Selected IBM System x, BladeCenter, and PureFlex System server models can now be shipped with the Microsoft Windows Server 2012 R2 Operating System.

Overview

Selected IBM® System x®, BladeCenter®, and PureFlex™ System server models can now be shipped with the Microsoft™ Windows™ Server 2012 R2 Operating System.

The Windows Server 2012 R2 product line offers 4 CPU versions of Standard and Datacenter, making it easier for clients to transition from Windows Server 2008 R2 Enterprise. The Windows Server 2012 R2 Product Family continues to include 2 CPU versions of Standard and Datacenter as well as new R2 versions of Foundation, Essentials and Storage Server.

Also included in this announcement are downgrade offerings from Windows Server 2012 R2 to Windows Server 2012 and from Windows Server 2012 R2 to Windows Server 2008 R2. The Windows Server 2012 downgrade kits include both Media and Activation Keys. When downgrading from Windows Server 2012 R2 to Windows Server 2012, or to Windows Server 2008 R2, the licensing rights of the Windows Server 2012 R2 product is maintained.

Windows Server 2012 R2 Datacenter and Standard 4 CPU Editions have a consistent licensing model (Per processor based + CALs) and each license grants rights to run on up to four processors.

- Differentiation between Datacenter and Standard editions is based on virtualization (there are no technical controls in software; the Virtual Machine (VM) usage rights are governed by the end user license terms).
- Windows Server 2012 R2 Standard edition (4 CPU) includes four VMs per license and Windows Server 2012 R2 Datacenter edition (4 CPU) includes unlimited VMs. The Datacenter and Standard edition code base and features are identical.

For licensing servers with greater than 4 CPUs, the Windows Server 2012 R2 Standard and Datacenter editions utilizes the existing Windows Server 2012 Standard and Datacenter Additional 2 CPU License. In the case of Windows Server 2012 R2 Standard, the Windows Server 2012 Additional 2 CPU License can also be used for additional VM licensing.

Windows Server 2012 R2 Standard and Datacenter editions continues to utilize Windows Server CALs (Client Access Licenses), new R2 CALs are not required and will not be introduced into the product line.

Windows Storage Server 2012 R2 Standard edition also offers a 4 CPU version (similar to Windows Server 2012 R2 Standard and Datacenter editions), with each
license granting the rights to run on up to four processors; however CALs are not required and unlimited external connections are allowed.

Windows Server 2012 R2 Essentials edition and Windows Server 2012 R2 Foundation licensing remain unchanged and have the following licensing model:

- Server-based licensing model: Foundation is for single processor servers and Essentials is for either one or two processor servers.
- CALs are not required for access: Foundation comes with 15 user accounts and Essentials comes with 25 user accounts.

IBM OEM licenses are available for the following Windows Server 2012 R2 operating system editions at a competitive price:

- Microsoft Windows Server 2012 R2 Standard edition: For nonvirtualized or lightly virtualized environments.
- Microsoft Windows Server 2012 R2 Essentials edition: For small businesses with up to 25 users running on servers with up to two processors.
- Microsoft Windows Server 2012 R2 Foundation edition: For small businesses with up to 15 users running on single processor servers.

**Key prerequisites**

- Must be ordered with or for usage on System x hardware
- Supported on System x and BladeCenter servers
- The media kit contains dual-layer DVD optical media. It is recommended that a dual-layer capable DVD drive be configured with the server.

**Planned availability date**

November 01, 2013

**Description**

**Windows Server 2012 R2 4 CPU Standard and Datacenter Simplified Editions**

The Windows Server 2012 R2 product line now offers 4 CPU versions of Standard and Datacenter, making it easier for clients to transition from Windows Server 2008 R2 Enterprise. The Windows Server 2012 R2 Product Family will continue to include 2 CPU versions of Standard and Datacenter as well as R2 versions of Foundation, Essentials and Storage Server.

For licensing servers with greater than 4 CPUs, the Windows Server 2012 R2 Standard and Datacenter editions utilizes the existing Windows Server 2012 Standard and Datacenter Additional 2 CPU License. In the case of Windows Server 2012 R2 Standard, the Windows Server 2012 Additional 2 CPU License can also be used for additional VM licensing.

Also included in this announcement are Downgrade offerings from Windows Server 2012 R2 to Windows Server 2012 and from Windows Server 2012 R2 to Windows Server 2008 R2. The Windows Server 2012 downgrade kits include both Media and Activation Keys. When downgrading from Windows Server 2012 R2 to Windows Server 2012 or to Windows Server 2008 R2, the licensing rights of the Windows Server 2012 R2 product is maintained.
Windows Server 2012 R2 Datacenter edition with unlimited virtualization rights provides the benefits of cloud-level scale with predictable, lower costs. Windows Server 2012 R2 Standard edition now offers all of the same enterprise-class features as Datacenter and is differentiated only by virtualization rights.

Clients can choose from five editions of Windows Server 2012 R2, based on the size of their organization and requirements for virtualization and cloud computing.

- **Microsoft Windows Server 2012 R2 Datacenter edition**
  - Ideal for highly virtualized private cloud environments.
  - Full Windows Server functionality with unlimited virtual instances.
  - Processor + CAL Licensing model.
- **Microsoft Windows Server 2012 R2 Standard edition**
  - Ideal for low-density or nonvirtualized environments.
  - Full Windows Server functionality with two virtual instances.
  - Processor + CAL Licensing model.
- **Microsoft Windows Storage Server 2012 R2 Standard edition**
  - Stand-alone NAS (Network Attached Storage).
  - Highly Available NAS.
  - NAS Gateways.
- **Microsoft Windows Server 2012 R2 Essentials edition**
  - Ideal for small business environments.
  - Simpler interface, preconfigured connectivity to cloud-based services; no virtualization rights.
  - Server Licensing model (25-user account limit).
- **Microsoft Windows Server 2012 R2 Foundation edition**
  - Ideal for economical general purpose server.
  - General purpose server functionality with no virtualization rights.
  - Server Licensing model (15-user account limit).
  - Only available from Microsoft OEMs like IBM.

**Windows Server 2012 R2 features increased scalability and performance**

Windows Server 2012 R2 maintains the increased scalability and performance of Windows Server 2012. The following information consists of the Windows Server 2012 R2 Maximum System resource numbers:

- **Host**
  - Logical processors on hardware: 320
  - Physical memory: 4 TB
  - Virtual processors per host: 2,040
- **Virtual machine**
  - Virtual processors per VM: 64
  - Memory per virtual machine: 1 TB
  - Active virtual machines: 1,024
- **Cluster**
  - Nodes: 64
  - Virtual machines: 4,000
Windows Server 2012 R2 business value features

Server Manager: Simplified, single-UI management of multiple servers
The expanded capabilities of Server Manager in Windows Server 2012 R2 can help facilitate multiserver tasks such as remote role and feature deployment to both physical and virtual servers and custom server group creation.

IT professionals can provision servers and offline virtual hard disks from their desktops without requiring physical access to the system or Remote Desktop Protocol connections to each server. Administrators can manage groups of servers collectively from within a single, integrated console, which enables them to respond to business-critical problems with greater speed and agility.

Capabilities provided by the new Server Manager include:

- Multiserver experience
- Efficient deployment of workloads to remote servers and offline virtual hard disks
- Installing roles and features on a remote server or offline virtual hard disk
- Streamlined server configuration and deployment
- Batch deployment
- Integration with other management tools

Storage Spaces
New virtualized storage by turning commodity hardware into virtual storage.

Storage Spaces is a storage virtualization technology which succeeds Logical Disk Manager and allows the organization of physical disks into logical volumes similar to Logical Volume Manager (Linux\textsuperscript{TM}), RAID 1 or RAID 5, but on a higher level.

A storage space will behave like a physical disk to the user, with thin provisioning of available disk space. The spaces are organized within a storage pool, for example, a collection of physical disks, which can span multiple disks of different sizes and different interfaces (USB, SATA, SAS). The process of adding new disks or replacing failed or older disks is fully automatic, but can be controlled with PowerShell commands. The same storage pool can host multiple storage spaces. Storage spaces have built-in resiliency from disk failures, which is achieved by either mirroring or striping with parity across the physical disks. Each storage pool on the ReFS filesystem is limited to 4 PB (4096 TB), but there are no limits on the total number of storage pools or the number of storage spaces within a pool.

Storage Spaces technology:

- Automatically restores data redundancy if a disk fails
- Provides ability to thin-provision storage
- Enable Storage Spaces management through the use of PowerShell

Storage Live Migration
More VHDs with minimal downtime risk and cost.

Hyper-V live migration moves running virtual machines from one physical server to another with no impact on virtual machine availability to users. By pre-copying the memory of the migrating virtual machine to the destination server, live migration minimizes the transfer time of the virtual machine. A live migration is deterministic, which means that the administrator, or script, that initiates the live migration determines which computer is used as the destination for the live migration. The guest operating system of the migrating virtual machine is not aware that the migration is happening, so no special configuration for the guest operating system is needed.
**Expanded device support**

More choice across a variety of devices.

Access to a centralized desktop is enabled from the following types of devices: PCs, laptops, mobile tablets, (RemoteFX-based) and thin clients (support for additional client devices is provided by Microsoft partners such as Citrix).

Simplified DirectAccess is designed for easy deployment and use of remote access capabilities.

DirectAccess allows remote users to securely access enterprise shares, websites, and applications without connecting to a virtual private network (VPN). DirectAccess establishes bidirectional connectivity with a user’s enterprise network every time a user’s DirectAccess-enabled portable computer connects to the Internet, even before the user logs on. Users never have to think about connecting to the enterprise network and IT administrators can manage remote computers outside the office, even when the computers are not connected to the VPN.

**Load balance failover (LBFO)**

Higher throughput and reliability through failover.

2.8.2.1.6 BranchCache: Simplified deployment and performance.

Simplifies the deployment by removing the need for having a certificate on the hosted cache. It improves performance by reducing the average block size of the cache, and allows the administrator to configure a set of servers to work together to act like a single hosted cache. In addition, BranchCache can be managed and configured using known tools such as WMI and PowerShell; this allows third-party management solutions to extend the solution using standardized tools.

**PowerShell templates**

Simplified, consistent scripting and configuration.

Windows PowerShell 3.0 provides a comprehensive platform to help manage server roles and automate management tasks. Sessions to remote servers are resilient and can withstand various types of interruptions. In addition, Windows PowerShell is designed to be easier to learn with improved cmdlet discovery and simplified, consistent syntax across all cmdlets.

Capabilities provided by Windows PowerShell 3.0 include:

- Robust session connectivity
- Disconnected sessions
- Job scheduling
- New Windows PowerShell ISE features
- Windows PowerShell workflows
- Syntax simplification
- Script sharing
- Windows PowerShell Web Access
- Updatable help
- RunAs capability
- Default parameter values
- New cmdlets

**Network virtualization**

Flexibility to place VMs on-premise or hosted.

Provides the flexibility to place any VM on any node irrespective of their IP address and allows multiple VMs to have their own IP address. This makes the transition
to hosters' private clouds easier for clients with existing on-premise VMs/physical servers.

**Windows NIC Teaming**
Improved network availability, performance, and load balancing.

Network adapter teaming, also known as load balancing and failover (LBFO), allows multiple network adapters on a computer to be placed into a team for the following purposes:

- Bandwidth aggregation
- Traffic failover to prevent connectivity loss in the event of a network component failure

**De-duplication**
Reduce storage capacity requirements by only storing unique data blocks.

De-duplication is an in-box feature that delivers capacity optimization, scale and performance, reliability, and data integrity at no additional cost.

**Client Access Licensing Modes**

Windows Server 2012 R2 Standard and Datacenter editions will continue to utilize Windows Server 2012 CALs (Client Access Licenses), new=R2 CALs are not required and will not be introduced into the product line.

After you have selected a license type—Windows Device CAL or Windows User CAL, you have the option to use the server software in two different modes: Per User/Per Device mode or Per Server mode. Both modes are available for either type of license.

**Per User/Per Device mode is defined as follows:**
- A separate Windows CAL (of either type) is required for each user or device that accesses or uses the server software on any of your servers.
- The number of Windows CALs required equals the number of users or devices accessing the server software.
- If you choose this licensing mode, your choice is permanent. You can, however, reassign a Windows CAL from one device to another device or from one user to another user, provided the reassignment is made either (a) permanently away from the one device or user or (b) temporarily to accommodate the use of the Windows CAL either by a loaner device, while a permanent device is out of service, or by a temporary worker, while a regular employee is absent.

Per User/Per Device mode tends to be the most economical designation for Windows CALs in distributed computing environments where multiple servers within an organization provide services across most devices or users.

**Note:** Per User/Per Device mode replaces Per Seat mode, used in previous licensing models.

**Per Server mode is defined as follows:**
- A separate Windows CAL (of either type) is required for each user or device that accesses or uses the server software on any of your servers.
- The number of Windows CALs required equals the maximum number of users or devices that may simultaneously access or use the server software installed on a particular server.
- The Windows CALs you acquire are designated for use exclusively with a particular server.
• If you choose this licensing mode, you have a one-time right to switch to the other licensing mode—Per User/Per Device mode. Your Windows CALs (of either type) would then be used in Per User/Per Device mode instead.

Per Server mode tends to be the most economical designation for Windows CALs in computing environments where a small number of servers have limited access requirements.

**Additional information**

All offers are subject to availability. IBM reserves the right to alter product offerings and specifications at any time without notice. IBM is not responsible for photographic or typographic errors.

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**Product positioning**

**Distributor and Reseller benefits**

• Great pricing: Take advantage of a great price to lower your product acquisition costs and increase margins.
• Convenience and flexibility: Enjoy convenience in ordering and stock flexibility.
• Add-on sales: Sell Software Assurance within 90-days and get more opportunities to sell value-added services.

**Client benefits**

• Price advantage: Buying the System x, BladeCenter, and PureFlex System server and Windows operating system together with the ROK offers clients better pricing than buying them separately.
• Convenient deployment: Ordering the ROK through a System x, BladeCenter, and PureFlex System server Reseller is the fastest and easiest way for clients to deploy server software.
• Easy ordering: Ordering Microsoft Windows Server 2008 ROK together with the System x, BladeCenter, and PureFlex System server offers clients a simple, one-stop shopping convenience.

**Windows Server 2012 R2: Benefits of upgrading**

Windows Server 2012 R2 benefits of upgrading that impact the day-to-day IT operations of a company and the benefits of upgrading:

• Simplified management: By upgrading to Windows Server 2012 R2 clients will experience an integrated, highly available, and easy-to-manage multiserver platform with breakthrough efficiency and ubiquitous automation.
• Affordable storage: Reduce storage costs by using SMB-based file storage instead of SAN storage. For pooled virtual machine deployment, storage requirements can be lowered for a set of users by using a combination of SMB and local DAS.
• Continuous availability: Cost-effective, highest IT service uptime is designed to protect against a wide range of failure scenarios and help both prevent downtime and speed recovery when needed.

**Windows Server 2012 R2: Advantages of virtualizing of infrastructure**

• Manage multiple servers across cloud and on-premise: Windows Server 2012 R2 is a scalable and elastic server platform that gives you the flexibility to build and deploy applications and websites on your own servers, in the cloud and in a hybrid environment using a consistent set of tools and frameworks.
• Affordable storage for VMs: Cost efficiency is provided by leveraging commodity storage, networking and server infrastructure, as well as increased power efficiency for superior acquisition and operating economics of the platform.
• Access almost anywhere, any device: Seamless, on-demand access to a virtualized work environment from virtually anywhere, including branch locations and public connectivity services, all while maintaining enhanced data security and compliance.
### Program number

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<th>Program number</th>
<th>V.R.M</th>
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### Product identification number

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<th>Maintenance 3 year PID number</th>
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### Offering Information

Product information is available via the Offering Information website


### Publications

No hardcopy publications from IBM are shipped with this program.

### Technical information

#### Specified operating environment

**Hardware requirements**

Supported eServer™ xSeries, System x, BladeCenter or PureFlex System servers.

For the most up-to-date information regarding compatibility, visit


**Software requirements**

The program's specifications and specified operating environment information may be found in documentation accompanying the program, if available, such as a readme file, or other information published by IBM, such as an announcement letter. Documentation and other program content may be supplied only in the English language.

### Planning information

**Packaging**

ESD

**Global Technology Services®**

Contact your IBM representative for the list of selected services available in your country, either as standard or customized offerings for the efficient installation, implementation, or integration of this product.
Consult your IBM representative.

**Program delivery**

The following license offerings can be ordered in conjunction with a new system order on which the selected operating system has been announced as an offering. Shipment of materials when ordered with a new system will be included with the system unit.

To order the programs listed below with a new system order, specify the type model number, order type description, one-time charge (OTC) feature, preinstall feature, or drop-in-the-box feature as indicated and listed in the tables below.

**Note:** A Hardware Installation Productivity Order (HIPO) must be placed if the operating system is part of a new system order. The feature numbers included on a HIPO order provide instructions and actions to the hardware and software Solution Provider and will be used to verify that the software orders for a given system unit solution exist and can be used for various logistical and business system measurements.

HIPO ordering information follows this section.

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Serialization feature code: 3444

For order routing purposes, serialization feature code 3444 must be included on every operating system license program order.

Hardware installation productivity order (HIPO): 5372-SWX

5372-SWX HIPO is mandatory for preinstall or shipments of program medium and publications associated with select operating system offerings in this announcement. The translation table below is for reference purposes. The operating system type model numbers, with offered OTC features numbers, are cross referenced to features that must be included on the 5372-SWX HIPO type model order for the purpose of completing valid (error-free) system solution orders.

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