

Implementing a Videoconferencing Studio in Cape Verde to Support a Blended Learning Education System

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Abstract

In 2004, the Calouste Gulbenkian Foundation invited the University of Aveiro to develop an education and training program in advanced topics of ICT for Cape Verde. The focus should be on technologies to support the development of distance education. Two years later, when the program was started, the University of Aveiro had a high-performance videoconferencing Studio installed by the Foundation for National Scientific Computing. However, the investment to duplicate this high quality structure and operating costs were not compatible neither with the project's budget nor with the technological options available in Cape Verde. This paper demonstrates the decision-making process by an economically viable option to meet the needs and local peculiarities.

Keywords: b-learning; computer resources; e-resources; infrastructure; videoconferencing equipments

Introduction

The implementation of a videoconferencing studio in Cape Verde providing support for blended-learning system adopted as well as its use in the final examinations (jury's meeting) of the Masters in Multimedia in Education and in Didactics of Language (speciality of Portuguese as a second language) was the subject of this article.

These courses were developed in January 2006 by the University of Aveiro (Portugal) at the Institute for Higher Education (Cape Verde) funded by the Calouste Gulbenkian Foundation (FCG), (Ramos, 2005).

Its adoption allowed to reduce physical journeys and promoted greater professor-student interaction subverting the paradigms of the current teaching-learning university model, focused on theoretical classroom of little interaction or even the models purely based on virtual learning environments (VLE).

It is another technological possibility, although it's proper, correct, timely and effective manner of use becomes necessarily by didactic innovation actions, language modification and paradigm shift as well as standardization of procedures and professionalization in the development, production and generation of content.

This paper is part of the results from the project "The Applicability of Desktop Videoconferencing Systems over Broadband Networks to Support the b-learning Education System" funded by the Portuguese Foundation for Science and Technology (FCT) and European Social Fund (ESF), under the 3rd Community Support Framework, 2000-2006.

Network infrastructure in Cape Verde

The IP connection available at the Institute for Higher Education (ISE) during the year of 2006 was a 512 kbps ADSL (no QoS). The cost was 15.000\$ (€ 135,88) per month (up to 1 MB downstream) plus 15\$ (€ 0,1359) per additional Mb. Consulting the CVTelecom website we note that the 512 kbps downstream allow theoretically the "maximum" 128 kbps of upstream, bandwidth critical for a video-conference of quality, that is, depending on the MCU capacity, participants will connect to each site in the site's speed slower or each site will connect at the speed of your call (a participant with 128 kbps, for example, will only receive 128 kbps of a participant connected in 2 Mbps (reserved speed for videoconferencing service of FCCN). This limitation does not occur in Access Grid (AG) rooms.

The upstream band was fixed (CVTelecom), for the available packages of 256, 512, 1024 and 2048 kbps. In this way, the upgrade to a 1024 kbps ADSL or higher was not justified because it would keep the same maximum speed (not guaranteed) of upstream (128 kbps).

ADSL connections in Cape Verde	
Upstream	Downstream
128 kbps	256 kbps
128 kbps	512 kbps
128 kbps	1024 kbps

source: <http://www.nave.cv/cvtelecom/empresa/html/adsl.htm>

In addition, most videoconferencing terminals or MCUs expect to find a fixed IP address (specific and unique) which typically ADSL connections do not provide. However during a particular connection the variable IP remains fixed which allows its identification and use.

Another product option offered by CVTelecom was the IP Service, with synchronous speeds, in packages ranging from 28 to 6144 kb/s of much higher cost. A connection of 512 kbps synchronous and fixed IP would have a monthly fixed cost of 560.000\$ (5,072 €) which could derail its use by need/cost/benefit ratio. However it would be the best option not discarding the hypothesis that in Cape Verde educational institutions could have treatment and differentiated possibilities, as is the case in Portugal.

source: <http://www.nave.cv/cvtelecom/empresa/html/internet.htm>

The widely accepted minimum bandwidth for videoconferencing H. 323 is 384 kbps (with QoS) at 30 fps. In commercial connections (cable and xDSL) with this limit, only the downstream can handle it, not upstream. In addition, many clients/endpoints are constantly experimenting and resetting the bandwidth and the frame rate based on congestion that they collect. Add to this a very poor quality, including severe losses from audio and video frames. The solution would be to choose or adjust a specific call speed. Values between 198 kbps or 256 kbps usually work well, and give a sufficient video quality for a standard meeting. A frame rate of 8-15 fps can also be supported.

Initial tests with the ADSL of 128 kbps also revealed that the speeds were only nominal, as they were (and still are) subject to interference from numerous factors including the bottleneck bandwidth due to the level of peripheral use and even the switching load imposed by intermediate

equipment of links mediation. Therefore, for better assess the conditions in Cape Verde we proposed the following list of procedures using only one device (PC or laptop) with multimedia support (sound, microphone and webcam) connected directly to the existing ADSL connection (no sharing and without processes and/or parallel applications):

1. Verification of the actual speed of ADSL connection.

In the FCCN website there is a functionality for verification, the Speed Meter, which allows to test the bandwidth by flow measurements while not ensuring total reliability of the results presented.

source: <http://speedmeter.fccn.pt/>

Bandwidth test performed from the CEMED in 27/06/2006:

Technology: Ethernet - Contracted Speed: 10 Mbps

Amount of Data Test: 13 MB

Start Date: 2006-06-27 14:38:22 - End Date: 2006-06-27
14:38:43






Transmitted Data: 13396.08 KB

Download Time: 20.454 sec.

Protocol: IPv4 (Could not perform the test in IPv6).

Useful bandwidth: 5.24 Mbps

Can perform downloads until 670.65 KB/sec.

2 Mbps	ADSL/ CABLE	
4 Mbps	ADSL/ CABLE	
5.2 4 Mbps	CEME D	
8 Mbps	ADSL/ CABLE	
10 Mbps	Ethern et	

	2 Mbps	4 Mbps	5.24 Mbps	8 Mbps	10 Mbps
1 MB	4.1 sec.	2.05 sec.	1.56 sec.	1.0 2 sec.	0.8 2 sec.
2 MB	8.19 sec.	4.1 sec.	3.13 sec.	2.0 5 sec.	1.6 4 sec.
4 MB	16.3 8 sec.	8.19 sec.	6.25 sec.	4.1 sec.	3.2 8 sec.
1 6 MB	65.5 4 sec.	32.7 7 sec.	25.0 2 sec.	16. 38 sec.	13. 11 sec.
6 4 MB	262. 14 sec.	131. 07 sec.	100. 07 sec.	65. 54 sec.	52. 43 sec.

Bandwidth test performed from the ISE in 19/10/2006:

Technology: ADSL - Contracted Speed 256 Kbps

Amount of Data Test: 941 KB

Start Date: 2006-10-19 11:18:27 - End Date: 2006-10-19 11:20:04

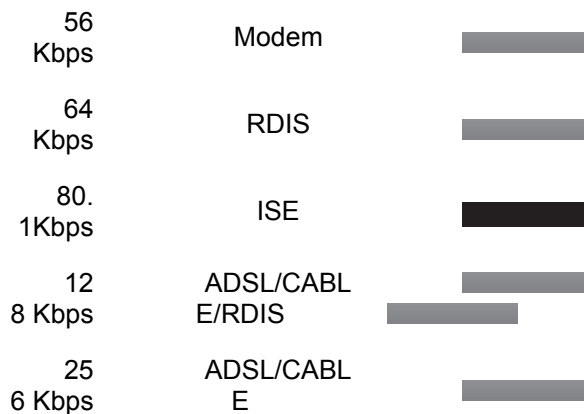
Transmitted Data: 941.47 KB

Download Time: 96.268 sec.

Protocol: IPv4 (Could not perform the test in IPv6).

Useful bandwidth: 80.10kbps

Can perform downloads until 10.01 KB/sec.



	56 Kbps	64 Kbps	80.1K bps	128 Kbps	256 Kbps
1 MB	149.8 sec.	131.0 7 sec.	104.7 3 sec.	65.54 sec.	32.77 sec.
2 MB	299.5 9 sec.	262.1 4 sec.	209.4 5 sec.	131.0 7 sec.	65.54 sec.
4 MB	599.1 9 sec.	524.2 9 sec.	418.9 1 sec.	262.1 4 sec.	131.0 7 sec.
1 6 MB	2396. 75 sec.	2097. 15 sec.	1675. 63 sec.	1048. 58 sec.	524.2 9 sec.
6 4 MB	9586. 98 sec.	8388. 61 sec.	6702. 51 sec.	4194. 3 sec.	2097. 15 sec.

2. Internet Protocol (IP address) - equipment identification (PC or notebook).

There are several ways to perform this procedure. In Windows XP just open the "Network Connections" and check the connection details, that is, the IP address and subnet mask. If the connection icon is available in the lower right corner of the taskbar it is possible to open a menu with the right mouse button and choose "status". The "support" tab will inform the IP address, subnet mask and default gateway.

Another option is to use some of the various websites that identify the IP of your connection.

source: <http://www.hospedia.com.br/ip/index.php>

3. Perform a traceroute to the Gatekeeper of FCCN (gk.fccn.pt).

In a DOS window ("Command Prompt", in Accessories) could be typed: "tracert gk.fccn.pt" or even "tracert 193.136.252.45" (without the quotes), followed by an Enter.

The following example performs the traceroute from CEMED: tracert 193.136.252.46

Tracing route to gk.fccn.pt [193.136.252.46] with a maximum of 30 hops:

```

1      <1 ms 1 ms 1 ms gt.cemed.ua.pt [193.137.87.62]
2      <1 ms <1 ms <1 ms cic-b07-sw03-12g.core.ua.pt [10.0.240.3]
3      1 ms <1 ms <1 ms fw1.core.ua.pt [193.136.86.222]
4      1 ms 1 ms 1 ms cic-b06-sw01-12g.core.ua.pt [193.137.173.254]
5      2 ms 3 ms 3 ms Router2.Porto.fccn.pt [193.136.1.193]
6      5 ms 5 ms 7 ms Router3.10GE.Lisboa.fccn.pt [193.136.1.221]
7      6 ms 6 ms 5 ms ROUTER7.GE.Lisboa.fccn.pt [193.137.0.26]
8      8 ms 7 ms 7 ms gk.fccn.pt [193.136.252.46]

```

The number of hops can then be evaluated (in the test example above, they were 8)

through which the information can be verified and potential losses that might arise.

These data could also be copied from the DOS window and sent.

These would be important data because the calls to the videoconferencing system of the UA are made through the Gatekeeper of FCCN.

4. Another interesting test to be done would be a traceroute to the CEMED, to test the link without using the videoconferencing system of the UA.

The point here would be `gt.cemed.ua.pt` or `193.137.87.62`, identifying the number of hops.

5. Using any messenger (MSN, Yahoo, Icq, etc.) in real-time to assess the tests in Cape Verde and in UA, would it be possible to make a call using the messenger itself as well as a client like Netmeeting which is already installed on Windows XP (but usually is not active). To enable it just click Start, click Run, type "conf" and click Ok. After a quick setting it is possible to make calls from IP to IP.

6. The next test, still using NetMeeting would use their H.323 compatibilities and perform a call to the videoconferencing system of the UA through the Gatekeeper of FCCN. In the NetMeeting Tools menu, click on Options, and then click Advanced Calling, identifying the Gatekeeper of FCCN, `gk.fccn.pt` or `193.136.252.46` with the data of connection.

After these basic initial assessments, other equipment could be tested on the same connection, including dedicated codec (hardware) for video conferencing and a camera of better quality, in PTZ standard.

PTZ is short for Pan-Tilt-Zoom and describes a function Zoom in and Zoom out that works along with the embedded Zoom.

Standard Studios of FCCN

In its pilot project, financed by POSI, the Foundation for National Scientific Computing (FCCN) provided under a free-lease agreement a set of six pilot institutions, a standard videoconferencing studio.

It is a high-quality installation and possibilities, although the location, diversity of uses of the room and little interest by the teaching community hampers a greater using and experimenting of the same at the University of Aveiro.

source: http://www.fccn.pt/index.php?module=pagemaster&PAGE_user_op=view_page&PAGE_id=205&MMN_position=89:4

Some institutions not covered as the Faculty of Science and Technology from New University of Lisbon (FCT/UNL) decided to join the project by purchasing the same equipment available to other institutions (Monteiro, 2006).

source: <http://www.fct.unl.pt/>

The list of equipment for videoconferencing room and its budget allows for a more accurate analysis of the systems, brands, models, values, suppliers, involved in the implementation of a standard installation FCCN. A total of € 37.169,99.

In the configuration shown, the codec H.323 Aethra model AVC8400 is the standard equipment of videoconference system, being the item with higher cost, quoted at € 8.330,00.

List of Equipment for Videoconferencing Room
(FCCN standard for Studios project)

Audio and Video	Wireless Lavalier Microphone	AKG	WMS-40PT	284.30	1	284.30 €
	Handheld Microphone Wireless	AKG	WMS-40HT	220.30	1	220.30 €
	Handheld Microphone Wired	AKG	D-3700M	108.20	2	216.40 €
	Mixer Audio Without Amplification	Phonic	MM-1805X	232.60	1	232.60 €
	Audio Amplifier 5.1	Pioneer	VSX-D714	244.00	1	244.00 €
	Speaker Set 5.1	Bose	Acoustimass 10 III	1,276.28	1	1,276.28 €
	Video Projector	Benq	PB7220	1,470.00	2	2,940.00 €
	Echo Cancelling	ClearOne	GT-1524	1,880.00	1	1,880.00 €
	Player Recorder DVD / MPEG2	Panasonic	DMR-E85	678.00	1	678.00 €
	Technical Cabinet 24U's (w/ glass door, rollers and a fixed shelf)	Olirack	24U's	373.10	1	373.10 €
	Tripod Table for Microphone	EuroMet	ATS-88-c	37.41	2	74.82 €
	Tripod Floor for Microphone	Proel	RSM-170	24.00	1	24.00 €
Videoconferencing	Videoconferencing System H.323	Aethra	AVC8400	8,330.00	1	8,330.00 €
	Document Camera	Samsung	SVP-5500DX	1,565.00	1	1,565.00 €
	Interactive Whiteboard	Hitachi	Smartboard Serie F75"	1,585.00	1	1,585.00 €
	PTZ Cameras	Sony	EVI-D100P	996.30	2	1,992.60 €
	Tripods with Static Heads	Manfrotto	190PRO + 460MG	260.30	2	520.60 €
	Digital Microphone	Aethra	360°	403.75	1	403.75 €
Informatics	LCD screen 15"	Hyundai	Image Quest L70S	329.00	1	329.00 €
	PC (P4, 3GHz, 2GB RAM, DVD Burner, 2 x video input, sound card Creative Audigy LS, RACK)	Niposom	Servidor Proj. Estúdios	1,500.00	1	1,500.00 €
	Keyboard and mouse wireless	A4Tech	KBS-8533RP	21.00	1	21.00 €
Signal Switching	Matrix VGA	Comm-tec	MX-88RA	1,799.00	1	1,799.00 €
	Matrix AV	Comm-tec	MX-1616CA	1,470.00	1	1,470.00 €
Control	Multifunctional remote control	Universal Remotes	MX3000	507.00	1	507.00 €
	Transportation System IR	Catlink	Kit Studios	70.00	1	70.00 €
	IR/RS232 Converter	Adicon	The Ocelot	200.00	1	200.00 €
	RS232 Control System	DKT	Freeway FWAY-IR	1,650.00	1	1,650.00 €
Accessories	Powerstrips (8 outlets without circuit breaker)			41.00	2	82.00 €
	PatchPanel 24 electrical outlets			45.62	2	91.24 €
	Support for interactive whiteboard			310.00	1	310.00 €
	Wiring to include in the rack			1,300.00	1	1,300.00 €
Miscellaneous	Adjustments in the room (variable cost between 5K to 20K, including screens, lighting, wiring system, etc.)			5,000.00	1	5,000.00 €
Total						37,169.99 €

source: <http://ferrari.dmat.fct.unl.pt/personal/mle/PUBL-rdf/E-learning05.pdf>

The AVC8400 model available in 2002 was replaced in 2006 by the AVC8500 model containing the latest technologies from Philips Trimedia and keeping the same capabilities of the previous model in addition to new features such as dual screen emulation on a single screen (H.239 Dual Video), 16:9 format support and 4 Mbps IP bandwidth. The AVC8500 model is quoted currently € 10.064,00.

This hardware-based codec follows the line of integration of major suppliers of H.323 videoconferencing in their products, being specifically designed to take on the task of compressing and decompressing allowing the global terminal to reach a good performance.

Unlike a standard studio that follows the specifications of FCCN (for Studios project), a basic videoconferencing studio, mobile or transportable will have a very different cost, according to the various options available in the market that follow the specification H.323. These options and products similar to PCs can sustain a rate of 15-30 fps (frames per second) and an extended variation of quality/bandwidth settings (128 kbps-1.5 Mbps) of calls, so that the quality of the videoconferencing sight on someone's desk can be the same to that of bigger and more expensive conference room-based.

Products available include Zydacron OnWAN series and VCON.

More recently, the trend is towards external devices "plug and play" that are connected to a USB port. The extra processing power required for encoding is included in the camera/USB device with the USB port providing the "bandwidth" required to pass the compressed video from camera/device to the PC.

The products available in this approach are the ViaVideo of Polycom and VCON ViGo.

Another videoconferencing terminal is the device single not based on PC.

These electronic devices are specialized hardware (combinations of system/camera/microphone that are usually on top of a TV monitor) that provide high quality for medium or large videoconferencing rooms. They do not run other programs such as a PC-based terminal can do and they are bigger and more expensive, although often such usage is equally or simpler than USB devices on a desktop PC.

The Polycom ViewStation and Tandberg 880 are examples of H.323 desktop devices.

Although the hardware-based terminals cost more than those based only on software (ranging from cheap to free), the extra cost is often justified in order to achieve a quality that is acceptable in video conferencing beyond a casual use.

Polycom is considered the world's largest maker of equipment for videoconferencing.

FCCN itself has, on its premises in Lisbon, a videoconference room with space for meetings up to four people.

This room has a Polycom iPower 900 series equipment (PC-based) using a 29" monitor, that is, a compatible configuration and much more accessible.

source: http://www.fcn.pt/index.php?module=pagemaster&PAGE_user_op=view_page&PAGE_id=206

System features:

Panoramic Controllable Camera; Microphone (TableTop); 29" Monitor; TableTop ImageShare (allows users to share the desktop of your notebook with remote participants). As additional equipment the room offers an auxiliary document camera, which allows filming a book, a transparency or even an article from a newspaper.

Software-based clients

NetMeeting is an example of H.323 client based on software. The software-based clients often have a low cost of implementation due to low cost of simple USB cameras and cheap microphones. The problem is that software clients require very powerful systems to work well, and some clients do not work correctly together with other H.323 systems. Software clients use

the main CPU system to encode and decode the video. This causes a large system overhead, often generating a wobbly video or other problems. However the PCs are becoming ever faster. The VCON recently introduced its vPoint for software-based clients. The vPoint software can be used in conjunction with VCON VIGO to USB-based clients, to the accelerated handling of the video or as standalone software with a standard USB or firewire camera.

There are many options for videoconferencing and many manufacturers. Not always costs are low. There is expensive equipment. For the needs of this project we sought lower-cost options, because the AU already has excellent facilities (Studio and auditorium) to cater to larger groups. The definition was marked by two variables: resources available x needs (number of units and type of room to be satisfied). Without these limits the search would not become objective. The lower cost option (practically free), software-based and already included in Windows remains the NetMeeting (there are other options for Windows and for Linux). It supports audio and video on H.323 standard and can make and receive calls in this standard. The problem was previously the processing speed (since the codec is software based), not something very critical nowadays. In Windows XP it is already installed by simply activating it.

source: <http://www.microsoft.com/brasil/windowsxp/using/networking/learnmore/tips/aljandali1.msp>

To enable NetMeeting on Windows XP: 1. Click Start, Run and type Conf. 2. Click OK. 3. In NetMeeting Wizard, provide the required information and then select the box NetMeeting shortcut on My Desktop (or in the Quick Launch bar).

Whereas, nowadays, virtually all PCs and notebooks already have video and audio resources (sound, microphones, webcams) makes this the most economic solution for end users. The limitation imposed by the video quality low cost webcams can be minimized with the use of better quality cameras.

Polycom has the product: PVX (single use)

source: http://www.polycom.com/products_services/1,1443,ee-4367-7953,00.html

One option of best quality and portability to Cape Verde would be an integrated camera and hardware codec. Polycom has the products V500 and VSX 3000.

source: http://www.polycom.com/products_services/1,1443,ee-6574-6575,00.html

source: http://www.polycom.com/products_services/1,,ee-35-6574-6197,00.html

V500 (to serve up to 5 people): Ideal for small environments, the V500 is the new compact and innovative videoconferencing from Polycom. Provides videoconferencing with transmission speed of up to 768 kbps over IP/SIP and up to 128 kbps in ISDN (the customer must choose at purchase); Has the support of integrated AES encryption to provide complete safety in video calls; It presents H.264 video technology that allows to play 30 fps even at low rates of transmission speed; Offers exceptional audio quality, similar to CD, due to wide audio bandwidth to 14 kHz; Has noise suppressor, automatic gain control and echo cancellation; Has intuitive interface. This unit already contains almost everything is needed (except the monitor) and can be connected to any TV or projector.

Polycom V500 IP 2.199,00 € (+16,00% IVA)

VSX 3000 (to serve up to 4 people) versatile, the VSX 3000 provides videoconferencing with quality image and audio, and even allows that flat screen to be used as a high-resolution PC

monitor. Includes camera, 17" flat screen monitor, speakers and built-in microphones. Provides transmission speeds up to 2 Mbps over IP/SIP and up to 512 kbps in ISDN (the customer must choose at purchase); Possibility to performing hybrid multiconference up 4 points in ISDN and IP (Optional); Content capture for live broadcasts by IP using Streaming Video; Displays H.264 video technology that allows to play high-quality images even in low rates of transmission speed; Count with integrated AES encryption integrated to provide complete safety in video calls; 14 KHZ of audio to deliver exceptional sharpness; Has noise suppressor, automatic gain control and echo cancellation; Displays intuitive interface, making it easy to use.

Polycom VSX 3000 IP 5.499,00 € (+16,00% IVA)

For the CEMED it could be adopted any of the proposed solutions to Cape Verde, or even better-quality options and features of the Polycom VSX 5000.

source: http://www.polycom.com/products_services/1,1443,ee-185-11034,00.html

The VSX is considered the entry level model among those with the most resources.

VSX 5000 with Media Cart

source: http://www.polycom.com/products_services/1,1443,ee-185-4362-10095,00.html

In configurations that include one or two 32" LCDs VSX 5000 with Video Cart

source: http://www.polycom.com/products_services/1,1443,ee-185-4362-11434,00.html

In configurations that includes a 32" monitor VSX 7000

source: http://www.polycom.com/products_services/1,1443,ee-185-11013,00.html

source: http://www.polycom.com/products_services/1,1443,ee-185-11033,00.html

VSX 8000

source: http://www.polycom.com/products_services/1,1443,ee-185-7292,00.html

Comparison between current Polycom systems

source: http://www.polycom.com/common/pw_item_show_doc/0,1276,3336,00.pdf

In the Rectory of UA Great Hall existed an equipment unused since 2002 (International Public Tender n.º 9 ST/2001), a Polycom VS4000 Release 4.2 FX (August 24, 2002).

source: http://www.polycom.com/common/pw_item_show_doc/0,1276,3147,00.pdf

The firmware has been updated to version 6.05 FX (June 8, 2005) by Roth (2007), in October 2006.

source: https://docushare.louisville.edu/dsweb/Get/Version-11541/VS_rel605_007a.pdf

The location is right next to the FCCN studio, but can accommodate a larger number of people in addition to having a projector high visibility.

For videoconferencing studio of UA were assigned eight IP addresses 193.136.252.128/29, Mask 255.255.255.248

source: <http://www.fccn.pt/files/documents/enderecamento.doc>

193.136.252.128	Network
193.136.252.129	Codec H.323
193.136.252.130	PC
193.136.252.131	Control System
193.136.252.132	
193.136.252.133	
193.136.252.134	Gateway
193.136.252.135	Broadcast

That is, the IPs 193.136.252.132 and 193.136.252.133 were vacant. One of these IPs could be destined for the VS4000 of Rectory Great Hall. The rack stays very close to the studio that facilitates changing network switch in the Rectory. The other IP could go to the CEMED, making it possible to place a third point in the FCCN network.

Ribeiro (2006) stated "Finally! We saw this in the equipment at site survey in 2004. Yes, you can use this system on videoconferencing network. You may use, for example, the 193.136.252.132. The equipment in the CEMED can receive the 193.136.252.133. Remember that the AV resources that are in a rack are not trivial to porting (nor should they be removed from the studio), but you can use the studio to complement activities that is going on elsewhere as, for example, record videoconferencing sessions or make broadcast sessions. The gatekeeper that must be configured is: 193.136.252.46. The numbers of GDS are: Equip - GDS - IP; Rectory Auditorium - 00351400103311 - 193.136.252.132; CEMED - 00351400103312 - 193.136.252.133. If you wish, we can include these systems in SAG. (sag.fccn.pt)".

- Equipment: Polycom/VS4000 Release 6.05 FX
- Maximum Speed: 2 Mbps (IP, ISDN and Serial)
- Integrated MCU: the introductory guide refers to an optional internal MCU.

source: <http://www.cebenetwork.com/pdf/produkte/VS4000.pdf>

source: http://www.polycom.com/common/pw_item_show_doc/1,1276,2780,00.pdf

- H.239 support: the standard H. 239 - Innovation of 2003 - is based on a simplified version of the collaboration feature "People+Content" of Polycom, offered since 2000.

source: http://www.polycom.com/common/pw_cmp_updateDocKeywords/1,1687,3224,00.pdf

Collaboration People+Content in VS4000:

source: http://www.polycom.com/common/pw_item_show_doc/0,1276,3147,00.pdf

- Receives or transmits dual images (receives/transmits both the presenter's video and high-resolution graphics);
- Dual audio (simultaneously transmits audio from microphones and notebooks);
- Supports IP, ISDN and Serial calls;
- Supports dual streams People+Content from any terminal;
- Maximum graphics resolution: Input 1280 x 1024, 60 Hz Output 1280 x 1024, 60 Hz;
- Audio Input for notebook;
- Second output for projector;
- Ethernet 10/100 3-port hub;

In the updated document there is reference to "The following configuration flags must be set to NO in the MGC configuration file 'system.cfg' in order for the ViewStation EX/FX/VS4000 system and MGC gateway functionality to work correctly: GW_EPC_H239".

source: https://docushare.louisville.edu/dsweb/Get/Version-11541/VS_rel605_007a.pdf

- SIP support: SIP is a standard of 2002. No reference was found regarding the implementation of the Basic SIP.

Sony PCS-1P and Polycom V500

Roth (2007) examined the documents received in the Sony Rep CEMED in Porto (Emilio de Azevedo fields) and made a brief comparison between the basic products since both companies (Sony and Polycom) has excellent premium products of extremely high costs which are not justified on grounds of the application.

- Both products are considered basic by their manufacturers, entry models and have very similar features;
- Both are a complete solution (all in one), which includes camera, microphone, codec and remote control;
- Both need a monitor/tv that is not part of the basic product.

Differentials:

1) Camera: the camera of Sony PCS-1P is not fixed to the Codec and can be positioned at another point. The Sony has a PTZ (Pan/Tilt/Zoom) camera complete. The camera from Polycom V500 is integrated and has no zoom (which is not critical for the intended application).

Features of the Sony PCS-1P:

image sensor: 1/4 CCD type; horizontal resolution: 460 TV lines

lens: 3.1 to 31mm (F 1.8 to 2.9); focus: auto/manual; iris: auto

horizontal viewing angle: 6.6 to 65 degrees; zoom: x 10 (optical) and x40 (digital)

pan: (panoramas) +/-100 degrees (left/right)

tilt (vertical gradients): +/-25 degrees (up/down)

Polycom V500 features:

horizontal view angle: 60 degrees

pan: (panoramas) +/-20 degrees (left/right)

tilt (vertical gradients): +/-20 degrees (up/down)

One detail to be considered is that when there are problems in the camera or codec, in the integrated solution we are left without the two and in the non-integrated solution we can isolate the problem and use another camera or another codec. But integration facilitates transport.

2) Expandability: only in the PCS-1P (optional, best quality cameras, etc...)

3) Price (Traditel)

source: <http://www.traditel.pt/index.html>

Sony PCS-1P 3.981,00 € (+16,00% IVA) - Total: 4617,96 €

Polycom V500 IP 2.199,00 € (+16,00% IVA) - Total: 2550,84 €

The difference in the final price, 2067,12 € is not negligible.

One Sony PCS-1P costs almost the equivalent of two Polycom V500 IP.

Sony maintains a website in Portuguese.

source: <http://www.sony.pt/>

The PCS-1P is on:

source: http://www.sonybiz.net/cgi-bin/bvisapi.dll/templates/neutral_content_product.jsp?BV_SessionID=@@@@2074990680.1161347362@@@@&BV_EngineID=cadiddehjfjbemgcfkmcjfdhl.0&OID=114513

Polycom maintains a website in English for the whole of Europe:

source: <http://www.polycom.com/home/1,1254,ee,00.html>

The V500 is on:

source: http://www.polycom.com/products_services/1,1443,pw-35-6575,00.html

The Polycom V500 was the indication of Roth (2007) as equipment to be purchased for the CEMED and for Cape Verde due to its excellent cost-benefit ratio.

Besides this factor, this equipment uses the same remote control found in VS4000 which facilitates standardization and utilization.

Ramos (2006) "Ok, accordingly. I appreciate that you proceed with the acquisition".

Ramos Moreira, Roth & Santos (2006) "... to be initially installed for trial operation in October 2006".

Vasco (2006) "Around here everything runs normally. We have acquired the videoconferencing equipment. It works very well".

Videoconferencing Studios of UA

The UA currently has three videoconferencing systems, two of them located in the Rectory Central Building (Academic Acts Room and Room of translations) and another in CEMED.

1. Studio Room of Academic Acts Rectory

Polycom/VS4000 Release 6.05 FX

GDS: 00351400103311 - 193.136.252.132 Codec H.323

The first system installed in the control room of the auditorium Room of Academic Acts Rectory, was acquired through the International Competitive Tender n.º 9 ST/2001. The company Proaudio Sistemas Profissionais Audio delivered a videoconferencing codec VS4000 of Polycom in October 2002, and the remainder audiovisual system in February 2003. Despite the tender specifications related to the system specify the use of ISDN/ISDN lines until speeds up to 384 Kb/s or over IP up to 1 MB/s, the system has never been configured by the company, which claimed the unavailability of ISDN/ISDN accesses. However the UA owned IP networks with adequate capacity and nothing was done. In this way, the equipment, though energized, remained for four years without use until October 2006 when it was tested, configured and had its firmware upgraded to Release 6.05 FX.

2. Studio Room of Translations Rectory / FCCN

Aethra/AVC8400

GDS: 00351400103212 - 193.136.252.129 Codec H.323 Aethra AVC8400

The second system, installed in the Room of Translations Rectory, based on the videoconferencing codec AVC8400 Aethra was delivered in lending through the initiative Studios project of FCCN, funded by POSI, with the aim to motivate and promote the investigation of techniques and technologies related to videoconferencing. In this sense, the University of Aveiro and FCCN signed in October 2004 a protocol aimed at equipping the UA with a videoconferencing studio. The Studios project was reported completed in March 2006 having given rise to the Network Studios.

3. Studio CEMED

Polycom/V500 IP

GDS: 00351400103312

193.136.252.133 Codec H.323

The third system, installed on CEMED, was purchased with funds from the Calouste

Gulbenkian Foundation (FCG) in December 2006, based on the videoconferencing codec V500 IP of Polycom. Its installation is due to the need for greater experimentation (one of the objectives of the project studios) hampered due to the shared use of Room of Translations for other purposes, together with its physical location (central relative to the UA campus, but far from CEMED) and need to support the Masters in Multimedia in Education and Teaching Language being developed by the University of Aveiro in the Institute of Education (ISE) of Cape Verde.

Addressing IP scheme of UA (2007):

193.136.252.128	Network
193.136.252.129	Codec H.323 Aethra AVC8400
193.136.252.130	PC
193.136.252.131	Control System
193.136.252.132	Codec H.323 Polycom VS4000
193.136.252.133	Codec H.323 Polycom V500 IP
193.136.252.134	Gateway
193.136.252.135	Broadcast

Updating the ADSL of Cape Verde

The last bandwidth upgrades in Cape Verde occurred in May 11, 2007, with the update of the existing line. Later in May 24, 2007, two more lines were installed. The current configuration (June 2007) was 2 Gbps of downstream, keeping the same 128 kbps of upstream. This data at the same time that reveals the limitations of CVTelecom in offering a product to market with upstream greater than 128 kbps shows that the upgrade to a 2048 kbps ADSL is not justified because it kept the same maximum speed (not guaranteed) of 128 kbps upstream.

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