AVAYA PASSIVE & ACTIVE CTI RECORDING

HOW TO DESIGN RECORDING FOR AVAYA PASSIVE & ACTIVE CTI RECORDING

This document is intended to provide an overview of the requirements for designing the CyberTech Recording Solutions for Avaya DMCC recording.

This document applies to:

1. Introduction

CyberTech delivers several Avaya passive & active CTI VoIP recording solutions. Each solution is highly reliable, easy to install and economical in use. Each solution uniquely enables organisations to achieve the highest levels of flexibility, quality assurance and liability protection while supporting existing hardware and infrastructure.

This document is intended to provide an overview of the CyberTech Active IP Recording solution. Other methods for Avaya IP recording offered by CyberTech are:

- <u>Passive IP Recording</u>: IP recording using the SPAN port of the network switches and dependant on IP/MAC addresses for recording.
- <u>Avaya SMS recording</u>: Standard Avaya passive recording does not provide Extension details. The Avaya SMS interface offers real-time information of registered IP phones and corresponding Extensions. By connecting to the Avaya SMS interface a passive recording system based on Extension recording could be realized.

This how to design is supported for the following recording methods

Passive CTI Recording:
- Passive CTI Set Side Recording (including Passive VoIP)
- Passive CTI Trunk Side Recording

Active CTI VoIP Recording:
- Service Observing Recording
- Single Step Conferencing Recording
- Multiple Registrations Recording

Avaya

With Avaya AES Release 3 the first third party call control possibilities were introduced called CMAPI (Call Manager API). In Avaya AES Release 3.1, extended capabilities were added and the CMAPI started to be referred to as Device, Media and Call Control API or DMCC. The latest Release 4 of AES has some additional capabilities.

CyberTech

CyberTech introduced Avaya DMCC recording with CyberTech Release 5. Avaya DMCC recording is available for CyberTech Myracle and CyberTech PRO. For Avaya DMCC recording, in addition to the standard CyberTech software, CTI Server software is needed for integration with the Avaya AES.

2. Overview

Active CTI recording methods use CTI to do the following:

- Detect call activity
- Control which calls are recorded, by duplicating the audio streams to the CyberTech Recording System

Passive CTI Recording methods also use CTI to detect call activity, but now audio is captured using passive tapping at either a trunk or phone.

2.1 Recording Methods

This Avaya DMCC / CTI integration supports the following recording methods:
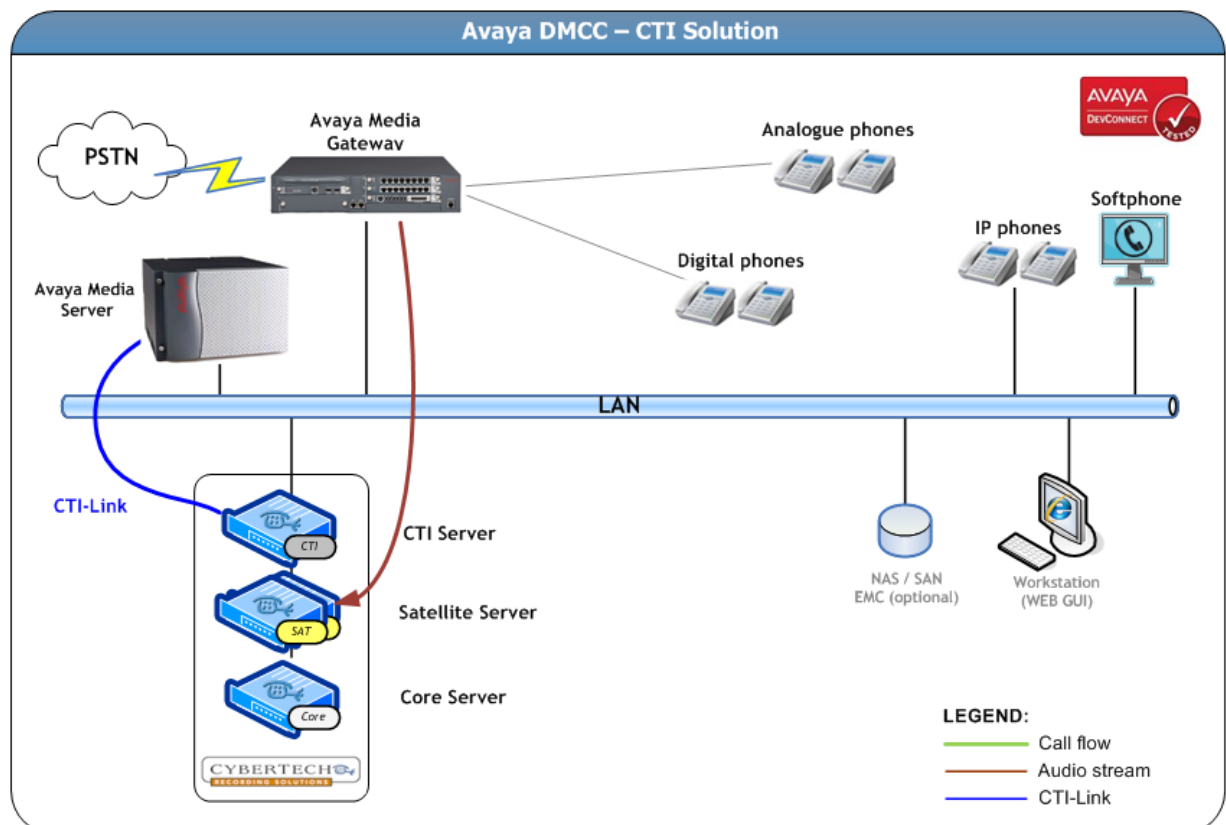
Passive CTI Recording:
- Passive CTI Set Side Recording (including Passive VoIP)
- Passive CTI Trunk Side Recording

Active CTI VoIP Recording:
- Service Observing Recording
- Single Step Conferencing Recording
- Multiple Registrations Recording

2.2 Active CTI VoIP Recording

The figure below visualises the corresponding call and audio flows of Active CTI DMCC recording.

2.3 Passive CTI Recording

The CyberTech Avaya DMCC / CTI Recording Solution supports the following Passive CTI Recording methods:
- Passive CTI Trunk Side Recording
- Passive CTI Set Side Recording (including Passive VoIP Recording)

The figure below visualizes the corresponding call and audio flows.

Avaya Passive - CTI Solution

1. Incoming or outgoing call on digital/analog/IP phone(s)
2. A CTI Start/Stop event is initiated upon device monitoring
3. Audio is received by parallel tap from trunk(s) or digital/IP phones

LEGEND:
- Call flow
- Audio stream
- CTI Link
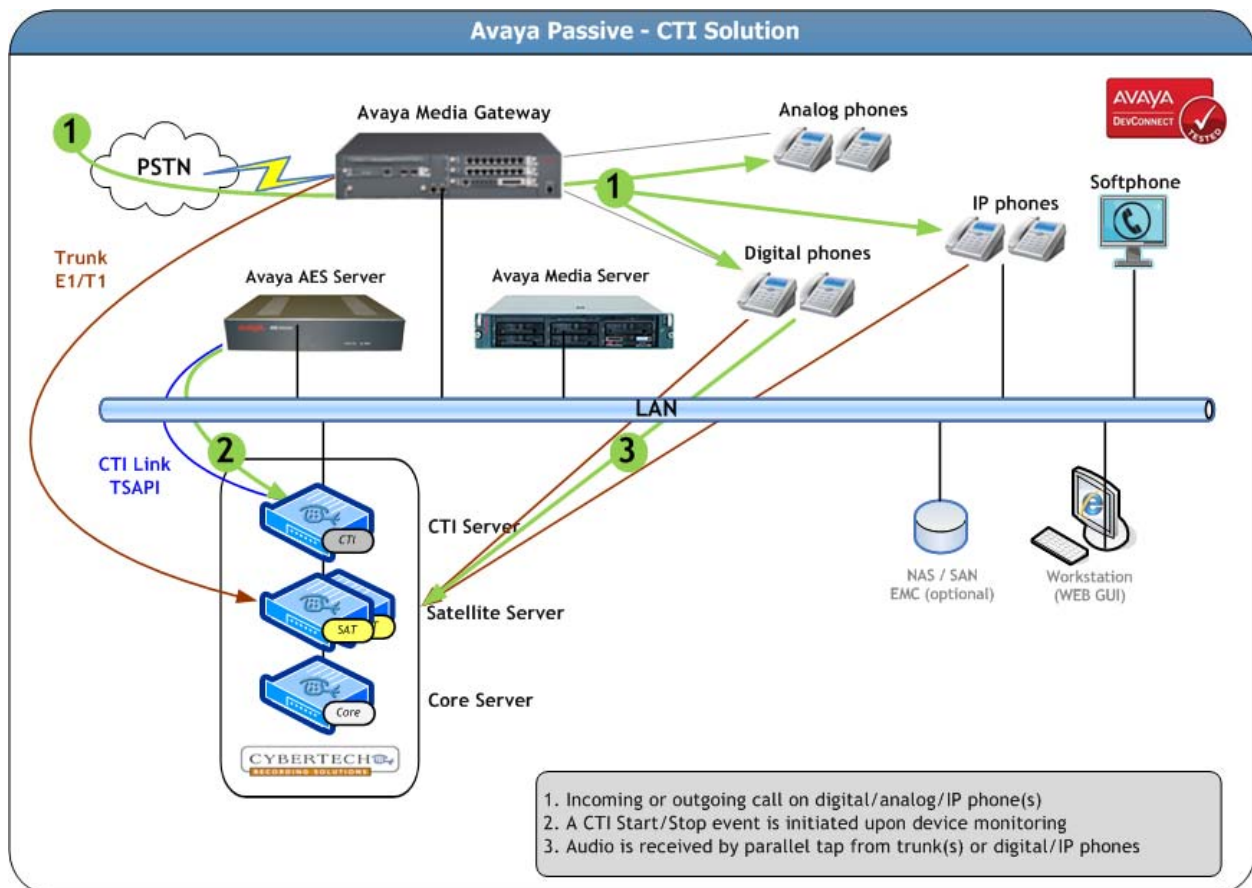
3. Features

3.1 Overview of features

The CyberTech Avaya DMCC / CTI Active IP Recording Solution is integrated with the Avaya AES platform.

The following characteristics apply to all supported Active CTI VoIP Recording methods:
- Avaya Communications Manager (CM) manages the target extension.
- The calls involve up to six participants, which is the maximum as supported by CM.
- The client application handles the media streams to be recorded.
- Avaya AES controls the audio streams and call data. It uses the DMCC service to provide the required media control and the TSAPI service to communicate with the CTI recording system.
- Cradle to Grave - Each call received an unique call-ID. By searching on this call-ID a call can be traced from Cradle to Grave, including transfers.

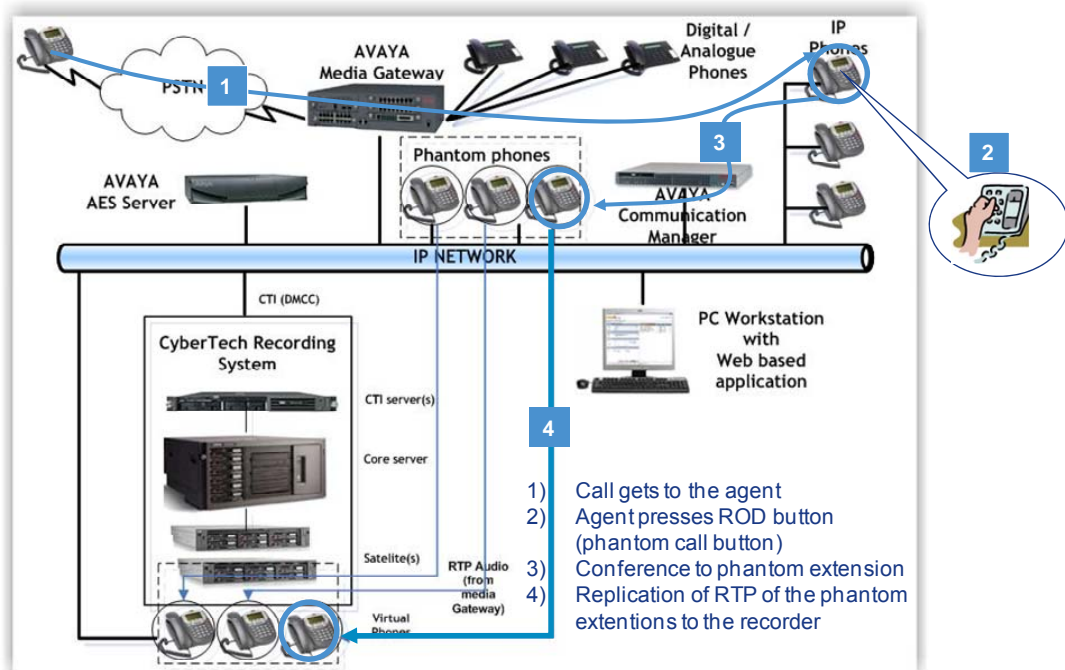| System Features	Supported	Not supported	Remarks
G729 Recording Format	✓		Supported by Avaya Installer Kit version 6.8.0 (and higher)
Call Marking (on the Handset)	✓		• Only supported for 'Multiple Registrations' (see section **Fout! Verwijzingsbron niet gevonden.**). • Supported by Avaya Installer Kit version 6.16 (and higher)
Recording on Demand (Keep/ Delete)	✓		• Multiple Registrations = Supported • Single Step/Service Observe = Supported via phantom extension. • **Application (Keep/Delete)** is supported on for all recording methods. Requires a desktop application that runs on Windows. Professional service, please contact sales for more information.
Recording Through Hold	✓		Supported by Avaya Installer Kit version 6.0.0 (and higher)
Save on Demand	✓		Prerequisite: the 'Call Marking' feature must be enabled for the Multiple Registrations recording method
Secure RTP (sRTP)	✓		Supported by Avaya Installer Kit version 6.8.0 (and higher)

3.2 Record on Demand

Multiple Registrations

Multiple Registration supports record on demand via a function key on the telephone set. The keypress is captured via the CTI Link to the recorder

Service Observe & Single Step Conference

This Record on Demand feature will not be part of the CyberTech Recording solution but will be configured on the Avaya solution.

Avaya Virtual extensions will be set in auto answer mode and as target on the recorder. Agents requiring record on demand will get a so called "conference key" on their phone. When this button is pressed, the virtual extension will be conference into the conversation and be recorded by the recording system.

All parties in the conference will be available in the call record on the recording system via DMCC, including the Agent extension.

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3.3 Call Details

Additional database fields – the following additional database fields will become available with Avaya DMCC recording:

Name	Supported	Not supported	Remarks
Agent ID	✓		
Answering Party	✓		
Call ID	✓		Each call is assigned a unique Avaya Call ID (Cradle to the Grave)
Call Marking	✓		Only supported for 'Multiple Registrations'
Called Party	✓		
Calling Party	✓		
Conference Parties	✓		
Hardware ID	✓		

Name	Supported	Not supported	Remarks
Last Cause	✓		
Last Party in Call	✓		
Originating ACD	✓		
Ringing Party	✓		
Targets	✓		
Trunk ID	✓		

3.4 Target Types

Basically, only the target 'Extension' is supported.

Recording: Analogue, Digital and VoIP phones. Operator consoles are not supported.

Target type	Supported	Not supported	Remarks
Extension	✓		

3.5 Call Scenarios

Scenario	Supported	Not supported	Remarks
Basic point to point calls	✓		
Bridged Call appearances	✓		Only supported for 'Single Step Conferencing' and 'Multiple Registrations'
Bridged Functionality with Multiple appearance	✓		
Call Transfer	✓		
Call Hold	✓		
Call Conference	✓		
Call Exclusion	✓		Not supported by Avaya for Multiple Registrations
Call Pick-up	✓		
Call Back	✓		
Consecutive Calls	✓		

3.6 Supported Codec's

| Codec	Supported	Not supported	Remarks
G711	✓		
G729	✓		Requires separate CyberTech licensing
G722	✓		Requires separate CyberTech licensing
G723.1	✓		Requires separate CyberTech licensing

3.7 Resilience

Resilience typically offers the advantage of additional failover transparency in the event of component failure.

3.7.1 CTI Resilience

CTI Server (N+1)
Available from call controller version 3 or higher

CTI Resilience requires 1 CTI link from the Avaya DMCC Call Manager. The CTI Resilience consists of one Active CTI and one Standby CTI server. In case the Active CTI fails, the Standby CTI will be activated.
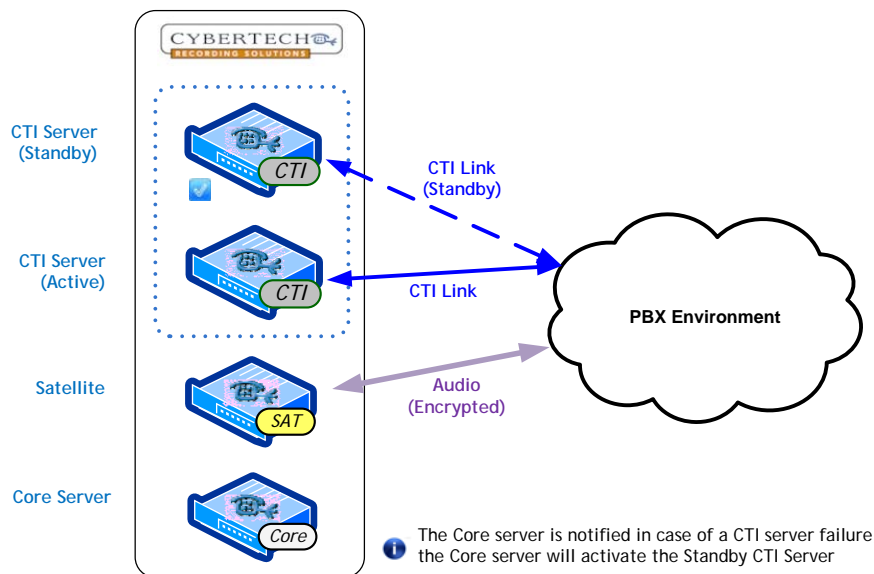
3.7.2 CTI Multilink AES (2N)

This applies to call controller version 2 only

Multiple AES servers may exist within one telephony/recording environment. For the CyberTech Recording System to be able to support such a configuration, each of these AES servers must have its own target group. Recording will then require multiple CyberTech 'Device Link Module Controllers'.

Two Link Controllers with Two AES Servers
The Avaya AES allows two simultaneous connections. Per connection, a CyberTech CTI server is connected with a separate Link Controller. This configuration is considered two 'separate' recorders (also called '2N integration'), each of which requires a separate CTI license. Each link controller must have its own specific target group.

To accomplish this, you have to define a specific group of recording extensions (virtual IP phones) for each AES Server so each extension can be recorded.

3.7.3 CTI link failover to standby AES

This section of the document is to provide details of the proposed engagement of CyberTech Professional Services to provide a solution for AES Server Failover.

The facility to automatically failover from a primary AES server to a secondary in the event of a link failure in order to provide resilience within their existing CyberTech Recording Solution.

CyberTech Professional Services are able to provide a solution for this requirement as an 'add on' to the current system. The solution will be based around the active monitoring of the AES link within the CyberTech Recording solution database and 'on the fly' modification to the configuration of the AES connection should a failure be detected.

This service will use information held in the CyberTech Call Recording Solution Database to check the status of the Primary AES server link and instigate fallback when required by updating the 'live' AES server configuration which is also held within the same database.
This service will be capable of running on any CyberTech server within the recording complex which has visibility of the associated call recording database, however CyberTech Professional Services recommend that the service is installed on the same server as the database.

The service will have three configurable elements:-
1.   Scan Period – The number of seconds between link status checks
2.   Failure Count – The number of consecutive scans to indicate link problem before failover is activated.
3.   Pointers to configuration records in the CyberTech database for both the Primary and Failover AES servers.
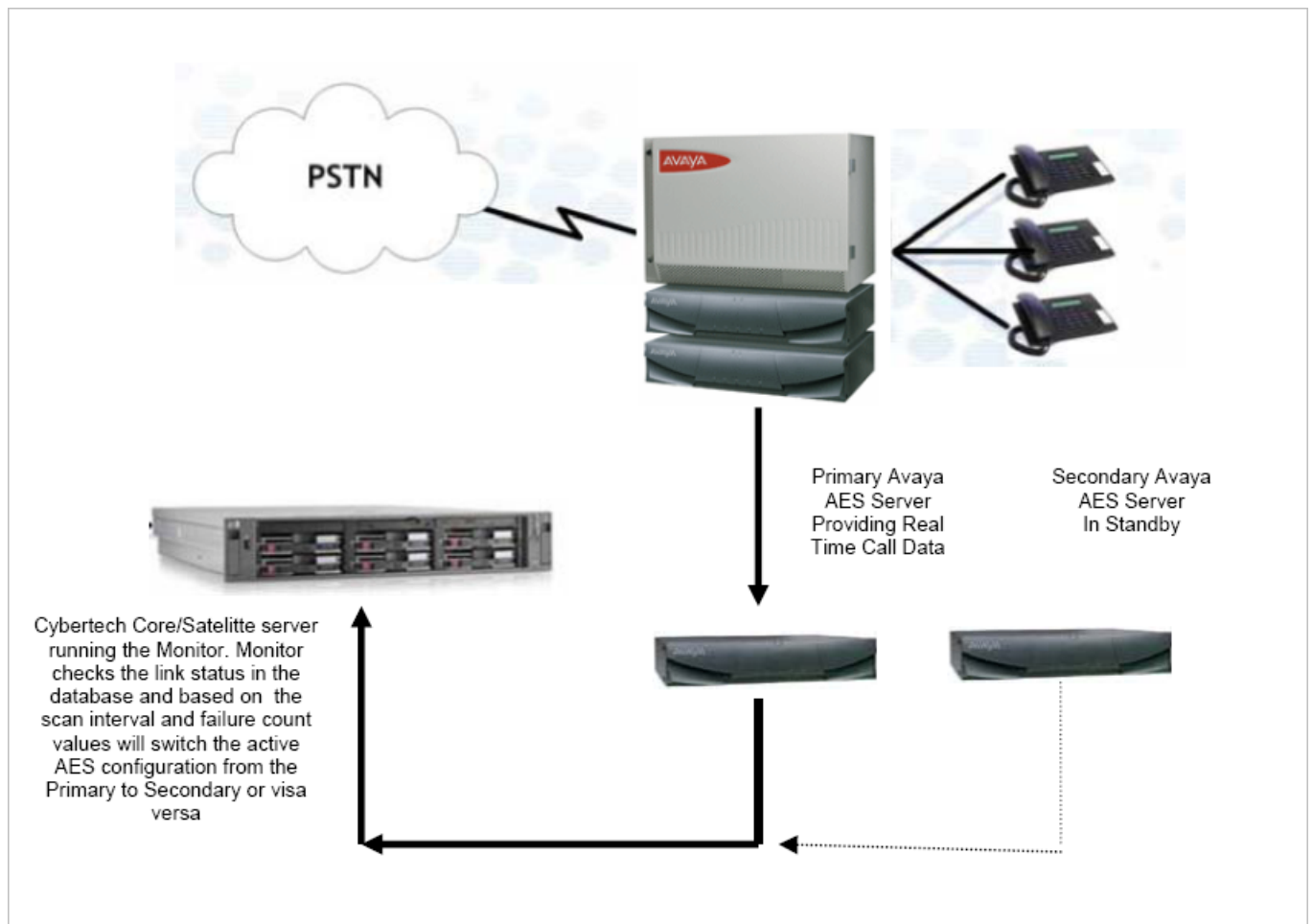
3.7.4 Satellite Server (N+1)

Satellite Resilience requires a maximum of 1 Standby Satellite. In case an Active Satellite fails, the Standby Satellite is automatically activated.
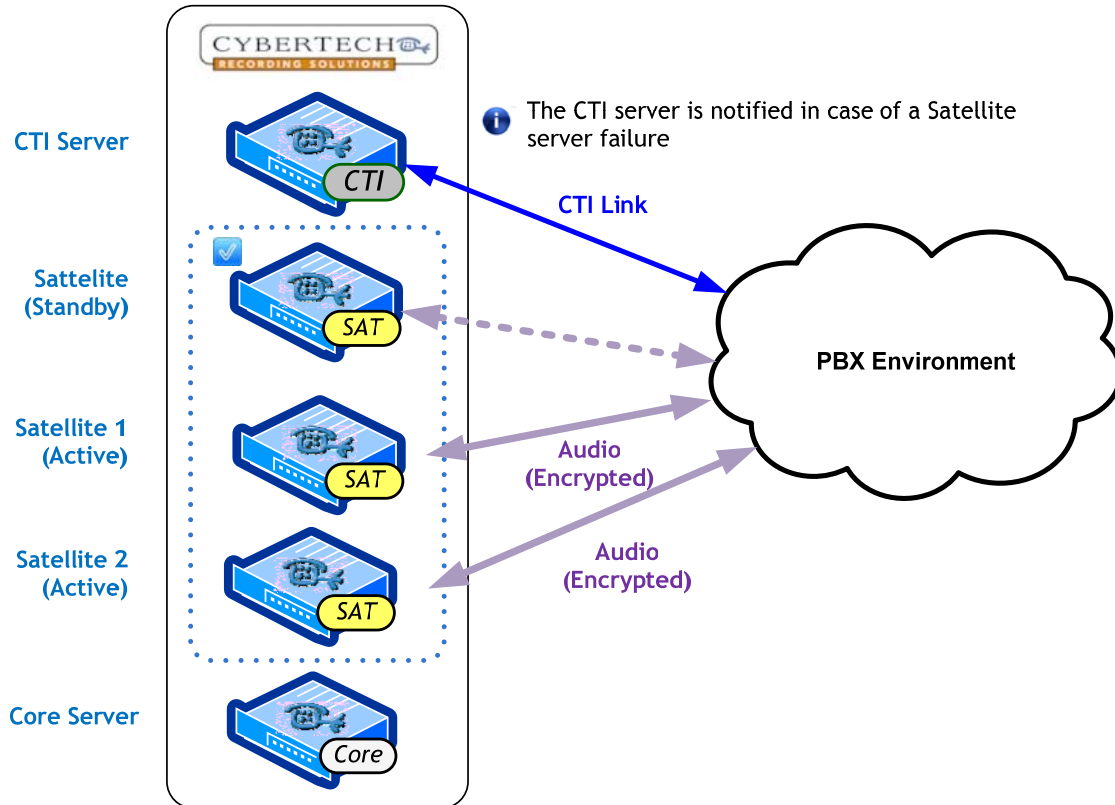
3.8 Requirements from Avaya

For Avaya hardware/software and licensing requirements, refer to the requirements as prescribed by Avaya, Inc.

The integrated CyberTech – Avaya Recording System contains the following basic Avaya elements:
- Avaya Media Gateway
- Avaya Communication Manager (with application software)
- Avaya AES Server

The version of the Avaya AES and Avaya Communication Manager (CM or ACM) depends on the recording method used. The table below contains a summary.

Recording Method	AES version	CM version
Passive CTI Set/Trunk Side	3.0 and higher	3.0 and higher
Single Step Conferencing	3.0 and higher	3.0 and higher
Service Observing	3.0 and higher	3.0 and higher
Multiple Registrations	4.1 and higher	5.0 and higher

3.9 Avaya Licensing

THIS INFORMATION MAY NOT BE COMPLETELY UPDATED; PLEASE NOTE CYBERTECH IS NOT RESPONSIBLE FOR THE INFORMATION PROVIDED IN THIS SECTION. ALWAYS CHECK WITH AVAYA.

The following Avaya licences are needed per recording method:

Licence	Passive CTI Set Side: TDM/Analogue	Passive CTI Set Side: VoIP	Passive CTI Trunk Side
TSAPI Basic	• 1 per Target • 1 per Agent Hunt Group / ACD Split	• 1 per Target • 1 per Agent Hunt Group / ACD Split	• 1 per Target • 1 per Agent Hunt Group / ACD Split
ASAI Link Core / CT Adjunct	1 per ACM	1 per ACM	1 per ACM

Licence	Active VoIP: SSC	Active VoIP: SO	Active VoIP: MR
IP_API_A / DMCC	1 softphone licence per virtual IP phone	1 softphone licence per virtual IP phone	1 softphone licence per virtual IP phone
TSAPI Basic	• 1 per Target • 1 per Virtual IP Phone • 1 per Agent Hunt Group / ACD Split	• 1 per Target • 1 per Virtual IP Phone • 1 per Agent Hunt Group / ACD Split	• 1 per Target • 1 per Agent Hunt Group / ACD Split
ASAI Link Core / CT Adjunct	1 per ACM	1 per ACM	1 per ACM

ASAI Link Licensing:
- ASAI Link Core Capabilities required (set to 'y')
- ASAI Link Plus Capabilities not Required

Check if enough DSP resources are available for the virtual devices using Service Observe or Single Step Conference.

3.10 Requirements from CyberTech

- VoIP/Monitoring licenses for each phone/extension that needs to be recorded
- CTI Server Software license for Avaya DMCC active VoIP recording
- At minimum 1 short size PCI(e) boards will be installed:
    1. 1 Server Solution   (Core/Satellite/CTI)   **1-64 Channels**
        - 1 PCI(e) Short Size slots required
        - 1 Server required for total solution

    2. 2 Server Solution   (Core/Satellite + CTI)   **1-168 Channels**
        - 1 PCI(e) Short Size slots required in Core/Satellite server
        - 2 Servers required for total solution

    3. Multiple server solution (Core +Satellite + CTI)   **1-∞ (∞ = depending on several parameters)**
        - 1 PCI(e) Short Size slot required per Satellite Server
        - 3 Servers at minimum required (1 satellite server per 480 channels)

3.11 CTI Server Requirements

CTI Server hardware requirements per CTI server for Avaya DMCC Active Voip are

- One Quad Core CPU, 2.0GHz, 2GB RAM   **Up to 240 targets**
- <u>Two</u> Quad Core CPU's, 2.0GHz, 4GB RAM   **Up to 720 targets**
- <u>Two</u> Quad Core CPU's, <u>2,53Ghz</u>, 4GB RAM   **Up to 1200 targets**

3.12 CyberTech Software Requirements

This section lists the minimum software requirements that apply to the server components of the CyberTech configurations

CTI Server
- CyberTech Avaya CTI Integration Software, which includes the following main components:
- Call Controller version 2
- TSAPI Link Controller (including TSAPI libraries)
- Service Monitor 5.2 (or higher)

Core Server
- CT Recording Software 5.2 (or higher)
- Microsoft .NET Framework 3.5 Service Pack 1
- WinPcap 4.0.2 or higher

Satellite
CT Recording Software 5.2 (or higher)
- Microsoft .NET Framework 3.5 Service Pack 1
- Parrot-DSC Card firmware:
- Passive CTI Recording: DSC Core version 4.22 or higher (for IP Recording: version 4.28 or higher)
- Active CTI VoIP recording: CTI_VOX_VoIP_16 or higher (Consult the firmware history for details.)

4. Avaya Recording Methods

The CyberTech Avaya DMCC / CTI Recording Solution supports the Active CTI VoIP Recording method.

The Active CTI VoIP solution applies to the following specific recording scenarios, each of which meets specific client requirements:
- Service Observing
- Single Step Conferencing
- Multiple Registrations

In the following section, the general characteristics are described that apply to all three of these active CTI recording methods.CyberTech Pro's & Cons

4.1 Service Observe

The Service Observing (SO) recording method uses the AE Services DMCC service to register itself as a stand-alone recording device. It is provisioned and activated on the device so that, when the target extension joins a call, the recording device is automatically added to the call.

SO is primarily intended to allow external parties to listen in on calls in progress. It is typically used in call centre environments for monitoring and training purposes.

With SO, the number of recorded channels equals the number of targets. It limits the number of participants to six in one call (minus a maximum of 2 recording devices).

Characteristics of SO
- 1..1 association of target and recording device.
- Up to 6 participants in a single call (minus recording devices).
- 2 of the 6 participants can be recording devices.
- Each recording device consumes a TDM time slot.
- For Listen/Talk, an extra time slot is needed.

Advantages of SO
- SO can be used to record calls against any type of target extension managed by CM.
- The installation of SO is relatively simple.
- SO involves less traffic load than SSC.
- The 'Service Observing' state remains Active at all times, resulting in a fast switch to recording state.
- The 'Service Observing' recording state is not visible on the target set display.
- With CM 4.x (and higher), it is possible to have a double 'Service Observing' occurrence in a call.
- It is possible to assign a 'recorder over supervisor' priority.

Disadvantages of SO
- Requires one recording channel (Virtual IP phone) per target.
- CM 3.x allows only one single 'Service Observing' per call.
- With CM 4.x (and higher), a maximum of two 'Service Observers' per call is permitted.
- SO requires more Avaya hardware resources and licences than SSC.
- Usage of the SO method may conflict with:
- Supervisor listening in on call.
- Internal calls between two 'targets' (no audio available in one of two recording call segments or 'legs').
- Registration needs up to 4 seconds per virtual extension due to Avaya limitations (general limitation with DMCC recording). This has major impact on switch over scenarios especially on bigger installations. Assuming the AES Server or the CyberTech CTI server needs to be restarted or a switch over to a n+1 server takes place this means that per 100 virtual phones the registration takes up to 400 seconds so more that 7 minutes.

4.2 Single Step Conferencing

The Single Step Conferencing (SSC) recording method is used to add participants to an existing call (this feature is also known as 'conferencing').

This functionality is provided by the TSAPI service, although it is also available through JTAPI and DMCC services.

There is no need to have a virtual IP phone for each extension that needs recording. This means that the number of virtual IP phones is less than the number of recorded target extensions. Effectively, the number of required virtual IP phones depends on the traffic load of the telephony environment.

As with the SO recording method, SSC limits the number of participants in one call to six (minus a maximum of 2 recording devices).

Characteristics of SSC
- N..1 association (recording devices are pooled).
- Up to 6 participants in a single call (minus recording devices).
- 2 of the 6 participants can be recording devices.
- Each recording device consumes a TDM time slot.
- For Active participation, an extra time slot is needed.

Advantages of SSC
- Number of recording channels may be less than number of targets.
- SSC requires less Avaya hardware resources and licences.
- Channels are assigned dynamically.
- Up to six conference parties are allowed.

Disadvantages of SSC
- A 'Single Step Conferencing' session starts after a target call is established, which may cause delays in busy environments.
- Installation of SSC is more complex compared to SO.
- SSC involves more traffic load then SO.
- Virtual IP phones may show up as 'conference parties' if a conference key is configured on the target phone set.
- To start a single step conference it the Avaya needs up to 1 second to setup the conferencing due to Avaya limitations. This means that the first second of a recording might be lost. As with Service Observe the Registration needs up to 4 seconds per virtual extension due to Avaya limitations (general limitation with DMCC recording). This has major impact on switch over scenarios especially on bigger installations. Assuming the AES Server or the CyberTech CTI server needs to be restarted or a switch over to a n+1 server takes place this means that per 100 virtual phones the registration takes up to 400 seconds so more that 7 minutes.
- Per virtual device a station license is needed compared to Multiple Registration

4.3 Multiple Registrations

With the Multiple (Device) Registration (MR) recording method, the Avaya AES integrates a recording device at the target extension. This creates a so-called 'Softphone-enabled Extension' for direct recording of the call.

MR is supported for Avaya AES 4.1 (and higher) in combination with CM 5.0 (and higher).
CM 5.0 allows up to three devices (DMCC Station clients) at a single, softphone-enabled extension. This extension must be administered as a DCP or Avaya H.323 IP extension.
All three endpoints that register to an extension can request media streams.

Each DMCC endpoint registration must go through separate AES Servers.
All three DMCC endpoints registered to a common extension can be configured for three different 'network regions'.
The DMCC endpoint that is connected to the call as 'Listen-Only', is registered in 'Dependent' mode, or, in the case of physical sets, in 'Independent' mode.

Therefore no additional talk time slot is allocated for this DMCC endpoint.
Also, this DMCC endpoint is not added to the number of participants that can be in a conference call.

Characteristics of MR
- 1..1 association of target and recording device.
- Up to 6 participants in a single call.
- Each of the 6 participants can be a recording device.
- No additional TDM time slots needed.

Advantages of MR
- It permits more participants in a single call than SO and SSC.
- Each call can be recorded.
- No additional slots are needed.
- No risk of insufficient devices when it is busy.
- Call Marking is supported.

Disadvantages of MR
- MR requires more specific configuration settings than SO and SSC.
- MR requires more recording devices/licences (one for each channel) than SSC.
- Recording of Call Master extensions is not possible. Due to missing softphone support for Call Master devices (missing internal loudspeaker)
- Not supported by all CM versions (see table below).
- Not all extension types are supported (see table below).

4.4 Comparison

The following table contains a feature comparison of the three Active CTI VoIP Recording methods described above.

Field	Call Recording Method		
	Service Observing	Single Step Conferencing	Multiple Registrations
Maximum number of Active participants in a recorded call	6 minus the number of recording devices, so the absolute maximum is 5 with one recording device	6 minus the number of recording devices, so the absolute maximum is 5 with one recording device	6
Allows notification message to be played to participants	Yes	Yes	No
Additional TDM time slots consumed (assuming a single port network)	1 per recording device - Listen/Talk FAC 0 Listen only FAC	1 per recording device - Active participation 0 Silent participation	0
Additional Media Processors consumed	1 per recording device	1 per recording device	1 per recording device
Association between target device and recording device	Typically one-to-one, but can be many-to-one	Typically many-to-one (or one-to-many)	One-to-one
Supported types of extension	All	All	DCP/ Avaya H.323 IP Softphones. *Call Master is not supported.
Available in AE Services/CM Releases	AE Services 3.0 and higher, Communication Manager 3.0 and higher	AE Services 3.0 and higher, Communication Manager 3.0 and higher	AE Services 4.1 and higher, Communication Manager 5.0 and higher
Records whole call or target extension participation only	Target extension participation only	Whole call, from when the target extension joins	Target extension participation only
Maximum number of recording devices in a call	2 Communication Manager 4.0 and higher 1 Earlier releases	6 minus number of Active participants, so the absolute max. is 4, in a two party call	6 (one per participant)
Supports highly available call recording	Yes, if Multiple Device Registration is not possible to avoid the miss of the 1 second of a call.	Yes (but at cost of available Active party slots in cells)	Yes

5. Certifications

The CyberTech Recording Solutions Release 5 have been tested and certified by Avaya.

Last Certification: Avaya's DevConnect Technical Team and has been officially accepted as compliant on September 30, 2009. CyberTech – Avaya DevConnect, click here