

Cisco Mobile Office: A Flexible, Feature-Rich Fixed-Mobile Communications Solution

Summary

The Cisco® Mobile Office solution enables service providers to offer seamless mobility to enterprise and small and medium-sized business (SMB) customers by integrating mobile and enterprise voice and messaging networks into a single communications environment. With the Cisco Mobile Office solution, service providers can offer their customers a rich set of fixed-mobile converged communications services, accessible from any device over any network type, and self-managed by subscribers through an intuitive Web-based interface.

The converged communications solution can increase revenues and market share while providing new competitive positioning, especially for mobile operators, mobile virtual network operators (MVNOs), and converged wireline/wireless operators. The combination of converged fixed-mobile voice and messaging services along with innovative next-generation capabilities such as presence and location-based services provides an opportunity to offer differentiated services to the enterprise and SMB markets. Other benefits include lower support costs through Web-based user self-administration and consolidated billing for all wireless and wireline services.

For enterprise and SMB customers, operator services based on Cisco Mobile Office increase employee productivity by effectively integrating existing TDM PBXs and IP PBXs with wireless networks including Wi-Fi, WiMAX, and mobile networks. Because the Cisco Mobile Office solution functionality resides within the operator's network, minimal to no additional capital investment is required by the end customer. A Web-based, easy-to-use interface for users makes it easy to configure preferences, extending an array of new and traditional productivity-enhancing applications such as single number reach, mid-call handoff, location-aware routing and billing, PBX integration, and much more.

Challenge

The decline of voice revenues along with the challenges of differentiating basic voice and data services are compelling service providers to look into offering new enhanced voice, data, and fixed-mobile convergence (FMC) services targeting enterprises and SMBs, markets which present unique challenges. Businesses typically have separate voice and data networks and different wireline and wireless service providers. Larger multi-site companies typically have installed communications equipment from multiple vendors and use different service providers across disparate offices and regions. Furthermore, business activity is increasingly mobile, conducted outside of offices, with employees often telecommuting from a home office or working on the road.

To enable the productivity gains and cost savings that businesses seek from converged communications, operators need the flexibility to cost-effectively serve businesses of all sizes, from SMBs to large enterprises with highly distributed operations. They must support various communication and network architectures and types of endpoints and provide access to a rich set of fixed-mobile convergence capabilities that address the unique needs of each customer. The Cisco Mobile Office solution provides such flexibility to operators while offering new revenue opportunities and a competitive entry point into new customer segments.

The Cisco Mobile Office Solution

Cisco Mobile Office allows operators to treat their business customers' combination of communication devices as a single entity having access to a rich set of converged communication services and call routing capabilities, independent of the underlying infrastructures. Operators can offer network-centric services that can be accessed by any device over any network type and can be managed by subscribers through intuitive Web-based interfaces. Mobile Office services can be offered simultaneously on multiple types of networks including Signaling System 7 (SS7), VoIP, and IP Multimedia Subsystem (IMS).

Unique advantages of the Cisco Mobile Office solution for service providers include:

- Enables service providers to offer services to SMB or enterprise customers without requiring them to make changes to their office PBX phones and applications or existing mobile handsets.
- Accommodates a broad range of network architectures, from traditional TDM to VoIP to networks based on IMS.
- Greatly enhances the features and efficiency of business voice applications through mobility without requiring major customer network redesign or investment.
- Provides service self-administration and management features at the operator, administrator, and end-user levels for ease of service rollout and maintenance.

The Cisco Mobile Office solution is easily deployed by operators to integrate their customers' mobile phones with their corporate TDM or IP PBX phones and services, enabling a wide range of features as summarized in Table 1. These include number translation, find-me/follow-me, location-based routing, private numbering plan, and simultaneous ring. Some features are uniquely innovative such as mid-call pickup which enables users, for example, to initiate a call on a mobile phone and, when they arrive at the office, easily transfer the call to their desk phone while keeping the call active. Higher productivity is possible with flexible routing so that any user or group of users can be reached based on their availability preferences. Greater cost-efficiency is also gained by user availability preferences that, for example, redirect calls to a mobile phone instead to the desk phone if the user is actually in the office. The solution does not replace the end customer's PBX. Rather, it works in conjunction with TDM PBXs and IP PBXs to extend operator-provided voice VPN and mobility functionality to these environments.

Table 1. Key Features Enabled by the Cisco Mobile Office Solution

Mobile Office Features
<p>Converged Voice VPN – <i>Private dialing plan services:</i> private numbering plan for multi-site enterprises incorporating all fixed and mobile endpoints; abbreviated dialing among service members; on-net, virtual on-net, and off-net calls; forced on-net; off-net access. <i>Call handling services:</i> Black/white lists for incoming and outgoing calls; Caller ID replacement. <i>Mid-call handling services:</i> mid-call transfer, call hold; three-way call.</p>
<p>Reachability and Mobility – <i>Group reachability services:</i> time-dependent routing; origin-dependent routing; hunt groups and queues; telefax support; scheduled/on-demand conferencing. <i>Personal reachability services:</i> single-number reach; find me/follow me; location-based routing and billing ("Office Zone" services); personal time-dependent routing; SimRing/Sequential ring; do not disturb; configurable call forwarding.</p>
<p>PBX Integration – <i>PBX integration diversity:</i> multiple integration approaches covering all types of PBXs; PBX PRI integration and trunk ID; service initiated two-step dial tone multifrequency (DTMF) programming; Defense Information Systems Agency (DISA) access into the PBX; Cisco Voice Gateway integration with TDM PBX via IP Primary Rate Interface (PRI) and Session Initiation Protocol (SIP). <i>Voicemail integration:</i> forwarding to selected voice mailbox (in the network or on the customer premise); MWI on multiple devices. <i>Converged billing:</i> Support for account codes; multi-site bill consolidation; prepaid and postpaid charging modules.</p>
<p>Fixed/Mobile Convergence – <i>Multi-device services:</i> single number reach; SimRing/sequential ring; call handoff and transfer between user devices. <i>Home zone/office zone services:</i> Location-aware routing; location-aware billing. <i>Dual-mode device services:</i> Wi-Fi/mobile call initiation and termination; assisted and automatic mid-call handoff.</p>
<p>Media – <i>Network IVR services:</i> customizable auto attendant; announcement on-demand; voice portal; call center front-end services. <i>Personalized media services:</i> customized ring-back tones; customized music on hold.</p>

Mobile Office Features

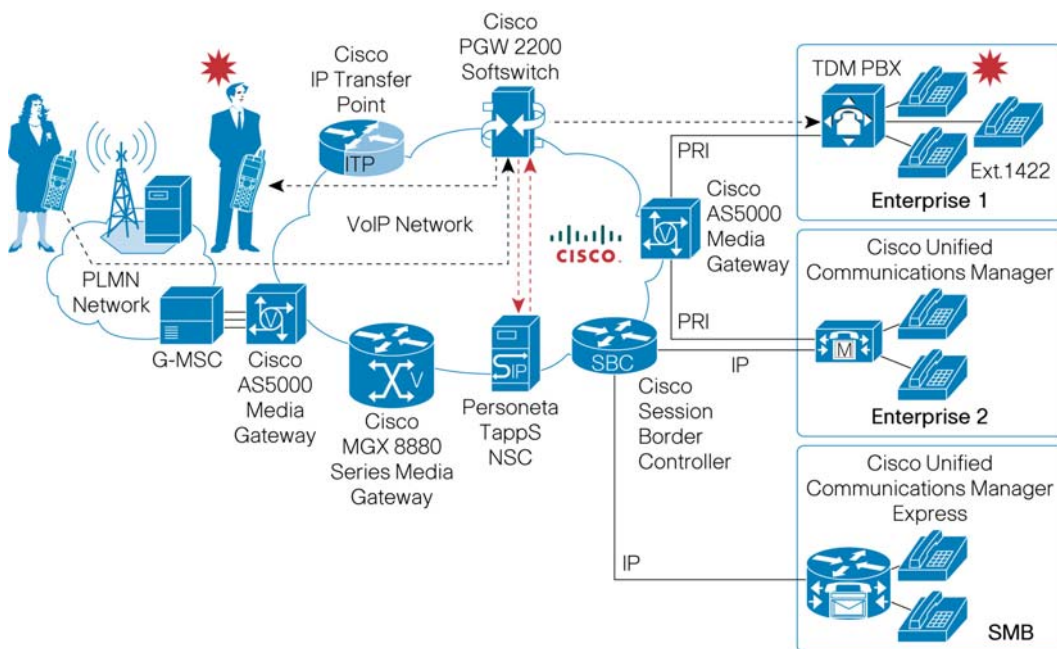
Enterprise Integration – PIM integration (syncML); directory integration (AD LDAP); messaging services (missed call SMS, SMS to short number, public IM support).

Web/IVR Provisioning – *Service provider interface*: service provisioning and management; service order and support; user management; reporting and auditing. *Business administrator interface*: customer self-care portal (either via the Web or telephone); Web-based reports. *End-user interface*: subscriber self-care portal (either via the Web or telephone).

Cisco Mobile Office Solution Components

The Cisco Mobile Office solution is based on the Cisco Service Exchange Framework (SEF), the service control layer of the Cisco IP Next-Generation Network (IP NGN) architecture, and includes the Cisco PGW 2200 Softswitch, Cisco MGX[®] 8880 Media Gateways, Cisco AS5000 Series Universal Gateways, Cisco IP Transfer Point (ITP), and Cisco Session Border Controller. Cisco partner Personeta provides its TappS Network Service Controller (NSC), a flexible service creation and delivery environment for voice, data, and messaging service features.

Figure 1. Cisco Mobile Office Network Architecture



Solution elements include:

- Cisco PGW 2200 Softswitch** is a very flexible multiprotocol softswitch that supports a variety of applications for service providers, ranging from providing national and international voice transit services over cost-effective IP networks, to feature interworking for managed and hosted business communication services, to enabling the introduction of new IP-based services such as fixed-mobile convergence. The Cisco PGW 2200 is an essential component of the Cisco Mobile Office solution, providing both call control signaling translation and media gateway control. The Cisco PGW 2200 provides seamless interoperability between TDM switches and packet-based voice networks, allowing providers to transition to more cost-effective and flexible services even while these new technologies continue to evolve. The Cisco PGW 2200 supports the PSTN SS7 protocol (including over 90 different country variants) and all standard VoIP protocols including Media Gateway Control Protocol (MGCP), H.323, H.248, and SIP.

- **Cisco MGX 8880 Media Gateways or Cisco AS5400HPX Series Universal Gateways** act as trunking gateways that transcode the media traffic between the TDM and VoIP networks. For greater flexibility and the ability to provide IP convergence for TDM connections, a Cisco access gateway (such as the Cisco 3800 Series Integrated Services Router) can be inserted at each customer site. Cisco can also provide the entire IP switching fabric for the solution at the operator's regional sites and core IP network.
- **Cisco IP Transfer Point (ITP)** is for transport of SS7 traffic over TDM networks or advanced SS7-over-IP (SS7oIP) networks. The Cisco ITP offers the feature set found in traditional signaling transfer points (STPs). The Cisco ITP is capable of operating in a mode that mixes TDM and SS7oIP.
- **Cisco Session Border Controller (SBC)** provides IP session management for data, voice, and video transport over IP networks, and allows for scaling networks from islands within a single customer network to an end-to-end IP community. The Cisco SBC runs on Cisco's leading router platforms ranging from Cisco 2800 Series Integrated Services Routers to high-end core routing products such as the Cisco 7600 Series and Cisco XR 12000 Series. Support for SIP, H.248, and other signaling protocols paves a path to future IMS architectures.
- **Personeta Telco Application Server Network Service Controller (TappS NSC)** offers an easy-to-configure comprehensive service creation and delivery application server based on IP Multimedia Subsystem (IMS) standards for voice, data, and messaging services. TappS NSC can work equally well with non-IP, non-IMS infrastructures (such as the PSTN, PLMN, and hybrid environments). TappS NSC includes a next-generation Media Server that enables announcement management and user interaction. All major signaling protocols are supported (SIP, INAP, AIN, CAMEL, MAP, etc.) TappS CAMEL IP service broker makes it possible for the solution to implement 2.5G mobile network features with IP service functionality. TappS also provides back-office functionality, enabling the operator and their customers to manage service features over the Web and even to integrate features with existing customer relationship management (CRM) platforms

Benefits to Operators

The Cisco Mobile Office solution enables operators to capture new enterprise and SMB revenue by integrating mobile and enterprise voice networks into a single communications environment. The solution extends the operator's capabilities by incorporating flexible IP-based switching, a rich set of network interfaces, and an IP-to-TDM network brokering functionality. Benefits to operators include:

- Accelerates new revenue growth in the enterprise and SMB markets by enabling operators to offer new fixed-mobile converged communications services
- Increases customer retention with highly customizable service features
- Lowers support costs with user self-provisioning and consolidated billing
- Reduces capital and operating expenses in purchasing, maintaining, and supporting new infrastructure
- Enhances average revenue per user (ARPU) by increasing mobile call completion rates and call duration
- Extends existing 2.0/2.5G-based networks with new services compatible with future IMS networks

Benefits to SMBs and Enterprises

The net benefits to enterprise and SMB customers of operators offering the Cisco solution are:

- Increased employee accessibility and productivity by effectively integrating mobile telephones and PBXs into the organization's private numbering plan
- Improved management and cost control for communications services with Web-based self-provisioning and a single bill for both mobile and enterprise communications services
- The flexibility for businesses to retain their existing voice CPE and evolve to an IP PBX such as Cisco Unified Communications Manager over any period of time while preserving and enhancing corporate communications practices and capabilities throughout the migration
- Service flexibility to support dual-mode phones when the customer chooses to make that investment

Technical Benefits

The Cisco Mobile Office solution introduces key elements of an IP NGN while fully preserving investments in existing network equipment. The Cisco Mobile Office solution:

- Enables smooth migration from legacy Signal Control Points (SCPs) to next-generation VoIP networks. The Cisco Mobile Office infrastructure bridges mobile voice and data networks and the backhaul TDM/VoIP network, and combines signal translation (using SS7 or PRI), Media Gateway Control Protocol (MGCP), and application call control using SIP.
- Introduces new elements (such as presence and location) into innovative services that interwork with existing 2G and 2.5G networks.
- Supports industry standards that minimize vendor-specific dependency while transitioning to IMS.
- Implements several functions of the IMS reference architecture including SIP Application Server, IP Multimedia Service Switching Function (IM-SSF), and Media Resource Function Controller (MRFC) based on Personeta TappS NSC, along with several IMS-compliant components from Cisco including the Cisco PGW 2200 (as Media Gateway Control Function [MGCF] and Breakout Gateway Control Function [BGCF]), Cisco ITP (as Signaling Gateway [SGW]), Cisco MGX 8880 (as Media Gateway [MGW]), and the Cisco Session Border Controller (SBC) which supports the H.248 standard adopted by IMS.

Intelligent Networking: Cisco Mobile Office Integrated with the Cisco IP NGN

Cisco Mobile Office is based on the Cisco Service Exchange Framework (SEF), an integral part of the Cisco IP NGN architecture and vision. Cisco SEF provides an intelligent services enablement and enforcement layer within the operator's network and easily interfaces to the control elements in the IP network.

Cisco Mobile Office integrates with the Cisco IP NGN architecture to deliver versatile end-to-end solutions. Any operator can now become the primary provider of converged fixed-mobile communications to SMBs and enterprises. By focusing on service differentiation rather than price as a competitive tool, operators can also achieve higher customer retention. The flexibility of Cisco Mobile Office gives operators around the world options to help ensure the solution complies with and optimizes the regulatory and tariff environment to maximize the efficiency and cost savings for the end customer.

Why Cisco?

Cisco Mobile Office is one of the most feature-rich, flexible, and proven solutions of its kind in the world. It is fully integrated with Cisco products and the Cisco IP NGN architecture to deliver dependable, scalable, carrier-grade, end-to-end performance. Operators that wish to increase revenues via service differentiation can work with Cisco and Cisco partners to deploy Cisco Mobile Office for businesses seeking to gain the productivity and cost benefits of converged fixed-mobile communications.

For More Information

Cisco PGW 2200 Data Sheet

www.cisco.com/en/US/products/hw/vcallcon/ps2027/products_data_sheet09186a0080091b59.html

Cisco MGX 8880 Data Sheet

www.cisco.com/en/US/products/hw/gatecont/ps3869/products_data_sheet0900aecd8033b6da.html

Cisco Session Border Controller

www.cisco.com/en/US/netsol/ns759/networking_solutions_sub_sub_solution.html

Cisco Unified Border Element (Cisco UBE)

www.cisco.com/en/US/products/sw/voicesw/ps5640/products_data_sheet09186a00801da698.html

Case Study: Mobile TeleSystems

www.cisco.com/application/pdf/en/us/guest/netsol/ns523/c647/cdcont_0900aecd8063f496.pdf



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