

Health Care Adoption of VoIP, IP VPN, and Converged Solutions

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IP and Convergence Adoption as a Part of Overall IT Expenditures

The US Business market has seen a lot of growth in the areas of Voice over IP (VoIP) and IP VPN (Virtual Private Network) adoption, as well as convergence of voice, data, and video capabilities over the last couple of years. In-Stat expects these trends to continue for the foreseeable future, with the Health Care market segment lagging other industries in these areas.

Businesses are increasingly well aware of the wide array of IP voice solutions available to meet their business needs. This has resulted in strong adoption among US business overall (33%), with lower than average adoption among the Health Care market segment (23%). This segment also lags the national average in adoption of IP VPN (37% nationally vs. 32% among the Health Care segment).

To date, the Health Care market segment has lagged other industries significantly in converging voice, data, and video capabilities. Health Care IT managers are also the least inclined to plan on converging network capabilities any time soon. In our estimation, this reflects concerns regarding IP telephony's ability to hold up in a communications-intense environment where its stability can mean life or death, in some cases.

These findings should be put in perspective. Overall IT expenditure in the Health Care sector outstrips the US average. Health Care companies represent 7.5% of all US businesses and 8.7% of US employment while accounting for 9.8% of total US business IT expenditures. Health Care IT managers have been focusing their investments more heavily in hardware and applications to provide improved operational efficiencies, than in IP solutions and converged networking. Examples include Picture Archiving and Communications Systems (PACS), pharmaceutical artificial intelligence software, medical records documentation software, and purchasing/inventory control software. This segment is also heavily regulated and prioritizes IT investments to meet industry requirements, such as HIPPA.

In-Stat believes that, in the long-term, efforts to improve employee productivity and contain costs will drive increasing levels of investment in IP-based services, including multiple VoIP solutions, such as IP PBXs, as well as IP VPN. Convergence of networks are also likely to grow over time, as IT managers integrate the ever-expanding medical technology applications into internal and customer facing solutions. This transition, however, will take time.

HIGHLIGHTS

- The Health Care segment lags other US industries in the adoption of both VoIP and IP VPN solutions, with 23% and 32% adoption rates, respectively, vs. 33% and 37% among US businesses, respectively.
- To date, the Health Care market segment has lagged other industries significantly in converging voice, data, and video capabilities. Health Care IT managers are also the least inclined to plan on converging network capabilities any time soon.
- Health Care IT managers have been focusing their investments more heavily in hardware and applications to provide improved operational efficiencies than in IP solutions and converged networking.
- It will be difficult to focus on IP and converged solutions in the Health Care segment for the near term. IT Managers in this segment are in a more political environment than is the case with other industries, but medical and nursing staff members are the most powerful influencers.

In-Stat's April 2006 *Health Care Trends That Drive IT Spending* report # IN0603310DDHC, found that Health Care managers are looking for IT applications that help cut costs, increase revenues, and improve service delivery. These IT managers are often faced with balancing operational performance with the needs of Doctors, patients, and highly skilled workforce, creating politically contentious environments where long sales cycles and solutions-selling skills are required.

These factors fuel the Health Care segment's adoption of IP and converged solutions, summarized in this analysis.

Data Collection for this Analysis

This analysis contains data gathered from the March, 2006 Business IP Communications survey. In-Stat surveyed 1,205 US business managers involved in decisions regarding the purchase of voice and data networking products for their entire organizations, or multiple departments/locations. The survey included a wide range of topics including IP VPN and VoIP adoption.

IP VPN Adoption

IP VPN services are the next-generation VPN services most widely purchased by business decision makers to replace legacy Layer 2 Frame Relay and ATM network services. In-Stat expects this market to be a key battle ground for service providers looking to capture customers looking to converge their voice, data, and video traffic onto a single service in the next several years.

IP VPN services provide secure connectivity similar to a Private-Line network using a lower-cost, shared, Layer 3 IP network. This is generally the public Internet or a private IP network infrastructure that is shared by the customers of the service provider. IP VPN services can be either CPE-based or network-based. The types of services offered by service providers are:

- CPE-based IPSec services for site-to-site communications
- Remote Access using IPSec and, more recently, Secure Sockets Layer (SSL)
- Network-based services, including
 - Network-based IPSec
 - MPLS (Multi-Protocol Label Switching)
 - Virtual Routers over an ATM backbone.

For CPE-based managed services, service providers deploy and manage IPSec gateways (either dedicated VPN appliances or VPN-enabled routers or firewalls) at customer sites. Customers generally communicate between sites (Intranet or Extranet) over the public Internet infrastructure that is provided by the service provider or another ISP.

Remote access services provide secure communications over the public Internet for telecommuters and mobile workers. Service providers typically provide users with IPSec software clients, and users communicate with CPE IPSec gateways at destination sites. SSL may be used to enable connectivity to Web-based applications, while IPSec may be used for remote users that require access to applications on the entire corporate network.

Most of the original IP VPN services were CPE-based, and all in-house (do-it-yourself) IP VPNs are CPE-based. Most service providers now feature at least one flagship network-based service in addition to their CPE-based, site-to-site, and

remote access services. Network-based VPN services are offered as a lower cost solution to the customer due to service providers' capital and operational cost savings of managing network VPN gateways that support multiple customers. In addition, network-based VPN services that are based on MPLS or virtual router over ATM architectures can offer customers classes-of-service to prioritize different types of applications. This provides the customer with the necessary, high Quality-of-Service (QoS) for real-time, voice and video applications, and mission-critical data applications that is not available for CPE-based services, which send their traffic over the public Internet.

For a more detailed review of the IP VPN market and service provider strategies, refer to In-Stat's May 2006 *In-Dustry Update: The US IP VPN Services Market: A Key Battleground for Service Providers* report # IN0602939BD, as well as *In-Dustry Update—IP VPN Service Providers: What Are They Offering?* report # IN0603246BD.

Health Care companies have not been as quick to adopt IP VPN services as has been the case with most US businesses to date. IT Managers do not seem inclined to close this gap any time soon, with only 16% planning deployment in the next 18 months. Table 1, below, summarizes current and planned adoption results for the Health Care segment, contrasted with the US business averages.

Table 1. Use and Planned Use of IP VPN

IP VPN Deployment Status		
	Health Care n=175	Total n=1205
Currently Deployed	32%	37%
Deployment Planned within 18 months	16%	25%
No Plans to Deploy	27%	21%
Don't Know	25%	17%

Source: In-Stat, 06/06

Fully one quarter of the respondents replied "don't know," reflecting the fluid nature of IP investment in the Health Care segment. This industry's IT managers have been focusing IT expenditures on hardware and applications to provide improved operational efficiencies rather than on IP solutions and converged networking. As current IT priorities are addressed, increased focus on IP VPN as a replacement for legacy services will take place. However, it may take several years for IP VPN to be deployed to the same extent as other vertical industry segments.

Current IP VPN Deployment

Our analysis of current IP VPN users in Health Care is limited to 56 respondents and does not yield adequate sample to make conclusive statements about the segment's use of IP VPN. However, the results do not vary significantly from the overall business results summarized in Table 2, below.

Table 2. Types of Current IP VPN Deployments (Multiple Responses Allowed)

Current IP VPN Deployment Among US Businesses	
	Total n=444
IP Sec (Remote User)	52%
IP Sec (Site-to-Site)	46%
SSL (Secure Socket Layer)	41%
MPLS (Multi Protocol Label Switching)	11%
Don't know	10%

Source: In-Stat, 06/06

IP VPN Deployment Plans

Health Care customers who are planning to deploy an IP VPN solution in the next 18 months favor the site-to-site IP Sec solution. Table 3, below, summarizes planned IP VPN service adoption for the Health Care segment, contrasted with the US average.

Table 3. Future IP VPN Deployment Plans (Multiple Responses Allowed)

Deployment Plans Over the Next 18 Months		
	Health Care n=76	Total n=684
IP Sec (Remote User)	43%	47%
IP Sec (Site-to-Site)	50%	43%
SSL (Secure Socket Layer)	32%	39%
MPLS (Multi Protocol Label Switching)	17%	20%
None of the above	9%	10%
Don't know	13%	11%

Source: In-Stat, 06/06

The Health Care segment mirrors the overall trend towards increased adoption of MPLS, with planned adoption increasing more than 50% above current use. The ability to implement QoS and class-of-service management is increasingly attractive to mid-sized and enterprise businesses, and will continue to gain favor down-market, as network convergence occurs and businesses seek solutions to manage voice, data, and video needs while ensuring delay-intolerant applications are not impaired.

IP VPN Displacement of Legacy Services

Traditional network transport services, such as ATM, Frame Relay and dedicated Private Lines have been under tremendous pressure from more cost-effective IP solutions for several years. Besides being less expensive, IP VPN solutions provide any-to-any connectivity that is often lacking, or not cost-effective with these legacy solutions. IP VPN services also provide a unified solution for data, voice, and video networking, as well as supporting remote and extranet communications.

Health Care IT Managers plan to replace a wide array of WAN services with IP VPN solutions. However, they indicate that 16% of their planned IP VPN deployments will be additive and not replace legacy services. This may fill the overall spending gap for WAN services caused by the shift to lower cost solutions, or actually lead to slightly incremental net spending on WAN services. Table 4, below, summarizes the extent to which IP VPN deployments will replace legacy WAN services in the Health Care segment, contrasted with the overall US business findings.

Table 4. IP VPN Displacement of Legacy WAN Services

WAN Services Replacement		
	Health Care n=61	Total n=554
Will Replace Existing Services	81%	77%
Will Not Replace Existing Services	16%	18%
Don't Know	3%	5%

Source: In-Stat, 06/06

In-House Deployment and Management Less Critical For Health Care IT Managers

IT Managers, traditionally, have a strong desire to maintain personal control over their networks and are not inclined to rely upon managed services from carriers unless there is a specific need to do so. These needs can include access to expertise outside of their realm of capabilities, a lack of in-house resources, or value-added benefits associated with managed carrier solutions, such as QoS or any-to-any connectivity.

Health Care IT managers are generally not inclined to rely exclusively on in-house deployment of IP VPN services. Table 5 summarizes deployment plans of Health Care contrasted with the US business national average.

Table 5. “In-House” vs. Carrier Deployment of IP VPN

How IP VPN Technology Will Be Deployed		
	Health Care n=61	Total n=554
In-House Deployment and Management	39%	44%
Carrier Deployment and Management	23%	29%
Combination of Both	28%	24%
Don't Know	10%	3%

Source: In-Stat, 06/06

As convergence of voice, data, and video accelerates, In-Stat expects to see more adoption of carrier deployment and management, particularly in the mid-sized and small business spaces within this vertical segment, as well as across other industries. The ever-changing nature of technology in the Health Care segment may accelerate the adoption of carrier-managed solutions in this segment.

VoIP Adoption

In-Stat queried respondents on their use of four distinct VoIP solutions:

- **IP-Enabled PBX**—where the user has IP-enabled legacy TDM equipment, typically a PBX and analog handsets
- **IP-Based PBX**—where the user has converted to full-blown IP capabilities
- **IP Centrex**—a hosted IP solution that works much in the same way as TDM Centrex services to an end-user
- **Broadband IP Telephony**—where the IP voice service is an application riding over a broadband service (typically DSL or cable)

Broadband VoIP solutions have seen explosive growth and attract much of the attention in the marketplace. While these solutions are fueled primarily by residential customers, they certainly have traction in the business arena. Other solutions tailored more directly to the needs of businesses, including Hosted IP Centrex, IP-enabled PBX, and IP-PBX solutions have also gained traction. As shown in Table 6, the Health Care segment significantly lags the US business average in VoIP adoption.

Table 6. Current VoIP Adoption

	Health Care n=175	Total n=1205
Deployed an IP voice solution	23%	33%

Source: In-Stat, 06/06

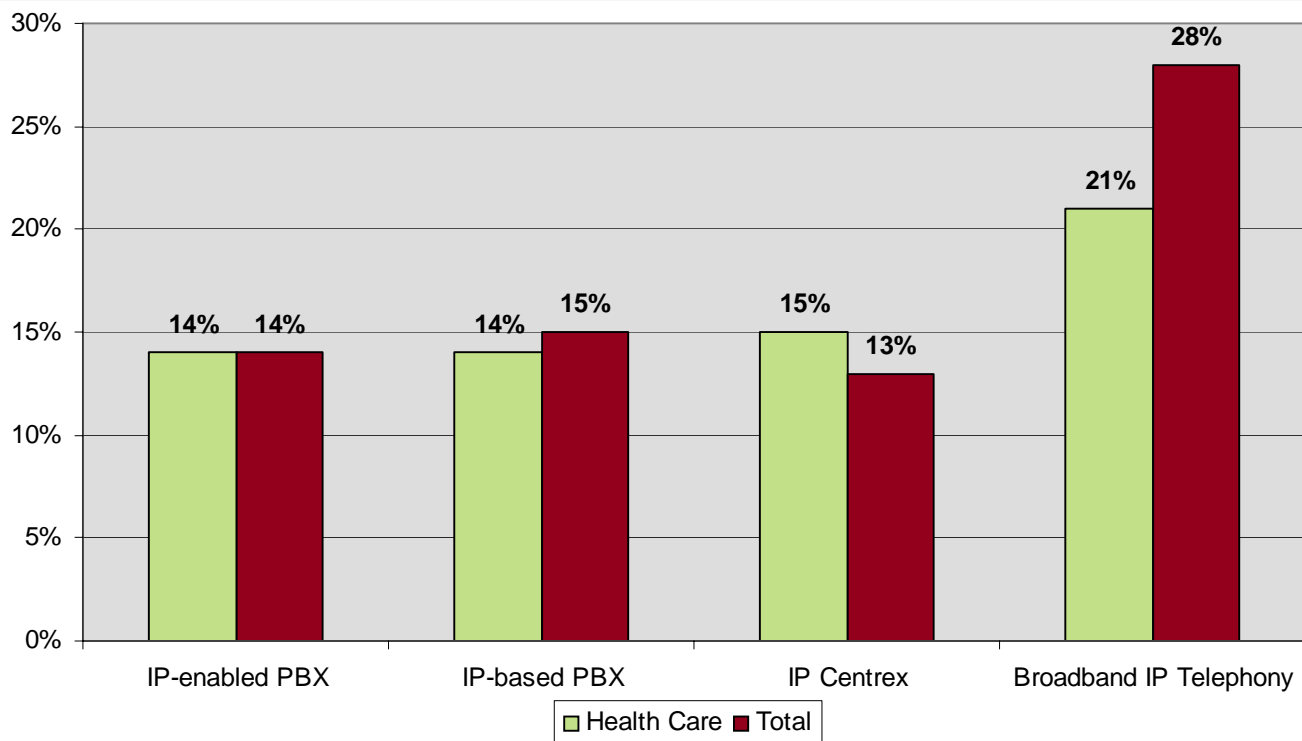
In-Stat expects this gap to close over the next several years as Health Care IT Managers refocus their IT priorities and become more confident and comfortable with VoIP technology's reliability and stability.

A Mix of VoIP Options are Being Adopted

US businesses, in general are taking advantage of this wide-ranging nature of VoIP options and adopting multiple solutions simultaneously. Fully 43% of current VoIP users responding to our survey currently subscribe to multiple VoIP solutions. Even after adopting VoIP in some form, businesses continue to show strong interest in experimenting with alternative solutions to meet their specific needs.

Overall, the mix of VoIP service types for the Health Care segment is similar to that of most industry segments, with the exception of Broadband IP Telephony, which is still the most popular solution, but lagging other industry adoption levels. Figure 1, below, summarizes current adoption of the four distinct types of VoIP service, contrasting the Health Care segment with the US average.

Figure 1. Type of VoIP Service Used



Source: In-Stat, 06/06

Broadband IP telephony has the most traction in the overall business market, as well as the Health Care segment, particularly among smaller businesses. However, a variety of options are being adopted in the mid-sized and large business spaces. Small businesses are also gravitating to business-grade solutions, approaching double-digit adoption of IP-enabled and IP-Based PBX, as well as IP Centrex services.

Customers Expect a Wide Range of Channel Options, Including Online Retail

The Health Care sector is similar to the total US business market in its expectation that VoIP options are becoming so pervasive that they will have multiple channel partner options when seeking assistance in meeting their VoIP needs. Service providers are best positioned with business customers overall, but as the size of business increases; a wider array of channel options is preferred. The Health Care sector channel preferences are fairly similar to other industries, but this segment seems slightly less inclined to favor the most traditional channel partners, service providers and, to a more significant degree, equipment manufacturers.

Table 7 below summarizes VoIP channel partner preferences for the Health Care segment contrasted with the US business average.

Table 7. Preferred Channel Partners for IP Solutions

Channel Partner Most Likely to Purchase IP Solutions From		
<i>(3 choices allowed)</i>	Health Care n=175	Total n=1205
Service Providers (like AT&T, Sprint, MCI, Qwest, Verizon, SBC, or BellSouth)	42%	48%
Direct from the Network Equipment Providers, such as Cisco, 3Com, Siemens or Avaya	19%	25%
A data networking integrator specializing in LAN design and implementaton, router configuration, etc.	17%	18%
A systems integrator, like IBM Global Services or your local computer consultant	15%	17%
A voice networking integrator specializing in PBX configuration and installation, etc.	11%	14%
A physical store retailer, such as BestBuy, Fry's or Staples	19%	14%
An online retailer, such as PCMall, CDW Online, Amazon.com or Staples.com	12%	12%
Don't Know	19%	14%
Other	1%	2%

Source: In-Stat, 06/06

Voice, Video, and Data Convergence

Technology has matured to a point where businesses are finding it cost-effective to consolidate their networking capabilities rather than maintain separate voice and data networks. This convergence of network capabilities is gaining quick momentum among US businesses; with nearly 60% of US business respondents indicating that they currently deploy some form of voice/video/data convergence technology. Implementations vary from small trials to full scale deployments, but the technology is taking hold. The Health Care segment lags this national average significantly, with only 46% of respondents indicating that they have deployed converged network capabilities.

Within the Health Care segment, it is not just network convergence that is lacking. Across all types of health care firms, IM and other collaboration applications are unwelcome, achieving one of the lowest levels of deployment of the choices provided, and a significant deviation from the average. CEOs within the hospital industry tend to be reluctant to implement proven organizational structures and management strategies employed in other industries.

Convergence is More of a Reality in Other Industries

The convergence of voice, data, and video among businesses in the Health Care sector is more limited than in other industries. Despite significant advancement in the technologies of medical imaging and telemetry, voice remains the most common denominator in the limited convergence that has taken place to date.

Table 8, below, summarizes the current convergence of voice, data and video applications for the Health Care segment, contrasted with the US business average.

Table 8. Current Common Network Convergence of Voice, Data and Video

Current Converged Network Deployment		
	Health Care n=175	Total n=1205
Voice and data share some common network facilities	30%	33%
Voice, video, and data share some common network facilities	7%	12%
Video and data share some common network facilities	7%	10%
Voice and video share some common network facilities	2%	4%
We do not have a converged network deployment	43%	32%
Don't know	11%	9%

Statistically significant difference.

Source: In-Stat, 06/06

Expansion of Convergence is Not in Immediate Plans

While expansion of convergence is expected to continue among US businesses in general, fewer than half of the Health Care respondents indicated that they intend to deploy convergence technology or expand their current converged deployment over the next 18 months. Video will play a more important factor in future deployment plans, but still lags when compared with other industries.

Table 9, below, summarizes planned expansion and additional implementation of convergence initiatives of voice, data, and video applications for the Health Care segment, contrasted with the US business average.

Table 9. Future Convergence Plans

Plans to Implement New or Additional Network Convergence Over Next 18 Months		
	Health Care n=155	Total n=1205
We plan to add/expand voice and data convergence	16%	19%
We plan to add/expand video and data convergence	12%	9%
We plan to add/expand voice and video convergence	8%	10%
We plan to add/expand voice, video and data convergence	11%	19%
No plans to implement additional or new network convergence	45%	34%
Don't know	8%	9%

Statistically significant difference.

Source: In-Stat, 06/06

Convergence Adoption is Driven Primarily by Cost Savings, but Many Factors Emerge as Significant

Respondents to our survey were given a wide range of factors to identify as drivers of network convergence. Not surprisingly, cost savings emerged as the primary driver, with 51% of total respondents and 48% of Health Care respondents citing this as a driving factor. The convergence of voice, data, and video over common network facilities can lead to significant cost savings in the right environment. In addition, a properly deployed converged network reduces the amount of individual network elements that need to be managed, decreasing operational overhead. Convergence also

helps the network manager address today's increasingly mobile and remote workforce; however, these needs generally do not resonate as strongly in the Health Care arena.

Table 10, below, summarizes the key drivers of convergence implementations for the Professional Services segment, contrasted with the US business average.

Table 10. Drivers of Network Convergence

Key Drivers for Implementation of Converged Networks		
<i>Check all that apply</i>	Health Care n=155	Total n=1205
Cost Savings	48%	51%
Support of remote workforce	21%	25%
Reduce number of network elements to manage	22%	23%
Disaster recovery plan	26%	23%
Support of mobile workforce	17%	23%
Effective technology for addressing new locations	21%	22%
Converged network implementations have matured/technology is now stable/reliable	14%	19%
Call Center support	21%	18%
Collaboration	13%	17%
Investment protection	13%	12%
Industry specific application	10%	12%
Other	1%	1%
Don't know	26%	17%

Source: In-Stat, 06/06

Health Care respondents place less importance on mobile or remote employees than in other industries, because clients typically are onsite for service or care. IT Managers in the Health Care segment remain unconvinced that technology has matured to a point where they can rely on converged networks. Outside of these areas, this segment's responses were similar to their counterparts in other industries, but not as strongly formulated. Respondents were given a chance to check all factors that apply. While the relative distribution of factors is similar to other industries, Health Care respondents tended to choose fewer categories.

Implications

- It will be difficult to focus on IP and converged solutions in the Health Care segment for the near term. IT Managers in this segment are in a more political environment than is the case with other industries, but medical and nursing staff members are the most powerful influencers. Physicians and other licensed health care professionals control the work flow, resources, and patients, not the CEO and his/her reports. Developing applications that address these constituencies will be critical through out the sales cycle, as IT managers routinely seek the input of physician and clinical staff.
- There are many competing IT priorities in this industry segment. In large health care organizations, depending on how they are organized, the CIO's priorities can vary considerably from those of the physicians, nurses, and clinical staff. It is common for multiple departments to have separate IT strategies, which can often conflict with one another. The ever-changing technological advancements in this industry also play a role in keeping priorities fluid.

- Compelling businesses cases and proven ROI for IP and converged network applications may help accelerate adoption rates at an individual company level. This may require a higher than average commitment to customer facing sales channels and specific industry application training.
- Change is difficult to promote and drive. CEO's within the hospital industry tend to be reluctant to implement proven organizational structures and management strategies employed in other industries. Due to the unique nature of medical staff politics and highly variable service delivery patterns, which heavily influence hospital managers, hospital leaders are prone to rely on consensus decision making methods.

Recommended Reading

Additional detailed information on the current IP VPN marketplace can be found in the following In-Stat reports:

- *The US IP VPN Services Market: A Key Battleground for Service Providers* (SKU: IN0602939BD)
- *IP VPN Service Providers: What are They Offering?* (SKU: IN0603246BD)
- *Health Care Trends That Drive IT Spending* (SKU: IN0603310DDHC)
- *In-Sights: IP VPN QoS & Converged Network Adoption* (SKU: IN0602935BD)
- *The Wide Ranging Nature of Business VoIP Adoption* (SKU: IN0603299BD)
- *In-Dustry Update—Health Care Vertical Market Deep Dive: IT Spending* (SKU: IN0603083DDHC)

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