A few months ago, Novell announced that a “new and innovative user experience” would play a key role in its vision for collaboration. In November, that innovative user experience—taking shape as Novell Pulse—was previewed to wide accolade at the Enterprise 2.0 show in San Francisco, California. With planned availability in mid-2010, this new cloud technology enables users to enter a completely new arena: real-time, enterprise-class collaboration. The goal behind Novell Pulse is to help drive enterprise productivity and innovation by making it easier for users to communicate, generate ideas and share information instantly and from anywhere. To deliver on this promise, Novell Pulse combines communication, document authoring and social messaging tools with robust security and management capabilities.

While Novell Pulse shares some capabilities inherent to Novell GroupWise and Novell Teaming, it complements these solutions by creating a seamless bridge between traditional collaboration and the productivity gains offered by in-the-cloud, real-time, ad-hoc collaboration. Essentially, this means that Novell Pulse lets users communicate, co-author, co-edit and share in the cloud from anywhere on an ad-hoc basis.

Get Ready, Set, Share

One powerful aspect of Novell Pulse is its self-service nature. As an on-demand service, users don’t have to wait for IT to set it up. (See Figure 1.) If a few users within a department want to try it out, they can sign up for the free version and take it for a test drive. (See Feel the Pulse – Part Two.) But the self-service aspect doesn’t end there.

Figure 1: The self-service nature of Novell Pulse makes it easy for users to sign up for it and try it out.

The goal behind Novell Pulse is to help drive enterprise productivity and innovation by making it easier for users to communicate, generate ideas and share information instantly and from anywhere.

Similar to popular social networking services, users can create their own profiles and connect with and follow other people. They can determine what elements of their profile are visible to their followers or different groups. Users can also set up groups of people with whom they want to share content and communicate. This enables the quick, ad hoc creation of distributed teams comprised of people who can offer unique insights, experience and expertise. And because one of the primary design principles of Novell Pulse is interoperability, these groups can span organizational, geographic and even product boundaries.

The ease with which you can create teams, follow people and build ad-hoc relationships forms the basis for users to share just about any type of content in real time. In fact, Novell Pulse breaks down the barriers created by traditional collaboration tools, letting you share and collaborate in ways that accommodate the way you work.

With Novell Pulse, the primary vehicle for sharing is messages, but messages can be communicated or delivered in a variety of ways. When you send a message to someone’s personal address, it works just like a regular messaging system. When you send it to your personal feed address, it’s similar to a personal blog that people can follow. When you send a message to a group, it acts like a group feed or a location to syndicate content.

Messages can be styled and directed to other locations as well. For example, a message can be styled like a Wiki within Novell Pulse. A message can also be embedded in another Web page, where it can be styled as a wiki or other appropriate format. Additionally, since Novell Pulse uses a powerful document editor for content creation, messages can become full-blown documents that can be shared, co-authored and co-edited as desired.
By combining a powerful document editor with a wide variety of content delivery modes, Novell Pulse greatly simplifies the effort of creating, sharing and collaborating on content. It also enables new types of collaborative interactions with a broader set of participants. Rather than relying solely on a push model that sends information to an explicit audience, it lets users easily identify the most relevant and helpful target audiences.

**Novell Pulse breaks down the barriers created by traditional collaboration tools, letting you share and collaborate in ways that accommodate the way you work.**

> **Get the Message**
Just as Novell Pulse supports multiple ways to share messages and content, it offers multiple ways to receive them as well. The first of these is a *Private* area. This is where all messages addressed specifically to you will display in real time. In addition to private messages, Novell Pulse supports feed messages. Feed messages are like personal social blogs. Rather than addressing a feed message to specific people, you simply put it on your feed where all your followers will see it. (See Figure 2.)

For example, if you want to follow your CTO, you click the *Add People and Groups* button on the interface’s navigation pane and then click the *Follow* button below your CTO’s profile. Once you do that, the CTO will show up in the *Follow* list of your navigation pane. You can also mark that person—or any other person you follow—as a favorite so they’ll display on the top of your navigation list, making them easy to find.

To see the feeds of the people you follow, you can click on them individually, or you can go to the *Home* area of the Novell Pulse interface. The *Home* area not only shows all the messages directed specifically to you, it also displays the feeds of all the people you’re following. But the ad hoc nature of Novell Pulse lets you do more than just view the feeds of people you follow. It lets you participate in those feeds in real time. You can reply to a live feed, allowing the feed owner and his or her followers to see your comments in real time. Furthermore, depending on the permissions you have been granted by the person you are following, you can co-edit the feed in real time. This would enable you and the person you’re following to type in the same feed at the same time, allowing all followers to instantly see comments from both of you coming across the feed. This type of real-time interaction can occur with private messages, blog posts and documents as well.

> **Co-Author, Co-Edit and Synchronize**
In addition to your private messages and follower feeds, the *Home* area will also display messages sent to any groups to which you belong. If you prefer, you can also open a particular group so you only see the

![Figure 2: Novell Pulse makes it easy to post messages to your feed for all your followers to view, reply and participate in real time.](image-url)
feel the pulse part one tech talk 1 by ken baker continued

messages for that group. your groups form a powerful basis for enhanced interactive communication, as evidenced by the ability to co-author and co-edit documents within a group.

for example, running the files app from within a group lets you easily post files from your desktop to a Novell Pulse group. other members of the group will then be able to open a file using its native application, make changes to it, save it and have it synchronized back to their desktop.

Additionally, groups can create and collaborate on documents using the Novell Pulse document editor. As you type in a document, other members of the group can type and edit along with you in real time. (see figure 3.) you can work together live, instantly see each other’s changes without waiting for the file to be unlocked or checked in. to further facilitate document creation, Novell Pulse includes a library of content templates for wikis, resumes, billing statements and more. (see figure 4.)

Furthermore, since Novell Pulse is a cloud-based solution designed from the ground up for interoperability, it facilitates inter-company collaboration. Not only can dispersed users in your own organization share and co-edit documents, they can easily share and co-edit with people from other organizations, as well.

Since Novell Pulse is a cloud-based solution designed from the ground up for interoperability, it facilitates inter-company collaboration.

For example, in the past if you planned to issue a joint product datasheet with one of your partners, you might have gone through several review cycles that included internal editing, aggregation of input, and e-mailing and importing file attachments. Novell Pulse lets you and your partner simply co-author and co-edit in real time, eliminating the back-and-forth sending of e-mail attachments—and all the time-consuming and error-prone manual work that follows.

> Break Through the Clutter
Novell Pulse also enables you to address the problem of information overload, where your users are bombarded with information from all directions—instant messaging, blogs, micro-blogs and more. From within the solution’s refinement panel you can search for any information within Novell Pulse and have it delivered to your inbox. For example, you can have it show you all the messages from Steve, Bill and Mary that have been tagged “GoToMarket”.

Figure 3: Novell Pulse allows you to co-author and co-edit documents in real time with other members in your groups.
Future revisions of Novell Pulse will synchronize and filter personal and professional content delivered from multiple external enterprise and consumer cloud services (i.e., Facebook, Twitter, LinkedIn, Google Wave and others), as well as many traditional sources and formats. It will unify and present this data in a single, easy-to-use interface—complete with folders, filtering and search—that will let your users make better sense of it all and focus on what's really important. In essence, Novell Pulse will become a universal inbox that will enable your most relevant information to rise to the top.

To accomplish this, Novell Pulse will eventually leverage a new data synchronization technology being developed by Novell that can connect disparate collaboration solutions, business-critical applications, mobile devices, social networking services and other cloud services. Using this multi-source, multi-target synchronization engine, Novell Pulse will be able to receive real-time messaging and content updates from applications such as Novell GroupWise, Novell Teaming, Microsoft Exchange, Microsoft SharePoint, SugarCRM, salesforce.com, ActiveSync, Documentum, SAP and others.

The seamlessness that Novell Pulse creates between traditional and real-time collaboration can dramatically enhance user productivity. Its real-time communication enables faster decision making. It streamlines document editing and review processes. It allows users to work in real-time with secure, enterprise-ready collaboration as-a-service. Ultimately, Novell Pulse lets you take advantage of the cloud to address the dynamic needs of your global, knowledge-based workforces—giving you the ability and confidence to embrace real-time collaboration technologies to drive down costs, enhance productivity and enable your business growth. To learn more about Novell Pulse from an IT perspective, read the second article in this two-part series. (See Feel the Pulse – Part Two.)

Novell Pulse lets you take advantage of the cloud to address the dynamic needs of your global, knowledge-based workforces—giving you the ability and confidence to embrace real-time collaboration technologies to drive down costs, enhance productivity and enable your business growth.

To learn more about Novell Pulse, or be notified of its availability, visit [www.novell.com/pulse](http://www.novell.com/pulse).

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**Figure 4:** Novell Pulse includes a library of document templates to further facilitate document creation and co-authoring.
As a real-time collaboration platform that combines communication, document authoring and social messaging tools with robust security and management capabilities, Novell Pulse occupies a unique niche. As the first enterprise-class solution of its kind, Novell Pulse aims to boost enterprise productivity and innovation by making it easier to communicate digitally, generate ideas and share information. With planned availability in mid-2010, this in-the-cloud collaboration solution will come in two different flavors: free and enterprise.

> Flexible Options
The free version of Novell Pulse makes it easy for you and your users to try it out to see what it can do for you. (See Figure 1.) You can easily move from the free version to the enterprise version if you decide you need more groups or more storage space, or if you want to take advantage of more robust management features. The enterprise version of Novell Pulse is especially helpful if you want to implement the solution for your entire organization. With its ability to leverage directory services and identity-based policies, the enterprise version makes it easy for you to manage the solution throughout your organization to strengthen security and support the way people work.

It's easy to move from the free to the enterprise version of Novell Pulse, so you can adopt and implement the solution at your own pace and according to your unique needs. Another aspect of the solution that not only facilitates implementation, but distinguishes it from most other cloud applications, is its flexibility. Cloud applications typically come in two varieties. The first variety, exemplified by applications like Facebook, takes a very open approach, where there is no notion of organization and individual users have fairly complete control over who can see their profiles and content. The second variety, including applications like salesforce.com, features a more closed, multi-tenant approach, where viewing and accessing content is confined within a specific organization.

Rather than taking an all-or-nothing approach, Novell Pulse offers a more flexible, multi-instance design. This allows you to have some aspects of your implementation very open, while others can be completely locked down. For example, you might decide to let users expose their blogs publicly, while keeping contact information or other sensitive content hidden. You can make Novell Pulse as closed or as open as you want, and deploy it within any scope that is appropriate. (See Figure 2.) This flexibility also lets you move beyond your own organizational boundaries — exchanging information and ideas more easily with partners or customers, while giving you the ability to limit access to certain areas as needed. You can even leverage Novell Pulse to securely and easily co-author and co-edit documents with those outside your organization. (See Feel the Pulse – Part One.)

Figure 1: The self-service nature of Novell Pulse makes it easy for you to try it out to see what it can do for you and your organization.
As the first enterprise-class solution of its kind, Novell Pulse aims to boost enterprise productivity and innovation by making it easier to communicate digitally, generate ideas and share information.

Flexible Administration

The flexible nature of Novell Pulse also makes life easier for your users and IT team. It provides a whole host of self-service management capabilities, while allowing IT to exert as much management influence as they want. For example, users don’t have to wait for IT involvement to create their own profiles and groups and start taking advantage of the solution’s real-time collaboration benefits.

To create a group in Novell Pulse, users simply click on the Add People and Groups button on its navigation pane, and then click Add Group. From within this interface they can easily control the “who, what and how” of the group. They can define the group’s basic attributes, such as its name, a description of its purpose, its leadership and member contact information. They can decide if they want the group to be open for the whole world to see, open just within their organization or limited to a select (“private”) group of invited individuals. The solution provides even more granular settings to help you define who can follow or contribute to a group, who can add followers, who can e-mail the group and more. (See Figure 3.)

If you want greater control over who in your organization can create groups and how they can create them, the enterprise version of Novell Pulse will give you this level of control through its ability to leverage your directory and identity-based policies. First of all, you can easily provision users and groups (along with their sign-on and permissions) by leveraging your directory servers and enterprise identity and access management systems. This allows you to use your established security and management processes to keep your content safe.

You can also set the visibility and access levels for messages and documents within a group, such as “open” (anyone can see it), “organization” (only people in same company), or “private” (only invited parties). Using roles and identity-based policies, you can limit the creation of groups that extend beyond the organization. You can control how a participant joins a group or requests entry into one. You can even restrict who can follow whom at the individual or role level.

Figure 2: Novell Pulse gives you the management flexibility to have a very open or a very controlled implementation.
To safeguard your identity infrastructure, Novell Pulse offers a variety of ways to manage provisioning and sign-on. First, it can make calls from the cloud to your directory environment using Security Assertion Markup Language (SAML) to dynamically provision users when they sign on. For added security, Novell Pulse can leverage the Novell Cloud Security Service for accessing your directory service. The Cloud Security Service essentially annexes a segment of a public cloud to hold your enterprise identity information securely behind your firewall, while still making it safely available to Novell Pulse. [See Cloud Security Service article.]

As another option, Novell Pulse provides a separate provisioning utility that you can run on-premise to periodically query the directory service and push updates out to the Novell Pulse cloud.

Even though Novell Pulse leverages enterprise-proven Novell security and compliance capabilities, some organizations might still be wary of relying on an in-the-cloud service to enable real-time interactions among their users and colleagues. To address this need, Novell plans to develop an on-premise version of Novell Pulse. Once again, since Novell Pulse is a multi-instance implementation, this would give you the flexibility to run the product both on-premise and in the cloud. So if you had highly sensitive content or interactions that you simply didn’t want hosted in the cloud, you could host them internally with the on-premise version, while allowing other interactions to be hosted by instances of Novell Pulse in the cloud.

With its ability to leverage directory services and identity-based policies, the enterprise version makes it easy for you to manage the solution throughout your organization to strengthen security and support the way people work.

> **Flexible Interactions**

Another exciting aspect of Novell Pulse is that it’s a federated technology. This is a significant game changer in the cloud space. Consumers view many popular cloud applications as the product of one virtual uber-company that owns everything, doesn’t share with others and leaves users entirely dependent on them. That type of scenario creates a lot of inherent risk.

As a federated technology, Novell Pulse will be able to interact and share content with other cloud services. In fact, at Enterprise 2.0 in San Francisco this past November, Novell demonstrated the ability to federate with Google Wave. This interoperability, the result of a technical collaboration between Novell and Google, leverages the Wave Federation Protocol (WFP).

Figure 3: Novell Pulse gives IT granular control over group policies, while providing the option to let users create their own groups and define the controls for group participation.
WFP enables messages to be shared in real time, character-for-character, as they are being created or edited between two or more separate systems. Similar to e-mail addressing, you can place addresses from different domains on a message, allowing the message to automatically become live for sharing and co-editing among users of the different systems. As a result, Novell Pulse and Google Wave will be able to operate in tandem so that users of the two platforms can work together in real time, each using their tool of choice.

In addition to its federation capabilities, Novell Pulse will be able to interact in real time with other cloud services, traditional collaboration solutions and mobile devices using a new data synchronization technology being developed by Novell. This synchronization technology will enable Novell Pulse users to easily receive and act upon messages and content updates from multiple sources—all from within the Novell Pulse interface.

Whether you’re looking to the cloud as a means to enhance user interactions or lower IT expense, Novell Pulse makes it easier to communicate digitally, generate ideas and share information—within your organization or well beyond it. Novell Pulse leverages the extensive experience Novell has in developing enterprise collaboration and communication tools, as well as its industry leadership in identity and security management solutions. As a key component of the Novell collaboration strategy and open collaboration architecture, Novell Pulse can be deployed stand-alone or in concert with the broader Novell product portfolio, including the Novell GroupWise and Novell Teaming collaboration solutions.

In addition to its federation capabilities, Novell Pulse will be able to interact in real time with other cloud services, traditional collaboration solutions and mobile devices using a new data synchronization technology being developed by Novell.

To learn more about the day-to-day benefits that users can derive from Novell Pulse, read the first article in this two-part series. (See Feel the Pulse – Part One.) To learn more about Novell Pulse, or to be notified of its availability, visit www.novell.com/pulse.
Annexing
The Cloud
Exploring a smarter approach to cloud security

By now, just about everyone understands the impressive potential of enterprise cloud computing. What’s not to like about the concept of tapping into vast pools of inexpensive processing power, storage capacity or even whole computing platforms whenever you need them—and then instantly releasing them when you don’t? But there are still a few significant hurdles preventing many enterprises from fully embracing cloud computing. And by far, the biggest of those hurdles is security. Survey after survey shows that cloud computing can never become a viable, compelling option for most enterprises until they can confidently secure, protect and enforce compliance on all the critical corporate data that lives in the cloud.

So what’s the best, most effective approach for addressing these cloud security issues? Novell believes the answer lies in creating a secure, trusted broker between your enterprise and your cloud security provider that makes it possible to extend your existing identity infrastructure—including all your security policies and controls—to public cloud environments. This identity-based approach makes sense. In virtualized cloud environments, the network layer inevitably becomes abstracted, which essentially makes most traditional network security methods ineffective and obsolete. As a result, more of the security burden gets pushed up to the identity layer. Fortunately, with its long history of successful identity-based solutions, Novell is ideally suited to step in and provide the level of enterprise-strength, identity-based security cloud computing environments demand. A dedicated team of more than 20 Novell engineers has been working for nearly a year to make it happen. And the result is the Novell Cloud Security Service.

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> Extending Your Enterprise Security Perimeter
This innovative new service, which is typically delivered through various types of cloud providers, provides enterprise-level cloud security by performing three critical functions. First, a process Novell calls “annexing” extends the perimeter of your enterprise security policies and practices to the cloud and provides a unified view of cloud resources. This makes it possible to uniformly enforce business policies and operational practices across both your internal data center and external cloud environments. Next, the Novell Cloud Security Service allows you to integrate workloads within this extended security boundary. This involves using patented and patent-pending technology to directly communicate identity and audit information to and from traditional workloads, whether they reside in your data center or in the cloud. Finally, the Novell Cloud Security Service also manages cryptographic keys to make sure information stays completely secure as it flows between the cloud and your private data center. And of course, you always maintain complete control over cryptographic key generation, exchange and storage.

With Novell Cloud Security Service, these core annexation, workload integration and encryption capabilities—all managed and controlled through a convenient web-based console—work together to provide the critical missing pieces of the cloud security space and make cloud computing a safe, viable option for your enterprise. (See Figure 1.)

> Anatomy of the Novell Cloud Security Service
The Novell Cloud Security Service consists of three main components (See Figure 2.):

- **Identity and event connectors** to specific Software as a Service (SaaS) and Platform as a Service (PaaS) providers
- **Connectors to specific identity systems** across your enterprise
- **A Cloud Security Broker** that resides within the cloud and maintains a secure communications bridge between your enterprise and all your SaaS and PaaS providers

Let’s take a look at each of these components in a bit more detail.
Annexing The Cloud  TECH TALK 3 by Todd Swenson continued

Connectors to SaaS and PaaS Providers
The Novell Cloud Security Service starts with out-of-the-box identity and event connectors for specific SaaS and PaaS providers. These connectors make it possible for your enterprise identity and audit systems to communicate securely with a wide range of PaaS and SaaS environments through the Cloud Security Broker. Today, Novell offers out-of-the-box connectors for most popular cloud applications and application frameworks, including Salesforce.com, Google Apps and Spring, as well as common network services like Microsoft SharePoint. Of course, the exact nature of these connectors depends on the capabilities and characteristics of various cloud services. For example, most PaaS environments are robust enough to provide the types of identity, audit and compliance mechanisms most enterprises require. Many SaaS environments, on the other hand, lack this type of robust underlying platform or are controlled by providers who are unwilling to expose that platform to users. In these cases, Novell will work directly with cloud providers to develop specialized connectors that work with specific SaaS environments in ways that make the most sense. You may also have the option of modifying enterprise applications running inside SaaS environments to use Novell Cloud Security Service APIs directly, which avoids these issues and typically provides a higher level of functionality.

Connectors to Enterprise Identity Systems
On the enterprise side, Novell Cloud Security Service offers standards-based integration for most identity management providers, including IBM, Microsoft, CA, Oracle, Sun and (of course) Novell. These connectors provide a secure bridge that sits behind your firewall and provides the following services and capabilities:

- A general purpose protocol proxy that allows the aggregation of many different protocols into firewall-friendly packets.
- An audit agent that allows the delivery of audit events to your on-premise auditing and monitoring mechanisms.
- A policy agent that provides secure access to enterprise policy requests from the Cloud Security Broker.
- A key management agent that maintains all the cryptographic keys necessary for secure communications between the Cloud Security Service's various components.
- A secure communication manager that ensures all the encrypted traffic handled by the multi-protocol proxy is transported correctly and securely.

It's also worth noting that unlike some cloud security solutions, this small footprint secure bridge uses standard ports and protocols for all communications.

Figure 1: A unified Novell Cloud Security Service console gives you complete control over the security status of all your cloud computing resources.
between your enterprise and the Cloud Security Broker. This approach, together with a fully encrypted communication channel, means you can achieve totally secure communications between your enterprise and the cloud without modifying your firewall.

The Cloud Security Broker
The Cloud Security Broker lies at the heart of the Novell Cloud Security Service, between the enterprise connectors and the SaaS and PaaS connectors. This core component resides inside the cloud and is responsible for maintaining all the essential connections between your enterprise and all your PaaS and SaaS providers. The Security Broker consists of a collection of protected virtual workloads that combine to provide a secure space for cloud workloads and storage resources. These protected workloads typically consist of enterprise services that have been moved from your data center to the cloud, as well as ancillary Novell Cloud Security Service processes. This creates an environment where workloads in the cloud can securely access enterprise resources using either standard protocols like HTTPS and LDAP or the more robust Cloud Security Broker API/Platform. In both cases, cloud workloads communicate with your enterprise over the Secure Bridge using cryptographic keys that are locked inside your secure data center. And both methods take full advantage of the Cloud Security Broker's robust identity and governance, risk and compliance (GRC) integration capabilities.

In the end, all of your cloud resources—whether they are accessed within the Cloud Security Broker or through SaaS and PaaS connectors—become secure, fully annexed extensions of your data center.

Benefits of the Novell Cloud Security Service
There are plenty of great reasons to “annex” cloud resources using the Novell Cloud Security Service. Here are a few you should consider:

- **Identity protection.** With the Novell Cloud Security Service, identity credentials are never exposed. Instead, protected identity information behind your firewall is used to create pseudonym credentials for use in cloud environments.
- **Regulatory reporting.** The Novell Cloud Security Service goes beyond identity management to extend business rules, policies and compliance enforcement to cloud environments.
- **Storage protection.** Novell is the only vendor that offers integrated and secure access to storage resources in the cloud through key-based encryption.
- **Workflow extension.** Annexation allows workflows to move beyond traditional enterprise boundaries, so cloud resources can be governed by your organization’s established business rules.
- **Zero-time deprovisioning.** The Novell Cloud Security Service can quickly block unauthorized access to your SaaS systems and immediately alert you when unauthorized users attempt to gain access.

Figure 2: The Novell Cloud Security Service verifies user identities through connectors to your existing identity infrastructure, generates an identity token through the Cloud Security Broker and passes the token to the relevant cloud provider in the requested format to grant user access.
Getting Started with the Novell Cloud Security Service

The Novell Cloud Security Service will begin shipping later this year. In most cases, the solution will be delivered through leading cloud computing vendors, and the Cloud Security Broker typically resides where those vendors host their SaaS applications. However, enterprises can also work with Novell to host the service through a participating Novell hosting partner or Infrastructure as a Service (IaaS) provider. Today, Amazon EC2, GoGrid, XEN, Eucalyptus and any IaaS that uses VMware ESX can support the Novell Cloud Security Broker. To get started with the Novell Cloud Security Service, ask your PaaS or SaaS provider if they plan to support or offer the solution. If not, contact Novell for more information about alternative IaaS hosting options.

Dig Deeper into Cloud Computing

For more details on the Novell Cloud Security Service and other Novell cloud computing solutions, check out the following resources:

- Visit [www.novell.com/cloud](http://www.novell.com/cloud)
- Download a technical white paper on the Novell Cloud Security Service
- Contact a Novell representative
Flying in the fog is the same as flying in clear weather, except you can’t see.
—An old aviation saying

When you’re in the cloud—literally, that is: flying an airplane—you need instant, real-time data to keep safe and on-course. Instrument-rated pilots are able to “fly blind” because they have a core set of gauges that show altitude, attitude, air speed, vertical speed and direction. When the aircraft enters the cloud, this information is critical to keeping on course.

As companies plan to move services to a cloud computing infrastructure, the same principles apply. In a cloud environment, you’re essentially flying blind.

If a service exhibits poor performance or even goes down, you can’t just look at the server it’s running on to see what has gone wrong. Whether you’re relying on a service provider’s hosted infrastructure or your company’s own internal cloud, there might be dozens or hundreds of virtual machines migrating between different physical resources as workload requirements evolve.

Your goal is to keep all these processes on course, even though you can’t see directly where they are at any given time or where they’re headed. With cloud computing, the ability to fly by instruments becomes essential.

Vendors have developed a wide variety of monitoring and management tools to show how the physical and virtual components that support your services are performing, so you can make course corrections as necessary. Unfortunately, all these tools have their separate purposes, data stores, formats and interfaces. You have access to a lot of data in various places, but without the ability to analyze data relationships for real-time decision making, you’re still just flying by the seat of your pants.

Figure 1: BSM Dashboard displays a top-level view of the order fulfillment application running at RetailGiant.com’s distributed data center. The green color-coding indicates normal operations. Orange shows a data center that’s beginning to experience problems.
Taking Off with Novell Business Service Management

Like a well designed instrument panel, Novell Business Service Management (BSM) consolidates and organizes data from all your physical and virtual systems. Whether you lease virtualized infrastructure from a service provider or run your own virtual data center, BSM offers instant analysis to help you navigate the cloud. Let’s step through a typical IT “flight” to see how BSM works to help you visualize in-the-cloud processes that would otherwise be obscured behind multiple layers of disparate technology.

First, let’s file a flight plan. Using Novell Business Service Management Dashboard, here is a view of our goal: an application that’s up and running efficiently in the cloud. (See Figure 1.)

The BSM Dashboard is displaying an order-fulfillment application for an online retailer we’ll call RetailGiant.com. There are multiple data centers distributed across the U.S. The green color-coding shows that all the data centers are operating normally.

What’s normal? It all depends on the parameters you have defined, based on any combination of data from any of the available feeds. That can mean anything from hardware performance on the technical side, to service levels on the business side, to website responsiveness and cart checkout rates on the customer side.

The orange highlighting shows a data center that is going off course. By clicking on it, you can drill down to see which service is affected. (See Figure 2.)

The billing service is showing an availability problem, and the server responsible for the problem is highlighted in orange. You need to address the problem before it goes red. Clicking on the orange server, you can drill down to see the root cause, including alarms that have been generated. (See Figure 3.)

The problem is a server that has exceeded its defined performance thresholds. And you can drill down even further to see the individual alarms that have been generated, find out who owns the problem, see the trouble ticket, follow the progress of the solution and much more.

In addition to drilling down to the root cause, you can also zoom out for a view of the virtual and physical technology supporting the troubled service, as well as the downstream services that are being affected. (See Figure 4.)

The problem we’ve been looking at is a technical malfunction. But by feeding business metrics and other data sources into BSM Dashboard, you gain the ability to trace other kinds of problems as well. For example, you might trace the root cause to a business problem, such as an increase in online traffic due to an approaching holiday. In that case, you might simply assign more virtual hosts to the service. Whether the source of the problem is technical or tactical, Novell Business Service Management is an invaluable tool for prioritizing issues and speeding their remediation.

Figure 2: This view shows that the billing service is experiencing an availability problem. On the left side, you can see the specific server at the source of the problem.
Looking Behind the Instrument Panel

Novell Business Service Management is the only solution that enables single-pane-of-glass analysis by combining information ranging from hardware performance, to business metrics, to IT policies. Let's take a look behind the instrument panel to see how it works.

The Novell BSM architecture includes three layers (See Figure 5):

- An integration layer designed to consolidate virtually any IT management, asset or configuration data source, along with business metrics and other data sources.
- An intelligence layer that provides normalization, aggregation and correlation of data to support relationship mapping, root cause and impact analysis, and automated services for problem determination, notification and remediation.
- A visualization layer that shows in real time when there’s trouble with key business applications or infrastructure. For most customers, the primary visualization mechanism is through the intuitive, role-based myMO Dashboard interface.

Integration with Management Systems and Help Desk Tools Using Adapters

The bottom layer collects data from all your disparate management and monitoring systems to enable logical analysis in the middle layer and single-pane-of-glass visualization in the top layer. This data-gathering is made possible by a collection of specially designed software adapters that provide an integration point between the BSM server and management systems such as HP OpenView, NetCool, Nagios, WhatsUp Gold and many others. (See Figure 6.)

There are more than 70 out-of-the-box adapters in all, each written to the specific API that integrates bi-directionally with each third-party management system. In some cases, the adapter communicates directly to the management system, in other cases, the communication is brokered through a Novell supplied object request broker (ORB).

You can also use adapters to connect your process-oriented tools, such as Remedy, Service Center and other tools that allow your help desk to receive alerts, issue trouble tickets, assign responsibility and track progress to a solution.
Integration with CMDB
You can also connect Novell Business Service Management to your configuration management database, whether you’re using the next-generation Novell CMDB360 or a third-party CMDB. For example, by configuring an integration with Atrium, you can visualize physical and virtual IT assets in the context of their technical and ownership relationships. This provides you with an application service-level view of the enterprise—spanning both the internal and external clouds—so you can build and adapt your service model on the fly.

Algorithms
In addition to external data sources, you can also create algorithms that define thresholds or provide a way to override how particular states are propagated. These algorithms are XML configuration files that define propagation rules related to the state of any given service. (See Figure 7.)

Because of the relationships captured in BSM, you can use algorithms to define rules that go far beyond what you could do with multiple, separate monitoring systems. And in addition to finding and fixing problems, the results can support all kinds of technical and business needs.

The Logic and Visualization Layers
With data sources and custom algorithms in place, the automated Business Service Configuration Management tool builds the middle-layer logic that links all this information into an intelligent service model. The myMO-based BSM Dashboard visualizes this intelligence to provide a “top-down” view of the entire enterprise including all service offerings, how they’re deployed and how they’re related.

You can build as many views as you need to suit different job functions—such as business manager, IT service manager and operations manager. Any change in the state of a service flows up through the various views to alert the appropriate users.

Figure 5: The three-tier architecture of Novell Business Service Management includes layers for data integration, intelligent modeling, and analysis and visualization.

Figure 6: This view shows the configuration of adapters. A few of the available adapters are shown on the left, and the properties available for use with a specific adapter are shown on the right.
Navigating the Cloud With Novell Business Service Management

Continued

> Beyond IT: A Business Use Case

Novell Business Service Management is more than an IT tool. It also provides invaluable business support—for example, documenting compliance with service level agreements. In this example, you can build a dashboard view for internal or external customers that lets them see for themselves that you’re meeting your SLA commitments using both real-time and historical data. (See Figure 8.)

> Flying High on Cloud 9

When flying in zero-visibility conditions, pilots rely on a centralized instrument panel that consolidates information from airspeed, attitude, hydraulics, electronics and other monitors distributed throughout the aircraft. Novell Business Service Management provides the same capabilities when you’re navigating the cloud. Consolidating information collected throughout your environment, BSM is designed to do the following:

- Map technology to applications to the business
- Create a trusted source for IT and the business
- Turn data into powerful intelligence
- Visualize intelligence in ways that are relevant to diverse management roles

In other words, Novell Business Service Management provides the reliable instrumentation you need to keep cloud-based services and applications in control and on course.

Figure 7: Here, we’re creating an algorithm to set the thresholds that trigger an alert.

Figure 8: This Business Service Management Dashboard is designed to let customers monitor SLA compliance.
As the leader in its industry, Burton requires high availability of its mission-critical applications, as well as the flexibility to adapt to changing market needs. Moving from UNIX to SUSE Linux Enterprise Server has helped the company achieve 99.999 percent uptime and an 80 percent cost reduction, compared to its previous proprietary solution.

Overview
In 1977, Jake Burton Carpenter founded Burton Snowboards out of his Vermont barn. Since then, Burton has fueled the growth of snowboarding worldwide through its groundbreaking product lines, its team of top snowboarders and its grassroots efforts to get the sport accepted at resorts. In 1996, Burton began growing its family of brands to include boardsports and apparel brands. Privately held and owned by Jake, Burton’s headquarters are in Burlington, Vermont with offices in California, Austria, Japan and Australia. For more information, visit http://www.burton.com.

Challenge
As a dynamic global enterprise, Burton operates 24/7 and requires the flexibility to react quickly to changes in the marketplace. The IT department, in particular, needs to provide consistent uptime and to be able to adapt to changing business needs.

The company’s previous HP-UX operating platform required expensive hardware and time-consuming administration. Frequent downtime was also an issue. While preparing for an upgrade of its SAP and Oracle applications, the company began evaluating a move to Linux.

Solution
After determining that a UNIX upgrade would be cost-prohibitive, Burton evaluated several Linux distributions. The company selected SUSE Linux Enterprise Server as a stable, reliable platform for its SAP and Oracle environment.

“It was important for us to have a Linux platform that is certified by SAP, and that was one of the compelling factors that led us to choose SUSE Linux Enterprise Server,” said Bill York, senior Linux administrator at Burton. “While snowboarders are not averse to risk, as a business, we can’t afford to take risks when it comes to our business-critical systems that need to be available at all times.”

“SUSE Linux Enterprise Server can take on a tremendous workload that would drive any other operating platform to its knees. Our systems run amazingly fast and are much more available and responsive than they used to be.”

Bill York
Senior Linux Administrator
The Burton Corporation

Burton migrated all of its mission-critical systems to Dell servers running SUSE Linux Enterprise Server, including SAP ERP, Business Intelligence, CRM, Enterprise Portal, as well as its Oracle applications. “SUSE Linux Enterprise Server can take on a tremendous workload that would drive any other operating platform to its knees,” said York. “Our systems run amazingly fast and are much more available and responsive than they used to be. We also no longer experience any random downtime.”

The company plans to use the built-in Xen virtualization to reduce its number of physical servers and adapt quickly to changing workloads. The ability to quickly deploy virtual servers will greatly improve the IT staff’s ability to add new applications as needed. Virtual servers will also help the team create better development and testing environments on existing hardware.

“Our entire IT staff made a smooth transition from our UNIX environment, with no need for additional training,” said York. “SUSE Linux Enterprise Server is so much simpler to administer through YaST, and we can now easily keep pace with new security enhancements.”

By moving from HP-UX and proprietary hardware to SUSE Linux Enterprise Server running on commodity hardware, Burton has greatly reduced its server-related costs which it can now re-invest in other parts of the business. The ability to leverage open source applications is helping the company to further reduce software costs.
The company is also looking into SUSE Linux Enterprise Server Priority Support for SAP Applications, a joint support offering from SAP and Novell that includes maintenance and support for SUSE Linux Enterprise Server, as well as SAP applications, with a single support entry point.

“Our experience with Novell support has been incredible,” said York. “We really take advantage of the Novell Web site to get technical information, tips and tricks from the experts, and to check out the Cool Solutions site.”

“Since moving to SUSE Linux Enterprise Server, our uptime has been insane. SUSE Linux Enterprise Server keeps us nimble and flexible, so we’re better able to meet the demands of the business and react quickly to a changing marketplace.”

Bill York
Senior Linux Administrator
The Burton Corporation

>Results
Moving its mission-critical SAP and Oracle environments to SUSE Linux Enterprise Server has helped Burton reduce overall server-related costs by 80 percent compared to its previous proprietary solution. The ability to use commodity servers has not only significantly reduced the company’s hardware costs, but has also reduced its power consumption by 30 percent.

SUSE Linux Enterprise Server has helped the company reduce administrative time and costs by 40 percent. Simplified administration and consistent uptime has also reduced the time spent supporting users by 25 percent. Overall, the company enjoys 99.999 percent uptime.

“Since moving to SUSE Linux Enterprise Server, our uptime has been insane,” said York. “We have some servers that have gone two years before being rebooted. SUSE Linux Enterprise Server keeps us nimble and flexible, so we’re better able to meet the demands of the business and react quickly to a changing marketplace. Particularly in today’s economy, flexibility is critical.”
TREND TALK

Intelligent Workload Management
Balancing flexibility and control in the cloud

"As enterprises increasingly seek application portability across private and public cloud environments, security and identity issues become paramount. Novell's intelligent workload management offerings will bring the relevant technologies together in a way that helps customers extract optimal value from their workload asset."

—Parag Patel, vice president of alliances, VMware

Everybody is talking about cloud computing these days. The conventional wisdom is that, some day soon, entire enterprise data centers will be outsourced—offloaded to some secure, undisclosed location where IT resources will be available anytime at a nanosecond’s notice. It may sound outlandish. Then again, cloud computing is happening. While 55 percent of CIOs said in a recent survey¹ that they will not be using cloud computing in 2010, only 21 percent make the same claim about 2012. Many start-ups are already building data centers entirely in the cloud, and established organizations everywhere are testing the waters by contracting with software as a service (SaaS) providers, or outsourcing less-than-critical business services to cloud vendors.

Clouds, whether public, private or a hybrid of the two, will certainly become essential components of the enterprise IT mix in the coming years because of their potential for lowering costs, increasing efficiencies and enabling organizations to tap unlimited processing resources. But there are still serious issues to be resolved. Who do you call when something goes wrong? Will there be a paper (or digital) trail that proves compliance with policies and regulations? Can you identify physical, virtual and cloud resources and pinpoint their locations at any time? And can you control access to data, applications and infrastructure even while sharing processing resources with other firms?

The answer to all of these questions is a qualified Yes. The qualification? Intelligence, security and management must be integrated components of the cloud. Any cloud. Moreover, the workload—the integrated suite of software that includes the operating system, middleware and application—is where the necessary intelligence and management functionality must reside. To be truly intelligent, workloads must be self-contained, identity-aware, policy-driven software packages that contain integrated management and offer real-time monitoring and reporting capabilities. They must be able to optimize the use of enterprise resources. They need to be platform-agnostic and therefore able to run anywhere and be easy to move around. And, linked together, they have to be able to deliver business services.

Today, the intelligence and management capabilities that are the basis for enterprise-grade security, compliance and control typically exist outside the workload. But all of that is changing with the emerging intelligent workload management (IWM) market.

Intelligent workload management will enable IT organizations to manage and optimize computing resources in a policy-driven, secure and compliant manner across physical, virtual and cloud environments to deliver business services for end customers.

When it comes to IT IQ, intelligent workload management is the cloud’s silver lining.

Intelligent Workload Management is...

Intelligent workload management is a computing model that enables IT organizations to manage physical, virtual and cloud environments as a unified, fully integrated system. Intelligent workload management provides the tools to build, secure, manage and measure an integrated stack of application, middleware and operating system—a mix that constitutes modern workloads.

Within this model, workloads are
- identity-aware
- platform-agnostic
- policy-driven
- portable
- secure
- self-contained

and capable of
- business service delivery
- enterprise resource optimization
- integrated management
- real-time monitoring and reporting

¹ www.novell.com/connectionmagazine\Page 1 of 4
Intelligent Workload Management  

> Why Cloud Computing Needs IWM

Cloud computing has the potential to provide better business agility and access to powerful hosted technologies even as IT managers retain control of vital assets from within the organization. Enterprises can gain greater efficiency, which can lower power requirements, operating costs and capital expenditures. But serious risks and challenges of cloud computing must be eliminated before cloud computing goes mainstream. Even more important, no business anywhere is going to put everything into the cloud. Any cloud computing environment needs to integrate with both the physical and virtual computing tools that every data center has in place today.

For starters, several “must-haves” need to be in place.

**Security, Compliance and Control**

According to IDC, security is the number one concern for enterprises considering deploying to the cloud. Data center managers must be able to replicate in the cloud the level of data protection, compliance with government and industry regulations, and access control that currently exist on premises in enterprises today.

**Flexibility**

Enterprises need the ability to move workloads from physical environments to virtual environments and into the cloud—and back again. These requirements mean that every application needs to be portable—able to run in every environment. Portability is key to business flexibility. Interoperability is equally important. Cloud services must be standards-based so enterprises can move workloads in and out of them as needed.

**Identity**

Identity awareness is a prerequisite for confidence in the cloud. Identity and access controls must be able to move with each workload between physical, virtual and cloud environments.

**Management**

Activity in the cloud must be governed by the business policies that are set by the enterprise. The enterprise needs to be able to impose its policies on the cloud, instead of just taking whatever the cloud vendor offers as “standard security.”

Integration

Workloads residing in the cloud must work with existing and new management frameworks that integrate the cloud into the existing pools of physical and virtual computing resources. In addition, they must plug in to a business service management layer.

**Dependability**

Compute resources are shared in a cloud, which makes processing performance optimization capabilities mandatory. Cloud-based workloads must be able to recognize when they reach capacity and find additional computing capacity to meet any spike in demand. Users must have unimpeded, secure and compliant access to the full computing services they need to do their jobs right.

> Finally, a Cloud Computing Model that Holds Water

Intelligent workload management enables you to put the cloud in context. Every article in the IT trade press may be talking about cloud computing, but the reality is that you want to use the cloud where it makes sense, when it makes sense and only if you can obtain guaranteed levels of security and compliance. Intelligent workload management delivers one integrated approach to managing resources across physical, virtual and cloud environments, and views the management of all three pools of resources through the prism of identity and security.

> How Novell Delivers Intelligent Workload Management

Novell has a differentiated approach to intelligent workload management that leverages our 26-year history of delivering identity management solutions that work in heterogeneous environments. Novell offers solutions for each of the four phases of intelligent workload management: build, secure, manage and measure. Let’s take a look at each:

- Tools and capabilities to **BUILD** workloads. These already exist within our Linux business, and especially with the SUSE Appliance Program that enables independent software vendors (ISVs) to create appliances combining their applications with the SUSE Linux Enterprise platform in one integrated package for end-customer deployment. The next step is integrating identity into workloads.

- The ability to **SECURE** workloads. Identity and security management are core Novell strengths.
Intelligent Workload Management  

**TREND TALK** Continued

- The ability to **MANAGE** workloads. Novell, with the combination of our ZENworks Configuration Management and PlateSpin Workload Management solutions, has a strong product suite to address this requirement.

- The ability to **MEASURE** workloads and tie them to business performance. With the acquisition of Managed Objects, Novell obtained the business service management (BSM) tools that enable us to deliver against this core customer requirement. Our next step—coming in 2010—is to integrate business service management with security information and event monitoring (SIEM) tools.

Novell brings essential capabilities to the intelligent workload management market. No other enterprise IT vendor offers all of these capabilities.

> **A Sneak Peek Over the Horizon**

Novell has been dedicated to developing industry-leading technology for heterogeneous environments for many years. Our product portfolio reflects this, as many of our offerings fit neatly into the Build, Secure, Manage and Measure model that is the foundation of the intelligent workload management market. (See Figure 1.)

Core to the Novell approach to intelligent workload management is the unique integration of our market-leading identity and security technologies into products that address customer challenges across the entire IWM lifecycle.

Throughout 2010, Novell will introduce eight new products that further extend the solutions the company already has in place for intelligent workload management. Among these new products is a toolkit to help ISVs create and deploy appliances, which features integrated management and security and a new self-service provisioning tool that enables enterprises to build and manage public and private clouds. Also planned is a major upgrade to the Novell identity management suite to help enterprise customers manage and provision identities inside and outside their four walls.

In addition, Novell will release the Novell Cloud Security Service, which allows enterprise system administrators to seamlessly control end-user security policies between cloud environments and their existing data centers, with single sign-on capability.

In 2010, Novell will also launch Novell Workshop, a tool to build intelligent workloads with embedded manageability, security and compliance for both Linux and Windows applications. And Novell will continue to build on its industry-leading PlateSpin suite of products, enlarging it by three new products that will help

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**Figure 1:** The unique Novell approach to intelligent workload management offers enable secure, policy-based computing across physical, virtual and cloud environments.

**How Novell Delivers Intelligent Workload Management**

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<thead>
<tr>
<th>Build</th>
<th>Secure</th>
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<tr>
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<td>Novell Identity Manager</td>
<td>PlateSpin Migrate</td>
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<td>Novell SecureLogin</td>
<td>PlateSpin “BlueStar”</td>
<td>Novell Sentinel™ Log Manager</td>
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*Available by end of 2010*
customers manage and move workloads within and across their physical and virtual environments. These new products will further integrate and extend management capabilities to the cloud to ensure optimal execution of workloads both on- and off-site.

> Making IT Work As One. Again.
Today, organizations are already using technologies to build, secure, manage and measure compliant environments that include many interoperating technologies and platforms. These are the foundations of intelligent workload management and can be implemented using current technologies and solutions from Novell and its ecosystem of partners. Moreover, Novell has additional products in the pipeline that will enable enterprises to deploy and manage identity-aware, secure and compliant intelligent workloads. Workloads that maximize both flexibility and control.

Read more:


1 Goldman Sachs IT Spending Survey, March 2009
It's Time to Get Serious About Novell BrainShare 2010

You've managed to survive the Holiday season. A new decade has officially begun. And that means it's time to get serious about BrainShare 2010. Why now? With just over two months left until BrainShare kicks off in Salt Lake City, good things definitely do not come to those who wait. By acting quickly, you can make sure you're taking full advantage of the steepest early-bird discounts and perks, reserving your seat at the best BrainShare sessions and getting totally prepared for the most informative and engaging BrainShare conference yet. Here are a few suggestions for getting serious about BrainShare 2010 in January and February:

Novell BrainShare 2010 Basics

- Conference Dates: March 21-25, 2010
- Location: Salt Lake City Convention Center
- Early-bird Registration (US$1,395): Ends February 19, 2010

> Register Now!

At BrainShare, Wish Lists Can Come True

The official online BrainShare 2010 Session Catalog becomes available on January 19—a long with a convenient online "Wish List" that can help you plan your week and pencil in the sessions and activities you want to attend. Make sure you take time to explore the more than 450 hours worth of great technical content outlined in the Session Catalog and begin filling out your Wish List, so you're ready to finalize your schedule beginning February 22. With the ability to sort sessions by focus area, solution or product, the Session Catalog makes it easy to find the courses you're most interested in without wading through courses you don't care about. The Wish Lists also help the BrainShare team determine how many people are interested in specific sessions, so they can allocate the right amount of classroom space and make sure there is enough room to accommodate everyone who wants to attend. You don't have to be officially registered to view the session abstracts online, but you will need to complete the registration process before you can convert your Wish List into a final, official BrainShare schedule. >Get Started

Early Birds Get the Best Values and the Best Seats

February 19 is a date you should definitely mark on your calendar, because it's the last day you can receive the impressive $300 early-bird discount, get a $500 self-study kit free of charge and take advantage of other early-bird perks. Self-study kit supplies are limited, so make sure you register now to receive the kit of your choice. Also, remember that February 22 is the first day you can begin using the BrainShare Session Scheduler to officially sign up and reserve your seat for specific courses. Some of the more popular sessions fill up quickly, so register early and don't wait to create your final BrainShare schedule. Please note that the sessions in your preliminary BrainShare Wish List do not automatically become part of your final BrainShare schedule. You'll need to use the Session Scheduler to complete that process yourself. >Register Now

BrainShare 2010 Action Items for January and February

- January 19: Explore the BrainShare Session Catalog and begin planning your schedule >Get Started
- January 19 to February 22: Complete your BrainShare Wish List >Get Started
- Before February 19: Complete your registration to receive the early-bird discount >Register Now
- Starting February 22: Use the BrainShare Session Scheduler to sign up for courses before they fill up

It's Your Conference

Registering for BrainShare is easy, as long as you're capable of remembering your own name and address. But deciding which courses to take can be much more difficult—especially when you can choose from more than 450 hours of technical content. To help get the process started, it might be useful to know what most interested your fellow attendees. Every year, as we work to finalize the BrainShare catalog, we give you the
opportunity to vote on all the proposed topics and sessions for the coming year. The votes are officially in, and here are some of the top choices for BrainShare 2010:

- What's new in Novell Identity Manager 4.0? (IAM1822)
- Novell Open Enterprise Server Upgrade and Migration Best Practices (CL1110)
- Novell eDirectory: Tuning and Troubleshooting Tips (IAM1808)
- Performance Tuning, Monitoring, Management: Getting the Most out of SUSE Linux Enterprise Server (ELS1483)
- Managing Novell GroupWise Agents on Linux (CL1423)

Sign up early if you're interested in any of these classes, because they will probably fill up quickly. And of course, this is just a small sampling of the great technical content you'll find in the complete BrainShare Session Catalog starting January 19. BrainShare is approaching quickly. But by registering early, exploring the Session Catalog, completing a Wish List and finalizing your schedule sooner rather than later, you can make the most of everything BrainShare 2010 has to offer.

Get a Self-Study Kit Free of Charge (A $500 Value)

Need another great reason to register for BrainShare by February 19, 2010? If you register before the early-bird deadline, you'll receive one of the following self-study kits totally free of charge (paid attendees only*):

- Novell ZENworks 10 Configuration Management Administration
- Novell GroupWise 8 Administration
- Novell Identity Manager 3.5 Administration
- Implementing Novell Open Enterprise Server 2 for Linux
- SUSE Linux Enterprise Server 11 Certified Linux Engineer

*You can pick up your self-study kit in Salt Lake City when you check in at BrainShare
Whether it's from work habits, the proliferation of rich media content, or data retention regulations, unstructured file-based data represents the fastest growing data type. Since most of today's data management tools operate at the block and volume level, businesses often have no intelligent way of keeping this exponential file growth under control. This results in file system chaos as their unstructured data consumes more and more of their valuable storage resources.

Many organizations deal with the proliferation of user data by simply purchasing more storage every year. Even though buying disk storage can be relatively inexpensive, managing it isn't. Storage management can be an expensive drain on an organization's budget since it often relies on manual, redundant processes that divert IT time and money from more strategic projects. Increased storage requirements also have a significant impact on power, cooling and space requirements in the data center.

To address these challenges and help you turn the chaos of your file systems into organized efficiency, Novell has released **Novell File Management Suite**, a storage solution bundle that delivers intelligent storage and data management at the file level. This bundle enables you to better track the growth of storage, allocate and manage storage based on identity, and save money in the administration and procurement of storage resources. (See Why Identity Matters.)

**Why Identity Matters**

One of the biggest challenges of file system storage is the inability to determine a file's value or relevance. This is largely because identity has not been linked to storage management in the past. However, identity is key to overcoming the once-insurmountable obstacle of appropriately assigning value or relevance to files.

For example, many data retention regulations link logically to identity. While you might be required to retain certain data stored or owned by your executives or controllers, you likely don't have the same requirements for low-level office workers. By tying identity to storage management, Novell File Management Suite lets you leverage the next-best thing to knowing what's actually in the file: who created it and when it was accessed. By connecting file management to people through identity-driven policies, Novell File Management Suite not only lets you better control future file growth, it allows you to take an in-depth, objective look at your existing unstructured data, make retention and removal decisions based on relevant criteria, and create policies that will consistently enforce those decisions.

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Figure 1: Novell Dynamic File Services enables you to intelligently and dynamically allocate data between your different physical storage tiers.
Intelligent Solutions

Novell File Management Suite is comprised of the following three individual products, which work together to dramatically improve the efficiency, effectiveness and manageability of your file storage infrastructure:

- Novell Dynamic File Services
- Novell Storage Manager
- Novell File Reporter

Novell Dynamic File Services has been available for Linux and NetWare since Novell Open Enterprise Server 2 shipped. Now available for Windows environments through Novell File Management Suite, Novell Dynamic File Services dynamically allocates and optimizes storage resources based on actual data usage in a manner that can result in significant savings.

While Novell Dynamic File Services optimizes file-level physical storage allocation and usage, Novell Storage Manager automates the full lifecycle management of file-level user and group storage. (See Figure 2.) Leveraging user identities, policies, and events that occur in the directory, the solution automates a comprehensive set of storage management tasks, including user storage provisioning, deprovisioning, storage rights management, quota management, file grooming, storage resizing, storage relocation, file and directory orphan management, load balancing, archiving and storage cleanup. (See Clean and Simple Moves.)

One of the things that makes Novell Storage Manager unique is that it manages storage based on identity. It provides a bridge between users’ identities and roles in an organization and their storage resources. When a user is provisioned in the directory, Novell Storage Manager sees this event, reads the storage policy stored in the directory and provisions...
access for this user’s personal and collaborative storage resources. Novell Storage Manager automates other storage management tasks in the same way. When a directory event on a user or group object occurs (i.e. user role change, user transfer, user termination, quota assignments, etc.), Novell Storage Manager applies the defined policy for that event, appropriately provisioning and managing the storage for that user or group.

The third component of Novell File Management Suite is a new offering called Novell File Reporter. The focus of Novell File Reporter is to provide you with an accurate assessment of your unstructured data, giving you file-level visibility into your storage infrastructure so you can make more informed decisions on where to store files, what files can be deleted, how to tier your storage, how to plan for storage growth and more. It answers vital questions to help you determine the best means of addressing your storage content.

For example, how much unstructured data exists on network storage volumes? How fast is data growth consuming storage capacity? What files are relevant? What needs to be archived? What files can be deleted? How much storage is used for non-work-related files? When were certain files last used and who owns them? Is storage being abused? If so, how and by whom?

>Bringing Logic to File Management

One of the biggest challenges in controlling unstructured data and file system chaos is that organizations typically lack a logical or intelligent means for understanding the relevance or value of the millions of individual files scattered across their network. Too many unanswered file storage, usage, importance and ownership questions exist, making it difficult to even know where to begin. Novell File Reporter provides these answers so you can better leverage Novell Storage Manager and Novell Dynamic File Services to bring order to your file system storage.

For example, inventory reports in Novell File Reporter scan your systems, collect detailed information on your stored files and then provide sizing recommendations. Summary reports give you an overview of how your storage space is being used by different file types, including total number of files of each type, their cumulative size and the percentage of disk space that each file type uses. The summary report also displays dates indicating when a file type was last created, accessed or modified.

These reports assist you in creating policies for better managing those files using Novell Storage Manager. For example, you’ll be able to assess the difference in home directory size for typical users and power users. With that sizing information, you can create storage quota policies that provide appropriate storage capacity for different user types, while preventing unnecessary storage consumption by individual users.

You can also run more detailed reports to see aging information on file access or file modifications, as well as reporting on filename extensions. (See Figure 3.) This type of information can help you tier your physical storage for optimal use and cost savings using Novell Dynamic File Services. For instance, you might decide that all files that haven’t been accessed or modified in over 18 months should be moved to less-expensive secondary storage. You might also decide that all multimedia files should be moved to secondary storage unless they belong to executives or marketing and sales personnel. These aging and file type reports can help you determine how much secondary and primary storage you’ll need.

Figure 3: Novell File Reporter provides aging information on file access.
You can also schedule reports to run on a regular basis to identify real-time changes in user storage practices and help you adjust policies as needed. The solution provides trending reports to help you spot potential problems or abusive behavior. It includes triggered reports that proactively monitor storage capacity thresholds, automatically notifying you when certain thresholds are met. Finally, the integration between Novell Storage Manager and Novell File Reporter lets you run reports against the policies you’ve created in Storage Manager. (See Figure 4.) All of these reporting capabilities make it easy for you to create, manage and fine-tune your policies for optimal file storage management.

A Competitive Advantage
Collaborative data is the primary output of employee creativity. When you have the ability to intelligently manage it, your users can access and maintain relevant information faster and with fewer headaches and hassle. As the industry’s only identity-driven, policy-based and automated collaboration data management solution, Novell File Management Suite delivers these competitive advantages while helping you address spiraling data storage and associated costs.

Novell File Management Suite gives you the tools to intelligently monitor and manage your unstructured data. By connecting identity to files, it helps you better understand what you need to do to bring file proliferation under control, and then gives you the means to take action in a way that enhances collaboration, streamlines regulatory compliance, and decreases your overall storage management efforts and costs.

Clean and Simple Moves
Novell File Management Suite can also be an invaluable tool for facilitating your migration efforts from NetWare to Linux on Novell Open Enterprise Server. Before you make a move, Novell File Reporter and Novell Storage Manager work together to help you find and get rid of the file storage junk you don’t need, such as orphaned directories, unallowed file types, duplicate files or personal multimedia files.

To facilitate the actual migration process, Novell Storage Manager and its state machine architecture can be leveraged to enable a safe and seamless migration of user home directories. It lets you define a schedule for the migration and set bandwidth throttling parameters so that network and server performance will not be affected during your normal business hours.

Novell Dynamic File Services can also be used to simplify the migration of data from NetWare servers to Linux servers. To do this, set up your Linux-based storage as your primary partition and your NetWare-based storage as a secondary partition. Next, turn on the "On Access" setting in Novell Dynamic File Services. Then, whenever users access one of their files, that file will automatically and transparently move from the secondary partition to a mirrored subdirectory on the primary partition.