Genesys Quality Management 8.1

Screen Capture Administration Guide

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Table of Contents

Chapter

1 Introduction

This chapter provides an overview of this document, identifies the primary audience, introduces document conventions, and lists related reference information.

This chapter contains the following sections:

Document Purpose

This document describes the basic installation of the Genesys Call Recording 8.1.500+ solution and operating system on a single server and on a simple cluster. Advanced configuration and integration with third party applications are described in other documents, for example the Call Recording Administration Guide and related Whitepapers.

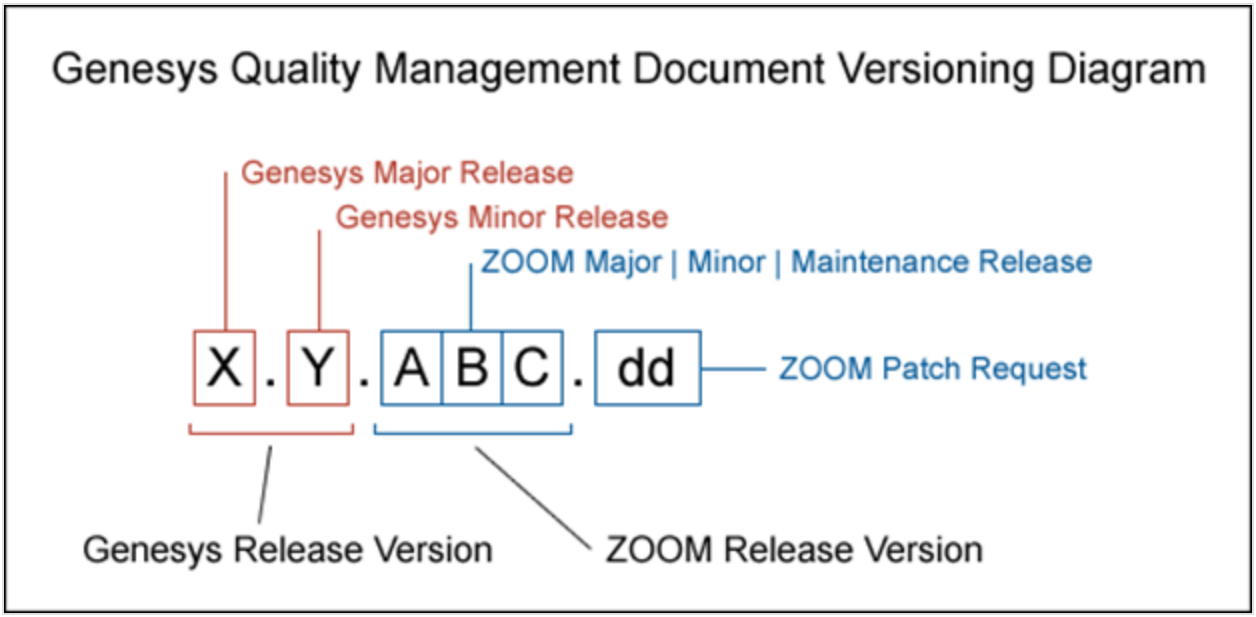
Audience

This document is intended for the technicians responsible for system installation and its preparation, on behalf of administrators who will then configure and administrate the system.

Document Version

The Genesys Quality Management products are provided by a partnership between Genesys and ZOOM International. The Genesys Quality Management products use a versioning format that represents a combination/joining of the versions used by these two separate entities. Although the Genesys Quality Management products and documentation use this combined versioning format, in much of the software and logs you will see the ZOOM versioning alone. You need to be aware of this, for example, when communicating with Technical Support.

The version for this document is based on the structure shown in the following diagram:



Typographical Conventions

Names of functions and buttons are in bold. For example: **Upload**.

File names, file paths, command parameters and scripts launched from the command line are in `non-proportional font`.

Referred documents are in italics. For example: see the document *This is a Document* for more information.

```
Code is placed on a gray background and bordered
```

Hyperlinks are shown in blue and underlined: http://genesyslab.com/support/contact.

Expected Knowledge

Readers of this document are expected to have the following skills or knowledge:

- Basic knowledge of the Genesys Call Recording system features and functionality
- Knowledge of Red Hat Enterprise Linux installation and configuration

- Unix system administration skills
- Network administration skills

Browser Recommendations and Technical Requirements

A minimum screen resolution of 1024 x 768 is necessary to use the GQM applications comfortably.

The following supported browsers are recommended for the Web GUI. The Windows Media Player is needed for Call Recording. The Java plugin is required for Universal Player in Quality Manager.

Important:
Use Java 6 with *Internet Explorer* or use another Browser. There is a known issue with Java 7 which causes *Internet Explorer* to freeze.

The browsers for PCs are shown in order of preference. The fastest performing browsers are first:

1. *Google Chrome:* Please download the latest version. Check issues using the latest browser version before reporting them.You must install the *Windows Media Player* plugin below:

http://www.google.com/support/chrome/bin/answer.py?hl=en&answer=95697

2. *Internet Explorer 9*
3. *Internet Explorer 8* with *Google Chrome Frame* plugin. The *Google Chrome Frame* plugin can be obtained here:

http://code.google.com/chrome/chromeframe/

4. *Internet Explorer 7* with *Google Chrome Frame* plugin.This version of IE should be upgraded to IE9 as soon as possible.
5. *Firefox 3.6.16+* Admin rights required for installation. You must install the *Windows Media Player* plugin below:

http://www.interoperabilitybridges.com/windows-media-player-firefox-plugin-download

6. *Opera 9+*
7. *Safari 5*

8. *Internet Explorer 8* without the *Google Chrome Frame* plugin.The performance is slow.

The following browsers are not recommended:

Internet Explorer 7 without the *Google Chrome Frame* plugin runs too slowly.

Internet Explorer 6 is not supported.

Important:

Use Safari or Firefox with Mac OS 10. There is a known issue with Chrome that causes problems with Universal player.

Web browsers require a media player plug-in (*Windows Media Player* 9+ for Windows PCs, *VLC* for Macs and Linux) for audio and video media review, and at least *Adobe Flash Player* 9.x runtime installed for viewing reports.

Internet Explorer Security Settings:

Windows XP

The following recommendations are encouraged for the Web GUI running on Windows XP:

- Check that the Call Recording URL is included in the "Trusted sites". If not, include it there. If the user doesn't have administrator privileges, contact the system administrator or set security level of the zone that contains the server to Low.
- Check that there is no proxy enabled in the web browser. If there is, try to disable it. The proxy can affect the functionality.
- Set the security level of trusted sites to Low.

Windows 7

The following recommendations are encouraged for the Web GUI running on Windows 7:

- Check that the Call Recording URL is included in "Trusted sites". If not, include it there. If the user doesn't have administrator privileges, contact the system administrator or set security level of the zone that contains the server to Low.

- Check that there is no proxy enabled in the web browser. If there is, try to disable it.
- Set the security level of trusted sites to Low.
- Disable protected mode for all zones. If protected mode is Enabled for the internet zone, it will affect the functionality, even if the server is in trusted sites (Internet Explorer only).

Technical Requirements for Playing Audio and Video Media

The following media players are recommended for successful video and audio playback. Please see the Screen Capture Administration Guide for more information about media player configuration.

The media players are listed in order of preference, for the reasons supplied below:

1. *Microsoft Windows Media Player*: Plays all audio and video media on the Windows 7 OS. Previous versions of Windows, for example,Vista and XP, need additional codecs to play video media.
   Download the K-Lite Codec Pack (BASIC or BASIC Mirror versions) from: http://www.free-codecs.com/K_Lite_Codec_Pack_download.htm.
2. *VLC*: Plays combined video and audio recordings, including dual-screen recordings of 1920x1080 or larger. It is not integrated into browsers, for example, *Internet Explorer* and *Firefox*, for audio playback. *VLC* is recommended for Macs and Linux-based systems for combined audio and video reviewing. *VLC* can be downloaded at: http://www.videolan.org/vlc/.
3. *QuickTime*: Plays audio and is integrated into *Internet Explorer*, but does not support playing mp3 audio and H.264 format video together for combined audio and video playback.

Chapter

2 Screen Capture Overview

Genesys Screen Capture is a client-server application providing screen capture and audio/video processing capability. It consists of the following components:

- **Screen Capture Server (SRS)**: Java-based server component that receives capture requests and controls screen capture clients (SCC).
- **Screen Capture Client (SCC)**: Native Windows client application that runs on an agent PC desktop machine, capturing screen data and sending to a Media Upload Server. It includes a loader application that manages the starting and stopping of the SCC.
- **Screen Capture Media Upload Server (MUS)**: Java-based server component running on standard Apache Tomcat server, receiving chunked-data stream from SCC clients and storing as raw compressed capture files to a defined location.
- **Screen Capture Media Encoder (SME)**: Java-based server component providing on-demand encoding of raw capture files (optionally mixed with audio) to MP4 video format.

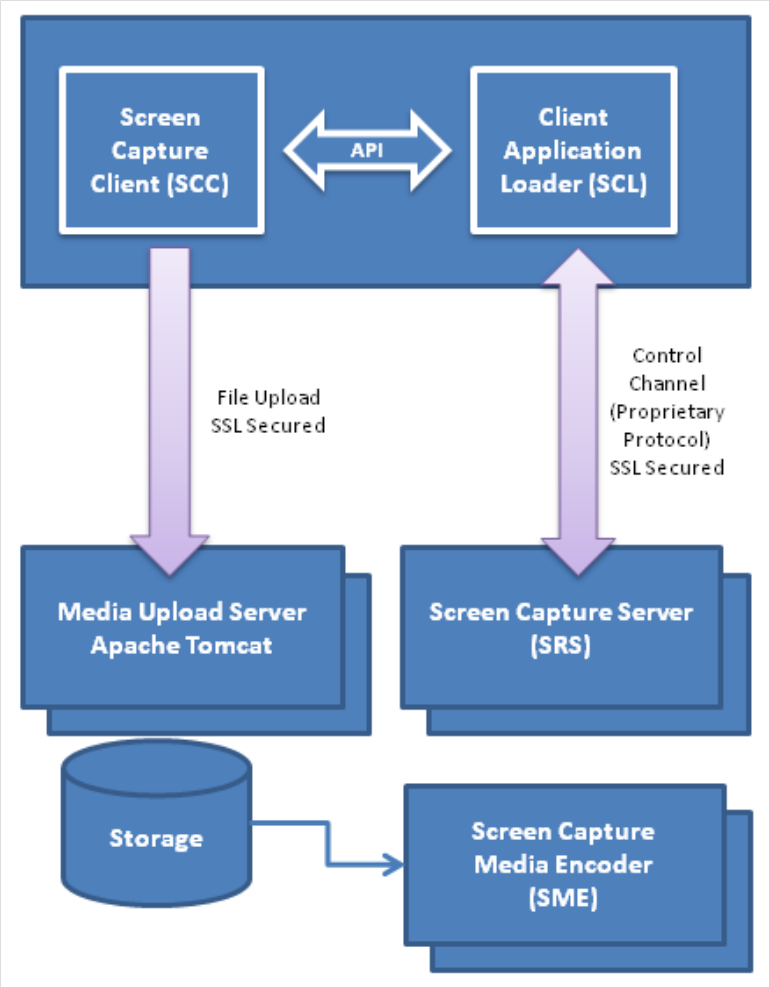


Figure 1: Screen Capture Components

Chapter

3 Key Features

Screen Capture has the following key operational features:

- Highly scalable:
  - Only changes between screen frames are transmitted from the lightweight client to server application for storage.
  - Encoding can be configured to perform only on demand to minimize the processing load.
- Intelligent bandwidth management – Screen Capture can automatically tweak capture quality to ensure bandwidth usage from client to server remains within defined limits.
- NAT-compatible - the Screen Capture Client running on the desktop PC initiates client-server connections.
- Zero-install mode for the Screen Capture Client, together with 3rd party integration options for the SCC executable (see the Appendix).
- Fully integrated into Genesys Quality Management.

Chapter

4 Operation

This chapter covers the basics of Screen Capture operation, including configuration parameters and the capturing and encoding of screens.

This chapter contains the following sections:

Capturing Screens

For a single server Call Recording installation, the Screen Capture server components (SRS, MUS, SME) are installed on the Tomcat application server deployed during Call Recording setup (this is also used for the Call Recording GUI and Quality Manager applications, if activated).

The Screen Capture Client (SCC) is installed on agents' PC desktops and configured to pair with the agent's IP phone. Call recording rules are set to require screen capture as well as audio recording.

When a call is received by an agent's phone, Call Recording checks for a rule that requires screen capture, and contacts the SRS with details of the call as well as starting the audio call recording. The SRS alerts the SCC running on the agent's PC to start recording according to the parameters it supplies. The SCC begins to send a stream of screen capture data in intermediate format to the Media Upload Server, where it is stored. When the call ends (or when another event occurs, such as external call center data is detected), the SRS notifies the SCC to stop recording, and the screen capture stream ceases.

Encoding and Viewing Captured Screens

Encoding of the intermediate screen capture files is performed by the *Media Encoder* (SME), either on demand (when the 'video export' icon is clicked for a call listed in the Call Recording Web GUI), or as a batch process at regular intervals, to ensure that the server processors are not adversely affected by encoding operations. The SME converts the intermediate .recd capture files and .mp3 audio files, and creates one mp4 container file with a payload of audio (mp3) and video (h.264 or MPEG-4 2).

Important:

QuickTime Player cannot play recorded screens because it does not support the combination of audio (mp3) and video (h.264) codec. Users are recommended to use a different media player for example, *VLC* or other. See Windows Media Player Configuration.

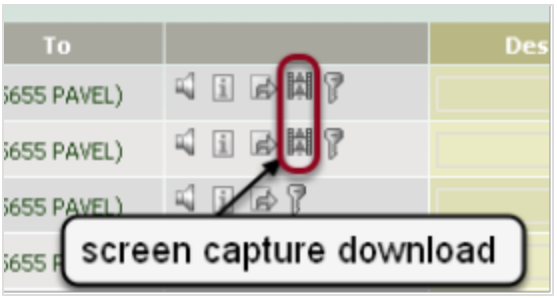


Figure 2: Screen Capture Download Icons in Call Recording Web GUI Call Recordings List

Recorded calls containing screen capture data include a special 'movie clip' icon on the Call Recording Web GUI **Recorded Calls** tab. Clicking on a screen capture icon can result in two different scenarios, depending on the *Media Encoder* configuration:

- Immediate download or playing of the MP4 file. This recording has already been encoded by the *Media Encoder* in batch mode, or has been viewed before.
- A long wait with no apparent activity (the larger the recording, the longer the wait). This occurs if a recent recording has not been encoded to MP4 format by the *Media Encoder* yet. The Encoder is invoked on-demand in this scenario, but it can take up to 75% of the original recording time to complete encoding to MP4 in this manner.

Important:

Performance Note

It is recommended that the *Media Encoder* scheduling configuration is tweaked to ensure that (where possible) screen captures have already been encoded before users are likely to view them.

This can be defined in the Media Encoder settings section, ensuring **Schedule task run** is checked, then modifying **Run period in minutes** and **Range of processed calls** settings as appropriate.

PCs running a version of Windows earlier than Windows 7 may not have the correct codecs installed in Windows Media Player in order to view the downloaded MP4 recordings. See the Media Player Configuration section to learn how to install appropriate free MP4 codecs to enable viewing of screen capture files on these operating systems.

Screen Capture Parameters

The agent screen can be captured at a rate of between 1 and 5 frames per second (fps). The SCC divides the screen area into tiles. For each new capture frame, the difference is calculated between tiles on current and previous capture frames. If a tile meets or exceeds the configured difference threshold, the tile with meta information is added in jpeg format to the capture stream. Each stream (that is, screen capture session) always starts with the first complete jpeg capture file, followed by the diff frames.

Quality settings, frame rate and screen resolution dictate the size of the intermediate (.recd) files created during screen capture. Normally, only one .recd file will be created during a single screen capture session, but for each drop in connection between the SCC and MUS a new file is created on the MUS.

Chapter

5 Installation

This chapter covers the installation of the Screen Capture Server components, Capture Client and media player configuration.

This chapter contains the following sections:

Screen Capture Server Components

The Screen Capture server components (SRS, MUS and SME) are installed and enabled during GQM setup, if the **Screen Capture Service** and **Media Encoder Service** options are checked in the service list. This single server installation is suitable for small deployments; for larger (cluster) deployments a multi-server scenario is preferable.

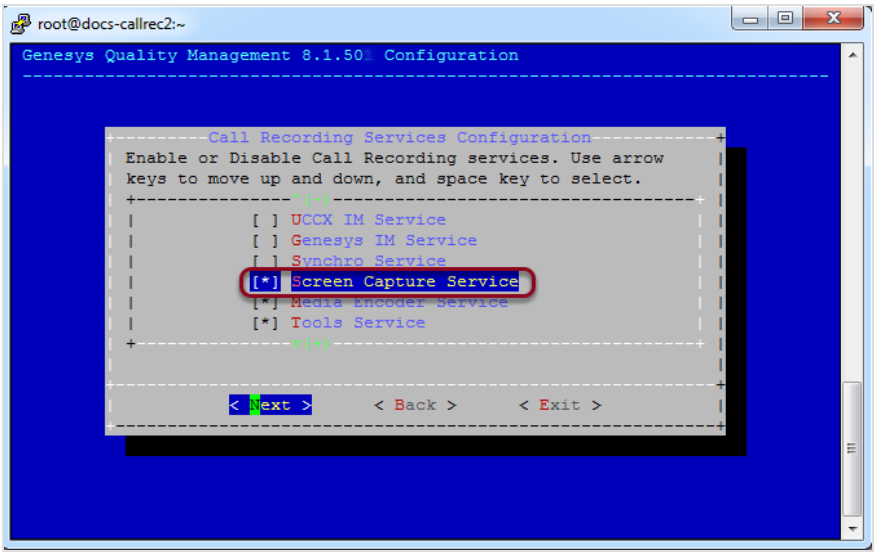


Figure 3: Screen Capture Services During GQM Setup

Important: Screen Capture Uploader Service

The `screenrec-uploader` service is a required part of the Screen Capture server-side installation. Although included as part of a new installation, this package is currently not installed during upgrade from GQM versions earlier than 8.0.47x. It must be installed manually after upgrade using the Linux RPM commands; please refer to the RPM documentation for more information, or contact http://genesyslab.com/support/contact.

Screen Capture Client

The Screen Capture Client is a Windows screen recording client that, on execution, attempts to connect to a specified SRS server. If a server connection fails or disconnects and more than one server is specified, the SCC will attempt to connect to the next server in the list, with a short pause between connection attempts. The client issues regular heartbeat messages to the current server during operation, to prevent timeouts and detect disconnections in a timely manner.

When a 'start recording' request is received from the SRS, screenshots are captured at intervals (specified in the **Recording Specifications** section of Screen Capture settings), split into tiles and sent in the intermediate `.rec` format to the *Media Upload Server*, until a 'stop recording' request is received. If an agent locks their screen while the capture client is capturing images, then the images will be blank until the screen is unlocked.

The Capture Client can be deployed in two modes:

- **Service Slave Mode**: The Capture Client is installed together with the Client App Loader as a Windows Service, which runs in the background on the Agent PC. The Loader can multiplex messages between multiple running Capture Clients (such as in a Terminal Services environment) via Windows named pipes.
  This mode is the standard operational mode, but requires access to the Windows Registry.
- **Standalone Mode**: The Capture Client is unpacked as a standalone executable, with no installation or access to the Windows Registry required (known as "zero-install"). This mode is provided for remote control of the Capture Client by an Agent Desktop. Information required by the Capture Client at startup is provided via command line parameters.

Service Slave Mode

The Capture Client Installer is deployed on each agent's desktop PC using a standard code-signed Windows installer file,which can be found at the following URL (where SERVER_URL is your main Call Recording URL):

```
http://SERVER_URL/callrec/plugins/screenrec-client-installer-8.1.500.msi.
```

Alternatively, it can be downloaded from the Call Recording Web GUI as follows:

Log in to the Call Recording Web GUI using any valid Call Recording account.

Navigate to **Settings > Configuration > User Setup > Plugins**

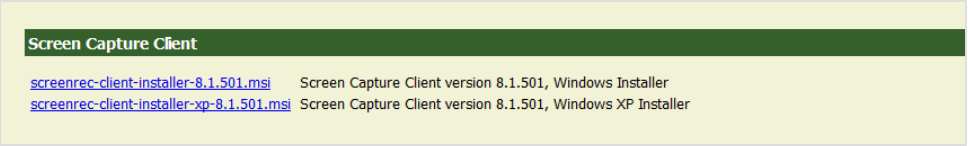


Figure 4: Download Capture Client Installable

Click on the appropriate Screen Capture Client link to download the ~2MB installer file.

The standard Windows Installer package for Windows 7 must be used.

The Windows XP Installer version can be used for XP service pack 3 or Vista.

Capture Client Installation

Double click on the Capture Client Installer (.msi) file: The security warning dialog box appears.

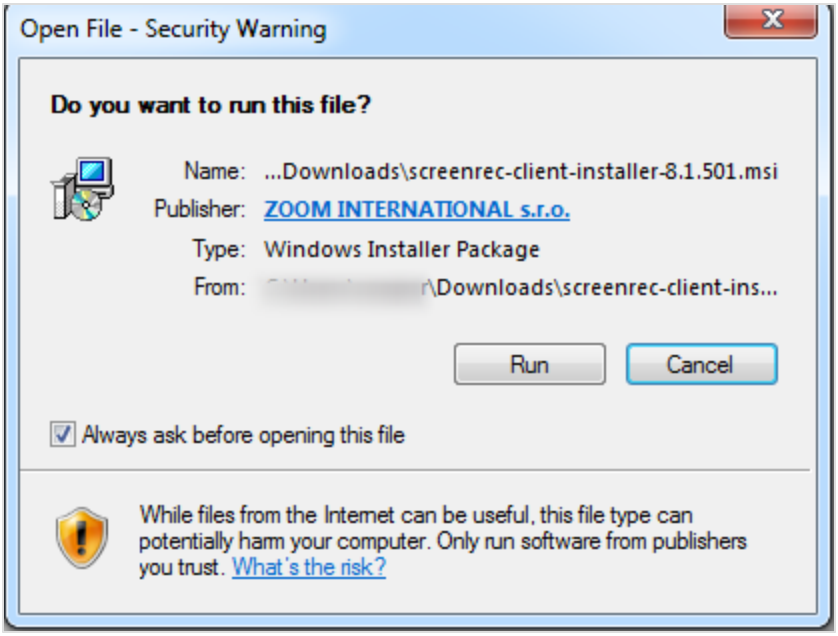


Figure 5: Security Warning

1. Click **Run**. The Welcome dialog box appears.
2. On the welcome dialog box click **Next**. The server selection dialog box appears.

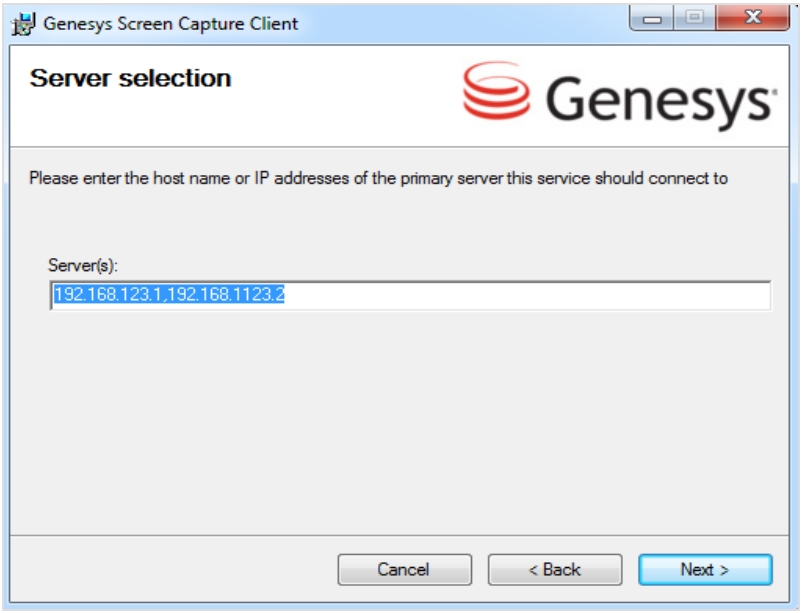


Figure 6: Server Selection

3. Enter one or more SRS server host addresses separated by a comma. Click **Next**. The Select Installation Folder dialog box appears.

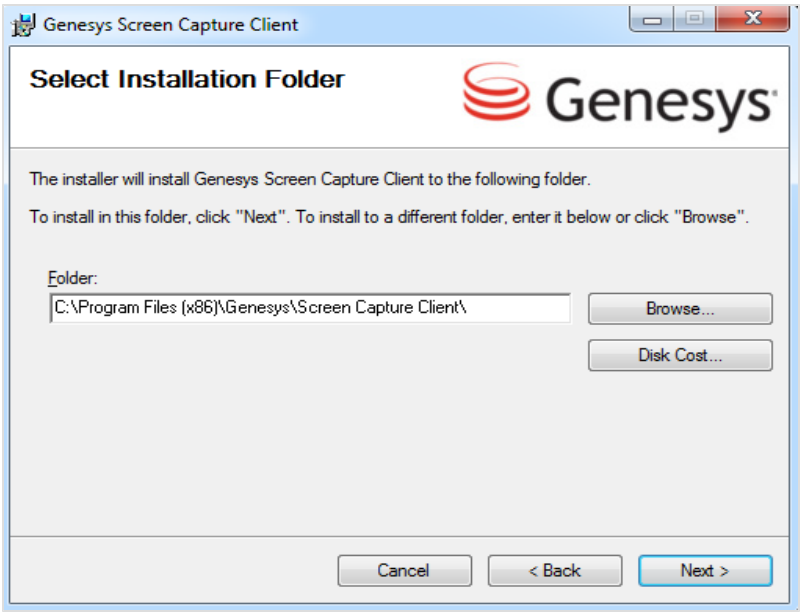


Figure 7: Selecting the Installation Folder

4. Click **Browse** and select the installation folder. Click **Next**. The confirm installation dialog appears.

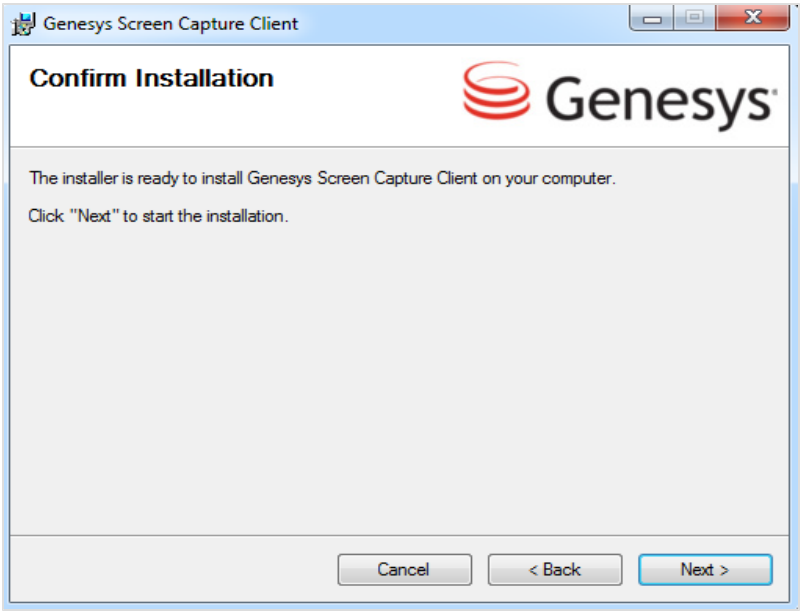


Figure 8: Confirming the.Installation

5. Click **Next** to confirm the installation.

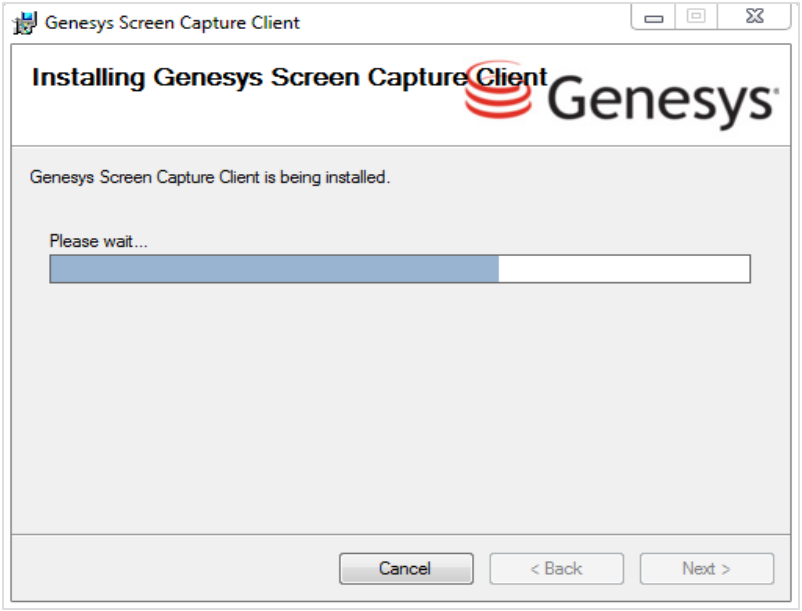


Figure 9: SCC Installation

6. Click **Close** when complete.

Once installation is complete, the Capture Client runs in the background. No icon is visible in the taskbar, but the SCC application ScreenREC.exe can be found in

the Windows Task Manager process list. Should this process ever be stopped manually by a user, the (hidden) ScreenRECStarter.exe process re-starts it within seconds.

The installer stores the settings entered during setup at the following Windows Registry location, dependent on PC architecture:

32-bit Windows installation:

```
HKEY_LOCAL_MACHINE\Software\Genesys Telecommunications
Laboratories, Inc.\Genesys Screen Capture Client
```

64-bit Windows installation:

```
HKEY_LOCAL_MACHINE\SOFTWARE\Wow6432Node\Genesys
Telecommunications Laboratories, Inc.\Genesys Screen
Capture Client
```

Standalone Mode

The *Standalone Capture Client Package* can be found only at the following URL (again where SERVER_URL is your main Call Recording server URL):

```
http://SERVER_URL/callrec/plugins/screenrec-client-
binary-8.1.500.exe.
```

Double-clicking on the package file (`.exe`) unpacks the `ScreenREC.exe` binary executable in the current directory.

In standalone mode, the following command line arguments are required:

```
ScreenREC.exe -agent <agent_ID> -host <hostname or IP address>[:optional_
port]
```

`-agent <agent_ID>`
The agent ID of the logged in agent, acquired by the Agent Desktop.

`-host <host_list>`
A list of one or more remote Screen Capture Recording Server (SRS) IPs or FQDNs, separated by spaces. In a single (standalone) GQM server scenario, the IP address of the Call Recording server is specified.
Each host can have an optional port appended after a colon (`:`). If no port is specified, the default port value of 7003 is assumed.

Examples

Agent 'jsmith', single host, port 7654 specified:

```
ScreenREC.exe -agent jsmith -host 192.168.200.132:7654
```

Agent 'jsmith', multiple hosts, default port (7003):

```
ScreenREC.exe -agent jsmith -host 192.168.200.132 -host 192.168.200.134 -
host 192.168.200.164
```

Capture Client Security

For additional security, a suitable Windows group security policy should be determined for the `ScreenRECStarter.exe` and `ScreenREC.exe` applications.
Microsoft provides a free Security Compliance Manager solution for all currently supported Windows platforms, which includes group policy definition capabilities.

Capture Client Hostname Configuration

For correct communications between Screen Capture components, it is necessary to ensure that the agent PC has a correctly configured IPv4 `localhost` hostname.
There should be the following entry in the`C:\Windows\System32\drivers\etc\hosts` file:

```
#::1 localhost
127.0.0.1 localhost
```

Chapter

6 Screen Capture Configuration

This chapter covers final configuration of Screen Capture components within the Call Recording Web GUI, together with details of command line syntax and parameters.

This chapter contains the following sections:

Pairing Screen Capture Agents to Their Desktops

Each agent's desktop PC and IP phone must be associated (paired) to each other; a process known as 'resolution'. This setting then tells Screen Capture which desktop to record when a call is initiated. There are four different methods of configuration, depending on the Filter setting:

Option 1 - XML Resolver

This is the simplest option, suitable for a small number of Screen Capture-enabled agents. On the configuration screen, you can use the default XML resolver to associate agent IPs and phones.

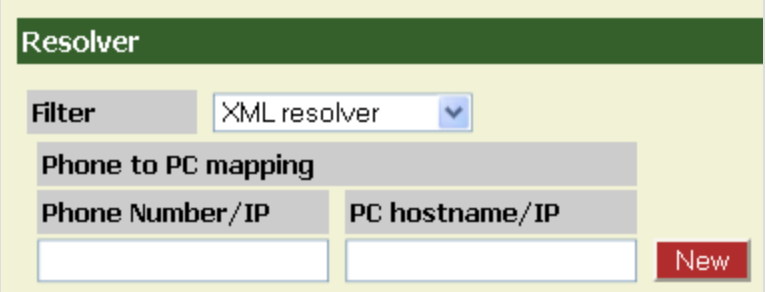


Figure 10: XML Resolver Pairing

1. In the **Filter** dropdown list, select **XML Resolver**.
2. Click **New**.
3. Enter the **Phone** (extension or IP address) and **IP** (PC hostname or IP address) for an agent. Repeat this until you have entered all agents' phone and IP information.
4. Click **Save configuration**.

Important:

Each mapping that pairs a phone extension to a PC IP address must be unique for Screen Capture to operate correctly!

Option 2 - Agent ID Resolver

The **Agent ID resolver** can only be used with Call Recording installations incorporating one of the following Contact Center integration components:

- Genesys Integration Module
- Genesys Enhanced Passive Recording (EPR)

The Windows login ID on the Agent's PC is matched with the Agent's Contact Center login ID, obtained as external data by the SRS from the Call Recording integration component.

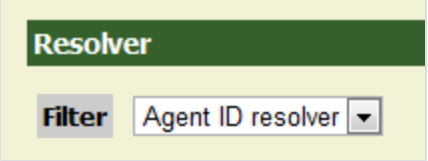


Figure 11: Agent ID Resolver

Option 3 – Property Resolver

To specify a large number of pairs, the use of a separate configuration file can be easier to maintain. This file is located on the Call Recording server (or can be created) at the following location:

```
/opt/callrec/screenrec/properties/cz/zoom/callrec/srs/addresses.properties
```

Each pair can be any combination of IP address, hostname, or phone extension; e.g. IP address to hostname, extension to IP address, extension to hostname, and so on. However, a pair consisting of a desktop IP address and an agent extension number must be unique (Screen Capture will not operate correctly if more than one extension number is paired to the same desktop IP address).

Use a separate line for each pair, for example, if the agent's IP phone is `192.168.50.12` and the agent's desktop PC IP address is `192.168.110.32`, enter:

```
192.168.50.12=192.168.110.32
```

If the desktop IP and phone IP are identical, for example, if the agent is using a software IP phone, enter the same IP address twice:

```
192.168.110.50=192.168.110.50
```

If all Screen Capture-enabled agents are using the same IP address for both desktop PC and IP phone, see the next option: IP to IP resolver.

After updating the addresses.properties file, select the Property resolver filter option in the Screen Capture Resolver configuration, then restart Screen Capture.

Important:

If a change is made to the addresses.properties file, Screen Capture must be restarted to commit the changes.

Use the command:

```
/opt/callrec/bin/rc.callrec_screenrec restart
```

Option 4 – IP to IP Resolver

If all agent pairs use the same IP address for both desktop PC and IP phone (as in all agents use a software IP phone), this option may be the most appropriate. If screen capture is requested according to the recording rules, Call Recording will automatically attempt to contact the *Screen Capture Client* using the same IP address as for the agent's IP phone.

Screen Capture Configuration in Call Recording

Pre-requisites

The following are required to ensure that Screen Capture will function properly:

1. A running Screen Capture service (view the output from `/opt/callrec/bin/callrec_status` to check)
2. An appropriate license for Screen Capture (the Call Recording license must include Screen Capture activation)
3. Agent IP phones paired to their PC IP addresses (configured in the last section)
4. At least one recording rule defined with the Screen Capture checkbox checked (and Screen Capture Usage (%) value above zero)

The remainder of the configuration continues to take place in the Call Recording Web GUI **Settings > Configuration >** Screen Capture **tab**:

- Use the Screen Capture settings tab for specifying quality, format, and so on.
- Use the Screen Capture Communicator settings tab to set the main RMI address and the recording initiation/stopping selection.
- Use the Media Encoder settings tab to set audio/video mixing options.

Screen Capture Settings

Master Screen Capture

Screen Capture supports multi-server installations for better load balancing.

If you are using only one Screen Capture server (this is the default configuration), leave these settings unchanged (for example, **Server status** is by default set to **master** and Load coefficient is equal to `1`).

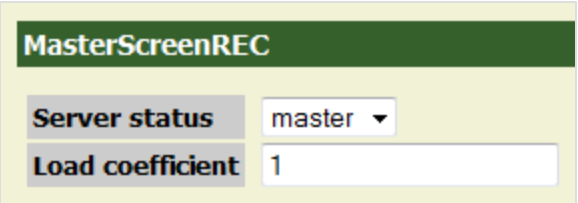


Figure 12: ScreenREC Master Configuration

Important:

The first Screen Capture server must always be set to **master**. If you are adding additional Screen Capture servers, set them to **slave** mode (all other parameters are set the same as the master). There can only be one master server.

- **Load coefficient** determines load balancing between servers – higher values allow higher loads. The load is divided proportionally according to this coefficient – for example: the first server coefficient is `1` and the second server is set at `3`, so the load is divided in a 1:3 ratio.

Resolver

- **Filter** – the method to determine desktop PC to IP telephone pairs. Filter configuration was described earlier in this document. If you are using a dynamic XML based web service for setting pairs, please consult the Genesys Supportteam at support@genesyslab.com.

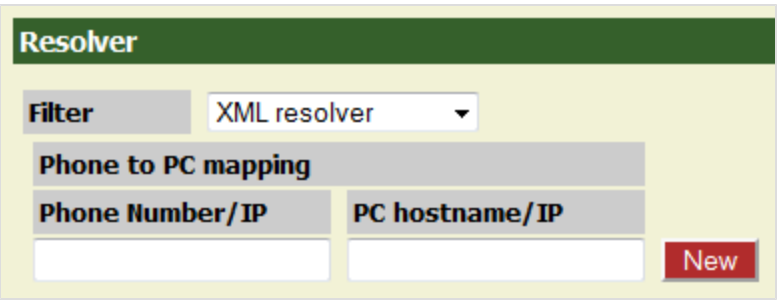


Figure 13: Resolver Settings

Registry address

- Screen Capture **Registry address** – sets standard binding information. Select the server where Screen Capture is running. Servers are defined in the Call Recording Servers tab.

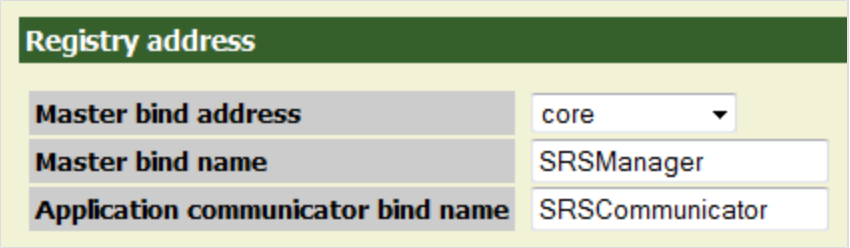


Figure 14: Registry Address

Output File & Uploader Settings

These settings relate to the *Media Upload Server* (MUS).

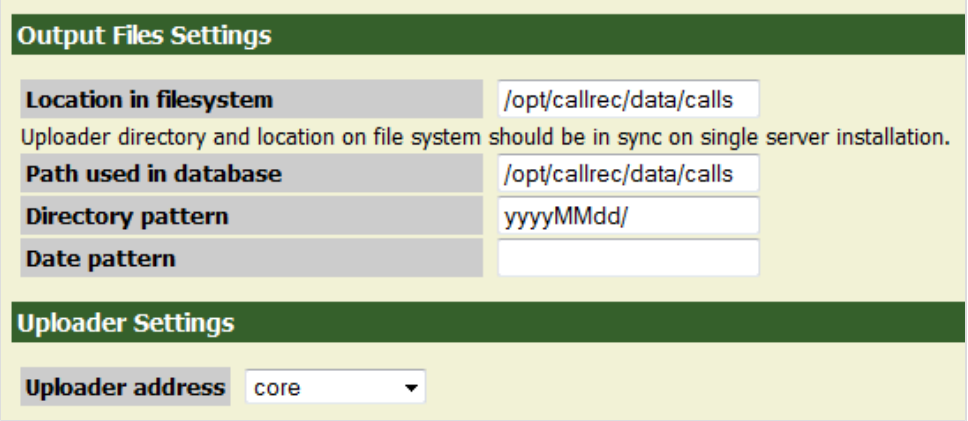


Figure 15: Output file and Uploader Settings

- **Location in filesystem** – Path to directory containing intermediate (.recd) screen capture files.
  If Screen Capture is installed as part of a single (standalone) GQM server, this path will be the same as the path used in database setting;
  For example: `/opt/callrec/data/calls`

  In a Screen Capture cluster scenario, where the *Media Upload Server* (MUS) is installed on a separate server, this setting will be the full mount path from the MUS server to the remotely mounted Call Recording Core file system directory;
  For example: `/mnt/core/opt/callrec/data/calls`
- **Path used by database** – Internal path to directory containing intermediate (`.recd`) screen capture.
  This will remain the same no matter whether a standalone or cluster installation is used;
  For example: `/opt/callrec/data/calls`

- **Directory pattern** – The directory pattern is the template for creating subfolders in the storage directory. By default Call Recording stores calls in a new folder every day – the default template `yyyyMMdd` means that recordings from 24.12.2009 will be stored in a folder named `20091224`. If this setting is changed in Call Recording, update this template to match your setting.
- **Date pattern** – Use this template for customizing the date format. Default: empty.

Important:

The Date pattern setting is not necessary for most Call Recording installations, since it overrides the standard date template. It is recommended to leave this field blank.

Uploader Settings

- **Uploader address** – The Screen Capture *Media Uploader Server* can be selected if different to the Core server – the server can be defined in the Call Recording Core settings in the Web GUI. Note that the MUS must be mapped to the Core server file system (the file paths must point to the same location).

Recording Specifications

The recording specifications, which directly affect screen capture quality, are defined by the following settings:

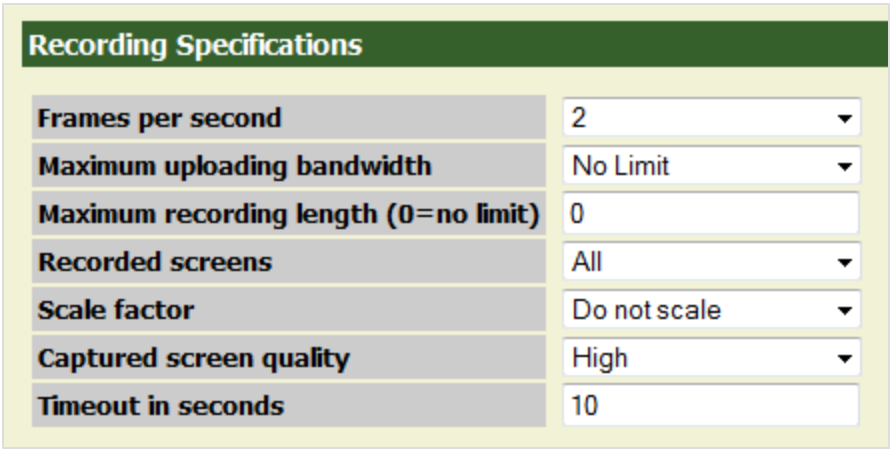


Figure 16: Recording Specifications

- **Frames per second**: [default: **2**] The number of frames per second. Value can be in the range **0.5** – **5**. A higher value will result in smoother animation,

but much greater demands on system resources (encoder processor load, file storage).

- **Maximum uploading bandwidth**: [default: **No Limit**]. A method of restricting the bandwidth used by the *Screen Capture Client* (SCC). A lower speed value will reduce bandwidth, but slow upload operations. Value range: **96kb/s** – **1024kb/s**. The value **No Limit** cancels this restriction.
- **Maximum recording length**: [default: `0` = no limit]. A value (in seconds, formatted as `hh:mm:ss`) after which all recordings will be terminated. A range of `0` – `23:59:59` is permitted; the value of `0` cancels this restriction.
- **Recorded screens**: [default: **All**] Record one (**Primary Only**) or **All** monitors and displays that are connected to the computer.
- **Scale factor**: [default: **Do not scale**]: Affects scaling. Value can be between **20%** and **75%** (**50%** corresponds to a final video screen size 50% smaller than the original screen, which reduces bandwidth requirements and stored file size). Small details can be lost in down-scaled screen recordings.
- **Captured screen quality**: [default: **High**]: Parameter for output of JPEG compression. Value can be within the range **Maximum** – **Low**. Typically it is set to a value of **High**. A lower quality value corresponds to a lower bandwidth required from SCC to MUS, but results in reduced capture quality.
- **Timeout in seconds**: [default: `10`]: Upload timeout for *Screen Capture Client* (SCC) before a new file is created (in the event of network issues etc.). Possible range is `1` – `60` seconds.

Recording Specifications (Advanced)

The advanced recording specifications provide additional flexibility in configuring SCC performance:

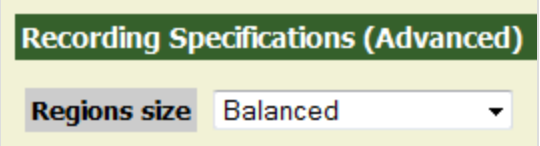


Figure 17: Advanced Recording Specifications

- **Regions size**: [default: **Balanced**]: Dictates how the screen recording regions are defined.
  Prefer lower bandwidth: Smaller regions requiring less bandwidth but more encoder processing.
  Balanced: A compromise achieving reasonable encoder performance and medium bandwidth requirements.
  Prefer encoder performance: Larger regions requiring more bandwidth, but enabling the best encoder performance.

Uploader global settings

These settings are global, for all Screen Capture *Media Upload* (MUS) servers added on this configuration screen. For this reason, these settings are found at the very bottom of the page.

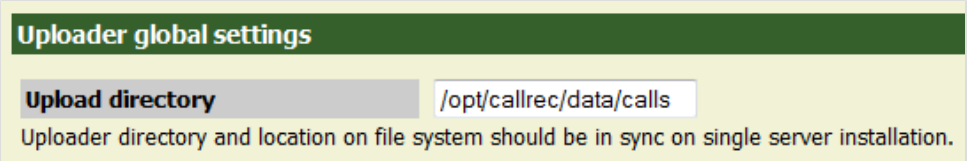


Figure 18: Global Media Upload Server (MUS) Settings

Upload directory – The global upload directory location for *Media Upload Server* (MUS) configuration. For a standalone (single) GQM server, this path should be the same as the **Location in filesystem** setting in the **Output Files Settings** section above.

For the correct settings and procedures for a clustered Screen Capture installation, please contact Genesys Support.

Screen Capture Communicator Settings

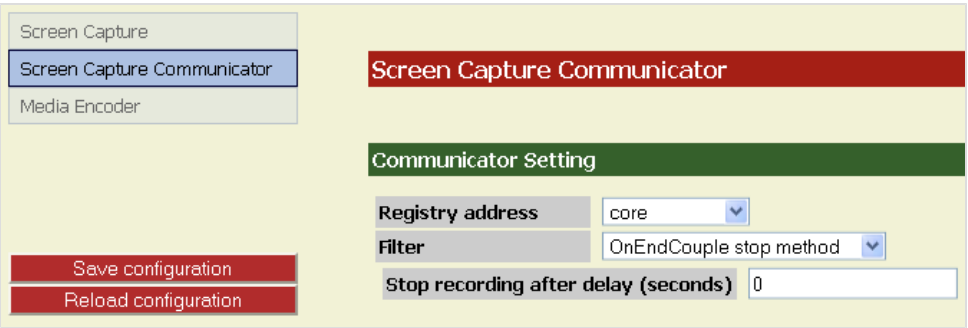


Figure 19: Screen Capture Communicator Configuration - OnEndCouple Stop

Communicator Setting

The Screen Capture Communicator is configured with the following settings:

Registry address: The server running the RMI service.

Stop Setting - The method of determining the end of the screen capture. Depending on this setting, the remaining fields change as follows:

OnEndCouple Stop

- **Stop Setting**: **OnEndCouple stop** Stops at the end of the associated audio call.
- **Stop recording after delay (seconds)**: – Specify any additional delay before stopping.
- **Wait for Agent ID in external data**: The Communicator will only stop when the Agent ID is found in at least one of the indicated external data fields (**External Data name for Agent ID of the calling party** / **External Data name for Agent ID of the called party**).

OnExternalData Stop

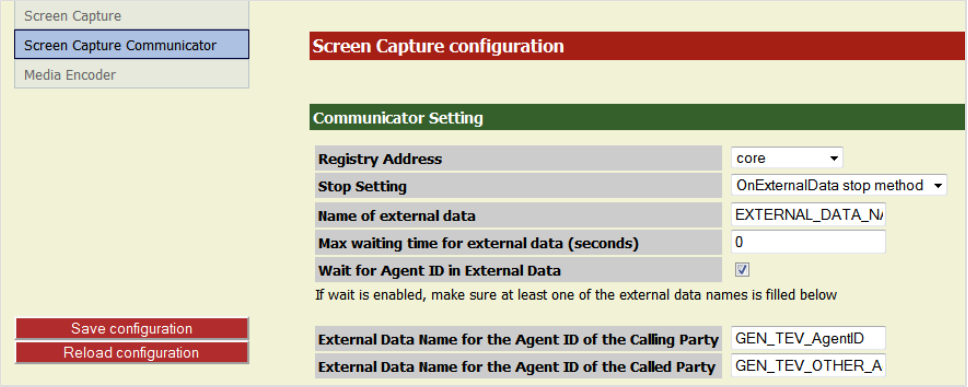


Figure 20: Screen Capture Communicator Configuration - OnExternalData Stop

- **Stop Setting**: **OnExternalData stop** Screen capture stops when a particular external data key is received after the call ends.
- **Name of external data**: Specify the name of the data key to be found.
- **Max waiting time for external data (seconds)**: Timeout value for external data key. After the call ends, if the specified key is not found in the external data within this time period, screen capture will be stopped automatically.

Important:
This feature is not yet supported by the Genesys platform.

Media Encoder Configuration

The Screen Capture *Media Encoder* is configured with the following parameters:

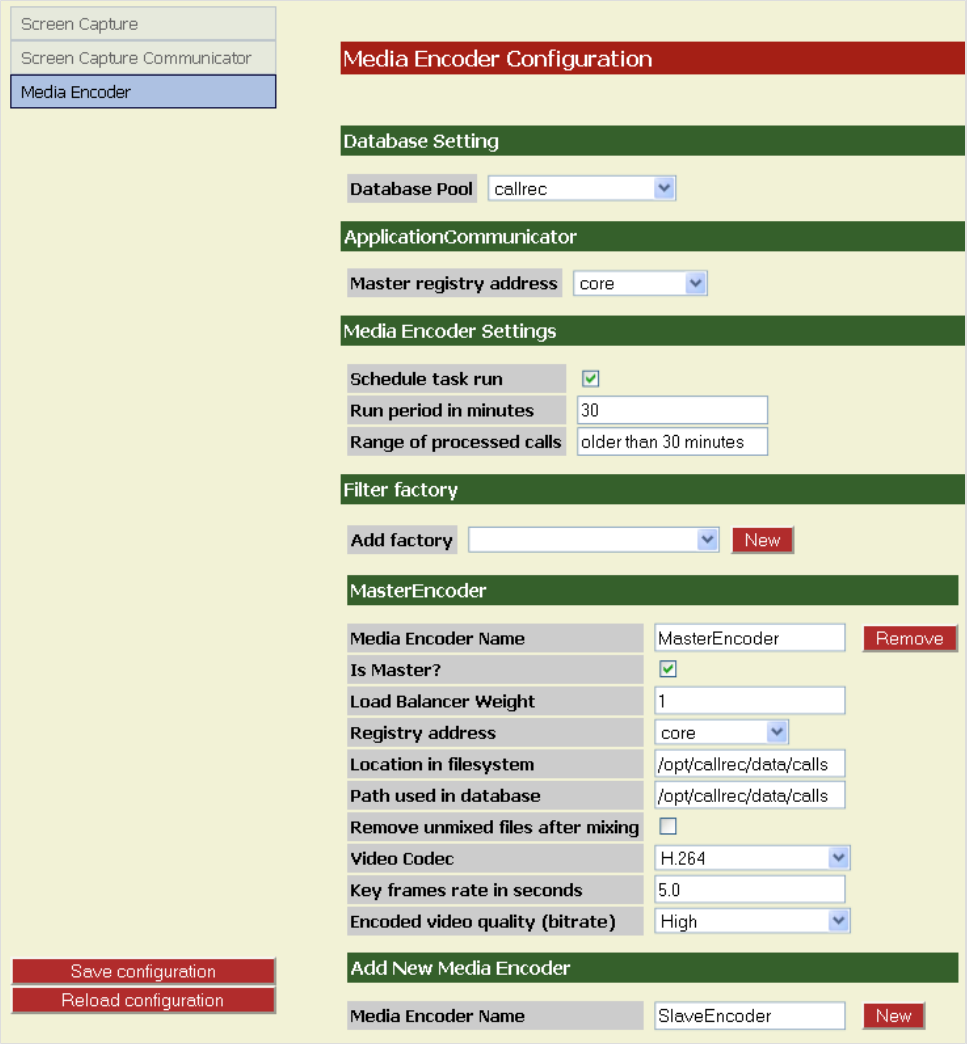


Figure 21: Media Encoder Configuration

Database Setting

- Database Pool: The database pool to use for the *Media Encoder*; usually `callrec`on a single server.

Application Communicator

- Registry address: The server running the RMI service (core on a single server).

Mixer Task Settings

- Schedule task run: When checked, the Media Encoder will perform batch encoding of capture files at regular intervals. When unchecked (cleared), the

Media Encoder will function on demand only (on the command line or selecting a capture file to export in the list of call recordings in the Call Recording Web GUI).

- Run period in minutes: Determines the wait period for the Media Encoder when no calls are queued for encoding.
- Range of processed calls – defines the time range of the calls for encoding. In some cases it is important not to process recordings right after they are saved, in which case this parameter enables you to define that only recordings older than x minutes get processed. It is recommended to use a variable time window, since it speeds up the selection of recordings from the database.

Encoder Settings

The following settings are assigned to each individual Encoder. After GQM installation, only one Master Encoder is defined, but more can be added if required.

- Media Encoder Name: A user defined name for this Encoder.
- Is Master?: Specify by checking this option that this is a Master Encoder.
- Load Balancer Weight: Relative weight / priority compared to other Encoders.
- Registry address: The server running the RMI service.
- Location in filesystem: Path to directory containing both intermediate (.recd) screen capture (input) files and the encoded files output by the Media Encoder.
  If Screen Capture is installed as part of a single (standalone) GQM server, this path will be the same as for the Path used in database setting;
  e.g. /opt/callrec/data/calls.

  In a Screen Capture cluster scenario, where the Screen Capture Media Encoder (SME) is installed and configured on a separate server to the database, this setting will be the full mount path from the SME server to the remotely mounted Call Recording Core file system directory;
  for example `/mnt/core/opt/callrec/data/calls`
- Path used in database – Internal path (prefix) to directory containing both intermediate (.recd) screen capture (input) files and the encoded files output by the Media Encoder;
  for example `/opt/callrec/data/calls`

  This value is checked by the Screen Capture Media Encoder (SME) in order to resolve the complete file system path to the directory specified in the location in filesystem parameter:
  - If the current path prefix found in the database is the same as the path used

in database parameter prefix, the SME replaces the prefix found in the database with that found in the location in filesystem parameter. This is typically used in a Screen Capture cluster scenario, where the SME(s) and database are on different servers.
- If the current path prefix found in the database is different to the path used in database parameter prefix (including if left blank), the SME uses the prefix found in the database unchanged. This is typically the case with single server scenarios.

Important:

Relocation Tool

If the Relocation Tool is scheduled to move recd data files to a custom directory elsewhere, that directory must be writable by Call Recording (for example, by using the chown tool: `chown -R callrec:callrec /path/to/custom/directory`).
The Screen Capture Media Encoder writes encoded mp4 video files to the same directory as the source recd files, so this will fail with the default permissions assigned by the Relocation Tool.

- Remove unmixed files after mixing: If selected, the original intermediate format files (`.recd`) will be deleted after mixing. By default, this option is not checked, so all source (unmixed) files are retained. This assumes that a media lifecycle policy (archive/delete) will be applied to the directories specified by the path to calls to be processed and the path to save the encoded file parameters above.
- Video Codec [default: H.264]: Video codec for encoded video (either H.264 or MPEG 4:2).
- Key frame rate in seconds [default: 5]: Value (in seconds) specifying how often to force a key frame in the output video; value range: 1 – 60
- Encoded video quality (bitrate) [default: High]: Quality of encoded video for playback; value range between Maximum and Low. Maximum quality will utilize the most system resources.

Configuring a Custom Temporary Directory for the Media Encoder

For reasons of performance, by default the media encoder is set up to use the system tmp directory. Many other applications use the existing system tmp directory to store information. Files marked for deletion (but not yet deleted) can use up vital space. This can lead to insufficient space for the media encoder to process large video files, and in severe cases, the media encoder will stop

encoding. The solution is to give the media encoder its own temporary directory independent of the system tmp directory.

Step 1

Specify a different temporary directory for the mixer module by adding the mixer parameters line at the end of /opt/callrec/etc/callrec.derived configuration file as follows:

```
JAVA_OPTS_MIXER="-server -Xms32m -Xmx1024m -DTMPDIR=/opt/callrec/tmp"
```

Step 2

Restart the configuration service, then the mixer module:

```
/opt/callrec/bin/rc.callrec_configmanager restart
/opt/callrec/bin/rc.callrec_mixer restart
```

Command Line Parameters

These advanced parameters are not necessary for standard operation of Screen Capture components. They are included here for reference only.

Media Upload Server Installation & Parameters

The Media Upload Server (MUS) component can be deployed independently as a Java Web Archive (WAR) file to an Apache Tomcat application server as follows:

1. Extract the `screenrec-uploader-1.x.war` file from the Screen Capture deployment zip archive (the 'x' here represents the minor version number, which can vary).
2. Copy this .war file to your Tomcat application server's webapps directory (by default found at `$CATALINA_HOME/webapps`, where `$CATALINA_HOME` represents the directory where Apache Tomcat is installed).

Each MUS servlet installation includes the following properties file:

```
$CATALINA_HOME/webapps/screenrec-uploader-1.x/WEB-
INF/classes/screenrec.properties
```

This file contains the following properties:

- targetDir: The full (absolute) path on this server to the directory containing uploaded video capture files – typically set to `/home/screens` or `/home/calls`. Note that the Tomcat application user must have write permission to this directory.

Screen Capture Media Encoder Parameters

The Screen Capture Media Encoder (SME) component is a Java module within a Linux shell wrapper that can be invoked manually at the command line as follows:

```
$ encoder.sh –codec <codec> [-logger <params>] -recFile <filepath> [-recFile
<filepath>] [-audioType <type> –audioInput <param> [-audioInput <param>]] –
out <filepath>
```

The module's parameters are as follows:

codec [required: video codec to use; either h264 or mpeg4_2; defaults to h264]

logger <log4j parameters> [optional: debug log parameters; similar as for other Call Recording scripts; see the Call Recording Administration Guide for more details]

recFile `/path/to/file.recd -recFile /path/to/file2.recd` [required: a list of one or more video capture files. They are expected to be in strictly increasing chronological order. The relative timestamps are taken directly from the file headers]

audioType WAVE|MP3 [optional: type of audio input file – currently WAVE or MP3 are valid. Must be accompanied by one or more audioInput parameters]

audioInput `<timestamp>,/path/to/audio.wav -audioInput <timestamp>,/path/to/audio2.wav` [optional: a list of one or more input audio files with parameters. Each parameter consists of a timestamp in milliseconds (from the start of the captured video) followed immediately by a comma then the file path to the audio file; for example, `11034,/home/calls/dk299dk1.wav`. Must be preceded by an audioType parameter]

out `/path/to/output/file` [required: location of the encoded output file]

Windows Media Player Configuration

The Screen Capture *Media Encoder* creates the final screen capture media files in the MPEG-4 (.mp4) format, which contains H.264 or MPEG-4 2 encoded video and MP3 encoded audio.

Windows-based computers using a version of Microsoft Windows earlier than Windows 7 (Windows Vista, Windows XP, etc.) do not by default include the required MP4 codecs within the Windows Media Player, so an error will be returned on these systems when attempting to view downloaded files.

Important:

View Dual Screen Recordings using Windows Media Player

The default Microsoft Windows Media Player version included with Windows 7 is unable to play H.264 video with dimensions greater than 1920x1080, often making Screen Capture recordings from PCs with a dual monitor configuration unplayable. To view these large size recordings on Windows 7, the following workarounds are recommended.

Use an alternative media player, such as the free VLC player, downloadable at: http://www.videolan.org/vlc/.

OR

Install good quality MP4 codecs as plug-ins for Windows Media Player:

- Download the K-Lite Codec Pack (BASIC or BASIC Mirror versions) from the following web url: http://www.free-codecs.com/K_Lite_Codec_Pack_download.htm

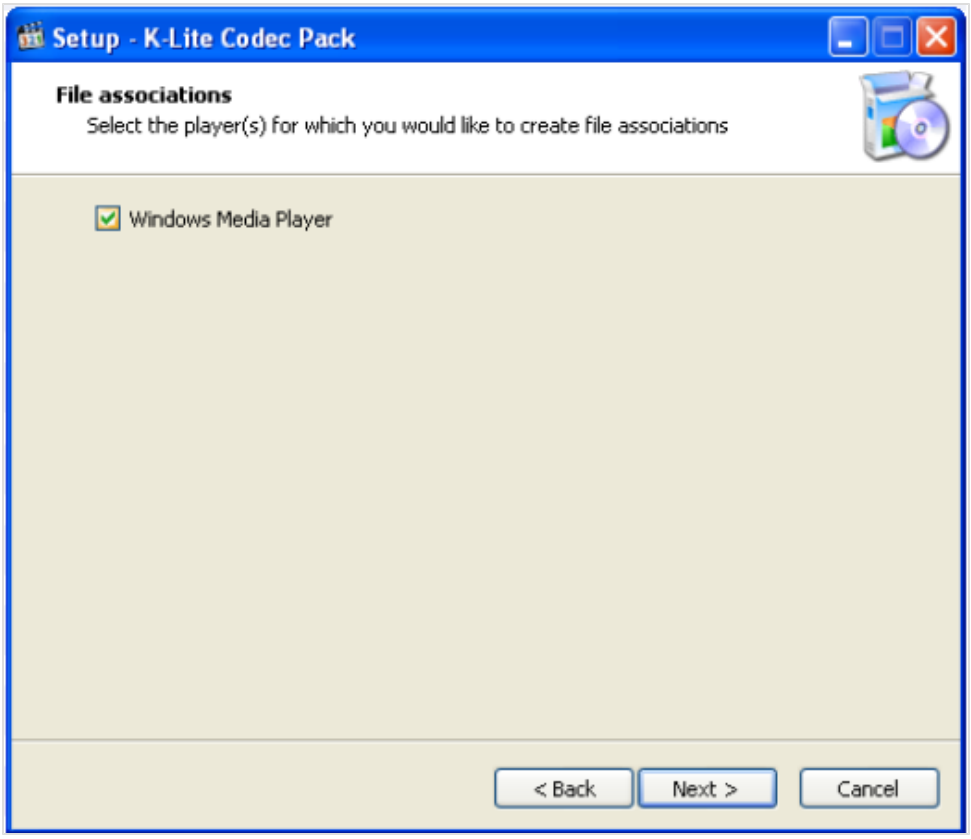


Figure 22: Codec Installer: create file associations for Windows Media Player

- Run the downloaded .exe installer file, select the simple installation mode and set the options as follows:

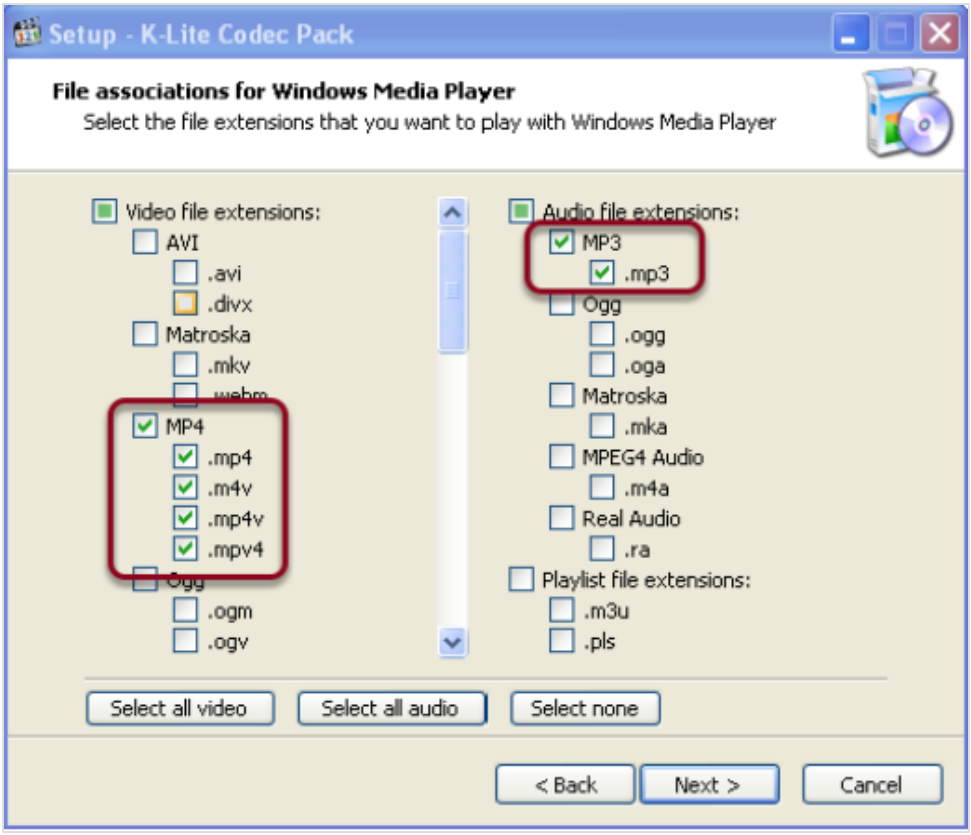


Figure 23: Codec Installer: add MP4 and MP3 file associations

- After completing the codec installation wizard, downloaded MP4 files will display a Windows Media Player icon in Windows Explorer, and will play correctly when double-clicked.

Chapter

7 Request Technical Support

Technical Support from VARs

If you have purchased support from a value-added reseller (VAR), contact the VAR for technical support.

Technical Support from Genesys

If you have purchased support directly from Genesys, please contact http://genesyslab.com/support/contact Genesys Technical Support.

Chapter

8 Reference

This chapter provides further advanced or optional detail for the use and integration of Screen Capture, such as descriptions of how to leverage the standalone thin clients provided for .NET and Java programming environments.

This chapter contains the following sections:

Java Standalone Thin Client

The integration of the standalone *Capture Client* with Java-based agent desktops is provided by the `screenrec-controller.jar` file that must be present in the classpath of the agent desktop application. This file can be found at the following default location on the Call Recording server:

```
/opt/callrec/screenrec/screenrec-controller-8.1.500.jar
```

The `screenrec-controller.jar` bundles a (compressed) *Capture Client*. The actual spawning of the *Capture Client* is performed by creating a new instance of the `cz.zoom.screenrec.impl.controller.ScreenRecorderStarter` class.

The `ScreenRecorderStarter` constructor takes the following parameters:

- The agent name (login ID)
- A list of servers where to connect

The `ScreenRecorderStarter` instance runs a background thread that monitors the *Capture Client* and restarts it if it exits. The application is bundled in the form of a highly-compressed self-extracting .exe application.

The starter instance extracts the application to a temporary directory, executes the self-extraction and runs the extracted binary application. A background thread deletes all old instances that may have been left over in the temporary directory.

To stop the capture client from the agent desktop, call `ScreenRecorderStarter.stop()` on this instance. This will stop the monitoring thread and destroy the running client application.

.NET Standalone Thin Client

The integration of the standalone *Capture Client* with .NET-based agent desktops is provided by the ScreenREC.exe binary application, which can be downloaded in compressed form from your Call Recording server at the following URL (where `SERVER_URL` is your Call Recording server address):

```
http://SERVER_URL/callrec/plugins/screenrec-client-binary-8.1.500.exe
```

Running the downloaded executable will extract the ScreenREC.exe binary application.

To start the application from C/C++ code, call the following method:

```
System.Diagnostics.Process.Start(appName, arguments)
```

where:

- `appName` is the full path to the *Capture Client* binary;
- `arguments` is obtained by calling:

```
System::String::Format("-agent {0} -host {1}", agentName, serverHostName)
```

The `-host` parameter may be used several times, in which case the format specification needs to be changed accordingly.

Screen Capture Port Usage Guide

The Screen Capture Server accepts incoming connections on predefined port 7003. The port is currently not configurable.
The Capture Client application does not use any predefined port.

In the Windows service mode, there is additional inter-process communication (between the service and running Screen Capture Capture Client applications). This inter-process communication uses the Named Pipes Windows API rather than sockets.

The Capture Client application connects as a client to the Screen Capture Media Upload Server (MUS), and the Screen Capture Server specifies the server endpoint that the Capture Client application uploads to. This endpoint is typically port 80 and on the same server that the Call Recording UI is installed. This port number can be changed from the Screen Capture configuration.