

(Press Release)

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Nippon Telegraph and Telephone Corp.
NTT Broadband Initiative Inc.
Blue Note Japan, Inc.
Kokusai Kanko Kaikan Co., Ltd.
Jasmac Inc.

NTT Initiates Trials for Real-time Distribution of High-quality Live Video via HIKARI Broadband

In November of last year, the NTT Group established its "Vision for a new optical generation--Broadband leading to the world of resonant communication^{*1}." Since then, it has devoted the resources of the entire Group to the construction of resonant communication networks that pursue true ease of use for customers, and to the creation of diverse and rich new services and business models that make use of these networks.

Now, from March to June of this year, Nippon Telegraph and Telephone Corp. (NTT; Office: Chiyoda-ku, Tokyo; President: Norio Wada), in cooperation with four partner companies, will trial services that enable users to enjoy live performances from the Blue Note Tokyo (Aoyama, Tokyo) via HIKARI broadband, from hotel facilities in remote locations outfitted with audio and video equipment. The four companies participating in the trial with NTT are: NTT Broadband Initiative Inc. (NTT-BB; Head Office: Chiyoda-ku, Tokyo; President: Hidetoshi Shirakawa), Blue Note Japan, Inc. (BNJ; Head Office: Osaka City; President: Yosuke Ito), Kokusai Kanko Kaikan Co., Ltd. (Kokusai Kanko; Head Office: Chiyoda-ku, Tokyo; President: Shiro Ishizu), and Jasmac Inc. (Jasmac; Head Office: Minato-ku, Tokyo; President: Nobutaka Kuzuwa).

Delivery control technologies developed by NTT Laboratories make it possible to offer stable, real-time distribution of 6 Mbps MPEG2^{*2} video via IP^{*3} networks, without any deterioration in quality.

1. Background and Objectives

Up to now, it has been difficult for users to enjoy high-quality live videos in real time on a 6 Mbps level via the Internet. The delivery control technologies developed by NTT Laboratories, however, enable distribution of 6 Mbps MPEG2 video without any deterioration in quality, even when using existing low-cost IP networks, thus making it possible to provide a new range of services.

The goal of the trial service is to evaluate the technological field developed by NTT Laboratories mentioned above, and at the same time to examine the business potential for new services that take advantage of the strengths of the various participating companies as demonstrated through the use of HIKARI Broadband.

2. Outline of Trial Services

Through this service, live performances by world-renowned jazz musicians at the Blue Note Tokyo (Aoyama, Tokyo) will be recreated in real time on large screens in two venues--the "Grand Cross" Tavern & Grill in the Celestine Hotel (Shiba, Tokyo; operated by Kokusai Kanko), and the "Zanadu" Multi-function Hall in the Jasmac Hotel (Sapporo, Hokkaido)--enabling guests to enjoy incredibly realistic live videos during their meals.

3. Role of Each Company

NTT Laboratories will develop VOD^{*4} control protocols stipulated by HSAC^{*5}, as well as video distribution systems equipped with functions for maintaining the high quality of MPEG2 videos in the face of the quality deterioration common to networks. It will also provide these protocols and systems for use in the tests.

NTT-BB will use the nationwide contents distribution networks of its full-scale broadband service "BROBA," which has already begun commercial operation, to enable stable, secure broadband distribution of high-quality contents at 6 Mbps.

By using HIKARI broadband environments, BNJ will create opportunities for even users who cannot usually visit live music venues to overcome the limitations of geography and time, and to share the experience of live performances by world-renowned jazz musicians in remote locations.

The Celestine Hotel and the Jasmac Hotel will use HIKARI broadband environments to provide simultaneous live feeds of famous musicians' performances to distant hotels, thus providing a new service through which guests can share the feeling of being at a live performance venue even as they enjoy a leisurely dinner.

4. Keys to Related Technologies

4.1 System Outline

In this service, videos encoded at Blue Note Tokyo will be transmitted to NTT-BB data center via NTT East Japan's video dedicated line service (Megalive). These videos will then be carried by NTT-BB's nationwide contents distribution networks, eventually being distributed to the hotels using NTT East Japan's regional IP networks (B-flets). (Ref. [Attachment 1](#))

4.2 Live distribution using HSAC Protocol

Field tests will be conducted by providing trial services of a variety of devices, including set top boxes^{*6} and distribution server systems equipped with VOD control protocol, which was stipulated in 2002 by the HIKARI Service Architecture Consortium (HSAC), whose members include NTT and numerous Japanese and foreign communication device vendors.

4.3 Delivery control methods for maintaining quality

In the past, UDP^{*7} has generally been used for live video distribution because of its small processing load and small delay. The UDP method, however, has no mechanisms to compensate for the data loss over networks, making it unsuitable for distribution of high-quality video data over long periods of time. NTT Laboratories has developed a new method for quickly resending data in the event of data loss during UDP

applications, in order to enable distribution of high bit-rate MPEG2 streams with no deterioration in quality. NTT has incorporated this method into the already developed "Live Streaming Switch (LSS) platform," enabling distribution of high-quality video using low-cost IP networks. (Ref. [Attachment 2](#))

5. Future Developments

Plans call for this service to be provided about six times each month from March to June of this year. The companies named below will provide details of the schedule through corporate websites, posters, and other media. Reservations for admission will be accepted at each hotel via phone and e-mail.

The participating companies will conduct technical tests and undertake studies of business potential by June 2003, and will make a decision regarding initiation of business activities based on the results of these tests and studies.

Shiba Celestine Hotel www.celestinehotel.com

Sapporo Jasmac Plaza Hotel www.jasmacplaza.jp

Glossary

***1 Resonant Communication**

Proposed by NTT as part of the "Vision for a new optical generation" in November 2002. Resonant: the adjectival form of the verb "resonate," meaning "to ring in harmony, vibrate sympathetically or echo."

***2 MPEG2 (Moving Picture Experts Group 2)**

MPEG is an international standard related to the compression of video signals. MPEG2 is a standard encoding method for high-quality video, including HDTV and other TV images, and is also used for DVD and digital TV broadcasting.

***3 IP (Internet Protocol)**

A standardized protocol for information transactions on the Internet.

***4 VOD (Video On Demand)**

A video delivery format that enables the user to play back, stop, pause, or otherwise control video contents according to subscriber's needs by using a VOD control protocol.

***5 HSAC (HIKARI Service Architecture Consortium)**

An organization whose aim is to study various types of services in the HIKARI broadband era, and to clarify the interface conditions that should be incorporated into HIKARI service platforms.

<http://www.hikari-sac.org/>

***6 Set Top Box**

A device that connects to standard TVs and other home appliances to provide a wide range of functions. Types include Internet terminals, VOD terminals, and receivers for satellite and CATV broadcasts.

***7UDP (User Datagram Protocol)**

A protocol that does not guarantee packet transmission quality. Enables rapid processing because there is no overhead for reception confirmation, resending, etc.

- ([Attachment 1](#)) [Outline of Distribution System](#)
- ([Attachment 2](#)) [Distribution Control Methods for Maintaining Quality](#)

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