Application Note: AN00195

Getting Started with Offline xSCOPE in xTIMEcomposer Studio

This application note shows how to get started with offline xscope using the xTIMEcomposer studio. It shows you how to run an application using xscope to log information about the application. It then explains how to analyze the resulting trace file using the built-in offline xSCOPE trace viewer.

To get started, simply double click on *Getting Started with Offline xSCOPE in xTIMEcomposer Studio* in the Examples view, and click finish in the resulting import dialog. The sample project will then be imported and you will be switched to the *XMOS Edit* perspective. The getting started pdf is then accessable from the *doc/pdf* folder at the top level of the imported project.

Required tools and libraries

- xTIMEcomposer Tools - Version 14.0

Required hardware

This application note is designed to run on any XMOS multicore microcontroller or the XMOS simulator.

Prerequisites

None

1 Overview

1.1 Introduction

Our comprehensive development tools suite provides everything you need to write, debug and test applications based on xCORE multicore microcontrollers. The full xTIMEcomposer tool set includes unique capabilities such as the xSCOPE logic analyzer and XMOS Timing Analyzer, that let you get the best performance from the deterministic xCORE architecture. With our collection of libraries and examples, it's easy to create and deliver xCORE applications.

xTIMEcomposer features:

- Eclipse graphical environment + plus command line tools
- LLVM C, C++ and xC compilers
- xDEBUG: GDB multicore debugger
- xSIM: Cycle accurate simulator
- xSCOPE: In-circuit instrumentation + real-time logic analyzer
- XTA: Static timing analysis
- Multiple platform support: Windows, OS X, Linux
- Enterprise/Community editions: Tools support for everyone

This application note shows how to get started with offline xscope using the xTIMEcomposer studio. It shows you how to run an application using xscope to log information about the application. It then explains how to analyze the resulting trace file using the built-in offline xSCOPE trace viewer.

2 Getting Started

Ensure you are in the edit perspective by clicking on the *Edit* perspective button on the left hand side toolbar.

In the *Project Explorer* view you will see the *app_getting_started_with_offline_xscope* project. Open *src/main.xc* by double clicking.

This application runs a loop for 100 iterations. On each iteration, it uses xscope to record a value based on the current loop index. 2 probes, named *Value 1* and *Value 2* are configured. See the *config.xcsope* file at the root of the project for thier defintion. Note: The xSCOPE system is enabled via the *enabled* attribute on the *xSCOPEConfig* element.

2.1 Build the application

To build the application, select 'Project -> Build Project' in the menu, or click the 'Build' button on the toolbar. The output from the compilation process will be visible on the console.

2.2 Create and launch a run configuration

To create/view an offline xSCOPE trace you first need to create a run configuration. The xTIMEcomposer allows multiple configurations to exist, thus allowing you to store configurations for running on different targets/with different runtime options and arguments.

Right-click on the generated binary in the *Project Explorer* view, and select *Run As -> Run Configurations*. In the resulting dialog, double click on *xCORE Application*, then perform the following operations:

- On the *Main* tab select the desired target, or check the *simulator* option.
- On the *XScope* tab, check *Offline Mode*.

Now select the *Run* button to launch the application. On completion, the offline xSCOPE file *xscope.xmt* will be written at the top level of the project. The perspective will automatically switch to *Offline xSCOPE*, and the file will be loaded into the *Offline Scope* view. The 2 probes, *Value 1* and *Value 2* will be checked by default.

2.3 Offline xSCOPE Navigation

The *Offline Scope* view contains 2 panes. The upper pane plots the probe values versus time. The lower pane show the times at which the values were sampled. Click the *Zoom Fit* button in the *Offline Scope* view toolbar to show the probe values for the entire duration of the run. As expected, you should be able to see *Value 2* rising at twice the rate of *Value 1*.

You can zoom into a desired portion of the trace by right clicking in the *Offline Scope* view, holding and dragging to define a region. Alternatively, zooming can be achieved via the toolbar buttons.

Left clicking in the *Offline Scope* view will relocate the red marker bar. The 3rd of the 4 boxes above shows the time at the marker bar location. The 2nd box shows the absolute time of the mouse position and the 4th box displays the time relative to the marker bar. The 1st box displays the probe value of the current mouse position.

3 References

XMOS Tools User Guide

http://www.xmos.com/published/xtimecomposer-user-guide

XMOS xCORE Programming Guide

http://www.xmos.com/published/xmos-programming-guide

4 Full source code listing

4.1 Source code for main.xc

```
// Copyright (c) 2015, XMOS Ltd, All rights reserved

#include <xscope.h>

int main() {
    for (unsigned int i = 0; i < 100; i++) {
        xscope_int(VALUE_1, i);
        xscope_int(VALUE_2, i*2);
    }
    return 0;
}
```

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