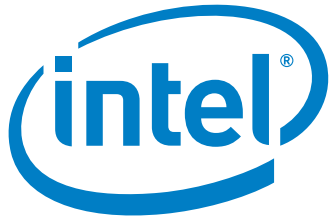

White Paper

Intel Information Technology

Mergers and Acquisitions

Faster, Simpler Integration of Acquired IT Environments

Delivering higher value through the strategic use of corporate standard client, server, and networking solutions

After nearly a hundred integration projects, Intel IT has found that extending corporate IT standards into acquired IT environments generally pays off in a faster integration, lower costs, reduced risk, and enhanced collaboration.

IT@Intel

Executive Summary

The acquisition of technology companies is a component of Intel's growth strategy, often providing pivotal new technologies, talent, and expertise. These acquired businesses can range in size from a handful of employees to several thousand. They also have very diverse business models and IT infrastructures, so integrating them into Intel's business and IT environment can be challenging. In almost every acquisition, a key issue for the Intel IT organization is determining the extent to which we will introduce our corporate standard IT solutions into the new environment.

Through nearly a hundred acquisitions over the past 12 years, we have found that deploying our standard systems and configurations almost invariably simplifies integration and delivers better total value at lower cost. Of course, it also introduces some degree of change for employees in the acquired business, so we work closely with them to minimize disruption and make sure their needs and preferences are taken into account as much as possible. This can be a major balancing act and sometimes requires significant trade-offs.

The advantages of transitioning acquired environments to our corporate standards are far reaching. This approach enables us to take advantage of best-in-class systems and proven configurations. These Intel® technology-based solutions generally deliver major increases in performance, scalability, reliability, energy-efficiency, and functionality versus the infrastructure they replace. They also provide a more flexible, secure, and well-understood foundation for future growth and can be managed largely by our remote teams using tools and processes that have been optimized across our global IT environment.

This paper discusses some of the business drivers that impact IT integration for small acquisitions. It also examines specific issues regarding the integration of corporate standards into key areas of an acquired infrastructure, including clients, servers, networking, telephony, and applications.

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Integration Best Practices – Clients

Refresh with corporate standard systems and processes to:

- Improve performance, mobility, and collaboration
- Reduce TCO via centralized management
- Reduce risk with proven security solutions

Intel IT deploys: Intel® Centrino® 2 with vPro™ technology-based notebooks

The Goals and Challenges of Small Acquisitions

Innovation comes from many sources in the technology industry, including thousands of small companies that are turning breakthrough ideas into valuable new products and solutions. That's why Intel supplements its own research and development efforts with the strategic acquisition of innovative and successful small businesses. These acquisitions often add substantially to our success, supplying critical intellectual property, talent, and expertise that help to accelerate our growth. In the past 12 years, Intel has acquired nearly a hundred businesses ranging in size from a handful of employees to several thousand (Figure 1).

With every acquisition comes the challenge of integrating the new company into Intel's global business and IT environment. Each acquired organization has a unique blend of tools, processes, applications, and IT infrastructure, all of which must be maintained, adapted, or replaced. This is an unavoidably complex process. In order to provide a framework for decision-making, the Intel IT organization has found it is essential to understand the unique business drivers behind each acquisition, so we can establish clear goals, along with appropriate criteria for evaluating our success.

From a business perspective, the goals of integration can vary widely. They typically include some combination of the following.

- Maximize the utilization and value of acquired intellectual property, such as products, technologies, engineering designs, and patents.
- Retain talented employees and provide them with tools and resources that enhance their productivity and satisfaction.
- Optimize communication, collaboration, and information sharing, both within the acquired organization and with Intel's global workforce to break down barriers and improve information flow.
- Maintain the acquired company's existing operations, revenue streams, and customers with minimal disruption, while moving toward an optimal level of integration with Intel's corporate environment.

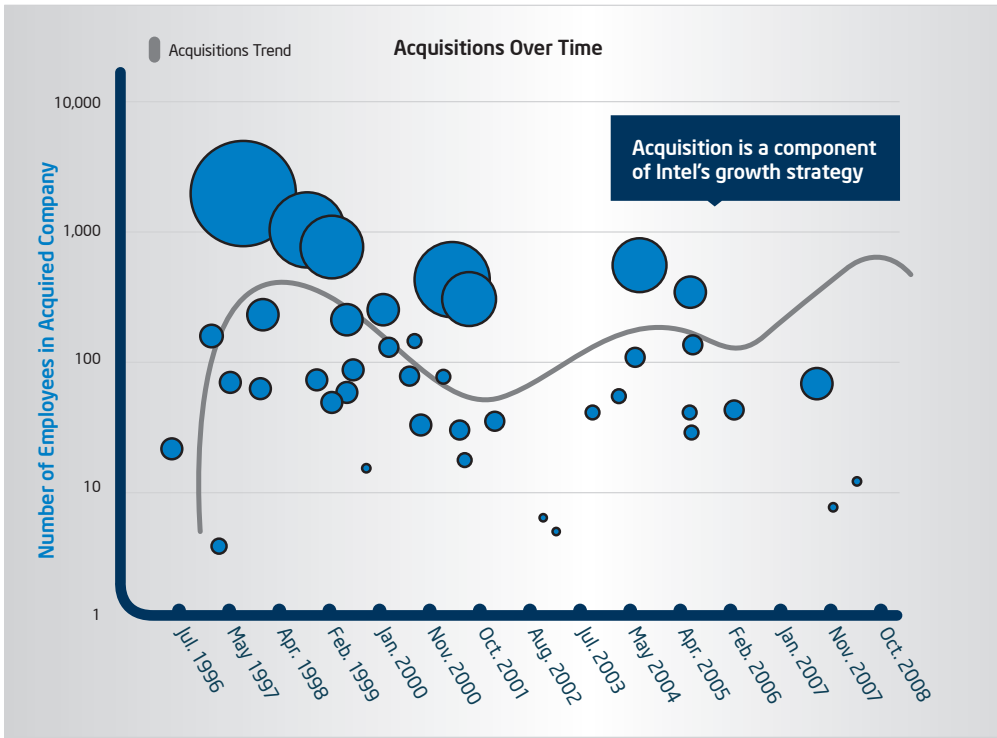

Figure 1. Intel IT has integrated the IT assets of nearly 100 acquired businesses over the past 12 years. The acquired companies have ranged in size from a few employees to several thousand.

Strategies for Integration

Depending on the specific business goals, our IT integration efforts follow one of three general strategies.

- **Leave the IT Infrastructure "as is" –** In a few unique cases, it has been decided that the acquired company should continue operating as a largely independent entity. In such a scenario, there may be little need for information sharing or collaboration with the broader Intel environment and it may be best to leave IT infrastructure and operations largely untouched. An example would be an acquisition in which talent retention is the primary driver and existing employees are strongly attached to an independent, small business culture. Leaving the infrastructure "as is" can send a signal that the culture and values of the company will not be disrupted.
- **Partial Integration –** In some acquisitions, it may be decided that the small business should remain somewhat independent, but not entirely. For example, Intel might want to leverage the expertise of acquired employees while leaving successful business operations untouched. In this case, we might integrate e-mail, telephony, WAN, and some collaboration tools, while leaving business applications and the data center largely unchanged.
- **Full Integration –** In most cases, we want to maximize information flow and collaboration with the acquired company and selected business units within Intel. We also want to enhance employee productivity and satisfaction within the acquired organization by providing them with more powerful IT solutions. In such cases, full IT integration with our global environment can be a fundamental enabler.

The Value of Integrating Corporate IT Standards

Once we decide that some level of IT integration is desirable, a key question is whether we should introduce our corporate IT standards into the new environment. Over time, it has become clear that the answer to this question is almost always a resounding yes. Although implementing our standards introduces some up-front capital and deployment costs, it almost invariably delivers better overall value, both from a business perspective and from an IT perspective.

Simpler, Faster Integration

Every small business IT environment is different. The more non-standard infrastructure we leave in place, the more we have to understand and accommodate those differences in our integration efforts. Deploying our own standards creates a common and well-understood framework for integration, which can greatly reduce time and effort.

Better IT Solutions

Most small businesses operate on a relatively small IT budget and have limited in-house expertise for designing, deploying, and managing solutions. They tend to deploy a mixture of clients, servers, and networking components, including, in some cases, consumer-grade products. Though their solutions can be both creative and effective, they typically lack the performance, scalability, and manageability of our corporate standard solutions. Most importantly, they rarely deliver the degree of stability and reliability we require to keep productivity high and support costs low.

Integration Best Practices – Servers

Refresh with corporate standard servers. Use virtualization/ consolidation to:

- Reduce power, cooling, and space requirements
- Improve service levels
- Reduce TCO via centralized management
- Provide headroom for growth

Intel IT deploys: Intel® Xeon® processor-based servers

Integration Best Practices – Network

Refresh with corporate standard network components to:

- Increase bandwidth for rich collaboration
- Reduce TCO via centralized management
- Reduce risk with proven security solutions
- Provide shared printing (security enhanced)

In contrast, our corporate standard designs are based on best-in-class Intel technology-based systems and components; and their design is the result of extensive collaboration among highly trained specialists across multiple IT disciplines. With these solutions, we can build out the infrastructure quickly and with complete confidence that we are delivering high-value computing solutions that will meet current and future needs effectively. In many ways, this strategy mirrors the "copy exactly" approach Intel uses to ensure excellence in its manufacturing facilities. However, since people and business goals are different for every acquisition, it's always important to balance unique needs and requirements against the benefits of standardization. In addition, we have occasionally found particularly good products and solutions in acquired environments, and some of these have ultimately been integrated into our corporate IT standards.

Lower Total Costs

The incremental cost of deploying new clients, servers, and networking infrastructure tend to be quickly offset by the simplicity of supporting a familiar, standards-based environment. We can leverage existing Intel personnel and proven processes in purchasing, deploying, and integrating the new solution. Once the integration is complete the costs benefits accumulate rapidly. We can take advantage of Intel's existing vendor support contracts and our centralized monitoring and management facilities, all of which deliver significant economies of scale. Our Intel technology-based solutions also tend to have a longer lifecycle and can be scaled and adapted more easily as needs evolve.

Although deploying standards may create some need for training among acquired employees, it reduces the need for specialized, one-off training among our IT staff. It also frees staff at the acquired company to focus on core business activities. Many small businesses rely on a product development or customer service engineer to maintain IT infrastructure on a part time basis, and that engineer can generally deliver much better value by focusing on the organization's core products and technologies.

Reduced Risk

Risk assessment is a critical part of every acquisition, especially when the integration involves providing new users with access to our corporate network. By replacing existing infrastructure with our corporate standard solutions, we eliminate a wide range of potential vulnerabilities and reduce the scope of our required risk and security analyses.

For example, new regulations and information security requirements are driving a need for improved data access, retention, and discovery. Our standardized environment includes automated backups for clients and systematic backups and retention for servers to address these needs. We also have proven tools and processes for testing and deploying security patches and for ensuring compliance through automated monitoring. If we decide to retain acquired systems, we need to invest additional time and money to make sure these and other security requirements are addressed.

Delivering High Value Across the Infrastructure

Every integration project has to encompass all aspects of the IT infrastructure (Figure 2). Based on our experience, the value of integrating corporate standards can vary substantially from one area of the infrastructure to another, so we adjust our strategy accordingly.

Clients – Mobility, Collaboration, and Centralized Management

We have found the value of integrating corporate standards to be particularly compelling for acquired client infrastructures. Our standard configurations and our centralized approach to PC fleet management enable us to deliver exceptionally high levels of performance and functionality at relatively low cost per user. In most cases, employees receive a major boost in performance and mobility when they get their new PCs. They also get instant access to optimized collaboration tools (corporate e-mail, instant messaging, live meeting, video-conferencing, etc.), plus assured interoperability with the many resources available via the Intel corporate intranet.

In contrast, leaving acquired client systems "as is" can lead to costly retrofits at a later date. For example, business users might assume that automated backup and restore will be supported, but that functionality may be either problematic or impossible with the acquired equipment.

Although we cannot accurately quantify the productivity benefits of upgrading client infrastructure, we can estimate them. Several years ago, Intel IT conducted productivity studies to assess the value of migrating employees from desktop PCs to notebooks. The results showed that a wireless-enabled notebook provided better than five percent time savings in an average employee's workweek. We believe the benefits have increased since then, as notebooks and wireless networks have become more powerful and nearly ubiquitous. Collaborative tools have also evolved to enable better productivity and a simpler user experience.

Though many small businesses appreciate the value of mobility for their sales force, they often deploy less-than-optimal systems and equip most of their office workers with desktop PCs. We provide mainstream users throughout the organization with high-end Intel® Centrino® 2 with vPro™ technology-based notebooks, which deliver dramatic improvements in application responsiveness and wireless networking performance, plus significantly longer battery life. For the most demanding client applications, we deploy Intel processor-based mobile workstations, so even engineers and other power users can go fully mobile.

We consistently find that new employees are amazed by the improvements in performance, functionality, and convenience. Prior to the acquisition, most don't realize they can get full mobility and full performance in a lightweight notebook, nor do they appreciate how transformative those capabilities can be. The ability to work effectively at any time and from anywhere gives employees better control over their work/life balance. This enables not only greater productivity, but also greater satisfaction—a win-win situation for Intel and its new employees.

The TCO benefits of deploying our corporate standard systems are equally compelling. Most small businesses have a hodgepodge of systems and configurations and take an ad hoc approach to management and maintenance. Our centralized teams can manage and troubleshoot our standard configurations remotely, and also repair many software-related issues. We are also in the first stages of rolling out Intel® vPro™ technology across our global client management environment. In addition to other capabilities, Intel vPro technology enables us to securely manage and troubleshoot PCs over the network, even if a system is powered down or its OS or hard drive is damaged. As we increasingly integrate these capabilities into our management processes, we expect to see very dramatic reductions in our client support costs, especially for remote sites without a resident IT technician.

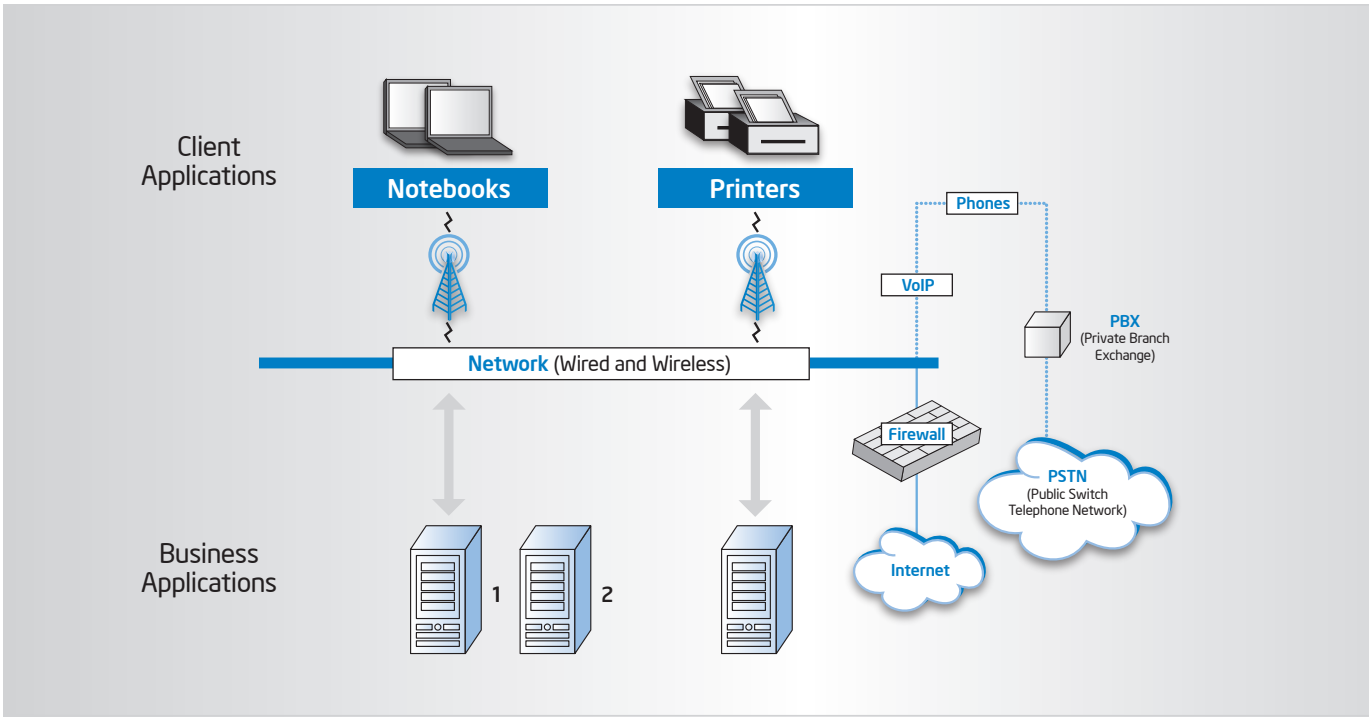

Figure 2. Following an acquisition, IT integration planning needs to encompass all aspects of the IT infrastructure, including clients, servers, applications, the network, and the telephony infrastructure.

Integration Best Practices – Telephony

Evaluate on a case-by-case basis. Integrate VoIP and unified messaging as appropriate to:

- Improve communication and collaboration
- Reduce costs by consolidating telephony onto IP network

Security is another important reason for deploying our standard client configurations. Every client system that contains sensitive information and/or connects to our corporate network introduces a potential security risk to Intel. Our standard client configurations provide extensive, multi-level protections, including virus protection, hard disk encryption, configuration monitoring and virtual private networking (VPN) for securely accessing the corporate network across the Internet. We also provide automated backup and restore capabilities. These protections are an essential part of Intel's overall risk management strategy, and refreshing the client infrastructure for newly acquired businesses ensures they are fully supported.

Servers – Flexible Computing Power and Lower Operating Costs

Two relatively recent technologies have dramatically changed the economics of integrating acquired server assets: virtualization and multi-core server processors. In the past, refreshing server infrastructure meant replacing each older server with a new one, a costly and sometimes complex undertaking. With virtualization, multiple existing applications can be migrated into virtual machines on each new server, often without any software modifications to the OS or the application.

Multi-core server processors increase the value of this strategy by enabling large numbers of virtual machines to be consolidated on each physical server. Based on our internal tests, the latest multi-core Intel® Xeon® processor-based servers deliver approximately nine times the performance of earlier, single-core processor-based servers,[1] while reducing idle platform power consumption by up to 50 percent.[2] A single two-socket Intel Xeon processor-based server can therefore typically replace as many as nine or more older servers, with relatively proportional savings in space, power, and cooling costs. If utilization rates for the older servers are low—a common scenario—consolidation ratios can often be much higher.

Since most of the small businesses we acquire are not yet taking advantage of virtualization, the value of consolidating acquired server assets onto our corporate standard Intel Xeon processor-based servers typically delivers major TCO benefits with relatively little effort. In many cases, this consolidation is not only valuable, but essential. The data centers for many small businesses are often small and have limited power and cooling capacity. In many cases, these facilities are already running beyond their power and cooling design specifications. Consolidating servers is far more cost effective than evaluating and upgrading these "broken" data centers.

1. Up to 9x performance per server based on Intel performance comparison using SPECjbb2005* business operations per second between four-year-old Intel® Xeon® processor 3.8 GHz with 2 M cache based servers and one new Intel Xeon processor X5570-based server. Performance tests and ratings are measured using specific computer systems and/or components and reflect the approximate performance of Intel products as measured by those tests. Any difference in system hardware or software design or configuration may affect actual performance. Buyers should consult other sources of information to evaluate the performance of systems or components they are considering purchasing. For more information, visit www.intel.com/performance/server.
2. Up to 50% lower platform idle power based on Intel internal measurement (Feb 2009). Configuration details: Intel internal measurements of 221W at idle with Supermicro 2xE5450* (3.0 GHz 80W) processors, 8x2 GB 667 MHz FBDIMMs, 1x700W PSU, 1x320 GB SATA hard drive vs. 111W at idle with Supermicro software development platform with 2xE5540 (2.53 GHz Intel® Xeon® processor E5540 80W) processors, 6x2 GB DDR3-1066 RDIMMs, 1x800W PSU, 1x150GB 10k SATA hard drive. Both systems were running Windows 2008* with USB suspend select enabled and maximum power savings mode for PCIe* link state power management.

Consolidating applications onto new servers enables us to deliver substantial upgrades in server performance and capacity, while significantly reducing power, space, and cooling requirements. We also gain the benefit of live virtual machine migration, so we can implement load balancing, automatic failover and disaster recovery to improve service levels at relatively low cost.

As with the client infrastructure, moving to our standard server environment also simplifies administration and management and reduces risk. We can use our existing remote management capabilities for monitoring, configuration management, troubleshooting, software upgrades, and security patching. The use of standard configurations also reduces the cost and complexity of testing upgrades and patches.

A closely related issue in integrating data center assets is the storage infrastructure. We invariably implement our corporate standard database and transmission protocols to simplify application integration and data sharing with Intel's broader business and IT environment. The hardware infrastructure is another matter. Depending on application requirements, we sometimes decide to deploy a centralized storage solution. This enables easier management, improves flexibility for data sharing, and provides a better foundation for live virtual machine migration. However, local storage in each server tends to deliver superior response times and can be more economical in small IT environments. To date, we continue to make our storage decisions on a project-by-project basis.

Network – Higher Bandwidth with Better Security

In most cases, maintaining the acquired network "as is" is not a realistic option. Bandwidth demands tend to increase sharply as we introduce new client solutions and enable data sharing and collaboration among remote design teams. These bandwidth issues are especially problematic for many acquired wireless networks, which we consider a fundamental resource for high productivity.

Videoconferencing is particularly bandwidth intensive, and we consider it a critical technology for improving collaboration and reducing the high costs associated with employee travel. We also deliver a great deal of high-value multimedia content to our employees from the Intel intranet. We want to make sure acquired companies have the bandwidth they need to enable a high-quality user experience so new employees can take full advantage of these resources.

In most cases, new employees are given direct access to the Intel network, so security is another reason for upgrading to our corporate standard. Our standard network solutions are designed to optimize performance and mobility while maintaining high security. Systems, traffic, firewalls, and DMZs can be monitored and managed by our centralized network security team using existing tools and processes. Upgrading acquired wired and wireless networks to our corporate standard also ensures sufficient headroom for growth, which helps to deliver a better business and IT solution while reducing lifecycle costs.

Integration Best Practices – Applications

- Replace financial/supply chain applications for tight business integration, but only where it makes sense
- Perform additional upgrades and integration based on cost/risk/benefit analysis

Integrating Users, Not Just Infrastructure

- As every IT organization knows, change is rarely welcomed by users, even when the change will ultimately make their lives easier. Because of this, we always work closely with key individuals in acquired businesses as we plan our IT integration projects. Taking the time to understand the requirements and preferences of our new employees is a great way to welcome them into the Intel family; it lets them know right from the beginning that they will be treated as valuable members of the team. It also helps us deliver solutions that meet their needs more effectively.
- This upfront engagement also gives us a chance to explain our methods and solutions to them. Along with appropriate training, this can significantly smooth the transition and help them get up to speed quickly with new tools and processes. Of course, delivering improvements in performance, mobility, reliability, and functionality helps too. In general, initial reluctance tends to be replaced fairly quickly with increasing satisfaction as users experience the benefits of more powerful and responsive computing tools.

Telephony – Determining Value on a Case-by-Case Basis

Intel IT has implemented Voice over Internet Protocol (VoIP) and unified messaging solutions in major pilot programs at several of our facilities and planning is underway to roll these capabilities out across our broader environment. However, successful implementation requires some level of hardware and software standardization, and it can be challenging to deploy our standards-based telephony solution in a small business environment.

For this reason, we continue to assess acquired telephony assets on a case-by-case basis. Should we tie the acquired infrastructure into our overall telephony system or leave it as is? Should we consider VoIP, which may require new desk phones and/or support in new client PCs, and will impact network decisions? As VoIP products continue to mature and become more widely available for small business environments, we expect it will become simpler and more cost-effective to integrate small business acquisitions with our growing VoIP infrastructure. For now, we continue to evaluate each integration project independently.

Applications – Targeted Upgrades Based on Business Goals

Since we deploy new clients in the majority of integration projects, we find it advantageous and cost-effective to transition end-users to our corporate standard productivity suites at the same time. We also provide training to get them up to speed quickly. This is particularly important for some of our collaborative applications, which are new to many users.

Engineering applications are treated somewhat differently. If the acquired company focuses on silicon design, it is imperative that their development environment integrates with ours, so we upgrade, as necessary, to ensure that it does. The same level of integration is often not required for software development teams, so we are more likely to let acquired software engineers use their existing development tools.

We invariably replace supply chain and financial applications with our corporate standard solutions, since the advantages in business efficiency are substantial. Of course, these and other application decisions have a major impact on operations, so we always work closely with the acquired company and with the relevant Intel business unit to assess cost, risk, and benefits for any application upgrades and/or integration work. We also include change management as a fundamental requirement in our planning process. Application changes are typically the most disruptive, and working with new employees to enable a smooth and productive transition is an important component of every integration project (see the sidebar: Integrating Users, Not Just Infrastructure).

The Power of Infrastructure Refresh

In recent years, we have seen the value of replacing acquired infrastructure with our current corporate standard increase substantially. The reasons for this are two-fold. First, our corporate standards have evolved. We have more sophisticated processes for designing and managing our IT solutions to optimize total cost, risk, and business value across our global environment. Because of this, our corporate standard technology solutions offer better value than ever before.

Second, IT products and technologies have evolved to deliver better business value at lower total cost. Powerful, energy-efficient notebooks and servers, high-bandwidth wired and wireless networking, virtualization, next-generation applications, and improved management and security tools enable us to deliver significantly better value at lower cost and with reduced risk. Similar advances are transforming networking and telephony solutions. For the most part, these technology advances have not yet arrived in the small business IT marketplace. As a result, upgrading to the latest technology solutions based on our proven corporate standards tends to deliver dramatic benefits.

Conclusion

Every small business integration project presents unique challenges. Business goals vary, as does the level of desired IT integration. However, for projects in which some level of integration is desired, we have found that deploying our corporate standards tends to deliver the best overall value in most areas, particularly across the client, server, and networking infrastructures.

Our standard solutions combine best-in-class Intel technology-based systems with software stacks and configurations designed to optimize performance, scalability, availability, stability, manageability, security, solution lifecycles, and total cost of ownership. We can leverage economies of scale in purchasing new systems and we can deploy them quickly and confidently.

We can also take advantage of our centralized management teams to keep them running optimally at relatively low cost. As a result, they tend to significantly simplify integration efforts and deliver better value than attempting to maintain acquired IT solutions.

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Acronyms

DMZ	Demilitarized Zone or Data Management Zone
IT	Information Technology
OS	Operating System
PC	Personal Computer
TCO	Total Cost of Ownership
VoIP	Voice over Internet Protocol
VPN	Virtual Private Networking
WAN	Wide Area Network

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