Hanwha Techwin

White Paper

HTML5 Streaming

(Non Plug-in Webviewer)

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Contents

1. Overview

Existing web viewers must install a plug-in (ActiveX, Silverlight, or NPAPI) to use a video streaming service. It is still a common way to use the service. Note, however, that Chrome -- the most popular browser in the world (48.65% as of June 2016) -- stopped support for plug-in installation (September 2015), and other browsers are likely to follow suit later.

Thus, removing a plug-in that is hard to standardize and using HTML5 (the latest standard that supports the use of media elements including video and audio through the standard API) are quickly becoming the standard.

Considering such change in the web environment, Hanwha Techwin provides HTML5 streaming-based web viewer service to deliver the best video service without any plug-in.

2. Background

When watching a video through a web viewer, the user can select many browsers. The standardization status of HTML5 streaming for various browsers is as follows;

2.1. HTML5 standard API

Each browser has a unique rendering engine, but API of HTML5 provides a standardized way of connecting the rendering engine of various browsers. As a result, it is possible to use services that require a plug-in, such as video and audio by the browser engine. Note, however, that video monitoring products must provide more video services than browsers. To service various codecs that are not supported by browsers, service module based on JavaScript (standard web environment) is required.

2.2. HTML5 streaming standard

Rendering standardization in HTML5 through standard API such as video, canvas, and audio is realized, but the standardization of video streaming is not completed. Because web service is generally based on stateless communication, the new adaptive streaming method is adopted.

This method conducts streaming based on small pieces (chunk: lasting a few seconds) in a server, and the player will request video chunks through the manifest file that contains a piece of information to connect them as a continuous stream. Currently, this method is being standardized by ISO as MPEG_DASH (Dynamic Adaptive Streaming over HTTP) technology.

3.1. RTSP/RTP over WebSocket

Note, however, that the HTTP adaptive structure does not meet the specification of our product to provide uninterrupted video (live latency). Therefore, we developed a method of maintaining statefull status using WebSocket (core component of HTML5 standard) and delivering the existing RTSP protocol of Hanwha Techwin. As a result, we secured a unique technology that maintains more stable streaming than HTTP and which can be applied regardless of streaming type.

It secured speed and stability by processing all of the data control interfaces through SUNAPI, the standard API provided by Hanwha Techwin's products, as well as providing interface through the WebSocket standard of HTML5 even though the streaming follows the RTSP/RTP standard.

3.2. MSE and JavaScript decoder

Hanwha Techwin's HTML5 streaming service is realized as a co-operative structure by optimizing the standard API and developing functions for higher additional specifications that must be provided by our products based on JavaScript.

Although the MSE structure that displays video through the browser's rendering engine provides better performance in high-resolution processing, it increases latency because data must be processed as a form that can be interpreted by the browser. In addition, *MSE only supports H.264 as a codec.

Therefore, Hanwha Techwin's web viewer is designed to guarantee minimum latency while supporting both H.265/H.264 codecs through its own JavaScript decoder, except when H.264 video must be provided via MSE. In other words, it operates both MSE and JavaScript decoder properly.

**MSE : Media Source Extension. HTML5 standard multimedia technologyHanwha Techwin Wisenet7 SoC*

4.1. HTML5 streaming performance & supported browsers

- Wisenet X series camera (released after September 2017)

Live	Playback
- MJPEG: Full HD 10 fps - H.264: All resolution of camera (Chrome, FireFox, Edge, Safari) - H.265: Up to full HD 10 fps 2Mbps • *Adaptive Streaming support* *: Automatic resolution control depend on user environment (incase over 5s delay)* • *Latency less than 0.55ms*	- MJPEG/H.264/H.265 : All resolution of camera

Browser	IE	Edge	Chrome	Firefox	Safari
Plug-in	O	X	X	X	O
HTML5 Streaming	MJPEG Only (live)	O	O	O	O

- Wisenet X series camera (released after December 2016)
- Wisenet P, Q series camera (released after August 2017)

Live	Playback
- MJPEG: Full HD10 fps - H.264 : All resolution of camera (Chrome only) - H.265: Full HD 10 fps (up to 2Mbps) • *Adaptive Streaming support* *: Automatic resolution control depend on user environment (incase over 5s delay)* • *Latency less than 0.55ms*	- MJPEG/H.264 : All resolution of camera - H.265: Up to HD • *Delays may occur at high resolutions, depending on PC specs*

Browser	IE	Edge	Chrome	Firefox	Safari
Plug-in	O	X	X	O	O
HTML5 Streaming	MJPEG Only (live)	O	O	X	X

5. Conclusion

Currently, Hanwha Techwin's video monitoring products provide video monitoring service via HTML5 standard API, in keeping with the change of web as a massive platform. Customers can use Hanwha Techwin's web viewer anytime, anywhere using any device, so there is no limit in using our products. This technology realizes the connection between various products and solutions more easily and faster.

In addition, HTML5-based video service technology has advanced rapidly with the web acceleration technologies. Based on the development of future video technology, advanced video service modules such as 3D Viewer, VR (Virtual Reality), and AR (Augmented Reality) will be adopted in our products swiftly using our HTML5 streaming technology.

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