

## WHITE PAPER

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# Optimizing Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Managing the Windows Desktop

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## EXECUTIVE SUMMARY

CIOs are under tremendous pressure to reduce IT costs while improving services to the business and end users. To understand what it takes to be successful, IDC conducted a research project to determine what successful organizations are doing right to achieve these goals. This research was conducted in 2005 and 2006 and focused on 141 for-profit enterprises in the United States with from 1,000–20,000 PCs. Each organization was interviewed about its IT assets, IT staffing levels, and management practices. The research also captured metrics about the quality and timeliness of IT services. The end goal of the research was to identify best practices that could provide guidance to other firms desiring to improve IT operations.

The research focused on three metrics of the IT infrastructure. Together, these three metrics describe the value equation for IT infrastructure:

- IT labor costs
- Service levels
- Business agility

IT labor is defined as the ratio of IT FTEs to PCs multiplied by a fully burdened IT labor rate of \$53/hour.

Service levels represent the quality and timeliness of IT services delivered to the business. Since service levels involve many variables, IDC chose the number of service desk calls per PC per year as a proxy for this category.

Business agility describes the IT department's ability to adapt to changing business conditions. As a proxy for business agility, IDC chose the time it takes to deploy a new application to the desktop.

Based on the IT labor cost per PC, IDC segmented the 141 organizations into the following groups: Basic, Standardized, Rationalized, and Dynamic. These four groups are collectively defined within a framework known as the Infrastructure Optimization Model (IOM). Microsoft was the lead developer of the IOM, an operational benchmark for gauging the maturity of a company's IT infrastructure.

- ☒ Basic organizations are the least efficient performers and have high costs and average service levels and agility. These organizations typically use few of the best practices defined in this paper.
- ☒ Standardized organizations have somewhat better IT costs with similar service levels and agility when compared to Basic. These firms leverage some of the easier-to-implement best practices.
- ☒ Rationalized firms have very low IT labor costs and show modest improvements in service levels and agility compared to the two lower groups. These organizations use many IT best practices and automate and standardize wherever possible.
- ☒ Dynamic organizations shift the focus from cost reductions to enabling business with optimal service levels and agility. Dynamic organizations may even choose to accept best practices that increase costs to optimize service levels and agility. Few Dynamic organizations exist today, largely because many of the prerequisite technologies are not available from a single vendor and must be assembled from an array of technologies from multiple vendors. No organizations that qualified as Dynamic were interviewed for this research.

Key Findings of this study by IOM level per PC per year:

**IT labor**

- ☒ Basic: \$1,320
- ☒ Standardized: \$580
- ☒ Rationalized: \$230

**Service levels** (Number of service desk calls)

- ☒ Basic: 8.4
- ☒ Standardized: 8.5
- ☒ Rationalized: 7.7

**Business agility** (Time to deploy a new business application — evaluation, procurement, and deployment)

- ☒ Basic: 5.4 weeks
- ☒ Standardized: 5.2 weeks
- ☒ Rationalized: 4.3 weeks

An organization's IOM level is determined by the adoption rate of best practices. Best practices are optimized IT processes supported by technology that reduce cost and/or improve service levels and agility.

## WINDOWS DESKTOP BEST PRACTICES

In this research, IDC evaluated more than 20 potential best practices and identified three that are consistently used by top-performing IT departments for optimizing Windows desktops.

- ☒ **Standard desktop strategy (savings of \$110/PC).** Deploying a standardized desktop by minimizing hardware and software configurations.
- ☒ **Centrally managed PC settings and configuration (savings of \$190/PC):** Keeping deployed PCs standardized by preventing users from making changes that compromise security, reliability and the application portfolio.
- ☒ **Comprehensive PC security (savings of \$130/PC):** Proactively addressing security with antivirus, antispymware, patching, and quarantine.

In this research, Basic organizations used few of these best practices consistently. Basic firms should focus on:

- ☒ An overall 3- to 4-year strategy for the desktop
- ☒ Minimizing hardware and software configurations
- ☒ Critical security functionality, such as antivirus and automated patching

Most Standardized organizations are deploying a common desktop. Standardized firms should focus on:

- ☒ Controlling the user's ability to change PC configuration settings
- ☒ Limiting the user's ability to install software outside of the approved PC application portfolio
- ☒ More advanced security functionality, such as antispymware and quarantine

Rationalized organizations typically already have all three of the best practices identified, and should focus on:

- ☒ Improving IT governance and process to ensure that IT is delivering optimal service levels and agility
- ☒ Investing in virtualization technologies to further reduce costs and improve agility
- ☒ Evaluating new technologies that can provide a competitive advantage

The remainder of the paper goes into more details, mapping to specific Microsoft technologies to support the above research conclusions.

## **SITUATION OVERVIEW**

This paper is one in a series of IDC White Papers based on research across a total of 141 North American organizations. The desktop study was based on a subset of 59 organizations interviewed about their desktop environment and having 1,000–20,000 PCs in their IT infrastructure.

Data collected from each organization participating in the study was used to categorize the relative level of IT optimization and the sophistication of their practices for deploying and using IT. The companies could then be mapped into the Infrastructure Optimization Model (IOM) based on their IT utilization and sophistication levels.

The purpose of this mapping exercise is to group companies together to determine the most commonly used best IT practices and to establish a correlation between the best practices and the savings realized. Integral to infrastructure optimization is another significant benefit, business agility, which is the ability of an organization's IT infrastructure to adapt to changing business conditions and technology requirements. The study found a number of factors that contribute to agility, including the overall IT optimization, the consistency of desktop operating system selection, and the management practices and tools in place to both support and update desktop systems with patches, fixes, and new software deployments. In theory, the greater the level of IT optimization, the better the agility that an organization can enjoy.

An organization's level of business agility is determined by a number of factors, many of which are difficult to measure in this type of research. For this reason, IDC chose the time it takes to deploy a new application as a proxy for a larger business agility metric. IT professionals readily understand this metric and, more important, it can easily be quantified.

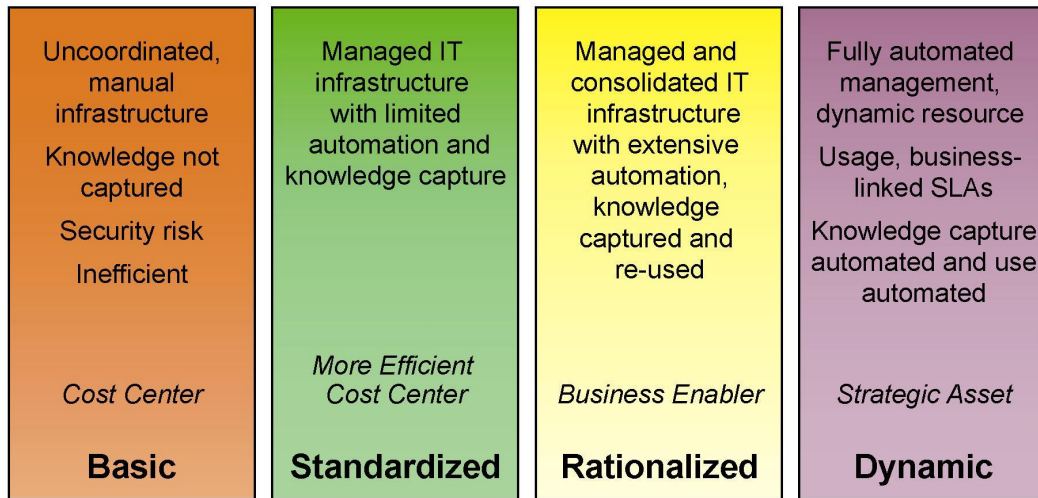
To determine an organization's optimization level, IDC examined the staffing patterns and IT labor levels across organizations in similar industries and of similar size. We then stack-ranked each organization by their IT labor costs for day-to-day desktop operations. We grouped organizations into Basic, Standardized, and Rationalized levels. This allowed us to identify common behaviors among organizations that performed well, and to contrast them with the behaviors of organizations that

performed less well. The common behaviors of our best performers provided our definitions of key best practices.

Figure 1 introduces the concept of the IOM in graphical format.

## FIGURE 1

### Microsoft's IOM Model



Source: Microsoft, 2006

This Desktop white paper is one of a portfolio of papers that also cover Microsoft Active Directory, Systems Management Server and Windows Server. (Another paper will cover the Overall Infrastructure Optimization model.) Those papers include:

- ☒ *Optimizing Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Managing Windows Servers*
- ☒ *Optimizing Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Identity and Access Management with Active Directory*
- ☒ *Optimizing Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Systems Management Server*
- ☒ *Optimizing Business Productivity Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Managing Collaborative and Messaging Systems*
- ☒ *Optimizing Infrastructure: Generating Value Through Improving IT Operations with Best Practices*

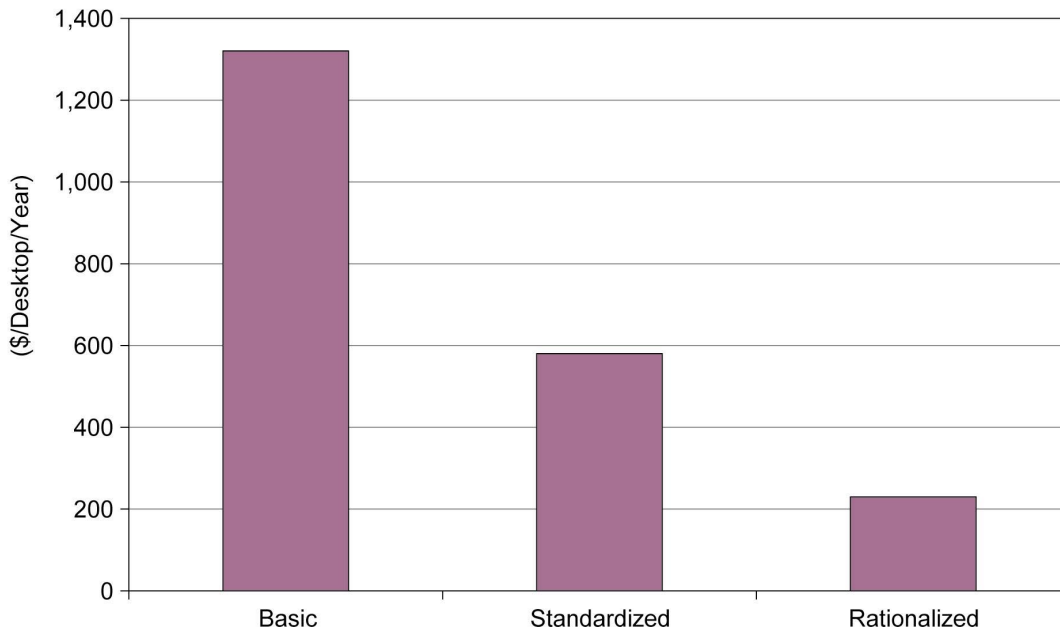
## THE IMPACT OF INFRASTRUCTURE OPTIMIZATION ON PC COSTS

In analyzing the impact of best practices for desktop systems, IDC used IT labor costs associated with supporting PCs as a major metric. IT labor costs include items such as service desk staffing costs, desktop engineering costs, and ongoing PC management using directories and systems management tools. The costs are derived through an analysis of IT full-time equivalent staffing. IT labor levels are more directly affected (positively and negatively) by IT policies than any of the cost elements of total cost of ownership, which includes hardware, OS, middleware, applications, services, and IT labor.

Figure 2 shows IT labor cost/desktop/year associated with desktop systems in use within the organizations studied. The figures cover staffing costs associated with evaluation, acquisition, hardware and software configuration, image management, hardware maintenance and software deployment, application management, security, and more. The IT labor costs fall by 56% from a Basic environment (\$1,320/desktop/year) to a Standardized environment (\$580/desktop/year), and then by an additional 61% to \$230/desktop/year when moving from Standardized to Rationalized. These cost reductions result from the streamlining of IT operations through the use of best practices and more common software stacks across desktop systems.

**FIGURE 2**

Annual IT Labor Costs Comparison by IT Optimization Level



Number of respondents = 141

Source: IDC, 2006

The savings potential is significant for an organization that moves from a Basic to a Rationalized environment — over 82%. However, IDC recognizes that such a quantum leap is not practical to implement quickly, and that there would be significant investment required.

The up-front costs would need to be rationalized through return-on-investment (ROI) calculations. However, the savings appear great enough that a viable ROI story should be achievable for most organizations.

In reality, infrastructure optimization is not a single leap in IT advancement, but rather an ongoing process with a series of smaller steps. For example, Basic organizations should first become Standardized and then pause to allow their infrastructure and best practices to stabilize. Then they should focus on getting to the next level.

IDC's definition of the Basic category incorporates a wide range of organizations. Factors contributing to the inclusion of such a variety of organizations:

- ☒ The study includes a number of companies that generate revenue with their IT infrastructure and are thus more concerned with availability and capacity, and less concerned with costs than the average commercial enterprise.
- ☒ A number of highly complex and distributed companies were included that experienced above-average support costs.
- ☒ Because Basic is the entry-level category, there are no minimum requirements for attaining such a rating. Companies that develop cost-reducing best practices quickly move into the Standardized level. We believe that the average costs per client would rise with the number of companies included in the study because the least carefully managed organizations would fall into this classification.

Table 1 presents a composite view showing the correlation between IT costs, service levels, and business agility for three levels of IT optimization. IT costs are expressed in terms of IT labor costs per desktop per year, the metric used to compare service levels is the number of calls to the service desk per PC per year, and business agility is measured in terms of the number of weeks to deploy a new application to 90+% of the organization.

**TABLE 1****IT Optimization Levels and Related Costs**

|  | Basic   | Standardized | Rationalized |
|--|---------|--------------|--------------|
| IT costs (IT labor costs per PC per year, excluding software and hardware costs) | \$1,320 | \$580        | \$230        |
| Service levels (number of service desk calls per PC per year)                    | 8.4     | 8.5          | 7.7          |
| Business agility (weeks to deploy new application)                               | 5.4     | 5.2          | 4.3          |
| Number of respondents =  | 28      | 83           | 30           |

## Notes:

- Lower values for IT labor costs result in cost savings for companies. IT labor costs are based on a fully burdened labor rate of \$100,000 per year.
- Service levels show the number of service desk calls per PC per year. Smaller numbers represent higher service levels.
- Business agility is represented as the time to deliver a new application in weeks and includes evaluation, application development, procurement, testing, packaging, deployment and troubleshooting. A smaller number represents a higher agility.
- Service levels remain relatively unchanged in the shift from a Basic to Standardized organization. A dramatic change in service level is experienced only when a company adopts the Rationalized model.

Source: IDC, 2006

As shown on Table 1, there is a directional consistency and a tangible cost savings associated with moving from a Basic IT environment toward a Rationalized environment. The companies in the study fell along a continuum from Basic to Rationalized but, on average, companies in a Rationalized environment enjoyed 60% lower IT labor costs, 9% fewer service desk calls, and 17% faster deployment of business applications compared to Standardized companies, and 83% lower IT labor costs, 8% fewer service desk calls, and 20% faster deployment of business applications compared to Basic companies. Organizations typically don't begin to focus on service levels and agility until the Rationalized and Dynamic levels.

### **Relationship of Best Practices and Optimization for Windows Desktops**

IDC examined the IT environment, strategies, and activities related to Windows desktops of 59 organizations with 1,000 to 20,000 PCs in commercial industries. To capture XP deployment costs, all participants had to have deployed some Windows XP or XPSP2 desktops. From its research, IDC has determined that there are three key best practices associated with the Windows desktop environments that improve IT performance and contribute greatly to the IT optimization level achieved. Table 2 shows these practices and the cost savings associated with using them.

**TABLE 2**

**Best Practices and Related Cost Savings**

| Best Practice                                    | IT Staff Cost Savings per Desktop per Year |
|--|--|
| Centrally managed PC settings and configurations | \$190                                      |
| Comprehensive PC security                        | \$130                                      |
| Standard desktop strategy                        | \$110                                      |

Number of respondents = 59

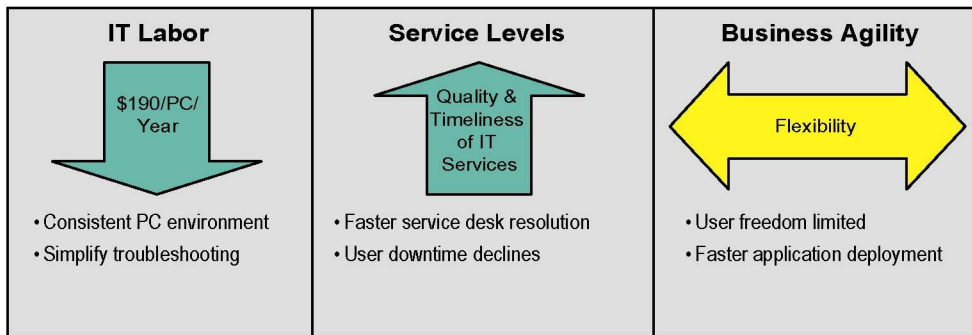
Source: IDC, 2006

These best practices primarily drive cost savings; for example, a centrally managed PC settings and configuration practice aggressively drives cost savings. Others, such as OS standardization through a Standardized desktop strategy, drive costs down while also potentially improving service levels and business agility.

Figures 3, 4, and 5 drill more deeply into the above best practice areas and discuss the reason for the positive benefits.

**FIGURE 3**

**Centrally Managed PC Settings and Configurations**



Source: IDC, 2006

In this study, we evaluated the impact of centrally managed PC settings and configuration, which includes PCs where users are limited in the number of administration functions they can perform on their own systems, including the ability to install software. This may involve prohibiting editing of the registry or removing the control panel altogether. In some environments, the degree of administration restrictions could potentially extend to negating the use of CD-R/W drives and USB ports. Specific aspects of this best practice include:

- ☒ No or limited administrative rights assigned to end users
- ☒ Use of group policies to prevent users from changing system settings that jeopardize PC reliability and security
- ☒ Use of group policies to ensure that users only install IT-sanctioned software
- ☒ Push/pull automated software distribution

### ***Centrally Managed PC Settings and Configurations Best Practice Findings***

Removing broad administrative privileges on personal computers is one of the most obvious ways to lower operational costs and improve the predictability of PC configurations. Since users are losing the ability to change their desktops, they lose some agility, but gain improved service levels due to the improved stability of their system. Additionally, the organization can effect widespread changes more quickly and reliably.

The benefit of a known and consistent desktop configuration is that IT departments can make valid assumptions about the state of a set of desktop systems, reducing the likelihood of installation or configuration challenges or outright failures when deploying new software, patches, or fixes.

A key part of the practice is driving complexity out of the desktop environment, which has the potential to reduce costs. That complexity hits the IT organization in many ways, including deployment, patching, service desk, migration, license management, and inventory management.

IDC notes that the ability to selectively remove administrative rights (through Group Policy today and enabled by default in Windows Vista) can give users the freedom to browse the Web without unintentionally installing hostile or rogue software. Once again, the result is improved service levels because end users are less likely to accidentally corrupt their own machines.

However, this best practice is not a good fit for every organization. Some organizations may find it challenging to implement the practice for political reasons, while others may experience a negative impact in environments where users need the ability to load and use a diverse set of software applications on demand to do their jobs. Business agility may improve since IT departments will find it easier to deploy applications more quickly. However, in some cases, business agility may decline since the end users will have less freedom to optimize their PC for personal needs.

Centrally managed PC settings and configurations create dramatic savings in IT labor costs of \$130 per desktop per year. For most user organizations, improved service levels will accompany the savings.

**Microsoft Technologies Required**

- ☒ Windows 2000 Server or newer Windows Server operating systems
- ☒ Active Directory configured and deployed
- ☒ The development of Group Policy objects
- ☒ The use of Microsoft Systems Management Server
- ☒ Windows 2000 Professional or newer Windows client operating system

Note that alternative server operating environments, directory stores, and systems management tools may be used to achieve some of all of the same goals.

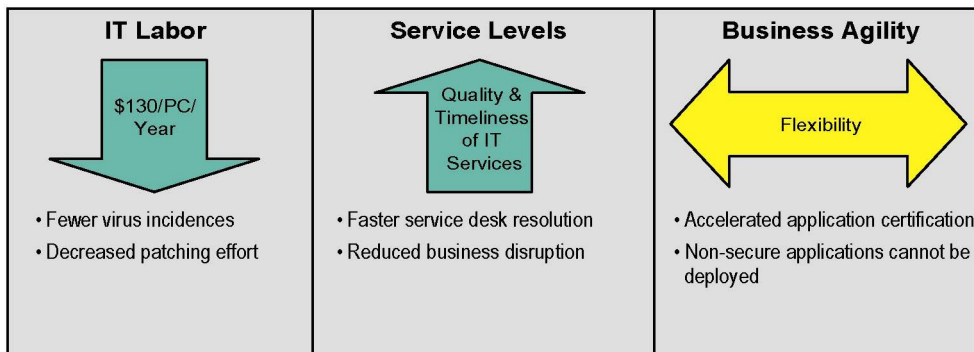
The Microsoft products identified here work together to enable the deployment of a tightly managed desktop environment, which can be updated and configured as the Group Policy and SMS settings dictate. It is possible to mix non-Microsoft products together with Active Directory and Group Policy Objects to achieve a similar effect.

**Who Will Want This Best Practice?**

This best practice is a good fit for organizations that have a stable PC application portfolio, where user needs do not change frequently or in complex ways. In this environment, new applications are pushed to users with automated software distribution, and users can pull pre-approved applications from a published directory.

**FIGURE 4**

Comprehensive PC Security



Source: IDC, 2006

In this study, we defined comprehensive PC security as a best practice that starts with physical security and is bolstered by basic system security configuration. Systems need to use password and other forms of authentication technology and should also incorporate several sets of layered software protection, including anti-malware software layers, as well as a properly configured firewall layer. Specific aspects of this best practice include:

- Notebooks and desktops equipped with antivirus utilities
- Notebooks and desktops with antispyware/malware utilities
- Notebooks protected by Centrally Managed PC firewalls
- Network Access Control (NAC) used for PCs entering the network
- Automated patch distribution system in place for all notebooks and desktops

### ***Comprehensive PC Security Best Practice Findings***

Recovering from a security breach is expensive, especially when the breach is spread across thousands of PCs throughout an organization. The burden of recovering is felt both at the service desk and desk-side support. Organizations that have taken a proactive approach to protecting PCs with firewalls, antispyware, antivirus, mandated patching, and network quarantines dramatically reduce their IT labor costs and improve service levels.

The deployment of comprehensive PC security is a best practice that may not deliver immediate results, but once implemented, it delivers significant long-term benefits. This is especially true with service levels, which should be positively impacted through comprehensive PC security, since users have fewer problems and downtime associated with security-related intrusions and infections.

Another key metric, business agility, can be to some degree, impeded by enhanced PC security. Applications with poor security cannot be introduced into the environment. However, a well-defined security process accelerates the application certification process, speeding deployment.

Proactive PC security is an investment in insurance. A successful set of PC security best practices lowers operational costs by preventing unwanted and unexpected mitigation and recovery costs associated with containing the outbreak of a virus, preventing a successful phishing attack or cleaning out unwanted spyware from desktop systems. Also, limitation of reactive security, management, and recovery operations leads to significant staff cost savings.

### **Technologies Required**

- Windows 2000 Professional or newer with a third-party firewall
- Windows XP SP2 or newer using the integrated firewall
- Active Directory

- ☒ Group Policy Objects
- ☒ Antivirus software
- ☒ Antispyware/malware software
- ☒ Network Access Control software
- ☒ Microsoft Systems Management Server or alternative system management solution

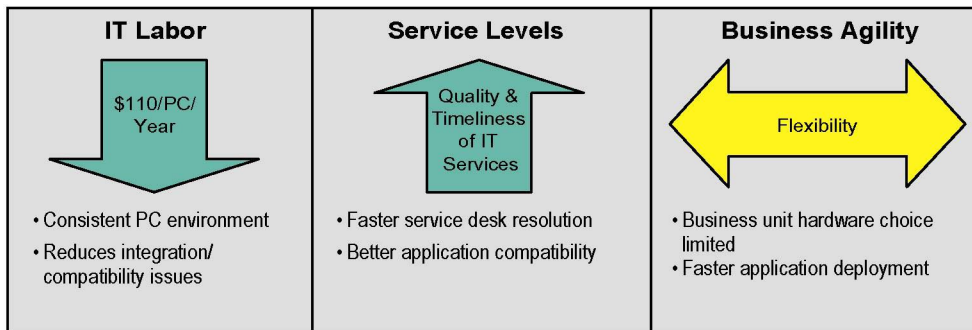
Today, Microsoft provides some, but not all, of the technologies required for this best practice. Future Microsoft products will help close some of the gaps. For example, Windows Vista will have new features to protect against phishing and spyware. Both Windows Vista and Windows XP SP2 have a PC firewall that can be managed centrally with Active Directory and Group Policies. Microsoft's upcoming Longhorn Server will provide features for Quarantine and Network Access Control.

**Who Will Want This Best Practice?**

There is little or no downside to this best practice, and all organizations will find it beneficial if they have the infrastructure to support it. With a secure environment, organizations will minimize the pain and hardship associated with recovering from any security breach.

**FIGURE 5**

**Standardized Desktop Strategy**



Source: IDC, 2006

Criteria for defining the best practice of using a Standard desktop strategy include the enforcement of PC procurement policies that result in common and interchangeable client hardware used broadly across an organization. This practice may also incorporate the use of tools for configuration, provisioning, systems management, optimizing the overall experience for users, and ensuring that their systems are provisioned with a uniform set of software components.

Included in this mix would be a single, or at least a minimal number of operating systems images used across the organization. In addition, standard policies and management process, along with automated fix and patch, review and regression testing, and other streamlining of ongoing IT management to ensure the overall portfolio of client hardware should be as consistent as possible. Specific aspects of this best practice include:

- ☒ Enforcing PC procurement policies for hardware, software, and system configurations
- ☒ Standardizing upon the latest Windows operating system within 18 months of release
- ☒ Using a minimal number of corporate images

### ***Standard Desktop Best Practice Findings***

Using a Standard desktop strategy will help limit the number of unique hardware and software configurations used within an organization. By limiting hardware configurations to one configuration for desktops and another for notebooks, it is possible to reduce the number of PC images to two, although it is probable that additional images may be used for a small subset of systems having unique requirements. Since there are costs associated with each individual image maintained by an organization, the savings associated with reducing the number of images has a direct positive effect on IT labor costs.

IT labor cost savings associated with the standardization of desktop systems is \$110 per PC per year. Associated with the cost savings are an increase in service levels and mixed results for business agility. On the one hand, agility is increased since it is now easier for IT to deploy new applications to a common desktop. On the other hand, business units are now restricted by the hardware and software configurations they can deploy, reducing their ability to optimize their infrastructure to their individual needs, reducing their overall agility.

Getting down to two images also requires an organization to develop a "thin image" strategy, where the core image only contains applications that are deployed to all PCs organizationwide. All business unit, group, and user-specific information is delivered through a directory and Group Policy Objects, and by a systems management tool such as SMS.

Beyond imaging, running a Standardized desktop also reduces service desk and security costs. When all the hardware and software are the same, the service desk can more easily diagnose and resolve incidents. In addition to the cost savings, service levels are increased as the service desk becomes more effective.

Running a single desktop operating system minimizes the duplication of effort for the IT department. Also, PC security concerns need to focus on the potential vulnerabilities of one operating system, and application compatibility and testing become less of a chore since they are only done for one operating system.

One of the drivers for images is the number of hardware configurations; the more hardware configurations the more images are required, regardless of whether or not there is a thin image strategy.

The high cost of image management is a common complaint from IT departments, with annual costs running between \$5,000–50,000 per image per year, depending on the testing regimen and image strategy. Reducing both the quantity and complexity of these images is a high priority for most organizations.

### **Technologies Required**

- Windows XP or newer operating system
- Systems Management Server
- Active Directory
- Group Policy Objects

It is worth noting that Windows Vista will be the first Microsoft operating system to be effectively hardware-independent with regards to imaging. For organizations with a diverse mix of hardware and a "thin" image strategy, Windows Vista will make it possible for them to attain a best practice of using a single image.

### **Who Will Want This Best Practice?**

Organizations that are highly automated and that can deploy a new OS at low cost will find this best practice most attractive. Firms without automation will find standardizing on a single PC operating system expensive to implement, making it difficult to gain the full benefit of the best practice. Organizations without the automation tools in place should fall back to the next-best alternative: using the PC hardware refresh cycle to deploy PCs, forcing the running of two operating systems simultaneously.

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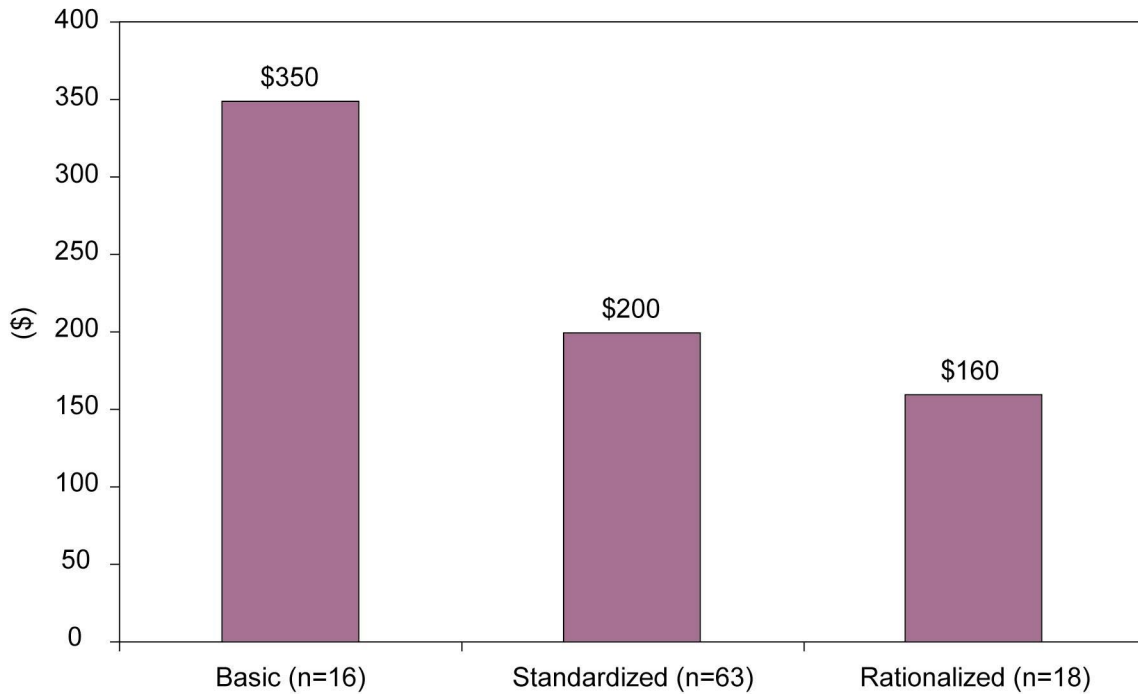
## **Deployment Costs**

Figure 6 shows the deployment costs associated with in-place upgrade levels of IT optimization in use within the organizations studied. The three different approaches to PC deployments are:

- Standardizing on a desktop operating system, skipping versions to minimize deployment costs.
- Maintaining a single, most-recent, standard operating system that is kept up to date with service packs, fixes, etc.
- Deploying new operating system images in conjunction with a hardware refresh, thus running more than one OS version at a time.

**FIGURE 6**

Deployment Costs for In-Place OS Upgrade



Notes:

\$53 used as standard IT hourly labor cost.

Number of organizations surveyed = 97.

Source: IDC, 2006

There are two Basic scenarios customers can use for the deployment of new operating systems. The first is an in-place upgrade, where an organization maintains a single operating system, which is kept up to date. This scenario is generally a cost-effective approach, although Basic organizations act as outliers lifting the average cost dramatically. This approach is a cost-effective solution, but only if organizations use other best practices and tools to ensure efficient deployment and management of the operating systems.

The benefit of a standard operating system is that only a single round of compatibility and regression testing is required before deployment of the update can be pushed out widely. The deployment will be nearly universally successful. The drawback is that organizations are forced to upgrade existing operating systems out of synch from hardware refreshes or other major logical transition points, which may increase upgrade costs. This must be weighed against the lower management cost associated with using a single operating system version.

Alternatively, organizations may use one of several techniques to move from operating system to operating system. A common scenario is to tie operating system

upgrades with hardware refresh cycles with the goal of not operating more than two versions of Windows at a time in a given environment.

The key is having a consistent strategy based on long-term requirements. Without a strategy an organization could end up with a highly heterogeneous environment, with multiple hardware and software versions to support. In such an environment the IT staff will be burdened with replicated activities, such as obtaining, qualifying, regression testing, and deploying hot fixes, patches, and service packs for not only the operating system but for the layered software as well. They will not have the time to initiate activities to move the Basic organization to a more standardized environment.

Clearly coordinating new OS deployments with hardware refreshes incurs the lowest deployment costs for most organizations. However, delaying the benefits delivered by newer OSs, especially those that enable better desktop management practices, may result in higher on-going PC management costs. This is a tradeoff that may make sense in the short run, but may have long-term drawbacks.

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## **Recommendations for Organizations Wishing to Optimize the Desktop Environment**

Based on its research, IDC offers the following guidance for organizations that are interested in optimizing their desktop deployment and management through best practices.

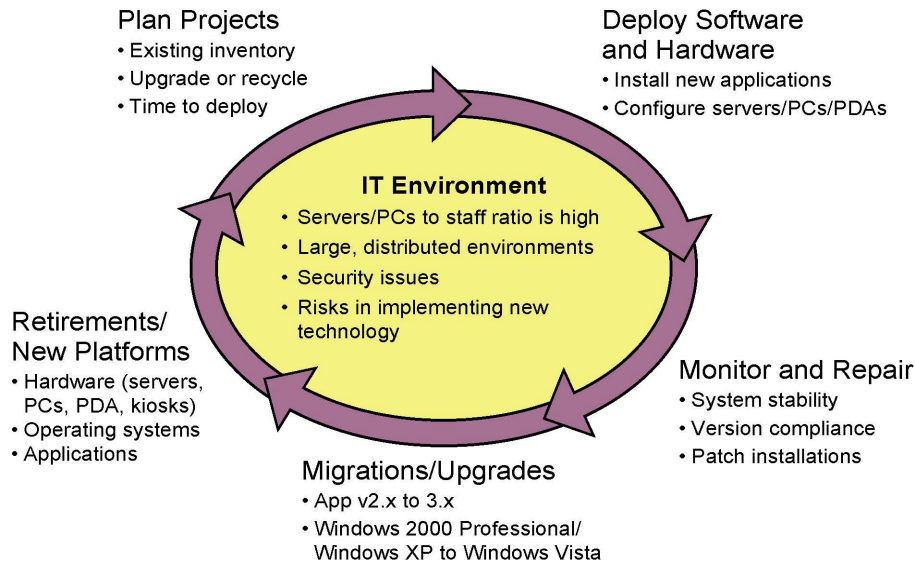
### ***General Recommendations***

The analysis presented in this IDC White Paper provides insight into the benefits realized by organizations from best practices related to desktop installations. The potential to reduce IT labor costs is real and applicable in varying degrees to many IT organizations using Windows client operating environments today. Adopting best practices and using technology to drive process improvement yields direct benefits as part of a more efficient deployment strategy. Further, implementing best practices as part of a larger infrastructure optimization initiative has the potential to deliver efficiencies as the optimization level increases.

An eye should also be kept on the overall life cycle for purchasing, installing, upgrading, and retiring hardware and software. Desktops, laptops, and other devices running a Windows client-operating environment tend to follow the endpoint life cycle (see Figure 7). Each step within the life cycle requires significant planning in addressing overall life-cycle costs. While planning for the initial deployment is relatively straightforward, system settings and OS migration that may occur years after installation typically receive less attention. Using a Standard desktop strategy will allow a more automated migration from Windows 2000 to Windows XP or Windows Vista in the future. This standardization leads to simplified migration and easier backup.

**FIGURE 7**

**Endpoint Life-Cycle Management**



Source: IDC, 2006

**Basic Organizations**

Customers that fall into the Basic level of the IT Optimization model do so for one of several key reasons, which can be readily addressed.

- ☒ **Lack of use of best practices.** A subset of the organizations studied has no policies in place for IT drivers such as centrally managed PC settings and configurations. They may also have no backup policy in place and are more likely not to enforce patch management practices. Organizations that fail to manage desktops in a consistent and IT-friendly way leave themselves open to expensive, reactive IT management that disrupts or prevents well-orchestrated IT deployments.
  
- ☒ **Inconsistent use of best practices.** Organizations rated as Basic, which may adopt some suitable best practices, often stop short of applying them pervasively across their installed base of Windows PCs. This means they will not realize some of the cost and agility savings that most Standardized and Rationalized organizations will experience. Using best practices is a step in the right direction, but until the practices cover the vast majority of an organization's installed base of Windows PCs, IT departments will be supporting a combination of ad hoc and best practice–driven management. This approach has the distinct potential to be more expensive than either a pure ad hoc or fully managed approach.

### **Guidance for Basic Organizations**

The practices reviewed in this analysis suggest that the following best practices should be considered by Basic organizations:

- ☒ Consider moving toward a managed environment that helps reduce the number of operating systems and images being supported. Forced deployment of patches, fixes, and system configurations should be a short-term goal of Basic organizations.
- ☒ Gradually reduce the administrative privileges held by end users. Such admin rights lead to an increasingly uncontrolled and inconsistent environment, and make for extra service desk calls related to self-inflicted system damage by end users.
- ☒ Move toward a standard desktop hardware configuration. This activity will make it easier to move toward a Standardized desktop, although such a transition is likely to be years in the making due to hardware and operating system refresh rates.
- ☒ Treat the adoption of security best practices as an investment that returns a more predictable environment, which no longer forces IT departments to spring into damage control operations every time a virus or a compromising spyware bug is released into the wild.

### ***Standardized Organizations***

Standardized organizations are on their way toward a more optimized infrastructure, and tend to be far more consistent in applying and enforcing standard approaches to PC procurement and security, and in following a strategic internal road map for IT deployments.

- ☒ Process is typically used and enforced in an organization applying standardized IT practices, especially the concept of centrally managed PC settings and configuration. However, most Standardized organizations have been unable to establish enough consistency, standardization, and administration restriction in their PC infrastructures.
- ☒ Backup and recovery sounds like a natural best practice, but a surprising portion of the companies interviewed in this study merely provide space for backup — but without any corporate enforcement to utilize the protected storage. Clearly, for Standardized companies that do not do so, enforcing backup for mission-critical data should be job one.

### **Guidance for Standardized Organizations**

The practices reviewed in this analysis suggest that the following best practices should be considered by Standardized organizations:

- ☒ Focus on extending management technologies that automate the process of system configuration and software distribution.
- ☒ Set a goal for use of a finite number of operating system images. This approach will have immediate effects on lowering staffing costs associated with multiple images that may be in use, and longer term, will set the stage for moving to a Rationalized environment.
- ☒ Work to limit or eliminate the ability of users to install their own software, but only after tools are in place within the organization to automate the software distribution process.
- ☒ Drive into greater levels of centrally managed PC settings and configurations. This goal will be made more achievable with the adoption of Windows Vista client operating systems as a next-generation desktop. Upgrading to Windows Vista will help organizations move from a Standardized into a Rationalized IT infrastructure. If not using Windows Vista in the short term, Standardized organizations should be focusing on moving toward a more comprehensive application of IT process to their existing Windows XP desktops.
- ☒ Ensure that comprehensive desktop security is fully leveraged. A comprehensive security policy may be expensive to deploy initially, but once in place, will be comparatively easy to maintain, and it will pay back with a significant reduction in fire drills associated with reactive IT management to outbreaks of viruses, worms, and other vulnerabilities.

### ***Rationalized Organizations***

Rationalized organizations are on the leading edge of IT optimization and can be likened to the high-performance version of their counterparts in the Standardized category. However, even within Rationalized organizations, there is usually room for further use of best practices and more complete utilization of tools and process.

- ☒ Rationalized organizations are at a critical decision point: will their business model benefit from pushing IT management practices into the domain of the Dynamic classification, or does such a move extend their IT optimization past the sweet spot of minimizing costs? IDC analysts believe that moving to a Dynamic environment is more about increasing business agility than it is about driving down costs. Indeed, moving to a Dynamic model could actually cost more since some centrally managed IT functions could be pushed out to the business units to increase responsiveness, resulting in a loss of economies of scale.
- ☒ More of a good thing is good. Most Rationalized organizations are likely to have some work left to reduce the diversity of applications, operating systems, and hardware in use. Reducing these variables can help lower costs further and ensure a rock-bottom cost structure.

## Guidance for Rationalized Organizations

Our analysis suggests that the following best practices should be considered by Rationalized organizations:

- ☒ Move beyond administrative restriction on PCs. By empowering users with systems that configure themselves and with a roaming profile, users become empowered to accomplish their work with any system, anywhere, and become less concerned about the specific configuration on any single piece of hardware. This helps end users see the benefit to breaking the bond between them and "their" PC, and frees them to accomplish their work from any system, anywhere, based on their log-on identity.
- ☒ Educate end users on the overall IT goals and the benefits for the company, and for end users, of an increasingly sophisticated and automated IT infrastructure.
- ☒ Virtualization should be seen not as a technology that creates migration and consolidation work, but rather as a game-changing technology that enables dramatically different deployment scenarios for IT professionals, enabling them to break the historical bond between operating systems, applications, and the underlying hardware platform. Within two years, virtualization software will be an integral element of every new server deployed with a modern operating system.
- ☒ The next step beyond virtualization is the use of management tools that enable the dynamic allocation of resources and workloads to virtualized operating systems. Tools of this type are emerging today from third-party vendors, and will be delivered by Microsoft in the next 12 months for Windows environments. The use of self-provisioning software and quarantine-like systems for ensuring patch management and compliance with established security policies allows the Dynamic organization to automate processes, thus helping to improve reliability, lower costs, and increase service levels.
- ☒ Rationalized organizations that have their sights set on achieving a Dynamic classification should be focused on business agility. There are products emerging in the market that provide application virtualization and, coincidentally, offer the side benefit of improved business agility, where users deploy applications to their desktops without actually installing the application while still fully achieving the application experience. This allows IT to potentially lower costs while providing users with agile access to IT-sanctioned applications. Microsoft recently purchased Softricity, which enables such a Dynamic scenario, and IDC is aware of at least three third-party solutions available that provide similar capabilities.

## CHALLENGES/OPPORTUNITIES

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### **IT Optimization – A Long-Term Investment**

The data presented in this IDC research indicates how broad the spectrum is between companies operating at the Basic level and those at the Dynamic level. Infrastructure optimization is a continuum driven by the adoption of IT best practices, and every company can improve dramatically through the implementation of policies and procedures automated through technology.

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### **Windows XP and Its Association with IT Optimization**

It is reasonable to assume that a more mature, optimized IT infrastructure would broadly incorporate cutting-edge technology. This study found such a correlation, although there was a less-than-perfect alignment between the penetration of Windows XP and the overall IT optimization in use at organizations. Organizations that got the best return on their Windows XP upgrade were those that did so as part of a program to improve infrastructure optimization. Just deploying is not enough.

IDC believes this relationship can be best understood by considering the objective associated with a more optimized, better-managed environment. The better-performing organizations utilized more advanced technologies and built processes around them. Extending management and centrally managed PC configurations and settings on a more universal basis and managing the life cycle of systems and software using tools require processes capable of not only managing the existing infrastructure, but also capable of managing some degree of diversity, too.

In a well-managed Rationalized environment, it is entirely possible to support a mixture of Windows environments cost effectively, which is what many organizations did here. While the goal of Microsoft may be to advance customers to each newer technology as it is released, the reality is that sophisticated customers are able to manage the diversity surprisingly well.

To reduce the impact of low infrastructure optimization, some Basic organizations have resorted to reducing complexity by standardizing on one Windows version. Since these organizations cannot manage complexity as well as organizations functioning in a Rationalized scenario, they would find it expensive to operate more than one operating system in their environment at one time.

### **FUTURE OUTLOOK**

As with many product changes in the IT industry, the recent history of the adoption of the most current Windows desktop operating system is likely to repeat itself in the near future as Windows Vista Business and Windows Vista Enterprise Edition begin to displace Windows XP sales. We expect to see most organizations delay full-scale deployment of Windows Vista until at least six months after the product release — a deployment scenario that IDC has documented in past releases of Windows client

operating systems. After such a classic delay, we expect that most organizations will then phase Windows Vista into their infrastructure on a transitional basis.

Not surprisingly, the number of organizations making net new deployments of a feature- and support-stabilized operating system, such as Windows 2000 Professional, is shrinking, particularly at companies focused on deploying a more optimized IT infrastructure.

IDC expects that large-volume deployments of Windows Vista products in enterprise and large organization environments will lag the formal introduction of the products by at least six months. This is normal behavior for conservative IT managers. Regardless of how good Windows Vista may be on launch, these professionals are likely to move cautiously into a new Windows release.

This caution will be counterbalanced in larger organizations by early pilot teams testing out Windows Vista. Once this adoption/deployment process finally begins, IDC expects adoption of Windows Vista to move quickly because the new operating system offers a number of benefits to end users, including:

- ☒ **User account control (UAC).** UAC will make it possible for users to run applications that require administrative rights while operating under Standard User rights. Not having this ability in Windows XP makes implementing this best practice difficult, and the often-required workarounds increase complexity.
- ☒ **Better engineered.** This will result from the Trusted Computing Initiative review that the Windows Vista and related code is subject to. In addition, the Windows Vista and layered software products are built under the specifications of Microsoft's Common Engineering Criteria.
- ☒ **Encourages more configuration standardization.** The use of Windows Multilingual User Interface (MUI) and Windows Imaging Format (WIM) enables the use of a smaller number of system images across an organization.
- ☒ **Better security.** Incorporation of Windows Defender antispyware controls; Windows Service Hardening, which prevents services from use outside of normal use patterns; Windows Resource Protection, which protects registry settings from being changed.
- ☒ **Improved browser stability.** The new release of Internet Explorer, version 7, will offer significant improvements to "safe browsing" that corporate users are concerned about.

## CONCLUSION

The data collected in this study strongly suggests that customers should seek the level of IT optimization that gives them the best mix of benefits, cost reductions, and business agility, in accordance with their business needs. In general terms, moving from a Basic to a Standardized level will reduce operational costs. However, of equal or potentially greater importance, organizations that move to the higher level end up with a better managed environment that allows easier and faster adoption and deployment of software updates, security releases, patches and updates, as well as new application software, in a shorter time window, consuming fewer IT staff resources in the process.

## APPENDIX

### Methodology

For this series of studies, IDC conducted in-depth interviews with IT personnel at 141 organizations in total. For the Desktop analysis, data from 59 organizations on the use of client operating environments in the context of a comprehensive IT infrastructure was used. IDC developed a metric for the depth and consistency of each organization's use of IT. This metric was subsequently applied against a continuum of IT sophistication to position each company within a spectrum of IT optimization found in the industry.

In conjunction with this work, IDC collected data specific to the Windows desktop environment to compare total IT labor costs for Windows platforms within the context of an IT optimization model.

The interviews, which were conducted during the first half of 2006, were divided into discussions of specific topics, including the use of Windows client operating environments (COEs) in managed and unmanaged environments, the use of related IT management technologies, and the use of images for operating systems and layered software. There were also separate discussions of IT labor, the IT adoption and deployment process, and outsourcing habits.

A key element of this study was the accumulation of staff cost data. Staffing costs tracked include the following topic areas:

- HW/SW evaluation and purchase
- Desktop deployment/replacement (HW/SW)
- Threat assessment and security planning
- Addressing security breaches and viruses
- Hardware configuration /reconfiguration
- User administration and provisioning (adds, deletes, and changes)

- ☒ Application management
- ☒ Image management
- ☒ Software deployment and patching
- ☒ Hardware maintenance and configuration/reconfiguration
- ☒ Data management, storage planning, backup, and restore
- ☒ Help desk
- ☒ User downtime

IDC tested the impact of best practices by comparing the IT labor costs of those companies using the best practice to those who did not. In some cases a single best practice by itself resulted in savings. In other cases, we found that the interaction of multiple, related best practices were required to obtain IT labor cost reductions.

Enterprises using at least one best practice tended to also use other best practices. We found that the more best practices an enterprise used, the greater the IT labor cost reduction that was realized. However, some of the best practices correlated in their impact on IT labor (e.g., using directory services is part of standardizing the desktop and centrally managing PC settings and configuration). Unfortunately, it was not possible to statistically tease out the exact IT labor impact of each individual best practice (single or compound) versus another.

Therefore, IDC used its best judgment to prorate the relative IT labor savings attributable to each best practice. The data in this white paper is presented to enable the IT professional to weigh the cumulative value of adopting multiple best practices.

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## **Additional Resources**

In conjunction with this IDC White Paper on desktop environments, there are several additional papers available in this series, covering the following topics:

- ☒ *Optimizing Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Managing Windows Servers*
- ☒ *Optimizing Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Identity and Access Management with Active Directory*
- ☒ *Optimizing Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Systems Management Server*
- ☒ *Optimizing Business Productivity Infrastructure: The Relationship Between IT Labor Costs and Best Practices for Managing Collaborative and Messaging Systems*
- ☒ *Optimizing Infrastructure: Generating Value Through Improving IT Operations with Best Practices*

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