



# QMS System Design Guide

## Technical Reference

QMS 7.4

This document is intended to aid system architects, sales engineers, and IT staff in designing the best possible installation and configuration recommendations for the Enghouse Interactive Quality Management Suite (QMS).

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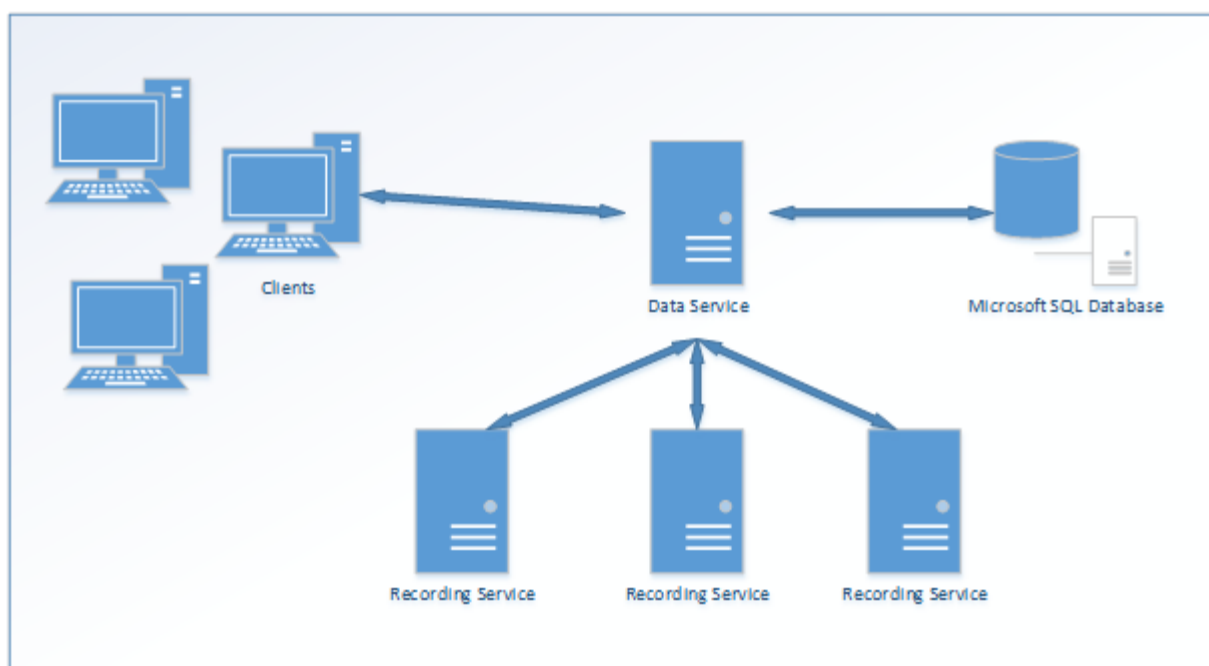
## About this document

This document is intended to aid system architects, sales engineers, and IT staff in designing the best possible installation and configuration recommendations for the Enghouse Interactive Quality Management Suite (QMS). The guidelines in this document are merely recommendations and the reader should still exercise their best judgment when deciding how to design a system based on the customer's specific needs.

## New in this document

We have added a new section QMS Media Processing Service [page 15](#)

## QMS Architecture



The Enghouse Interactive Quality Management Suite (QMS) is a distributed call recording system consisting of a collection of services which can be deployed in many configurations. In most deployments, a QMS system contains four different components:

- A QMS Data service
- One or more QMS Call Recording services
- The QMS Client website, hosted within a web server
- A Microsoft SQL database

## High Availability Configuration

When running in a high-availability configuration, the Enghouse Interactive Quality Management Suite consists of the following components:

- Up to two instances of the QMS Data service, running as a redundant pair
- Up to two instances of the QMS Call Recording service for each instance that would normally run in a non-redundant configuration
- One or more instances of the QMS Client website, hosted within a web server
- A Microsoft SQL database running in a highly available SQL instance utilizing either merge replication or SQL AlwaysOn High Availability

For more information on QMS high availability deployments, please refer to the QMS High Availability Deployment Guide.

## QMS Components

### QMS Data Service

The QMS Data Service acts as the hub of all information within the QMS system. With the exception of live monitoring and some file transfer operations, all client-to-server communications flow through the Data Service. The Data Service is also responsible for:

- Managing all data access to the SQL database
- Keeping track of real-time state for all calls
- Updating clients in real-time when call states change
- Proxying file transfer operations after recordings have been archived or moved to a storage location off of the original recording server
- Managing encryption keys when recording encryption is enabled
- Sending emailed alerts when an alert condition is hit

### Data Service System Requirements

Servers running the Data Service must meet the following requirements.

### Data Service Software Requirements

Supported Operating Systems:

- Microsoft Windows Server 2019
- Microsoft Windows Server 2016
- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2012
- Microsoft Windows Server 2008 R2 SP1\*
- Microsoft Windows 10\*
- Microsoft Windows 8/8.1 Professional\*
- Microsoft Windows 7 Professional\*

Not all operating systems are suitable for all deployments. Client operating systems such as Microsoft Windows 7, 8, and 10 are limited to a total of five QMS Client connections and should only be used for very small deployments.



\* Note that Windows 7 and Windows Server 2008 R2 are not supported if using the default SQL Express 2017 database. Nor are any 32 bit systems. In these cases an older version of SQL Server or a remote database must be used.

### Database Requirements

By default, Microsoft SQL Express edition is installed with the Data Service although other options are available. The Express edition of SQL has a 10 GB database size limit. One call recording entry consumes approximate 1200 bytes of space in the database although it can be more if lots of call

flagging is used or if QMS is running in conjunction with another Enghouse Interactive contact center product. In order to determine which edition of SQL is appropriate for the customer, the expected call volume needs to be taken into account.

For example, if the customer has 100 users who each take 50 calls per day and the calls need to be stored for one year (260 business days) then the calculation is as follows:

$100 \times 50 \times 260 \times 1200 = 1,560,000,000$  bytes or about 1.45 GB

In this case the default database instance should be sufficient for the customer's needs. If the same customer is a financial institution that is required to store calls for 7 years then the calculation is:

$100 \times 50 \times 260 \times 1200 \times 7 = 10,920,000,000$  or about 10.17 GB

In this case the customer will need to purchase a copy of SQL Server standard edition.

## Data Service Firewall Configuration

The QMS Data Service requires the following ports to be open for inbound connections:

Port	Protocol	Description
80	(TCP)	Inbound connections from web browsers. This port must be open if the QMS Data Service is running on the same host as the QMS Client website.
443	(TCP)	Inbound connections from web browsers. This port must be open if the QMS Data Service is running on the same host as the QMS Client website and SSL is in use.
1801	(TCP)	MSMQ communications. This port must be open when at least one instance of the QMS Call Recording Service is running on another server.
4530	(TCP)	Client connections for recording file transfer. This port must be open if the IIS web server is running on a system other than the system running the QMS Data Service.
8002	(TCP)	Web services communications from client website. This port must be open if the IIS web server is running on a system other than the system running the QMS Data Service.
8003	(TCP)	Alternate web services for real-time phone states. This port must be open if the IIS web server is running on a system other than the system running the QMS Data Service.



Port	Protocol	Description
8004	(TCP)	Web services for QMS Call Recording Service. This port must be open when at least one instance of the QMS Call Recording Service is running on another server.
8007	(TCP)	MSMQ messaging from QMS Call Recording Service. This port must be open when at least one instance of the QMS Call Recording Service is running on another server.
8011	(TCP)	Client Reporting interfaces
8013	(TCP)	Data Service to Data Service communications in high availability configurations when using TCP transport
8014	(TCP)	Data Service to Data Service communications in high availability configurations with using http transport
8015	TCP	Web services for real-time phone states. This port must be open if the IIS web server is running on a system other than the system running the QMS Data Service.
8021	(TCP)	Inbound connections from Call Recording Service
8031	(TCP)	Web services for QMS Reporting Service

## QMS Call Recording Service

The QMS Call Recording service is responsible for creating voice recordings. A minimum of one Call Recording Service must be present in a QMS deployment but many of them can be deployed in a wide variety of configurations in a single QMS deployment with a single Data Service. Groups of users are assigned to a call recording service and the service will record only the phone calls for those users that have been assigned to it.

The Call Recording Service is also responsible for:

- Determining if a recording should be made based on defined policies
- Streaming live audio to connected clients during live monitoring sessions
- Sending call state updates to the Data Service
- Sending recording metadata to the Data Service

- Sending email alerts when an alert condition is hit
- Sending raw audio files to the Media Processing Service for conversion

## Audio Collection

The Call Recording service must be connected to an audio source for the calls that it records. This source is typically a network switch that supports mirroring of ports from one or more network switches, or mirroring of virtual LANs (VLANs), where the mirror port is connected to a dedicated secondary network interface card residing in the server running the Call Recording Service. Some PBX systems can operate without requiring network switch mirroring in some circumstances. Those are:

- Cisco UCM – Most Cisco phones have a Built-in-Bridge (BIB) that can be configured to stream audio to the Call Recording server. Many Cisco partners find this solution easier to configure initially because they do not have to have knowledge of network data switches in order to start recording calls. Network mirroring is also supported with Cisco and both approaches should be considered when designing a Call Recording Service deployment for Cisco. [For more information, see Cisco specifics: page 25](#)
- Mitel 3300 – With Mitel, a component called Mitel SRC (or Mitel Border Gateway) can be installed which will deliver encrypted audio directly to the Call Recording Service. Network mirroring is also supported as long as media encryption has been turned off on the Mitel server. [For more information, see Mitel specifics: page 28](#)
- Microsoft Lync / Skype for Business – There are numerous options for audio collection in a Microsoft Skype for Business deployment. [For more information, see Microsoft Skype for Business: page 26](#)
- Avaya Communication Manager – When using Avaya DMCC software and licenses, call audio will be streamed directly from the Avaya system to the Call Recording service. Network mirroring based recording is also supported. [For more information, see Avaya specifics: page](#)

When network mirroring is being used as the audio source, it is important to make sure that all of the sources of RTP (real-time protocol) packets, for calls that need to be recorded, are included as part of mirroring configuration. For example, if the customer only needs to record inbound and outbound calls to and from the public telephone network then the mirroring configuration can be as simple as copying all packets going to or coming from the voice gateway or PBX (whichever is connected to physical trunks). If internal calls need to be recorded in addition to external calls, the mirroring configuration can be a bit more complicated as it requires the packets going to and from every recorded phone device to be copied to the mirror port on the network switch. For larger deployments, that usually involves either using network switches that support VLAN mirroring or mirroring a series of chained-together switches to a single mirror port.

The following audio codec payloads can be captured:

- G.711 PCMA/A-Law
- G.711 PCMU/ $\mu$ -law
- G.729 Simple / G.729A
- G.722
- Siren7 (Skype for Business deployments only)

- Red (Skype for Business deployments only)
- RTAudio (Skype for Business deployments only)
- SILK (Skype for Business deployments only)
- iLBC (Cisco deployments only)
- iSAC (Cisco deployments only)
- Opus (Cisco deployments only)

Final recordings are saved as single or dual-channel .opus files with Opus encoded audio or .mp3 files with MP3 encoded audio.

## Call Event Collection

A source of real-time phone call events is also required by the Call Recording service. The call events tell the Call Recording service information about a phone call such as which parties are involved in the call and when the call starts and ends. The source of these events is highly dependent on which PBX system is being used and in some cases there is more than one option available for a given PBX system.

The required event sources for each PBX system are as follows. **See each PBX section for more information.**

Call Event Source		Additional requirements
Avaya Communication Manager	Avaya DMCC. No installation on server required.	Avaya Application Enabled Services (AES) server is required in both cases.
Avaya IP Office	Avaya TAPI software must be installed on Call Recording server.	
Avaya CS1000	Enghouse Interactive CTI Connect must be installed on Call Recording server.	Avaya Meridian Link Services (MLS) server.
Cisco UCM	Network mirroring (when using network mirroring for audio). Cisco TAPI service provider (when using Built-in-Bridge for audio) – must be installed on Call Recording server.	Please see Appendix A for OS requirements.

	Call Event Source	Additional requirements
Microsoft Skype for Business	QMS NetService must be installed on Skype for Business Front End servers.	
Innovaphone	Innovaphone TAPI must be installed on the Call Recording server.	
Mitel	Mitel MiTAI software must be installed on Call Recording server.	
NEC (all)	Network mirroring.	
ShoreTel	ShoreTel TAPI service provider must be installed on Call Recording server.	
Generic SIP	Network mirroring.	

## Deployment Configurations

If more than one type of PBX system is deployed in the customer environment then separate Call Recording Services should be deployed for each PBX type. In some cases, Call Recordings services can be deployed at remote sites to handle Call Recording for the users at those sites.

### Single-Site Single-Server Configuration

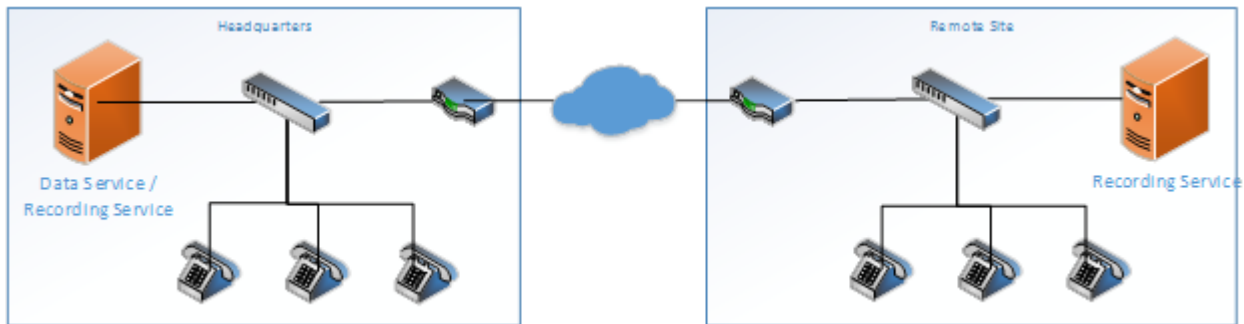
Both the Data Service, SQL database, and Call Recording Service can be installed on the same server for small or medium sized deployments of up to 100 simultaneous recordings.

### High-load Single Site Configuration

In high load situations, where the number of simultaneous recordings will exceed the capabilities of a single server, additional recording services can be deployed on separate servers at the same site. The servers will not automatically load balance so care should be taken to assign users to the recording servers in a way that will equally distribute the load. In this scenario, the Data Service should be running on a dedicated server.

## Distributed Multi-Site Configuration

In many cases, especially when using network mirroring as the audio capture method, instances of the Recording Service should be placed in the same physical location as the phones being recorded. This reduces WAN bandwidth requirements since captured audio does not need to be copied over WAN connections. For small sites, the Recording Service can be run within a virtual machine which minimizes hardware investment. Running the recording service at each site also improves overall resiliency since recording will not be interrupted in the case of WAN outages.



## Server Virtualization

The Call Recording Service can be run in both VMWare and Microsoft Hyper-V server virtualization environments. Live server migration systems, such as VMWare vSphere vMotion, should not be used. Virtual machines must have a dedicated MAC address on all virtual network adapters that must not change.

When network mirroring is being used as the call audio source and/or call event source, the virtual machine must have a virtual network adapter that is bound to a physical network adapter on the host machine. The physical network adapter must then be plugged into the mirror port on the network switch and that adapter must not be used by any other virtual machine on the host system. Promiscuous mode support must be enabled in the physical-to-virtual adapter binding settings. This option is not available with all versions of Microsoft Hyper-V so an additional software component called the QMS Packet Forwarding Service is required in that case.

The QMS Packet Forwarding Service is a service that is installed on Hyper-V host machines and can be installed on both GUI and Server Core installations of Windows. The Packet Forwarding Service listens for packets on a dedicated network capture card that is plugged into a network port mirror. The service filters out all packets except for those necessary for recording and forwards them to the destination address of the QMS Recording Service. See QMS Packet Forwarding Service Installation Guide for more details.

## Call Recording Service System Requirements

Servers running the Call Recording Service must meet the following requirements.

### Call Recording Service Software Requirements

Supported Operating Systems:

- Microsoft Windows Server 2019
- Microsoft Windows Server 2016

- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2012
- Microsoft Windows Server 2008 R2 SP1
- Microsoft Windows 10 Professional
- Microsoft Windows 8/8.1 Professional
- Microsoft Windows 7 Professional

Not all operating systems are suitable for all deployments. Client operating systems such as Windows 7, 8, and Windows 10 cannot be used in ShoreTel deployments and have significant limitations in other deployments. The Screen Recording add-on may not be used in deployments in which the Call Recording Service is running on a client OS. 64-bit editions of Windows Operating Systems are not supported for installations using Cisco Unified Communications Manager prior to version 8.5. ShoreTel installations on 64-bit operating systems are limited to Windows Server 2008 SP2 x64 and Windows Server 2008 R2 x64 and require ShoreTel version 11 or greater.

Any anti-virus package can be used with QMS. However, when installed it is recommended that QMS folders are excluded from any virus scans. The location of the QMS folders is configurable. The folders that should be excluded are:

- The QMS logs folder. This is typically located at C:\ProgramData\CallRex
- The folder that holds recordings. This is configured for each Call Recording service and is viewable in the Services section in the QMS Client.

## Call Recording Firewall Configuration

The QMS Call Recording Service requires the following ports to be open for inbound connections:

Port	Protocol	Description
1801	TCP	MSMQ port – required when a QMS Recording Service is running on another server.
4533	TCP	Client connections for live monitoring
8005	TCP	Web services for QMS Data Service
8006	TCP	Web services for QMS Desktop Agent (legacy – pre QMS 5.2)
8008	TCP	Messaging from QMS NetService (Skype for Business deployments only)

Port	Protocol	Description
8009	UDP	Audio from RTP Data Collector (Skype for Business deployments only)
8010	TCP	Web services for contact center integrations
8012	TCP	Web services for custom PBX integrations
8016	TCP	Web services for QMS Desktop Agent (QMS 5.3 and later)
8022	TCP	Communications from QMS Data Service
8023	(TCP)	Call Recording Deployment Service to allow RTPDCs to auto update
5060	TCP/UDP	Cisco Dual Media Streaming only – SIP communications
8901	TCP/UDP	Cisco Dual Media Streaming only – RTP communications

## QMS Media Processing Service

The QMS Media Processing service is responsible for taking raw recording files from the Call Recording Service and Desktop Agents and converting them to playable compressed audio and video formats. A minimum of one Media Processing Service must be present in a QMS deployment but many of them can be deployed in a wide variety of configurations. Media Processing Service(s) are assigned to a Call Recording Service, which will then send its voice recordings to the assigned Media Processing Service(s). In addition, Desktop Agents assigned to the QMS users that belong to the call recording service, will also send their screen recordings to the assigned Media Processing Service(s).

The Media Processing Service is responsible for:

- Compressing raw audio recordings
- Transferring local recordings to the Data Service for playback in the client.
- Migrating recordings to other storage locations on the network
- Encrypting recordings when encryption has been enabled
- Receiving and processing screen recordings from connected QMS Desktop Agent services
- Sending email alerts when an alert condition is hit



## Deployment Configurations

The Media Processing Service can be deployed in many different ways to accommodate the needs of a customer environment.

### Single-Site Single-Server Configuration

The Data Service, SQL Database, Call Recording Service can be installed on the same server for small or medium sized deployments of up to 100 simultaneous recordings.

### Co-Located Call Recording Service and Media Processing Service

The Call Recording and Media Processing services can be co-located on the same server. This configuration would be similar to earlier versions of QMS where the Call Recording Service handled the media conversion work.

### Stand-alone Media Processing Service

The Media Processing service can be deployed on its own dedicated server to handle media processing requests from one or more Call Recording services.

### Media Processing Pools

Several Media Processing servers can be configured to function as a Media Processing Pool. The Media Processing Pool can then be assigned to one or more Call Recording services. When a Call Recording Service as a Media Processing Pool assigned to it, the Call Recording Service will load balance its media processing needs across all Media Processing services in the pool.

## System Requirements

Servers running the Media Processing Service must meet the following requirements.

### Media Processing Service Software Requirements

#### Supported Operating Systems:

- Microsoft Windows Server 2019
- Microsoft Windows Server 2016
- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2012
- Microsoft Windows Server 2008 R2 SP1
- Microsoft Windows 10 Professional
- Microsoft Windows 8/8.1 Professional
- Microsoft Windows 7 Professional

### Media Processing Service Storage Requirements

It is recommended that operating system files and recordings reside on different volumes or physical disks. Media Processing can be a very disk-intensive process so higher speed storage is recommended.



**System volume:** The primary disk volume of the server running the Media Processing service must have enough storage space to store application logs. It is recommended that 30 GB of free space, in addition to the storage required for the operating system and applications, is allocated to the system volume for the purpose of log storage.

**Recording volume:** If recordings are being stored on the media processing server, the disk volume that stores call recordings will need enough storage space to hold all recordings for the entire duration in which they are needed. If QMS is configured to automatically move recordings to a secondary storage location, it is still recommended to have at least enough space for one week of recordings on the server. One gigabyte of storage will hold approximately 210 hours of mono voice recordings or 105 hours of stereo recordings when using the OPUS audio codec. One gigabyte of storage will hold approximately 72 hours of mono voice recordings or 36 hours of stereo recordings when using the MP3 audio codec.

For example, if OPUS (mono) is selected as the codec type and there are 100 users making phone calls and each user talks on the phone for five hours per day and recordings must be stored for one year (260 work days) then the calculation is:

$100 \times 5 \times 260 = 130,000$  hours of recording

$130,000 / 210 = 619.05$  GB of storage required

## Firewall Configuration

The QMS Media Processing Service requires the following ports to be open for inbound connections:

Port	Protocol	Description
1801	TCP	MSMQ port – required when a QMS Media Processing Service is running on another server.
4531	TCP	RemoteFileServerClient connections for recording file transfer
8017	TCP	Web Services for Call Recording Service, Data Service and Desktop Agent

## QMS Client

The QMS Client software is a web based application that runs within a Microsoft Internet Information Services web server and can be used from a variety of web browsers.

### Client Browser Requirements

The Quality Management Client software is installed into an internet information services (IIS) website on the same server as the Data Service. A user can run the Quality Management Client by connecting to this website via a supported web browser. There is no additional software that needs to be installed on the user's computer.

IE browser is not supported for screen recording playback in QMS v7.0 onwards

The following web browsers are supported:

Operating System	IE 11*	IE 10*	Chrome	Firefox
Windows 10 Professional	✓	✗	✓	✓
Windows Server 2019	✓	✗	✓	✓
Windows Server 2016	✓	✗	✓	✓
Windows 8.1 Professional	✓	✗	✓	✓
Windows 8 Professional	✗	✓	✓	✓
Windows Server 2012 R2	✓	✗	✓	✓
Windows Server 2012	✗	✓	✓	✓
Windows 7 Professional SP1	✓	✓	✓	✓
Windows 7 Professional	✗	✗	✓	✓
Windows Server 2008 R2 SP1	✓	✓	✓	✓
Windows Server 2008 SP2	✗	✗	✓	✓
Windows Vista SP2	✗	✗	✓	✓

\* For best results Internet Explorer must not be run in compatibility mode.

Unlisted browsers may work but are not officially supported.

## Live Screen Monitoring

There is one additional piece of client software that is used in screen recording deployments. When live monitoring of computer desktops is required, the QMS Monitor application must be installed on those desktop computers that will be viewing live monitoring sessions. The QMS Monitor application is

only supported on Microsoft Windows desktops running Microsoft Windows 7 and newer or Microsoft Windows Server 2008 and newer. The QMS Monitor application must be able to directly connect to any desktop computer that is the target of the monitoring session.

### **Logging in using QMS Authentication vs Windows Authentication**

QMS provides standard credential management for QMS users in the client and Desktop Agent, but QMS also supports using Windows Authentication. If a Quality Management server is joined to a domain, the Quality Management Suite can be configured to use Windows Authentication to automatically log in users of the Quality Management Client. When a user navigates to the Quality Management Client URL their domain credentials are used to associate them with a Quality Management user whose Windows login information contains the same domain and username. The client is logged into the Quality Management Client without having to enter their Quality Management username and password. If there is no user configured with the domain and username presented by the web request, then the Quality Management Client login dialogue is presented. Windows Authentication does require using the Security Configuration Tool to setup QMS to use Windows Authentication.

## QMS Hardware Requirements

The recommended hardware for running the Call Recording Service (CRS) and the Media Processing Service (MPS) depends on the projected total number of simultaneous recordings. The recommended hardware for running the Data Service (DS) depends on the projected number of total users. For smaller deployments, it is possible to co-locate the DS, CRS and MPS on a single server. For larger deployments, the DS should be located on its own server and sized based on the total number of users in the system.

### Calls Only (Co-Located DS, CRS and MPS)

#### LESS THAN 50 SIMULTANEOUS CALL RECORDINGS

- Processor: Haswell 2.2 Ghz or better, 4 logical CPUs minimum
- Memory: 4GB memory (minimum)
- Disk used for QMS local storage locations:
  - SSD (recommended)

### Calls Only (Co-Located CRS and MPS)

#### 50 TO 100 SIMULTANEOUS CALL RECORDINGS (Dedicated Server)

- Processor: Haswell 2.2 Ghz or better, 4 logical CPUs minimum
- Memory: 4GB memory (minimum)
- Disk used for QMS local storage locations:
  - 15k RPM drive (minimum)
  - SSD (recommended)

#### 100 TO 250 SIMULTANEOUS CALL RECORDINGS (Dedicated Server)

- Processor: Broadwell 2.3 Ghz or better, 8 logical CPUs minimum
- Memory: 8GB memory (minimum)
- Disk used for QMS local storage locations:
  - 15k RPM drive (minimum)
  - SSD (recommended)

#### 250 TO 500 SIMULTANEOUS CALL RECORDINGS (Dedicated Server)

- Processor: Broadwell 2.3 Ghz or better, 16 logical CPUs minimum
- Memory: 16GB memory (minimum)
- Disk used for QMS local storage locations:
  - 15k RPM drive (minimum)
  - SSD (recommended)

## Call and Screen Recording (Co-Located CRS and MPS)

### LESS THAN 25 SIMULTANEOUS CALL AND SCREEN RECORDINGS

- Processor: Broadwell 2.3 Ghz or better, 8 logical CPUs minimum
- Memory: 8GB memory (minimum)
- Disk: used for QMS local storage locations:
  - 15k RPM drive (minimum)
  - SSD (recommended)

### 25 TO 50 SIMULTANEOUS CALL AND SCREEN RECORDINGS

- Processor: Broadwell 2.3 Ghz or better, 16 logical CPUs minimum
- Memory: 16GB memory (minimum)
- Disk used for QMS local storage locations:
  - 15k RPM drive (minimum)
  - SSD (recommended)

## Call and Screen Recording (Co-Located CRS and MPS)

### 50 TO 100 SIMULTANEOUS CALL AND SCREEN RECORDINGS (Dedicated Server)

- Processor: Broadwell 2.3 Ghz or better, 32 logical CPUs minimum
- Memory: 32GB memory (minimum)
- Disk used for QMS local storage locations:
  - 15k RPM drive (minimum)
  - SSD (recommended)

### 100 TO 150 SIMULTANEOUS CALL AND SCREEN RECORDINGS (Dedicated Server)

- Processor: Skylake 2.7 Ghz or better, 32 logical CPUs minimum
- Memory: 32GB memory (minimum)
- Disk used for QMS local storage locations:
  - 15k RPM drive (minimum)
  - SSD (recommended)

## DataService (Dedicated Server):

### Local SQL Server

#### LESS THAN 200 TOTAL USERS

- Processor: Server class 4 logical cores minimum
- Memory: 6 GB memory (minimum)

#### 200 TO 500 TOTAL USERS

- Processor: Server class 6 logical cores minimum
- Memory: 8 GB memory (minimum)

OVER 500 TOTAL USERS

- Separate SQL Server required

**Remote SQL Server**

LESS THAN 200 TOTAL USERS

- Processor: Server class 4 logical cores minimum
- Memory: 4 GB memory (minimum)

200 TO 500 TOTAL USERS

- Processor: Server class 6 logical cores minimum
- Memory: 6 GB memory (minimum)

500 TO 1000 TOTAL USERS

- Processor: Server class 8 logical cores minimum
- Memory: 8 GB memory (minimum)

OVER 1000 USERS

- Contact Enghouse Interactive to discuss specifications

For deployments larger than those scoped out in this document or for deployments where co-locating the Call Recording Service and Media Processing service is not desired, please refer to the QMS Sizing spreadsheet for suggested server sizes and configurations.

**Note:** Logical CPU counts are calculated differently depending on deployment type:

- Virtual servers: 1 virtual CPU assigned to server = 1 logical CPU
- Physical servers with Hyper Threading: 1 physical CPU core = 2 logical CPUs
- Physical server without Hyper Threading: 1 physical CPU core = 1 logical CPU

## Supported telephony platforms

### Matrix of Support Features by PBX

	Avaya CM DMCC	Avaya IP Office	Avaya CS1000	Cisco CUCM	Cisco Forked Audio	Innovaphone	Microsoft Skype for Business	Mitel	Mitel SRC	NEC SV8100	NEC SV8300/ SV8500	NEC Forked Audio	ShoreTel	Generic SIP
Internal Call Recording	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
Call Chaining	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
User Mobility	✓	✓	✓	✓	✓	✗	✓	✗	✓	✓	✓	✓	✓	✓
DNIS Support	✗	✗	✗	✓	✗	✗	✗	✓	✓	✗	✗	✓	✓	✓
Concurrent Call Recording	✓	✓	✓	✓	✓	✓	✓	✓	✓	✗	✗	✓	✓	✓
PBX Side Call Encryption	✗	✗	✗	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗	✗
Phone Initiated Recording	✗	✗	✗	✓	✓	✗	✗	✗	✗	✗	✗	✓	✗	✗
Dual Endpoint Recording	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Private Line Appearances	✗	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

	Avaya CM DMCC	Avaya IP Office	Avaya CS1000	Cisco CUCM	Cisco Forked Audio	Innovaphone	Microsoft Skype for Business	Mitel	Mitel SRC	NEC SV8100	NEC SV8300/ SV8500	NEC Forked Audio	ShoreTel	Generic SIP
Port Mirroring Required	✗	✓	✓	✓	✗	✓	✗	✓	✗	✓	✓	✗	✓	✓
CTI System Required	✓	✓	✓	✗	✓	✓	✗	✓	✓	✗	✗	✓	✓	✗
CT Connect Required	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗
Additional Licensing Required	✓	✓	✓	✓	✗	✗	✗	✓	✓	✗	✗	✓	✓	✗
Vendor Certified	✗	✗	✗	✓	✓	✗	✓	✗	✗	✗	✗	✗	✓	✗
QMS High Availability Supported	✓	✗	✗	✓	✓	✗	✓	✗	✓	✓	✓	✓	✗	✓
Speech Analytics Supported	✗	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓

## Avaya Communications Manager with DMCC

Avaya's Device Media Call Control (DMCC) API provides a method of recording calls without the need for network mirroring.

**Method of audio capture:** DMCC API

**Method of call event capture:** DMCC API



Licensing: Avaya AES server is required. One TSAPI Basic license and one DMCC license is required per recorded user.

## Avaya IP Office

Recording on Avaya IP Office utilizes a combination of network mirroring and the Avaya TAPI service provider.

**Method of audio capture:** Network mirroring

**Method of call event capture:** Avaya TAPI service provider

Licensing: One Avaya CTI Link Pro license required per PBX

Special configuration needed: SNMP must be enabled on the PBX and PBX user ID's must be specified in the QMS user configuration in order for user mobility to work. See Avaya IP Office Integration Guide for more details.

## Avaya CS1000

QMS can operate with Avaya CS1000 in one of two modes. The standard mode is for basic configurations where users sit at the same extension each day. For situations where agents hot-desk, QMS can be put into contact center mode and will track Symposium agent logins allowing calls to be associated with agents regardless of what extension they are at. Special configuration is required to enable this feature.

**Method of audio capture:** Network mirroring

**Method of call event capture:** Enghouse Interactive CTI Connect via Avaya Meridian Link Services (MLS)

Licensing: MLS must be purchased separate and installed in advance. CTI Connect must be licensed.

## Cisco Unified Communications Manager (Network packet capture)

Utilizing network packet capture for a Cisco UCM environment has some advantages over using Dual Media Streaming (DMS). There are two features that are completely unique to this environment that are not available when using DMS: Dual endpoint recoding and private line appearances.

Dual endpoint recording allows the user to have two separate phones in use at the same time and is designed for situations where the user has both a hard phone on their desk and a soft phone running on their PC. Assuming that both devices are in separate network subnets, QMS will allow the same primary extension to appear as the first line appearance on both devices.

The private line appearances feature allows the QMS administrator to designate one extension on the user's phone as private meaning that no calls to or from that extension will be recorded.

Multi-port ATA proxies are not supported with this integration. Single-port ATA devices are supported. If multi-port ATA devices are in use then consider either using Dual Media Streaming (assuming the ATA has Built-in-bridge support) or a hybrid installation of both network mirroring and DMS.

**Method of audio capture:** Network mirroring

**Method of call even capture:** Network mirroring

Licensing: For SCCP endpoints, one SCCP license per recorded endpoint must be purchased from Enghouse Interactive. SIP endpoints do not require this license.

## Cisco Unified Communications Manager (Dual Media Streaming)

Choosing to implement Dual Media Streaming with Cisco UCM is a good choice when the customer environment does not support network mirroring or the customer does not have network engineers available to maintain a network mirroring environment. It can also be used to record remote sites when having call recording services at each site is not desirable.

There are a few limitations with this integration type. The minimum Cisco UCM version supported is version 7. Cisco UC5xx or Communications Manager Express are not supported and must use network capture instead. All phones must support the Built-in-bridge feature.

**Method of audio capture:** Built-in-bridge. Phones must have a network route to send data to the Call Recording service.

**Method of call event capture:** Cisco TAPI service provider

## Microsoft Skype for Business

QMS supports four recording methods for Microsoft Skype for Business:

1. Recording can be performed via packet capture of RTP traffic on user desktops
2. Recording can be performed via packet capture of RTP traffic at a network data switch
3. Calls can be forced to route through the Edge server, providing a single point of capture for recording
4. Calls can be captured at the Skype for Business Mediation server

All four recording methods require deployment of a software component called the QMS NetService onto all Skype for Business Front End servers and SBA appliances within the Skype for Business deployment. The QMS NetService requires special elevated permissions for the installation and the account it runs under also requires special permissions. Please refer to the Enghouse Interactive Skype for Business Installation Guide for more details.

	Internal calls	PSTN calls	Skype for Business Clients	Hard phones	Edge calls
Audio capture at desktop	✓	✓	✓	✗	✗
Audio capture at network switch	✓	✓	✓	✓	✗
Audio capture at Edge server	✓	✓	✓	✓	✓

	Internal calls	PSTN calls	Skype for Business Clients	Hard phones	Edge calls
Audio capture at Mediation server	✗	✓	✓	✓	✗

## Audio Capture on Desktop

The RTPDataCollector component is a QMS service that is used to capture Skype for Business audio at a source and redirect it to the QMS Recording Service. When no hard phones are in use and the user is only using Microsoft Skype for Business client software for voice communications, the RTPDataCollector can be installed directly on the user's desktop PC. The advantages of this method is that it does not require any modifications to the call route nor does it require network level mirroring in order to get the audio required for recording. The disadvantage to this method is that it requires software to be installed on each PC that a recorded user could potentially use. This method of audio capture typically does not work for users working outside of the network and connecting through the Edge server.

It should be noted that network adapters that become available after system boot up can sometimes pose issues with capturing packets when using this method of recording. Specifically, laptop computers that are booted with Wifi turned off at boot up or are placed into a docking station with a hard-wired network connection may not always capture packets from those adapters until the system has been rebooted.

It is recommended that the customer have a software deployment system or strategy in place to avoid having to manually install the RTPDataCollector on each desktop. Automated deployment tools are not provided for this component, however once installed the RTPDC component will auto-update itself if the QMS server version is updated.

## Audio Capture at Network Switch

Audio can be recorded on Microsoft Skype for Business very similar to how audio is recorded for many other telephony systems: by mirroring a network switch or VLAN. The advantages of this method are that both soft phones and hard phones can be easily captured from a single location. One potential disadvantage to consider in this case is that in Microsoft Skype for Business deployments, voice traffic typically does not travel over a separate voice network but instead uses the same data network that all other computer traffic is running through. This may create a larger load on the network switch as there is more traffic to mirror. This method of audio capture typically does not work for users working outside of the network and connecting through the Edge server.

When configuring this method of recording, no RTPDataCollector or Packet Forwarding Service is required. The network mirror should be connected directly to the computer running the QMS Recording Service.

## Audio Capture at Edge Server

When QMS is configured in Edge recording mode, all calls are directed through the Skype for Business Edge server. This creates a single point of capture for all calls. The advantages of this method is that it eliminates the need for software on desktop PC's, eliminates the need for network mirroring, and allows recording of calls that cannot be accomplished via other recording methods such as Edge-to-internal calls, Edge-to-PSTN calls, and Edge-to-Edge calls. The disadvantages of this method are that the Edge server will need to be scaled to accommodate the additional traffic and all recorded endpoints will need to have an available route to the Edge server. The Packet Forwarding Service is a QMS component that needs to be installed on the Edge server in order to forward audio packets to the QMS server.

## Audio Capture at Mediation Server

In some cases, if the Edge server will not work due to routing issues, the Skype for Business Mediation server may work as a single audio collection point assuming that Media Bypass has been turned off in the Skype for Business deployment. This configuration may have more limitations on what can be recorded than standard Edge recording scenarios. The Packet Forwarding Service is a QMS component that needs to be installed on the Mediation server in order to forward audio packets to the QMS server.

## Microsoft Teams with Enghouse Contact Center

Recording on Microsoft Teams is possible when paired with Enghouse Contact Center. Recording is achieved from the FreeSwitch intermediary (installed with Contact Center) rather than Teams itself.

**Method of audio capture:** Network mirroring

**Method of call event capture:** Network mirroring

## Mitel (Network packet capture + MiTAI)

While less costly from a licensing perspective, recording Mitel using network mirroring has a few limitations:

- Media encryption must be disabled on the PBX
- Mitel ACD is supported only if users do not change desks each day
- Teleworker users cannot be recorded

**Method of audio capture:** Network mirroring

**Method of call event capture:** Mitel MiTAI

Additional licensing required: Mitel MiTAI license must be purchased from Enghouse Interactive.

## Mitel (Secure Recording Connector / Mitel Border Gateway)

Using Mitel SRC is the recommended solution if either network mirroring is not desired or if the limitations mentioned above are not acceptable (for instance, hotdesking support is required). This solution allows the audio to be encrypted all the way from the phone to the call recording service,

enhancing security. QMS supports single SRC servers as well as SRC servers running in a redundant configuration.

**Method of audio capture:** Secure Recording Connector / Mitel Border Gateway

**Method of call event capture:** Mitel MiTAI

Additional licensing required: Mitel MiTAI license must be purchase from Enghouse Interactive. Mitel SRC server and licensing is also required.

## NEC SV8100/SV9100

The QMS integration with NEC SV8100/SV9100 PBX's is a basic network mirroring based integration and will function with any NEC-SIP endpoint.

**Method of audio capture:** Network mirroring

**Method of call event capture:** Network mirroring

## NEC SV8300/SV8500/SV9300/SV9500

The QMS integration with NEC SV8300/SV8500/SV8300/SV9500 is a basic network mirroring based integration and will function with any Protims protocol endpoint (such as DTerm phones) as well as with any NEC-SIP endpoint.

**Method of audio capture:** Network mirroring

**Method of call event capture:** Network mirroring

## NEC SV9500 Forked Audio

The QMS integration with NEC SV9500 is also possible with a forked audio based integration and will require NEC phones with a built-in-bridge capability.

**Method of audio capture:** Built-in-bridge

**Method of call event capture:** NEC OAI

Additional licensing required: NEC recording license.

## ShoreTel

When designing a ShoreTel deployment, please note that the servers running the Call Recording Service must be a Windows Server platform. This is due to a limitation with ShoreTel's TAPI service provider. Calls for remote users that utilize features such as Find Me/Follow Me and remote extension assignment will not be recorded.

**Method of audio capture:** Network mirroring

**Method of event capture:** ShoreTel TAPI service provider

Additional licensing required:

- For ShoreTel v6 and prior: ShoreTel DVS license is required (ShoreTel part #21020)
- For ShoreTel v7 and later: ShoreTel DVS or ShoreTel TAPI application license (ShoreTel part #30049) is required.

## Innovaphone

Recording on Innovaphone utilizes a combination of network mirroring and the Innovaphone TAPI service provider.

**Method of audio capture:** Network mirroring

**Method of call event capture:** Innovaphone TAPI service provider

## Generic SIP

Most telephony platforms that utilize SIP phones that comply with RFC 3261 can be recorded by QMS with no special configuration required.

**Method of audio capture:** Network mirroring

**Method of call event capture:** Network mirroring

## Compatibility with other telephony applications

How QMS will interoperate with other telephony applications needs to be carefully considered. Two types of applications have the potential to produce unexpected call recording results when used alongside QMS.

## Dialer applications

The use of some kinds of outbound dialers, such as predictive dialers, can pose challenges to recording calls. Some types of dialer applications will create a single call (from the PBX's perspective) to the recorded user's phone for the entire duration that the user is logged into that application. The dialer will then deliver other calls to the user over this single open call. In this case, QMS will end up making a single recording for the duration that the user is logged in. The exception to this is if the customer is using the Enghouse Interactive IAT Smartdial product, which has been integrated with QMS. When customers have a need to make separate recordings for each call when using a third party dialer application as describe above, the Enghouse Interactive Advanced Services team should be consulted to see if a full solution can be provided.

## Contact center applications

QMS can successfully record most contact center applications. The one situation that needs to be carefully considered is when a non-Enghouse Interactive contact center product is being used and the agents utilize a contact center hot-desking feature that does not require them to be at the same phone extension each day. There are two possible solutions in this case:

1. Give each agent a unique extension that they will use each day. Even if they move desks, many telephony systems have the ability to have extensions move from phone to phone with the user. If the user has an extension that only they use, QMS will be able to record it and associate all calls with that agent.
2. Add unnamed extension users to QMS rather than actual user names. If each extension that an agent could possibly use is added to QMS as a separate user, the calls will be recorded but QMS won't have information on which agent was at a particular extension for the day. In this scenario, finding a recording for a particular agent becomes more challenging as the user

searching for the recording will need to know which extension the agent was using on a particular day.

When QMS is integrated with either Enghouse Interactive Contact Center: Enterprise or Enghouse Interactive Communications Center products, additional functionality is available as part of the integration between the products. In addition to the typical functionality of QMS, users will also get:

- Queue information in search results
- Agent hot-desking support
- Recording profile rules that can be based on contact center specific information such as queue based recording
- Additional contact center specific information attached as flags to recordings



## Compliance options

The recording of phone calls is in many cases a regulated activity that falls under any of a number of industry or government regulations. QMS has features to assist in compliance with these various regulations.

### Call Encryption

When regulations require call recordings to be encrypted, QMS provides this functionality as well as key management capabilities to make compliance as easy as possible. When call encryption is enabled, all recordings are encrypted using the AES-256 algorithm.

When designing a call recording system that requires encryption, there are a few important points to keep in mind.

- Keys are protected by Microsoft DPAPI so that they are never stored in cleartext. This requires that the QMS services run under a domain service account rather than the default local system account. This must be manually configured after the installation of the software.
- All key operations require two QMS administrators to be present. This includes: enabling encryption in QMS, backing up keys (each administrator will be able to back up half of the key onto a small USB device), and doing a re-key operation.

When playing back recordings in QMS, all media transferred across the network is always encrypted regardless of if call encryption has been enabled or not.

### Recording Rules

Many regulatory compliance issues can be handled through the use of recording rules, which are part of Recording Profiles.

For example:

- If calls involving financial transactions must be retained for seven years then a Recording Profile can be created that retains recordings for that duration of time when the call information matches criteria that identifies the call as a financial transaction.
- If calls from certain country codes, area codes, or specific numbers must be recorded or must not be recorded, rules can be easily made to accommodate that.

Users can be members of multiple Recording Profiles which allow many different sets of rules to be applied to different situations.

### On-demand recording

To deal with situations where the remote party may need to opt-out of being recorded (for instance, in areas that require two-party notification of recording), on-demand recording can be used. This feature will prevent a recording from happening until the user manually triggers the recording using either the Client user interface or the optional QMS Desktop Utility, which is an application that can run directly on the user's desktop.



## Recording pause/resume

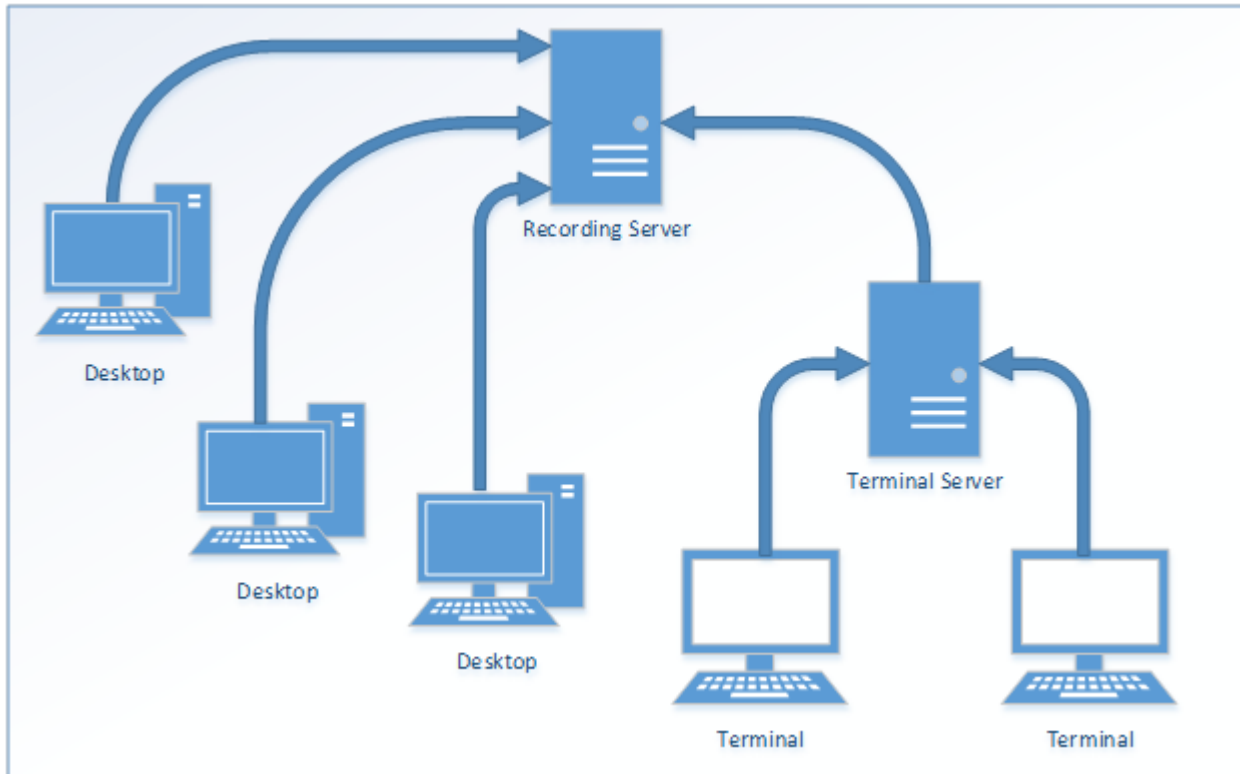
Some regulations require that portions of a phone call must not be recorded. For example, PCI-DSS regulations require that the verification number on credit cards must never be recorded. There are several ways to accomplish this within QMS. Both the QMS Client user interface and the optional QMS Desktop Utility provide mechanism to allow users to pause and resume their own recordings. If this level of control is not sufficient, the process can be automated by using the QMS Client API. For turn-key solutions, the Enghouse Interactive Advanced Services team can provide full solutions customized to the customer's needs.

## Two-user Authorization for Recording Playback

Special users can be configured with permissions that allow them to authorize playback of recordings. If a user needs to play back a recording and does not have full permissions, the authorizing user can enter credentials and allow the playback to occur.

## Screen Recording

### Screen Recording Architecture



The QMS Screen Recording add-on component does either full-screen or application specific recording of what is shown on the display of the computer of the recorded user. A small piece of software called the QMS Desktop Agent must be deployed to each desktop computer that a QMS user could potentially use. In the case of a Terminal Services environment, the QMS Desktop Agent must be installed on the Windows Terminal Server itself. The QMS Desktop Agent is responsible for (if configured to do so):

- Recording full screen video during calls
- Continuing to record for a certain duration after the call ends
- Making recordings of the screen during the time between calls
- Recording all windows for specific applications, each as a separate video
- Transferring recordings to the QMS Recording Service
- Providing live screen monitoring streams to monitoring clients

It should be noted that as of QMS 7.0, Windows Terminal Services and Citrix XenDesktop are the only supported VDI environments for screen recording.

Live screen monitoring requires additional client software to be installed on the supervisor's (or whoever is viewing the monitoring) desktop. The client software must be able to directly connect to the

target user's desktop PC. Live screen monitoring is not supported in Windows Terminal Services or Citrix environments. If the customer is concerned about live screen monitoring or is in an area where notification is required by law for live screen monitoring, the feature may be disabled by using a firewall to block inbound connections to TCP port 8426 on the recorded users' desktops.

QMS users who have screen recording licenses may move to any computer with the Desktop Agent software installed and still be recorded. They are identified by their Windows login account, which must be unique to them.

It is recommended that the customer have a software deployment system or strategy in place to avoid having to manually install the QMS Desktop Agent on each desktop. A deployment tool is provided and can be installed separately (see Screen Recording Installation Guide for more details), however the deployment tool requires special configuration and is not recommended unless the customer does not already have a way to deploy software automatically. Installation can also be scripted using `msiexec.exe` as long as the target computers already have the necessary prerequisites installed (.NET 4.5 Full and Visual C++ 2012 x86 redistributable). The command for scripting is as follows:

```
msiexec.exe /i DesktopAgent.msi REBOOT=ReallySuppress /qn SERVER=<server>
```

Where <server> must be replaced by the address of the QMS Call Recording Service.

## System Requirements

### Software Requirements

The QMS Desktop Agent can be installed on any of the following operating systems:

- Microsoft Windows Server 2019
- Microsoft Windows Server 2016
- Microsoft Windows Server 2012 R2
- Microsoft Windows Server 2012
- Microsoft Windows Server 2008 R2
- Microsoft Windows 10
- Microsoft Windows 8/8.1 Professional
- Microsoft Windows 7 Professional

The QMS Desktop Agent also requires the following components to be installed on the hosts on which it will run:

- .NET Framework 4.5 Full
- Microsoft Windows Desktop Experience

When using the QMS Client with Internet Explorer, reviewing screen recordings will also require the WebM Plugin which is available for download from this link:

- <https://tools.google.com/dlpage/webmmf/>

### Hardware Requirements

It is recommended that hardware used is above the minimum requirements for each supported operating system. Doing full screen Recording can require a substantial amount of CPU and is highly

dependent on factors such as number of monitors, screen resolution, and the amount of activity on the screen. For single monitor displays with low levels of screen activity, the CPU usage required for screen recording should fall within a reasonable level but may still exceed 10 or 15% of the CPU depending on hardware.

If you are using Screen Recording please contact Enghouse so that we can evaluate your specific minimum requirements.

## **Storage Requirements**

Screen Recordings are only temporarily stored on the user's desktop PC and are transferred to the QMS Recording Service as soon as possible. The QMS Recording Service requires enough space to store these files, in addition to storage required for call recordings. A good rule is to plan for at least 30 times the amount of space for screen recordings as are planned for call recordings. Like the amount of CPU usage, the amount of storage space required is highly variable based on a number of factors.

## **VDI Server Sizing**

The minimum requirements listed above for a single physical PC to run the QMS Desktop Agent also apply to a single VDI desktop. Sizing estimates for a VDI server must therefore take into account the cumulative resource needs of all of the VDI desktops it serves that will be running the QMS Desktop Agent. For example, take a VDI host server that has 8 CPU cores, which serves out 16 VDI desktops. If each VDI desktop is allocated one CPU core, and all 16 desktops are running simultaneously, each of the 8 CPU cores is shared between two of the desktops. The QMS Desktop Agent running on each desktop could take up to 15% or more of the CPU resources, depending on activity on the screen, so each CPU core on the host server could be running at 30% or more just due to the QMS Desktop Agents. An extrapolation of this example can be made over the total number of CPU cores in the host server hardware to determine how many simultaneous VDI desktops, running the QMS Desktop Agent, can be allocated by the host server.

## Firewall Configuration

The QMS Desktop Agent Service requires the following ports to be open for inbound connections, except in the case of a Windows Terminal Services environment:

8426 TCP Client connections for live desktop monitoring

## Text Recording

QMS can record and evaluate text based media including Skype for Business chat sessions. This can include webchat and email media delivered from an integrated contact center application. A text recording license is required for all recorded users.

## Speech Analytics

When QMS is purchased alongside ITsonix ELSBETH VocalCoach software, the two systems can be integrated to provide batch speech analytics processing of QMS recordings with the results accessible

in the VocalCoach product. The customer environment needs to be carefully configured for this solution. The only acceptable voice codecs that can be in use are G.711 a-law and G711  $\mu$ -law. Any other voice codec will prevent usable analysis of the resulting recordings.

## Archiving

Archiving, in QMS, refers to the relocation of recorded content to a different storage location. Archive operations do not remove any data from the database and archived recordings are still fully accessible from the QMS client user interface. Archiving is most useful for situations where it is desired to have all recordings reside on a single storage device to aid in ease of backups or for situations where it is desirable to have older recordings reside on a less expensive storage device.

One alternative to archiving is to enable the automatic transfer of recordings from the server that recorded them to a network storage device. This setting can be enabled in the service configuration within the Administration section of the QMS Client application. Files can either be transferred immediately after recording or else they can be transferred based on a schedule during off-hours so as to minimize impact to the network.

## Amazon S3 Storage

QMS now supports Amazon S3 cloud storage as a recording file destination for remote storage or archiving purposes. The connection details for Amazon can be managed directly from within the QMS web client.

## Licensing

When designing a QMS system it is important to know how QMS licensing is allocated so that the correct number of licenses are purchased. QMS can be licensed on a per-user basis or on a concurrent recording basis. When licensing on a per-user basis, you will need to consider the following factors when determining how many licenses are required:

1. How many people need to have their phone calls recorded? These users will need a Call Recording license. This license is available as a per-user all calls, per-user on demand or concurrent model.
2. How many people need to have their text media interactions recorded? These users will need a Text Recording license. This license can be licensed as a per-user model.
3. How many supervisors, who are not having their calls recorded (so not counted in the first item), need to access recordings? These users can use Supervisor licenses.
4. How many system administrators need to log into the system to administer recordings? These users can also use Supervisor licenses.

Call Recording, Text Recording and Supervisor licenses are considered base licenses. One of these licenses are required to use the application. There are a few possible add-on licenses:

- Agent Evaluation – allows a user to have their recordings scored based on defined scoring criteria. This license is available as a per-user license only.
- Screen Recording – enables recording of the agent's computer desktop. This license can be licensed in a per-user or concurrent model.

- Desktop Utility – allows agents to use the QMS Desktop Utility to enable pausing and flagging of call recordings from an easy-to-use desktop application. This license is available as a per-user license only. Desktop Utility requires a Call Recording License (All calls, Concurrent or On Demand).
- Voice Analytics Real Time – enables the QMS application to be integrated with Elsbeth VocalCoach for real-time speech analytics. This does not include the licensing for the VocalCoach application itself. This license is a per-user license.
- Voice Analytics Batch – enables the QMS application to be integrated with Elsbeth VocalCoach for batch speech analytics. This does not include the licensing for the VocalCoach application itself. This license is a per-user license.

High Availability versions are available for all recording licenses (Call, Screen and Text). If you have an HA (High Availability) license, all recording licenses must be HA. You are unable to mix HA with non HA recording licenses.

The following table shows the available licensing options and what functionality is included.

□□□□□□□□

	Web Client *1	Call Recording (all calls)	Screen Recording	Call Recording (on demand)	Text Recording	High Availability (HA)	Agent Evaluation *3	Desktop Utility	Voice Analytics Real Time	Voice Analytics Batch
Call Recording	✓	✓	✗	✓	✗	✗	✗	✗	✗	✗
Call Recording – HA *2, *6	✓	✓	✗	✓	✗	✓	✗	✗	✗	✗
Computer Recording *4	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗
Computer Recording - HA *2, *4	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗
Call Recording – Concurrent	✗	✓	✗	✓	✗	✗	✗	✗	✗	✗

	Web Client *1	Call Recording (all calls)	Screen Recording	Call Recording (on demand)	Text Recording	High Availability (HA)	Agent Evaluation *3	Desktop Utility	Voice Analytics Real Time	Voice Analytics Batch
Call Recording - Concurrent - HA *2	✗	✓	✗	✓	✗	✓	✗	✗	✗	✗
Computer Recording – Concurrent *4	✗	✗	✓	✗	✗	✗	✗	✗	✗	✗
Computer Recording - Concurrent - HA *2, *4	✗	✗	✓	✗	✗	✓	✗	✗	✗	✗
Call Recording On Demand	✓	✗	✗	✓	✗	✗	✗	✗	✗	✗
Call Recording On Demand - HA *2	✓	✗	✗	✓	✗	✓	✗	✗	✗	✗
Text Recording	✓	✗	✗	✗	✓	✗	✗	✗	✗	✗
Text Recording - HA	✓	✗	✗	✗	✓	✓	✗	✗	✗	✗
Supervisor	✓	✗	✗	✗	✗	✗	✓ <input type="checkbox"/>	✗	✗	✗
Agent Evaluation	✗	✗	✗	✗	✗	✗	✓	✗	✗	✗
Desktop Utility *4	✗	✗	✗	✗	✗	✗	✗	✓	✗	✗
Voice Analytics Real Time	✗	✗	✗	✗	✗	✗	✗	✗	✓	✗
Voice Analytics Batch	✗	✗	✗	✗	✗	✗	✗	✗	✗	✗

**Note:** All licenses are named licenses with the exception of: Call Recording Unlimited\HA, Screen Recording Unlimited\HA.

- \*1 The Web Client enables users to: Search and Play Recordings, Access Administrator Functions, Perform Agent Evaluations (requires an Agent Evaluation License).
- \*2 If you have HA (High Availability) license, all recording licenses must be HA.
- \*3 Agent Evaluation includes the ability to evaluate other users or to be evaluated by other users.
- \*4 Screen Recording\Desktop Utility requires a call recording license (All calls, Concurrent or On Demand).
- \*5 Supervisors only have the ability to evaluate users that have an evaluation license.
- \*6 Concurrent users only have the ability to search and playback their own recordings. Managers that wish to review recordings of other users must have a full Call Recording license (if they need to record calls) or a Supervisor license.



## Appendix A – Supported Windows OS for Cisco TAPI

Delete this text and replace it with your own content.

	Server 2008	Windows Server 2008 64-Bit	Windows 7 32-Bit	Windows 7 64-Bit	Windows 8 32-Bit	Windows 8.1 32-Bit	Windows 8 64-Bit	Windows 8.1 64-Bit	Windows Server 2012	Windows Server 2012 R2	Windows 10 32-Bit	Windows 10 64-Bit	Windows Server 2016 64-Bit	Windows Server 2019 32-Bit	Windows Server 2019 64-Bit
Pre-Cisco TSP 4.3	N	N	N	N	N	N	N	N	N	N	N	N	N	* 6	* 6
Cisco TSP 4.3.x	N	N	N	N	N	N	N	N	N	N	N	N	N	* 6	* 6
Cisco TSP 5.x,6.x	N	N	N	N	N	N	N	N	N	N	N	N	N	* 6	* 6
Cisco TSP 7.x	Y * 1	N	N	N	N	N	N	N	N	N	N	N	N	* 6	* 6
Cisco TSP 8.x	Y	N	N	N	N	N	N	N	N	N	N	N	N	* 6	* 6
Cisco TSP 8.5	Y	Y * 3	Y	Y * 3	N	N	N	N	N	N	N	N	N	* 6	* 6
Cisco TSP 8.6	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	* 6	* 6

	Server 2008	Windows Server 2008 64-Bit	Windows 7 32-Bit	Windows 7 64-Bit	Windows 8 32-Bit	Windows 8.1 32-Bit	Windows 8 64-Bit	Windows 8.1 64-Bit	Windows Server 2012	Windows Server 2012 R2	Windows 10 32-Bit	Windows 10 64-Bit	Windows Server 2016 64-Bit	Windows Server 2019 32-Bit	Windows Server 2019 64-Bit
Cisco TSP 9.0	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	*	*
														6	6
Cisco TSP 9.1	Y	Y	Y	Y	N	N	N	N	N	N	N	N	N	*	*
														6	6
Cisco TSP 10.0	Y	Y	Y	Y	Y	N	Y	N	Y	N	N	N	N	*	*
														6	6
Cisco TSP 10.5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	*	*
											4	4		6	6
Cisco TSP 11.0	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	*	*
											4	4		6	6
Cisco TSP 11.5	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	*	*
														6	6
Cisco TSP 12.0	*	*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	*	*
	5	5												6	6
Cisco TSP 12.5	*	*	Y	Y	Y	Y	Y	Y	Y	Y	Y	Y	N	*	*
	5	5												6	6

- \*1 - Cisco TSP 7.x support for Windows 2008 will be available for ARC only.
- \*2 - Cisco TSP legacy wave driver is not supported under VMWave.
- \*3 - Requires Unified Communications Manager release 8.5(1) Service Update 1 (or later)  
CiscoTSP does not support titanium platform.
- \*4 - CiscoTSP versions supports windows 10 from the following versions:
  - 1. 10.5.2.8 for 10.5
  - 2. 11.0.1.4 for 11.0
- \*5 - Deprecated
- \*6 - Unknown support. Please contact Cisco.

**Reference: Supported Windows OS for Cisco TAPI**

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