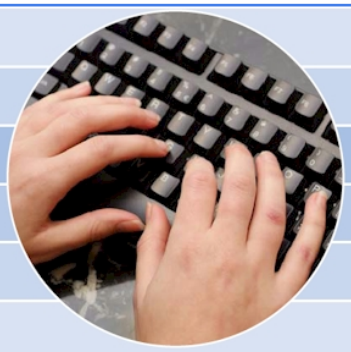
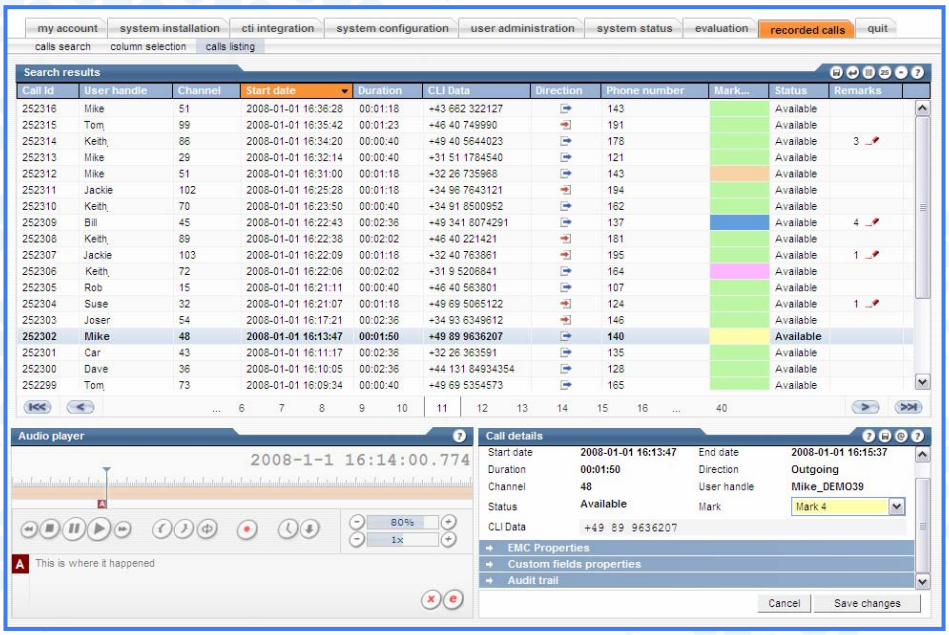
CAPTURE
STORE
SEARCH
REPLAY
EVALUATE
ANALYSE



CYBERTECH OVERVIEW

Integrating Compliance and Quality Recording



Version: 5.3b

Date: 17 December 2009

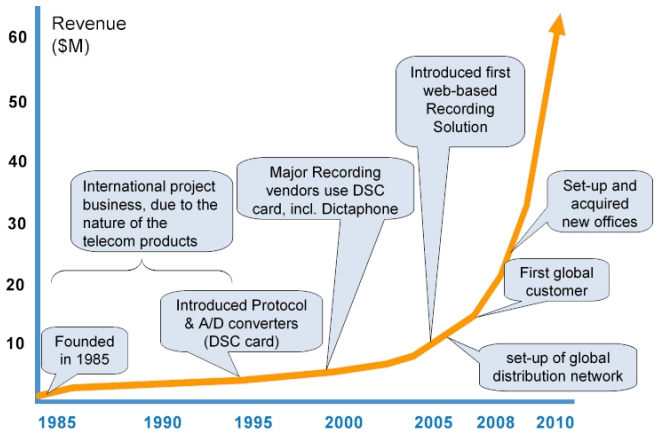
Reference: CT-MS-M-091113

Content

1. CyberTech International

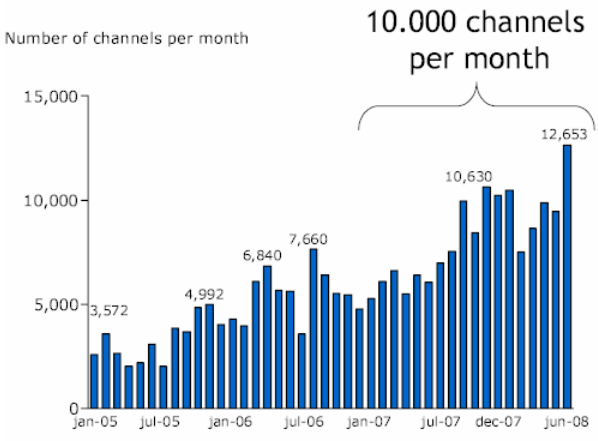
Established in 1985, CyberTech has a passion for challenging conventions and is committed to pushing back the technology barriers in terms of what can be achieved. This has been a key factor in helping us to become one of the world's leading innovators in the development of call recording and quality monitoring solutions for a wide range of voice and data applications.

CyberTech has grown in strength as a result of building a close-knit team of highly skilled and motivated employees, all of whom are committed to meeting the needs of customers. We have formed close relationships with technical educational establishments around the world and regularly set up new study programmes. Work placement experience is also provided for university students in our research and development laboratory. This provides us with a continuous exchange of knowledge and an ongoing influx of young talent.



Quality throughout the business is the key to our success, whether it is the processes we use or the products that we develop. CyberTech has achieved both ISO9001:2000 certification, which guarantees the delivery of the highest levels of product quality and consistency across our customer facing activities. CyberTech also achieved the ISO14001 certification. The ISO 14001 environmental management standards exist to help CyberTech minimize how their operations negatively affect the environment and comply with applicable laws and regulations.

Today, CyberTech International leads the voice logging and communications recording industry and is a recognized innovator of voice recording and quality monitoring applications. CyberTech sold over 100,000 channels in 2008 and had a 175% increase in revenue from 2005 to 2008. This makes CyberTech the third largest global manufacturer of voice recording solutions.



With products and services that drive efficiencies in the capture, storage, retrieval and playback of voice, radio and data communications, CyberTech offers a worldwide suite of innovative recording technologies that enable organizations to achieve the highest levels of performance, quality assurance, compliance and liability protection while supporting existing business processes.

With solutions deployed widely throughout organisations in the financial services, public safety, and call centre markets, CyberTech uniquely adds value through commercial-off-the-shelf (COTS) products and applications that are scalable, turnkey, and easy to implement over a virtually unlimited number of channels. An unsurpassed commitment to customer satisfaction additionally assures maximized technology investments and quality of customer contacts without proprietary hardware, complex integrations or expensive software upgrades.

CyberTech has global operations and offices throughout Europe, Asia, Middle East and the Americas. For local distribution and support, CyberTech has ±60 distribution partners in 45 countries.

2. Recording Solutions

The CyberTech Recording Solutions is one of the first open and secure recording solutions, designed to use industry standard hardware and software. This best-in-breed technology is being used by the world's leading financial institutions, governmental and public safety organisations and call centres. By taking advantage of commercial off-the-shelf (COTS) hardware and customer provided network storage devices, this future-proof solution for the capture, storage, retrieval and playback of voice, radio and data communications provides unsurpassed functionality while reducing a firm's total cost of ownership.

This flexible, multi-media product delivers high quality recordings of traditional or VoIP telephony, together with data and desktop screens for all applications, including verification and compliance, dispute resolution, training and quality monitoring.

This document describes the CyberTech Recording Solution in these topics:

- **Capture** of Voice, Data and Screens
- **Store** for short- and long-time archiving
- **Search** using a Web-based user-interface
- **Replay** using commercial off-the-shelf (COTS) hardware
- **Evaluate** additional applications for Quality Monitoring and Scenario Replay
- **Analyse** with Call Statistics

2.1 Capture

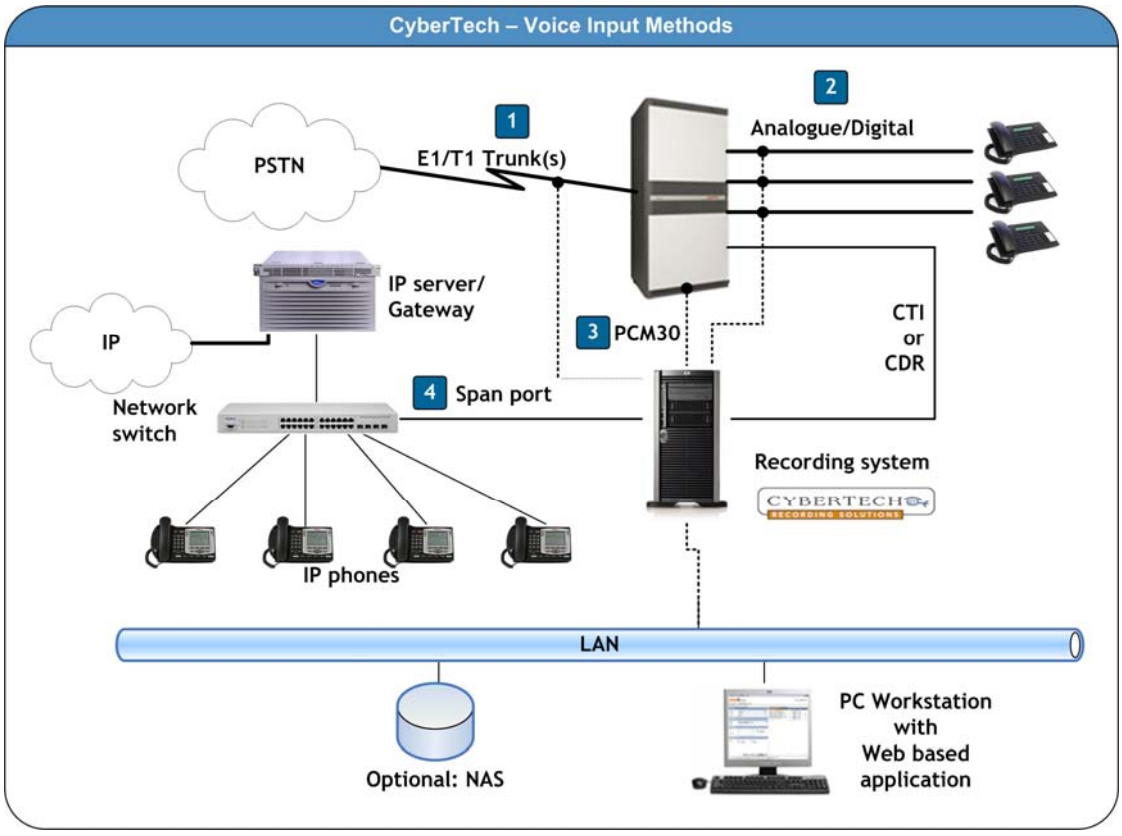
The CyberTech Recording Solutions can capture different kinds of input:

1. Voice
2. Data
3. Screen

2.1.1 Voice

The voice input is the most important input of the Recording Solution. Four types of voice input are accepted:

1. Trunk (E1, T1, CAS, DPNSS, Q.SIG)
2. Analogue or Digital Extensions
3. PBX Recording Port (PCM30/PCM32)
4. Span Port (VoIP extensions, SIP)



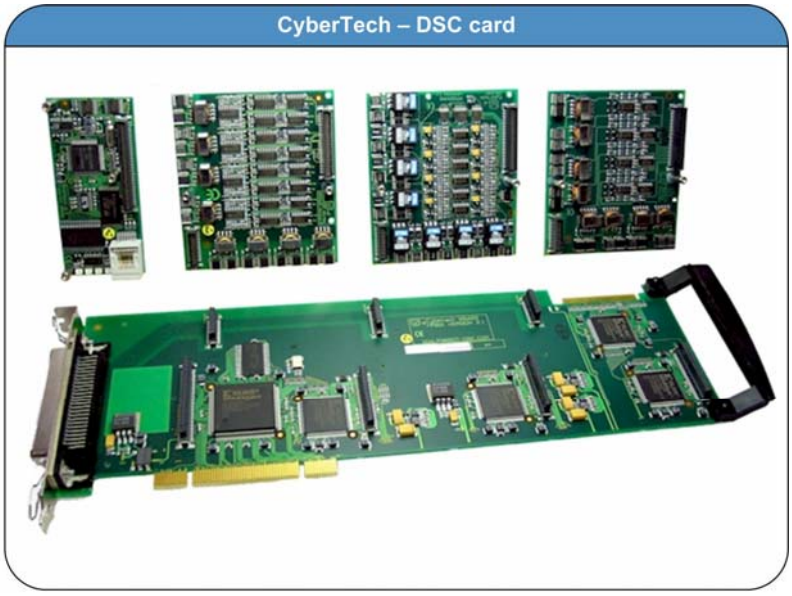
Passive tapping is used for all these inputs. In other words, a 'tap' is placed on the line which does not interfere with the actual information being transported.

DSC cards

Tapping of these communication lines is done with the CyberTech Digital Speech Converter (DSC) cards for:

- Trunk lines
- Digital/Analogue Extensions
- Passive VoIP

Each card consists of a Baseboard with a processor module, and one or more 'detection' modules.



Detection modules are available in 5 versions:

- Analogue (8 input channels)
- Analogue + Beep tone (8 input channels)
- Digital Parallel (8 input channels)
- Digital Serial (4 input channels)
- Trunk (24 T1 or 32 E1 input channels).

By placing 1, 2 or 3 detection modules on a baseboard (one type per baseboard), many different card configurations are possible:

	Full size	Medium Size	Short Size
Analogue	24 channels	16 channels	8 channels
Analogue+Beeptone	24 channels	16 channels	8 channels
Digital Parallel	24 channels	16 channels	8 channels
Digital Serial	12 channels	8 channels	4 channels
Trunk	96 channels	64 channels	32 channels

CyberTech DSC cards are modular cards that use PCI or PCI-E baseboards with space for different detection circuit modules:

# modules	Full size	Medium Size	Short Size
PCI	3	n/a	1
PCI-Express	3	2	1

Each baseboard also contains a 'processor module'. This module contains the licenses for activating the modules, and firmware for configuring the card to the specified PBX extension.

CyberTech has developed specific firmware for almost every available PBX brand available. Since almost every extension type, digital or otherwise, uses a different protocol, there are currently more than 100 firmware protocols available for extension types for the following PBX brands:

Digital Parallel	- Generic	- Realitis DX 4-wire	VoIP
- Alcatel OmniPCX	- Goldstar	- Rockwell Spectrum	- Alcatel
- Ascom Ascotel	- Intertel Axxess	- Selta	- Avaya
- Aspect	- ISDN2 ETSI/1TR6	- Siemens	- Cisco
- Avaya	- LG Starex-VSP	- Tadicom Coral	- Mitel
- Bosch Integral	- Nitsuko DX2E	- Toshiba Strata	- Nortel
- DMS-100 (BRI)	- Nortel	Digital Serial	- Siemens
- Ericsson	- Panasonic KX-TD	- Avaya Index (SDX)	- Ericsson
- Fujitsu Coral	- Philips/NEC	- Mitel X200/SX2000	- Selta

See http://www.cybertech-int.com/10272/1/connectivity.html for the complete list of supported communication platforms.

For **VoIP recording**, only a standard (additional) Ethernet card in the chassis is required. The recording interface layer monitors the IP-stream and detects the VoIP and the associated data packages and call data.

2.1.2 Data

Next to the voice capture, additional call data can be captured in three ways:

1. from the D-channel of the line
2. from a CDR output of the PBX
3. with a CTI connection

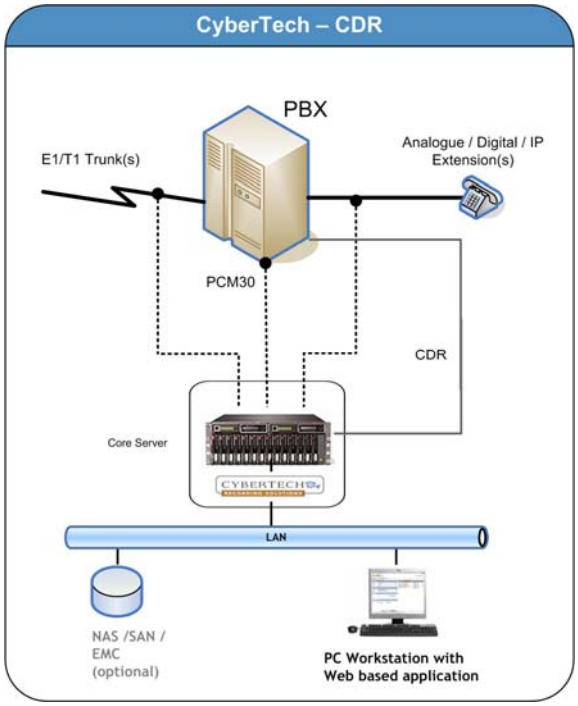
D-channel capture

Each firmware protocol converter is able to decode the available data (D-channel). This means that not only can additional data like CLI and dialled number be decoded, but also any information that is displayed on the display of the extension. Also with VoIP tapping, additional call data is retrieved from the VoIP-stream.

The complete list of supported telecommunication platforms for D-channel capture can be found on http://www.cybertech-int.com/10272/1/connectivity.html.

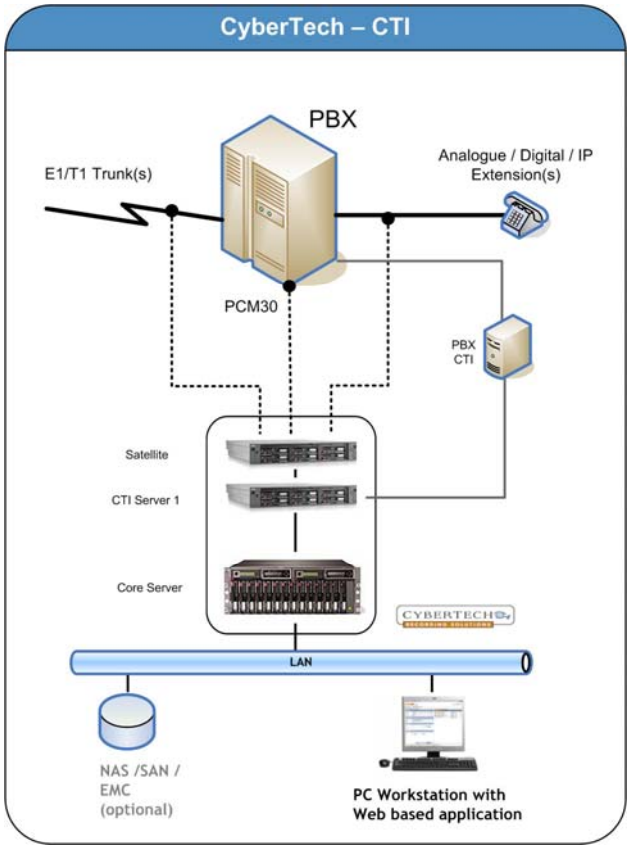
CDR

By adding a feed from the PBX with CDR (Call Detail Records) information to the configuration, additional call data can be added to the database. CDR input is processed by an additional service running on the same Server. CDR is always one way, from the PBX to the Recording System. Since the CDR input differs per configuration of each PBX-type, small custom-made adjustments to the CDR Service are sometimes needed. A CyberTech CDR Service is available for several PBX and Trading Room systems.



CTI Integration

By adding a feed with CTI (Computer Telephony Integration) to the configuration, a two-way communication between the PBX and the Recording can be established. Additional information about a call can be stored in the database and the recording system can be instructed by the PBX to start recording calls.

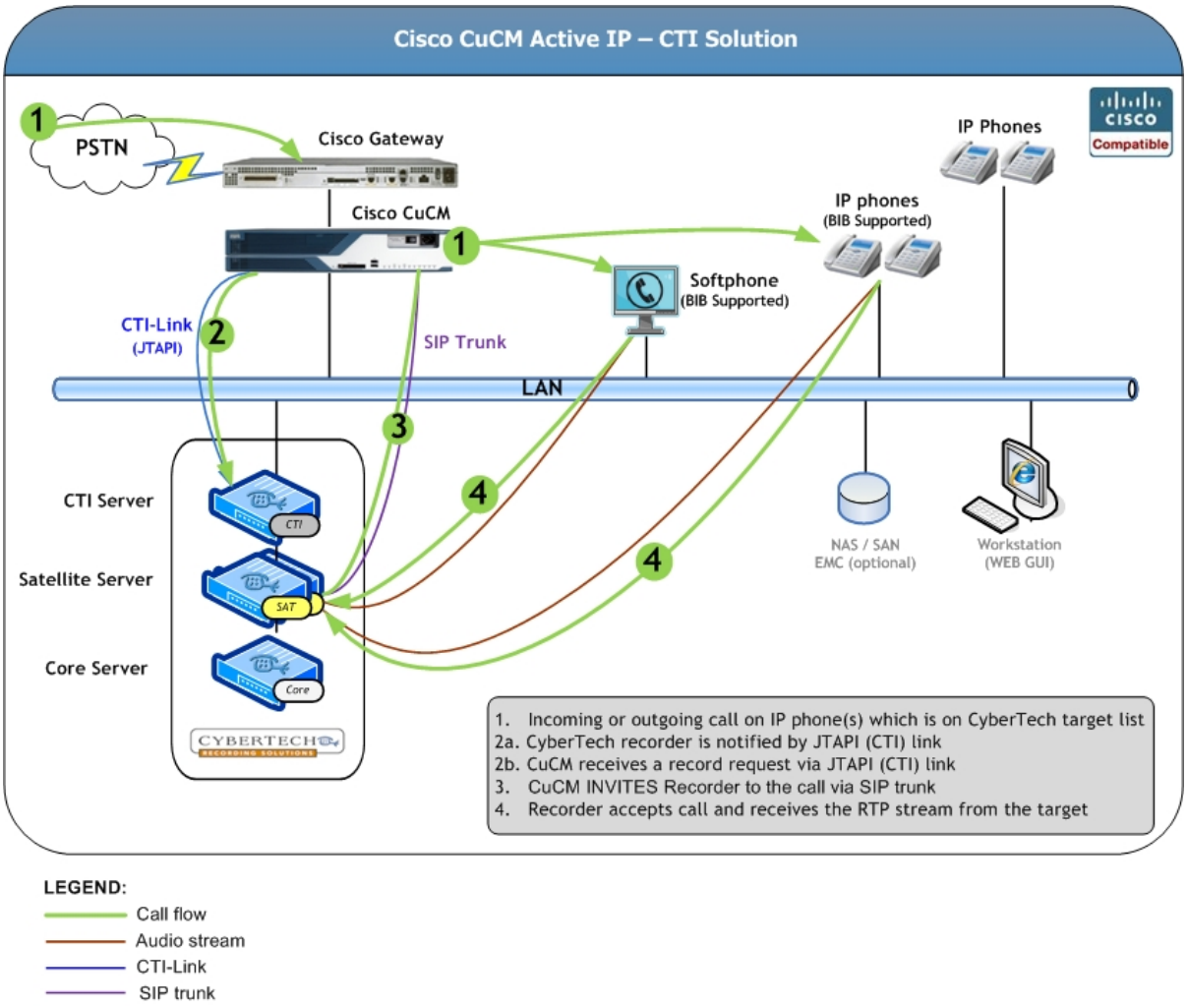


A CTI Server can be used for 'active IP recording'. For CTI input an additional CTI server is added to the architecture to process the CTI feed from the PBX switch. There are two ways of sending audio from the extensions to the recording system:

- Observe / conferencing
- Duplicate audio stream

With 'Observe', a server put 'virtual' IP phones in a conference mode and sends the audio to the Recording Server. With 'Duplicate audio stream', a server instructs the IP phones to send a duplicate of the audio streams to the Recorder Server.

With the CTI Server, additional call data also becomes available, such as call ID (for cradle to grave tracing of a call), target ID (extension or agent position), agent ID (or queue name or skill group), list of parties (in case of a conference) and last cause (reason for call ending).

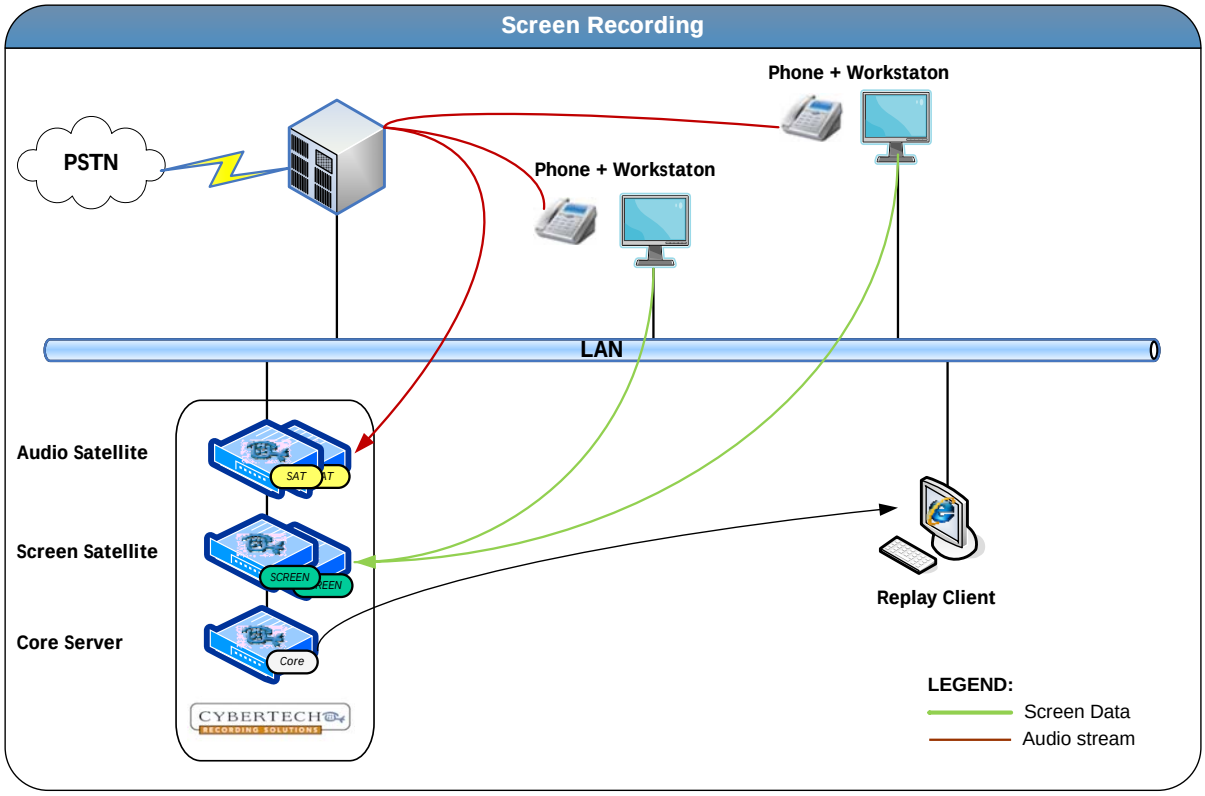


The CyberTech Recording Solution has CTI integration for Active VoIP recording available for:

- Avaya DMCC (formerly known as CMAPI)
- Cisco Unified Communication manager
- Nortel CS1000 (formerly known as MLS)
- Mitel Secure Connector (SRC)

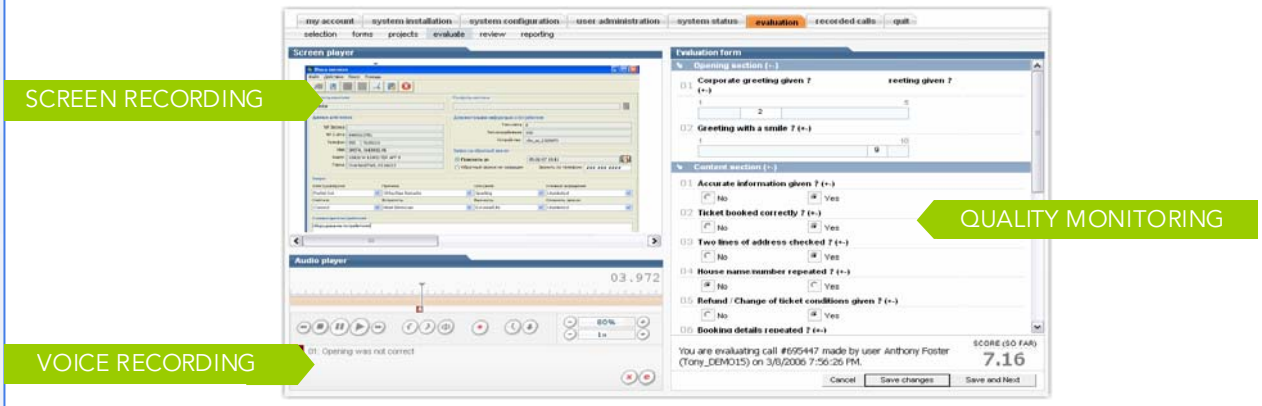
2.1.3 Screens

With the Screen Recording capability, a complete picture of every call can be made to identify where and how performance can be improved. The current screen recording feature can record up to 100 monitors.



The *CT Recording System* block is the complete recording system, providing audio and screen recording. The *Phone + workstation* block shows a typical agent desk consisting of a phone and a workstation. The phone conversations are captured and transferred to a satellite where the audio is recorded along with call details. The workstation screen is captured and transferred to the screen recorder. Both the satellite and the Screen Recorder send their recorded data (call + screen) to the Core Server, where it is stored centrally. The CT Recording Solution web GUI provides access to the call and screen recordings.

In the standard web-based search & replay application, the audio, evaluation (QM) and screens can be displayed in the same window.



2.2 Store

The CyberTech Recording solutions have a scalable architecture that allows an easy scaling of the configuration and storage facilities.

2.2.1 Architecture

The Recording Solutions platform consists of hardware and software. The hardware consists of a chassis (commercial off-the-shelf hardware can be used) and one or more tapping cards for analogue, digital or trunk tapping. For VoIP recording only one card is needed to hold the licences. For scaling only the hardware (card and/or chassis) need to be adjusted. The software of the Recording Solutions is the same for small and large configuration, only the number of recording channel licenses determines the size of the configuration. For scaling in configuration size (e.g. more channels) no additional software is necessary.

The scaling takes place at 3 levels:

A. within a stand-alone recording system
B. within a server/satellite architecture
C. within a multi-site environment.

A. Stand-alone recording system

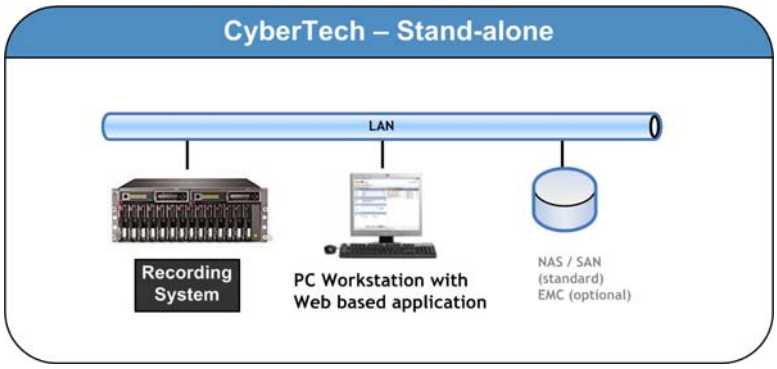
A stand-alone recording system consists of one server with all hardware and software. The maximum number of channels in one stand-alone Recording System is:

- **Myracle**: max. 64 channels
- **Pro**: max. 240 channels

For Digital, Analogue or Trunk recording, PCI or PCI-Express cards are needed in the hardware server. The maximum number of recording channels per card size:

	Full size card	Medium size card	Short size card
Analogue	24 channels	16 channels	8 channels
Analogue+Beeptone	24 channels	16 channels	8 channels
Digital Parallel	24 channels	16 channels	8 channels
Digital Serial	12 channels	8 channels	4 channels
Trunk	96 channels	64 channels	32 channels
VoIP	n/a	n/a	240 channels

For Digital, Analogue or Trunk recording, several PCI or PCI-Express cards can be combined in one Server. For VoIP recording only one short PCI or one short PCI-Express card is needed in the chassis.



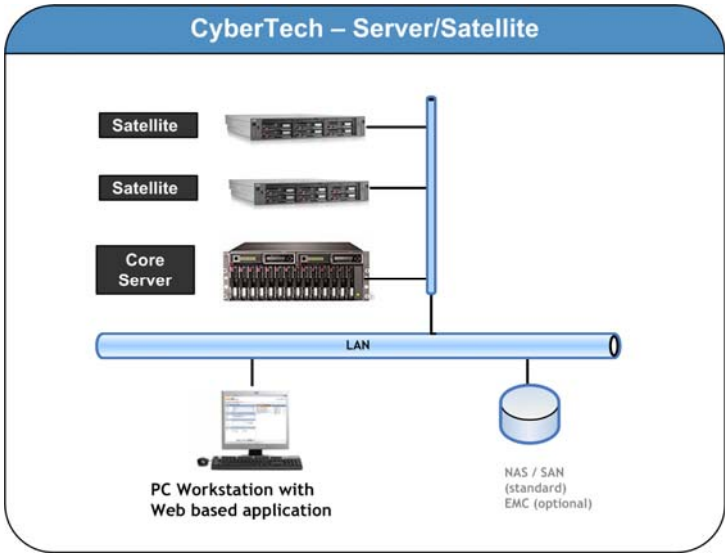
A **Myracle** system can be upgraded to a **Pro** system to accommodate more than 64 channels. Only a new license per channel is required.

A **Pro** system can be transformed into a Server/Satellite architecture to accommodate more than 240 channels.

B. Service/Satellite architecture

The flexible Server/Satellite architecture configuration consists of a server chassis, and one or more satellite chassis. The server chassis can contain tapping cards with up to a maximum of 64 channels. The satellites can contain tapping cards with up to a maximum of 240 channels per satellite. The services, the database and the web server are installed on the server while the satellites has only a small satellite application, which is the same as the server application but with a limited number of services activated. The maximum load of a CyberTech system can be scaled up to 1500 channels.

The Maximum number of end points which is fully tested and supported in the market is 1500 channels. Each channel can be Analogue, Digital, Trunk or IP endpoint. Different types of endpoints can be combined in one recording system.



The maximum number of channels per chassis type (Satellite) depends on:

- CPU type
- Internal memory
- Free PCI slots
- Compression used

For example, the maximum number of channels for a **Satellite** with a dual **Xeon processor** with **2 GB Ram** is:

Compression/channels	Analogue	Digital	Trunk	G.711	G.729A
Uncompressed	288	288	240	240	192
ADPCM32	288	288	240	240	192
(Fast) GSM	288	288	240	240	192
True Speech	120	120	96	128	96

The maximum number of channels for a **Satellite** with an **8 Core processor (2 Quad Corre)** with 4 **GB Ram** and **Windows 2003 std** is:

Compression/channels	Analogue	Digital	Trunk	G.711	G.729A
Uncompressed	480	480	480	480	480
ADPCM32	480	480	480	480	480
(Fast) GSM	480	480	480	480	480
True Speech	240	240	240	240	240

See the document *CT Recording Solutions - Server Requirements (CT-TN-08003-1)* for more information on the maximum number of channels per processor type.

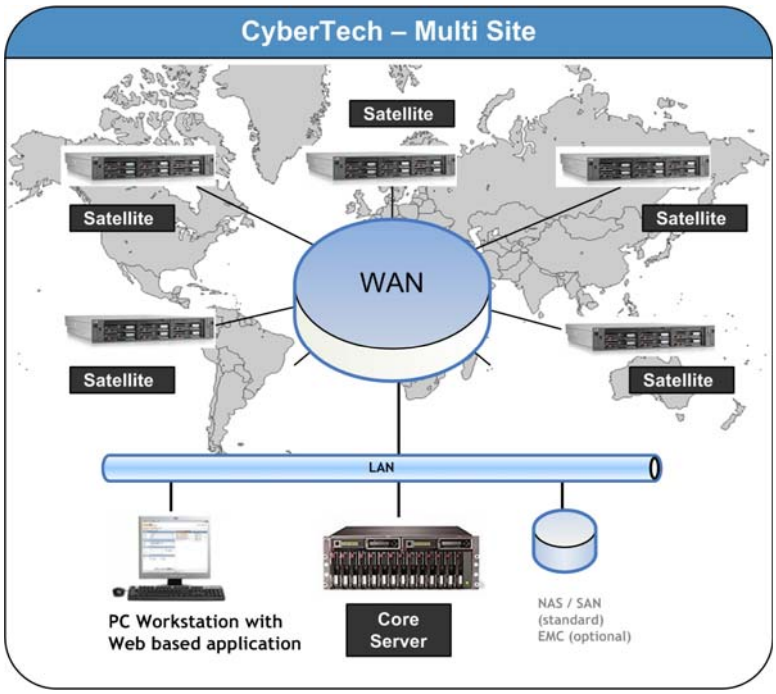
C. Multi-site environment

For a multi site recording solution with central storage, CyberTech offers two possibilities:

- Stand-alone CyberTech Recording Servers on each location, with archiving to 1 central location
- CyberTech Recording Satellites in each location, with a central Recording Server.

With a central archive location (e.g. EMC), all archiving of individual recording systems is done to one location. The maximum number of channels is virtually unlimited as additional individual recording system can be added with archiving to a central storage device.

With satellites on remote locations, the complete configuration acts as one Server/Satellite recording system. Additional satellites with recording channels can be added as long as the maximum number of channels does not exceeds the maximum as mention in the 'Scaling within a Server/Satellite architecture' paragraph.



2.2.2 Hardware Overview

The Recording Solution can be used with any commercial off-the-shelf (COTS) hardware. Depending on the configuration used, the Recording Solution hardware can either have:

A. Stand-alone configuration
B. Server/Satellite configuration

A. Stand-alone server configuration

A stand-alone configuration consists of one chassis with all the tapping cards, the server software, and the web servers.

Desktop PC

A desktop chassis is typically used for smaller configurations, with a maximum of 64 input channels. The selected desktop chassis should have at least enough PCI or PCI-E slots to hold the necessary tapping cards.

Industrial chassis

Examples:

3U: Chenbro RM31408

4U: Chenbro RM42200

B. Server/Satellite configuration

Server

Since a core server holds none or few tapping cards, it does not need a lot of PCI slots. It does, however, need the resources to perform the necessary core services.

Examples:

HP ProLiant DL370 G6

HP ProLiant DL380 G6

HP ProLiant DL360 G6

Satellite

A satellite is used for tapping cards only and does not run any services or databases. A satellite must contain enough PCI slots to place the tapping cards. For VoIP recording, only 1 PCI slot is required.

1U: HP ProLiant DL360 G6

2.2.3 Short-term storage

Within the CyberTech Recording Solutions all the voice and call data is stored as WAV files on the systems Hard Disk and as records in a central Database.

This MySQL database contains one record for every call.

If the 'encryption' option is enabled, all stored calls will be encrypted with the 256 bit Rijndael AES audio encryption. This means the WAV file can only be replayed if the encryption key is available.

Hard disk

The number of hours of recording storage depends on the size of the hard disk and compression used. Below is an example for 3 different hard disk sizes:

Storage Capacities

Compression Type	80 Gb HDD	180 Gb HDD	250 Gb HDD
Uncompressed 64Kb/s	2.625	5.906	8.203
ADPCM 32Kb/s	5.250	11.813	16.406
ADPCM 24Kb/s	7.000	15.750	21.875
GSM 13Kb/s	12.727	28.636	39.773
Fast GSM 13Kb/s	12.727	28.636	39.773
True Speech 8.5Kb/s	19.765	44.471	61.765
Speex 8Kb/s	21.000	47.250	65.625
Speex 5.95Kb/s	28.235	63.529	88.235
Speex 3.95Kb/s	42.532	95.696	132.911
Speex 2.15Kb/s	78.140	17.5814	244.186

LIFO/FIFO

In the System Installation - Recorder error notification section of the CyberTech web application it is possible to select FIFO (First In, First Out) or LIFO (Last In, First Out) as Disk Full error handing mode

2.2.4 Long-term storage

The archive service archives the calls to the storage media. Several types of storage media are supported:

DVD Ram

DVD Ram drives are the most commonly used archive media as they are cheap and widely available. Each DVD Ram can store 4.7 GB.

RDX Removable Disk Backup System

HP RDX Removable Disk Cartridges are removable hard disk drive (RHDD) based cartridges that combine the best features of disk and tape storage for recording solutions. The cartridges are available in from 160 GB till 500 GB versions. RDX Drives are back- and forward compatible.

Iomega REV disks

The Iomega REV disks are removable hard disks in a cartridge and offer larger storage capacity than DVD Rams. The cartridges are available in 35 GB and 70 GB versions.

Network Attached Storage (NAS)

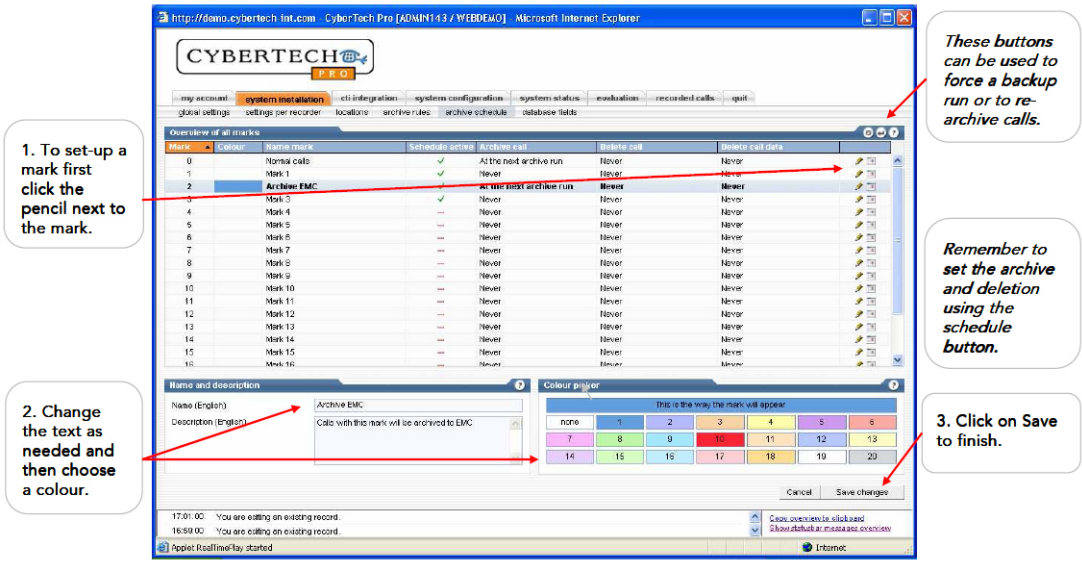
Any disk that can be reached through a drive letter can be used as archive media. This means that any NAS or SAN that can be accessed by the Recording Solution can store the archived calls.

EMC

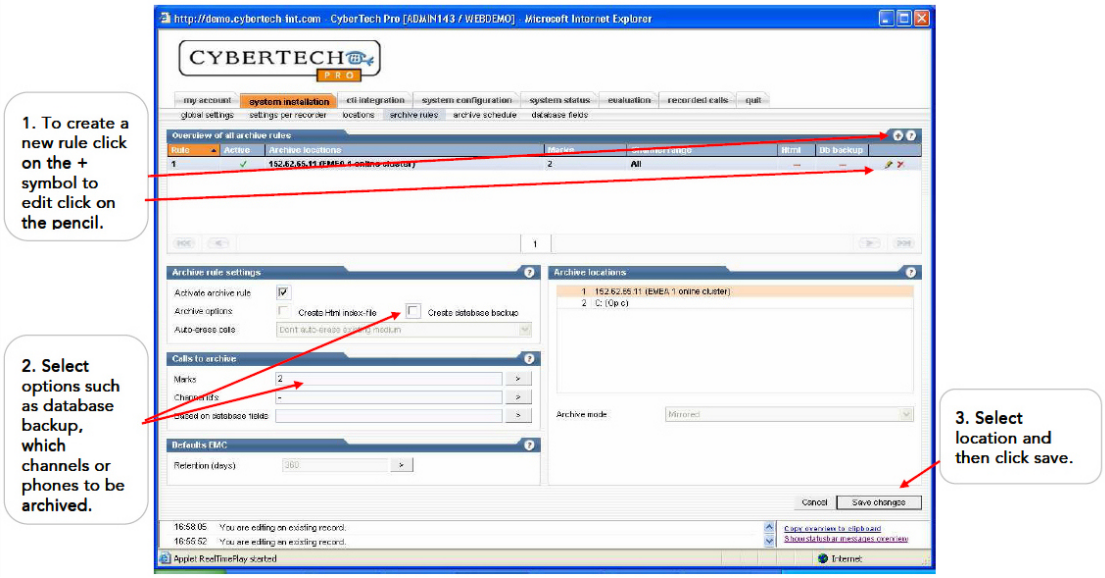
A special form of media is the EMC Centera, this archive media can also be used as archiving media.

2.2.4.1 Archiving Methods

- Marking and Archiving Schedules



- Archiving Rules



2.3 Search

2.3.1 User Interface

The user interface allows the user to control the system and perform search and replay actions. It is browser-based, can use Java scripts and standard MS-Windows modules such as Windows Media Player.

This means that any PC workstation with a network connection to the Recording Solution server can access the recordings. The minimal PC Workstation requirements are that it runs MS Internet Explorer software

The user interface has an easy menu structure, with two main functions:

- System installation: to enable the administrator to configure the system
- Recorded calls: to enable the user to search, replay and analyse recorded calls

Access to the software is restricted by a username/password.

If a user account is configured for a free seating agent, the menu 'Free Seat' is visible and can be selected. The user logs on to the Recording Solution using his user name and password. The recorder will automatically link the user name to the right channel on the recorder. All calls made on this channel while the user is logged on will now contain the correct user name and extension.

When logging on as free seating agent, the IP-address or PC name of the agent PC is matched with the recorder channel configuration. The Recording Solution checks if this IP-address or PC name is linked to one of the free-seating channels. If so, this channel is assigned to the user. All calls on this channel will now contain the user settings for this user.

Current available languages are:

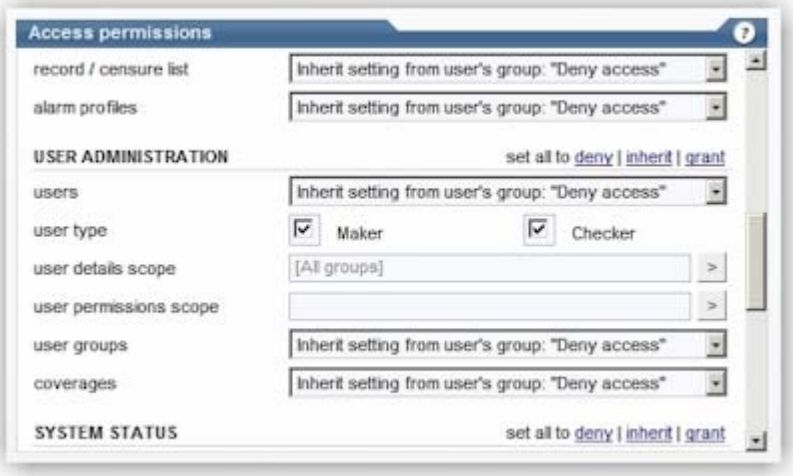
English	Dutch	Italian
Spanish	German	More on request
French	Portuguese	

All labels and field names are stored in a separate language file. Any new language file can be added with the CyberTech 'online translator'. Users can log on via internet to a special Recording Solution with online translating functionality. By retyping the labels, buttons and text-fields on-screen, a new language file can be created. CyberTech can capture this language file and re-distribute it to any installation requiring this new language.

2.3.2 Secure Access

The CyberTech Recording Solutions have the following standard features for secure access and storage.

- Access to the voice recorder browser can be protected by enhanced security features such as unique user IDs, alphanumeric passwords, domain authentication, account lockout mechanism, and will comply with most password polices
- Passwords for the browser are all stored encrypted
- User account overviews can be downloaded for review
- The level of browser and call access is controlled by the permissions given to each individual account
- Calls can be archived to various forms of media including secure network storage
- The system includes two audit trails which allow individual calls and user access to be monitored, as well as more detailed reporting
- IP address of the computer used to access the browser is recorded in the audit trail (Static IP address environments)
- All the calls and data on the recorder server and archive media are encrypted using 256bit AES Encryption.
- Remote administration by CyberTech engineers is based on encrypted communications
- Data and calls stored on the recorder can be deleted after a preset time interval.

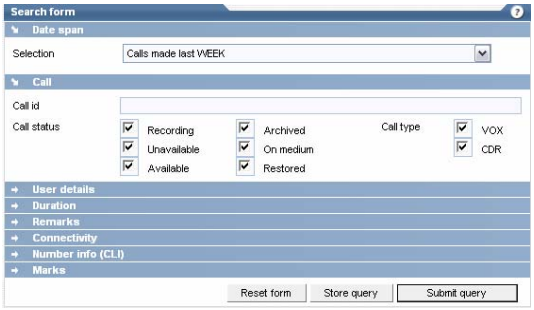


2.3.3 Search for a call

Search form

All recorded calls are stored as WAV files (encryption is optional), and all call data is stored in the MySQL database on the server. The Recorded Call and Evaluation menus search and replay calls and, optionally, allow calls to be evaluated.

The recording server supports web-based search and replay. The associated browser enables the user to enter a number of search criteria which are then used to return a list of matching call records. Users can search the calls database by channel name, the date and time of the call, the caller's number, the dialled number, the call direction and call marks.

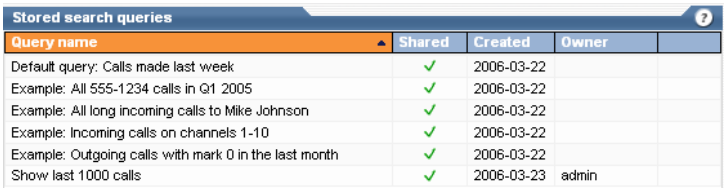


Option	Value
Date span	Date period
Call	Call ID, status and type
User details	User name and criteria to look for
Duration	Duration period
Remarks	Keywords
Connectivity	Channels, extensions, in and/or outgoing calls
Number info (CLI)	Keywords
Marks	Select a mark

Stored search queries

The stored search queries provide an overview of the saved search queries.

By clicking the query for fast call searching is re-run.



The calls which meet the selection criteria appear in the call overview window. The functions that are available depend on the rights given. They may include Listen to call, Add note to call, View notes to call, Remove call, Store call, and E-mail call.

This window shows the results of a query. Select a call to commence playback.

Search results

This window shows the results of a query. Select a call to commence playback.

The audio player enables calls to be played back. This may be through an external speaker, through the sound card on a PC connected to the WAN or LAN or, as an additional option, through a telephone on the desktop.

The audio player has the following options:

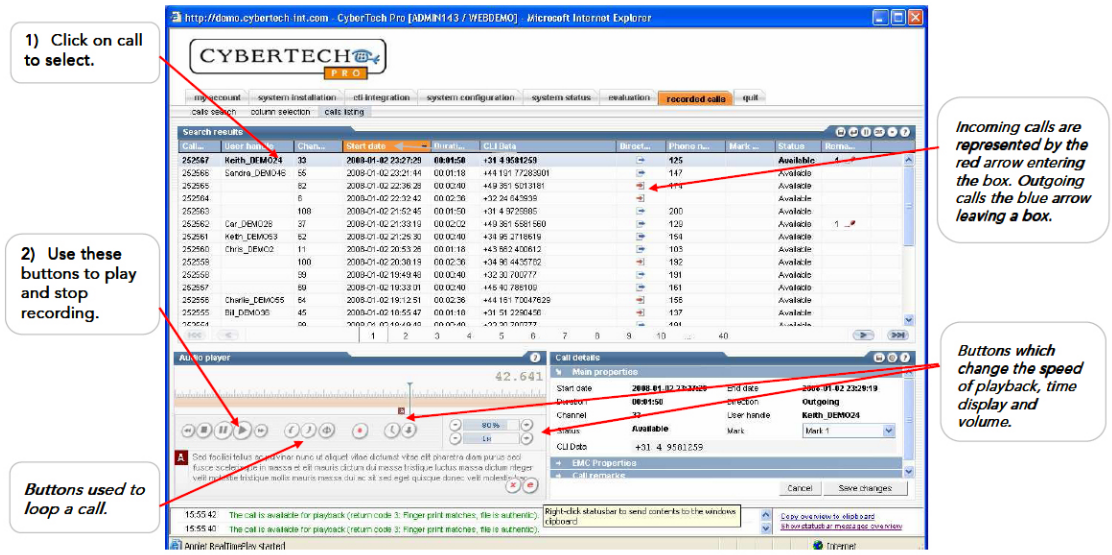
Option
Play / Pause / Stop
Forward / Backward
Set Loop
Add / Edit comments
Change time display format
Set Volume
Set Speed

The playback window illustrates how the user has full control of audio replay, ranging from simply starting and stopping playback to more advanced control such as adjusting playback speed without pitch distortion. The call can also be sent as a .WAV file to a remote location.

The replay application also enables the user to transcribe free text to each of the calls. Any text which has been annotated to the call can then be used as search criteria.

2.3.4 Replay

Web Replay



The standard 'search & replay' features may be supplemented by additional, optional applications which are available through the standard web-based user interface. There are two types of applications:

A. Client applications
B. Module applications

The client applications are 'fat' clients which need to be installed on each workstation that requires the application. Four applications are currently available:

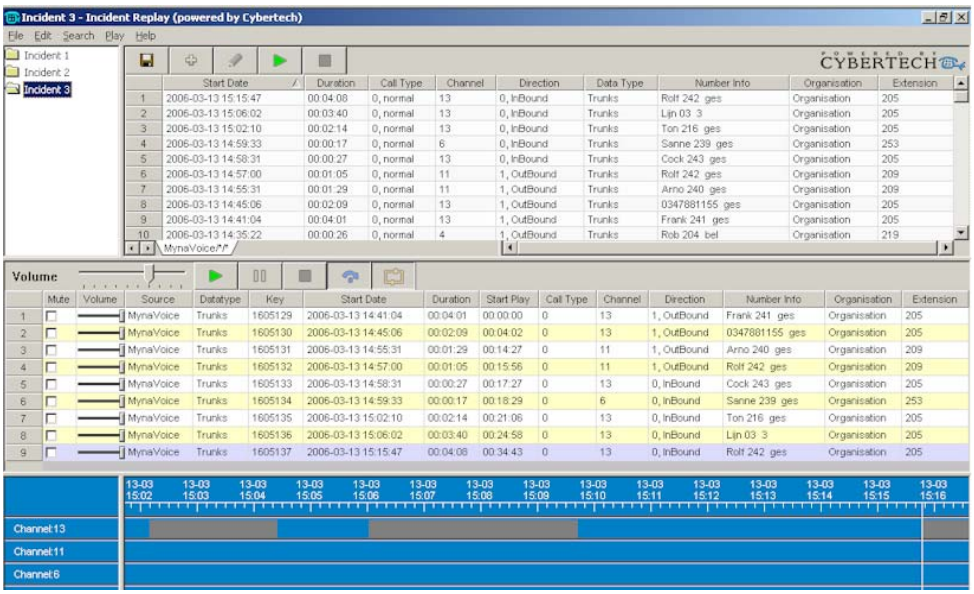
- Incident Replay Application
- PC Replay Application
- Replay to Handset / Reply by Phone
- Evaluation Application (Quality Monitoring)

2.3.5 Incident Replay Application

The Incident Replay Application has been specially developed for the search and replay of digital radio recordings. The Incident Replay Application is an intuitive and easy-to-use application for rapid and accurate incident reconstruction from different audio sources (Radio, PBX, etc.), as captured by the Recording Solution.

The Incident Replay Application satisfies the most common requirement in control rooms for analysing specific emergency situations where the simultaneous replay of all communications is necessary to accurately reconstruct a scenario. Valuable time can be saved in collecting the required evidential information which can then be used to more quickly resolve the incident.

The Incident Replay Application can also be used to analyse operational efficiency by providing a clear overview of how teams operate, helping to improve their interaction. Additionally, Incident Replay is a powerful tool for training new team members by allowing them to easily review real life scenarios.

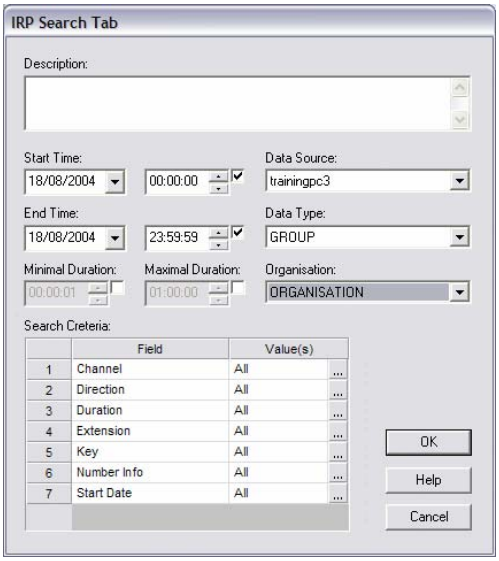


The Incident Replay Application:

- Connects to different data sources at the same time and combines the search results into one scenario.
- Reproduces search and replay in the same window, making it very easy for the end user to search and play directly
- Enables easy replay of complete scenarios
- Is a user friendly application with a familiar 'look and feel' for Windows users
- Has low implementation costs due to its compatibility with standard Recording Solutions
- Can save a complete scenario and write it to DVD or e-mail it. Once saved the calls can be replayed using programs such as Microsoft Media Player.
- Have configurable columns. Name and data type for each column can be changed and columns can be added or removed.
- Has a configurable time line with different colours for each data type
- Can mute selected channels to improve understanding of the way in which events unfolded.

The Incident Replay Application provides a powerful array of search capabilities to enable to retrieve any case easily. Searching a call or a series of calls is easy using the following search criteria:

Option	Value
Description	Select
Start time	Select date en time On/off
Data Source	Select
End time	Select date, time On/off
Data type	Select type
Minimal duration	Select duration On/off
Maximal duration	Select duration On/off
Organisation	Select organisation
Search criteria	• channel • direction • duration • extension • key • number info • start date



By adding the Incident Replay Application to the Recording Solution, incidents can be replayed exactly as they occurred, combining different audio sources into one complete application.

2.3.6 PC Replay Application

The PC Replay Station Application allows users to search and replay calls from an archive location without having a live connection to the Recording Solution. Calls can be retrieved using any PC from all the available archive locations, such as DVD RAM media or a network archive location (NAS/SAN).

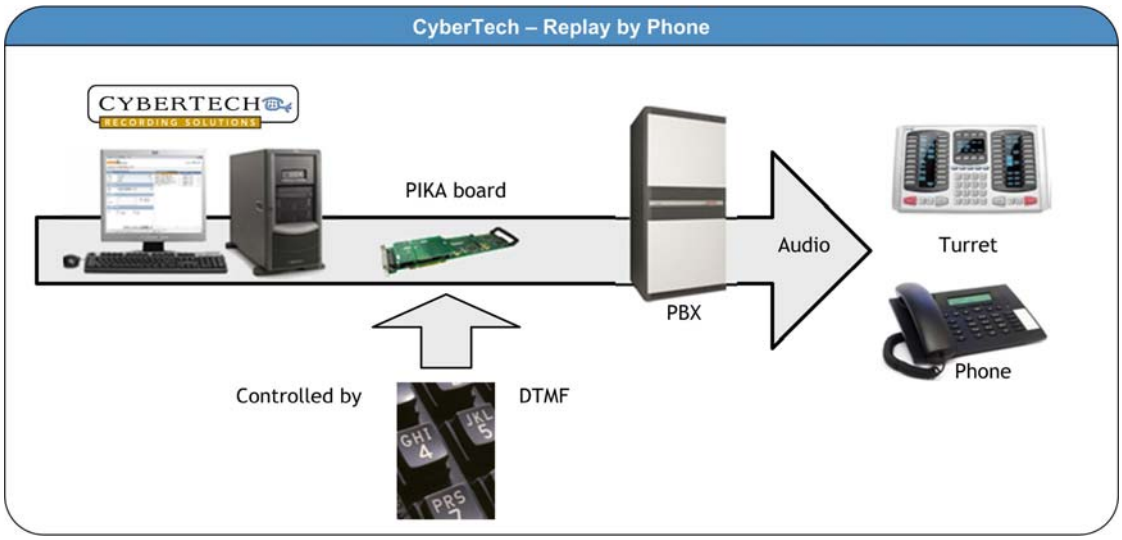
The PC Replay Station Application is compatible with the latest versions of the Recording Solution and uses the standard web browser based graphical user interface. The application can be installed on any standalone PC with the following minimal configuration:

- MS-Windows XP Operating System
- MS-Explorer version 5 or higher

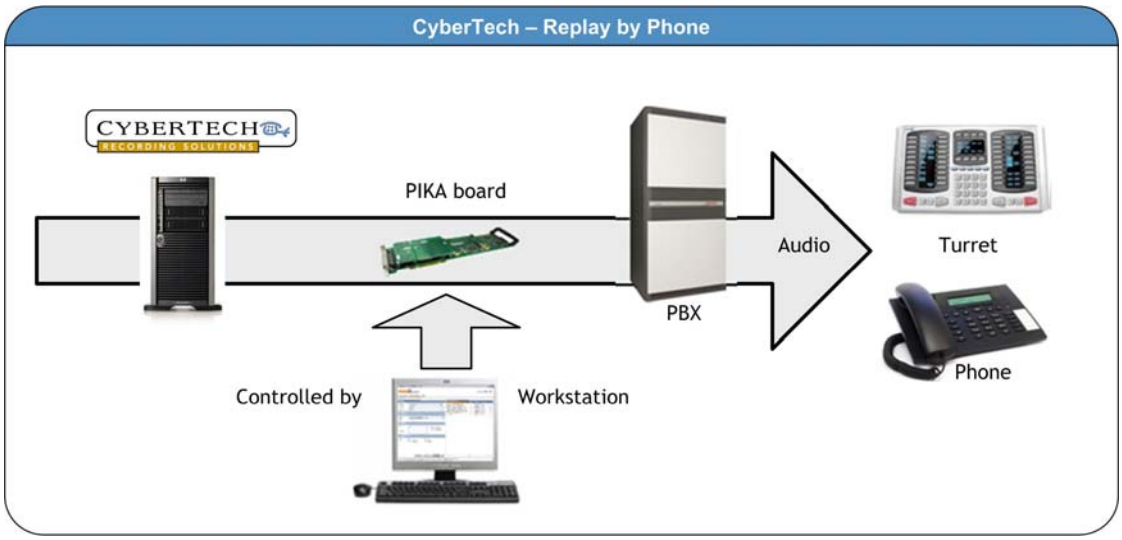
Calls are first imported from the archive media into the PC Replay Station Application database, from where the selected calls can be replayed.

2.3.7 Replay to Handset / Reply by Phone

CyberTech offers the additional "Replay to Handset" and "Reply by Phone" applications, which allow users to send the audio of a replayed call to the handset of a Turret or phone. There are two ways to control the audio:



Replay by Phone: a call can be searched using DTMF buttons on the phone and replayed on the handset.



Replay to Handset: a call can search using the standard Workstation and the audio can be send to a selected handset

In both cases, an additional PIKA board in the Recording Solution is used to stream the audio to the handset.

2.3.8 Recorder API

The CyberTech Recorder API Software Development Kit (SDK) provides System Integrators with a comprehensive set of routines, protocols and tools for building software applications on CyberTech's Recording Solutions. It is designed to enable application developers to access the CyberTech recorder in a conditioned way. The API supports e.g. addition of custom data to call database records and creation of 3rd party search and replay applications.

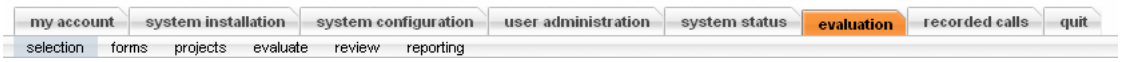
It enables full integration of the CyberTech Recoding Solution application into the customer's IT environment. The CyberTech Recorder API has been implemented as a client/server application. The server component resides on the CyberTech recorder. The connected client components reside on client PC's in the 'recorder network.

The list below shows some of the functions available via the CyberTech Recorder API. The Recorder API reference manual describes all API functions in detail.

Common functions	Retrieving user, channel*, call data information Registering and un-registering of free-seating users Retrieving audio from the recorder
Access to historical data	Powerful and flexible search capabilities Access to all available call data
Modify parts of historical data	Modify parts of the stored information
Real-time functions*	Receiving start and stop events Start/stop recording on demand

2.4 Evaluate

The Evaluation Application is integrated into the web-based search & replay application. Using a separate menu, the calls for evaluation can be selected, evaluated and reviewed. A report module is available for generating individual, group or company reports.



The evaluation application consists of 6 parts:

1. Selection
2. Forms
3. Projects
4. Evaluate
5. Review
6. Reporting

2.4.1 Selection

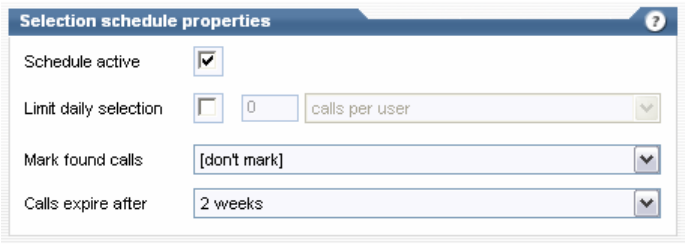
In the selection part, the calls that need to be evaluated are selected from all the recorded calls.

Selection schedule name

Each schedule for selecting calls is given a name.

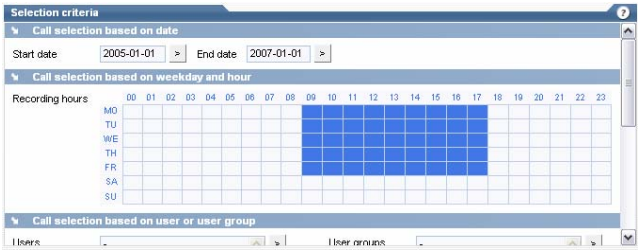
Selection schedule properties

The parameters for selecting the calls can be set using the following configurations:



Selection Criteria

Selection criteria are used for the query of the search. A call selection is based on date, weekday & hour, user or user group, duration, direction, CLI data and mark.



2.4.2 Forms

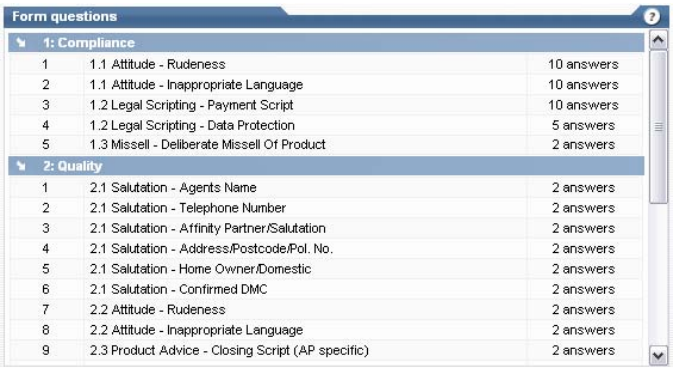
Electronic forms are used to rate the performance of an agent. Each form is made up of a series of sections and questions, with each section and question carrying an individual weighting in the total score.

Form name

Each form is given a name.

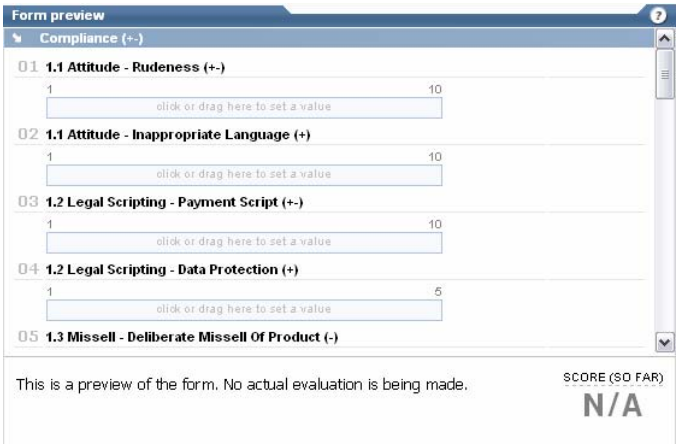
Form questions

The questions are grouped into sections with each question having 2, 5 or 10 possible answers with minimum and maximum values (e.g., using words like Yes/No, Bad/Good or numbers (1...10). There is no limit to the number of questions or sections. Each section and question is weighted in the total score.



Form preview

Each question in the form has a score bar. The score is dragged to the required positions using a mouse. The score is re-calculated each time a question is answered.



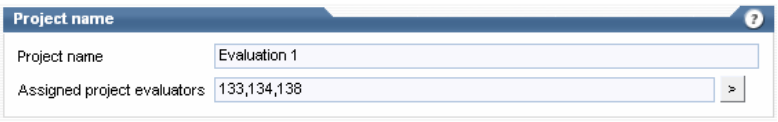
2.4.3 Projects

Each evaluation project consists of three parts:

- The selection schedule
- A form
- The assigned project evaluators

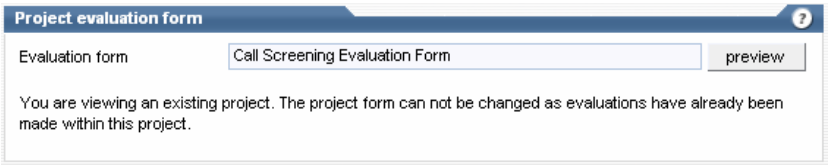
Project name

Each project is given a name. The following options can be configured:



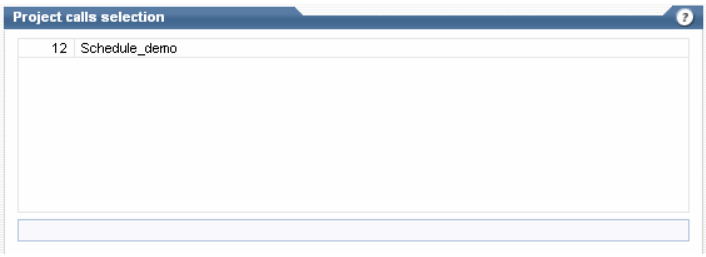
Project evaluation form

Each project is assigned a form. The following options can be configured:



Project calls selection

One or more selection schedules can be assigned to the project.



2.4.4 Evaluate

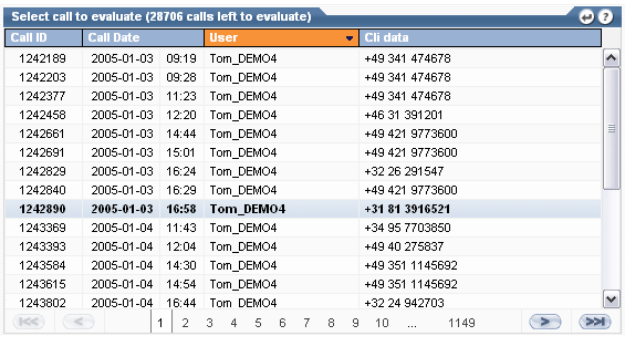
The evaluation starts when an evaluator selects a project that is assigned to them.

Select evaluation project

Here, a project can be selected for evaluation.

Select calls to evaluate

From the list of calls generated by the selection schedule, the evaluator can select a call to evaluate.



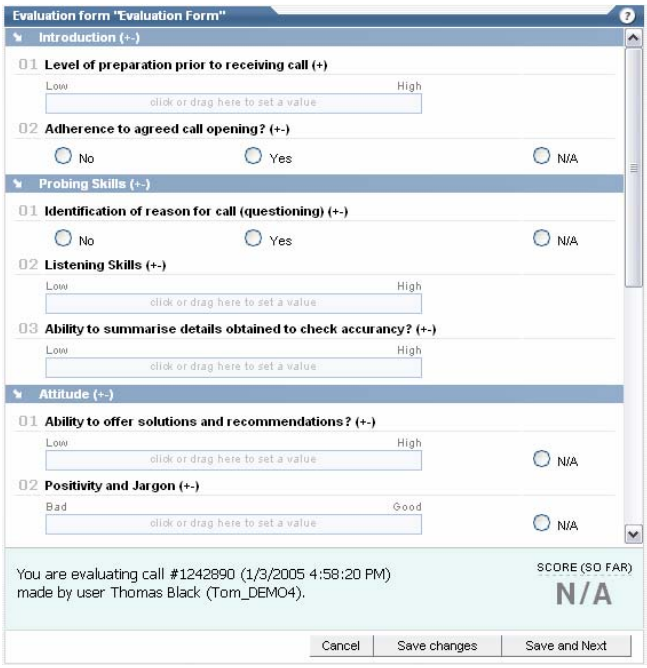
Audio player

When a call is selected for evaluation, the standard integrated audio player will play the call.

Evaluation form

The evaluator can complete the evaluation form while listening to the call. The score is re-calculated automatically after each question.

After completing the form, the data is saved in the database. The next call from the list can then be selected for evaluation.

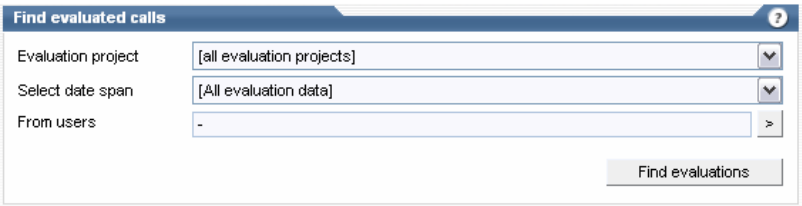


2.4.5 Review

Once the evaluations have completed, the results can be reviewed.

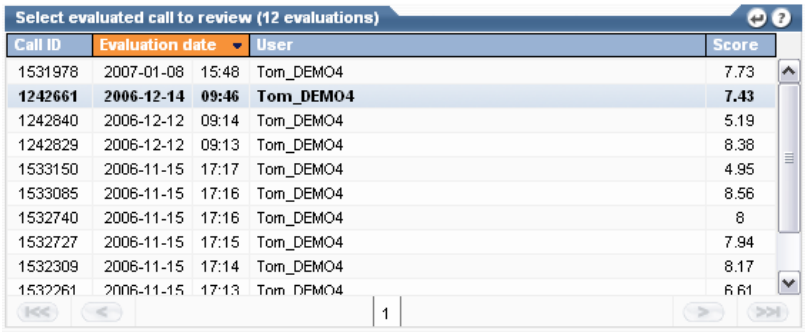
Find evaluated calls

The calls that need to be reviewed after evaluation can be found according to a variety of parameters:



Select evaluated call to review

From the list of calls, a call can be selected for review. Once the call has been selected, it will be replayed using the standard audio player. The evaluation form can also be viewed, but the data in the form can no longer be modified.

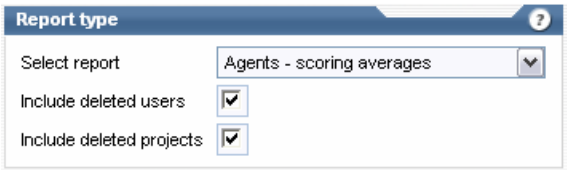


2.4.6 Reporting

A range of reports can be generated using the stored evaluation scores.

Report type

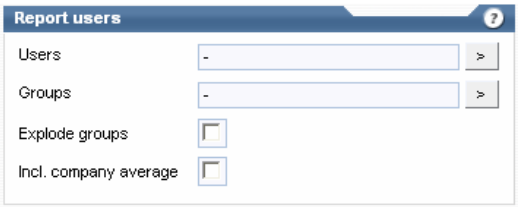
This allows the type of report to be selected:



- Agent – scoring averages
- Group(s) – scoring averages
- Agent(s) compared to Group(s)
- Agent(s) compared to Company Average
- Group(s) compared to Company Average
- Agent(s) and Group(s) compared to Company Average

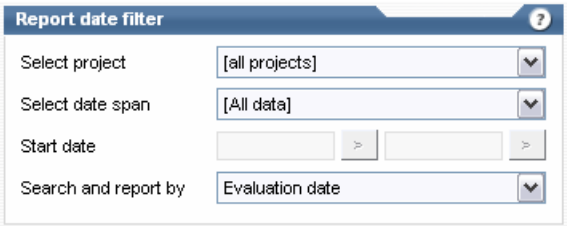
Report users

The users and/or user groups on who the report should be generated can be selected in this section. The following options can be configured:



Report date filter

Reports can be generated for a specific project or data span. The following options can be configured:



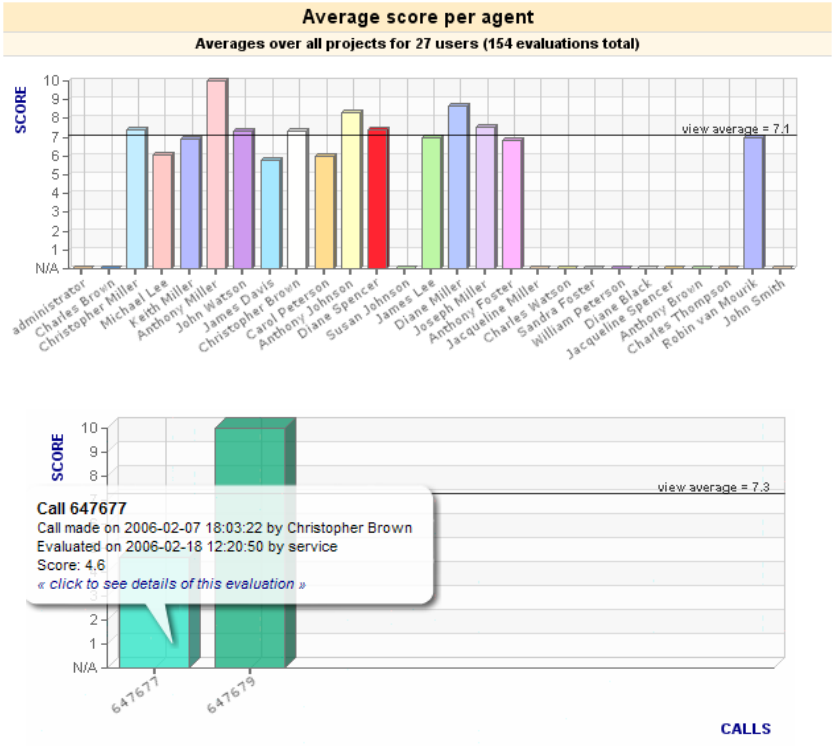
Report options

An optional feature displays the report data. The following options can be configured:

Evaluation report

Once the parameters have been set, a report can be generated.

By hovering over a bar on the graph, more details will appear. Clicking on a bar will 'zoom in' on the specific results and generate a new graph:



2.5 Analyse

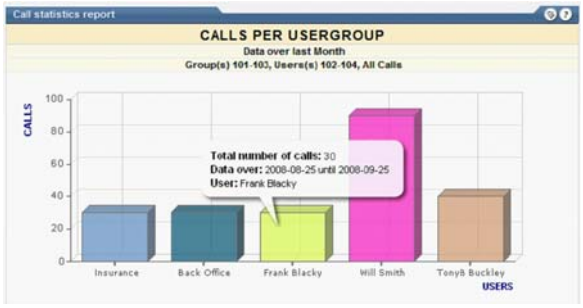
2.5.1 Call Statistics

CyberTech Recording Solutions can also generate statistical reports using the data stored about the recorded calls. These statistics can be used to measure the efficiency of the organization and the utilization of the recording system.
The Call Statistics feature generates reports for:

- **Administrators**: about utilization of the recording system, e.g. usage of channels and resources.
- **Managers**: regarding the number of calls and average call length per user or user group.
- **Supervisors:** by combining use of Evaluation Reports, supervisors of call centers can assess both the efficiency and quality of agents.

To generate a report, parameters can be set, such as date span (max. 1 month back), user or channel groups, or one specific channel or user. Four types of report are available: Utilisation, Number of Calls, Average Call Length, and Hours on Call.
The Call Statistics feature offers call reporting functionality on recorded calls. It enables generation of a variety of reports on the recorded calls channel occupation. Each report has a drill down function that allows users to click on an area of the bar graph for a more specific report.
Features of Call Statistics are:

- Easy to use – a combination of pre-defined reports, in addition to flexible parameters, enable many different report types.
- Cost effective – all data of recorded calls are already available in the recording solution; no external call statistics application is necessary.
- Total picture – In combination with the Evaluation feature (Quality Monitoring), the Call Statistics application offers information on call quantity and duration; a total picture of call can be generated.
- Integrated – Call Statistics is an integrated, free-of-charge application feature.

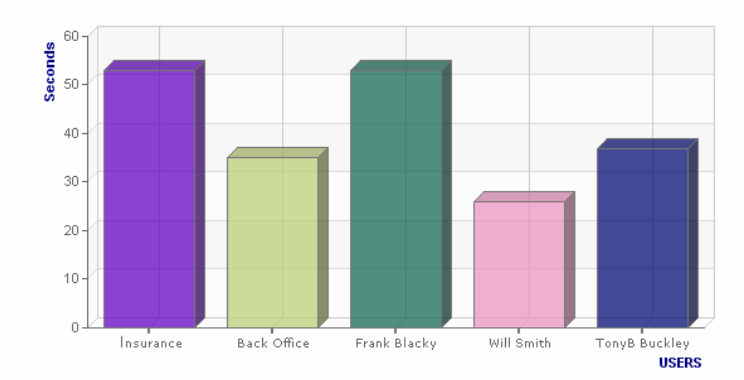


Report types are:

- Percentage utilization
- Call volume
- Average call length
- Hours on call

A variety of parameters can be set to define the report output. A report can be based on users or on channels. From this choice, a number of individual users or channels can be selected.

A report filter defines the reporting date span and defines a filter on call direction to be included in the report.
Optionally, report data can be added to the graphical report output. A table may be added to the report with select values defining each reporting bar. It can be exported to an external application.



By using the **drill down** reporting feature, reports can be reviewed, and the source of low or irregular results can be found in just a few mouse clicks. In each newly generated report, the Go Back button allows the user to return to the previous report. Additional details such as the reporting interval and user information are shown when the mouse is hovered over a specific reporting bar.

Example:

For call statistics reporting based on the *average call length* per user group/channel group, the first report will show the average call length *per user group/channel group* calculated over the reporting time span. From the initial report, three drilldown reports can be made:

By clicking on bar, a new report is generated displaying the details for this specific bar. The drill down report shows the average call length for the *specific users/channels* over the reporting time span. Per user/channel, a separate bar is shown.

By clicking again on a bar, a new drilldown report is generated displaying the details for this specific bar. In this case zooming in on a user/channel displays the average call length *per day.*

By clicking again on a bar, a new drilldown report is generated, in this example the average call length, for the specific user/channel, *per hour*.

3. Technology Partners

CyberTech products are developed together, and have integrations with strategic technology partners such as:

3.1 Avaya

The CyberTech Solutions are compliant with the Intelligent Communications solutions from Avaya. The applications are compliance-tested by the Avaya Solution Interoperability and Test Lab for compatibility with the Avaya Communication Manager.

CyberTech is a Gold member of the Avaya DeveloperConnection Program—an initiative to develop, market and sell innovative third-party products that interoperate with Avaya technology and extend the value of a company's investment in its network.

The CyberTech Recording Solutions are tested and certified by Avaya for the platforms:

- Avaya Communication Manager 5.1 (Certification)
- Avaya Aura CM 5.2 (Certification)

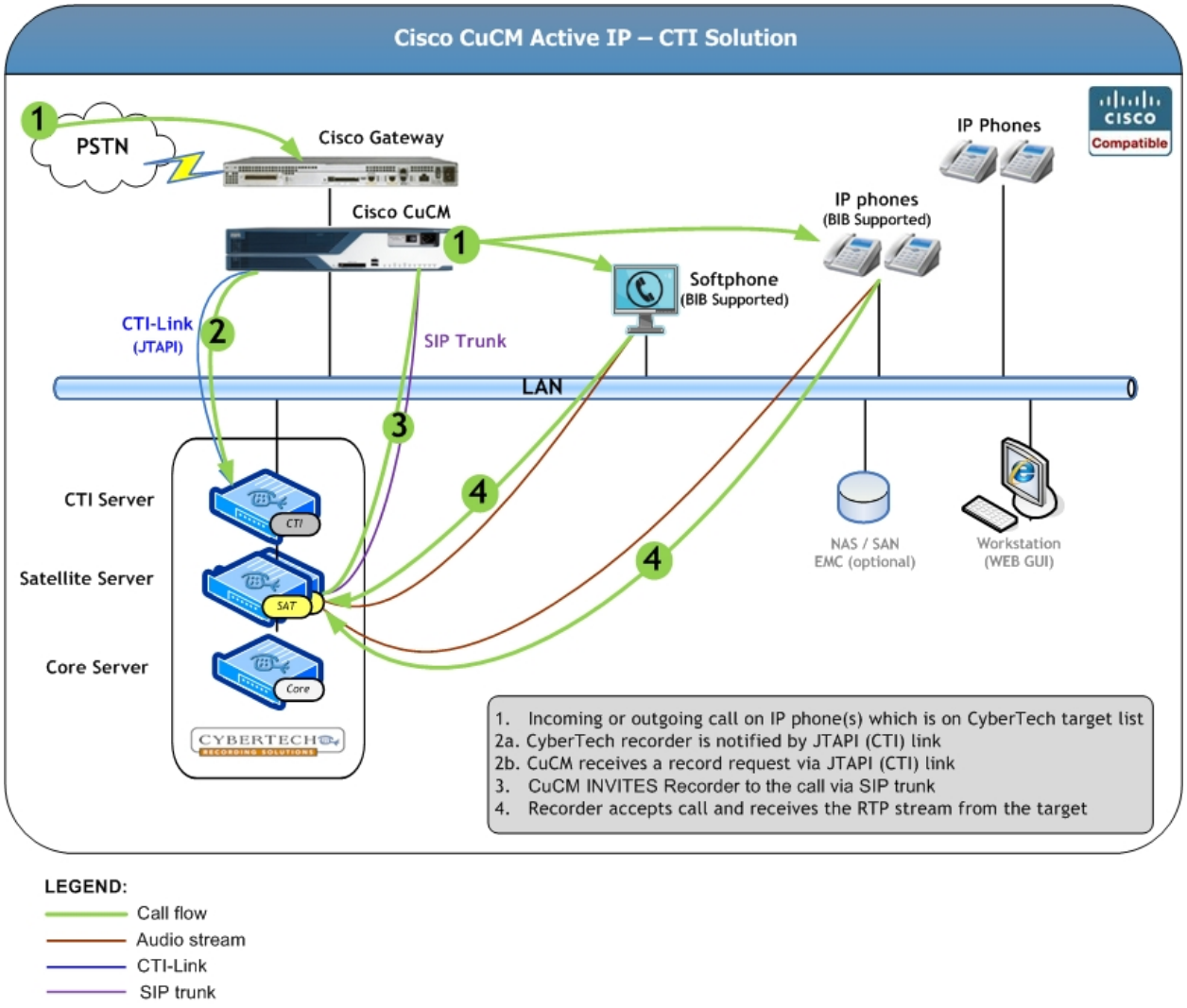
3.2 Cisco

CyberTech offers several Cisco VoIP recording methods. Each method 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.

CyberTech is a member of the Cisco Technology Developer program. As a members of this Program we enhance and unite the comprehensive Cisco technology portfolio with Voice Recording products that feature verified interoperability. As a member of this Program we share Cisco's strong commitment to customer service.

The Voice Recording Solutions and Tapping Cards from CyberTech are tested and certified by Cisco. This means the CyberTech products are labelled 'Cisco Compatible'.

- Cisco Certificate for CUCM 7
- Cisco Certificate for CUCM 6
- Cisco Certificate for Active IP recording



3.3 BT

The CyberTech Recording Solutions have been approved for British Telecom (BT) interconnection as a result of successful and exhaustive testing. The certification enables CyberTech to connect to the carrier's ITS trading room system, one of the industry's leaders in trading room system platforms worldwide.

The ITS voice trading platform from BT Global Financial Services (GFS) supports voice, video, IM, e-mail and other applications across a range of devices and protocols. It is used by more than 60,000 traders in 51 countries across 800 customer sites. As a result of the certification, CyberTech can extend to customers its award winning and open digital recording platform into that of BT, a globally leading system specifically designed to meet the soaring expectations of financial industry users.

The certification has been done for the:

- BT ITS Trading System: ITSlink Application Server 4v6

3.4 IPC

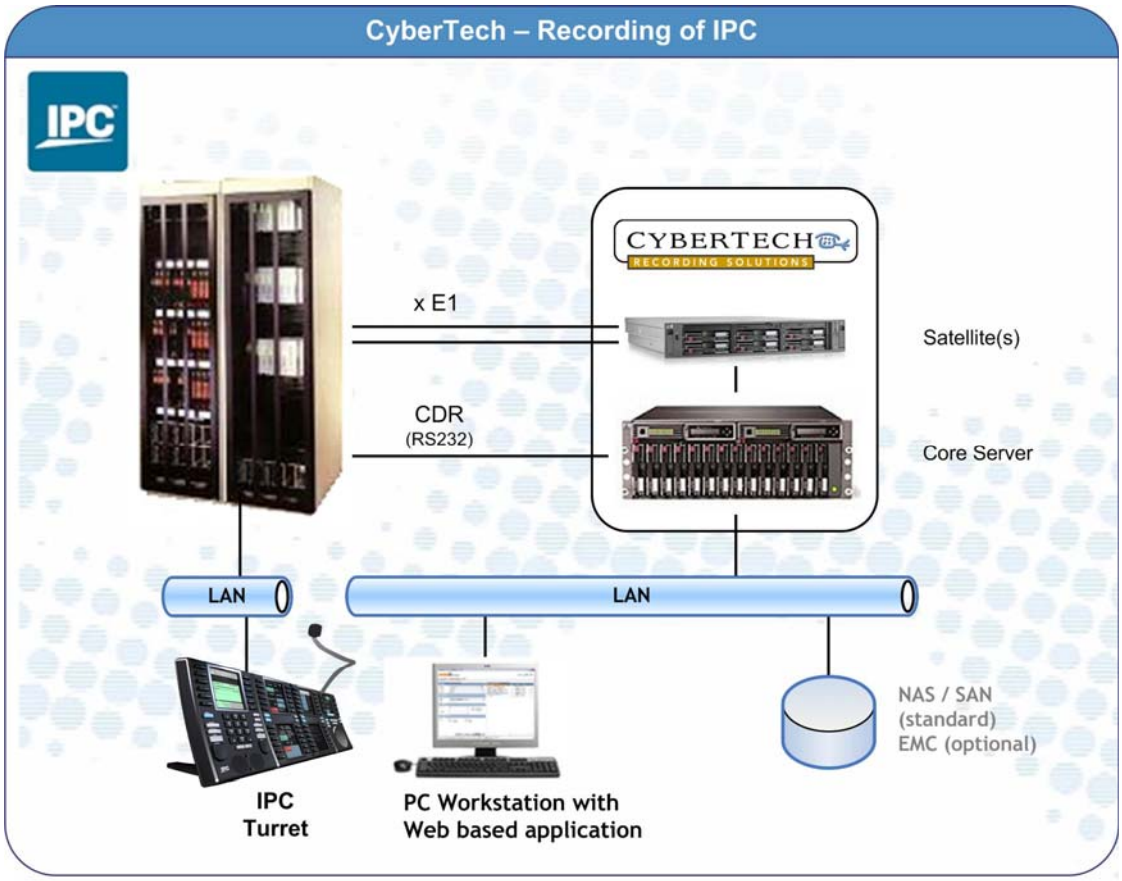
The CyberTech Recording Solutions have integration with the IPC trading platform.

IPC Systems, Inc. is a leading provider of communications solutions to financial services firms worldwide. IPC offers customers a suite of products and enhanced services that includes advanced Voice over Internet Protocol (VoIP) technology, and integrated network and management services to more than 40 countries.

For recording of the IPC Alliance MX™ the audio is recorded at the PCM30 trunks via VOX, and stored in the CyberTech calls database. The additional CDR information about calls is also stored in the database. Using the CyberTech application the CDR information is shown, and using this information, calls can easily be selected for replay.

The CDR link with the IPC Alliance MX provides the following additional call information:

- Date & Time
- Trader ID
- Station Iac
- Line Iac
- CLI information

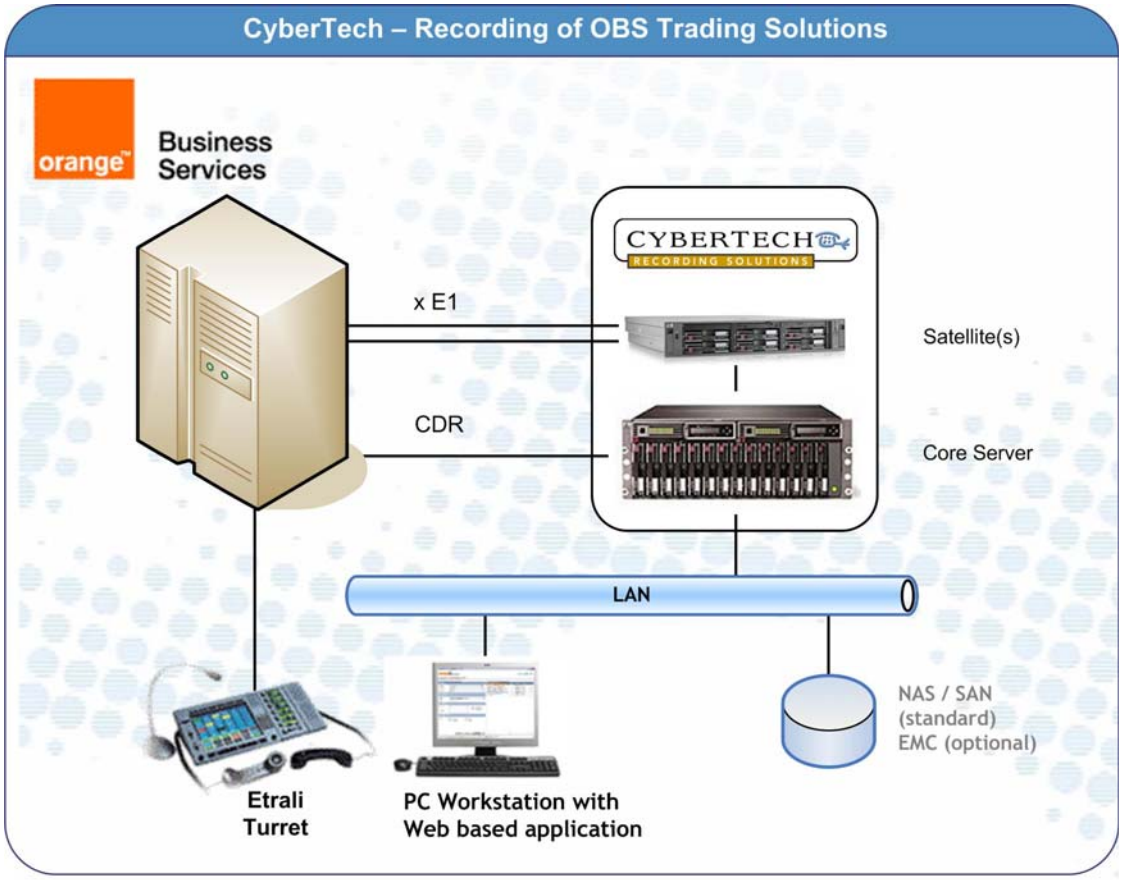


3.5 OBS

The CyberTech Recording Solutions are certified by Orange Business Services – Trading Solutions for the recording of the Etrali Voice Platforms (Etradeal).

Recording of Etrali Trading Solutions can be done for a max. 64 channels in a stand alone configuration (Myracle), or for thousands of channels in a Server/Satellite configuration (Pro). In a stand-alone configuration, the CDR integration can be done in the same chassis. For recording of more than 64 channels, an additional CTI server chassis is used.

The integration is compatible with CDR connection version 33 or newer, and uses the "SIM 709 card" (connect to SIM 622 box) and "SIM 622 box" (serial connection).



4. Maintenance Services

4.1 Introduction

CyberTech recognises that every Customer is different in terms of organisation and requirements concerning the support and maintenance of its critical systems.

CyberTech Maintenance Services allow for flexibility in the extend to which Services are required and the level of cooperation between CyberTech and the Customer.

In the next paragraph Services required are described with different service levels

The degree of CyberTech's required involvement in the Maintenance Services depends upon the type of Service and the Customer's level of knowledge. CyberTech strongly believes that end-users should be supported by their own organisation for usage-related questions (Helpdesk) and user-management (System Administration), since these functions require detailed knowledge of the operational processes within the end-user organisation. For on-site activities, a Customer can decide to undertake all activities themselves when they have a highly trained I(C)T department or to outsource to CyberTech.

Based on a discussion the required levels of Services and required CyberTech involvement needs to be specified.

4.2 Maintenance Services

CyberTech can offer the following Maintenance Services

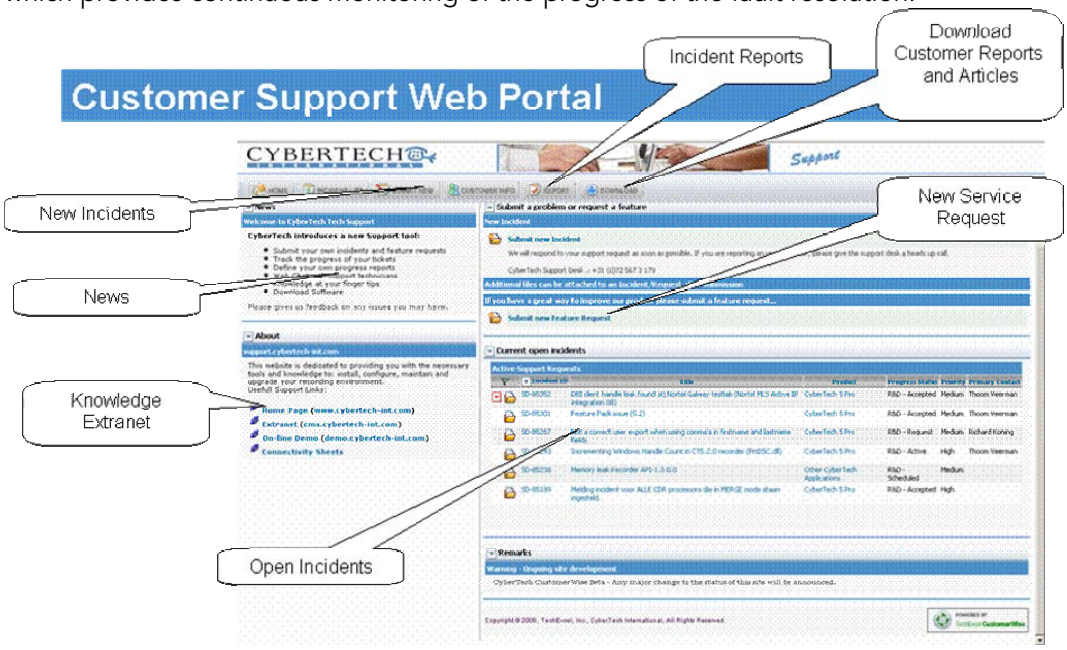
1. CyberTech Support Desk
2. On-site Support
3. Board Repair and Spare Parts Holding
4. Active Remote Monitoring (only in combination with the CSD)
5. Reporting and Trends Analyses (only in combination with the CSD)
6. Preventative Maintenance
7. Training
8. Software Support

4.2.1 CyberTech Support Desk

The CyberTech Support Desk (CSD) is the single point of access for all support questions. It can actively monitor the installed base, resolve all technical issues and provide answers to questions. Incidents can be triggered via multiple channels:

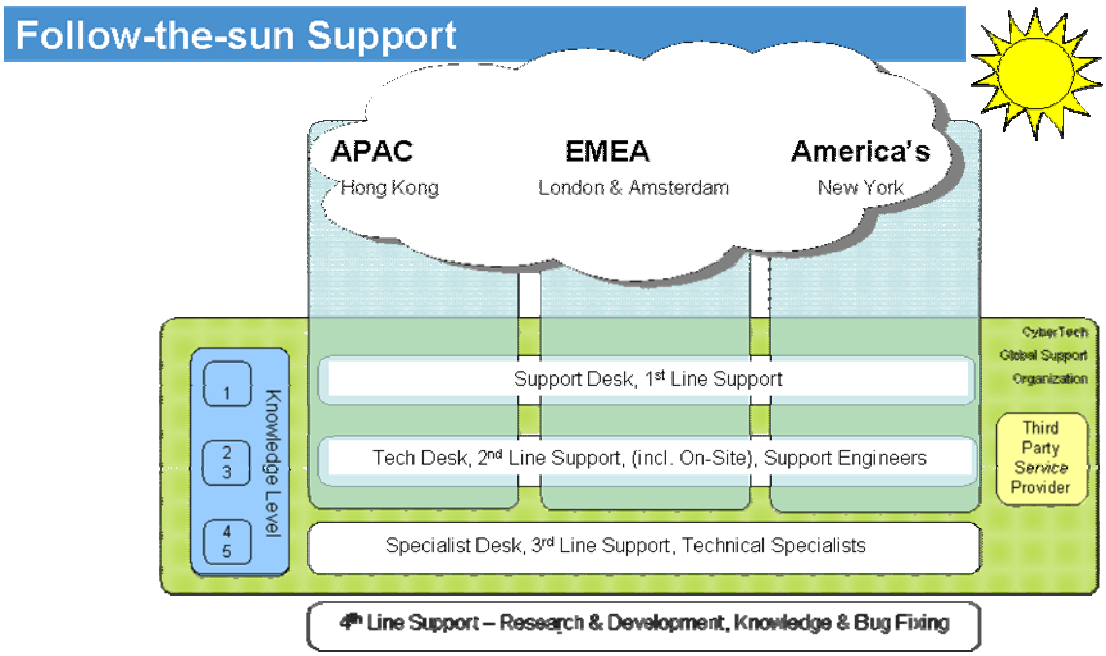
- **Remote monitoring tool** (see description of Active Remote Monitoring)
- **Website**
  By filling-out and issuing an Incident report form on the Customer specific support Website of CyberTech.
- **E-mail** (dedicated support email address).
- **Telephone** (dedicated support number)

All reported Incidents are entered into a central database and are given a unique support ticket number. All activities undertaken to resolve an issue are entered into the database, which provides continuous monitoring of the progress of the fault resolution.



To support this process, management reports can be produced on the key performance indicators and/or agreed Service Levels.

The CSD is available either during (Dutch) Working Hours or 24h a day, 7days a week through follow the sun principle.



The CSD is bound by a Reaction Time, which is typically one (Business) hour.

If the reported problems are due to software abnormalities, the CSD will involve and monitor the actions of CyberTech's R&D department in the diagnosis and resolution of the fault and issue a Service Pack or Hot-Fix. The CSD will validate whether the Service Pack or Hot-Fix resolves the Incident.

4.2.2 On-Site Support

With modern systems, most of the support activities can be provided remotely. However, in the case of hardware failures or high-impact software updates/upgrades an engineer has to go on-site to restore the voice recording service.

CyberTech can, under its sole responsibility, deploy its global distribution network and/or CyberTech subsidiaries to undertake any contracted on-site activities.

Various options are available in terms of Response Time. When CyberTech has control over the full service process, CyberTech can warrant a Restore Time for hardware failures. This is warranted under the assumption that the organization's 1st and/or 2nd line support team provides CyberTech with all relevant configuration information and undertakes all necessary system administration tasks, such as back-up procedures.

4.2.3 Board Repair & Spare Parts Services

Board Repair is a generic service available to Customers, which is offered with a few variants, namely:

- Board Repair
- Spare Parts Holding

Board Repair

During the warranty period, CyberTech will repair 'defective hardware' which is sent to CyberTech by the Customer according to the CyberTech standard RMA procedure. CyberTech will return the repaired or replacement part, within a turn around time (TAT) of typically 15 Working Days. Additionally an extended hardware warranty can be ordered for a maximum period of 4 years from the moment of delivery.

When the Customer requires a fixed TAT for the repair or replacement of defective components, CyberTech can provide a TAT "Next Business Day". This time starts at the moment of receipt of the component by CyberTech. CyberTech will issue a monthly report on the board repair activities, including Service Levels.

Spare Parts Holding

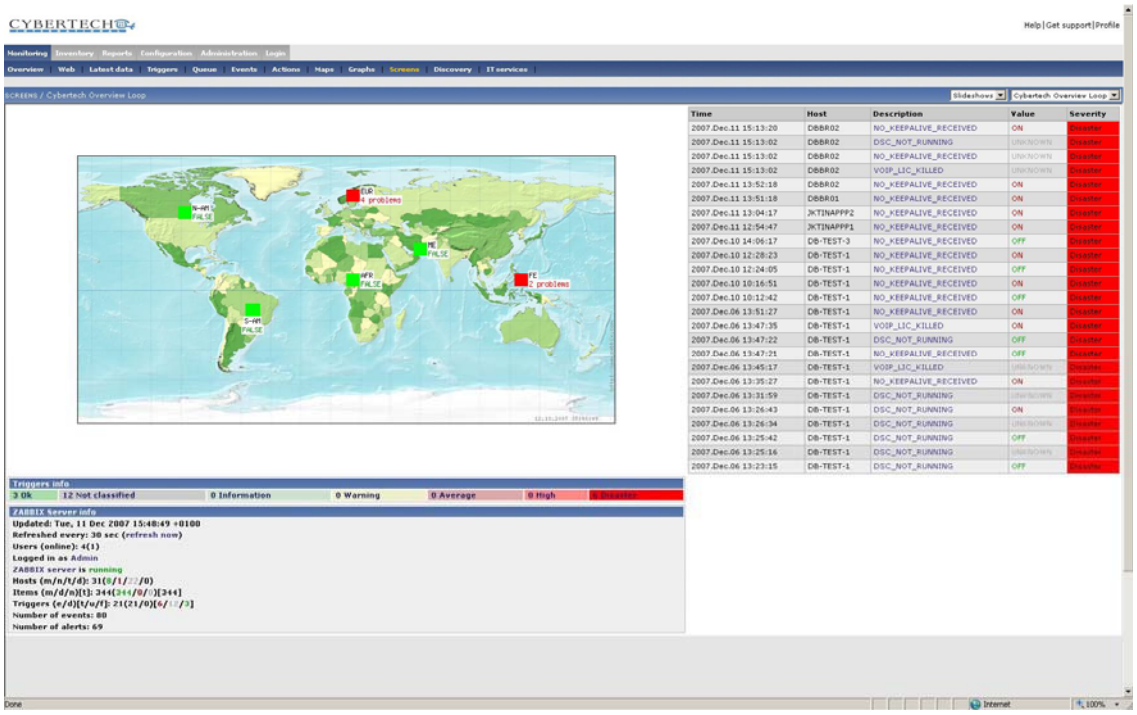
CyberTech can maintain a Spare Parts Holding at a location to be determined by CyberTech. Board Repair Next Business Day is automatically included to ensure replenishment of spare parts. This can only be ordered in situations where CyberTech has been contracted to supply On-site Support

4.2.4 Active Remote Monitoring

If Active Remote Monitoring (ARM) is ordered, the CSD actively monitors recording systems in real time by means of central reactive processing of alarms (SNMP or email). When an alarm is received, CyberTech diagnoses the cause and, if required to, resolves the issue either via a remote access link or via a secure VPN/"dial-in". If a problem cannot be resolved remotely, the CSD will initiate the dispatch of an engineer to site. Also regular system health checks (free of charge) and reports are included

For ARM remote access via a secure connection is required, which allows CyberTech to access the monitored systems. This connections, should at least provide the following services:

1. Remote Desktop Protocol (RDP)
2. Secure File Transfer Protocol (SFTP) and
3. Simple Network Management Protocol (SNMP) Trap Forwarding.



Example of the Remote Monitoring Tool in the CyberTech Support Desk

4.2.5 Reporting and Analysis

The Reporting and Analysis service provides a detailed monthly report on recording system uptime, failures, response time, time to fix, etc. The reports can be sent by email or posted on a dedicated (closed-user) Customer website. Additionally, via this website the following information can be made available:

- New Releases
- Support information, service packs, feature packs, etc.;
- Frequently Asked Questions (FAQ);
- Ordering information / Ordering facility;
- User 'interactive' session;
- Service Level Reporting

If this option is ordered in combination with Active Remote Monitoring, CyberTech will also undertake (technical) configuration management, which, amongst other things, includes Capacity Management reporting i.e. the number of available (not-connected) recording channels per site. In addition, further integration of Customers' management information systems can be investigated and implemented at an additional charge.

4.2.6 Preventative Maintenance

Preventative Maintenance is intended to prevent any failure from happening and includes regular full checks of the operational system, including, but not limited to:

- Full check of the configuration (software and firmware check, settings, etc.),
- Full system health check (hard disk / memory usage, etc.)
- Check on replacing unserviceable parts, cleaning, etc. (if applicable)
- Visual equipment- and environmental check (if applicable).

A preventative maintenance check is typically performed once a year and will result in a Preventative Maintenance report being delivered to the Customer, which highlights the status, any adjustments made (in configuration and/or replacements made) and suggestions for further action.

It is noted that typically the CyberTech Recording Solution runs on COTS equipment provided and maintained by the Customer, in which case this equipment is the responsibility of the Customer. However, if remote access is available, this equipment may be monitored remotely. In situations where Active Remote Monitoring has been ordered, CyberTech will include monitoring the COTS equipment in this service.

If a software support package has been order in the absence of remote access facilities, service packs and/or feature packs will be installed during a preventative maintenance visit.

4.2.7 Training

CyberTech provides training for users, administrator and (On-site) engineers. CyberTech has an engineer certification program for On-site engineers, which is mandatory in all situation where either CyberTech employs a third party for the On-site support and/or in all situation where a third party undertakes the On-site support activities. All training can be provided at the CyberTech premises, on site or remotely (via a net meeting). Pricing is included in the CyberTech Pricelist.

Certification Program

At least once per year CyberTech will provide a three day engineer certification program in Alkmaar, The Netherlands. This program is dedicated to initial certification of 'on-site' engineers.

In addition CyberTech will provide yearly a single day re-certification training course that can be attended in person or via the web. This course is mandatory for all certified engineers to re-validate their certification. Certification expires when an engineer has not attended (re-)certification training for 2 successive years. Engineers who successfully completed the (re-)certification program will receive a certificate.

CyberTech maintains a database of all certified engineers.

4.2.8 Software Support

A substantial part of functionality of the voice recording system is provided by the CyberTech software (this includes the Recording Application software and the Parrot-DSC ("Recording Card") firmware. Although the development process is geared to minimise the number of issues in the field, software issue might occur. Additionally, since CyberTech is continuously innovating its product, new versions of the software will be released periodically.

CyberTech has a proven methodology to support its systems in terms of software support. From this process new versions of soft- and/or firmware will become available in different manners, namely:

- Hot Fixes
- Service Packs
- Feature Packs
- New Releases.

Hot Fixes

When it becomes manifest that there is a critical problem in the software which needs immediate correction, the fix of the problem is released as a Hot Fix. Of its nature, a Hot Fix is an unplanned and temporary solution to the problem, and it is only installed on sites which are susceptible to the critical problem, e.g. due to the specific system configuration. The formal release of the Hot Fix is within a Service Pack and/or Feature Pack.

Service Packs

In order to reduce the number of system interventions, CyberTech combines solutions to non-critical problems into a Service Pack. The periodicity of Service Packs is determined by the number and classification of the reported and resolved problems. Service Packs are incremental, meaning that a new service pack contains all previous Service and Feature Packs

of the same release of software. Installing Service Packs will ensure that Customers have the latest version of software for the Release used.

Feature Packs

Once or twice a year a Feature Pack for the current CyberTech Recording Solution software release is issued. These Feature Packs may include new features, but also fixes for bugs and additional enhancements to the system. Feature Packs are incremental, meaning that a new Feature Pack contains all previous Service and Feature Packs of the same release of software. Installing Feature Packs will ensure that Customers have the latest version of software for the particular Release used.

Software Releases

CyberTech defines a roadmap for the development of new features in the CyberTech Recording Solution. Also it may provide support for newly introduced operating system platforms, e.g. Windows Server 2006, This generally results in a new Release of the software once a year. Typically, a new Release incorporates enhancement to the general software, similar to the Service- and Feature Packs described earlier. However, new Releases will contain new features; these new features may be licensed with a license-key and charged for separately. The Release Note for software releases will state which new features are optional and priced separately. Installing new Releases will ensure that Customers have the latest version of the software and that their system supports all the latest new features.

N-1 Software Support Policy

CyberTech supports the current (latest) software Release, and the previous software Release. This N-1 support policy means that end-Customers have to upgrade in general at least once every two years to maintain their current level of support.

In the event of a version of the Software being replaced by a new version (N), CyberTech will continue to provide maintenance and support services for the previous (N-1) version for a maximum of two (2) years after the upgrade to the new version. After this period, CyberTech may require a Customer to upgrade to the new version (N) prior to providing any additional maintenance and support services.

Customer (Certification) Testing & Microsoft (patch) Testing

Every customer environment is different, both in terms of COTS environment (OS hardening) and/or version/implementation of PABX/trading system. Typically to prevent any problems in the operational systems a test/lab environment in which all new version of software are tested in accordance with a pre-agreed test plan.

In addition to any special arrangement between the Customer and CyberTech, CyberTech maintains a bi-weekly test cycle of all OS (Microsoft) patches, which are published to all Customers.

Test Lab

CyberTech maintains a full test environment for its products. The test lab is used for the development of new releases, but is also used for fault diagnoses by the support department. As the test lab contains the majority of the PABXs and trading systems supported by the CyberTech Recording Solutions, a representative test environment can be quickly set-up to investigate Incidents. Combined with the replay facilities provided in the recorder, the majority of in-field circumstances can be simulated. In this way a swift response to incidents can often be provided without actually going on-site.

CyberTech provides three levels of software support:

- Software Warranty
- Software Maintenance
- Software Assurance

Software Warranty

During the warranty period CyberTech warrants that the Software will materially meet the contents of its specifications and product documentation. If a software defect becomes apparent, CyberTech will provide the Customer with either a Hot-Fix, Service Pack and/or Feature Pack. It is assumed that the Customer will install the solution.

Software Maintenance

With Software Maintenance, the Customer will have access to all Hot-Fixes, Service Packs and Feature Packs. Additionally, CyberTech will respond to reports of Software bugs.

When Software Maintenance is ordered, CyberTech will install the Hot-fixes, Feature Pack and Service Packs on the various systems, either by remote access or locally on-site.

Software Assurance

The highest level of Software support is provided by Software Assurance, which warrants that the system is always on the latest Release. This package also includes the Software Maintenance arrangement.

For clarity the following items are not included in Software Assurance and will have to be ordered separately by the Customer:

- any additional licensed new features in a Release;
- the labour cost for installation of a new Release. This is not included because of the potential impact of the new functionality that it introduces;
- sometimes upgrading to a new software Release may also require a hardware (e.g. more processor power) or system platform upgrade (e.g. Microsoft Windows 2000 to Windows 2003).