Mobile TeleSystems (MTS) Converges Fixed and Mobile Telephony

MTS creates new revenue opportunities with new services.

EXECUTIVE SUMMARY
Mobile TeleSystems (MTS) • Industry: Telecommunications
BUSINESS CHALLENGE • Increase revenue opportunities and market share by offering fixed-mobile converged voice services.
NETWORK SOLUTION • A Cisco gateway and softswitch solution that delivers enhanced signaling and call control.
BUSINESS RESULTS • Delivered new fixed-mobile converged voice solution to customers in multiple regions. • Reduced capital and operating expenses in purchasing, maintaining, and supporting new infrastructure. • Gained competitive advantage by presenting customers with a unified bill.

Business Challenge

Wireless applications for voice and data are becoming as essential to today's businesses as their fixed, or wired, counterparts. Although many enterprises have sophisticated IP data networks in place, and many have implemented IP Communications applications over those networks, they must still rely on a separate mobile voice network. In Europe, many operators of Global Systems for Mobile Communications (GSM) networks are monitoring technology advances that will enable them to build an open, IP-based service infrastructure that can provide a reliable foundation from which to deploy rich multimedia communication services – including mixed telecom and data services and combined fixed and mobile services. The emerging IP Multimedia Subsystem (IMS) approach to deploying IP infrastructure promises to help operators achieve this goal.

Mobile TeleSystems (MTS), with multiple networks and more than 50 million existing customers in Eastern Europe and Russia, saw an opportunity to increase its revenue opportunities and market share in large enterprises by offering a fixed-mobile converged voice service. If successful, the service could advance MTS well ahead of its competitors and allow it to capture a significantly large share of the enterprise telecom revenue.

First however, MTS had to overcome several formidable obstacles. Its existing 2.5G service infrastructure did not support a fixed-mobile converged (FMC) service implementation. Most enterprise customers in Russia and Eastern Europe use traditional private branch exchange (PBX) systems for telephony. These PBXs rely on time-division multiplexing (TDM) network infrastructures, which meant that MTS would have to build an infrastructure that could integrate its

GSM network with customers' existing TDM networks. To achieve this successfully, MTS would have to combine signaling translation, media control, call control protocols, and applications for transport over the network. This option was costly and time-consuming.

A second obstacle was the fact that a competing operator already offered an FMC services, although it did not work well. For example, there was no way for enterprise customers to configure and provision the service themselves. The operator had to assume the cost of system management, which reduced its profit margins. At the same time, fulfillment was slow, resulting in reduced customer satisfaction. The competitor's solution also required allocating a fixed range of mobile numbers per customer, which severely limited scalability and made it difficult for customers to easily add numbers as business grew. Finally, the solution resulted in a billing problem for customers. The service required the cooperation of numerous fixed operators and service providers to deliver, and each provider billed the customer separately. New billing processes were time-consuming and complex for each provider to deploy, and there was no way to provide a unified bill.

To avoid deploying an FMC solution with similar shortcomings, MTS turned to a trusted local system integrator for help. By working with Cisco® and Personeta, a provider of intelligent network service creation platforms, the integrator was able to offer MTS an FMC solution that overcame all of the obstacles and delivered a reliable, productive, easy-to-use system.

Network Solution

The new FMC solution combines several important elements common to IMS architectures from Cisco and Personeta. To perform signaling and call control tasks, the system integrator chose the Cisco PGW 2200 Media Gateway Controller. The PGW 2200 provides signaling and call control, supporting the Signaling System 7 (SS7) protocol for calls incoming from a TDM infrastructure, and it simultaneously supports most industry-standard voice-over-IP (VoIP) protocols, including Media Gateway Control Protocol (MGCP), H.323, and Session Initiation Protocol (SIP).

The Cisco PGW 2200 acts as a signaling gateway in this infrastructure to bridge SS7 signaling from MTS' GSM network to the Primary Rate Interface (PRI) signaling used by enterprise customers' backhaul TDM networks. Currently, MTS also uses a Cisco AS5400HPX universal voice gateway as the access gateway for customers' PBX connections and as a trunking gateway that faces the GSM network. Cisco provided the entire IP switching fabric for the FMC solution, including numerous PGW 2200 media gateway controllers, AS5400HPX universal voice gateways, and the switches and routers required for deployment at each of MTS' regional sites.

For greater flexibility and customer premises IP convergence in providing TDM connections, a central Cisco AS5400 Universal Gateway may be replaced by inserting one of the following solutions at each customer site: a Cisco 2600 Series Multiservice Access Platform, Cisco 2800 Series Integrated Services Router, a Cisco 3700 Series Multiservice Access Platform, or a Cisco 3800 Series Integrated Services Router.

The Personeta TappS NSC network service controller offers a comprehensive service creation and delivery environment, enabling fast and flexible service creation for voice, data, and messaging service features. As part of its service execution capabilities, the system implements a next-generation media server into the operator's network, enabling flexible user interaction. Personeta's Customized Applications for Mobile Enhanced Logic (CAMEL)/IP service broker function enables the system to orchestrate 2.5G network features with IP-based service functionality.

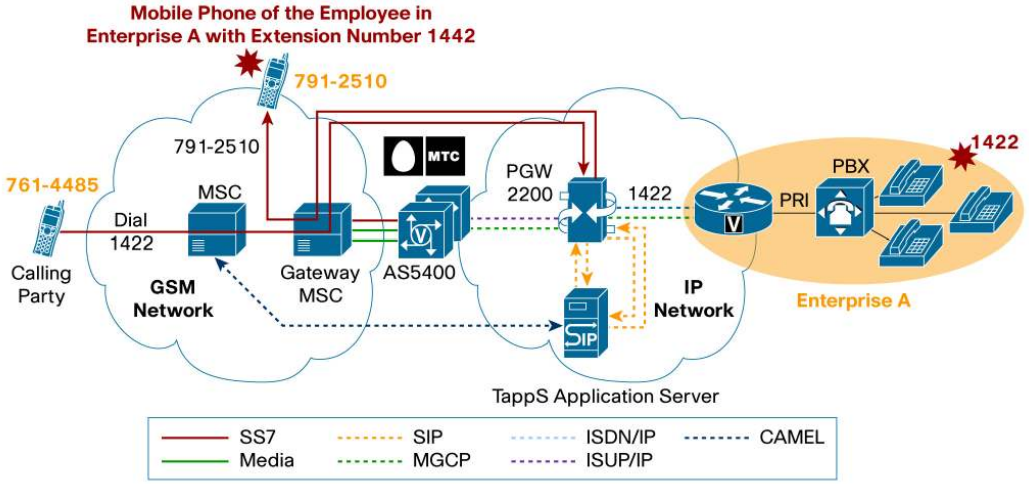
TappS also provides complete back-office functionality, enabling MTS and its customers to manage service features over the Web and even integrate features with existing customer relationship management platforms. The solution extends MTS' capabilities by incorporating flexible IP-based switching, a rich set of network interfaces, IP-to-GSM brokering functionality, next-generation media server functionality, and an innovative carrier-grade service creation and delivery environment. Exceeding MTS' requirements, the solution also opens the way for future feature extensions.

This infrastructure has also enabled the implementation of simultaneous ring (SIM-Ring) services. This feature was designed to allow a caller to try to reach someone at his or her desk (fixed-line) telephone and simultaneously on other devices such as his or her mobile phone. If the called party was not at the desk phone, then he or she would still receive the call on the mobile phone, reducing the number of missed calls, and importantly for MTS, increasing call completion rate on its mobile network. The SIM-Ring feature translates and forks calls to the correct enterprise phone number and to the called party's mobile phone.

An example is shown in Figure 1. An employee of enterprise A, who subscribes to MTS' GSM service, calls a colleague in the same company by dialing the short extension number 1422. This call generates a signal to the Personeta TappS software. It identifies the call as belonging to a service subscriber and routes it through the GSM network to the appropriate PGW 2200. The TappS server then checks the subscriber's profile and associated calling rules, and determines that the call should be sent to both the desk phone and the mobile phone. The TappS server then initiates two new calls via the PGW 2200 – one to the mobile phone, 791-2510, and another to the employee's office with the PBX extension of 1422. Even if the employee is out of the office, he or she will not miss phone calls.

The same feature will work if the caller is inside the enterprise, dialing from one office extension to another extension. In this scenario, the caller dials an access code, such as "0," to have the call routed off the PBX. Once the access code is dialed, the call-forking feature can be activated and applied by the Cisco PGW 2200 and TappS application server.

Figure 1. Simultaneous Ringing Architecture and Call Flow Examples



Business Value

The combined Cisco and Personeta solution provides MTS with true carrier-grade resiliency, scalability, and security. Solution elements are integrated to eliminate single points of failure, while Cisco PIX® security appliances protect external access to the service.

For enterprise customers, the solution is the first to easily unify mobile voice and fixed PBX telephony using VoIP technology, and to enable voice virtual private networks, each with its own universal number. In addition, an integrated “find-me” feature and an ability to specify time-dependent simultaneous or sequential ringing on employees’ fixed and mobile phones can further increase employees’ productivity. Today, customers’ employees miss fewer calls and can be more productive. The service also includes full customer self-provisioning via the Web. Customer managers can manage the service, while employees can personalize service features for their specific phones.

Within three months of MTS purchasing the equipment, the new solution was completed and functional – including resolution of all customization and localization issues. The Cisco and Personeta FMC application is installed in at least five sites, serving tens of thousands of subscriber lines belonging to almost 50 corporate customers. The initial adoption by customers has been enthusiastic, and MTS is already expanding the system’s capabilities.

MTS has realized numerous benefits from the Cisco and Personeta FMC solution. New services and applications can be easily developed in the flexible service creation environment, accelerating time to revenue for new services. By using an approach based on IP technology, the new solution was cost-effective to deploy and maintain. And today, MTS can easily scale to hundreds of thousands of subscribers without major network reengineering or service disruption.

Financially, the solution has reduced capital expenses by substituting cost-effective Cisco VoIP solutions in place of expensive circuit-switched transport. A new service that offers mobile access for business is already generating revenue. Future revenue-generating services that require a platform for bridging existing TDM networks with next-generation IP-based networks can be accommodated easily.

In addition to operational cost savings and new services, the Cisco PGW 2200 reduces MTS’ per-port costs. Efficient use of media server ports, engaged only when needed, reduces the number of ports that must be purchased and maintained. A single PGW 2200 and a small number of gateways can be deployed at first, and added to as demand grows. Flexible configuration of the PGW 2200 solutions allows operators to capitalize on dynamic market changes by providing a cost-effective and rapid deployment vehicle.

The new solution has reduced management and support costs, allowing customers to self-provision their service over the Internet or through MTS’ interactive voice response system. Centralized announcement storage and management eliminates the need to make changes on multiple devices, and a single Business Support System/Operations Support System integration point simplifies provisioning tasks on back-office systems.

PRODUCT LIST

- Cisco PGW 2200 Media Gateway Controller
- Cisco AS5400HPX Universal Gateway

Customers receive a single, correlated call detail record. A single bill minimizes billing expenses for MTS and simplifies control, auditing, and accounts payable for customers. In addition, customers do not have to purchase premises equipment or commit to a capital investment, making it easy and attractive to subscribe.

Next Steps

MTS is planning a number of enhancements to its service. For example, it is considering adding time-dependent routing, which would enable variable routing based on the time of day or day of week, a feature that makes the solution even more efficient for customers. New features that are being planned include advanced inbound call routing – such as origin-dependent routing, location-based routing and automatic call distribution functionality, automated attendant features, advanced speech recognition functionality, email-to-Short Message Service or voice functionality, and conferencing on demand.

With foundational elements of IMS in place, MTS is already benefiting from the convergence capabilities it offers – while creating a clear migration path to a full IMS implementation in the future.

For More Information

To learn more about Cisco service provider voice solutions, visit: http://www.cisco.com/go/sp.

To learn more about Cisco Voice and IP Communications solutions, visit: http://www.cisco.com/go/voice.

To learn more about the Cisco PGW 2200 platform, visit: http://www.cisco.com/en/US/products/hw/vcallcon/ps2027/index.html.

To learn more about Personeta, visit: http://www.personeta.com/.

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