NEWS RELEASE

NTT

This English text is a translation of the Japanese original. The Japanese original is authoritative.

April 6, 2007

Successful development of a H.264 real-time CODEC LSI for the contribution of broadcasting use

Nippon Telegraph and Telephone Corp. (NTT; Head Office: Chiyoda-ku, Tokyo; President: Norio Wada) has succeeded in developing the world first HDTV[*1] real-time CODEC[*2] LSI chipset employing the High 4:2:2 profile[*3] in H.264/MPEG-4 AVC[*4] (hereinafter called H.264) international standard which is applicable to high quality video image transmission like the contribution use for broadcasting[*5].
This developed technology will be exhibited at the National Association of Broadcasting (NAB2007) held in Las Vegas, the U.S. from April 16th, 2007.

Background

In summer 2002, NTT Cyber Space Laboratories (hereinafter NTT Lab.) [*6] developed the world first single-chip MPEG-2[*7] HDTV CODEC LSI "VASA" for professional high-quality broadcasting use, which complied with the international standard of CODEC technology. NTT Lab. has also been engaged in development of high-quality MPEG-2 CODEC systems utilizing VASA LSI. The VASA technology has been adopted in the system LSIs sustaining the terrestrial digital broadcasting service started in December 2003 and utilized in the essential devices of various sorts of broadcasting equipments such as MPEG-2 encoders and the digital TV relaying network. These achievements have made our MPEG-2 technology a de facto standard for professional broadcasting use.
The upcoming real era of H.264 would require downsizing and cost-saving of H.264 CODEC equipment and efficient methods to realize highly-realistic video image on a large screen exceeding HDTV which will, for example, be used for live broadcasting of sport and music events.

Achievements

Development of a H.264 CODEC LSI specialized for professional broadcasting use (appendix):
Whereas H.264 HDTV CODEC LSIs are developed for the purpose of using them in consumer products such as video cameras, NTT Lab. has developed a H.264 CODEC LSI "SARA" (a development code; abbreviation of Super Advanced Real-time CODEC Architecture for H.264 professional implementations), processing HDTV with multiple LSIs each of which processes SDTV, which can be applied for the purpose of cascade linkage indispensable for broadcasting facilities. The SARA LSI enables

H.264 CODEC equipments to simplify their structure and control by using the multi-chip extension function that are composed by the control of cooperative processing among multiple LSIs and the multiplexing/demultiplexing stream processing.

Technical essentials

1. A postcard-size compact module processing double color information of the 4:2:0 chroma format

It is generally said that H.264 is capable of achieving double compression ratio of MPEG-2. However, traditional technologies using the DSPs for general purpose, which processes encoding/decoding HDTV in H.264 High Profile*8 of 4:2:0 chroma format, could not achieve this level of compression ratio with keeping equivalent image quality. This SARA LSI enables us to maximize true capability of H.264 and to process encoding/decoding HDTV (1920x1080i) in the High 4:2:2 profile, which contains double chroma information of that in the 4:2:0 format, on a single postcard-size board.

2. Applicable to various H.264 equipments

Due to HDTV encoding/decoding processing on a compact postcard-size module using the SARA LSI, this result allows us to construct various H.264-related functions in a single unit size equipment, such as a MPEG-2/H.264 transcoder and a two-pass H.264 encoder.

3. An on-chip real-time transcoding function from MPEG-2 to H.264

Another advantage of this LSI is a function of real-time transcoding from MPEG-2 to H.264, which is widely available for various purposes, such as the utilization of huge amount of MPEG-2 video archive for H.264 video distribution service and the simultaneous retransmission of terrestrial digital broadcasting over IP-based network.

Future work

NTT is planning to evaluate and verify the equipments employing this LSI in field tests, which would be primary test for the future real-world services of H.264 video distribution and the simultaneous retransmission of terrestrial digital broadcasting over IP-based network. The equipments employing this LSI will be on sale at NTT Electronics Corporation from the third quarter of fiscal year 2007 onwards.

Glossary

*1 HDTV (High Definition Television):
An enriched broadcasting method in terms of video and audio quality compared with traditional television by increasing the number of scanning lines, expanding screen size and digitizing audio signal.

*2 CODEC (COder and DECoder):
A signal processing technology having both encoder (coder) - compressing audio and/or video data into a certain stream - and decoder - extracting audio and/or video data from a compressed stream.

*3 The High 4:2:2 profile:
A set of CODEC definition in the H.264 standard, which applies the High profile of H.264 to the 422 color space. It is said that the High 4:2:2 profile is indispensable function for professional broadcasting use.

*4 H.264/MPEG-4 AVC:
An international standard of video image CODEC that was standardized by a combined team between the Video Coding Experts Group (VCEG) in ITU-T and the Moving Picture Experts Group (MPEG) in ISO/IEC JTC 1. It is said that H.264/MPEG-4 AVC is capable to achieve more than double compression ratio compared with MPEG-2. It is also said that H.264/MPEG-4 AVC needs 10 to 100 times processing ability of computer compared with MPEG-2.

*5 Contribution use for broadcasting:
Transmission of original video image and/or audio data before editing.

*6 NTT Cyber Space Laboratories
(http://www.ntt.co.jp/cclab/e/ccsouken/sp/sp_index.html):
NTT's laboratories engaged in research and development of media processing component technologies such as video and audio, in order to create additional values and to realize realistic communication environments in information communication services for the upcoming broadband and/or ubiquitous network era.

*7 MPEG-2 (Moving Picture Experts Group-2):
MPEG is an international standard in motion picture signal compression. MPEG-2 is particularly a standard of coding high-quality video including HDTV, which is applied for DVD and digital television broadcasting service.

*8 The High profile:
A set of CODEC definition in the H.264 standard, which extends the Main profile in H.264 in the 8x8 integer transform, the quantization matrix and so on.

- Appendix Appearance of SARA LSI

For further information, Contact:
General inquiries:
Public Relations Office, Department I, Nippon Telegraph and Telephone Corporation
Phone: 81-3-5205-5550
Technical inquiries:
Video Codec Produce, Nippon Telegraph and Telephone Corporation
Phone: 81-46-859-2985