Moving to IP Saves Costs, Boosts Productivity

The Cisco® Unified Communications Manager Session Management Edition integrates multivendor private branch exchanges into one network and centralizes applications. The Cisco Unified Border Element works with it to route traffic on secure cost-saving Session Initiation Protocol trunks. Together they help workers around the world achieve higher productivity through high-performance collaboration tools.

Executive Summary

With budget cuts and delayed spending, modernizing your IT infrastructure can become a real pain point. But two products-the Cisco Unified Communications Manager Session Management Edition and the Cisco Unified Border Element-can help you significantly reduce your time-division multiplexing (TDM)-based public-switched-telephone-network (PSTN) costs. The means is IP, particularly Session Initiation Protocol (SIP), trunking for internal and external communications. Even AT&T has said IP communications is the future. SIP can accommodate any application, from high-performance immersive video and audio to low-bandwidth basic voice.

With these two Cisco products, your communications can evolve to IP on a schedule that suits you. They streamline your network-partly by integrating Private Branch Exchanges (PBXs) from multiple vendors; they also centralize the management of applications. They streamline collaboration among your company's employees, too: Workers can reach each other any time, anywhere, by any medium. Given that these two products can also extend your enterprise's collaboration capabilities to team members at suppliers, customers, and partners, they are changing business models. The cost savings and productivity benefits may surprise you.

The Next Few Years: Building the Network You Need

Do the following two challenges describe your situation?

- Juggling multiple budget cuts, delaying spending, and reducing and consolidating costs
- Modernizing your IT infrastructure and cutting network complexity to help your company's workers be more productive and collaborate more easily with colleagues

With challenge comes opportunity. You have an opportunity to organize and unify your network, even if it has been cobbled together over the years with different vendors' PBXs and a multitude-often an excess-of PSTN lines.

Addressing these challenges will also enable your employees to collaborate with each other and with customers, suppliers, and partners, using rich unified communications and Web 2.0 applications. With only modest changes, your network can alter how your company functions and how it uses information. That is a good value proposition.

You can address these challenges incrementally; you do not have to ask for a big budget. But big savings and productivity benefits start coming in quickly.

IP Is the Key

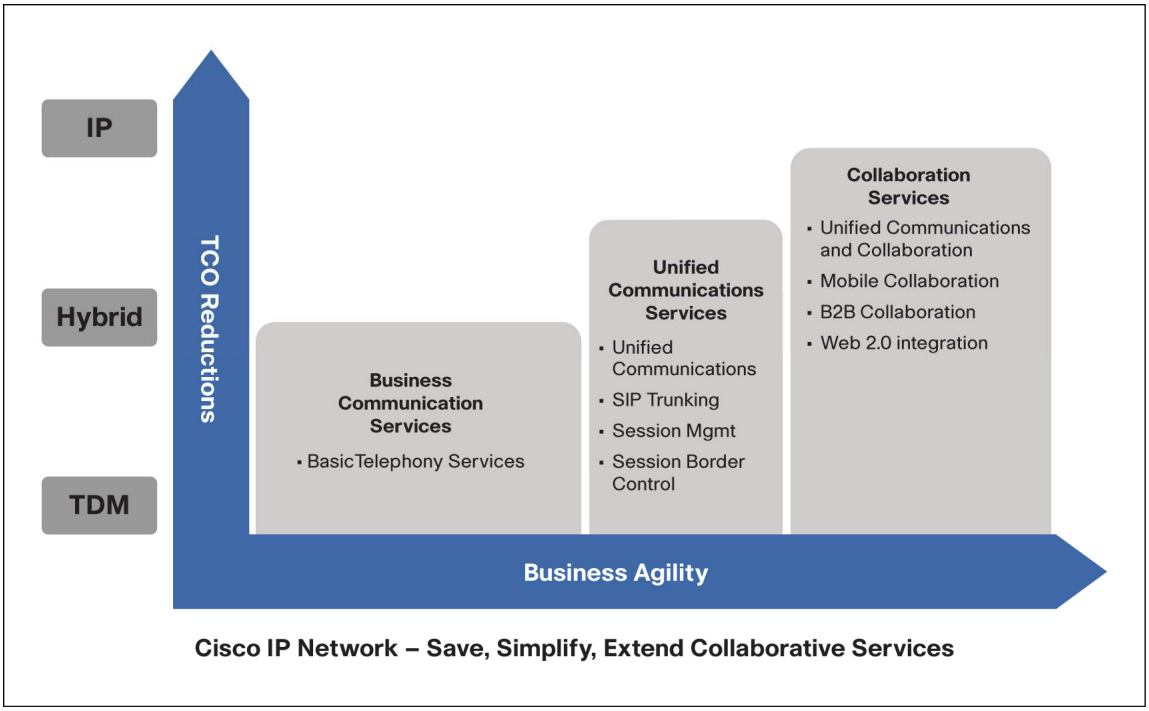
More and more, enterprises are replacing legacy TDM networks with IP ones. IP networks solve three problems:

- PSTN costs and rigidity
- Network complexity
- User demand for richer collaboration tools and more business agility

IP networks can carry voice, data, and video freely, unchecked by PSTN limitations, within company boundaries-to other locations, branch offices, and call centers and even beyond to other companies-at far less cost than TDM connections. You save on PSTN minutes, the equipment needed for PSTN calling, per-line charges, and fixed-quantity basic and Primary Rate Interface (PRI) formats. If you need only six or eight channels at a given location, why pay for the 24 or 30?

IP can also help you create a unified, much more responsive network. A lot of network complexity arises from having PBXs from multiple vendors, perhaps from acquisitions or from allowing different groups to make their own purchasing decisions. Managing those disparate PBXs is expensive, complex, redundant, and inefficient.

Figure 1. Migrating from Basic Telephone Services over the PSTN to Rich Unified Communications over IP reduces costs and enhances business agility.



When you run your entire network on IP, all kinds of communications and applications can flow freely anywhere, unhindered by differing technologies.

Telecommunications giant AT&T has gone on record with the FCC as saying, “Due to technological advances, changes in consumer preference, and market forces, the question is when, not if, POTS service and the PSTN over which it is provided will become obsolete.”

Integrated Session Management and Border Control

Two crucial tasks in IP networking are border control at the enterprise network edge and session management at its core.

A border control system routes IP traffic onto outgoing SIP trunks, which afford security and advanced call-processing features for IP transport, and routes TDM traffic onto the PSTN.

The system should provide advanced call-processing features at the signaling layer to ensure, for example, that the calling and called party are valid, and also at the media layer, to ensure that call quality is as good as possible for calls going over the PSTN. In addition, it should act as a back-to-back user agent (B2BUA) when needed. For smaller sites it should be able to perform the session manager role, including normalizing PBXs and performing some header manipulation.

A session management system should aggregate all outgoing IP calls for routing over SIP trunks. It should also allocate capacity dynamically; it, too, should act as a B2BUA. Ideally, the session management system centralizes distribution of applications; coordinates PBXs from different vendors; and centralizes network administration. In addition, it should allow you to invoke and control corporate policies.

Cisco has recently introduced the Cisco Unified Communications Manager Session Management Edition and the Cisco Unified Border Element to handle these core and border tasks in an integrated manner. They offer both familiar interfaces and coordinated troubleshooting. Together, they allow you to take on those three hurdles in cost-effective enterprise networking:

- High PSTN costs
- Network complexity
- Demand for better collaboration

Three Steps to Cost-effective, Nimble Networks

Three problems? Three steps to solve them, using Cisco Unified Communications Manager Session Management Edition and Cisco Unified Border Element:

- Save by interconnecting networks efficiently
- Simplify by streamlining the aggregation of services
- Extend your network so it can share collaborative applications globally

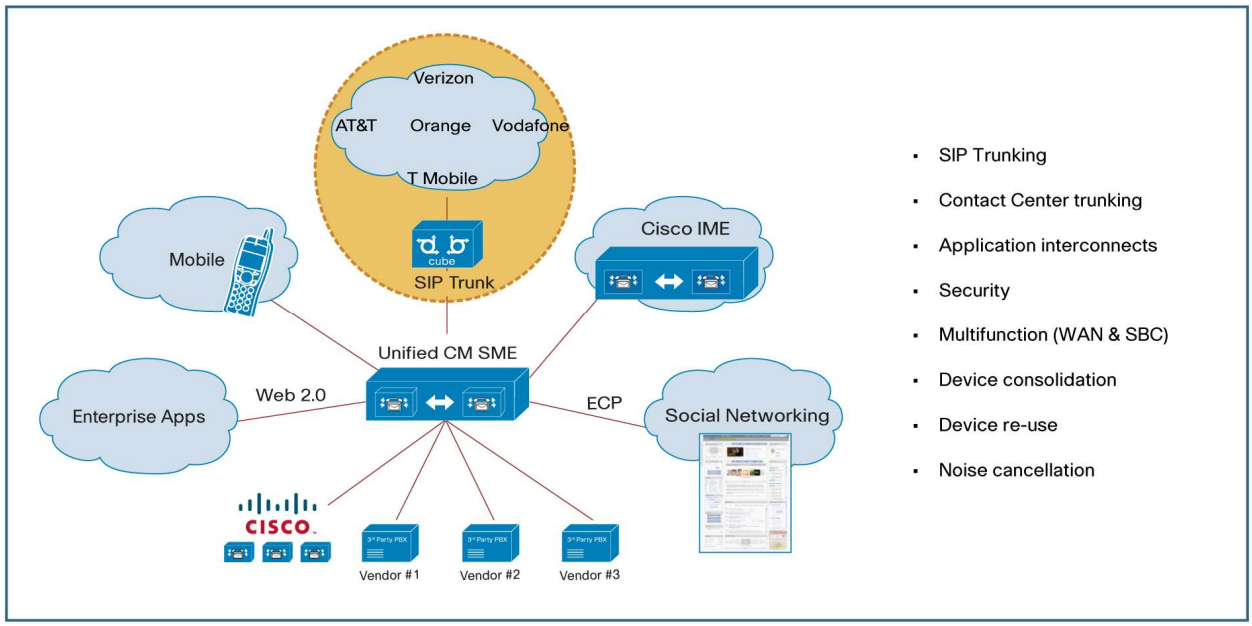
Step 1: Save with SIP for Efficient Interconnection

SIP trunking overcomes PSTN limits on full-throttle communications. Because the signaling for internal traffic is in SIP format, your network can mix and match a variety of IP connectivity methods, from Wi-Fi to Metro Ethernet.

In addition, SIP trunks, not being limited to ISDN PRIs, are dynamic-they can be provisioned quickly and automatically to meet changing needs, including business continuity when a disaster strikes. They are very cost-effective in conveying calls to call centers, especially when business conditions dictate a change in call capacity. And SIP's ability to initiate calls on various media and with flexible bandwidth makes for easy migration to rich unified communications.

With the Cisco Unified Border Element, you can deploy cost-cutting SIP, rather than TDM or PSTN, trunks. SIP trunking interconnects rich collaboration applications to all workers in the network (Figure 2).

Figure 2. Step 1: Save Money by Efficiently Interconnecting Networks



The Cisco Unified Border Control Element is more than just a session border controller. It captures the big savings on interconnections. You can save up to 25 percent on voice connectivity costs by moving traffic from multiple dedicated voice lines such as T1s or E1s to the many fewer SIP voice channels needed.

In addition, the Cisco Unified Border Element:

- Normalizes SIP signals, if needed, for routing over external SIP trunks
- Interworks between SIP and H.323 protocols
- Manages security-fault isolation, encryption, authentication, toll fraud, and registration; it terminates signals, inspects them, and protects against malformed or malicious packets
- Manages call access control, offering different mechanisms such as total calls, memory, IP call capacity, spike detection, and a maximum number of calls per destination
- Acts as a PSTN gateway if needed

If you now use Cisco 2800, 2900, 3800, or 3900 Series Integrated Services Routers as PSTN gateways, you can repurpose them as Cisco Unified Border Element systems with just a software download, saving you money and rack space.

Cisco WebEx Collaboration: Increase Capacity and Take Advantage of Cisco Technology to Grow

Challenge
- How to transition Millions of minutes from the PSTN to an all Cisco IP end to end networks

Solution
- Deployed Cisco Unified Border Element to allow an all IP connection from WebEx to Unified Communications Manager on Campus

Impact
- Moved over 60M minutes PER MONTH from TDM network
- Over 1B minutes of conferencing, handling peak loads of 10X standard daily loads

"The deployment of Cisco Unified Border Element was an immediate cost savings and resulted in an accelerated program deployment."

Kees G.
Network Administrator

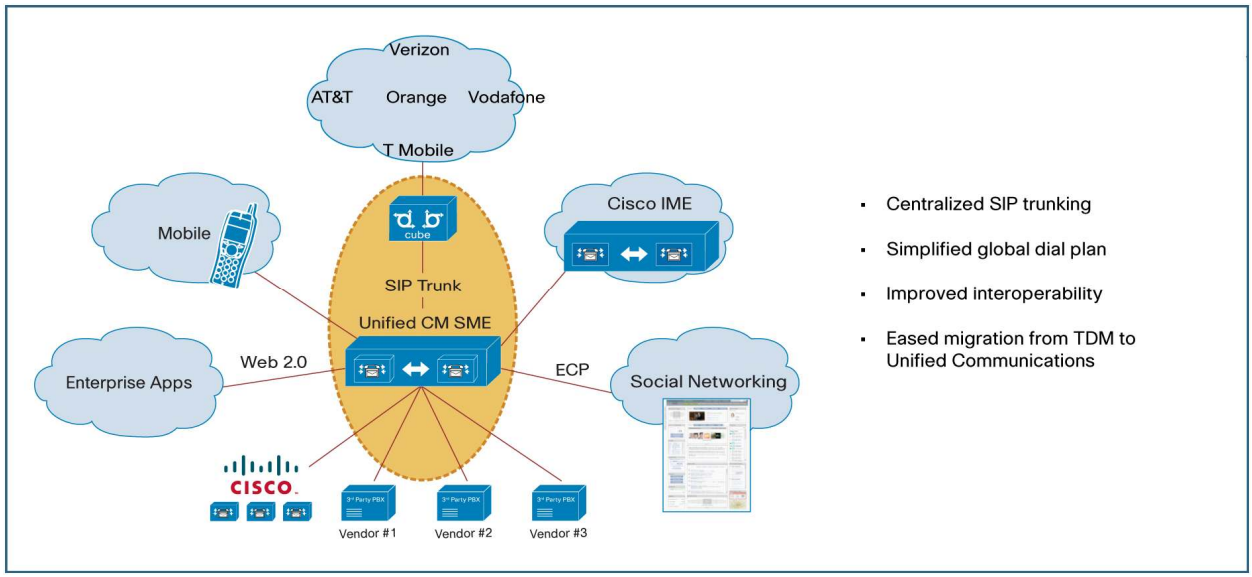
Cisco has demonstrated the efficacy of moving from the PSTN to an IP network with its internal use of Cisco WebEx™ meeting applications. With just this one application, the company has moved more than 60 million minutes per month from the PSTN to IP. The total over 2 years was more than 1 billion minutes.

Step 2: Simplify by Streamlining Services Aggregation

The Cisco Unified Communications Manager Session Management Edition system aggregates with a capital "A". It can work with disparate, often legacy, PBXs, and it vastly simplifies internal as well as external communications.

Three capabilities are particularly important: enabling disparate PBXs to work together, accommodating multiple protocols, and extending various application interfaces to users of any PBX (Figure 3).

Figure 3. Step 2: Simplify by Streamlining Services Aggregation



You know too well the problems that arise in your network when disparate PBXs cannot readily function in concert-problems created because different manufacturers may interpret SIP standards differently and create mismatched SIP headers. The Cisco Unified Communications Manager Session Management Edition can modify disparate SIP headers to promote interoperability among PBXs from various vendors. It also supports the various protocols that

your PBXs may employ, such as H.323, Media Gateway Control Protocol (MGCP), PRI, and Q.SIG. In addition, it can deliver application interfaces to their users.

Cisco has completed extensive testing and certification of the interoperability of Cisco Unified Communications Manager Session Management Edition with PBXs from major vendors.

When your network can transcend different SIP headers, you can replace PSTN trunks with centralized SIP trunking. In other words, you can consolidate underused PSTN trunks and gateways at remote locations to create a unified network with fewer, more efficiently used SIP trunks. Because the Cisco Unified Communications Manager Session Management Edition understands multiple protocols, you can integrate existing legacy PBXs with it-without having to upgrade them to SIP. You can modernize without investing more resources in outdated PBXs.

In addition, you can register IP phones and soft clients directly to the Cisco Unified Communications Manager Session Management Edition or even to the Cisco Unified Communications Manager. This capability gives you a migration path for retiring aged PBXs and phones: You can replace TDM phones with IP ones and register them directly to one of these systems.

Cisco Service Advertisement Framework

The Cisco Service Advertisement Framework is a dynamic communications framework for network applications that permits clients and servers to advertise and discover services. You can use it to create a unified dial plan. To do so, call agents throughout the network advertise their calling ranges and discover those of others to route calls dynamically and establish a dial plan that covers your whole enterprise.

Among the call agents that can use the Cisco Service Advertisement Framework are the Cisco Unified Communications Manager and the Session Management Edition, the Cisco Unified Border Element, and Cisco PSTN gateways.

The Cisco Unified Communications Manager Session Management Edition and the Cisco Service Advertisement Framework are complementary technologies. The Cisco Service Advertisement Framework enables configuration of a dynamic dial plan and the discovery of the dial ranges of participating call agents. The Cisco Unified Communications Manager Session Management Edition acts as a front end to third-party PBXs so framework messaging can reach them and the rest of the network can understand their number ranges. The session management edition also generates centralized call detail records that you can use for billing and accounting and handles policy and application management.

When legacy PBXs are integrated with it, the Cisco Unified Communications Manager Session Management Edition can manage a single, centralized dial plan for all your company's locations and equipment. It can also configure simplified routing and trunking within your company. You will then have tight, dynamic control over both least-cost routing and best-quality routing.

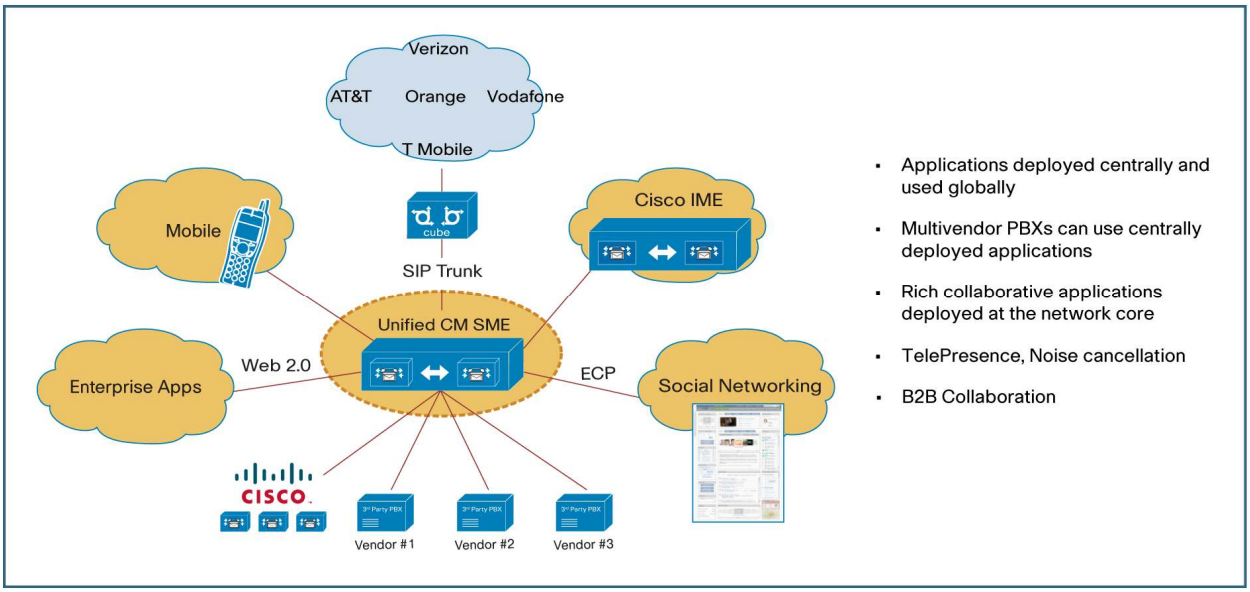
Step 3: Extend your Network to Introduce Rich Collaboration

Much of people's work already involves collaborating with co-workers and with partners, suppliers, and customers As these teams develop, rich unified communications will have a role in shaping new business models.

The Cisco Unified Communications Manager Session Management Edition can control access to any of these communications applications. When you add unified messaging and mobility applications, you can extend the reach of your network-and your employees-outside your firewall.

The Cisco Unified Communications Manager Session Management Edition makes itself the center of a web of interfaces-to collaboration applications and even to other companies (Figure 4).

Figure 4. Step 3: Extend Rich Collaboration Applications



Rich Unified Communications

The Cisco Unified Communications Manager Session Management Edition cooperates with Cisco Unified Communications applications such as high-performance video and audio, instant messaging (IM), and unified messaging. With unified messaging, employees can always track down the person with whom they need to talk. They can reach their co-workers through email messages, IM, a voice call, or even a teleconference-and they can upgrade from one to another as needed during a call.

Web 2.0 Application Development

Sitting at the hub of your network, the Cisco Unified Communications Manager Session Management Edition can deploy applications that enhance business processes using existing application programming interfaces (APIs) such as Telephony Application Programming Interface (TAPI), Java TAPI (JTAPI), and Administrative XML (AXL). In addition, Web 2.0 interfaces created by Cisco enable easy development of third-party business applications. In the future, Web 2.0 capabilities will allow applications to control TDM phones connected to a legacy PBX linked to the Cisco Unified Communications Manager Session Management Edition with SIP trunking.

These new provisions enable you to extend the value of your TDM phones and to extend productivity applications to all your users.

Cisco Quad Enterprise Collaboration Platform

The session management system and the Cisco Quad together make social networking effortless, extremely useful, and a business-changer. You can envision the Quad as the Facebook for the enterprise. Or the next-generation corporate directory, or the next-generation corporate Intranet.

The Cisco Quad creates a comprehensive enterprise portal for social software applications that further the ability of employees to work together. The portal is people-centric. It facilitates creation of boundaryless team spaces in real time so team members can communicate through high-performance voice and video whenever they want. As the application integrator, the session management system is the heart of the Cisco Quad platform.

Creating Applications

To make it easier for you to design your own applications, the Cisco Unified Communications Manager Session Management Edition works with the Cisco Unified Application Environment. This product provides an intelligent interface with the Cisco Unified Communications Manager, including the session management version, so your application developers do not have to understand telephony protocols in depth. This advantage will be particularly useful as you move into Web 2.0 applications.

The system can also work with interfaces for provisioning; interfaces for device monitoring and call control such as such as TAPI, JTAPI, and Wave Driver; and interfaces for serviceability applications, including Simple Network Management Protocol (SNMP) and XML.

Moreover, it accepts custom mashups of applications built for your company's specific needs.

Cisco Intercompany Media Engine

Moreover, the Cisco Unified Communications Manager Session Management Edition will foster collaboration beyond your walls. It can pass outgoing calls on to the Cisco Intercompany Media Engine (IME) for transmission to other companies through the Verification Involving PSTN Reachability Network (ViPRNet), enabling your employees to work closely with colleagues and their new team members at partner, supplier, and customer companies.

The ViPRNet, consisting of Cisco Intercompany Media Engines installed at companies and service providers, takes full advantage of SIP trunking to take rich unified communications beyond your company boundaries. Because it runs on SIP, as collaboration technologies evolve you will be able to share high-performance video and audio, documents, rich caller ID, personal work profiles on business cards, and other tools.

Mobility Management

The Cisco Unified Communications Manager Session Management Edition works with Cisco Unified Mobility applications to bring rich unified communications to smart phones: mobile presence, visual voicemail, collaborative applications, IM, video telephony, and more. That is another assist for teamwork.

When calling on regular mobile devices, your employees can use enterprise features such as hold, resume, transfer, conference, and others; session hand-off between wireless protocols; and dial-via-office.

In addition, the Cisco Unified Communications Manager Session Management Edition enables you to extend Cisco Unified Mobility services to third-party PBXs.

The session management system provides another kind of mobility as well: freedom to move extensions around a building if, say, a company uses hot desks or hoteling for mobile employees or visitors. From its central location, it enables dynamic association of device settings and feature preferences with a given user.

Total Cost of Ownership Savings

The combination of an IP internal network, session management and border control systems, and unified communications saves crucial dollars-quite a few of them.

For example, Cisco Unified Communications Manager Session Manager Edition and Cisco Unified Border Element together achieve savings in both obvious outlays such as PSTN trunks and less complexity and more flexibility in network administration (Table 1).

Here are some of just the network savings:

- The 12 to 26 percent cited earlier on voice connectivity costs

- Four to 8 percent from the centralized routing and management of the session management edition: If you also migrate to full unified communications, the savings will be even greater, and using the Cisco Service Advertisement Framework creates even more
- Thirteen to 20 percent of mobile costs by combining the session management system with Cisco Unified Mobility solutions

Table 1. Monthly Voice Connectivity Operating Costs of TDM vs. SIP

Comparison of Monthly Voice Connectivity Operating Costs Per Seat (TDM versus SIP)		
Cost Category	**TDM**	**With SIP Trunking**
DID	$4-6	$5-8
Channel cost	PRI $27-37	$3-6.8 (assumes a 5x to 8x reduction in channels based on concurrent call density)
MPLS data service	Not applicable	$1-4-2.8 (assumes each branch has 10 to 20 Users
SIP equipment	Not applicable	$1-2.1
Total Costs	**$31-43**	**$10.4-19.7**

Source Cisco White Paper: Next-Generation Cisco Unified Communications Platform Accelerates Return on Investment, November 2009

Many companies have already achieved considerable savings in time by using rich communications, as shown in a 2008 survey by Chadwick Martin Bailey. The firm surveyed 244 organizations of all sizes that used an IP PBX and at least one unified communications application. It found that 64 percent of these organizations report the typical user saves up to 30 minutes a day. Nearly half that deploy TelePresence save more than 5 days of travel per employee per year.

Savings like these will grow when you offer full unified communications through these two systems from Cisco.

Moving to IP for most communications will be evolutionary, probably taking several years. During that time, companies will change their phones, PBXs, and internal networks from TDM to IP; both formats can coexist during the transition. With the new session management and border control systems, you can move at your own pace. You can continue to use your legacy PBXs while still moving to cost-saving IP trunks.

More Than the Sum of Its Parts

The Cisco Unified Communications Manager Session Management Edition, assisted by the Cisco Border Control Element, does indeed serve as both the center of your network and the center of a web of collaboration applications and platforms.

As the center of your network, the session management system can take a large, complex, disjointed enterprise network and transform it into a pliable, multipurpose one that advances your company's goals and productivity.

As the center of collaboration, it can bridge among systems, including PBXs, and applications from other vendors. In addition, it is surrounded by a wealth of associated Cisco products:

- Cisco Unified Communications Mobility solutions, for extending collaborative applications to mobile and movable devices
- The Cisco Service Advertisement Framework, for moving traffic and applications efficiently around the internal network
- Rich Cisco Unified Communications Solutions
- The Cisco Unified Application Environment, for designing your own collaborative or other applications more easily
- The Cisco Quad, for setting up an enterprise social networking portal
- The Cisco Intercompany Media Engine, for external collaboration

This wide-ranging portfolio, combined with Web 2.0 application interfaces, enables you to create just about any kind of collaborative capabilities you want. And as you create them, you can depend on the well-tested security and reliability of the Cisco platforms on which they are built.

Moreover, these products employ familiar interfaces and management tools, so your staff members do not need to learn to use new ones.

Cisco pioneered IP communications. We also pioneered unified communications. Now we are pioneering IP networks that unify your network-saving you money as well-and collaboration technologies that enable your employees to work efficiently and creatively.

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