# System Services and Device Drivers for CrossCore® Embedded Studio

**Craig Gilchrist**

**Embedded Systems Products &Technologies Group**

**Analog Devices Inc.**

# Training Module Outline

**What are the System Services and Device Drivers for CrossCore® Embedded Studio?**

- **Supported Features and Availability**

**Low-Level Device Driver API Overview**

**Demo: SSL 2.0 with CrossCore® Embedded Studio**

- **Adding Device Drivers and Services through the System Configuration Manager (system.svc)**
- **Pin multiplexing**
- **Power Service**
- **GPIO Service**
  - Input and Output Configuration
  - Callbacks
- **UART Device Driver**
  - Initialization
  - Non-Blocking Tx Buffer Transactions
- **SSM2603 (Audio) Device Driver**
  - Initialization
  - Non-Blocking Tx/Rx Buffer Transactions

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# What are the System Services and Device Drivers for CrossCore® Embedded Studio?
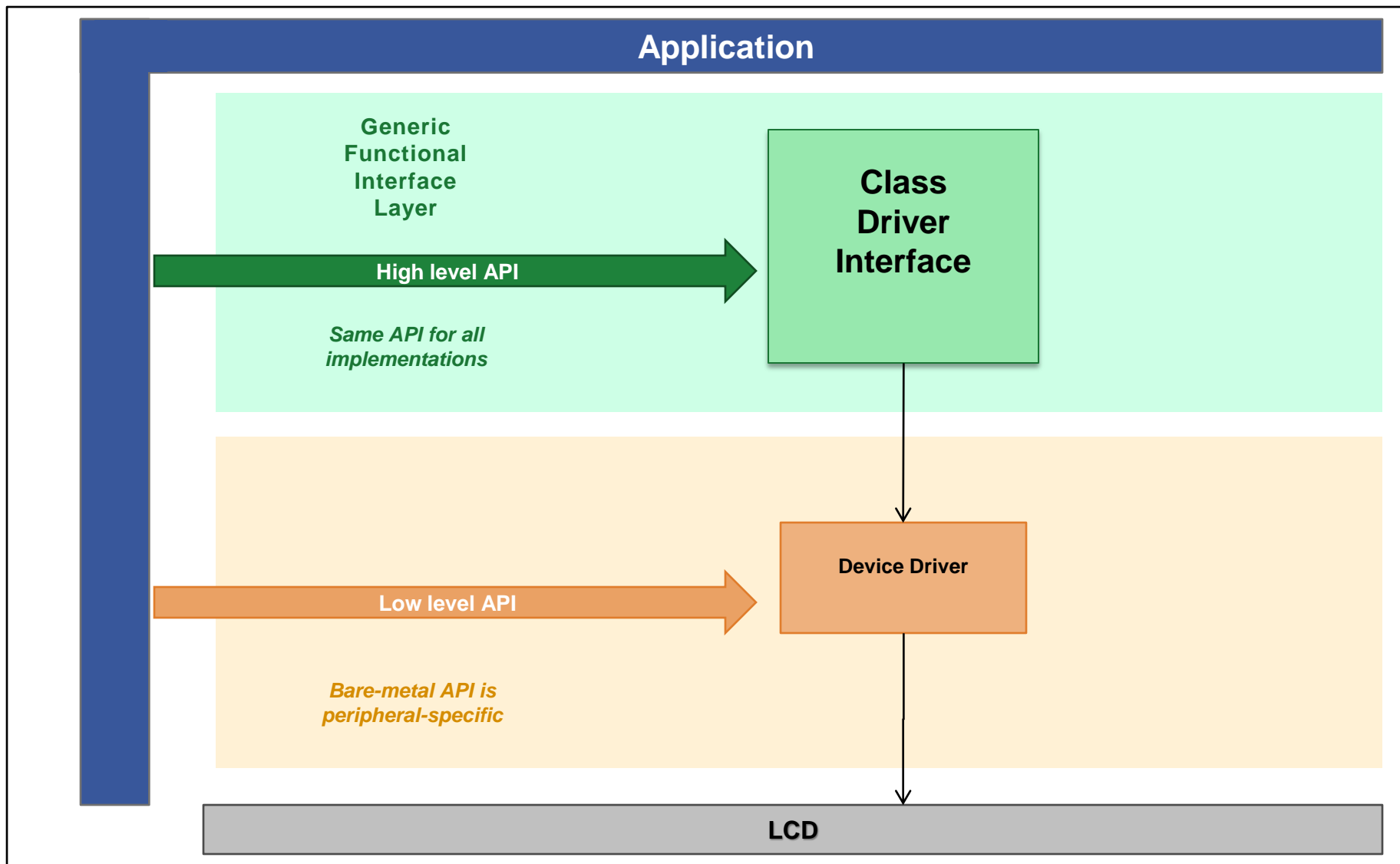
**System Services**

- **Collection of functions commonly found in embedded systems**

- **DMA, Interrupts, GPIO, RTC, STDIO, Timers, Watchdogs, Dynamic Power Management**
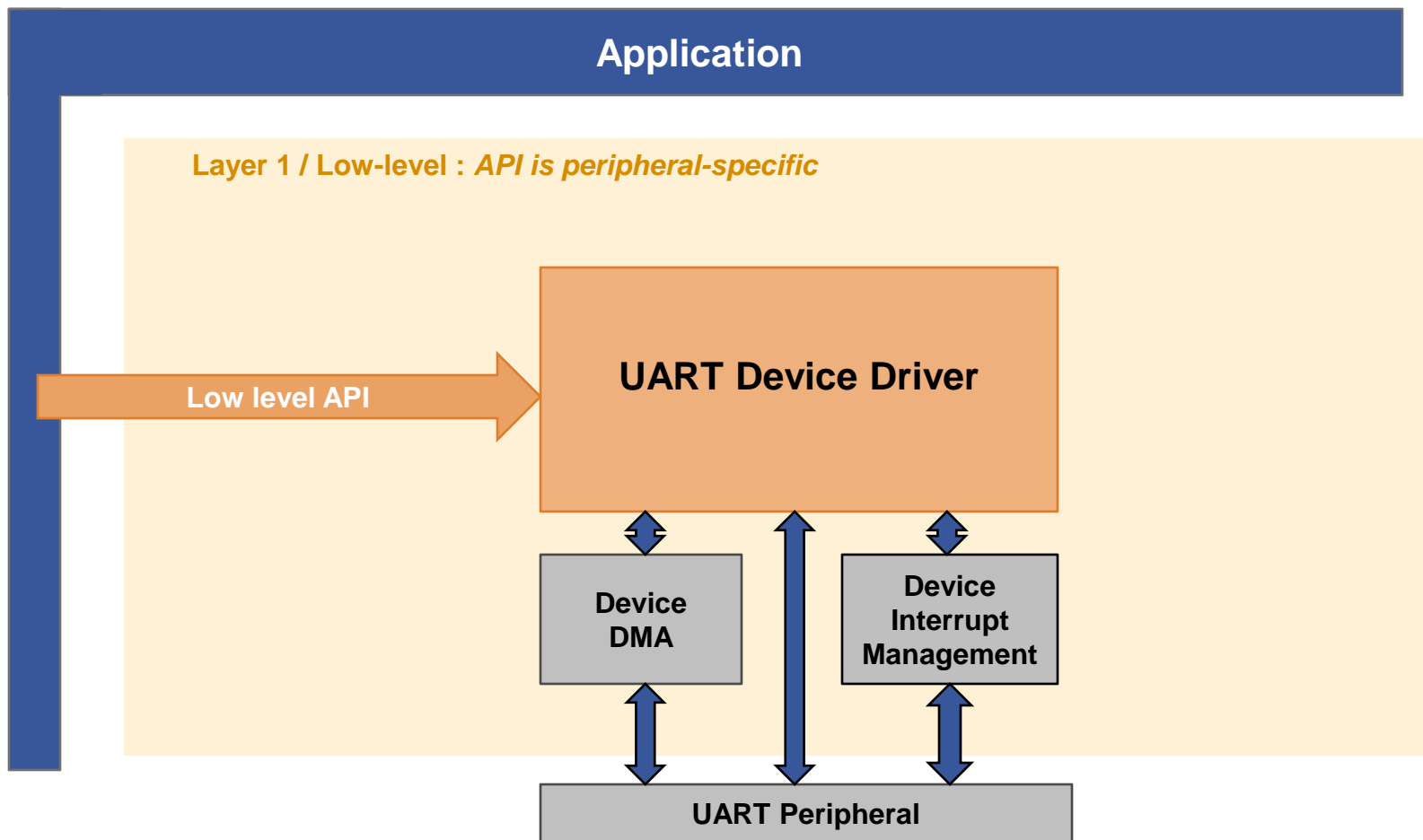
**Device Drivers**

- **Collection of low level device drivers offering high-level interfaces to Blackfin® Peripherals**

- **On and Off-Chip devices**

- **Common API**

- **Device Class Drivers for Audio and Video**

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# Driver Interface Levels



**Application**

**Generic Functional Interface Layer**

High level API

*Same API for all implementations*

**Class Driver Interface**

**Device Driver**

Low level API

*Bare-metal API is peripheral-specific*

**LCD**

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# Low Level Driver Overview



**Application**

Layer 1 / Low-level : *API is peripheral-specific*

Low level API

**UART Device Driver**

Device DMA

Device Interrupt Management

**UART Peripheral**

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# Low-Level Device Driver API Overview

**Device-specific variants of a common API**

- **Open and Close**

- **Non-Blocking Buffer Transactions**

- **Blocking Mode APIs**

- **Switching between Interrupt and DMA Mode**

- **Using Callbacks**

- **Peripheral Error Reporting**

**For more information, see the CrossCore® Embedded Studio Help**

- **Device Drivers User Guide, Chapter 4 "Low-Level API Reference"**

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# System Services and Device Drivers Example

**Example for the ADSP-BF527 EZ-KIT Lite® board using CrossCore® Embedded Studio 1.0.2**

- **Audio Loop Back through on-chip SSM2603 Codec**
- **Debug information over UART**
- **Application status through LEDs**
- **Volume Up/Down through Push Buttons**

**System Services**

- **Dynamic Power Management Service**
- **GPIO Service**

**Device Drivers**

- **SSM2603 Codec Device Driver**
  - SPORT Device Driver
  - TWI Device Driver
- **UART Device Driver**

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# System Services and Device Drivers Example Requirements and Resources

**Hardware**

- **BF527 EZ-KIT Lite®**
- **Audio Source (e.g. MP3 player)**
- **Audio Output Device (e.g. headphones or speakers)**
- **Serial (RS-232) cable**

**Software**

- **CrossCore® Embedded Studio**
  **http://www.analog.com/cces**
- **BF527 Board Support Package**
  **http://www.analog.com/swexamples**

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# Demo
# SSL 2.0 with CrossCore® Embedded Studio

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# For More Information

**CrossCore® Embedded Studio: www.analog.com/cces**

**Board Support Packages: www.analog.com/swexamples**

**Processors and DSP Website: www.analog.com/processors**

**Blackfin Documentation: www.analog.com/blackfin/manuals**

**Analog Devices Video Channel: videos.analog.com**

**EngineerZone Support Community: http://ez.analog.com/**