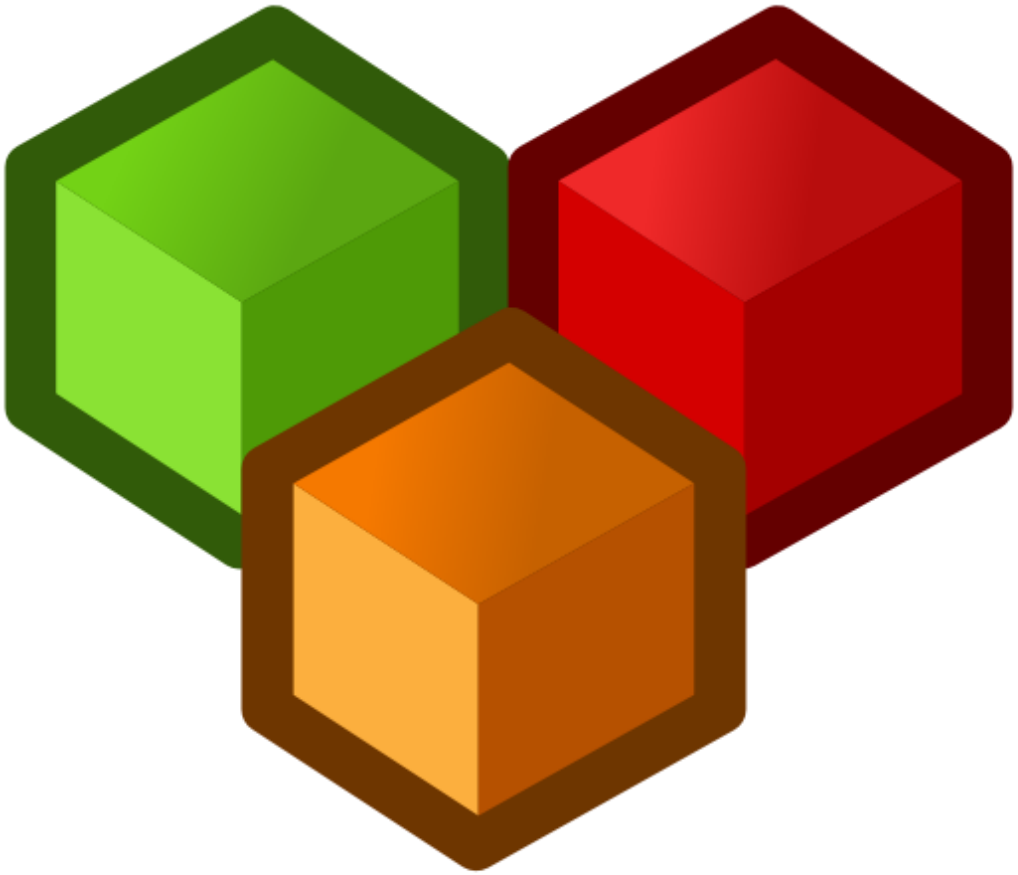
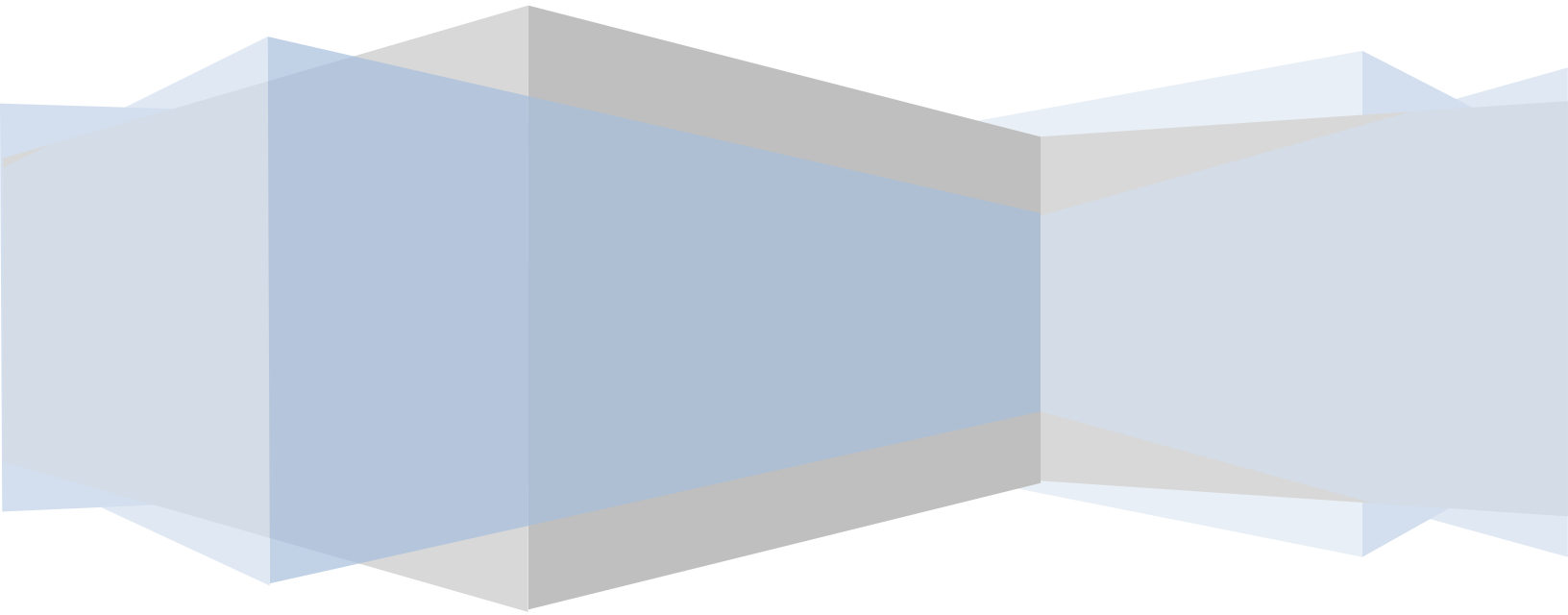
Windows Server 2008 R2



Essentials

Windows Server 2008 R2 Essentials

Installation, Deployment and Management



Windows Server 2008 R2 Essentials – First Edition

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Chapter 1. About Windows Server 2008 R2 Essentials

This is the second edition of Windows Server 2008 Essentials and has been updated to reflect the new features and functionality introduced by the second release of Microsoft's highly regarded server operating system, known as Windows Server 2008 R2.

Consisting of 35 chapters of detailed, in depth and practical information, Windows Server 2008 R2 Essentials is intended to cover all aspects of installing, configuring and administering Windows Server 2008 R2 systems. Whether new to Microsoft's Windows Server operating systems, or upgrading from Windows Server 2003, this eBook is designed to help the reader traverse the learning curve as rapidly as possible.

Topics covered in this publication include installation and upgrades, networking configuration, terminal services, disk and partition management, RAID configuration, security, BitLocker encryption, remote desktop access, print services, resource sharing, clustering, load balancing and user permission management.

In addition to providing a detailed overview of the features and functions of Windows Server 2008 R2, this on-line book also provides practical, step by step examples intended to bridge the gap between text book theory and real world practice.

Chapter 2. Windows Server 2008 R2 Editions and System Requirements

Before embarking on the installation of Windows Server 2008 R2, it is important to first gain an understanding of the different editions available and the corresponding hardware requirements. It is also important to be aware of the upgrade options available with each edition. With this objective in mind, this chapter will focus on providing an overview of both the different Windows Server 2008 R2 editions and the recommended hardware requirements.

2.1 CPU Requirements

The first of note for user familiar with the first version of Windows Server 2008 is that the R2 edition is only available for 64-bit systems. Whilst some editions of the original Windows Server 2008 operating system were available in 32-bit versions, this is now longer the case for the R2 version.

2.2 Windows Server 2008 R2 Foundation Edition

The Foundation edition of Windows Server 2008 is the new entry level edition of Windows Server 2008 and is designed specifically with the small business in mind. It is the least expensive of the various editions and lacks some of the more advanced functionality typically found in the higher end editions such as full Active Directory support and Hyper-V virtualization capabilities. In addition, the Foundation edition limits some of the included features, such as restricting the number of concurrent remote desktop services connections to 50 and is able to access a maximum of 1 processor and 8GB of RAM.

2.3 Windows Server 2008 R2 Standard Edition

Windows Server 2008 R2 Standard is another one of Microsoft's entry level server offerings (alongside Windows Web Server R2 2008 and Windows Server R2 2008 Foundation). As previously stated, whilst the original version of Windows Server 2008 supported both 32-bit and 64-bit versions, the R2 version supports only 64-bit processors. In terms of hardware Standard Edition supports up to 4GB of RAM and 4 processors.

Windows Server 2008 is primarily targeted and small and mid-sized businesses (SMBs) and is ideal for providing domain, web, DNS, remote access, print, file and application services. Support for clustering, however, is notably absent from this edition.

An upgrade path to Windows Server 2008 R2 Standard is available from Windows Server 2008, Windows 2000 Server and Windows Server 2003 Standard Edition.

2.4 Windows Server 2008 R2 Enterprise Edition

Windows Server 2008 R2 Enterprise Edition provides greater functionality and scalability than the Standard Edition. As with Standard Edition both 32-bit and 64-bit versions are available. Enhancements include support for as many as 8 processors and up to 2TB of RAM.

Additional features of the Enterprise edition include support for clusters of up to 16 nodes and Active Directory Federated Services (AD FS).

Windows Server 2000, Windows 2000 Advanced Server, Windows Server 2003 Standard Edition and Windows Server 2003 Enterprise Edition may all be upgraded to Windows Server 2008 R2 Enterprise Edition.

2.5 Windows Server 2008 R2 Datacenter Edition

The Datacenter edition represents the top end of the Windows Server 2008 R2 product range and is targeted at mission critical enterprises requiring stability and high uptime levels.

Windows Server 2008 R2 Datacenter edition supports up to 2TB of RAM and a minimum of 8 processors up to a maximum of 64.

Upgrade paths to Windows Server 2008 R2 Datacenter Edition are available from the Datacenter editions of Windows Server 2008, Windows 2000 and 2003.

2.6 Windows Web Server 2008 R2

Windows Web Server R2 2008 is essentially a version of Windows Server 2008 R2 designed primarily for the purpose of providing web services. It includes Internet Information Services (IIS) 7.0 along with associated services such as Simple Mail Transfer Protocol (SMTP) and Telnet. It supports up to 4 processors but RAM is limited to 32GB.

As with other entry level editions, Windows Web Server 2008 R2 lacks many of the features present in other editions such as clustering, BitLocker drive encryption, multipath I/O, Windows Internet Naming Service (WINS), Removable Storage Management and SAN Management.

2.7 Windows Server 2008 R2 Features Matrix

Now that we have covered in general terms the various different editions of Windows Server 2008 R2 we can now look in a little more detail at a feature by feature comparison of the four different editions. This is outlined in the following feature matrix:

Feature	Enterprise	Datacenter	Standard	Itanium	Web	Foundation
Active Directory Certificate	Yes	Yes	Limited	No	No	Limited

Services						
Active Directory Domain Services	Yes	Yes	Yes	No	No	Yes
Active Directory Federation Services	Yes	Yes	No	No	No	No
Active Directory Lightweight Directory Services	Yes	Yes	Yes	No	No	Yes
Active Directory Rights Management Services	Yes	Yes	Yes	No	No	Yes
Application Server	Yes	Yes	Yes	Yes	No	Yes
DHCP Server	Yes	Yes	Yes	No	No	Yes
DNS Server	Yes	Yes	Yes	No	Yes	Yes
Fax Server	Yes	Yes	Yes	No	No	Yes
File Services	Yes	Yes	Limited	No	No	Limited
Hyper-V	Yes	Yes	Yes	No	No	No
Network Policy and Access Services	Yes	Yes	Limited	No	No	Limited
Print and Document Services	Yes	Yes	Yes	No	No	Yes
Remote Desktop Services	Yes	Yes	Limited	No	No	Limited
Web Services (IIS)	Yes	Yes	Yes	Yes	Yes	Yes
Windows Deployment Services	Yes	Yes	Yes	No	No	Yes
Windows Server Update Services (WSUS)	Yes	Yes	Yes	No	No	Yes

2.8 Windows Server 2008 Hardware Requirements

Before investing time and resources into downloading and installing Windows Server 2008, the first step is to gain an appreciation of the hardware requirements necessary to effectively run the operating system. The following table provides an overview of Microsoft's recommended minimum hardware:

Category	Minimum / Recommended Requirements
Processor	• Minimum: 1.4GHz (x64 processor) • Recommended: 2GHz or faster **Note:** For Itanium based systems an Intel Itanium 2 processor is required.
Memory	• Minimum: 512MB RAM • Recommended: 2GB RAM or greater • Maximum: 8GB (Foundation) 32GB (Standard) or 2TB (Enterprise, Datacenter and Itanium-Based Systems)
Available Disk Space	• Minimum: 10GB • Recommended: 40GB or greater **Note:** Systems with RAM in excess of 16GB will require greater amounts of disk space to accommodate paging, hibernation, and dump files
Drive	DVD-ROM drive
Display and Peripherals	• Super VGA or greater-resolution monitor (800x600) • Keyboard • Microsoft Mouse or compatible pointing device

As with the specified system requirements for all Windows systems it is best to aim for the *Recommended* values rather than the *Minimum* values to ensure acceptable levels of performance. For example, whilst it is possible to run Windows Server 2008 in 512MB of RAM it is unlikely that performance levels will be optimal with such a configuration.

Chapter 3. Performing a Clean Windows Server 2008 R2 Installation

Windows Server 2008 R2 may be installed using a number of different approaches. One such approach involves installing an entirely new instance of the operating system on a disk or partition such that any previous operating system installation and associated data are destroyed. Another option is to perform an upgrade of an existing Windows installation such that user data, settings and applications are retained. In addition, the installation may be performed interactively where the user is required to respond to prompts during the installation, or unattended where pre-configured responses are supplied by an *answer* file.

The topic of this chapter is the clean, interactive installation of Windows Server 2008 R2. The subject of upgrades is covered in *Chapter 4 - Performing a Windows Server 2008 R2 Upgrade*.

3.1 Obtaining Windows Server 2008 R2

If you do not already have access to the Windows Server 2008 R2 installation media this can be downloaded from the Microsoft web site. Downloads are available for the Foundation, Standard, Enterprise, Datacenter and Web editions of the operating system. For detailed information on the features provided with each edition refer to *Chapter 2 - Windows Server 2008 R2 Editions and System Requirements*.

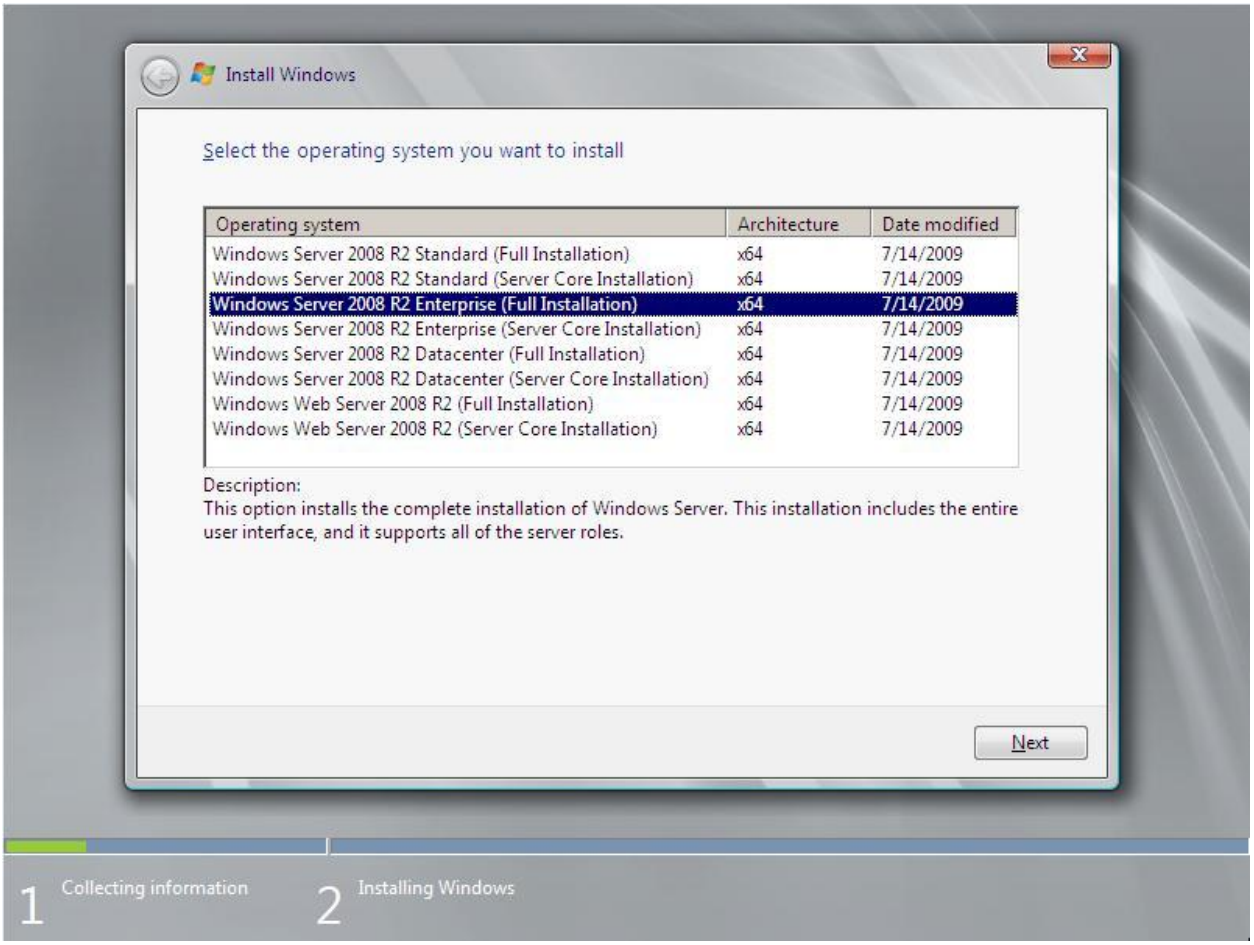
All downloadable editions can be run either without a key (i.e. in evaluation mode) or with a key (if a license has already been purchased). The evaluation period lasts for 180 days.

The Windows Server 2008 R2 download is provided in the form of an ISO image which may burned to a DVD and subsequently be used to perform the installation.

3.2 Starting the Installation Process

Windows Server 2008 R2 may be installed either by booting from the installation DVD or by logging into the previously installed operating system as an administrator and launching the *Setup* tool on the DVD (typically this will auto-run when the DVD is inserted into the drive). The following figure shows the initial installation screen:

Select the appropriate language preferences and click *Next* to proceed with the installation process. On the subsequent screen the installation may be started by clicking on the *Install now* button. Alternatively, the *What To Know Before Installing Windows Server 2008* link will provide information on system requirements and advice about issues such as application and driver compatibility. Clicking on *Install now* proceeds to the *Operating System Selection* screen shown in the following figure:



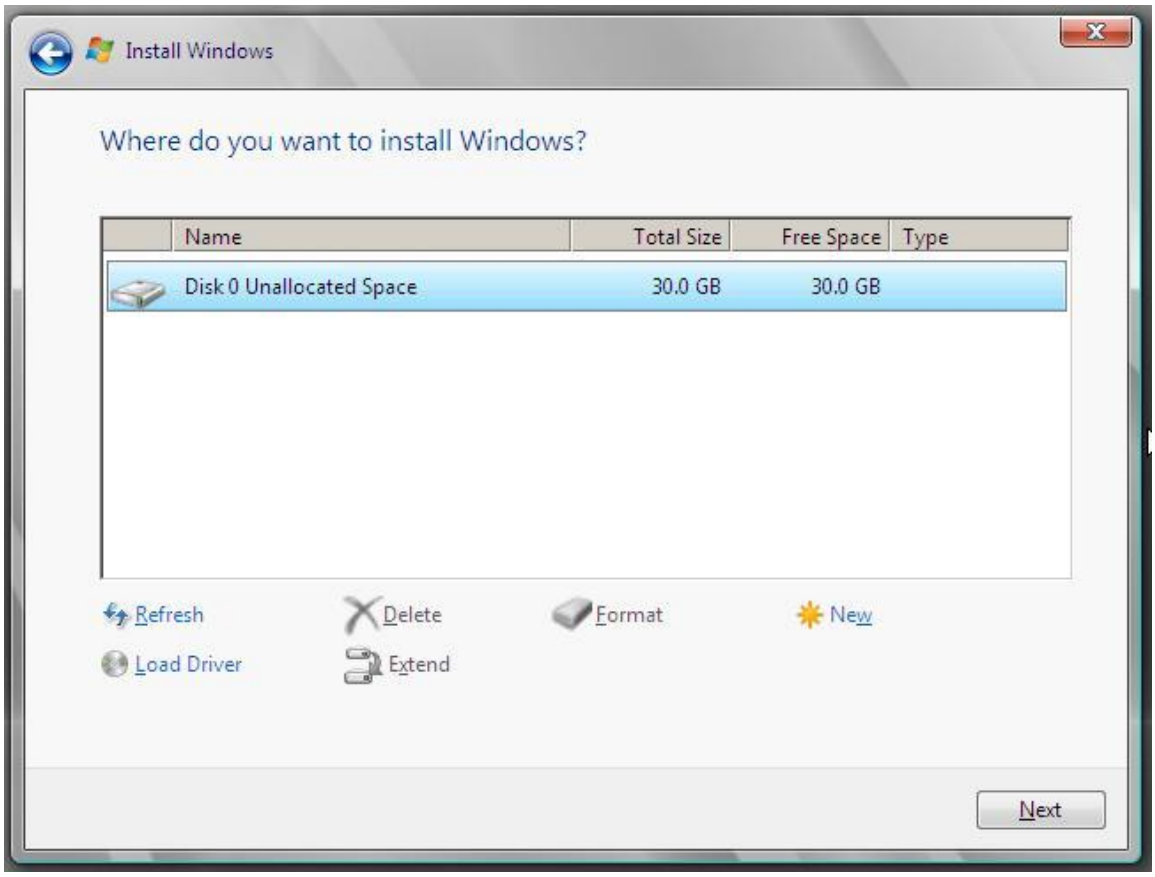
Having selected the edition of Windows Server 2008 R2 that you wish to install, click *Next* to proceed to license terms screen. Read and agree (assuming you do agree) to the license terms and proceed to the next screen where the options to upgrade or perform a custom installation are provided. If the installer was invoked by booting from the DVD, or the host operating system is not suitable for upgrade, only the custom installation option will work at this point. Select this option to proceed.

3.3 Disk and Partition Management

The next screen provides an interface for selecting and configuring disks and partitions for the installation. Initially, this screen displays a list of physical disk drives available on the system together with any pre-existing partitions on those disks.

Clicking on the *Drive options (advanced)* option displays a number of options including the deletion, creation and formatting of partitions on the listed disk drives. In addition, the *Load*

driver option allows any driver necessary to access a disk drive to be loaded into to system so that the device may be used as an installation destination. For the purposes of this installation, the entire disk drive will be used as the installation target. The following figure shows a single, unpartitioned disk drive with the *Drive options* displayed:



Click *Next* to begin the installation process. A new screen will appear listing the progress of the installation and highlighting the fact that the system will reboot a number of times during the installation.

3.4 Accessing the Command Prompt during Installation

At any point during the setup process (except when the installation is actually being performed) *Shift+F10* may be pressed to gain access to the command-prompt. From within this command prompt window most of the standard Windows Server 2008 R2 command-line tools are available allowing tasks to be performed that might otherwise not be possible from within the setup interface. A full list of available commands and respective descriptions can be found in *Chapter 5 - Windows Server 2008 R2 Command-line Tools*.