International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 05 Issue: 05 | May-2018 www.irjet.net p-ISSN: 2395-0072

OpenMAX in Embedded Systems

Sarfaraz Shaikh[1], Prof. A.U. Wagdarikar[2]

[1]V.V.P.I.E.T, Solapur University, Solapur, India
[2]Head of Electronics and Telecommunication Department V.V.P.I.E.T Solapur, India

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Abstract – *OpenMAX is the acronym for Open Media Acceleration. It is popularly known as "OMX". It is a cross platform based standard for the development of multimedia application. This can be very helpful in rapid development of application for Embedded Systems. OpenMAX finds wide use in Video, Audio, Speech, Image and Graphical domain. In this paper we are going to have a view on different standards and layers of OpenMAX and it's wide application into Application development in Embedded Systems.*

Key Words: OpenMAX, OMX, Video Decoder, Video Encoder, Image Processing, Audio Systems.

1. INTRODUCTION

Open Media Acceleration is a royalty free and non-proprietary cross platform set of API developed in C language. It is developed by different research organization from the world and managed by consortium Khronos group. OpenMAX provides three layer of interface, Application Layer(AL), Integration Layer(IL) and Development Layer(DL). OpenMAX working group was formed by Motorola, Samsung, STMicroelectronics, ARM, Texas Instruments. OpenMAX of the paper.

1.1 OpenMAX AL

OpenMAX AL is the Application Layer it acts as an interface between multimedia applications like media player and media framework. It helps in development of applications that can be ported to different platform. The Multimedia Driver must support the OpenMAX API at low level interfaces.

1.2 OpenMAX IL

OpenMAX IL stands for Open Multimedia Acceleration Intermediate Layer. It is a interface between multimedia framework and multimedia components. Types of different multimedia framework are StageFright or Media codec API in Android based systems, DirectShow in Windows based systems FFmpeg on Linux based platforms.

1.3 OpenMAX DL

OpenMAX DL is the Development Layer of OpenMAX API. It is the lowest layer of the OpenMAX standard. It is the connection between the physical hardware and the codecs. Physical hardware can be any like Digital Signal Processor, Graphics Processing Unit, Image Signal Processor, Video Decoder, etc.

2. Software Landscape

Sometime there can be existing media framework there can be absence of the middle framework in that case OpenMAX AL can help in the filling of this gap. OpenMAX IL can even more seamlessly fit into an OpenMAX AL implementations.

Table -1: OpenMAX IL API Software Landscape

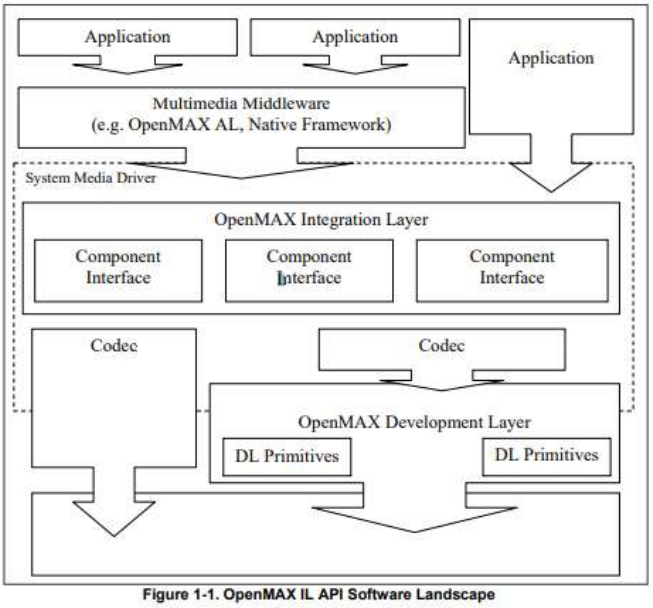

Figure 1-1. OpenMAX IL API Software Landscape

From the above figure we can see that the OpenMAX DL layers directly interact with the hardware and acts as a bridge between hardware and codecs. This can help in fast development of the codecs. OpenMAX IL or the Intermediate layer is above the development layer and supports different components in it. Different codecs can be integrated in the IL layer. This helps in the fast development of the Application for Embedded multimedia.

OpenMAX AL i.e. application layer also known as OpenMAX IL client is the most important layer for the development of the multimedia application. Different multimedia framework makes direct access of AL layer. Due to this the application can be ported across different platform.

OpenMAX IL gives media framework and applications the ability to interface the codecs and components. Components can be combination of hardware or software. They are completely accessible to users. IL has many features few of them are as follows. A component based API. Ability to plugin new components. Two components can directly interact among themselves or interact with the help of user.

3. Philosophy

The main aim of OpenMAX IL API is the portability among various media components. OpenMAX IL targets the higher layer of the multimedia stack for the use of end user. OpenMAX AL is designed to be amenable to OPENMAX IL implementations. The design of the API accommodates many system architecture. This helps in utilizing the hardware to optimum level.

4. CONCLUSION

OPENMAX finds multiple applications for the development of Multimedia application in Embedded systems. OpenMAX is widely integrated in mobile systems and TV based systems. Integration of OpenMAX helps developers of different multimedia domain to form cross platform applications which can be ported on different architecture and operating systems.

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