
Update on imCast (GLORIAD-KR uncompressed HD video transport system)

**(Jinyong Jo from KISTI, JongWon Kim
and Jongchurl Park from GIST on behalf
of GLORIAD-KR HDTV WG)**

Date : 2008. 8. 5

26th APAN Meeting @ Queenstown NZ

imCast(Immersive-Media-Cast):

Focusing on high-definition

4096x2160



What is imCast?

- Immersive-Media-Cast

**“Cast all Wide/Loud stuffs
through the Internet”**

- Sub-systems

- ① uvCast: uncompressed HD
- ② dxtCast: light-weight compressed HD
- ③ stereoCast: binocular stereoscopic HD

For-What?

“Think more than Real-time
and High-quality”

Yesterday: 2k (20Mbps, ~ 1.485Gbps)

Today: 4k (500Mbps, ~ 7.6Gbps)

Tomorrow: 8k (120Mbps, ~24Gbps)

- ① **Evaluate** leading-edge network tech.
- ② **Understand** system & network behaviors
- ③ **Apply** to R&E for advanced collaboration

uvCast

Scopes/targets of our R&D

1. Demonstration

- Never let use the system by others

2. Prototype system

- Let use by others, but never works well

3. Testbed

- Let use by others, to debug

4. Professional

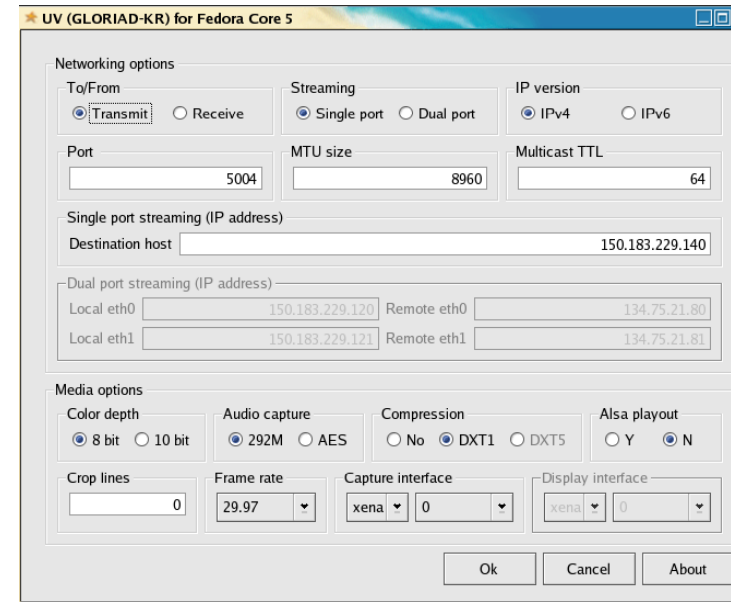
- Platform for general service

5. Commercial

- Failure is fatal for business

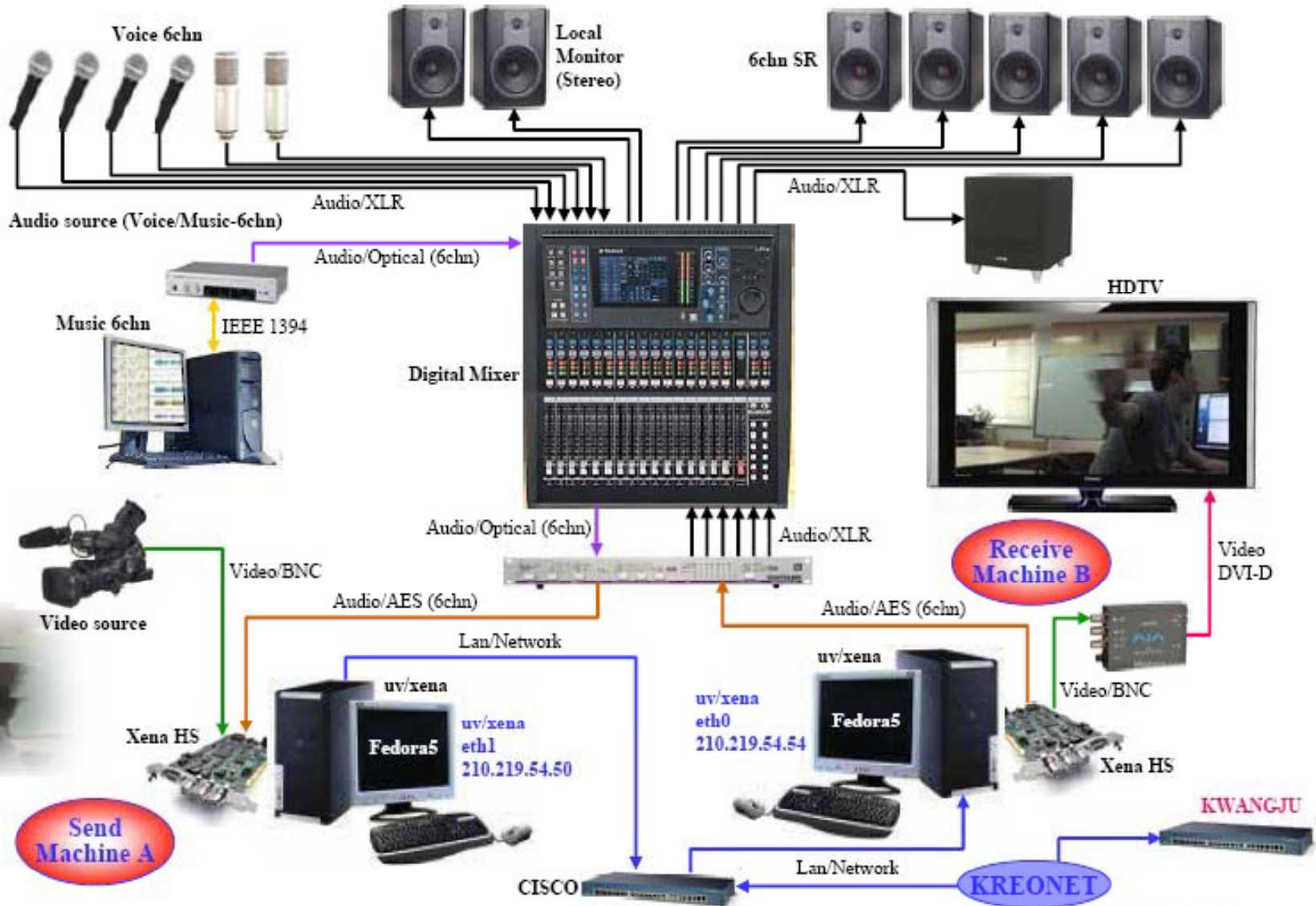
uvCast spec.

- Skeleton from UltraGrid Project
- Enhancements
 - New HD-SDI interface: XENA HS
 - 8-/10-bit 1080i/29.97 YCbCr
 - 6-channel audio for XENA-HS & ALSA
 - Simple graphical user interface
 - Dual-port streaming (2x1 Gbps)
 - Image crop for under 1 Gbps, 1 Gbps, 2x1 Gbps, or 10 Gbps
 - Bi-directional (handle more than 2 streams)
 - and etc.



uv-0.3.9.4 over 32-bit Linux box
is available at
(<http://www.gloriad-kr.org/hdtv>)

uvCast configuration



uvCast applied

- iGrid 2005 (Robot performance)



uvCast applied

- DancingQ 2006 (Dancing performance)



uvCast applied

- ELSA 2006 pre-congress (Live liver surgery)



uvCast applied

- 2008 CTnet (Networked performance)

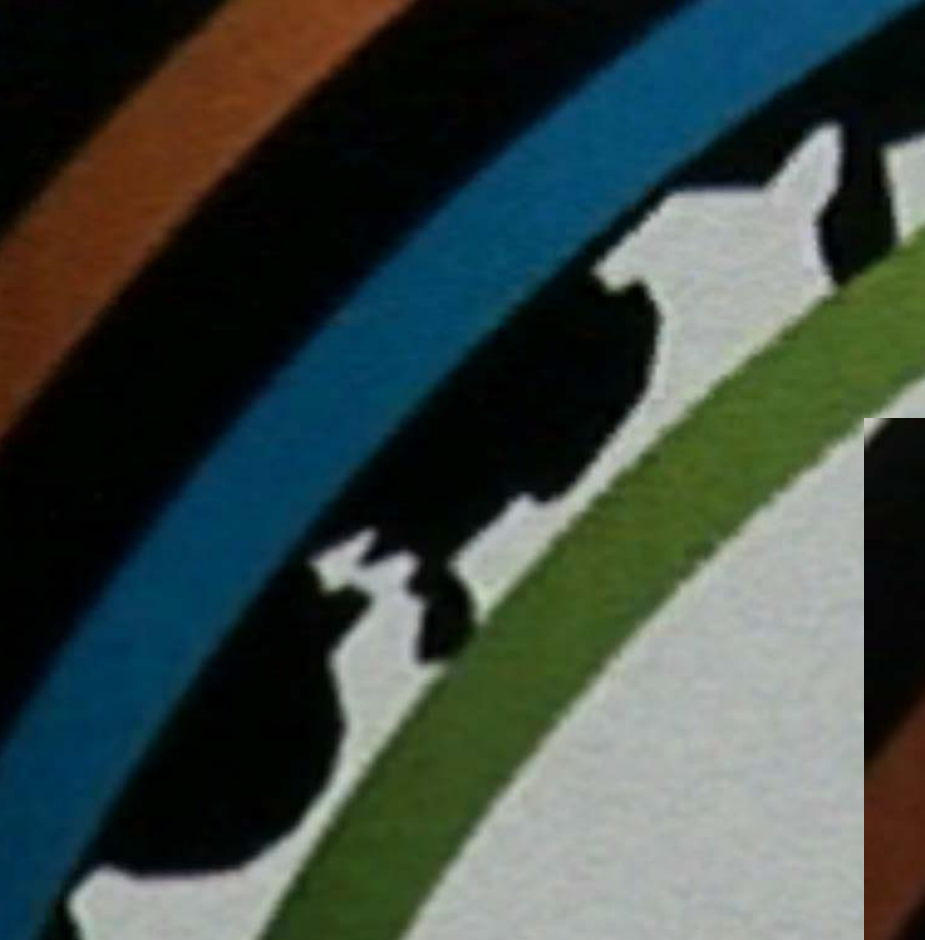


dxtCast

dxtCast

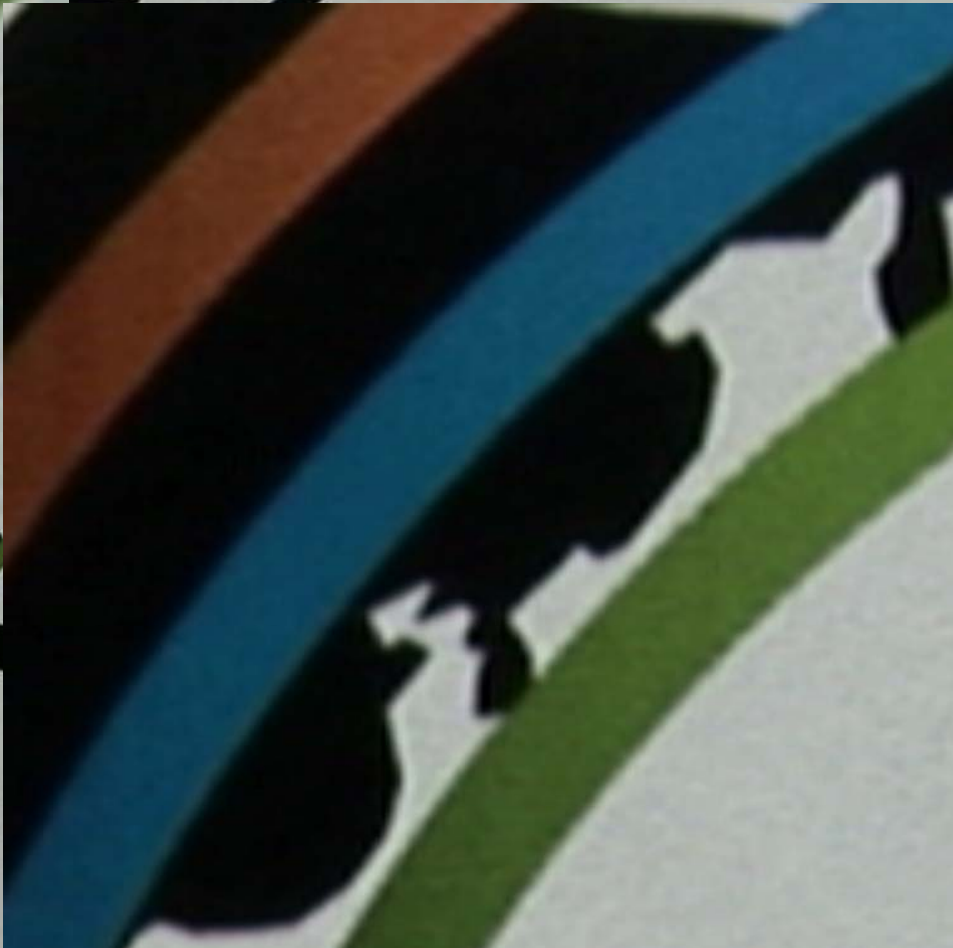
“Pie in the sky for those who have only 1 Gbps access”

- Lightweight compression
 - 260 Mbps including audio. FastDXT (EVL), GL Rendering (CESNET)
- Features
 - Accept **RGBA**
 - Single threaded compression **with FastDXT (SSE2)**
 - **16% CPU utilization.**
 - Very vulnerable to system load
 - CUDA, instead of FastDXT (on-going)
 - * Scalar ver (C/C++ implementation) : Extremely high system load.
 - 2-channel 16-bit audio for **Linux ALSA**
 - **Pixel read-back** with off-screen rendering
 - HDTV out



ONET

KRE



stereoCast

Feel more sense-of-presence?

- Year 2005, Dual beamers
 - Frame-sequential, MPEG2 MP@HL, first demo.
- Year 2008, Ready to accept stereoscopic HD signal
 - Commodity display machines from MiraCube, Hyundai IT, Samsung, and etc

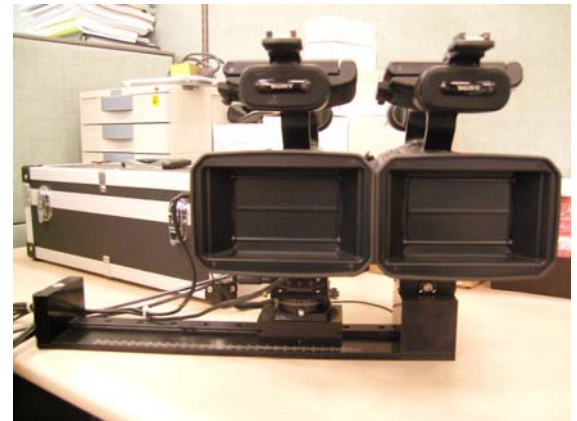
stereoCast

- Features

- Accept **side-by-side** (standard, HW | SW multiplexing) and **horizontal line interleaved** (non-standard, HW)
- Uncompressed or Light-weight compressed at this moment
- **Passive (glass-type) stereo**

- 1st phase

- Commercial hardware
- HD synchronizer & stereoscopic display (**circular polarization**)



Stereoscopic multiplexer

stereoCast

- 2nd phase (on-going)
 - Fully software-based (OpenGL)
 - Multiplexing (image decimation & merge)
 - De-multiplexing (segment & interpolation)

