Media Alert

For Immediate Release

Media Alert Title	Kanagawa Institute of Technology develops and verifies world's first edge-based video handling system that allows consumers to instantly switch between 8K ultra-high-definition multiple live streaming videos and distribution using the software packet switch.
Leading text	The Kanagawa Institute of Technology (KAIT) has succeeded in switching uncompressed 8K ultra-high-definition (UHD) live streaming videos faster than switching TV channels. This is done through multiple 8K cameras and stored video materials in cloud that switches the network edge portion on based on the request from the terminal devices.
Article	As for 8K/4K broadcasting which started in December 2018, KAIT has been developing the transmitter, store and distribution system to deliver the broadcasting material without having to use a compression tool and at the same time sacrificing UHD streaming video quality. Through transmit/display experimentation, we have succeeded in delivering live streaming video from multiple 8K ultra-high-definition (*1) cameras that switch out signal level deterioration in response to request from the terminal devices. By utilizing the software packet, we have been able to switch on the network edge portion of the technology for multiple events such as the Sapporo Snow Festival in February 2019 (*2) and Interop Tokyo 2019 (*3), which is a network exhibition that took place in June 2019. Currently, technology takes approximately 100 milliseconds to a couple of seconds to complete the transfer request between switches. However, it is now proven that installing the newly developed software packet to switch on the transmitting line makes it possible to change video display within 1 video frame. This experiment during the Sapporo Snow Festival in February 2019 was conducted in cooperation with several related organizations, including the Japanese Test Bed Network JGN (*4) of "the National Institute of Information and Communications Technology (NICT)" and the SINET5 (*5) of "the National Institute of Informatics (NII)". Four types of 8K uncompressed videos were instantaneously switched and transmitted using a software packet to switch on the 8K dual green (8K-DG) format (24 Gbps) of 8K (7680 × 4320 pixels, 16 times the HDTV) ultra-high-definition live uncompressed video through a 100 Gbps domestic broadband line between Sapporo and Tokyo and Osaka. In the case of the software-based packet switch, processing 24 Gbps per stream had been achieved by conducting an IP packet data input preparation process that used a conventional IP multi-cast technology. The IP packet data section of the selected 8K ultra-high resolution live video was replaced with the IP packed data section in order to output a video switching process of less than 1 video frame. After reviewing the result of this proof experiment, we will further proceed with our R&D by establishing new media producing technology in collaboration with the Multimedia Research Laboratory. **A related exhibition of the results will be held at the NICT booth (# 1169) at SC 19 (Nov. 19 – 21, 2019, Colorado Convention Center, Denver).** https://sc19.supercomputing.org/

Note	(＊1) 8K ultra-high-definition The "8K" has 33 million pixels, approximately 16 times larger than the current full high-definition TV. Various schemes have been proposed. The test used the 8K dual-green (8K-DG) with a 60 fps and 10-bit video stream (24 Gbps). (＊2) Experiment during Sapporo snow Festival in February 2019 NICT provided an experimental venue using the JGN, a research and development testbed network, as a venue to experiment the advanced telecommunication and broadcasting technologies. Taking up "security for video distribution network" as theme of the study, the "Sapporo Snow Festival" 8K video distribution experiment was conducted. (＊3) Interop Tokyo It was the largest network exhibition in Japan and was held from June 12, 2019 to 14th. The Kanagawa Institute of Technology (KAIT) held an experimental exhibition in its academic innovation booth. (＊4) JGN An R&D testbed network operated by NICT. Following the JGN-X, which has been operating since April 2011 as an environment for the realization and deployment of new-generation network technology, the new test bed has been in operation since July 2016 for integrated promotion of technology demonstration and social demonstration. This includes an IoT demonstration test bed in conjunction with wireless test beds, a large-scale emulation base and a combined service housing infrastructure. (＊5) SINET5 A telecommunications network constructed and operated by the National Institute of Informatics (NII) as the academic information infrastructure for universities, research institutes, etc. throughout Japan. In this experiment, SINET5, which started its official operation in April 2016 by connecting all prefectures and Japan/US line with 100 Gbps ultra-high-speed network, access line for Kanagawa Institute of Technology was installed. (＊6) Multicast A one-to-many transmission scheme from one source to a group with multiple destinations. Since it has a function of replicating data transmitted from a transmission source to only a necessary destination at an intermediate node, selecting a necessary transmission path based on a request, allowed for efficient transmission with minimum bandwidth utilization. Contact for this subject: Kanagawa Institute of Technology, Promoting Organization of Technological Education and Research 1030 Shimo-Ogino, Atsugi-Shi, Kanazawa-ken, Postal Code: 243-0292 Representative: Haruhisa Ito Phone: +81-46-291-3299 E-mail: Ito.haruhisa@ccokanagawa-it.ac.jp https://www.kait.jp/english/ Contact for press release: MSS-NewYork,Inc. 228 East 45th Street 7th Floor, New York, NY 10017 Representative: Masa Honge Phone: 1-646-709-7707 E-mail: sc19@mss-newyork.com https://www.mss-newyork.com/

Additional File
1) SC19 Figure
   https://gallery.mailchimp.com/d4079581931311b9ab9cd04a7/files/3271662f-b3ab-4c94-8e89-202e1d761b45/SC19_figuresNov17.pdf