Mobile and Embedded Operating System

Android Mobile Operating System for i.MX Applications Processor Platforms

Overview

Android is a free, open source and fully customizable mobile platform based on the Linux® kernel. Android offers a full vertical software stack: an operating system, middleware and key applications. It also contains a rich set of APIs that allows third-party developers to develop great applications. Freescale now supports Android with a board support package (BSP) that is ready to be adapted to select i.MX platforms. The i.MX51 multimedia applications processor running Android is an excellent platform for building a high-performance, low-power and cost-effective mobile device that successfully passes the Android Compatibility Test Suite (CTS). The reference hardware, images, source patches and documentation are available now for the i.MX51 Evaluation Kit (EVK) at **www.freescale.com/imxandroid.**

Freescale enables our customers with integrated hardware/software solutions to realize faster time to market, and the Android platform provides a compelling and innovative end user experience to support this effort. Using a layered approach with the right selection of components to interface into the Android stack results in a more complete and ready solution. Customers will be able to directly develop applications on this integrated solution or easily modify their own drivers based on Freescale's i.MX Android BSP.

Target Processor Architecture

Freescale's i.MX51 applications processor is based on the ARM Cortex™-A8 core. The i.MX51 is a high-performance, full-featured System-on-Chip (SoC) that supports multimedia acceleration, connectivity, security, expansion buses and low power.

Features

- Optimized Android solution with accelerated multimedia codecs and graphics
- Based on the latest stable Android kernel/release
- Common code base across Freescale i.MX SoCs to greatly reduce porting effort to next-generation i.MX processors
- Source patches for selected drivers
- Documentation (Reference Manual, User's Guide, Release Notes)
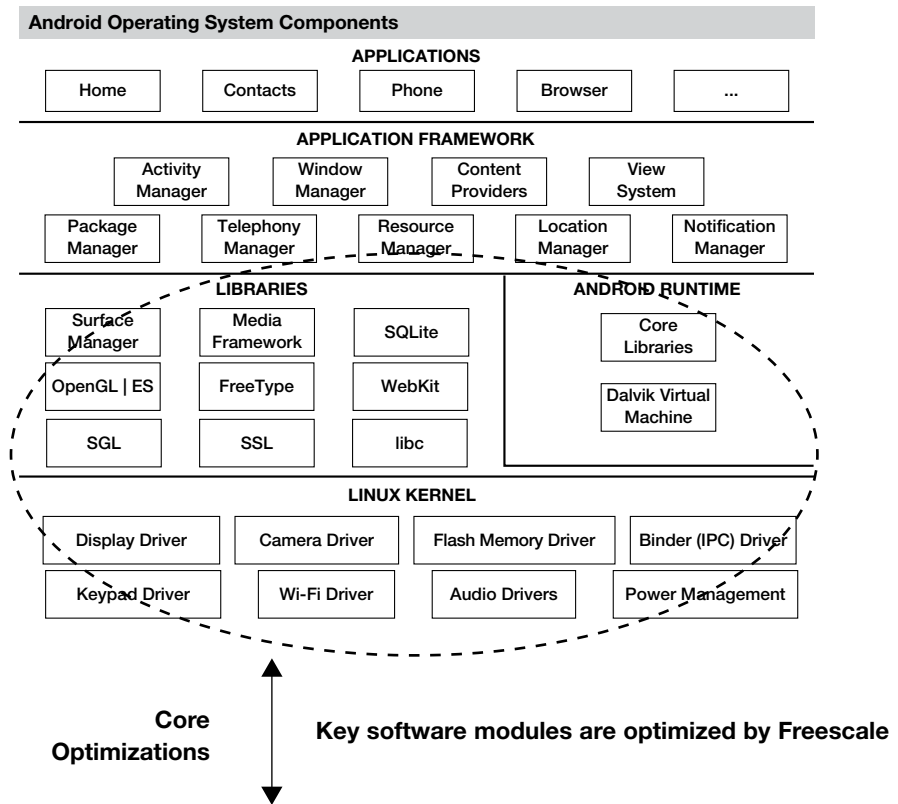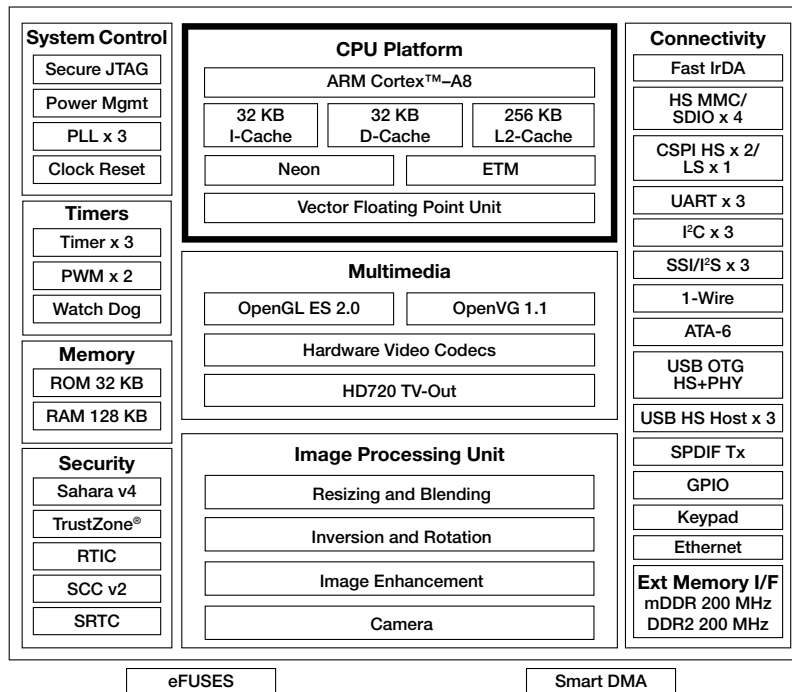
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Benefits

- High performance and low power operation
- Optimized multimedia codecs in the Android framework include:
  - ARM7™ optimization
  - Hardware encode and decode acceleration using the video processing unit (VPU)
- Graphics hardware acceleration
  - 2-D graphics for UI rendering
  - OpenGL® ES 2.0 for 3-D applications
- Latest Android kernel/release
- Specific extensions for the i.MX platform
- Extensive test cases for BSP and multimedia codecs

Open Handset Alliance™

Freescale is a proud member of the Open Handset Alliance–a group of mobile and technology leaders responsible for the creation and proliferation of Android and an open mobile ecosystem. Freescale contributes kernel code and drivers via the Android Open Source Project.

Android Operating System Components

APPLICATIONS

Home	Contacts	Phone	Browser	...

APPLICATION FRAMEWORK

Activity Manager	Window Manager	Content Providers	View System
Package Manager	Telephony Manager	Resource Manager	Location Manager	Notification Manager

LIBRARIES

Surface Manager	Media Framework	SQLite
OpenGL | ES	FreeType	WebKit
SGL	SSL	libc

ANDROID RUNTIME

Core Libraries
Dalvik Virtual Machine

LINUX KERNEL

Display Driver	Camera Driver	Flash Memory Driver	Binder (IPC) Driver
Keypad Driver	Wi-Fi Driver	Audio Drivers	Power Management

Core Optimizations

Key software modules are optimized by Freescale

i.MX515 Applications Processor

System Control
- Secure JTAG
- Power Mgmt
- PLL x 3
- Clock Reset

Timers
- Timer x 3
- PWM x 2
- Watch Dog

Memory
- ROM 32 KB
- RAM 128 KB

Security
- Sahara v4
- TrustZone®
- RTIC
- SCC v2
- SRTC

CPU Platform
- ARM Cortex™–A8
- 32 KB I-Cache
- 32 KB D-Cache
- 256 KB L2-Cache
- Neon
- ETM
- Vector Floating Point Unit

Multimedia
- OpenGL ES 2.0
- OpenVG 1.1
- Hardware Video Codecs
- HD720 TV-Out

Image Processing Unit
- Resizing and Blending
- Inversion and Rotation
- Image Enhancement
- Camera

Connectivity
- Fast IrDA
- HS MMC/SDIO x 4
- CSPI HS x 2/LS x 1
- UART x 3
- I²C x 3
- SSI/I²S x 3
- 1-Wire
- ATA-6
- USB OTG HS+PHY
- USB HS Host x 3
- SPDIF Tx
- GPIO
- Keypad
- Ethernet

Ext Memory I/F
mDDR 200 MHz
DDR2 200 MHz

eFUSES

Smart DMA

Learn More: For current information about Freescale products and documentation, please visit **www.freescale.com/imx**.

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