

WHITE PAPER

**3Com<sup>®</sup>**  
**Solutions:**  
**STRATEGIES FOR**  
**SUCCESSFUL IP**  
**TELEPHONY**  
**IMPLEMENTATIONS**



## 3Com Solutions: STRATEGIES FOR SUCCESSFUL IP TELEPHONY IMPLEMENTATIONS

### CONTENTS

The Problem with Legacy.....	2
Hybrid.....	2
Greenfield.....	3
Forklift.....	3
Overlay.....	3
A Combination of Strategies.....	3
Conclusion.....	4

## THE PROBLEM WITH LEGACY

Dial tone is probably the most critical enterprise service of all IT services. Right up there with payroll service, dial tone or the lack of it, can inspire 1,000 times more passion than poor PC availability, e-mail spam, or elevator power outages. That's because people have grown accustomed to high quality audio in their personal and professional lives, and they continue to demand it from the technology their company might employ.

For whatever reason, telecommunications departments have tended to have longer product life cycles and more heterogeneous environments than any application or IT unit in the company. More than anything else, that may have to do with the heritage of limited innovation, oligarchy-style pricing, and high maintenance costs perpetuated by telephone company repairmen in little white trucks. In fact, the multivendor environment is probably due not just to the spate of mergers and acquisitions in the customer environment over the past decade, but also to the geographic strength of different vendor sales and service organizations, timing of projects, and the natural tendency to keep vendors "honest" by splitting the business.

So it should come as no surprise that IP telephony remains a potentially perplexing technology for many companies, possibly tempering enthusiasm for wholesale deployment of IP telephony products. Yet, in the face of what has always been considered a weak business case (how much can you really save by consolidating wiring infrastructure?), there is a compelling demand for IP telephony products. A compilation of four leading analyst reports indicates that 2005 will be the year of "inflection"—when the rate of market growth changes. It is the year in which more IP lines will be purchased than digital, signaling the market's preference for IP technology.

In the face of this anticipated surge in market demand, a re-evaluation of a company's IP telephony strategy is appropriate since the technology risk and the company's risk-tolerance have changed. As the advantages of IP telephony become a business requirement, organizations face strategic decisions. They should understand the tradeoffs of each of the following IP telephony deployment options:

1. Hybrid
2. Greenfield
3. Forklift
4. Overlay
5. A Combination of Strategies

## HYBRID

As a response to the introduction of the IP-PBX by 3Com in 1998, legacy PBX vendors introduced the "Hybrid PBX." Logically, many enterprises looked to their portfolio of legacy vendors for insights into what IP telephony could do for their business and considered various deployment options.

The classic response—the Hybrid—involved two components: an IP phone and an IP adjunct card that provided access to the PBX switch fabric. As a typical line card, the IP card had Digital Signal Processors that could convert IP packets to circuits and interfaced directly with the switch fabric. The card would also transmit the vendors' proprietary signaling and TDM-translated features into an IP packet destined for the appropriate IP phone. In this way users would get similar, if not identical features, on the IP set, and the economic link between the PBX switch fabric and the handset would be protected.

With the Hybrid strategy, users get telephony service on an IP phone, but not much else. Similar to the sizes of PBX line cards that control access concentration and manage call blocking, these IP cards can only support a limited number of IP phones. If too many

calls access the switch fabric or access the card bus, contention may occur and cause users to hear fast busy tones, affecting their satisfaction and the service availability.

Furthermore, most vendors offer messaging services separately for these users, directly over IP, reducing interoperability with the legacy PBX. Note that since calls always pass through the PBX switch fabric, audio quality is limited to 8 kHz sampling and 64 kbps maximum bandwidth.

## GREENFIELD

The “Greenfield” strategy is the deployment of a new system in a new facility—often a new building on a campus, an office relocation, or a refurbishment. It takes its name from the original “field of green grass” that (theoretically) existed before construction began.

With this strategy the opportunity is to create an experimental “island” of functionality to assess benefits, interoperability functionality, cost control, and user acceptance of the new technology. In this setting, the company classically conducts a Request for Proposal (RFP) process for acquiring IP telephony products and services and reviews proposals from a variety of vendors and their partners.

Companies typically adopt this strategy when the digital PBX infrastructure is complex or large, making wholesale change expensive, disruptive, and difficult. Also, it is a popular choice when much of the gear is not completely depreciated or when the IT management team is skeptical of the benefits.

Many companies look to Greenfield strategies once confronted by the limitations associated with the Hybrid approach. This has historically been a frequent point of success for the 3Com® NBX® IP telephony solution. The NBX product sports features such as H.323-based call

control, dual-port Ethernet phones (keeping Ethernet port-count requirements to a minimum), included voice mail, and simple user and administrator functionality previously unavailable in business telephony products.

The benefits of lower operating costs—easier moves, adds, and changes—has proved effective in many enterprises that swapped their digital PBXs as budget and depreciation schedules allowed.

## FORKLIFT

Without the opportunity to design a controlled experiment, many enterprises are, perhaps by default, limited to the Forklift model. Here the implementation involves a complete removal of legacy equipment, hence the “Forklift” analogy, since most PBXs are large boxes requiring power assists to relocate them. No doubt, many vendors consider this their best option for sales. However, the risk of failure can be higher than with other strategies.

The Forklift often implies a flash-cut of the service—one day the old service and the next day the new service. This is not a realistic implementation. Clever project managers first deploy the infrastructure (data network, call controller, digital gateways) and then rollout the training and desktop devices in lumpy groups, perhaps 100 users at a time. IP phones can function on the same desk as the standard PBX phones. As training occurs and user anxiety diminishes, the legacy phones and PBX can be decommissioned.

Of course, in a global multisite enterprise-wide model, economics and timetable will drive implementation parameters. The project team may design a cost-optimized, quality process that they can easily replicate. Often, what is appropriate for dozens or hundreds of sites is to divide the labor into specific tasks. The organization employs specialized third parties to perform each

implementation step, including site preparation, user training, staging and testing configurations, shipping assembled product, and installing and commissioning the new system as well as decommissioning the legacy one.

## OVERLAY

Some enterprises may choose to unify applications first—centralize messaging and other convergence applications for presence and desktop video conferencing. Then they may deploy IP telephony service more gradually as user demand and user acceptance warrants. In these “Overlay” implementations, enterprises deploy the applications globally to quickly extract application benefits.

Network-wise, they deploy call controllers that use Session Initiation Protocol (SIP) to control the Wide Area Network (WAN). Digital gateways cap PBX investments and new users with IP phones are deployed on the call controllers. Gateway-to-gateway traffic is carefully managed across the IP WAN using an enterprise management system. PBX Interworking Devices (PIDs) are used to turn on the message waiting lamps of users on digital PBXs, “capping” the legacy investment, and enabling new IP telephony application delivery for enhanced business performance.

The term “Overlay” is derived from the way a tablecloth covers the table surface, providing a smooth and clean basis for doing work without regard to the wood below the cloth. In the same way, the Overlay strategy covers the legacy PBX infrastructure with IP and enables new applications without serious regard to the legacy system.

Companies consider this option because they can’t control other factors such as depreciation schedules on existing equipment, higher investment priorities, or a skills gap in converged network implementation—each of which pose serious challenges to an IP

telephony project. The Overlay option allows a company to quickly extract value from the applications enabled by an IP telephony infrastructure without necessarily deploying IP telephony servers. Benefits are made available through user PCs. As the pool of new users on the IP telephony system grows, maintenance costs on the PBX can be reduced.

Furthermore, it is increasingly practical to deploy softphones—telephone dialing and audio control PC software—to all users, especially those on digital handsets. These applications usually reduce the use of the digital set completely. This behavior is possible since processors have grown in performance and PC operating systems have improved their stability, and are now able to support interrupt-intolerant applications like telephony. Call logs can even provide the trigger moment when the use of the digital PBX falls below the economic point of use.

## A COMBINATION OF STRATEGIES

In complex environments, some of these strategies are implemented at the same time, often because of a decentralized organization of telecom assets and responsibilities. One division may prefer Forklift and another the Hybrid, while the corporation may insist on Overlay to deploy common convergence applications. Each decision-making unit has to consider the risk, cost, and applications impact for their operation and their business. It is within this context, rather than by strategic design, that an enterprise might legitimately deploy a combination of these strategies.

## CONCLUSION

There are as many ways to implement IP telephony as there are ways to slice bread. The following table indicates strategic alternatives and associated risks, applications impact, and cost.

IT architects and network designers need to proceed with caution and work with companies that understand the fundamentals of not only telephony, but more importantly, of the potential and value of IP telephony. The need for care in selection and implementation comes from the very high expectations of users and customers. It is the author's hope that this presentation of strategic options clearly demonstrates the broad array of opportunities for enhancing investment returns and delivering business benefits now.

**TABLE 1: C – Comparisons of strategies and their features.**

	<b>Hybrid</b>	<b>Greenfield</b>	<b>Forklift</b>	<b>Overlay</b>	<b>Combination</b>
<b>RISK</b>	Low	Low	High	Low	Varied
<b>APPLICATIONS IMPACT</b>	Low	High	High	High	Varied
<b>COST/USER</b>	Highest	Low	Low	Medium	Varied

3Com has been a major contributor to the convergence industry since the introduction in 1998 of the world's first IP-PBX, the NBX solution. In 1999 the company developed an architecture for a distributed softswitch for AT&T and brought the first commercially- deployed carrier softswitch to market. The 3Com VCX™, introduced in 2003, is the world's first convergence applications suite.

Transforming business through innovation is not new to 3Com. The company holds over 900 patents and is the market leader in IP telephony for small to medium enterprises. 3Com operates in over 45 countries and has 1,900 employees. We are changing the way business speaks.

## CONTACT INFORMATION

For additional information about the 3Com Strategies for Successful IP Telephony Implementations contact an authorized 3Com reseller or 3Com Global Services

### North America

Telephone: TippingPoint 888 878 3477

Email: [NAquotedesk@tippingpoint.com](mailto:NAquotedesk@tippingpoint.com)

### Asia Pacific

Email: [APACquotedesk@tippingpoint.com](mailto:APACquotedesk@tippingpoint.com)

### Europe, Middle East, and Africa

Email: [EMEAquotedesk@tippingpoint.com](mailto:EMEAquotedesk@tippingpoint.com)

### Latin America

Email: [LATAMquotedesk@tippingpoint.com](mailto:LATAMquotedesk@tippingpoint.com)



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3Com Corporation, Corporate Headquarters, 350 Campus Drive, Marlborough, MA 01752-3064  
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