H.323 IP Videoconferencing demonstrator

Low Cost videoconferencing

Comparison of Radvision Hardware MCU and CUSeeMe Networks Software MCU

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1 Introduction

This deliverable is produced within the framework of the UKERNA H.323 VIP Demonstrator Project, and provides a comparison of two H.323 Multipoint Conferencing Units (MCU) and their associated Gatekeepers. The two units are:

- Radvision MCU-323 and L2W-323P Gateway.
- CUseeMe Networks MeetingPoint Conference Server v4.05

This report highlights the primary functional difference between the two systems, the approximate costs, and gives an initial subjective performance difference.

2 Product Descriptions

2.1 Radvision MCU-323:

This is provided as a unit of standard dimensions for stacking in a 19-inch rack. It has a number of status indications and a standard 9 pin d-type serial connector on the front panel, and 4 10Base-T Ethernet LAN connectors on the rear panel (although only 1 is active). It provides the MCU functions, and can also have the gatekeeper functionality installed.

2.2 Radvison L2W-323 Gateway

This is a unit of standard dimensions for mounting in a 19-inch rack. It has a standard 9 pin d-type serial connector on the front panel, and 4 10Base-T Ethernet LAN connectors and a non-standard ISDN RJ-45 connection on the rear panel. In the scope of the VIP project, this unit hosts the gatekeeper functions to reduce the load on the MCU unit.

2.3 MeetingPoint v4.0.5

This is a software package for installation on a Windows NT4.0, Windows 2000, Solaris or Red Hat Linux server. This installation provides the MCU and the gatekeeper, although the gatekeeper can be hosted on a different server.

3 Functional Overview

The table 1 below lists the primary functionality of the components of the MCU/Gatekeeper combination, with any additional comments.

Function	Radvision	MeetingPoint
Videoconferencing Server	H.323 Compliant videoconferencing supporting up to15 participants in 110 Kbps conference. Up to 4 MCU's can be stacked allowing up to 60 users in a conference.	H.323 Compliant videoconferencing supporting up to 50 participants. More MCU's can be added extend number of users that can be handled.
Data Sharing Server	Allows data sharing between clients that support NetMeeting's T.120 tools.	T.120 server installed as an integral part of the H.323 server.
Conference Administration	Web based administration. Set-up is achieved through dedicated Windows software. A small set of additional text based advanced commands can be accessed through part of the set-up software.	Web based set-up and administration. All server functionality can be configured through an extensive set of telnet commands.
Continuous Presence	Available in the standard installation	Available as an add-on function
Streaming Media	Locked video broadcast from one participant to all.	Locked video broadcast from one participant to all. Integration with third party streaming media server.
Web Client Serving		Add-on function to allow users of web based videoconferencing clients to participate in conferences
Conference scheduling		Web-applet based client initiation of new conferences. Conference administration can be integrated with Microsoft Exchange
Dedicated Education Conferences		ClassPoint conference administration tools provides conference administration and integration with web based learning materials delivery.

Table 1: Function Comparison on hardware and Software MCU

4 H.323 Protocols Supported

Both systems support the following Protocols:

Call Control: H.323 Ver 2.0, H.225, H.245, RTP/RTCP

Video Coding: H.261, H.263

Audio Coding: G.711 A/μ Law. The MeetingPoint MCU also supports the G.273 low bandwidth codec.

Data: T.120

5 Gatekeeper Functionality

Both systems provide standard gatekeeper functionality, allowing calls from endpoints to be routed to the appropriate conference on the appropriate MCU. Terminals are identified both by their E164 (phone number) and their H323_ID (Nickname) identity. Various standard bandwidth and routing facilities are provided.

6 Subjective Performance

On Wednesday 6th December a subjective performance comparison between the CuseeMe Networks MeetingPoint Gatekeeper and MCU (software MCU) and the Radvision system (hardware MCU) was performed. Five endpoints of various types, including VCON Escort 25, Polyspan H.323 terminals and NetMeeting v3 software clients, were connected into the systems. Initially the connection was made to the software MCU at the University of Dundee. This was followed by a connection to the hardware MCU at the University of Edinburgh.

The software MCU was running on an 800MHz Athlon server running NT 4.0. No other server functions were being used at the time, other than the web server for providing the MCU and gatekeeper web pages.

In order to eliminate network differences from the variables, traceroute traces were provided from the endpoints, to ensure that there were no major differences in the network routes to the MCU's. These traces revealed that the routes between the endpoints and the MCU were essentially the same.

In both cases, the MCU/gatekeeper combination served conferences successfully, with endpoints being able to connect and disconnect at will. The subjective impressions of the performances of the two MCU's was however different. The hardware MCU in general provided a more reliable conference than the software MCU. The audio break-up and loss of video frames experienced with the software MCU were less apparent with the hardware MCU.

The reasons for poorer performance of the software MCU could be due to an underlying weakness in performance when compared to the hardware MCU. Experience of use of the software MCU within the local area however, has been good. For this reason, the cause of the less than optimal performance of the software MCU/gatekeeper combination is not obvious. It may be that configuration of the software MCU in terms of the settings for dealing with lower bandwidth connections may not have been optimal. In this case, endpoints experiencing loss or poor performance due to adverse network conditions may have been affecting the conference on the software MCU more than on the hardware

MCU. It would be worth performing a more detailed analysis of the performance of each system, and the factors affecting the performance.

7 Costs

Component	Radvision Hardware MCU	MeetingPoint Software MCU
MCU - 10 User	£ 14,780.00	
MCU - 10 User	£ 14,780.00	
Gateway	£ 9,476.00	
Software MCU - 25 Users		£ 8,827.20
Continuous Presence		£ 2,758.40
Server Computer		£ 1,200.00
Total	**£ 39,036.00**	**£ 12,785.60**

All prices are quoted by EDAS computers on 12/12/2000 and are exclusive of VAT.

8 Conclusion

The software MCU is considerably cheaper than the hardware MCU, and has a richer set of features targeted specifically to the education market place. Its performance on initial comparison does not meet that of the hardware MCU when used to host a nation-wide conference, although it appears to perform perfectly satisfactorily when used within a campus.

The software MCU has a number of features that make it particularly suitable for the education marketplace. In particular, it is particularly suitable for providing the A/V functionality to support collaborative distance learning, where material can be presented and learners can participate in the presentation, or where learners can collaborate in a discussion and in the preparation of material. The hardware MCU is optimised for pure A/V interaction, where the focus is on the most natural audio and video performance possible.

This suggests that the software MCU could provide an interesting deployment path for education institutions interested in H.323 videoconferencing. Initial deployment could be at an institutional level at a time when demand is low. As demand increases, the software MCU could be supplemented by a hardware MCU, and the software MCU dedicated to specific education conferencing activities such as ClassPoint learning activities, for which it is ideally suited. Because of the scalable nature of the H.323 gatekeeper

architecture, no component is wasted as it can be dedicated to hosting the conferences most appropriate to its performance capabilities.

In conclusion, initial findings suggest that the software MCU seems to be an appropriate solution for departmental or institutional deployment, or for A/V support for collaborative learning, but that a hardware MCU seems to be more appropriate for high quality wide area video-conferences.