

William Panek  
Microsoft MVP

Updated for  
**Server  
2012 R2**

# MCSA

## Windows Server® 2012 R2 Configuring Advanced Services STUDY GUIDE

**EXAM 70-412**

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# **MCSA**

## **Windows Server® 2012 R2**

### **Configuring Advanced Services**

### **Study Guide**

### **Exam 70-412**





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William Panek

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*This book is dedicated to the three ladies of my life: Crystal, Alexandria,  
and Paige.*





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# Introduction

This book is drawn from more than 20 years of IT experience. I have taken that experience and translated it into a Windows Server 2012 R2 book that will help you not only prepare for the MCSA: Windows Server 2012 R2 exams but also develop a clear understanding of how to install and configure Windows Server 2012 R2 while avoiding all of the possible configuration pitfalls.

Many Microsoft books just explain the Windows operating system, but with *MCSA: Windows Server 2012 R2 Complete Study Guide*, I go a step further by providing many in-depth, step-by-step procedures to support my explanations of how the operating system performs at its best.

Microsoft Windows Server 2012 R2 is the newest version of Microsoft's server operating system software. Microsoft has taken the best of Windows Server 2003, Windows Server 2008/2008 R2, and Windows Server 2012 and combined them into the latest creation, Windows Server 2012 R2.

Windows Server 2012 R2 eliminates many of the problems that plagued the previous versions of Windows Server, and it includes a much faster boot time and shutdown. It is also easier to install and configure, and it barely stops to ask the user any questions during installation. In this book, I will show you what features are installed during the automated installation and where you can make changes if you need to be more in charge of your operating system and its features.

This book takes you through all the ins and outs of Windows Server 2012 R2, including installation, configuration, Group Policy objects, auditing, backups, and so much more.

Windows Server 2012 R2 has improved on Microsoft's desktop environment, made networking easier, enhanced searching capability, and improved performance—and that's only scratching the surface.

When all is said and done, this is a technical book for IT professionals who want to take Windows Server 2012 R2 to the next step and get certified. With this book, you will not only learn Windows Server 2012 R2 and ideally pass the exams, but you will become a Windows Server 2012 R2 expert.

## The Microsoft Certification Program

Since the inception of its certification program, Microsoft has certified more than 2 million people. As the computer network industry continues to increase in both size and complexity, this number is sure to grow—and the need for proven ability will also increase. Certifications can help companies verify the skills of prospective employees and contractors.

The Microsoft certification tracks for Windows Server 2012 R2 include the following:

**MCSA: Windows Server 2012 R2** The MCSA is now the lowest-level certification you can achieve with Microsoft in relation to Windows Server 2012 R2. It requires passing three exams: 70-410, 70-411, and 70-412. Or, if you qualify, you can take an Upgrading exam: Exam 70-417. This book assists in your preparation for all four exams.

**MCSE: Server Infrastructure or MCSE: Desktop Infrastructure** The MCSE certifications, in relation to Windows Server 2012 R2, require that you become an MCSA first and then pass two additional exams. The additional exams will vary depending on which of the two MCSE tracks you choose. For more information, visit Microsoft's website at [www.microsoft.com/learning](http://www.microsoft.com/learning).

**MCSM: Directory Services** The MCSM certification takes things to an entirely new level. It requires passing a knowledge exam (in addition to having the MCSE in Windows Server 2012 R2) and a lab exam. This is now the elite-level certification in Windows Server 2012 R2.

## How Do You Become Certified on Windows Server 2012 R2?

Attaining Microsoft certification has always been a challenge. In the past, students have been able to acquire detailed exam information—even most of the exam questions—from online “brain dumps” and third-party “cram” books or software products. For the new generation of exams, this is simply not the case.

Microsoft has taken strong steps to protect the security and integrity of its new certification tracks. Now prospective candidates must complete a course of study that develops detailed knowledge about a wide range of topics. It supplies them with the true skills needed, derived from working with the technology being tested.

The new generations of Microsoft certification programs are heavily weighted toward hands-on skills and experience. It is recommended that candidates have troubleshooting skills acquired through hands-on experience and working knowledge.

Fortunately, if you are willing to dedicate the time and effort to learn Windows Server 2012 R2, you can prepare yourself well for the exam by using the proper tools. By working through this book, you can successfully meet the requirements to pass the Windows Server 2012 R2 exams.

## MCITP Exam Requirements

Candidates for MCITP certification on Windows Server 2012 R2 must pass one Windows Server 2012 R2 exams. This book will help you get ready for the 70-412: Configuring Advanced Windows Server 2012 R2 Services exam.

Microsoft provides exam objectives to give you a general overview of possible areas of coverage on the Microsoft exams. Keep in mind, however, that exam objectives are subject



to change at any time without prior notice and at Microsoft's sole discretion. Visit the Microsoft Learning website ([www.microsoft.com/learning](http://www.microsoft.com/learning)) for the most current listing of exam objectives. The published objectives and how they map to this book are listed later in this introduction.



For a more detailed description of the Microsoft certification programs, including a list of all the exams, visit the Microsoft Learning website at [www.microsoft.com/learning](http://www.microsoft.com/learning).

## Tips for Taking the Windows Server 2012 R2 Exams

Here are some general tips for achieving success on your certification exam:

- Arrive early at the exam center so that you can relax and review your study materials. During this final review, you can look over tables and lists of exam-related information.
- Read the questions carefully. Do not be tempted to jump to an early conclusion. Make sure you know *exactly* what the question is asking.
- Answer all questions. If you are unsure about a question, mark it for review and come back to it at a later time.
- On simulations, do not change settings that are not directly related to the question. Also, assume the default settings if the question does not specify or imply which settings are used.
- For questions that you're unsure about, use a process of elimination to get rid of the obviously incorrect answers first. This improves your odds of selecting the correct answer when you need to make an educated guess.

## Exam Registration

At the time this book was released, Microsoft exams are given at Prometric testing centers (800-755-EXAM/800-755-3926). As of December 31, 2014, Microsoft will be ending its relationship with Prometric, and all exams will be delivered through the more than 1,000 Authorized VUE Testing Centers around the world. For the location of a testing center near you, go to VUE's website at [www.vue.com](http://www.vue.com). If you are outside the United States and Canada, contact your local VUE registration center.

Find out the number of the exam you want to take and then register with the Prometric or VUE registration center nearest to you. At this point, you will be asked for advance payment for the exam. The exams are \$150 each, and you must take them within one year of payment. You can schedule exams up to six weeks in advance or as late as one working day prior to the date of the exam. You can cancel or reschedule your exam if you contact the center at least two working days prior to the exam. Same-day registration is available in

some locations, subject to space availability. Where same-day registration is available, you must register a minimum of two hours before test time.

When you schedule the exam, you will be provided with instructions regarding appointment and cancellation procedures, ID requirements, and information about the testing center location. In addition, you will receive a registration and payment confirmation letter from Prometric.

Microsoft requires certification candidates to accept the terms of a nondisclosure agreement before taking certification exams.

## Who Should Read This Book?

This book is intended for individuals who want to earn their MCITP by taking exam 70-412: Configuring Advanced Windows Server 2012 R2 Services.

Not only will this book help anyone who is looking to pass the Microsoft exams, it will help anyone who wants to learn the real ins and outs of the Windows Server 2012 R2 operating system.

## What's Inside?

Here is a glance at what's in each chapter:

**Chapter 1: Configure and Manage High Availability** This chapter explains how to set up Windows Server 2012 R2 high availability, including clustering and failover systems.

**Chapter 2: Configure File and Storage Solutions** This chapter shows you how to configure file and storage solutions. You will learn how to help your system run faster and give you better response times.

**Chapter 3: Implement Business Continuity and Disaster Recovery** This chapter shows you how to protect yourself in the event of a system crash or a catastrophic failure.

**Chapter 4: Configure Advanced Network Services** This chapter shows you how to configure the different types of network services and how to configure them properly.

**Chapter 5: Configure the Active Directory Infrastructure** This chapter takes you through the different ways to create and manage your Windows Server 2012 R2 Active Directory infrastructure.

**Chapter 6: Configure Access and Information Protection Solutions** You will see how to set up your Windows Server 2012 R2 system so that your information stays secure.

# What's Included with the Book

This book includes many helpful items intended to prepare you for the 70-412: Configuring Advanced Windows Server 2012 R2 Services exam.

**Assessment Test** There is an assessment test at the conclusion of the introduction that can be used to evaluate quickly where you are with Windows Server 2012 R2. This test should be taken prior to beginning your work in this book, and it should help you identify areas in which you are either strong or weak. Note that these questions are purposely more simple than the types of questions you may see on the exams.

**Objective Map and Opening List of Objectives** Later in this introduction is a detailed exam objective map showing you where each of the exam objectives is covered. Each chapter also includes a list of the exam objectives covered.

**Helpful Exercises** The book includes step-by-step exercises of some of the more important tasks that you should be able to perform. Some of these exercises have corresponding videos that can be downloaded from the book's website. Also, in the following section is a recommended home lab setup that will be helpful in completing these tasks.

**Exam Essentials** The end of each chapter also includes a listing of exam essentials. These are essentially repeats of the objectives, but remember that any objective on the exam blueprint could show up on the exam.

**Chapter Review Questions** Each chapter includes review questions. These are used to assess your understanding of the chapter and are taken directly from the chapter. These questions are based on the exam objectives, and they are similar in difficulty to items you might actually receive on the 70-412: Configuring Advanced Windows Server 2012 R2 Services exam.



You can obtain the Sybex Test Engine, flashcards, videos, and glossary at [www.sybex.com/go/mcsawin2012r2config](http://www.sybex.com/go/mcsawin2012r2config)

**Sybex Test Engine** Readers can access the Sybex Test Engine, which includes the assessment test and chapter review questions in electronic format. In addition, there is a practice exams included with the Sybex test engine for exam 70-412.

**Electronic Flashcards** Flashcards are included for quick reference. They are great tools for learning important facts quickly. You may even consider these as additional simple practice questions, which is essentially what they are.

**Videos** Some of the exercises include corresponding videos. These videos show you how to do the exercises. There is also a video that shows you how to set up virtualization so that you can complete the exercises within a virtualized environment. This same video also shows you how to install Windows Server 2012 R2 Datacenter on that virtualized machine.

**PDF of Glossary of Terms** There is a glossary included that covers the key terms used in this book.

## Recommended Home Lab Setup

To get the most out of this book, you will want to make sure you complete the exercises throughout the chapters. To complete the exercises, you will need one of two setups. First, you can set up a machine with Windows Server 2012 R2 and complete the labs using a regular Windows Server 2012 R2 machine.

The second way to set up Windows Server 2012 R2 (the way I set up Server 2012 R2) is by using virtualization. I set up Windows Server 2012 R2 as a virtual hard disk (VHD), and I did all the labs this way. The advantages of using virtualization are that you can always just wipe out the system and start over without losing a real server. Plus, you can set up multiple virtual servers and create a full lab environment on one machine.

I created a video for this book showing you how to set up a virtual machine and how to install Windows Server 2012 R2 onto that virtual machine.

## How to Contact the Author/Sybex

Sybex strives to keep you supplied with the latest tools and information you need for your work. Please check the website at [www.sybex.com/go/mcsawin2012r2config](http://www.sybex.com/go/mcsawin2012r2config), where I'll post additional content and updates that supplement this book should the need arise.

You can contact Will Panek by going to [www.willpanek.com](http://www.willpanek.com).

## Certification Objectives Maps

In addition to the book chapters, you will find coverage of exam objectives in the flashcards, practice exams, and videos on the book's companion website. [www.sybex.com/go/mcsawin2012r2config](http://www.sybex.com/go/mcsawin2012r2config)



Exam objectives are subject to change at any time without prior notice and at Microsoft's sole discretion. Please visit Microsoft's website ([www.microsoft.com/learning](http://www.microsoft.com/learning)) for the most current listing of exam objectives.

# Objectives

## **Exam 70-412: Configuring Advanced Windows Server 2012 Services**

### Configure Network Load Balancing (NLB), Chapter 17

This objective may include, but is not limited to:

- Install NLB nodes
- Configure NLB prerequisites
- Configure affinity
- Configure port rules
- Configure cluster operation mode
- Upgrade an NLB cluster

### Configure failover clustering, Chapter 17

This objective may include, but is not limited to:

- Configure Quorum
- Configure cluster networking
- Restore single node or cluster configuration
- Configure cluster storage
- Implement cluster aware updating
- Upgrade a cluster

### Manage failover-clustering roles, Chapter 17

This objective may include, but is not limited to:

- Configure role-specific settings including continuously available shares
- Configure VM monitoring
- Configure failover and preference settings

### Manage Virtual Machine (VM) Movement, Chapter 17

This objective may include, but is not limited to:

- Configure Virtual Machine network health protection
- Configure drain on shutdown
- Perform quick, live and storage migrations
- Import/export/copy of VMS

Configure advanced file services, Chapter 18

- Configure NFS data store
- Configure BranchCache
- Configure File Classification Infrastructure (FCI) using File Server Resource Manager (FSRM)
- Configure file access auditing

Implement Dynamic Access Control (DAC), Chapter 18

- Configure user and device claim types
- Create and configure resource properties and lists
- Create and configure Central Access Rules and Policies
- Configure file classification
- Implement policy changes and staging
- Perform access-denied remediation

Configure and optimize storage, Chapter 18

- Configure iSCSI Target and Initiator
- Configure Internet Storage Name Server (iSNS)
- Implement thin provisioning and trim
- Manage server free space using Features on Demand
- Configure tiered storage

Configure and manage backups, Chapter 19

- Configure Windows Server backups
- Configure Windows Azure backups
- Configure role-specific backups
- Manage VSS settings using VSSAdmin

Recover Servers, Chapter 19

- Restore from backups
- Perform a Bare Metal Restore (BMR)
- Recover servers using Windows Recovery Environment (Win RE) and safe mode
- Configure the Boot Configuration Data (BCD) store

Configure site-level fault tolerance, Chapter 19

- Configure Hyper-V Replica including Hyper-V Replica Broker and VMs
- Configure multi-site clustering including network settings, Quorum, and failover settings
- Configure Hyper-V Replica extended replication
- Configure Global Update Manager
- Recover a multi-site failover cluster