



Cost-Effectively Manage SMS Growth Using IP

Introduction

Short Message Service (SMS) provides end users with the ability to send and receive text messages to and from mobile devices. SMS provides carriers and service providers with an exciting revenue-generating service that wireless customers are embracing worldwide. These alphanumeric messages are an efficient, practical way for people to communicate without having to make an actual phone call.

As SMS traffic growth continues, service providers and network planners face two distinct challenges:

1. How to cost-effectively manage SMS traffic growth.

2. How to separate non-time-critical SMS traffic from more performance-critical voice call control and database queries for 1-800 numbers, calling card and many other voice related services.

Unlike voice calls, SMS traffic does not travel on voice circuits; instead they are transported and delivered to subscribers via the Signaling System 7 (SS7) network. The SS7 network is the mainstay for the delivery of signaling information regarding wireline and wireless services, including call setup, teardown, 8xx number resolution, Local Number Portability (LNP), and other value-add services. The increase in SMS traffic means that SS7 networks now must handle the non call-related SMS traffic through expensive SS7 facilities that may already be at or near capacity. Furthermore, short messaging is a non time-critical application that should not necessarily be mixed with mission critical ISUP (ISDN User Part) SS7 traffic.

To alleviate this burden, many carriers are considering moving the transport of their SMS traffic to IP. By doing so, service providers can leverage existing IP data networks without having to expand their costly Time Division Multiplexed (TDM)-based signaling network.

Why IP Instead of SS7?

SMS, unlike voice traffic, is not especially time-sensitive. It does have a guaranteed delivery but does not need to be delivered within the same stringent time constraints as voice calls. Rather than using costly TDM Signaling Transfer Points (STP) and other elements of the SS7 network to deliver SMS, it makes business and engineering sense to redirect these less time-critical services to IP. Taking advantage of proven reliable IP networks as a transport mechanism for SMS offers a more compelling solution.

By using IP for SMS, carriers can free up dedicated SS7 signaling facilities for their designed purpose of controlling voice-related services. This network offload prevents the need for costly SS7 network expansion to support SMS growth. This concept applies equally to carriers that outsource their SS7 networks. For these carriers, network expansion is a costly proposition due to the monthly charges incurred for SS7 links, Message Signal Units (MSU) costs and STP port charges required for each additional SS7 link.

Because SMS is a packet-based service, operationally it becomes just another data stream to manage in an IP network, along with email, Web and other IP-based network applications. This means that existing IP network management personnel and equipment can be leveraged to manage the IP traffic and its underlying infrastructure.

The Business Problem

The deployment of SMS presents a unique situation for carriers. Carriers need to have an easily managed, scalable solution, but the use of a separate, highly engineered, reliable and costly SS7 infrastructure to deliver this service is not necessarily the most cost-effective choice.

While it initially made sense to leverage the SS7 network as a data transport service for SMS, most carriers today are looking for ways to unburden and extend the life of their SS7 networks and migrate away from circuit-switched network dependencies in favor of IP-based transport. In order to sustain SMS growth without expanding very expensive SS7 TDM facilities, carriers must consider alternatives. From a business perspective, the question is how to grow revenue per user with services like SMS without negatively impacting the capabilities of the critical SS7 network.

Consider Carrier X: a small wireless provider that leases its SS7 signaling facilities from a national SS7 wholesaler. This wholesaler provides Carrier X with TDM-based SS7 links and STP access for signaling and SMS message routing. Carrier X has its own Message Service Centers (MSC) and Short Message Service Centers (SMSC) that provide voice and SMS services to its subscriber base. Carrier X's SMS traffic is now 30 percent of its total SS7 traffic. With the amount of subscribers making voice calls and sending data messages, Carrier X's busy hour call attempts along with the increase in SMS traffic are causing the links to exceed the SS7 provisioning guidelines of 40 percent utilization on any given SS7 link. This compromises the critical redundancy features provided by the SS7 network architecture.

As a solution, Carrier X can either lease more TDM SS7 links, costing upwards of \$2000 a month plus STP port charges, or it can gradually and transparently move its growing SMS traffic off of these SS7 links and onto IP facilities. By moving to IP, Carrier X should see an ROI in less than one year compared to the costs of provisioning more SS7 links. This offload will also reduce the burden on the existing SS7 links, returning them to normal levels of utilization.

How does it Work?

In its simplest implementation, the offload of SMS can be accomplished by using Performance Technologies' SEGway™ Link Replacement devices to redirect existing SMS traffic away from the core of the SS7 network directly to the SMSC, as shown in figure 1.

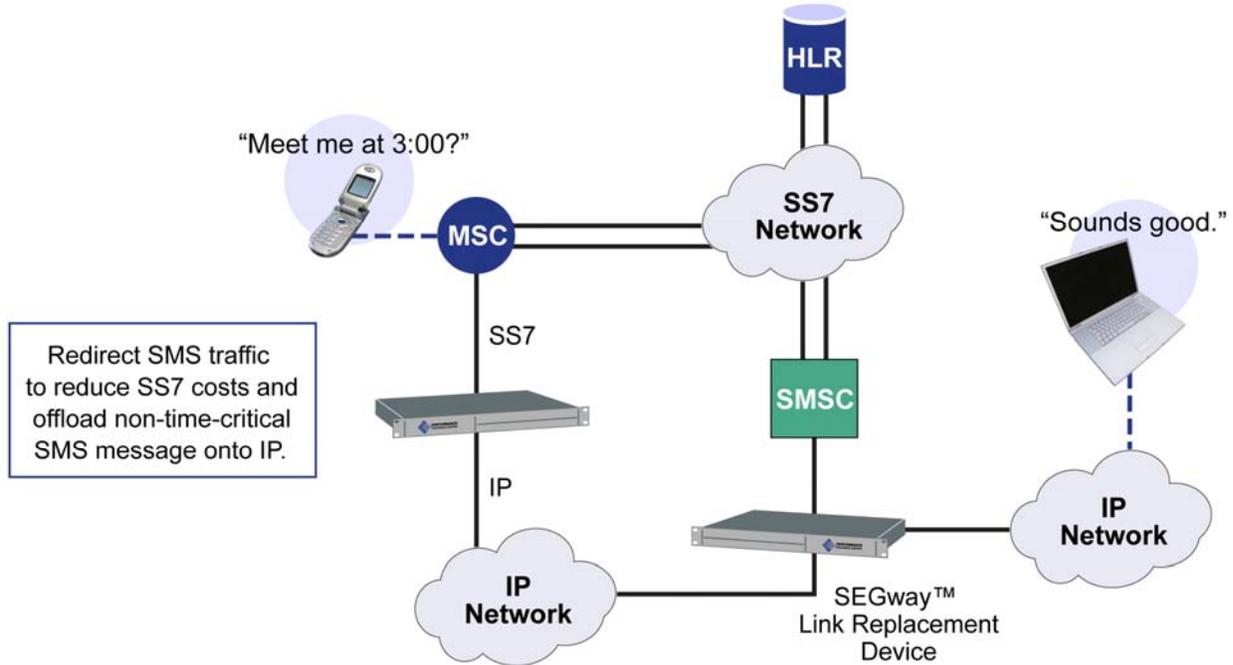


Figure 1: The Performance Technologies Solution – Example 1

For a more complete solution, Carriers can also implement the equivalent of their own STPs for message routing over IP instead of SS7. The implementation of these STPs allows all the traffic to be transported from the MSCs (Mobile Switching Center) to the SMSC over IP networks. The result is to completely remove the burden of SMS from the SS7 network altogether. See figure 2.

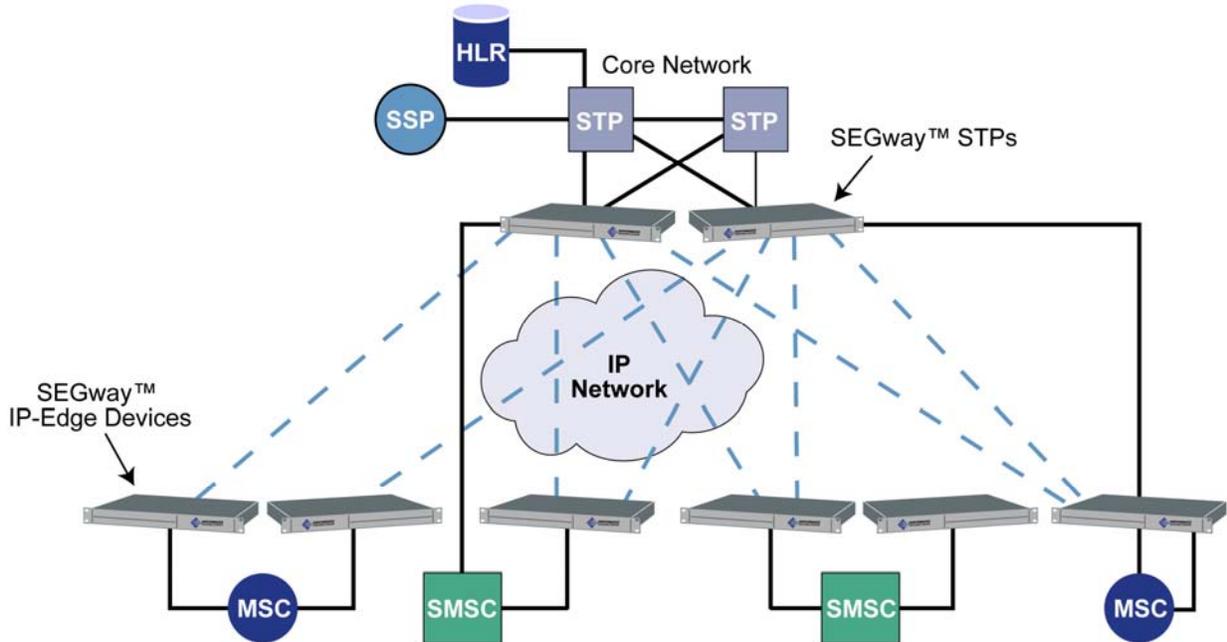


Figure 2: The Performance Technologies Solution – Example 2

The commercial migration of TDM-based SS7 traffic to IP continues to gain industry acceptance, as the Internet Engineering Task Force (IETF) and other standards bodies finalize the necessary protocols to make it robust and reliable. The maturing SIGTRAN (Signaling Transport) protocols, increased bandwidth capacity and quality of service mechanisms for IP are all positioning IP as the path forward for all Signaling applications. SMS offload is one natural step towards that migration.

Performance Technologies offers a host of SS7 over IP products including:

- [Signaling Gateways](#)
- [SS7 Link Replacement Devices](#)
- [SS7 Edge Devices](#)
- [STP Solutions](#)
- [Custom SS7/IP Solutions](#)

To learn more about these SS7 over IP solutions, visit Performance Technologies' Web site at www.pt.com/products/prodgroup_signaling.html.

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