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Inventors

Adolph Seema

Martin Reisslein

Contact

Shen Yan
shen.yan@skysonginnovations.com

Cross-Network Compatible Streaming Using Independent Filename-Indexed Video Segments

Hypertext Transfer Protocol (HTTP) transfers information across the World Wide Web by routing packets of data from the web's most available servers to a client, whose browser then builds a webpage (or streams media) from those packets. MPEG's Dynamic Adaptive Streaming over HTTP (DASH), Apple's HTTP Live Streaming, Microsoft Smooth Streaming, and Adobe's HTTP Dynamic streaming, are all multimedia distribution protocols that help reduce buffering caused by intermittent HTTP data transfer. These protocols work by downloading the best available image quality that can be transferred before playback based upon the available bandwidth, while referencing a front-end list file containing metadata (data that describes other data) that serves as directions for where to find the data and how to assemble the video. These list files must be compatible with browsers, often requiring complex plugins and codecs that invite security vulnerabilities or have very limited cross-platform support. Additionally, current DASH players can only interact with video servers operating on TCP/IP protocol stacks, making them incompatible with non-TCP/IP networks such as WiFi, Bluetooth, and ZigBee used by wireless video sensors and camera-integrated consumer electronics.

Researchers at ASU have developed a method for generating, storing, and distributing video between dissimilar network protocols by using independently playable video segments whose filenames are uniquely indexed with identification and compilation information. The length of the segments can be adjusted from zero to thirty seconds and each segment contains all video formatting information needed for playback. The framework includes a media player build upon only the core elements of HTML5. The interim client-side storage of the HTML5 File System enables streaming from non-TCP/IP networks directly to the HTML5 canvas, transferring the CPU workload from a mobile sensor network to whatever client device is hosting the media player. Since the indexed filenames provide all the HTML5 video tags necessary for compiled playback, metadata list files are no longer required (but are still optional), eliminating the need for outside browser plugins or video codecs.

Potential Applications

- Information-Centric Network Services/Streaming
- Mobile Device Cameras
- Multimedia Streaming/Playback
- Wireless Video Sensor Networks

Benefits and Advantages

- Efficient – Saves power and bandwidth by transferring CPU workload away

from mobile network devices that have limited processing power.

- Innovative – Permits streaming from non-TCP/IP networks such as WiFi, Bluetooth, and ZigBee.
- Practical – Does not require a metadata list file as filenames provide the all the necessary indexing for playback.
- Versatile
  - Video can be any file format.
  - Can be implemented via hardware or software.
- Secure – Does not require any outside plugins or codecs.

For more information about the inventor(s) and their research, please see

Dr. Martin Reisslein's directory webpage