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MX27 VPU Decoder WinCE 6.0 Release Notes

ABSTRACT:

Release Notes for VPU Decoder

KEYWORDS:

Multimedia codecs, H264, MPEG4, Directshow

Revision History

VERSION	DATE	AUTHOR	CHANGE DESCRIPTION
1.0	23-Jan-2007	Raviraj Aithal	Initial Draft
1.1	23-Feb-2007	Raviraj Aithal	Added MPEG4 decode support
1.2	13-Dec-2007	Sukruth K	Porting of MX32 VPU Decoder onto MX27 Platform
1.3	17-Dec-2007	Lauren Post	Update for new release notes template
1.4	21-Jan-2008	Lauren Post	Update based on CPO comments
1.5	04-Feb-2008	Lauren Post	Update for WinCE 6.0 version
1.6	28-Feb-2008	Lauren Post	Updates for fixes and frame dropping
1.7	13-Mar-2008	Lauren Post	Updates for resolution

Table of Contents

1 Introduction

1.1 Purpose

The purpose of this document is to provide information on the package contents, instructions on building library and test applications and test execution for MX27ADS with WinCE OS.

1.2 Scope

The scope is restricted to information on the package contents and instructions for building and testing. This document does not provide any details about the architecture or APIs in the Decoder.

1.3 Audience Description

The reader is expected to have basic understanding of Video Signal processing, H264 decoding, MPEG4 decoding and MS DirectShow Framework.

1.4 References

1.4.1 Standards

- Draft ITU-T Recommendation and Final Draft International Standard of Joint Video Specification (ITU-T Rec. H.264 | ISO\IEC 14496-10 AVC), JVT-G050r1.doc
- Proposed Draft AVC|H.264 Conformance Spec, JVT-J011.doc
- ITU-T H.263 video coding specification.

1.4.2 Freescale Multimedia References

- VPU API Specification Document - c&m-tristanex-api_reference_manual-v1.3.0.doc
- VPU Decoder Data Sheet – mx27_vpu_dec_datasheet.pdf
- VPU Decoder Release Notes – mx27_vpu_dec_release_notes.pdf

1.5 Definitions, Acronyms, and Abbreviations

TERM\ACRONYM	DEFINITION
API	Application Programming Interface
AVC	Advanced Video Coding
FSL	Freescale
ISO	International Standards Organization
ITU	International Telecommunication Union
MPEG	Moving Pictures Expert Group
VPU	Video Processing Unit
DSHOW	Direct Show

2 Release History

RELEASE NUMBER	DELIVERABLES	FEATURES
1.0	• Documentation • Application Interface header file • Decoder filter with sources and test application • Test vectors	• H264 and MPEG4 BaseLine Profile Decoder
1.1	• Same	• MPEG4 Decoder
1.2	• Same	• Porting of MX32 VPU Decoder onto MX27 platform
1.4	• Same	• WinCE 6.0 support
1.5	• Same	• WinCE 6.0 support fixes
1.6	• Same	• Frame dropping and trick modes – including test bench
1.7	• Same	• Fixes for odd resolutions

Table 1. Details of the release

2.1 Assumptions and Known Problems

- This filter supports H264 decoding and MPEG4 decoding only. The Filter will not be able to decode H264 streams less than 17 frames (as the re-ordering is enabled to meet conformance). This filter uses Post-Processor (eMMA on iMX27) for YUV to RGB565 conversion of the output data from the VPU Decoder. The Post processor supports only one instance and hence the decoder does not support multiple instances.
- This filter source is only supported on WinCE 6.0 using Intrinsic BSP
- Support for MP4 container content requires the FSL MP4 Parser filter provided in a separate package as well as the MX27 AAC Decoder package for audio support.
- Audio codecs not provided with this release.

2.2 Support

If you have any questions or problems concerning this release, please contact a Freescale representative. Please include release version, board version, BSP version and any other relevant information.

3 List of Deliverables

3.1 Documentation

Base directory: \fsl_mm_wince\Multimedia\

Subdirectory	Files
docs\ mx27_vpu_dec	mx27_vpu_dec_release_notes.pdf mx27_vpu_dec_datasheet.pdf

3.2 Public Headers

Base directory: \fsl_mm_wince\Multimedia\

Subdirectory	File
API_include	FSLGuids.h

3.3 Binaries

Base directory: \fsl_mm_wince\Multimedia\

Subdirectory	File
bin600\libarm9\ARMV4I\retail	WinCE 6.0 Decoder filter dll – mx27_vpu_dec_dshow.dll
bin600\exearm9\ARMV4I\retail	WinCE 6.0 Decoder Testbench - mx27_vpu_dec_dshow_testbench.exe

3.4 DSHOW Source

Base directory: \fsl_mm_wince\Multimedia\components\video\mx27_vpu_dec_dshow_6.0

Subdirectory	Files
dshow_filter	VPU Dshow decoder source and header files
dshow_test	VPU Dshow decoder test bench sources & header files

3.5 Registry

Base directory: \fsl_mm_wince\Multimedia\misc

Subdirectory	Files
misc	fslmm_mx27.reg for MX27 platforms

4 Software Setup & Tools

- Build machine should be running Microsoft WinXP
- Build machine should have following installed
  - o Microsoft Windows CE 6.0 Visual Studio
  - o WinCE BSP F14
- iMX27 ADS BSP must be built with VPU and eMMA drivers.
  Location of VPU driver and eMMA driver in Catalog:
  - Third Party->BSPs->Freescale MX27 ADS: ARMV4I ->Device Drivers->VPU
  - Third Party->BSPs->Freescale MX27 ADS: ARMV4I ->Device Drivers->eMMA
    - To support container format playback MP4 splitter & AVI filter needs to be added.
    - Graphics and Multimedia Technologies -> Media -> Media Formats->AVI Filter
    - Graphics and Multimedia Technologies -> Media -> Media Formats-> Mpeg1 Parser Splitter

5 Build Procedure

VPU Decoder would be available as Platform Builder *dirs* projects with the directory structure mentioned above. The details of the projects are given below.

- mx27_vpu_dec_dshow_6.0 - This contains the DSHOW filter and the test bench (dshow_filter & dshow_test)

Steps to insert projects into PB workspace:

- Copy the directory Multimedia to the MX27ADS workspace.

- Right click on Subprojects in the MX27ADS BSP Solution Explorer, select the option 'Add Existing Subproject….'.

- Select the option 'Sources\Dirs Files(sources;dirs)' in dropdown menu for "Files Of Type".

Open the "dirs" file in the folder \fsl_mm_wince\Multimedia\Components\Video\ mx27_vpu_dec_dshow_6.0
- (Visual Studio will automatically create the mx27_vpu_dec_dshow_6.0.pbpxml).

Steps to build the DSHOW:

1. Right click on mx27_vpu_dec_dshow_6.0 present in the projects in Visual Studio solution
2. Select "Rebuild"

This builds the vpu dshow filter (mx27_vpu_dec_dshow.dll) in \fsl_mm_wince\Multimedia\bin600\ libarm9\ARMV4I \Retail and test bench (mx27_vpu_dec_dshow_testbench.exe) in \fsl_mm_wince\Multimedia\bin600\exearm9\ ARMV4I\Retail\.

6 Test Application Execution

The package contains the test applications for
- Testing VPU Decoder DirectShow filter

6.1 Test Bench for Decoder DSHOW filter

Update the project.reg (Parametric view in the PB) file with the the registry file available in the folder "\\fsl_mm_wince\Multimedia\misc\fslmm_mx27.reg" before doing "Build Current BSP and Subprojects".

Command for executing the test bench:

mx27_vpu_dec_dshow_testbench.exe < input filename > < Width > < Height > <decoder type>

Decoder type should either be "H264" or "MPEG4"

Command for executing the test bench and dumping the data to a file:

mx27_vpu_dec_dshow_testbench.exe < input filename > < output > < Width > < Height > <Decoder type>

For this rebuild the test application with FILE_SINK defined. Also in the decoder filter, disable PP.

NOTE:

1.The <output> here is a folder containing subfolders – y, cb and cr .

7 Pre compilation Options

7.1 DSHOW Options

The following C options need to be set

C Defines	Purpose	Remarks
PP	To enable the post processor.	When defined, this does the mirroring of the image & YUV to RGB conversion.
PERFORMANCE	To measure the performance	When defined, this measures the total time taken for decoding all the frames.
FRAME_DROPPING	Drops frames to maintain a/v sync	This has two types of frame dropping – drop at render and drop before decode – At Stopstreaming it will print out statistics of where drops occured and achieved frame rate
ENABLE_VPUROTATION	Rotates VPU for PP input	Removes extra memcpys to allow VPU output direct to PP input
_WINCE6_DDRAW	compilation	Allows compilation with fslguids.h

7.2 DSHOW Test Bench Options

The following C options need to be set

C Defines	Purpose	Remarks
FILE_SINK	To enable dumping the output to a file	If it is not defined, it renders using the default video renderer