



WHITE PAPER

MAXIMIZING THE VALUE OF MOBILE NETWORKS

OVERVIEW

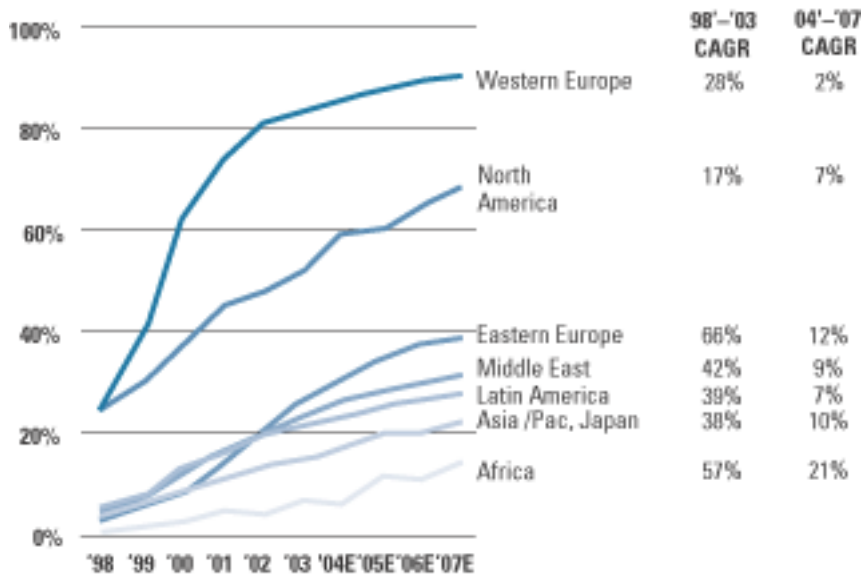
Mobile network operators have been extremely successful in deploying mobile voice services. But with mobile voice growth rates slowing worldwide and subscriber penetration nearing saturation in developed countries, mobile operators are now concentrating on increasing profitability by using their two greatest assets: their network and their subscriber base. One approach to increasing profitability is to reduce the costs of mobile operators' current voice business by optimizing their network operations. Another approach is to increase revenue by introducing new, profitable, incremental services to their existing subscriber base.

Wireline carriers, with their broadband offerings, have benefited from the increased bandwidth optimization and service flexibility associated with Cisco Systems® IP-enabled networks. Now more than ever, mobile network operators are realizing the same benefits through Cisco® mobile wireless solutions utilizing IP signaling and packetized voice transport. The connectivity, adaptability, and flexibility of Cisco IP-enabled networks also support future rollouts of new, profitable mobile data services aimed at both consumers and enterprises.

THE LANDSCAPE

Until recently, signing up new subscribers has been the primary focus for many mobile network operators. However, mobile subscriber growth rates are slipping into single digits (see Figure 1 below). Simultaneously, tougher competition in these near-saturated markets is resulting in sagging profit margins. As a result, mobile operators are shifting their primary focus away from acquiring new subscribers and toward reducing operating costs and expanding their value-added service portfolios. Rather than valuing the business on subscriber growth and average revenue per user (ARPU), the emphasis is now on more direct profit measures such as average margin per user (AMPU).

Figure 1
 Penetration of Mobile Phones Worldwide by Percentage of Population



Source: Gartner, 2003

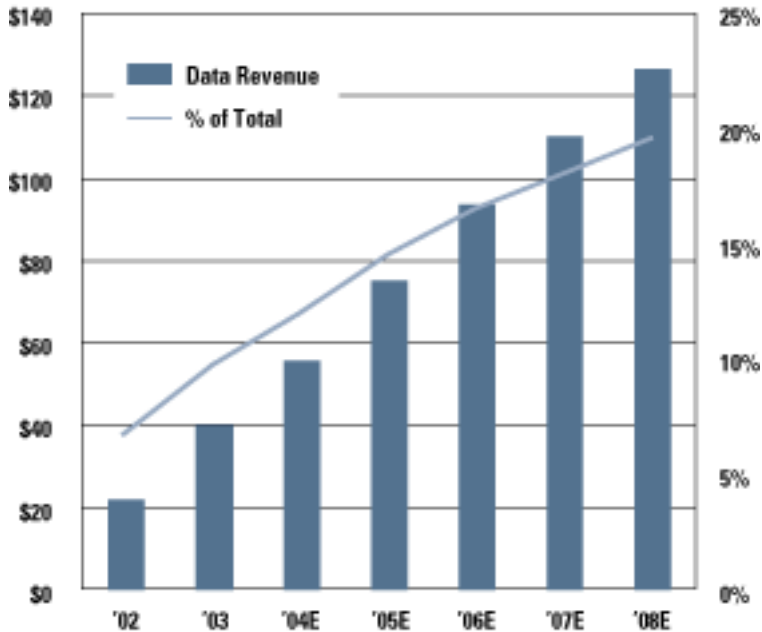
UTILIZING THE SUBSCRIBER BASE

As with any capital-intensive business, offering more services while taking advantage of the existing infrastructure lowers the overall cost per service. But which services should mobile network operators offer subscribers? Which services will maximize return on investment (ROI)?

Glowing market forecasts aside, it's difficult to predict exactly which new mobile services will be the future's runaway successes. Few market prognosticators predicted just how popular downloadable ring tones would become among youth in Western Europe, yet the European market for ring tones is estimated to be worth over 1 billion euros annually¹. Mobile network operators are structuring both their organizations and networks to be nimble enough to take advantage of new service opportunities as rapidly as possible.

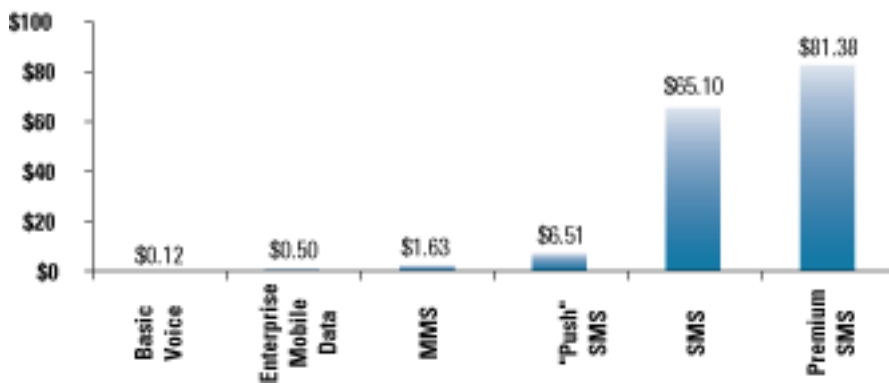
However, some trends have emerged. The wide spectrum of mobile data services will provide a profitable way for network operators to grow their businesses and use economies of scope (see Figure 2 below).

Figure 2
Percentage of New Revenue Generated from Mobile Data Services



In fact, as short message service (SMS) has demonstrated, data services provide better revenue per megabit than voice (see Figure 3 below). This is contrary to the current state of the landline world, where regulation in the voice market and large amounts of available bandwidth in the data market result in lower revenue per megabit for data traffic than for voice.

Figure 3
Revenue per Megabit Transmitted over Mobile Networks



Source: Based on analysis of mobile services in the United States, 2004

Currently, SMS is extremely profitable in Europe and North America, generating significantly more revenue per megabit from the same spectrum as voice services. However, as the SMS market saturates, other sources of AMPU growth must be found. While not as profitable as SMS, analysis shows that other data services ranging from multimedia messaging service (MMS) to enterprise data services still outperform

voice services by at least a factor of four on a revenue-per-megabit basis. Premium SMS services, whereby operators charge a transaction fee for certain types of messaging, will continue to extend the SMS business.

Data Services: Favorable Traffic Patterns

How can data services be more profitable than voice? For messaging services (for example, SMS and MMS), each message consumes less bandwidth than the equivalent of voice communication, while pay-per-use tariffs provide operators with the equivalent of several minutes of revenue. But what about enterprise mobile data services, which typically charge monthly rates? The answer lies in the bursty, multiplexing-friendly nature of data traffic on the network. Cisco’s analysis of live broadband networks shows that data is transferred across the network less than 5 percent of the connection time. Users spend the other 95 percent of the time reading and assimilating the downloaded information. Thus, while data connections can burst to speeds higher than voice connections, the amount of overall bandwidth drawn from the network can be much lower.

As mobile data services and devices become more sophisticated and wireless usage increases, the expectation is that wireless data usage will mirror the pattern of broadband data (see Table 1 below). Users accessing mobile data services through PDAs and laptops will have traffic patterns similar to those on broadband networks, albeit at lower speeds. IP networks are ideally suited to carry this bursty traffic efficiently because they aggregate very large numbers of users on the same bandwidth.

Table 1. Bandwidth Economics of a U.S. Mobile Network Operator Offering Wireless Voice and Data Services

	Voice	Enterprise Data
Peak bandwidth	16 kbps (96 calls per T1)	192 kbps
Monthly minutes of use	480	350
Network utilization of active connections	100%	5%
Net bandwidth consumed monthly	58 Mb	25 Mb
Service ARPU	\$55	\$99
Revenue per megabit	\$0.12	\$0.50

Reducing Subscriber Churn

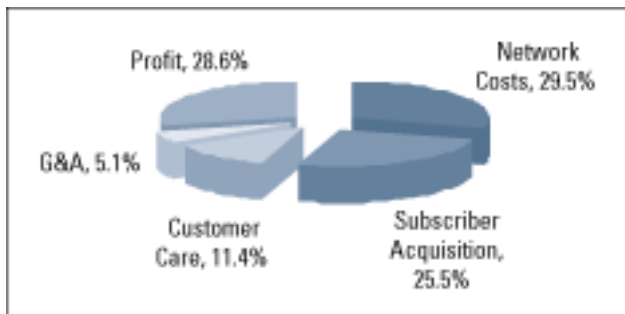
As all mobile operators know, it costs far more to capture a new subscriber than it does to retain them. Offering subscribers a variety of bundled services is one proven subscriber retention method. Aside from providing profitable incremental revenue, new services can also increase the value of existing services through churn reduction. For example, Kagan World Media reports that a regular cable and high-speed data customer is 14 percent less likely to churn than a video-only customer², while adding voice services to the bundle cuts churn by an additional 50 percent, doubling the customer lifetime and, by extension, the cash flow stream.

New services not only reduce churn and revenue—they increase profit. A customer paying for several wireless services generates more revenue than one with a single service—and that customer consumes little or no additional billing, marketing, or customer relations resources. Another analysis of broadband bundling showed that a customer receiving three services (for example, video, high-speed internet access, and voice services) generated six times more value over their lifetime than a customer receiving a single service. This value is multiplied beyond services revenue due to less customer churn, combined with optimized customer expenses that result from economies of scope.

MANAGING NETWORK COST THROUGH ECONOMIES OF SCALE

While finding new subscribers is the second largest expense for most mobile network operators, their largest cost is owning and operating the network itself (see Figure 4 below). Managing that expense can also dramatically enhance the value of the business. With network cost and profit representing roughly equal percentages of revenue, a 10 percent reduction in network costs translates to a 10 percent gain in profitability.

Figure 4
Mobile Operator Cost Structure



Source: Strategy Analytics, 2003

But where are the opportunities for network cost reductions? Often, one of the largest recurring network expenses for mobile operators is the cost of leasing transport links. Another large recurring network expense is staffing. Any small reduction in maintenance, training, upgrades, or repair can translate into big savings in staffing spread across the entire mobile network.

The following sections introduce Cisco solutions that can help reduce the cost of carrier services by maximizing the efficiency of backhaul and intertrunking interfaces, while simultaneously providing the foundation for future high-margin data services.

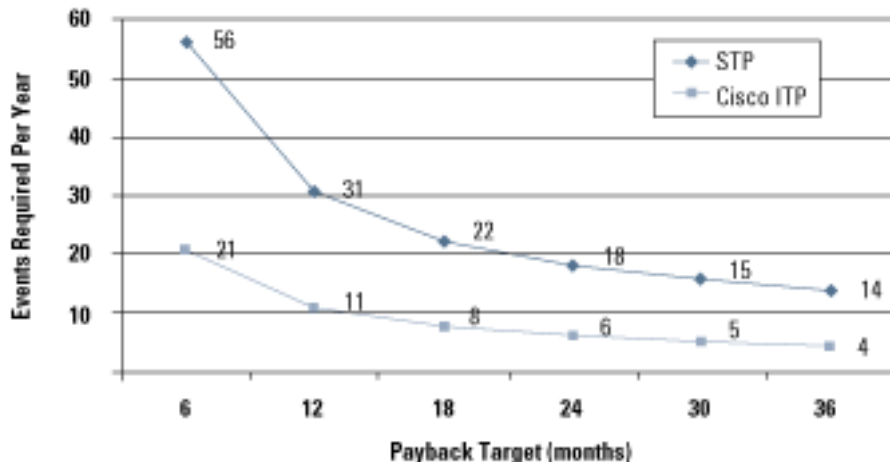
CISCO IP TRANSFER POINT SAMPLE BUSINESS CASE—SMS TELEVOTING

The popularity of reality television has created a business opportunity for mobile operators to provide a channel for viewer feedback. Game shows such as *Pop Idol*, *American Idol*, and *Big Brother* invite viewers to vote for their favorite contestants using several methods, including SMS text messaging, or SMS televoting. These events also provide pull-through value by increasing awareness of SMS in markets such as North America, where usage is in its early stages. For example, AT&T Wireless saw 13.5 million SMS votes cast during the 2004 *American Idol* season, with a 700 percent increase in votes between the first and last episode. These voting events can be very lucrative, with each vote generating standard SMS revenue plus premium SMS charges (similar to 1-900 services levying a premium charge in the wireline world). Event voting via SMS is also popular, with participation rates of up to 10 percent of a carrier's subscriber base. One reason for this popularity is that during televoting events, SMS often costs less than wireline 1-900 services.

The traffic generated by SMS televoting is extremely bursty because it is driven by scheduled TV programming. Most viewers vote immediately after the program. For example, in the United Kingdom, a single *Big Brother* episode in the 2002 season generated almost a million SMS votes within two hours of the broadcast. Since these voting events are relatively infrequent, the business model requires a solution that is highly scalable, but at a cost point that allows payback with only a few events.

The Cisco IP Transfer Point solution (ITP) is ideally suited for these infrequent, high-traffic events. By enabling Short Message Service Center (SMSC) connectivity with IP, the Cisco ITP solution eliminates an additional layer of SS7 ports and stack licensing fees. This reduces infrastructure costs by two-thirds when compared to existing SS7 networks using signaling transfer points (STPs). This creates a corresponding drop in time-to-payback and events required to break even (see Figure 5 below).

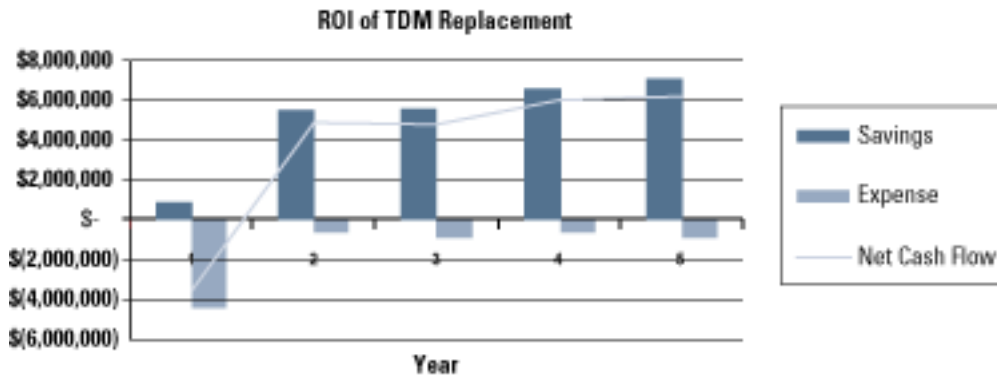
Figure 5
Number of Voting Events Required for Payback, STP vs. Cisco IP Transfer Point



CISCO WIRELESS TRUNKING SOLUTION

The Cisco Wireless Trunking solution offers mobile wireless service providers an immediate ROI by significantly lowering the cost of voice transport using sophisticated bandwidth-saving technologies. The Cisco Wireless Trunking solution uses codec compression and voice activity detection (VAD) technologies to send voice traffic more efficiently across the network. Cumulatively, this can reduce the total amount of traffic in the core by more than 75 percent, allowing network operators to reduce the number of required transport links and provide payback in less than a year (see Figure 6). Many service providers have successfully deployed the Cisco Wireless Trunking solution as a first step towards a packetized network for mobile voice traffic, using either IP with Multiprotocol Label Switching (MPLS) or ATM at the core.

Figure 6
ROI of Cisco Wireless Trunking Solution³



Once mobile operators have realized the cost savings of the Cisco Wireless Trunking solution, they can further extend the benefits of packet transport by deploying the Cisco Wireless Transit and Gateway Mobile Switching Center (GMSC) solution and the Cisco Distributed MSC solution.

Cisco Wireless Transit and Gateway MSC Solution

Extending the Cisco Wireless Trunking solution with the Cisco Wireless Transit and Gateway MSC solution provides a highly efficient mobile core network with dynamic routing of calls for Global System for Mobile Communications (GSM) or Code Division Multiple Access (CDMA) environments. By efficiently routing the calls to their destinations, the Cisco Wireless Transit and GMSC solution helps alleviate the MSC trunk and port exhaustion problem. As a result, both network traffic and revenue can grow without a corresponding increase in transit costs.

Cisco Distributed MSC Solution

The Cisco Distributed MSC solution further extends the Cisco Wireless Trunking solution. This solution provides complete MSC functions while providing mobile operators with a range of deployment options to reduce backhaul costs. For example, placing media gateways at the periphery of the mobile network keeps traffic on-net for as long as possible, reducing termination costs. In addition, the Cisco MGX 8880 Media Gateway helps enable deployment of revenue-generating packet-based services such as multimedia messaging and enterprise IP telephony.

SUMMARY

As penetration of mobile voice services nears its peak in several markets, mobile operators need to effectively utilize economies of scale and scope. Mobile data services not only offer profitable incremental revenue—they also offer the opportunity to reduce churn, thereby extending cash flow from existing services.

Cisco mobile wireless solutions, including Cisco IP Transfer Point and Wireless Trunking solutions, help mobile network operators achieve continuing value in two ways: first, by optimizing the cost structure of their core voice business through economies of scale; and, second, by giving them the adaptability and flexibility to pursue new, profitable, incremental revenue opportunities using economies of scope.

If you are interested in learning more about the economics of Cisco wireless solutions, and how they can work for you, please contact your account manager or send an email to: cssa-internal@cisco.com

1. Source: Netsize

2. Based on a reported 2.5% monthly churn for a customer subscribed only to video service.
3. Sample ROI profile based on upgrading a 10-MSC network. Each MSC carries traffic of three T3 TDM links, via G.729a compression and 45 percent VAD ratio.



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