Microsoft

Implementing an Advanced Server Infrastructure

Exam Ref 70-414

Steve Suehring

Microsoft

Exam Ref 70-414 Implementing an Advanced Server Infrastructure

Steve Suehring

PUBLISHED BY
Microsoft Press
A Division of Microsoft Corporation
One Microsoft Way
Redmond, Washington 98052-6399

Library of Congress Control Number: 2014940676
ISBN: 978-0-7356-7407-3

Printed and bound in the United States of America.

First Printing

Microsoft Press books are available through booksellers and distributors worldwide. If you need support related to this book, email Microsoft Press Book Support at mspinput@microsoft.com. Please tell us what you think of this book at http://www.microsoft.com/learning/booksurvey.

The example companies, organizations, products, domain names, email addresses, logos, people, places, and events depicted herein are fictitious. No association with any real company, organization, product, domain name, email address, logo, person, place, or event is intended or should be inferred.

This book expresses the author's views and opinions. The information contained in this book is provided without any express, statutory, or implied warranties. Neither the authors, Microsoft Corporation, nor its resellers, or distributors will be held liable for any damages caused or alleged to be caused either directly or indirectly by this book.

Acquisitions Editor: Anne Hamilton
Developmental Editor: Karen Szall
Editorial Production: Box Twelve Communications
Technical Reviewer: Brian Svidergol
Cover: Twist Creative • Seattle

Contents at a glance

This page intentionally left blank

Contents

Introduction

This book covers the 70-414 certification exam, "Implementing an Advanced Server Infrastructure." More specifically, the book examines the second revision, or "R2," edition of the exam objectives. The book is written for IT professionals who already have experience with Windows networks.

The 70-414 exam covers advanced topics that IT professionals encounter in the enterprise environment. Topics such as monitoring, virtualization, and high availability are emphasized in the exam objectives. You should have a thorough understanding of a basic server infrastructure as a prerequisite for this book and the 70-414 exam.

There are four main objective areas on the 70-414 exam and each area is covered to a differing level:

- Manage and maintain a server infrastructure: 25 to 30 percent
- Plan and implement a highly available enterprise infrastructure: 25 to 30 percent
- Plan and implement a server virtualization infrastructure: 20 to 30 percent
- Design and implement identity and access solutions: 20 to 25 percent

As you can see from the broad objective areas, there is coverage of both planning and implementation as well as management and design. This level of coverage means that you'll likely need to be able to choose an appropriate solution given a specific scenario or set of technologies for that scenario. Once chosen, you'll then need to be able to determine the most successful path for implementation.

This book covers every exam objective, but it does not cover every exam question. Only the Microsoft exam team has access to the exam questions, and Microsoft regularly adds new questions to the exam, making it impossible to cover specific questions. You should consider this book a supplement to your relevant real-world experience and other study materials. If you encounter a topic in this book that you do not feel completely comfortable with, use the links you'll find in the text to find more information and take the time to research and study the topic. Great information is available on MSDN, TechNet, and in blogs and forums.

Microsoft certifications

Microsoft certifications distinguish you by proving your command of a broad set of skills and experience with current Microsoft products and technologies. The exams and corresponding certifications are developed to validate your mastery of critical competencies as you design and develop, or implement and support, solutions with Microsoft products and technologies both on-premises and in the cloud. Certification brings a variety of benefits to the individual and to employers and organizations.

MORE INFO **ALL MICROSOFT CERTIFICATIONS**

For information about Microsoft certifications, including a full list of available certifications, go to *http://www.microsoft.com/learning/en/us/certification/cert-default.aspx*.

Acknowledgments

Thanks to Karen Szall and the Microsoft Press team, as well as Jeff Riley. It's been a pleasure working with you all, as always.

Free ebooks from Microsoft Press

From technical overviews to in-depth information on special topics, the free ebooks from Microsoft Press cover a wide range of topics. These ebooks are available in PDF, EPUB, and Mobi for Kindle formats, ready for you to download at:

http://aka.ms/mspressfree

Check back often to see what is new!

Errata, updates, & book support

We've made every effort to ensure the accuracy of this book and its companion content. You can access updates to this book—in the form of a list of submitted errata and their related corrections—at:

http://aka.ms/ER414R2

If you discover an error that is not already listed, please submit it to us at the same page.

If you need additional support, email Microsoft Press Book Support at mspinput@microsoft.com.

Please note that product support for Microsoft software and hardware is not offered through the previous addresses. For help with Microsoft software or hardware, go to *http://support.microsoft.com*.

We want to hear from you

At Microsoft Press, your satisfaction is our top priority, and your feedback our most valuable asset. Please tell us what you think of this book at:

http://aka.ms/tellpress

The survey is short, and we read every one of your comments and ideas. Thanks in advance for your input!

Stay in touch

Let's keep the conversation going! We're on Twitter: http://twitter.com/MicrosoftPress.

This page intentionally left blank

Preparing for the exam

Microsoft certification exams are a great way to build your resume and let the world know about your level of expertise. Certification exams validate your on-the-job experience and product knowledge. While there is no substitution for on-the-job experience, preparation through study and hands-on practice can help you prepare for the exam. We recommend that you round out your exam preparation plan by using a combination of available study materials and courses. For example, you might use this Exam Ref and another study guide for your "at home" preparation and take a Microsoft Official Curriculum course for the classroom experience. Choose the combination that you think works best for you.

Note that this Exam Ref is based on publicly available information about the exam and the author's experience. To safeguard the integrity of the exam, authors do not have access to the live exam.

This page intentionally left blank

CHAPTER 1

Manage and maintain a server infrastructure

The 70-414 exam looks to stretch your understanding of planning, implementation, and management of an advanced Microsoft-based infrastructure. The tools and products included in the exam are used in enterprise-level networks and emphasize automation, high availability, and self-service. The first chapter of this book discusses objectives surrounding server infrastructure management. Within this chapter and indeed the entire book, you'll find hands-on examples that directly tie to the exam objectives, and you'll find numerous links to more information on TechNet.

IMPORTANT

Have you read page xv?

It contains valuable information regarding the skills you need to pass the exam.

Objectives in this chapter:

- Objective 1.1: Design an administrative model
- Objective 1.2: Design a monitoring strategy
- Objective 1.3: Plan and implement automated remediation

Objective 1.1: Design an administrative model

Designing an administrative model for an enterprise network involves a large amount of planning, especially in complex or highly structured enterprises. A good administrative model will enable delegation of authority while also enforcing the principle of least privilege. Many organizations have unique needs, but the overall administrative model can follow a common pattern. For example, an organization that's geographically dispersed may allow personnel at remote locations to change passwords for users at that remote site.

This objective covers how to:

- Understand design considerations, including user rights and built-in groups
- Understand designing a delegation of administration structure for System Center 2012 R2
- Understand self-service portal design using System Center 2012 Service Manager
- Delegate rights for managing private clouds by using System Center 2012 App Controller and Virtual Machine Manager

Understanding administrative model design considerations

Typical enterprise administrative and privilege models use groups to assign and delegate permissions. Groups save time and administration overhead by combining similar users and computers into one entity that can then be assigned permissions.

MORE INFO **DESIGN STRATEGIES FOR ACTIVE DIRECTORY DOMAIN SERVICES (AD DS)**

This section examines user rights and built-in groups. If you're unfamiliar with design strategies for Active Directory Domain Services (AD DS), you can find more information in the AD DS Design Guide at *http://technet.microsoft.com/library/cc754678.aspx*.

Groups can have users and computers and are created as a security group or a distribution group. The security group type is covered in this chapter; distribution groups are typically used to create email distribution lists and aren't covered in this book. Groups are also scoped, which means that they can apply locally to a computer, to a domain, or to an entire forest. Table 1-1 describes the three types of group scopes available in AD DS.

TABLE 1-1 Active Directory Domain Services group scope

Group Scope	Description
Domain Local	Members in a Domain Local scoped group can have permissions within the same domain where the Domain Local group is located and can contain any combination of groups with domain local, global, or universal scope.
Global	Members of groups with a Global scope can have permissions in any domain within a forest, but members can come from only the domain within which the group is defined.
Universal	Members of groups with Universal scope can have permissions in any domain or forest and can originate from any domain or forest.

User rights

Before looking at user rights, it's important to agree on the definition of a user right. You can find a definition all the way back to Windows NT Server 4.0 in the "NT Server 4.0 Concepts and Planning Manual" on TechNet, where a *right* is defined as something that "authorized a user to perform certain actions on a computer system." See *http://technet.microsoft.com/en-us/library/cc751446.aspx* for more discussion on the definition.

What's important to realize is the distinction between a right and a permission. A *right* defines what a user can do on a computer system, whereas *permissions* apply to objects. Rights can override permissions in certain instances. For example, if a user is a member of a group that has the right to back up a computer or has the Back Up Files and Directories right, that user inherently has read access to the files on the computer, even if permissions would normally deny such access. More specifically, the Back Up Files and Directories right has the following permissions:

- Traverse Folder/Execute File
- List Folder/Read Data
- Read Attributes
- Read Extended Attributes
- Read Permissions

The Back Up Files and Directories right is just one example of this concept. Table 1-2 shows several other security-related user rights available with Windows Server 2012. An abbreviated constant name applies to each of the rights described in Table 1-2. The constant names are used for logging and can also be used for Windows PowerShell, as discussed later in this section.

TABLE 1-2 Additional security-related user rights

User Right	Description	Constant Name
Access Credential Manager as a trusted caller	Applies to Credential Manager during backup-related processes. This privilege is assigned to the Winlogon service only and should not be assigned to the account.	SeTrustedCredManAccessPrivilege
Access this computer from the network	Determines whether a user can utilize protocols related to accessing a given computer, such as Service Message Block (SMB), NetBIOS, Common Internet File System (CIFS), and Component Object Model Plus (COM+).	SeNetworkLogonRight
Act as part of the operating system	Applies to processes to determine whether they can use a user's identity to gain access to the privileges granted to that user.	SeTcbPrivilege

User Right	Description	Constant Name
Add workstations to domain	Enables a user to add a computer to a domain.	SeMachineAccountPrivilege
Adjust memory quotas for a process	Enables a user to change the memory used by a process.	SeIncreaseQuotaPrivilege
Allow logon locally	Enables a user to start an interactive session.	SeInteractiveLogonRight
Allow logon through Remote Desktop Services	Enables a user to log on using Remote Desktop Services.	SeRemoteInteractiveLogonRight
Back up files and directories	Enables an account to bypass permissions for backup purposes.	SeBackupPrivilege
Bypass traverse checking	Enables an account to traverse an NTFS file system without needing to check the Traverse Folder permission.	SeChangeNotifyPrivilege
Change the system time	Enables a user to change the time on the local computer.	SeSystemtimePrivilege
Change the time zone	Enables a user to change the time zone on the local computer.	SeTimeZonePrivilege
Create a pagefile	Enables a user to change settings around the pagefile, including its size.	SeCreatePagefilePrivilege
Create a token object	Enables a process to create a token using the privileged account.	SeCreateTokenPrivilege
Create global objects	Enables creation of global objects.	SeCreateGlobalPrivilege
Create permanent shared objects	Enables creation of directory objects.	SeCreatePermanentPrivilege
Create symbolic links	Enables an account to create a file system symbolic link.	SeCreateSymbolicLinkPrivilege
Debug programs	Enables a user to attach to a process for debugging.	SeDebugPrivilege
Deny access to this computer from the network	Prevents users from accessing the computer.	SeDenyNetworkLogonRight
Deny logon as a batch job	Prevents an account from logging on using batch-related methods.	SeDenyBatchLogonRight
Deny logon as a service	Prevents an account from logging on as a service.	SeDenyServiceLogonRight
Deny logon locally	Prevents an account from logging on locally at a computer console.	SeDenyInteractiveLogonRight
Deny logon through Remote Desktop Services	Prevents users from logging on to a computer using Remote Desktop Services.	SeDenyRemoteInteractiveLogonRight

User Right	Description	Constant Name
Enable computer and user accounts to be trusted for delegation	Enables a user to set the Trusted for Delegation setting.	SeEnableDelegationPrivilege
Force shutdown from a remote system	Allows a user to shut down a computer when connected remotely.	SeRemoteShutdownPrivilege
Generate security audits	Enables an account to generate audit records in the security log.	SeAuditPrivilege
Impersonate a client after authentication	Enables a program to impersonate a user or account and act on behalf of that user or account.	SeImpersonatePrivilege
Increase a process working set	Enables a user to increase the size of a working set of a process.	SeIncreaseWorkingSetPrivilege
Increase scheduling priority	Enables a user to increase the base priority of a process.	SeIncreaseBasePriorityPrivilege
Load and unload device drivers	Enables a user to dynamically load or unload device drivers.	SeLoadDriverPackage
Lock pages in memory	Enables an account to keep data from a process in physical memory.	SeLockMemoryPrivilege
Log on as a batch job	Enables an account to log on using batch-related methods, including Task Scheduler.	SeBatchLogonRight
Log on as a service	Enables a service account to register a process.	SeServiceLogonRight
Manage auditing and security log	Enables a user to work with auditing and security log.	SeSecurityPrivilege
Modify an object label	Enables an account to modify integrity labels used by Windows Integrity Controls (WIC).	SeRelabelPrivilege
Modify firmware environment values	Enables a user to modify non-volatile RAM (NVRAM) settings.	SeSystemEnvironmentPrivilege
Perform volume maintenance tasks	Enables a user to do volume- and disk management–related tasks.	SeManageVolumePrivilege
Profile single process	Enables a user to view performance aspects of a process.	SeProfileSingleProcessPrivilege
Profile system performance	Enables a user to use the Windows Performance Monitor tools.	SeSystemProfilePrivilege
Remove computer from docking station	Enables a user to undock a computer without logging on.	SeUndockPrivilege
Replace a process level token	Enables a process to replace an access token of a child process.	SeAssignPrimaryTokenPrivilege
Restore files and directories	Enables a user to bypass the normal permission checks when restoring.	SeRestorePrivilege

User Right	Description	Constant Name
Shut down the system	Enables a local user to shut down the system.	SeShutdownPrivilege
Synchronize directory service data	Enables a user to synchronize service data, such as LDAP directory synchronization.	SeSyncAgentPrivilege
Take ownership of files or other objects	Enables an account to take ownership of objects in the computer.	SeTakeOwnershipPrivilege

The constant name described in Table 1-2 can be used with Windows PowerShell cmdlets related to privileges:

- Get-Privilege
- Grant-Privilege
- Revoke-Privilege
- Test-Privilege

As described in Table 1-2, user rights generally shouldn't be applied to accounts directly, but rather should be granted through the use of groups.

MORE INFO **USER RIGHTS ASSIGNMENT**

See *http://technet.microsoft.com/library/dn221963* for more information on user rights assignment.

Built-in groups

Built-in groups, also called *default groups*, are added with the operating system. Many of the default groups have user rights assigned already. Certain rights also apply depending on the type of computer on which the right is being exercised. For example, the Allow Logon Locally right is granted to the following groups for logging on to workstations and servers:

- Administrators
- Backup Operators
- Users

By contrast, the following groups have the Allow Logon Locally right for domain controllers:

- Account Operators
- Administrators
- Backup Operators
- Print Operators
- Server Operators

Table 1-3 shows the local groups for a computer and the user rights granted to them by default.

TABLE 1-3 User rights for local groups

Group	User Rights
Administrators	Access this computer from the network Adjust memory quotas for a process Allow logon locally Allow logon through Remote Desktop Services Back up files and directories Bypass traverse checking Change the system time Change the time zone Create a page file Create global objects Create symbolic links Debug programs Force shutdown from a remote system Impersonate a client after authentication Increase scheduling priority Load and unload device drivers Log on as a batch job Manage auditing and security log Modify firmware environment variables Perform volume maintenance tasks Profile system performance Remove computer from docking station Restore files and directories Shut down the system Take ownership of files or other objects
Backup Operators	Access this computer from the network Allow logon locally Back up files and directories Bypass traverse checking Log on as a batch job Restore file and directories Shut down the system
Cryptographic Operators	No user rights granted by default
Distributed COM Users	No user rights granted by default
Guests	No user rights granted by default
IIS_IUSRS	No user rights granted by default
Network Configuration Operators	No user rights granted by default
Performance Log Users	No user rights granted by default
Performance Monitor Users	No user rights granted by default
Power Users	No user rights granted by default
Remote Desktop Users	Allow logon through Remote Desktop Services
Replicators	No user rights granted by default

Group	User Rights
Users	Access this computer from the network Allow logon locally Bypass traverse checking Change the time zone Increase a process working set Remove the computer from a docking station Shut down the system
Offer Remote Assistance Helpers	No user rights granted by default

MORE INFO **DEFAULT LOCAL GROUPS**

See *http://technet.microsoft.com/library/cc771990.aspx* for more information on default local groups.

AD DS also contains default groups. These groups are placed into either the Builtin or Users container.

Table 1-4 describes the groups in the Builtin container.

TABLE 1-4 Groups in the Builtin container

Group	User Rights
Account Operators	Allow logon locally Shut down the system
Administrator	Access this computer from the network Adjust memory quotas for a process Back up files and directories Bypass traverse checking Change the system time Create a pagefile Debug programs Enable computer and user accounts to be trusted for delegation Force a shutdown from a remote system Increase scheduling priority Load and unload device drivers Allow logon locally Manage auditing and security log Modify firmware environment values Profile single process Profile system performance Remove computer from docking station Restore files and directories Shut down the system Take ownership of files or other objects
Backup Operators	Back up files and directories Allow logon locally Restore files and directories Shut down the system
Guests	No user rights granted by default

Group	User Rights
Incoming Forest Trust Builders	No user rights granted by default; applicable to forest root domain only
Network Configuration Operators	No user rights granted by default
Performance Monitor Users	No user rights granted by default
Performance Log Users	No user rights granted by default
Pre-Windows 2000 Compatible Access	Access this computer from the network Bypass traverse checking
Print Operators	Allow logon locally Shut down the system
Remote Desktop Users	No user rights granted by default
Replicator	No user rights granted by default
Server Operators	Back up files and directories Change the system time Force shutdown from a remote system Allow logon locally Restore files and directories Shut down the system
Users	No user rights granted by default

Table 1-5 describes the groups in the Users container.

TABLE 1-5 Groups in the Users container

Group	User Rights
Cert Publishers	No user rights granted by default
DnsAdmins	No user rights granted by default; installed as part of DNS
DnsUpdateProxy	No user rights granted by default; installed as part of DNS
Domain Admins	Access this computer from the network Adjust memory quotas for a process Back up files and directories Bypass traverse checking Change the system time Create a pagefile Debug programs Enable computer and user accounts to be trusted for delegation Force a shutdown from a remote system Increase scheduling priority Load and unload device drivers Allow logon locally Manage auditing and security log Modify firmware environment values Profile single process Profile system performance Remove computer from docking station Restore files and directories Shut down the system Take ownership of files or other objects

Group	User Rights
Domain Computers	No user rights granted by default
Domain Controllers	No user rights granted by default
Domain Guests	No user rights granted by default
Domain Users	No user rights granted by default
Enterprise Admins	Note: Permissions are applicable to forest root domain only Access this computer from the network Adjust memory quotas for a process Back up files and directories Bypass traverse checking Change the system time Create a pagefile Debug programs Enable computer and user accounts to be trusted for delegation Force a shutdown from a remote system Increase scheduling priority Load and unload device drivers Allow logon locally Manage auditing and security log Modify firmware environment values Profile single process Profile system performance Remove computer from docking station Restore files and directories Shut down the system Take ownership of files or other objects
Group Policy Creator Owners	No user rights granted by default
IIS_WPG	No user rights granted by default; installed with IIS
RAS and IAS Servers	No user rights granted by default
Schema Admins	No user rights granted by default; applicable to forest root domain only

Built-in groups are different from special identities. A special identity is a group for which membership cannot be modified, such as the Everyone group. Special identities include those in Table 1-6.

TABLE 1-6 Special identities

Identity	Description
Anonymous Logon	Used for anonymous access to services and resources
Everyone	All network users, with the exception of the Anonymous Logon group
Interactive	Users who are logged on locally to the computer
Network	Users who are accessing a computer's resources over the network

MORE INFO **SPECIAL IDENTITIES**

See *http://technet.microsoft.com/en-us/library/cc733001* for more information on special identities.

Understanding delegation in System Center 2012 R2

Microsoft System Center 2012 R2 consists of several products, including Configuration Manager, Operations Manager, Data Protection Manager, Service Manager, AppController, and Virtual Machine Manager (VMM). The products used in the organization determine the delegation structure. For example, certain roles are only applicable for Virtual Machine Manager and others are applicable for Configuration Manager. If the organization doesn't use VMM, then those roles wouldn't be used. However, the concepts of delegated authority and role-based administration are applicable no matter what products are being used. This section examines delegation for Configuration Manager and Operations Manager. Other products such as Virtual Machine Manager and Data Protection Manager are covered in other objectives in this chapter.

Role-based administration

System Center 2012 R2 uses role-based administration to facilitate the structure needed in many organizations. Using role-based administration you can limit the authority and scope of permissions to the least amount necessary in order to complete a task. For example, an organization may grant the ability to change passwords for normal users to help desk staff. This scenario can be accomplished by granting the limited privileges to the help desk personnel. An important concept surrounding role-based administration in System Center is administrative scope. Administrative scope defines the permissions that a given user has on objects within the scope's control. Administrative scopes consist of:

- Security roles
- Collections
- Security scopes

MORE INFO **ROLE-BASED ADMINISTRATION**

See *http://technet.microsoft.com/en-us/library/65fffa65-5c09-4f6c-82bf-e01d567cda20#BKMK_PlanningForRBA* for more information on role-based administration planning.

SECURITY ROLES

Security roles, which you might think of like a group in Active Directory, are used to grant sets of permissions to users based on their role. For example, the Asset Analyst role is granted certain permissions to view Asset Intelligence and inventory information. Users can then be given the Asset Analyst role to do their job.

Each security role is granted specific permissions, such as Approve, Create, Delete, Modify, and so on. The permissions apply to specific object types within System Center. There are several built-in security roles that come with Configuration Manager and with other System Center products. The permissions granted to these roles can't be changed. However, the roles can be copied, and a new role can be built and modified as needed.

The general steps for planning security roles are:

1. Identify tasks. Examine the responsibilities for administrators. For example, you might have administrators that are responsible for client security while others are responsible for software updates.
2. Map tasks to roles. Determine how the responsibilities connect to built-in security roles.
3. Assign roles. Assign roles to users. If a user has responsibilities across multiple roles, assign that user to multiple roles.
4. Create new roles (optional). Create new roles if the responsibilities don't map to one or more of the built-in roles.

COLLECTIONS

Computers and users are grouped into collections in Configuration Manager. Collections are important in the hierarchical delegation of administration for Configuration Manager. Collections can be created to meet the needs of the organization. For example, you might create a collection for each physical location in an organization, or you might create a functional collection that includes all servers or all client computers. Like security roles, there are several built-in collections that can't be modified. Collections become very useful when you want to distribute software, provide reporting, or ensure configuration changes are consistent across the devices within the collection.

> ***MORE INFO*** **COLLECTIONS**
>
> **See *http://technet.microsoft.com/en-us/library/gg682177* for more information on collections.**

SECURITY SCOPES

Security scopes can be used to grant access to securable objects by type. Security scopes provide granular access control. However, security scopes can't be nested or used in a hierarchical manner. Security scopes are useful for segregating objects of the same type so that different levels of access can be granted to them. For instance, if a set of administrators should be granted full access only to non-production servers, the servers can be scoped to separate production from development servers.

There are two built-in security scopes:

- **All** Includes all scopes. Objects cannot be added to this scope.
- **Default** Installed with Configuration Manager, the default scope also includes all objects.

EXAM TIP

Security scopes are configured within Configuration Manager in the Set Security Scopes dialog box found in the Classify group.

Certain objects can't be secured by security scopes. Instead, access to these objects is granted using security roles. Objects that can't be included in security scopes are:

- Active Directory forests
- Administrative users
- Alerts
- Boundaries
- Computer associations
- Default client settings
- Deployment templates
- Device drivers
- Exchange server connectors
- Migration site-to-site mappings
- Mobile device enrollment profiles
- Security roles
- Security scopes
- Site addresses
- Site system roles
- Software titles
- Software updates
- Status messages
- User device affinities

Delegation design

Hierarchical structure is important for designing a delegated administration for System Center. When it is properly structured, you can delegate responsibilities merely by using scopes and security roles. However, as the organization's needs change, so too will the needs for delegated administration. For example, if a merger takes place, the newly merged company may need to manage its own site.

Designing delegation involves determining the following:

- **Who** Who is responsible for managing a given client computer or server? Determine the various tasks involved in administration, whether that's software updates, security, or anything else that System Center can do. These tasks will map to security roles.
- **Which and Where** Which computers, servers, or other objects will those people manage, based on their roles? Where are those objects located, both physically and logically? For instance, there may be different responsibilities based on physical location or logical location (production versus test). Collections are used to group the objects together in Configuration Manager, and security scopes can be used to provide more granular control over the objects.
- **What** What permissions do administrators need on a given object? Permissions can be changed within the security roles, and their scope can be limited through security scopes.

Configuration Manager

System Center 2012 R2 Configuration Manager is an important piece of enterprise IT management. Configuration Manager provides a unified solution for management of operating systems, devices, software updates, asset inventory, and more. Using Configuration Manager, an enterprise can deliver software to devices within the organization and ensure consistency of updates and configurations. Configuration Manager also integrates with other System Center products and with other services like Windows Intune.

Configuration Manager can be configured as a standalone set of services or in a hierarchy, known as primary site and central administration site, respectively. The primary site-only scenario is useful for small implementations or small networks, whereas the central administration site scenario is useful for larger enterprises, especially those that need hierarchical or delegated management.

Site system roles

Within Configuration Manager, site system roles are used to define what tasks the various servers perform within a site. Site system roles shouldn't be confused with role-based administration, which is also covered in this section. Table 1-7 describes some of the typical site system roles.

TABLE 1-7 Core site system roles

Role	Description
Component server	A basic service that is responsible for running Configuration Manager services. This role is automatically installed for all roles except the distribution point role.
Site database server	The server that runs the SQL Server database and is used to store information and data related to the Configuration Manager deployment.
Site server	The server from which the core functionality of Configuration Manager is provided.
Site system	The site system role is a basic role installed on any computer hosting a site system.
SMS Provider	Provides the interface between the Configuration Manager console and the site database. Note that the SMS Provider role can be used only on computers that are in the same domain as the site server.

Multiple site system roles typically run on a single server, especially in new or small implementations of Configuration Manager. Additional servers can be deployed as distribution points to ensure availability of software packages and related files or to provide those files at strategic locations. For example, you might place a distribution point close to a large number of client computers.

Aside from the core site system roles, other site system roles may be used. Table 1-8 describes some other site system roles.

TABLE 1-8 Additional site system roles

Role	Description
Application Catalog web service point	Responsible for providing information from the Software Library to the Application Catalog website.
Application Catalog website point	A website that displays available software from the Application Catalog.
Asset Intelligence synchronization point	Exchanges Asset Intelligence information with Microsoft.
Certificate registration point	New for System Center 2012 R2, this role provides for communication for devices using Simple Certificate Enrollment Protocol (SCEP) with Network Device Enrollment Service. This role cannot exist on the same server as the computer running Network Device Enrollment Service.
Distribution point	A role that holds software packages, updates, system images, and other files for clients to download.
Endpoint Protection point	Accepts Endpoint Protection license terms and configures default membership for Microsoft Active Protection Service.
Enrollment point	Enrolls mobile devices and Mac computers using public key infrastructure and also provisions Intel Active Management Technology computers.
Enrollment point proxy	Manages enrollment requests for mobile devices and Mac computers.

Role	Description
Fallback status point	Monitors client installation and identifies clients that can't communicate with their management point.
Management point	A role that interacts with client computers to receive configuration data and send policy and service location information.
Out of band service point	Configures Intel AMT computers for out of band management.
Reporting services point	A role that creates and manages Configuration Manager reports. This role works with SQL Server Reporting Services.
Software update point	Together with Windows Software Update Services (WSUS), this role provides software updates to clients.
State migration point	Holds client user state data during migration to a new operating system.
System Health Validator point	Validates Network Access Protection (NAP) policies. The role must be installed on a NAP health policy server.
Windows Intune connector	Manages mobile devices with Windows Intune through the Configuration Manager console. This role is available with Service Pack 1 (SP1).

MORE INFO **ROLE-BASED ADMINISTRATION IN CONFIGURATION MANAGER**

See *http://blogs.technet.com/b/hhoy/archive/2012/03/07/role-based-administration-in-system-center-2012-configuration-manager.aspx* for more information on Role-Based Administration in Configuration Manager.

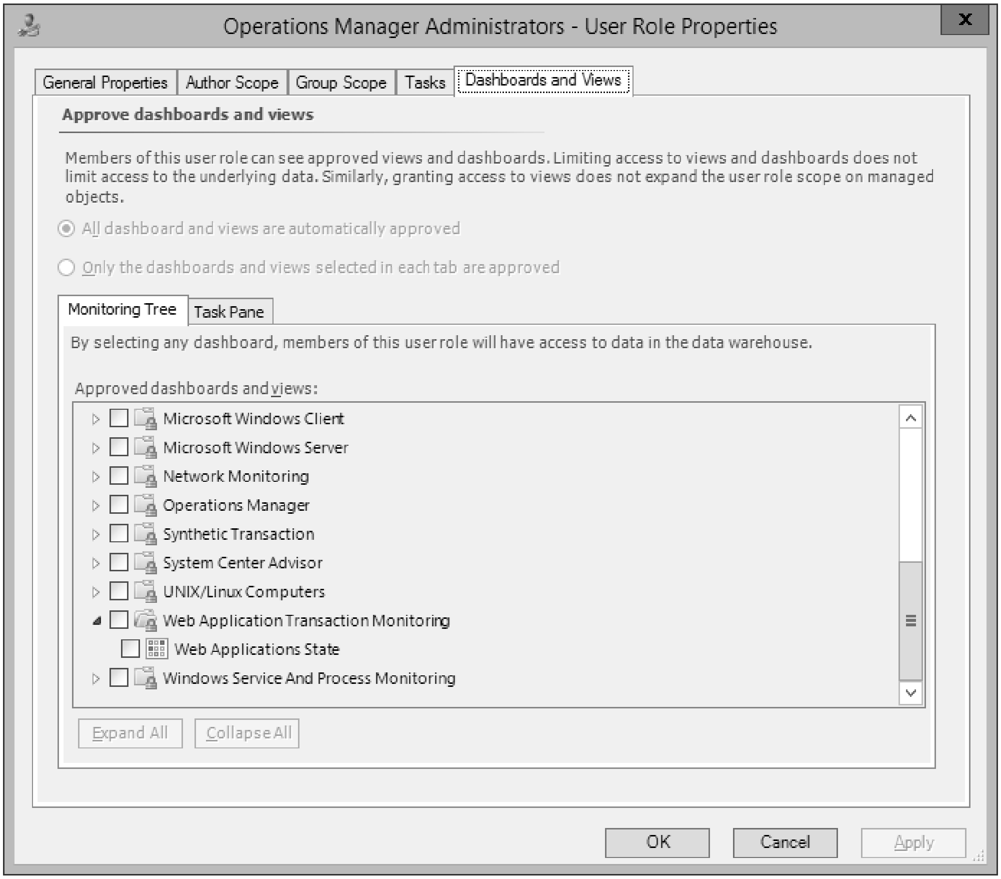
Operations Manager

System Center 2012 R2 Operations Manager provides monitoring capabilities to computers across an enterprise. The roles necessary within Operations Manager include those to create monitoring configurations, view and edit reports, and provide overall administration, among others.

Operations Manager uses many of the same concepts as other System Center products for rights delegation. Operations Manager uses user roles and role profiles which are then combined with a scope to produce the user role. For example, Operations Manager has several built-in user roles, called *profiles* in Operations Manager:

- Administrator
- Advanced Operator
- Application Monitoring Operator
- Author
- Operator
- Read-only Operator
- Report Operator
- Report Security Administrator

Each of these built-in user roles can be changed through its properties settings. The scopes can be changed, as can the tasks and dashboards and views available to the user role. This is illustrated in Figure 1-1.



Approve dashboards and views

Members of this user role can see approved views and dashboards. Limiting access to views and dashboards does not limit access to the underlying data. Similarly, granting access to views does not expand the user role scope on managed objects.

● All dashboard and views are automatically approved

○ Only the dashboards and views selected in each tab are approved

By selecting any dashboard, members of this user role will have access to data in the data warehouse.

Approved dashboards and views:

- □ Microsoft Windows Client
- □ Microsoft Windows Server
- □ Network Monitoring
- □ Operations Manager
- □ Synthetic Transaction
- □ System Center Advisor
- □ UNIX/Linux Computers
- □ Web Application Transaction Monitoring
  - □ Web Applications State
- □ Windows Service And Process Monitoring

FIGURE 1-1 Changing the dashboards and views available to one of the built-in user roles in Operations Manager

Each of the built-in user roles can contain one or more local or Active Directory–based groups or users. For example, the Operations Manager Administrators user role (shown in Figure 1-1) contains the BUILTIN\Administrators group.

You can also create user roles within Operations Manager by using the Create User Role Wizard. When creating a new user role you first choose the type of user role on which the new user role will be based from among these choices:

- Operator
- Read-Only Operator
- Author
- Advanced Operator

Each of these profiles provides certain privileges that are connected to that profile. For example, the Author profile contains privileges specific to creating monitoring configurations.

MORE INFO **USER ROLES**

See *http://technet.microsoft.com/en-us/library/hh230728.aspx* for more information on implementation of user roles in Operations Manager.

Understanding self-service portal design using Service Manager

Maintaining an enterprise server infrastructure can be accomplished in a number of ways, but when considering management solutions that scale to large environments, the System Center 2012 R2 family of products comes to the forefront. For example, with Service Manager, you can create a self-service portal for end users, among other things. Service Manager provides incident and configuration management while enabling visibility into current issues. Service Manager uses a Configuration Management Database (CMDB) to provide a master location for all changes, issues, and requests for an infrastructure. Service Manager integrates with other System Center 2012 R2 products to provide an end-to-end solution.

At a minimum, there are three components to a Service Manager implementation: a management server, a configuration management database server, and the management console. Additional components can be added for things like data warehousing, which then facilitates reporting.

Using the self-service portal, users can find answers to common support questions, change their passwords, create help-desk tickets, and request software. When designing a management structure, you should consider deployment of the self-service portal to ease the burden on IT and the help desk for common requests. The end-user self-service portal requires a Silverlight component to run on the client computer and thus is applicable only to those platforms that can run Silverlight through the browser.

MORE INFO **SELF-SERVICE PORTAL**

See *http://technet.microsoft.com/library/hh667344.aspx* for more information on the self-service portal in Service Manager.

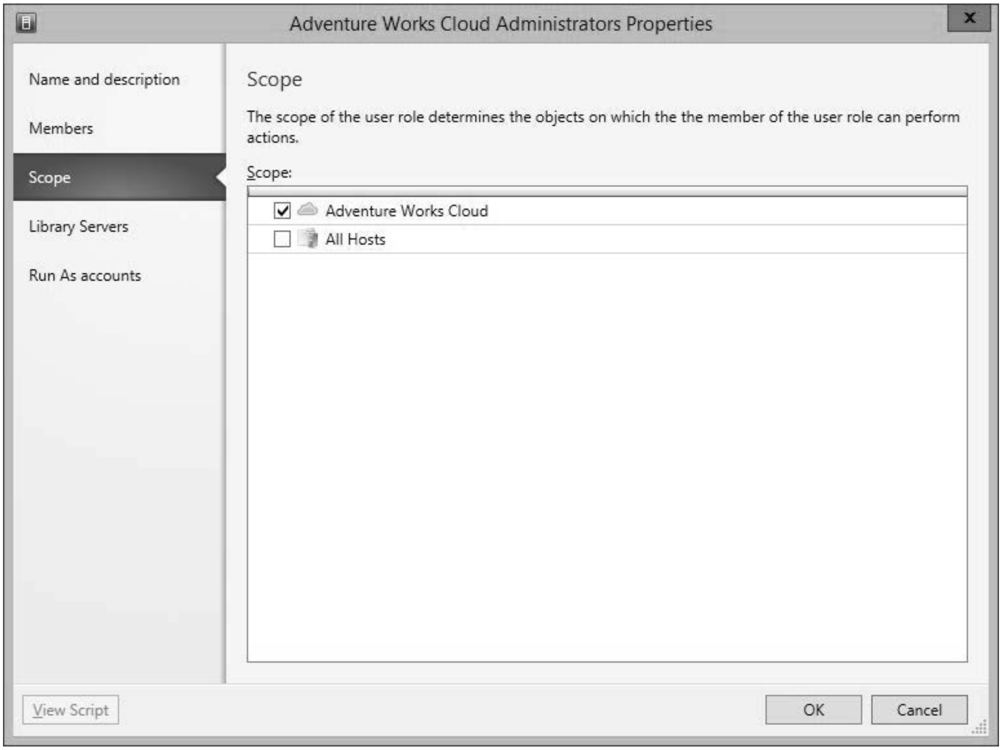
Delegating rights for the private cloud

System Center 2012 Virtual Machine Manager provides a centralized management console for virtual machines, such as those managed by Hyper-V. VMM manages virtual machines, networks, and storage as resources, which are then configured within the organization. A VMM deployment consists of a management server, database, library (and library server), and console.

Another component of managing the private cloud is App Controller. App Controller looks at service provision from a service-oriented view rather than from a server or software view. In other words, using App Controller you can connect the components that make up a service to facilitate management.

User roles can be created to manage various aspects of private cloud-based virtualization infrastructure. Virtual Machine Manager can be used to create such a delegation, and then App Controller can be used to manage the private cloud.

Rights are managed within the User Roles area of the Security section in the Settings area of Virtual Machine Manager. User roles can be created using individual user accounts or using Active Directory groups. The scope of the user role can then be assigned to the private cloud, as shown in Figure 1-2.



The scope of the user role determines the objects on which the the member of the user role can perform actions.

Scope:

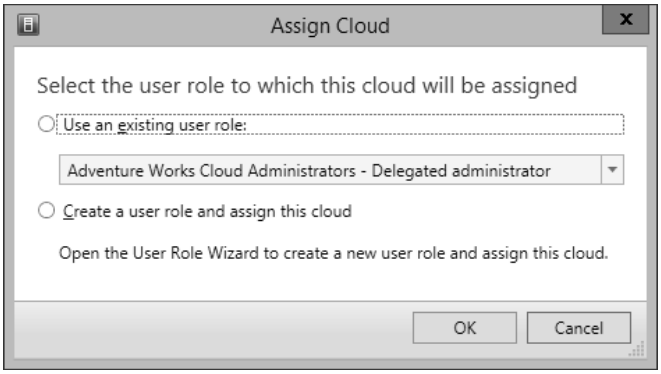
☑ Adventure Works Cloud

□ All Hosts

FIGURE 1-2 Assigning a scope to a user role for private clouds in Virtual Machine Manager

Members that have been assigned to the new user role will be able to log on to App Controller and manage private clouds within the user role scope.

An alternate method to assign access is by clicking Assign Cloud from the VMs and Services section in Virtual Machine Manager. Doing so enables you to select the user role to be assigned privileges for a given cloud or to create a new user role for the private cloud, as shown in Figure 1-3.



○ Use an existing user role:

Adventure Works Cloud Administrators - Delegated administrator

○ Create a user role and assign this cloud

Open the User Role Wizard to create a new user role and assign this cloud.

FIGURE 1-3 Assigning a user role to a cloud in the Assign Cloud dialog box

MORE INFO **DELEGATING RIGHTS**

See *http://technet.microsoft.com/en-us/library/hh221343.aspx* for more information on rights delegation.

Thought experiment

Delegating administrative authority

In the following thought experiment, apply what you've learned about this objective to predict what steps you need to take. You can find answers to these questions in the "Answers" section at the end of this chapter.

You're working on delegating administrative authority for your Configuration Manager deployment. You need to enable certain individuals to apply updates to test computers and, once tested, enable another set of individuals to apply those updates in the production environment.

Describe the overall concepts and types of configuration items that you'll use in Configuration Manager to facilitate this design.

Objective summary

- User rights and built-in groups can be used to provide a robust administrative model.
- Certain user rights shouldn't be assigned to users or groups but are instead used by system processes and functions.
- Built-in groups have certain user rights inherently assigned to them.
- System Center 2012 R2 can utilize a delegated administration structure that enables separation of responsibilities within an infrastructure.
- Security roles, security scopes, and collections are all used to facilitate the delegated administration structure necessary.
- Determining who, which and where, and what can be helpful for designing a delegation of role structure.
- Service Manager is used to provide end-user self service.
- Service Manager requires at least three servers to run including a management server, configuration management database server, and console.

Objective review

Answer the following questions to test your knowledge of the information in this objective. You can find the answers to these questions and explanations of why each answer choice is correct or incorrect in the "Answers" section at the end of this chapter.

1. Which of the following permissions allows the currently logged on user to shut the computer down?

   A. SeShutdownComputer

   B. SeShutdownPrivilege

   C. SePrivilegeShutdown

   D. En_ShutdownComputerPermission

2. Which of the following is not a privilege of the built-in Backup Operators group?

   A. Shut down the system

   B. Create symbolic links

   C. Back up files and directories

   D. Allow logon locally

3. Which of the following roles provides the core functionality for System Center?

   A. Site server

   B. Component server

   C. Core server

   D. Site Core server

4. Which of the following are not built-in security scopes in Configuration Manager?
   - A. All
   - B. System
   - C. Administrator
   - D. Default

Objective 1.2: Design a monitoring strategy

As it pertains to the exam, Operations Manager is the primary tool used for enterprise monitoring. Operations Manager provides security logging (through Audit Collection Services) and performance monitoring and meets the criteria for centralized monitoring and reporting, which are all part of the objectives for this section.

This objective covers how to:

- Understand monitoring servers using Audit Collection Services (ACS) and System Center Global Service Monitor, performance monitoring, application monitoring, centralized monitoring, and centralized reporting
- Implement and optimize System Center 2012 R2 Operations Manager management packs
- Plan for monitoring Active Directory

Enabling Audit Collection Services (ACS)

Part of Operations Manager, Audit Collection Services (ACS) collects audit policy records for analysis and reporting. When used as part of an overall monitoring design strategy, ACS is responsible for collecting security-related events. This effectively means that you can gather security audit logs from multiple sources, including Linux and Unix–based computers, and access them from that centralized console for reporting and further action, as necessary.

ACS consists of the following:

- **ACS forwarders** The ACS forwarder is included, but not enabled, as part of the Operations Manager agent installation. Once enabled, security events are sent to the ACS collector and the local security event log.
- **ACS collector** The ACS collector is responsible for processing events from ACS forwarders so that the event can be entered into the database.
- **ACS database** The ACS database relies on SQL Server as its backend database and is responsible for holding the events sent to it from the ACS collector.

Each of these components can exist on the same server, though you'll install ACS forwarders on each computer to be monitored. When considering performance and as the deployment grows, the collector and ACS database servers can be split onto separate servers. For many enterprise deployments, SQL Server will exist on a separate server as part of the initial rollout of Operations Manager.

MORE INFO **ACS SYSTEM REQUIREMENTS**

See *http://technet.microsoft.com/en-us/library/hh212908.aspx* for more information on ACS system requirements.

ACS forwarders are not enabled as part of the normal health-monitoring agent in Operators Manager. Instead, ACS forwarders are enabled through the Monitoring, Operations Manager, Agent Health State section of the Operations Manager console. Within the details pane of this area, selecting the computers (agents) and then selecting Enable Audit Collection within the Health Service Tasks section of the Actions pane enables ACS to begin collecting from that computer.

EXAM TIP

If necessary, a firewall exception for TCP port 51909 should be added to allow an ACS forwarder to communicate with the ACS collector.

When designing ACS-based solutions, the number of events sent by forwarders can overwhelm the ACS collector. Additionally, the ACS collector queues events when the ACS database server is offline, such as for maintenance. The collector queue has settings that can be adjusted for performance. These settings are in the registry at HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\AdtServer\Parameters. The settings are described in Table 1-9.

NOTE **MANAGING DOWNTIME**

The Enterprise version of SQL Server can be deployed to prevent maintenance-related downtime.

TABLE 1-9 ACS collector queue settings

Setting	Description	Default
MaximumQueueLength	The maximum number of events that can be held in the ACS collector queue if the database is offline.	0x40000
BackOffThreshold	The maximum number of queued events before the ACS collector denies new connections. The value is a percentage of the MaximumQueueLength.	75
DisconnectThreshold	The maximum number of queued events before the ACS collector begins disconnecting ACS forwarders. Like BackOffThreshold, this value is a percentage of the MaximumQueueLength.	90

ACS collects every Windows Security Event for each forwarder involved in the deployment. This can be a large amount of data and, in many instances, isn't necessary. One approach is to create a filter to prevent unnecessary events from being logged to the ACS database. Combining a filter with a policy for archiving ACS events ensures that compliance is met while at the same time not overwhelming the ACS implementation (or the administrators responsible for it).

Management of ACS is accomplished using the AdtAdmin.exe command-line tool found in %WINDIR%\System32\Security\AdtServer. Using AdtAdmin, you can create groups, show information about forwarders, and filter audit event data.

You might filter event data if the ACS collector queue is becoming full. ACS event filters are defined using Windows Management Instrumentation Query Language (WQL), which is a subset of standard SQL.

Table 1-10 describes some of the parameters available for AdtAdmin.

TABLE 1-10 AdtAdmin parameters

Parameter	Description
/AddGroup	Creates a group of ACS forwarders.
/DelGroup	Deletes a group of ACD forwarders.
/Disconnect	Disconnects an ACS forwarder or group.
/GetDBAuth	Shows information regarding the connection between the collector and database.
/GetQuery	Shows the current WQL queries being used by the ACS collector.
/ListForwarders	Shows information about forwarders.
/ListGroups	Shows the groups available on the collector.
/SetDBAuth	Sets the authentication method (SQL or Windows authentication) between the collector and the database.
/SetQuery	Configures a WQL query for filtering audit events.
/Stats	Shows statistics about the forwarders.
/UpdForwarder	Makes changes to a forwarder, including its name or the group to which the forwarder belongs.
/UpdGroup	Renames a group.

As described in Table 1-10, the current value of the WQL query can be obtained using the command:

```
AdtAdmin /getquery
```

By default, the WQL query for events is:

```
select * from AdtsEvent
```

MORE INFO **ADTADMIN AND CHANGING THE DEFAULT QUERY**

See *http://technet.microsoft.com/en-us/library/hh230740.aspx* for more information, including an example query for filtering events with WQL on ACS. See *http://technet.microsoft.com/en-us/library/hh212727.aspx* for additional information on AdtAdmin.exe.

The performance of ACS can be monitored through the Operations Manager console. Several counters are included by default and can be used to help diagnose and monitor performance of ACS itself.

MORE INFO **ACS PERFORMANCE MONITORING**

See *http://technet.microsoft.com/en-us/library/hh230714.aspx* for more information on performance counters for monitoring ACS performance.

Understanding Global Service Monitor

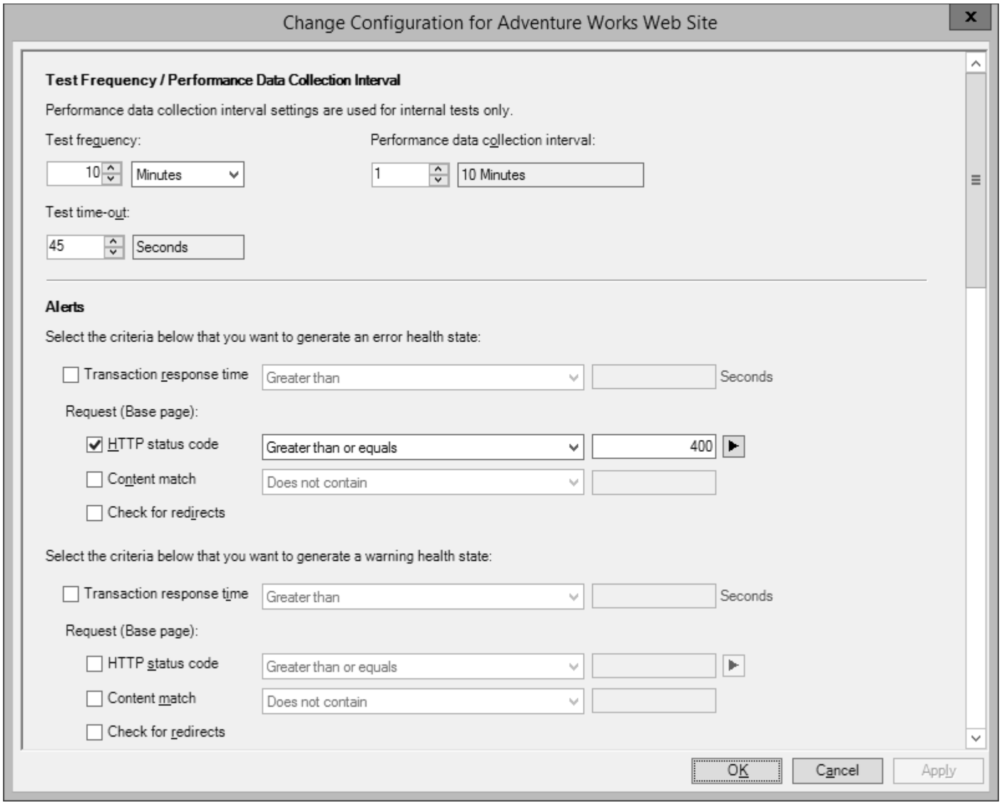
Global Service Monitor is provided as a management pack for Operations Manager and as part of an online offering such as a cloud-based service. Global Service Monitor provides an external view of websites for an organization. Global Service Monitor has two primary components: an online component managed by Microsoft and an Operations Manager component, which is handled as a management pack.

It's important to understand how Global Service Monitor fits within an enterprise scenario. Global Service Monitor is used for monitoring externally facing websites, such as those hosted through Microsoft Azure; as such, it fits within but isn't intended to be a replacement for Operations Manager but rather an enhancement to an Operations Manager installation. Global Service Monitor facilitates and makes easy the process of setting up multiple, globally dispersed monitoring locations for web applications.

The next section describes importing management packs as well as additional monitoring scenarios discussed in the objective domain for the 70-414 exam. Once a management pack is imported and a subscription started, you can configure monitoring through Operations Manager. Tests run with Global Service Monitor can be executed from multiple locations around the world so that you can have a complete view into your web application.

The simplest of tests is the Web Application Availability Monitoring test, which performs a basic HTTP request from an external location. If you need a more complex test, such as when you need to view multistep transactions or provide authentication details, then the Visual Studio Web Test Monitoring scenario is the correct choice. Finally, Web Application Transaction Monitoring provides monitoring for internal web applications that aren't available from external locations.

When configuring a test, you can set several parameters, such as the length of time that a request can take, the interval between requests, whether to look for specific text on the resulting page, and many additional settings, as shown in Figure 1-4.



Change Configuration for Adventure Works Web Site

Test Frequency / Performance Data Collection Interval

Performance data collection interval settings are used for internal tests only.

Test frequency: 10 Minutes

Performance data collection interval: 1 10 Minutes

Test time-out: 45 Seconds

Alerts

Select the criteria below that you want to generate an error health state:

- □ Transaction response time — Greater than — Seconds
- Request (Base page):
  - ☑ HTTP status code — Greater than or equals — 400
  - □ Content match — Does not contain
  - □ Check for redirects

Select the criteria below that you want to generate a warning health state:

- □ Transaction response time — Greater than — Seconds
- Request (Base page):
  - □ HTTP status code — Greater than or equals
  - □ Content match — Does not contain
  - □ Check for redirects

FIGURE 1-4 Configuring parameters related to a web availability test in Global Service Monitor

These settings are useful when you need to ensure specific behavior of a webpage or ensure that the page is served in less than a certain number of seconds. You can even check portions of the request, such as the time it takes to receive the first byte, the time it takes for DNS resolution, and so on.

When integrating Global Service Monitor into a monitoring design, consider the areas from which your customers will most likely access your website. Choose external monitoring locations close to your customer base.

MORE INFO **CONFIGURING GLOBAL SERVICE MONITOR**

Because this is a design-based objective, the actual configuration steps aren't covered in this text. Instead, see *http://technet.microsoft.com/en-us/library/jj860370.aspx* and *http://technet.microsoft.com/en-us/library/jj860376.aspx* for specific information on configuration in Global Service Monitor.

Implementing and optimizing Operations Manager management packs

Looking beyond performance monitoring of ACS, Operations Manager can provide performance monitoring, application monitoring, and reporting for Windows computers and the network as a whole. To do so, a System Center management pack can be installed. The management pack contains additional information about monitoring points for Windows Server.

Management packs provide information about how to monitor servers, applications, and services on a network. Management packs can also provide reports, tasks, and other components as defined by the management pack. For example, a management pack for a Windows Server might contain information on how to monitor disk performance. Management packs can be created by third parties to provide an integrated monitoring solution within Operations Manager.

MORE INFO **MANAGEMENT PACKS**

If you're unfamiliar with management packs, see "What Is in an Operations Manager Management Pack?" at *http://technet.microsoft.com/en-us/library/hh212794.aspx* for additional details.

The management pack lifecycle includes the following stages:

- Install the management pack in a nonproduction environment to ensure that the management pack is compatible and provides the desired functionality.
- Customize the management pack. Create overrides, add knowledge, and make other changes to the management pack for your environment.
- Deploy the management pack. Install the management pack and any changes in the production environment.
- Maintain the management pack. As your environment changes, you may need to make changes to the management pack. For example, you may require additional monitoring, or the application being monitored may change.

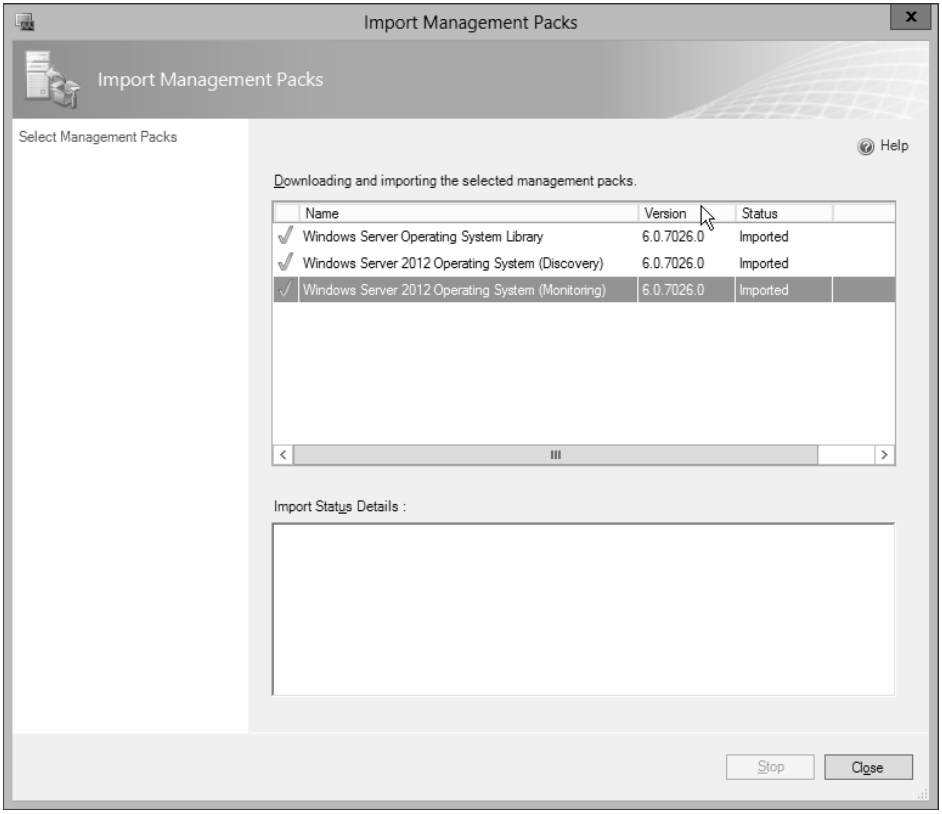
IMPLEMENTING A MANAGEMENT PACK

Management packs are added through the Administration area of the Operations Manager console by clicking Import Management Packs. The Import Management Packs Wizard will begin and enable you to choose the location from which the management pack should be installed. You can choose an existing catalog or add from a file. Alternately, the Import-SCOMManagementPack cmdlet is used to import a management pack using Windows PowerShell.

MORE INFO **IMPORTING MANAGEMENT PACKS**

Importing management packs is covered in depth at *http://technet.microsoft.com/en-us/library/hh212691.aspx*.

Monitoring Windows servers requires the Windows Server Operating System Library, the Windows Server 2012 Operating System (Discovery), and the Windows Server 2012 Operating System (Monitoring) management packs. The Import Management Packs tool, shown in Figure 1-5, can resolve dependencies. For example, selecting the Windows Server 2012 Operating System (Monitoring) management pack requires that the additional management packs mentioned earlier be installed as well. The Import Management Packs tool can install those prerequisites.



Downloading and importing the selected management packs.

	Name	Version	Status
✓	Windows Server Operating System Library	6.0.7026.0	Imported
✓	Windows Server 2012 Operating System (Discovery)	6.0.7026.0	Imported
✓	Windows Server 2012 Operating System (Monitoring)	6.0.7026.0	Imported

FIGURE 1-5 Importing a management pack with dependencies

MANAGEMENT PACK OPTIMIZATION

An important step in deploying management packs is optimizing them for your environment. When first installed, management packs perform discovery to find applicable objects for monitoring. Those objects are then monitored according to the rules set forth in the management pack. The default management pack rules may not be appropriate for your environment and should therefore be changed as necessary.

NOTE **CREATE A NEW MANAGEMENT PACK**

When making changes to a management pack, it is recommended that you create a new management pack for the changes, rather than changing the default.

The overall process for optimizing a management pack is to examine the highest severity alerts first and then proceed to the lowest severity. Alerts should be examined to ensure that they are both valid and actionable. In other words, if you don't need to react when an event occurs, then it's probably not worth alerting. That's not to say that the event isn't noteworthy, so it may need to be logged but not alerted. Related to alerting is ensuring that only one alert is generated for a given event.

Management packs are customized through overrides. Overrides change the configuration of a monitor or diagnostic. When configuring an override, you choose whether the override will apply to all objects of the current class (such as all Windows Server 2012 computers), to a group, to a specific object of the current class, or to all objects of another class. This gives you the flexibility to gather objects for which you don't need alerts, such as nonproduction Windows servers.

Classes, sometimes called *targets*, are used to help define the items that can be discovered and managed. Groups are sets of objects that help define the scope of an override.

NOTE **CLASSES AND GROUPS**

Classes can be applied for monitors, rules, discoveries, overrides, and tasks. Groups can define scope for overrides, views, user roles, and notifications.

MORE INFO **USING CLASSES AND GROUPS**

See *http://technet.microsoft.com/en-us/library/hh212771.aspx* for more information on classes and groups for overrides, and see *http://technet.microsoft.com/en-us/library/hh212869.aspx* for information on creating an override.

Another optimization for management packs is achieved through knowledge. Knowledge is used to provide notes and other information about a monitor or rule. Adding knowledge is accomplished in the Authoring workspace of the Operations Manager console within the properties settings for a given monitor or rule. However, as of this writing, adding or editing knowledge requires the Operations Manager console on a 32-bit operating system with the 32-bit version of Microsoft Word 2010 and other prerequisites as described at *http://technet.microsoft.com/en-us/library/hh212900.aspx*. Adding or editing knowledge requires the Author or Administrator role.

Planning for Active Directory monitoring

The AD DS management pack for System Center enables monitoring of several aspects of an AD DS environment. Several key monitoring scenarios for Active Directory monitoring are identified at *http://technet.microsoft.com/library/dd262116.aspx* and described in Table 1-11.

TABLE 1-11 Active Directory monitoring scenarios

Scenario	Description
Multi-forest monitoring	Gather health and performance data from remote forests through two workflows, Microsoft.AD.Topology.Discovery and Microsoft.AD.Remote.Topology.Discovery. Note that AgentProxySetting must be enabled on all domain controllers for this scenario.
Replication	Gather health of data replication between domain controllers. You can monitor both health and performance of replication. See *http://technet.microsoft.com/en-us/library/dd262066.aspx* and *http://technet.microsoft.com/en-us/library/ee662305.aspx* for more information on each of these aspects of replication monitoring.
Essential services	Gather health information on the following services, which are vital to the operation of Active Directory: NT File Replication Service (NTFRS) Distributed File System Replication (DFSR) Windows Time Service (W32Time) Intersite Messaging (ISM) Key Distribution Center (KDC) NT Directory Services (NTDS) Net Logon (NetLogon) Active Directory Web Service (ADWS)
Trust monitoring	Gather trust information using the TrustMon WMI provider.
Directory service availability	Gather various metrics on the availability of Active Directory, including: GC Response - The time it takes to load the global catalog GC Search Time - The time it takes to return a search result from a global catalog Lost & Found Count - The number of Lost and Found objects DNS Verification - Verify DNS records AD General Response - The time it takes to do a serverless bind
Active Directory database monitoring	Verify the health of the Active Directory database, including its size, consistency, and that there is sufficient space available for the database to grow.
Time skew monitoring	Gather information on the time skew or difference between computers taking part in authentication. The authoritative time source is chosen as follows: The primary domain control (PDC) for the root domain is authoritative in all instances. If a computer is a PDC for a nonroot domain, the PDC for the root domain is authoritative. If a computer is not a PDC then its own local PDC is authoritative.
Operations Master monitoring	Gather information on availability of the following Operations Master roles: Schema Operations Master Domain Naming Operations Master Infrastructure Operations Master Relative ID (RID) Operations Master PDC Emulator Operations Master

Thought experiment

Managing Active Directory performance

In the following thought experiment, apply what you've learned about this objective to predict what steps you need to take. You can find answers to these questions in the "Answers" section at the end of this chapter.

You've set up the Active Directory management pack. After receiving reports of slow logons, you investigate.

1. What are some of the performance indicators and alerts you can examine?
2. Where are those performance indicators and alerts located?

Objective summary

- Management packs are configured using overrides, which include customizations for your infrastructure.
- ACS is composed of one or more forwarders, an ACS collector, and an ACS database.
- The AdtAdmin.exe program can be used to configure ACS.
- The Active Directory management pack enables advanced performance monitoring and alerting for an Active Directory domain.
- Global Service Manager provides an external view of web application performance from multiple geographically dispersed locations.

Objective review

Answer the following questions to test your knowledge of the information in this objective. You can find the answers to these questions and explanations of why each answer choice is correct or incorrect in the "Answers" section at the end of this chapter.

1. Which of the following commands would be used to change the audit event filter for ACS?

   A. AdtAdmin /setquery

   B. AdtAdmin /addFilter

   C. AcsAdmin /addFilter

   D. AcsFilter /add

2. Which of the following roles is required to add or edit company knowledge for a management pack?

   A. Operator

   B. Knowledge Administrator

   C. Author

   D. Management Pack Administrator

3. Which of the following is not an essential service for Active Directory monitoring?

   A. NTDS

   B. NetLogon

   C. DFSR

   D. ADMon

4. What is the correct registry path for collector queue settings?

   A. HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\ADT \Parameters

   B. HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\AdtServer\Parameters

   C. HKEY_LOCAL_MACHINE\User\CurrentWindowsServices\AdtServicer\Parameters

   D. HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\AdtSvc\Parameters

Objective 1.3: Plan and implement automated remediation

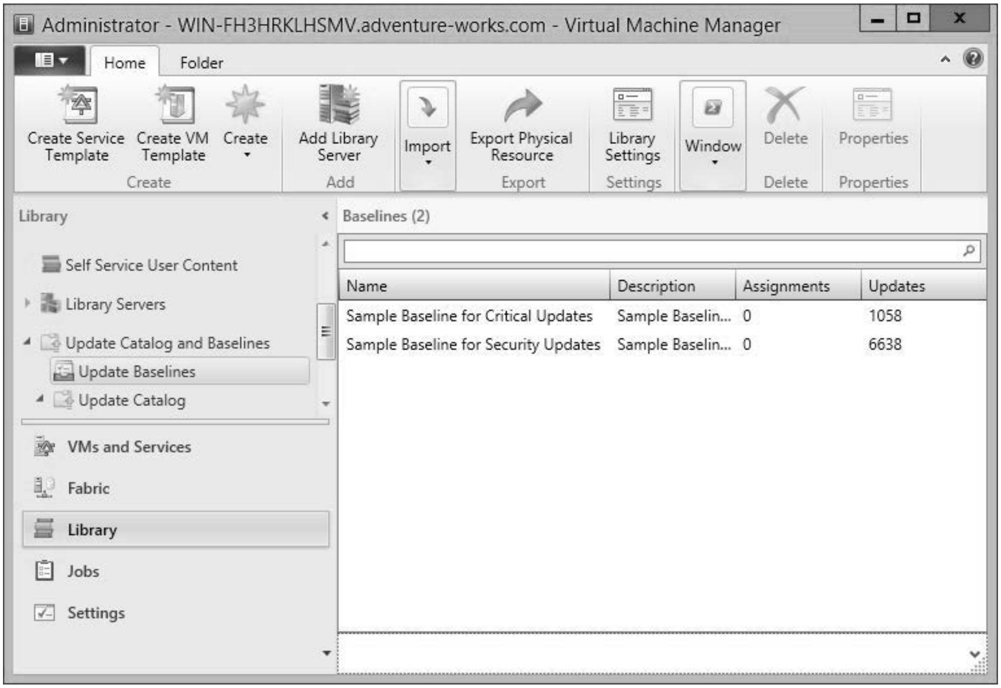
This objective covers how to:

- Create an update baseline in Virtual Machine Manager
- Implement a Desired Configuration Management (DCM) baseline
- Implement Virtual Machine Manager integration with Operations Manager
- Configure Virtual Machine Manager to move a VM dynamically based on policy
- Integrate System Center 2012 R2 for automatic remediation into your existing enterprise infrastructure
- Design and implement a Windows PowerShell Desired State Configuration (DSC) solution

Creating an update baseline in VMM

Update baselines are used to manage updates within a VMM fabric. For example, a virtual machine can be compared to the update baseline and, if found to be out of compliance with that baseline, the virtual machine can be remediated and brought into compliance.

When VMM is configured with a WSUS server and synchronization is complete, two sample update baselines will be created. These samples can be found within the Update Catalog And Baselines area of the Library workspace, shown in Figure 1-6.



Administrator - WIN-FH3HRKLHSMV.adventure-works.com - Virtual Machine Manager

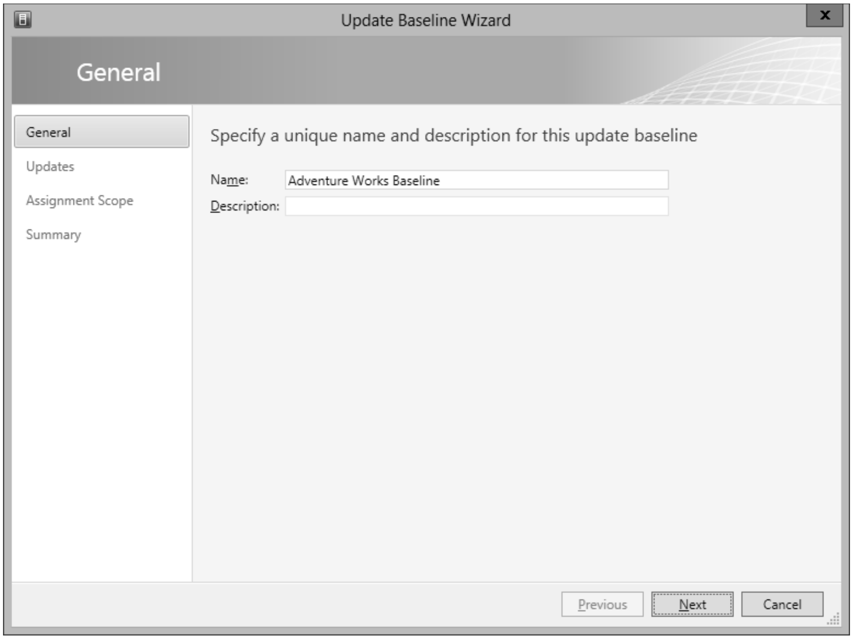
Baselines (2)

Name	Description	Assignments	Updates
Sample Baseline for Critical Updates	Sample Baselin...	0	1058
Sample Baseline for Security Updates	Sample Baselin...	0	6638

FIGURE 1-6 Sample baselines in VMM

When working with baselines, you can use one of the existing sample baselines or create a new one. This section looks at creating a new baseline in VMM.

An update baseline is created in the Update Baselines area of the Library workspace. Within that area, selecting Baseline from the Create group opens the Update Baseline Wizard. In the Update Baseline Wizard, you first specify a name and optionally a description, as shown in Figure 1-7.



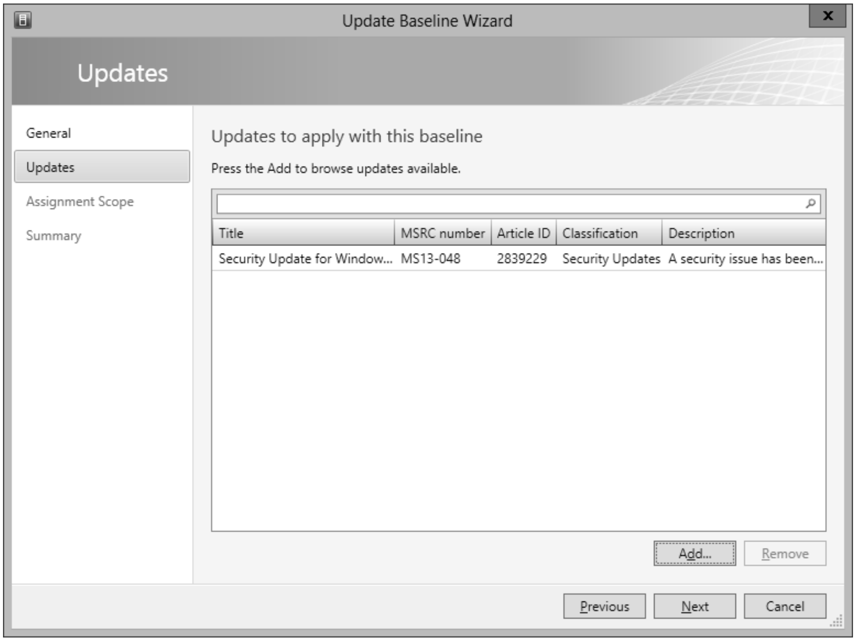
Specify a unique name and description for this update baseline

Name: Adventure Works Baseline

Description:

FIGURE 1-7 Entering a name to create a new baseline

Next, you select the updates that will be included in this baseline. For this example, a single update has been selected, as shown in Figure 1-8, but you could select more updates by clicking Add.



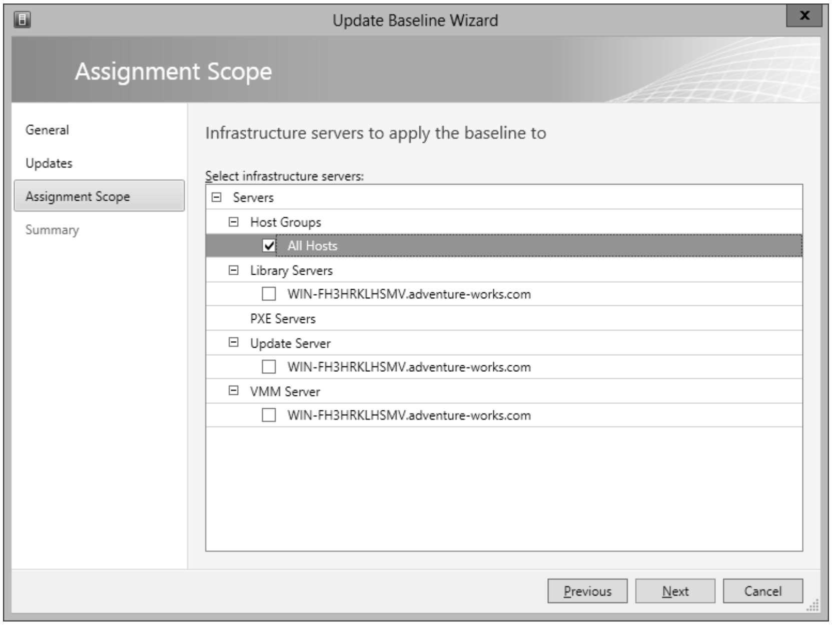
Updates to apply with this baseline

Press the Add to browse updates available.

Title	MSRC number	Article ID	Classification	Description
Security Update for Window...	MS13-048	2839229	Security Updates	A security issue has been...

FIGURE 1-8 Selecting updates for the baseline

Finally, you select the scope to which the baseline will apply. This is accomplished within the Assignment Scope page, shown in Figure 1-9, where All Hosts has been selected.



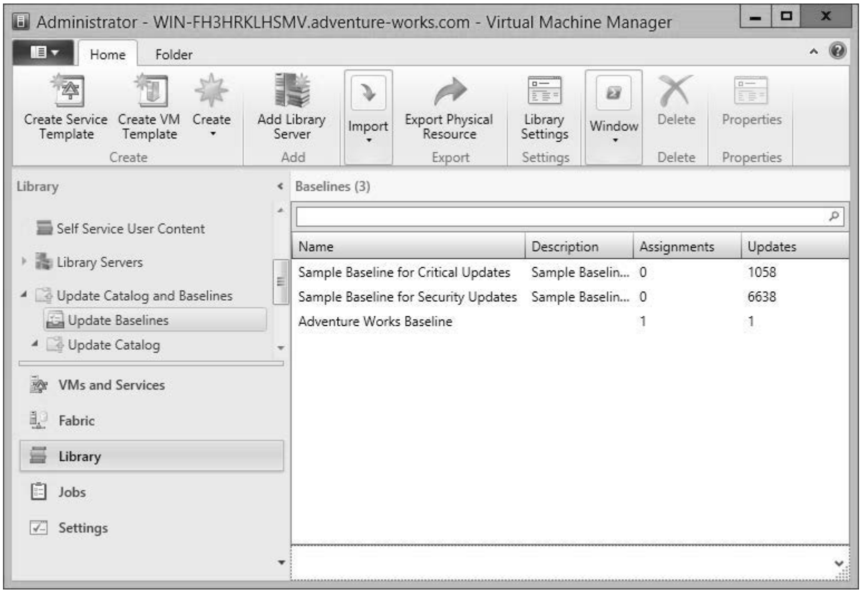
Infrastructure servers to apply the baseline to

Select infrastructure servers:

- ⊟ Servers
  - ⊟ Host Groups
    - ☑ All Hosts
  - ⊟ Library Servers
    - □ WIN-FH3HRKLHSMV.adventure-works.com
  - PXE Servers
  - ⊟ Update Server
    - □ WIN-FH3HRKLHSMV.adventure-works.com
  - ⊟ VMM Server
    - □ WIN-FH3HRKLHSMV.adventure-works.com

FIGURE 1-9 Choosing an assignment scope

Once complete, the summary page will display, and clicking Finish will start the jobs for baseline creation. The newly created baseline will be shown in the VMM console, as depicted in Figure 1-10.



Baselines (3)

Name	Description	Assignments	Updates
Sample Baseline for Critical Updates	Sample Baselin...	0	1058
Sample Baseline for Security Updates	Sample Baselin...	0	6638
Adventure Works Baseline		1	1

FIGURE 1-10 The newly created update baseline

You also have the option to create a baseline using Windows PowerShell. The relevant cmdlets include:

- **New-SCBaseline** Creates the new baseline and assigns it a name and a description
- **Set-SCBaseline** Changes parameters such as the host group and update list to the baseline

When using the Update Baseline Wizard, the final step enables you to view the scripts that will be run as part of the VMM job. The script that was executed to create the Adventure Works Baseline example is shown here:

```
$baseline = New-SCBaseline -Name "Adventure Works Baseline" -Description ""
$addedUpdateList = @()
$addedUpdateList += Get-SCUpdate -ID "7254a3fc-98db-4ca6-ad3f-3bf095de0bc8"
$scope = Get-SCVMHostGroup -Name "All Hosts" -ID "0e3ba228-a059-46be-aa41-2f5cf0f4b96e"
Set-SCBaseline -Baseline $baseline -AddAssignmentScope $scope -JobGroup
"c1477221-a4a0-4c4f-82ef-e502b46a517f" -RunAsynchronously
Set-SCBaseline -Baseline $baseline -RunAsynchronously -AddUpdates $addedUpdateList
-JobGroup
"c1477221-a4a0-4c4f-82ef-e502b46a517f" -StartNow
```

MORE INFO **UPDATE BASELINES**

See *http://technet.microsoft.com/library/gg675110.aspx* for more information on creating update baselines in VMM.

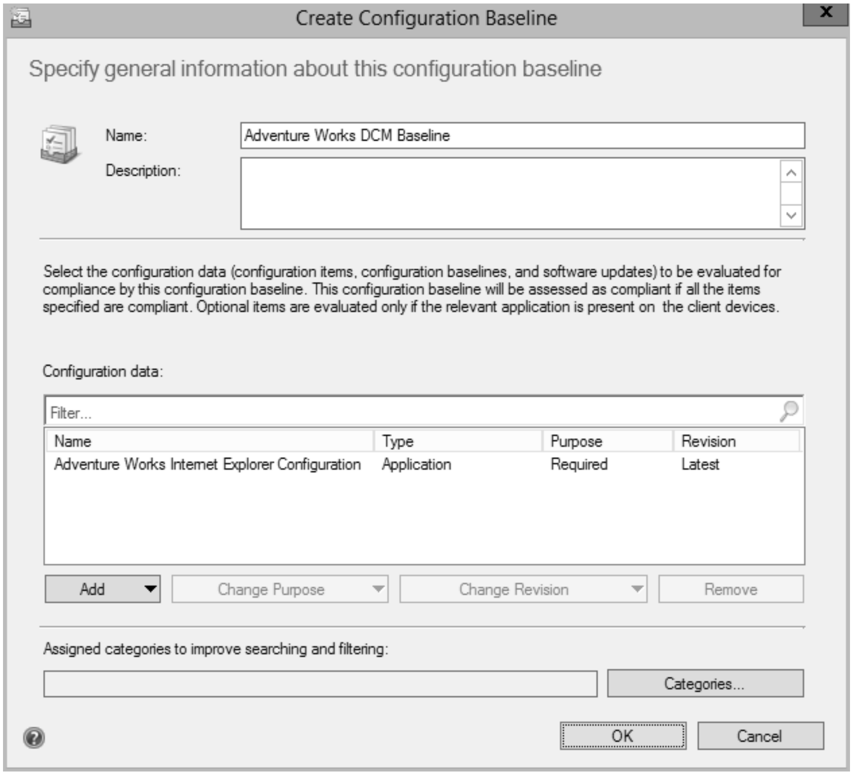
Implementing a Desired Configuration Management (DCM) baseline and automatic remediation

DCM baselines are used in Configuration Manager to ensure compliance for a variety of configuration settings. This section focuses primarily on the exam objective of implementing DCM. DCM provides assessment of managed computers against desired or known-good configurations, for example, whether an update has been applied. This section looks at both the implementing DCM subobjective as well as the automatic remediation subobjective contained within the overall “Implement Automated Remediation” exam objective.

MORE INFO **UNDERSTANDING DCM**

See *http://technet.microsoft.com/en-us/library/bb680553.aspx* for an overview of DCM.

DCM baselines are configured within the Assets and Compliance workspace within Compliance Settings, Configuration Baselines. Clicking Create Configuration Baseline opens the Create Configuration Baseline dialog box. Within the Create Configuration Baseline dialog box, you enter details of the baseline to be created, as shown in Figure 1-11.


Create Configuration Baseline

Specify general information about this configuration baseline

Name: Adventure Works DCM Baseline

Description:

Select the configuration data (configuration items, configuration baselines, and software updates) to be evaluated for compliance by this configuration baseline. This configuration baseline will be assessed as compliant if all the items specified are compliant. Optional items are evaluated only if the relevant application is present on the client devices.

Configuration data:

Filter...

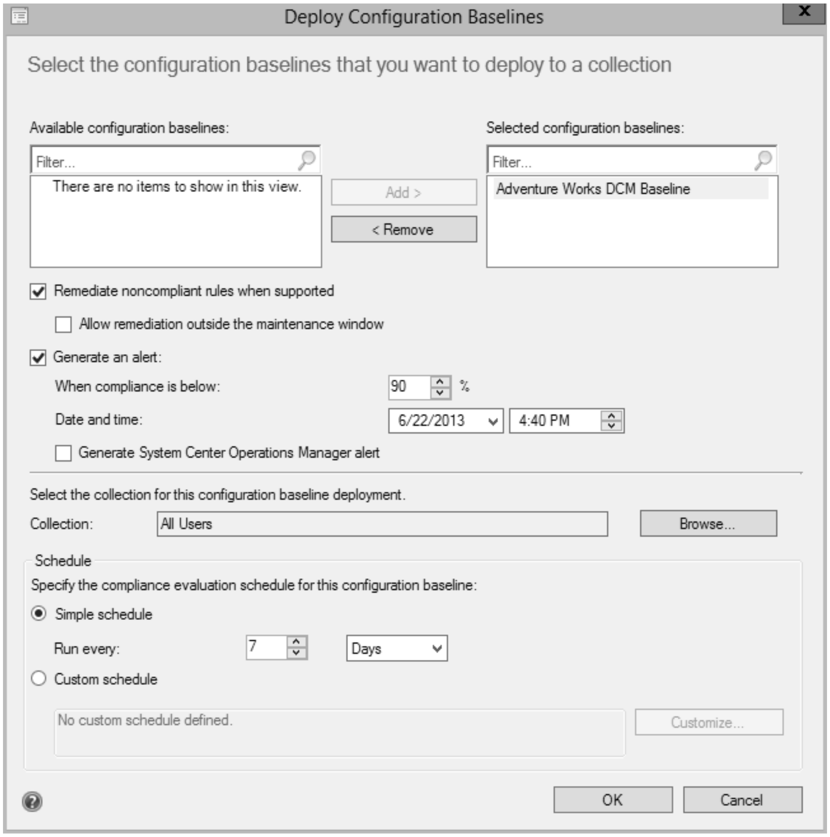
Name	Type	Purpose	Revision
Adventure Works Internet Explorer Configuration	Application	Required	Latest

Assigned categories to improve searching and filtering:

FIGURE 1-11 Creating a desired configuration baseline

A configuration baseline applies one or more configuration items, other configuration baselines, or software updates. The example shown in Figure 1-11 uses a previously defined configuration item, which was added through the Configuration Items page of the Compliance Settings area in Configuration Manager.

Once a configuration baseline is created, it needs to be deployed. This is accomplished by selecting Deploy within the Configuration Baselines area. Clicking Deploy opens the Deploy Configuration Baselines dialog box shown in Figure 1-12. You can select the Remediate Noncompliant Rules When Supported option, select the Generate An Alert option, and specify a schedule for the baseline to be deployed. The deployment will apply to the collection that you select within this dialog box.



Deploy Configuration Baselines

Select the configuration baselines that you want to deploy to a collection

Available configuration baselines:

Filter...

There are no items to show in this view.

Selected configuration baselines:

Filter...

Adventure Works DCM Baseline

☑ Remediate noncompliant rules when supported

□ Allow remediation outside the maintenance window

☑ Generate an alert:

When compliance is below: 90 %

Date and time: 6/22/2013 4:40 PM

□ Generate System Center Operations Manager alert

Select the collection for this configuration baseline deployment.

Collection: All Users

Schedule

Specify the compliance evaluation schedule for this configuration baseline:

● Simple schedule

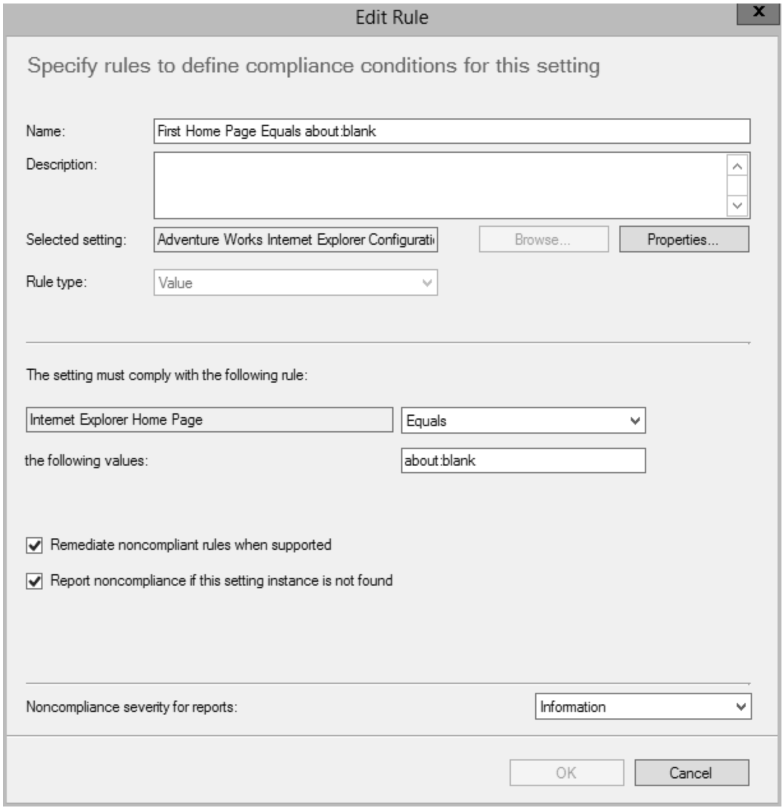
Run every: 7 Days

○ Custom schedule

No custom schedule defined.

FIGURE 1-12 Preparing to deploy a configuration baseline

In addition to configuring automatic remediation through host groups, you can also configure automatic remediation within a configuration item or within the deployment of a configuration baseline. For example, Figure 1-13 shows the Edit Rule dialog box for a configuration item on the Compliance Rules tab. Note the Remediate Noncompliant Rules When Supported option is selected.



Edit Rule

Specify rules to define compliance conditions for this setting

Name: First Home Page Equals about:blank

Description:

Selected setting: Adventure Works Internet Explorer Configurati

Rule type: Value

The setting must comply with the following rule:

Internet Explorer Home Page Equals

the following values: about:blank

☑ Remediate noncompliant rules when supported

☑ Report noncompliance if this setting instance is not found

Noncompliance severity for reports: Information

FIGURE 1-13 Editing a compliance rule of a configuration item

Implementing VMM integration with Operations Manager

Virtual Machine Manager can be integrated with Operations Manager. Integrating VMM and Operations Manager involves configuring both the Operations Manager server and the server running VMM.

EXAM TIP

Windows PowerShell 2.0 is required for System Center 2012, and Windows PowerShell 3.0 is required for System Center 2012 SP1 and System Center 2012 R2.

The first step in integration is to install the Operations Manager console on the VMM server. This is accomplished by using the Operations Manager Setup Wizard and selecting the Operations Manager console as the component to be installed.

MORE INFO **INSTALLING THE OPERATIONS MANAGER CONSOLE**

See *http://technet.microsoft.com/en-us/library/hh298607.aspx* for information on installing the Operations Manager console.

The next step in integrating VMM and Operations Manager is to install the agent on the server running VMM and on any virtual machines under its control. Many times this step has already been done as part of the Operations Manager rollout. However, if the Operations Manager agent hasn't yet been installed, do so as part of the integration implementation.

The Operations Manager agent can be installed manually or through an automated means, such as the native Operations Manager discovery process. Once installed, you should verify that the VMM server and its virtual machines can be seen from within the Operations Manager console.

MORE INFO **INSTALLING THE OPERATIONS MANAGER AGENT**

See *http://technet.microsoft.com/en-us/library/hh551142.aspx* for more information on methods to install the Operations Manager agent.

The next installation-related step is to import the appropriate management packs into Operations Manager. The necessary management packs include:

- Windows Server Internet Information Services 2003
- Windows Server 2008 Internet Information Services 7, including Windows Server 2008 Operating System (Discovery) and the Windows Server Operating System Library, which are prerequisites
- Windows Server Internet Information Services Library
- SQL Server Core Library

NOTE **ABOUT THE PREREQUISITES**

These seemingly outdated prerequisites are still necessary even though the Operations Manager and VMM servers are running Windows Server 2012 with Internet Information Services 8.0.

Integration of VMM and Operations Manager is accomplished from the VMM server, specifically in the Settings workspace of the VMM console. Within the Settings workspace, selecting System Center Settings reveals the Operations Manager Server, as shown in Figure 1-14.

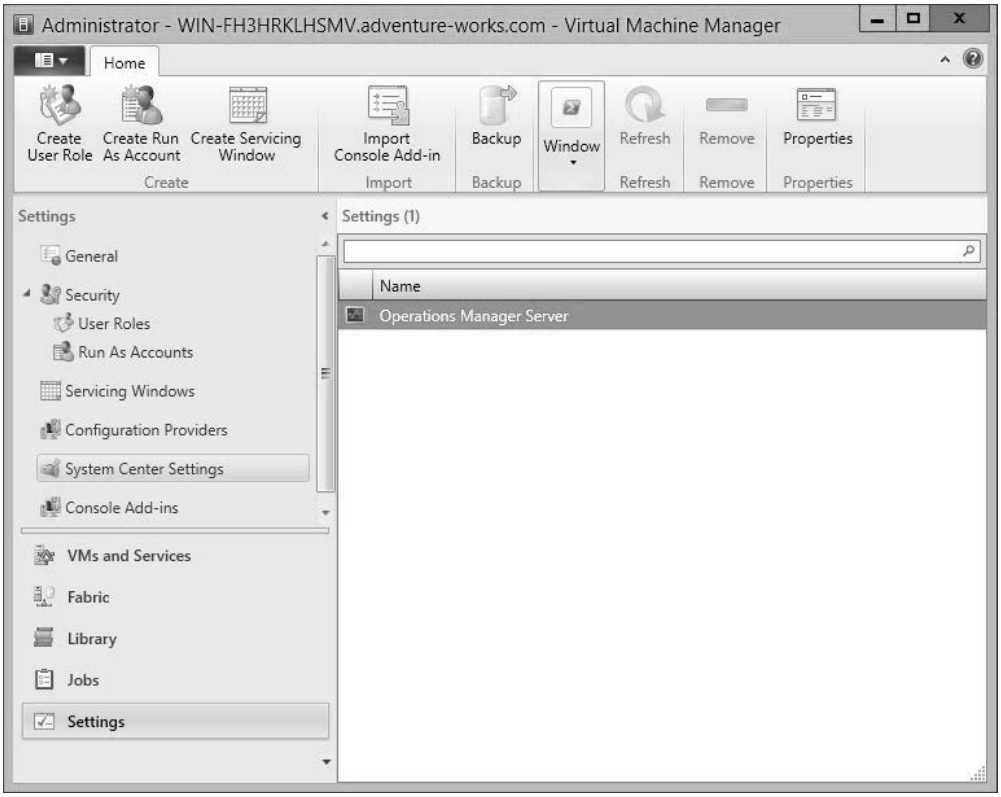
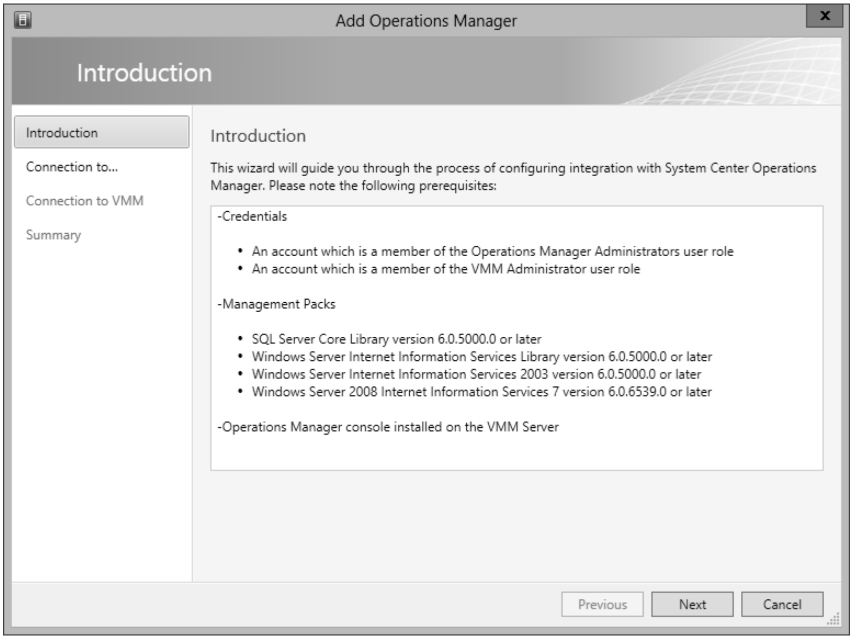


FIGURE 1-14 Viewing System Center settings

With Operations Manager Server selected, click Properties to start the Add Operations Manager Wizard, shown in Figure 1-15.



Introduction

This wizard will guide you through the process of configuring integration with System Center Operations Manager. Please note the following prerequisites:

-Credentials

- An account which is a member of the Operations Manager Administrators user role
- An account which is a member of the VMM Administrator user role

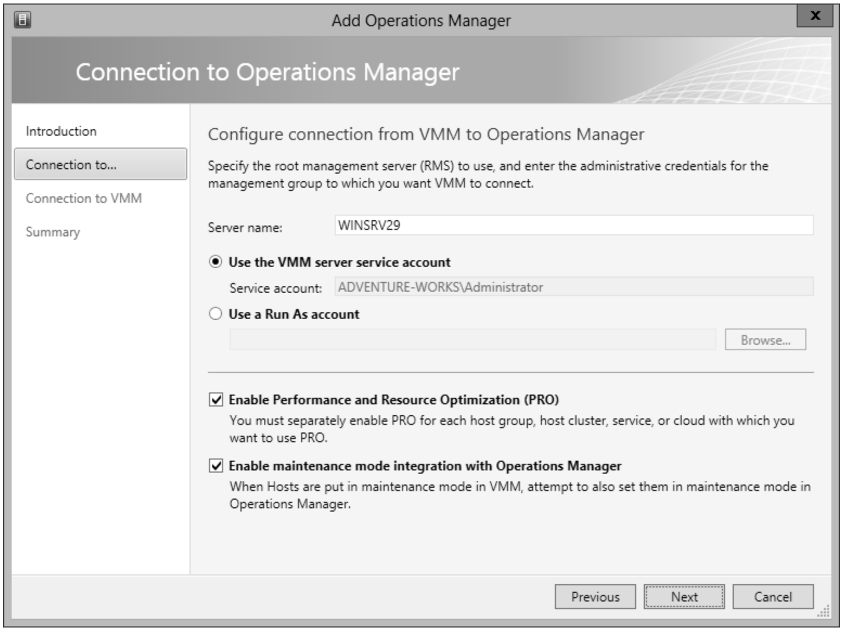
-Management Packs

- SQL Server Core Library version 6.0.5000.0 or later
- Windows Server Internet Information Services Library version 6.0.5000.0 or later
- Windows Server Internet Information Services 2003 version 6.0.5000.0 or later
- Windows Server 2008 Internet Information Services 7 version 6.0.6539.0 or later

-Operations Manager console installed on the VMM Server

FIGURE 1-15 The Add Operations Manager Wizard

The Connection to Operations Manager page, shown in Figure 1-16, enables you to enter the server name and credentials, and to select the Enable Performance And Resource Optimization (PRO) and Enable Maintenance Mode Integration With Operations Manager options.



Configure connection from VMM to Operations Manager

Specify the root management server (RMS) to use, and enter the administrative credentials for the management group to which you want VMM to connect.

Server name: WINSRV29

● **Use the VMM server service account**

Service account: ADVENTURE-WORKS\Administrator

○ **Use a Run As account**

☑ **Enable Performance and Resource Optimization (PRO)**

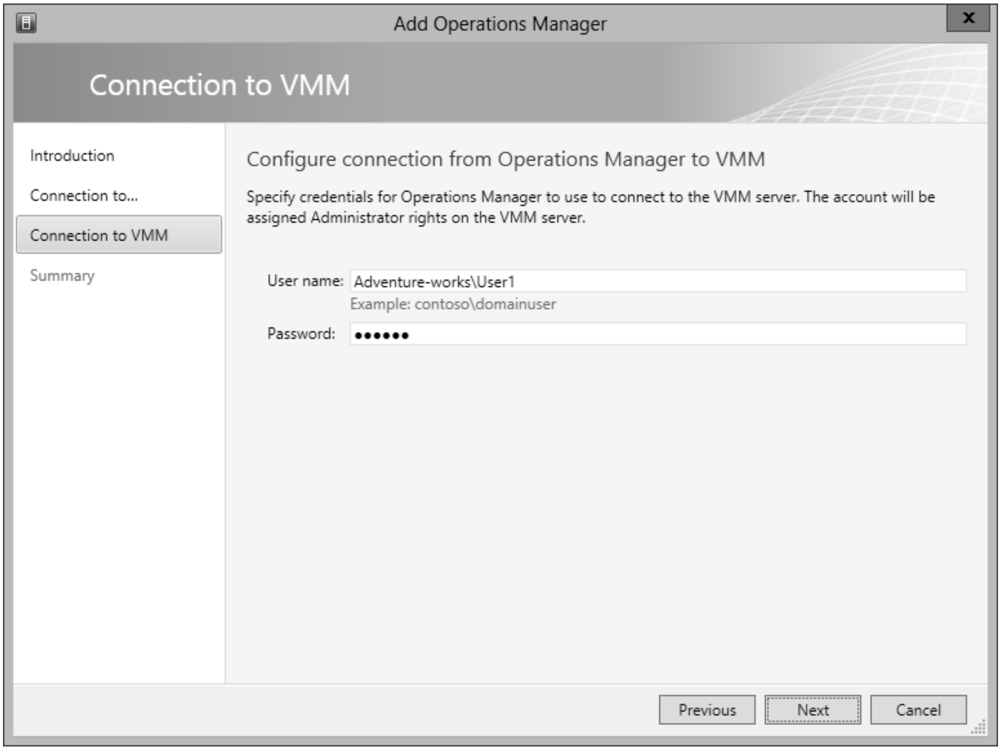
You must separately enable PRO for each host group, host cluster, service, or cloud with which you want to use PRO.

☑ **Enable maintenance mode integration with Operations Manager**

When Hosts are put in maintenance mode in VMM, attempt to also set them in maintenance mode in Operations Manager.

FIGURE 1-16 Adding details of the integration

The Connection to VMM page, shown in Figure 1-17, is where you specify credentials to be used by Operations Manager when connecting to VMM.



Configure connection from Operations Manager to VMM

Specify credentials for Operations Manager to use to connect to the VMM server. The account will be assigned Administrator rights on the VMM server.

User name: Adventure-works\User1

Example: contoso\domainuser

Password: ●●●●●●

FIGURE 1-17 Specifying Operations Manager credentials

A summary page shows a summary of the configuration about to take place. When you click Finish, a job will begin the integration by installing the VMM management pack on the Operations Manager server.

Like other operations, integrating with Operations Manager can be accomplished through PowerShell. The New-SCOpsMgrConnection cmdlet can be used to add the connection.

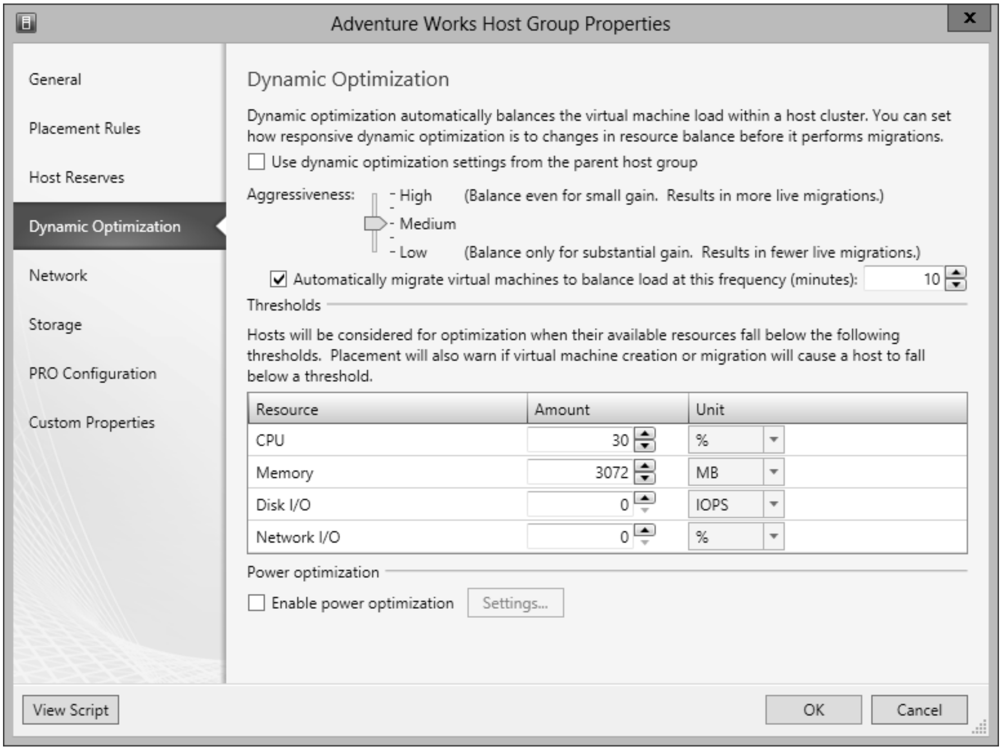
MORE INFO **THE NEW-SCOPSMGRCONNECTION CMDLET**

See *http://technet.microsoft.com/en-us/library/hh801397.aspx* for more information on the New-SCOpsMgrConnection cmdlet.

Configuring VMM to move a virtual machine dynamically based on policy

This section provides a brief overview of automated migration of virtual machines using dynamic optimization.

Dynamic optimization enables virtual machines to be migrated between hosts in a host group based on load and other factors. Figure 1-18 shows the Dynamic Optimization page for a host group.



Dynamic Optimization

Dynamic optimization automatically balances the virtual machine load within a host cluster. You can set how responsive dynamic optimization is to changes in resource balance before it performs migrations.

□ Use dynamic optimization settings from the parent host group

Aggressiveness:
- High (Balance even for small gain. Results in more live migrations.)
- Medium
- Low (Balance only for substantial gain. Results in fewer live migrations.)

☑ Automatically migrate virtual machines to balance load at this frequency (minutes): 10

Thresholds

Hosts will be considered for optimization when their available resources fall below the following thresholds. Placement will also warn if virtual machine creation or migration will cause a host to fall below a threshold.

Resource	Amount	Unit
CPU	30	%
Memory	3072	MB
Disk I/O	0	IOPS
Network I/O	0	%

Power optimization

□ Enable power optimization Settings...

FIGURE 1-18 Configuring dynamic optimization in Virtual Machine Manager

By default, dynamic optimization rules will be inherited from the parent host group. (This option is not selected in Figure 1-18 to better illustrate the available options.) Dynamic optimization can be configured for manual migrations or automatic, as is depicted in Figure 1-18. Manual migrations are the default option, but when configured for automatic migrations, 10 minutes is the default frequency for dynamic optimization.

***MORE INFO* DYNAMIC OPTIMIZATION**

See *http://technet.microsoft.com/en-us/library/gg675109.aspx* for more information on dynamic optimization.

Designing and implementing a Windows PowerShell Desired State Configuration solution

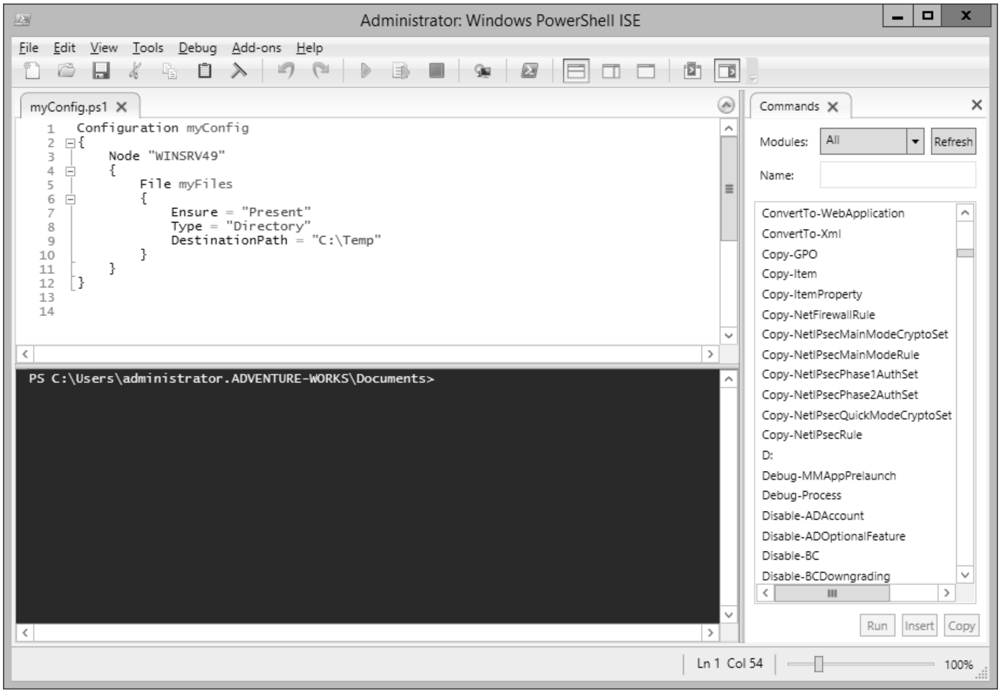
Desired State Configuration (DSC) is a new feature found in Windows PowerShell that enables scripting of configuration data. This configuration data can then be shared across servers to ensure consistency and promote ease of administration. For example, with DSC you can create a script that assists in deployment of web servers or other servers within the organization.

EXAM TIP

DSC is new with Windows Server 2012 R2.

The DSC service enables a server to act as a centralized repository for configuration scripts. When designing a DSC implementation for the enterprise, consider placing the DSC service server geographically close to the computers that will pull from it. Even though the configuration scripts themselves are small, you can store additional resources on the DSC service server, which could place a measurable load on resources.

DSC scripts are defined with the Configuration keyword and frequently written using Windows PowerShell Integrated Scripting Environment (ISE), as shown in Figure 1-19.



```
Configuration myConfig
{
    Node "WINSRV49"
    {
        File myFiles
        {
            Ensure = "Present"
            Type = "Directory"
            DestinationPath = "C:\Temp"
        }
    }
}
```

```
PS C:\Users\administrator.ADVENTURE-WORKS\Documents>
```

FIGURE 1-19 Creating a DSC script in Windows PowerShell ISE

Once created, the script is run from within the ISE and then enacted from within the ISE command prompt by typing the script name. Doing so creates Microsoft Operations Framework (MOF) files for each node identified in the script. For example, the following script (also shown in Figure 1-19) ensures that there's a directory called C:\Temp on the server named WINSRV49.

```
Configuration myConfig
{
    Node "WINSRV49"
    {
        File myFiles
        {
            Ensure = "Present"
            Type = "Directory"
            DestinationPath = "C:\Temp"
        }
    }
}
```

The MOF file is placed within a directory with the same name as the configuration script. From there, the desired configuration for a configuration named myConfig would be invoked with the command Start-DscConfiguration -Wait -Verbose -Path .\myConfig.

Once invoked, the command will run and apply the desired configuration to each of the servers (nodes) defined in the Configuration block.

EXAM TIP

You can also check to ensure that configuration changes are still applied to a given node using the Test-DscConfiguration cmdlet.

Parameters can be used within DSC scripts. Therefore, rather than repeating the same configuration within several hundred node blocks, you could instead use a parameter to define node programmatically, as shown here:

```
Configuration myConfig
{
    param ($nodeName)
    Node $nodeName
    {
        File myFiles
        {
            Ensure = "Present"
            Type = "Directory"
            DestinationPath = "C:\Temp"

        }
    }

}
```

MORE INFO **DESIRED STATE CONFIGURATION**

See *http://technet.microsoft.com/en-us/library/dn249918.aspx* for more information on getting started with DSC.

Thought experiment

Understanding update baselines

In the following thought experiment, apply what you've learned about this objective to predict what steps you need to take. You can find answers to these questions in the "Answers" section at the end of this chapter.

The infrastructure at your organization has shown remarkable growth over the past year. Unfortunately, the staff to maintain that infrastructure has not grown. Therefore, you're looking at ways to automate as many tasks as possible. You've been asked to brief the management team on some of the solutions available for automating the infrastructure.

- Describe update baselines and Desired Configuration Management.

Objective summary

- Update baselines provide an automated means by which virtual machines in a VMM deployment can have updates deployed automatically.
- DCM enables advanced configuration settings to be deployed across clients managed by Configuration Manager.
- System Center can be integrated for automatic remediation of various issues.

Objective review

Answer the following questions to test your knowledge of the information in this objective. You can find the answers to these questions and explanations of why each answer choice is correct or incorrect in the "Answers" section at the end of this chapter.

1. Which command creates an update baseline in VMM?
   - **A.** New-SCBaseline
   - **B.** Create-SCBaseline
   - **C.** SCBaseline /new
   - **D.** New-VMMBaseline

2. Which of the following is not a setting that can be used when creating a configuration management baseline?

   A. Configuration Item

   B. Software Update

   C. Configuration Agent

   D. Configuration Baseline

3. What's the default frequency for automatic dynamic optimization?

   A. One day

   B. One hour

   C. 10 minutes

   D. 24 hours

Answers

This section contains the solutions to the thought experiments and answers to the lesson review questions in this chapter.

Objective 1.1: Thought experiment

You'll likely use security roles to enable the administrators to apply those updates to a security scope of each type of server, test, and production. The key elements for this answer are the security roles and the security scopes.

Objective 1.1: Review

1. **Correct answer:** B
   - **A. Incorrect:** SeShutdownComputer is not a valid privilege.
   - **B. Correct:** SeShutdownPrivilege is the correct privilege.
   - **C. Incorrect:** SePrivilegeShutdown is not a valid privilege.
   - **D. Incorrect:** En_ShutdownComputerPermission is not a valid privilege.
2. **Correct answer:** B
   - **A. Incorrect:** Shut down the system is a privilege for the Backup Operators group.
   - **B. Correct:** Create symbolic links is not a privilege of the Backup Operators group.
   - **C. Incorrect:** Back up files and directories is a privilege for the Backup Operators group.
   - **D. Incorrect:** Allow logon locally is a privilege for the Backup Operators group.
3. **Correct answer:** A
   - **A. Correct:** Site server is the core functionality for System Center.
   - **B. Incorrect:** Component server is not the core functionality for System Center.
   - **C. Incorrect:** Core server is not a valid functionality.
   - **D. Incorrect:** Site Core server is not a valid functionality.
4. **Correct answers:** B, C
   - **A. Incorrect:** All is a built-in scope.
   - **B. Correct:** System is not a built-in scope.
   - **C. Correct:** Administrator is not a built-in scope.
   - **D. Incorrect:** Default is a built-in scope.

Objective 1.2: Thought experiment

1. There are several performance indicators that can be examined, including the GC Response time, as well as GC Search Time and AD General Response.
2. Operations Manager contains the performance monitoring and alerts for this scenario.

Objective 1.2: Review

1. **Correct answer:** A
   - **A. Correct:** AdtAdmin /setquery is the correct command to change the audit event filter.
   - **B. Incorrect:** AdtAdmin /addFilter doesn't perform the requested action.
   - **C. Incorrect:** AcsAdmin is not a valid command.
   - **D. Incorrect:** AcsFilter /add is not a valid command.
2. **Correct answer:** C
   - **A. Incorrect:** Operator does not have this privilege.
   - **B. Incorrect:** Knowledge Administrator is not a valid role.
   - **C. Correct:** Author has this privilege.
   - **D. Incorrect:** Management Pack Administrator is not a valid role.
3. **Correct answer:** D
   - **A. Incorrect:** NTDS should be monitored.
   - **B. Incorrect:** NetLogon should be monitored.
   - **C. Incorrect:** DFSR should be monitored.
   - **D. Correct:** ADMon is not a valid service.
4. **Correct answer:** B
   - **A. Incorrect:** HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\ADT \Parameters is not a valid path.
   - **B. Correct:** HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\AdtServer\Parameters is the correct path.
   - **C. Incorrect:** HKEY_LOCAL_MACHINE\User\CurrentWindowsServices\AdtServicer\Parameters does not exist.
   - **D. Incorrect:** HKEY_LOCAL_MACHINE\SYSTEM\CurrentControlSet\Services\AdtSvc\Parameters is not a valid path.

Objective 1.3: Thought experiment

Update baselines are used to maintain updates on virtual machines. Update baselines are coordinated with a WSUS server, and an administrator chooses the appropriate updates for a given baseline. Sample baselines are included to provide a starting point.

DCM enables advanced configuration items to be tracked across a Configuration Manager deployment. For example, a registry setting can be monitored and changed (remediated) automatically using DCM.

Objective 1.3: Review

1. **Correct answer:** B
   - **A. Incorrect:** New-SCBaseline is not a valid command.
   - **B. Correct:** Create-SCBaseline is the correct command for this question.
   - **C. Incorrect:** SCBaseline /new is not a valid command.
   - **D. Incorrect:** New-VMMBaseline is not a valid command.
2. **Correct answer:** C
   - **A. Incorrect:** Configuration Item can be used as a setting for DCM.
   - **B. Incorrect:** Software Update can be used as a setting for DCM.
   - **C. Correct:** Configuration Agent is not a setting used with DCM.
   - **D. Incorrect:** Configuration Baseline can be used with DCM.
3. **Correct answer:** C
   - **A. Incorrect:** One day is not the default frequency.
   - **B. Incorrect:** One hour is not the default frequency.
   - **C. Correct:** 10 minutes is the default direct optimization frequency.
   - **D. Incorrect:** 24 hours is not the correct frequency.

This page intentionally left blank

Index

This page intentionally left blank

About the author

STEVE SUEHRING is a technical architect with significant hands-on experience in system administration, networking, and computer security. Steve has written on numerous subjects, including Windows, Linux, development, and networking. You can follow him on Twitter at @stevesuehring.