

Mobile Call Recording

A safe haven for telephone calls, SMSs, MMSs



Preface

Around the world, the obligation of financial institutions to record telephone calls and text messages such as SMS, MMS, Email, etc. of their advisory staff involved in finance and trading is being extended to also include mobile networks. Moreover, network operators can offer the technical means for the banking industry to comply with their legal obligation to record both mobile phone calls and SMS, MMS and Email messages and thus open up an opportunity to implement and gain revenue from for a completely new range of services.

The CreaLog MCR solution records calls originating or terminating in mobile networks, stores them in a secure encrypted way, and provides a player for the recorded files. Optionally, SMS/MMS messages can be stored and managed as well as recording calls coming from landline networks or third party software.

The CreaLog solution meets all the technical and legal requirements of MiFID II. This European financial market directive states that from 1st January 2018 on, all telephone calls where orders are placed by investors to buy or sell financial instruments must be recorded and archived for a period of five years.

The recording platform encrypts calls on the fly while they are recorded along with their meta data using the public/private key principle. The associated private key is solely in possession of the customer – a security trader, for instance. On site, only authorized persons have access and can decrypt their fellow workers' data. Neither the telecommunications provider nor CreaLog can decrypt this data itself. Decryption follows the four-eyes principle in every case – so data privacy is observed to the highest degree.

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Executive Summary

With Mobile Call Recording, CreaLog has been the first supplier to implement, and successfully operate in practice, secure mobile call recording as required by legal provisions. This solution enables financial institutes to record and retain mobile telephone calls as well as SMS and MMS messages and all relevant call information in encrypted form, making use of a network feature right inside the mobile network supplier's secure data center. All internal and external calls of this kind need to be recorded in Switzerland since early 2015. Therefore, more than 40 financial institutes have already opted for this solution, within a short period of time since it was launched.

Mobile Call Recording provides the technological means for network operators and service providers to be able to offer their customers new, profitable services. To use such a service, Banks or organizations from other business sectors only have to register the mobile telephone numbers of those staff members with their network operator whose customer calls need to be recorded. These telephone numbers are stored in a data base. Mobile Voice Recording does the rest – even if one or both parties make or receive international roaming calls.

The recording platform encrypts calls along with their meta data on the fly while they are recorded. The associated private key is solely in possession of the customer – the financial institution, for instance. On site, only authorized persons have access and can decrypt their fellow workers' data. Neither the telecommunications provider nor CreaLog can decrypt this data itself. Decryption involves logging all access operations and follows the four-eyes-principle in every case – which means that data privacy is observed to the highest degree.

«Our customers can use CreaLog's Mobile Call Recording to comply with FINMA requirements. We are proud to be Switzerland's first mobile provider to offer a solution that also takes into account the more stringent financial market regulations introduced by the European Parliament.»

Adrian Mühlethaler

Mobile Voice Recording Project Manager, Swisscom

Introduction

CreaLog's recording platform offers high scaling flexibility and allows for incremental migration. It is not restricted to recording mobile subscribers communications but lends itself to land line and IP networks as well. Unified communications applications such as Skype for Business range within the scope of CreaLog's Call Recording platform just as SMS/MMS communications or broad band voice communications along the lines of the HD Voice quality standard. CreaLog Mobile Call Recording can be customized to the telco network operator's needs with the option to migrate it to a Universal Recording Service for any or all communication networks.



MCR by CreaLog

- Designed for MiFID II as well as other fields of application
- Flexible solution to cater for varying (and time-evolving) requirements of regulators, operators, and banks
- Supports a variety of business models and product options on the network operator's level
- Sophisticated encryption features to meet data privacy requirements
- Open, standards-based, multi-tenant solution for easy integration
- Scalable to accommodate future growth in users, and additional services/applications
- Leverages multi-year's experience

Basics

Recording consulting calls

Recording and archiving inbound and outbound land line calls is already common practice in many telecommunication systems in corporate headquarters and branch offices today. The aim is to help improve the quality of customer care and call center staff or to provide evidence for orders by telephone at a later date. For this purpose, the organization's PBX system is fitted with an intelligent, centralized recording system that has direct access to signal and call detail data. At justifiable expense, such a recording system can also cover calls made or received by staff members working at home, e.g. as required by the financial market supervisory authority. The home office worker does have to route their calls via the company's PBX, though.

Satisfying the recording rule for staff members using their mobile telephone to make consulting calls is much more of a technological challenge – whether they are on site or on the road. Traditionally, a company could only record such calls at one central location if customer contacts were handled via the organization's communication system in all cases.

Legal certainty and dependability

In theory, a smartphone app could be used to record staff members' mobile calls. Such an app would have to be installed directly on the user's mobile device. The drawback of this concept is that vintage mobile telephones and smartphones running on older or less common operating systems would not be eligible. Added to that, an app satisfying this purpose would need to be continuously updated to remain compatible with all currently used smartphone operating systems such as Android, iOS, Windows, or Blackberry.

Furthermore, in view of country specific legislation and for the sake of data privacy it is both advisable and reasonable to store data in the country where they were recorded. If, for instance, data recorded in Germany were stored outside of the EU, this could be unlawful in the worst case but it could also lead to uncertainty about which country's laws are applicable. You can avoid such uncertainty by opting for a solution from CreaLog. This involves data recording and storage countries being the same so legal certainty is assured.

Links to the mobile network system and a multi-tier subscriber data base

The CreaLog Mobile Call Recording platform is linked up with the network operator's MSC (Mobile Switching Center) via secured lines. Under the control of a service broker, the platform is granted multi-level access rights to all necessary system and signaling information. It also accesses mobile network subscriber data stored in the HLR (Home Location Registers) and links these up with a configurable multi-tier data base. This is used to determine separately which discussions of which employees must be recorded according to the legal regulations for each of the customer organizations of the network operator.

The Internet service portal used for managing the recording platform allows to define default global stuff settings for each customer organization. In many cases, this helps avoid entering details for each and every staff member of the company or other organization. Individual default settings can also be defined for sub-organizations such as branch offices or departments.



Automated recording comes with alerting announcements

Operating independently within the telephone network, the Mobile Call Recording platform cares for everything else all by itself: As soon as a connection request arrives at a mobile subscriber registered for mobile call recording, a second connection to this subscriber is established within the recording server. A customer specific announcement is then played back through both of these two channels informing the two parties about the legal requirement to record their telephone conversation.

Mobile Call Recording - 5 key elements

- 1. Provision**
Set up new tenants (e.g. bank, broker), and register new subscribers
- 2. Capture**
Trigger the need to record, and route the call to the MCR platform
- 3. Record and encrypt**
Record calling and called subscribers and encrypt the recordings
- 4. Store**
Secure storage of recordings; on premise and/or network-based (off premise)
- 5. Manage records**
Secured access to recordings; role-based access rights

CreaLog also provides an option to make announcements in different languages depending on the subscriber's number or the call's origin. Other options also include to determine separately for each staff member and calling or called customer number whether the announcement should be repeated before each call. Its playback could also be omitted altogether for one or both subscribers in subsequent calls if the staff member and/ or their customer signs a disclaimer to that effect. To accomplish this, subscribers can be entered into a non-announcement list at the service portal. In this case, the call connection is made and call recording commences without any preliminaries.

MP3 stereo recording helps save storage space

First, the voice channel of each call party is recorded internally and separately using the a-law format (8bit, 8kHz, 8000 Bytes per second per channel). The two channels are then immediately combined to form a stereo signal with each call party having their own sound channel. After that, the stereo signal is converted into the MP3 data format with a bit rate of no more than 4kbps and encrypted. In addition, all relevant call information (meta data), including call date and duration, subscriber numbers, and more, is stored in the MP3 file. Finally, the MP3 file is provided with a unique call ID and a likewise unique recording ID, which includes a time stamp and also the recording location's server name and the recording channel number.

Added to that, a call record containing all the meta data is stored in a central data base maintained by the mobile network operator. This is to ensure the encrypted call recording can easily be found should the call's content need to be retrieved. Call records are also written to the data base in cases where the connection fails to be made or the call is aborted. Calls answered by answering machines are also recorded so any voice messages left are available for analysis should the need arise.

Data encryption on the fly

To protect against data abuse, the Mobile Call Recording platform encrypts the complete call directly along with its meta data as part of the MP3 coding. To effect this, the corporate customer

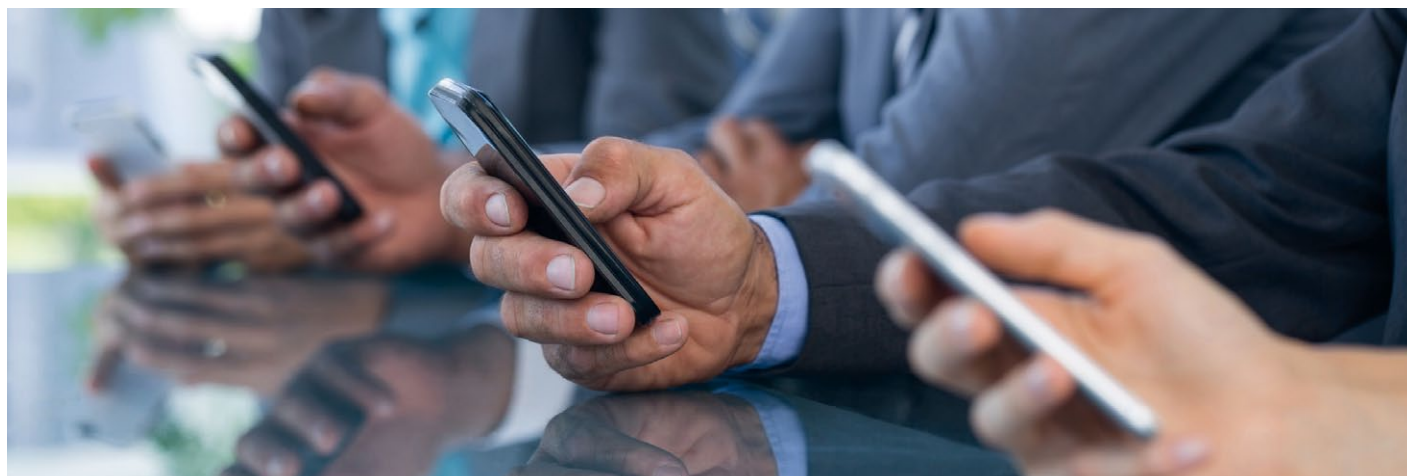
Features

- Strong data encryption – on the fly: call recordings, SMS/MMS, meta data
- Comfortable and secure data retrieval via four-eyes principle
- Complete compliance with legal and regulatory requirements
- Integrated into the Telco network
- Ideal as a managed service offering for business clients
- No training required for users, recording is carried out automatically

uses a Windows software application provided by CreaLog to generate a pair of encryption keys, one of which is public, the other private. The public key is then uploaded to the mobile operator via Web interface and a secured data link.

Apart from voice recordings, CreaLog's Mobile Call Recording system also stores SMS messages, with encryption following the same principle. This only requires the network operator's SMS center to be linked to the recording platform. A MMS-C (multimedia messaging center) can be linked to the recording platform as well so multimedia messages will be recorded and stored in the same encrypted and secure way.

The encrypted recordings (calls and SMS/MMS messages) are archived on the telco network operator's centralized NAS systems. As a rule, this is done following the geo redundancy principle, that is, on at least two spatially separated locations. For safety and in some areas legal reasons the data is stored within the country of the network operator in question.



More reasons for call recording solutions

- **Corporate Compliance**
e.g. enterprise-internal regulations, following labor union regulations
- **Quality Assurance** e.g. determine customer satisfaction level, identify process short-falls
- **Contract documentation and dispute resolution**
- **Hotlines: Keeping track of communication**

Each encrypted recording's session key is additionally archived in a centralized data base, which is geo redundant as well. This session key is again encrypted based on an asymmetrical RSA 2048 method using the public key of the company or other organization in question and then stored. The associated private key is solely in possession of the corporate customer – the financial institution, for instance.

All these precautions help prevent any tampering with the stored data. They also ensure that no unencrypted voice or meta data whatsoever and likewise no clear text session keys will end up on any of the network operator's data storage devices.

Customized provisioning and billing

CreaLog's solution concept is structured in a way to enable the mobile network operator to implement a unique model for provisioning recording services and charging for them for each customer. Options include lump sums per subscriber, department, or the whole organization as well as charging in relation to the actual duration and/or number of recorded calls. Provisioning options can also account for the length of time the recordings need to be retained for, e. g., two years or ten years.

International calls, answering machines, and SMS messages

The CreaLog Mobile Call Recording platform is not only able to record national mobile calls of staff members but international roaming calls as well. It doesn't matter at all whether one of the two parties or even both of them happen to be in a foreign network. For the CreaLog solution to record roaming calls or even transmit automated alerting announcements, the particular foreign mobile network only needs to support the basic SS7 or CAMEL (Customized Applications for Mobile networks Enhanced Logic) triggering.

Searching and retrieving encrypted recordings

Decrypting telephone conversations and/or messages is tightly restricted to authorized representatives of the respective corporate customer or organization. All accesses to the stored data



are logged when call recordings are decrypted. Should the need arise to decrypt recordings in an effort to clarify disputed factual evidence, this can only be done following the four-eyes-principle. Thus data privacy is observed to the highest degree.

Only the network operator's corporate customer (bank, insurance company, law firm, etc.) can search for recordings made on their behalf by the Mobile Call Recording platform. This involves one of the customer's administrators accessing the service portal's search tool over the Web. Specific filter settings allow for preselecting calls or SMS messages between bank staff members and their clients within a defined time window, for instance. Another possible option is to narrow down the search to the entire communication between two specific individuals within a precisely defined time frame. To ease the burden of clarifying disputed facts, search results are listed in chronological order which allows to follow the history of a dispute efficiently.

Once the search results are narrowed down far enough to serve the desired analysis the administrator requests to release the found selection for review by the actual auditor. This selection is then retrieved but still in form of encrypted data packages. Accordingly, the designated auditor needs the financial institution's private key to decrypt the individual calls or SMS messages. Depending on the individual solution, a Windows decryption and listening tool provided by CreaLog or an equivalent as preferred by the customer is then used to decrypt the information.

BroadSoft Integration

CreaLog is a Broadsoft Application Partner. The Broadsoft platform offers a sophisticated interface for the integration of recording media servers like the CreaLog platform.

The SIP interface for recording is the SIPREC recording standard. Recording on the CreaLog MCR platform with SIPREC is stereo (both channels separated).

Broadsoft Users can be configured to one of five different modes:

- Always Mode: Calls are always recorded
- Always Mode with Pause / Resume: Calls are always recorded, but recording can be paused and resumed
- On-Demand Mode: Calls are always recorded, but only kept after sending a DTMF code
- On-Demand Mode with User Initiated Start: User can start/stop recording by sending a DTMF code
- Never Mode: No calls are recorded for this user

On-Premise

Due to security concerns or policies, some customers (e.g. banks, government offices) require call recordings data to be stored locally only. They cannot use a hosted call recording service. CreaLog can deliver an on-premise deployment that perfectly fits the demands of such customers.

SmartCard use

A private key is used to decrypt Mobile Call Recording data. This can either be retrieved from a file or stored on a physical SmartCard. CreaLog's MCR solution provides for both, decryption via file and using a SmartCard.

Data storage and security

- Data is stored encrypted for a predefined period of time
- Storage can also be geo redundant
- Voice data are converted into memory saving MP3 files on the fly
- Data is encrypted using the public-key method
- Only the corporate customers can decrypt their own data



Mobile Call Recording Fields of Application

 Banks	<ul style="list-style-type: none">• Improve transparency• Prevent market manipulation• Comply with legal requirements
 Insurance	<ul style="list-style-type: none">• Document contracts
 Hotlines	<ul style="list-style-type: none">• Keep track of communication
 Lawyers and tax consultants	<ul style="list-style-type: none">• Document legally binding advice
 Reviewers	<ul style="list-style-type: none">• Document technical opinions
 Emergency	<ul style="list-style-type: none">• Document assignments

Outlook

CreaLog's Call Recording Platform can be combined with speech analysis tools to help recognize key terms, which then can be stored in conjunction with the calls meta data. This way, customers are capable of using Speech Analytics with Keyword Spotting through speech recognition (ASR). Speech Recognition helps communicate more effectively, increase efficiency, reduce operating costs, increase customer satisfaction and improve employee productivity.



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