GENERAL

PERIOD

March / April 2013

SW VERSION

The test was performed with the software version LS_VC_2.1.3(20), Enterprise Edition. The installed options were "5 HD Recording Ports", "250 Streaming Ports" and "350 On Demand-Playback Ports". The software is part of the LifeSize UVC Platform, which was used in the version LS_UVC_1.1.2(20).

DEVICE CLASS

This device is a recording, streaming and replay/recall solution for video conferences and MCU conferences. Furthermore it supports user and rights management and offers several output formats, e.g. for mobile terminal devices. Interfaces to media servers, e.g. for additional streaming, do not yet exist but they are supposed to be available in future versions.

SCOPE OF DELIVERY

The system should be mounted in a server rack. During the test a VM ware version was used, provided and pre-installed by LifeSize.

BANDWIDTHS

The system facilitates calls according to SIP with bandwidths up to 2000 kbps for each recording.
**INSTALLATION**

The tested VM ware version was pre-installed by LifeSize, making it impossible to evaluate the complexity of the installation.

**TEST**

**OPERATION**

The LifeSize UVC Video Center (in short: Video Center) is operated via a web interface. In this web interface, depending on the rights of the user, recordings can be watched, managed and started and settings of the Video Center or the entire LifeSize UVC Platform can be adjusted. The menu is well-structured, but due to the plethora of possible settings, pages and interconnections it is difficult to get an overview at first.

**CONFIGURATION SETTINGS IN GENERAL**

The web interface of the Video Center offers several different language settings. It is also possible to send automated e-mail alerts - e.g. when a recording is finished. For this purpose, a sending address and access to the corresponding SMTP server have to be provided. Another very useful option is the download or upload option of the entire configuration in one single file, e.g. for backup purposes.

The network settings include, among others, overall bandwidth limits - for recording, transcoding and display of recordings each separately. Apart from that, the Video Center supports multicast, proxy server, SSL and secure streaming. The latter requires a certificate and reduces the streaming capacity.

One feature of the Video Center is the so-called federation abonnement option. It can be used to subscribe to content of other Video Centers, which is then available at the local Video Center. It is necessary to enable this option at the participating Video Centers and to log into the other Video Centers with a user login which is created specifically for this purpose. The local Video Center then offers the content which is available on the remote Video Centers connected via federation.

For recordings, various standard settings can be determined, which can be adjusted for every group and every user individually. For example, the length of the recording keys (a row of numbers which represents concrete recording settings) can be set between 3 and 10 digits and whether the recording key can be empty. The maximum available disk space for users and groups, the maximum recording time, the maximum recording bitrate and the standard recording bitrate can be specified as well. Further global options are: Comment option for recordings for registered users, chat option for live streaming, download option for recordings, generation of recording keys for content creators (see "Users, Groups and Roles"), selection of video formats in recording keys (was not possible in the test), creation of subtitles for recordings and auto start of replay on selection.
The authentication method for users of the Video Center can be conducted locally or via LDAP. Groups can also be integrated via LDAP. The following roles are available for users of the Video Center:

- **Anonymous user**: Any user who is not logged in has this role. Only recordings that are not subject to access restrictions can be displayed. Commentaries on recordings are not possible.
- **Registered user**: Each logged in user has this role. Recordings that are shared with the user or their group can be displayed. Commentaries on recordings are possible.
- **Content creator**: A content creator can start recordings with their own recording keys. These recording keys must have been previously created by an administrator or, with the corresponding setting of the Video Center, content creators can also create recording keys. Furthermore, it is possible to upload videos to the Video Center.
- **Administrator**: Administrators additionally have all administrative privileges. There is a distinction made between server administrator (entire LifeSize UVC Platform) and content administrator (Video Center).

Groups allow it to manage multiple users simultaneously. Like user roles, a differentiation of the roles available for groups is possible. If a member of a group has extended rights due to their user settings (e.g. server administrator), these rights are not limited by the group settings. A user can be member of multiple groups, in that case the rights are also united.

**RECORDING KEYS**

Recording settings are stored in the Video Center as so-called recording keys, i.e. specific recording settings are associated with a sequence of 3-10 digits (recording key). At default settings, recording keys can only be created by an administrator. With corresponding settings of the Video Center, content creators may also create recording keys. Meta data, such as a description and tags, can be specified and the users and groups that should have access to it are determined in each recording key. In addition, each recording key is associated with a channel, in which the recordings are then stored. Each channel can therefore contain several recordings and has a separate access control for users and groups.

Further settings in the recording keys concern the recording types. You can choose whether live streaming is to be used, if it should be recorded, if the recording in question will be available for download and can be commented on and whether a chat should be available during live streaming. The functionality to download, comment and chat can be disabled for the entire Video Center and is consequently not available. You can specify up to two different recording bitrates, where the first is the actual recording bitrate. The other is used for a transcoded version with lower resolution and bitrate. Similarly, two other live streams are available for mobile devices in two different resolutions and bitrates.

**CONNECTION ESTABLISHMENT**

Selecting the Video Center via SIP from a terminal device was not possible in the test with the syntax specified by LifeSize. It did not matter whether the device was registered with a SIP registrar and whether the recording key was specified in the syntax.
The selection of a terminal device by the Video Center via SIP was possible in principle. The recording is started and controlled via the web interface of the Video Center. A maximum resolution of 720p and G.711 as audio codec were achieved in the test. Apart from that, BFCP (second video channel for data presentation) is not supported in this call direction. BFCP support and better audio codecs in this call direction are scheduled for the next versions of the Video Center, according to LifeSize. In the test only a simultaneous recording of this call direction was possible. Other connections to different terminal devices were rejected by the Video Center, although only one recording port of the five available was occupied.

With compatible LifeSize products, a third alternative for connection establishment exists. In the settings under Administer, Video, Recording and Streaming, the Video Center can be specified directly. In a normal connection between the LifeSize product and another terminal device, the recording can then be started by pressing a button at the LifeSize product. For that purpose, a second connection is established from the LifeSize product to the Video Center via SIP. In the test a maximum of 720p with audio codec AAC-LD was achieved. With this connection type, BFCP with 5 fps is supported and stored in a separate file on the Video Center. It is possible to set a fixed recording key for the LifeSize product or to re-enter it with each use. Automatically recording each video conference is possible as well. Furthermore, with this connection type, layout settings can be specified at the LifeSize product because in this case, two terminals are recorded simultaneously. One option is recording on one side only (LifeSize product or connected terminal device) the other from both sides. In the test, several recordings could be carried out simultaneously by the Video Center with this connection type.

### LIVE STREAMING AND ON-DEMAND PLAYBACK / TRANSCODINGS

The Video Center is only capable of live streaming with Flash. Interfaces to other media servers, for example for additional streaming, are not provided, but they are planned for future versions according to LifeSize. When live streaming, time delays of up to 100 seconds occur. In the test several times the live stream only showed a black screen in connection with the RADVISION (Avaya) Scopia XT5000 after indefinite time. In the associated recording the image simply froze at that point.

The recordings and transcodings are saved as MP4 with the codecs H.264 and AAC-LD at 720p. Transcodings were always immediately ready and usable after the end of the recording. The assessment of the quality of the live streaming and recordings/transcodings are included in the following point "Audio / Video Load Test".

### AUDIO / VIDEO LOAD TEST

With full use of only one simultaneous recording, i.e. with 2 recording bitrates, live stream and mobile device streams, significant quality problems were noticeable in the test. That is, the recording or the live stream stopped periodically every few seconds, sometimes there were even freeze images in the video and data presentation, especially for high motion content in the data presentation. Audio was also affected and partly compressed, i.e. reproduced much faster than normal, and thus missing elsewhere. In the absence of additional transcodings and mobile device streams the problems in the test decreased significantly, but there were still pauses and partially artefacts and audio dropouts.

Live stream and recordings do not differ significantly in quality. The type of dial-up had no effect on the quality. Live streaming or recording at a resolution of 1080p, which should be available according to the data sheet, could not be achieved in the test. A maximum resolution of 720p was implemented.

A load test could not be carried out, as only one recording could be started from the Video Center to a terminal at the same time (see "Connection Establishment"). This restriction held regardless of which transcodings and mobile device streams were selected in the recording key. Other connections to different terminal devices were rejected by the Video Center, although only one recording port of the five available was occupied.
BFCP

The Video Center supports BFCP (second video channel for data presentation) only in conjunction with compatible LifeSize products (see "Connection Establishment"). 5 fps are then supported in the second video channel and it is stored in a separate file on the Video Center. In cases where BFCP is not supported, the data presentation is sent via the video channel. The distribution of video and data presentation is determined by the transmitting terminal. Full support of BFCP is planned for the next versions of the Video Center, according to LifeSize.

SERVICE DFNVIDEOCONFERENCE

Collaborating with the MCU within the service DFNVideoConference was not possible in the test. Calling the MCU through the Video Center with the syntax "Konferenz-ID@mcu.vc.dfn.de" did work, but the Video Center immediately dropped out of the MCU conference. Inviting the Video Center to a MCU conference with the help of the MCU control was not successful either, no connection was established.

CONNECTION OF EXTERNAL MEMORY

The Video Center possesses an internal memory capacity of 1 TB for recordings. Direct access to the files of the Video Center or the recordings is not possible. Connecting external memory through the protocols CIFS and NFS is possible. During the test, the installation could not be performed.

MISCELLANEOUS

It is possible to access sundry log files through the web interface. It is possible to upload recordings to the Video Center. They either have to have been downloaded beforehand from a Video Center or use the format MP4 with the codecs H.264 and AAC-LD.

CONCLUSION

The LifeSize UVC Video Center could not convince in the test due to considerable problems in video and audio quality. The scope is further reduced by the restriction to SIP and the fact that BFCP is only partly supported. The connection problems are a big flaw, especially with the MCU within the service DFNVideoConference. Nevertheless, the Video Center can score with well-thought-out user management and with a variety of configuration settings.

DOCUMENTATION

We would like to thank Mr. M. Winter from the company LifeSize (a department of Logitech) for providing the test.

Manufacturer: LifeSize (a department of Logitech)
Contact person: Herr M. Winter
<table>
<thead>
<tr>
<th>Supported general standards</th>
<th>SIP, partially BFCP</th>
</tr>
</thead>
<tbody>
<tr>
<td>Audio encodings</td>
<td>G.711, AAC-LD</td>
</tr>
<tr>
<td>Video compression</td>
<td>H.264</td>
</tr>
<tr>
<td>Resolution</td>
<td>Up to 1080p with 30 fps (not reached during test)</td>
</tr>
<tr>
<td>Bandwidth</td>
<td>Up to 2000 kbps per recording</td>
</tr>
</tbody>
</table>