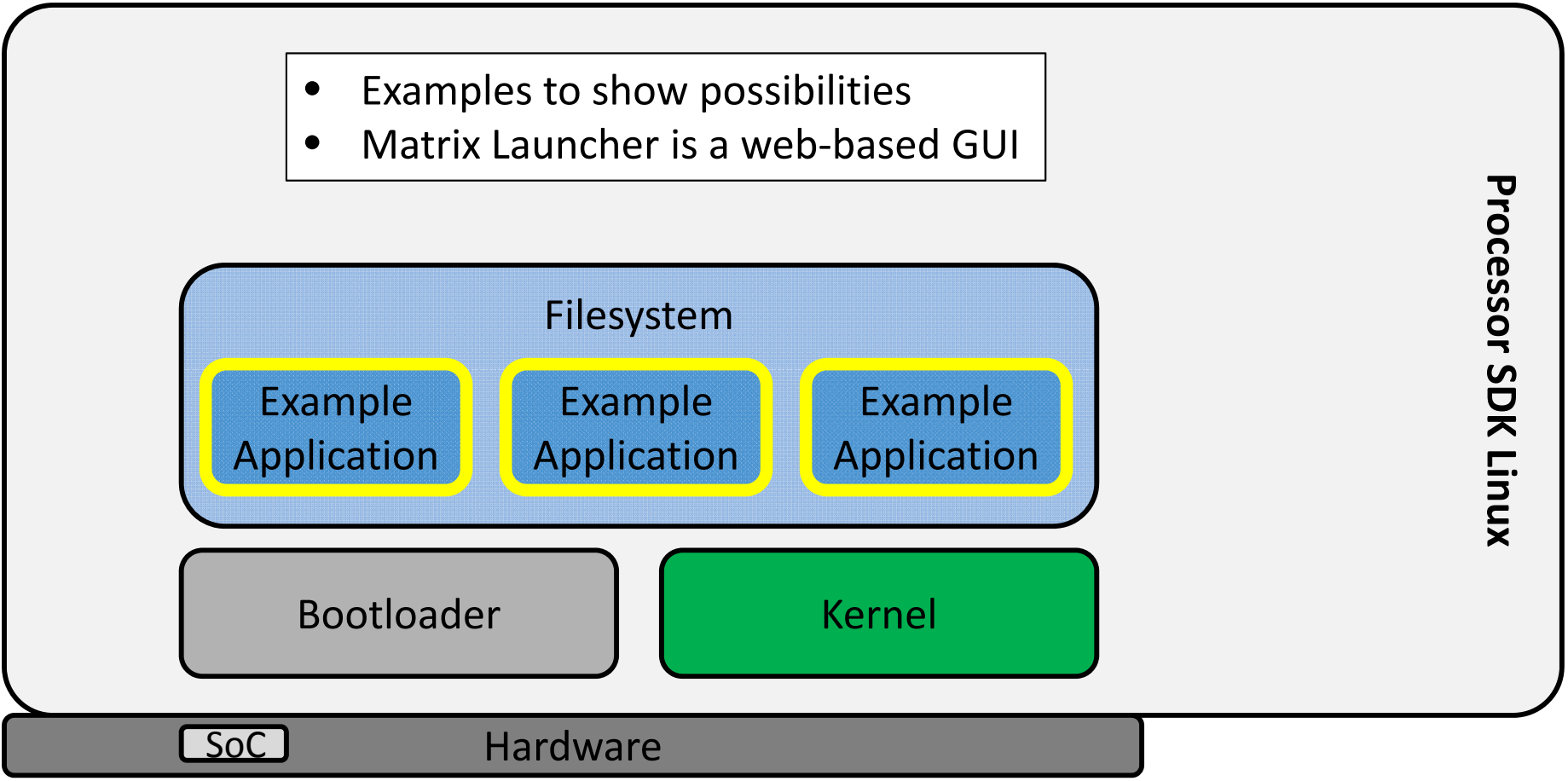
Hardware

Processor SDK Linux

Processor SDK Linux: Example Applications

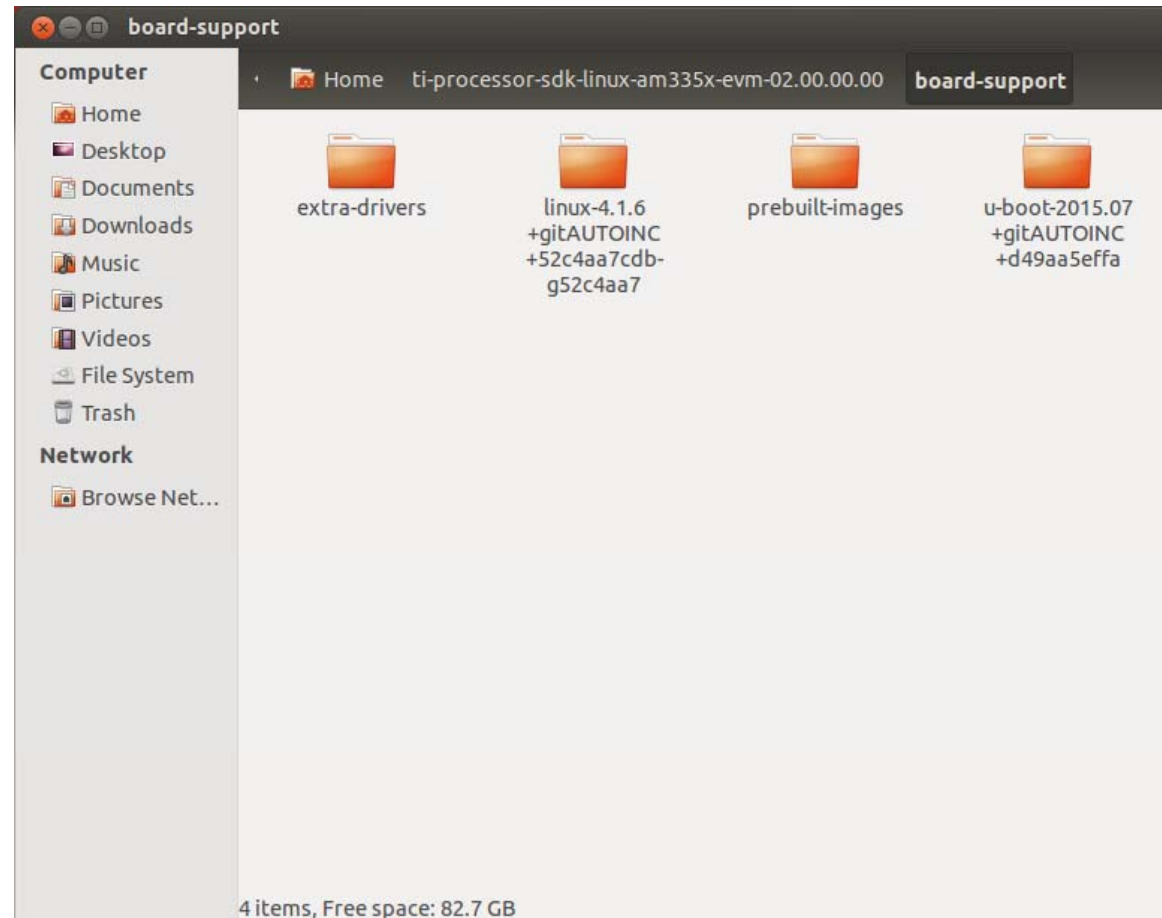
- Examples to show possibilities
- Matrix Launcher is a web-based GUI

Processor SDK Linux

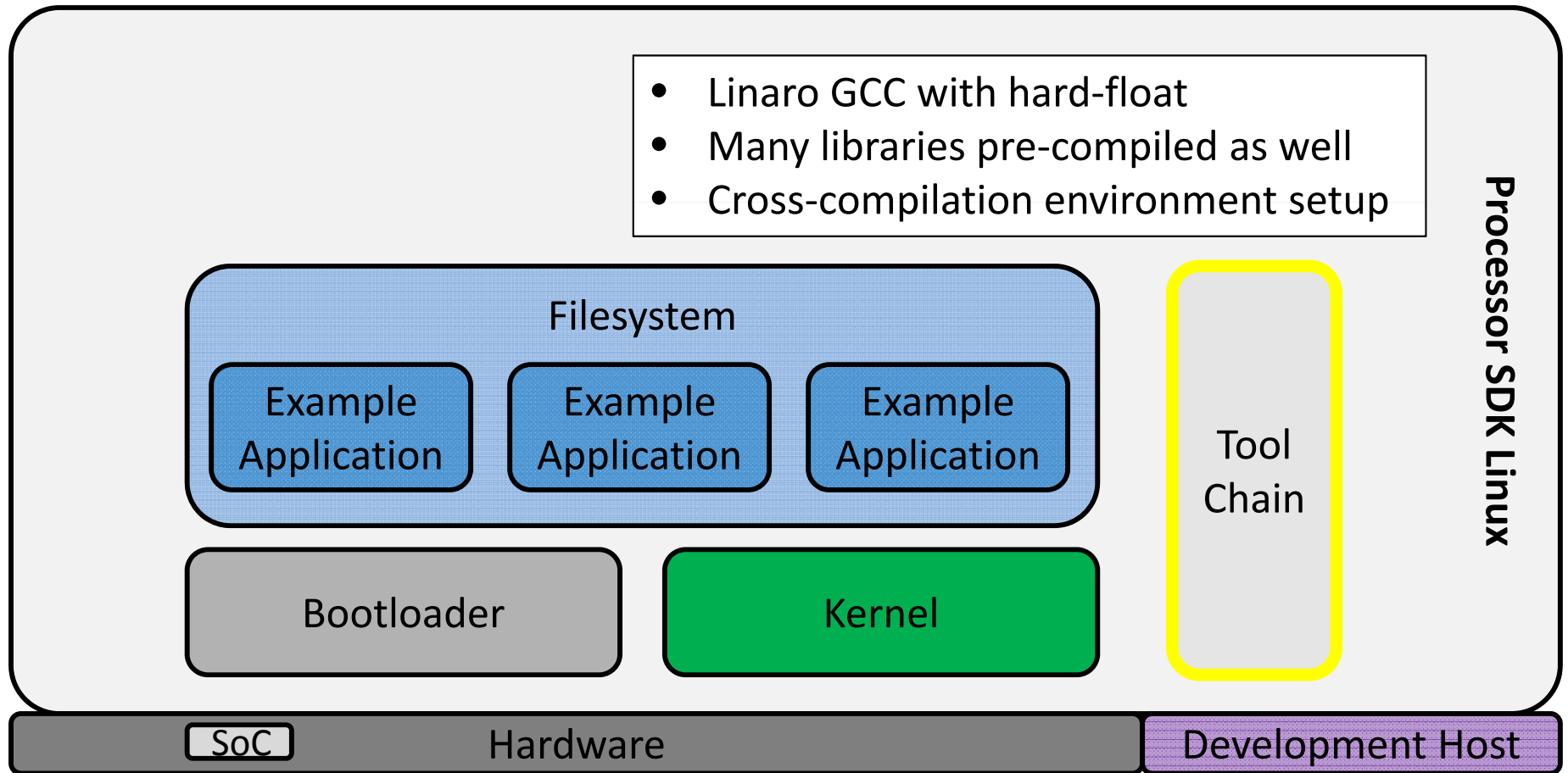


SDK Target Development Tools: Board Support Package

- At the top-level of the SDK there is a directory called **board-support**. This directory contains the components required to port to your custom hardware, including:
 - The Linux kernel sources
 - The bootloader sources
NOTE: In most cases, the u-boot SPL is used in place of x-loader, which has been deprecated.
 - Driver source for out-of-tree drivers
- The SDK components in this directory are those that typically require modification/configuration/rebuilding when porting to a new hardware platform.
- Pre-built kernel and bootloader images in the “prebuilt-images” directory can be used to boot the TI EVM.

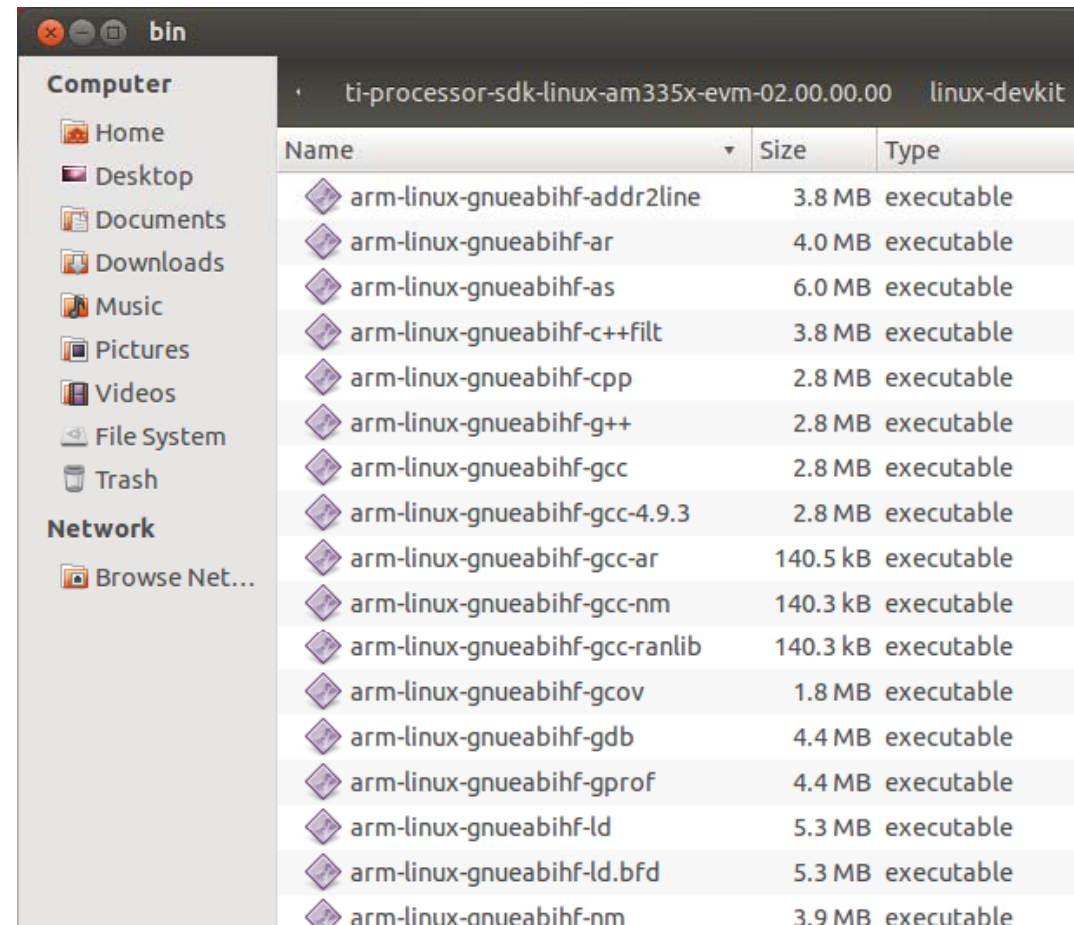


Processor SDK Linux: Toolchain



SDK Target Development Tools: Cross Compiler

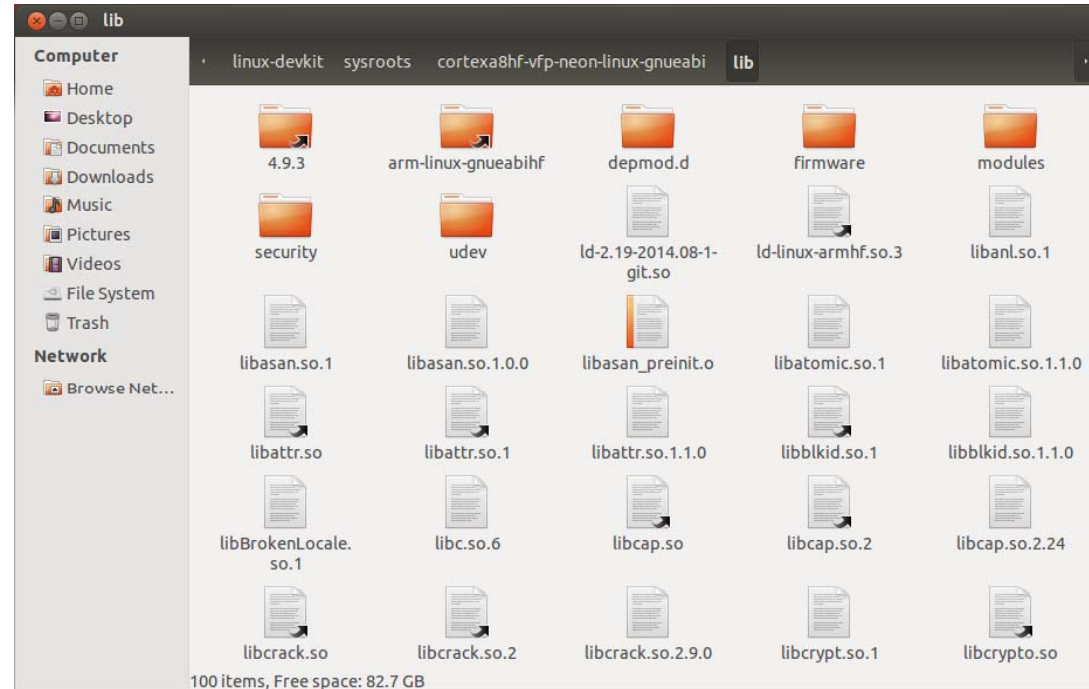
- The Sitara SDK contains its own Linaro GCC-based ARM cross-compiler.
 - This eliminates the need for a separate toolchain download and removes the need for the customer to provide a toolchain location.
- This toolchain is optimized for the processor family the SDK is targeting.
 - The toolchain included with the SDK for Cortex-A devices has been optimized for Cortex devices and uses the Neon coprocessor.
- The cross compiler is located in the linux-devkit directory of the SDK.
- This cross compiler is also paired with a gdbserver installed on the reference file system to allow for source code debugging.



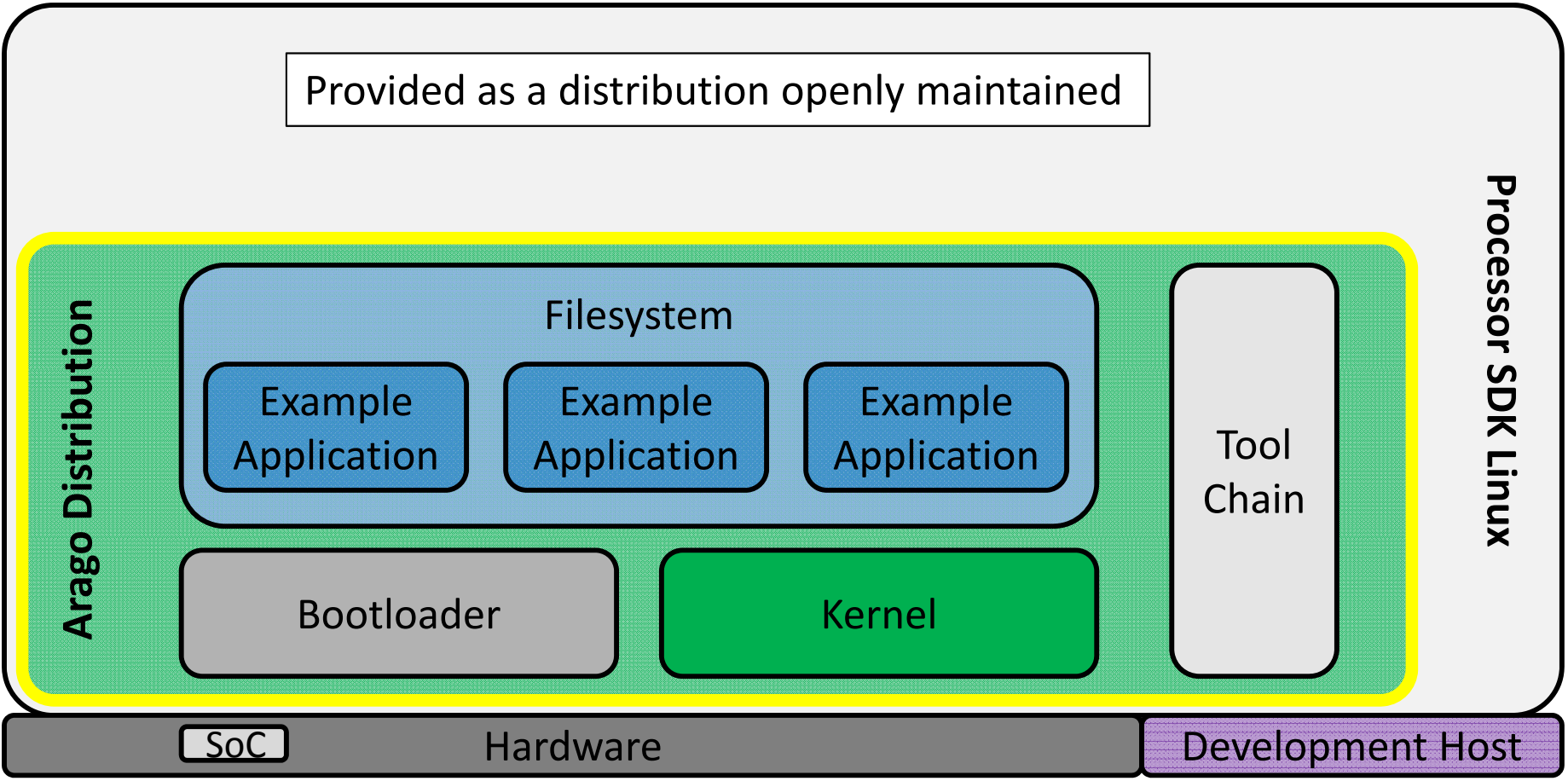
Name	Size	Type
arm-linux-gnueabi-hf-addr2line	3.8 MB	executable
arm-linux-gnueabi-hf-ar	4.0 MB	executable
arm-linux-gnueabi-hf-as	6.0 MB	executable
arm-linux-gnueabi-hf-c++filt	3.8 MB	executable
arm-linux-gnueabi-hf-cpp	2.8 MB	executable
arm-linux-gnueabi-hf-g++	2.8 MB	executable
arm-linux-gnueabi-hf-gcc	2.8 MB	executable
arm-linux-gnueabi-hf-gcc-4.9.3	2.8 MB	executable
arm-linux-gnueabi-hf-gcc-ar	140.5 kB	executable
arm-linux-gnueabi-hf-gcc-nm	140.3 kB	executable
arm-linux-gnueabi-hf-gcc-ranlib	140.3 kB	executable
arm-linux-gnueabi-hf-gcov	1.8 MB	executable
arm-linux-gnueabi-hf-gdb	4.4 MB	executable
arm-linux-gnueabi-hf-gprof	4.4 MB	executable
arm-linux-gnueabi-hf-ld	5.3 MB	executable
arm-linux-gnueabi-hf-ld.bfd	5.3 MB	executable
arm-linux-gnueabi-hf-nm	3.9 MB	executable

SDK Target Development Tools: Cross Libraries

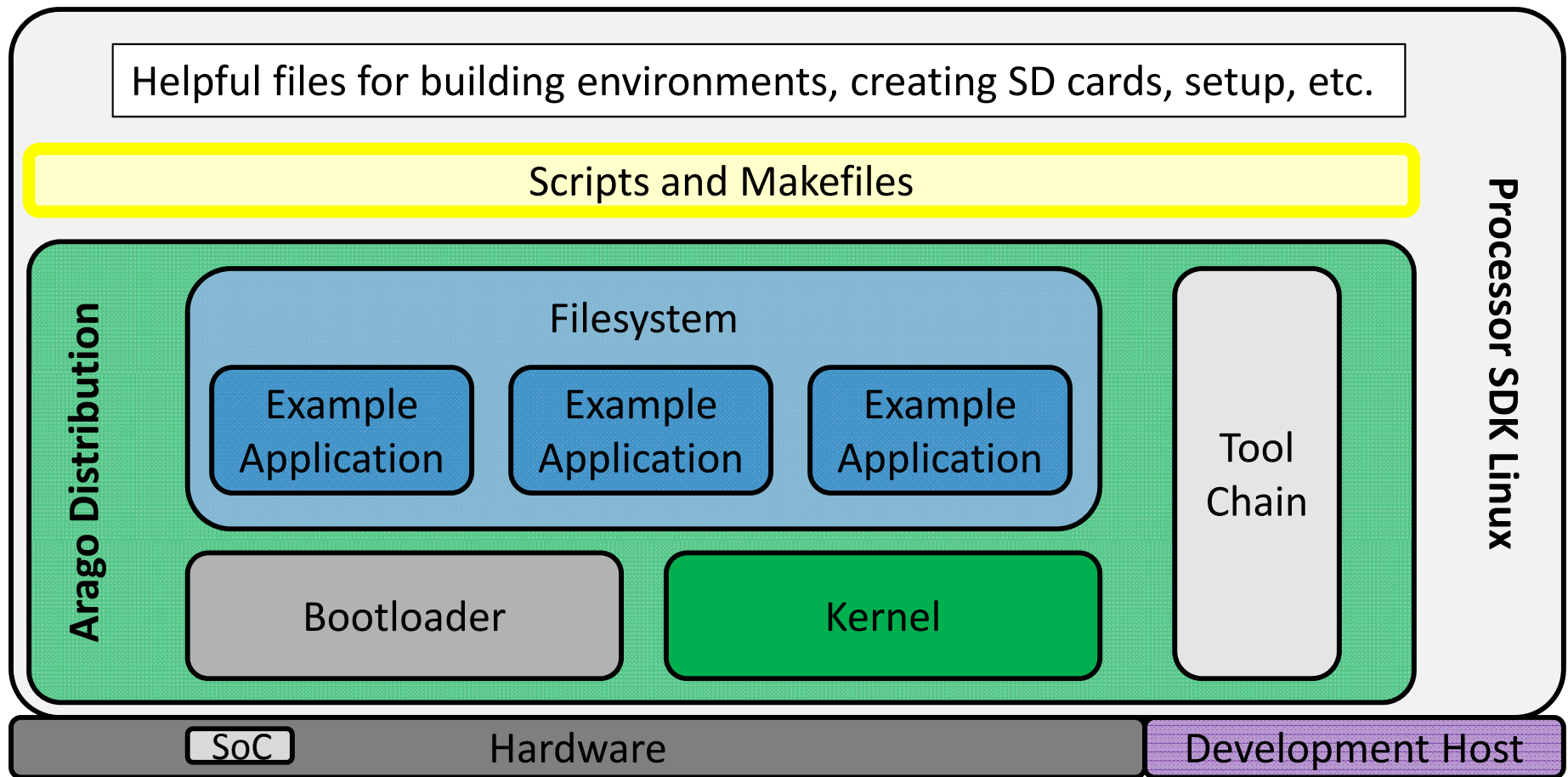
- The Sitara SDK ships with many open source libraries already cross compiled and ready for linking.
- The libraries are located in the **linux-devkit** directory of the SDK.
- There is a script in the linux-devkit directory of the SDK called **environment-setup**. Sourcing this script configures your development environment for cross compiling by performing actions such as:
 - Setting standard compile variables, such as CC for the cross compiler
 - Adding the cross compiler to the PATH
 - Setting the PKG_CONFIG and other autotools settings to the cross libraries
 - Configuring the Qt variables
- Sourcing the environment setup file prepares the host system for target development.
- Users can identify if the **environment-setup** script has been sourced because the prompt will change to **linux-devkit**.



Processor SDK Linux: Arago Distribution

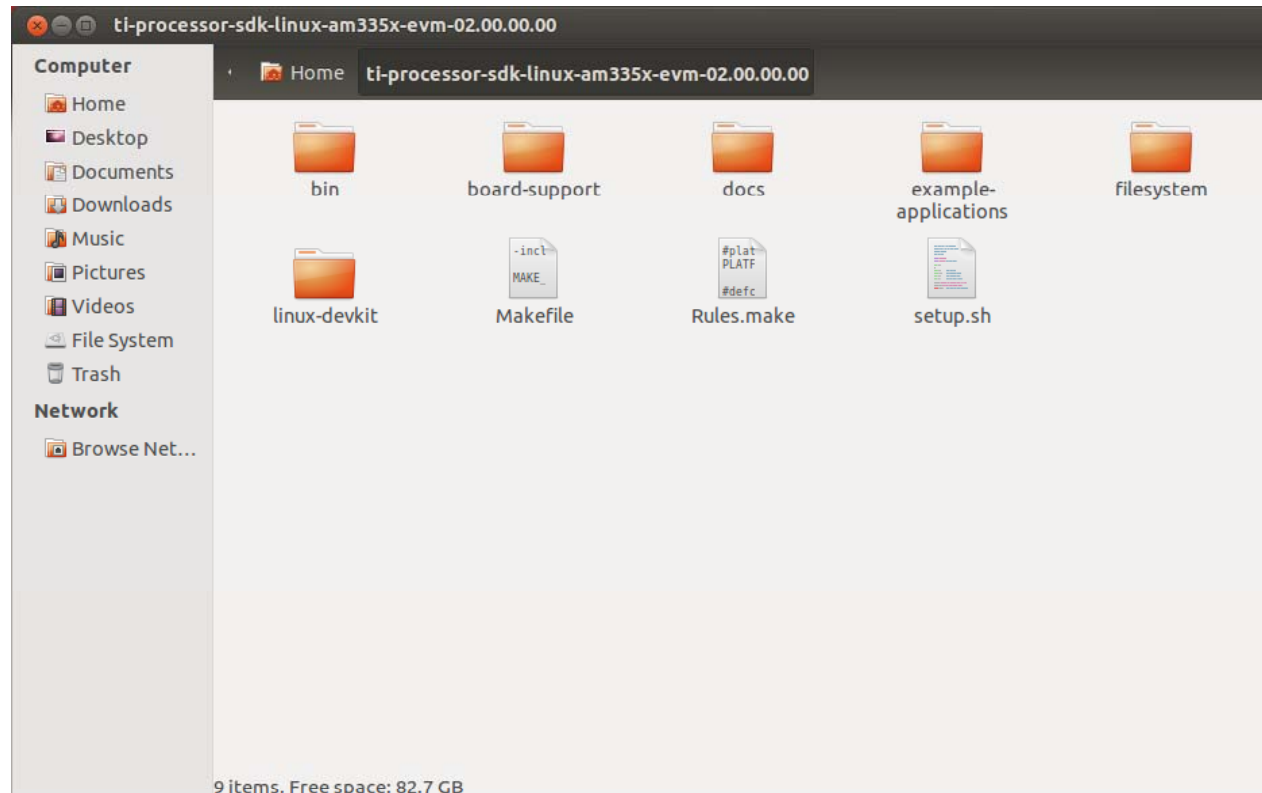


Processor SDK Linux: Scripts and Makefiles



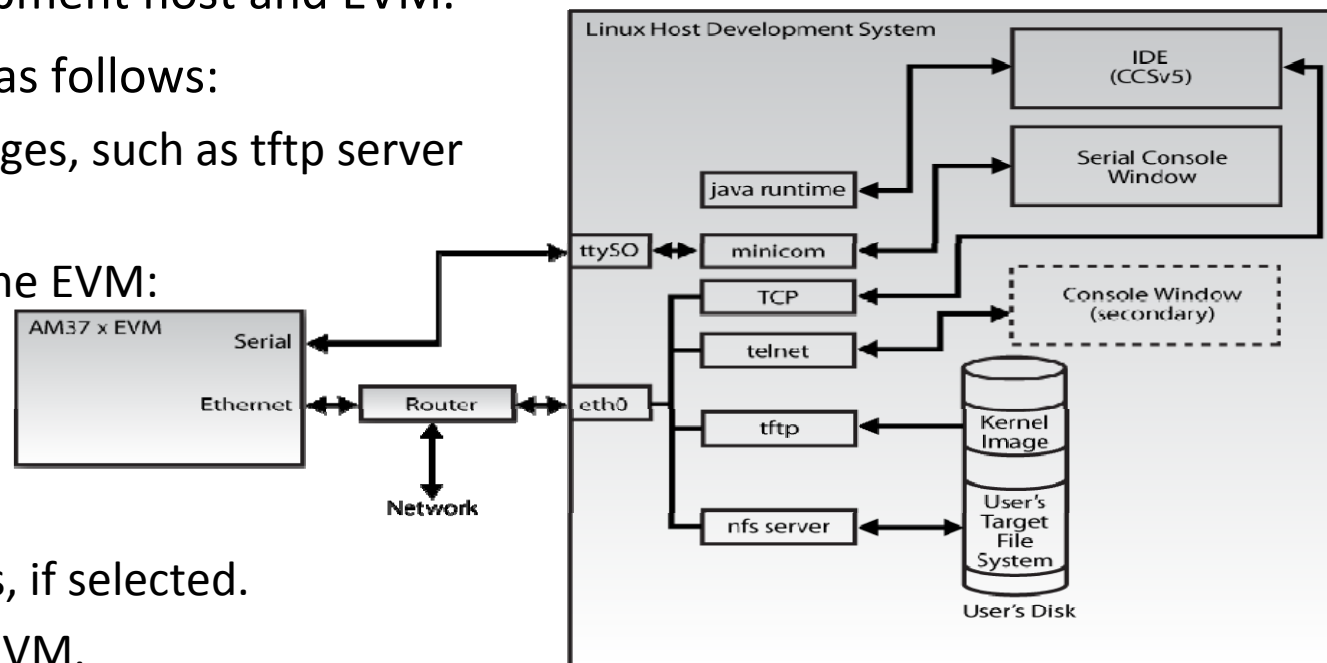
SDK Target Development Tools: Top-level Makefile

- At the top-level of the SDK, there is a **Makefile** and a **Rules.make** file. These files can be used to build the SDK components as well as to import useful settings.
- **Rules.make** provides settings used by component Makefiles for building the components. These include setting for the cross compiler and machine being built.
- **Makefile** contains targets to build, install, and clean most of the components of the SDK, such as the board-support packages and the example applications.

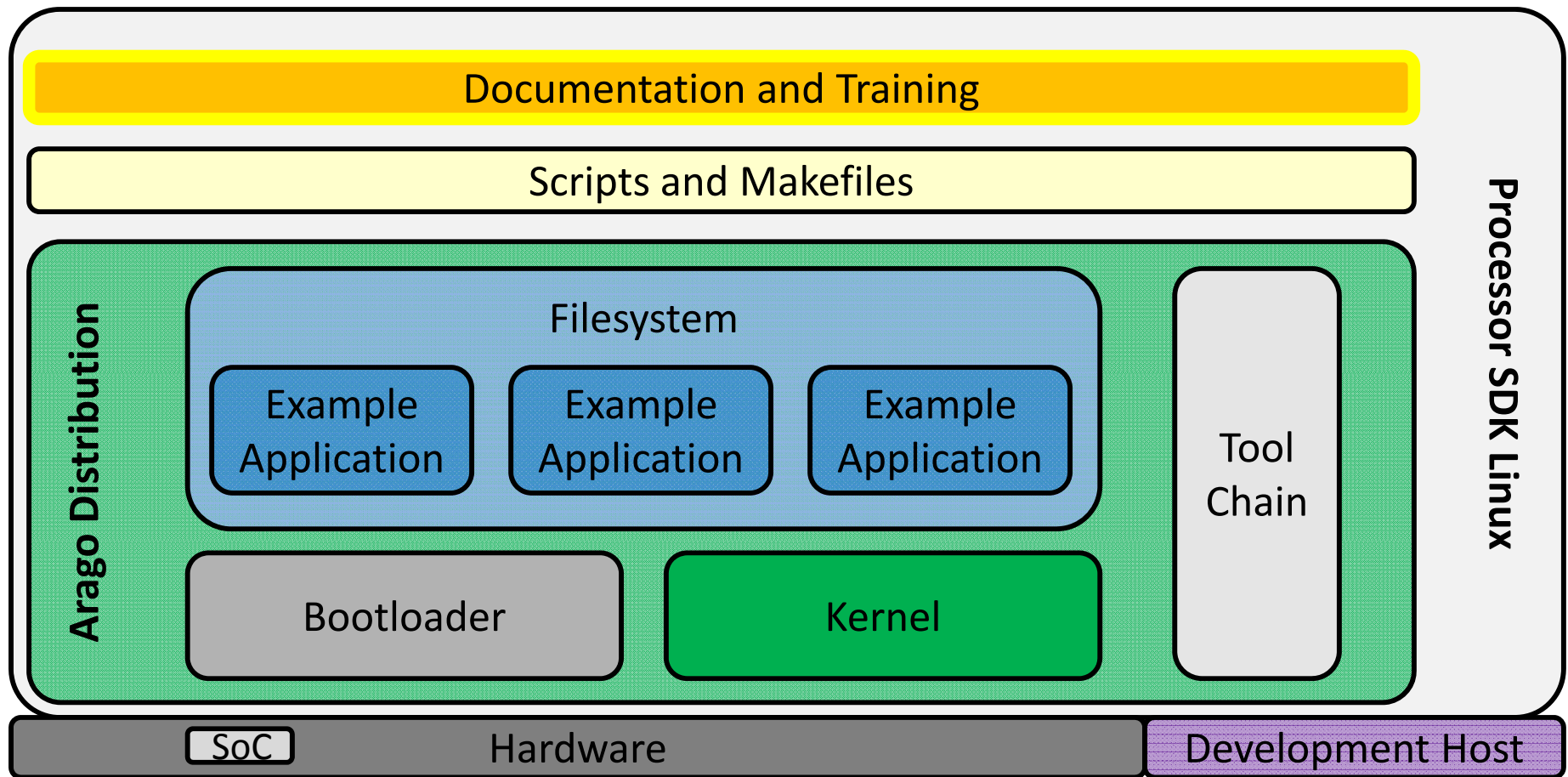


SDK Target Development Tools: Setup Scripts

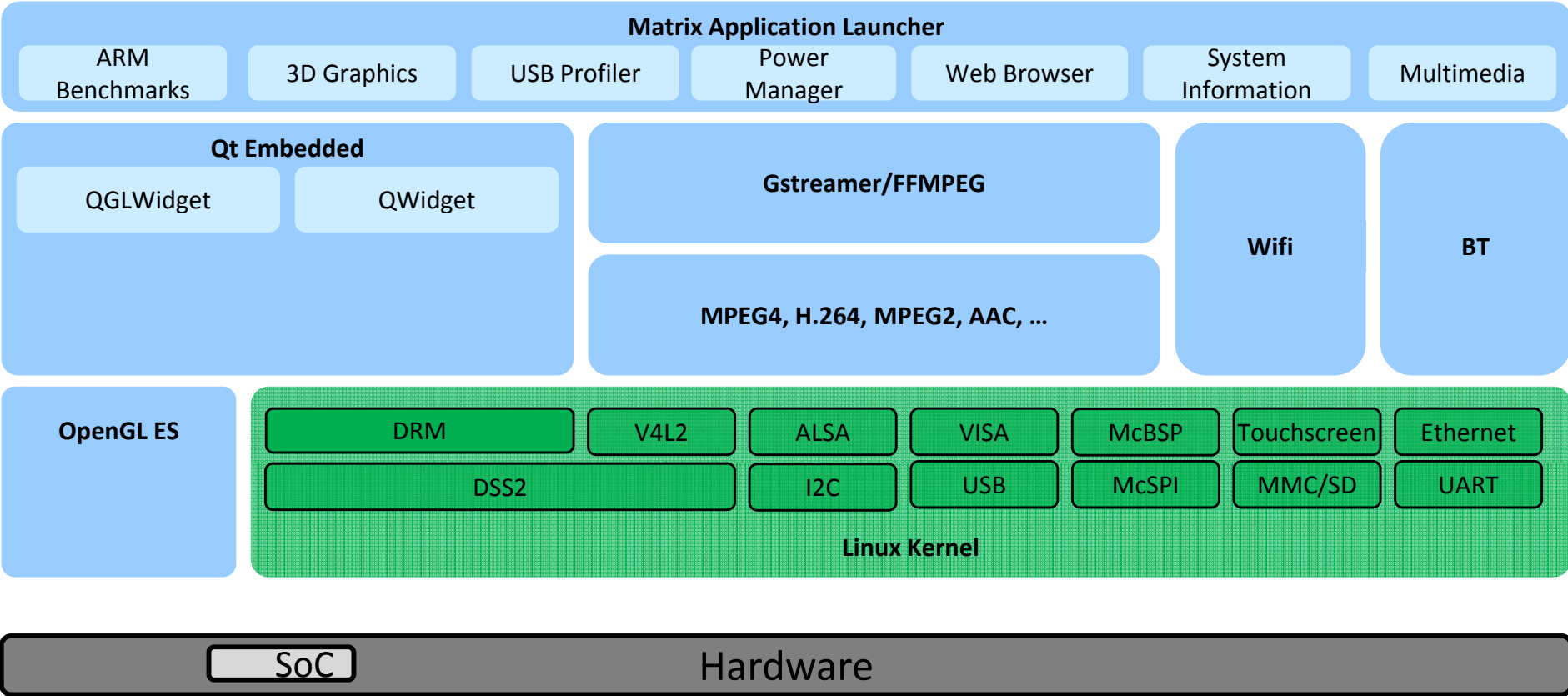
- At the top-level of the Sitara SDK, there is a script called **setup.sh**. When run with “root” permission, this script assists in configuring the development host and EVM.
- The general flow of the setup is as follows:
 - Install required host side packages, such as tftp server and nfs server.
 - Prompt the user to configure the EVM:
 - TFTP kernel + NFS file system
 - SD kernel + NFS file system
 - TFTP kernel + SD file system
 - SD kernel + SD file system
 - Setup the TFTP and NFS images, if selected.
 - Send the configuration to the EVM.



Documentation and Training



Linux Software Stack



Summary

- The Processor SDK Linux provides a full suite of components to help speed and ease development.
- For additional training on the Processor SDK, use the links on the next page.

For More Information

- Processor SDK Training Series
 - Processor SDK Overview
 - Processor SDK RTOS Overview
 - Processor SDK Linux Overview
 - Processor SDK Linux Matrix
 - Processor SDK Linux Installation
- Processor SDK Documentation
 - Processor SDK Linux Getting Started Guide
 - Processor SDK RTOS Getting Started Guide
- For questions about this training, refer to the E2E Community Forum:
<https://e2e.ti.com/support>