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NTT Press Releases

Press Release

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Nippon Telegraph and Telephone Corporation
NEC Corporation

NTT and NEC successfully achieve real-time HEVC compression of 4K/60P ultra high definition digital video

~NEC has started to sell an HEVC compression unit corresponding to 4K/60P~

Tokyo, February 12, 2014- NTT and NEC Corporation (NEC: TSE:6701) have achieved the world's first real-time HEVC ([Note 1](#)) compression of 4K/60P digital video ([Note 2](#)) resulting from research and development of high efficiency compression technology for ultra high definition digital video.

Sales begin today of the NEC developed VC-8150, the world's first real-time HEVC encoder for 4K/60P digital video. This product complies with the latest international video coding standard of HEVC, and in real-time provides both high compressibility and the highest quality video available in the industrial sector.

This product field will enable NTT and NEC to make significant contribution to next generation broadcasting services by providing ultra high definition digital video that surpasses full HD ([Note 3](#)).

VC-8150



Background

Currently, broadcast service is being upgraded through the use of ultra high definition digital video of 4K or 8K ([Note 4](#)). There is strong demand for HEVC compression to become quickly available commercially, since 4K can handle eight times the pixel count of conventional HD. Furthermore, it provides nearly double the performance specified in the AVC ([Note 5](#)) international video coding standard with its high coding efficiency. On the other hand, there is a need for greater processing efficiency because of the huge amount of calculation required in HEVC.

NTT and NEC, utilizing the video coding technology and know-how they have acquired and cultivated over many years, have developed the novel technologies given below for achieving highly efficient compression for high definition digital video.

Key characteristics of the new technologies

- (1) NTT has been developing a hardware algorithm for utilizing the HEVC features of inter and intra-frame prediction with variable block size. This algorithm will enable efficient motion prediction for multiple blocks with wide search areas, and intra prediction with pre-determination by analyzing the image characteristics for multiple sizes of blocks.

- (2) To enable compression of images partitioned into multiple blocks, NEC has developed an optimum-compression parameter estimation technology that analyzes images instantly and executes optimum block partitioning patterns, and by cutting throughput by 20% enables real-time encoding of 4K high definition digital images [\(Note 6\)](#).
- (3) Existing compression systems process 4K high-definition images lotted out over four areas in an area-by-area fashion and then integrate them. However, this degrades image quality in the image parts crossing over the area boundaries. NEC has developed "Image border processing technology" that suppresses the degradation and enables the compression to produce seamless, high quality, ultra high definition images as a result [\(Note 6\)](#).

NTT and NEC have developed these technologies to accelerate the development and spread of next generation broadcast services. The companies have used these technologies to achieve the first-ever real-time HEVC compression of 4K/60P ultra high definition digital video.

New product characteristics

1. The products feature an image compression method that meets the H.265/HEVC image encoding standard for handling Main 10 profiles [\(Note 7\)](#). It also features a high 10-bit dynamic range [\(Note 8\)](#) and 60 fps encoding of images in real time.
2. These features are implemented into the hardware to achieve high stability and reliability.
3. Performance level of 3G-SDI×4 and 1.5G-SDI×8, 3G-SDI corresponds to automatic recognition of level A/B [\(Note 9\)](#).
4. Inter-Stationary Control signals (ARIB STD-B39 compliant) enable real-time changing of colorimetry [\(Note 10\)](#) or audio mode.

Refer to the attachment for product specifications.

NTT and NEC aim to contribute to the realization of next generation broadcasting services by upgrading IPTV, cable TV, and satellite services through the high definition images of (4K/8K) super high vision.

NTT aims to achieve high definition quality, low power consumption, and low cost by researching and developing a high efficiency compression technique for ultra high definition images.

Based on its Mid-term Management Plan 2015, the NEC Group is working towards the safety, security, efficiency and equality of society. Going forward, NEC aims to develop solutions for a wide range of social issues, as a company that creates value for society through the promotion of its "Solutions for Society," which provide advanced social infrastructure utilizing ICT.

NEC is exhibiting these products at "NEC Innovation World" in its Shinagawa showroom, Tokyo, Japan.

<http://jpn.nec.com/niw/>

- (Note 1) HEVC: The ITU-T and ISO/IEC have respectively established ITU-T Rec. H.265 and ISO/IEC 23008-2 High Efficiency Video Coding as international standards.
- (Note 2) 4K/60P: Progressive scanning video of 3,840×2,160 pixels, 60 frames per second.
- (Note 3) Full HD: Video of 1,920×1,080 pixels
- (Note 4) 8K: Progressive scanning video of 7,680×4,320 pixels
- (Note 5) AVC: The ITU-T and ISO/IEC have respectively established ITU-T Rec. H.264 and ISO/IEC 14496-10 as international standards for applications such as Blue-ray Disc, one-segment broadcasting, etc.
- (Note 6) <http://www.nec.com/en/global/rd/crt/hevc/>
- (Note 7) "Profile" is a term specified by an HEVC function group to maintain compressed data convertibility in accordance with objectives. Currently Main10 profile is the highest level HEVC profile.
- (Note 8) 10-bit pixel precision enables accurate reproduction of subtle gradation changes in images such as sky scenes.
- (Note 9) A term for mapping signals to 3G-SDI, specified in SMPTE 425M.
- (Note 10) A term used in defining color reproduction in recommendations such as ITU-R BT.709 and ITU-R BT.2020.

Attachment Reference

▶ [Attachment: Specifications](#)

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Innovative R&D by NTT
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