

SMS Integration with Twitter and Other Social Networks

Boosting Social Networking Profitability for Mobile Operators.

This paper provides a brief introduction into social networks – in particular Twitter – the challenges operators are facing, and how Tekelec can help solve these challenges.



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Introduction

"A social network is a social structure made of nodes (which are generally individuals or organizations) that are tied by one or more specific types of interdependency, such as values, visions, ideas, financial exchange, friendship, sexual relationships, kinship, dislike, conflict or trade." **Wikipedia**

Social networks (SNs) are taking the market by storm. Twitter experienced a 1,382 percent growth rate from February 2008 to February 2009. Even the more established social networks such as Facebook, Bebo, and Orkut are seeing double-digit growth.

Since these networks opened up for mobile access through mobile data or short message service (SMS), mobile operators have been faced with the challenge of how to cost effectively handle traffic generated by this dynamic group of users, who are a part of their subscriber base.

This paper provides a brief introduction into social networks – in particular Twitter – the challenges operators are facing, and how Tekelec can solve these challenges.

Social Networks and Twitter

Social networks, typically referred to as "online" social networks, allow users to connect with likeminded individuals or organizations to share ideas, raise discussion topics, add blogs, and comment on fellow networker updates. Early online social networks include LinkedIn, Xing, Plaxo, and Naymz for professionals and Facebook, Orkut, and MySpace for family and friends.

In the early days of social networking, communication occurred via the Web through a specific social networking portal, personalized profile and page. More recently, messaging capabilities have been added to allow people to interact in real-time with each other in chat mode. Status updates, which are available on the personal page, are broadcast automatically to all connected friends within the personal/virtual social network. The updates are simple indications of where people are or what they are doing. Examples include: "I'm at the gym;" "Going to school;" "Traveling for business to Munich;" or "Working on a proposal for customer x." Such status updates often trigger a simple response like "Do u want 2 meet me in Munich?" or initiate chat sessions with other members within the social network.

Twitter is an interesting subset of the online social networking environment. It lacks a fancy personal Web page and has limited text capacity providing status updates, known as Tweets. Seen as a type of micro-blogging tool, it uses a very simple model in which the user answers one straightforward question – "What are you doing?" – in 140 characters or less. The reason for the character limit is to enable mapping to SMS to allow easy "Tweeting on the road" for those who don't have PC-based Internet or smartphone access.

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The Twitter team provided a public application programming interface (API), which stimulated an ecosystem of PC and mobile clients with related applications (i.e., picture upload sites, statistics applications, social network map generators, friend/follower management tools, etc.) that have found their way to users, all increasing the popularity and usage of Twitter.

Since its public launch in July 2006, Twitter has become a vehicle to provide updates on activities to friends, colleagues and other interested parties. Its uses are expanding to include news broadcasts, tracking target groups, networking with people in the same industry, and gathering feedback. It has also become a channel to follow celebrities and other VIPs such as President Barack Obama, Britney Spears, Oprah and Lance Armstrong. The most popular users can be found at <http://twitterholic.com/>. Businesses are also starting to use Twitter to send out company news and product updates to their customers.

Social networking has become a real-time tool for tracking what a user is doing and thinking. As the importance of social networks increases, networkers are searching for ways to update their status while on the go. Since PC access is not always available, the mobile handset has become an important means for exchanging status updates within the social networks. Initially this happened via off-deck mobile portals such as WAP browsers, but now occurs mainly through on-deck mobile clients, using mobile data and/or SMS. SMS provides the largest reach, since 99 percent of mobile handsets support SMS.

The Amazing Growth of Social Networks

Social networks, including Twitter, have seen explosive growth in the last several years. Despite high levels of churn (Twitter: 30-40 percent, Source: Nielsen, April 2009), growth figures are still impressive. Twitter experienced a growth rate of 1,382 percent in one year (Table 1). Even the more established social network players have growth rates in the triple digits.

Rank	Site	Feb 08	Feb 09	% Growth
1	Twitter.com	475,000	7,038,000	1382%
2	Zimbio	809,000	2,752,000	240%
3	Facebook	20,043,000	65,704,000	228%
4	Multiply	821,000	2,394,000	192%
5	Wikia	1,381,000	3,758,000	172%

Source: Nielsen NetView, 2/09, U.S. Home and Work

Table 1. Growth Rate in One Year

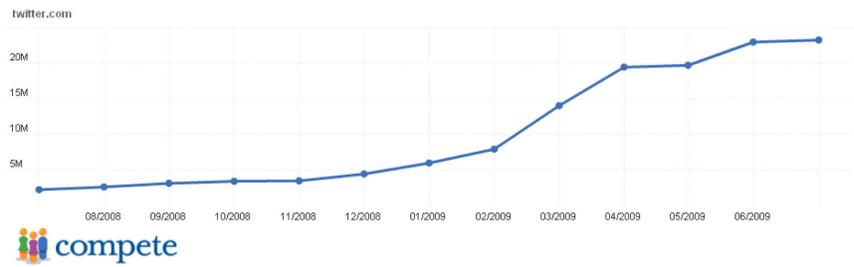


Figure 1. Growth Rate in Unique Twitter Visitors (Source: compete.com)

According to recent statistics, Twitter reached 22 million unique visitors in June 2009 – three times the rate of February 2009 – and approximately 14 million tweets a day were generated. Twitter demographics indicate that the majority of people who Tweet are under the age of 30. The numbers also show that the more followers a Tweeter has, the more Tweets per day are generated.

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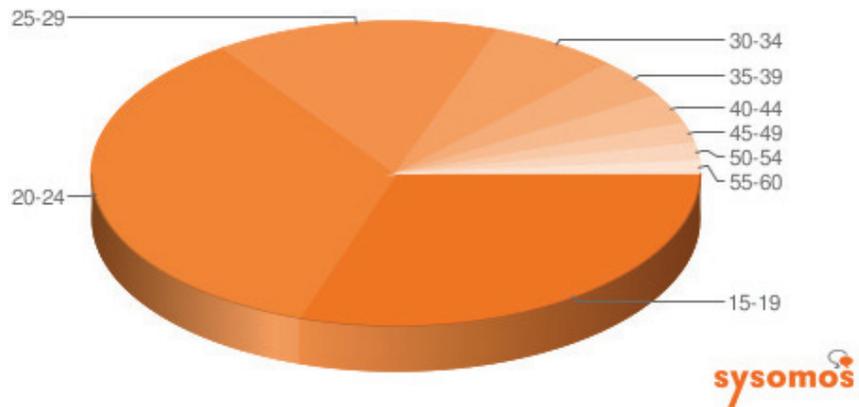


Figure 2. Twitter Users by Age Group (Source: sysomos.com)

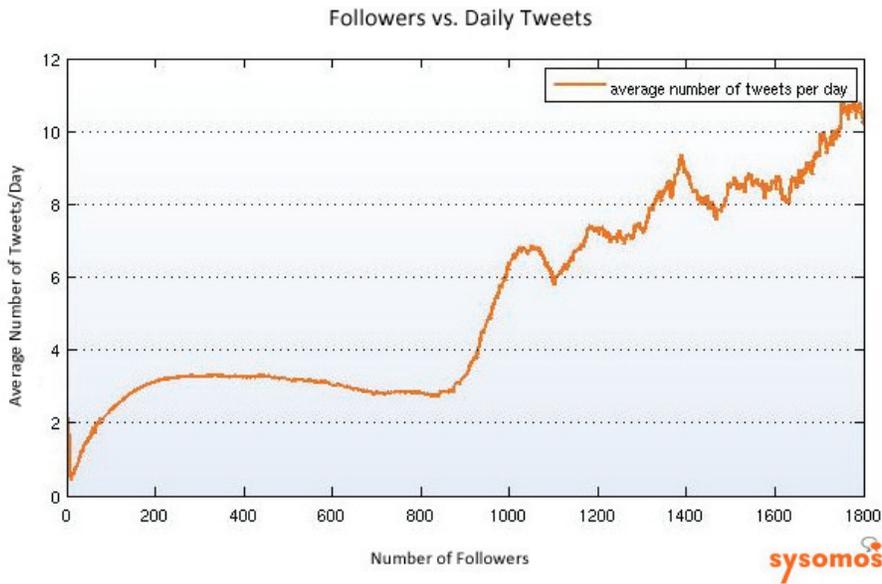


Figure 3. The Relationship Between Followers and Daily Tweets (Source: sysomos.com)

The average mobile user accesses Twitter 14 times per month and spends 7 minutes on the site. SMS is a favorite method for exchanging Twitter updates on mobile devices. SMS represents 3 percent of all Tweet publishing tools and generates 15 percent of mobile Tweets. Other publishing tools include Web (APIs), IM, smartphones, and clients. The number of SMS Tweets is expected to increase significantly with the growing popularity of Twitter, particularly when social networking moves beyond early adopters to early- and late-majority users, who typically have less innovative handsets that don't support applications beyond voice and SMS.

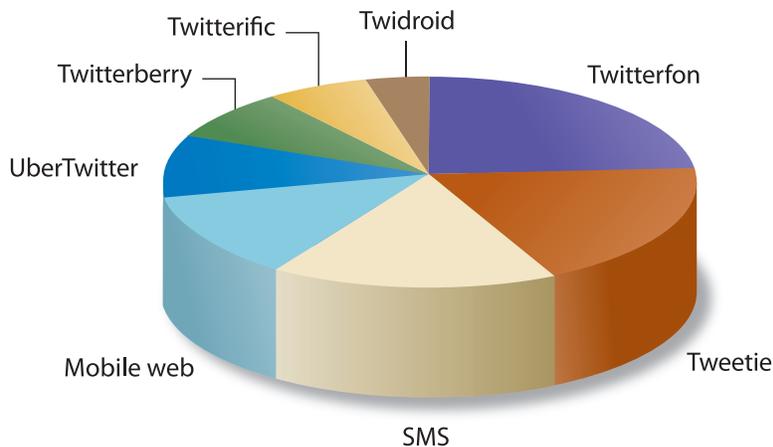


Figure 4. Market Share of Mobile Publishing Tools – SMS 15% (Source: sysomos.com)

In the US, more than 3 million subscribers use SMS to exchange their Tweet updates. With an average of 1 to 3 Tweets per day, they generate roughly 280 million SMS-based Tweets per month.

A European operator reports about 3 million Twitter subscribers, who primarily use Web and mobile clients to exchange data. The operator, which assumes that approximately 15 percent of those subscribers used SMS to access Twitter, estimates the number of SMS-based Tweets generated per month at 40 million.

Connecting Twitter and Other Social Networks with Mobile Operators

Twitter and other online social networks can receive updates from several sources, including the Web, smartphone clients (using mobile data) or SMS.

SMS is most popular with Tweepers on the road. In Figure 5, we see that short message peer-to-peer protocol (SMPP), an IP-based messaging interface, is used to send SMS-based Tweets from the Twitter datacenter to the mobile operator's network. Update Tweets are submitted via short- or long-code mobile subscriber ISDN (MSISDN) number. The Tweet is fed via the short message service center (SMSC) into the Twitter datacenter for further distribution to all followers. These Tweet SMS uploads, which are mobile-originated (MO) messages, are charged either at a standard or premium rate*. In the case of smartphones, the Twitter datacenter generally is accessed via mobile data (i.e., general packet radio service [GPRS]) by an API-based, third-party Twitter client.

The main issue mobile operators have is with the broadcasting nature of the Twitter update service. Subscribers follow several other users, with the most popular users having more than a million followers. Each Tweet from those followed users can generate an avalanche of as many as a million messages. For example, Tour de France winner, Lance Armstrong, has over 1 million followers. He tweets an average of 10 messages a day when he is not cycling, generating about 10 million update tweets to his followers. A percentage of these tweets go mobile through SMS, creating spikes on the participating operators' SMS infrastructure.

* In the US, unlike the rest of the world, subscribers are charged for both mobile-originated and mobile-terminated Tweets.

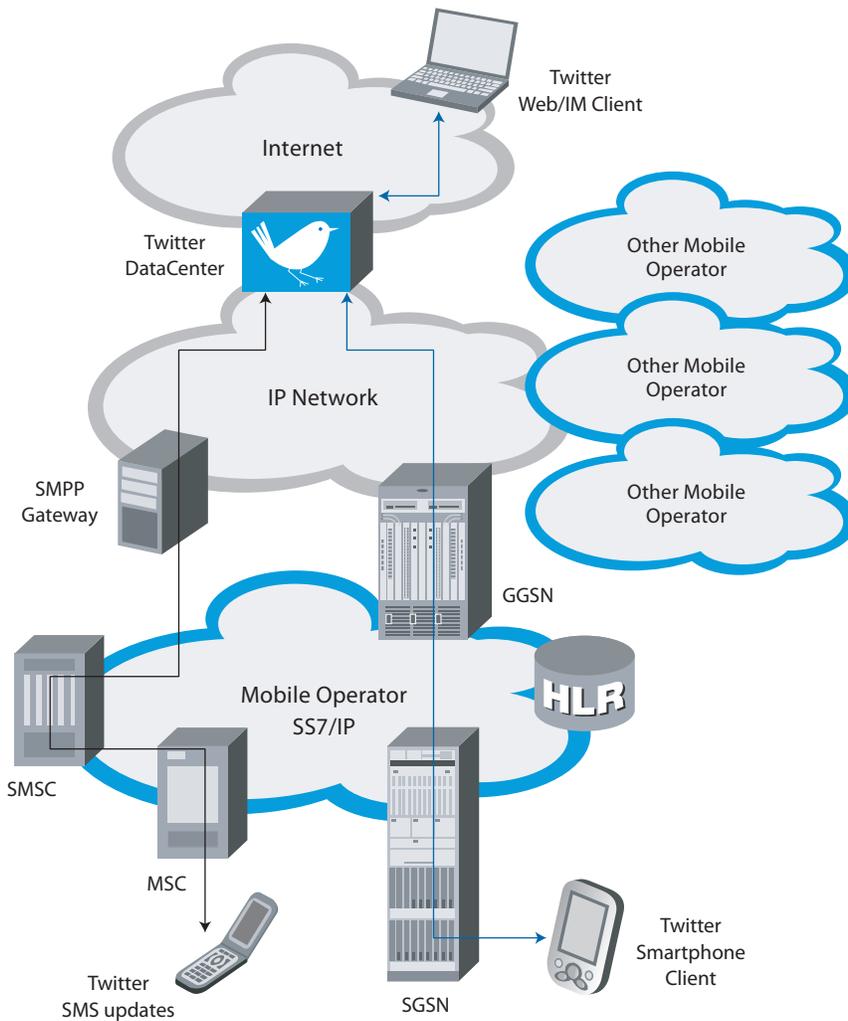


Figure 5. Mobile Tweet Publishing Architecture

Twitter calculated the financial burden of SMS-based Tweets. With 250 Tweets per week, Twitter has to pay \$1,000 US per user per year to mobile operators, which is not sustainable for a relatively small VC-funded company (Source: Twitter Blog).

Initially Twitter paid operators for the submitted Twitter updates, but since the service has gained such huge popularity, it is no longer economically feasible to do so. To reduce costs, Twitter struck special deals with a group of mobile operators, which agreed to provide Tweet updates at no charge. However, not all operators are willing to provide free SMS-based Tweets to their subscribers. The lack of a clear positive business case is hindering this option. Soft benefits, such as being seen as an innovative messaging player or reducing customer churn, are difficult for operators to quantify.

“When we launched our free SMS service to the world, we set the clock ticking. As the service grew in popularity, so too would the price. Our challenge during this window of time was to establish relationships with mobile operators around the world such that our SMS services could become sustainable from a cost perspective. We achieved this goal in Canada, India, and the United States.”* **Biz Stone (Co-Founder) Tweeter Blog Page**

(* Recently Operators in New Zealand, United Kingdom and Italy have joined.)

Using Tekelec’s SMS Network to Connect Social Networks

As SMS updates from social networks mature, more behavioral statistics are becoming available. For every six mobile-terminated (MT) Tweets, one MO Tweet is sent (6:1). During special campaigns or events, this ratio can get as high as two-to-one (2:1). Michael Jackson’s death generated a traffic surge of 5,000 messages per minute. These charged MO messages represent additional revenue and could be enough for mobile operator to provide free delivery of MT Tweets. Reducing the message delivery cost by optimizing the SMS infrastructure will help to improve overall profitability. Tekelec’s SMS Network solution enables operators to optimize their SMS network and deliver added capabilities such as charging for delivered Tweets or having sponsors pay for their delivery.

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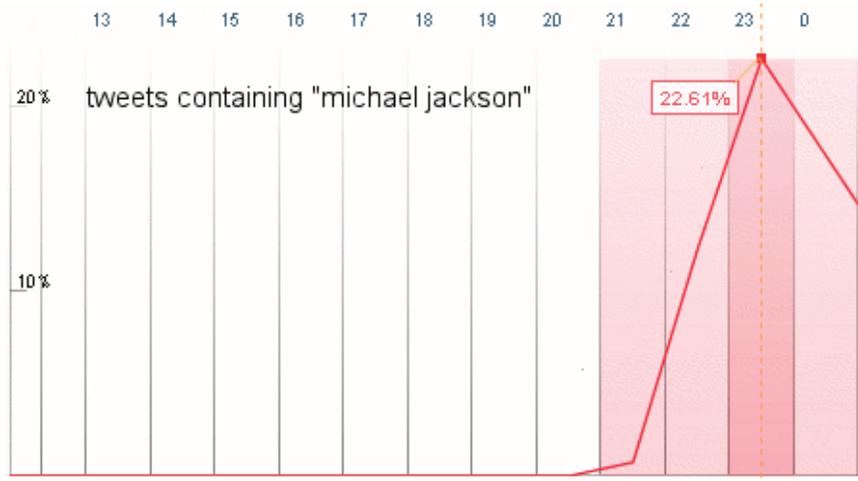


Figure 6. Fast Broadcast Media – Spikes Occur (Source: mashable.com)

Lowering Costs via Optimized SMS Delivery and Load Balancing

Tekelec's SMS Network solution, with the SMS Store and Application Gateway, optimizes SMS Tweet delivery. Tweets received from the data center enter the SMS Store, where the embedded first delivery attempt (FDA) capability immediately tries to deliver the message to the handset. In the case delivery failure, the messages can be stored for later retry. The strong, rules-based SMS routing engine ensures swift and accurate delivery of the Tweets. If required, optional message settings can be applied. The SMS Store solution provides:

- Optimized Tweet delivery using FDA with retry capability in case of an unsuccessful delivery (typically only 5-15 percent of the messages need a retry);
- Single-shot delivery (FDA without retry), which can be an acceptable approach since potential missed messages can be found on the Twitter web page;
- Blocking of mobile-terminated Tweets for outbound roamers to reduce interconnect fees; and,
- Conversion of a message into a Flash SMS that appears on the handset screen without being stored in the handset to reduce subscriber identity module (SIM) or phone memory usage.

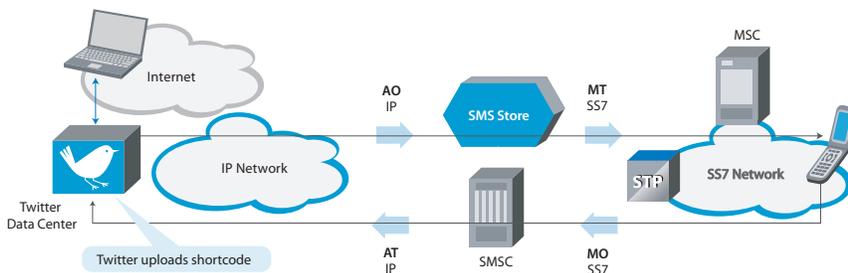


Figure 7. Efficient SMS-Based Tweet Delivery Using FDA

The solution's optional Application Gateway ensures equal traffic distribution over different SMS Stores or even traditional SMSCs, if required.

Charging for Mobile Terminated (MT) Tweets

Tekelec's SMS Store solution also enables the introduction of MT charging for SMS Tweets. Traditional SMSCs can only charge on MO messages. In such an environment, most pre-paid charging triggers are initiated at the mobile switching center (MSC). The SMS Store solution offers the flexibility to provide a mix of MO and MT message charging, using separate billing profiles, and can generate related call detail records (CDRs), as well as query pre-paid billing platforms via CAMEL v2/v3 or Diameter.

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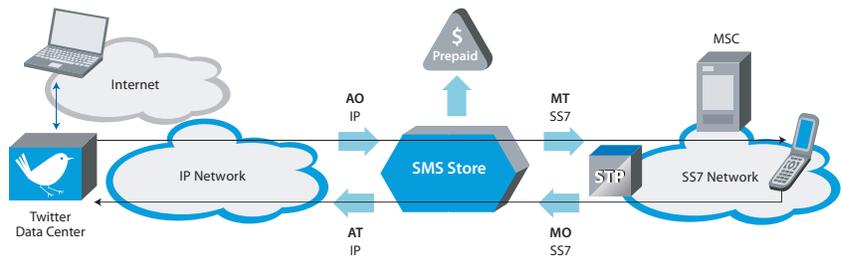


Figure 8. Followed (MT) Tweets Can Be Charged for – Post and Pre-Paid

If the mobile operator’s business model does not provide room for free delivery of SMS Tweets, the operator can offer users an opt-in to pay for MT SMS Tweets. Particularly where tariff bundles or buckets are enforced, users could view this option as the next best thing to a free service since it enables them to stay informed with Tweets while on the road.

Sponsored Tweets

The Advertising Insertion Center (AIC), part of Tekelec’s SMS Network solution, provides another funding model for the delivery of SMS Tweets. The AIC enables operators to insert advertisements into each Tweet submitted to the handset. A clear separator (character) is used between the Tweet text in the SMS and the inserted ad. The AIC ensures that the ad uses the remaining space in the SMS message. It can also add a segment to the overall SMS Tweet to expand it beyond the 140-character limit.

The AIC typically interfaces with third-party ad server environments to allow operators to run a multi-channel marketing campaign (i.e., banner ads, multimedia message service (MMS) and SMS-based ads). The ad servers can be used to allow subscribers to opt-in for sponsored SMS-based Tweets, providing a new channel for media agencies to reach out to a profiled target group.

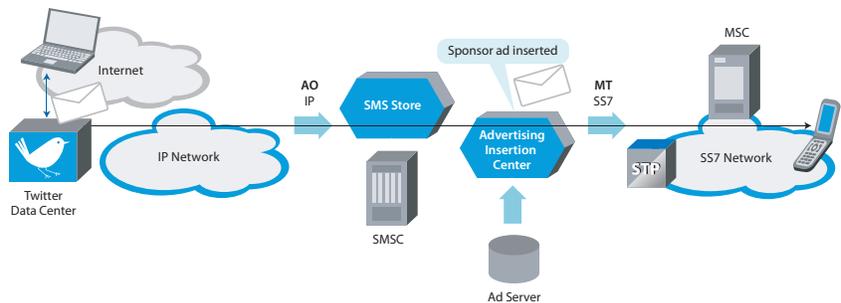


Figure 9. Sponsored (MT) SMS-Based Tweets

Conclusion

Social networks, including Twitter, have taken the market by storm. Since these networks opened up for mobile access, operators have been faced with the challenge of how to cost effectively handle the escalating traffic loads generated by this dynamic group of users. To create a viable business model, operators need to optimize their SMS networks to reduce operating costs and leverage the existing infrastructure to create new revenue streams.

Using Tekelec's SMS Network to connect Social Networks, helps operators manage increasing traffic loads today while preparing them for the next wave of social network growth. The application, which uses FDA capability, optimizes network routing to lower the delivery cost per message. Using the Application Gateway, operators can balance loads across SMS Routers and SMSCs to prevent the bottlenecks created by surges in SMS-generated Tweets. With SMS Store, operators can boost revenues with MT charging for SMS Tweets. By combining the Advertising Insertion Center with third-party ad servers, providers can create the highly targeted and relevant advertising campaigns that bolster their bottom line and prevent customer churn.

About Tekelec

Tekelec, a global leader in core multimedia session control, mobile messaging and network intelligence, ensures scalable, secure and highly available communications. The company's market-leading signaling solutions enable the interworking of different network applications, technologies and protocols, providing a smooth transition to next-generation networks. Tekelec has more than 25 offices around the world serving customers in more than 100 countries, with corporate headquarters located near Research Triangle Park in Morrisville, N.C., U.S.A. For more information, please visit www.tekelec.com.

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Appendix: Acronyms Used in This Document

AIC	Advertising Insertion Center
API	Application Programming Interface
CDR	Call Detail Record
FDA	First Delivery Attempt
GPRS	General Packet Radio Service
IP	Internet Protocol
MMS	Multimedia Message Service
MSC	Mobile Switching Center
MO	Mobile Originated
MSISDN	Mobile Subscriber ISDN
MT	Mobile Terminated
SIM	Subscriber Identity Module
SMPP	Short Message Peer-to-Peer Protocol
SMS	Short Message Service
SMSC	Short Message Service Center
SN	Social Network

