



HQ video workshop

TERENA TF-VVC act.area H
@ SURFnet, nov. 7 2005



Agenda

- **10.00 Intro & Goals of the workshop**
 - 10.15 Review of last workshop**
 - 10.30 Overview of past / ongoing activities/projects of participants**
 - 11.30 HD over IP**
 - available systems
 - demonstrations
 - do it yourself/hands on
 - HD wiki
 - 13.00 Lunch**
- **14.00 DV over IP**
 - available systems
 - demonstrations
 - do it yourself/hands on
 - 15.30 MPEG related streaming and conferencing**
 - MPEG-2
 - MPEG4/H.264
 - demonstrations
 - 16.30 Discussion what to do next**
 - TF-VVC activities
 - collaborating in experiments/demos
 - activity area H
 - other technical developments
 - plans/future projects of participants
 - 17.00 Closing**
 - review of goals
 - conclusion



Intro & Goals

- Disseminate knowledge
 - What's available out there
 - What are others doing
 - Where to go for help
- Hands on/learn to work with it
 - HD capturing
 - Compressed HD over IP streaming
 - DV over IP
- Set up experiments
 - Let's do it together



Review of last workshop

- 26 June 2001 @ University of Edinburgh
- Report: <http://www.terena.nl/tech/archive/tf-stream/high-quality.pdf>
- Technology interest: MJPEG, MPEG-2 (hw codecs), H.323 (H.263), migration ATM to IP

• HQ =

	Low Quality	High Quality	Very High Quality
Edinburgh <i>video conferencing</i>	/	S-VHS, latency <50 msec MPEG-2 12 Mbps > CellStack 15 Mbps > vc and streaming for studio environment	HDTV compressed 50 Mbps
<i>streaming</i>	/	Desktop CIF 400+ Kbps	/
Glasgow <i>video conferencing</i>	/	MPEG-1 and MPEG-2, 2-4 Mbps, latency <50 msec	HDTV compressed 50 Mbps
<i>streaming</i>	/	CIF 500+ Kbps	4CIF + CD Audio 4 Mbps
RedIRIS <i>video conferencing</i>	/	MPEG-2 12 Mbps>	/
<i>streaming</i>	/	MPEG-1 3Mbps>	/
SURFnet	/	H.261 - H.263 384+	MPEG-2
<i>video conferencing</i>		latency <250 msec	VR: HDTV * 4 (??) latency <10 msec
<i>streaming</i>	/	MPEG-2 4Mbps>	/
HEAnet <i>video conferencing</i>	/	MPEG-2 4Mbps> latency <50 msec	MPEG-2 15-20 Mbps
<i>streaming</i>	22 Kbps	CIF 800 Kbps>	/
FUNET <i>video conferencing</i>	/	576 lines (half D1) MPEG-2 2 Mbps>	medium, MPEG-1
<i>streaming</i>	/	idem - full screen	Real 800 Mbps>
Geneva <i>video conferencing</i>	/	MPEG-2 10-15 Mbps latency <100 msec	/
<i>streaming</i>	/	/	/



Activities/projects of participants

- [each participant gives short oral presentation of their/institutes' experience and interest]



HD over IP

- Intro
 - HD
 - Definition: “everything > SD” ?
 - Formats: 720p, 1080i and the rest
- Essential resources
 - RC/Internet2 bigvideo mailinglist
 - HD wiki (see other presentation)
- Available SW/HW systems
- Needed equipment
- Demonstration
- Do it yourself/handson

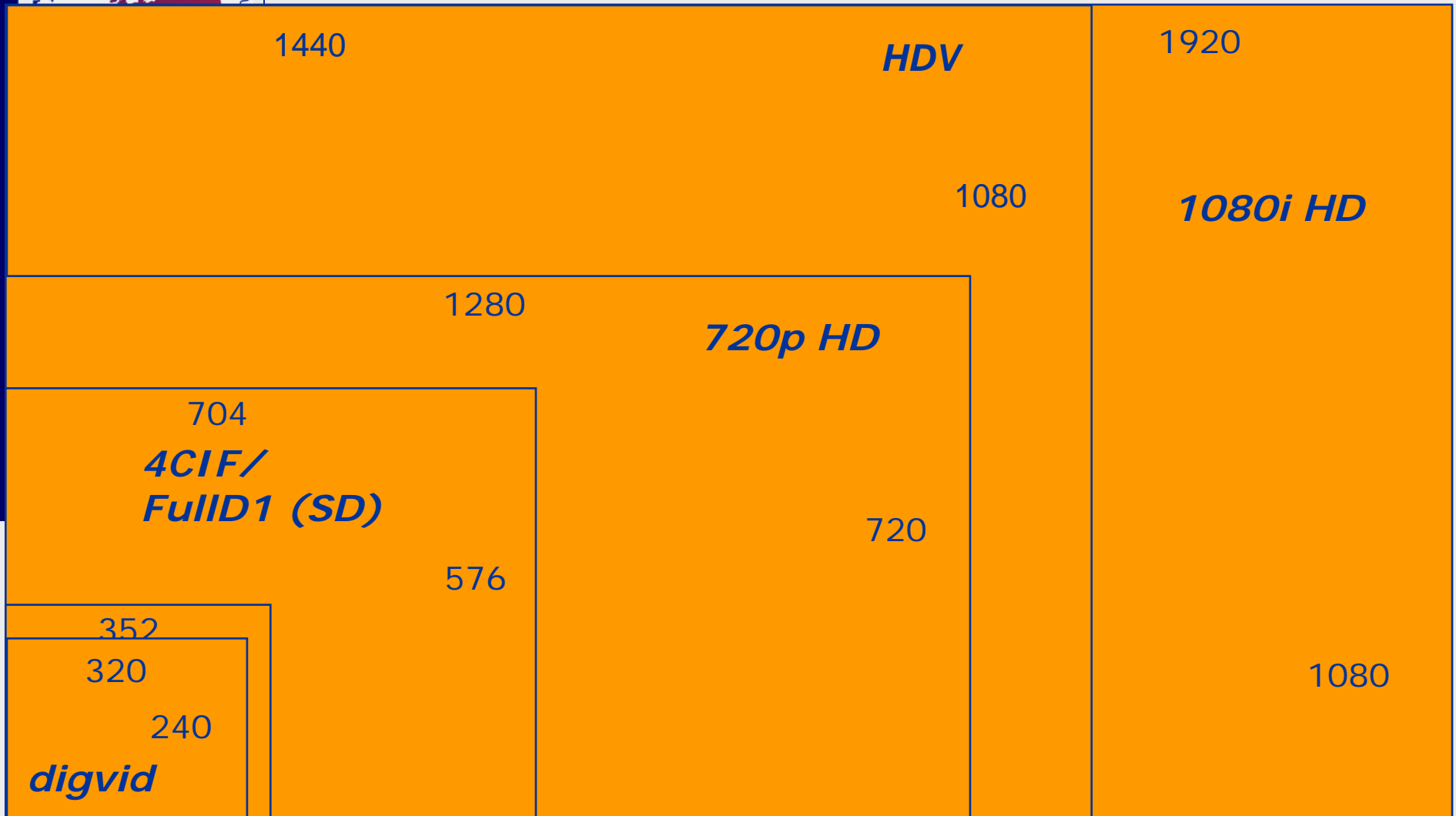


HD formats

Resolution	Aspect ratio	Interlaced frames per second (fps)	Progressive fps
1280 x 720	16:9		23.976, 24, 29.97, 30, 59.94, 60
1920 x 1080	16:9	25 (50i), 29.97 (59.94i), 30 (60i)	23.976, 24, 29.97, 30

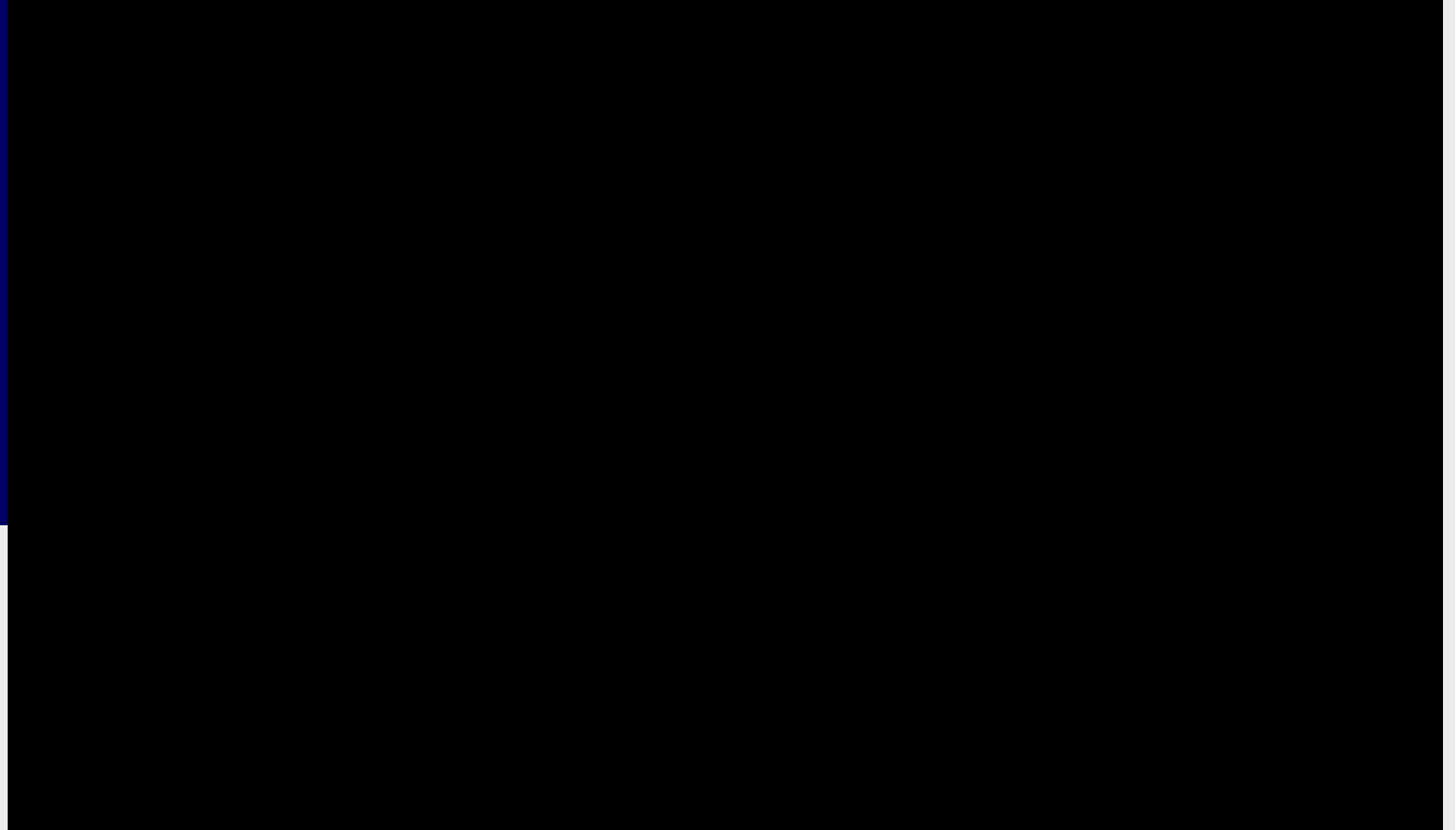


HD video size





Format examples





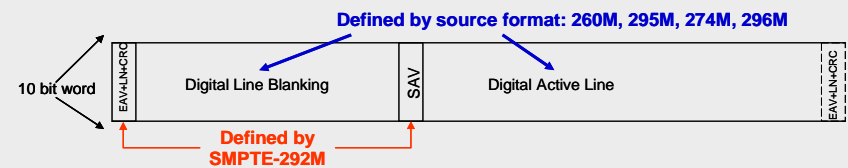
HDTV & High Definition Video (Cont.)

Light Compression for Transporting Contribution-Quality HDTV

- Panasonic (HD D-5, DVCPRO HD), JVC (D9-HD), and Sony (HDCAM): DCT-based I-frame only 100 ~ 235 Mbps
- SONY HDCAM Compressed (143 Mbps video over 270 Mbps SMPTE305M SDTI interface)
- HDCAM SR (Superior Resolution) by MPEG-4 SP (studio profile) compressed around 600Mbps (440Mbps video + uncompressed audio (12) / metadata)
- Uncompressed HDTV (1.5 Gbps via SMPTE292M HD-SDI interface)

- <http://videoexpert.home.att.net/artic3/262hdvr.htm>

Compressed Recorded Data rate	Format	Resolution	Production Type
140 Mbps	CineAlta 24P/30P HDCAM 60i	HD	Highest Level Production Mainstream HD Workhorse
90 Mbps	DVW 4:2:2 10-Bit	SD	Highest SD Production
50 Mbps	IMX 4:2:2 8-Bit	SD	High-end SD Production MPEG IMX Platform
18 Mbps	DNW 4:2:2 8-Bit	SD	Broadcast News MPEG-Based



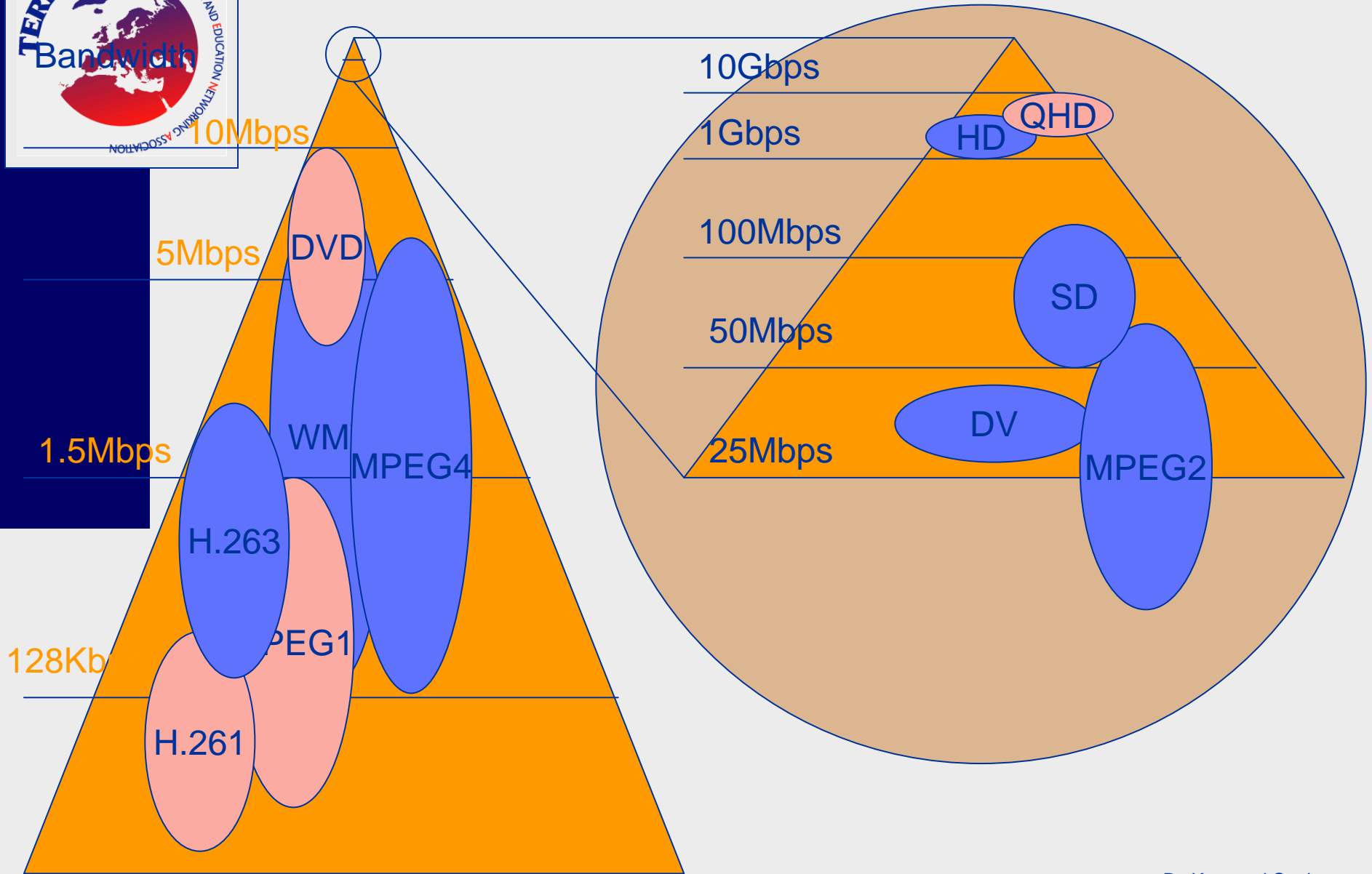


HDTV & High Definition Video

- HDTV: MPEG-2 Compressed
 - MP@HL, 19.2Mbps MPEG-2 stream
 - Note: SONY MPEG IMX for SD video: 50Mbps I-frame only MPEG-2 4:2:2P@ML
 - HDTV over IP: MPEG-2 TS/PS stream over RTP/UDP/IP
 - Stored (D-VTR, file from disk), Live (HDV Camcoders: JVC), and Broadcasted (HD Reception card)



Video Streaming Over the Network





HDoIP Available SW/HW systems

- See [WIKI](#) !
- Uncompressed/SMPTE292M based (1.5 Gb/s)
- Compressed/Sub1Gbps
 - Korean developments
 - ...
- SDTi (HD SDI @ 270 mb/s)
 - Sony/Evertz gear
 - ResearchChannel
 - ...
- Compressed
 - HDV (MPEG-2 TS @ 20 mb/s)
 - MPEG-2 HD (TS @ 15-20 mb/s)
 - WMV HD (@8-10 mb/s)
 - MPEG-4 H264/AVC ??



Uncompressed HD Available systems

- ResearchChannel
 - <http://www.researchchannel.org/>
- UltraGrid
 - <http://ultragrid.east.isi.edu/>
- NTT iVisto
 - <http://www.i-visto.com/>
- ...



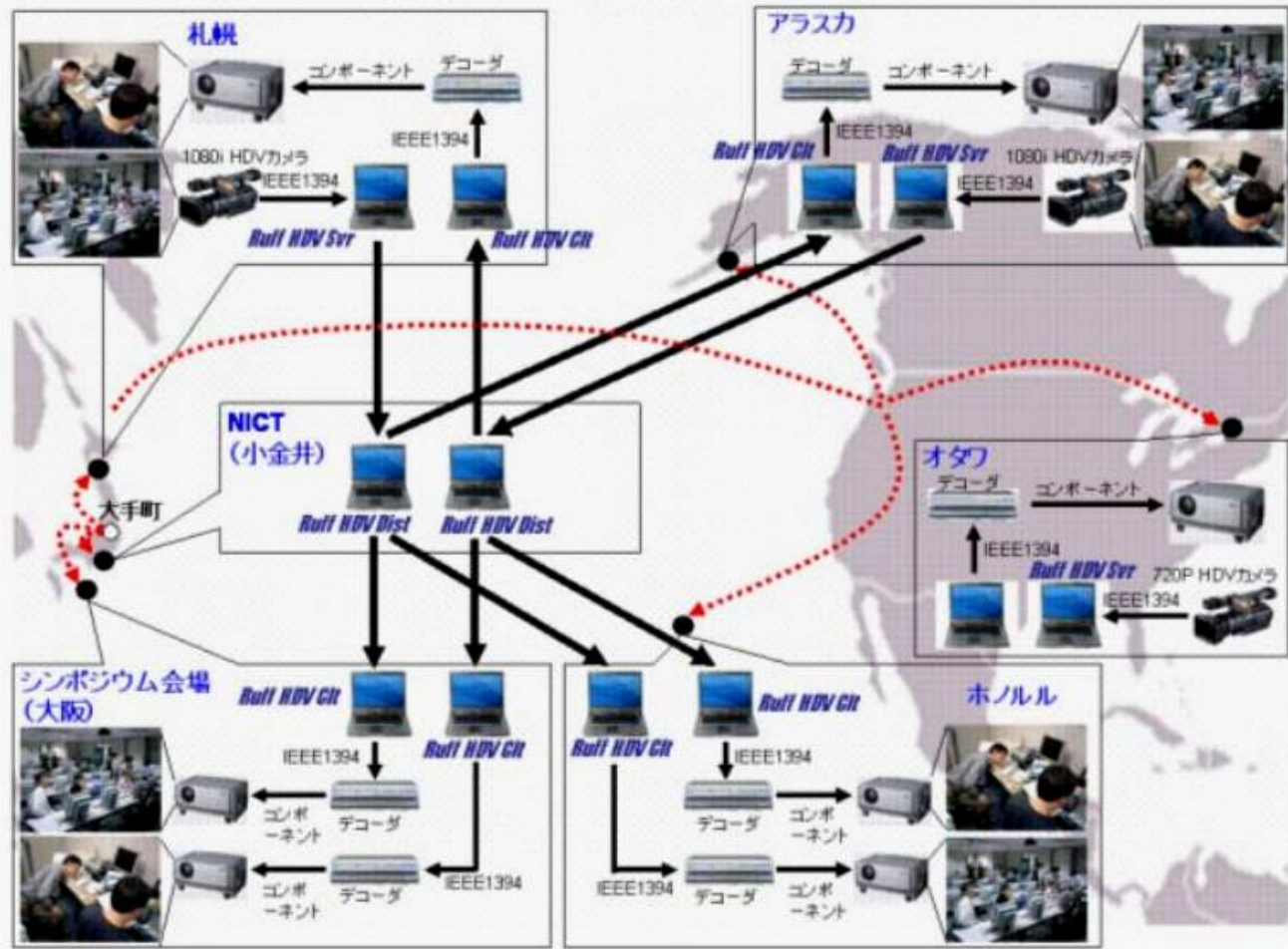
HDoIP Available SW/HW systems

- See WIKI !
- Uncompressed/SMPTE292M based (1.5 Gb/s)
- Compressed/Sub1Gbps
 - [Korean developments \(GIST\)](#)
 - ...
- SDTi (HD SDI @ 270 mb/s)
 - Sony/Evertz gear
 - ResearchChannel
 - ...
- Compressed
 - HDV (MPEG-2 TS @ 20 mb/s)
 - MPEG-2 HD (TS @ 15-20 mb/s)
 - WMV HD (@8-10 mb/s)
 - MPEG-4 H264/AVC ??



HDV conferencing

- RUFFsystems
- (I only have fax, no online info)





HDV conferencing

- Videolan



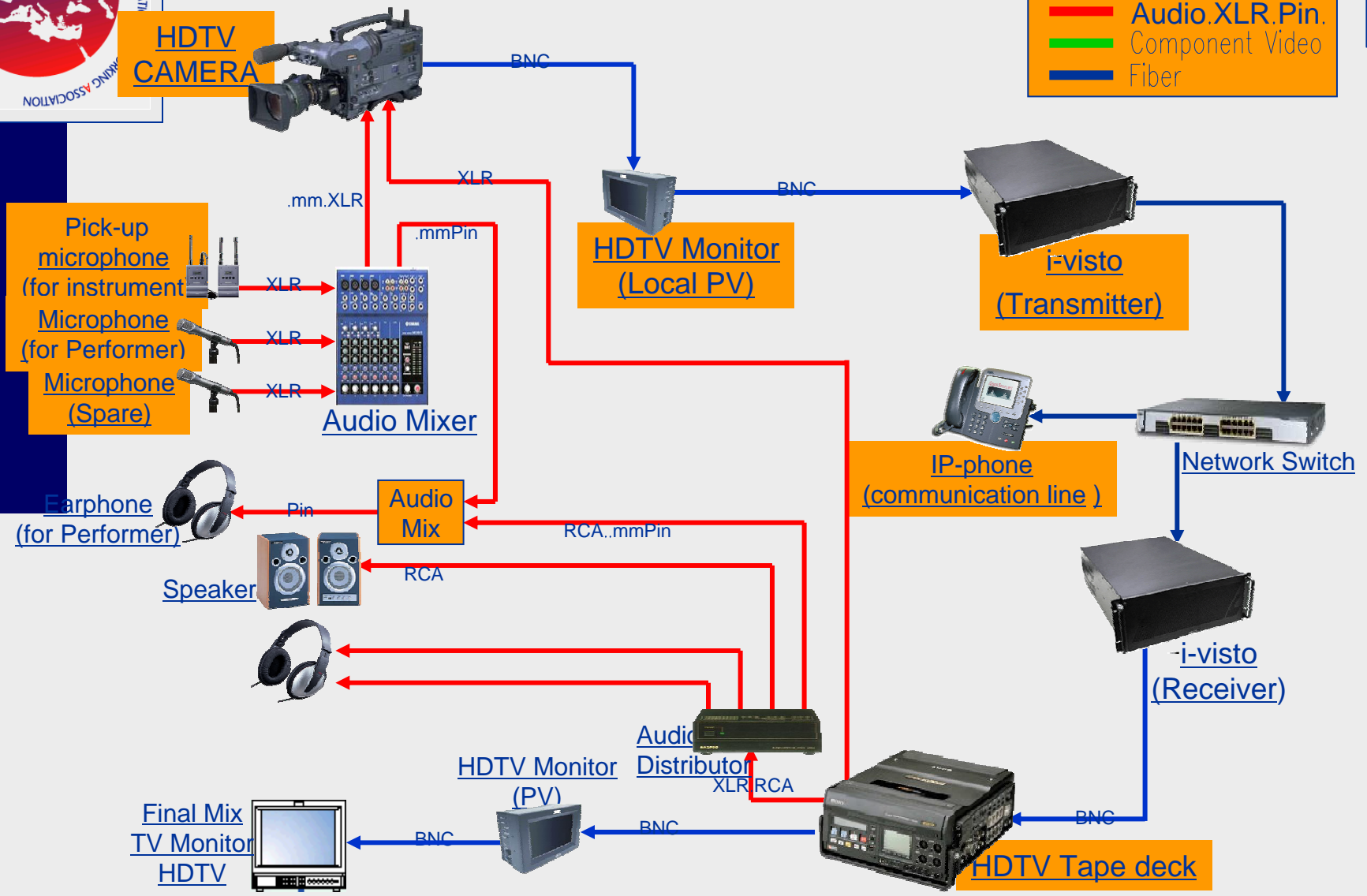
HDoIP Needed equipment

- Camera
- Audio
- Converter
 - To HDSDI
 - To others
- Capture
- Encoder
- Packetizer/Depacketizer (see “available systems”)
- Decoder
 - Settop box
 - PC
- Converter
- Audio
- Display



Equipment for Uncompressed HD for worldexhibit Japan 2005

	HD-SDI
	Audio: XLR, Pin, Component Video
	Component Video
	Fiber





Access Grid with HDV

AG Retreat 2004, Toronto, Canada



Ministry of MOST @ KISTI



HD content



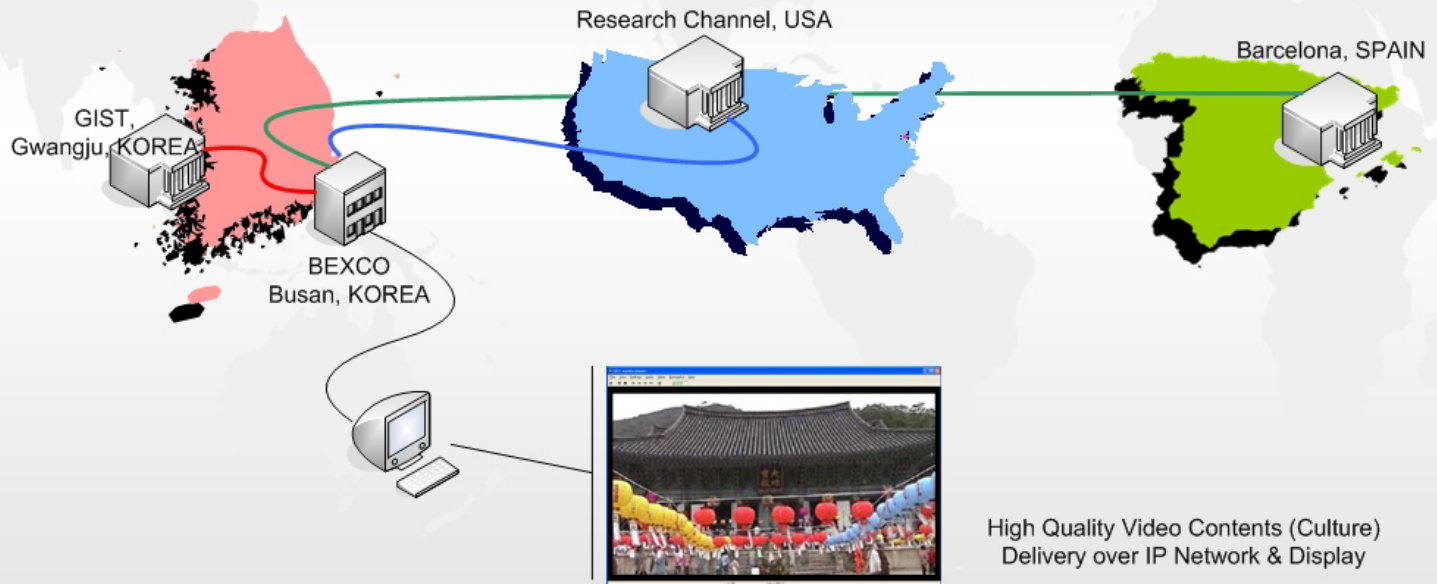
'Buddha on the Net'



HD Contents



HD Culture Video





HD contents

- <http://hdtv.nm.gist.ac.kr/v2/main.php>
- <http://www.researchchannel.org/desktop-ihdtv/index.html>
- <http://videolan.i2cat.net/videolan/hd192.html>



DV over IP

- Intro
- Available systems
 - DVTS ([see other presentation](#))
- Demonstration
- Do it yourself/hands on



AG with DV

VP
Control

AARNet

Richard Leow

Sydney Vslab

Prometheus GrangeNet

Default Site

- ANU



Other issues

- Latency
 - DV vs MPEG (incl. HDV)
- SARA iGrid2005 demo
 - vs QHD



MPEG related streaming and conferencing

- MPEG-2
 - Hw
 - Sw
- MPEG-4 H.264/AVC
 - Hw
 - Sw



What's next

- TF-VVC activities
 - activity area H
 - HD wiki
 - SIP for HD
 - collaborate in experiments/demos
- other technical developments
 - Join bigvideo mailinglist
 - Participate in experiments
- plans/future projects of participants



Review of goals

- Disseminate knowledge
 - What's available out there
 - What are others doing
 - Where to go for help
- Hands on/learn to work with it
 - HD capturing
 - Compressed HD over IP streaming
 - DV over IP
- Set up experiments
 - Let's do it together



Links

<http://www.aja.com/>
<http://www.blackmagic-design.com/>

- HDV editing (beware, not all do it natively!):
 - pinnacle liquid edition ; pinnacle Studio Plus version 10 (of studio mediasuite version 10)
canopus edius
Adobe Premiere Pro + cineform aspect HD
MPEG Edit Studio Pro 1.0 LE from KDDI R&D Labs of Japan
Sony Vegas Video + cineform aspect HD
Ulead MediaStudio Pro 8
Ulead VideoStudio 9
 - Capture met CapDVHS
<<http://home.earthlink.net/~weathersix/other.htm>>
Manual
<<http://hdvforever.com/hdv/hdrhc1/freecapture/default.htm>>
Edit with Wings (+ support modules)
<<http://www.stumpfl.com/common/index.php?load=products.php&language=english&select=Products&auth=&session=1130615217&cat=mi&folder=109&product=118>>
- Example of HD Settopbox: Amino 120 <http://www.aminocom.com/>
- HD over IP channel in NL: <http://www.firstmovertv.nl/>
- Virtual studio software: Serious Magic Visual Communicator and Ultra2:
<http://www.seriousmagic.com/>