NTT Press Releases

November 20, 2014

DWANGO Co.,Ltd.
Nippon Telegraph and Telephone Corporation

DWANGO × NTT:
Highlights of collaboration between the Japan's largest service provider and telecom carrier

Evaluation and Field Trials of Viewing Quality Optimization Technology
Joint Testing of Application of H.265/HEVC Technology to Niconico Live
Launch of a Virtual Reality Live Streaming Service and First Live Broadcast

DWANGO Co.,Ltd. (DWANGO; Head Office: Chuo-ku, Tokyo, President: Takashi Araki) and, Nippon Telegraph and Telephone Corporation (NTT; Head Office: Chiyoda-ku, Tokyo; President and CEO: Hiroo Unoura), have been promoting technological developments for the advancement of video and social services under a business tie-up agreement initially signed in July 2013.

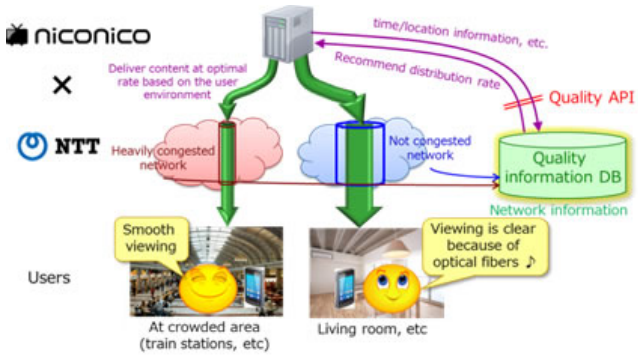
DWANGO and NTT announced today that they have started field trials to evaluate the applicability of viewing quality optimization technology to DWANGO's real service environment, and a collaborative experiment to apply H.265/HEVC technology developed by NTT to Niconico Live. The viewing quality optimization technology is expected to efficiently predict the optimal delivery rate based on user environments and network traffic conditions and lead to an improvement in the quality of the video-viewing experience. The HEVC technology is expected to deliver higher-definition video at the same network rate.

In addition, on Nov. 17 DWANGO launched a virtual reality live streaming service that applies interactive streaming technology jointly developed by NTT and DWANGO. This service was first used for Niconico Live of Enka singer Sachiko Kobayashi's 50th anniversary performance at Nippon Budokan.

These collaborative activities undertaken by the national flag video sharing service provider, DWANGO, and the world's largest telecom carrier, NTT, are jointly tackling common network issues and dramatically improving user viewing experiences and future network efficiency.

Start of Evaluation and Field Trials of Viewing Quality Optimization Technology

DWANGO and NTT will begin field trials today to improve the quality of Niconico users' viewing experience by applying the viewing quality optimization technology. This new technology recommends the optimal delivery rate based on users' environments and network traffic conditions.
In DWANGO and NTT's experiments, NTT set up a quality API system, the foundation of the viewing quality optimization technology. DWANGO developed and distributed an app for smartphones that connects to the quality API, enabling optimization.
Ahead of the field trials, to evaluate the applicability of the viewing quality optimization technology, DWANGO transmitted information about users' environments and network conditions to the NTT's quality API. NTT calculated the improvement in the Quality of Experience (QoE) when the delivery rate was optimized.
From the results, DWANGO and NTT estimated that Niconico users's QoE improved dramatically as a result of the application of the viewing quality optimization technology.



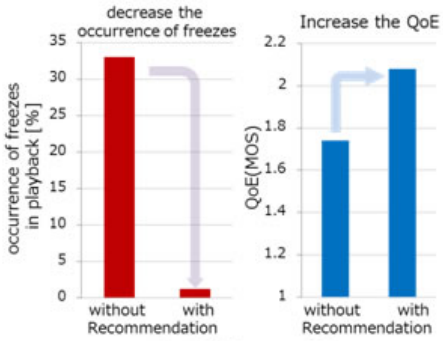


Fig. Efficiency of the Quality API during peak time

Summary of Benefits

(1) Decrease in Rate of Playback Freezes

During peak use times, freezes in playback occur for 33 percent of users. By applying DWANGO and NTT's technology, a 1 - 2 percent decrease in occurrence could be confirmed.

(2) Improvement in Quality of Experience (QoE)

Calculation of users' QoE showed an improvement of 35 percent during peak use times and a daily average of 21 percent were possible.

(3) Reduction of Total Amount of Communication Data

By applying the viewing quality optimization technology, a 17 percent reduction in the total amount of communication data was confirmed as a secondary benefit of optimizing the delivery rate.*

* The reduction in the total amount of communication data differs depending on the user's network environment.

By applying DWANGO and NTT's viewing quality optimization technology for video viewing to some users** from today, improvement in users' QoE can be expected.

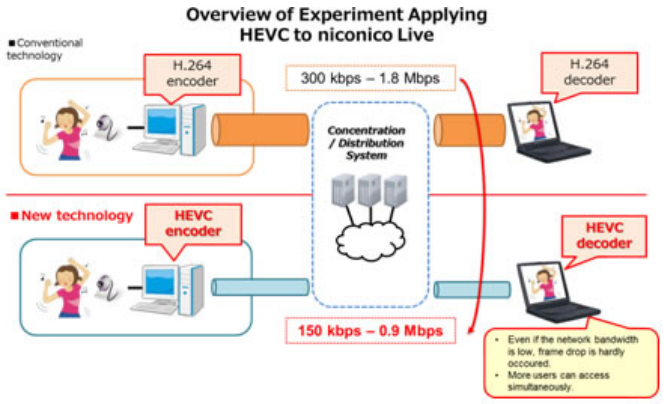
** Users are selected at random from those using DWANGO's public Android app.

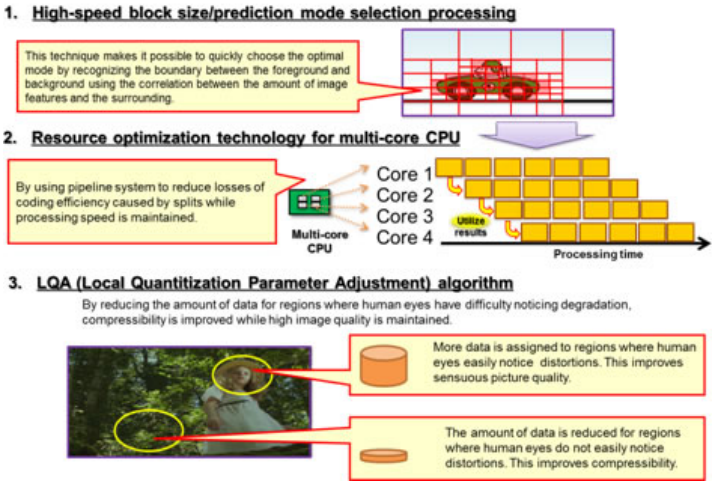
Start collaborative experiment to apply H.265/HEVC technology to Niconico Live

NTT and DWANGO have started collaborative experiment to apply High Efficiency Video Coding (HEVC) to Niconico Live. HEVC is the next-generation video coding standard that makes it possible to provide high-reality services such as 4K and 8K on the same bandwidth as conventional services. Until now, the processing load for HEVC has been greater than for H.264, the previous standard. It was especially difficult for HEVC to provide live streaming services at a low cost.

NTT has been conducting research of high-speed HEVC compression software technologies. Furthermore, the company has established a software technology that can compress video in real time and in high quality for small displays with low bitrate by optimizing related algorithms on those displays. With this technology, NTT makes it possible to carry out real-time compression with just a PC and develop inexpensive live streaming services.

By applying NTT's technology to Niconico Live, NTT and DWANGO are launching a joint trial that assesses improvement in processing performance, image quality, and bandwidth reduction. Testing of transmission using HEVC encoding until now had been limited to large-screen video such as 4K and 8K. In contrast, this new trial will evaluate large-scale live streaming for mobile display resolutions. Adoption of this technology promises to improve processing performance and image quality and reduce traffic for Niconico Live, one of the biggest live streaming services in Japan.





Overview and Features

Compared with conventional H.264, the new technology reduces the amount of data by up to 50 percent. Besides region splitting processing and optimization of parallel processing tailored to small screens, the encoding speed and picture quality is improved especially for small screens and low bitrate by finely controlling allocation of the amount of data.

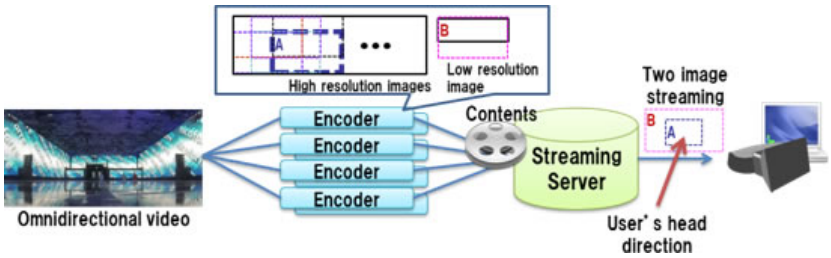
- In addition to high-speed block size/predictive mode selection processing, which utilizes the correlation between the amount of image features and the surrounding, NTT's original pipeline processing tuning maintains high parallelization efficiency, even during encoding on small displays for which parallelization is difficult, and makes real-time compression possible.
- LQA (local quantization parameter adjustment) algorithmic processing, which assigns the encoding amount to needed regions based on properties of the human visual system, results in image quality with unnoticeable distortion, even at low bitrate.

Launch of a Virtual Reality Live Streaming Service and First Live Broadcast

On Nov. 17 DWANGO launched a virtual reality live streaming service that applies interactive streaming technology jointly developed by NTT and DWANGO. This service was first used for Niconico Live of Enka singer Sachiko Kobayashi's 50th anniversary performance at Nippon Budokan. The service allows users to enjoy an immersive experience by watching 360-degree omnidirectional video in high image quality, using an Oculus Rift virtual reality headset that tracks the user's head movements.

Outline of interactive streaming technology for 360-degree omnidirectional video

The technology the service uses enables users to choose and watch whatever they want to watch in high image quality from 360-degree omnidirectional video. This is accomplished by dividing the omnidirectional video into multiple sections and encoding them, then selectively streaming the sections in a limited bandwidth. DWANGO has been updating this technology for real time systems since completing a joint trial with NTT this February, and will continue to use the technology to provide attractive virtual reality contents.



Application for the service

A virtual reality live streaming application has also been developed that implements the interactive streaming technology for 360-degree omnidirectional video. By installing the application on a PC, users can watch and enjoy 360-degree live video content at Niconico Live website using the Oculus Rift headset.

Download site: http://blog.nicovideo.jp/niconews/ni049632.html

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Innovative R&D by NTT
NTT Has Instituted a Logo to Represent R&D Activities.

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