Super high-resolution video handling system and highly accurate video traffic monitoring technology

- Demonstrations at SC10 -

2010.11.16

NTT Laboratories.

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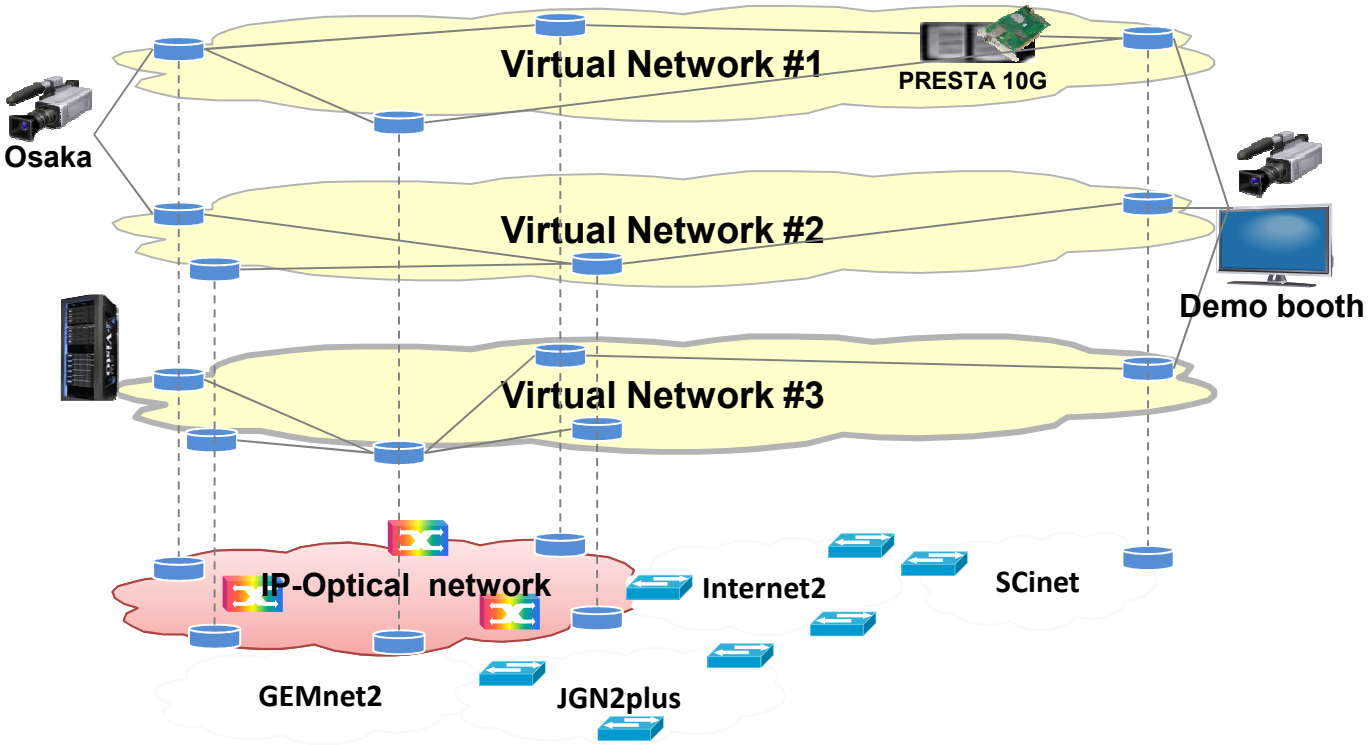
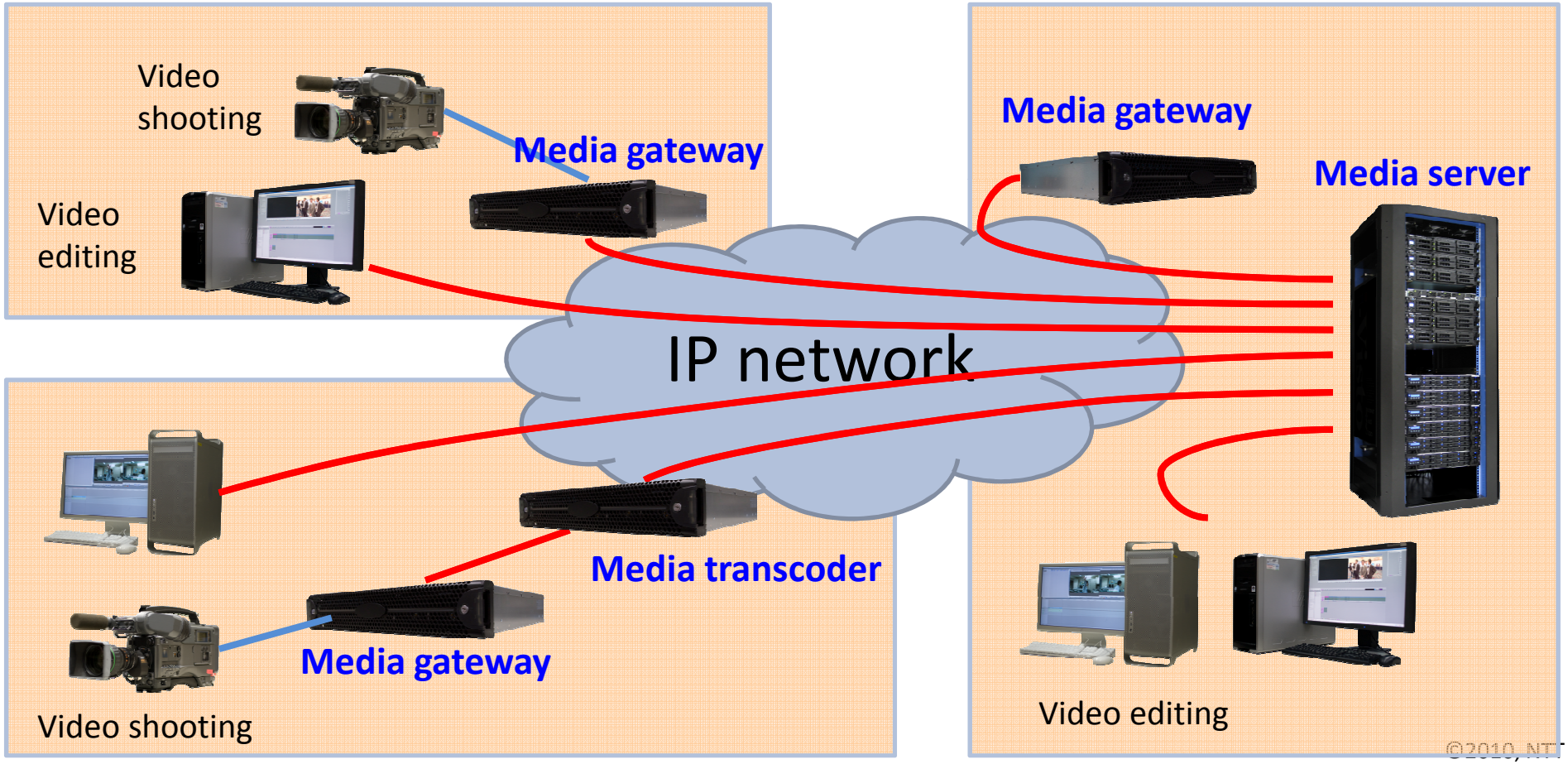
Overview of the demonstrations

1. Over 10-Gbps high-resolution video handling system
   - Video editing work flow of broadcasting station on IP networks
2. PRESTA 10G: 10-Gbps high-resolution network monitoring platform
   - Network measurement for stable transmission of high-quality video streams
   - Integration of multi-layer network monitoring into perfSONAR



1. Over 10-Gbps high-resolution video handling system overview

- Functions:
  - Transferring, recording, playback, and transcoding in real time
- Video formats:
  - Uncompressed SD/HD/4K/8K-resolution video, compressed HD



Components of the video handling system

Media server

- PC-cluster based ultra-high-speed video server
- Recording/delivery high-quality video stream in real-time through IP network
  - Uncompressed/compressed HD, uncompressed 4K/8K video
- Also delivery the video as a video file instead of video
- Maximum video delivery capability: 25-Gbps
  - Equivalent to capability of 16-uncompressed HD video

Media gateway

- Connecting between video network and IP networks
- Simultaneously converting two HD-SDI video signals to IP packets and vice versa with ultra-low latency
- Converting ultra-high resolution video, such as 4K video or SHV using multiple “Media Gateways”

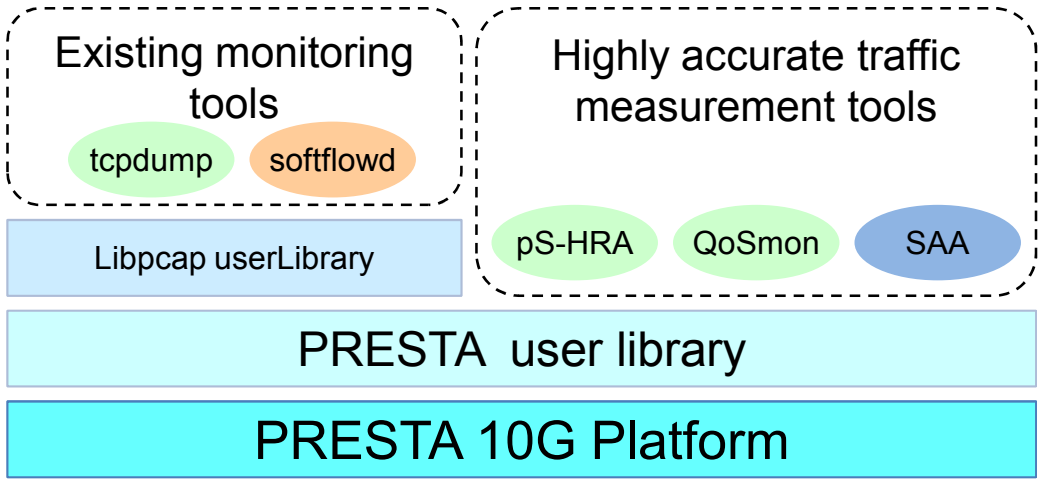
Media transcoder

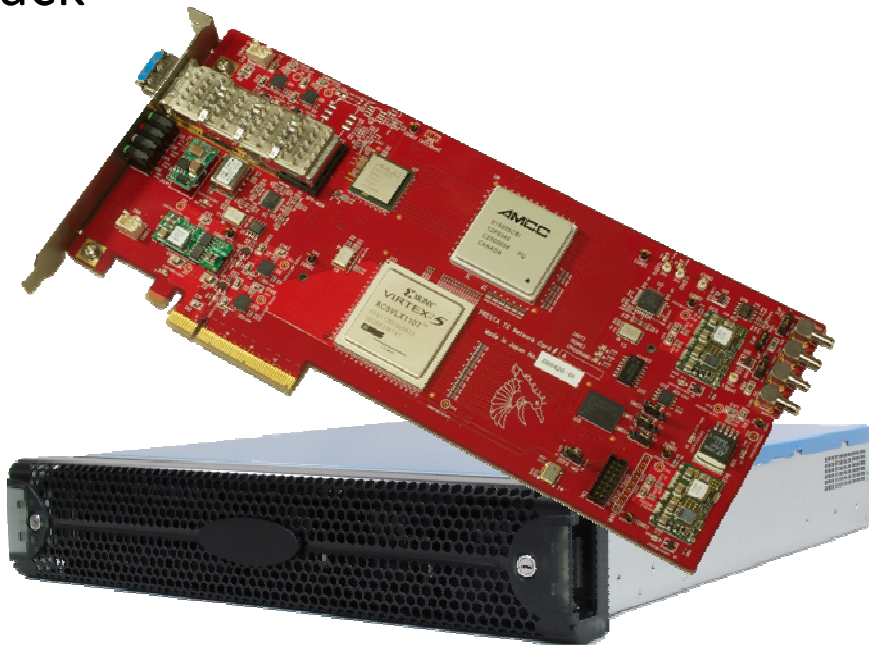
- Compress or decompress HD video in real time
- Transferring high-quality video over various bandwidth IP networks by implementing “Media transcoder” between “Media server” and “Media gateway”

2. PRESTA 10G: 10-Gbps high-resolution network monitoring platform

Features:

- ✓ Supports 10-Gbps Ethernet LAN-PHY/WAN-PHY and OC-192c POS
- ✓ 10-Gbps wire-rate full-packet capture and generation capabilities
- ✓ 10-ns-order packet time-stamping using external timing source
- ✓ Hardware packet-filtering
- ✓ Highly-accurate streaming traffic playback
- ✓ libpcap compatible API library



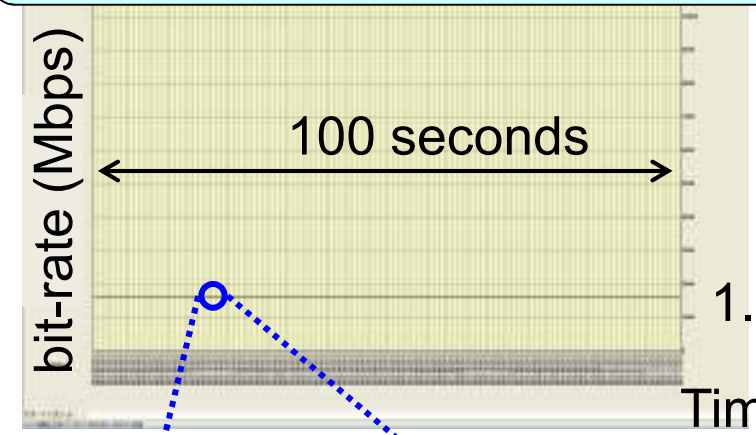


Application example of PRESTA10G

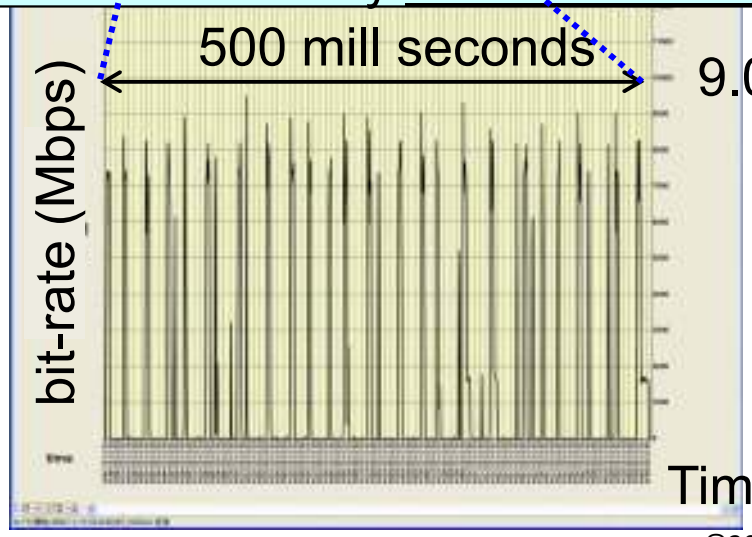
In 10-Gb/s networks, the time resolution at microseconds is necessary especially for measuring the video stream of 1-Gb/s and higher.

Disorder of image by packet drop
(uncompressed HDTV transmitted by i-Visto)

Measurement result of bit-rate calculated every **100 milliseconds**



Measurement result of bit-rate calculated every **500 microseconds**



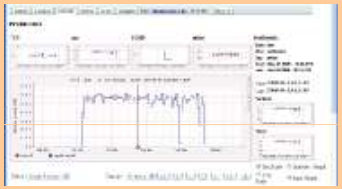
Integration of multi-layer network monitoring into perfSONAR

NTT

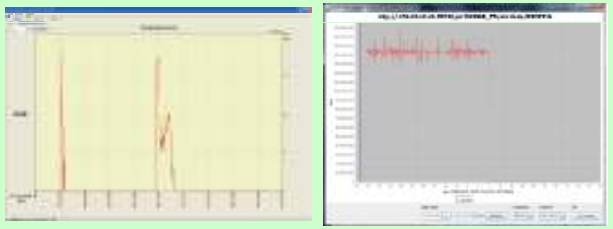
perfSONAR
with high-resolution extension

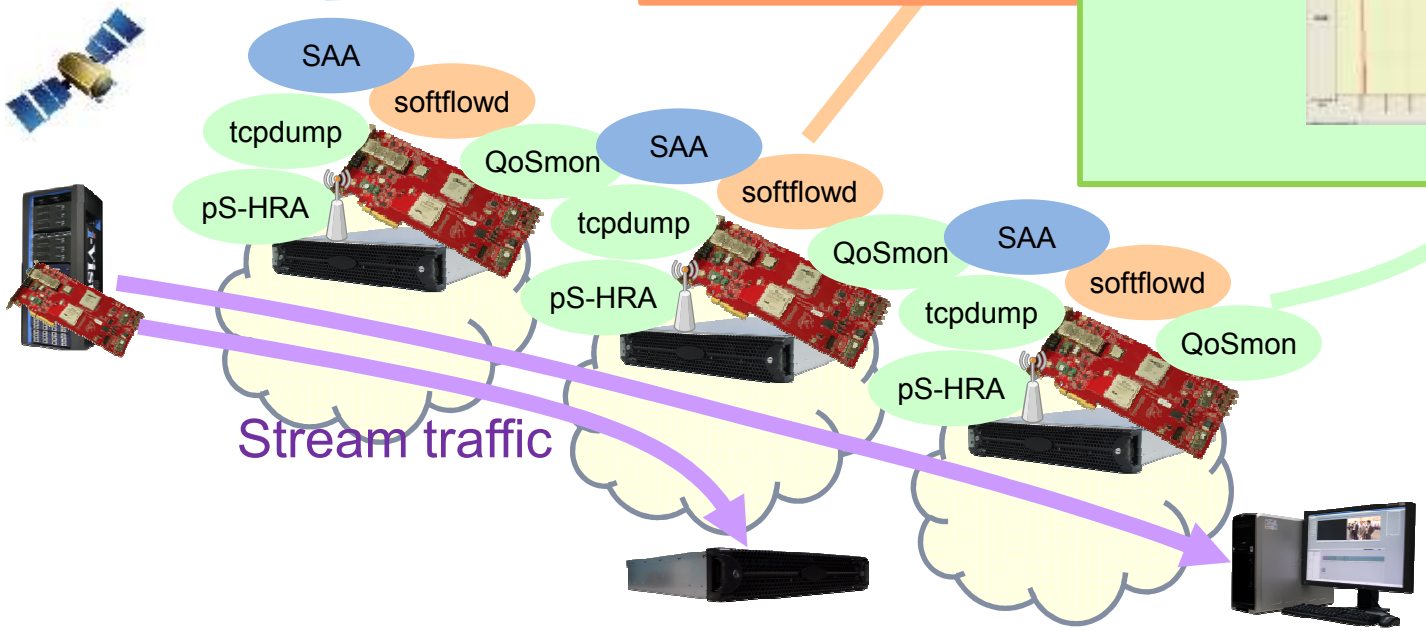
Layer-7: streaming application header analysis

Layer-3/4: non-sampling Netflow v9 flow-records

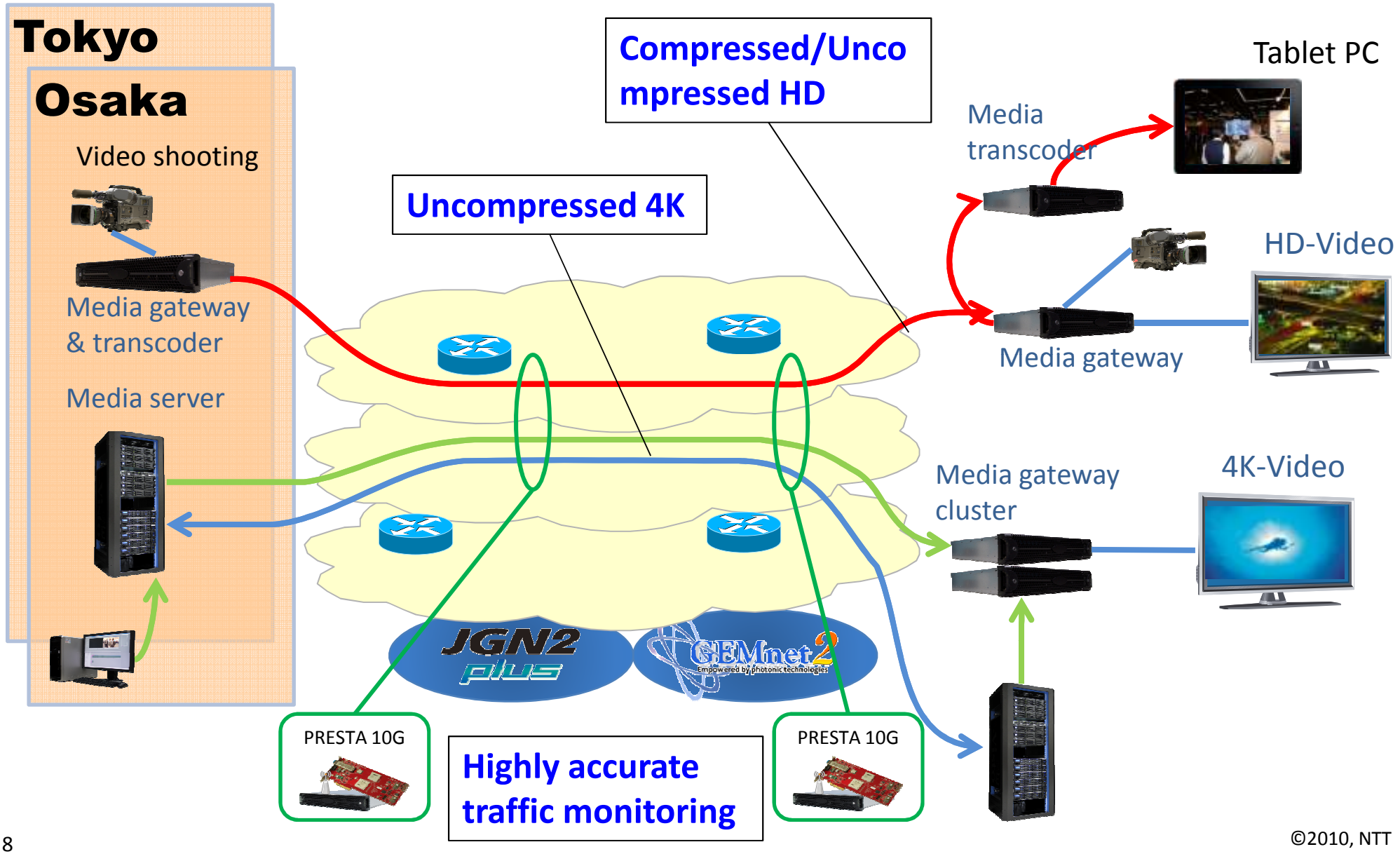


Layer 2: real-time behavior of traffic bit-rate, delays, and jitters in micro-second resolution





Demonstrations of video transferring on IP networks



Local demo.: any time

On-demand streaming from Japan:

Wed. 1:00 PM – 1:30 PM (HD)

4:30 PM - 5:00 PM (4K)

Thu. 10:30 AM- 11:00 AM (4K)

12:30 PM- 1:00 PM (HD)