

INSIGHT

Novell Adds to High Availability Extensions for SUSE Linux Enterprise Server 11

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IDC OPINION

The high availability (HA) extensions in Novell's SUSE Linux Enterprise Server 11 are being shipped in recognition of the increasing demands being placed upon all enterprise Linux deployments. IDC believes that all enterprise Linux deployments will see increased requests from datacenter customers for enhanced HA features/functions. In this case, Novell has taken proactive steps to engineer more resilient Linux features/functions and can be expected to continue to add to future service pack releases over time. Further, enterprise Linux platforms and Microsoft Windows platforms will get an increasing number of workloads that may have run on aging Unix servers that are being replaced or downsized in the datacenter. To the degree that these sorts of platform migrations accelerate, following the economic downturn of 2009, Linux server enterprise customers will come to expect:

- More Linux features that would be comparable to those found on scalable Unix server platforms
- Strong support for high availability features
- Support for backup/recovery for mission-critical workload data
- Enhanced support for disaster recovery

IN THIS INSIGHT

This IDC Insight discusses Novell's additions to the SUSE Linux Enterprise Server 11 High Availability Extension functionality. The new High Availability Extension 11 Service Pack 1 brings more features that support demanding enterprise workloads, addressing the need to evolve Linux platforms to support mission-critical applications and databases.

SITUATION OVERVIEW

Novell has extended the functionality of the high availability features in Novell SUSE Linux Enterprise Server 11. IDC believes that this move will be increasingly important because more demanding applications and databases will be deployed into Linux x86 computing environments in 2010. IDC worldwide server market research shows that Microsoft Windows and Linux are the two operating environments that are most widely deployed on x86 servers.

Running on x86 Servers and Non-x86 Servers

Linux runs on a variety of hardware platforms, including IBM System z mainframes, RISC servers, and Itanium-based servers — all of them environments that would be likely to run enterprise Linux applications and databases.

IDC recognizes that beyond its use on x86 servers, Novell SUSE Linux Enterprise is also deployed on IBM System z mainframes, where it supports Web-enabled workloads, including Java applications and IBM WebSphere workloads, as part of IBM's Linux-on-z strategy — and on IBM Power Systems — where Linux environments co-reside with the IBM AIX Unix operating system. Historically, SUSE Linux has also run on servers based on Intel's Itanium-based servers from Fujitsu, HP, NEC, SGI, Unisys, and others. This is part of Novell's strategy to support Linux across multiple hardware architectures and of systems vendors that want to support Linux across their server product lines.

The new release of the HA software, called High Availability Extension 11 Service Pack 1 and announced in spring 2010, contains a number of new features, each of which was designed to improve reliability and availability of mission-critical workloads running on Novell SUSE Linux Enterprise operating environments. Service Pack 1 was announced on May 19, 2010, and shipped the first week of June 2010.

One driver for improving HA for Linux enterprise environments is that a new wave of x86 multicore processors are being shipped into the server marketplace (e.g., Intel Xeon 5600, Intel Xeon 7500, and AMD Opteron 6000). Another driver is the phenomenon of platform migration from aging Unix servers to x86 servers running Windows and Linux.

Overall, the Service Pack 1 functionality is aimed at making the product easier to use, addressing longtime concerns among x86 server customers that clustering and failover software are complex to deploy and to manage. Other design goals included being competitive with other failover, clustering, and HA software products; delivering robust data protection and node recovery features; and continuing to support both physical (P) and virtual (V) servers.

New Functionality in Service Pack 1

Top features in Service Pack 1 include the following:

- ☒ **Enhanced cluster-aware file system.** Service Pack 1 provides improved support for Oracle Cluster File System (OCFS2) designed to reduce file fragmentation for improved file operations. The Service Pack 1 release offers OCFS2 reference counter links (also known as reflinks), which are clusterwide snapshots that allow unlimited image cloning for improved provisioning, management, and backup of virtual machines (VMs), including those used in cloud computing.
- ☒ **Cluster-aware logical volume manager (cLVM2).** Service Pack 1 includes support for operating system-level cluster-concurrent RAID1 (host-based mirroring) to improve storage reliability.

- ☒ **Enhanced distributed data/storage replication (DRBD) and node recovery.** This includes new support for both synchronous and asynchronous three-node data replication and for an open source bare metal node recovery framework called Relax and Recover (ReaR).
- ☒ **Support for transparent switch and failover of Samba services.** This allows the SUSE Linux server to act as a network file server for CIFS-style Windows clients.
- ☒ **Virtualization-aware support for both the Xen and KVM hypervisors.** This allows Novell SUSE Linux Enterprise Server 11 Service Pack 1 to manage guest operating systems in hybrid physical and virtual clusters.
- ☒ **Extended support for ISV applications.** The new Service Pack 1 provides additional software agents to support virtual machine management (Xen, KVM), SAP applications, IBM WebSphere, the IBM DB2 and Informix databases, Oracle applications, and Oracle databases.
- ☒ **Policy-driven clustering solution.** Service Pack 1 provides increased automation through the use of policies that define node capacity and resource utilization, such as those used in private cloud environments. It also provides storage-based quorum coverage for the use of shared storage resources and support for the Open Clustering Framework and Service Availability Forum's Application Interface Specification for improved integration with open systems APIs. There are new improvements in managing metro area clusters, storage-based quorum coverage, and node recovery.

IDC Analysis

The process of platform migration is moving more demanding workloads to the Linux x86 platform over time. The Linux segment of the worldwide server market is growing rapidly, with quarterly revenue growing 36.5% year over year compared with 1Q09, reaching \$1.9 billion for 1Q10.

IDC reported in its quarterly server data that Linux servers generated 18% of worldwide server revenue in 1Q10 compared with 46.7% of worldwide server revenue for Windows servers in the same quarter and 22.2% of worldwide server revenue for Unix servers.

Just a few years ago, most Linux servers were being deployed for Web serving, email serving, and infrastructure workloads (e.g., file/print and network support). Now, a wider array of applications are being deployed on Linux — including many that formerly ran on Unix servers. One reason for this is that Linux and Unix have similar programming tools, and system administrators find the two types of operating system similar to manage. One more driver is that Linux servers are often deployed in high-performance computing (HPC) clusters, such as those used in scientific/engineering and technical analysis — and those that support simulations of financial markets.

The enterprise Linux space has several competitors, including Red Hat Enterprise Linux (RHEL) and Oracle Enterprise Linux (OEL). These Linux distributions will likely gain more importance as the total installed base of Linux servers grows — and as Linux environments take on business-critical and mission-critical applications and

databases that run on compute-dense systems based on multicore processors. Red Hat has already enhanced the availability features in its next RHEL6 release, which will be shipping this year. Oracle is focusing on adding more availability features for integrated software stacks that leverage OEL for enterprise server deployments.

Demanding workloads, such as those for enterprise applications from SAP and Oracle and for scalable databases (e.g., Oracle Database 11g, IBM DB2, and Sybase), mean that enterprise Linux — whether supplied by Novell or its top enterprise Linux distribution competitor by units shipped, Red Hat — will need to provide similar functionality to what was provided under Unix operating environments. Clearly, Linux servers will also compete for applications and workloads that might also run on Microsoft Windows platforms — or might run alongside Windows environments in a virtualized x86 server infrastructure.

At the same time, Linux environments are often deployed in mixed computing environments — along with Unix and Microsoft Windows — and need to interoperate with both of these types of operating environments to meet customer requirements. Novell has worked to address customer needs for improved scalability, availability, and support for high availability and disaster recovery. It also supports interoperability with other operating environments, including functionality that allows Novell SUSE Linux and Microsoft Windows guests and hosts to interoperate when both environments are running on virtualized x86 server platforms.

A Growing Checklist of HA/DR Requirements

To the extent that Linux and Windows will account for the largest presence, by units licensed, on x86 servers, along with Oracle Solaris x86 — a form of Unix, high availability and support for disaster recovery will become increasingly more important for these operating systems. As such, high availability features are expected to become more prominent in the enterprise distributions of Linux from Novell and Red Hat, starting with the current releases.

The extent to which demanding workloads will migrate from Unix systems on RISC- or Itanium-based servers to x86 servers will not be known for several years. However, some amount of migration is taking place — something that IDC will be tracking, via customer surveys, in 2010 and years to come. For the business-critical and mission-critical workloads, applications that go offline result in costly downtime and revenue loss to the business.

Novell Service Pack 1 Functionality

For Novell SUSE Linux Enterprise 11, the High Availability Extension 11 Service Pack 1 attributes will contribute to this set of customer requirements:

- Backup and recovery for enterprise workloads must take place on a regular basis in order to be effective. To the extent that backup and recovery is automated, it reduces IT staff time and avoids delays that would otherwise leave gaps in the production data being replicated and stored to alternate devices. It is the combination of the ability to restart applications and the ability to access replicated production data that supports restart of enterprise applications.

- ☒ Support for Oracle Database 11g and the previous version, Oracle Database 10g, is very important in the enterprise class of workloads, many of which run for five years, or more, following deployment. That is why Novell's enhanced support for Oracle's OCFS2 file system is key to providing enhanced HA support for customers deploying Linux applications on SLES and accessing Oracle databases.
- ☒ The Service Pack 1 provides automation and support for the HA/DR policy. As tasks running on Linux servers become more complex, it will become increasingly important to ensure that all the major elements of the HA/DR policy are orchestrated properly — and that important tasks take place, as planned, to ensure high levels of uptime. Given the delta between system admin tasks found in mission-critical and noncritical environments, support for automation will help by reducing IT staff time associated with manual management tasks, and allowing system admins to focus on the "big picture" rather than the repetitive tasks.

FUTURE OUTLOOK

IDC expects that the Service Pack 1 of Novell's High Availability Extension 11 will be well received within the Novell SLES base, because it enhances the HA functionality that was already provided. Novell's acute sensitivity and attention to this emerging requirement within the broader Linux operating environment space builds on earlier HA work, including its focus on HA for SLES deployments on IBM's Power Systems and IBM System/z mainframes.

In the coming years, IDC expects that the other two primary enterprise Linux providers, Red Hat Enterprise Linux and Oracle Enterprise Linux (OEL), will ship more HA/DR functionality — and that this cycle of increasing reliability/availability will continue, as enterprise customers ask for stronger support. Indeed, IDC expects all of these enterprise Linux providers to focus on a growing list of IT and business requirements for next-generation deployments.

It is clear that each of these Linux distributors will build on "lessons learned" in the mainframe and Unix server spaces, as they deliver more HA/DR support for use in the enterprise Linux computing environment running across all platform types.

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