

Connection

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ARTICLES

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Novell.

Great New Moves

The Time has Come for GroupWise 8 and ZENworks 10 Configuration Management

by Ken Baker

An old proverb states that all good things must come to an end. That might be true, but sometimes when one good thing ends, something great takes its place. Such is the case for general support for older versions of Novell ZENworks and Novell GroupWise. General support for GroupWise 7 has ended and moved into the extended support phase, and general support for ZENworks 7 will end in June of next year. (See [Lifecycle Support Terms](#).) However, these endings signal even greater features, functionality and integration in the forms of GroupWise 8 and ZENworks 10 Configuration Management.

> Collaboration Moves

Now that general support for GroupWise 7 has ended, and it's moved into extended support, the time has come to move to the latest version of GroupWise if you haven't already. But beyond support lifecycle considerations, there are a number of compelling reasons to upgrade to GroupWise 8. From the personal productivity dashboard to enhancements in time, task and contact management, the array of new features that GroupWise 8 delivers over its predecessors has been widely chronicled over the past two years. (See [GroupWise Resource Library \[http://www.novell.com/products/groupwise/resource-library.html\]](http://www.novell.com/products/groupwise/resource-library.html) [Untapped Power](#), and [Personal Overdrive](#)) And upcoming product releases—including Novell Data Synchronizer, new BlackBerry Enterprise Server support, and a GroupWise update that brings additional integrations with Novell Conferencing and Novell Teaming—offer additional reasons to make the move.

Opening the door to the GroupWise and third-party application integration you've been waiting for, Novell will soon release Novell Data Synchronizer and the Novell Data Synchronizer Mobility Pack (See [Higher Levels of Collaboration](http://www.novell.com/connectionmagazine/2010/06/higher_levels_of_collaboration.html).) [http://www.novell.com/connectionmagazine/2010/06/higher_levels_of_collaboration.html]. Novell Data Synchronizer provides bi-directional synchronization of e-mail, calendar data, tasks and contacts between Novell GroupWise and other connected applications, such as SharePoint, SugarCRM and salesforce.com.

Info // Novell Connection Magazine LIFECYCLE SUPPORT TERMS

For a minimum of five years, Novell provides General Support for its platform and operating system products. General Support consists of installation and configuration support, enhancements requests, patches and fixes, security updates, Novell Support Advisor, and access to the Novell knowledgebase, support forums, technical subscriptions, the existing patch database and documentation.

When General Support ends, Novell may offer Extended Support for an additional two years. Extended Support includes installation and configuration support, critical security updates, Novell Support Advisor, and access to the Novell knowledgebase, support forums, technical subscriptions, the existing patch database and documentation.

For more information on support programs and options, visit support.novell.com/lifecycle/index.html

Opening the door to the GroupWise and third-party application integration you've been waiting for, Novell will soon release Novell Data Synchronizer and the Novell Data Synchronizer Mobility Pack.

And the Novell Data Synchronizer Mobility Pack gives you bi-directional synchronization of e-mail, calendar data and contacts between connected applications and a wide variety of mobile devices that use the iPhone, Android, Symbian, Palm and Windows Mobile operating systems. For your mobile users in the BlackBerry world, Research In Motion is soon set to release BlackBerry Enterprise Server 5.0.1, which will include support for GroupWise 8.

And with GroupWise 8.0.2 right around the corner, you can take advantage of a number of powerful new integrations between Novell collaboration products. One of these is integration with Novell Conferencing, the new, inexpensive and easy-to-use Web conferencing service from Novell. (See [It's Hot.](http://www.novell.com/connectionmagazine/2010/04/opportunity_knocks_one.html)) [http://www.novell.com/connectionmagazine/2010/04/opportunity_knocks_one.html] This integration enables you to instantly transform a GroupWise appointment that you're scheduling into a Novell Conferencing Web event. You'll have a tab option where you can set Novell Conferencing event details, such as the meeting room URL, audio/video settings, chat options and more. (See [Figure 1.](#)) Those whom you invite to the Web event will be able to jump directly to the Novell Conferencing meeting room URL right from their GroupWise appointment.

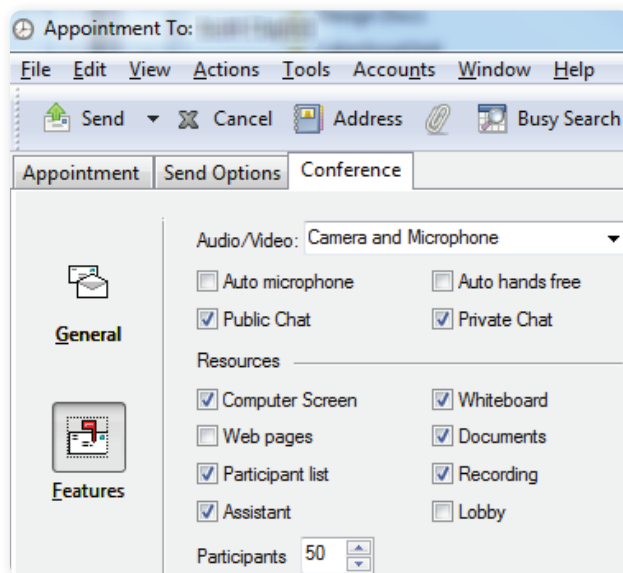


Figure 1: Integration between Novell GroupWise 8 and Novell Conferencing lets you create Novell Conferencing Web events within GroupWise appointments.

GroupWise 8.0.2 also includes new drag-and-drop capabilities with Novell Teaming. For example, it lets you drop an e-mail into a Teaming blog folder, automatically posting the contents of that e-mail, including its attachments. (See Figure 2.) If you drag a GroupWise contact to a Teaming folder, the contact is saved as a vCard in Teaming. If you drag a GroupWise item into your Teaming calendar folder, it gets posted as a Teaming appointment. These GroupWise and Teaming integrations make it even easier for you to keep all the project information you need in the right Novell Teaming workspaces. In addition to drag and drop, you can simultaneously search GroupWise and Teaming content from a GroupWise search dialog.

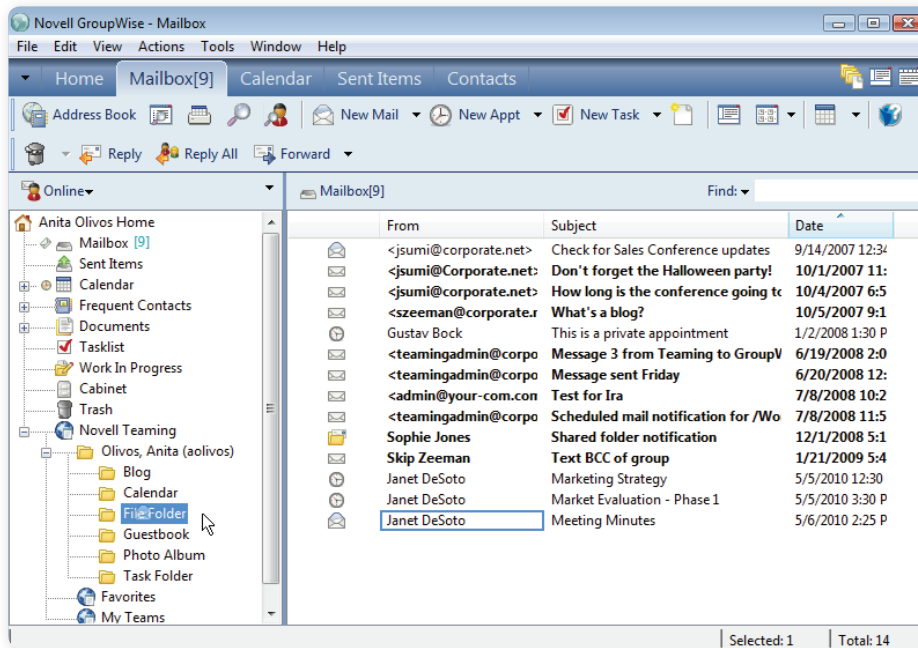


Figure 2: Integration between Novell Teaming and GroupWise 8 lets you drag items from your Teaming folders into GroupWise.

The good news is that if you're current on your GroupWise maintenance or you moved to GroupWise 8 in May or June, you can take advantage of all the powerful new features and integrations of GroupWise 8.0.2 at no additional cost. Even if that's not the case for you, what GroupWise 8 delivers in terms of enhanced productivity and collaboration more than justifies moving up.

Also, if you're not already running on Linux, your upgrade to GroupWise 8 is the perfect time to make the move to GroupWise on Linux. This will make it easier for you to transition to the next major release of GroupWise (See [Novell GroupWise Futures.](#)), which will only run on Linux 64-bit and Windows 64-bit platforms. To help you make the move to GroupWise on Linux, Novell provides a variety of helps and resources. (See [Get Comfortable](#)) [http://www.novell.com/connectionmagazine/2009/04/migrating_groupwise_from_windows_or_netware_to_linux.html]. For more information on moving to Linux, or simply moving to the newest version of GroupWise, visit www.novell.com/products/groupwise/.

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NOVELL GROUPWISE FUTURES

Novell GroupWise 8.0.2 delivers personal productivity at its best. And when the next major release of GroupWise comes out this summer, it will deliver even more value to end users. One added value is dynamic contacts, which allows users to edit their own contact details, including adding photos to their address book. These updated contact details sync to all of the other domains and post offices, so that the most recent information for a user is always available. Calendaring will also receive a major facelift with improved recurring appointment creation, immediate busy searching of appointment attendees, and enhancements to multi-user calendars. Web access and information sharing will see significant improvements, as well.

> IT Management Moves

The policy-driven automation in Novell ZENworks Configuration Management helps you automate and enforce business and IT management processes across the lifecycle of your endpoints, including desktops, notebooks, servers, handhelds and removable storage devices. While support for ZENworks 7 Desktop Management and ZENworks 7 Suite has been extended until June 2011, now is the perfect time to start planning your move to ZENworks 10 Configuration Management (See [ZENworks Product Editions](#)) [<http://www.novell.com/products/zenworks/configurationmanagement/compare.html>]. When you make the move to ZENworks 10 Configuration Management, you'll be able to take advantage of its Web-based architecture, tighter suite component integration, Windows 7 support and much more.

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In terms of its Web based architecture, the console in ZENworks 10 Configuration Management is served up by an https server. This allows you to manage, secure and track all your endpoints from any standard Web browser whether you're in the office, on the road or at home. It also makes it easier to distribute management responsibilities to other IT administrators in geographically diverse locations. Whether they're located across campus, town, the country or the ocean, they can easily log into the Web-based ZENworks Control Center and access its system dashboards and hot lists to get an immediate view of task status, errors, warnings, statistics and policy compliance. (See Figure 3.) Inside the Web console, you can also drill down to event details for faster and more effective problem resolution than ever before.

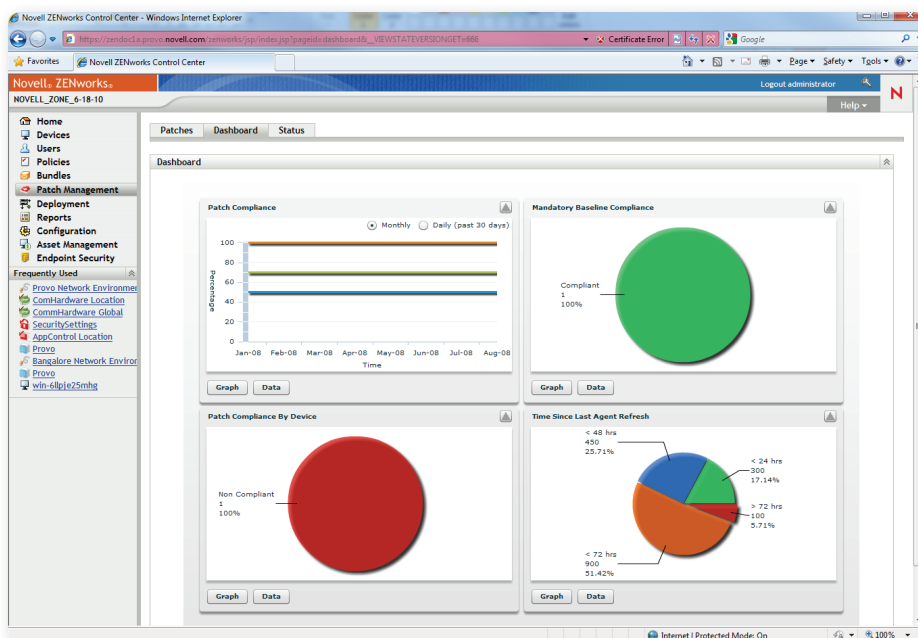


Figure 3: The Web-based console in ZENworks Configuration Management makes it easy to manage your endpoints from anywhere.

ZENworks 10 Configuration Management also provides tighter integration between other ZENworks products. Whether you're managing your endpoints with ZENworks Configuration Management, your patches with ZENworks Patch Management, or your assets with ZENworks Asset Management, you'll be able to use the same integrated console, the same integrated database and the same integrated agent. (See Figure 4.) You'll no longer have to switch between management consoles, and you'll only have one ZENworks database to deploy and one agent to deploy.

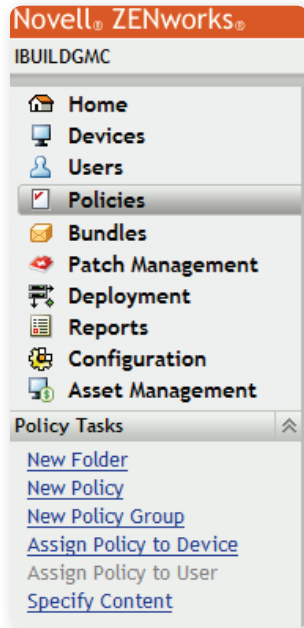


Figure 4: With ZENworks 10 Configuration Management you can manage your patches and assets from the same console as you use to manage your endpoints.

A natural benefit of this integration is that it also makes it easier to try and take advantage of new ZENworks products. For example, if you have ZENworks 10 Configuration Management Standard Edition, but you want to evaluate ZENworks Patch Management, there's nothing new to install. You just turn on the free trial and give it a try. If you want to deploy it, you simply buy a license and activate the license keys, and the new features automatically become available.

When ZENworks 11 (See [Novell ZENworks Futures](#)) comes out later this year, console and agent integration will be extended further to include ZENworks Endpoint Security Management. (See [Figure 5](#).) Management console integration will also be extended to ZENworks Linux Management. All of this current and future integration goes a long way to simplifying overall deployment and streamlining your day-to-day management experience.

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NOVELL ZENWORKS FUTURES

Upgrading to Novell ZENworks 10 Configuration Management now will make it even easier to move to ZENworks 11 when it comes out near the end of this year. ZENworks 11 will boast integration with ZENworks Endpoint Security Management and ZENworks Linux management. This means you'll be able to manage both your Windows and Linux endpoints from the same console, including managing your Linux patches. ZENworks 11 will also offer new power management capabilities for your endpoints.

Another compelling reason to move to ZENworks 10 Configuration Management is its support for Windows 7—something you don't get with ZENworks 7. In fact, if you have plans to migrate to Windows 7, ZENworks 10 Configuration Management can dramatically simplify that migration by helping you 1) plan your migration with readiness reports for your current applications and hardware and 2) implement the actual migration to Windows 7 with as little disruption as possible.

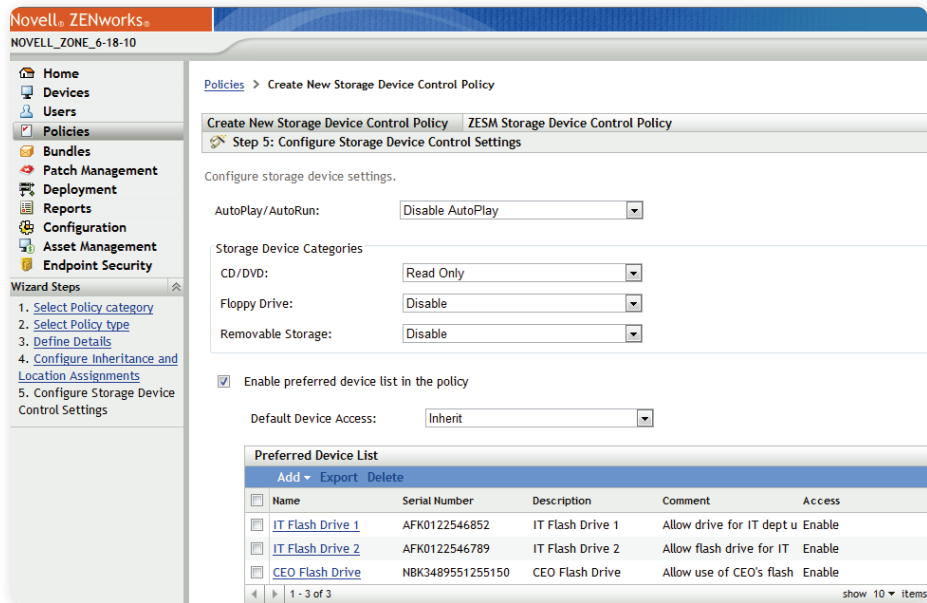


Figure 5: When ZENworks 11 Configuration Management comes out later this year it will extend console integration to ZENworks 11 Endpoint Security Management and ZENworks 11 Linux Management.

Taking advantage of the Web-based infrastructure, tighter component integration and Windows 7 support in ZENworks 10 Configuration Management is easy if you're current on your maintenance. ZENworks 7 Suite customers current on maintenance are entitled to the ZENworks 10 Configuration Management Advanced Edition, and ZENworks 7 Desktop Management customers current on maintenance are entitled to the ZENworks 10 Configuration Management Standard Edition. If you're not current on maintenance, you can still upgrade to ZENworks 10 Configuration Management according to standard upgrade licensing provisions. Contact your sales representative for information or visit www.novell.com/products/zenworks/configurationmanagement/howtobuy.html for more information on upgrading.

Whether it's for the latest version of Novell ZENworks or GroupWise, and whether you look at it from a support or feature perspective, there's no better time than now to make the move.

> Make the Move

Whether it's for the latest version of Novell ZENworks or Novell GroupWise, and whether you look at it from a support or feature perspective, there's no better time than now to make the move.

To get the latest information to help you upgrade either product, visit www.novell.com/products/zenworks or www.novell.com/products/groupwise/, respectively.

Two Paths to Server Performance

I/O scheduler and file system selection can boost SUSE Linux Enterprise server performance

By Matthias G. Eckermann and Bill Tobey

The Novell approach to assembling a SUSE Linux server distribution has always been to provide a wide range of the best packages and tools available from the community. Our goal is to give IT organizations the most flexible and versatile resource set for configuring and optimizing high-performance servers for a complete range of data center applications.

This article will explore two often-overlooked areas where SUSE Linux Enterprise Server provides multiple options that administrators can exploit to enhance server performance: the I/O scheduler and the file system.

> Meet Your I/O Scheduler

The I/O scheduler is the part of the kernel that handles read / write access to block storage devices—a USB stick, local disk, NAS filer, SAN, network file system and any other storage environment that holds data in blocks. A scheduler queues and sequences the execution of read-write requests in order to manage mechanical latency (the seek time related to head travel around the disk) and optimize data delivery performance. Its bag of tricks includes three techniques for manipulating the request queue:

- **Request merging** – Requests for data in adjacent blocks can be combined to improve throughput by reducing both seek time and the total number of syscalls required to service a request.
- **Directional (elevator) reordering** – Requests can be reordered based on location, to maintain head movement in one direction for as long as possible, using the same control methodology as an elevator to avoid service starvation at the disk peripheries.
- **Priority reordering** – Requests can be sequenced according to various priority schemes, such as a start-of-execution deadline assigned to each request at time of receipt.

> The Four Types of Linux I/O Schedulers

There are four types of Linux I/O schedulers, each of which implements the basic sequencing techniques in different ways and combinations, providing significant variations in I/O performance with different application workloads.

The NOOP scheduler is the simplest of all Linux I/O schedulers. It merges requests to improve throughput but otherwise attempts no other performance optimization. All requests go into a single unprioritized first-in, first-out queue for execution. It's ideal for storage environments with extensive caching, and those with alternate scheduling mechanisms—a storage area network with multipath access through a switched interconnect, for instance, or virtual machines, where the hypervisor provides I/O backend. It's also a good choice for systems with solid-state storage, where there is no mechanical latency to be managed.

To activate the NOOP I/O scheduler for use with all applications and storage devices, edit your boot loader configuration settings to pass the kernel parameter: [elevator=noop](#).

The Deadline scheduler applies a service deadline to each incoming request. This sets a cap on per-request latency and ensures good disk throughput. Service queues are prioritized by deadline expiration, making this a good choice for real-time applications, databases and other disk-intensive applications. To activate the Deadline I/O scheduler for use with all applications and storage devices, edit your boot loader configuration settings to pass the kernel parameter: [elevator=deadline](#).

The Anticipatory scheduler does exactly as its name implies. It anticipates that a completed I/O request will be followed by additional requests for adjacent blocks. After completing a read or write, it waits a few milliseconds for subsequent nearby requests before moving on to the next queue item. Service queues are prioritized for proximity, following a strategy that can maximize disk throughput at the risk of a slight increase in latency.

The Anticipatory scheduler delivers best performance with Web and file servers, and desktops with single IDE/SATA disks. It is the default scheduler in the mainline Linux kernel, and can be activated by editing the boot loader configuration file to pass the kernel parameter: [elevator=as](#).

The Completely Fair Queuing (CFQ) scheduler provides a good compromise between throughput and latency by treating all competing processes even-handedly. Each process is given a separate request queue and a dedicated time slice of disk access. CFQ provides the minimal worst-case latency on most reads and writes, making it suitable for a wide range of applications, particularly multi-user systems. Because of our unique desktop-to-data center strategy, CFQ is the default I/O scheduler in SUSE Linux Enterprise Server 11. It can be activated by editing the boot loader configuration file to pass the kernel parameter: [elevator=cfq](#).

> **Making Per-Device I/O Scheduler Assignments**

If you have multiple applications running on a server, using different storage environments, it's possible to make separate I/O scheduler assignments to optimize the performance of each application-storage pair. These assignments can even be changed in production. You can check the I/O scheduler setting for individual storage devices with the following shell command: [/sys/block/*DEV*/queue/iosched](#).

If desired, you can then re-set the I/O scheduler assignment for each device using this command: [echo SCHEDNAME > /sys/block/*DEV*/queue/scheduler](#).

> **Integrity, Performance and the Barrier In Between**

Barriers are a feature the kernel's block I/O subsystem makes available to journaling file systems to protect data integrity. A barrier request temporarily locks the I/O scheduler's execution queue, ensuring that a sequence of journal write requests are securely committed to physical media before any subsequent requests are served. Barriers protect metadata and ensure file system integrity in the event of a system crash, but they do so at the expense of a noticeable performance penalty. Novell assumes a higher value for data integrity than performance in enterprise computing

environments, so barrier support is switched on by default in SUSE Linux Enterprise Server. It can be turned off to improve performance, but only by a knowledgeable administrator prepared to assume the risk.

- With reiserFS you can enable / disable barriers using the mount options: `barrier=flush` or `barrier=none`.
- With ext3 you can enable / disable barriers using the mount options: `barriers=1` or `barriers=0`.
- With XFS you can enable / disable barriers using the mount options: `barrier` or `nobarrier`.

> **File System Selection for Server Performance**

Another set-up decision that can significantly affect server performance is the choice of file systems. As is the case with I/O schedulers, SUSE Linux Enterprise Server ships with a number of file system alternatives, allowing administrators to match file systems and application workloads for optimum performance. Here are a few guidelines for making the right performance pick.

- **Choose ReiserFS for small files** – ReiserFS is best suited for applications that generate lots of small files, including mail, NFS and database servers, and for applications that use synchronous I/O.
- **Choose ext3 for small file systems** – Ext3, the default file system in SUSE Linux Enterprise Server 11, is best suited for small file systems of 100 gigabytes or less. If you're planning to use ext3 with large numbers of files in a single directory, you should consider enabling btree support. This can be accomplished with the shell command: `# mkfs.ext3 -O dir_index`. Note that btree support is enabled by default in version 11 SP1.
- **Choose XFS for large files and streaming media** – XFS is an excellent choice for large files and medium to very large file systems (up to 16 terabytes on 32-bit systems, or a theoretical 8 exabytes on 64-bit systems). Its low latency transfer characteristics also make it an ideal selection for streaming media applications. SUSE Linux Enterprise has supported XFS since version 8, and Novell is working closely with SGI to optimize its performance with future releases of SUSE Linux Enterprise Server. It merits consideration for any file system likely to exceed 100 gigabytes, unless other factors (e.g. many small files) dictate another choice.

XFS also offers a number of special features that can be particularly useful, including dump / restore for backup and recovery, online file system check, and online defragmentation.

- **Choose OCFS2 for cluster performance or high availability** – Oracle Cluster File System 2 (OCFS2) is a POSIX-compliant shared-disk cluster file system for Linux that is developed by the community under GPL. Because it provides local file system semantics, OCFS2 can be used with any application. Cluster-aware applications can leverage its parallel I/O support for higher performance, other applications can leverage its multi-node support to achieve higher availability through automated failover.

- **Consider btrfs for the future** – Btrfs is a new, copy on write file system for Linux aimed at bringing additional enterprise class file system features to the Linux kernel. Initially developed by Oracle, btrfs is licensed under the GPL and has quickly been adopted by the community. Long-awaited features include integrated volume management, copy on write, writable snapshots (and snapshots of snapshots), extents, dynamic inode allocation, checksums on data and metadata, online file system check and defragmentation, and integrated multiple device support.

Btrfs is still under intense development, but is included as a technology preview in SUSE Linux Enterprise Server 11 SP1.

> **Measuring I/O Scheduler and File System Performance**

Once you've made your I/O scheduler and file system selections, there are many tools available to measure your configured system's performance. A few favorites include:

- **Bonnie** is a simple but useful tool that provides a variety of benchmarks on the speed of your file system, OS caching, the underlying device and your libc. It is supported in the SUSE Linux Enterprise Server distribution.
- **fiio** is an I/O tool meant to be used both for benchmark and stress/hardware verification. It has support for 13 different types of I/O engines. It is available at: <http://freshmeat.net/projects/fio/>. Packages for SUSE Linux Enterprise Server 11 are available at: http://download.opensuse.org/repositories/benchmark/SLE_11/.
- **IOzone** is a file system benchmark tool that generates and measures a variety of file operations. IOzone has been ported to many machines and runs under many operating systems. It is available at: <http://www.iozone.org/> and http://download.opensuse.org/repositories/home:/mge1512:/benchmarking/SLE_11/.

> **Experiment to Find Your Optimum Configuration**

I/O scheduler and file system selection can have major effects on the performance of SUSE Linux Enterprise Servers. We strongly recommend that you experiment with different configurations to gain first hand experience. And watch for our upcoming article on cgroups for kernel resource management.

Introducing Novell Cloud Manager

Soon to-be-released product creates and manages a cloud environment

by Jo De Baer and Eric Harper

If you're organization is like most, you've found the realities of virtualization haven't quite met your expectations. You were probably counting on virtualization to improve flexibility and reduce costs, but after spending money on large capital expenditures and consulting expenses, you'll still be coming up short of the promised ROI.

In addition, many application managers complain of long provisioning times, complex processes and poor visibility into application performance. I guess it's no surprise that current estimates from industry analysts show less than fifteen percent of enterprise workloads have been virtualized.

The private cloud has the potential to transform the virtualized data center by improving efficiency and reducing costs while radically increasing agility and business responsiveness. However, implementing a private cloud presents its own challenges of security, management and sprawl. Until those challenges are addressed, organizations will continue to keep cloud computing in their plans without moving forward very quickly.

Novell Cloud Manager takes these challenges head on with a product that not only builds and manages a private cloud, but does so in a way that's so easy to use and quick to implement, you could deploy and begin leveraging a private cloud in your own data center in days or weeks instead of months or years.

Novell Cloud Manager is also massively scalable and supports multi-tenancy, making it an ideal solution for building a new public cloud. We'll reserve this service provider focus, however, for a future Novell Connection article.

> Provisioning a Service—The Typical Way

To understand the benefits of Novell Cloud Manager, I need you to first step back and think of how a typical service is provisioned in the traditional IT environment. Please note that in cloud terminology, business services are made up of one or more workloads that work together to accomplish a specific task. For example, a Web application could actually be made up of three different workloads: the Web application itself, the presentation layer users see and the back-end database that serves up the data to the application. These three different workloads work together to form one defined service.

The private cloud has the potential to transform the virtualized data center by improving efficiency and reducing costs while radically increasing agility and business responsiveness.

So let's take our example here and pretend that you need to find a home for a new Web application you'll be hosting. The typical approach might be to spec out the server you need, get approval, order it and wait for it to show up. Then you'll work with your network and storage IT folks to get it racked, stacked, and properly provisioned. This process, in most enterprises, can take 60-90 days or more! That's two to three months of manual, error-prone, and difficult-to-track processes. Nothing is automated, and there's often a lot of red tape and hand-holding just to get the process started.

> Novell Cloud Manager Provides an Easier Way

Now let's look at a similar example using Novell Cloud Manager. We'll start with an easy example—a new business service for file sharing. Instead of going through that whole process I just mentioned, you can make your request online through a Web portal. When you log in to Novell Cloud Manager, you'll have the ability to select the workloads you need from an online service catalog.

> Creating a New Business Service for File Sharing

First, you have to name your business service request. Because this is a new file share, we'll call it iFolder. (See [Figure 1](#).) And you have to specify the business purpose, so let's say this is a new file share for the London office. You can also specify a start and stop date for this new business service; of course, we want it immediately.

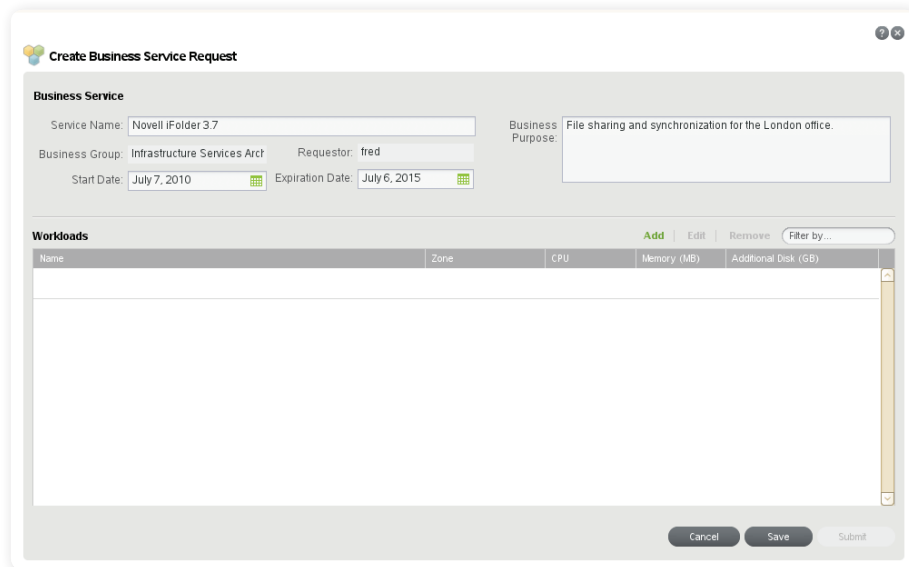


Figure 1: Creating a new business service is easily done through the Web console of Novell Cloud Manager.

With Novell Cloud Manager, it's easy to make buying decisions based on your needs and your budget because you'll immediately know what your costs will be.

Next, you'll choose the workloads you need. To help, you're presented with a list of workloads from a catalog that has been created for you. (See [Figure 2](#).) Just as important as what's on this list is what isn't on it. This list may not represent the entire catalog, just what's available to you based on your role, your security level and whatever else the infrastructure manager has decided you need. It's impossible for you to request a business service that doesn't match your responsibilities. In our example, we're creating a new file share so we'll choose the iFolder workload template from the list.

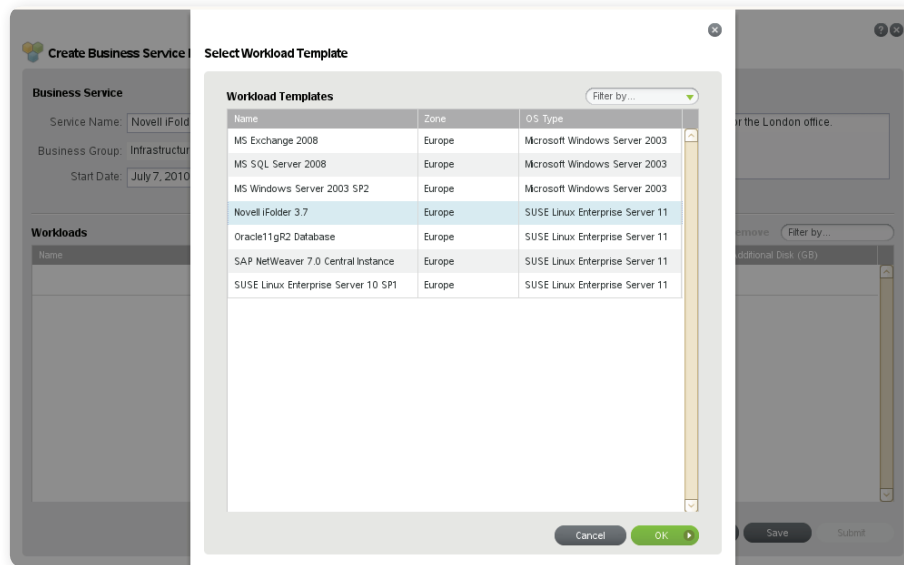


Figure 2: To power the business service, you select the workloads you need from the catalog of workload templates.

The next step is to define the computing power you require based on the options provided to you by the infrastructure manager. That includes CPUs, RAM, network and storage requirements. (See Figure 3.) And finally, you must set a password to control access to the new workload you've created.

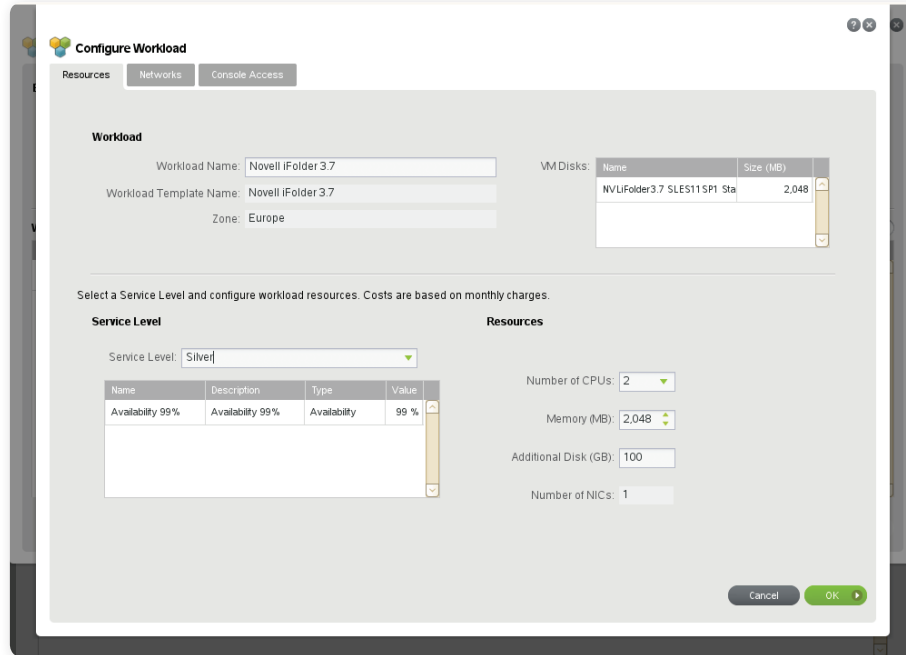


Figure 3: You can request the computing power you need, from CPUs and RAM to network and storage requirements.

When you have your business service request looking the way you want it, submit your request and let Novell Cloud Manager take care of the rest. For example, it sends an e-mail to your manager to get approval for the new service request and its associated budget. Once the request has been approved, Novell Cloud Manager will automatically provision the service for you. And literally, within minutes, you created a new file share for your users.

> **Creating a New SAP Business Service**

Let's take another example. A new file store is pretty simple, so think about a business service that's a little more complicated. Say you need a new SAP ERP application. Again, you know how the usual process goes, right? Ordering the server, provisioning the hardware and software, waiting 60-90 days at least. But with Novell Cloud Manager, even a complex service like SAP can be created quickly and easily.

Back at the catalog of workload templates once again, you'll see that SAP NetWeaver is one of the options. (See Figure 4.) Now, this could very well be an SAP appliance that was created with SUSE Studio. As with many business services, you'll need more than one workload. For example, you will also need a data base to power the SAP application. You can look through the workload templates and select Oracle 11g to power your SAP service.

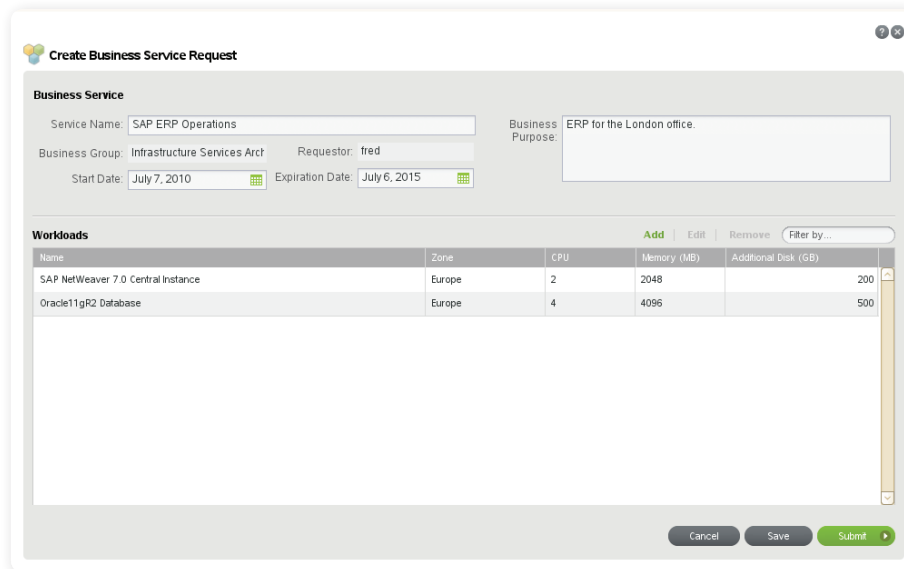


Figure 4: Many business services require more than one workload.

Novell Cloud Manager is designed to leverage your existing virtual infrastructure, without disrupting your architecture or requiring painful changes to existing systems.

There's another part of this that's very important. Since this is probably a mission-critical application, let's talk about Service Levels. You have some options listed here in the lower left corner of the screen. (See Figure 5.) The Platinum level, for example, ensures 99.99 percent uptime. Each selection has a cost associated with it, and the prices change dynamically right there on the screen based on what's selected.

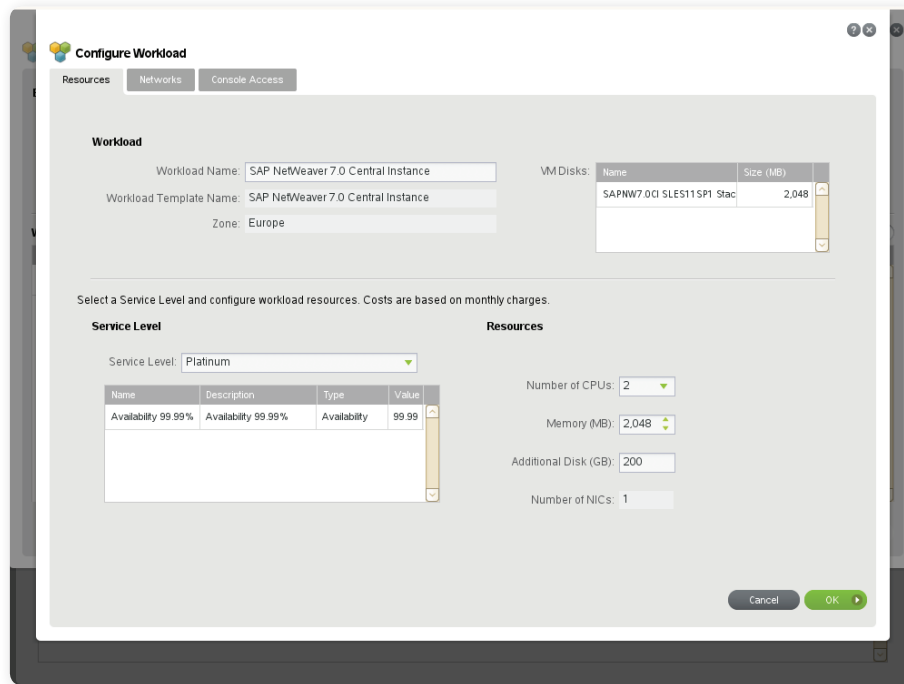


Figure 5: When you define the SLA options you're considering, you can immediately see the impact on your costs.

With Novell Cloud Manager, it's easy to make buying decisions based on your needs and your budget because you'll immediately know what your costs will be. Or maybe you're going to start this service off in a test environment where that much uptime isn't required. Then, later, when you go live, you can bump up the SLA to meet your changing needs.

That's another big benefit of Novell Cloud Manager. As your needs change, you can respond very quickly.

> **Getting the Cloud Ready for Novell Cloud Manager**

Let's talk a little bit about the cloud itself. You're probably wondering what changes you'll have to make to your existing virtualization infrastructure to accommodate Novell Cloud Manager. The answer is simple: none. Novell Cloud Manager is designed to leverage your existing virtual infrastructure, without disrupting your architecture or requiring painful changes to existing systems. In particular, we support building your private cloud atop all of the major hypervisors—Xen, VMware ESX and Microsoft Hyper-V. Most importantly, Novell Cloud Manager can stitch together multiple virtual infrastructures, regardless of platform, into a single, unified cloud environment. We want to empower the enterprise with the option to use whatever virtual infrastructure that works best for your needs, without concern for lock-in.

In fact, there may be occasions where you don't even have the infrastructure in-house to serve all of your workload requirements. And that's okay too. Some of you may have a private cloud you're using. Some of you may want to use an external cloud, such as Amazon: a private cloud for the simpler business services and an external cloud to accommodate those with high SLA demands. A future release of Novell Cloud Manager will support provisioning in external clouds as well. And it's completely transparent to users.

> **Opening Up Your Options**

Novell Cloud Manager opens up a sky full of options. It lets you create and manage business services across a virtual infrastructure, private cloud and, soon, an external cloud in a secure and compliant manner. Delivering on the promise of utility computing, Novell Cloud Manager lets your users deploy IT services on demand, paying only for the resources they consume and the service levels they expect. And it lets you create a more intelligent infrastructure through integration with best-of-breed business service management and identity and access management solutions from Novell.

To learn more about this new product, visit www.novell.com/cloudmanager. You can download a white paper with more technical information, sign up to learn more about the product, learn how to follow Novell Cloud Manager news on Twitter, or sign up for the Early Adopter Program. And be sure to look for the release of Novell Cloud Manager later this fall.

Mercy Memorial Hospital System

Mercy Memorial Hospital System had just a few months to migrate its entire outsourced data center to an in-house environment. Using PlateSpin Migrate, the hospital met its aggressive migration deadline while achieving a consolidation ratio of 18:1.

> Overview

Founded in 1929, Mercy Memorial Hospital System (MMHS) is comprised of a 238-bed, full-service community hospital, as well a skilled nursing and rehabilitation center, ambulatory surgery center, outpatient physical rehabilitation center, hospice care, home care, durable medical equipment service, outpatient satellite offices and retail pharmacies. The organization, which serves Monroe County as well as the eastern section of Lenawee County and Northwest Ohio, has more than 1,600 employees.

> Challenge

To modernize its IT environment, MMHS wanted to replace many aging servers and update several mission-critical applications. Modernization would also help the hospital prepare the back-end systems for upcoming government-issued healthcare IT requirements.

The hospital decided to move its data center from an outsourced model to an in-house model and needed to complete the migration in just a few months. The organization also wanted to migrate many of its older servers to a virtualized environment to take advantage of high availability. Above all, the migration needed to happen with minimal downtime, as any disruption to critical systems could negatively impact patient care.

“PlateSpin Migrate has really enabled us to transform our data center. The solution paid for itself several times over with our ability to complete the migration in such a short time and with minimal downtime.”

Erik Mynster, IT Operations Manager, Mercy Memorial Hospital System

> Solution

Working with C/D/H, a Novell Platinum Partner, MMHS selected PlateSpin Migrate to move its servers to an in-house virtualized environment.

“PlateSpin offered the best features and the most migration options,” said Eric Mynster, IT Operations Manager at Mercy Memorial Hospital System. “It was the perfect solution for us because C/D/H was able to perform the conversions remotely, without having to physically access the outsourced data center. Most important, virtualizing our servers resulted in downtime measuring minutes instead of days.”

The hospital used PlateSpin Migrate to convert 100 servers from its outsourced vendor to its in-house data center – more than half of these servers were physical-to-virtual conversions. PlateSpin allowed C/D/H to effectively virtualize the servers ahead of time by remotely capturing the server images with USB storage, then running them through a synchronization process and bringing them live as the offsite servers were powered down.

“The biggest advantage and differentiator of PlateSpin Migrate is the ability to do a virtual-to-physical migration in case of a performance issue,” said Jason L. Cooper, consultant at C/D/H. “This functionality provided a safety net and actually allowed us to virtualize more systems.”

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Jason L. Cooper, Consultant, C/D/H

C/D/H and the hospital IT staff finished the project within an aggressive timeline, migrating all of its servers in 30 days, with 80 percent of them performed in one weekend.

“We moved most of our servers with mission-critical patient applications in a single day to minimize that amount of downtime for our nursing systems,” said Mynster. “In fact, the only significant downtime we experienced was for servers not virtualized. We are aware of similar migration projects at other hospitals that caused several days of downtime.”

Using VMware ESX, the team virtualized more than half of its existing servers, creating nearly 80 virtual machines (servers) on just eight physical servers. The hospital uses VMware VMotion, VMware High Availability and VMware Distributed Resource Scheduler to take full advantage of its new virtualization environment.

“Virtualization gives MMHS a lot more room to grow,” said Craig Eidelman, consultant at C/D/H. “More important, we have a solid disaster recovery plan. We have essentially eliminated any downtime potential as a result of hardware failure.”

PlateSpin Migrate is now an essential tool for the hospital's data center, as the IT staff can now quickly perform server conversions without incurring any downtime.

“C/D/H has been a great fit for our organization and was absolutely critical to the success of this project,” said Mynster. “They played a significant role in the technical planning and preparation, as well as the migration itself. They really understood our environment and where we wanted to go. Their expertise was a huge advantage.”

> Results

Using PlateSpin Migrate, MMHS completed its data center migration project in just a few months, successfully meeting its aggressive deadline. By moving to a virtualized, in-house environment, the hospital has achieved a consolidation ratio of 18:1 and has reduced data center total cost of ownership by 30 percent over a three year period.

The high availability of a virtualized environment has dramatically increased system performance. In addition, the IT staff can now quickly create as many virtual servers as needed to respond to changing business needs, as well as future government requirements.

“PlateSpin Migrate has really enabled us to transform our data center,” said Mynster. “The solution paid for itself several times over with our ability to complete the migration in such a short time and with minimal downtime.”

Does Apple's iPad Really Mean Business?

Love it or hate it, you should probably start paying attention to Apple's iPad

by Todd Swensen and Eric Harper

What was your gut reaction when Steve Jobs first unveiled Apple's new iPad tablet computer on January 27th? Fawning admiration? Healthy skepticism? Open hostility? All of these reactions were well represented and expressed in a frenzy of articles, blog posts, tweets and coffee shop conversations. When the iPad finally started showing up in retail stores in early April, millions of people already wanted one (although most couldn't have told you exactly why). Since then, surprisingly robust iPad sales—together with unprecedented interest in developing apps for the iPad—seem to indicate that something big is happening. So whether you consider the iPad another overhyped consumer fad built for people who like to show off at Starbucks, a legitimate technology game changer, or something in between, it's hard to argue with success. And that probably means it's time to at least start asking questions about what the iPad might mean for your business.

> Gauging the iPad's Potential

Before the iPad shipped, technology experts and reviewers joined millions of consumers in wondering exactly what this heavily hyped new device was and how people and businesses might actually use it. Would it suffer from the same limitations (and limited success) as other tablet PCs? Would it offer something unique—an experience you couldn't get from a less expensive smartphone, netbook or other portable device? Would it have anything compelling to offer businesses? Now that the iPad is actually available, experts, reviewers and users have started chiming in on some of these questions. Wall Street Journal tech reviewer Walter Mossberg said, "After spending hours and hours with it, I believe this beautiful new touch-screen device from Apple has the potential to change portable computing profoundly, and to challenge the primacy of the laptop. It could even help, eventually, to propel the finger-driven, multitouch user interface ahead of the mouse-driven interface that has prevailed for decades." (WSJ article March 31, 2010)

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NOVELL MONOTOUCH 2.0—IPAD APPS FOR .NET DEVELOPERS

Microsoft is not currently developing any iPad apps, but thanks to Novell, the same does not hold true for Microsoft .NET developers. Novell MonoTouch 2.0 provides .NET developers with the tools they need to:

- Develop applications for the Apple iPad, iPhone and iPod Touch using Microsoft .NET languages
 - Extend iPad development to .NET developers around the world
 - Create apps that turn the iPad into an efficient, productive business tool
-

On the business side, Salesforce.com chairman and CEO Marc Benioff believes the iPad has important implications for the next generation of cloud computing. In a recent guest post on TechCrunch, he said, "What's most exciting is that this fundamental transformation—cloud + social + iPad—will inspire a new generation of wildly innovative new apps that will change entire industries... This will result in a new generation that looks more like Facebook on the iPad than Yahoo on the PC." (<http://techcrunch.com/2010/03/29/ipad-cloud-2/>)

There are also some legitimate iPad concerns and criticisms to counter the enthusiasm—especially in a business context. Many worry about Apple's relatively closed application development and distribution model, its restrictive DRM controls, and the company's overall propensity for control over openness. And of course, the iPad introduces the same security and management challenges as any new, untested portable device. These concerns are causing many businesses to take their time with the iPad. But given its fairly remarkable early success, it's also becoming clear that the iPad is not something businesses can afford to ignore.

> **Putting the iPad to Work**

Some of the industry's most prominent enterprise software vendors are certainly paying attention. PeopleSoft, SAP, Oracle, Novell and many others are actively working on developer kits and enterprise iPad applications. In fact, Oracle already has eight iPad applications available through Apple's App Store. Many of these early CRM and database apps are nearly identical to their existing iPhone counterparts, but developers are building specific business apps that take advantage of the iPad's beefy processor and other unique capabilities. This level of activity from major enterprise application providers is notable, given that the iPad has only been available for a few short weeks.

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IPAD IN THE ENTERPRISE

- Oracle Announces Siebel CRM Support for the iPad (link to: <http://www.oracle.com/us/corporate/press/068482>)
- Salesforce CEO Marc Benioff on the iPad and Cloud 2.0 (link to: <http://techcrunch.com/2010/03/29/ipad-cloud-2/>)
- IBM launches Lotus software for the iPhone platform (link to: <http://www.forbes.com/2010/02/11/ipad-iphone-apple-technology-cio-network-ibm.html>)

> **The Microsoft Exception**

The most significant exception to this trend is Microsoft, which to this point has chosen not to develop any applications—including Microsoft Office—for the iPad. Stephen Elop, the president of Microsoft's business division, recently told Bloomberg that they were taking a "wait and see" approach to the iPad. "We never say never," said Elop, "but we have no current plans to develop a version of Office for the Apple iPad."

At one level, this makes sense. Microsoft doesn't typically like potential game changers, because they prefer the game (which they currently dominate) just the way it is. It will be interesting to see how this strategy plays out—especially given that Apple's Pages word processor is already available for iPad. Google, which is directly targeting Microsoft Office dominance with Google Apps, is also actively working to optimize its offerings for the iPad (despite intriguing rumors of an upcoming "Google iPad killer"). [Link to: <http://gizmodo.com/5514989/google-preparing-ipad-rival>]

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IS AN "IPAD KILLER" ON THE WAY?

According to a recent New York Times article, Google, HP, Microsoft, Nokia, and others are all working on new slate computers that will compete directly with the iPad. The upcoming Google and HP devices will both run Google's Android OS, and Google is apparently working quietly with publishers to explore distribution options for books, magazines and other content. [Link to: <http://www.nytimes.com/2010/04/12/technology/12slate.html>]

> **Off and Running**

When the iPad was first announced, a number of industry watchers and reviewers openly wondered why Apple chose to put such a powerful 1GHz A4 processor into such a simple device. Clearly, Apple was counting on people (and businesses) wanting to use the iPad for much more than reading books, browsing the Web, and watching movies. That bet appears to be paying off. It has been less than 3 months since the iPad became available in the U.S. People apparently want them more than ever. Only now, they actually know why.

From Microsoft Windows XP to Windows 7

Six Steps to Success

By: Richard Hanley

Migrating Microsoft Windows XP workstations to Windows 7 is a huge job. The pressure to get the job done is intensifying because Microsoft will stop supporting Windows XP SP2 after July 13, 2010 and Extended Support for Windows XP SP3 will end in April of 2014.

An in-place migration from Windows XP to Windows 7 isn't possible because the two operating systems are based on different architectures. Instead, Windows 7 requires a completely new install. It's not a trivial undertaking, especially if you have to migrate hundreds, even thousands of workstations.

IT organizations that are managing their Windows XP workstations with Novell ZENworks Configuration Management have an advantage: Novell has developed a straightforward, six-step methodology for migrating ZENworks Configuration Management-managed Windows XP workstations to ZENworks Configuration Management-managed Windows 7 workstations. (ZENworks Desktop Management users can also take advantage of the methodology but they must first move up to ZENworks Configuration Management.)

The methodology employs both Novell and Microsoft tools that automate many of the migration processes, minimizing risk and reducing effort and cost. The methodology retains the individual personalities of the user workstations, so users see a smooth transition. (A workstation's personality generally consists of system settings that govern the look and feel of the desktop, configuration data for the user's applications, personal files and Internet browser settings and bookmarks.)

The methodology enables you to use the same ZENworks Configuration Management tools with Windows 7 that you are currently using with Windows XP. The ability to manage a mix of Windows XP and Windows 7 workstations means you can migrate the workstations incrementally.

Novell offers a one-day, instructor-led (online or in-classroom) training course to guide you through the migration process. The course includes lab exercises that provide hands-on experience in using the tools and applying the methodology.

> The Tools

The methodology uses both Novell ZENworks Configuration Management tools and Microsoft tools. Here's a brief description of each tool used.

ZENworks Configuration Management Tools

- ZENworks Configuration Management Personality Migration captures and records the personalities of the Windows XP workstations so you can restore those personalities as part of the Windows 7 migration. This tool generates an XML document that the Personality Migration Engine uses when gathering or applying personality.
- ZENworks Configuration Management Inventory/Reporting Feature enables you to assess your workstation inventory to determine which Windows XP workstations are capable of accommodating Windows 7.
- ZENworks Configuration Management Bundle Management provides the ability to gather, package, deliver and install content on remote workstations. You can use this feature for such purposes as driving the capture and restoration of workstation personality and installing applications.
- ZENworks Configuration Management Image Explorer is used to build add-on images. These images are so named because, unlike base images, they are deployed without deleting and recreating existing partitions. The contents of add-ons are simply added to the contents of existing partitions. An example of an add-on image is one used to deliver the ZENworks Adaptive Agent to the target workstations.

Microsoft Tools

- Windows Automated Installation Kit (WAIK) comprises a set of GUI and command-line tools with associated documentation. Network administrators use it to create, configure and modify Windows 7 operating system images, and to automate the installation of Windows 7 operating system images on target machines. The Windows System Image Manager (WSIM) component exposes all configurable settings of an image file and enables you to write your selected settings to an XML Answer File. Both Sysprep and Windows Setup use the Answer File as input to their processes.
- Sysprep is installed as part of all versions of Windows 7. (You must run Sysprep before deploying a Windows 7 image.) Sysprep prepares a Windows 7 workstation for imaging and removes the machine's "uniqueness." It's generally used as a command-line utility but you can also use it with a GUI.

> The Methodology

The six-step methodology from Novell wraps around Microsoft Image-Based Setup (IBS) technology that applies an entire Windows 7 image in Windows Imaging (WIM) format to the workstation's drive. You can deploy the image that Windows Setup applies to the drive using either traditional ZMG-based imaging or ZENworks Configuration Management 3rd Party Imaging Support.

Step 1 - Identify Windows 7-ready workstations

This first step is an assessment of the inventory of Windows XP workstations to determine which ones are capable of migrating to Windows 7. You can use either the ZENworks Configuration Management Inventory/Reporting Features or Microsoft's Windows Upgrade Advisor for this assessment.

Step 2 - Configure the Technician's Computer

In this step, you build and configure the Technician's Computer that you will use to create the control files and bundles needed to perform the migration. You begin by installing the operating system. (You can use either Windows XP SP3 or Windows 7. Novell recommends Windows 7.) You then install WAIK and ZENworks Configuration Management Image Explorer, and install and configure ZENworks Configuration Management Personality Migration.

You will use the Technician's Computer for a variety of purposes, including:

- Creating a Sysprep Answer File to configure how the Windows 7 Standard Operating System (SOS) will be installed on the target workstations
- Determining what workstation settings and data are to be backed up and restored as part of the workstation personality migration
- Building ZENworks Configuration Management Application Bundles for installing ZENworks Configuration Management Personality Migration, capturing and applying workstation personality, and deploying images to the workstations
- Building add-on images using ZENworks Configuration Management Image Explorer

Step 3 - Backup operating system settings and user data files

This step employs ZENworks Configuration Management Personality Migration and ZENworks Configuration Management Bundle Management to save the operating system settings and user data files of all Windows XP workstations so you can restore them to the Windows 7 workstations.

Step 4 - Build and configure the Reference Computer

At this point, you build a Reference Computer from which you create the Windows 7 Standard Operating System Image that you will apply to the target workstations. You begin by installing your selected version of Windows 7. The configuration of the Reference Computer is determined by the Sysprep Answer File that you created on the Technician's Computer in Step 2. You specify the name of the Sysprep Answer File you created when you run the Sysprep utility on the Reference Computer. After running Sysprep, you then make an image of the Reference Computer using ZENworks Configuration Management ZMG-based or ZENworks Configuration Management 3rd Party Imaging.

Typically, in addition to the Windows 7 SOS base, you will deliver content, such as the ZENworks Adaptive Agent and the Novell Client for Windows 7, to the target machines during the imaging operation. To do so, you create nondestructive add-on images using ZENworks Configuration Management Image Explorer. You also configure a default profile that will be assigned to all local users created on the target workstations.

Step 5 - Deploy Windows 7 SOS Image to target machines

In this step, you use ZENworks Configuration Management to deploy the Windows 7 SOS base image created from the Reference Computer, plus any add-on images you created, to the target machines. These add-on images include the ZENworks Configuration Management Adaptive Agent to make the target machines manageable from ZENworks, and may also include other standard line-of-business applications.

Step 6 - Restore user settings and data files

In this final step, you use ZENworks Configuration Management Personality Migration and ZENworks Configuration Management Bundle Management to restore the user data and settings that you saved in Step 2 to the migrated machines. After the target machines have been imaged, they will automatically reboot. Windows Setup will then configure Windows 7 according to the settings in your Sysprep XML Answer File that will also include the installation of the ZENworks Adaptive Agent. Once the agent is installed, the target machines will again reboot. As each target machine reboots, a device object for that machine will appear in the ZENworks Control Center making the machine fully manageable by ZENworks Configuration Management.

> The Training

The Novell training course presents the generalized methodology, which you can easily customize to meet your organization's specific requirements. There are two recommended prerequisites for attendees. First, they should be experienced Windows users or support people. Second, they should have a basic understanding of ZENworks Configuration Management, including an understanding of the feature set and experience using the ZENworks Control Center.

Major Topics

The major topics covered include:

- Understanding the new Windows 7 Image-Based Setup (IBS) Technology — Includes an understanding of how IBS differs from Windows XP Setup and an understanding of Windows Imaging Format (WIM)
- Introduction to the Novell Migration Methodology — Includes an overview of the basic processes of the methodology and an introduction to the tools used
- Understanding the Microsoft tool set — Includes Windows System Image Manager (WSIM) and Sysprep
- Understanding ZENworks Personality Migration — Includes a definition of workstation personality, and an understanding of the components of ZENworks Personality Migration and ZENworks Personality Migration Template Builder
- Building a Windows 7 Standard Operating System (SOS) image — Includes selecting the image format, building the Sysprep Answer File that is used to configure the Sysprep process that you will run on your Reference Computer, and running Sysprep
- Creating add-on images to deploy with the Windows 7 SOS Image — Includes installing and using ZENworks Configuration Management Image Explorer, and building add-ons for the ZENworks Adaptive Agent and other third-party applications
- Deploying the SOS base image and add-ons — Includes creating the Image Bundle to deploy your Windows 7 SOS base image and add-on images, configuring the imaging hardware rule to trigger imaging operations, and building a ZENworks Directive Bundle to restore the personalities from the users' Windows XP machines to their new Windows 7 machines

Lab Sessions

Lab sessions include:

- Session 1. Configuring the Technician's Computer
- Session 2. Configuring ZENworks Configuration Management Personality Migration
- Session 3. Building the Sysprep XML Answer File
- Session 4. Configuring and imaging the Reference Computer
- Session 5. Creating add-on images using ZENworks Configuration Management Image Explorer
- Session 6. Deploying the new Windows 7 SOS environment with add-ons

> **Take the Next Step**

Find out more about how the Novell methodology and training class can help you lower the cost, effort and risk involved with Windows XP to Windows 7 migration.

Visit <http://www.novell.com/training/online/>