

# Microsoft Windows Vista Migration

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Addressing the issues of operating system upgrades  
and migration

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## ► INTRODUCTION

### Methodology

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The information to support this White Paper has been gathered by reviewing material published by both Microsoft and Altiris, as well as internal documents produced by Altiris that provide deeper technical insights into the issues involved. We have also undertaken extensive research of publicly available material and Butler Group's own published research.

### Background

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#### A Very Short History of Vista

Windows Vista (originally codenamed Longhorn) has been one of the greatest software challenges in history and has resulted in a completely re-written operating environment that has over 50 million lines of code. The scale and complexity involved in its development has resulted in a number of high-profile delays, with the first production release still eagerly awaited. For those actively involved in the testing of this new operating system, Vista offers a new benchmark in terms of reliability and security on the desktop.

## ► THE DRIVERS FOR MIGRATION

### Enhanced Features Within Vista and Their Applicability and Value

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Windows Vista offers improvements to all aspects of Microsoft's desktop operating environment. Some are important architecturally to those building applications; some are aesthetically pleasing and are likely to improve the user's experience; and some have clear business value. In this section we will give a short description of these features and their value.

#### Architecture and Development Improvements

- **NET Framework 3.0** (previously called WinFX: Managed Code Programming Model). The centerpiece of Windows Vista's new developer platform is that it allows developers to write better code more easily, which is easier to integrate with other processes and has an enhanced interface. NET Framework has the following key components:
  - **Windows Workflow Foundation (WWF)** provides a programming model, engine, and tools for building workflow-enabled software. Embedded WWF is one of the most innovative parts of Windows Vista and is the first time that workflow has been embedded in an operating system.
  - **Windows Presentation Foundation (WPF), XAML, and Aero** are enhanced interface components that make Windows applications behave the same when running locally or remotely, and that contain both two and three dimensional graphics primitives and widgets. Partially because it is vector-based it means it delivers sharp fonts, smoother video playback, and a GUI that can scale and adapt to a variety of display devices. The WPF is the basis on which the new Aero interface is built. This interface is optional and requires an enhanced graphics card in order to run (see hardware requirements).
  - **Windows Communication Foundation (WCF)** offers significant time-savings when it comes to building connected systems by simplifying the way connections between services are defined and managed.
  - **Windows Future Storage (WinFS)** is a new data storage engine that Microsoft is building on top of SQL Server 2005 but it is not shipping it in the first release of Windows Vista. WinFS is going to provide a highly sophisticated indexing technology built on the NTFS file store that will improve search and information management capabilities for both structured and unstructured information.

- The architectural improvements may not mean that much to a senior business user but the result that it brings is a better, more stable environment and one on which it is easier to implement web based and connected solutions, which is in itself of significant value.

## Features Offering Real Business Value

- **Security.** Windows Vista is the first operating system built from the ground up using the Security Development Lifecycle (SDL) model. SDL is a process of secure design, coding, testing, review, and response designed to remove vulnerabilities and minimize exposure to attacks. Windows Vista includes a number of significant security enhancements that will be of immediate benefit post migration.
  - User Account Protection is a mechanism which ensures that even if you log on to a computer with administrative permissions that the applications you set off, run with reduced levels of permission. This stops viruses and other malware from exploiting a high level of access authority to access areas that should not have been permitted.
  - Digital Identity support (Cardspace formerly infoCard) that offers support for any digital identity system providing consistent user control of digital identity, replacement of password-based Web login, and improved user confidence in the identity of remote applications.
  - Volume-based encryption (Windows BitLocker) so that information on disks and devices can be secured based on policy definitions.
  - Windows Defender is the version of Microsoft's anti-spyware solution included within Windows Vista that will reduce the immediate need for additional Anti Spyware software.
  - Internet Explorer Protected Mode runs Internet Explorer processes with reduced rights, allowing the browser to manipulate only the files that are stored in a protected space, which will prevent malicious programs that have been downloaded from accessing the Windows subsystem.
  - The Windows Firewall in Windows Vista has been upgraded with multiple enhancements over the Windows XP SP2 Firewall. These enhancements include: filtering of both incoming and outgoing traffic, an MMC snap-in for managing via group policies, integrated filtering, and IPSec protection settings, and rules that can be configured via AD.

For many the improved security will be a major reason to consider the upgrade, particularly if there have been significant breaches in security in the past. The architecture has major improvements in this respect.

- **Support for Legacy Windows and UNIX Applications.** Virtual PC Express provides better legacy support without the need to upgrade PC applications. It allows most legacy Windows applications to run unmodified in a virtual Windows environment, and therefore reduces greatly the need to re-write or upgrade older applications. The subsystem for UNIX enables UNIX-based applications to run in a virtual UNIX space under Windows Vista Enterprise – just one of six versions being offered by Microsoft.

## Additional Useful Benefits

- **New User Interface.** The most visible improvement to Vista is the interface. Depending on the capabilities of the computer's graphics card, users will be able to experience the new Aero Glass interface. If a machine's graphics chip-set is not capable of running the Aero Glass interface, then it will default to Aero Express – a Windows XP-like interface. The Aero features include:
  - Virtual Folders – the contents of which are dynamically generated by the operating system's underlying search technology.
  - Flip, Flip 3D, – allows the user to easily switch between different applications based on tabs rather than the old Alt +Tab mechanism. Flip 3D presents all open applications and documents in a three-dimensional, stacked view.
- **Desktop search** – There is a system-level desktop search feature that lets users easily find information on their PCs and organize it using virtual folders.

- **RSS Feeds.** Microsoft has embedded Really Simple Syndication (RSS) capabilities into Windows Vista, and they can be used for subscribing to human-readable information feeds and implementing sophisticated publish/subscribe data integration services.
- **Improved support for new Internet Protocol IPv6.** Enhances security and also makes it easier to incorporate video and audio into applications.
- **Metro advanced printing environment.** A device- and application-independent printing architecture called XML Paper Specification (XPS) based on XML that allows documents to retain their exact formatting in any application and when printed. (Functionally similar to PDF and Postscript) and makes it easier to use and share documents.
- **Internet Explorer 7.** Vista comes with a new release of Internet Explorer which has new Active X security controls and supports encrypted feeds.

In Butler Group's opinion, many of the 'Additional User Benefits' are 'nice-to-haves', but do not deliver the main drivers that will promote migration, having less obvious immediate business value. In many cases, these new features are available today as add-ons or through third-party products and utilities; but by including them as part of the operating environment, Microsoft is undoubtedly adding value and reducing cost. Microsoft is very aware that visual styling is a great attraction to users, and this will no doubt add to Windows Vista's overall appeal – it may even improve usability.

## The Vendor, Customer, and Market Pressures to Migrate

### The Imminent Release of Office 2007

Bill Gates told attendees at an Office developers' conference that he thinks the majority of people will upgrade both to Microsoft Office 2007 and Windows Vista at the same time. "We've made Office backwards-compatible so you don't need Vista to run it. But there are a lot of features in Office 2007 that can really take advantage of the Vista experience."

In fact, the pressure from corporate users to migrate is not likely to cause an immediate rush. 40% of big companies in the US and in Europe have moved to a licensing model for Office, so they can upgrade whenever they want to. The decision to upgrade or migrate will therefore be determined by the cost and effort of doing so, and that will not necessarily be linked to license costs.

Many sales of Windows and Office are tied to the purchase of new PCs which have the software preloaded and many organizations are refreshing PC hardware more frequently because PC hardware has moved on rapidly since the introduction of Windows XP back in 2001. With the significant upgrade in performance required by Windows Vista, particularly the requirements needed to support its new interface; hardware refresh is likely to be a factor driving migration into Windows Vista (see hardware requirements below). In fact it is estimated that some 75% of organizations will undertake migration as part of a hardware refresh cycle.

There are enhancements to Office 2007 in the ease of use, navigation, and interoperation; but to counter this it has to be said that Office 2007 is twice the code size of Office 2003. Judging by previous corporate experience, Butler Group would not expect corporate users to adopt Office 2007 quickly, as they normally wait for the second Service Pack release to ensure stability of the product before considering such a move. However, there are still many organizations on Office 97 and a very large number on Office 2000, who will probably skip editions and go to Office 2007 when they finally upgrade, and this has become more urgent as support for Windows 2000 is being withdrawn.

### Individual and Personal Use

Individuals who buy new computers for home use are going to be buying Windows Vista Premium ready machines that will make full use of the new operating system's capabilities and be able to use the new Aero Glass interface. This will lead to a desire by individuals to replicate their experience in the office. This is potentially also true of organizations that purchase new laptops for their most mobile workers if they come pre-installed with Vista. The trend is moving to the use of notebooks for corporate use even if the user is not that mobile. There are many reasons for this including energy efficiency and the mobility of users within the office environment, and also the reduced differential in pricing between mobile and desktop machines. Having Vista Capable and Vista Premium Ready Laptops being used for both personal and corporate use might prompt users to pressure for an upgrade more widely.

Butler Group believes that pressure from end users will drive initial Windows Vista deployments, and that over time, organizations will begin to appreciate the business value of Windows Vista's security, reliability, and interoperability features, and that adoption will then accelerate.

## ► MIGRATION PLANNING

### Hardware Requirements

- Migrating to Windows Vista is not at all a trivial matter, and has to be carefully planned as there are likely to be a number of hardware issues. There are two discrete levels of hardware compatibility, Vista Capable and Vista Premium Ready. Windows Vista Capable machines can run the operating system with the XP style interface, whereas Vista Premium Ready machines can take full advantage of the three dimensional enhancements available in Aero Glass. Many of today's corporate PCs ship with integrated graphics chip-sets, and few, if any of these, will be able to run Aero Glass.
- For a computer to be labeled Vista Capable, the computer must run an 800 MHz processor, come with 512MB of memory, and have a DirectX 9-capable video processor. To be Vista Premium Ready, the system needs to run at 1GHz, have 1GB of memory and have a more powerful 128 Mb video card to meet the Windows Aero specifications. The graphics requirement will be problematic for many users, since so many business PCs come with integrated graphics, such as the Intel 915 chip, which is not designed for something like Aero.
- Being able to run Aero is the key differentiator between Capable and Premium, along with the extra memory for improved performance. Also, Vista Capable PCs will require 20GB of hard disk space, while Vista Premium PCs will need 40GB of space available to do an upgrade because temporary and rollback files need additional space until the migration is successful and the code size of the new operating system is considerably larger. What this means in practice, is that many machines which have been partitioned to be efficient for XP do not have the required space on their system partitions, and so will need to be re-partitioned.
- Although some analysts have suggested that nearly half of the machines shipping today might be Vista Capable, it is quite likely that general rollout will come with the next wave of machines that will be Vista Premium ready, and that mainstream adoption will occur during 2008. It is also clear that up until that date many organizations will be undertaking tests, piloting the new software, and application re-packaging which will keep them very busy during 2007.

### Application Compatibility

- We mentioned in the features section that there was better support for legacy and UNIX Applications. This ability is facilitated by running legacy (and UNIX) applications in a separate virtual area that provides the appropriate operating environment for them to run without the need for upgrades and amendments. This is an important point as the cost and potential migration problems; particularly of legacy applications has been a strong deterrent in the past against migration.

These virtual environments eliminate previous upgrade issues affecting legacy applications and enable them to run unchanged under a different host operating system.

### Available Versions, Costs, and Upgrade Paths

#### Editions and License Costs

Vista comes in a number of editions to suit both the personal and business user. In Butler Group's (and most other commentators') opinion, the only versions relevant for the business user are Windows Vista Business and Windows Vista Enterprise. Windows Vista Business is roughly equivalent to XP Professional whilst Windows Vista Enterprise is designed to meet the needs of large global organizations and includes additions such as Microsoft's drive encryption software (BitLocker) and the Subsystem for UNIX-based Applications (SUAs) as well as multi-language support.

The full list of releases with pricing options is provided as an Appendix to this White Paper.

### Upgrade Options

Enterprise Edition will be available only to customers with a Software Assurance or Microsoft Enterprise Agreement. Given that customers with as few as 5 PCs can qualify for this it is expected that this will be the route for the majority of organizations.

For some smaller businesses, the Windows Anytime Upgrade license, which allows you to upgrade some editions of Vista to a higher edition, may be of interest.

Windows Anytime Upgrade is a helpful new feature for Windows Vista, as compared to the upgrade of previous versions of Windows which required users to purchase the physical media of the version they wished to upgrade to, the Windows Vista installation DVD will ship with the upgrade versions digitally encrypted on the DVD. Purchasing and downloading an upgrade license will unlock these versions and allow them to be installed on a user's machine.

### Migration Paths Supported by Microsoft

**Windows NT** – Microsoft does not offer a direct migration for Windows NT users who would need to go through two migrations via either Windows 2000 or XP.

**Windows 2000** – Users can migrate to either XP or Vista but the hardware requirements are likely to be a burden on the Vista migration until a significant hardware refresh cycle commences.

**Windows XP** – Users can migrate to Vista if their hardware is compatible.

### Supporting Pre-migration Evaluation Tools Offered by Microsoft

Microsoft is delivering a number of tools that can be run in advance of migration to aid the planning process.

- Microsoft's Application Compatibility Toolkit – to help you identify applications that will:
  - Upgrade to Vista without issues.
  - Need enhancements to work with Vista.
  - Need to be prepared to run in a virtual space.
- Microsoft's Windows Vista Upgrade Advisor is a downloadable tool that reviews your system for hardware capabilities, including the video card capabilities and space available, and provides a review of the upgrades required to run the different versions of Vista.

## Overview of the General Migration Process

There are a number of ways to conduct an operating system migration. These can include the basic system upgrade (or in-place installation) of the new operating system; the side-by-side computer replacement, which involves moving data from one computer to another; and the clean (or wipe-and-load) installation, which reuses the same system but erases the hard disk to perform a new installation. There are essentially two-key questions that need to be asked:

- Is the migration going to be carried out to new hardware or to the existing hardware?
- Should the users' personality settings be captured and transferred or restored?

The answers to these questions will then influence which of the three styles of migration should be used, and how the migration should proceed:

- **In Place Upgrade:** The in place upgrade involves a visit to the user's machine and potentially their involvement. This is fine for the home user, but not an efficient way to manage large numbers of users or to create a consistent standard installation that will be easily managed in the future. It also leaves old operating system files on the machine and potentially many outdated applications and data.

- **Side-by-Side Migration:** A side-by-side migration involves taking a particular machine and transferring the user's data onto a newly-established operating environment on a new or cleaned machine close by. It requires a support lab and staging area and may be appropriate if machines are being cascaded from power users to less demanding users. User settings can be transferred via this method, but it is better to use more sophisticated tools to capture the 'personalities' and users' business data from users' remote machines centrally, e.g. via an LDAP Directory, and replace or clean all of their machines prior to an automated, remotely managed installation (often called Zero Touch). However, this method of migration still imposes a substantial burden on support staff.
- **Clean Installation:** Creating a standard installation (with a base machine load) on a new machine or cleaned machine (using a wipe and re-load) is a far better way to migrate users. To reduce complexity and increase standardization, organizations should select a combination of hardware and software to distribute to all users. This means putting in place a Standard Operating Environment (SOE) that can serve as the baseline for all system installations. The SOE should include standard hardware drivers, core operating system features, and core productivity applications – especially if they are under volume licensing and core utilities. It should also include a standard set of security features as outlined in the organization's corporate policy. Using such an SOE can vastly reduce deployment challenges. Users' personality settings can also be captured and restored as part of this process if required.

## ► MICROSOFT'S MIGRATION SUPPORT

### What Microsoft is Making Available to Support Migration

For home (or stand-alone) users, Microsoft is providing the Microsoft Migration Assistant. This manages the in place upgrade described above, and whilst it is not a satisfactory migration method for large numbers of business users, it is perfectly adequate for most personal users, and because it is easy to roll back it is also a safe upgrade option for them.

For businesses there is a far more extensive set of best practices and tools to support the migration process. These include:

- **Microsoft BDD** – Microsoft Solution Accelerator for Business Desktop Deployment (BDD) is a set of best practice guides and workflows providing end-to-end support and automation for large-scale deployment of Microsoft Windows Vista and the 2007 Microsoft Office system. It has been designed to help customers plan and automate as much as possible of the migration process. BDD contains the following sub components:
  - **Microsoft Windows Pre-installation Environment (WinPE)** for booting computers into a 32-bit staging environment to install Windows.
  - **Microsoft Windows Automated Installation Kit (WAIK)** is for configuring unattended setup answer files.
  - **System Image Manager (SIM)** is used to manage Windows images.
  - **ImageX** is a command-line based imaging tool used to deploy/create .WIM images.
  - **Microsoft Windows Deployment Services (WDS)** for starting Windows PE on destination computers across the network.
  - **Microsoft Application Compatibility Toolkit (ACT)** for gathering application inventory as well as testing and remediation of application-compatibility issues.
  - **Task Sequencer** is a standalone tool borrowed from System Center Configuration Manager (SCCM) to script tasks together.
  - **User State Migration Tool (USMT)** sits on top of the SMS OS tools, allowing administrators to specify which user settings are to be moved over to the new deployment. This is far more than just MyDocs and your IE Favorites; it includes favorite fonts, display settings, Outlook Express, or Microsoft Office, and more. Theoretically, it is possible to swap XP for Vista and upload every Microsoft application to the new OS using USMT.

- **Systems Management Server (SMS)** is a separate support environment through which migration can be managed. It includes support for WIM (Windows Imaging) to load a SOE and provides tools such as the OS Deployment Feature Pack, which contains a small-footprint OS, called Windows PE (Pre-installation Environment). Windows PE can be used in conjunction with the SMS and is used to save the users state information to the local disk by running a USMT script and to automatically restore it after the new reference WIM has been applied.

These main tools are augmented by a whole series of additional and separate support tools that are too technical to go through in detail here. The point to note however, is that they involve a great deal of scripting and manual editing of XML definitions to prepare the final migration scripts that will automate the process of migration. In any event Microsoft states that a great deal of detailed testing should be undertaken before attempting to apply these scripts and that backup and restores should be tested and proven before the process is undertaken for real.

Butler Group would note here that Microsoft's best practices state that, wherever possible, duplication should be eliminated. For instance, as few as possible unique machine configurations should exist in an organization, and similarly, as few tools as possible should be utilized in order to accomplish migration tasks. It is one of Altiris' aims to deliver fewer and better integrated migration tools and thus improve upon Microsoft's own best practices.

## Lite Touch and Zero Touch Migration

The aim of a successful business-led migration is to automate as much as possible of the process, so that there is no manual intervention required. Microsoft, with its BDD cannot do this without at least minimal intervention, and thus calls this a 'Lite Touch' migration. It is called Lite Touch because when ImageX is used with WDS, a button (F12) has to be pressed on the machine that is being imaged during start up to load the WinPE image and start the imaging process. In conjunction with Microsoft's SMS it is possible, although complicated, to fully automate the process and deliver 'Zero Touch' deployments, although in practice we believe that there will be many circumstances where some intervention will be required. Tools such as Altiris' Deployment Solution can do Zero Touch imaging without having to add extra software.

## Limitations of Microsoft Migration Support

Microsoft has worked extremely hard to improve its migration support processes and has tested them on some 5 million desktops. However, migration is a very complicated and client-specific issue, with most organizations having their own unique combinations of applications and hardware that generate countless permutations and complications. Despite Microsoft's good work, and its improved Windows Image Manager (WIM) support for greater hardware independence, there are still many areas where specialized firms can add significant value to the migration process. History shows that such support can often be crucial. The following non-exclusive list gives some idea of the areas that can be enhanced, and shows how integrated systems management tools such as those provided by Altiris, can help to overcome these limitations.

Major Issues are:

- **Complexity of Installation of Microsoft BDD** – Installation of BDD is not a simple task. Unlike Altiris Deployment Solution (DS), many additional components have to be touched to install and use BDD. The components needed to install and use BDD include:
  - Active Directory, ACT, DHCP, MSXML Services 6.0, DNS, Windows AIK, NET 2.0, USMT, RIS, Office 2003 Resource Kit, and SQL.
- **Limited Inventory Management** using Microsoft Application Compatibility Toolkit (ACT). ACT can determine which applications will run on Windows Vista based on Microsoft's list of approved applications. However ACT has major limitations that include:
  - ACT gathers only basic information and stores it in a SQL database, not in a Configuration Management Database (CMDB) that can be used by other applications, as is the case with Altiris.
  - ACT is also limited to Windows machines. Altiris Inventory Solution is heterogeneous as it can inventory Windows, Linux, UNIX, Macintosh, Handhelds, and even Network Devices.
  - ACT has no zero touch inventory capability because an agent must be installed.

- Integrated systems management tools such as Altiris use a CMDB to gather additional information such as what is installed vs. what is actually being used. This information can then be used to help with license compliance and determine where they are over/under licensed during a migration.
- **Need for multiple manual interventions** – despite Microsoft's assertions regarding zero touch deployment, this requires a combination of tools and a great deal of scripting work. In the event that issues arise there will be the need to provide on site support. The BDD toolset does not have the ability to “wake up” a PC that is turned off or manage it in various different power states. Even SMS can not do out-of-band management without the use of third-party products. Therefore, a physical visit to a PC that is turned off will be required.
  - With integrated systems management tools such as Altiris, PCs can be managed in any power state even if the system is unbootable. Altiris uses several different out-of-band and in-band technologies, including WMI, AMT, and ASF, so that PCs of various different hardware and technologies are supported.
- **Lack of graphical support tools** (no single standard interface) – there is no common graphical support environment to integrate all the separate tools offered by Microsoft. BDD uses four different consoles and two command-line tools to handle migrations.
  - With integrated systems management tools such as Altiris, customers can use a single console with a common set of integrated tools. Altiris reduces the complexity of performing migrations saving time and money on training technicians to use these tools.
- **Reporting** – There is no common reporting framework and the reporting offered is minimal. The BDD toolset does not have reporting other than the basic hardware/software inventory information that ACT collects. This means that OS deployments, migrations, etc. will not be able to report their status.
  - With integrated systems management tools, such as Altiris, all aspects of a migration are tracked and can be reported on. This includes OS and migration success/failures and more.
- **Limited support for bandwidth optimization** – Microsoft does not support Multicast image deployment. Microsoft supports only limited remote installations using USMT.
  - Integrated systems management tools such as Altiris support multicast out-of-the-box. Network bandwidth may be the greatest savings in multiple deployments, along with time. At a minimum, time is saved for end-users, whilst in addition having a single packet on the wire when multiple machines are imaged (instead of many packets) allows for other work to continue.
- **Microsoft Personality Capture is limited.** Microsoft can capture personalities with USMT, but the tool is command-line driven and text based, and limited to Microsoft products out-of-the-box. Any changes to this must be researched manually, and then made to the text files manually, through edits of XML script.
  - An integrated systems management tool such as Altiris PCT has an easy-to-use GUI interface, tools to help automate third-party software migration, and has provided the settings pre-configured for over 60 common third-party applications. Additionally, the tool is highly integrated with other Altiris tools. Time savings can be found in not having to manually add third-party app support, ability to save multiple configurations, and many other features. Further, Recovery Solution integration allows a personality capture to be pulled from the saved Recovery data, reducing capture time to practically nothing.
- **Microsoft Imaging only supports Image Acquisition from a SMB Source.** Microsoft only supports image acquisition from an SMB source. This means a drive must be mapped back to a server to do imaging. Altiris Deployment Solution can use both an SMB source and HTTP source. There are three main advantages to using HTTP:
  - 1) **Performance:** HTTP is a light-weight protocol that can often be more efficient. If SMB signing is required then HTTP has even more performance advantage as the SMB signing can further increase SMB overhead.

*“...for very large file transfers the overhead could get extremely high – up to 40% in some situations”*

*<http://www.microsoft.com/technet/community/columns/secmgmt/sm0905.mspx>*

- 2) **Security:** Using HTTP as the network transport for imaging does not require firewalls to open potentially dangerous SMB ports. Most environments will already have a policy in place that allows HTTP traffic. Additionally the security of the HTTP image data store could now be controlled independently of the DS data store.
  - 3) **Ease-of-use:** HTTP allows for the use of IP addresses in all pre-boot environments. This eliminates the need to configure name resolution mechanisms that can often be confusing or problematic (especially in DOS). No special pre-boot configuration is needed to image to/from alternate data-stores. Using SMB requires that a drive be mapped to the network share.
- **Limited hands free deployment on Bare-Bones systems** – Microsoft does not support this although its newly released OSD tool supports MS RIS server. The process has many manual steps, such as selecting the image to be deployed – on every machine.
    - An integrated systems management tool such as Altiris can configure the PXE server, connect the clients to it, and push images – in a 100% automated and hands-free process. Most image deployments are on new equipment, rather than in-place. With Altiris, deployment time is reduced to simply plugging a machine in and automatically imaging.
  - **Limited Problem Resolution** (rollback, reporting, and automatic management) – The Microsoft tools when suitably scripted, will automate most of the tasks of migration, particularly when moving Microsoft-only environments. During real-world implementations problems and unforeseen events occur during some migrations.
    - An integrated systems management tool such as Altiris provides a fully-automated rollback and reporting mechanism that captures the required information required to help rectify problems. Altiris solutions' provide the following problem resolution support –
      - Undo options.
      - Integration with back-up and recovery applications.
      - Automatic Error Code handling.
  - **Windows 2000 Pro support** – Microsoft does not yet offer a migration path directly from Windows 2000 Pro to Vista, and the capability to upgrade to XP using the BDD is also not yet available with the beta 2 release. These are promised in the first production release.
    - An integrated systems management tool, such as Altiris offers a direct migration path from Windows 2000 Pro to Vista that will not require an intermediate migration.

In association with SMS, Microsoft has delivered a comprehensive set of point-based tools that when linked correctly provide most of the required migration capabilities for Vista. However tools offered by other suppliers are typically better integrated and easier to use.

## ▶ ALTIRIS' ENHANCED MIGRATION SOLUTIONS

Microsoft's BDD should primarily be looked on as a best-practice guide for deployment that Altiris embraces and complements with enterprise-ready tools. In many ways, the BDD mirrors Altiris' own 6 step migration process defined in the next section. If customers are looking to BDD as an end-to-end solution for their migration, they should recognize that BDD is really a best-practice guide, and that Altiris provides an extensive and integrated set of tools that support these best practices and where appropriate, it will make use of the tools provided by Microsoft as part of its migration solutions.

Altiris provides extensive suites for client and service management. **Altiris® Migration Suite™** and **Altiris® Client Management Suite™** both make use of the **Altiris Deployment Solution (DS)** to aid migration. Migration Suite includes the core elements needed to successfully migrate, while Client Management Suite includes a complete solution for migration as well as ongoing management of systems.

**Altiris DS** is an easy-to-use, Wizard-driven and automated-deployment solution that supports servers, desktops, notebooks, thin clients, and handheld devices from a centralized location enabling OS deployment, configuration, PC “personality” migration, and software deployment across hardware platforms and OS types.

DS provides zero touch desktop and server deployment by building a reference system using Altiris' unattended OS installation Wizard. Then once your reference system has been built with your standard OS and applications, you can mass-deploy an image of the reference system to your new and existing systems.

Altiris Deployment Solution is driven through a simple-to-use management console that contains Wizards that let you build and manage events visually. DS also enables the capture of detailed user settings and data which it then packages into a self extracting file for easy redeployment on a new computer or operating system.

**Altiris PC Transplant** – is a component of the Altiris Deployment Solution that enables the transfer of files and settings that make each PC unique — its user’s personality — to a new PC quickly and intuitively. Powerful features include cross-version support for more than 60 applications and it provides automated application installation on the new environment.

**Altiris Inventory Solution** – helps to target systems for migration and to perform pre-migration readiness assessment for both hardware and software. It provides comprehensive and accurate information to reduce the cost and complexity of application and OS rollouts.

**Wise Package Studio** – Wise Package Studio enables the migration of applications to Windows Installer (.MSI) through providing quality assurance tools, project and data management, repackaging, and customization, validation, and distribution system integration. The result is error-free, high-quality, reliable deployments that decrease packaging efforts by 50%. Wise package studio also supports the preparation of applications that will make use of Altiris' Software Virtualization Solution to run in a virtual space on a PC as well as create packages for Linux and a variety of mobile devices.

**Altiris Software Delivery Solution** – provides secure, bandwidth-sensitive distribution of applications and updates throughout an organization. Software Delivery Solution supports LAN, WAN, and remote and mobile clients from a single infrastructure, and offers advanced application management features such as application self-healing, conflict analysis, and other ongoing software management capabilities.

## Six Steps to Successful Migration

Over the years Altiris has developed a six-stage migration process that has been further refined and enhanced to support the Vista migrations. The steps and the actions taken are defined briefly below.



Figure 1: Altiris' Six-step Migration Process

## 1. Pre-Migration Readiness Assessment

The first step in the migration process is to determine exactly what you have and what you intend to migrate. A detailed checklist might include:

- Hardware compliance to the specifications required by the Vista, so that you know which machines are already compliant and what is required to bring others up to either Vista Capable or Vista Premium Ready status.
- A complete inventory of the operating systems installed and an understanding of the licensing implications of a migration.
- The technology infrastructure including the location and number of PCs, and the network infrastructure.

Altiris Inventory Solution automates and documents the asset discovery process in a Configuration Management Database (CMDB).

Systems management will then have to determine the schedule and available bandwidth to support the migration process.

## 2. Data and Settings Preservation

In the second step Altiris PC Transplant will be used to remotely and silently gather the personalities of each user's machine (or profile). The gathered information is very detailed and includes: mapped network drives, desktop wallpaper, control panel settings, dialup connections, Word Files, Excel Files templates, e-mail configuration, and other information as appropriate.

The migration administrators will then define templates, using an easy-to-use Wizard-driven interface, that determines which settings and data are to be transferred over to the new Standard Operating Environment based on the needs of different departments or groups of users.

## 3. Image Build Process

It is good practice to create a very small number of base images of the required operating system rather than making an image for every department or group of users. The base image can then have further more specific applications pushed out to it later in step 5. For customers who want to use Microsoft's Vista based WIM imaging files then Altiris can build these files automatically. Alternatively the client can make use of Altiris' established and proven imaging solution.

## 4. Software Packaging

Altiris uses the Wise Package studio to create self installing applications that have been configured and tested to ensure that they maximize the benefits of the new environment. For a lot of companies, re-packaging applications for deployment on a new OS is a big part of the migration project, and Altiris' Wise Package Studio offers extensive assistance for this process.

## 5. Software Delivery

Altiris Software Delivery includes the three major phases of building a users environment.

- Installing the base images of the operating systems.
- Using push technology to deliver the applications either by having answer files to provide required input parameters that deliver a scripted installation, or by using a pre-built snapshot of the required application with all necessary registry changes and patches applied in a single install package, which can save considerable processing time. Altiris makes use of Multicasting technology to improve the bandwidth and speed of installation.
- Personality Restoration using PC Transplant will restore personal information and data from a centralized console without any user interaction.

At this point the user's machine should be fully functional and ready for use.

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## 6. Post-migration Reporting

Altiris Migration Reporting is used once migration is complete to allow management to evaluate the completeness and effectiveness of the migration. It shows how many machines are up and running and how the new operating environment is performing, and more importantly reporting identifies which machines had problems in the migration and what needs to be done to fix them.

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## Other PC Deployment Solutions, Products, and Technologies

Alternative systems management tools to assist with Vista migration include the following:

- **CA's Desktop DNA Professional/Desktop DNA Enterprise** editions enable the capture of a PC's user personalities and their data. The suite offers an extensive capability to collect and transfer a user's files and settings between machines. It is not designed to load and manage the operating system migration process.
- **Symantec Ghost Corporate Edition** is a comprehensive enterprise tool for OS deployment, software distribution, and client migration, which incorporates multi-cast and operating system imaging techniques.
- **Tranxition's Personality Transport Professional 3.0** is an easy-to-use migration tool for Windows that provides a simple graphical interface for one-off migrations and an advanced command-line interface for administrators to drive enterprise-wide migrations.
- **LanDesk** includes asset management, device discovery, software license management, PC remote control, software distribution, and operating system recovery and migration.
- **IBM Tivoli** provides extensive Inventory discovery and systems management capabilities.
- **Custom Developed Solutions.** In some cases, System Integrators (SIs) develop custom tools to fill in the gaps that the standard Microsoft Tools leave, by developing scripts and workflows that integrate point solutions. This is particularly the case for legacy and custom applications. Butler Group recognizes that there is always a place for such custom work but stresses that where there is a solution that has been tested over many hundreds of customers and thousands or millions of desktops, then this is obviously the preferable option.

## ► INDUSTRY EXPERIENCE

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### A Review of Customer Experiences

The experience gained by Altiris is most clearly demonstrated by reviewing the many customer testimonials available on its Web site, and anyone considering this migration is strongly advised to do so.

*Please see the Altiris' online resource center at [www.easyvistamigration.com](http://www.easyvistamigration.com)*

However, here are two examples of European customers who have had highly-relevant experience:

- "The solutions of Altiris allowed us to migrate our entire workstation park of 1,500 PCs from Windows NT4 to Windows XP and Windows 2000 in merely six months. In that same period we also completed the migration of all our servers to Windows 2000. Thanks to Altiris we do not only experience an improved efficiency, we have also cut operational costs. This is clearly a solution with plenty more applications, on which we will continue to rely in future."

*Steff Teuwen – Network co-ordinator at the IT department of the Province of Antwerp.*

- “Thanks to Altiris Client Management Suite, Merial, a world-leading animal health company, has been able to automate, ensure reliability, and industrialize the deployment process of its workstations. In 2005 the replacement of over 900 workstations was completed within three months. The complexity of the project lay in the fact that users were administrating their workstations and that all data and personality had to be captured for each of them (data, Internet links, desktop, configuration settings...) to make the changes as transparent as possible for the users. The project ran smoothly thanks to Altiris solutions.”

*Serge Magnier, Director of Infrastructures – EMEA of Merial.*

## ► BENEFITS AND SAVINGS THROUGH ENHANCED MIGRATION

The value provided by Altiris solutions during an OS migration can be seen in several areas, including reduced IT efforts, reduced end-user downtime, reduced time to migrate, improved project management, and standardization.

### Reduced Effort

By automating the key processes involved in a migration, including personality capture, imaging, application deployment, and personality restoration, Altiris significantly reduces the amount of time spent by the IT function. Industry estimates indicate a reduction of 75% in IT efforts using automated tools such as the Altiris' Migration Suite. For an organization with 1,000 PCs, that results in a savings of 2,920 person-hours. In addition to automating manual migration tasks, Altiris also provides tools to streamline project management through the entire process, from pre-migration readiness and cost assessment to status tracking and comprehensive, Web-based reporting.

- Where HealthNow's former process would at best allow them to migrate 10 machines a day, Altiris was able to help them migrate 40 a night and 100+ on a weekend. Using Altiris, three to five of HealthNow's support technicians can do more in one day than 10 to 15 technicians used to accomplish in one week, an overall productivity increase of 200%.
- Colorado Department of Transportation, estimates savings of US\$125,000 in IT technician time during their migration of 2,400 PCs.

### Reduced End User Down-time

End-users experience downtime during an OS migration due to a number of factors, including time spent waiting for re-imaging, time for deploying applications, time to customize the PC to a user's specific preferences, and also downtime due to issues that were not caught during testing. By automating the personality migration and software delivery process, Altiris significantly reduces the time spent by an end-user configuring their own machine. In a typical scenario, an end user loses 5 hours of productivity during a manual migration (1 hour configuring their machine and another 4 hours of downtime). This can be reduced to 1 hour by automating the migration with Altiris. Again, for an organization of 1,000 PCs, the result is 4,000 hours of end-user productivity that can be gained.

- “PC Transplant captured many more user settings such as specific application settings making the deployment a much less disruptive process.” – Mark Barrett, a contractor working on Air Force Pentagon Communications Agency migration project.
- DaimlerChrysler – “Our users don't like change. They want to open up their computer and see what they have always seen. We were able to transfer all the settings without users noticing any difference.”

### Reduced Time to Migrate

A company-wide OS migration is a large-scale, time-consuming project. Some organizations will choose to perform the migration as a “forklift” project, meaning they will migrate all PCs in the organization rapidly. Others will take a more gradual approach, migrating over time as new PCs are purchased. Both approaches require significant effort and the sooner it is completed, the sooner an organization will begin to see a return on its investment. By automating the migration process, Altiris will help organizations complete their Vista migrations sooner with less disruption to the business.

- OMD originally had one-month to migrate 250 users on three different platforms from different organizations. However, their computers arrived late leaving just two weeks to get everything set up and ready to go. By utilizing Altiris, OMD was able to complete the task in the short two-week time frame.
- Reed Smith LLP – Altiris Deployment Solution reduced migration time from eight months to six weeks, saving thousands of hours in IT staff time and expenses.

### Standardization

An OS migration is the perfect time to standardize desktop PCs and systems management processes. By starting with a clean slate, organizations can obtain an accurate inventory and put in place the tools needed to keep inventories accurate and PCs up-to-date and in compliance with standards. Tools such as Software Virtualization Solution and Wise Package Studio can be used to automate the installation of software while maintaining a clean OS image. Deployment Solution can be used to create and manage standard images that can be used across a variety of hardware platforms.

- Cornwall County Council – enables the IT staff to quickly restore computers that have been migrated to the defined standard in case of any deviations, enforcing the ever so vital standardization of the Council's systems. This ensures that the benefits of the migration project can be sustained in the long-term, giving rise to a substantial reduction of support costs on a permanent basis.
- “Our goal was to develop a homogeneous desktop environment,” said Mitch Fillmore, Navigant director of central IT operations, “and Altiris played a big role in making that possible. Prior to this initiative, a technician would sometimes go onsite and find a configuration he'd never seen before. He would spend way too much time determining the base configuration and dealing with unfamiliar applications. Now that we all work from a standard image we can walk in the door and start the repair process immediately.”

## ▶ ALTIRIS OVERVIEW

### Altiris' Relationship with Microsoft

Altiris has a strong relationship with Microsoft and is a Microsoft Gold Certified Partner. Altiris has a long history of managing millions of desktops, mobile devices, and servers on various Microsoft platforms, and the company's solutions integrate seamlessly with Microsoft initiatives for Software Asset Management (SAM), Increased Operational Efficiency, Desktop Deployment, and Security Audit and Compliance. Altiris is also a member of the Microsoft Technology Adoption Program (TAP) for Windows Vista and Windows Longhorn Server.

Over the years Altiris has worked closely with Microsoft, providing deployment, migration, and management solutions that are built on Microsoft's tools and technologies. Furthermore, Altiris also extends solutions to other platforms, and improves ease-of-use, management, and scalability. Services offered by Altiris that extend the reach of Microsoft Systems Management Server (SMS) include:

- Full Asset Management.
- Help Desk.
- Client Recovery.
- Software Packaging.
- OS Deployment.
- Security Auditing and Compliance.

Altiris further extends the reach of Microsoft SMS by supporting heterogeneous enterprises with support for –

- UNIX, Linux, Macintosh, Palm, and older versions of Windows.

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## Altiris' Partners

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Altiris' partner list is extensive and includes a number of important IT infrastructure vendors, such as: **Cisco, Dell, Fujitsu Siemens Computers, Hewlett-Packard, IBM, Intel, Oracle, Philips, and VMware.**

Altiris develops solutions that provide the core technologies supporting the services that these vendors offer their customers, including:

- Improved lifecycle management of IT assets to simplify and reduce the cost of owning desktops, notebooks, thin clients, handhelds, and servers.
- Optimization of the deployment and provisioning of servers.
- Automated delivery of software and patches in highly-distributed environments.
- Discovery of all hardware and software computing assets.
- Healing of systems remotely regardless of the OS or system state.
- Protection against malicious software attacks, and increase security with persistent management.

These capabilities have made Altiris a highly-trusted partner for these IT firms and a fundamental part of their plans for Windows Vista migration.

## ► CONCLUSIONS

Altiris products provide significant advantages when compared to BDD tools in terms of integration and automation. All data is stored in a single repository (CMDB) that can be leveraged by other Altiris Solutions. Altiris offers flexible reporting that can easily be reviewed for targeted machines. Altiris also offers greater scalability when doing deployments via better bandwidth management capabilities and multicasting. However, the Altiris enhanced migration strategy is fully compliant with and encompasses the best practices defined in the BDD definition.

In Butler Group's opinion, Altiris' experience and the success of its customer base are essentially the proof points that show the value of making use of their extensive knowledge and expertise when planning for a critical migration, such as that to Windows Vista.

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## APPENDIX 1 – MICROSOFT VISTA LICENSE OPTIONS AND PRICING

- **Windows Vista Business**

Equivalent to XP Professional.

Windows Vista Business will cost US\$299 (€239), the same price as XP Professional. The upgrade is US\$199 (€159), also the same price as the XP Professional upgrade. An additional license for Vista Business is US\$179 (€143).

- **Windows Vista Enterprise**

Windows Vista Enterprise is designed to meet the needs of large global organizations and includes the extra features, such as BitLocker Drive Encryption, application compatibility tools, SUA (Subsystem for UNIX-based applications), and advanced multi-language support.

Enterprise edition will only be offered to Microsoft Volume License customers and will not be available for retail purchase.

- **Windows Vista Home Premium**

Extended media support for home users.

Vista Premium, the mid-range consumer product similar to the Media Centre edition of Windows XP, will cost US\$239 (€191) for a full version or US\$159 (€127) for the upgrade.

- **Windows Vista Home Basic**

Windows Vista Home Basic is designed to deliver improved reliability, security, and usability to home PC users who just want to do the basics with their PCs.

Windows Vista Home Basic, the low-end of the product line, will cost US\$199 (€159) for the full product or US\$100 (€80) for the upgrade edition, which is what XP Home Edition's full and upgrade versions cost, respectively. An additional license for Home Premium is US\$215 (€172), that is US\$24 (€19) less than the full price with a Home Basic additional license at US\$89 (€71).

- **Windows Vista Ultimate**

It has all the enhanced features, although it is questionable whether the home media features are of significant enough value to the business user, to make this the optimal choice for business users.

Windows Vista Ultimate Edition will sell for US\$399 (€319) in the US, with upgrades available for US\$259 (€207).

## APPENDIX II – GLOSSARY

| Item    | Description  |
|---------|--|
| ACT     | Microsoft's Inventory gathering solution that determines the basic software and hardware configurations.   |
| CMDB    | Altiris' Configuration Management Database (CMDB) stores details about configured items including detailed information on software installed.  |
| BDD     | Microsoft's Business Desktop Deployment Solution Accelerator is a framework of tools and documentation that describes how to undertake migrations and incorporates SIM, Image X WinPE, and WAIK.                         |
| Image X | This is a command line based imaging tool for the creation and deployment of WIM images.   |
| SIM     | System Image Manager used to manage windows images, particularly in adding and modifying an image.   |
| SMS     | Systems Management Server.   |
| UAC     | Vista User Account Control.  |
| USMT    | Microsoft's User State Migration Tool (the main mechanism for the migration of users personalities).   |
| WDS     | Microsoft Windows Deployment Services (WDS) for starting Windows PE on destination computers across the network.   |
| WAIK    | Microsoft Windows Automated Installation Kit (WAIK) is for configuring unattended setup answer files (Unattend.xml and Unattend.txt) and capturing images. ImageX and System Image Manager (SIM) are included with WAIK. |
| WCF     | Windows Communication Foundation.  |
| WIM     | Windows Image Manager.   |
| WinPE   | Microsoft Windows Pre-installation Environment (WinPE) for booting computers into a 32-bit staging environment to install Windows.   |
| WPF     | Windows Presentation Foundation.   |
| WWF     | Windows Workflow Foundation  |



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