

Microsoft white paper



Migrating your SAP solution to Windows 2000



Microsoft®

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INTRODUCTION

"More than any other company we work with, SAP has strong influence on our product development, and we see that growing in the future."

Bill Gates

The launch of mySAP.com promises to transform the business processes of all organizations in all industries. As well as addressing a wider range of business issues than ever before, the distributed nature of mySAP.com means that more end-users than ever before – using PCs, workstations and handhelds – will use SAP technology in their everyday working lives in areas as diverse as e-commerce, customer relationship management, supply chain management, strategic enterprise management, knowledge management, human resources and financials.

In the past, Microsoft and SAP have worked closely to maximise the performance of products such as SAP R/3 on Windows NT. Now the arrival of mySAP.com and Windows 2000 demonstrates the extent to which both organizations are working closer and harder than ever to ensure that the new products leverage their respective functionality.

The new announcements from SAP and Microsoft demonstrate a common philosophy and a commitment to highly scalable, distributed solutions which take full advantage of web-based technologies, enabling enterprises to transform themselves into true Internet businesses, exchanging information quickly and efficiently to wherever it is required. They also address the issues which arise when you distribute applications and business critical information to many different parts of the enterprise and more employees than ever before.

In particular the Active Directory component of Windows 2000 greatly increases the manageability of sophisticated server architectures which arise with the full implementation of mySAP.com. With this increased manageability comes lower total cost of ownership at the same time as added functionality. Add to this the overall scalability, availability and ease of use of Windows 2000 and the Microsoft/SAP combination presents an unbeatable combination for most organizations.

Microsoft also recognises that for many enterprises who have installed Windows NT, swift, cost-effective migration to Windows 2000 is key to their long-term enterprise IT strategy. In response it supports both online and CD-based deployment.

Finally, customers can rest assured that Microsoft and SAP are committed to a long-term partnership which will anticipate and respond to all future business and technical requirements. Both companies are already committed to substantial investment in technical support, testing facilities and joint training which address current and future Windows 2000 and mySAP.com developments.

Above all, enterprises of all sizes can be sure that their mission critical systems and applications, including those from SAP, are underpinned and supported by an operating system whose reliability and availability is second to none.

WINDOWS 2000 FOR SAP – AN OVERVIEW

Unprecedented reliability and availability

Issues such as scalability, performance and total cost of ownership (TCO) are essential for any enterprise when it comes to selecting an operating system. But at the end of the day, all these issues are superseded by the big question which dogs all IT implementations: will the combination of operating system and mission critical applications give your enterprise the near 100% reliability and availability that modern organizations, especially those selling and partnering over the web, require.

The Windows 2000 operating system responds directly to this need. It was designed specifically for data centres and mission critical applications such as those offered by SAP. It integrates standards-based directory, application, network, file and print services with powerful end-to-end management and reliability, providing even higher levels of availability than previous versions of Windows NT.

Above all the benefits of Windows 2000 are available to businesses of all sizes. Indeed in recent public statements, senior SAP executives have expressed their conviction that Windows NT and now Windows 2000 will potentially fulfill all the requirements of any business using an SAP solution.

FEATURES AND BENEFITS

7 x 24 system availability

Windows 2000 Server has undergone rigorous testing and includes key operating system enhancements which make it even more reliable than its predecessors. It had to pass a daily test on thousands of test machines for more than 30 days at a time to identify any problem that might occur. Thanks to multi-billion dollar investment from Microsoft, the operating system is even more robust. It now enables early detection and prevention of improper memory management practices in applications, kernel components, and device drivers.

Windows 2000 also eliminates many of the tasks that used to require a system reboot. Common system management tasks such as configuring plug-and-play devices (such as HotPlug PCI controllers), modifying the size of the page file, adding or removing a page file, increasing the size of an NTFS partition, adding or removing network protocols or controllers, or installing applications such as SQL Server no longer require a system reboot.

If businesses are running SAP on the Advanced and Datacenter Server versions of Windows 2000, they can take immediate advantage, at no additional cost, of Microsoft Cluster Services to deliver higher levels of service and availability. Microsoft Cluster Services monitors the health of standard applications and services, and can automatically recover mission-critical data and applications from many common types of failure. A graphical management console enables

administrators to visually monitor the status of all resources in the cluster and move workloads around with simple point-and-click actions.

The Recovery Console and Backup Tool features of Windows 2000 can also repair and save the SAP operating system respectively.

Scalability

The wider availability and greater distribution of mySAP.com components means that knowledge workers all over the enterprise, from back and front offices through to the warehouse, are potential SAP users. They will use a variety of devices – from high-end PCs to hand held devices to interface with mySAP.com applications. Windows 2000's outstanding scalability ensures that whether the end user is working from a workstation or using Windows 2000 Professional on a laptop, they benefit from identical operating system functionality.

Windows 2000 also offers significant enhancements to SMP (symmetric multi-processing) technology, leading to higher levels of scalability through:

- Key SMP improvements to memory allocation and locking to remove contention across processors;
- Ability to support up to 8GB with Advanced Server, 64GB with Datacenter Server;
- Support for up to 8 CPUs with the Advanced Server and 32 CPUs with the Datacenter version of Windows 2000;
- A unit of processing called "fibers" which has a lighter weight than "threads". For instance, Microsoft SQL Server uses fibers to achieve higher scalability on Windows 2000 Server;
- The Job Object API, with its ability to set up processor affinity, establish time limits, control process priorities, and limits memory utilisation for a group of related processes, allows an application to manage and control dependent system resources. This additional level of control means the Job Object API can prevent an application from negatively impacting overall system scalability.

With production databases in the Terabyte range, Windows 2000 Server now takes advantage of large storage subsystems. The updated NTFS file system provides: better performance, per-user disk quotas, distributed link tracking, inclusion of a re-parse point enabling hierarchical storage management, and elimination of drive letter limitations. Windows 2000 Server also includes support for advanced storage controllers including Fibre Channel devices and I20-based devices.

Ease of use

When an SAP user logs onto Windows 2000 they get swift and easy access to all their regular tasks, enabling them to get productive quickly. For example, the user interface for both Windows 2000 Server and Windows 2000 Professional has been refined to make it easier to access information on your system with Personalized Menus and extensive usage of Most Recently Used lists across all tasks.

Administration

In a typical SAP environment where many users access a variety of applications from any number of servers, it is essential that system administration is efficient, cost-effective and straightforward. With use of the Microsoft Management Console (MMC) for all administrative purposes (including SAP R/3 and mySAP.com applications), users will only have to familiarise themselves with one graphical management system. Interfaces to the Windows Scripting Host enable the administrator to schedule and script jobs.

By integrating Terminal Server into Windows 2000, it can be used as a standard tool for controlling a variety of systems in the Datacenter regardless of their location.

Using the Active Directory and associated IntelliMirror technologies, administrators can remotely install Windows 2000 Professional and provide users with a personalised desktop configuration anywhere on the network. Windows 2000 Server IntelliMirror change and configuration management technologies also allow administrators to predefine desktop requirements via group policy and have these policies apply whenever users log in.

There are other important features which significantly enhance the administration of mySAP.com applications in a Windows 2000 environment.

Thanks to Windows Management Instrumentation (WMI) or Web Based Enterprise Management (WBEM) trouble shooting mechanisms for SAP are much more powerful. These include:

- Logical Drives: DISK-Layout for SAP can be managed remotely
- System Properties: Virtual memory paging file can be managed remotely
- System Services: SAP services can be managed remotely

In addition, Windows 2000 remote disk administration means that disk management for SAP is much easier. Web based printing support means that SAP can access <http://> printers via Microsoft Internet Information Server 5, while printers for SAP can be managed and monitored via Internet Explorer, which is especially beneficial for mySAP.com application components.

Thanks to group and computer policies, SAP used objects can be manipulated easily and SAP software can be rolled out in a straightforward fashion. In addition, Active Directory and Organizational Units enable administration tasks under the operating system to be organised by roles.

The industry view

After implementation of Windows 2000, you'll immediately begin seeing rewards in these major areas:

- A drastic reduction in the amount of handholding you do with your users
- A huge reduction in network administrators at remote locations
- A drastic reduction in the number of machines needed to manage your infrastructure

Compaq tips for evaluating, planning, preparing and piloting a Microsoft Windows 2000 environment

Integrated security mechanism

The implementation of mySAP.com applications gives a significantly larger number of end-users access to mission-critical data. Clearly it is essential that they are only able to use information which they have been authorised to access. Windows 2000 addresses this issue by providing single network sign-on access to resources anywhere in the corporate network without requiring multiple user logons. In addition, the domain model integrates Kerberos-based authentication, the primary security protocol for access to Windows 2000 and Unix-based resources. This allows organizations to support a full spectrum of secured deployment requirements. And by using an NTFS encrypted file system, even data from spool process and downloaded files can be secured for authenticated users.

Lower Total Cost of Ownership (TCO)

Windows 2000 Server is designed to let organizations increase the value of their existing investments while lowering overall computing costs. It provides powerful management services through infrastructure enhancements such as the "Active Directory" directory services, as well as tools built on the infrastructure, such as IntelliMirror management technologies.

Windows platforms are purported to offer significant cost savings. The recent Meta Group report concluded that Microsoft Windows offers two to three times better TCO than other enterprise platforms when used in Enterprise Resource scenarios. A recent report from Aberdeen Group showed an Unisys ES 7000 at one-third the price of Sun E10000 at equivalent high-end AP performance. For more details, see the Microsoft web site at:

<http://www.microsoft.com/windows2000/server/evaluation/compare>.

In the SAP environment it is a prerequisite that organizations use the International / US version of the operating system on the server side. Windows 2000 allows the administrator to add languages of the menus while staying with the International / US version on the core operating system. Administrators with global organizations now have the ability to standardise on one version of the core operating system while providing localised user interfaces to individuals in other countries.

Incremental implementation

Not all businesses will want to migrate to Windows 2000 across the entire enterprise, supporting all business applications at once. Indeed Microsoft and SAP have ensured that there is no need for 'rip and replace' in order to enjoy the benefits of Windows 2000 and mySAP.com. Many organizations have already developed solid architectures based on Windows NT and SAP R/3. The beauty of mySAP.com is that it allows such businesses to run mixed environments involving Windows NT and Windows 2000. For example, SAP Data Warehousing can be implemented on a Windows 2000 server while R/3 can continue to run on a Windows NT system. Ultimately there may be no need to replace the core system at all – new SAP components can be added and integrated as and when required.

Performance

SAP performance on the Microsoft Platform of Windows 2000 and SQL Server 2000 has grown over 430 percent in the past 28 months alone. The combination of Microsoft Windows 2000, SQL Server, SAP and the Unisys e-@ction Enterprise Server 7000 hardware offers enterprises of all kinds scalability as well as price/performance which is second to none. The most recent series of benchmarks conducted in the year 2002 on systems equipped with 16, 24 and 32 processors demonstrated state of the art scalability topping even high end UNIX servers.

Database Server	# Benchmark Users	Avg. Dialog Resp. Time (sec)	Dialog Steps/h	SAPS	Line Items/h	Database Server Memory (MB)	Application Servers
Unisys e-@ction ES7000, 32-way, Pent. III Xeon, 900 MHz, 2 MB L2	26.000	1.97	7.818.000	130.300	2.606.000	12.288	91 x Enterprise Server ES5085, 8-way, Pent III Xeon 700 MHz
Unisys e-@ction ES7000, 32-way, Pent. III Xeon, 700 MHz, 2 MB L2	18.500	1.94	5.578.000	92.970	1.859.330	12.288	91 x Enterprise Server ES5085, 8-way, Pent III Xeon 700 MHz
Unisys e-@ction ES7000, 24-way, Pent. III Xeon, 700 MHz, 2 MB L2	14.400	1.83	4.382.000	73.030	1.460.670	8.192	73 x Enterprise Server ES5085, 8-way, Pent III Xeon 700 MHz
Unisys e-@ction ES7000, 16-way, Pent. III Xeon, 700 MHz, 2 MB L2	10.400	1.83	3.166.000	52.770	1.055.330	8.192	49 x Enterprise Server ES5085, 8-way, Pent III Xeon 700 MHz

Table 1: SAP SD benchmark results (SAP/R3 4.6C, Windows 2000, SQL Server 2000)

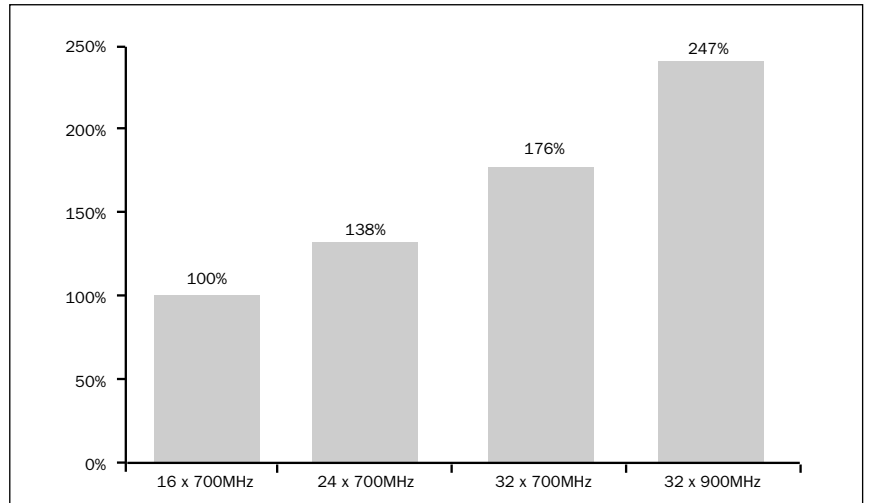


Figure 0: Scalability from 16 to 32 processors

The industry view

"Windows 2000 and its directory services will make your environment more efficient, more productive and reduce TCO. You can't afford to miss the advantage."

HP Compaq tips for evaluating, planning, preparing and piloting a Microsoft Windows 2000 environment

WINDOWS 2000 ACTIVE DIRECTORY

Active Directory and mySAP.com

mySAP.com includes an enormous raft of application areas: R/3, e-commerce, customer relationship management, supply chain management, strategic enterprise management, business intelligence, knowledge management, human resources, logistics execution, manufacturing, product lifecycle management, and financials. These systems are usually all dedicated so customers can end up having a lot of servers that need to be managed. Windows 2000 can handle all these instances as objects in Active Directory and make it significantly less expensive to manage these servers and systems

What is Active Directory

Active Directory is an essential part of the Windows 2000 network architecture that improves on the domain architecture of the Windows NT 4.0 operating system to provide a directory service designed for distributed networking environments. Active Directory lets organizations efficiently share and manage information about network resources and users. In addition, Active Directory acts as the central authority for network security, letting the operating system readily verify a user's identity and control his or her access to network resources. Equally important, Active Directory acts as an integration point for bringing systems together and consolidating management tasks – an essential resource for businesses implementing mySAP.com which contains many different application areas, many of which required dedicated servers.

Active Directory provides a single point of management for Windows-based user accounts, clients, servers, and applications such as mySAP.com. It also helps organizations integrate systems not using Windows with Windows-based applications, and Windows-compatible devices, thus consolidating directories and easing management of the entire network operating system. Companies can also use Active Directory to extend systems securely to the Internet. Active Directory thus increases the value of an organization's existing network investments and lowers the overall costs of computing by making the Windows network operating system more manageable, secure, and interoperable, especially in the SAP environment.

What are the benefits of Active Directory?

Totally integrated with Windows 2000 Server, Active Directory gives network administrators, developers, and users access to a directory service that:

- Simplifies management tasks
- Strengthens network security
- Makes use of existing systems through interoperability

Simplifies management

Distributed systems often lead to time-consuming and redundant management. As companies add applications to their infrastructure and hire more personnel, they need to distribute software to the desktop appropriately and manage multiple application directories. This is especially true where companies decide to add additional mySAP.com components incrementally to an existing core system. Active Directory allows companies to significantly reduce management costs by providing a single place to manage users, groups and network resources, as well as distribute software and manage desktop configurations. For example, Active Directory uses one place for managing both Windows 2000 users and Microsoft Exchange mailbox information. Active Directory helps companies simplify management because it:

- Eliminates redundant management tasks. Provides a single point of management for Windows user accounts, clients, servers, and applications as well as the ability to synchronise with existing directories;
- Better maximizes IT resources. Securely delegates administrative functions to all levels of an organization;
- Lowers TCO. Simplifies the management and use of file and print services by making network resources easier to find, configure, and use.

Strengthens security

Strong and consistent security services are essential to corporate networks. Managing user authentication and access control is often tedious and prone to error. Active Directory centralises management and enforces role-based security consistent with an organization's business processes. For example, support for multiple authentication protocols such as Kerberos, X.509 certificates, and smart cards-combined with a flexible access control model-enables powerful and consistent security services for internal desktop users, remote dial-up users, and external e-commerce customers. The following are some ways in which Active Directory strengthens security:

- It improves password security and management by providing single sign-on to network resources with integrated, high-powered security services that are transparent to end users;
- It ensures desktop functionality by locking-down desktop configurations and preventing access to specific client machine operations, such as software installation or registry editing, based on the role of the end user;
- It speeds e-business deployment by providing built-in support for secure Internet-standard protocols and authentication mechanisms such as Kerberos, public key infrastructure (PKI) and lightweight directory access protocol (LDAP) over secure sockets layer (SSL);
- It tightly controls security by setting access control privileges on directory objects and the individual data elements that make them up.

Extends interoperability

Active Directory also addresses the fact that an enterprise might implement several SAP components, which must work together with a diverse collection of technologies across the entire organization. As a result, many corporate networks have an equally diverse collection of disparate directories as part of e-mail servers, applications, network devices, firewalls, e-commerce applications, and more. Active Directory provides a set of standard interfaces for application integration and open synchronisation mechanisms to ensure that Windows can interoperate with a wide variety of applications and devices. Active Directory extends interoperability because it:

- Takes advantage of existing investments and ensures flexibility. Standards-based interfaces to all features make use of investments and ensure flexibility for future applications and infrastructure;
- Consolidates management of multiple application directories. Using open interfaces, connectors, and synchronisation mechanisms, organizations can consolidate directories including Novell's NDS, LDAP, ERP, e-mail, and other mission-critical applications.
- Allows organizations to deploy directory-enabled networking. Network devices from leading vendors such as Cisco and 3COM can use the directory to let administrators assign quality of service and allocate network bandwidth to users based on their role in the company.
- Allows organizations to develop and deploy directory-enabled applications. Using the fully extensible directory architecture, developers can build applications that deliver functionality tailored to the needs of the end user.

Synchronisation of Active Directory and mySAP.com

The synchronisation between Active Directory and mySAP.com saves substantial effort and money.

To begin with SAP automatically registers services in Active Directory with the following benefits:

- Management gets easier, making it more straightforward for an administrator to view a list of SAP systems and assess their current status;
- End users can take advantage of the SAP GUI to log on to and be assigned to appropriate SAP applications.

This solution dramatically reduces the time and resources required to get a new employee set up and authorised in all the different areas of the organization where they work. In the past, organizations have built specific directory services for specific applications, for example, IT networks, telephone networks and applications. So when a new employee arrived on their first day they needed to be registered with human resources, access the IT network and use specific applications such as email. Thanks to Active Directory, it is no longer necessary to register an employee for all these areas separately. This is because Active Directory automatically triggers registration in the designated systems and ensures that this is consistent and replicated across all the appropriate systems and applications.

SAP COM+ CONNECTOR

Expanding SAP business processes

Another important example of where SAP and Microsoft have worked closely together to leverage the business functionality offered by their respective products is the SAP COM+ Connector.

This responds to typical scenario where company wide use of SAP business functionality might include employee self-service, such as employee expense management and internal procurement. Although the idea of applying one set of SAP business rules to each individual person and process (across a variety of tools and infrastructures) inside the enterprise as well as to the business relationships with customers and partners is appealing, it is a difficult goal to achieve in a cost-effective and reusable way.

SAP has recognised the need for a reusable and standardised way to extend and embrace the SAP business processes outside of the R/3 framework, and it has delivered the SAP Business Framework as the way to achieve this goal.

A critical part of the business framework is its integration into standard infrastructures that customers have already deployed. For native integration on the Microsoft Windows platform, SAP delivers the SAP COM+ Connector - an extension to the Remote Function Call Software Development Kit (RFC SDK). Through exposure as COM components, the business framework integrates easily into the Microsoft Office, Development Tools, and BackOffice systems.

The SAP COM+ Connector

The SAP COM+ Connector is the bridge between the SAP Business Framework and the Windows platform. The connector has the ability to:

- Enable a Windows programmer to view SAP Business Objects and Business APIs (BAPIs) as native COM components, which behave like any other COM component available on the market. This lets all development tools (such as Microsoft Visual Studio and Inprise Delphi), personal productivity suites (such as Microsoft Office and Lotus SmartSuite), and server environments (such as Microsoft Site Server, Microsoft Exchange, and Lotus Notes) view the SAP objects as an integrated part of their environment.
- Eliminate the need to deploy a variety of infrastructure technologies to satisfy multiple SAP usage scenarios by providing a single, secure extension to the Windows platform. This infrastructure is tightly integrated into standard components of Windows, enabling any trained administrator to deploy and maintain the integration into SAP R/3 or SAP R/2 (version 5.0D or up).
- Integrate RFC tables and structures with the standard Windows data access technology OLEDB/ADO.
- Integrate into the security on Windows and allow for advanced scenarios, such as two-phase commit or asynchronous COM integration with Windows 2000.

The combination of SAP business objects exposed as COM components and the resulting tight SAP integration into the Windows infrastructure lets Windows programmers integrate R/3 into every aspect of an enterprise. As a developer, you don't have to use the predefined SAP user interfaces or communication styles in your solutions; you are free to use your preferred tools together with SAP business functionality. Likewise, you can create solutions that access multiple systems - R/3, R/2, CICS/IMS applications, or custom-developed components - without introducing new infrastructure or programming environments. COM lets you maintain your focus on solutions, rather than on technology or infrastructure.

MIGRATING TO WINDOWS 2000

Although SAP applications will run successfully on Windows 2000 Server, Microsoft recommends that businesses implement Windows 2000 Advanced Server or Windows 2000 Datacenter Server to take full advantage of the availability, manageability, performance and TCO benefits of the combined Microsoft/SAP offering.

Whatever the size of your business, or its specific SAP requirements, upgrading to Windows 2000 offers you a variety of options which cost-effectively and efficiently meet your requirements. For example, many SAP R/3 users will shortly need to upgrade to 4.6 B. From a strategic point of view, upgrading the operating system at the same time as the SAP solution, represents an excellent opportunity to take advantage of the price/performance and availability qualities of Windows 2000.

At the same time, the Microsoft/SAP combination offers the opportunity to gradually implement the outstanding functionality of mySAP.com application components where businesses want to avoid the 'rip and replace' of established operating system and R/3 architectures. mySAP.com enables the addition of application functionality around the core R/3 system. For example, SAP DataWarehousing can be implemented on a Windows 2000 server and then plugged back in to the core R/3/NT system. Ultimately there may be no need to replace the core system at all – new SAP components can be added and integrated as and when required.

How to upgrade from Windows NT Server 3.51 or 4.0

If you are currently running either Windows NT Server 3.51 or Windows NT Server 4.0, you can upgrade to Windows 2000 Server. Note that the Terminal Services feature in Windows 2000 Server replaces Windows NT 4.0, Terminal Server.

The information below outlines the steps you should take to prepare your system before upgrading to Windows 2000 Server, and then outlines how to begin the Setup program, whether you are using the Windows 2000 Server CD-ROM or upgrading from a network server.

Before you begin

1. Make sure your computer meets the system requirements to run Windows 2000.

Check your hardware specifications to see if they meet the minimum system requirements for upgrading to Windows 2000.

2. Make sure your hardware and software are compatible with Windows 2000.

Go to the Hardware and Software Compatibility search area to find out if your hardware and software are compatible with Windows 2000. Setup generates a list of known incompatibility issues, but the tools available in the compatibility area will help you determine if you need basic input/output system (BIOS) or driver updates before upgrading. You also need to bear in mind that SAP plans to support R/3 4.x on Windows 2000

3. Read the release notes.

Read the release notes in the root directory of the Windows 2000 Server CD-ROM: the Read1st.txt file, as well as the Readme.doc, which has an "Application Notes" section with information about programs that need to be disabled or removed before running Setup. Also obtain the latest SAP installation notes from SAP's support infrastructure.

4. Prepare for upgrading an existing domain.

Microsoft recommends that you plan the roles your servers will have within domains in Windows 2000 before running Setup. However, you can still adjust these role assignments after Setup. You also need to decide whether you want to upgrade your domains by first upgrading domain controllers and then member servers, or vice-versa. Review the Windows 2000 Server online Help on upgrading an existing domain.

(<http://www.microsoft.com/Windows2000/upgrade/compat/default.asp>)

5. Provide a mass storage driver or HAL file if necessary.

If you have a mass storage controller that requires a driver supplied by the manufacturer, or if you have a custom hardware abstraction layer (HAL) file supplied by the manufacturer, you need to provide the appropriate driver file or HAL file during Setup.

6. Plan ahead for rolling back.

Windows 2000 Server does not provide an uninstall feature. You will not be able to return to your previous version of Windows after installing Windows 2000 unless you completely reinstall your older version of Windows and all of your programs.

Prepare your system

1. Install hardware and software updates, if necessary.

You may need Windows 2000-related hardware and software updates (drivers, BIOS updates, and so forth) from your hardware or software manufacturer. Check the Hardware and Software Compatibility area for tools to help you determine if you need updates. It is particularly important to make sure you have the latest BIOS available from your computer manufacturer.

2. Back up your files.

Back up your files to a disk, a tape drive, or another computer on your network.

3. Scan for viruses.

Use anti-virus software to scan for and eradicate any viruses on your hard drive(s).

4. Uncompress drives.

Uncompress any DriveSpace or DoubleSpace volumes before upgrading to Windows 2000. Do not upgrade to Windows 2000 on a compressed drive unless the drive was compressed using the Windows NT file system (NTFS) compression feature.

5. Uninstall power management or disk management tools.

If you are running power management or disk management tools provided by your computer manufacturer you should uninstall these programs before upgrading.

6. Disconnect UPS devices.

If you have an uninterruptible power supply (UPS) connected to your target computer, disconnect the connecting serial cable before running Setup. Windows 2000 Setup attempts to automatically detect devices connected to serial ports, and UPS equipment can cause problems with the detection process.

7. Disable disk mirroring.

Before upgrading, if you have disk mirroring installed on your target computer, disable it before running Setup. You can re-enable disk mirroring after completing the installation.

Start the upgrade

To start an upgrade using the Windows 2000 Server CD-ROM:

1. Insert the CD-ROM in the drive and wait for Setup to display a dialog box.
2. Follow the Setup instructions.

To start an upgrade using a network connection:

1. On a network server, share the installation files, either by inserting the CD-ROM and sharing the CD-ROM drive, or by copying the files from the I386 folder on the CD-ROM to a shared folder.

On the computer on which you want to install Windows 2000, connect to the shared Setup files:

- If you are sharing the CD-ROM drive, connect to the shared drive and change to the I386 folder.
 - If you are sharing a folder, connect to that folder.
2. Run Winnt32.exe.
 3. Follow the Setup instructions.

How to upgrade from Windows NT Server 4.0, Enterprise Edition

If you are currently running Windows NT Server 4.0, Enterprise Edition, you can upgrade to Windows 2000 Advanced Server, but not to Windows 2000 Server. Windows 2000 Advanced Server is designed for e-commerce and line-of-business applications. It includes everything in Windows 2000 Server plus high availability and scalability features — particularly clustering technologies — that support higher volumes of users and more complex applications.

The information below outlines the steps you should take to prepare your system before upgrading to Windows 2000, and then outlines how to begin the Setup program. Additional upgrade resources are listed at the end of this document.

Before you begin

1. Make sure your computer can run Windows 2000.

Check your hardware specifications to see if they meet the system requirements for Windows 2000.

2. Make sure your hardware and software are compatible with Windows 2000.

Go to the Hardware and Software Compatibility search area (<http://www.microsoft.com/Windows2000/upgrade/compat/default.asp>) to find out if your hardware and software are compatible with Windows 2000. Setup generates a list of known incompatibility issues, but the tools available in the compatibility area will help you determine if you need basic input/output system (BIOS) or driver updates before upgrading. Also obtain the latest SAP installation notes from SAP's support infrastructure

3. Read the release notes.

Read the release notes in the root directory of the Windows 2000 Server CD-ROM: the Read1st.txt file, as well as the Readme.doc, which has an "Application Notes" section with information about programs that need to be disabled or removed before running Setup.

4. Prepare for upgrading an existing domain.

It is recommended that you plan the roles that your servers will have within domains in Windows 2000 before running Setup. However, you can still make adjustments to these roles after Setup. You will also need to decide whether you want to upgrade your domains by first upgrading domain controllers and then member servers, or vice-versa. Review the online Help on upgrading an existing domain.

5. Prepare to provide a mass storage driver or HAL file, if necessary.

If you have a mass storage controller that requires a driver supplied by the manufacturer, or if you have a custom hardware abstraction layer (HAL) file supplied by the manufacturer, you will need to provide the appropriate driver file or HAL file during Setup.

6. Prepare to upgrade or install clustering.

If you are using or plan to use clustering to enhance the availability and scalability of your system, make sure that your cluster disks are compatible with Windows 2000 Advanced Server (check the updated Hardware Compatibility List [/hcl/default.asp](#) available online) and that you have the proper drivers for them (check with the manufacturer). If you have at least two nodes in your cluster, you may want to perform a "rolling upgrade" to ensure that at least one node will be continuously available to handle client requests. See *Introducing Windows 2000 Advanced Server* as well as the resources listed below for further information on clustering and rolling upgrades.

7. Plan ahead for rolling back.

Windows 2000 Advanced Server does not provide an uninstall feature. You will not be able to return to your previous version of Windows after installing Windows 2000 Advanced Server unless you completely reinstall your older version of Windows and all of your programs.

CONCLUSION

Migrating to Windows 2000 will significantly improve the technological and business functionality of any enterprise which plans to implement mySAP.com applications. As well as its outstanding performance, scalability, ease of use and high availability, the new Microsoft platform offers the manageability necessary to maintain the server architectures which support mySAP.com, reduce total cost of ownership and improve performance.

Organizations can also take advantage of the ease of integration between Microsoft platforms and solutions such as SQL Server and Microsoft Office. Windows 2000 builds on the core platform strength found in Windows NT enabling businesses to build a consistent, reliable, enterprise IT architecture which is flexible enough to accommodate and exploit future challenges, whatever they might be.

Above all, businesses can be certain that there is a long-term commitment by both Microsoft and SAP to support and leverage future developments of their respective technologies. SAP's support of the Windows platform along with its adoption of other Microsoft supported initiatives such as BizTalk demonstrates the extent of this collaboration as well as the determination of both organizations to offer the best enterprise-wide solutions to the marketplace.

Looking to the future businesses now have the opportunity to implement long-term strategies which embrace and respond to the challenge of an Internet-based business world and the new demands of customers, partners and suppliers. mySAP.com in conjunction with Windows 2000 brings together enterprise resource planning, the supply chain and the Internet to create a powerful, scalable launch pad which enables businesses to respond to these needs.

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