OpenMeetings as a Browser-Based Teleconferencing Tool for EFDA Laboratories

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ABSTRACT

Remote Participation is a key success factor of worldwide organizations and video-conference is an aspect of high importance when laboratory collaborators are geographically dispersed.

Several tools for video-conference are available worldwide. However, there is a need for a default integrated set of tools which provide all the needed features for remote participation between cooperating laboratories. Moreover, laboratories currently use different video-conference tools to communicate leading to a non-compatible method among them.

OpenMeetings is a open source software which provides video-conferences through web-browsing. It is operating system independent, requires no computer installation and provides easy integration with already existing tools and customization of requirements.

This paper intends to give an OpenMeetings overview as a video-conference application with enhanced features between worldwide laboratories and to demonstrate its ability to authenticate and authorize through integration with the European Fusion Development Agreement (EFDA) Federation. EFDA Federation is a multi-organization security infrastructure, whose purpose is to provide sharing and provision of a wide set of resources so that authenticated users may access them in a transparent and secure mode. This infrastructure is based on a distributed security technology called PAPI (Point of Access to Providers of Information). OpenMeetings can be a valuable EFDA Federation resource and a good approach as a method to provide a worldwide laboratory video-conferencing application, based on standard browsers.

OPENMEETINGS

- Open source software with Eclipse Public License
- Provides video-conferences through web-browsing
- Web-app divided on server side and client side
  - Server side includes the installation of core and all requirements in a lightweight system
  - In client side, clients access the server through a common web browser
- Supports audio and video
- Allows users to see the desktop of any participant
- Enables co-browsing and is multi-language and customizable.
- Includes a whiteboard and the ability to import a variety of formats of documents and pictures
- Sending invitations into meetings, a moderating system, group users by organization
- Backup module, private and public conference rooms, and the ability to record meetings

Key features

- Server and client CPU and memory usage statistics are dependent of computer architecture
- Delay of communications and loss packets are directly the bandwidth of clients connection and it was impossible to consider standard values
- In clients, transmitted data (TX) is dependent from quality of audio and video (89 to 195 kbps)
- In clients, received data (RX) is dependent from number of users (128 kbps x number of user)
- For server, with achieved data in tests, was calculated the best fit to RX and TX.

Table shows the extrapolation for server RX and TX bandwidth to different number of clients, calculated with fitting functions.

<table>
<thead>
<tr>
<th>Clients</th>
<th>Bandwidth in Mbps</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>TX</td>
</tr>
<tr>
<td>2</td>
<td>0.54</td>
</tr>
<tr>
<td>5</td>
<td>1.21</td>
</tr>
<tr>
<td>10</td>
<td>1.23</td>
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<tr>
<td>20</td>
<td>50.41</td>
</tr>
<tr>
<td>50</td>
<td>355.54</td>
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</tbody>
</table>

CONCLUSIONS

- All Federation Members have direct access to the platform. OpenMeetings has been successfully integrated with EFDA Federation authentication and authorization mechanisms.
- OpenMeetings is a open source software that allows EFDA members to debug or develop new custom features. This advantage increases the platform value.
- Provide good quality of service and collaborative developments, overcoming most of the problems associated with open source tools, featuring a low price solution for use in EFDA Federation. At IPFN, the platform is used to provide meetings between collaborating laboratories geographically dispersed with good quality, improving interaction within the group.
- Acceptable bandwidth requisites for most Fusion labs. With 50 users in a meeting, clients only need a 6 Mbps connection and server needs a 300 Mbps network connection.
- The installation of platform in several federated labs will provide extensive testing and bug-fixing along with new features development.
- Support for server installation and tool use will be provided to EFDA members by IPFN.