



- three continent networked music and dance performance -
Barcelona(ES)-Salvador(BR)-ChiangMai(TH)-Daejeon(KR)

Draft Ver. 0.9

Feb 8th, 2012

APAN e-Culture WG

Introduction

- During the APAN 2012 congress, there will be a Live Music and Dance performance with interactive participation of people and organizations in three different continents / four sites: Chiang Mai/Thailand, Barcelona/Spain, Salvador/Brazil and Daejeon/Korea. The full shot of the main stage at Chiang Mai will be streamed to KISTI/Korea in real time.

Information

Date: Tuesday, 14 Feb 2012

Time: 17:00 (Chiang Mai) | 11:00 (Barcelona) | 8:00 (Salvador) | 19:00 (Daejeon)

Venue: APAN 2012 Main auditorium (Same as the APAN 2012 Opening Plenary)

Performance Infrastructure

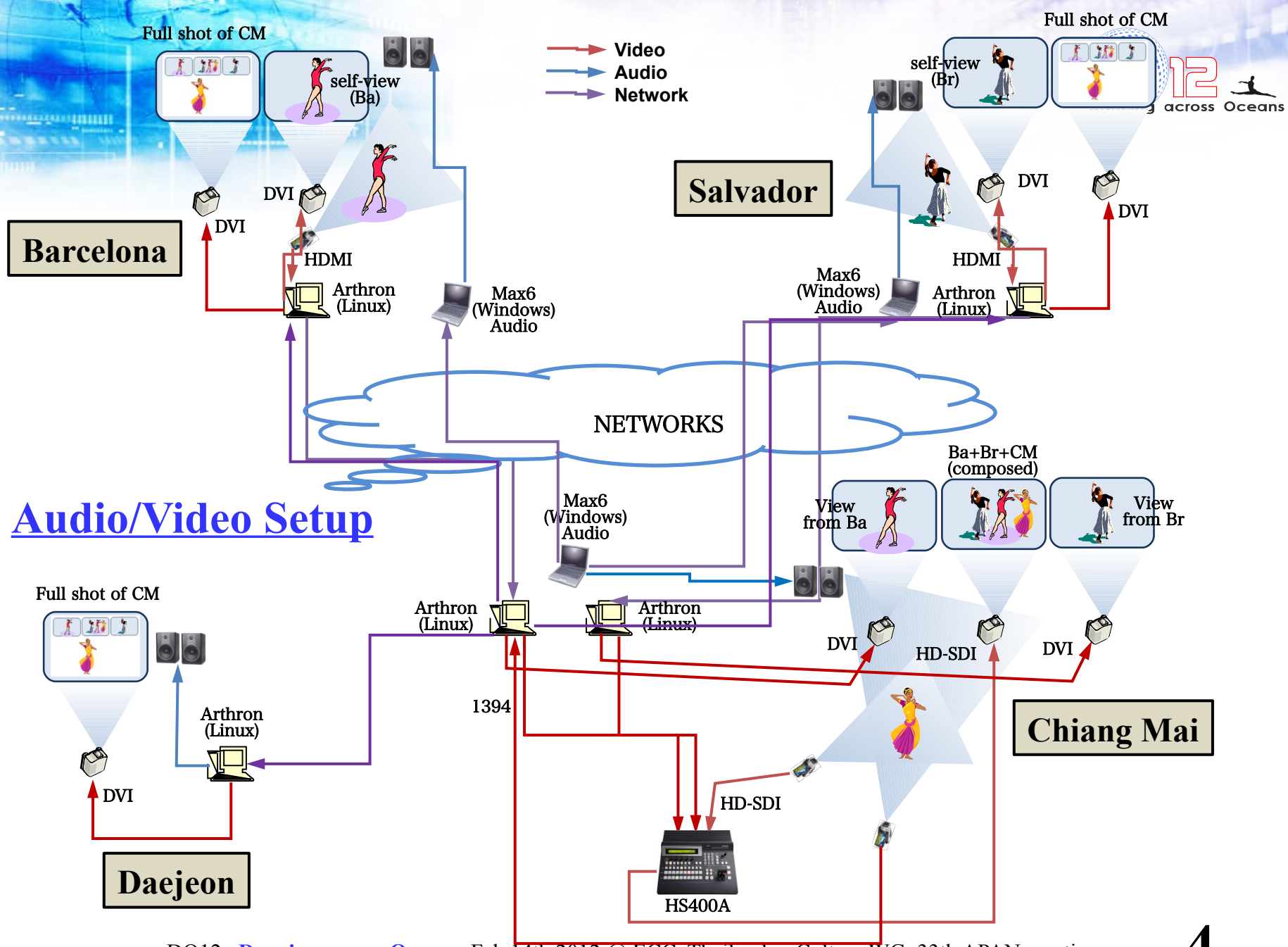
- As the performance includes live interaction of dancers and audience in the four venues (*endpoints*) - Chiang Mai, Barcelona, Salvador and Daejeon - the network infrastructure must support the video applications requirements for live transmission of HD audio and video streams.

Monitoring

- All *endpoints* must have in their connections monitoring of their respective network performance and monitoring of the multimedia applications.

Network Endpoints

- Barcelona : Konic / i2cat
- Chiang Mai : APAN main auditorium
- Salvador : Ivani Lab, LAViD Lab, RNP PoP-BA, RNP PoP-RJ
- Daejeon : KISTI



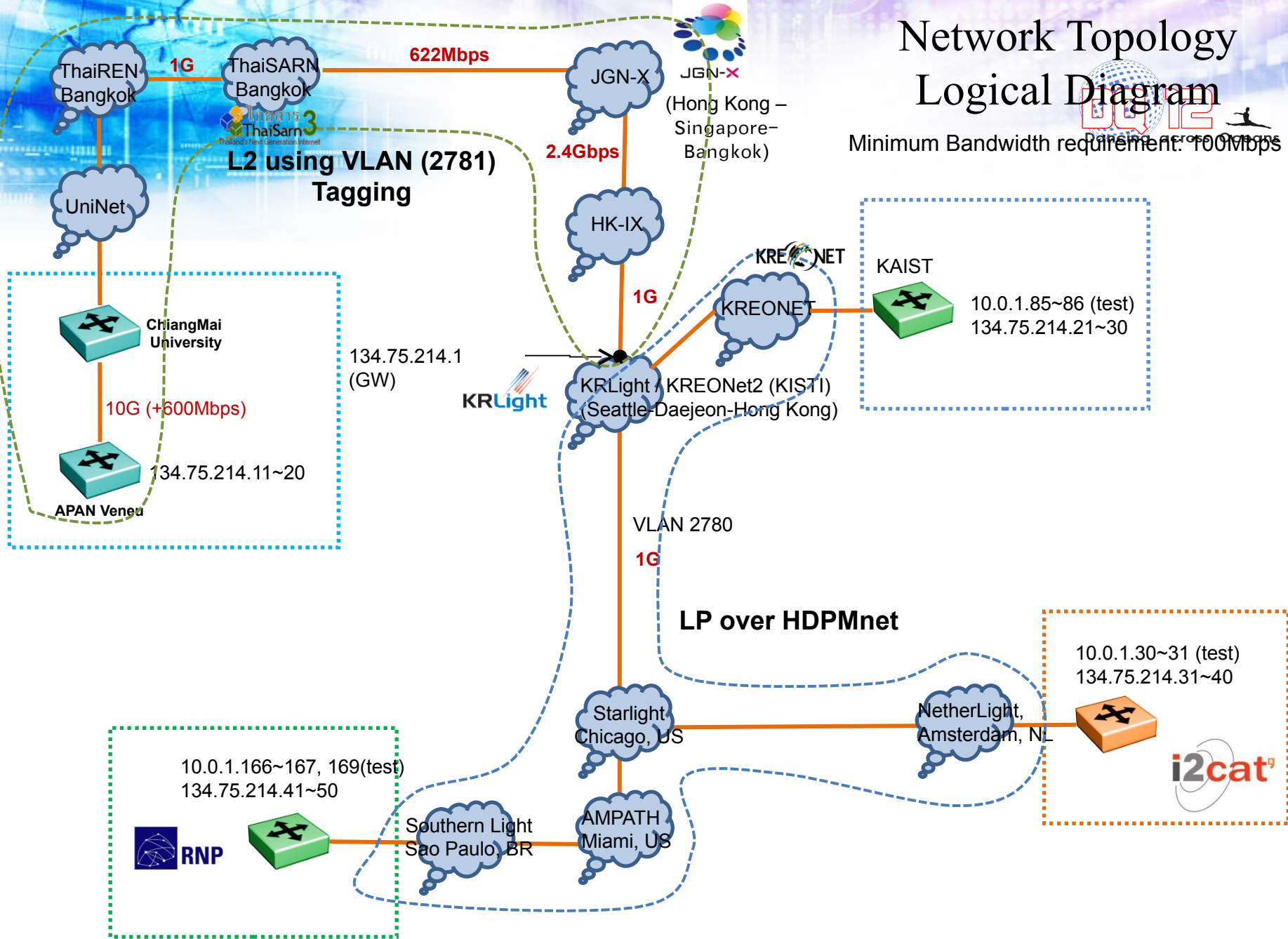
Network Infrastructure



Endpoints		Network	VLAN ID	IP Address
Barcelona(Spain)	Kònic			10.0.1.30 = Test host Kònic 10.0.1.31 = Test host Kònic
Chiang Mai(Thailand)	APAN Venue			
	ThaiREN			202.28.194.4
Daejeon(Korea)	KAIST	HPDMnet	2780	10.0.1.85 = A/V System KAIST 10.0.1.86 = A/V System KAIST
	KISTI	HPDMnet	2780	IP range: 10.0.1.80 - 10.0.1.89 10.0.1.81 = HPDMnet Test Server KIST
	KRLight	HPDMnet	2780	10.0.1.87 = KRLight interface
Salvador(Brazil)	Ivani Lab	HPDMnet	2712	10.0.1.162 = MAX6 (A/V host) 10.0.1.163 = Encoder (A/V Camera) 10.0.1.165 = Articulador (A/V Flux mgr.) 10.0.1.166 = VC equip. 10.0.1.167 = Ivani's notebook (Test host) 10.0.1.168 = Switch ASGA
				IP range: 10.0.1.160 – 10.0.1.169/24 Multicast: 233.3.50.160 – 233.3.50.169
	LAViD Lab	HPDMnet	2712	10.0.1.169 = Test / A/V Host
	RNP PoP-BA	HPDMnet	2712	10.0.1.164 = Backbone (for tests)
	RNP PoP-SP	HPDMnet	2712	10.0.1.161 = Backbone (for tests)
Miami(US)	AMPATH	HPDMnet	2712	10.0.1.160 = Backbone (for tests)

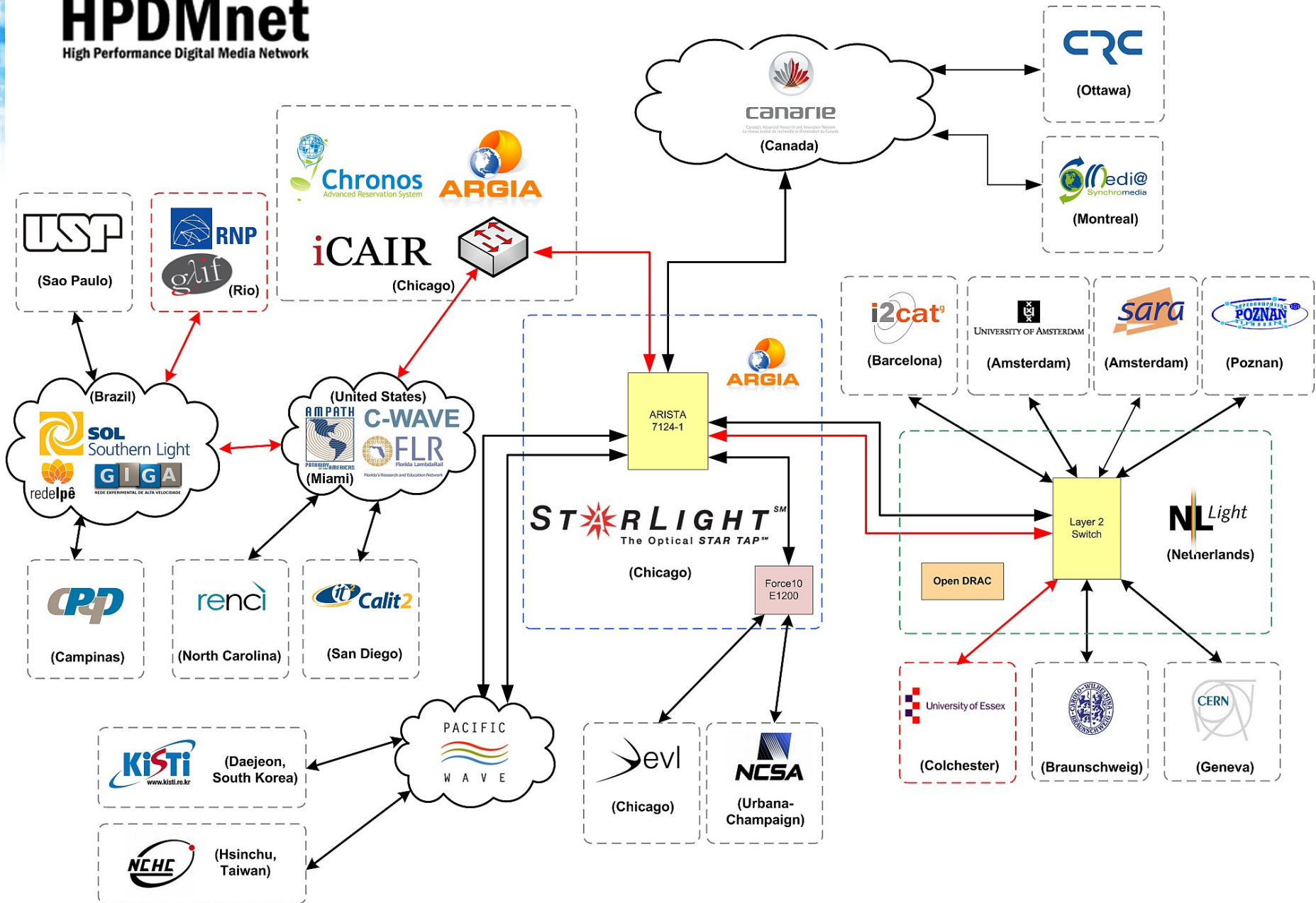
Network Topology Logical Diagram

Minimum Bandwidth requirement: 100Mbps



HPDMnet

High Performance Digital Media Network



Software : Arthron

Arthron was developed to assist the execution of artistic performances that make use of multimedia representations and real time sharing of real and virtual spaces. In this context, Arthron was used in the domain of research and development in Art and Technology, as well as in artistic presentations like Versus, In ToQue and e-Pormundos Afeto events.. Arthron's main functionality is the simple and direct interface, designed for the manipulation of different sources and streams of media (audio and video) simultaneously. This way the user can remotely add, remove and configure the presentation format as well as schedule the streams of media in time and space during an event.

Arthron is composed of six main components: Articulator, Encoder, Decoder, Reflector, VideoServer and MapManager. The Articulator is responsible for the remote management of the other components, concentrating a great part of the Arthron functionalities such as stream scheduling (manual or automatic, via the creations of different scenarios), network monitoring and measurement, remote configuration of other modules, access control, automatic generation of a web page for online publication of low definition videos, addition of several video effects, chat for communication between the components and much more. The Encoder is responsible for the capture and encoding (when necessary) of the media source, which can be external (DV or HDV camera, DVD, etc) or internal (a local file). The Decoder's main functionality is to decode and display the media stream in a specific device (monitor, projector, etc). The Reflector is responsible for the replication and redistribution of a media stream over the network. The VideoServer is able to transcode the media streams that will be published online, being able to transcode to the flv, ogg and h264 formats. The MapManager controls and displays the interactive map of the Arthron components. All streams can be generated in geographically distributed locations.

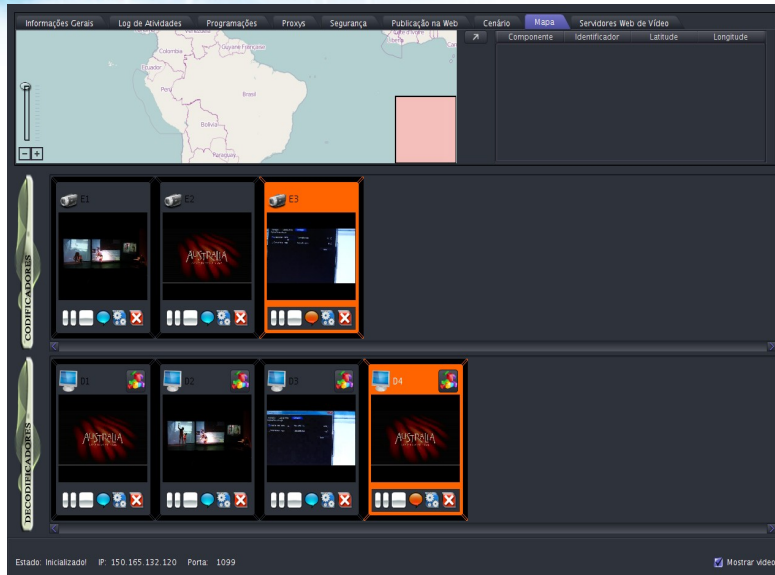


Fig. A : Arthron's Articulator main screen

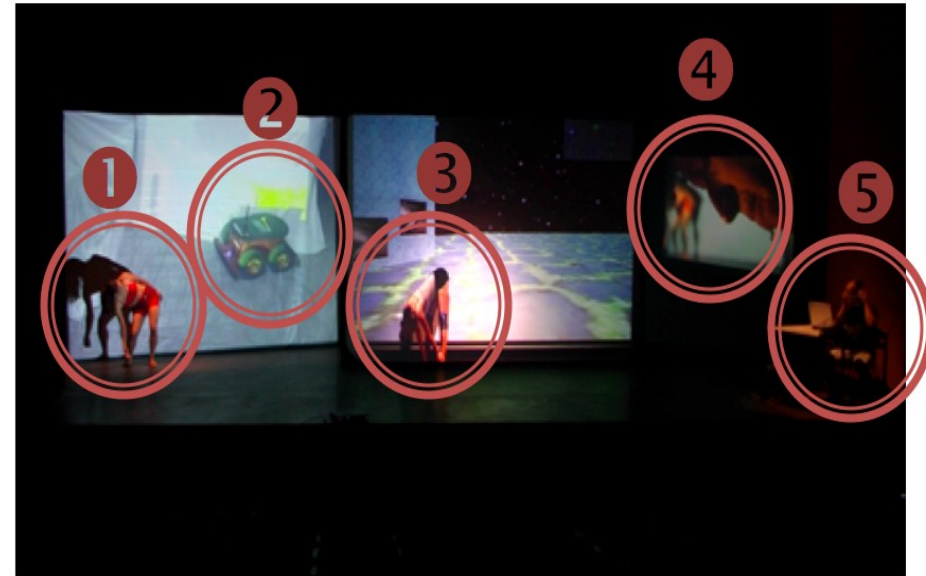


Fig. B : Elements of the e-Pormundos Afeto event, on the stage of the Dragão do Mar theater

In Figure B we can see a general overview of the objects in scene during the show. The dancer located inside the Dragão do Mar Theater, in Fortaleza, can be seen in (1). The central screen that receives the video stream of the dancer from Barcelona can be seen in (3). On the left screen(2) is shown the video stream generated by the robot Galateia, from the NatalNet laboratory. On the right screen (4) is the video sent to the internet and several people could watch online, inside the GTMDA website. In (5) we can see the musician located in Fortaleza.



System module where the user can visualize the states (scenarios) and configure events



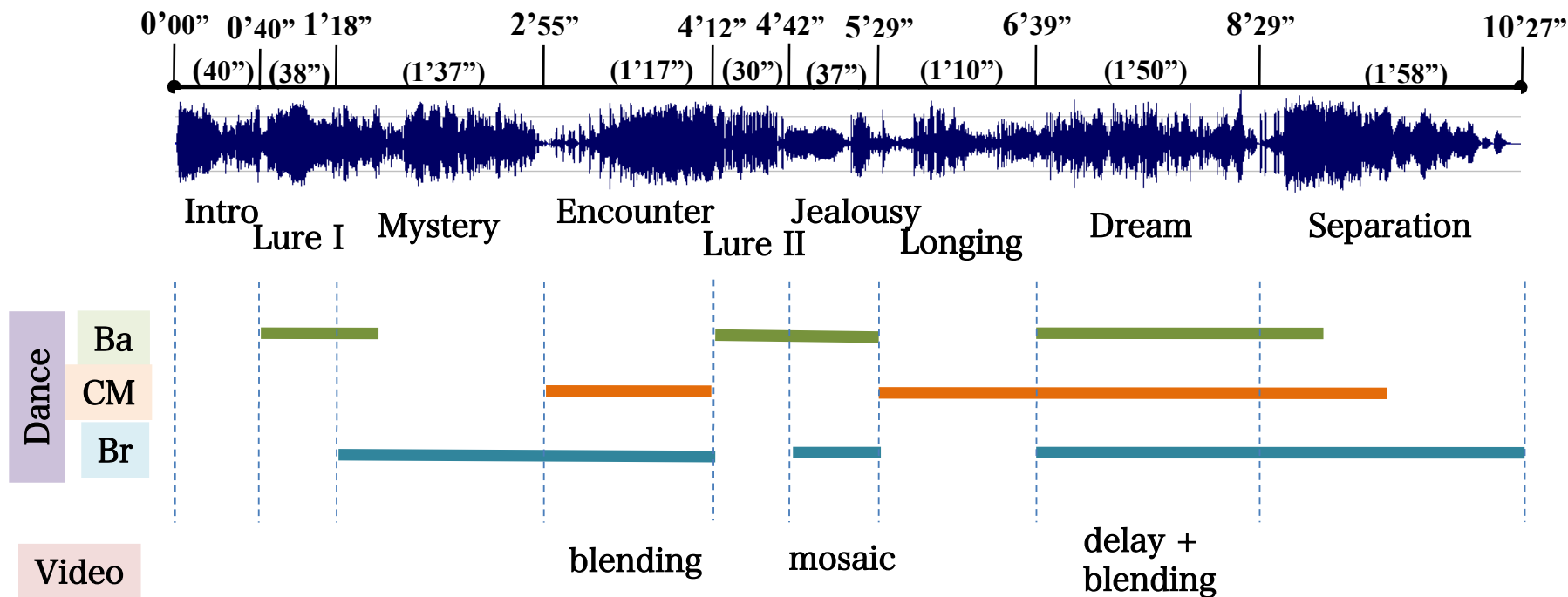
- Automatically generated web page of the transmission of a specific Decoder




Images of the Versus show

The Plot of the music

Cyber World, now the tools of the digital age give us to easily communicate with people on the other side of the world in new ways. New contacts create a new culture, new arts create new paradigm. Here, there are gestures from three locations meeting virtually and they are suddenly transferred to another space. Three points disperse and flock dreamily. Harbor your futuristic dream in the wide world while taking a cyberwalk with them.



TECHNOLOGICAL POETICS RESEARCH GROUP - DRA. IVANI SANTANA + Koniclab

	0'00"	0'40"	1'18"	2'55"	4'12"	4'42"	5'29"	6'39"	8'29"	10'27"
tempos moods places	40" Intro	38" Lure I	1' 37" Mystery	1' 17" Enconter (<i>encontro</i>)	30" Lure II (<i>atrain 2</i>)	37" Jealousy (<i>ciúme</i>)	1'10" Longing (<i>desejo</i>)	1'50" Dream (<i>sonho</i>)	1'58" Separation (<i>separação</i>)	
SPAIN		Arms and hands choregraphy. Medium shot	Close-up Hands 		Mosaic body fragments. Close-up	Evolution Dance in fragments + signal Chiang Mai -Mosaic 3D		DancerTorso and spine + image deformation (3d convol.) Medium shot	dancer walking to the endless path. Long shot	
THAILAN D										
BRAZIL			abstract image from a part of the body and/or part of the face (part of the mouth) talking (without sound) = Camera shot: close up	the hand touching the other part of the body = Camera medium shot		dancer stands with his back to camera and with just slow head movement (video scenery behind him) = Camera full shot		the camera will capture the dancer image projected in a glass with water (illusion effect) = Camera shot: close up	dancer walking to the endless path (video scenery behind him) = Camera long shot	
MIXER VIDEO				blending		mosaic		delay + blending		

Remote Control for Music to synchronize audio and video from multi-sites

step 1 : measuring of RTT using OSC(Open Sound Control)

- sending a 'bang' signal from CM to Ba/Br
 - The arrived 'bang' signal returns to CM immediately.
 - measuring the RTT between started 'bang' and returned 'bang' at CM (fig.1)
- ※ It takes about 100ms like ping.

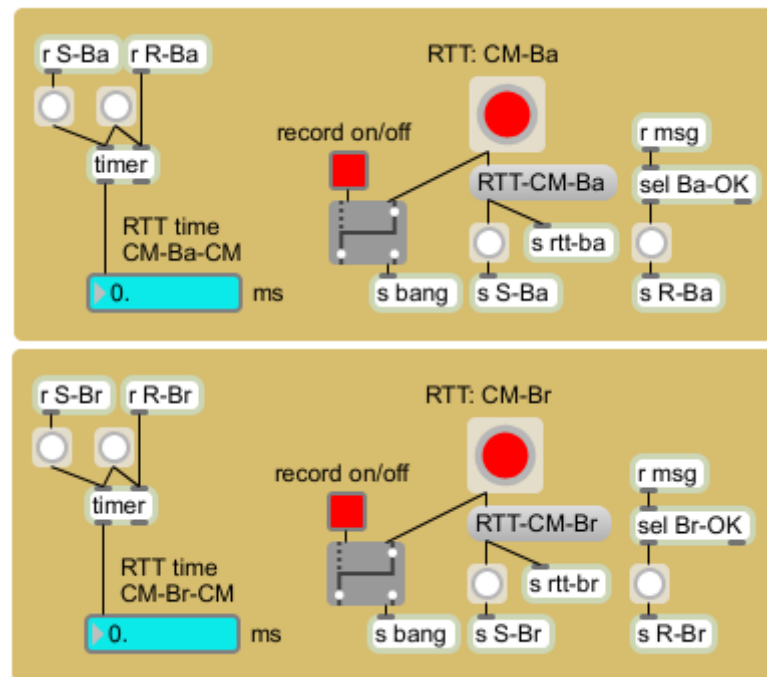


fig.1 RTT measuring

step 2 : measuring of delay time including latency through Arthron from each site Ba/Br to CM

- shooting the Max6 window with a camera connected to Arthron at Ba/Br (fig.2)
 - sending a 'bang' signal from CM to Ba/Br, at the same time, started the video recording with a webcam connected to Max6 machine at CM (fig.3)
 - When a 'bang' signal arrived at Ba/Br, the object in the Max6 window will blink in red.
 - The video recording at CM will continue until the red blinking on the video from Ba/Br is appears
 - calculating video frames from the start to red blinking, and then multiply 33(FPS: 30)
 - The actual delay time is {video delay time - (OSC RTT/2)}
- ※ I predict it will take around 1~2s according to codec.

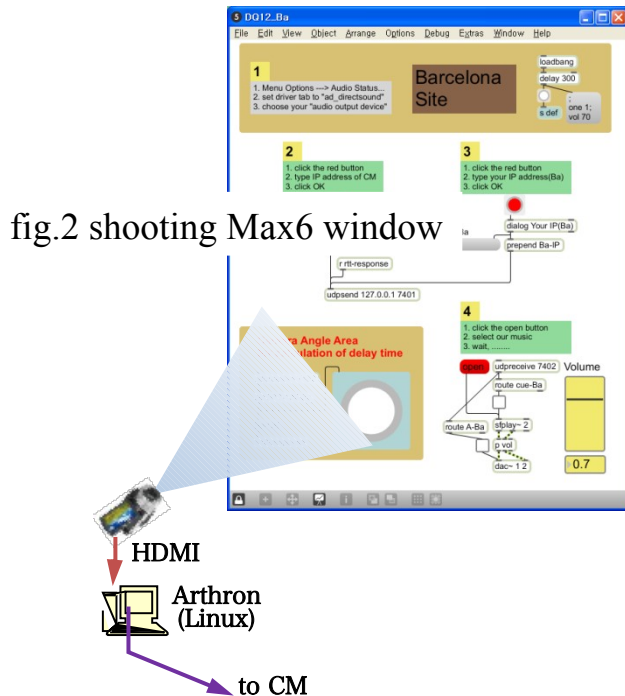
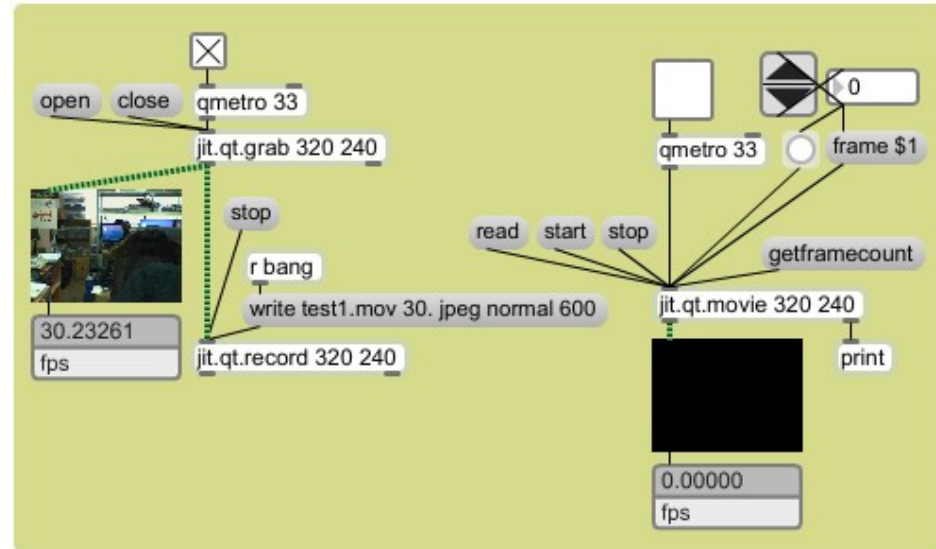


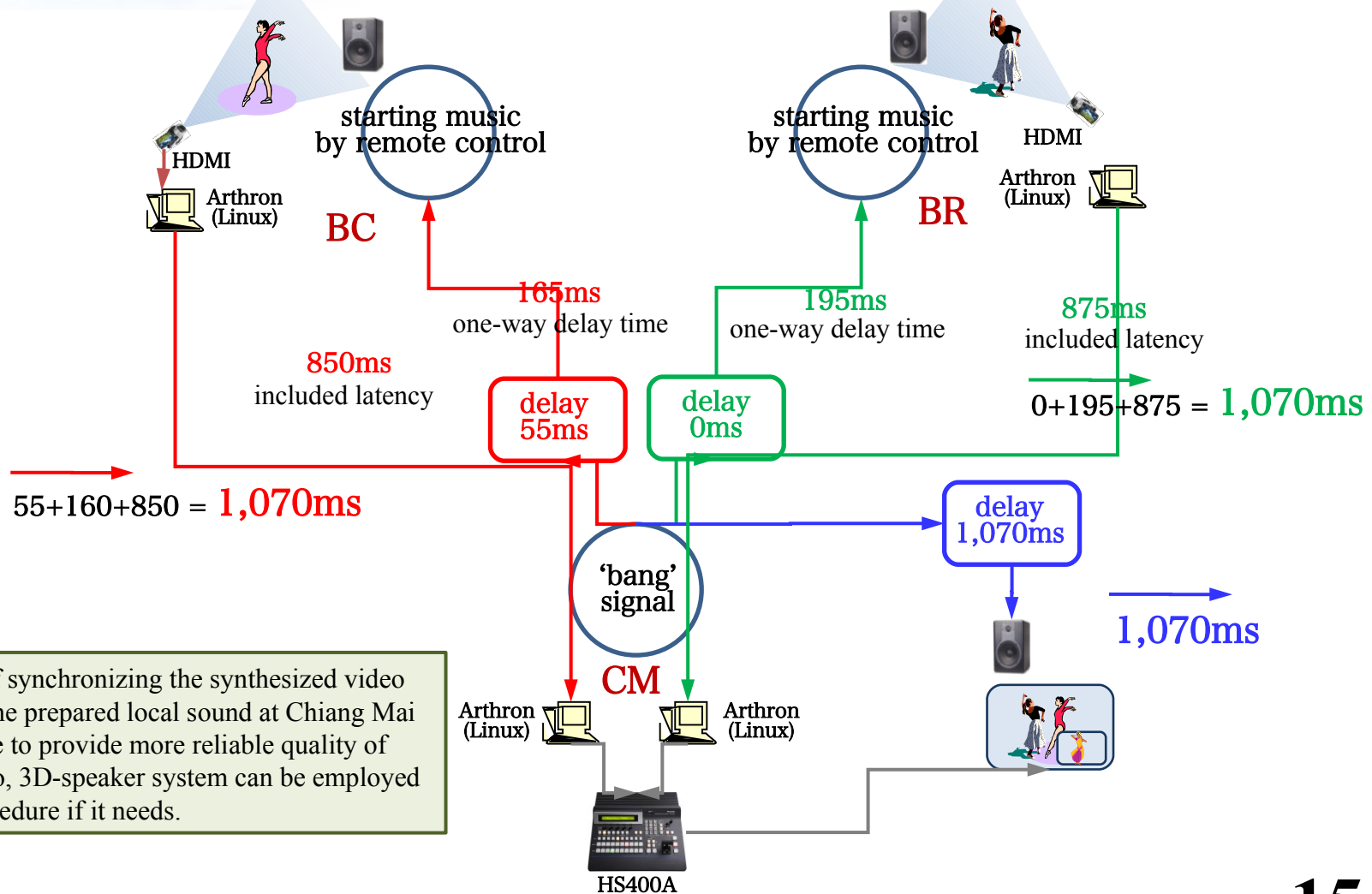
fig.3 recording arrived video from far-end site



Remote Control for Music to synchronize audio and video from multi-sites(cont')

step 3 : remote control of starting point of music at Ba/Br

- adjusting the delay time of each start signal sent to Ba/Br and of start signal for the local music which should be synchronized with receiving video from Ba and Br
- Finally, we can get synchronized audio and video all together between three sites.



The idea of synchronizing the synthesized video data with the prepared local sound at Chiang Mai will be able to provide more reliable quality of music. Also, 3D-speaker system can be employed on the procedure if it needs.

Participants (PD/Artist)

Organizer

- Faridah Noor Mohd. Noor | um/my
Chair of APAN e-Culture WG
<http://apan.net/wg/eculture.php>

Steering

- Dae Young Kim | cnu/kr
- Artur Serra | i2cat/es
- Michael Stanton | rnp/br
- Panjai Tantatsanawong | uninet/th

Support

- Patama | uninet/th, sec
- Jeffrey Withaya Campbell | culture360/tw, web
- Wichan Lertwipatrakul, uninet/th
- Elvis Silva, Victor Tavares, ufba/br

Artist

- BonCheol Goo | kaist/kr
- Rosa Sánchez | kònic/es
- Alain Baumann | kònic/es
- Ivani Santana | ufba/br
- ??? | /th

Audio/Video

- Andrew Howard | anu/au
- Seongtaek Lim | kaist/kr
- Fco. Javier Iglesias Gracia | i2cat/es
- Erick Melo | LAViD/br
- Sindolfo | LAViD/br
- Wutjanun M. (Nunny) | mu/th

Participants (Network)

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 - Takatoshi Ikeda
- **APAN-KR, KISTI** (Korea)
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 - Buseung Cho, bscho@kisti.re.kr (KISTI, KREONET/KREONet2/KRLight)
 - MinKi, Noh, mknoh@kisti.re.kr (KISTI, KREONET/KREONet2/KRLight)

Organizations

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i2Cat		Spain	
LAViD	Laboratório de Aplicações de Video Digital (UFPB)	Brazil	
RNP	Rede Nacional de Ensino e Pesquisa	Brazil	Rua Lauro Müller, 116 Room 1103 Botafogo 22290-906 Rio de Janeiro, RJ +55 21 2102-9660 - Tel. +55 21 2279-3731 - Fax.
UFBA	Universidade Federal da Bahia	Brazil	
		Thailand	

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