

Smart prioritization of visually important data to improve video streaming

January 4 2017

By prioritizing the delivery of rich visual data, A*STAR researchers have demonstrated that the quality of streaming video can be vastly improved on even the most crowded wireless networks.

Video streaming is one of the most demanding tasks on mobile networks, not only because of the large amount of data that needs to be transmitted, but because even the faintest stutter or artifact in video playback can dramatically degrade the experience. Network engineers are continuously looking for new ways to maximize video quality in increasingly congested wireless environments with many users vying for limited bandwidth.

There are already methods for guaranteeing a certain transmission rate to maintain the quality of [streaming video](#) and audio. Known as Quality of Service (QoS) protocols, these methods work well in many cases, but generally require a large allocation of bandwidth to each user, which might not be available on crowded [mobile networks](#). Peng Hui Tan, Maodong Li and colleagues from the A*STAR Institute for Infocomm Research instead studied how it might be possible to rate the importance of discrete video 'packets' to reduce the bandwidth needed to maintain a certain Quality of Experience, or QoE.

"QoE refers to the performance metric used to gauge the experience of the end user," explains Tan. "We need to translate a given QoE into a set of parameters for QoS, which is then implemented in the [network](#) communication protocol. We found that by passing information across

the different layers of communications, from [video playback](#) application to network transmission, we could enhance the QoE through more efficient allocation of network resources."

The researchers developed an efficient method to derive an 'importance index' for each video packet based on the video bit rate, which varies packet-to-packet depending on how much new information needs to be displayed – for example slow scenes with little movement require lower bit rates, while fast action scenes require very high bit rates.

By prioritizing video packets – each a fraction of an individual frame of video – based on bit rate and other network parameters, then inserting this priority in the QoS scheme in real time, the team was able to achieve a significant enhancement in the perceived quality of streaming [video](#) among multiple users in a laboratory environment with limited wireless bandwidth.

"For the end user, [video quality](#) will be improved with less distortion, while service providers can accommodate more users with the same network resources," says Tan.

More information: QoE-Aware Scheduling for Video Streaming in 802.11n/ac-Based High User Density Networks. *IEEE Xplore* [DOI: 10.1109/VTCSpring.2016.7504437](#)

Provided by Agency for Science, Technology and Research (A*STAR), Singapore

Citation: Smart prioritization of visually important data to improve video streaming (2017, January 4) retrieved 24 April 2024 from <https://phys.org/news/2017-01-smart-prioritization-visually-important-video.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.