

ShoreTel Integration

Integration Guide

QMS 9.4

This document contains information about the configuration of Quality Management Suite for recording ShoreTel calls.



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About This Document

Audience

This document is for the contact center system administrator who installs, configures, and integrates ShoreTel with Enghouse Interactive Quality Management Suite (QMS).

Reference materials

The content contained in this document works in combination with the information and procedures in the following documents or Help.

- Quality Management Suite System Design Guide
- Quality Management Suite Installation Guide
- Quality Management Suite High Availability Guide

Document conventions

This document uses the following text formats and notation conventions.

Text format

Bold text indicates a button, field, link, option name, or similar function requiring an action.

Italicized text indicates new terms, directory paths, or references to external documents.

Notes and cautions

Icons used throughout this document identify additional details or special conditions.



Note

Provides additional information or describes special circumstances.



Caution

Warns of user actions that may cause system failure or irreversible conditions.



Stop

Describes actions that you should only perform under the supervision of Enghouse Customer Support.

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Solution Overview

The QMS Call Recording solution supports two methods of recording calls for ShoreTel. Both methods employ an integration with ShoreTel TAPI to receive call control events. For this integration with ShoreTel TAPI, an Application Server for the QMS server must be configured on the ShoreTel PBX. Also, the ShoreTel Remote Server software must be installed on the QMS server, which installs the ShoreTel Telephony Service Provider (TSP) on the QMS server.

The difference between the two methods centers around how audio is sent to, and received by, the QMS server. The first method of recording employs port mirroring to create call recordings. Any network switches to which ShoreTel IP phones are connected must have port mirroring enabled, in order to forward all audio packets from any recorded phones to the QMS server. Audio packets are captured (also referred to as “sniffed”) off of the “Capture” network adapter in the QMS server for processing.

The second method of recording uses the ShoreTel feature called TAPI/Wave recording. When using this method, the ShoreTel Remote Server software is responsible for interacting with the Windows Wave subsystem to send audio to the QMS Server. When a call is to be recorded, the QMS server will make a call to a Route Point, defined in the ShoreTel PBX. This call is automatically answered by the QMS server, and once connected, the Route Point is responsible for making audio available to QMS for recording. The main advantage of this method is flexibility, as it does not require setting up port mirroring. ShoreTel TAPI/Wave also allows recording of calls in the following instances:

1. An extension has been reassigned to another extension’s phone, or to an external phone number, through the External Assignment feature.
2. A ShoreTel user has enabled the Find-Me feature, which will forward a call to another ShoreTel extension if the call is not answered at the original extension. The Find-Me feature allows a call to be forwarded to an external phone number, but calls going to an external phone number cannot be recorded as the ShoreTel PBX will have no access to the audio streams.

There are a few disadvantages, however, which are all ShoreTel limitations:

1. Only 200 simultaneous calls are allowed per ShoreTel Remote Server.
2. Internal calls are unable to be recorded.
3. During certain conference call scenarios, the Route Point disconnects briefly, which results in a gap in the audio while the Route Point reconnects. There is not an option to keep the Route Point connected when a party leaves a conference call.
4. Stereo recordings are not available, as the audio streams coming from the Route Point are mono only.

ShoreTel TAPI

Port mirroring is the action of copying all inbound and outbound network traffic from one port on a network switch to another port. Most modern network switches allow for some level of port mirroring, including Virtual LAN (VLAN) configurations that allow the network administrator to segment the local network as needed. QMS can utilize port mirroring to record calls to and from ShoreTel IP phones.

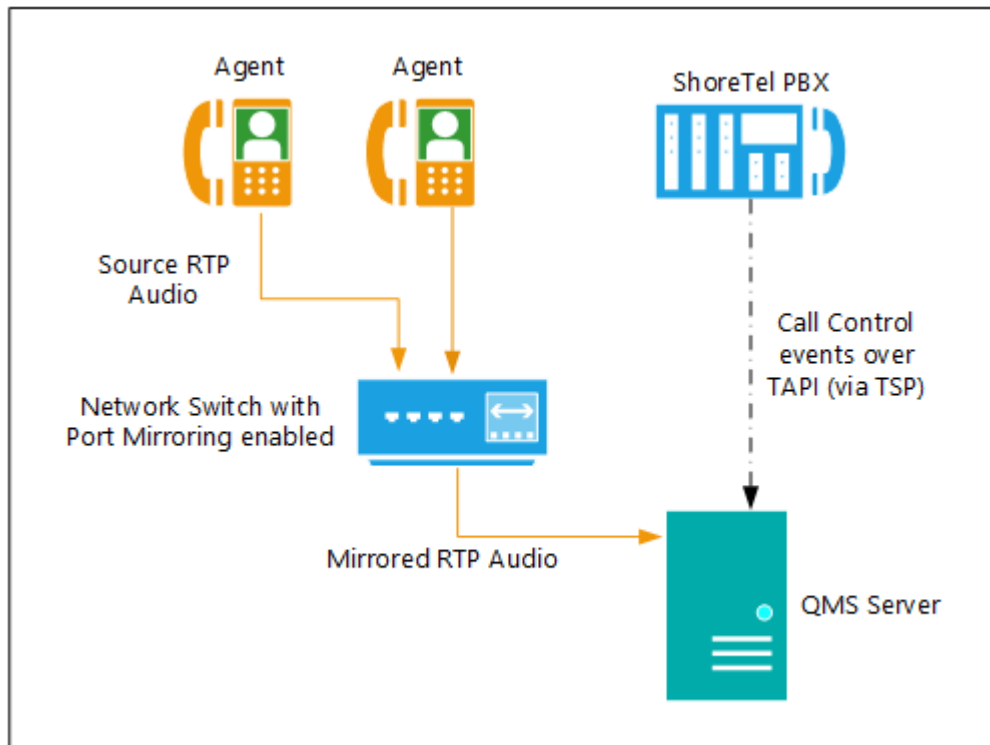


Figure 1 ShoreTel TAPI integration

PBX Configuration

Configuration on the PBX side of the ShoreTel integration includes the Call Control section, the Sites section, the Users section, and the Application Servers section. The Call Control section and Sites section together specify and set the list of audio codecs the PBX will use for the site(s) that will be recorded by QMS. The Users section defines the Class of Service to allow a user to be recorded. Lastly, the Application Servers section defines the QMS server within the PBX, which allows the TSP on the QMS server to connect to the PBX for call control events. Following are the steps needed in each section to configure the PBX.

Call Control section:

1. If not already logged in, log into the ShoreTel Shoreware Director web site as a user with admin-level privileges, at **http://<ShoreTel server name or IP address>/shorewaredirector**. Some installations will use secure http traffic; in this scenario, use **https** rather than **http** in the above URL.
2. Click on **Call Control...** under the Administration section of the navigation pane.
3. Click on **Codec Lists** under the Administration > Call Control... section of the navigation pane.
4. Click **New** to create a new codec list.
5. Enter **QMS** for the Name.
6. From the Choose Codecs list, select **PCMU/8000**, **PCMA/8000**, and **G729/8000**.
7. Click **Add>>** to move the selected codecs to the Codec List Members list.
8. Click **Save**.

Sites section:

1. If not already logged in, log into the ShoreTel Shoreware Director web site as a user with admin-level privileges, at **http://<ShoreTel server name or IP address>/shorewaredirector**. Some installations will use secure http traffic; in this scenario, use **https** rather than **http** in the above URL.
2. Click on **Sites** under the Administration section of the navigation pane.
3. Click the link for the **Site** that will be recording by QMS.
4. For the Intra-Site Calls value, select **QMS** from the drop-down.
5. For the Inter-Site Calls value, select **QMS** from the drop-down.
6. Click **Save**.
7. Repeat steps 3-6 for any other sites that are to be recorded by QMS.

Users section:

1. If not already logged in, log into the ShoreTel Shoreware Director web site as a user with admin-level privileges, at **http://<ShoreTel server name or IP address>/shorewaredirector**. Some installations will use secure http traffic; in this scenario, use **https** rather than **http** in the above URL.



The creation of ShoreTel Individual Users, User Groups, and Classes of Service are beyond the scope of this guide. Please refer to the ShoreTel System Administration Guide for further information.

2. Click on **Users...** under the Administration section of the navigation pane.
3. Click on **User Groups** under the Administration > Users... section of the navigation pane.

4. Find or create a User Group that is assigned a Telephony Features Permissions set with the **Allow Recording of Own Calls** permission checked.
5. Click on **Individual Users** under the Administration > Users... section of the navigation pane.
6. Click on the **First Name** of a ShoreTel User that is to be recorded by QMS.
7. For the **User Group** value, select the group found/created in step 3 above from the drop-down list.
8. For the **Site** value, select a site that is to be recorded by QMS.
9. Click **Save**.
10. Repeat steps 6-9 for all users that should be recorded by QMS.

Application Servers section:

1. If not already logged in, log into the ShoreTel Shoreware Director web site as a user with admin-level privileges, at **http://<ShoreTel server name or IP address>/shorewaredirector**. Some installations will use secure http traffic; in this scenario, use **https** rather than http in the above URL.
2. Click on **Application Servers...** under the Administration section of the navigation pane.
3. Click on **HQ/DVS** under the Administration > Application Servers... section of the navigation pane.
4. From the **Add new DVS at site** drop-down, select the site that will be recorded by QMS.
5. Click **Go** to bring up the HQ/DVS Edit Server view.
6. Enter in a **Name** and the rest of the parameters as applicable.
7. Click **Ping this Server** to verify the PBX can find and connect to the QMS server.
8. Click **Save**.

Network Configuration

While different brands and models of network switches have unique methods of configuration, setting up network mirroring usually involves accessing the network port settings through the network switch's administration portal. One port is selected to be the destination port for the mirrored packets; this port might be selected by default, or the port might be selectable by the administrator. The destination port is the port to which the QMS server's capture network interface card (NIC) is connected. After setting up the destination port, the source ports from which network traffic will be mirrored must have mirroring enabled. The source ports will be ports to which the ShoreTel IP phones are connected. Refer to the network switch's administration manual for more specific details on configuring port mirroring for the switch.

QMS Configuration

Services configuration:

1. Log into the QMS Client as a user with permissions to create new or update existing Services information.
2. Click on **Services** under Administration in the navigation area.
3. Select the Call Recording Service that will have users assigned, and click **Edit**.
4. A new tab will appear, displaying the settings for the service.
5. Select the option titled **ShoreTel TAPI** from the drop-down.
6. Enter in the PBX IP Address.
7. Click **Save**.

Users configuration:

1. Log into the QMS Client as a user with permissions to create new or update existing User information.
2. Click on **Users** under Administration in the navigation area.
3. Click **Add** to create a new user, or if users already exist in the system, select a user to update from the user list and click Edit.
4. Fill out the Personal and Account Information sections.
5. Check the **Call Recording** checkbox in the Licenses section.
6. In the Call Recording Settings section, pick the name of the server used to record the user.
7. Fill in the Extension and Endpoint IP Address fields accordingly.
8. Enter in any Additional Extensions that should be recorded for this user.
9. Click **Save**, and repeat for each additional QMS user.

TSP Installation:

Follow the steps outlined in the **ShoreTel TSP Installation** section.

ShoreTel TAPI/WAVE

In some situations, a port mirroring solution for call recording is undesirable or not possible, due to network topology complexity or other factors. ShoreTel has a second option for recording calls, which uses the Windows Wave multimedia subsystem to transfer audio. QMS makes use of this capability by defining a Route Point that it can use to transfer audio from the ShoreTel PBX for recording. When a call comes in that should be recorded, the QMS server makes an internal phone call to the Route Point's extension, automatically answering that call. Once connected, audio will be transferred from the PBX to QMS via the call to the Route Point. QMS will then open a Windows Wave device in order to get the actual audio packets for processing.

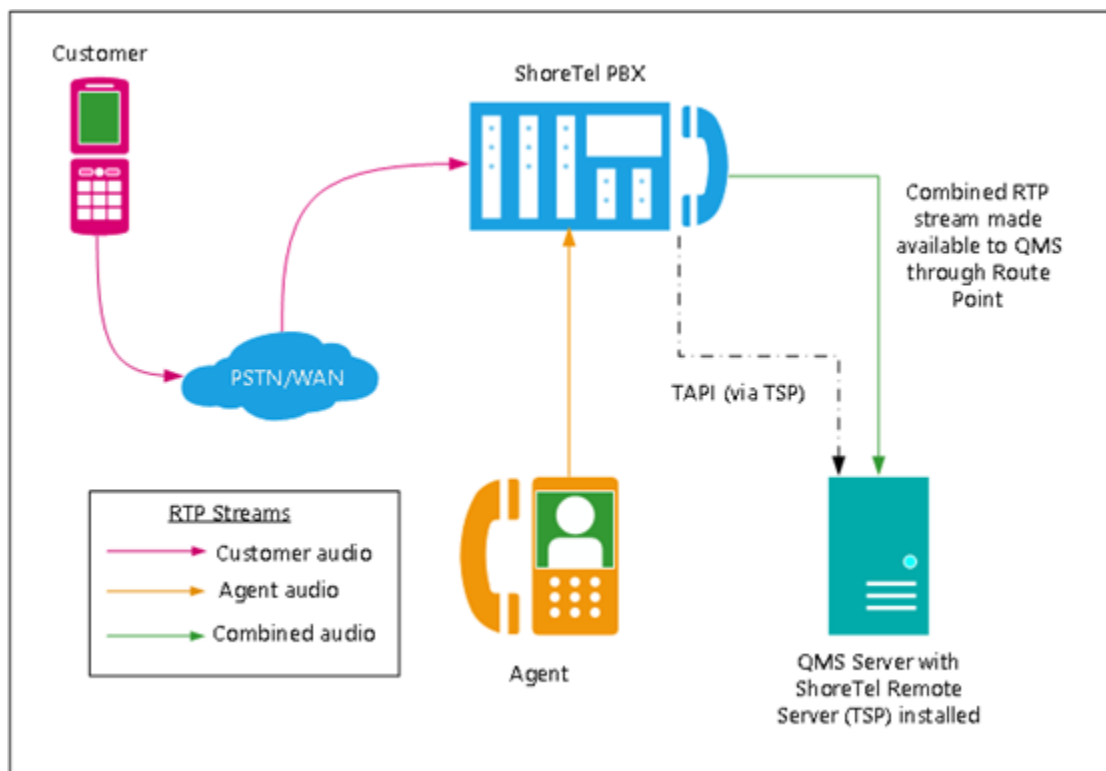


Figure 2 ShoreTel TAPI/Wave integration

PBX Configuration

Configuration of the ShoreTel PBX for TAPI/Wave integration is very similar to the configuration for ShoreTel TAPI integration. The only difference will be the addition of configuring a Route Point for the QMS server, which will be used to receive audio through the Wave subsystem. Complete the steps listed above in the **PBX Configuration** section under ShoreTel TAPI Integration Details, then continue with the following:

1. If not already logged in, log into the ShoreTel Shoreware Director web site as a user with admin-level privileges, at **http://<ShoreTel server name or IP address>/shorewaredirector**. Some installations will use secure http traffic; in this scenario, use **https** rather than http in the above URL.
2. Click on **Call Control...** under the Administration section of the navigation pane.
3. Click on **Route Points** under the Administration > Call Control... section of the navigation pane.
4. Click **New** to create a new Route Point.
5. Enter any character string to use as an identifier in the **Name** field.
6. Enter the extension that will be called by QMS to establish audio flow for recorded calls in the **Extension** field.
7. Select the name of the Application Server created for the QMS server in the PBX Configuration section above from the drop-down list for the **Route Point Server**.
8. Enter any other values specific to the environment, and click **Save**.

QMS Configuration

Services configuration:

1. Log into the QMS Client as a user with permissions to create new or update existing Services information.
2. Click on **Services** under Administration in the navigation area.
3. Select the Call Recording Service that will have users assigned, and click **Edit**.
4. A new tab will appear, displaying the settings for the service.
5. Select the option titled **ShoreTel TAPI/Wave** from the drop-down.
6. Enter in the PBX IP Address.
7. Enter other values for other fields as applicable to the installation.
8. Click **Save**.

Users configuration:

1. Log into the QMS Client as a user with permissions to create new or update existing User information.
2. Click on **Users** under Administration in the navigation area.
3. Click Add to create a new user, or if users already exist in the system, select a user to update from the user list and click **Edit**.
4. Fill out the Personal and Account Information sections.
5. Check the **Call Recording** checkbox in the Licenses section.
6. In the Call Recording Settings section, pick the name of the server used to record the user.
7. Fill in the Extension and Endpoint IP Address fields accordingly.
8. Enter in any Additional Extensions that should be recorded for this user.
9. Click **Save**, and repeat for each additional QMS user.

TSP Installation:

Follow the steps outlined in the **ShoreTel TSP Installation** section.

ShoreTel TSP Installation

The ShoreTel Telephony Service Provider (TSP) is installed as part of the ShoreTel Remote Server (SRS) software. The SRS setup.exe can be found on the ShoreTel installation DVD. Insert the DVD into the QMS server's DVD drive, or copy the SRS installation files out to a network share that is accessible by the QMS server. Execute the following steps to install the SRS:

1. Double-click the setup.exe to start the installation.
2. On the **Welcome to...** view, click **Next**.
3. On the **License Agreement** view, select the **I accept the terms...** option and click **Next**.
4. On the **Destination Folder** view, change any of the installation folders, if desired, or accept the default values. Click **Next**.
5. On the **ShoreWare Server Information** view, enter in the hostname or IP address for the **Headquarter Server Name** to which the TSP will connect. Click **Next**.
6. On the **Ready to Install the Program** view, click **Install**.
7. 7. On the **InstallShield Wizard Completed** view, click **Finish**.
8. 8. Reboot the QMS server when prompted.
9. To verify the TSP is functioning, go to Windows Control Panel > Administrative Tools > Services. There should be several ShoreTel services, and they should all be in the Running state.

QMS High Availability and ShoreTel TAPI/Wave

QMS High Availability functionality allows for two Call Recording Services to be linked together, such that should the primary Call Recording Service become unavailable, the secondary Call Recording Service will take over the recording of phone calls. In most other PBX integrations, when both Call Recording servers are up and running, each Call Recording Service makes its own copy of a recorded call. In a ShoreTel TAPI/Wave environment, however, only one Route Point connection can exist for any call. The result of this is only one Call Recording Service will make recording for any given call.

To handle this situation with a minimum of calls to the ShoreTel Remote Server, the Call Recording servers will have a rudimentary communication between them in the form of basic UDP heartbeat messages. The Primary Call Recording server will send a heartbeat message at a defined interval of time to the Secondary Call Recording server, indicating the Primary is available and making recordings. If the Secondary Call Recording server does not receive a heartbeat within that time interval, it will assume the Primary is down, and take over call recording duties. If there is a situation where the Primary is actually still up and running, and a network problem or other reason kept the Secondary from receiving the heartbeat, the Primary will make the recording, and the recording attempt by the Secondary will fail because another Route Point (the Primary's) is already recording the call.

There are a few extra configuration settings that need to be added to the CallRecordingService.exe.config file for a High-Availability setup. These configuration settings are described in the **Configuration File Settings** section below.

QMS Configuration File Settings

The following are ShoreTel-specific settings that can be added if necessary to the CallRecordingService.exe.config file, located in the QMS installation folder. All key names are case-sensitive.

1. **EnableDnis:** Turns on processing of DNIS information when it is sent from the ShoreTel PBX to the QMS server over TAPI. Valid values are true and false, with a default value of false. This key is located in the <Tapi /> section.

The ShoreTel TAPI/Wave integration has several other configuration settings, some that are required, while others are optional.

1. **ShoreTelTapiWaveRoutePointExtension:** Defines the extension the QMS server should use to control wave audio flow through the Route Point. Valid values are any extension defined within the ShoreTel PBX. This is a required setting for TAPI/Wave integrations. This key is located in the <Tapi /> section.
2. **TapiWaveBuffersPerDevice:** Defines the number of audio buffers to use per call recording. Valid values are any positive integer greater than 1, with a default value of 4. Values greater than 8 are not recommended, as no performance gain is seen at larger values. This key is located in the <Tapi /> section.
3. **TapiWaveHeartbeatSendPort:** In a High-Availability configuration, defines the UDP port the Primary Call Recording server will use to send heartbeat messages to the Secondary Call Recording server. Valid values are any integer within the valid network port range (1-65535), with a default value of 8040. This key is located in the <Tapi /> section.
4. **TapiWaveHeartbeatReceivePort:** In a High-Availability configuration, defines the network port the Primary Call Recording server will use to send heartbeat messages to the Secondary Call Recording server. Valid values are any integer within the valid network port range (1-65535), with a default value of 8041. This key is located in the <Tapi /> section.
5. **TapiWaveHeartbeatTimer:** In a High-Availability configuration, defines the interval used to send or receive heartbeat messages between the Primary and Secondary Call Recording servers. Valid values are any positive integer, with a default value of 5000 (unit is milliseconds). This key is located in the <Tapi /> section.

Troubleshooting

1. After upgrading the ShoreTel PBX software, QMS is no longer receiving call control events.

An upgrade to the ShoreTel PBX software will require an upgrade of the ShoreTel Remote Server (TSP) software on the QMS server. Uninstall the current version of the Remote Server on the QMS server, then install the version of the Remote Server corresponding to the version of the ShoreTel PBX.



The version of the ShoreTel Remote Server can be verified by checking the Registry key HKEY_LOCAL_MACHINE\Software\Wow6432Node\Shoreline Communications\InstallState\Products\ShoreWare Remote Server on the QMS Server.

2. After rebooting the ShoreTel PBX, QMS is no longer recording.

If the ShoreTel PBX is rebooted, the QMS server should also be rebooted in order to reestablish the TAPI link between the ShoreTel Remote Server (TSP) on the QMS server and the ShoreTel PBX. After the QMS server has rebooted, follow these steps to verify connection:

- a. Log into the ShoreWare Director website with administrator rights.
- b. Click on Quick Look under the Maintenance section on the navigation pane.
- c. Find the name given to the QMS server's Application Server in the Server/Appliance list.
- d. A green up-arrow shows that the ShoreTel Remote Server on the QMS server has connected with the PBX. If a red down-arrow is showing, troubleshoot the status listed.

3. In a ShoreTel TAPI/Wave environment, during a conference call, when the first recorded agent drops off the call, there is a gap in recording for the remaining agent.

This is expected behavior in this scenario, because the Route Point disconnects briefly, when the first agent drops off the call. ShoreTel has not implemented a method to keep the Route Point connected in this scenario.

4. In a ShoreTel TAPI/Wave environment, a ShoreTel user with Find-Me enabled to an external phone number does not have calls recorded.

This is expected behavior, because once the call leaves the ShoreTel PBX, the PBX no longer has access to the audio streams.

5. In a ShoreTel TAPI environment, users show as OnPhone in the QMS Real-Time Activity view, but no calls are being recorded.

- a. Verify port mirroring has been correctly configured in the environment.
- b. Verify the IP addresses of the agents' phones have been correctly entered in QMS.
- c. Verify the QMS Users have been assigned to the correct Recording Server.

6. In a ShoreTel TAPI/Wave environment, users show as OnPhone in the QMS Real-Time Activity view, but no calls are being recorded.

- a. Verify the value for the ShoreTelTapiWaveRoutePointExtension has been set correctly in the CallRecordingService.exe.config file, in the <Tapi /> section.
- b. Verify the Route Point has been defined in the ShoreTel PBX, as described in the PBX Configuration section under ShoreTel TAPI/Wave Integration Details above.
- c. Verify the ShoreTel User for the agent not being recorded belongs to a ShoreTel User Group that has the Allow Recording of Own Calls permission checked, as outlined in the Users section under ShoreTel TAPI Integration Details.

7. In a ShoreTel TAPI/Wave environment, calls between QMS users are not being recorded.

-or-

In a ShoreTel TAPI/Wave environment, during a consultative transfer or consultative conference call, there is silence for the consultative leg of the call.

This is expected behavior, because ShoreTel TAPI/Wave has the limitation of not allowing internal calls to be recorded. In the case of consultative transfer/conference calls, the consultative leg is a completely separate call between two internal parties, which will not be recorded.

- 8. After running without any issues for some time, calls stop recording and there is no longer any activity in the QMS Real-Time Activity view. There are no errors in any of the QMS logs, QMS services have not crashed, and no errors are indicated in Windows Event Viewer.**

There are times when the ShoreTel Remote Server software gets into a bad state for an unknown reason, with no errors indicated anywhere. In this case, a reboot of the QMS server is needed to reset the ShoreTel Remote Server and reestablish a connection to the PBX. If a reboot does not resolve the issue, the ShoreTel Remote Server software will have to be reinstalled.

- 9. In a ShoreTel TAPI/Wave environment, a 3-party conference call records as expected. When a fourth party is conferenced in, recordings stop, even though the users show OnPhone in the QMS Real-Time Activity view.**

This is a ShoreTel TAPI/Wave limitation. Once the fourth party is added, the original 3-party conference call is torn down, and a new conference call utilizing a ShoreTel System Conference extension is created. This type of conference call is not recordable through the ShoreTel TAPI interface.

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7. **Relationship of the Parties.** Each party acknowledges that they are independent contractors, and that the relationship between Supplier and Customer is that of manufacturer/Customer. Neither party shall in any way represent or obligate the other party to any contract, term, or condition, nor may it represent the other party as agent, employee, franchisee, or in any other capacity. Customer is expressly prohibited from making representations to other third parties regarding Supplier or the Software and Services in excess of or contrary to representations contained in Supplier's or its third-party supplier's product specifications, brochures, newsletters, and other publications provided to Customer by Supplier. Nothing in this Agreement shall be construed to limit either party's right to independently develop or distribute products which are functionally similar to the other party's products, so long as Confidential Information of the other party is not used in such development or distribution.
8. **Assignment.** Neither this Agreement nor any rights under it may be assigned by Customer without Supplier's prior written consent. Any unauthorized assignment by Customer shall be void. Supplier may assign the Agreement, in whole or in part, upon thirty (30) days' notice to the Customer.

9. **Severability.** If a court of competent jurisdiction holds any provision in this Agreement to be invalid, void, or unenforceable, the remaining provisions will yet continue in full force without being impaired or invalidated in any way
10. **Notices.** Any notices given to Supplier may be made either by facsimile, overnight courier, hand delivery, or by registered or certified mail, postage prepaid with return receipt requested. Mailed notices shall be addressed to Supplier at the address appearing below, but Supplier may change such address by written notice in accordance with this paragraph. Notices mailed, or delivered personally or by electronic means will be deemed communicated as of actual receipt or the date of transmission, as applicable.

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