

Activities on uncompressed HD over IP using "i-Visto"

- i-Visto gateway: See the document at last APAN meeting in Taipei
- Experiments: JGN II Symposium, Expo in JAPAN, Interop, InterBEE and others

• i-Visto eXmedia Server (New!!)

World's First Video Stream Server Capable of Handling up to Ten Uncompressed HDTV Video Streams.

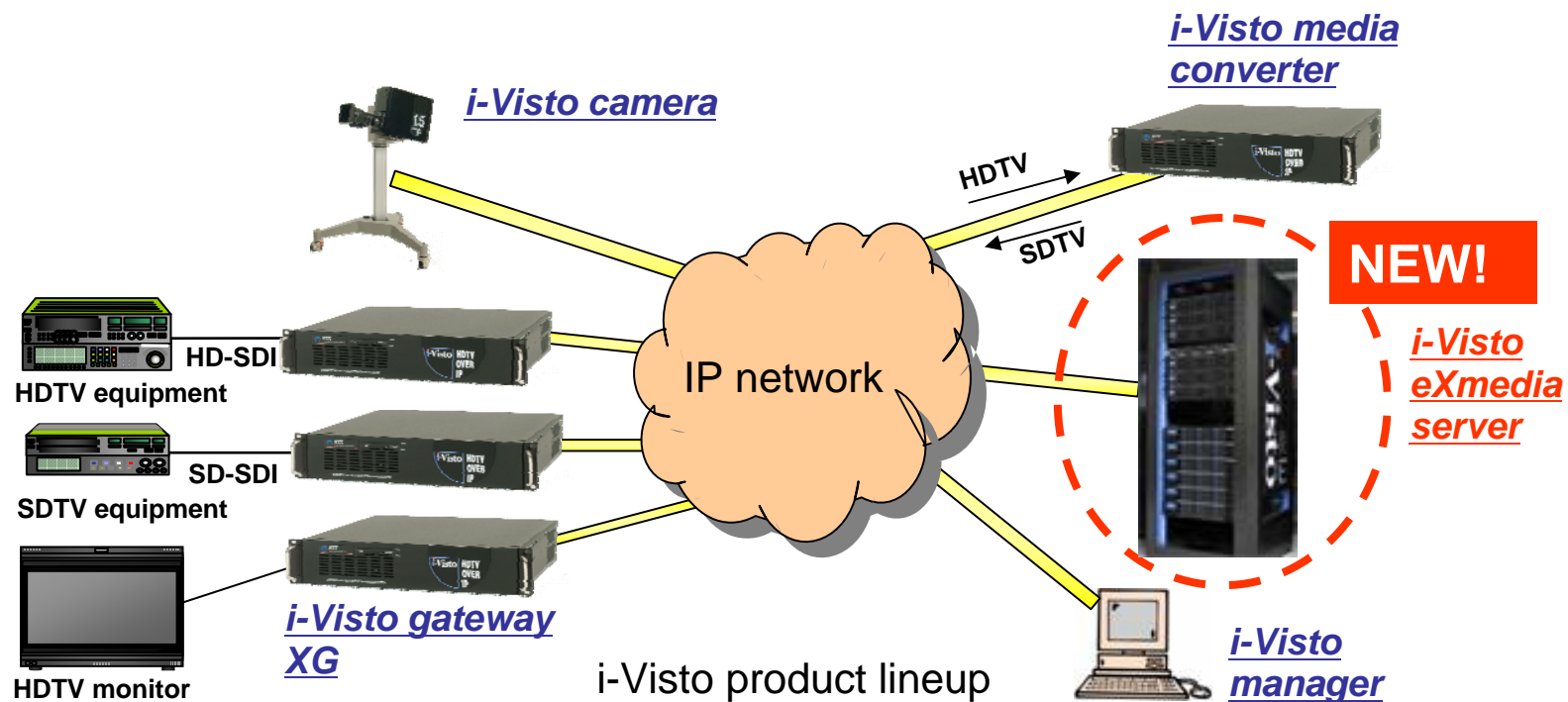
Keiji Harada (NTT), Katsuyuki Hasebe (NTT Communications),
Hiroyuki Kimiyama (NTT) and Tsuyoshi Ogura (NTT)

1/24/2006

i-Visto: NTT's technology for high-quality video handling over IP

i-Visto: Internet Video Studio System for HDTV production

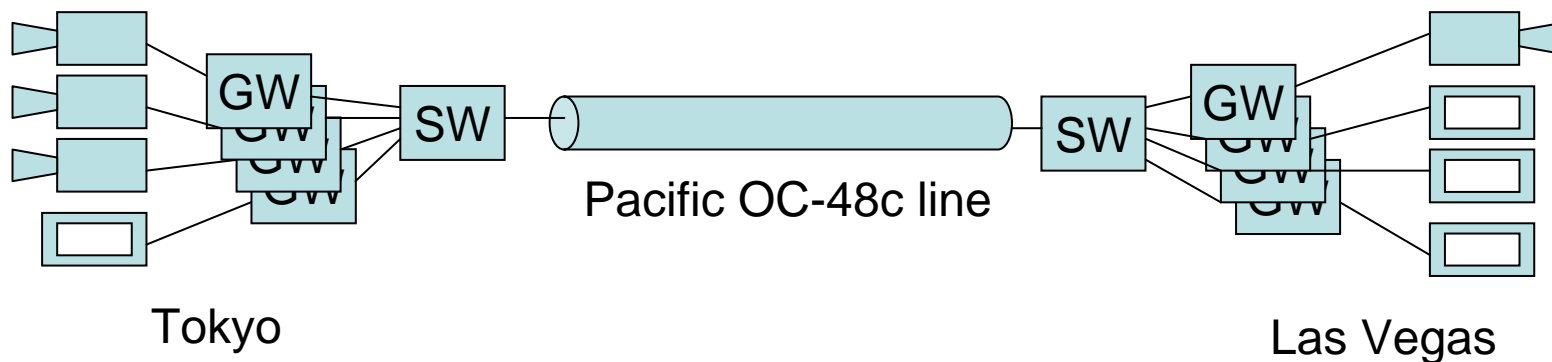
- Transmits/stores/delivers uncompressed HDTV streams in real time (press release Oct. 2001)
- Easy integration with common IP-based systems such as WWW, database, computing resources
- Low-delay (less than the time taken to display one HDTV video frame)
- PC-based cost-effective system
- Many field tests in cooperation with broadcasting stations (NAB and JGN II)



NAB 2004

【Apr. 2004】

☆Interactive HDTV communication between U.S. and Japan



- One uncompressed HDTV and two SDTV signals were transferred in two directions over pacific OC-48c line.
- Transmission delay less than three frames was achieved.
 - Very natural interactive communication was achieved.



InterBEE 2004 (Dec. 2004)

- Four remote sites in Japan were connected with 10GbE
- Transferred five uncompressed HDTV streams over 10GbE
- Demonstrated video clock synchronization over IP network

Interop 2005 Japan (Jun. 2005)

- Demonstrated GMPLS path change (NTT Communications)
- Connectivity test with various IP routers → *Session #3!!*
- Transferred uncompressed HDTV over IPv6 multicast



InterBEE2004

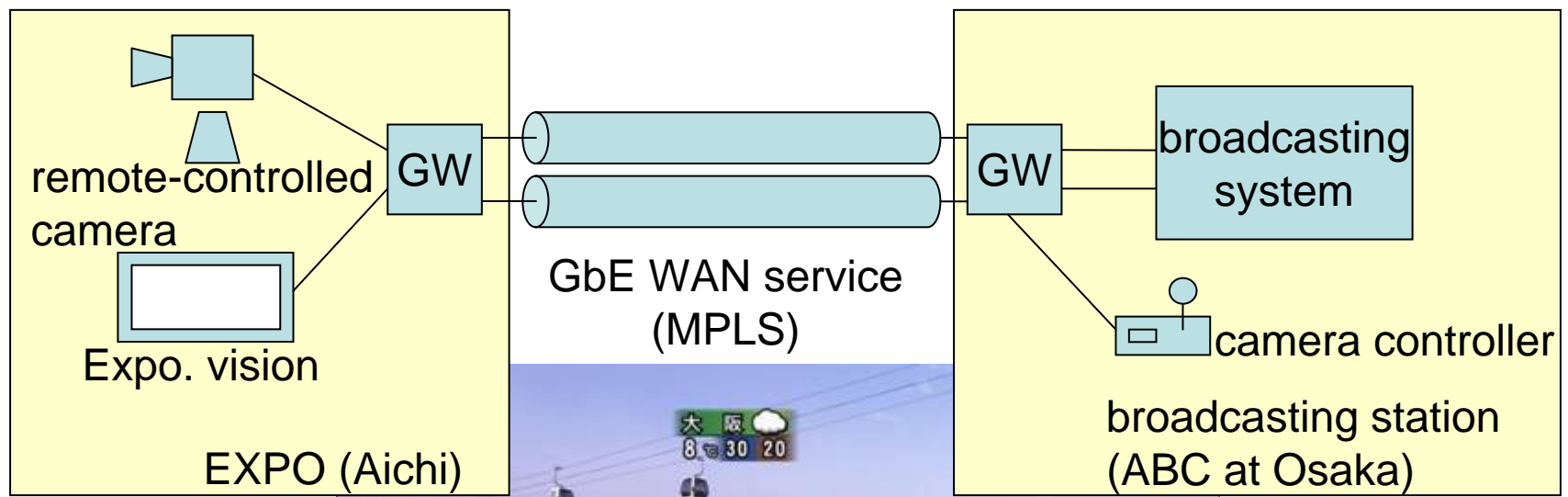


Interop2005

EXPO 2005 Aichi Japan

【Mar. 2005】

- ☆Live video was used for TV programs (ON AIR)
- ☆Using MPLS and GbE WAN service by NTT Communications



Koushien 2005

(Japanese high-school baseball)

【Aug. 2005】

- ☆ **Used for very important international program** (Public view)
- ☆ Uncompressed HD recording and realtime editing by [i-Visto eXmedia Server](#)



Expo-Vision (2005.8.19)

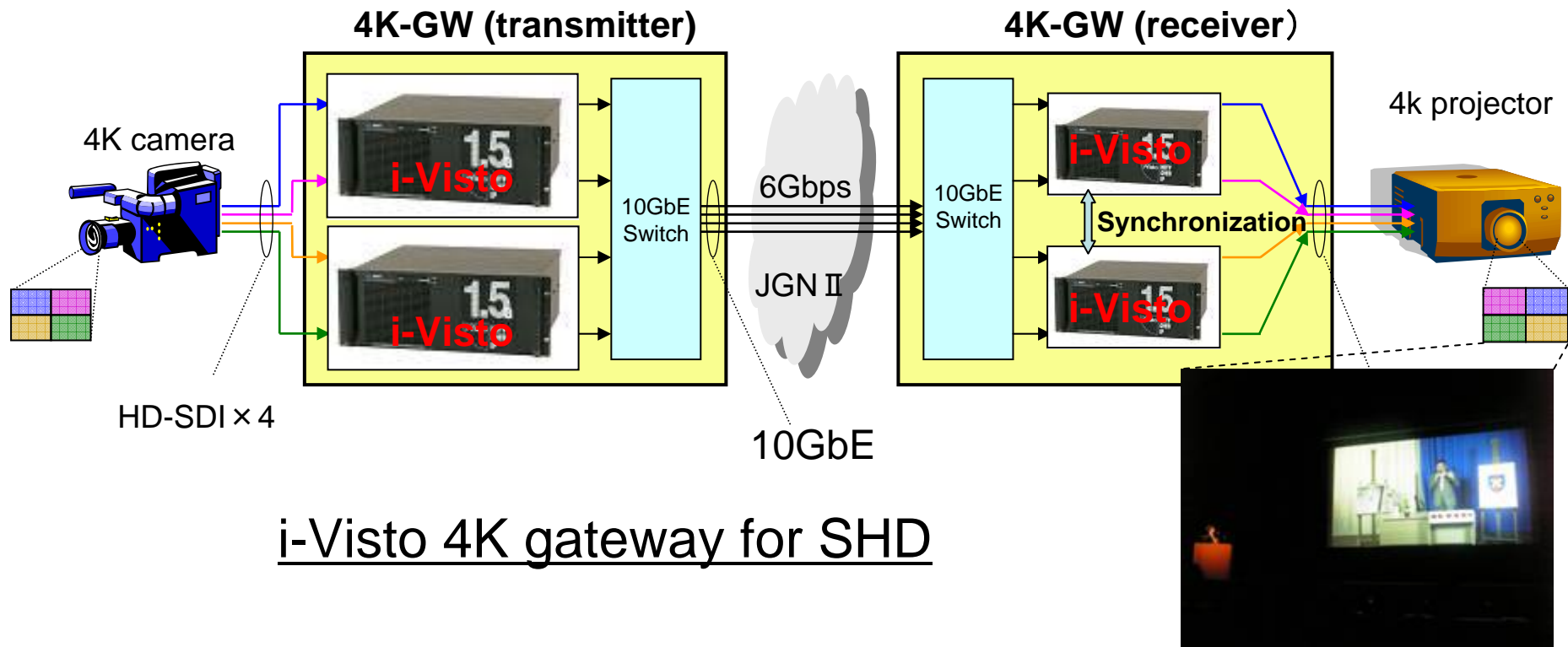
JGN II symposium in Sendai, Japan

【Jan. 2006】

☆ "i-Visto 4K gateway clusters" capable of handling a 6-Gbps uncompressed Super-high-definition (SHD) stream

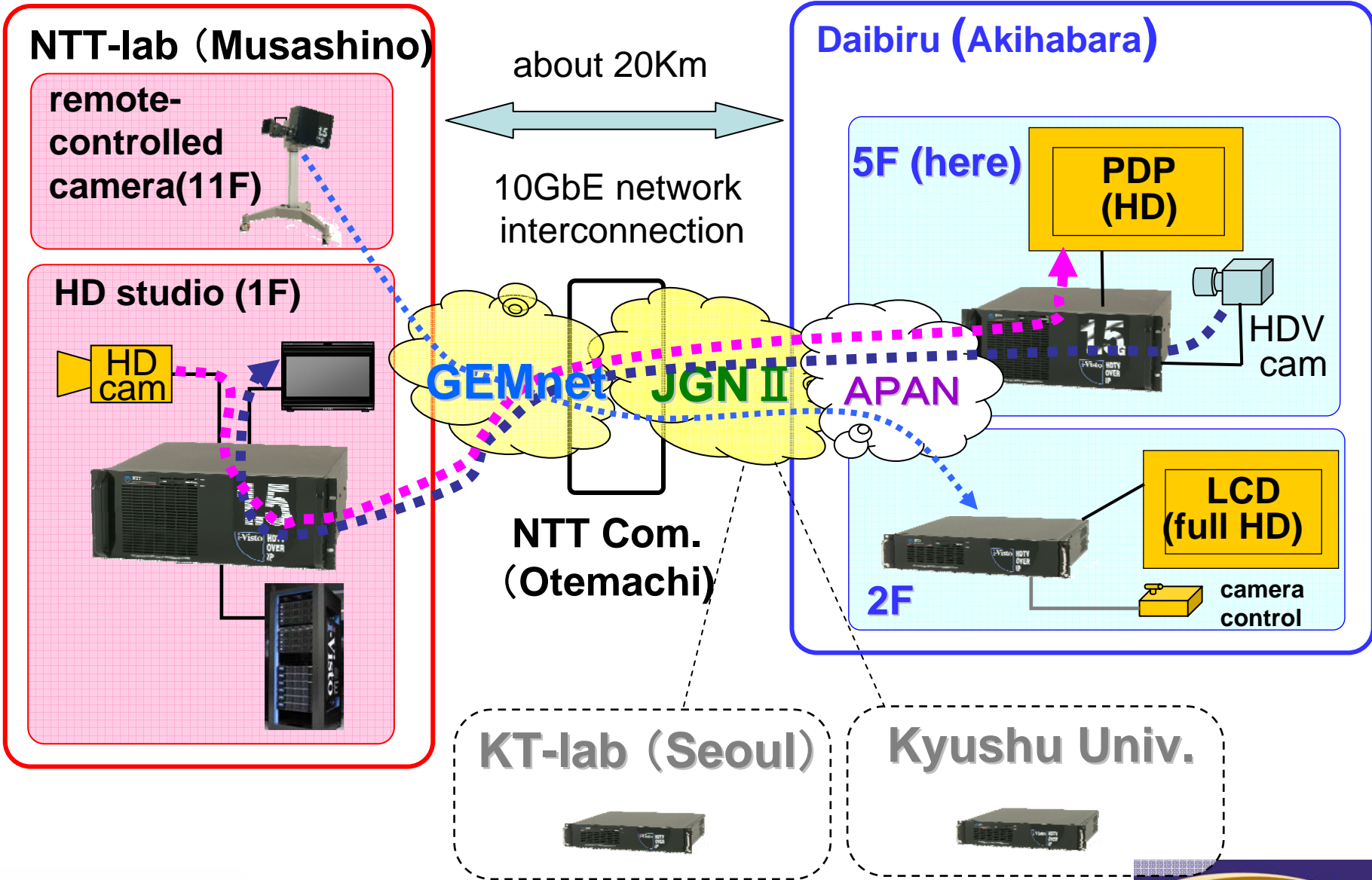
(<http://www.ntt.co.jp/news/news06/0601/060119.html>)

The fastest uncompressed video transfer trial over IP network except HD-SDI ?!



i-Visto 4K gateway for SHD

eXmedia server presentation from Musashino Lab.



i-Visto eXmedia server (features)

- PC-cluster architecture.

 - Scalable:**

 - System size can be changed according to individual requirements for transmission performance.

 - High performance:**

 - When 10 PCs are used, total throughput is 15 Gbps.

 - (10 uncompressed HDTV / 100 HDCAM / 600 HDV streams)

 - Flexible:**

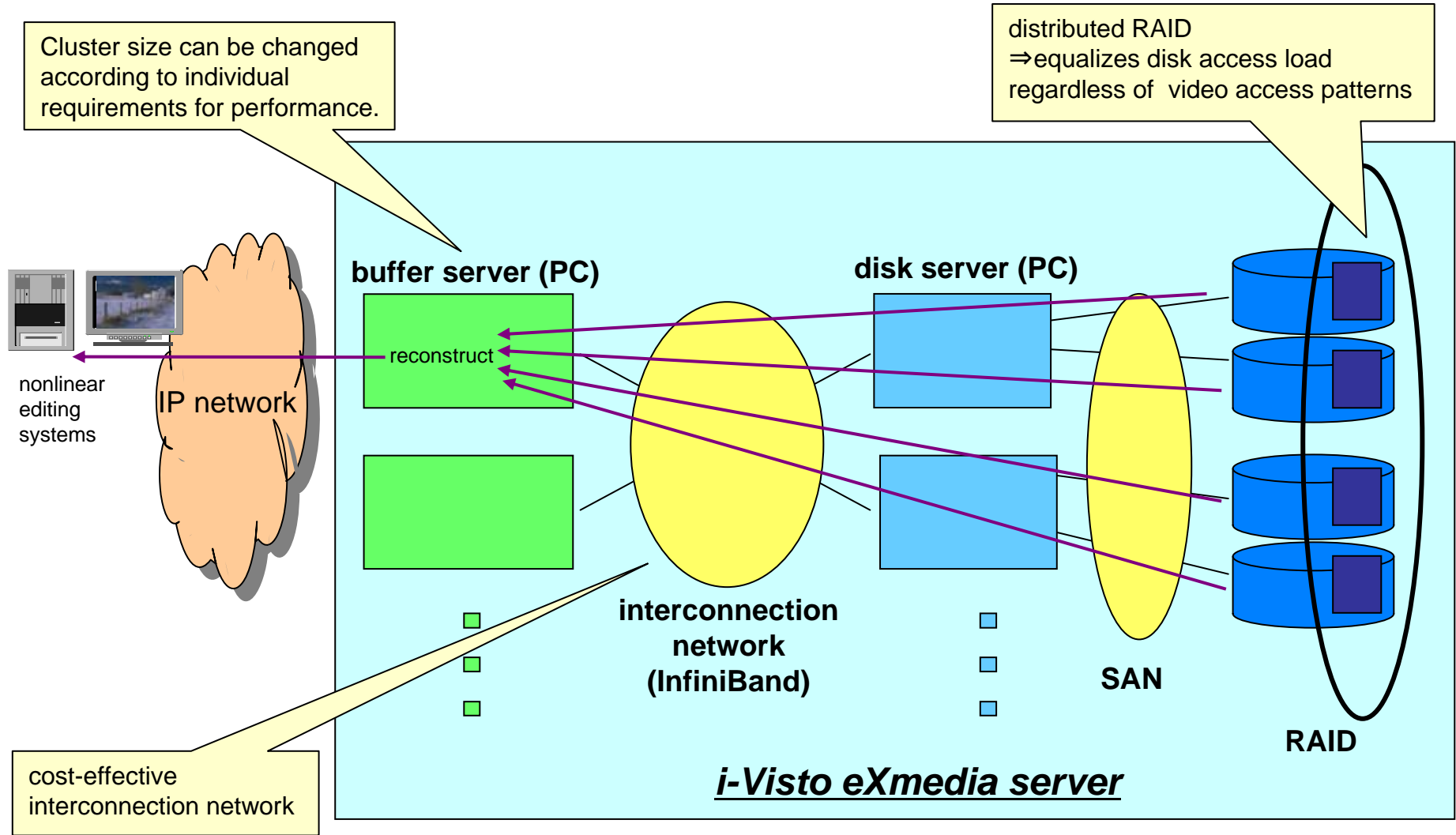
 - Users can choose PC/RAID vendors according to their own requirements.

- Very cost-effective **InfiniBand** technology is used as an interconnection network.

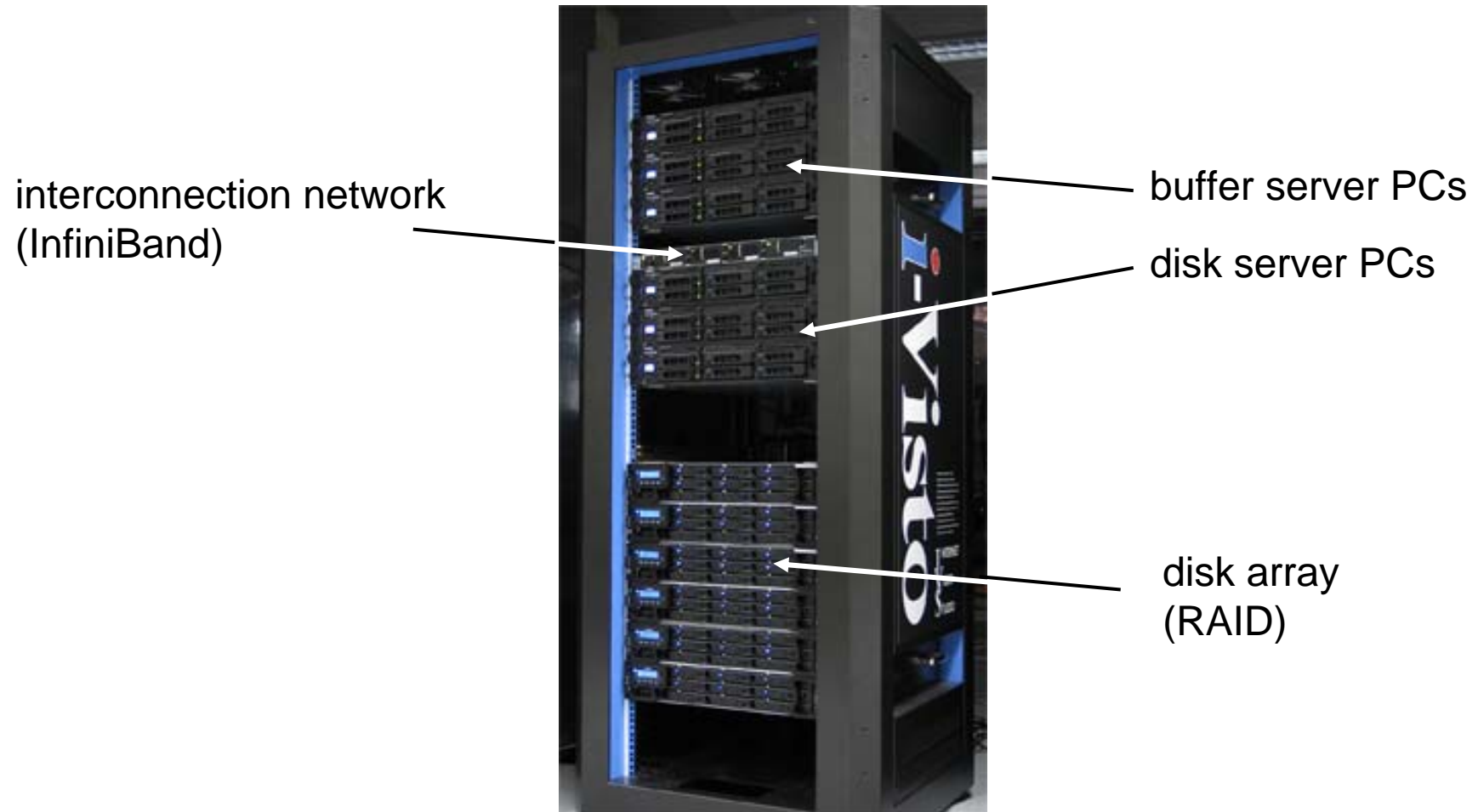
- **Distributed RAID** mechanism equalizes the disk access load of each RAID systems regardless of the video access patterns.

- EDL (edit decision list) -based video clipping function.

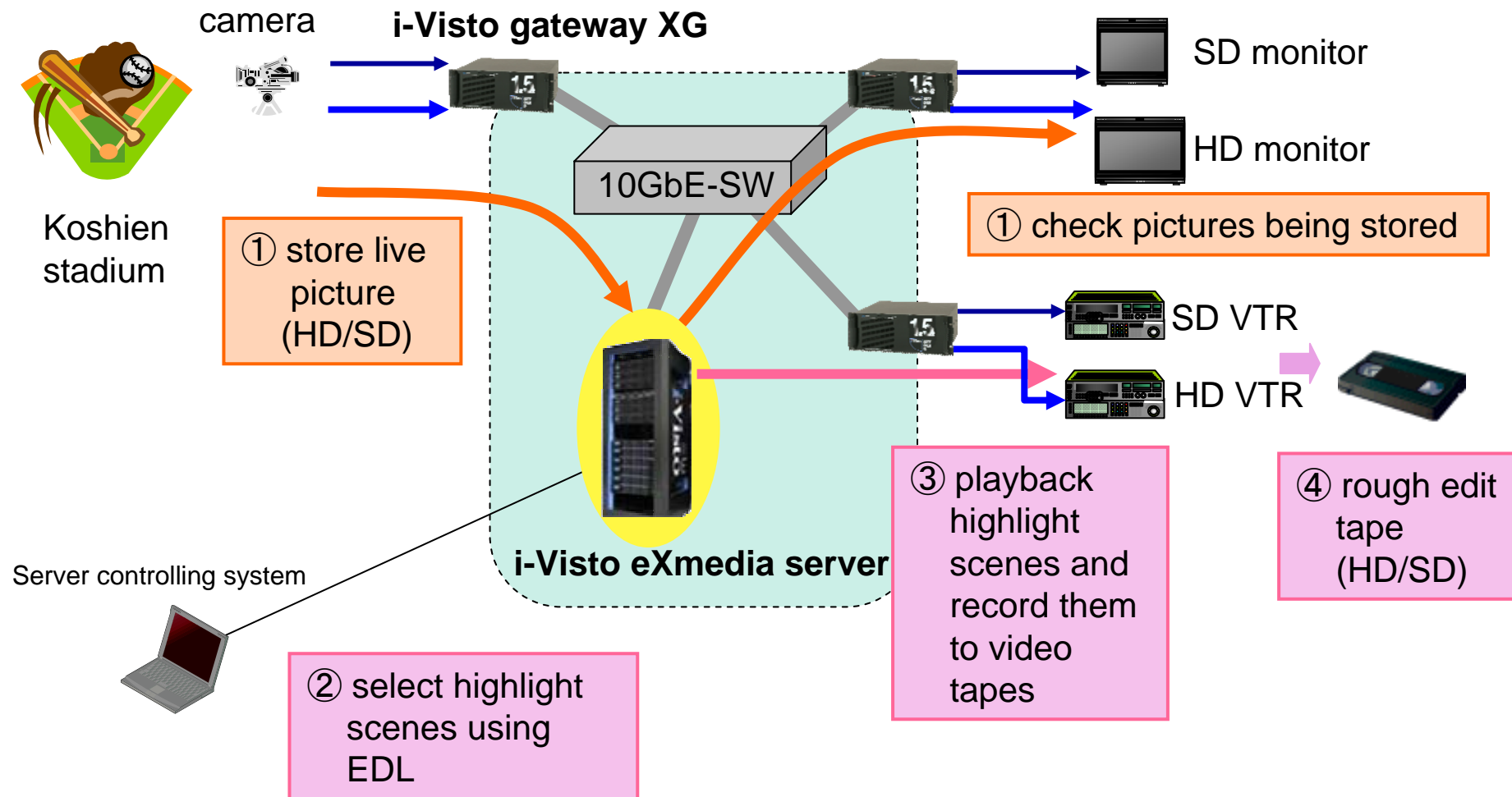
Block diagram



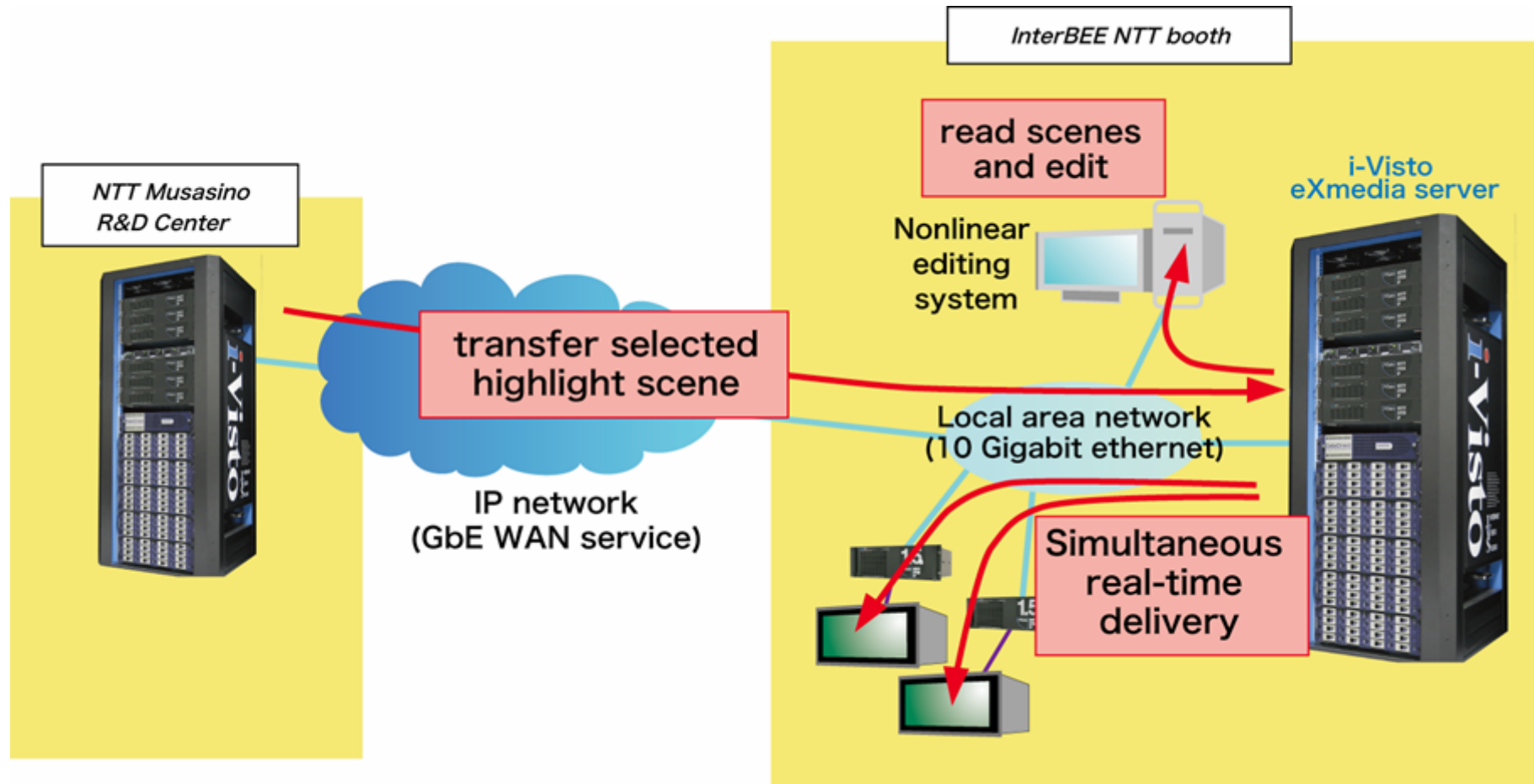
Appearance

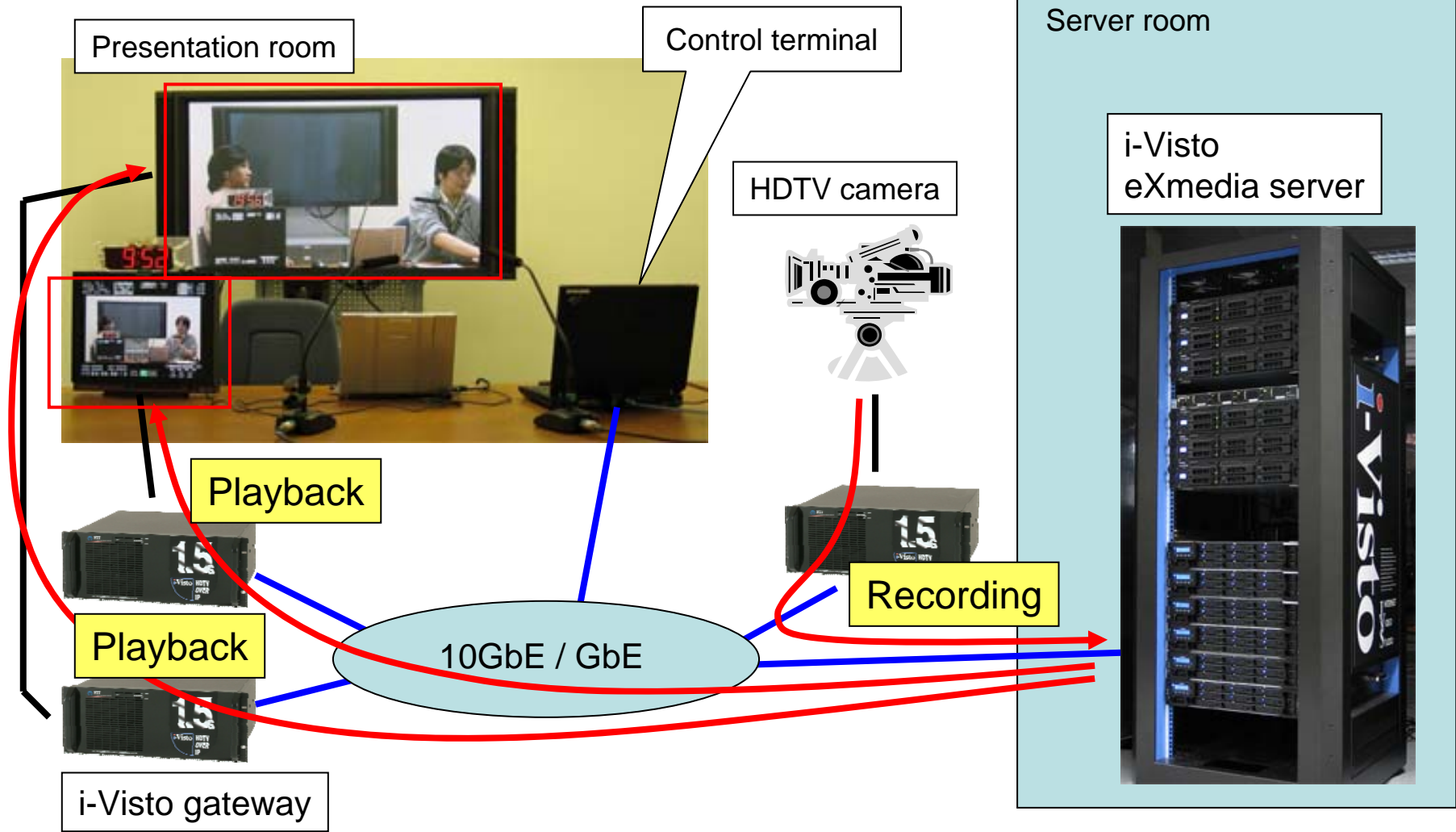


Koushien 2005 (Aug. 2005) (Japanese high-school baseball)



InterBEE 2005 (Dec. 2005)





Summary

i-Visto Gateway

- Low latency (0.5-frame delay) for broadcasting industry
- 2 × GbE, 10G POS/10GbE network interfaces was supported
- Multiplexing control and metadata
- Network computing (down-conversion, delay control)
- Remote video clock sync.

【Future】

- Up-conversion, transitions, video synthesis, etc.
- Interoperability for other IP transmission system

i-Visto eXmedia server

- Handling up to Ten Uncompressed HDTV Video Streams

【Future】

- Incorporate customer feedback
- Planned availability is in Q1 of 2006
- Further enhancement of system performance

Goal: Full-IP high-quality video delivery network