OnStream MediaPlayer+ Device Capability File (cap.xml)

Application Guide for All Platforms

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1 About This Manual

1.1 Overview

This application guide provides a reference manual for the device capability file (*cap.xml*), which can be used with the OnStream® MediaPlayer+ (referred hereafter to as OSMP+) to optimize playback of variant playlists on devices with specific characteristics.

1.2 Related documents

The following documents (included with your installation package) provide additional information related to this application guide:

- API Reference Manual.zip
- OnStream MediaPlayer+ Player SDK Integration Guide for Android.pdf
- OnStream MediaPlayer+ Player SDK Integration Guide for iOS.pdf
- OnStream MediaPlayer+ Player SDK Integration Guide for Windows.pdf
- OnStream MediaPlayer+ Player SDK Integration Guide for Mac OS.pdf

2. Introduction

The device capability file (*cap.xml*) is an Extensible Markup Language (XML) file that specifies the maximum bitrate that the SDK tries to play when targeting a variant playlist (multiple tracks of the same content) on a specific type of device. The maximum bitrate defined in the device capability file overrides the default initial bitrate selection. The maximum bitrate is also respected by the SDK bitrate adaptation algorithm.

Note: The bitrate cap defined in the *cap.xml* file applies to both H.264 and H.265/HEVC and is only applied when targeting a variant playlist. If there is only a single audio or video track, the bitrate cap does not apply. In addition, the bitrate cap defined in cap.xml is designed for H.264 and might not work properly for H.265/HEVC. Contact your VisualOn sales person to obtain the cap.xml file specific for H.265/HEVC.

Clusters or groups of devices can be identified in the device capability file by their platform characteristics that include:

- Number of cores
- CPU frequency
- Availability of optimizations

The device capability file can be packaged with the application or be downloaded at runtime, and is support across all platforms (Android, iOS, Windows browser plug-in, and Mac OS browser plug-in).

2.1 API implementation

The bitrate cap can also be implemented by using the Player API. The Player API can be used to manually get the platform characteristics and set the bitrate cap.

Note: For more information on the Player API and its integration, refer to the platform-specific *API Reference Manual* and *OnStream MediaPlayer+ Player SDK Integration Guide*.

3. XML Syntax

The device capability file uses a simple XML syntax to describe the characteristics and maximum bitrates of one or more platforms. The basic syntax is described as follows.

```
<?xml version="1.0" encoding="UTF-8"?><!--CPU Cap XML file.-->
<CapData><!--Begin cap data-->
<item><!--Begin platform configuration-->
<Core><!--Number of cores--></Core>
<Neon><!--Neon available 1:yes|0:no--></Neon>
<Frequency><!--Frequency (khz)--></Frequency>
<CodecType><!--Codec type (see next section)--></CodecType>
<BitRate><!--Bit rate (bps)--></BitRate>
<VideoWidth><!--(Optional, currently ignored) Video width
(px)--></VideoWidth>
<VideoHeight><!--(Optional, currently ignored) Video height
(px)--></VideoHeight>
<ProfileLevel><!--(Currently ignored) Profile level--></ProfileLevel>
<FPS><!--(Currently ignored) Frame rate (fps)--></FPS>
</item><!--End platform configuration-->
<!--More items-->
</CapData><!--End cap data-->
<!--End Cap XML file-->
```

3.1 CodecType definitions

The *CodecType* uses the same definitions as the *VOOSMP_VIDEO_CODINGTYPE* enumerated type as follows.

```
typedef enum {
VOOSMP_VIDEO_CodingUnused = 0, /*!< Value when coding is N/A */
VOOSMP_VIDEO_CodingMPEG2, /*!< A.K.A. H.262 */
VOOSMP_VIDEO_CodingH263, /*!< H.263 */
VOOSMP_VIDEO_CodingS263, /*!< S.263 */
VOOSMP_VIDEO_CodingMPEG4, /*!< MPEG-4 */
VOOSMP_VIDEO_CodingH264, /*!< H.264/AVC */
VOOSMP_VIDEO_CodingWMV, /*!< All versions of Windows Media Video */
VOOSMP_VIDEO_CodingRV, /*!< All versions of Real Video */
VOOSMP_VIDEO_CodingMJPEG, /*!< Motion JPEG */
VOOSMP_VIDEO_CodingDIVX, /*!< DIV3 */
VOOSMP_VIDEO_CodingVP6, /*!< VP6 */
VOOSMP_VIDEO_CodingVP8, /*!< VP8 */
VOOSMP_VIDEO_CodingVP7, /*!< VP7 */
```

```
VOOSMP_VIDEO_CodingVC1, /*VC1: WMV3, WMVA, WVC1 */
VOOSMP_VIDEO_Coding_Max = 0X7FFFFFFF
}VOOSMP_VIDEO_CODINGTYPE;
```

3.2 Example #1

Platform characteristics: two core device with Neon enabled and a frequency of 1GHz (Codec reads these values from the device model)

Maximum bitrate: 1.5Mbps from the variant playlist (This maximum bitrate is recommended based on the platform characteristics, to ensure the best performance using the codec.)

Item definition:

```
<item>
<Core>2</Core>
<Neon>1</Neon>
<Frequency>1000000</Frequency>
<CodecType>5</CodecType>
<BitRate>1500000</BitRate>
<VideoWidth>640</VideoWidth>
<VideoHeight>480</VideoHeight>
<ProfileLevel>1</ProfileLevel>
<FPS>30</FPS>
</item>
```

4. Recommended Bitrate Caps

Table 1 lists the recommended bitrate caps for platforms without hardware acceleration.

Table 1: Recommended bitrate caps

Core numbers	Neon optimization	Frequency (MHz)	Recommended bitrate cap (kpbs)	Resolution (width x height)	Frame rate (fps)
1	No	600	300	320x240	30
1	No	800	500	480x320	30
1	Yes	1000	800	640x480	30
1	Yes	1500	1000	640x480	30
2	No	1000	1500	720x480	30
2	No	1500	1800	720x480	30
2	Yes	800	1400	720x480	30
2	Yes	1000	1600	720x480	30
2	Yes	1200	1800	720x480	30

2	Yes	1700	2000	720x480	30
4	Yes	1000	2500	1280x720	30
4	Yes	1500	3000	1280x720	30
4	Yes	2000	4000	1280x720	30

Note: These values are only recommendations only, which might vary depending on your hardware and software platform requirements. Currently, the values of video width/height and frame rate are ignored.