The video conference software Polycom Telepresence m100 was tested in November 2011 at the VCC.

The official software version 1.0.0 was provided, checks were performed with version 1.0.3. In August 2012, well-known errors were checked with version 1.04. This brief test report presents the results.

The video conference system Polycom Telepresence m100 is a software client for the operating systems Windows 2000, XP, Windows Vista and Windows 7. The software is enabled by means of an activation key. If the key is not entered when starting the program, the product can be used unrestrictedly as a trial version for 30 days.

The software is available on the manufacturer's website. It can be used right after installation. To activate the program you have to purchase the activation key, otherwise it will be restricted to a test period of 30 days. Standard webcams as well as HD webcams can be used with this program.

When using LAN, the system facilitates video conferences up to 1920 kbps with a maximum of 30 fps.

The manufacturer demands clear minimum requirements for the underlying hardware configuration, which should be taken into account under any circumstance to ensure the software is running error-free:

- P4 CPU with 1.5 GHz for video conferences in minimum quality (QVGA)
- P4 CPU with 2 GHz for video conferences in standard quality (CIF+H.239)
• Pentium CPU 3,2 GHz for video conferences in premium quality (VGA +H.239)
• Quad Core Duo 2,0 GHz for video conferences in HD-quality (receive up to 720p)
• Working memory: XP 1 Gbyte, Vista 2GByte

The VCC used an Intel Core 2 Extreme CPU X9100 (3,06 GHz, 4 GB RAM) with Logitech HD Webcam C910 and an Intel Core i7 2600 CPU (3,40 GHz, 8 GB RAM) with Tandberg PrecisionHD USB camera as test systems. Tests were carried out under Windows 7.

Under Windows, the installation proceeds smoothly. During the installation routine, the installation or update of Adobe Air is performed as well. It is used to display the graphical user interface.

After the installation process, all system properties (audio, video, network parameters, H.323- properties, SIP-properties, ...) have to be adjusted one time only in the settings menu (cf. right hand graphic). The configuration can still be adjusted subsequently. In the settings menu it is also possible to change a test version into a full version with the activation key.

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**TEST**

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**OPERATION**

The program's graphical interface (cf. right hand graphic) has been adopted from Polycom's Client-Server-System CMA and shows the clearly defined functionalities "own image", "contact list" and "calling". Apart from your own image, which can be deactivated, your IP-address as well as your registered name are displayed. The contact list consists of manual entries and recently performed calls. Calls can be carried out via H.323 (IP and E.164) or SIP. The bandwidth for calls has to be entered centrally in the configuration area. You can access numbers you already dialled via drop down menu.

An established connection is opened in a separate window (cf. right hand screenshot), which displays the video of the opposite side. You can control all relevant functionalities with the menu at the top of the image. The icons' functions are not self-explanatory via their design but the respective tool tips help clarify their purpose.
Users who are experienced in using Polycom can easily operate this software, the interface is well structured and can be operated intuitively most of the time. Starting and ending a data presentation is slightly inconvenient, though. When you click the respective menu entry a new window opens that can be used to initiate the desired action. A menu entry, which does not open a new window, would have been a better solution. You cannot choose freely where to position your own image. If you do not want to position it on the bottom to the right, your only option is to deactivate it. A practical feature allows you to see a preview of your own image before accepting or performing a call.

**AUDIO/VIDEO**

During all test connections, audio was encoded with G.722, G.722.1C or Siren 14, which further contributed to a usually very good audio quality. Only in connections with LifeSize Room the audio quality has to be rated poor because the spoken word is not comprehensible on the part of the LifeSize device due to very bad audio dropouts.

The video quality was good to very good in all the tested connections. The video codec H.264 was negotiated in connections to all remote systems, except for the video of Codian MCU, which was encoded with H.263+. Polycom m100 could send with its maximum resolution of 640x480 pixels in all tests, save in connections with Sony PCS G70, which only allowed QVGA (320x240). The received resolution varied between CIF to 720p, depending on the remote system. The resolution Codian MCU received corresponded to XGA (1024x768).

**H.239**

In the area of parallel data presentations via H.239 Polycom m100 shows huge flaws. Only when testing with Polycom HDX 8004 the quality of the H.239 transmission could be rated very good bar none on both sides. In few cases, the quality could be rated good: in connections with Tandberg systems 990MXP, 6000MXP and C40 bidirectional H.239 transmission was possible. It was impaired qualitatively though due to long loading times (up to 45 seconds to refresh the transmitted slide) and package loss in the H.239 channel (which lead to pixel errors). This error is patched in version 1.04, unfortunately the slides are now displayed almost quadratically.

In connection with Tandberg Movi, H.239 could be sent from m100 in very good quality, the remote side's transmission was qualitatively average though (image errors, poor readability). Only mediocre H.239 was sent and received with Polycom PVX (i.e. pixel errors and artefacts were quite common). LifeSize Room received the data presentation almost free of errors but the device could only send with diminished quality. The resolution of 4SIF (704x480) is insufficient and therefore not acceptable.
Many errors occurred which reinforced the impression that the H.239 implementation is inadequate: when a H.239 channel is started by Sony PCS-XG80, the m100 client crashes (however, m100 can send in very good quality).
In connection with Sony PCS-G70 the data presentation is also restricted; A black image is displayed when m100 sends (a presentation sent by the Sony system is received by m100 in good quality though). Both of these errors, which occur in connections with Sony devices, were not patched in version 1.04 from June 2012.
Moreover, presentations by Mirial Softphone (Mac as well as Windows) are not displayed at the Polycom m100, but the remote direction sends in very good quality. Mirial still shows the presentation when the remote side has already finished the H.239 connection.
In version 1.04 from June 2012 presentations are displayed at the Polycom m100.
In the course of a multipoint conference with the DFN Codian-MCU, sending and receiving of H.239 worked in very good quality. Still, for all participants of the conference it was not possible to send H.239 after m100 had transmitted a presentation. This error was fixed by Polycom in the 1.0.3 version.
Usually, H.239 was transmitted (if not stated otherwise) in XGA resolution (1024x768) with H.264 or H.263+. Tandberg Movi sent a resolution of 1280x720 (with H.264).
You may want, especially when transmitting slides, to use a computer that is up-to-date and exceeds the minimum requirements significantly.

REMOTE CONTROL

The camera's remote control always worked, as long as the technical requirements were met by the remote systems.

MCU

Collaboration with the CODIAN-MCU of the DFN only worked faultlessly in the dial-in, up to the maximum bandwidth of 1920 kbps. Video was received in XGA resolution (1024x768) with H.263+ and sent with H.264 in VGA resolution (640x480). A dial-out of the MCU (add participant) triggers a crash of the m100 client with an "internal error" message. This dial-out error is patched with the 1.04 version from July 2012.

GATEKEEPERS

The collaboration with the gatekeepers GNU-GK 2.0.7 and CISCO MCM worked faultlessly and stable. Registration with the devices always worked.

MISCELLANEOUS

Connections can be encrypted. You can choose between encryption "on", "off" and "auto". The first one demands encryption and only encrypted calls are established. The "auto" function implies optional encryption (if the remote system supports encryption). All test connections, except for Mirial Softphone (does not support encryption), were carried out encrypted.

CONCLUSION

With this software Polycom has a modern product in their portfolio, which is promising especially in a heterogeneous VC landscape like the German Research Network because the software is distributed under the single user licence model and is not bound to server structures (unlike e.g. Polycom CMA).
The video conference software m100 from Polycom provided convincing audio and video quality in most of the test connections. Isolated incidents, mainly concerning the transmitted audio quality, impair this rating though.

The user is promised a HD-capable software which turns out to be incorrect: the product supports HD resolutions (max. 720p) only when receiving. In sending direction, VGA is reached at maximum even when a high-resolution camera is connected.

The minimum hardware requirements should be observed under any circumstances. Even sufficiently performant computers may overload in extreme cases, which results in loss of quality.

The insufficient quality of the H.239 implementation, which was determined in the test period of November 2011, has been mostly corrected with the subsequent SW updates (current version 1.0.6 from July 2013).

**Documentation**
Producer: Polycom
Distribution Partner: MVC

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