Hermès, a collaborative environment at IN2P3

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Abstract. IN2P3, the institute bringing together HEP laboratories in France, opened a videoconferencing service in 2002 based on an industry standard H323 MCU (Multiple Control Unit). This service has steadily grown since then, serving other French scientific communities in addition to HEP and reaching an average of about thirty conferences a day. The relatively small amount of manpower required to deploy and maintain this facility can be explained by the very sound design and the large array of built-in capabilities offered by the equipment that replaced the original equipment purchased in 2005.

1. Introduction
Hermès is a collaborative environment based on an H323 MCU and RMS, a PHP/MySQL program. It offers a wide range of services for collaboration while only requiring a relatively small amount of human effort for its development and operation. The Hermès infrastructure (Figure 1) is entirely hosted at the IN2P3 Computing Center (CCIN2P3) in Villeurbanne near Lyon, France. Its capacity has been recently extended from 40+20 video ports to 3*40 + 20 ports (a 40 port MCU can accommodate about 30 meetings a day). A key feature of Hermès is the set of simple but robust tools and concepts it is built upon, such as avoiding the use of a gatekeeper and leveraging the rich set of features of industry standard devices.

Figure 1: The main Hermès infrastructure at CCIN2P3.
RMS is designed, written, and maintained by Daniel Charnay (CCIN2P3); Hermès is operated by Gérard and Olivier Drevon (CCIN2P3). They can be reached at visioconf@in2p3.fr.

2. Conference Workflow
The workflow for organizing and running a videoconference is straightforward.

2.1. Schedule

Only RMS registered users can schedule a meeting in Hermès. Mandatory parameters for booking a conference are minimal: date, starting hour, duration and title of the meeting. Optionally, a user can provide:

- A list of e-mails to receive meeting data (with assisted search in the CERN LDAP directory, the IN2P3 LDAP directory, or the private RMS database) and
- A list of rooms for which their planning manager will receive a notification of the meeting data.
A two-hour instant meeting can be started by the click of a button.
The home page (Figure 3) gives the list of all the meetings scheduled by the user.

2.2. Connect
Any user equipped with an H323 system (room or PC based) may join a conference for which the title
and pin code are known. Registration to a gatekeeper is not required, extending the range of people
with whom regular Hermès users can collaborate.

Users connecting to Hermès MCUs are welcomed by an audio/video "auto-attendant". This allows
them to check outside of any meeting that they can receive audio and video and to resolve common
firewall problems. A permanent session ("Café"), open to anybody, allows more complete tests before
a meeting.

Figure 4: Users choose their meeting by using
the arrow keys of their end-point (or entering
their meeting's number), and are then prompted
for a pin-code before joining this meeting

2.3. Meet
Users enjoy the very good audio/video quality, stability and flexibility that Hermès MCUs provide. In
practice any connection rate, video codecs, audio codecs, and frame rates are seamlessly transcoded by
the MCU, providing each user the optimal quality within the capability of the user’s equipment.

Figure 5: The layout of the screen is changeable individually by each attendant
All known H323 systems work with Hermès, except the obsolete NetMeeting. Users who do not have access to a standard videoconferencing room can use Polycom PVX (Windows), Ekiga (Windows, Linux) or XMeeting (MacOS X) on their personal computer.

Any session can be attended by phone using the ISDN gateway. There are 90 phone lines available. Each user can easily change the layout of his screen using the far end control keys on the remote pad of his terminal.

Remote document presentation is achieved via the use of the H239 capability of the system, which adds a "content stream" to the audio/video streams. The content is usually the screen of the current speaker.

2.4. Chat
Hermès offers a simple chat system that provides another communication channel to participants in addition to audio/video interaction. At present, the chat is shared among all participants, i.e. there is no private chat between a subset of attendees.

2.5. Watch
Users without an H323 endpoint or simply wanting to monitor a conference can use the streaming capability of the MCU to watch an ongoing meeting with a very small delay (often less than a second). They can do so either through the "buddy page" associated with every meeting or by accessing directly the web conferencing feature of the MCU. In the latter case, the quality of the H239 stream (remote document presentation) is very good, both in terms of resolution and refresh rate.
The MCU offers a built-in chat system for the stream watchers.

2.6. Share
Documents can be uploaded to and downloaded from a shared area private to the meeting. This area will contain the recording of the session, if applicable (see next paragraph). All documents are permanently stored, except for bulky recordings, which are deleted after a week.

2.7. Record
When scheduling a meeting, a user can request that it be recorded. Hermès can now record eleven simultaneous sessions. A red light flashes on every participant’s display to indicate that the session is being recorded. About an hour after the meeting has ended, users can download the video file from the document area. The delay is caused by format conversion and transfer times.

3. Statistics
The number of conferences per month (Figure 8) has grown steadily over the last two years, reaching more than 600 per month, an average of more than 25 per day. As of the writing of this paper (May 2009), this has increased further to 40 conferences per day on average.

There are currently more than 1200 registered users (who can schedule a meeting), serving an estimated community of more than 15,000 users.

Most of the meetings now involve phone attendees. The number of phone only meetings is increasing. Up to now, this has not been a problem (every video port is doubled by an audio only port, yielding a total capacity of 140 extra audio ports).
4. Bandwidth usage
The peak bandwidth (Figure 9) used by Hermès is about 20 Mb/s, in both directions. When the High Definition era comes to our community (i.e. soon), the peak bandwidth will increase by a factor of 5. Then, it will be mandatory to share the workload among locations distributed over the planet to take advantage of different peak hours.

5. Future
Among the planned enhancements planned, we can cite:
• Displaying on the buddy page a list of attendants (video, audio, stream) as they are known by the MCU;
• Giving the user the control of the layout of streaming as seen by watchers; this will be very useful when using Hermès as a webcasting system for a conference or a lecture for instance;
• Ability for any participant, or a designated “chairman”, to mute any remote participant’s audio;
• Call new participants by their IP address, or from a directory;
• Extend meeting duration while it’s alive at the push of a button;
• Permanent "venues": pre-defined conferences would allow a mode of operation very near to the “ad-hoc” mode used by ECS for instance; ad-hoc mode is built-in in the MCU and requires the use of a gatekeeper; Hermès permanent venues would be reserved to well established working groups;
• “Video on demand” of recorded sessions including content (only video is available today).

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