

IP telephony puts voice and data on one network

IBM Systems
MAGAZINE

Simplification on the Line

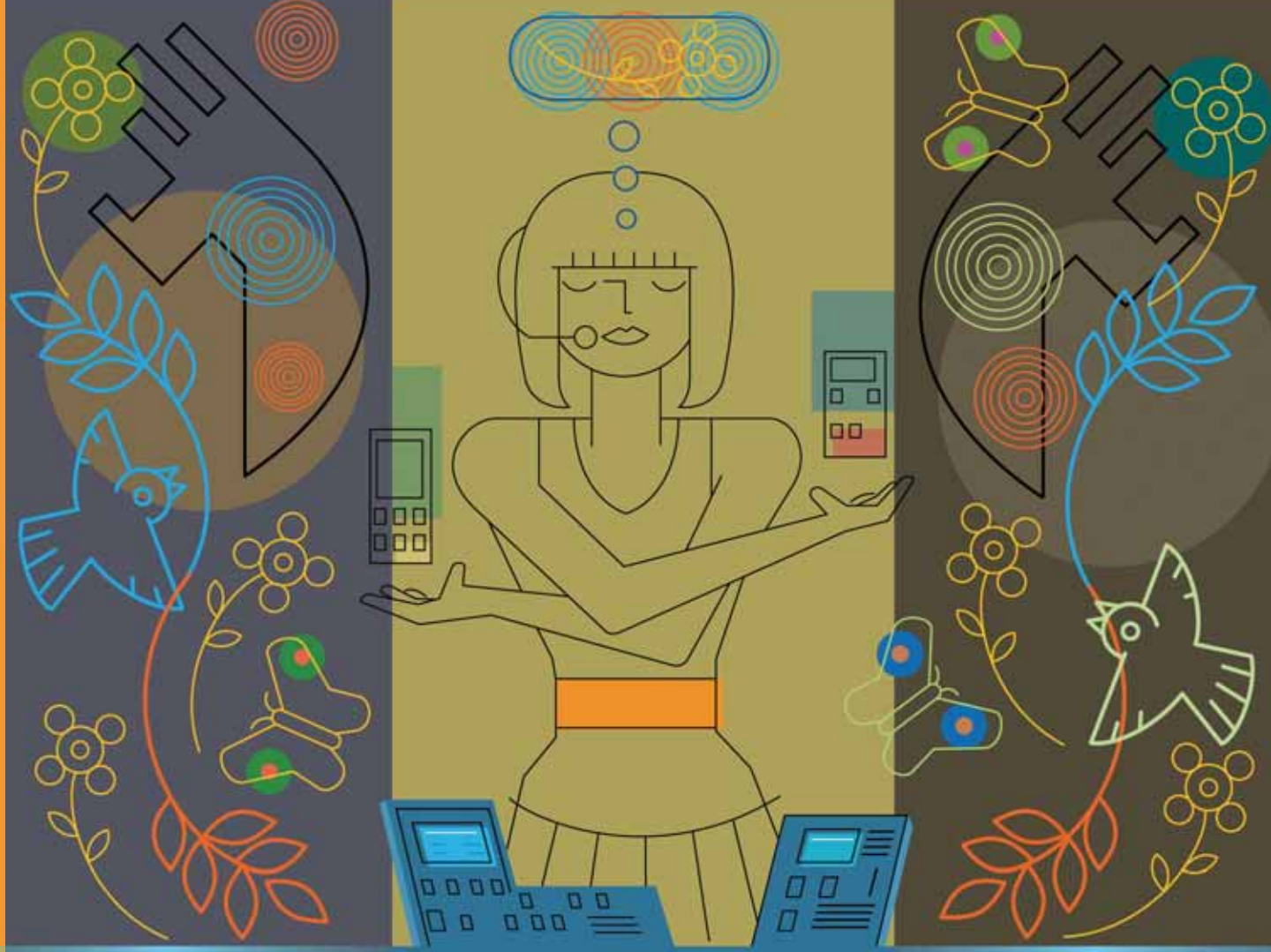
BY KIM GREENE

In the March i5 EXTRA e-newsletter, I wrote a brief overview of IP telephony and the many benefits of integrating the IBM* solution into your business (www.ibmssystemsmag.com/i5/mar07/extra/greene). That was just to get your toes wet—in this article, I'll explain how an IBM System i* IP Telephony solution can simplify your infrastructure.

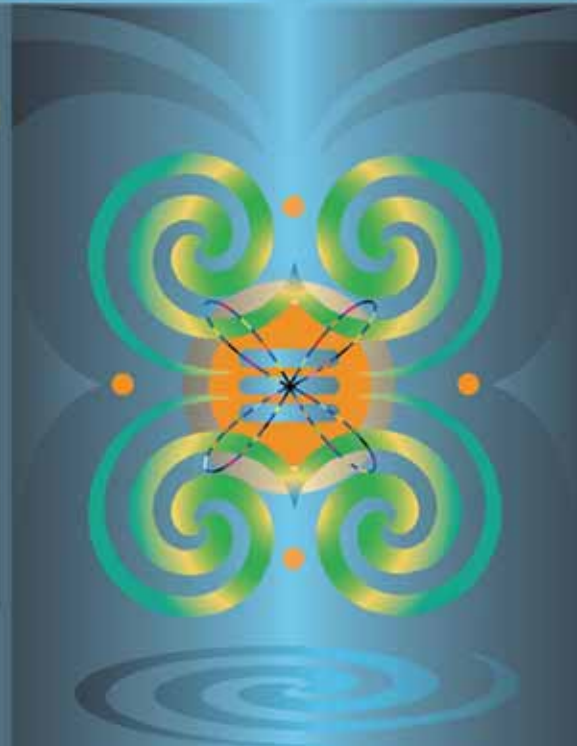
Remember when switchboard operators physically connected callers? It's unreal how labor-intensive a phone call was! Eventually, electro-mechanical switches replaced phone operators, resulting in lower overhead and greatly improving connectivity speed and accuracy. The next evolution was the

switch to digital or electronic switches that used digital signaling. The equipment that made digital switching so prolific, the private branch exchange (PBX), is still popular today.

PBXs provide critical functionality that helps businesses perform day-to-day voice operations such as call routing. PBXs' main limitations are that they only work with voice data and they're based on proprietary hardware and software. While integration with PBX systems is possible, it's often costly. IP telephony is today's answer to PBX systems, allowing one network to work for both data and voice and greatly easing application integration. This translates directly into infrastructure simplification.



IBM IP TELEPHONY



Infrastructure Simplification

Because many companies maintain separate networks for data and voice, IP telephony can reduce network requirements by letting companies consolidate phone and data networks. Plus, IP telephony calls take place on low-cost data networks.

IP telephony lets you use your existing resources, including the System i platform, your network, Session Initiation Protocol (SIP)-enabled phones, IBM Lotus® Domino® environment and line-of-business (LOB) applications. There's no need to rip and replace; you can build upon your existing infrastructure. This is largely due to the Linux® and SIP open standards that compose the IBM System i IP Telephony solution provided by 3Com.

Figure 1 (below) captures how the solution takes advantage of System i LPAR and virtualization capabilities. The full IP telephony suite runs on a single system rather than deploying each telephony component on a separate server. Due to the System i's LPAR capabilities, the IP telephony solution can run on the same System i server as your collaboration workloads and business applications.

There are three main application interfaces at the top of the diagram: collaboration, telephony and business applications. Telephony applications include IP Messaging, IP Presence, IP Conferencing and IP Contact Center. The business applications can include customer-relationship management, sales-force automation, ERP and many more custom-written applications. Collaboration applications include both Lotus Domino and IBM Lotus Sametime®.

Each application interface communicates with the analog or digital media gateways and various SIP-enabled devices, such as Wi-Fi phones or soft phones. All of these interfaces are

available because of the open-standard SIP interface. 3Com is the only IP telephony provider today that's fully embraced SIP. You can use your existing SIP-enabled phones without needing to replace them with 3Com SIP phones. Additionally, using a foreign-exchange-office or foreign-exchange-subscriber gateway to incorporate existing analog phones into the new IP telephony phone environment allows for a phased migration to a full-blown IP telephony solution.

Also notice in Figure 1 the administration and management interface into either the application layer or the media-gateway and SIP-device layer. This means you have one interface to manage, which can lower costs.

IP Telephony Architecture

The IBM System i IP Telephony suite includes a System i primary server, optional System i backup or secondary server, 3Com IP telephony software and licenses, 3Com IP phones and one or more gateways.

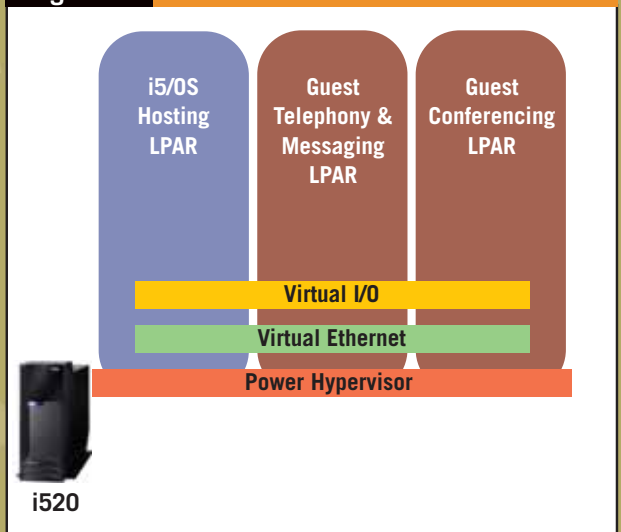
Figure 2 (below) shows one IBM i5/OS® hosting LPAR and two Linux partitions for deploying the 3Com IP telephony solution. In this example, the i5/OS hosting partition shares its resources with the hosted IP telephony partitions through virtual I/O and virtual Ethernet. The IP telephony partitions are started from the i5/OS hosting partition when the associated network server description is varied on. The guest-conferencing LPAR is only needed if the customer requires large-scale conferencing.

The virtual I/O referenced in Figure 2 is I/O to the disk, tape and optical device being shared from the i5/OS hosting partition. Virtual I/O lets resources that aren't physical hardware appear to the operating system as such. This lets the customer

Figure 1



Figure 2



minimize total physical hardware. The hosting partition can provide virtual storage and virtual Ethernet to associated LPARs.

The LPAR implementation of the environment lets companies grow and still accommodate their IP telephony needs with a System i solution. The sweet spot is, you get the complete IP telephony suite on a single, scalable system. No separate Linux licenses or additional i5/OS licenses are needed.

Hardware and Software Requirements

As Figure 2 shows, the IP telephony suite runs on IBM POWER Hypervisor* technology. This means the solution requires a POWER5* processor with L3 cache, IBM i5/OS V5R3 or V5R4, 5639-3CMN (multiple function 3Com software modules and licenses) and 5771-3CMN (3Com software maintenance). The 3Com IP Telephony and Messaging DVD includes the required Linux kernel that the IP telephony software runs on, so you don't need to obtain and install the Linux software separately.

Because IP telephony works with both voice and data on the same network, you must assess your network to ensure it's ready for IP telephony. Additionally, the IP phones will need power, which you can provide through Ethernet or a power brick for the 3Com IP telephone. If you plan to use Lotus collaboration workloads such as e-mail and fax integration, you need Domino 6.5.x or 7.x. Sametime collaboration requires Domino 7.x and Sametime 7.5.1.

Infrastructure Flexibility

You have many options when choosing how to implement IBM's System i IP Telephony solution in your environment. To start with, you can choose from two ways to create logical

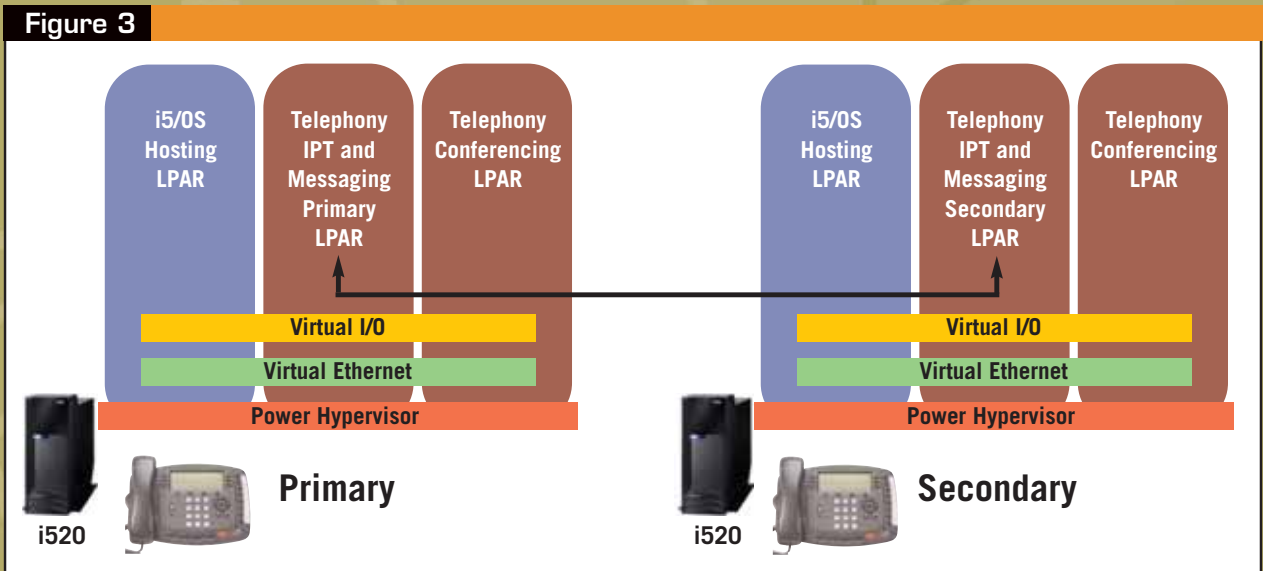
partitioning: Virtual Partition Manager (VPM) or Hardware Management Console (HMC). VPM is a good solution for smaller installations that don't require more than four IP telephony partitions. HMC is a more expandable option, providing more flexibility and scalability for configuring LPARs.

With VPM, each Linux partition running the IBM System i IP Telephony partition software is hosted from an i5/OS partition, with a limit of four total IP telephony partitions. All of the IP telephony partitions use virtual I/O to access Ethernet, disk, tape and optical resources. The managing i5/OS partition owns and manages these virtual resources. HMC, a more flexible option for creating the logical partitions, lets LPARs utilize Capacity on Demand (CoD) and dynamic LPAR (DLPAR). With this LPAR configuration, you may use virtual, direct or hybrid I/O.

Direct I/O is physical I/O associated with a given LPAR. In this scenario, all resources are owned and managed by the IP telephony LPAR; there's no dependency on the i5/OS managing partition. These resources are dedicated to the IP telephony partitions, which means i5/OS can't use these resources. This solution is more reliable and offers increased performance.

Another option when using HMC to configure LPARs is hybrid I/O, which combines virtual and direct I/O. In this scenario, you can have i5/OS manage the disk and optical while a dedicated Ethernet card performs communication services.

While VPM simplifies implementation, an HMC implementation provides more flexibility and scalability. The resource allocation options are much more flexible. Additionally, an HMC implementation provides the capabilities of CoD and DLPAR. Allocation of dynamic resources can be vital for those quarterly or yearly all-employee conference calls.



IBM's System i IP Telephony solution offers one central place to manage the whole system.

Deployment Options

Deployment of the IBM System i IP Telephony solution can be in a single- or multiple-system installation environment, depending on the level of high availability your business demands. Figure 2 shows a single-server installation; a multiple-server installation appears in Figure 3 (page 37). Two separate System i servers are hosting IP telephony systems—a primary and a secondary server. The 3Com IP telephony solution has built-in redundancy, meaning replication between the primary and secondary servers is automatic. Note that Figure 3 shows two 520s, providing both the primary and secondary server features. This is a realistic solution, where two servers mirror each other.

Express bundle packages are another, low-cost option. They let customers have smaller, less expensive server setups as their primary or secondary servers. This solution applies to most small and mid-sized System i customers. Businesses that don't require very high availability may choose a single System i server with the primary and secondary IP telephony LPARs providing redundancy.

The choice is yours. The solution is flexible, allowing any business to adapt specific implementation details to its needs.

Management Simplification

IBM's System i IP Telephony solution offers one central place to manage the whole system. One of the biggest benefits I see of management simplification is directory integration. You can use a corporate lightweight directory access protocol to seed the IP telephony user database. This translates into automatic creation of users, phones and associated mailboxes. Name and phone number changes also are propagated through the system automatically, easing administrators' burdens.

The aforementioned built-in replication also simplifies management. Either the primary or secondary server can be set as primary to allow maintenance on the other server. It doesn't cost anything extra in licensing fees for this level of flexibility.

Another significant benefit is the "knowing" power. Phones know their backup server and servers know the user's IP address. Each phone in the solution has its own media access control (MAC) address into the network. A MAC address is a unique identifier for devices attached to a network adapter. This provides mobility, as employees' SIP-based phones will follow them anywhere in the network, whether at the corporate office, home office or remotely while plugged into the network through a VPN connection.


Application Integration

Collaboration and LOB applications can easily interface with the IBM System i IP Telephony solution. Most of the integration among Domino, Sametime and the IP telephony solution is built into the product. Just configure the servers that provide Domino and Sametime functionality to integrate with the IP telephony servers. This integration provides voicemail, e-mail, fax, click to call, click to conference and Web conferencing. Users don't need separate fax numbers—all faxes are mapped to be deposited into users' Domino mail files. Figure 1 shows an additional comprehensive call-center application called EPICCenter. Version one of this product includes inbound-call support; version two will incorporate outbound-call support.

The 3Com IP Telephony Integration Software Developer Kit (SDK) for System i technology provides what the proprietary PBX functions lack to integrate LOB applications. This SDK is a Web-services API that lets business partners and customers write their own IP-telephony integration solutions. The SDK simplifies integration by not requiring addressing of individual terminals or end stations. The system resolves users by name or phone number on the IP telephony server and routes requests and responses accordingly. This means developers and business applications needn't keep track of IP addresses; 3Com SDK does this mapping under the covers.

The 3Com IP Telephony Integration SDK provides sample applications in a variety of languages and developer documentation. You'll find more details on the 3Com SDK Web page (<http://open.3com.com/tcom/rc/devToolkit.jsp>).

Tools to Help You Get Started

Several resources are available to help get you started with IBM's System i IP Telephony solution implementation. The IBM System i IP Telephony Web site (www.ibm.com/systems/i/solutions/iptelephony/), the IBM Redbooks* publication "IBM System i IP Telephony Configuring the System i Infrastructure" (www.redbooks.ibm.com/abstracts/sg247382.html?Open), and the 3Com System i home page (<http://csoweb4.3com.com/series/>) are good places to start. An IBM IP telephony solution could bring many infrastructure-simplification benefits. 



Kim Greene is an IBM Systems Magazine, i5 Business Systems edition *technical editor and an independent consultant specializing in Domino consulting*. She has more than eight years' experience with Domino and 18 years' experience with the System i platform. Kim can be reached at kim@kimgreene.com.