Application Note

Processors Tools Overview

ABSTRACT

This application note provides an overview of the key tool offerings for Arm®-based processors. The tools highlighted in this application note are intended to help customers through various phases of evaluation, development and production.

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Trademarks

1 Introduction

To fully leverage the potential of ARM-based processors, developers need access to various software and hardware resources. These include an Integrated Development Environment (IDE), software development kits, debuggers, configuration, and simulation tools.

This application note provides a quick overview and links to key hardware and software tools provided for the Arm®-based processors.

2 Tools for Arm®-based Processors

2.1 Code Composer Studio™ (CCS)

Code Composer Studio™ (CCS) is an Integrated Development Environment (IDE) for TI's microcontrollers and processors. CCS comprises a suite of tools used to develop and debug embedded applications. CCS includes an optimizing C/C++ compiler, source code editor, project build environment, debugger, profiler and many other features.

2.2 DCC ISP Tuning

To obtain the best image quality for a specific raw camera module at run-time, the parameters of the Vision Preprocessing Accelerator (VPAC) need to be computed and then applied to process the raw sensor images frame by frame. To achieve this, the best VPAC parameters are typically prepared by engineers in an imaging lab under various controlled lighting conditions. These prepared parameters are then referenced and interpolated to fit the run-time lighting environment with the help of software imaging algorithms of Auto Exposure (AE), Auto White Balance (AWB), and dynamic ISP parameter control. The DCC ISP Tuning tool helps to configure these parameters.

2.3 DDR Margin Analysis

The DDR margin analysis tool and supporting scripts allow visualization and measurement of system margin in the DDR interface on the board. These tools enable probe-less measurement of critical data signals to understand the integrity and robustness of the interface.

2.4 K3conf

K3conf is a standalone application designed to provide a quick and easy way to debug, diagnose, and audit TI architecture-based processor configuration at runtime, with no particular kernel dependency.

2.5 OTP Keywriter

One Time Programmable (OTP) Keywriter is the software tool, used to provision customer keys into the device eFuses for enforcing secure boot and establishing root of trust.

2.6 Power Estimation (PET)

The PET spreadsheet allows the user to estimate power consumption for a particular use case configuration based on measured and simulated data.

2.7 Snagfactory Flashing

Snagboot is a fully open-source and vendor-agnostic recovery and flashing tool. Snagboot is composed of snagrecover and snagflash, which, respectively, run U-Boot on a target platform using USB recovery mode and flash non-volatile storage devices using USB gadgets exposed by U-Boot.

2.8 SysConfig

SysConfig is a configuration tool designed to simplify hardware and software configuration challenges to accelerate software development. SysConfig provides an intuitive graphical user interface for configuring pins, peripherals, software stacks, RTOS, clock tree and other components. SysConfig automatically detects, exposes and resolves conflicts to speed software development.

2.8.1 Clock Tree

The device clock tree can be used to determine the exact Phase-Locked Loop (PLL) register settings to obtain specific clocking configurations.

2.8.2 DDR Config

The DDR Config is intended to simplify the process of configuring the DDR Subsystem Controller and PHY to interface to DDR4 and LPDDR4 memory devices. The tools consists of a number of parameters to be input by the user (based on the memory device data sheet, board design, and topology), and outputs a file to be used by software to properly initialize and train the selected memory.

2.8.3 Memory Configurator

The Memory Configurator tool seamlessly integrated into SysConfig empowers users to configure critical parameters for memory allocation (that is, stack size, heap size, memory region). Based on the memory configuration, this tool generates the linker filer which can be used with the MCU+ SDK. This feature significantly streamlines the process, eliminating the need for manual adjustments to the linker files.

2.8.4 Pinmux

SysConfig provides a convenient way to configure SoC's pin attribute by avoiding/resolving conflicts between configured pins at the early stage of development.

2.8.5 Resource Partitioning

Resource Partitioning tool is used for partitioning various system-level resources to different software components in a multi-core SoC. Typical usage for this tool is for system integrator, where users can partition various resources across different software components. These resources include DMA channels, NAVSS rings, proxies, interrupts and more.

2.8.6 Software Configuration

When developing using the MCU+ SDK for the Cortex®-R or Cortex®-M cores, SysConfig provides the ability to configure peripherals, interrupts, RAT and other resources and generate the initialization code.

2.9 UniFlash

UniFlash is a software tool for programming on-chip flash on TI microcontrollers and wireless connectivity devices and on-board flash for TI processors. UniFlash provides both graphical and command-line interfaces.

3 Summary Table

The application note detailed the many tools available at TI that aids users in every step of development; from evaluation to production. Table 3-1 summarizes the tools available for different SoCs and links to find the tools.

Table 3-1. Available Tools

Tools	AM243x	AM64x	AM62x	AM62Ax	AM62Px	AM62Dx	AM62Lx
Clock Tree	NA	Link	Link	Link	Link	Link	Link
CCS	Code Composer Studio™						
DCC ISP Tool	NA			Link	NA		
DDR Config	Link	Link	Link	Link	Link	Link	Link
DDR Margin Analysis Tool	Link						
K3conf	Link	Link					
Memory Configurator	Link	Link	NA				
OTP Keywriter	Link		Link				
PET	Link		Link	Link	Link	Link	3Q25
Resource Partitioning Tool	Link	Link	Link	Link	Link	Link	NA
Snagfactory Flashing Tool	NA	Link					
SysConfig	Link						
SysConfig (Software Configuration)	Link	Link	Link	Link	Link	Link	Link
SysConfig (Pinmux)	Link	Link	Link	Link	Link	Link	Link
UniFlash	Link	Link	Link	Link	Link	Link	NA

4 References

In addition to this document, refer to the following references which can be found at TI.com.

1. Texas Instruments, AM243x Sitara™ Processor
2. Texas Instruments, AM64x Sitara™ Processor
3. Texas Instruments, AM62x Sitara™ Processor
4. Texas Instruments, AM62Ax Sitara™ Processor
5. Texas Instruments, AM62Px Sitara™ Processor
6. Texas Instruments, AM62Dx Sitara™ Processor
7. Texas Instruments, AM62Lx Sitara™ Processor
8. Texas Instruments, Processors Academy

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