

View Point



Windows Server 2008 R2:

Top 5 Features

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Abstract:

Finally Microsoft has joined the elite “64-bit only” club, when it launched Windows 2008 R2. Yes, Windows 2008 R2, which has been released recently, runs only in native 64-bit mode. Apart from this, there are other new stunning features, which make the release quite a hit amongst the IT community. One of the major highlights of the new release is Hyper-V 2.0 coupled with a “true” live migration feature, which puts Microsoft Hyper-V in direct comparison with other Virtualization solutions in the industry.

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Introduction True 64-bit

Windows Server 2008 R2 will be a fully and true 64-bit version of the OS. This helps to support the wide variety of hardware features available in the 64-bit servers in the market. However this means that Windows Server 2008 R2 will run only on the latest Itaniums and Opterons, apart from the latest versions of Intel Xeon. It will run on newer desktop class machines as these new releases generally support 64 bit architectures, be it Intel or AMD.

Windows Server 2008 R2 integrates well with the 64-bit bus architectures of the server hardware. This allows the OS to make full use of the hardware features like bus scalability, hardware virtualization, etc. Windows Server 2008 R2 can address upto 256 logical CPUs on one single physical server – as against the maximum of 64 servers, in the earlier release of Server 2008.

The flip side of this is that the 2008 R2 will not run on the old 32 bit servers. But this might not be a major problem as most of the organizations today have a high concentration of 64 bit servers (which used to run a 32-bit OS, actually undercutting the hardware capabilities). But the existing 32 bit applications can be run on 2008 R2 using the OS's 32-bit compatible Windows-On-Windows (WoW) subsystem.

Hyper-V 2.0

The erstwhile Hyper-V has been spruced up to give power packed features, which now compares Microsoft Virtualization to VMWare on a scale-to-scale basis. Hyper-V 2.0 now supports up to 64 logical processors on the host computer, more than what used to be in the earlier version of Hyper-V. This capability not only takes advantage of new multi-core systems, it also means greater virtual machine consolidation ratios per physical host. [This directly translates to reduction of physical hosts and thereby reducing Opex.](#) Also the new Hyper-V includes the ability to add resources to a running virtual machine (and remove them) without the need to reboot the OS on that VM. It also allows administrators to dynamically allocate memory without any interruption of service. [This leads to increased availability and reduced downtimes.](#)

Another key feature of Hyper-V 2.0 is the Cluster Shared Volumes (CSV), which enables dynamic clustering of Virtual Machines. CSV allows having multiple VHDs on a single LUN, but the VMs still see each of the Virtual Hard Disk (VHD) as if it is on a LUN of its own. And since the CSVs are stored in the Cluster Storage root, it helps the administrators to navigate to the CSVs, as easily from Windows explorer.

What more, even Microsoft's own public site (www.microsoft.com) is being powered by Hyper-V 2.0, having around 15,000 requests per second and 40 million hits per day.

Live Migration

A la v-Motion type feature with Hyper-V 2.0 puts it in direct comparison with VMware ESX platform. The earlier release of Hyper-V supported Quick Migration, which performed VM migration in the range of seconds, which was seen as a bigger downtime for mission and business critical applications. Now with Live Migration, it is possible to move a VM from one physical server to another, with no downtime, which is a seamless transition from the end user perspective.

Combined with other improvements like Windows CSV and Windows Failover clustering, it will only take a few milliseconds for moving VMs between hosts. This is a great advantage especially from a system maintenance perspective. This eases the maintenance tasks which need to be done on the servers without having to worry about the availability of the applications on those servers. Live Migration helps to seamlessly move the applications to another physical server and then bring the server for maintenance. And bring back the VMs once the maintenance is completed. All this, are transparent to the end user.

Also as an add-on to the SCVMM for Hyper-V, the new release supports a VM-oriented Performance and Resource Optimization feature, which provides enhanced feature support for managing failover clusters. The reporting dashboard gives a much better view of the resource utilization and helps in making quick, what-if scenarios that can help in planning for migration and maintenance activities.

In a sense, these are the features, which made most customers waiting to implement Microsoft Virtualization fully in their organizations. What was lacking in the earlier version of Hyper-V was the punch of live migration and clustering feature, which now seems to have been resolved with Hyper-V 2.0. While the product and the technology look excellent, we will have to wait and watch on the adaptation of Hyper-V 2.0.

Virtual Desktop Infrastructure (VDI)

Desktop Virtualization is a new feature in Windows Server 2008 R2. VDI is a centralized desktop delivery mechanism which allows centralizing the storage, execution and management of a Windows desktop in the data center. It enables Windows Vista Enterprise and other desktop environments to run and be managed in virtual machines on a centralized server. Though not actually new (it existed as Terminal Services earlier), VDI has now been integrated with the Remote Desktop Services (RDS) basket. VDI allows deploying Windows Vista and Windows 7 to centrally managed virtual machines. This helps in achieving a Standard Operating Environment (SOE) which is consistent and manageable.

Combined with Windows 7, which offers Remote App & Desktop (RAD) feature, VDI facilitates virtualization of desktops and applications by using Remote Desktop Services (RDS) of Win7 user interface. This could actually make the provisioning of the virtual desktops easier and less cumbersome. Also with Win7, this integration enhances the user experience for executing virtual (ized) applications the same as running them locally.

Moreover, VDI combined with better management features, facilitates a better enablement of flexible work environment including hot-desking and also increased data security, compliance and efficient management.

Go Green

Microsoft, has for the first time ever, introduced some true power management processes and policies in the new Windows Server 2008 R2. A new 'balanced power' policy monitors the utilization level of the processors on the server and dynamically adjusts the processor performance states to limit power to the needs of the workload. The largest area of savings can be realized for a server at idle load, and mainly due to improvements in driver tuning and power management in hardware. The ability to detect power use and act on that is something new to Windows, and Windows Server 2008 R2 adds power consumption and budgeting information reporting features.

Windows Server 2008 R2 includes a Core Parking (CP) feature that allows the Operating System to dynamically control the processor cores that are used in the multi-core server, based on the workloads. CP continuously monitors the CPU utilization and based on the utilization of the CPU cores, the underutilized cores are "put to sleep" thus reducing the power consumption. When the workload increases, the "sleeping" cores are activated and full processing power returns. So the power consumption is based on usage.

Another power-management feature built into Server 2008 R2 is the ability to adjust processors' Advanced Configuration and Power Interface (ACPI) P-states. This feature essentially allows very granular control over a system's power consumption.

Microsoft claims R2 will present anywhere from 10% to 15% -- and sometimes even 18% -- power savings over Windows Server 2003 with Service Pack 2, without requiring any additional configuration.

Apart from the above, there are a multitude of new features, which makes Windows Server 2008 R2 much more attractive. Also the product features tend to drive home a point that an integrated OS (with Directory, Security, Virtualization Services) has arrived and will make customers to go forward with lots of conviction on the migration to the new version.

5 reasons why should an organization adopt Windows Server 2008 R2

- Better Virtualization features compared to the earlier version of Windows Server 2008.
- Advanced Power Management features integrated into the new version
- VDI has really been simplified and integrated with 2008 R2
- Improvised support for Web and Applications Services
- Supports Live Migration of Virtual Machines

About the Author

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