Genesys Quality Management 8.1

Genesys Active Recording Ecosystem

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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

New Features in this Release

Audience

Document Version

Typographical Conventions

Expected Knowledge

Document Purpose

This document gives a short overview that describes how Genesys Active Recording Ecosystem uses Media Stream Replication to record calls.

New Features in this Release

New Features in 8.1.500.

• Support for After Call Work (Wrap-up).

• Support of Geo-Location.

• Support of Alpha-numeric DNs.

• Custom tags for multi-location duplication of recording.

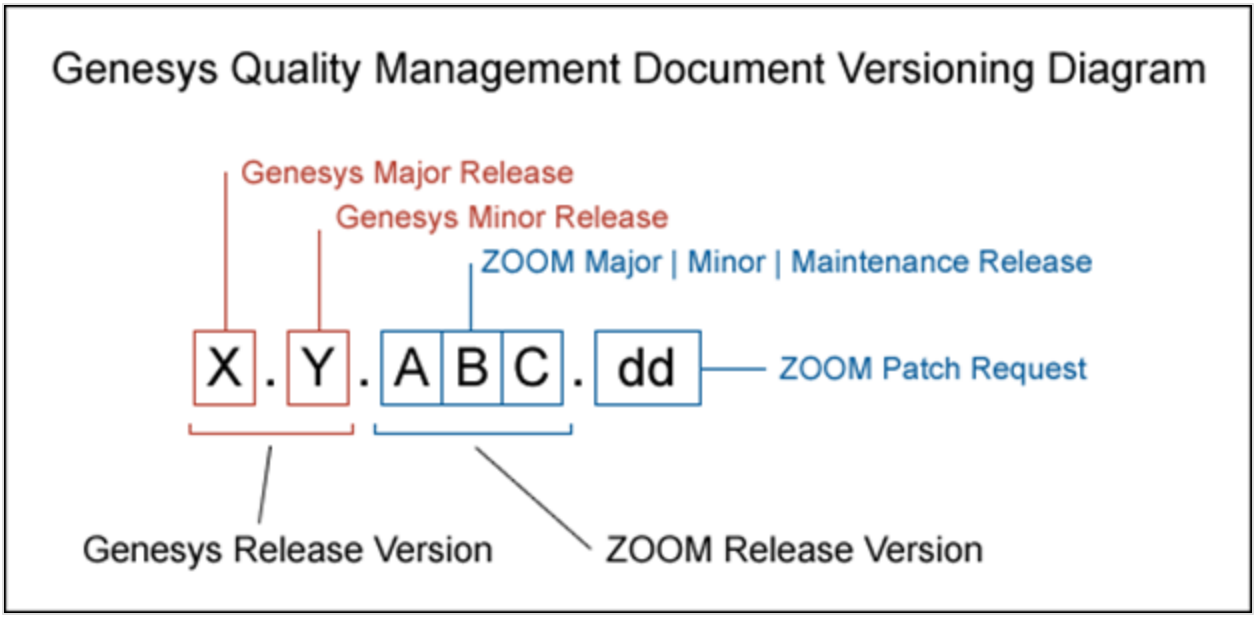
Audience

This document is intended for system engineers, programmers and administrators responsible for integration of the Genesys GQM with other existing third party applications.

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
- Unix system administration skills
- Network administration skills

Chapter

2 Active Recording Ecosystem Overview

The Active Recording Ecosystem uses Media Stream Replication (MSR) for a fully Active recording solution with Dual Channel Recording (see Genesys document *Call Recording Solution SIP Server* for more information). SIP sessions to the recorder provide basic call info and voice (RTP) data. MSR is where the Media Server replicates the RTPs and makes them available to the recording server. Additional events and information are provided by the T-Server part of the SIP Server.

This chapter contains the following sections:

MSR Call Recording Architecture

MSR Recording methods

MSR Recording Process

MSR Integration

Multi-tenant Environment Support

Screen Capture

MSR Live Monitoring

MSR Call Recording Architecture

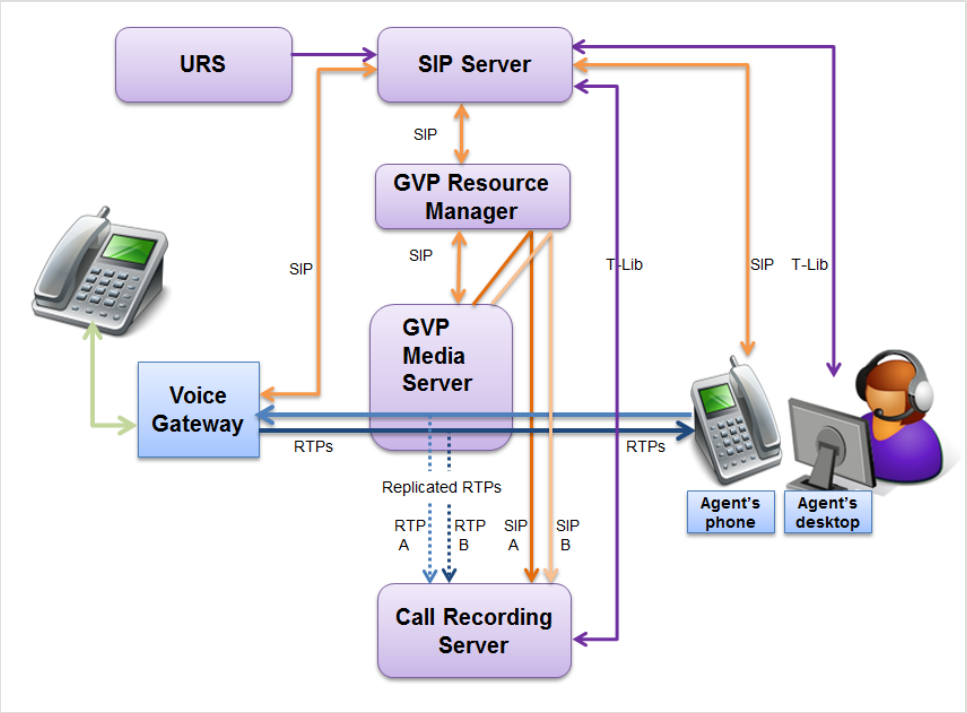


Figure 1: MSR Call Recording Architecture

There are four scenarios that will start call recording. Once the call recording has been initiated, the recording process is the same in all four cases.

- The SIP Server initiates call recording (for example, a DN is configured to record all calls).
- The Call Recording server requests recording by sending a T-lib request `TRequestPrivateService` to the SIP Server. The recording server can also use run-time controls for pause, resume, and update.
- A third party, for example an agent desktop, can request call recording by sending a T-lib request `TRequestPrivateService` to the SIP Server. The third party can also use run-time controls for pause, resume, and update.
- A recording can be initiated by a Routing Strategy (`extension record=source` in TRouteCall).

MSR Recording methods

Full-time recording

Records every call for a specific Directory Number (DN). Setting the option `record=true` in the DN object instructs the SIP Server to enable full-time recording for this DN. Also Routing Strategy is able to make the decision to record the call. This will record the whole conversation regardless of transfers and conferences.

Selective recording

The decision to record a call is made based on recording rules per conversation. Recording rules may be based on any call related meta data such as:

- Extension number
- Agent identification
- User attached data

Dynamic recording

Recording sessions are established on an as-needed basis after the communication session is established. T-lib recording functions are provided to allow third parties such, as agent desktops, to record on demand.

Supported DN monitoring

From version 8.1.500 and on, the following DN types are supported:

- Extension
- ACD Position
- Voice Treatment Port
- Trunk Group

Types of T-Server Supported

There are several types of T-Server available, but Call Recording only supports SIP T-Servers.

MSR Recording Process

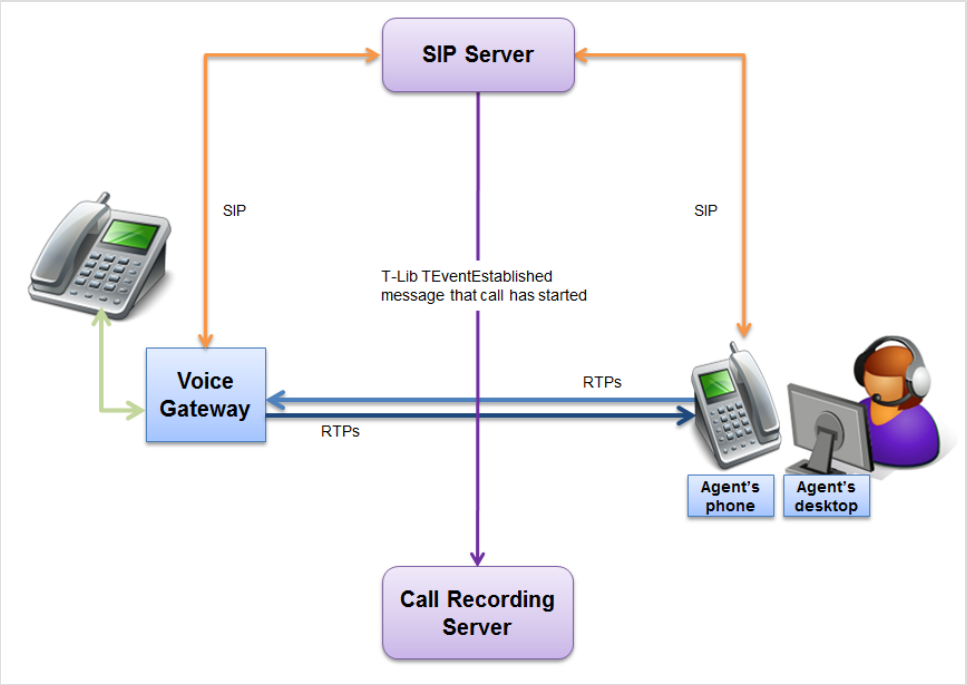


Figure 2: SIP Server Informs Call Recording of call

The Call Recording server monitors certain Directory Numbers (DNs) by subscribing to them at the SIP Server. When there is a new call involving a monitored DN the SIP server informs the Call Recording server about the call using T-Lib.

One of four things can occur to start call recording. No matter what device starts the process, the process is the same.

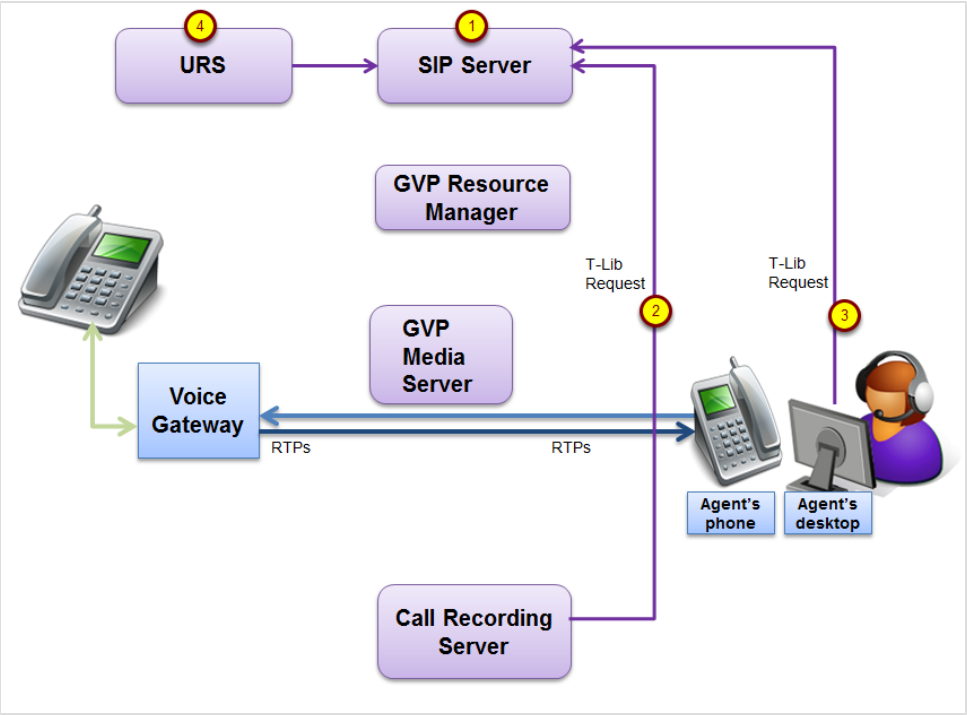


Figure 3: Agent or Call Recording Can Request Recording

One of the following initiates recording:

1. The SIP Server initiates recording itself, for example, because a DN is configured in Configuration Manager to always be recorded.
2. The SIP Server informs Call Recording of a call with a DN that Call Recording monitors. Call Recording has a recording rule for the DN. Call Recording evaluates the rule, determines that the DN must be recorded and requests recording by sending a T-lib request `TRequestPrivateService` to the SIP Server.
3. A third party, for example an agent desktop, requests call recording by sending a T-lib request `TRequestPrivateService`to the SIP server.
4. A recording can be initiated by a Routing Strategy (`extension record=source` in TRouteCall).

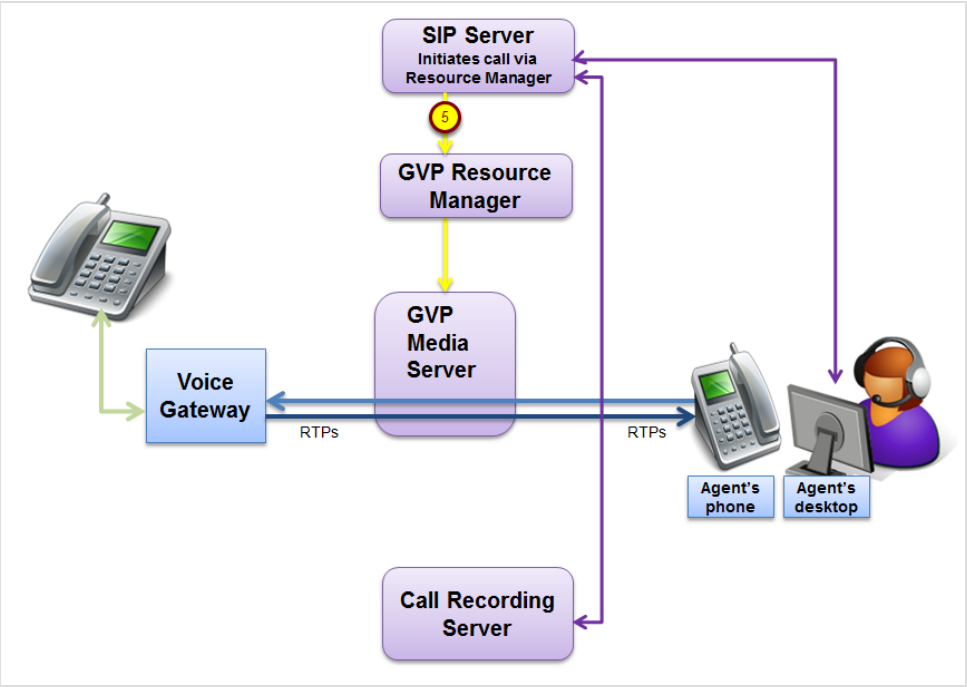


Figure 4: SIP Server Initiates Call Recording

5. Using media control, the SIP Server invites the Media Server to replicate the RTPs (2 invites one per RTP Stream).

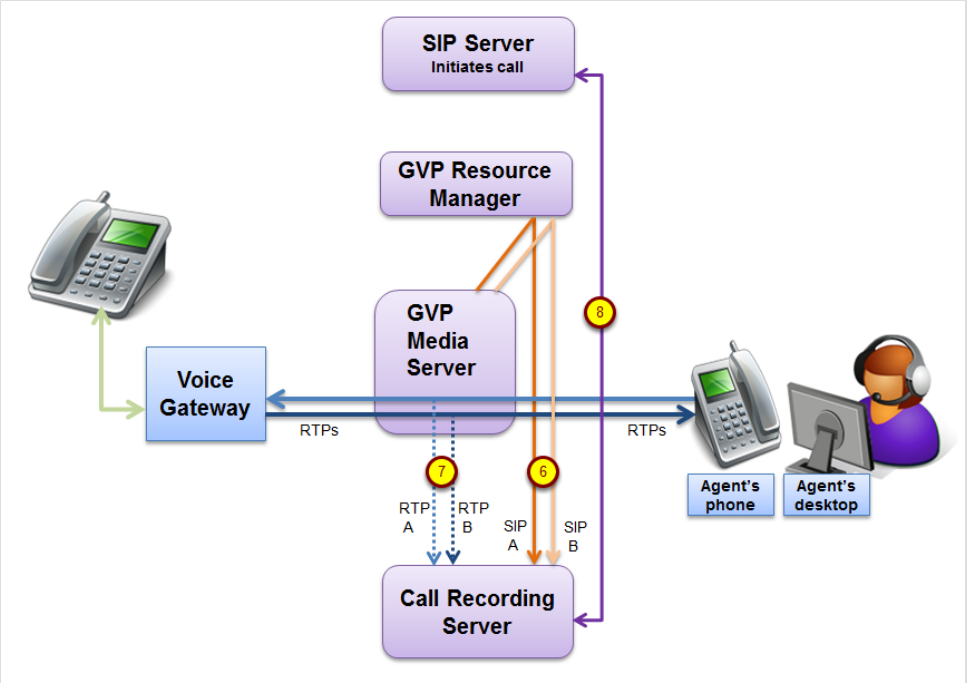


Figure 5: MS Replicates RTPs

The Media Server replicates the RTP streams and:

6. Sends the SIP invite messages to the Call Recording server (2 invite messages, one each per RTP Stream).
7. Sends the RTPs to the Call Recording Server.

   Recording starts.
8. The Call Recording server requests additional information such as user attached data via T-Lib.

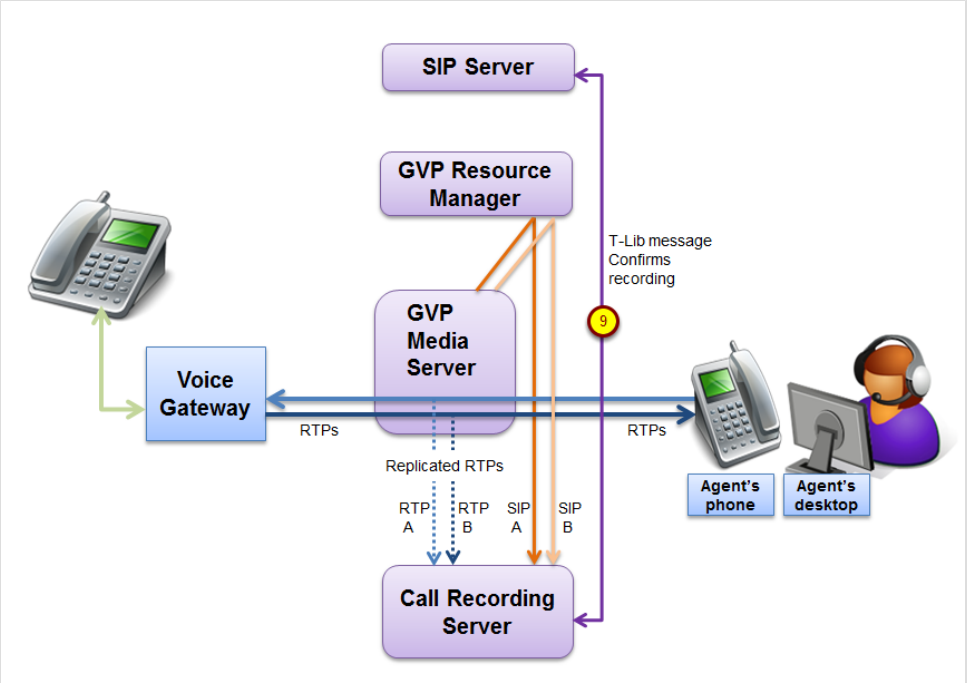


Figure 6: Recording Starts

9. At any time the Call Recording Server or third party for example the agent desktop can use a `TRequestPrivateService` message for pause, resume and stop.

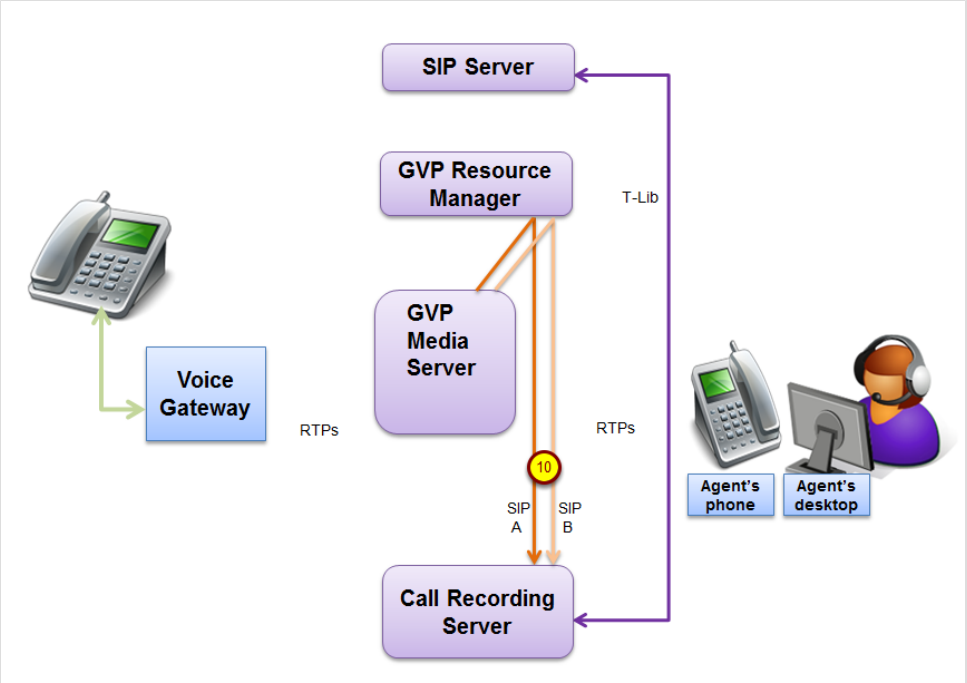


Figure 7: Recording Finishes

10. SIP messages from each stream indicate that the call has ended. The Call Recording Server stops recording.

MSR Integration

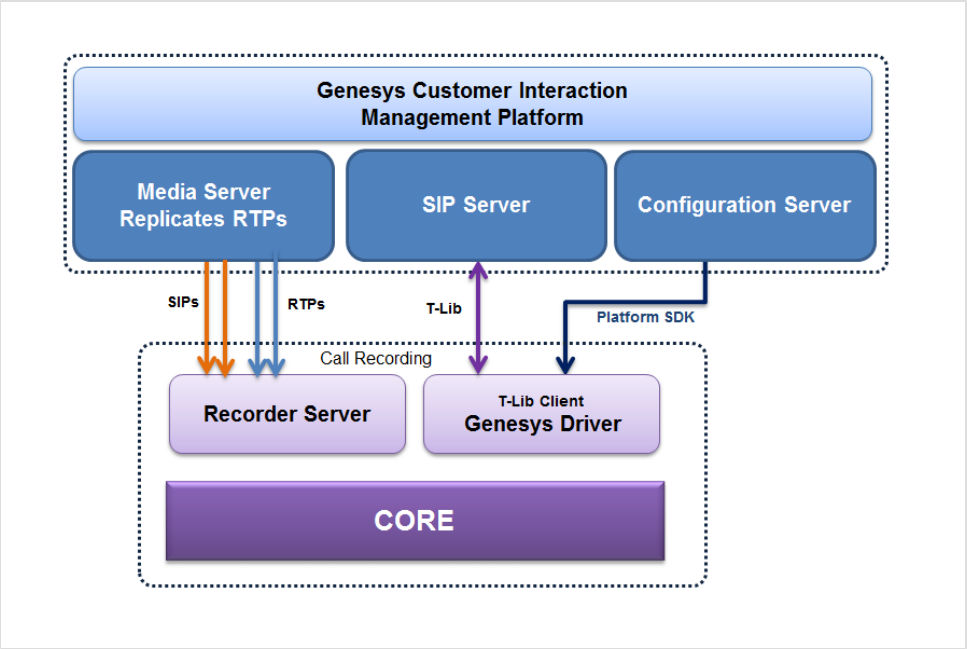


Figure 8: MSR Integration with Call Recording

The Genesys driver has a T-Lib Client that handles all communication via T-Lib. The Genesys driver also handles communication with the Configuration Server.

Call Recording caches information from the Configuration Manager including the list of agents, devices, and other such information. This can be configured to be done in regular intervals.

Multi-tenant Environment Support

There are two different Environments in Configuration Manager

- The **Enterprise Environment** is for companies (also referred to as single-tenants) that own their telephony equipment and use it for their own needs.
- The **Hierarchical Multi-tenant Environment** is for companies (such as service providers) that make their telephony equipment available to other companies.

Enterprise Environment

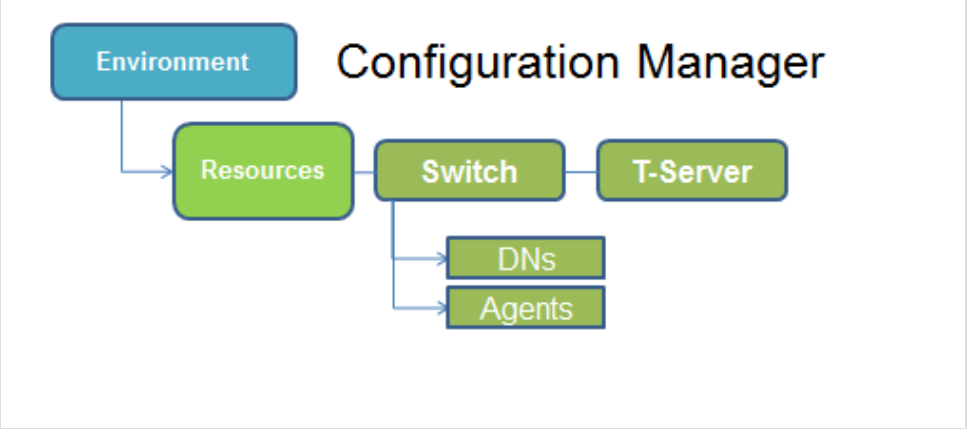


Figure 9: Single Tenant Configuration

Call Recording caches information about the DNs, agents, and SIP T-Servers.

Hierarchical Multi-tenant Environment

Multi-tenancy is fully supported on the recording level for calls and screen capture.

In a multi tenancy environment, each tenant has its own T-Servers, DNs, and agents connected to a Configuration Manager. In this structure, all are contained in the Configuration Environment.

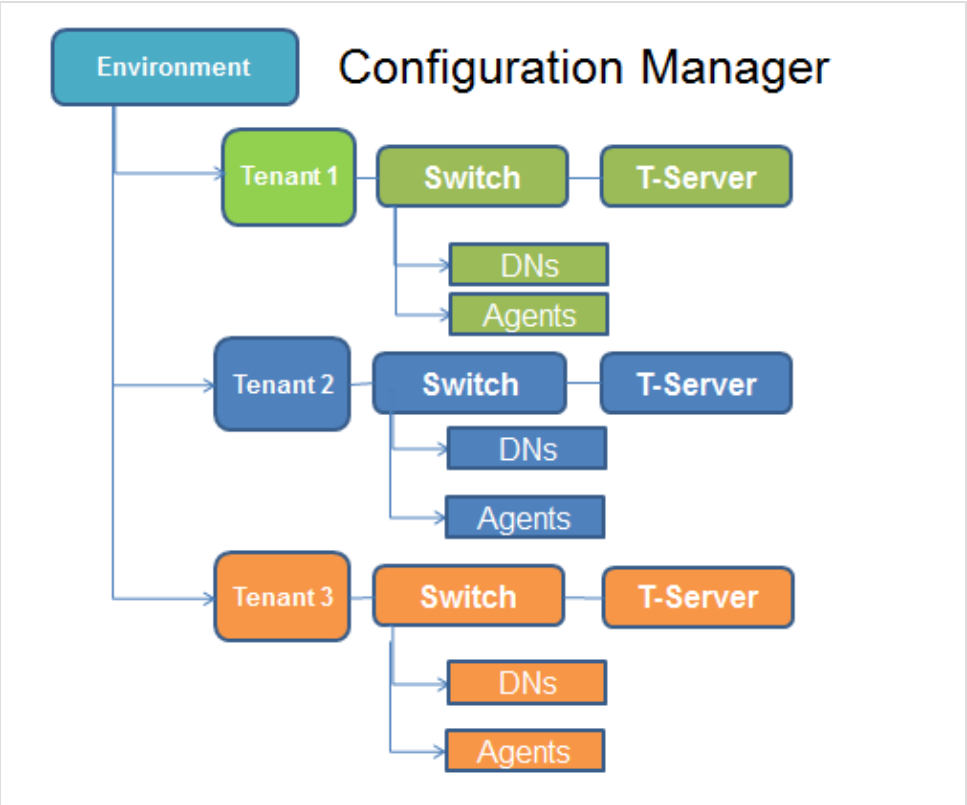


Figure 10: Configuration Manager Multi-Tenant Structure

In the Hierarchical Multi-tenant Environment, in addition to caching information about the DNs, agents, and SIP T-Servers, Call Recording caches information about the structure that represents the multi tenancy environment from the Configuration Manager and uses meta data to distinguish between the tenants.

Important:

If there is no SIP T-Server associated with the switch then Call Recording cannot monitor the DNs and therefore no recording can take place.

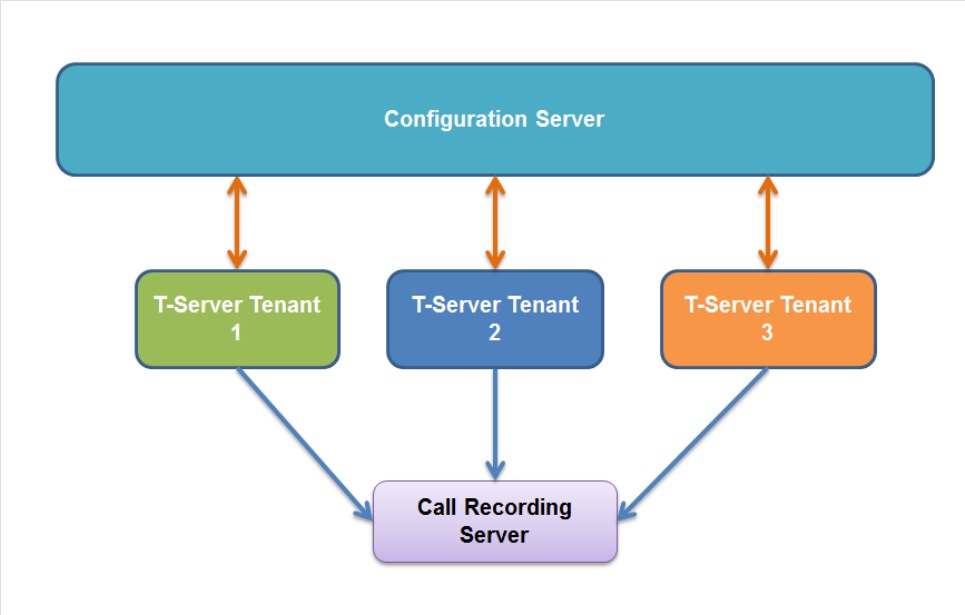


Figure 11: Configuration Manager Multi-Tenant Structure 2

A single instance of the Call Recording server can handle multiple T-Servers. To identify each tenant separately, Call Recording stores each recorded couple (conversation) with meta data:

- `GEN_CFG_TENANT = X` to identify the tenant ID
- `GEN_CFG_SWITCH = Y` to identify the switch

Where `X` is a number that identifies which Tenant and `Y` is a number that identifies the switch.

Screen Capture

Screen capture can only take place while there is a conversation involving a monitored DN.

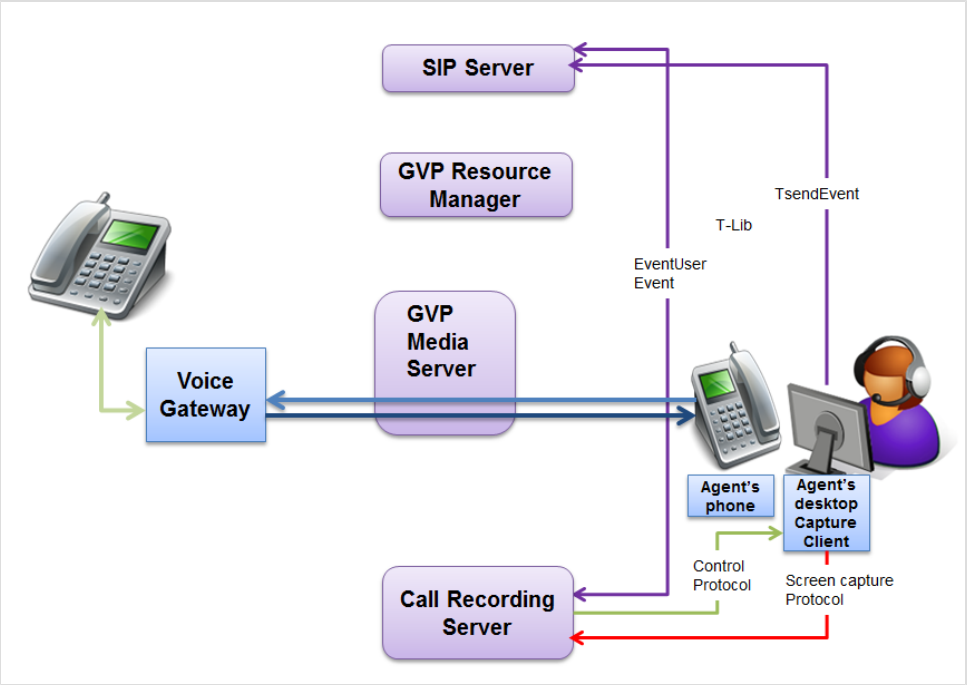


Figure 12: Screen Capture

Screen captures can be initiated in one of two ways

Either

- The Call Recording Server initiates screen capture because of a recording rule.

Or

- The agent desktop (or other third party) requests screen capture by sending a `TsendEvent` via T-Lib to the SIP server. The SIP server then sends an `EventUser` event via T-Lib to instruct the Call Recording server to start recording.

In either case the Call Recording server sends a request using a control protocol to the Screen Capture Client to capture screens. The capture client starts

uploading the captured media to the Call Recording server using a Screen Capture protocol. The Call Recording server processes and stores the media.

MSR Live Monitoring

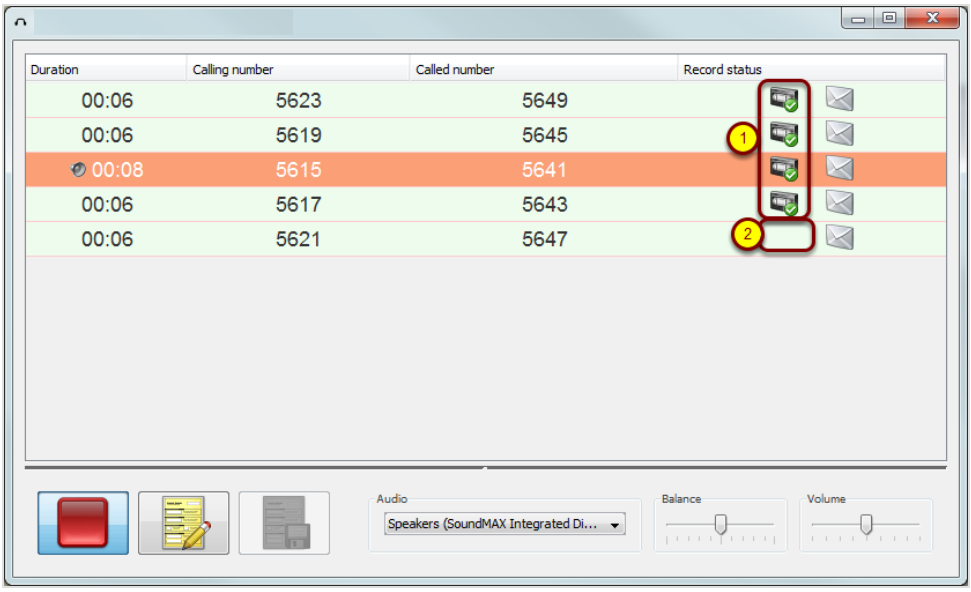


Figure 13: Live Monitoring Showing Recording Icon

1. In Live Monitor it is only possible to monitor calls that are being recorded.
2. If a call shown in the list does not show the recording icon, the RTPs have not been replicated, and there will not be audio.

Chapter

3 Genesys MSR Setup

This section explains how to configure the services needed during installation.

This chapter contains the following sections:

Selecting the SLR Service

Selecting the MSR Service

Entering the MSR Settings

Verifying the Configuration

Selecting the SLR Service

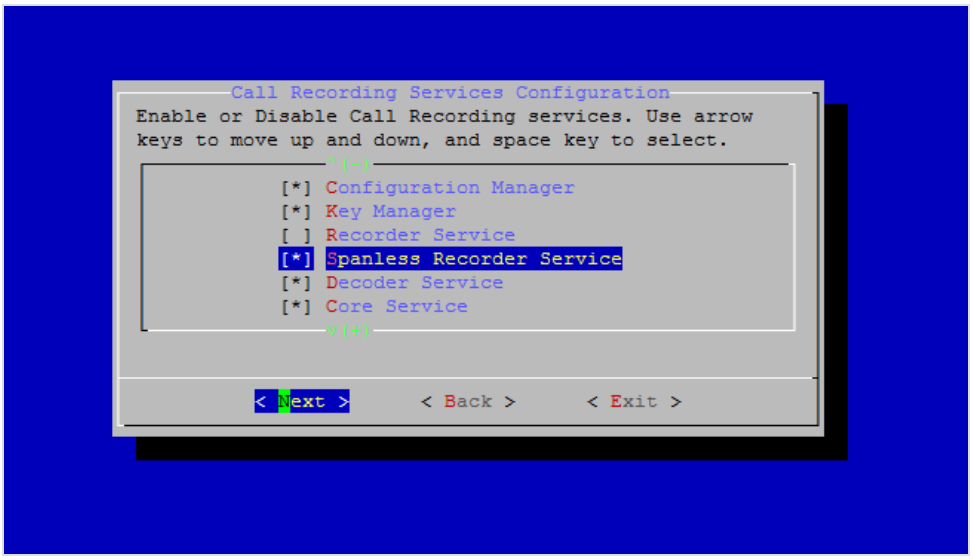


Figure 14: Selecting the SLR Service

To enable Genesys Active Recording SIP Solution while installing Call Recording you must select the Spanless Recorder Service. Do not select the Recorder Service.

Selecting the MSR Service

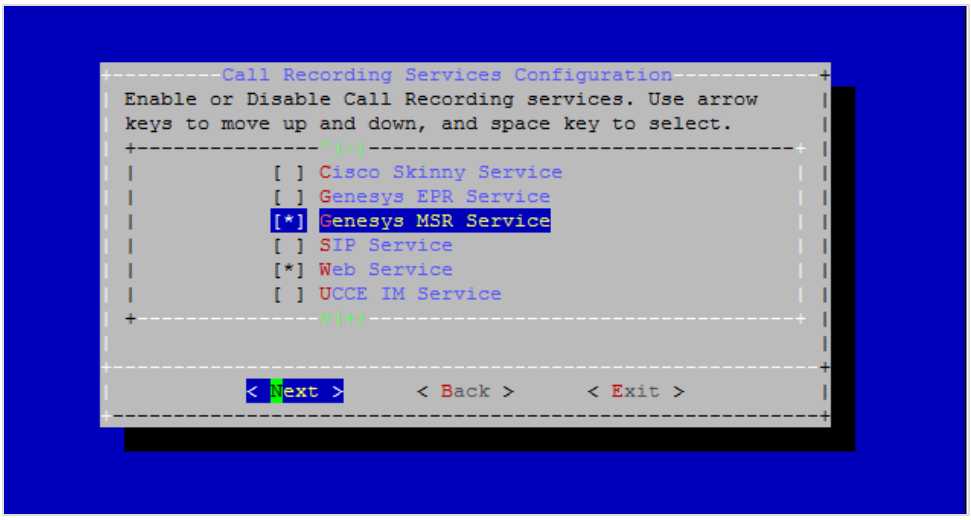


Figure 15: Select MSR Service

To enable Genesys Active Recording SIP Solution while installing Call Recording, enable the **Genesys MSR service**. Genesys MSR service can only be used if no other:

- Telephony Driver (Cisco JTAPI Service or Cisco Skinny Service or Genesys EPR Service or SIP service) is selected.

or

- Integration Module (Genesys IM Service or Cisco UCCE Service or Cisco UCCX Service) is selected.

Use the arrow keys to move up and down and the space key to select. When you have selected all the services you require select **Next**.

Entering the MSR Settings

Later in the installation you will see screen below.

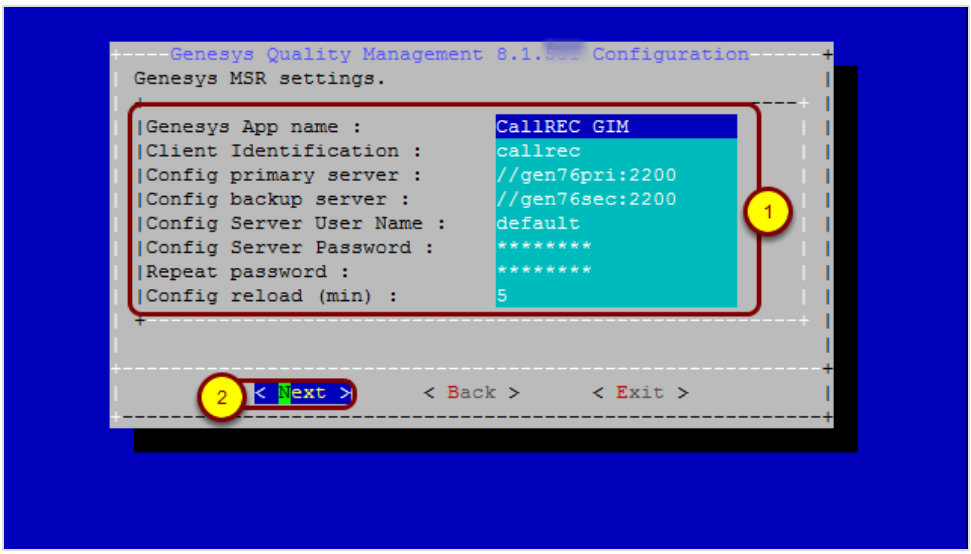


Figure 16: MSR Settings

To enter the settings.

1. Type:
   - Your Genesys **App Name**, this must be the same as that configured in the Genesys Configuration Manager.
   - An (optional) **User Name** and **Password** for a user account on the T-Lib servers.
   - The **Config primary server** and **Config secondary server** IP addresses (or FQDN) of your Genesys Configuration Servers. Use a comma-separated list for more than one.
   - The (required) **User Name** and **Password** of the Call Recording user set up in the Genesys Configuration Server.
   - The **Config Reload interval** in minutes. This specifies how often the Genesys driver will re-connect to the Configuration Manager to get the latest configuration data.
2. Select **Next**.

Verifying the Configuration

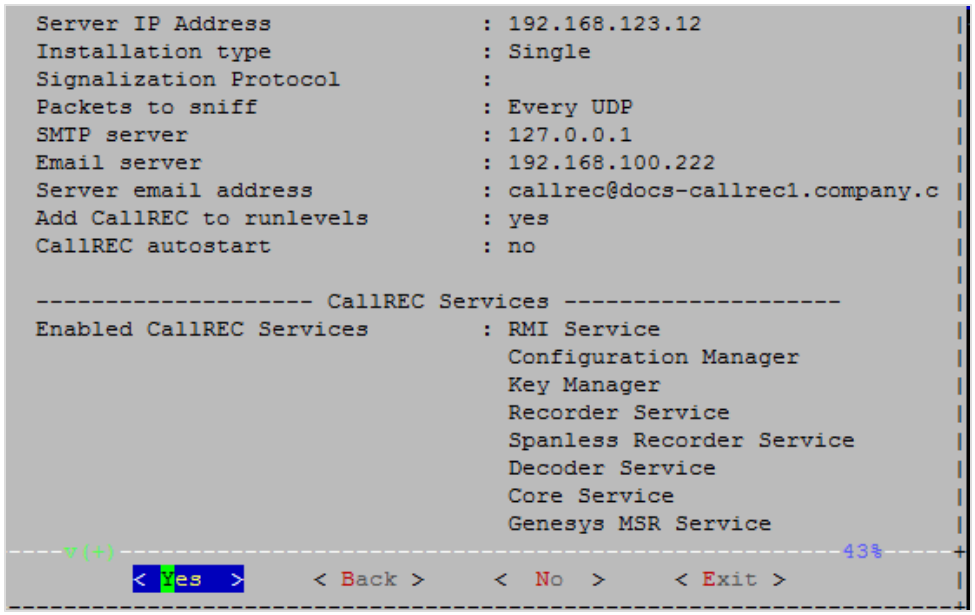


Figure 17: Configuration Confirmation

Before GQM setup completes the configuration and setup, it displays the information you have entered so far. This allows you to verify the settings and change them if needed.

Chapter

4 Configuring MSR for Call Recording

This section describes how to configure the Genesys driver for MSR.

This chapter contains the following sections:

Setting up Genesys Driver

Setting up Tenant Specific Parameters

Default Tenant Configuration

Configuring DN Activity Detection

Notification of Recording

User data configuration

Full Agent Name Assembly

Agent Configuration Data

Configuring Virtual Sniffers

Detect Recorder Ping

Setting up Genesys Driver

The most important configuration is the address of the Configuration Manager. Configuration Manager provides Call Recording with a list of available T-Servers and their addresses.

Navigate to **Settings > Protocol Drivers > Genesys Driver**.

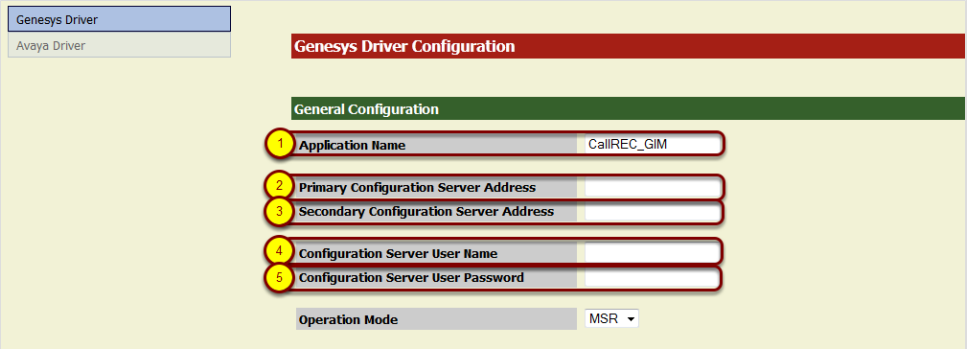


Figure 18: MSR Configuration

1. Enter the **Application Name** that has been created in Genesys Configuration Manager. For example, `CallREC_GIM`. See the section *Adding the Call Recording Application to the Configuration Manager* in the Pre-implementation Guide.
2. Type the **Primary Configuration Server** address. This may be the hostname or IP Address of the Primary Configuration Server, or Configuration Server Proxy, or Single Configuration Server.
3. Type the **Secondary Configuration Server** address. This may be the hostname or IP address of the secondary Configuration Server, or leave empty if there is no Secondary Configuration Server.
4. Type the **Configuration Server User Name**.
5. Type the **Configuration Server User Password**.

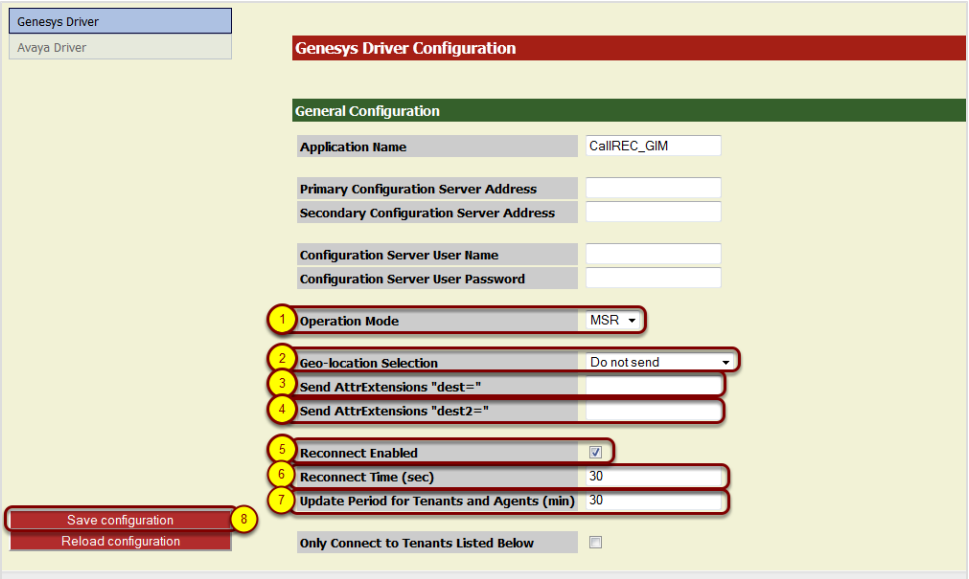


Figure 19: MSR Configuration

1. Select the **Operation Mode**: **MSR** or **EPR**. The default is **MSR**.
2. [MSR mode only] Select the **Geo-location Selection** option, which sets the `RequestPrivateService record` attribute. In a Dynamic Recording scenario, this allows Call Recording to specify where the recording leg will be pinned to the Media Server:

- **Do not send** (default): Do not send a geo-location preference in this attribute.
- **Source (thisDN)**: Specify `record=source`.This is normally the extension (agent) DN and is the SIP Server default if the extension is not defined.
- **Destination (otherDN)**: Specify `record=destination`. This is normally the trunk (customer) DN.

3. [MSR mode only] Enter an optional value for **Send AttrExtensions "dest="**: Set the `RequestPrivateService dest` attribute; `dest` is the address specifying the first server group for media duplication. If empty, the attribute is not sent.
4. [MSR mode only] Enter an optional value for **Send AttrExtensions: "dest2="**: Set the `RequestPrivateService dest2` attribute; `dest2` is the address specifying the second server group for media duplication. If empty, the attribute is not sent.
5. Ensure that the **Reconnect Enabled** checkbox is checked (default).
6. Set the **Reconnect Time** in seconds (default 30 seconds).

7. Set the **Update Period for Tenants and Agents** (min) in minutes (default 30 minutes).
8. Click **Save Configuration** to save the configuration.

Setting up Tenant Specific Parameters

If some tenants do not require recording then you can select to only record specific listed tenants. To do so, select the **Only connect to tenants listed below** checkbox. If there is only one tenant then do not select the **Only connect to tenants listed below** checkbox.

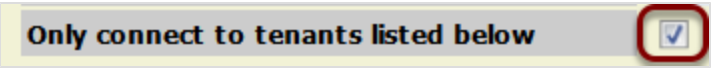


Figure 20: Only Connect to Tenants Listed below

At the bottom of the page, provide a list of tenants that will be recorded.

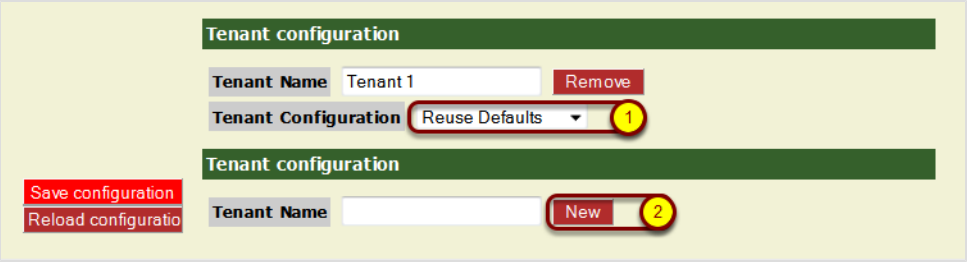


Figure 21: Tenant Configuration

For each tenant you can choose whether to:

1. Use the default the configuration options by selecting **Reuse Defaults**. Configure each tenant separately by selecting **Override Defaults**:
2. If the default configuration is reused, the default configuration must include settings that cover all DNs to be recorded for all tenants. Click **New** to provide space for the next **Tenant Name**.

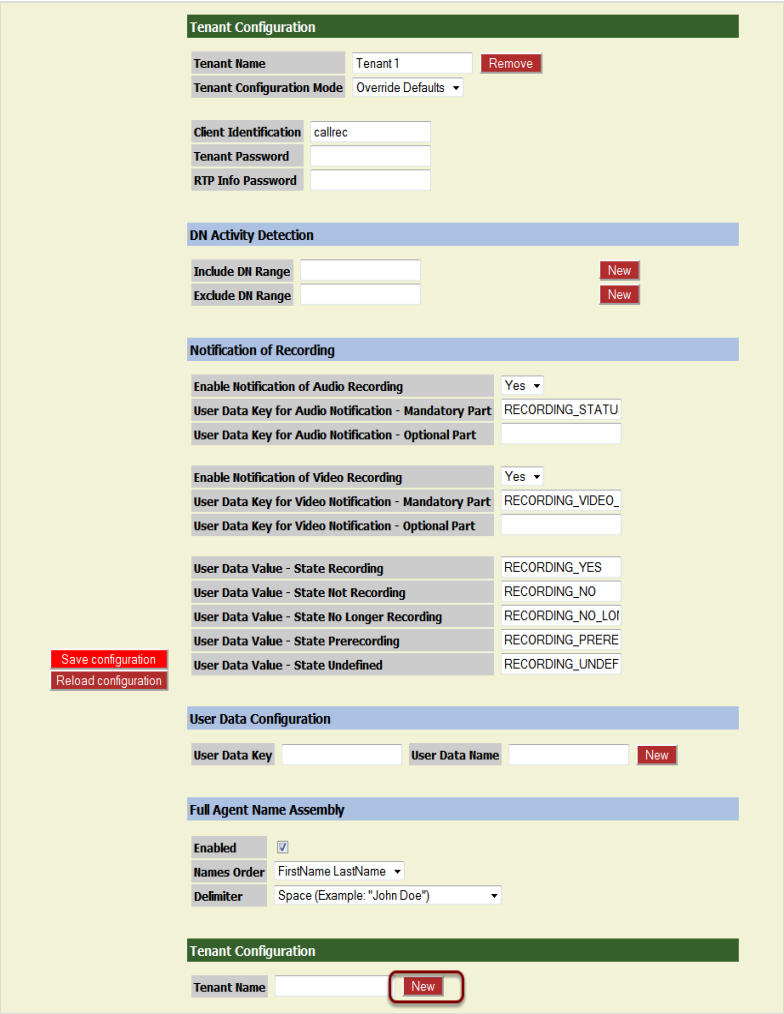


Figure 22: Override Defaults

Configure the setting for each tenant in its **Tenant Configuration** section starting with the **Tenant Name**. If the tenant has more than one T-Server the T-Servers must use the same parameters for **Include DN Range**, **Exclude DN Range** and login.

The fields are the same as those in the **Default Tenant Configuration** and following sections.

Click **New** to provide space for the next tenant.

Default Tenant Configuration

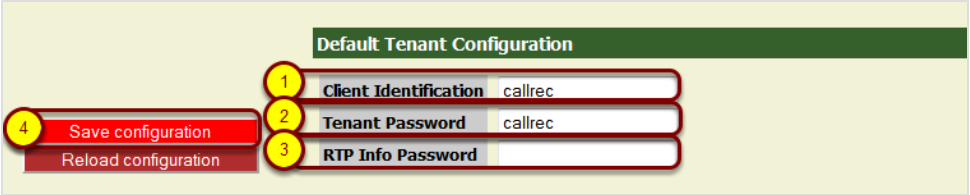


Figure 23: Default Tenant Configuration

1. Type the **Client Identification**.
2. Type the **Tenant Password**.
3. Type the **RTP info password** if required. The RTP password is ignored in MSR mode.
4. Click **Save Configuration**.

Configuring DN Activity Detection

Call Recording must monitor the activity of all Directory Numbers (DNs) to be recorded, including:

- DNs to be recorded by third parties.
- DNs configured to record all calls in the GVP Configuration Manager.
- DNs to be recorded because of a recording rule in Call Recording.

To monitor these DNs, Call Recording must subscribe to receive information from the SIP Server. Call Recording detects the activity of agent DNs, captures all relevant information, and determines whether the DNs should be recorded. If a DN is not monitored then it will not be recorded.

It is important that Call Recording does not subscribe to receive unnecessary information from DNs that will never be recorded. This will reduce the load on both the SIP server and the Call Recording server.

The **DN Activity Detection** configuration allows you to configure which DNs Call Recording subscribes to for monitoring.

Specify a range of Agent DNs (for example 3000-3999) or an individual Agent DN (for example, 3556). You can specify as many ranges as are required.

GQM supports extensions, DNs and terminals that include alphanumeric characters. The following characters are supported:

Character Type	Valid Characters
Letters	`A-Z, a-z`
Numbers	`0-9`
Symbols	`@ & + $ % ' . , : ; ! ~ ( ) [ ] # - _`

Table 1: Valid Alphanumeric Characters for Extensions, DNs and Terminals

Ranges can only use numeric characters, for example: `1234-5678`, or a regular expression. Multiple ranges must be separated by commas (,) with no additional spaces, for example: `1000-1900,2000-2700,3200-3500`.

For High Availability (HA) and load sharing where there are several instances of Call Recording Core, use **Include DN range** to configure each Call Recording

Core to monitor a range of DNs. Then configure other Call Recording Cores to monitor the other ranges until all DNs are monitored by at least one Core.

Important:

If there is no number range stated in **Include DN range** and no DNs excluded in the **Exclude DN range** then all DNs will be monitored.

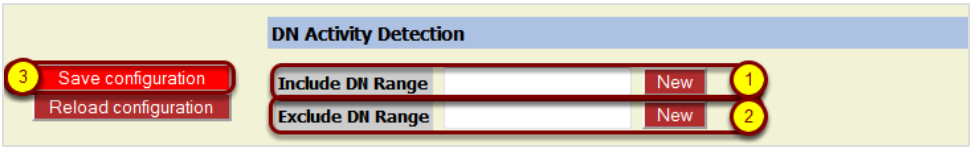


Figure 24: DN Activity Detection Configuration

1. Type a range of agent Directory Numbers in the **Include DN range** field to be monitored. If necessary click **New** to create a new field for an additional **Include DN range**.

   Repeat this for additional agents or ranges.
2. Optionally, you can enter a DN or range of DNs that do not require activity detection in the **Exclude DN range** field. If necessary click **New** to create a new field for an additional **Exclude DN range**.

   Repeat this for additional agents or ranges.
3. Click **Save configuration** to save changes.

Important:

Be careful which DNs you exclude. If you exclude a DN or range of DNs, recording will not be processed, even if an external (third party) application requests the recording.

Notification of Recording

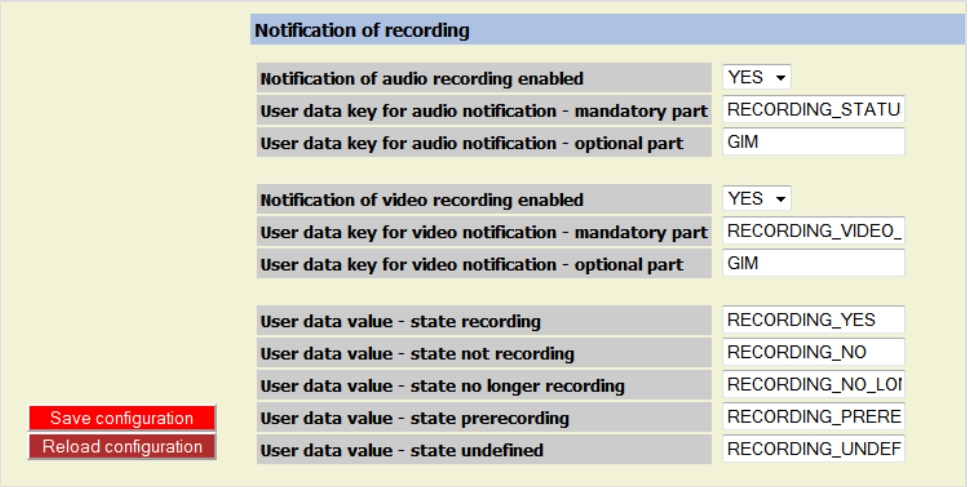


Figure 25: Notification of Recording

Call Recording can send a notification confirming whether a monitored DN call or screen capture is being recorded. This notification is in the form of attached data where the key consists of a mandatory and optional part linked by underscores, for example `RECORDING_STATUS_GIM`, the value part can be `YES` or `NO` as follows:

- **Notification of Audio Recording enabled**: Select from the dropdown list. The default value is `YES`
  Notification of Recording allows third party systems to display an icon on the agent desktop to indicate whether the call and screen are being recorded. This is useful, for example in the financial sector where certain transactions must be recorded and certain transactions must not be recorded (for instance credit card details).
- **User data key for audio notification - mandatory part**: Select from the dropdown list. The default value is `RECORDING_STATUS`.
- **User data key for audio notification - optional part**: Select from the dropdown list. The default value is `GIM`.
- **Notification of video recording enabled**: Select from the dropdown list. The default value is `YES`.
- **User data key for video notification - mandatory part**: Select from the dropdown list. The default value is `RECORDING_VIDEO_STATUS`.
- **User data value - state recording**: Select from the dropdown list. The default value is `RECORDING_YES`.

- **User data value - state not recording**: Select from the dropdown list. The default value is `RECORDING_NO`.
- **User data value - state no longer recording**: Select from the dropdown list. The default value is `RECORDING_NO_LONGER`.
- **User data value - state prerecording**: Select from the dropdown list. The default value is `RECORDING_PRERECORD`.
- **User data value - state undefined**: Select from the dropdown list. The default value is `RECORDING_UNDEFINED`.

Important:

All of the values in **Notification of recording** are pre-defined defaults and should not be changed unless there is a specific need.

Click **Save Configuration** to save your changes.

User data configuration

The **User data configuration** option enables the definition of Genesys User Attached Data.

The following table shows the Genesys Attached Data keys that are supported by the Genesys driver. Keys that the GIM offers by default are marked bold in the table.

	Call Parameters	**Agent Data**	**User Defined Parameters**	**Extension Parameters**
Source	T-Server messages	Configuration Server messages	`KVList UserData (T-Server messages)`	`KVList extensions (T-Server messages)`
Data Prefix in Couple Parameters	`GEN_TEV`	`GEN_CFG`	`GEN_USR`	`GEN_EXT`

Supported Keys	`AgentID`
	`CallID`
	`CallType`
	`CallUuid`
	`ConnID`
	`ANI`
	`DNIS`
	`ThisDN`
	`OtherDN`
	`CollectedDigits`
	`CustomerID`
	`NetworkCallID`
	`NetworkNodeID`
	`NodeID`
	`ThisQueue`
		`EmployeeID`
		`FirstName`
		`LastName`
		`UserName`
		`AdminType`
		`AgentType`
		`PlaceDbid`
		`State`
		`AgentLoginInfo_:_ LoginDbid`
		`AgentLoginInfo_:_ WrapupTime`
		`AgentSkillLevels_:_ SkillDbid`
		`AgentSkillLevels_:_ Level`
			<user defined>	<user defined>

Table 2: User Data Configuration

Only the user data in the column **User Defined Parameters** can be added in the GIM configuration section of the Call Recording GUI. Other non-default, pre-

defined keys can be specified in the integration configuration file (`/opt/callrec/etc/integration.xml`) in XML format. These values should not be modified unless there is a very good reason to do so.

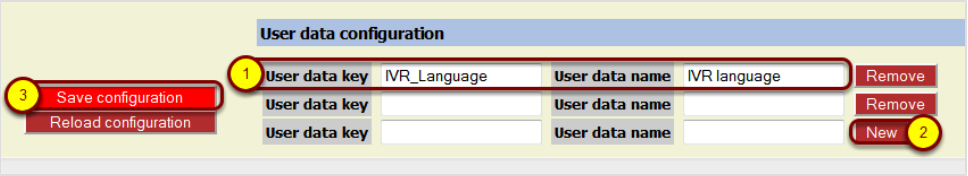


Figure 26: Adding a User Data Definition Key

To add a **User data key** definition to GIM configuration:

1. Type the **User data key** and **User data name**(value).
2. Click **New**to add another key value pair if necessary.
3. Click **Save Configuration** to save your changes.

Full Agent Name Assembly

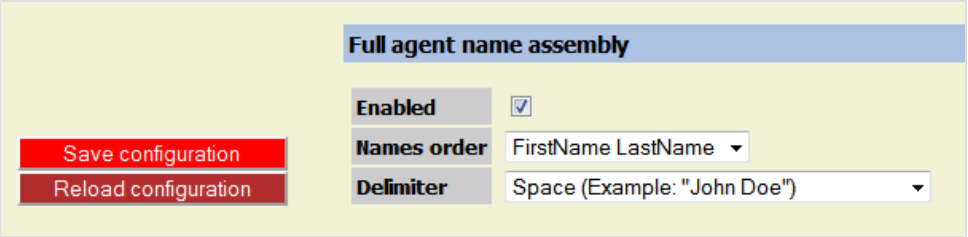


Figure 27: Full Agent Name Assembly

The display of Genesys agent names can be defined in the **Full agent name assembly** section of Genesys driver configuration using a combination of the **Names order** and **Delimiter** options (including a custom delimiter). The following variations can be achieved, assuming a sample agent name of John Smith:

Sample	Name Order Setting	Delimiter Setting	Custom Delimiter Value [5 char limit]
John Smith	"Firstname Lastname"	"Space"	(not visible)
Smith, John	"Lastname Firstname"	"Comma + space"	(not visible)
Smith - John	"Lastname Firstname"	"Custom"	- (space dash space)

Table 3: Agent Name Configuration

Agent Configuration Data

Configuration data objects enable the client to get information about the user, agent, server or other object configuration stored in the Genesys configuration database as well as about the current state of the specific object.

Any values available from the configuration library should be attached using the following naming convention:

Externaldata key: `GEN_CFG_<CfgData.key>`
Example: `GEN_CFG_UserName = "jsmith"`

The following information is available from the Configuration Platform SDK:

Key	Description
EmployeeID	The code identifying the person within the tenant staff.
FirstName	The person's first name.
LastName	The person's last name.
UserName	The name the person uses to log into a CTI system.
AdminType	Specifies whether the person is configured as 'Admin'. Yes=1, No=0
AgentType	Specifies whether the person is configured as 'Agent'. Yes=1, No=0
PlaceDbid	A unique identifier of the Place assigned to this agent by default.
State	The current state of the person object.

Table 4: Agent Configuration Data

Important:
Please note that if the value is empty, the respective key is NOT stored in the Call Recording database!

Some of the properties, namely `LoginInfo` and `SkillInfo` contain more items as agent can have more logins or more skills. In that case Call Recording saves them as indexed fields:

Key	Description
AgentLoginInfo_<index>_ LoginDbid	agentLoginDBID — A unique identifier of the Agent Login identifier.
AgentLoginInfo_<index>_ WrapupTime	wrapupTime — Wrap-up time in seconds associated with this login identifier. Cannot be a negative value.
AgentSkillLevels_<index>_ SkillDbid	skillDBID — A unique identifier of the skill the level relates to.
AgentSkillLevels_<index>_ Level	level — Level of the skill. Cannot be a negative value.

Table 5: Agent and Skill Info

Important:

Please note that if the value is empty the respective key is NOT stored in the Call Recording database!

Configuring Virtual Sniffers

When running in MSR mode, the SLR needs to send signaling information back to Call Recording Core so that Call Recording Core can assemble the necessary information about the call. This is achieved by creating a Virtual Sniffer (passive signaling provider) within the SLR.

GQM Setup performs all of the configuration tasks. Only modify the configuration if setting up multiple cores and/or recorders.

1. Add a `-w` option in the SLR startup parameters contained within the file `/etc/callrec/callrec.derived`, and specify the port that the SLR uses. It is not necessary to specify the host, SLR will connect to every Core that is available.
   Example:

```
SLR_IORFILE="$TMP/slr"
SLR_COUNT=1
SLR_PARAMS[1]="-w 30350 -t 120 -m 40 -A 0 -A 8 -A 9 -A 18 -A 13 -A 19 -l
/etc/callrec/slr.log4cxx.properties"
```

2. Create a new **Sniffer Reader** in **Settings > Call Recording Core > Drivers and Readers**and specify a server and port.

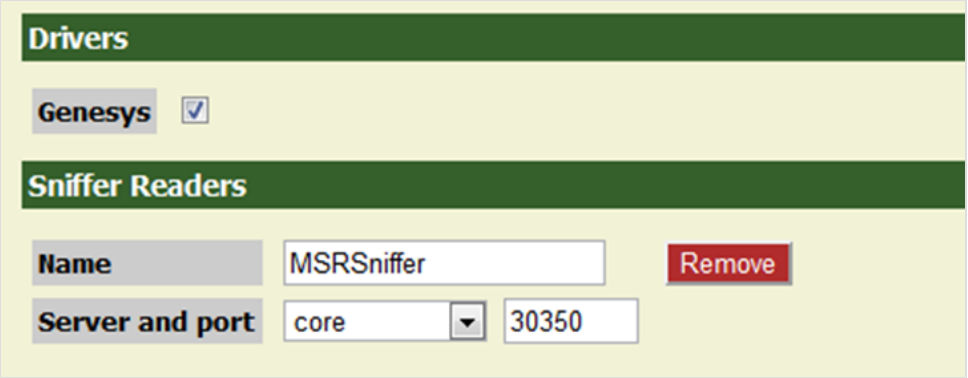


Figure 28: Create New Sniffer

In HA mode when multiple recorders are connected to multiple cores, **Sniffer Readers** must be created so that every core monitors all of the connected recorders. This must be configured manually.

Detect Recorder Ping

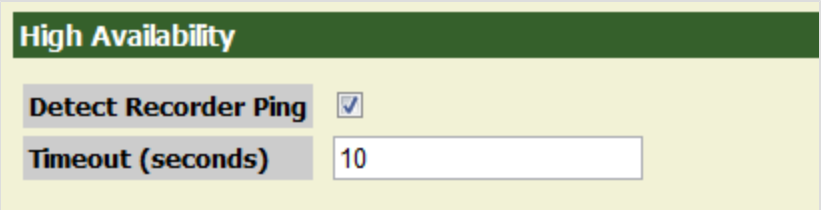


Figure 29: Detect Recorder Ping

Select the **Detect Recorder Ping** checkbox for most implementations.This will restart recording if all recorders fail. When **Detect Recorder Ping** is selected, Call Recording Core detects ping messages from the recorders during the recording. If all the recorders recording a particular call fail, then there will be no pings and Call Recording Core will send a request to the T-Server (SIP Server) to restart the recording session.

Unselect **Detect Recorder Ping** if there are multiple cores and high availability. When multiple cores record the same conversation, if one core fails to record, another core will continue recording so that there is no need to restart recording. This will prevent calls from being recorded in multiple segments unnecessarily.

Chapter

5 Recording Rules

This section describes how to set up recording rules.

This chapter contains the following sections:

Recordings Not Set by Call Recording

Recording Rules

Using Wild Cards in Masks

Rule Priority

Recordings Not Set by Call Recording

With MSR certain directory numbers DNs can be configured to always record even if there are no recording rules. Be careful not to create recording rules in Call Recording which conflict with the configured settings.

For example a DN configured for full recording in the configuration manager but with a recording rule **Do not record** in Call Recording will not be recorded.

Recording Rules

- **Record**: The system records calls depending on ranges or masks entered.
- **Pre-record**: The system records calls and saves them upon request.
- **Do not record**: The system does not record calls based on numbers, ranges or masks entered.

Using Wild Cards in Masks

Wild cards can be substituted for numbers when setting a mask, enabling you to set ranges and the direction of recorded calls.

Ranges

- 200? selects 2000 - 2009
- 20?? selects 2000 - 2099
- 2* selects all numbers which start with 2
- *2 selects all numbers which end with 2

Incoming / Outgoing

- 2005> selects all calls made from 2005
- >2005 selects all calls made to 2005

Between

- 2501=2525 selects calls made between extensions 2501 and 2525

Combinations

- 20??> selects all outgoing calls made from 2000 to 2099

Rule Priority

- Put the “do not record” rules above the “record / pre-record” rules.
- Recording rules apply from top to bottom throughout the hierarchy.
- Admin - has highest priority: Any rule defined for Admin always overrides any rule from subordinate groups.
- Add global rules in the Admin Group.
- Add group specific rules to the appropriate group.

Chapter

6 Configuring the SIP Server for MSR

Configure the following parameters in the SIP Server in order to enable MSR recording.

This chapter contains the following sections:

Configuring the Application Level

Configuring the DN Level

sip-hold-rfc3264

Configuring the Application Level

Configuring msml-support

In the T-Server section of the SIP Server application, configure:
`msml-support`
as `true` to support the call recording solution.

The valid values are:

- `true` : The msml service is enabled for treatment and conference and recording service.
- `false` : The msml service is disabled for treatment and conference and recording service.

The default value is `false`.

Configuring resource-management-by-rm

In the T-Server section of the SIP Server application, configure:
`resource-management-by-rm`
to `true` to support the call recording solution.

The valid values are:

- `true`: Resource Monitoring and Notification will be done by the RM. The SIP Server will contact MS through RM.
- `false`: Resource Monitoring and recovery will be done by the RM. The SIP Server will contact MS directly.

The default value is `true`.

Configuring msml-record-support

In the T-Server section of the SIP Server application, configure:

`msml-record-support`

to `true` to support the msml based call recording solution.

The valid values are:

- `true` : This enables SIP Server to engage GVP as a media server through the msml protocol for call recording (SIP Server uses msml protocol for call recording).

- `false` : The SIP Server uses existing NETANN protocol for call recording.

The default value is false.

Configuring the recording-filename

In the T-Server section of the SIP Server application, configure:
`recording-filename`
to an empty field.

The Value of this option must be set to empty field otherwise GQM won't be able to match RTP received from MCP with TLib events.

The default value is an empty field.

Configuring record-consult-calls

In the T-Server section of the SIP Server application, configure:

`record-consult-calls`

This can have either a true or a false value depending on whether consult calls are to be recorded.

Configuring the DN Level

Configuring the Extension, record Parameter

Configure the:
`record`
parameter in
`Extension`
to `true` to enforce recording without a request from GQM. This option changes behavior of GQM when EXTERNAL DATA recording rules are considered.

Configuring the Trunk, record Parameter

Configure the:
`record`
parameter in
`Trunk` to `false`.

The option cannot be set to true because it will cause GQM not to record calls. This related to fact that with value true GQM will receive the number of calling party in SIP signaling as a recorded DN and GQM will not be able to match TLib events for such stream.

Creating a TServer section for msml

Create a TServer section and add a parameter
`service-type=msml`
for the `msml` service.

Contact:

Point the option
`contact`

of the `msml` service to the IP address and port of the Resource Manager.

`Contact=sip:<ResourceManager:port>`

This is a mandatory parameter.

prefix:

Configure the option

`prefix`

in the MSML service and value of the `prefix` should be `msml=`

`prefix=msml=`

This is a mandatory parameter.

subscription-id:

Configure the option
`subscription-id`

in `msml` service, and set the value of the service must be set to <TenantName> where <TenantName> is the name of the tenant .

`subscription-id=<TenantName>`

This is a mandatory parameter.

refer-enabled:

Configure the option
`refer-enabled`
as `false`. This is a mandatory parameter. If not used, some transfer functions will not work.

make-call-rfc3725-flow:

Configure the option parameter:
`make-call-rfc3725-flow`
in the MSML service. This parameter should be set with a value = 1.

ring-tone-on-make-call:

Configure the option parameter
`ring-tone-on-make-call`
in the MSML service. This parameter should be set to `false`

If multiple RMs are configured, then create multiple VoIP DNs of the

`service-type=msml`.

In this case, the SIP server will balance the load between the multiple RMs.

sip-hold-rfc3264

In VoIP Service DN add an option:
`sip-hold-rfc3264`
This parameter should be set to `true`

```
sip-hold-rfc3264=true
```

Chapter

7 Configuring the Media Server for MSR

Configure the following parameters in the media server to enable MSR recording.

This chapter contains the following sections:

Creating a Resource Access point

Configuring MCP Options

Configuring the MCPs

Configuring the Recording Servers

Access Points

Configuring the Recording Server Group

Resource Assignment

Configuring the IVR Profile

Creating a Resource Access point

Each recorder for the recording server is assigned as a resource access point. The **.apd** file, when provided with the IP Address of the resource manager, helps to create this and populates the parameters for the resource access point. The host part configuration is not as important as configuring the host for the **recordingserver** itself, because the host part configuration is a Resource Access Point (external), MF is not going to ping or check its status.

After creating the object, check the following:

- Whether the `gvp.rm` section exists.
- That the aor parameter points to the `recordingserver` address.
- Whether the provision section has the parameter `recording-server=1` (this should be by default).

Configuring MCP Options

Configure the following MCP parameters:

1. Navigate to **vrmrecorder > sip.routset**.
   Set
   `sip.routset`
   to
   `<sip:[rm-ip]:[rm-port];lr>`
   This defines the route that MCP uses to access recording server. Set to RM to allow RM to invite the SLR servers from Call Recording.The syntax is very important, the expression must have '<' and '>' (without the < and > MCP would not invite RM and recordings will fail).
2. Create the
   `recordingserver`
   resource group using the resource group wizard in Genesys Administrator. Select the service type for a recording server. GA actually finds the RACs with
   `provision.record-server=1`
   set, and displays a list to choose from.
3. For the selected recorder resource, set the port-capacity (the GA has a column for that) and set the redundancy-type as Active (this option is also there in GA).
4. Also as for any resource group select which RM should manage this group.

MTInternal Transmit Rate

Navigate to **mtinternal > transmit_rate**.

The parameter
`transmit_rate`
specifies the transmission rate limit as a multiple of real time.

- A value of 1 means real time, 2 means twice real time and so on.
- Set to a smaller number to lower transmit to real time in order to improve the overall processing power if there is a more constant load on the servers.

Configuring the MCPs

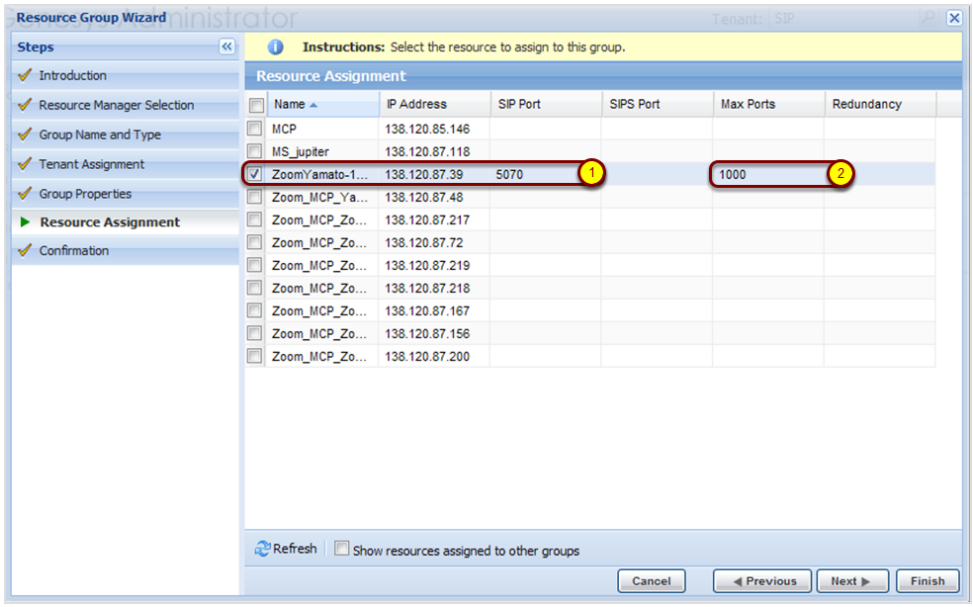


Figure 30: Configuring the MCP

1. When configuring the Media Control platforms (MCPs) the IP address and Port must of course match the details of the MCP.
2. Set the Max ports option to double the number of calls you want to handle with the MCP. The reason for the number being doubled is because one port is used per stream in the call, one for the customer leg and one for the caller leg. With the Max Ports set to 1000 the MCP can handle 500 calls.

Configuring the Recording Servers

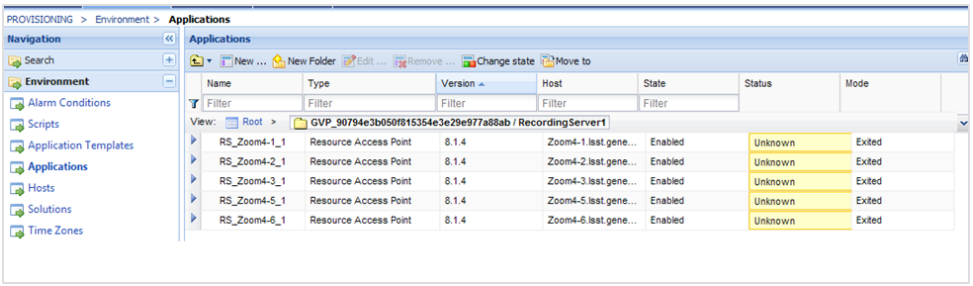


Figure 31: Applications

The Recording Servers are also configured and represented in Genesys Administrator (GA) CME. Each recording Server added to the resource group will show up in the group in GA (the same as the MCPs).

Access Points

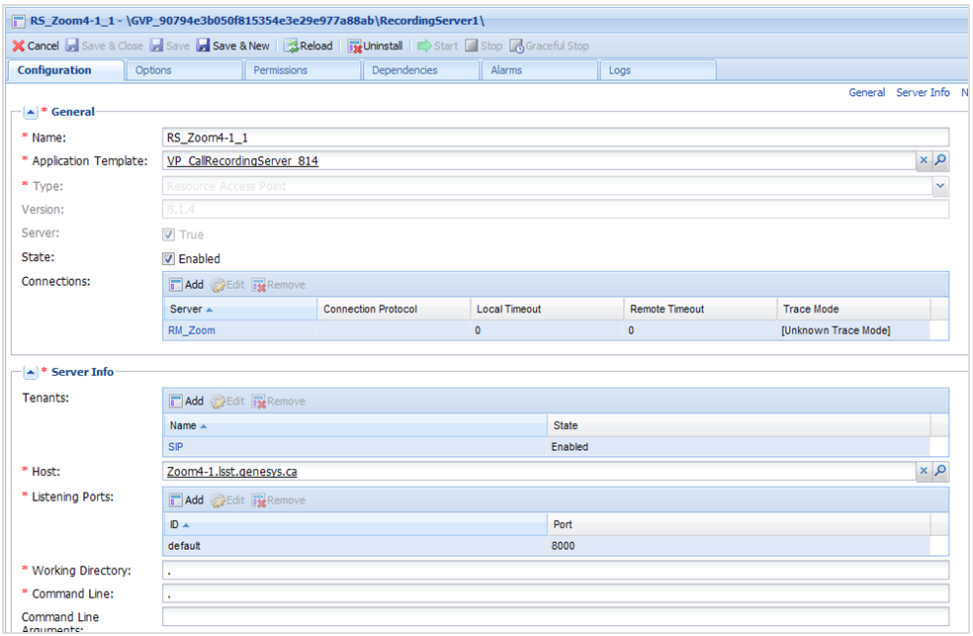
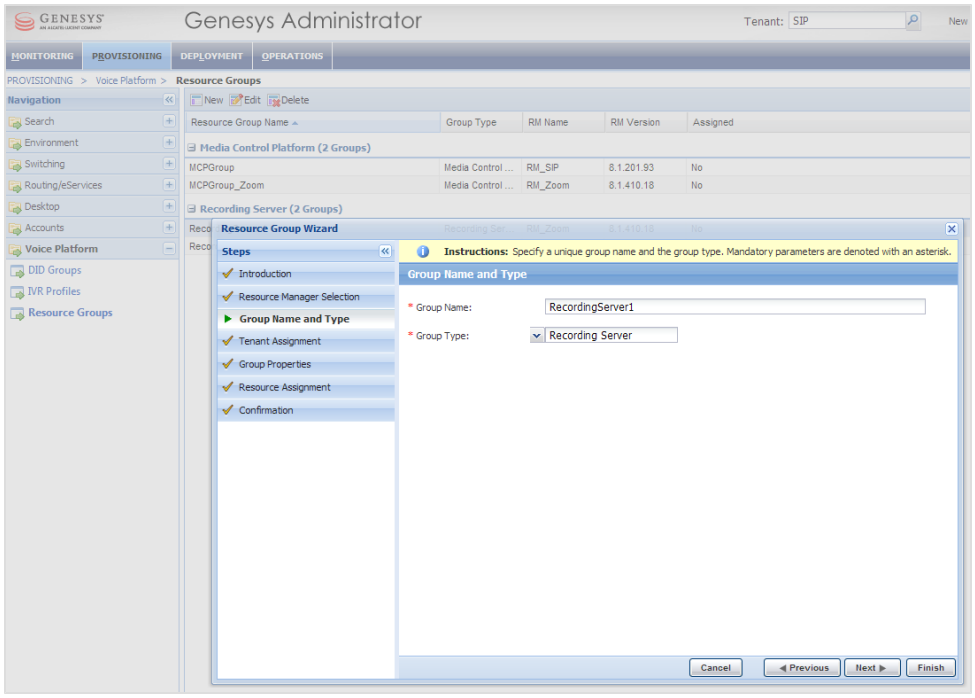


Figure 32: Configuration of the Recording Server

The access points are simply representations and do not include any configuration data for the SLR servers. The port is defined but is not used.

Configuring the Recording Server Group



Creating a New Resource Group for Servers

Steps to create a new Resource Group for Recording Servers.

Under **PROVISIONING > Voice Platform > Resource Groups**, click **New.** This will start the Resource Group Wizard.

In Resource Manager Selection, select the Resource Manager.

In Group Name and Type, enter the group name and select Recording Server in Group Type.

Use the defaults for Tenant Assignment and Group Properties.

Add
`recordingclient.recmediactl=fixed,2`

See next section for Resource Assignment screen shot and instructions.

Resource Assignment

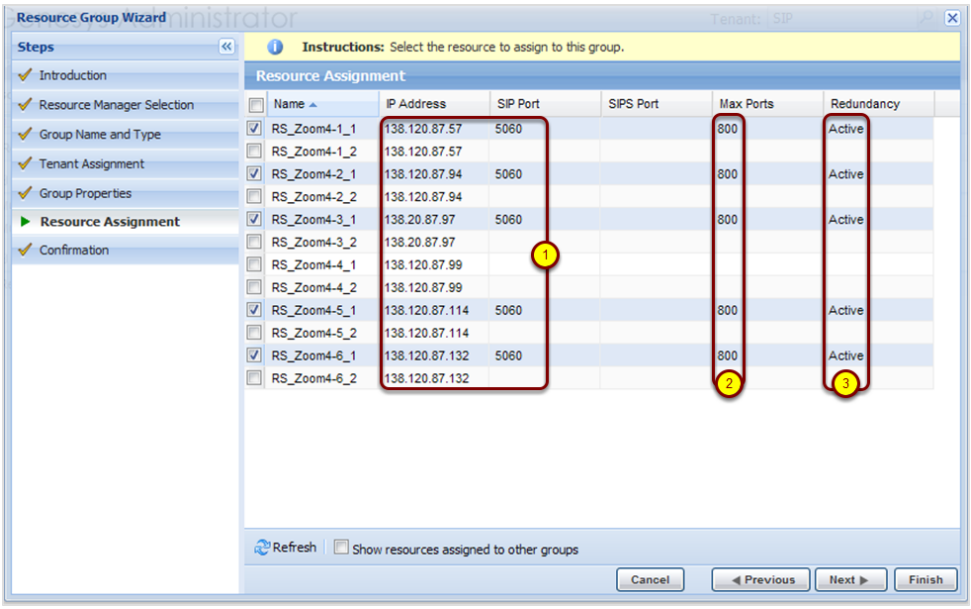


Figure 33: Resource Assignment

1. Set the **IP Address** and **SIP Port** of the Recording Servers to those of the installed zoom component.
2. Set the **Max Ports** option to double the number of calls you want to be able to record.
3. When configuring recording servers all Recording servers must have the Redundancy set to **Active**. If not they will not be seen as an available resource to RM and calls will not be recorded.

In the gvp.service-parameters section in options, add `recordingclient.recdest=fixed,sip:[rm-ip]:[rm-port].`

Configuring the IVR Profile

1. Navigate to **Environment > Tenants**, select **Environment** go to the **Options** tab - check what the default profile for tenants is (look under the section **gvp.general**,
   `gvp.general/default-application`
   The value is set to Default application).
2. Then go to **Voice platform > IVR profiles > Default application**, go to the **Options** tab, look under
   gvp.service-parameters,
   if it is not there click on **New** and create:
   `Section > gvp.service-parameters`
   `Name > recordingclient.recmediactl`
   `Value> fixed,2`
   Click **OK**.
   The value says we want to separate the dialog for each call-leg.
3. If it is not there, click **New** and create:
   `Section > gvp.service-parameters`
   `Name > recordingclient.recdest`
   `Value > fixed,sip:[rm-ip]:[rm-port]`
4. Save the changes.

Chapter

8 Increasing Capacity in the GQM Host

To increase the total number of calls that can be recorded, you must increase the number of files that can be open simultaneously in RHEL and increase the numbers of streams that the SLR will handle.

This chapter contains the following sections:

Increasing the Total Number of Open Files in RHEL

Increasing the Number of Simultaneous Call Recordings

Increasing the Total Number of Open Files in RHEL

The default for RHEL allows 1024 simultaneous open files for users. Recording requires many files to be written to simultaneously (more than 1024 if doing a moderate amount of recordings).

Using an SSH (such as PuTTY), log in as callrec user, or if you are logged in as root, switch user to callrec using the command:

```
su - callrec
```

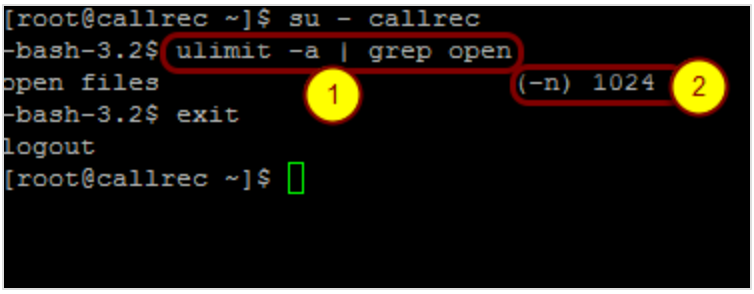


Figure 34: Default Value of Open Files in RHEL

1. Check the number of permitted **open files** using the commands:

```
ulimit -a | grep open
exit
```

`exit` at the end brings you back to root if previously logged in as root.

2. If this value is 1024, increase the number of permitted open files for the user `callrec`.
3. To increase the `open files` limit to 10240, edit the following file using root `/etc/security/limits.conf`.

Add the lines:

```
callrec hard nofile 10240
callrec soft nofile 10240
```

4. Check that the ulimit has increased by using the commands:

```
su - callrec
ulimit -a | grep open
exit
```

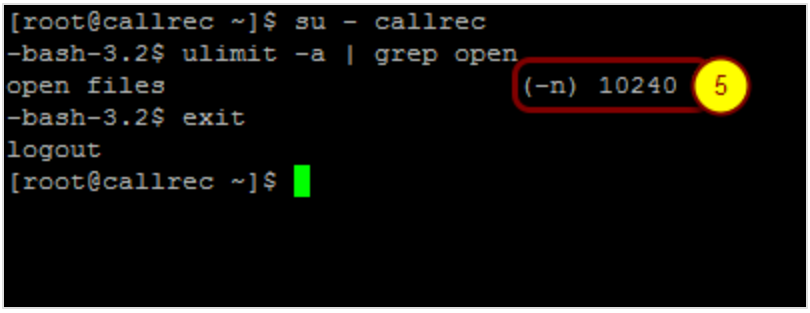


Figure 35: Value of Open Files in RHEL After Increase

5. Look at the value of `open files`.
6. Reboot the Linux server to apply the changes.

Increasing the Number of Simultaneous Call Recordings

The default value for GQM allows less than 300 simultaneous call recordings. Modify SLR startup parameters to increase the number of streams (two per call).

Using a text editor, edit the file: `/opt/callrec/etc/callrec.derived`.

Add a parameter `-S` to the `SLR_PARAMS` files and set the value of it to double the number of calls that are planned to be recorded.

```
SLR_IORFILE="$TMP/slr"
SLR_COUNT=1
SLR_PARAMS[1]="-S 1350 -w 30350 -t 120 -m 40 -A 0 -A 8 -A 9 -A 18 -A 13 -A
19
 -l /etc/callrec/slr.log4cxx.properties
```

In the configuration you can see that the `-S` value for `SLR_PARAMS[1]` is set to 1350, allowing 675 calls.

To complete the changes, restart the SLR service using the command:

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

Chapter

9 Troubleshooting Recording, Notes and Development

This chapter contains the following sections:

Troubleshooting

Notes

Development Info

Troubleshooting

If calls are not being recorded, start troubleshooting from the SIP server by checking if the following attached data keys are present:

- GSIP_RECORD
- RECORDING_STATUS_GIM

If neither of the keys is present, one of the following is likely:

- Nothing is configured. Follow the instructions above to check if an attached data is present, and then enable recording on the GQM side.
- Only the Genesys side is configured. Enable recording on the GQMside.

If only the RECORDING_STATUS_GIM key is present with the value RECORDING_NO:

Look in the SIPS log to see if a PrivateRequest was received from GQM by SIP Server.

- If it was received but SIPS returned an error code, then recording is not configured on Genesys side.
- If it was not received, then there is no recording rule which matched a call.

If there was PrivateRequest and it was handled correctly (SIPS returned success response), there is mismatch between RTP and TLib events.Check whether record=true is set on the trunk or if recording-filename has non empty value.

If only GSIP_RECORD is present.

- GQM has disconnected from SIP Server. Restart the core process and see why there was disconnection.
- GQM is not configured but record option is set on DN level. Enable recording on GQM side.

If GSIP_RECORD=OFF and RECORDING_STATUS_GIM=RECORDING_NO then there was error during recording.

Follow SIP logs in SIPS, MCP and in RM and check the following:

- Whether both DN's were properly connected to the MCP. Check if both `reINVITE`'s sent to the phone and the gateway were ok.
- Whether the MCP is sending the correct `INVITE record=<value>` to the correct RM after parties are connected to MCP.

- Whether the RM forwards the `INVITE record=` to the external recording system.
- Whether the external system received an `INVITE record=` and whether it responded correctly to this `INVITE`.

If GSIP_RECORD=ON and RECORDING_STATUS_GIM=RECORDING_NO there is a mis-configuration in the default profile. Please check section name, option names and values."

Notes

Recording of Counterpath Bria or Genesys SIP endpoint: Make sure that the Extension has the proper configuration and in the event that Bria is configured to support G729, make sure that G729 annexb is enabled for MCP.

ACD Position for agent phones: GQM does not monitoring devices of type ACD Postion.

Cannot mix different recording modes (active and file based recording) on single SIP Server.

Use of dedicated pool of MCP's to handle stream replication requires manual change of resource group parameters.

Development Info

The AttrPrivateMsgID that specifies the operation required, should be one of the following:

- GSIP_RECORD_START (3013) - start the recording
- GSIP_RECORD_STOP (3014) - stop the recording
- GSIP_RECORD_PAUSE (3015) - pause the recording
- GSIP_RECORD_RESUME (3016) - resume the recording

Chapter

10 Failover, Scalability and High Availability

This chapter discusses options/possibilities for failover and high availability for the call recording solution. The scalability of the solution in simple (non-redundant) mode and in High Availability mode is also discussed.

This chapter contains the following sections:

Failover and Load Balancing

Scalability

High Availability

High Availability with Duplication of Recording

Failover and Load Balancing

This section describes failover and load balancing methods and their implementation.

The RTPs are distributed to one recorder at a time, between recorders in a resource group, using one of the following methods:

• Round Robin

• Least used

In both cases there is only one recorder recording the current session.

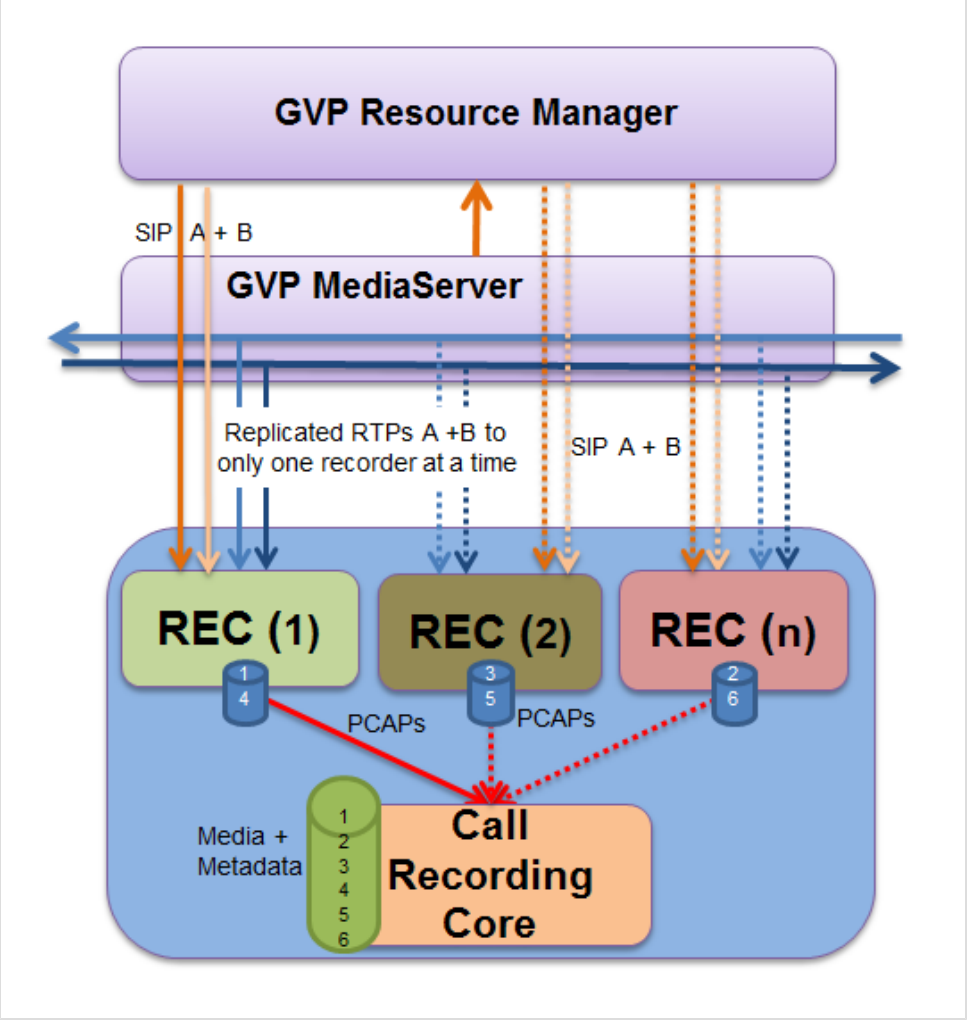


Figure 36: Simplified Failover Architecture

In the diagram the dotted lines indicate interconnections. The solid arrows show a particular call being recorded.

Load Balancing

The Resource Manager detects all active recorders in the Logical Resource Group. The Media Server replicates a call's RTPs to an active recorder. The recorder receives the RTPs, records them, and provides the media + meta data to Call Recording Core. The RTPs for the next call will go to another active recorder in the LRG using load balancing.
Call Recording Core consolidates all data relating to each call.

Failover

If a recorder fails:

1. The failed recorder stops responding to pings from Call Recording Core.
2. Call Recording Core detects the failure and requests the SIP to restart the recording.
3. The SIP Server restarts the recording via the Media Server, and the Resource Manager will find an active recorder from an LRG and forward the Media Server request to this recorder.

Call Recording Core consolidates all data relating to the call.

Scalability

This chapter discuss the possibilities to scale the recording solution by adding multiple recording resources in order to provide recording for large number of simultaneous calls.

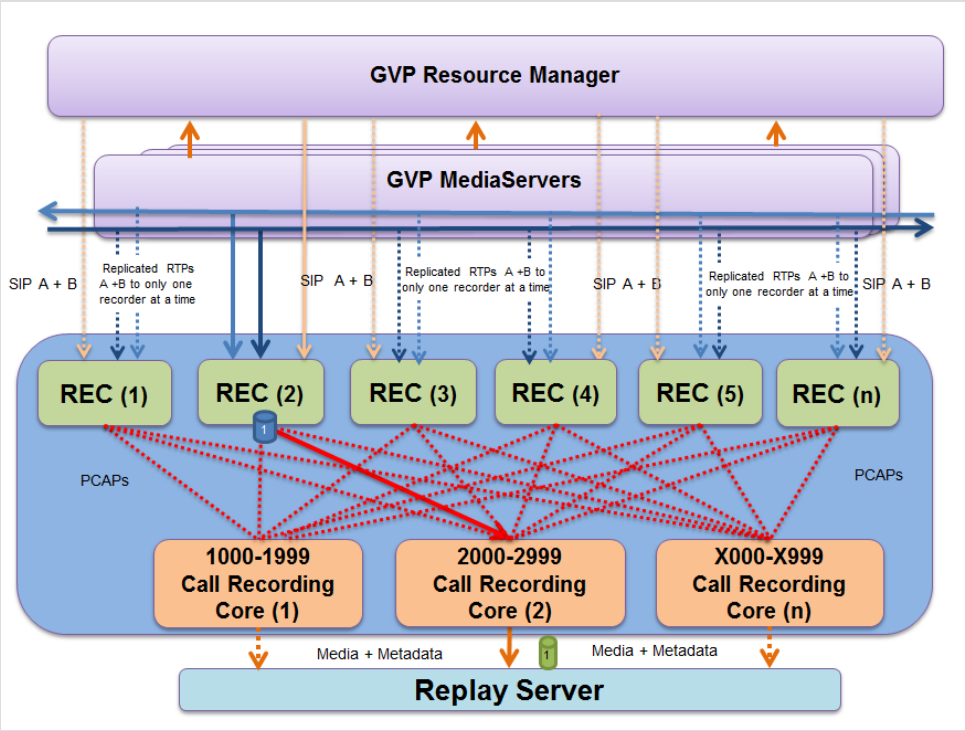


Figure 37: Scalability with (n) Call Recording Clusters

In the diagram, the dotted lines indicate interconnections. The solid arrows show a call being recorded.

The Resource Manager detects all active recorders in the Logical Resource Group. The Media Server replicates a call's RTPs to an active recorder. The recorder receives the RTPs, records them and provides the media + meta data to Call Recording Core. The RTPs for the next call will go to another active recorder in the LRG using load balancing.

Each core is only responsible for a range of DNs.

- The core also gets associated metadata (through T-Lib).
- The replay server requests all recordings and metadata and consolidates (assembles and removes duplicates) all data relating to each call.

Scalability of the Recording Solution

For a large deployment, where multiple SIP Servers are configured, each Call Recording Core instance will monitor a separate SIP server instance. Each Call Recording Core will monitor the range of DNs configured by each SIP server.

However, the REC instances are not specifically tied to any range of DNs or SIP servers. All REC instances can accept a recording session from any GVP media server. GVP Resource Manager will treat all of the RECs in an LRG as a single pool of recording servers. Since Resource Manager can place a limit on the number of concurrent recording sessions on each REC instance, Resource Manager can ensure that the RECs are not overloaded.

Whenever a REC receives a recording session, the REC generates pseudo recording events to a Call Recording Core. In this case, REC sends the pseudo recording events to all Call Recording Core instances. When Call Recording Core instance receives such an event for a DN that it is not responsible for, that instance may ignore the event.

High Availability

There are two possible methods of High Availability. The First method leverages the Load Balancing/Failover principle of the Recorder (see the document Failover and High Availability) while adding the redundancy of an additional recording Core.

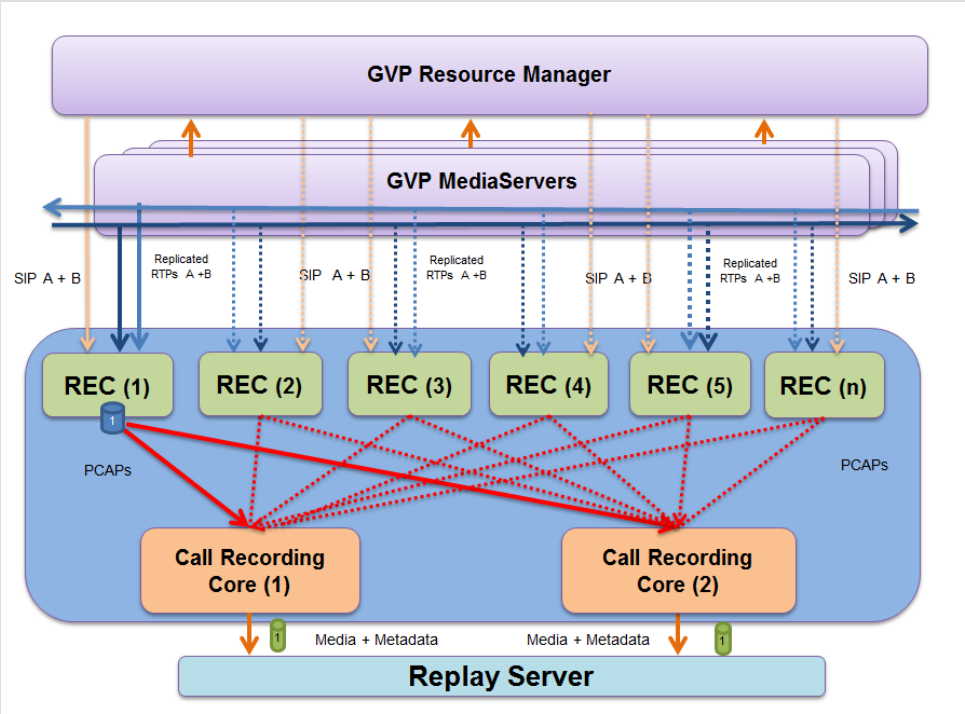


Figure 38: Multiple Cores in HA mode

In the diagram the dotted lines indicate interconnections. The solid arrows show a call being recorded.

To provide full redundancy, every DN must be monitored by two different Cores. If there are less than 1200 DNs, then two Cores can both monitor all of the DNs. If there are more than 1200 DNs, multiple Cores need to be deployed while monitored ranges must overlap. The DNs monitored by each Call Recording Core must set by configuring the **DN activity Detection** for each Call Recording Core. For details please see DN Activity Configuration.

- Each core operates independently, working in active mode.
- There are multiple recorders (two or more) interconnected with every core.

The Resource Manager detects all active recorders in the Logical Resource Group. The Media Server replicates a call's RTPs to an active recorder. The recorder receives the RTPs, records them, and provides the media + meta data to Call Recording Core. The RTPs for the next call will go to another active recorder in the LRG using load balancing. The Replay Server consolidates all data relating to each call.

The failover for Two or More Cores:

1. If one of the Recorders fails, the current recording session is re-established and sent to the second recorder. Both Cores get the recorded data.

Important:

Both cores will attempt to re-establish the recording session since the core detects that the recorder has failed. The end result is that the recording session is re-established, but with the possibly of a duplicate set of intermediate messaging trying to re-establish the recording session.

2. If one of the cores fails, then another core completes the process. Since both recorders provide recordings to all cores it does not matter if the first core fails while the first recorder is processing the stream. The stream gets passed to the second core.
3. If there is a failure, some of the recordings may not be available in the first or second database. In some cases, only metadata is available on the first server with no recording, while the complete recording and metadata are available on the second server. In either case all of the recordings get consolidated to the replay server where all of the recordings are available for search and replay.

GVP Configuration steps

1. Make sure that the `VP_CallRecordingServer_814` application template is installed.
2. For each Recorder, **REC(1)**, **REC(2)...REC(n)**, create an application using the application template from above.
3. Create a new Resource Group of **recordingserver** service type using the Resource Group creation wizard in Genesys Administrator (**PROVISIONING >Voice Platform >Resource Groups**).

- Set the load balancing scheme (**Round-Robin** or **Least Used**).
- Assign **REC(1)**, **REC(2)...REC(n)** as the resource access points.
- Set the aor field as the SIP addresses for **REC(1)**, **REC(2)...REC(n)**
- Remember to set the port-capacity to the number of concurrent calls allowed for **REC(1)**, **REC(2)...REC(n)**.

4. In the default IVR Profile, go to the gvp.service-parameters section in options (create one if it does not exist).
   - Add a parameter `record-ingclient.recdest=fixed,sip:rm:port`, where `rm:port` is the address:port of the GVP resource manager.

Important:

Note that HA and scalability work independently of each other. You can choose one of the two models mentioned above for handling HA in a large deployment.

High Availability with Duplication of Recording

This HA option provides the best level of redundancy, but requires the most resources, especially on Media Server. This constitutes true redundancy (every conversation is recorded on both call recorders), but is more resource intensive (every recording session creates two pairs of replicated media which increases the load on the Media Server).

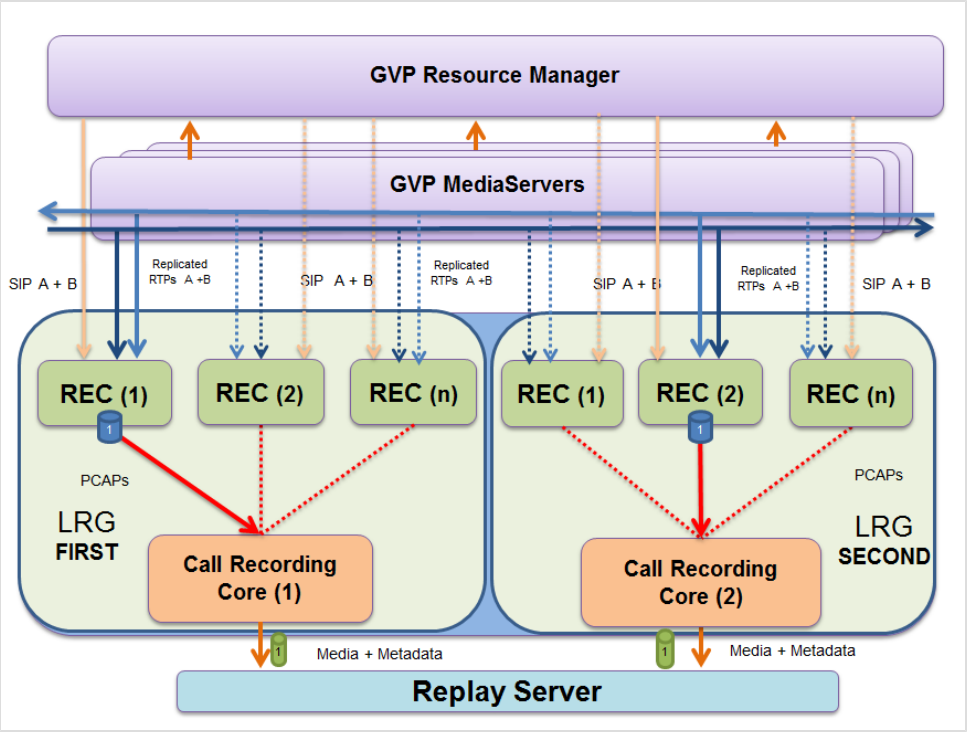


Figure 39: Media Duplication with (n) Call Recording Clusters

In the diagram the dotted lines indicate interconnections. The solid arrows show a call being recorded

Each Call Recording cluster (Call RecordingCore and its associated recorders) is in a different Logical Resource Group (LRG):

The Resource Manager detects all active recorders in each Logical Resource Group. The Media Server replicates a call's RTPs to an active recorder in each LRG. The recorders receive the RTPs, record them, and each provides the

media + meta data to its Call Recording Core. The RTPs for the next call will go to another active recorder in each LRG using load balancing.

- There are multiple clusters (two or more) separated as LRG **FIRST** and LRG **SECOND**.
- Every core operates independently, working in active mode.
- There are multiple recorders (two or more) interconnected with every core.
- To provide full redundancy, every DN must be monitored by two different cores.To provide full redundancy, every DN must be monitored by two cores. If there are less than 1200 DNs then two cores can both monitor all the DNs.. If there are more than 1200 DNs, multiple cores need to be deployed for each monitored range. The DNs monitored by each Call Recording Core must set by configuring the **DN activity Detection** for each Call Recording Core. For details please see DN Activity Configuration.
- The GVP media server creates TWO recording sessions (SIP and RTP) for each call being recorded
  - The two recorders (in the diagram LRG **FIRST REC (1)** and LRG **SECOND REC (2)**) will receive RTP's simultaneously.
- Since every DN is observed by two different cores, the two Call Recording cores get the available metadata for all of the recorded calls from the SIP Server.
- The replay server requests all recordings and metadata and consolidates (assembles and removes duplicates) from both clusters and all data relating to each call.

GVP Configuration steps

- Make sure the `VP_CallRecordingServer_814` application template is installed.
- For each Call Recording Core, create an application using the application template from above.
- Create a new Logical Resource Group of the **recordingserver** service type using the Logical Resource Group creation wizard in Genesys Administrator (**PROVISIONING > Voice Platform > Resource Groups**). Call this resource group **FIRST**.
  - Set the load balancing scheme (**Round-Robin** or **Least Used**).
  - Assign LRG **FIRST REC(1), REC(2)...REC(n)** as the resource access points.
  - Set the aor field as the SIP addresses for LRG **FIRST REC(1), REC(2)...REC(n)**.

- Remember to set the port-capacity to the number of concurrent calls allowed for **FIRST REC(1), REC(2)...REC(n)**.

- Create a new Resource Group of the **recordingserver** service type. Call this resource group **SECOND**.
  - Follow the same steps above for LRG **SECOND**.
- In the default IVR Profile, go to the gvp.service-parameters section in options (create one if it does not exist).
  - Add a parameter `recordingclient.recdest=fixed,sip:rec1:port`, where `rec1:port` is the address:port of REC1 (or one of the addresses of recorders if there are more than one recorders in the **FIRST** resource group).
  - Add a parameter `recordingclient.recdest2=fixed,sip:rec2:port`, where `rec2:port` is the address:port of REC2 (or one of the addresses of recorders if there are more than one recorder in the **SECOND** resource group).

Important:
Disable Detect recorder Ping in Call RecordingConfiguration.

Upon failover

1. If one of the recorders fails, the current recording sessions will continue in the other LRG.
2. If one of the cores fails, the other completes the process.
3. If there is a failure, some of the recordings and associated metadata will not be available in the first or second database. All of the recordings get consolidated to the replay server, where all of the recordings are available for search and replay.

Limitation: If there is a failover, there is no guarantee of recording.

Important:
Note that HA and scalability work independently of each other. You can choose one of the two models mentioned above for handling HA in a large deployment.

Chapter

11 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.