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Customer Spotlight: Musicland



"Mobile 365 presented us with a unique and creative program without the hurdles of going to multiple vendors." –David Brinker
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Upcoming Events

3GSM
13-16 February, 2006
Barcelona, Spain

Mobile 365 Singapore Seminar
23 February, 2006
Pan Pacific Hotel, Singapore

Mobile 365 India Seminar
3 March, 2006
New Delhi, India

Emobility
4-5 April, 2006
Madrid, Spain

MD Expo
4-6 April, 2006
Paris, France

Mobile Content World Asia 2006
4-6 April, 2006
Suntec Convention & Exhibition Centre
Singapore

A complete list can be found on page 6.



Corporate Viewpoint: On Corporate Fitness

Mobile 365™ embarks on a "corporate fitness" program in 2006, which involves teamwork, responsiveness, accountability, integrity, and innovation. [page 2](#)



Network News: Richer Content = Greater Capacity Needs

As mobile messaging becomes increasingly content-rich, Mobile 365's APEX Network becomes increasingly important, helping us continue to provide our customers with the best mobile delivery mechanisms possible. [page 3](#)



Regional Perspective: EMEA

Exciting growth opportunities in Western Europe, explosive growth expected in Eastern Europe in the next few years, and great opportunity in South Africa for Mobile 365. [page 4](#)



Case Study: McWilliam's Wines

Mobile 365 works with McWilliam's Wines, one of Australia's largest and most highly regarded family-owned wine companies, helping them run a number of competitions and campaigns to promote various individual brands. [page 7](#)

Industry Insight

Attacking Cellular Networks with SMS: A Threat Assessment [page 4](#)

Perspective on Wireless Number Portability for Messaging [page 5](#)

The Future is IMS [page 6](#)

Country Focus: Spain

by Francisco del Sol Moreno, General Manager Spain + Portugal

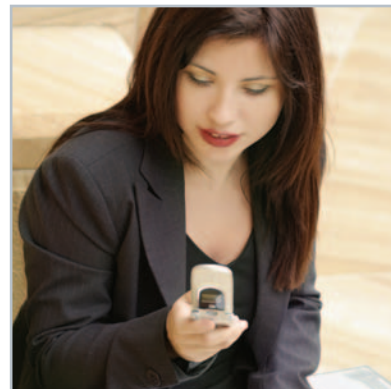


Spain is one of the most mature mobile markets in the world. With 40.7 million wireless subscribers and 100.94% mobile penetration (more than one mobile per person), Spain offers a large marketplace for content and services.

Last year, Premium SMS (PSMS) services represented about €265 million.

The market has grown since 2002, when PSMS was first introduced, and today includes ringtones, logos, wallpaper, voting, chat services, Java games, and interactive services for publishers and broadcasters. This represents around 60% of the mobile premium services market.

With WAP/GPRS portals, the three Spanish mobile operators – Telefónica Moviles, Vodafone, and Amena – offer their subscribers their own portfolio of content and services. All mobile portals provide general news, weather, and financial updates; email, restaurant, and event information; entertainment services; and banking and direction assistance. Many mobile portals also offer directories; community services; TV, movie, and nightlife information; adult entertainment; games; flight and hotel information; and personalization of mobile portal services. They also offer calendars and stock trading.



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Corporate Viewpoint

On Corporate Fitness

by Patrice McAree, Vice President, Global Business Development



Is it the arrival of another New Year (and those dreaded resolutions), or simply the past year's glut of too many airplanes, too many odd meals, and not enough exercise? Whatever the prompt, my thoughts recently turned to fitness – both physical and mental – and how that concept of “fitness” applies to Mobile 365's corporate New Year's resolutions. Perhaps the concept is more “real” to me because of my day-to-day role managing the company's biggest corporate clients, including Microsoft, Yahoo!, MSN, and others.

With this in mind, let me offer a few thoughts for calendar year 2006.

Work the Plan

Any decent fitness trainer will counsel you to make a plan and then stick with it – and I suspect the advice holds true for companies, as well. So this fall, the Mobile 365 executive team signed the entire company up to a 2006 “exercise plan” that involves the following rigor:

- **Teamwork:** Employees willingly reach across organizational, geographic, and time zone boundaries to help make the Mobile 365 work environment rewarding, fun, and collaborative.
- **Responsiveness:** We respond quickly to the demands of our customers with energy, agility, and enthusiasm.
- **Accountability:** Mobile 365 employees accept responsibility for achieving personal and team objectives, and for delivering on all commitments.
- **Integrity:** The company acts with integrity in everything we do, while respecting the skills, responsibilities, and challenges of others – customers, co-workers, partners, and vendors.
- **Innovation:** We continuously seek creative, effective ways to improve every aspect of our business, while delivering greater value to our customers.

Some will dismiss these five simple metrics as another set of ill-fated “corporate values” – the forgotten epitaph glued to a company security badge, the unread “mouse type” printed on a cheesy corporate mouse pad. I disagree. These five tenets form the standards by which Mobile 365 employees will be measured – from executive staff to engineers to sales to administration.

Mobile 365 is actively pushing these measures into every aspect of company life, especially as part of our employee performance reviews.

To further abuse the simile, it's a bit like “corporate crunches” – ignore the plan (and retain the potbelly) at your own peril.

Fitness Partners

Fitness trainers frequently recommend finding partners who can help with the discipline a stern regimen demands. For Mobile 365, these partners come in two flavors, internal and external.

In 2005, Mobile 365 added over 60 new employees – 20% company growth – as part of our fitness commitment. Based on our core competencies of running a world-class network – and billing and settling mobile transactions worldwide – it is no surprise that the Engineering and Finance teams received the bulk of the “new muscle.” But we also staffed up in key areas such as a new chief legal counsel, new pan-European head of sales, new head of human resources, and many others. These are all areas of vital importance to my customers – whether beefing up a network or resources for a given contract. We're confident that these new internal partners will help shoulder the load in 2006.

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Press Releases

Mobile 365 Provides Connectivity to Sensis (14.12.2005)

MSN India and Mobile 365 Sign up Five Mobile Operators to Deliver MSN Hotmail and MSN Messenger via Two-way SMS (13.12.2005)

Mobile 365 Appoints Andy Sherman as General Counsel (08.11.2005)

SOLD! Mobile 365 Delivers “For Sale” Messages for CellSigs (27.10.2005)

Mobile 365 Named Rising Star in Deloitte's Technology Fast 500 Program (19.10.2005)

Mobile 365 Connects Over 3 Million Africans to the World via SMS (18.10.2005)

Mobile 365 Named Rising Star in Deloitte's Technology Fast 50 Program for Virginia (12.10.2005)

Mobile 365 Adds India and China to Its Global Footprint (27.09.2005)

Sam Goody First National Retailer to Offer In-store Ringtone Download Service (26.09.2005)

MMS Traffic Takes Off in the United States with Mobile 365 Inter-operator Solution (26.09.2005)



“Mobile 365 has the global reach to ensure the seamless execution of a program of this magnitude, and the company is always looking to collaborate with partners to bring superior mobile programs in a one-stop-shop fashion.”

Gregory Dunn

*Vice President of Sales, Americas
Mobile 365*

Customer Spotlight

Musicland Selects Mobile 365 to Help Make Their Sam Goody Brand the First U.S. Retailer to Offer In-store Ringtone Downloads

You're strolling through the local mall looking for that little store where you can return the awful tie you got for your birthday when your mobile phone rings. "Pick up some milk at the market on your way home," says your wife. No problem, darling. You hang up and continue strolling. As you walk on, you decide that your phone's ringtone is getting old fast. Time for a new one. So you turn the corner, walk into a Sam Goody record store, pick out a song from the "Most Wanted" CD wall, and make that your new ringtone.

Sounds like the future, but it's happening right now. Mobile content has become the latest extension of the retail world, and Mobile 365 is right in the thick of things.

Mobile 365 is partnering with Musicland Group, Inc., a leading national entertainment retailer

and owner of the Sam Goody chain of record stores, to make ringtones from popular songs available to Cingular and T-Mobile subscribers.

Mobile 365 and Musicland have teamed up to launch a new in-store ringtone download service called "G-Tones." This unique offering is an integral part of Musicland's revamping of the Sam Goody division as they strive to re-connect the well-known brand with teen and young adult customers.

On October 4, 2005, G-Tones launched at more than 460 Sam Goody stores across the U.S. Cingular (including former AT&T subscribers) and T-Mobile subscribers can now purchase, via a text message addressed to "GOODY" (46639), ringtones from albums found on Sam Goody's "Most Wanted" CD wall – master (an actual audio clip of the master recording –

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The APEX Network has the capacity to deliver high bandwidth content quickly and easily across the widely disparate handsets around the world, and customers are already taking advantage.

Network News

Richer Content = Greater Capacity Needs

by David Gilbert, Vice President, Network Engineering



During the final quarter of 2005, we continued to see a dramatic and consistent increase in higher-bandwidth messaging, generally MMS and WAP transactions. Anticipating the greater capacity demands these trends would bring, Mobile 365 continues to invest in our global APEX Network. By bolstering our industry-leading network infrastructure, our customers can be assured they will continue to receive service that is second to none.

A new state-of-the-art data center recently came online in the U.S., immediately increasing the traffic capacity and technical capabilities of the APEX Network. Additionally, our network facilities in Europe have received significant improvements that translate into improved content management and distribution capabilities worldwide. We also added advanced hardware to our Shanghai data center for the benefit of the increased traffic we are seeing in China.

On the software/service side of the equation, further modifications and upgrades to Mobile 365's reporting capabilities (already leagues ahead of competitors) are yielding great results for our customers.

Person-to-person (P2P) MMS messaging is here to stay, and even we have been surprised at the up-tick in message flow. As U.S. domestic operators "plugged in" to Mobile 365's interoperability platform one by one, numbers immediately took off. The most encouraging statistics pertain to the organic growth in P2P MMS messaging, which show that as new MMS-capable phones find their way into consumers' hands, those consumers are more than eager to use them. U.S.-to-international MMS interoperability is now coming online, and we expect the messaging volume to be equally impressive.

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Regional Perspective: EMEA

by Charles Damen, Business Development Director, Europe



Western Europe continues to be both the most mature – and the most saturated – mobile messaging market in the world. While penetration rates in some Western European countries exceed 100% – on average, one person may own more than one mobile phone – growth continues to be found in the launch of new, innovative services and in utilizing operators' upgraded network capacities for enhanced and richer media messaging.

Eastern Europe is beginning to make some noise in the mobile messaging space, but for now, messaging volume and mobile marketing activities are relatively light. However, this should be a region of explosive growth over the next few years.

Much of the growth comes from so-called "emerging markets." Turkey, in particular, has shown many promising signs, with high rates of mobile phone penetration, fairly substantial mobile data flow, and several successful

large-scale mobile campaigns carried out by big brands.

South Africa is currently an exciting place to do business and – Mobile 365 believes – will be in the future, as well. Mobile 365 has established its first permanent African presence by opening a sales office in Johannesburg and is currently enabling some of its global clients for content delivery to the South African market. Mobile 365 has worked diligently to establish connections with all mobile operators in South Africa, and has successfully connected to all three mobile networks – Vodacom, MTN, and Cell C. We look forward to great success in this market.

New services and technologies present an enormous opportunity for content providers to push the envelope and innovate, for operators to increase revenues, and for consumers to purchase tremendous new content and services on their handsets. This is especially true in Western European markets, which can accurately be labeled as some of the most advanced in the world.

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Industry Insight

Attacking Cellular Networks with SMS: A Threat Assessment

by William Dudley, Senior Director, Product Management



The *New York Times* reported on October 5, 2005 that "hackers, using text messaging, could effectively jam cellular networks." This

article was based on recent data from a Penn State University Paper titled "Exploiting Open Functionality in SMS-Capable Cellular Networks." The paper is posted online at www.smsanalysis.org, and was presented at the 12th ACM Conference on Computer and Communications Security (CCS '05).

The Penn State paper evaluates the security impact on cellular networks of Internet-originated text messages on voice and SMS services. The authors contend that by using large, accurate "hit-lists," or lists of phone numbers, attackers could deny voice services to cities such as Washington, D.C. or London

with little more than a cable modem. It also theorizes that it would be possible to target an entire country with resources of a medium-sized "zombie network." The paper then offers a number of security upgrades that mobile network operators should implement to circumvent this threat.

While this paper provides a number of details on how such an attack could be carried out, and describes the fragility and vulnerability of mobile networks, it does not address or acknowledge the mobile operator security details currently in place that would thwart such an attack. Due to the ubiquitous nature of mobile networks today, there is actually more security in place than is acknowledged by the paper's authors. Still, the paper does the industry a service by pointing out specific vulnerabilities of mobile networks.

So, is this type of attack possible? Can it easily be thwarted? The answer to both questions is "yes." While such an attack is absolutely possible, the reality is that it may not be possible to the extent postulated by the paper. There are a number of reasons why, in reality, it is more difficult to overwhelm a mobile network by using SMS than are outlined in the paper.

First, let's take a look at how text messages are delivered over the air, which is what is being overwhelmed during a denial of service (DoS) attack using SMS. Mobile networks' radio networks are divided between control channels (CCHs) and traffic channels (TCHs). CCHs are a small part of the radio frequency or bandwidth that are used to send information about call setups. SMS uses CCHs for delivery. The control channel also provides information about TCHs, such as availability. Have you

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Industry Insight

Perspective on Wireless Number Portability for Messaging

by William Dudley, Senior Director, Product Management

Number portability offers subscribers the ability to change service providers or operators while keeping the same phone number. There are a variety of number portability terminologies. Mobile Number Portability (MNP) and Wireless Number Portability (WNP) refer to the same thing – the ability of a subscriber to change mobile operators while retaining their mobile number. Then there is Local Number Portability (LNP), which typically refers to subscribers changing wireline or fixed service providers. WNP can also involve moving between fixed and mobile operators, or vice-versa.

The process of porting a number from one mobile operator to another involves several steps, including the initiation of the port from the subscriber, an exchange of porting information between the operators, and updates to the network routing scheme. This is a fairly complex operation, and does not affect how a message (either SMS or MMS) is routed. Once the port operation is complete, only then does WNP affect how mobile messages are routed and delivered.

Number portability has now been successfully implemented around the world, including the European Union countries, the United States, Hong Kong, Singapore, and Australia. Many other countries are either in the process of implementation or are in the planning stages. In the U.S., WNP began in November 2003. Previously, there had been several delays and significant political debates in which various courts and lawmakers became involved. Many operators were afraid that mandated WNP would cause a significant amount of subscriber churn and ultimately

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Product Spotlight

Network Query: Knowing Your Customer

by Ran Margalit, Director, Messaging Delivery



Type the phrase “knowing your customer” into your search engine of choice, and you will get millions of Web page hits discussing one of the most fundamental business principals in the modern era – for a business to be successful, it has to know its customers.

But as content providers are quickly realizing, wireless subscribers make for an elusive customer set that is difficult to track – an issue with rising impact on content providers’ billing rates.

Underpinning the problem is the very nature of the content industry. Content providers have to rely on third parties (aggregators and operators) for service delivery, billing, and payment collection. Critical information about the customer – from credit status to handset capabilities to network identity – resides outside of the content provider’s span of control. As subscribers recharge their accounts, upgrade their phones, or port their services, content providers are dependent on their business enablers (aggregators/operators) for insight into the ever-changing profile of their customer base.

To understand the magnitude of the issue, one needs look no further than Wireless Number Portability (WNP). WNP, available to more than 550 million subscribers worldwide, increasingly causes accidental subscriber churn for the content industry. As users port their numbers, content providers lose delivery and billing relationships. And if the operator does not acknowledge the porting events in real-time, content providers can be left in the dark for months as to the whereabouts of their customers. So how much of an impact does WNP have on content providers’ billing rates? According to Mobile 365 estimates, content providers operating in WNP markets are subject to a gradual decrease in billing rates of between 5 and 15%.

Operators have long recognized the need to share pertinent subscriber information with content providers. Many operators provide message delivery acknowledgments (SMS-C Ack, Handset Ack), and some even offer information about the subscriber’s real-time credit status or service profile.

However, the information flow is far from perfect. Most operators do not acknowledge subscribers who have ported out of their network. And the same goes for recycled numbers, leaving the door open for content providers to accidentally charge a subscriber for content they never requested. Finally, only a handful of operators share handset information critical for optimal content delivery and service stickiness.

Aggregators such as Mobile 365 play an important role in filling this information gap. The company is active in managing WNP, and has deployed a global set of delivery notifications, translating network-level information received from hundreds of operators into clear and actionable transaction status reports that are sent back to content providers.

Mobile 365 recently introduced a new service, Network Query, which enables content providers to take failed transactions and query the mobile phone number for portability and/or inactivity. Content providers use the service to keep their customer databases clean, eliminate “dead”/recycled numbers, and establish the whereabouts of ported subscribers to renew customer relationships.

The industry is beginning to show a willingness to learn and adapt. International operators, such as SFR, Bouygues Telecom, Orange France, and TIM Italy, have opened up new communication channels with aggregators, transmitting (in real-time) the subscriber’s handset information. Such information is critical to content providers’ ability to understand the technical capabilities of their customers, and optimize the content delivery at the specific handset level. Other operators, such as Orange UK, offer aggregators and content providers a database screening service (free of charge) to identify subscribers who have left the Orange network.

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Industry Insight

The Future is IMS

by William Dudley, Senior Director, Product Management



The IMS framework makes it possible for a brand new paradigm for initiating communications.

Over the past year, IMS (IP Multimedia Subsystem) has become the latest “hot” technology and buzzword, along with its underlying protocol SIP (Session Initiation Protocol). IMS is quite misunderstood for what it is and the benefits it will provide. There has been much speculation as to the impact of IMS on operator networks and what will be the next “killer app.” A lot of questions, many opinions, and few true answers exist; however, with persistence, the answers are starting to become clearer, and Mobile 365 will have a significant role within the IMS domain.

IMS is an open industry standard for voice and multimedia communications over IP networks. It is a core network framework that will support a foundation (or building blocks) for such services as Voice over IP (VoIP), Push-To-Talk (PTT, also known as Push-To-Talk over Cellular, or PoC), Push-To-View, Video Calling, Video Sharing, and the concept of presence. IMS is based primarily on SIP.

For users, IMS-based services enable person-to-person and person-to-content communications in a variety of modes, including voice, text, pictures, and video, or any combination of these in a highly personalized and controlled way. For mobile operators (as well as fixed line operators), the benefits of IMS include increased flexibility to offer new 3G services and lower costs. Among the key benefits of IMS is the ability to blend various services together, creating enhanced user experiences that were not possible with current wireless (and fixed line) infrastructures.

For subscribers, IMS will provide an entirely new paradigm for personal messaging communications. It extends the instant messaging experience so users can see who they can connect to – and how they can be connected. Users will be able to see alternatives such as text, MMS, and voicemail. They will be able to define alerts to be sent to them when friends, family, or other contacts become available for different types of communication. Users will also be able to define how they look to others (who gets to see what).

A number of factors must come into play before IMS achieves its full potential – from handset support to radio network support to infrastructure to applications (especially applications). In reality, IMS will be deployed incrementally with most initial applications supportable on today’s 3G handsets, such as video sharing (while a voice call is underway) and possibly Push-To-Talk. The more advanced applications will become available as operators build out their IMS components and handset clients support more applications.

IMS infrastructure is now being deployed at a number of operators worldwide, with many more in the planning stages. Operators that have announced IMS deployments in 2005 include the following:

- British Telecom: BT Fusion, a fixed-mobile convergence; to be launched September 2006
- China Unicom: Mobile VoIP trials underway
- Commander Communications (Australia): Multimedia service to be launched Q4, 2005
- France Telecom: Fixed-mobile convergence
- O2 (UK): Push-To-Talk over Cellular (PoC), multimedia conferencing
- Sprint: EVDO services
- TIM Italy: Video sharing
- Telia Sonera: Instant Messaging, video sharing, and gaming; trial in 2005, commercial launch in 2006
- Cingular/SBC/Bell South: Fixed mobile convergence, multimedia services; commercial launch likely in second half of 2006
- Many more commercial launches, including Tier 1 and Tier 2, in 2006

Upcoming Events

3GSM

13-16 February, 2006
Barcelona, Spain

Mobile 365 Singapore Seminar

23 February, 2006
Pan Pacific Hotel, Singapore

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Mobile Content World Asia 2006

4-6 April, 2006
Suntec Convention & Exhibition Centre
Singapore

CTIA Wireless 2006

5-7 April, 2006
Las Vegas, Nevada, USA

World Telemedia

24-26 April, 2006
Berlin, Germany

Mobile Content World Australasia

6-8 June, 2006
Star City Casino Sydney, Australia

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Case Study: McWilliam's Wines



"The campaign went very well. Mobile 365 assisted us in managing the campaign with great customer service and technical support."

*Jonathan Weavers
Senior Brand Manager
McWilliam's Wines Pty Ltd.*

McWilliam's Wines is one of Australia's largest and most highly regarded family-owned wine companies. They are also a distributor of prestigious international brands.

McWilliam's chose Mobile 365's mobile application platform to seamlessly integrate SMS, IVR, customer service, and prize drawings into one easy-to-use interface that could be managed internally. Mobile 365 also supplied a full technology back-up and customer service to ensure success and a positive customer experience.

McWilliam's uses mobile marketing as a way to connect directly with its customers, increase sales, and build loyalty and brand awareness across several brands, including McWilliam's prestige wine brand, Hanwood Estate, and its imported champagne label, Henckell Trocken.

McWilliam's has run a number of competitions to promote its individual brands, including the following:

Hanwood Estate, McWilliam's Inheritance, and McWilliam's Regional Collection

The promotion ran over three brands for a period of three months with the major prize

being an E*TRADE account worth \$25,000. The campaign received more than double the usual rate of entries and had a sales rate of 6-7%, a significant improvement on previous campaigns.

Henckell Trocken

The Henckell Trocken promotion ran for three months with one major prize of five nights in New York. The mobile marketing campaign was designed to cover SMS, IVR, customer service, and the prize drawing. Over 10% of purchasers went on to enter this competition.

The campaign was also designed to build longer-term dialogue with customers by incorporating an opt-in for further communications. A further 5% of entrants opted-in to receive ongoing marketing offers. This promotion exceeded the client's expectations.

"It was a fantastic result for the Henckell promotion, with an outstanding redemption rate of 11.7%," said Oliver Cast, Senior Brand Manager - Imported Brands, McWilliam's Wines Pty Ltd. ■

Regional Perspective

continued from page 4

Mobile 365 is the first mobile service provider to launch a global platform for WAP billing, which will be of great benefit to both content providers – who can now be more flexible on pricing points while reducing bad debt and revenue leakage through real-time billing to prepaid and post paid users – as well as to end-users, who now have an easy way to purchase content on their mobile phones. Mobile 365 is leading the market through its WAP billing connections to all operators in Spain, and is currently rolling out in Germany and the U.K. Shortly thereafter, France and Portugal will be coming online.

Other exciting growth opportunities in Western Europe are mobile music and mobile TV. With the expanded capabilities of 3G networks, consumers are finding that their ever-present mobile handsets – if they are advanced enough – are great for keeping up with important audio or video. By adding WAP billing capability, Mobile 365 provides content providers with an end-to-end solution for the hosting and management of mobile portals, content management, and WAP billing.

It is very likely that the upcoming World Cup football matches in Germany this summer will be a great opportunity for increased use of high-bandwidth mobile technologies.

Mobile 365 will be partnering with several global clients to connect their customers to events in and around World Cup matches. We plan to take full advantage of the powerful technologies now available to provide a better and fuller mobile experience than ever before.

Across the board, the EMEA region continues to see strong growth in mobile data usage – simple SMS volume increases in developing areas and service enhancements in the more mature sectors. 2006 will undoubtedly be about richer and more compelling content, and Mobile 365 will be assisting our valued partners to deliver the content to any device, anywhere, at any time. ■

Industry Insight

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cost the subscribers. In fact, over 30 million subscribers were predicted to have ported during the first year.

The reality was that through April 2005, only 11.3 million subscribers ported from one operator to another. Of that figure, 7.8 million occurred through December 2004. Churn rates have not substantially changed – not only in the U.S., but in other markets, as well.

For many markets, WNP also means that consumers can move their fixed-network phone numbers to their mobile handset. Since WNP was launched in the U.S., more than a million subscribers have done just that, with the number of mobile subscribers now surpassing that of fixed line subscribers.

To route and deliver messages to its various operator customers around the world, Mobile 365 utilizes a comprehensive approach for routing. By implementing a combination of periodic range updates, real-time range updates, static number ranges, and individual numbers, the Mobile 365 routing database is among the most comprehensive in the world.

For WNP call routing, there are three significant schemes for network routing:

- Onward Routing
- All Call Query
- Query on Release

These routing methods are specifically applicable to how each operator handles incoming calls or message routing.

When Mobile 365 routes a message, it queries its own database to determine the destination operator. The destination operator may take further action, depending upon the network routing scheme utilized. In all cases, Mobile 365's routing database, or routing methodology utilized, depends on how the message is delivered – via a direct IP connection or through the GSM SS7 network.

With Onward Routing (OR), the destination network (called the "donor network" if the subscriber has ported to a new network) queries the recipient number and indicates that the subscriber has been ported out, and then

the call or message is forwarded to the correct new provider. This is also called the "message forwarding" method.

OR is used in several countries, including the UK and other European countries. Mobile 365 does receive periodic routing updates that it uses to update its line-range database, to greatly minimize the need for actual forwarding. Depending upon the frequency of routing updates that Mobile 365 receives for a particular operator or country, a subsequent message delivery may bypass the donor operator altogether and communicate directly with the new operator. In fact, the vast majority of Mobile 365's deliveries into countries where OR is used function like this.

In countries where OR is not used, the predominant method is called All Call Query (ACQ). In this scheme, the originating network does not route calls to the donor network. Once the number has been ported, all calls (and messages) must be directly routed to the new network. The caveat for implementing this type of routing scheme is that a centralized database must be maintained – usually by an impartial third-party. The U.S. and several European countries utilize ACQ.

Mobile 365's routing methods – especially IP-based message routing for SMS and MMS – utilize a method similar to ACQ, except the routing database is Mobile 365's internal database. If a call or message is sent to a subscriber and that subscriber no longer exists at the operator (either they have ported away or disconnected), the message or call will fail. The internal protocols used will notify the originating network (the originating operator or Mobile 365 as an intermediary) of the error, and depending upon the protocol in use, Mobile 365 can "try" other operators, in some instances, to find the subscriber.

Call delivery is similar to a variation called Query on Release (or QoR). If the call is delivered to the destination network and the recipient subscriber has ported away, the call will be released by the originating network, at which point the originating network queries the centralized database to determine the correct destination operator. Mobile 365 does not use this scheme for message delivery.

Mobile or Wireless Number Portability has been promoted as the ultimate prerequisite for true competition. Some have said that the mobile telecommunications market is not truly competitive until subscribers have the ability to change operators with minimal cost and effort, all while keeping their phone number. WNP affects all aspects of the mobile service because nearly everything mobile is coupled with the subscriber's phone number. Operators must now cooperate in a realm of service where there was once only competition.

Mobile 365 has designed its routing databases in such a fashion that regardless of a country's WNP status, all subscriber number queries result in identifying the proper operator. For some country codes, the routing database may only have a handful of number ranges to identify all operators. For others, such as in the U.S., there are tens of millions of number ranges, maintained with dedicated real-time feeds from third-party sources to keep the routing up to the second. Still other countries with WNP have no means of providing real-time updates, but Mobile 365 receives and implements frequent, periodic updates and is capable of alternate means to determine the correct routing. For many of these countries, the OR method is accepted by all operators.

And does this work? Is Mobile 365's global routing database accurate? Absolutely. Mobile 365's current daily volume is tens of millions of SMS and MMS messages, and the ability to find a route for each and every message is paramount. Mobile 365's routing database can also diagnose problems, as most operators simply send all out-of-network traffic to Mobile 365 without having verified not only the route-worthiness, but even the validity of the recipient's number. They leave that up to Mobile 365. Consequently, we believe that our level of accuracy in routing messages to operators we service – regardless if they are applications, personal, SS7-delivered, IP-delivered, SMS, or MMS (wherever in the world) – is completely unparalleled. It is one of our most valued assets. ■

Country Focus: Spain

continued from the front cover

Multimedia messaging (MMS) has huge potential in Spain. In contrast to the quiet, rapid growth of SMS, MMS poses a serious challenge from the onset. The number of MMS-capable devices is growing quickly, and has already reached a critical percentage. The consumer is accustomed to using MMS on mobile devices, and Mobile 365 delivers MMS content in the best format to suit the numerous handsets available with regard to various resolution, aspect ratio, and color depth. Mobile 365 is the company best-equipped to deliver varying content types to the multitude of available handsets. Brands and interactive agencies have started to focus on this rich media communication, and are investing considerable budgets toward making it an essential ingredient of the marketing mix.

The success of PSMS and its associated complexities has prompted the three Spanish operators to develop a range of next-generation payment platforms. In keeping with

the expectations of the market, Mobile 365 has become the first aggregator to offer WAP billing in Spain. These WAP premium platforms enable merchants to charge subscribers directly to their mobile phone account – without the need to send or receive premium-rated messages.

These solutions offer much greater flexibility for merchants to charge consumers at various price points, without the great complexity of shortcode and keyword assignment. Additionally, Spanish operators will start to use these payment solutions to accept a range of both mobile and non-mobile transactions.

Spanish operators benefit from Mobile 365 aggregation and mediation, as they become part of a larger global charging community that attracts both local and international merchants – a single connection interface helps operators compete with other payment types, such as credit cards and e-wallets.

Merchants benefit from the Mobile 365 platform's single interface, which enables them to design more user-friendly purchase experiences and charge that elusive youth market for low-value transactions for a range of electronic products and services.

To be able to deliver to the Spanish mobile market, Mobile 365 has connected its platform directly to the billing systems of the three networks in Spain. This enables greater flexibility for content owners, brands, and broadcasters using the Mobile 365 network to set price points on an item-per-item basis, as Mobile 365's Operator Charging Gateway (OCG) integrates different bearer-independent billing systems across the globe, facilitating cross-border offerings. ■

Customer Spotlight

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\$2.99 USD) or polyphonic (a synthesized re-creation of the music – \$1.99 USD). Each ringtone has a corresponding keyword that the user types in the body of the text message to initiate the download. After the customer confirms the order via SMS, the ringtone is delivered to the phone. Billing is handled through the customer's mobile phone bill.

"We are excited about adding a mobile component to the launch of G-Tones so our customers can personalize their cell phones with their favorite songs and artists' downloads in a fun atmosphere," says David Brinker, Musicland's Senior Director of Corporate Development and Business Affairs.

"Mobile 365 presented us with a unique and creative program," Brinker added, "without the hurdles of going to multiple vendors."

Mobile 365 handles delivery, clearing, and settlement of the Sam Goody service, and delivers the ringtones to G-Tone users' phones, handling billing integration with wireless operators.

Mobile entertainment continues to grow in importance with Sam Goody customers, and G-Tones is their most recent answer. Sam Goody is the first retailer to effectively market and merchandise ringtones together with physical products.

G-Tones provides a new way for customers to purchase mobile content, furthering the record seller's mission of establishing the brand as "an entertainment lifestyle destination." Goody's ringtones complement their target customers' desire to express themselves.

Mobile 365's Gregory Dunn, Vice President of Sales, Americas, says, "From concept to connectivity, Musicland was able to add an entirely new element to the G-Tones launch and will extend mobile content to a whole new demographic of their customer base." Dunn added that "Mobile 365 has the global reach to ensure the seamless execution of a program of this magnitude."



So go ahead. Buy a new ringtone at the Sam Goody kiosk and continue strolling through the mall. Buy a coffee, window shop for a more appealing tie, and watch the shoppers come and go... all the while hoping your phone will ring. ■

Product Spotlight

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These and other steps taken by operators go a long way towards building a deeper understanding of content customers, and facilitate the content providers' ability to offer compelling services with a high degree of stickiness. As the content industry continues to grow, the responsibility lies on operators, aggregators, and content providers to demonstrate they can work side-by-side in developing the level of customer knowledge needed to support the ever-changing needs and preferences of content customers. ■

Network News

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MMS delivery enables our brand and marketing customers to deliver content-rich messages to their customers, enhancing the user experience in ways never before seen on handheld devices. The APEX Network has the capacity to deliver this high-bandwidth content quickly and easily across the widely disparate handsets around the world, and customers are taking advantage.

Billing for content via the mobile handset is becoming more flexible with the advent of WAP billing. Mobile 365's WAP billing solution is connected to operators and content providers in many Asian countries, and is now in the process of rolling out across important European markets, beginning with Spain, Germany, and the U.K. Providing customers with more choices to pay for mobile content is a truly exciting notion.

Mobile 365 continues to deliver on the promise to provide our customers with the best delivery mechanisms possible – from the tools to select and filter content, to the network to deliver content, to the reporting needed to analyze delivery. As mobile messaging becomes increasingly content-rich, Mobile 365 ensures that it is delivered... 365 days a year. ■

Industry Insight

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The leading infrastructure vendors include Alcatel, Lucent, Motorola, Ericsson, Nokia, Bridgeport Networks, and Siemens. Of course, there are many more providing various components and applications. For handsets, all of the major vendors are planning to support IMS compatible functionality, but it will likely be at least 18 months before a wider assortment of handsets are available. Handset client features (as well as supported network capabilities) will be phased in over time. IMS and non-IMS based networks will co-exist for years, in the same manner that analog and TDMA networks co-exist with today's CDMA, GSM, and UMTS networks. Users will see IMS-related services launched in many markets in 2006 – significantly more than the handful that are currently commercial in a few markets.

While there is no one acknowledged killer app, industry pundits are beginning to agree that it may actually be the IMS framework itself as a key enabler for new services that will lead to entirely new communications ecosystems. Fixed-Mobile Convergence (FMC) is another buzzword that has been circulating lately, but in reality a solid definition of FMC is hard to pin down. It brings to mind the phrase, "I'll know it when I see it" or, better yet, "FMC is in the eye of the beholder." Rogers Wireless defines convergence as "common content delivered over multiple access services, repurposed and optimized for the target device." IMS has been identified as the framework to make this vision possible.

Mobile 365 is actively developing solutions that will address IMS interoperability issues and expand its content delivery capabilities to support delivery into IMS frameworks. We believe that IMS is the future of mobile and fixed communications and will offer services to enable quicker adoption and user acceptance of this new paradigm. ■

FOOTNOTE:

¹ Presence is defined as the availability and willingness of a user for communications. Presence information is published by individuals to other systems' users known as "watchers" to indicate their communication state. The concept of presence is well-known to users of Instant Messaging (AOL, MSN, etc.) when they see their buddy lists with each user's availability state (Idle, Away, Online, etc.).

Corporate Viewpoint

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We also are gratified to take note of promising external partners for 2006. One example is Vodafone, who has been a vocal advocate for cross-operator billing – again, something our big customers demand. Vodafone's proposed plan comes with a name: X-Pay.

In a recent Amsterdam panel hosted by Mobile 365, Jeremy Flynn, Head of Commercial Partnerships for Vodafone UK, shared the company's philosophy on X-Pay. Learning from the lessons of the past, X-Pay attempts to find a common, cross-operator approach for mobile payments – one that does not force operators to alter their unique billing

systems, but instead relies on third-party aggregators (such as Mobile 365) to moderate the payment infrastructure. While the Vodafone specifications have yet to be published – early 2006 is the target – it is encouraging to see a major operator take the initiative, especially one that plays to all parties' relative strengths.

Strength, fitness, and partners who will help us stick to our aggressive plan in 2006. Guess I'd better find time for five more minutes on the treadmill...

Good health and corporate discipline to everyone in 2006. ■

Industry Insight

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ever tried to initiate a mobile call and received a “network busy” signal or notification? That is a situation where there is no available room on the traffic channels for a particular tower. TCHs have significantly more bandwidth than do CCHs. The DoS attack is possible because the control channels are used by both SMS and voice call control; by flooding the control channels with SMS, it is possible for calls to be blocked.

The Penn State authors state that “the fundamental issue at hand is that a connection exists between the Internet and mobile networks that enable adversaries to flood the phone network. In doing so, an attacker can use the Internet to attack cellular voice networks and prevent phones from connecting.” While this is certainly true, it is not as easy as the authors would have you believe.

The paper assumes that by utilizing public gateways or “send a text message” Websites, multiple messages can be sent to the SMSC to flood the network – if enough valid destination phone numbers can be obtained. This is true, but the authors fail to mention that all of these Internet entry points – such as message-sending Websites and bulk messaging sites – are connected to the SMSC, which serves as the operator’s SMS gatekeeper. One of the primary keys to this problem is to manage message injection rate, which most SMSCs have the capability to do.

All major SMSCs incorporate what many vendors call “large account” interfaces. This terminology is used to identify external entities, such as content providers, content aggregators (such as Mobile 365), inter-operator SMS providers (especially Mobile 365), and bulk messaging providers. Large accounts also typically utilize various IP messaging protocols – SMPP and EMI/UCP being the most common – as well as some proprietary protocols. Additionally, virtually every large account interface incorporates message flow control (or throttling), as well as filtering and validation capabilities.

For example, messages originating from an operator’s Website or the operator’s email gateway can be limited to only one or two messages per second or less; messages from

legitimate large accounts (such as aggregators, representing multiple content providers) typically employ higher rates. Messages from larger inter-operator SMS providers, such as Mobile 365, enable even more messages to pass through the system, so there is little or no blocking.

Incidentally, a DoS attack would be almost impossible to conduct across mobile operator boundaries through Mobile 365, because this traffic is validated on both the originator and destination sides. All inter-operator SMS traffic is validated to originate from a mobile handset only, the appropriate SMSC and IP link is validated, and no binary messages are allowed on the network.

In addition, mobile operators typically deploy numerous SMSCs – some of which are designated to perform certain functions, and others are distributed geographically. Consequently, the Penn State paper makes the following assertion, which is not completely true: “Given the sheer number of entrances into these networks, including but not limited to website interfaces, email, instant messaging, and dedicated connections running the Short Messaging Peer Protocol (SMPP), we conservatively estimate that it is currently possible to submit between several hundred and several thousand messages per second into a network from the Internet using simple interfaces.”

The authors fail to take into account the vast number of message flow rate protections and filters that are present in large account interfaces in most deployed SMSCs.

Once a message is successfully delivered into the SMSC, most message delivery traffic is over the SS7 network, even before messages leave the operator’s communications infrastructure (before they reach the radio to be transmitted to the handset). The bandwidth of the SS7 traffic is limited and tightly controlled. Communications channels over SS7 are typically engineered to operate only to some percentage of their absolute capacity – normally around 40% (called 0.40 erlang²).

An SS7 link is realized as one channel, or timeslot, of a T1/E1 circuit. For purposes of illustration, consider a T1 circuit containing 24

channels and operating in the aggregate at a rate of 1.544 Mb/second. Each of the 24 channels operates at a maximum sustained rate of 56,000 bits/second. This configuration yields an SS7 link operating at a maximum sustained rate of 56,000 bits/second (or 7,000 bytes/second – where one byte equals eight bits). So, with a 40% loading factor, we have a maximum sustained SMS message transfer rate of approximately eight messages per second.³

Of course, there are multiple SS7 links for each SMSC that are carefully sized to handle any traffic (usually aggregate traffic), so any traffic that would exceed the SS7 network’s capability to deliver would be queued by the SMSC. Finally, if SS7 link capacity is exceeded, SMSCs would raise serious alarms that would be noted by the operator’s Operations Support Services (OSS) staff.

The end result would be a delay in delivering the message, or, in the worst case, some messages being lost at the SMSC. There would likely not be a total area-wide – or even nationwide – voice traffic DoS. The messages simply cannot get to the radios to fill up the control channels fast enough or in enough volume to overwhelm these channels.

While the Penn State paper makes some very good statements and recommendations, the reality is that current SMSC security, inter-operator SMS security, SS7 capacity, and advanced flow control and filtering makes a voice-targeted Denial of Service extremely unlikely. ■

FOOTNOTES:

¹ A zombie network describes a number of computers or servers connected to the Internet that have been compromised either by a hacker, remote control viruses, or trojan software that are used to perform malicious tasks of one sort or another, under remote direction.

² A dimensionless unit of average traffic density in a telecommunications network. One erlang is the intensity at which one traffic path would be continually occupied.

³ The math for this value is: 7000 bytes/second * 0.40 = 2800 bytes per second ÷ 365 bytes per message = 8 messages per second.

Mobile 365 maintains an active and comprehensive Intellectual Property program, including issued patents and pending patent applications, to protect key elements of Mobile 365 technology.

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