Lesson 1
Playstation 4 (PS4) Development

Setting-up and getting started

Benjamin Kenwright[1]*

Abstract
A beginners guide to getting started with programming and developing on the Sony Playstation 4 (PS4). This article gives a brief introduction for students on setting up the development kit (DevKit) and working with the console specific tools and software.

Keywords
Sony, PS4, PlayStation, Setup, Windows, Programming, Visual Studio

[1] *Edinburgh Napier University, School of Computer Science, United Kingdom*: b.kenwright@napier.ac.uk

Contents

Introduction

About the Edinburgh Napier University Game Technology Playstation 4 Development Lessons   Edinburgh Napier University Game Technology Lab is one of the leading game teaching and research groups in the UK - offering students cutting edge facilities that include Sony's commercial development kits. Furthermore, within the Edinburgh Napier Game Technology group are experienced developers to assist those students aspiring to releasing their own games for PlayStation. Student have constant access to he Sony DevKits and encourage enthusiastic students to design and build their own games and applications during their spare time.

Getting Started   Sony's Playstation 4 (PS4) development tools support the ANSI C/C++ coding standard (even the latest C++ 11 standard). Hence, it's straightforward to compile and run programs for the PS4. This article introduces the fundamental tools and software necessary to connect, compile, and debug your programs on the PS4. The lessons are intended to give step-by-step explanations in conjunction with screen-captures and code samples to get the students up to speed quickly on developing on the PS4.

What is different this time?   Each new console generation brings along ever more bleeding edge advancements, and the PS4 is no different:

Figure 1. Sony PS4 Development Console - The latest generation of development consoles, specifically, the PS4, opens up new amazing possibilities.

1. Even more powerful game machine
2. Modern graphics features
3. PC based architecture
4. Lightning fast memory
5. New networking and interface features

CPU
- AMD x86-64 Jaguar
- Low power consumption, low heat 8 cores, 8 HW threads
- 2MiB L2 cache per 4 core group
- 32KiB L1 I-cache and D-cache per core
- Atomics, threads, fibers, ULTs (user-level threads)

GPU
- DX 11.1+ feature set with SCE custom features

- Fine-grained cache control
- Performance counters
- Extra debugging support
- Asynchronous compute architecture
- Carefully balanced for maximum graphics power plus compute tasks
- 800MHz clock, 1.843 TFLOPS
- Greatly expanded shader pipeline compared to PS3™
- Geometry and tessellation shaders
- More direct exposure to shader stages than DirectX

RAM
- 8GB 256 bit GDDR5
- GDDR5 is very high end graphics memory only found on PC graphics cards
- Fully unified address space
- 176 GB/s total bandwidth

Additional Reading In addition to the lesson tutorials, we would recommend reading a number of books on Playstation 4 development and cross-platform coding, such as, Cell Programming for the PS4 [3], Vector Maths and Optimisation for the PS4 [1], and Cross-Platform Development in C++ [2].

Components The Playstation 4 development lessons are divided into subsequent parts. The article lessons give the students a chance to work within a commercial console environment. In addition, it allows the students to port their games/applications to the PS4. The different lessons include:
- Setting-Up and Installing
- Running and Debugging on the PS4
- Graphics
- Input (i.e., Controller)
- Sound

1. Development Tools

You need access to the following tools:
- Microsoft Windows (x32 or x64)
- Microsoft Visual Studio
- Sony's Playstation 4 Software Development Kit (SDK) - Software
- Sony's Playstation 4 Development Kit (DevKit) - Hardware

1.1 Playstation 4 Software Development Kit (SDK)
The Sony PS4 SDK proves a set of tools that integrates in with Microsoft's Visual Studio environment seamlessly. Previous versions of the PS4 SDk intergrated with Visual studio. If you install the wrong version of the PS4 SDK you will not be able to open or compile your programs within Visual Studio. While the installer might not give you any errors, when you try and open a PS4 project in Visual Studio you will get an error message saying that Visual Studio doesn't have the necessary information and cannot open the PS4 project.

1. Windows 7 (and later), 64-bit

2. Tools are fully integrated into Visual Studio 2010 , 2012, and later
3. Simple wizard-based project creation
4. CPU compiler, shader compiler, linker, debugger
5. SN-DBS (distributed build system)
6. CPU and GPU performance analyzers
7. Real time and static analysis
8. Various supporting binary utilities

[...]

Acknowledgements

Recommended Reading

Programming the Cell Processor: For Games, Graphics, and Computation, Matthew Scarpino, ISBN: 978-0136008866
Vector Games Math Processors (Wordware Game Math Library), James Leiterman, ISBN: 978-1556229213
Clean Code: A Handbook of Agile Software Craftsmanship, Robert C. Martin, ISBN: 978-0132350884

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