



# EVALUATING MOBILE PHONE RECORDING ARCHITECTURE

**A B.I.S.S. RESEARCH WHITE PAPER**

Sponsored by



**Compliant Phones**

Voice and data recording for mobiles

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## INTRODUCTION

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This is the second in a series of complimentary educational white papers commissioned by leading recording specialists Compliant Phones. The first white paper entitled *'Planning a secure mobile communication strategy'* outlines the issues around the necessity for firms to have a secure mobile communications strategy and architecture and touches on the technology to fulfil this requirement. This white paper examines in greater depth the solutions available, pointing out their strengths and weaknesses.

The UK Financial Services Authority's (FSA) impending mobile recording regulation, due to come into force on *14<sup>th</sup> November 2011*, marks a watershed for financial institutions' use of mobile technology. To date firms have been satisfied with legacy systems based on regulatory requirements, first set in the mid eighties but will now be unable to step up to meet the forthcoming regulatory changes and modern mobile technology.

CIOs, IT directors and compliance officers must evaluate their communications architecture and recording capability to not only achieve compliance, but to ensure that it forms a basis for likely, future rule enhancements.

To gain regulatory compliance, they will need to delve deeply into the workings of mobile communications – a challenge complicated by the surge in mobile recording products appearing on the market and the relative lack of published independent analysis.

The first step in accurately assessing the effectiveness of a technology solution is to understand its underlying operating architecture. Feature sets and deployment options are important. But invariably it is the system's design foundations that shape its capability – none more so than in the case of mobile voice recording.

This paper aims to address this knowledge gap by helping system evaluators understand the different solution architectures that are offered by today's mobile recording solutions – and make better, more informed choices as a result.

## OUTLINING TODAY'S MARKET SOLUTIONS

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Current mobile recording systems are based on one of four approaches. These are referred to as:

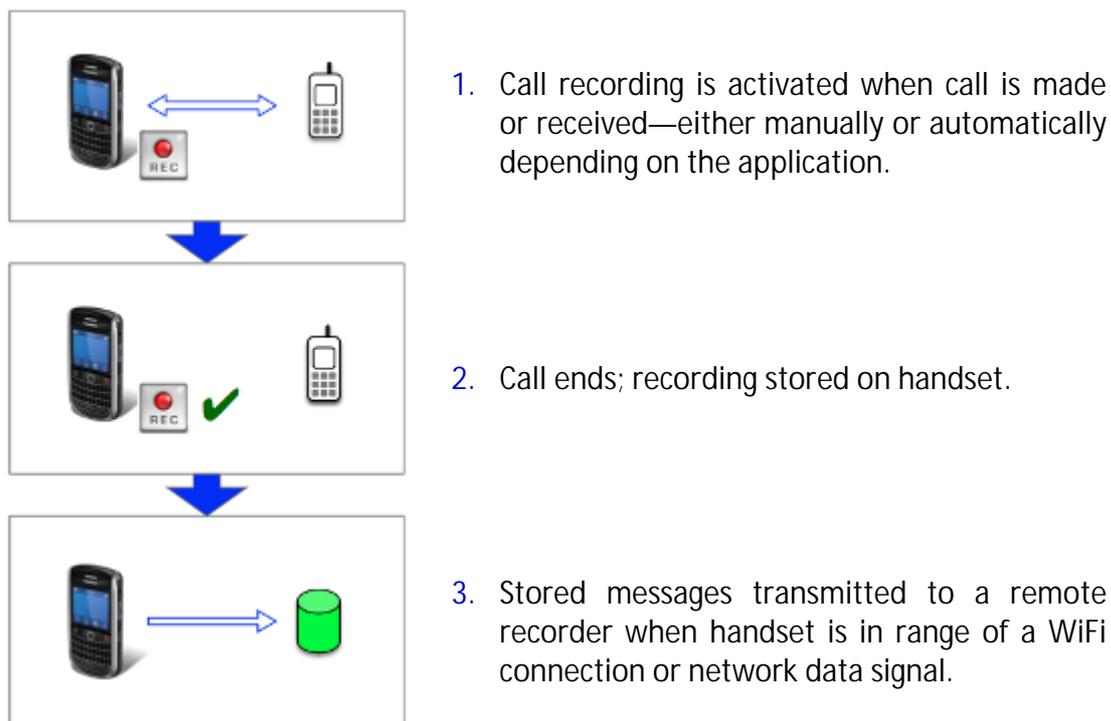
- Store-and-forward
- Conference-call based recording
- Unified-Communications based recording
- Inline mobile recording™

Each of these will be explained in more detail, describing how they capture voice communications and their inherent strengths and weaknesses.

### STORE-AND-FORWARD

This approach uses the handset to capture and record calls, before forwarding them over the airwaves to a remote recorder.

#### STORE-AND-FORWARD – HOW IT WORKS



This solution is probably the simplest and cheapest option available. However, it is far from being secure and is the easiest to circumvent. Battery failure, loss of signal, lack of phone memory or deliberate disabling of the phone can result in the recording data not being transmitted. In addition, loss, theft or replacement of the handset, or insufficient handset storage capacity, could result in incomplete records.

### STORE-AND-FORWARD – STRENGTHS

- Easiest and cheapest option for existing handsets
- Depending on the solution selected, the user doesn't have to change network or handset

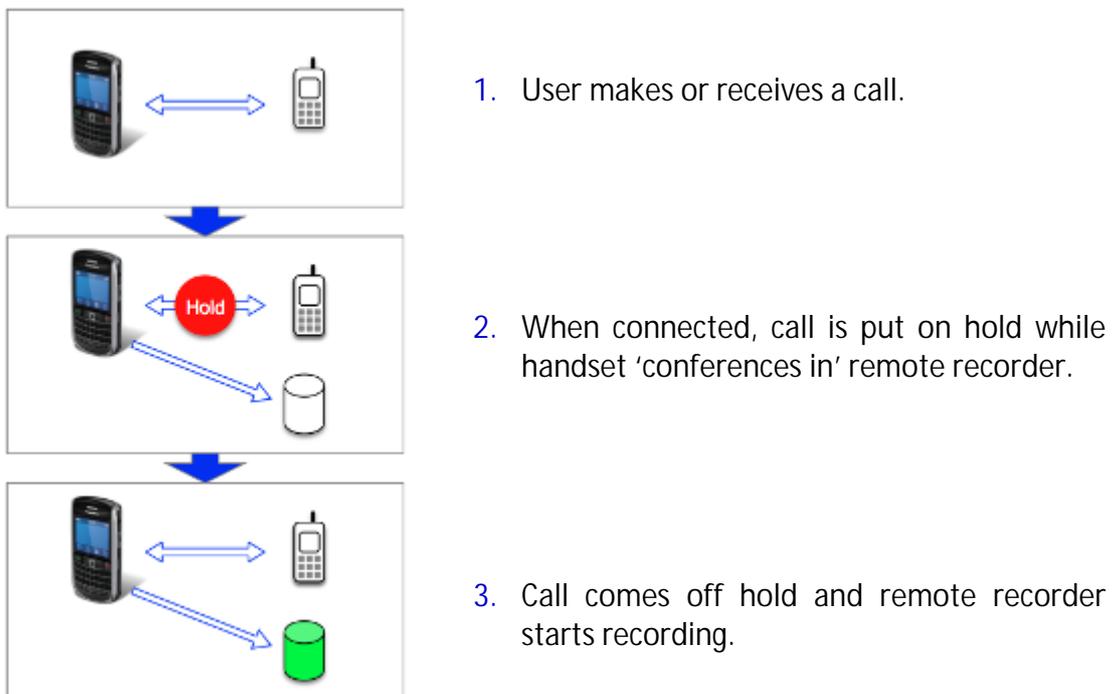
### STORE-AND-FORWARD – WEAKNESSES

- Relies on user intervention and the availability of a data connection to upload recordings
- Liable to significantly increased mobile data charges, especially when abroad
- Integrity of recordings is vulnerable to loss or theft of handset

### CONFERENCE-CALL TYPE SOLUTION

This approach uses an application on the handset to automatically connect a recorder when a call is made or received, thereby creating a three-party conference call.

#### CONFERENCE-CALL RECORDING - HOW IT WORKS



Conference-call technology is well understood by the industry and used extensively by financial services firms in their day-to-day business. However, extending this to call recording presents potential recording integrity and even handset problems and in some cases, prevents any calls being made.

Firstly, this approach relies on the network to enable the conferencing process and to minimise the time required to set up the recording leg. Since this functionality is not supported consistently across networks – including, for example, on networks in the UK and North America - there is a significant risk that when roaming, the user may experience long connection delays waiting for the recording leg to be set up, or even no recording connection at all.

Secondly, by creating a second leg to all calls, there is increased exposure to the ever-present risk of dropped lines or interference. The implications depend on how the application is set up: either recordings fail without the user realising or the loss of the recording leg forces the call to be terminated.

A potentially more serious compliance issue is the limitations of this operating architecture to capture complete call-detail records (CDRs), which could affect a firm's ability to respond adequately to regulator's information requests or undertake effective internal investigations.

Because the recorder is conferenced into a call by the user's handset, it has no visibility of call direction or the third-party caller's number. This has important consequences for record search and investigation. Although some conference-call solutions may fashion workarounds – for example, using (Dual Tone Multiple Frequencies) DTMF tones to transfer metadata to the recorder – these would almost certainly lengthen call setup times and therefore impact user experience.

This architecture can also have a significant impact on call costs and therefore total cost of ownership (TCO). Since every call involves an additional recording leg, users can easily experience a tripling in the number of billable calls made.

In summary, although relatively well developed conference-based recording applications exist, they are built on a weak foundation with fundamental compliance and usability issues, which should be of concern to buyers as this solution opens up too many gaps for non-compliance.

#### **CONFERENCE-CALL TYPE SOLUTION – STRENGTHS**

- Easy option for existing handsets
- Readily understood by the user

## CONFERENCE-CALL TYPE SOLUTION – WEAKNESSES

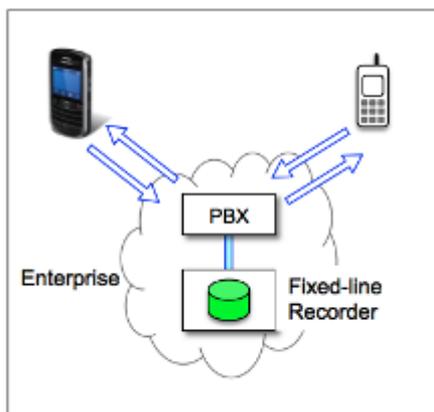
- Unreliable when roaming – depending on the network and the specific solution, may lead high connection latency, unrecorded calls or inability to make calls
- Doesn't work on every network, therefore may require a change of provider
- High call charges
- Potentially limited CDRs

## UNIFIED-COMMUNICATIONS BASED

This approach uses 'Unified Communications' (UC) technology, originally developed to offer users integrated communications capabilities such as 'single-number reach' across multiple fixed-line and mobile handsets.

More recently it is being promoted as a method to comply with the mobile recording regulations. By making the mobile/cell phone another 'end point' on the company's private exchange (PBX), all calls to and from the handset can be routed through the fixed-line system and recorded using the existing fixed-line recorders connected to the PBX.

### UC RECORDING - HOW IT WORKS



1. Calls routed through corporate telephone system (PBX).  
*Outgoing:* User dials number as normal.  
*Incoming:* Caller dials a designated number—not native mobile number.
2. When call is answered, recording starts, using fixed-line recorder connected to PBX.

The core weakness with using UC for mobile recording is that calls direct to the user's native mobile/cell phone number will bypass the central system and the recorder. This is easily done. For example, a text message from the user will expose the user's native number to callers who can then use it to reply direct.

Such compliance loopholes can be closed. The user's mobile number can be hidden. SMS, which cannot be captured by fixed-line based UC solutions and recorders, can be disabled. This of course, undermines the benefits of having a Smartphone at all. Most significantly for financial services firms, UC relies on users relinquishing their mobile numbers.

This is universally unpopular among the type of staff that fall under the mobile taping regulations. And for good reason! Mobile numbers are a personal 'hotline' for key clients and contacts and have intrinsic value for the customer, user and firm.

Presently this approach does not go far enough to fulfil the needs of regulatory compliance. It has the basis for further development. But without significant improvements to ensure that inbound calls direct to the mobile and SMS are captured, it falls at the first hurdle.

#### UNIFIED COMMUNICATIONS RECORDING – STRENGTHS

- Utilises company's existing in-house voice recording platforms
- Can integrate real-time communications, including telephony, IM and email
- Offers callers 'single-number reach'
- Easily understood by user
- User doesn't have to change network or handset

#### UNIFIED COMMUNICATIONS RECORDING – WEAKNESSES

- Unable to record inbound calls direct to mobile - users must relinquish native mobile number
- Fixed-line based UC architectures unable to record SMS text messages
- Recorder easily circumvented by calling the user's native mobile number

### INLINE MOBILE RECORDING™

Today there are two methods of routing calls through a recording gateway:

1. **Application-managed routing**, which uses an application on the handset to divert incoming and outgoing calls through a recording gateway.
2. **Network-controlled routing**, which relies on 'network intelligence' in order to route calls through a recording gateway.

By capturing calls inline, both offer maximum recording quality and the ability to capture comprehensive CDRs – even when the caller withholds their number, the system will still know the call direction.

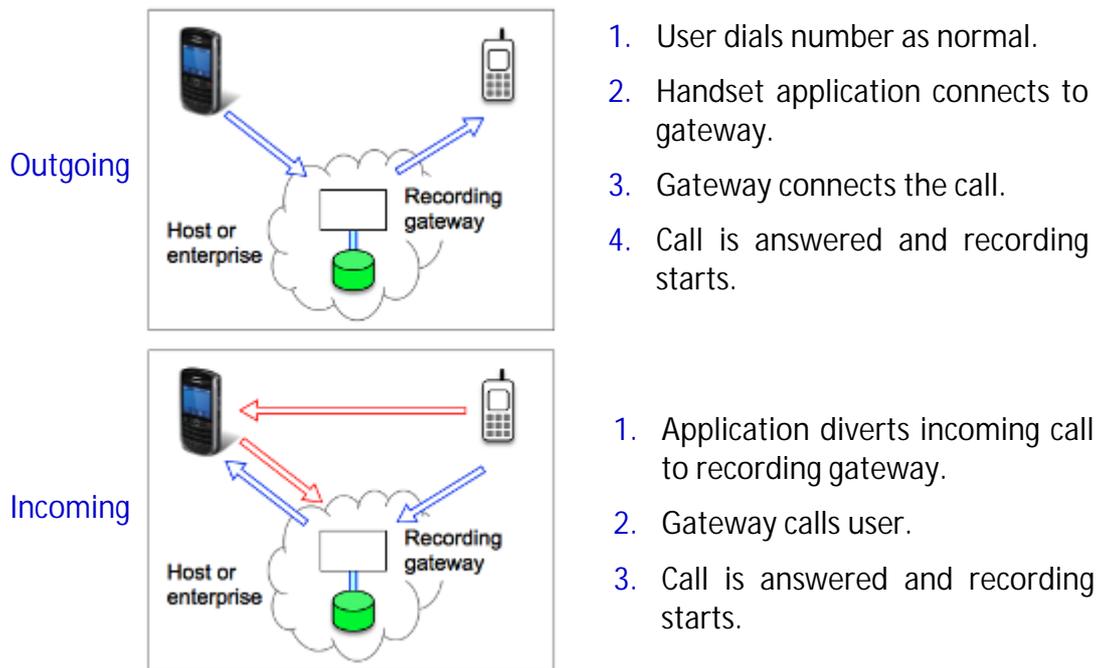
Beyond this however, significant differences exist in the efficiency of these two approaches. These solutions also have a number of different deployment options, which are explained in this white paper.

## APPLICATION-MANAGED INLINE MOBILE RECORDING™

This is a unique patented process originating from Compliant Phones, which was first deployed in 2007 by Centrica Energy Trading.

A unique characteristic of application-managed routing is that it is not reliant on the network to route calls. This means that (1) users can roam across any network in any country without affecting the reliability of recording or the phone and (2), there is no need to change air-time provider or mobile number in order to use the solution.

### APPLICATION-MANAGED INLINE MOBILE RECORDING™ - HOW IT WORKS



Application-managed routing can not only capture all inbound and outbound calls and text, but also voicemail. Because the application uses the phone's call-divert process, it is able to provide a voicemail system that, as far as the user is concerned, operates in exactly the same way as network-provided voicemail, including when the handset is switched off or has no signal.

Also, the application can be setup, activated and deactivated remotely, without the user having to relinquish their phone, or IT having to manually install software or SIMs. This will be an important cost and scalability consideration for larger firms with time-pressured IT resources and users that need their phone at all times.

Application-managed routing also offers scope for call-cost reduction. Because the calls are routed through a recording gateway, outbound call legs can potentially take advantage of low-cost routing.

There are weaknesses to consider with application-managed routing. Firstly, the application will only work on supported phone operating systems. It is therefore important that firms check what phones are compatible first before purchase.

Secondly, outbound call setup times using less advanced solutions can be affected by the need to make two connections in order to complete the call, a process that can add appreciable delay to the total connection time. But this has been addressed by a patented technology called "Fast Reach™". This uses the data channel to send the number instantaneously to the recording gateway, enabling the second leg from gateway to recipient to be dialed concurrently, thus removing any perceptible delay in connection for the user.

#### **APPLICATION-MANAGED INLINE MOBILE RECORDING - STRENGTHS**

- Works on any network, world-wide
- Transparent to user
- No change in number
- Can be deployed remotely
- No change to the way the users operates the handset
- No impact on user experience
- No change to air-time provider
- Potential for reducing overall call charges – in particular on international calls and when roaming

#### **APPLICATION-MANAGED INLINE MOBILE RECORDING – WEAKNESSES**

- Not all phone operating systems are supported
- Some solutions may produce extended outbound call setup times
- Local call charges may increase slightly

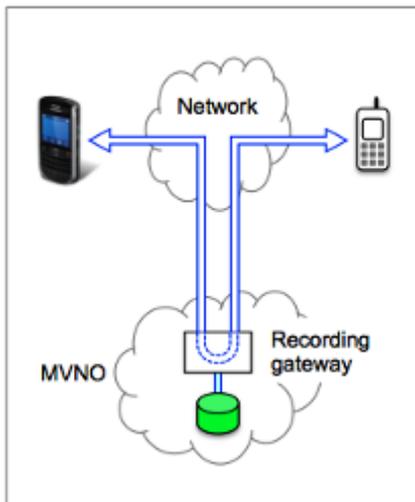
#### **NETWORK-CONTROLLED INLINE MOBILE RECORDING™**

This is the latest approach to appear on the market. It exploits network functions more commonly used by mobile virtual network operators (MVNOs) to enable, for example, low-cost calling.

This approach has several advantages it can work on any phone, provided it is unlocked:

- There is no call-connection latency
- There is scope for low-cost routing
- It can work on any phone
- It is highly tamper-proof, since recording of the number is 'hardwired' into the SIM

## NETWORK-CONTROLLED INLINE MOBILE RECORDING - HOW IT WORKS



1. Mobile Virtual Network Operator (MVNO) provides SIM card with unique ID, which is placed in handset
2. When call is made or received, network recognizes the ID and routes call to MVNO
3. MVNO recognizes ID and initiates recording when call connected

The first serious weakness with this approach is the potential risk of recording failure when roaming. This is because the call-routing processes are enabled using network protocols that are not universally supported. When roaming, the call-control processes that underpin the recording may cease working even though the handset doesn't.

For example, 'CAMEL', a set of telephony protocols that are used to enable a variety of 'added-value' applications, is supported on only three out of North America's 20 mobile networks - and is completely absent from over 40 countries around the world. To rely solely on network intelligence creates a significant point of failure if the user is to roam off the home network.

This approach will also require a change in air-time provider – an important consideration for organisations that are tied into long-term competitive contracts.

Finally phone set up is manual: handsets recalled from users, unlocked, the SIMs replaced and phone numbers ported between operators - a cost and operational hassle that larger firms may be unwilling to take on.

### NETWORK-CONTROLLED - INLINE MOBILE RECORDING – STRENGTHS

- Easy to use
- Low impact if no existing mobile/cell phone and looking to take out a new contract with a network
- It can work on any phone, provided it has been unlocked

## NETWORK-CONTROLLED - INLINE MOBILE RECORDING – WEAKNESSES

- Relies entirely on network intelligence to control call routing, meaning that recording cannot be guaranteed when roaming off home network
- Likely to require a change to air-time provider and phone contract
- Time-consuming manual set up

## INLINE MOBILE RECORDING DEPLOYMENT OPTIONS

Both solutions can support fully hosted and 'on-premise' or 'enterprise' deployment.

For enterprise deployments, a recording gateway or server is installed within the firm's data-centre, enabling them to take advantage of existing in-house telecoms and storage infrastructure and also to customise installation to suit their specific security, performance and resilience requirements.

In a fully hosted solution, telecoms switching, media storage, search and playback and administration functions are provided in a single, fully managed service. This offers all the usual benefits of hosted solutions: rapid implementation, little or no capital expenditure and flexibility to turn capacity on and off.

While the hosted path is a natural solution for smaller organisations, it offers a quick short-term option for any size of firm needing to meet the impending FSA regulations. Institutions wanting an in-house solution could start with this offering as a pilot option as a precursor to adopting the same vendor's enterprise option. This short-term option should be considered thoughtfully as time is growing shorter to comply with November 2011 deadlines.

A third, hybrid option is also being pioneered by Compliant Phones, designed to meet the needs of organisations that want a hosted solution, but want to store records at a different location to the hosting site, for example within their own data-centres in order to consolidate their stored data, or in their home territory in order to comply with local data protection legislation. This has international appeal as the regulatory landscape for recording mobile technology is uneven at the moment but is expected to harmonise in the future.

## SUMMARY

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To summarise, of the four main solutions available today; the *store-and-forward* approach has been around for many years and fails to offer the level of security and reliability necessary to enable firms to meet the forthcoming regulations.

The *conference-call type* is a more effective approach than store-and-forward because it records in real-time. However, the ability of this architecture to enable firms to comply with regulatory requirements is brought into question by two issues: recording reliability when working off preferred networks and potential incompleteness of call detail records, which would limit the effectiveness of this type of recording solution. In addition user experience could also be problematic, particularly when not on a preferred or home network.

The *pass-through*: Extending the use of a *unified communications* approach to address mobile recording falls down on two inter-related points: firstly, its inability to capture and record calls direct to the mobile and secondly the requirement that users relinquish their mobile number – universally unacceptable among those staff that fall under the remit of the FSA regulations, hence for many this will not be an acceptable solution.

*Application-managed inline mobile recording*: Appears to be the most reliable and compliant approach currently available. In addition to recording-quality advantages inherent in its inline architecture, it's reliability when roaming, comprehensive call, voicemail and message capture and its ability to be set up remotely and used with no change to mobile number or standard handset operations, set it apart from all other approaches in use. There may be some increase in local call costs, however

*Network-controlled inline mobile recording*: The newest approach to appear has some attractive benefits in terms of simplicity, operating-systems independence and potential low-cost call routing. However, its reliance on advanced network-specific functionality to control call-routing processes raises serious questions about its reliability when off its home network. Firms may also be unwilling to switch existing air-time contracts and network, which in most cases will bring additional costs.

Firms should therefore undertake a comprehensive critique of solution features, the suitability of deployment options, as well as broader issues such as company strength, size and technology road map before selecting a solution.

It is vitally important that firms create an enterprise wide communication strategy, which is underpinned by the ability to record and retrieve *all* pertinent data where possible.

In an age where there are a multitude of different mediums, which provide social media access to employees which provide the means to weaken the firms ability to protect their business, clients and employees, it appears a logical decision to implement a communication and recording capability, not only for regulatory compliance but to provide a firm foundation to meet future challenges.

There is a new and noisy market for recording compliance in the financial services industry. Technology never stands still and each of these current solutions is sure to evolve and be enhanced with additional features. But the ability to identify the underlying system architectures is a vital first step in being able to quickly sort the wheat from the chaff.



## ABOUT COMPLIANT PHONES

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Established in 2005, Compliant Phones develops voice and data recording applications for mobiles, for use in financial institutions, industry, healthcare, transport and government. Its patented Inline Mobile Recording™ technology enables organizations to use mobile phones without exposure to regulatory or operational risk.

Selected by Vodafone Global Enterprise and Autonomy to power their mobile recording solutions for some of the world's largest banks and corporates, Compliant Phones offers the only reliable solution for automatically recording mobile voice and data communications across any network, worldwide.

Compliant Phones is head-quartered in London UK, and has offices in New York and Singapore.

If you would like to learn more about the company and its market-leading mobile-recording solutions, please visit: [www.compliantphones.com](http://www.compliantphones.com)

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