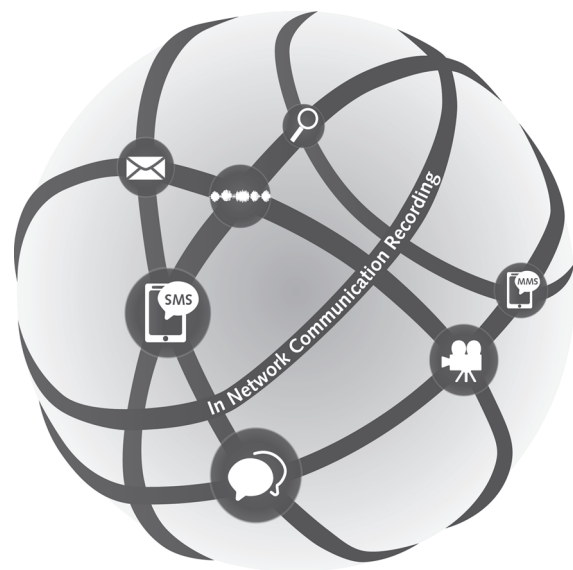


'In-Network' Mobile Recording

A Sustainable Approach for Mobile Network Operators

A CTI Group White Paper

in Partnership with KNet Technology



KNET
TECHNOLOGY

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Abstract

This white paper discusses in detail the market opportunity and technical implementation of in-network recording for mobile phones. It is intended to provide Mobile Network Operators (MNOs) with sufficient detail to understand the market opportunity, show how MNOs can monetise the service, and overviews the principal technical solutions for embedding a recording service into the MNO's network.

As an industry, interaction recording and workforce optimization generates revenues in excess of \$2bn per annum and shows annualized growth of 12%. This growth is driven by a number of factors, including the expansion of contact centers into multi-channel entities who interact with customers via voice, chat, email and social media and continue to invest in technology to improve productivity and customer satisfaction. Furthermore the increases in regulations, particularly in the financial services sector, are compelling companies to expand their recording solutions to cover mobile phones.

CTI Group (CTIG) is the industry leader in supplying recording solutions to network operators. Recording within the network presents unique challenges that are addressed in this white paper, namely:

- Seamless network integration;
- Creating a product offering as an over-the-top (OTT) service;
- Integrating provisioning, sign-on and billing of the service into the network operators OSS/BSS systems;
- Monetising the service;
- Branding;
- Ensuring resilience and scalability for seamless service delivery and low cost-of-ownership as the service expands;
- Selling and supporting the service;
- Delivering the service through a multi-tenant platform for economies of scale.

Recording Industry Background & Drivers

CTIG works in an industry that covers interaction recording and workforce optimization. Interaction recording is a business requirement that involves securely and robustly recording customer interactions for reasons stated below. Workforce optimization is a set of complimentary applications that then unlock the value of the interaction data (whether that is at a transactional level via the call detail record (CDR) or through the analysis of the content of the communication itself) in order to provide business intelligence back to the enterprise.

The annual revenue the industry is measured at over \$2bn, and it currently has an annualised growth rate of around 12%.

The industry is broken down into vertical applications: contact center, emergency services, financial trading, regulatory compliance (PCI DSS, HIPPA), etc. The principal drivers for recording customer interactions include:

- Increasing staff productivity;
- Improving the customer experience;
- Meeting regulatory and mandatory compliance;
- Risk management;
- Legal liability (keeping a record of customer instructions in case of dispute);
- Event reconstruction (emergency services, regulatory).

Recording was traditionally associated with fixed-line voice recording. Today, customers interact over a wide range of media including voice, video, SMS, chat, email, and social media, therefore today's recording solutions are sophisticated systems that can record across multiple media types and multiple devices. The systems can then provide unified analytical and management reporting across these media types in order to provide business intelligence relating to the management of employees and the improvement of customer services..

In addition, regulations governing financial transactions are being rolled out by national and international regulators including the payment card industry (PCI-DSS), USA (Dodd Frank), EU (MiFID) and UK (FSC). These regulations increasingly stipulate that business calls on mobile phones must be recorded in addition to fixed-line calls. Furthermore, text communication on mobile phones is also included in the scope of regulations requiring SMS, chat and pin-to-pin messages to be recorded. This presents a significant problem for traditional voice recording systems: How do you ensure that the company's mobile phones route all inbound and outbound calls and messages back to the premise-based recorder regardless of where the user is located? Additionally, how do you ensure that the end user experience is not seriously impacted by the implemented solution, and that the user cannot just switch it off and bypass it?

The answer is to implement the solution within the MNO's network, which provides a seamless service to the end user, is secured against tampering, meets regulatory compliance standards and offers the MNO a valuable over-the-top service that can help attract and retain high-value customers.

CTIG's Approach to Recording

CTIG's speciality is in the provision of over-the-top (OTT) services to Network Operators and Service Providers. CTIG has an install-base of approximately 70 Providers globally (measured at the end of 2013) who use CTIG's recording solution, SmartRecord®.

SmartRecord® is designed specifically as a provider network application, rather than a premise-based appliance. Demand for the product has principally been driven by the growth of hosted IP Centrex services, or Cloud PBX and Cloud contact center services. CTIG's growth in recording seats has exceeded the market by a factor of 3x for the last three years and is accelerating rapidly through 2014 as Tier 1 Providers bring their Cloud PBX solutions and in-network mobile phone recording services to market.

In order to deliver the product as a provider network application CTIG has engineered a number of important features into the product. The first consideration was the architectural approach to the product. It was important to separate the recording subsystem (the subsystem that interfaces with the voice and data networks and provides the recording function) from the main system in order to achieve an economically scalable model coupled with the ability to interface with multiple independent network systems and consolidate all recorded data into a single platform. The recording subsystem utilises a carrier-grade application stack and supports single-server, local high availability, and geographical high availability deployment models. A patented storage architecture provides maximum flexibility for the provider as storage location and storage policy can be configured at group level, for each individual corporate account, if required, or set at a central or regional level. The application supports all common storage systems (local storage, network storage, SAN, etc.) with support for Windows and Linux file systems. The product's database supports both local and geographical clustering, whilst the presentation and API layer is provided through one or more web servers and can therefore be load-balanced for high availability.

The second consideration was to produce a system that inherently and securely supported a multi-tenant approach, again to produce an economically scalable model. Many of CTIG's network operator customers host hundreds of corporate accounts on the recording system. This would not be manageable if the system required a virtual instance per account.

Another important consideration for the provider is how they integrated the system into the OSS/BSS functions. SmartRecord® includes a rich set of APIs that allow for the automation of provisioning and billing tasks, such as account setup, activation of a subscriber, branding, single sign-on, and extraction of utilisation data for billing purposes. These tasks can also be managed manually through a Service Provider interface that provides access to the provisioning and billing functions of the product.

Finally, SmartRecord® includes a patented feature-based licensing system. This allows the provider to create different product offerings for different vertical markets. For example, it is possible to create a basic recording product that would provide simple record and playback functions and would be suitable for back-office or basic regulatory compliance recording. A second product could be created using an extended set of features that is more focused on contact center recording, with functions that link the recorder to the customer's CRM system for example. The feature-based licensing system is therefore intended to allow the provider to productize the application.

In summary SmartRecord® delivers an economically scalable, multi-tenant platform with the ability to interface with provider voice and data networks, whilst allowing the provider to white-label, automate provisioning, productize, bill, and deliver a central customer portal for recording services.

Mobile Recording Opportunities & Challenges

CTIG is now noticing a trend towards the adoption of mobile recording as an OTT service. This is being driven by recent regulation in the financial services sector that requires trading firms to implement a mobile phone recording policy. Examples include the Dodd Frank regulations in the US and Financial Conduct Authority (FCA) regulations in the UK, but this is a global phenomenon, with regulation coming into force through Asia Pacific and Europe.

Recording mobile phones is more complex than recording fixed line devices. A fixed line device always has a guaranteed network connection, whether that is IP or TDM, therefore the network connection can be tapped for recording purposes. This network tapping is carried out at a network level and is outside of the end-users control, meaning that tampering and disabling are not possible.

Mobile recording is inherently more complicated as the end-user has a device that is not physically connected to a network. Regulations state that all calls (and other media types such as text and messaging) have to be recorded, therefore solutions must be tamper-proof and able to record inbound and outbound communications (voice and text), and work wherever the user is located (home network or roaming).

Historical Approaches

The following table shows just how complicated it is to record mobile phones. The list is not exhaustive but does contain nine different techniques (some of which do not meet regulatory standards) that all have unique advantages and disadvantages. Many of these techniques are easy for the end user to bypass.

Method	Description	Advantages	Disadvantages	*FCA Compatibility
One-number Dialing	The mobile handset has a client installed. It only receives calls from one number (the company's PBX). If a call is made directly to the phone the client routes the call to the PBX. Software integrated with the PBX controls inbound routing to the mobile. The mobile client controls outbound routing to the PBX. The solution will pass CLI details to and from the handset. A call recorder is connected to the office telephone system and records the call as it does for fixed-line phones	Permits seamless integration with the PBX for identical fixed-line and mobile recording. Covers global roaming. Can help in reducing mobile call costs. Can also record SMS.	Requires a handset specific application, one for each operating system (Blackberry, iPhone, Symbian, Windows Mobile, Android). Requires a provisioning and auditing engine to ensure the client is deployed and active. The client typically can be easily disabled or deleted by the user.	Assessed by the FCA in PS 08/01 to be compliant.

Call Conferencing	A client is deployed to the mobile handset. When a call is made or received the client intercepts the call, places it on hold, opens a conference leg to a recording server, then connects the call.	<p>The user can choose whether or not to record the call.</p> <p>Covers global roaming.</p> <p>Does not require routing through a PBX</p>	<p>As above plus the following.</p> <p>Adds delay in call setup.</p> <p>For a fast paced environment it quickly becomes painful to use.</p>	Assessed by the FCA in PS 08/01 to be compliant.
Call Interception	There is no solution for inbound calls. It would need to be coupled with a solution similar to one-number dialing. Outbound calls are intercepted, placed on hold, and re-routed via a DDI that terminates on a hosted or premise-based PBX. A recorder is attached to the PBX and records the outbound call.	<p>Really a subset of the one-number dialing solution.</p> <p>Can also record outbound SMS.</p>	<p>As above plus the following.</p> <p>Outbound recording only unless coupled with an alternative solution.</p>	Not compatible without an inbound solution.
Passive Capture	A client is deployed to the handset. When either an inbound or outbound call is detected the client activates an in-built recorder and records the call on to the handset. Periodically, during times when the handset is inactive, the client transmits the recordings via 3G or Edge to a central file store, which could be hosted or premise-based. The transmission is over a data network connection using standard IP protocols.	<p>Works in the background on the handset without users being aware.</p> <p>Can capture call details for transmission with the call file.</p> <p>Can also record SMS.</p>	<p>Still a client based solution so drawbacks as above.</p> <p>Requires a minimum amount of store space to be available on the handset for temporary storage. The application would need to reserve space.</p> <p>Requires that the user has a data service as well as a voice service.</p> <p>Does not work as a standalone client. It must be integrated with a call recorder, unlike the other client based solutions.</p>	Yes, if integrated with a FCA compliant recorder.

SIM Gate- way	<p>The mobile SIM is re- moved from the mobile and installed into a SIM gateway device. A second SIM, whose number is not published, is inserted into the phone. Potentially a third SIM is installed into the gateway for outbound call routing. Inbound calls are received at the SIM gateway, which has a call recorder attached to it. The SIM gateway uses its routing table to forward the call to the dummy SIM in the handset. Outbound calls require a client to intercept and forward to a bank of SIMs inserted into a second partition on the SIM gateway. The gate- way uses its routing table to forward calls to the in- tended party.</p>	<p>Handset agnostic.</p> <p>Does not require handset client soft- ware.</p> <p>Cannot be disabled by the users.</p> <p>Can help in reduc- ing mobile call costs.</p> <p>No SMS solution.</p>	<p>Up to three SIMs are required per handset.</p> <p>Not every MNO al- lows the use of SIM gateways.</p> <p>May require a client for outbound calling. This is not essential but clientless solu- tions require three SIMs per device.</p> <p>The solution is not a Provider proposition. It is not scalable and is only suitable for premise-based de- ployments.</p>	<p>Yes, if integrated with a FCA com- pliant recorder.</p>
SIM Applica- tion	<p>A lightweight application is deployed to the SIM that acts as a call interception and rerouting device. In- bound calls may not be covered with this solution. This is under investiga- tion. In which case an approach similar to (1) would need to be used. Outbound calls are inter- cepted by the client and the dialed number is re- placed by an alternative number associated with a DDI attached to a hosted or premise-based PBX. The PBX forwards the call to the dialed party. A call recorder is attached to the PBX.</p>	<p>Seamless to the user.</p> <p>Cannot be tam- pered with.</p> <p>Handset agnostic.</p> <p>Works instantly. No perceptible delay in connecting the call.</p>	<p>Would require Provid- er cooperation to provision over the air and verify that the application did not affect call reliability.</p> <p>Would require a sep- arate solution for inbound calls.</p>	<p>Yes, if integrated with a FCA com- pliant recorder.</p>

Provider Application Gateway	An application gateway is installed into the Provider's network, interfacing with their mobile gateways. The application gateway provides an interface between the mobile network and the recording server, which can be a multi-tenant or dedicated application server. Mobile numbers that are registered for call recording create a duplicate call leg with the application gateway whenever an inbound or outbound call is made and this is forwarded to the call recorder for recording.	<p>Seamless and invisible recording for the end user.</p> <p>No handset client deployment need.</p> <p>Provisioning can be automated.</p> <p>Carrier-grade approach.</p> <p>Handset agnostic.</p>	<p>Only records calls that originate or terminate within the Provider's network.</p> <p>Global roaming is not covered. A handset client would be required to cover out-of-network calls.</p> <p>The solution is not scalable for multinational corporations.</p> <p>Could not be deployed without Provider consent.</p>	Yes, if integrated with a FCA compliant recorder.
Wire-tapping	Similar approach to application gateway but using existing lawful intercept interfaces on the Provider's switch to create a duplicate call to a voice recorder.	<p>Uses existing interfaces for duplicating calls to listening devices.</p> <p>Can be discrete from government surveillance so there are no security concerns.</p> <p>Otherwise same as Application Gateway.</p>	The same issues as Application Gateway.	Yes, if integrated with a FCA compliant recorder.
Forced Call Routing	This is the method used by Providers who are instructed by government agencies to record calls of users who roam. Calls are forced through the Provider's network, which then have a wiretap recorder implemented. Inbound and outbound calls are passively tapped.	<p>Eliminates global roaming issue whilst implementing a Provider-grade solution.</p> <p>Handset agnostic.</p>	<p>Would require the full cooperation of the Provider.</p> <p>Is not completely transparent to the end user when roaming, but this is not an issue for legitimate recording, only when federal agencies are trying to secretly tap calls.</p> <p>Potentially has a scalability issue, both in terms of network routing costs and provisioning for the Provider.</p>	

Current Out of Network Techniques

By 2014, three techniques have emerged for recording mobile phones in regulated markets outside of the MNO's network. These solutions have evolved because MNOs have been slow to implement solutions within their networks. The disadvantages with these three solutions easily outweigh the advantages. The experience for both the company trying to record mobile phones and the individual user is far from ideal.

Mobile App

Users can download an 'app' directly from their Service Provider. The app provides a call interception and redirection function, effectively intercepting inbound and outbound calls, placing them on hold, dialing a conference bridge on a predefined DID/DDI, which terminates at the enterprise where a call recorder taps the trunk to record the call. Once the conference bridge is established the call is placed.

The conference bridge is a fixed DID/DDI that terminates at a call recording server usually via an ISDN or SIP trunk. The recording server typically auto-answers each call that it receives. Vendors that produce the apps typically do not produce the recorders; they just provide the means of pushing the call from the mobile phone to a recorder.

The advantage of this solution is that it works wherever the user is, so recording calls while roaming is widely supported.

The major disadvantage is that the only regulatory compliant solution is for Blackberry devices. These are the only devices that have an external management framework (Blackberry Enterprise Server). It is not possible to implement a solution on an iPhone, and, whilst it is possible to implement a solution on an Android device there is no protection from users deleting the app. Every call (inbound and outbound) creates an additional outbound call to the conference DID/DDI, which increases call costs. There are frequently delays of several seconds when calls are made or received, which creates a negative end-user experience.

A further disadvantage with this approach is that you need an app for each type of operating system. Apple iOS does not allow this type of background application at all so the solution is not even an option for iPhone users.

PBX Simultaneous Ring

A second approach is to control the call recording directly through the company's PBX system using a service called Simultaneous Ring. With this approach the user gives out a landline number so that all incoming calls are directed through the PBX. The PBX rings all of the user's devices, then the user selects which device to take the call on. The user is also able to transfer the call between devices. As the call is being routed through the PBX a traditional fixed-line recorder is sufficient to record the call. PBX vendors produce soft-clients for mobile phones that allow the phone to integrate with the PBX, which then allows users to place outbound calls through the PBX as well.

The advantage of this solution is that the recording is fully integrated with the fixed-line recording already in place at the PBX.

The disadvantage is that if the user gives out their mobile number and uses the native dialler on the phone then they bypass recording. This is not a regulatory compliant solution.

SIM Replacement

The third option is classed as a SIM replacement solution. It is typically operated by mobile virtual network operators (MVNOs) who install a recording capability into their network. Companies have to migrate their mobile estate to the MVNO who issues new SIM cards. The subscriber numbers have special routing instructions within the network that ensure the calls are routed through the recorders.

This solution has advantages over an app as it is handset agnostic and cannot be tampered with or bypassed. However, companies first have to migrate their mobile service to a MVNO. Secondly roaming coverage is usually quite restrictive, which is problematic as regulations state that all calls should be recorded regardless of location.

Conclusion

None of the above solutions have long term viability. This makes them all unsuitable for the finance sector, which is in need of a network-based solution in order to achieve compliance.

A small number of MVNOs have implemented a call recording capability into their networks. Users are obliged to migrate their mobile estate to that of the MVNO, which means the instant loss of a customer to the MNO. Many of these MVNO solutions suffer from poor roaming coverage, making them impractical for organizations that operate in multiple countries or have users that travel extensively.

In-Network Recording

MNOs are emerging as viable long term providers of mobile phone recording solutions. These solutions are being introduced as over-the-top services and provide a competitive advantage to those operators already in the market. MNOs have multiple routes to market with these solutions, both direct to corporate accounts and indirectly through MVNO and reseller channels.

For the customer the benefits of a network-based approach are numerous.

- Network-based solutions are handset agnostic – companies are not restricted to certain makes of handset.
- There is no service setup delay – the experience to the end user is seamless.
- Roaming coverage is provided through the Provider's CAMEL/WINS gateways.
- Users can't disable the service unless given permission to do so.
- There is no need to migrate to an alternative Provider.
- It is not necessary to manage the distribution of apps to handset users.

This network-based approach also has advantages for the Provider as it adds a high value over-the-top service into their portfolio, increasing ARPU and stickiness per subscriber on the service. There are initial integration challenges that make setup quite complex, but the end result is a robust, regulatory compliant solution that is tied to the subscriber rather than the handset.

Network-based recording is typically implemented using one of three techniques, all of which are supported by CTIG. Each Provider will have unique deployment requirements and provisioning the service will involve network management per subscriber.

Intelligent Network (IN) Integration

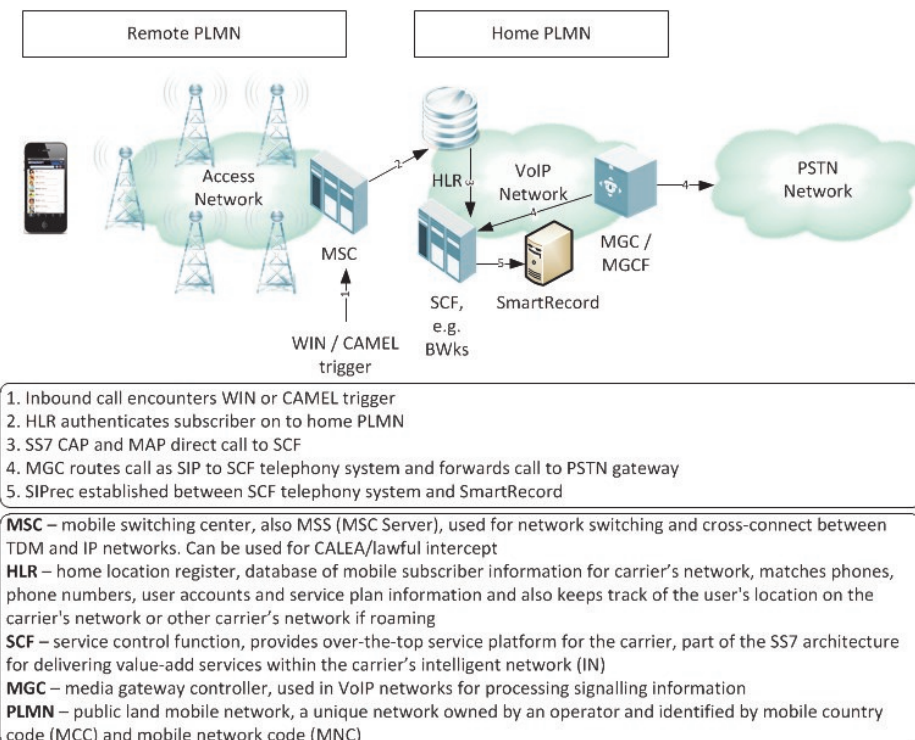
Intelligent Network integration is the preferred method. An intelligent network is IP-based and includes application gateways for bringing over-the-top services into the network. There are many integration points for recorders within mobile networks but the approach is unique for each provider. Examples include:

- The use of a Session Continuity Function (SCF) gateway service;
- IP multimedia subsystem integration;
- Duplicate media streaming from session border controllers.

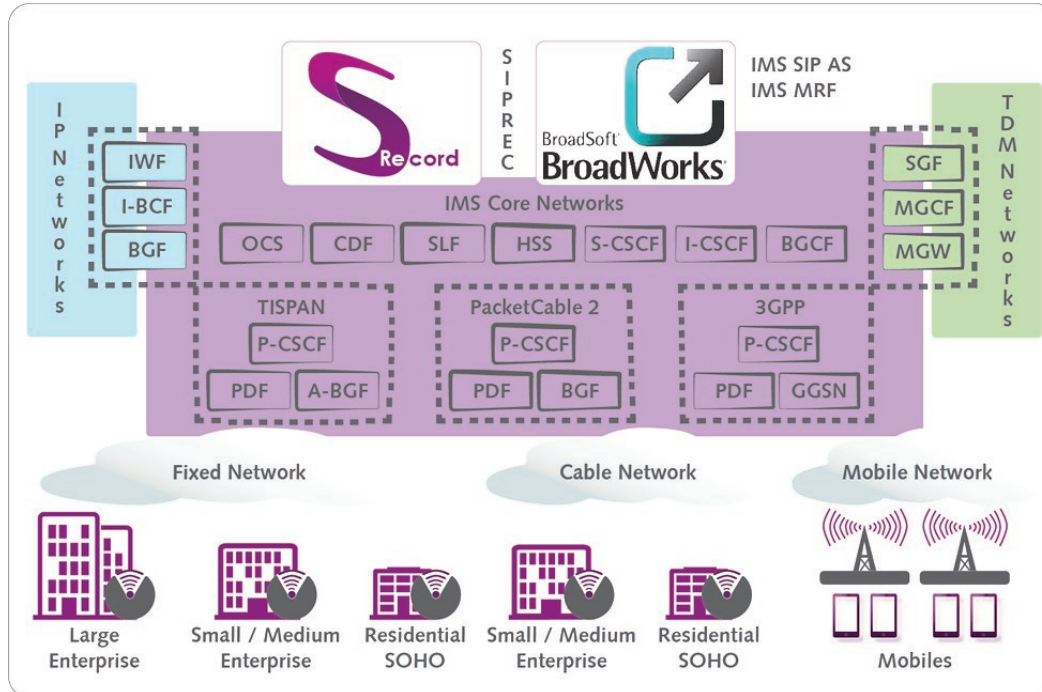
Subscribers using the recording service need their calls to always be routed to their home network, which can add a slight delay at call placement. However, this ensures that roaming calls are recorded.

The following diagrams show typical deployment scenarios for each of these options.

IN Integration via SCF

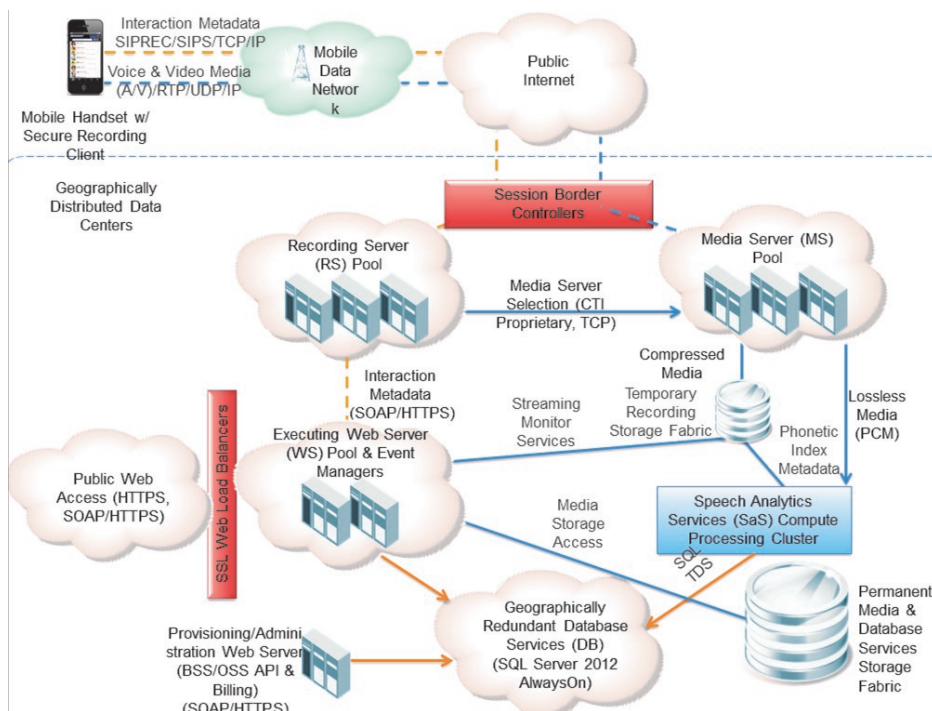


IMS Integration



Session Border Controller Media Forking

The most popular SBCs found in MNO networks support the SIPREC recording standard, therefore, integration is reasonably straight forward. The complexity is in the configuration of the subscribers to be recorded, which is usually done within a realm, or virtual routing and forwarding (VRF) configured on



Lawful Intercept

Lawful intercept (communications assistance for law enforcement, CALEA, in the US) can be used for providing recording services as it was originally designed for this purpose. Some Providers object to this approach as they want to keep law enforcement separate from customer services, although there is no technical reason why customer-facing recording cannot be provided securely and in isolation from law enforcement services even on the same subscriber. There is a potential for this approach to not scale for large customer service requirements as LI was not originally intended for large-scale use.

Back-to-Back User Agent

Back-to-back user agent is a technique whereby the recording system is placed in the call path and calls are routed through the recorder. While this is a legitimate configuration option it adds an additional service into the call path, and this has minor risks in terms of service continuity.

Data Storage

When using the SmartRecord® system, the Service Provider has flexibility in terms of storage policy because of the unique storage solution available in the recording platform. SmartRecord® is a multi-tenant application and storage policy can be defined uniquely for each customer. Storage policy may include policy settings such as retention period (typically 180 days for financial service customers), or storage location. The location is typically within the Service Provider's data center, which will provide a secure and highly resilient environment to store recordings. However, customers can elect to have the recordings sent to a storage path that is external to the Service Provider, assuming that a sufficiently sized data connection exists between the Provider and the customer.

The method that SmartRecord® uses to manage this distributed storage architecture is called Media File Server and has been patented by CTIG.

Roaming Calls

The one issue that providers will encounter with their in-network solution is that of roaming subscribers. In order to route the call to the home network for recording the remote network must support the Intelligent Network CAMEL protocol. Not every network does this, with China being a specific case. Providers are overcoming this issue in the short term by offering the corporate customer two options. The first option is to allow the call to continue, but report call details to the organization such as the third party number and call duration. The second option prohibits the call from being made if it cannot be recorded. It is the organization's decision as to which approach is employed, not the individual subscribers', as it is implemented in-network without the individual subscriber having control.

CTIG's Solutions

CTIG has used IN integration through SRC functions, SBC media forking and IMS integration in its implementations of mobile recording services for providers. These approaches have the advantages of being highly scalable and robust, with duplicate media streams being used for recording rather than placing the recorder directly in the call path.

CTIG has deliberately built its recording products to meet the needs of Service Providers. This means several things.

- CTIG has an understanding of how to integrate recording services into a Provider's network. These are OTT services and must have a seamless fit for a high quality end user experience
- CTIG delivers tools for Providers to take the recorder and turn it into a service, such as multi-tenancy, white-label web-driven interfaces (HTML5/CSS3), multiple options for single sign-on, provisioning services for OSS/BSS integration including a comprehensive API layer, and billing data that enables the provider to create multiple product offerings and bill accurately.
- CTIG has a rich feature set that enables the Provider to provide a comprehensive set of services into different vertical markets.

Typical Provider Requirements for Recording Systems

The recording platform will form a critical element of the provider's value-add voice services. Call recordings contain sensitive data and many customers will be under regulatory obligations to record and retain calls, meaning that the system must be secure and robust.

A hosted recording platform should, therefore, fulfil the following basic requirements:

- Tight security for each tenant. It must be impossible for anyone other than an authorized Tenant account holder to view CDR data and playback recordings that are associated with that Tenant account.
- Ease of use of the application. Carriers are not usually in a position to offer training courses or professional services to customers purchasing their recording service as it is not a core competency. It is important that the product be self-intuitive and it should contain online training material.
- High resilience. The recording platform must be able to support both local and geographical redundancy. This is true across all aspects of the recorder, from the signaling and media capture engine, through to the database, web servers and call store.

- Scalability. There are several facets to this. The first is in the signaling and media capture elements of the recorder. These subsystems must scale linearly and seamlessly to allow for expansion of the Carrier's customer base. These subsystems should also be able to record from multiple sources, with the ability to transmit recordings and metadata to a single central system. For example, many carriers operate more than one voice platform. The recorder should be capable of recording all voice platforms, while presenting a single logical system to the end user. The user interface, typically delivered through as a web service, must also scale linearly to absorb high volumes of transaction requests through the user portal. Finally the call store must scale to cover the online storage requirements of the customer base and future expansion of the service. Typically call storage is network-based for this reason.
- Horizontally scalable. The system should be able to service multiple vertical markets, including finance, call center, quality assurance, and liability protection. In order to do this the product must have a variable feature set, with the ability to offer different feature sets depending on individual customer requirements. The system should also scale to meet the needs of different types of enterprise, from small businesses to large corporates.
- Branding. The system must support white-label branding and should be at a per-group level. This allows the Carrier to offer branded services on an individual basis to its resellers.
- Integrated service delivery. The system should offer seamless integration into the Carrier's provisioning, billing and customer care systems, allowing the Carrier to automate the provisioning of the recording service, extract billing data from the system and integrate it into their support infrastructure.
- Single sign-on. Carriers are concerned about the number of different portals that they provide to their customers. The recording system should offer seamless integration into the online customer experience, including single sign-on.

Service Provider Markets

The table below shows the typical company profile for businesses that have purchased an in-network recording service. The table is populated with data gathered from over 70 hosted recording systems and is reasonably representative, although every Service Provider differs and the table is provided for guidance only.

Market	% of Subs
Company size: 1-20 Employees (SMB) Recording requirements: On-demand recording, regulatory recording, all devices Telephony services: Find-me/Follow-me (One-Number)	50%
Company size: 20-250 Employees (SME) Recording requirements: All customer facing lines plus some back-office lines, standard recording features, adherence to regulatory standards Telephony services: Mix of fixed and mobile, some UC, informal contact centers	20%
Company size: 250-10,000+ Employees (Enterprise) Recording requirements: All customer facing lines, specific contact center applications, advanced analytics, adherence to regulatory standards Telephony services: Mix of fixed and mobile, fully integrated UC, informal contact centers, full contact center	15%
Company size: Government, Education, and Health Recording requirements: On-demand for low-use phones, mandatory recording for customer facing teams Telephony services: Mix of fixed, mobile, fully integrated UC, informal Contact centers, full Contact Center, adherence to regulatory standards	15%

How Service Providers Monetize the Offer

Service Providers typically offer call recording using one of two business models: value-added service or bundled service. This section details how these are implemented in practice.

Recording is generally a high annual revenue per user (ARPU) service. The equivalent cost of deploying a premise-based recording system is very high, involving a large capital outlay, and is typically out of reach for many small enterprises. This is an area of opportunity for hosted recording Providers.

A bundled recording service is offered as part of the feature set within the core telephony product. It is usually a very basic recording service that records and offers a search and replay function coupled with limited online storage. For example, customer recordings are stored online for 7 days.

Service Providers use this technique to introduce competitive differentiation into their product set. Providing a core hosted telephony service with inclusive call recording is unique in the market, and it increases the perceived value of the Provider's service offering.

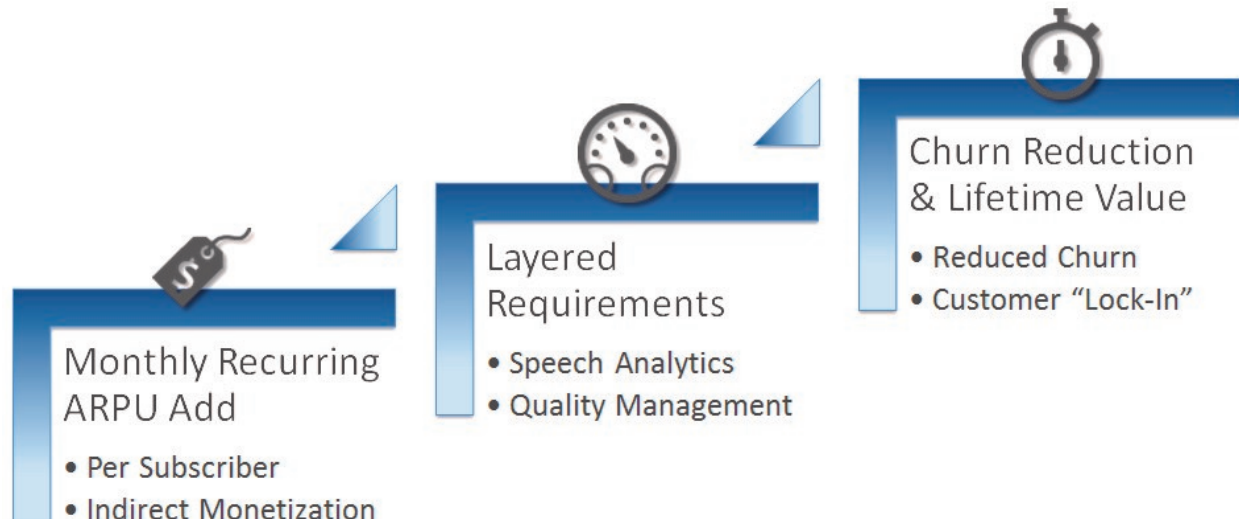
Bundled services are generally part of the Service Provider's product strategy. The strategy also consists of a portfolio of additional recording products that customers can be upsold to, or that provide more appropriate feature sets for specific vertical markets, such as Finance and Regulatory or Call Center.

Offering recording as a value-added service is another product strategy, and it is frequently coupled with the bundled approach, as explained above.

Value-added services are generally quite simple. Adding too many options confuses customers and increases the provisioning and billing complexity. Products suitable for call center recording (feature rich) and regulatory recording (longer online storage retention) are the two most common product variants.

Pricing models for Recording as a Service are also generally simple and often fall into line with the pricing strategy of the hosted telephony service. For example, some Service Providers will charge a setup fee for recording, while others find that this conflicts with their pricing strategy, and they choose to charge a monthly service fee only.

Pricing is generally based around a fixed monthly service fee as this is simple to understand and simple to bill. The fee may include a storage allowance (measured in gigabytes (GB)) with additional storage charged per GB. Occasionally Service Providers will choose an alternative pricing approach, for example pricing on an usage basis (price per minute of recorded call, possibly as an uplift to the call charges), but this is not a common approach.



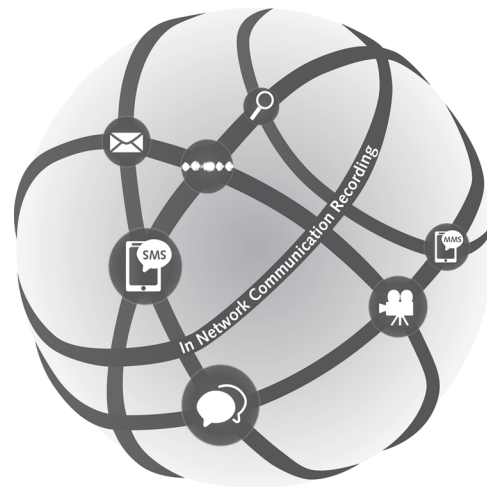
The above diagram illustrates that Providers start with a simple per subscriber service, adding vertical applications to suit specific market requirements, combining to make the customer far more "sticky" as the cost of migration becomes proportionally greater.

Conclusion

CTIG believes that network-based mobile recording is the only sustainable approach for meeting regulatory requirements and mission critical enterprise mobile recording needs. The initial driver for mobile recording has been regulation within the financial sector, but the entire telephony “culture” is shifting away from fixed-line systems to mobile unified communications strategies. This is partly being driven within the consumer sector. For example 15% of households in the UK no longer have fixed line telephones. Enterprises are continually investing in remote working, disaster recovery and fixed-mobile convergence (FMC) strategies that utilise smartphone and tablet devices in increasing volumes.

Within the industry itself, mobile operators are beginning to roll out LTE networks, with the obvious consequence of being able to deliver voice of LTE (VoLTE) and video over LTE. Additionally, the increasing use of fixed cost “all you can eat” tariffs and tougher regulation on roaming charges, are bringing mobile estate costs in line with those of fixed-line services.

These changes will only increase the demand for mobile recording solutions and the business drivers for recording need to be migrated from a fixed-line only solution to a FMC and even mobile-only user base.



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