

Microsoft White Paper



Migrating your SAP Solution to Windows Server 2003



Microsoft®

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"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

INTRODUCTION

The introductions of mySAP ERP and SAP NetWeaver, along with the Microsoft Windows Server 2003 family of operating systems, have charted a clear course for companies seeking smooth and orderly updates of their ERP systems to meet changing business requirements.

Existing SAP R/3 software customers can add important capabilities by moving to mySAP ERP, which itself can be upgraded to add any or all of the full range of SAP solutions found in SAP's premier offering, mySAP Business Suite.

SAP NetWeaver includes SAP's Web Application Server, which now adds Windows Server 2003 to its supported 64-bit platforms, to complement its 32-bit Windows offering. The Web Application Server provides the infrastructure and underlying technology for NetWeaver and the specific SAP business applications that it makes available. In combination with Windows Server 2003 and SQL Server 2000 Enterprise Edition (64-bit), it delivers all the advantages of 64-bit computing to your business right now.

SAP and Microsoft have a 10-year relationship working together in support of joint customers. These product development activities ensure integration between Microsoft's operating system, database, and server products with SAP solutions – whether in 32- or 64-bit environments.

Microsoft also recognizes that for many enterprises that have installed Windows NT or Windows 2000, swift, cost-effective migration to Windows Server 2003 is key to their long-term enterprise IT strategy.

Microsoft and SAP are committed to a long-term partnership, which will anticipate and respond to all future business and technical requirements. Both companies continue to invest heavily in research and development. These efforts are coordinated with those of their joint partners to ensure lasting protection of investment for mutual customers.

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, availability and security is second to none.

In this white paper we discuss Windows Server 2003 and the new SAP technologies and include an overview of the upgrade/migration process.

WINDOWS SERVER 2003 – AN OVERVIEW

Improvements across the board

The Microsoft® Windows® Server 2003 operating system represents a significant advancement over the Microsoft Windows 2000 family of operating systems. Windows Server 2003 is the fastest, most reliable, most secure Windows server operating system ever offered. It features overall enhancements in reliability, availability, and manageability, as well as scalability extending to 64 processors.

The Windows Server 2003 family builds on the strengths of Windows 2000 to provide a platform that is more productive, dependable, and connected than ever before. New and improved file, print, application, Web, and communication services provide a more robust, comprehensive platform for your mission-critical business resources. Integrated features such as the Active Directory® service and enterprise-class security services allow you to provide secure yet flexible access to all the resources your users need.

The Windows Server 2003 family was designed to allow for an easy upgrade from the Windows 2000 Server family. This document provides an overview of the upgrade process (from Windows NT as well as from Windows 2000) and provides information on some of the basic decisions you will make during the process — whether you are upgrading an existing system or performing a new installation.

FEATURES AND BENEFITS

Windows Server 2003 is the first Windows operating system to ship under the Trustworthy Computing initiative.

Security

The Trustworthy Computing initiative launched by Bill Gates in January 2002 is based on four pillars: security, privacy, reliability, and business integrity. Windows Server 2003 is the first Windows operating system to ship under the Trustworthy Computing initiative.

The security innovations in Windows Server 2003 offer customers a flexible security experience, providing both a more secure out-of-the-box foundation and extensive technologies to help customers build, deploy and manage more secure solutions. Microsoft has made engineering design changes, adjusted settings to help deliver security by default, and delivered new features and technologies that enhance security for the Windows platform.

Secure by Design. Improved security of Windows Server 2003 reflects Microsoft's \$200 million investment in 2002 to reduce code vulnerabilities in its platform, modify the development process, and improve accountability at every level for security. Designed with a focus on improving security, Windows Server 2003 features a redesigned IIS, strong authentication protocols such as 802.1x and PEAP, and the common language runtime to create a safer computing environment.

- Internet Information Services (IIS) was redesigned in Windows Server 2003 to improve security for Web transactions. IIS 6.0 makes it possible to isolate an individual Web application into a self-contained Web service process, which prevents one application from disrupting the Web services or other Web applications on the server. IIS also provides health-monitoring capabilities to discover, recover, and prevent Web application failures. In IIS 6.0, third-party application code runs in isolated worker processes, which by default use the new lower-privileged Network Service logon account. Worker process isolation makes it possible to confine a Web site or application to its root directory through Access Control Lists (ACL).
- Improved network communication security in addition to host security. To improve the security of wireless communication, Windows Server 2003 supports strong authentication protocols such as 802.1x (WiFi) as well as Protected Extensible Authentication Protocol (PEAP). Internet Protocol Security (IPSec), a suite of cryptography-based protection services and security protocols, has been enhanced for stronger LAN data encryption.
- The common language runtime (CLR) software engine is a key element of Windows Server 2003 that improves reliability and promotes a safer computing environment. CLR verifies that applications can run without error and checks security permissions to ensure that code only perform appropriate operations. CLR reduces the number of bugs and security holes caused by common programming mistakes, leaving fewer vulnerabilities for attackers to exploit.

Secure by Default. To secure Windows Server 2003 by default, the attack surface area has been reduced by creating stronger default policies (e.g., file system Access Control Lists (ACL)), redesigning IIS, and reducing the total number of services, the number of services running by default, and the number of services running as system.

- To reduce the default attack surface of Windows Server 2003, Microsoft disabled 19 services, and reduced several services to run under lower privileges. For example, in order to reduce the Web infrastructure attack surface, installing Windows Server 2003 does not install IIS 6.0 by default—administrators must explicitly select and install it. When a server is being upgraded to Windows Server 2003, IIS 6.0 will be disabled also. In addition, as IIS 6.0 is being installed, it is configured by default in a “locked down” state. After installation, IIS 6.0 accepts requests only for static files until configured to serve dynamic content, and all time-outs and settings are set to aggressive security defaults. IIS 6.0 can also be disabled using Windows Server 2003 group policies.
- Stronger default settings are used in ACLs, which define the criteria an operating system uses to protect network resources. For example, creating the new System Root ACL and setting it as the default means that users can no longer write files to the root of the system drive, which prevents certain spoofing attacks.
- Two additional user accounts were created to run services at lower privilege levels, which helps ensure that a vulnerability in a service cannot be exploited to take over the system. The new Network Service account is used, for example, to run DNS Client and all IIS Worker Processes. Telnet now runs using the new Local Service account.

Secure in Deployment. In addition to the secure architecture design and added security features in Windows Server 2003, Microsoft offers its customers tools, prescriptive guidance, training, and services to help them deploy a secure connected infrastructure.

- Software Restriction Policy (SRP) is a new feature in Windows Server 2003 and Windows XP that gives administrators a policy-driven mechanism to identify software running in their domain and control its ability to execute. Using a software restriction policy, an administrator can confine execution to a set of trusted applications, thus preventing the operation of unwanted applications, such as viruses or software known to cause conflicts. A software restriction policy also could be used to allow only administrators to run certain programs on shared machines.
- Security Configuration Editor (SCE) is designed to help businesses secure Windows systems operating in various roles and deployment scenarios, such as a Web server that is connected both to the Internet and to a secure internal network. The goal of SCE is to help customers maximize the security of such systems without sacrificing their required functionality. For example, services (e.g. Fax) that may not be required for file server role can be disabled. Administrators can use the Security Configuration Wizard in SCE to construct security policies for their different types of servers, and perform Lockdown Testing to verify that systems function as expected. This tool will be released in the later part of 2003.
- Microsoft Audit Collection Services (MACS) is a tool to monitor and audit systems. MACS collects security events in a compressed, signed, encrypted manner and loads the events into a SQL database for analysis. This tool works with Windows XP, Windows 2000 Server, and Windows Server 2003, and uses existing security technologies to protect against tampering and disclosure during network transit. It enables the separation of auditor and administrator roles to ensure that administrators cannot make changes to audit information. This tool will be released in the later part of 2003.

Internet Information Services 6.0

One of the key highlights of the security enhancements in Windows Server 2003 is the complete redesign of Internet Information Services (IIS). Internet Information Services 6.0 is a powerful Web server available in all versions of Windows Server 2003 that provides a highly reliable, manageable, scalable, and secure Web application infrastructure.

IIS 6.0 makes it possible for organizations of all sizes to quickly and easily deploy powerful Web sites and applications, and provides a high-performance platform for all applications. Applications built with Microsoft .NET frameworks are faster and more reliable on IIS 6.0 due to the integration of the .NET frameworks into the IIS 6.0 process model. IIS 6.0 features a new fault-tolerant process architecture with health monitoring that runs all application code in an isolated environment for maximum reliability and availability.

Web server administration is simplified using an XML-based configuration file that can be modified without having to stop and restart the server. IIS 6.0 enhancements such as kernel-mode caching and "Web gardens" dramatically increase the product's scalability and performance compared to previous versions of IIS. In terms of security, IIS 6.0 is not installed by default with Windows Server 2003 and is fully "locked down" when first installed to reduce attack surface area. The benefits of choosing IIS 6.0 include less planned and unplanned system downtime, increased Web site and application availability, lower system administration costs, server consolidation (reduced staffing, hardware, and site management costs), and a significant increase in Web infrastructure security.

Scalability

Windows Server 2003 takes the scalability gains on Windows 2000 Server Family to a new height. Windows Server 2003 is designed for both scale-up and scale-out scenarios. Scale-up scenarios are enabled by symmetric multiprocessing (SMP) and CC-NUMA (Cache Coherent Non-Uniform Memory Access) optimizations, and scale-out by the various types of clustering provided by Microsoft.

Windows Server 2003 scales from single processor solutions all the way up to 64 processors in a single partition and offers 8-node clustering with Enterprise and Datacenter Editions. In comparison, Windows 2000 Server scaled to 32 processors and offered up to 4-node clustering.

Internal tests indicate that, compared to Windows 2000 Server, Windows Server 2003 delivers up to 140 percent better performance in the file system and significantly better performance in various other features, including Microsoft Active Directory service, Web server, Terminal Server components, and networking services. Key scalability enhancements include:

- **64-Bit Support.** Windows Server 2003 offers support for 64-bit architecture with Enterprise and Datacenter Editions. With 64-bit architecture, Windows offers scalability up to 64 processors and 512 GB of RAM. Initial benchmark results for SAP applications on Windows Server 2003 64-bit platform show promising trends of performance improvement.
- **Support for Intel Hyper-Threading.** Intel Hyper-Threading Technology (HT) allows a single physical processor to execute multiple threads (instruction streams) simultaneously, potentially providing greater throughput and improved performance. In general, multithreaded Windows applications perform better when running unmodified on an HT processor than they do on a similarly equipped single-threaded processor. Windows Server 2003 32-bit

" By implementing Microsoft SQL Server 64-bit and Microsoft Windows 64-bit on an industry-standard 64-bit server, we were able to get the performance and scalability we needed to run our SAP applications with maximum efficiency."

Rolf Müller, head of Microsoft Platforms group at SAP

platforms provide HT support both on architectural and licensing fronts.

- **NUMA Optimization.** Windows Server 2003 provides enhanced NUMA (Non-Uniform Memory Access) support. Most Windows applications will perform optimally without modification on NUMA systems running Windows Server 2003 due to the automated NUMA features in the operating system. NUMA support is offered only on 32-bit and 64-bit Enterprise and Datacenter Editions.
- **Hot Add Memory.** This new feature allows ranges of memory to be added to a compatible computer and made available to the operating system and applications as a part of the normal memory pool. This does not require rebooting the computer or other downtime. Hot Add Memory is offered only on 32-bit versions of Enterprise and Datacenter Editions.

Reliability and Availability

Reliability and availability are woven into every aspect of Windows Server 2003 design to provide better customer experience. Key highlights include:

The addition of 8-node clustering offers increased deployment flexibility, particularly for geographically dispersed cluster configurations.

- **8-Node Clustering.** Windows Server 2003 supports 8-node clustering with 32-bit and 64-bit Enterprise and Datacenter Editions. This is an increase from 2- and 4-node support in Windows 2000 Advanced and Datacenter Servers, respectively. By increasing the number of nodes in a server cluster, an administrator has many more options for deploying applications and providing failover policies that match business expectations and risks. The addition of 8-node clustering offers increased deployment flexibility, particularly for geographically dispersed cluster configurations.
- **Majority Node Set.** Windows Server 2003 provides the traditional cluster quorum mechanism, as well as a new quorum resource called "Majority Node Set." This quorum resource allows server clusters to be built without using a shared disk as the quorum device. Using this new quorum mechanism, additional cluster topologies such as server clusters with no shared disks can be built. Majority Node Set also makes it easier to build and configure multi-site, geographically dispersed clusters.
- **Network Load Balancing Manager.** This new utility in Windows Server 2003 provides a single point of configuration and management for NLB clusters. NLB Manager can be used to create new NLB clusters and automatically propagate cluster parameters and port rules to all hosts in the cluster, add and remove hosts to and from NLB clusters, automatically add Virtual IP (VIP) addresses to TCP/IP, manage existing clusters by connecting to them or by loading their host information to a file and saving this information for later use, configure NLB to load balance multiple Web sites or applications on the same NLB cluster, and diagnose improperly configured clusters.
- **Datacenter High Availability Program.** The Datacenter Program has been expanded to meet the growing customer demand for higher availability on Windows. The new Datacenter High Availability Program strengthens the support and services model, expands the range of support providers, and merges the Joint Support Queue (JSQ) with the new Microsoft High Availability Resolution Queue (HARQ). The improvements to the support and services model enable vendors to act in a unified, consistent way. This new model ensures our mutual customers they can achieve the highest levels of reliability and availability from the Datacenter Server platform. In addition, the Datacenter High Availability Support Program has added change management and configuration auditing services as required practices to participate in the program.

Manageability

Management capabilities delivered with Windows Server 2003 are designed to simplify and automate the management of Windows environments while providing the flexibility and reliability necessary to meet the business needs of customers. Windows Server 2003 includes new and enhanced management capabilities to address the challenges faced by customers and improve the manageability of Windows Server environments. Key highlights include:

- **Active Directory Enhancements.** Active Directory in Windows Server 2003 provides customers increased flexibility and manageability. Examples of the enhancements include secure credential and certificate management to provide a consistent single sign-on experience; health monitoring visibility to easily monitor trusts and replication activity; improved interfaces (e.g., multi-select and bulk-edit users, frequently save used searches, Resultant Set of Policy (RSOP), new setup wizards and DNS "self-diagnostics"); domain rename to allow customers to easily rename one or more already deployed domains and create a different domain-tree structure; design flexibility via Cross-Forest Trust, enabling autonomy with interoperable authentication and share files and other resources across forests; schema enhancements to easily redefine attributes or class definitions and deactivate unused or no longer needed elements.

Active Directory has undergone SAP's "SAP BC-LDAP-USR" certification process. This SAP certification indicates that Active Directory has been thoroughly tested and approved at SAP's Integration and Certification Center (ICC) for use with the SAP and mySAP Enterprise Portal products. The integration of SAP products with Active Directory provides strengthened security, increased manageability and lowered administration costs for identity management. Additionally, customers avoid the costs related to acquiring products and services to integrate their SAP systems within the Windows environment – that enterprise integration comes built in.

- **Policy Based Management.** Policy-based management provides fine-grained control over the definition and enforcement of IT policies. Policy-based management enables 'one-to-many' management, making it almost as easy to manage very large distributed systems environments as to manage a single system or user, once the policies have been defined. Windows Server 2003 unleashes the power of policy-based management via improved Group Policy infrastructure, new and vastly improved Group Policy management capabilities, and broad support for policy-based management across server components.
- **Automated Deployment.** Remote Installation Services (RIS) enables fully automated script-based or image-based deployments to servers and desktops. In conjunction with Windows PE, the new Windows pre-installation operating system environment, RIS enables complete automation of highly customized deployments. The new Automated Deployment Services (ADS) includes a new set of imaging tools developed by Microsoft and a secure, remote-able infrastructure for rapidly deploying and re-deploying servers in high-bandwidth data center environments. In addition, ADS offers a secure, reliable script execution framework that lets administrators perform script-based administration on 1,000 servers as easily as they once did on a single server.
- **Effective User Service Management.** IntelliMirror[®] – the ability to provide users with consistent access to their applications, roaming user profiles, and user data, from any managed computer – even when they are disconnected from the network, is enabled by

Windows Server 2003 technologies such as Active Directory, Group Policy, Software Installation, Windows Installer, Folder Redirection, Offline Folders, and Roaming User Profiles. This also enables centralized backup of user data and configuration files by the IT organization. The volume shadow copy capabilities enable automated point-in-time backups of user data and provide self-service capabilities to allow users to find and restore lost or corrupted files. Together, these capabilities result in high levels of user productivity, satisfaction, and data safety.

- **Enhanced Security Management.** Windows Server 2003 provides powerful capabilities to establish and manage the security of your Windows environment. The ability to restrict and delegate rights for specific administration roles, software restriction policy enforcement, strong password requirement enforcement, and the ability to deliver highly managed user environments minimizes the risk of unintentional or deliberate security breaches. Also included is Software Update Services (SUS), a solution that enables automated download of security & critical operating system updates and gives administrators control over the testing, staging, distribution, and application of these updates within their organizations.
- **Scalable Operations Management.** Remote administration is enabled via Terminal Server, Windows Script Host and Windows Management Instrumentation (WMI), the management infrastructure that provides access to over 10,000 system objects in Windows Server 2003 via application, scripting, and command line interfaces. WMI allows fine-grained discovery, monitoring, control, and reporting of system and application settings and state. Windows Server 2003 also includes built-in performance monitoring, logging, tracing, and system recovery capabilities to enable quick troubleshooting and resolution of abnormal operating conditions. With the Microsoft Services for UNIX 3.0 product (a separately licensed add-on), Windows Server 2003 delivers a complete UNIX environment on Windows and allows IT organizations to leverage their investments in UNIX scripts and expertise to do unified management of Windows and UNIX environments.
- **Windows System Resource Manager (WSRM).** WSRM enhances application availability and quality of service by providing control over application CPU and memory utilization, making it easier to run mixed application workloads on a single server. You can use WSRM to manage multiple applications on a single computer, users on a computer on which Terminal Services are installed, IIS app pools, or virtual machines. Managing resources with WSRM improves system performance and reduces the chance that applications, services, or processes will interfere with the rest of the system. This aligning of IT resources with business priorities creates a more consistent and predictable experience for users of applications and services running on the computer. WSRM's accounting tracks resource usage, which results in improved understanding of application resource utilization; this accounting data can serve as the basis for charge backs and capacity planning. WSRM is offered on 32-bit and 64-bit versions of Windows Server 2003, Enterprise and Datacenter Editions.
- **Remote Desktop for Administration.** Windows 2000 Terminal Services remote administration mode is called "Remote Desktop for Administration" in Windows Server 2003, and supports the Remote Desktop Protocol (RDP) 5.1 feature set. This feature improves and simplifies the remote support of SAP servers. Terminal Server lets you deliver Windows-based applications, or the Windows desktop itself, to virtually any computing device—including those that cannot run Windows. When users run an application on Terminal Server, the application execution takes place on the server, and only keyboard, mouse and display information is transmitted over the network.

Terminal Server helps users become more productive by enabling access to current applications on any device—including under-powered hardware and non-Windows desktops. And because Terminal Server lets you use Windows anywhere, you can take advantage of extra processing capabilities from newer, lighter-weight devices such as the Pocket PC.

SAP NetWeaver

The SAP NetWeaver solution is designed to be fully interoperable with Microsoft .NET and J2EE standards

SAP NetWeaver is the comprehensive integration and application platform from SAP. SAP NetWeaver (formerly called mySAP Technology) marks SAP's adoption of an Enterprise Services Architecture as it moves forward into the new century. This open technology platform has powered the tight integration of a Portal and Exchange infrastructure to unify people and business processes.

The NetWeaver solution - designed to be fully interoperable with Microsoft .NET and J2EE (IBM WebSphere in particular) standards - includes a portal infrastructure for user-centric collaborations; the SAP Web Application Server to run applications and provide Internet connectivity; and the Exchange infrastructure for process-centric collaborations.

64-bit performance

NetWeaver's Web Application Server was designed to run in the 64-bit environment, resulting in high levels of speed and reliability. Operating in an environment with Windows Server 2003 and SQL Server 2000 Enterprise Edition (64-bit), it maximizes the potentials of 64-bit computing.

Scalable architecture

SAP NetWeaver delivers a coherent, scalable architecture that can handle the complete range of enterprise solutions across heterogeneous systems and company boundaries. The underlying SAP Web Application Server uses software-based dispatching to distribute requests to all Web Application Server instances running in a clustered environment. The workload of the machines in the cluster is determined from regularly received information. Transparent load balancing with SAP Web Application Server is session based; if one request is sent to SAP Web Application Server, all subsequent requests during the same session are sent to the same SAP Web Application Server instance.

High availability

SAP Web Application Server contributes to the fail-over strategy at the application-server level and at the component level. With SAP Web Application Server, requests are automatically distributed to other SAP Web Application Server instances if one server breaks down. This scenario increases the overall throughput and is supported through Windows Loadbalancing, an out-of-the-box feature of Windows Server 2003.

Security standards

SAP Web Application Server supports state-of-the-art Internet security standards such as HTTPS, Secure Sockets Layer (SSL), and Lightweight Directory Access Protocol (LDAP). It provides secure communication between all client and server components, authentication and single sign-on capabilities, central user administration, digital certificates, digital signatures, and auditing capabilities.

Monitoring and administration

SAP Web Application Server's agent-based architecture acts as a common starting point and gives administrators a view of monitored components and their performance. Quick reaction to various types of

alerts and exceptions, performed either automatically or manually by the administrator, reduces costs and helps ensure continuous operation.

Cross Application Foundation

NetWeaver is the foundation for xApps and the full line of SAP business solutions. Debuting in 2002, SAP's Cross Applications (xApps), which pull together data and events from various heterogeneous systems, confirmed the huge potential of this platform to solve your growing concern with openness, integration of existing applications, and increased flexibility/scalability.

Enterprise Services Architecture

SAP's Enterprise Services Architecture extends the concept of Web services to an enterprise-class business architecture. An Enterprise Services Architecture (ESA) expands the concept of Web services into a services-based, enterprise-scale business architecture. While Web services are merely a technical concept, the ESA is the blueprint for complete and services-based business solutions.

SAP .NET Connector

With the new SAP .NET Connector, companies can extend SAP solutions powered by SAP NetWeaver with applications built for the Microsoft .NET platform. This connector offers bi-directional access so SAP applications can access and integrate .NET services. At the same time, projects developed in a .NET environment can access SAP business functionality. SAP .NET Connector comes with comprehensive support for the Visual Studio.NET integrated development environment, allowing the .NET programmer to work completely within Visual Studio.

MIGRATING TO WINDOWS SERVER 2003

Businesses should implement Windows Server 2003, Enterprise Edition or Windows Server 2003, Datacenter Edition 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 Server 2003 offers you a variety of options that cost-effectively and efficiently meet your requirements. For example, many SAP R/3 users are upgrading to mySAP Business Suite solutions. From a strategic point of view, upgrading the operating system at the same time as the SAP applications represents an excellent opportunity to take advantage of the price/performance and availability qualities of Windows Server 2003.

At the same time, the Microsoft/SAP combination offers the opportunity to gradually implement the outstanding functionality of mySAP application components where businesses want to avoid the "rip and replace" of established operating system and R/3 architectures. The mySAP Business Suite enables the addition of application functionality around the core R/3 system. For example, SAP DataWarehousing can be implemented on a Windows Server 2003 and then plugged back in to the core R/3/NT or 2000 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. However, Microsoft recommends that businesses implement Windows Server 2003, Enterprise Edition or Windows Server 2003, Datacenter Edition to take full advantage of the availability, manageability, performance and TCO benefits of the combined Microsoft/SAP offering.

Important. All backup and failover systems must be upgraded in tandem with a production system installed on the same machine. This is especially necessary in light of NTFS structure changes caused by Windows Server 2003.

Determine Supported Software Upgrades

Identify the versions of Windows NT 4.0 and/or Windows 2000 that are running in your environment and determine whether you can upgrade

your computers to Windows Server 2003, or whether you must perform a clean operating system installation.

The table below lists the Windows NT 4.0 and Windows 2000 platforms and whether they can be upgraded directly to different versions of Windows Server 2003. You do not need to reinstall applications on platforms that can be upgraded directly to Windows Server 2003.

Supported Upgrade Paths to Windows Server 2003

Platform	Upgrade to Windows Server 2003, Standard Edition	Upgrade to Windows Server 2003, Enterprise Edition	Upgrade to Windows Server 2003, Datacenter Edition
Windows NT 4.0 Server – Standard Edition			
Windows NT 4.0 Server – Enterprise Edition			
Windows 2000 Server			
Windows 2000 Advanced Server			
Windows 2000 Datacenter Server			

If you have computers in your environment that are running operating systems that cannot be upgraded directly to a version of Windows Server 2003, you must do one of the following:

- If you need to migrate applications that are located on those computers, upgrade the computers to run an operating system that you can upgrade to Windows Server 2003.
- Perform a clean installation of Windows Server 2003 on those computers.

How to upgrade from Windows NT 4.0 or Windows 2000

If you are currently running Windows NT 4.0 or Windows 2000, you can upgrade to Windows Server 2003. Note that the Terminal Services feature in Windows Server 2003 replaces Windows NT 4.0, Terminal Server.

The information below outlines the steps you should take to prepare your system for upgrading to Windows Server 2003, as well as how to begin the Setup program using the Windows Server 2003 CD-ROM or a network server.

Note. This outline serves as an overview of the migration process. For detailed preparation and installation instructions, please refer to the Windows Server 2003 product documentation and the Microsoft website at http://www.microsoft.com/technet/prodtechnol/windowsserver2003/pr oddocs/entserver/installing_windows_2000_server.asp.

Before you begin

1. Make sure your computer meets the system requirements to run Windows Server 2003.

Check your hardware specifications to see if they meet the minimum system requirements for upgrading to Windows Server 2003.

2. Make sure your hardware and software are compatible with Windows Server 2003.

For the most recent information on compatible applications for products in the Windows Server 2003 family, see the Windows Server Catalog (<http://go.microsoft.com/fwlink/?LinkId=4303>). 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 familiarize yourself with information about hardware compatibility for products in the Windows .NET Server 2003 family by visiting http://www.microsoft.com/technet/prodtechnol/windowsserver2003/proddocs/entserver/hardware_compatibility.asp

3. Read the release notes.

Relnotes.asp is located in the \Docs directory of the Windows Server 2003 CD-ROM. This file contains important usage information about hardware, networking, applications, and printing.

You should also obtain the latest SAP notes for installing or upgrading the operating system.

4. Determine whether your current operating system is one from which you can upgrade to Windows Server 2003.

Upgrading is either replacing Windows NT 4.0 (with Service Pack 5 or later) or Windows 2000 with a product in the Windows Server 2003 family. Installing means completely removing the previous operating system, or installing a product in the Windows Server 2003 family on a disk or disk partition with no previous operating system. If you upgrade, Setup automatically installs Windows Server 2003 into the same folder as the currently installed operating system.

Please refer to the table above for Windows operating system upgrade compatibility.

5. Prepare for upgrading an existing domain.

Microsoft recommends that you plan the roles your servers will have within domains in Windows Server 2003 before running Setup. However, you can still adjust these role assignments after Setup. Review the Windows Server 2003 online Help on upgrading an existing domain.

- For upgrades in any domain where all domain controllers run Windows NT 4.0, you should decide whether you want to upgrade your domains by first upgrading domain controllers and then member servers, or vice-versa.
- For upgrades in any domain where one or more domain controllers run Windows 2000, upgrade the schema (before upgrading the operating system) using a tool located on the Windows Server 2003 installation CD.

Note. When domain controller upgrades are complete, review concepts about domain functional levels and, if appropriate, raise the functional level.

6. 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.

7. Prepare to upgrade or install clustering.

If you are upgrading from Windows 2000 to Windows Server 2003, Enterprise Edition on cluster nodes, you might be able to perform a rolling upgrade of the operating system. In a rolling upgrade, you sequentially upgrade the operating system on each node, making sure that one node is always available to handle client requests. When you upgrade the operating system, the Cluster service is automatically upgraded also. A rolling upgrade maximizes availability of clustered services and minimizes administrative complexity.

If you are upgrading from Windows NT 4.0, Enterprise Edition to Windows Server 2003, Enterprise Edition on cluster nodes, you cannot perform a rolling upgrade. To maintain cluster availability, you must first upgrade to Windows 2000, then to Windows Server 2003, Enterprise Edition. You can perform a non-rolling upgrade directly from Windows NT Server 4.0, Enterprise Edition to Windows Server 2003, Enterprise Edition, which will not allow you to maintain cluster availability.

For more information, please see SAP note 112266 and http://www.microsoft.com/technet/prodtechnol/windowsserver2003/proddocs/entserver/installation_and_upgrading_of_cluster_nodes.asp.

Note. In a cluster upgrade, SAP components and SQL Server must be moved to a different node before the original node's operating system is upgraded. After the upgrade, they can be restored to the original node.

8. Plan ahead for rolling back.

Windows Server 2003 does not provide an uninstall feature. You will not be able to return to your previous version of Windows after installing Windows Server 2003 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 Server 2003-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. Check the system log for errors that could cause problems during the upgrade.

Use Event Viewer to review the system log for recent or recurring errors that could cause problems during the upgrade.

3. Back up your files.

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

4. Scan for viruses.

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

5. Uncompress drives.

Uncompress any DriveSpace or DoubleSpace volumes before upgrading to Windows Server 2003. Do not upgrade to Windows

Server 2003 on a compressed drive unless the drive was compressed using the NTFS compression feature.

6. Disable disk mirroring. (Windows NT 4.0 only)

With the disk management technologies in Windows NT 4.0, you could create volume sets, mirror sets, stripe sets, or stripe sets with parity, each with specific capabilities and limitations. By using dynamic disks, introduced with Windows 2000, you can take advantage of similar technologies, and with Windows Server 2003, Enterprise Edition you can also extend dynamic volumes without repartitioning or reformatting. This transition from the technologies used in Windows NT 4.0 means that you must make certain choices before running Setup for Windows Server 2003, Enterprise Edition.

7. 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.

8. 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 Server 2003 Setup attempts to automatically detect devices connected to serial ports, and UPS equipment can cause problems with the detection process.

9. Stop all applications.

All applications, including SAP systems and SQL Server, must be closed before beginning the upgrade.

Start the upgrade

To start an upgrade using the Windows Server 2003 CD-ROM:

1. Insert the CD-ROM in the drive and run the Setup program.

If the Setup program does not launch automatically when the CD is inserted, use Windows Explorer to run Winnt32.exe from the CD.

2. Follow the Setup instructions.

To start an upgrade using a network connection:

1. On a network server, share the installation files.

Insert the CD-ROM and share the CD-ROM drive, or copy the contents of the CD-ROM to a shared folder.

2. On the computer on which you want to install Windows Server 2003, 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.

3. Run Winnt32.exe.

4. Follow the Setup instructions.

How to migrate to SQL Server 64-bit

The 64-bit version of SQL Server 2000 opens a new chapter in high-end database computing. It is ideally suited to memory-intensive data applications such as mySAP Business Intelligence (mySAP BI) and mySAP Supply Chain Management (mySAP SCM) that require 64-bit support for optimum results. In short, any database application with

memory-sensitive workloads that requires working data sets larger than 4 GB to be loaded in memory will benefit from the higher memory support of the Microsoft 64-bit platform.

SAP and Microsoft work closely together to deliver SAP's business solutions on the Microsoft 64-bit platform. As a result, SAP now offers extremely sophisticated, stable products with enhanced performance on Microsoft SQL Server 2000. SAP is convinced that SQL Server 2000 64-bit combined with Windows Server 2003 64-bit is a winning platform not only for demanding data warehousing and supply chain management applications but also for classic enterprise resource planning applications due to its superior reliability, availability and performance.

Migration procedures

Important. These steps are for illustrative purposes only. For full instructions on migrating and copying database systems and files, please see SAP note 151603. SAP and Microsoft also strongly recommend scheduling an SAP OS/DB Migration Check before attempting this operation. The SAP OS/DB Migration Check optimally prepares you for a successful migration and supports smooth continued operations on the new platform. For more information please see <http://service.sap.com/osdbmigration>.

- 1. On the 32-bit node, shut down the SAP system that is using the database.**
- 2. Detach this database using SQL Server Enterprise Manager.**
Mark the database and select **All Tasks -> Detach Database** from the **Action** menu.
- 3. Install the 64-bit version of SQL Server on the 64-bit hardware.**
Follow the installation instructions included in the SQL Server product documentation set.
- 4. Copy the data and log files to the 64-bit system.**
Copy the data and log files on the target machine into the corresponding target directories.

Alternatively, if you are using a remote database, connect the new server to the storage of the database.

- 5. Attach the database using SQL Server 64-bit Enterprise Manager.**
Mark the **Databases** branch and select **All Tasks -> Attach Database** from the **Action** menu.
- 6. Initiate post-processing.**
Follow the post-processing procedures outlined in SAP note 151603 or recommended by the SAP OS/DB Migration Check.

CONCLUSION

Migrating to Windows Server 2003 will significantly improve the technological functionality of any enterprise that plans to implement mySAP Business Suite 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 that support mySAP 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 Server 2003 builds on the core platform strength found in Windows 2000, enabling businesses to build a consistent, reliable, enterprise IT architecture that 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 demonstrates the extent of this collaboration as well as the determination of both organizations to offer the best enterprise-wide solutions to the marketplace.

Businesses now have the opportunity to implement long-term strategies that embrace and respond to the challenge of an interconnected business world and the new demands of customers, partners and suppliers. SAP in conjunction with Windows Server 2003 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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EMEA **MICROSOFT SAP**
COMPETENCE CENTER

Connecting Business with Success

Microsoft SAP Competence Center

in Walldorf, Germany:

Email: mssapcc@microsoft.com

Phone: +49 (0) 6227 73 17 10

Microsoft®