System Center Operations Manager 2007 R2

UNLEASHED

Supplement to System Center Operations Manager 2007 Unleashed
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Foreword

To all of our customers…In 2000, Microsoft acquired a technology license for the software that became Microsoft Operations Manager (MOM) 2000 and later MOM 2005. In ten years, things have changed. Long gone are those days where applications lived on standalone web servers; instead there is a new era of distributed applications, spread across multiple devices including both Windows and non-Windows platforms. This is the reality of the data center, and it is where Microsoft needs to be for our customers.

When designing System Center Operations Manager 2007, we realized we needed to answer some questions on how to tie all this together and create relationships between objects that constructed these applications. Messaging, for example, consists of many parts, like storage, servers, services, and devices. On the same note, we needed to build and enhance native management packs for key workloads such as SharePoint, SQL Server, and Active Directory—applications business critical to the success of our customers.

Operations Manager 2007, the successor to MOM 2005, allowed the server to take a back seat in the monitoring space and brought to light a new notion of monitoring objects. This required some fundamental architectural changes; for example, management packs are no longer in binary format, but rather XML. This required customers to reinvest in management pack authoring and tooling because, architecturally speaking, our design was so different, and most legacy management packs couldn’t convert cleanly. Making big investments in performance and scale was paramount, including the number of agents supported per management group and management server. We extended scale for URL monitoring in bulk by adopting the Bulk URL Editor (BUE) tool. We added process monitoring and extended functionality around service monitoring, and provided SLA reports and dashboards—key to enabling our customers to have the “big picture” overview of service management.

We always envisioned monitoring the data center and to achieve this needed to reach our Unix and Linux operators. We had to meet this group in the middle and decided to build our agent on open source technologies, namely OpenPegasus. In non-traditional Microsoft fashion, we open sourced our providers and are working toward submitting our changes to the OpenPegasus group for integration into their code. Today, OpsMgr 2007 R2 supports over 19 non-Windows platforms, including Red Hat and Solaris. We needed to make it easy to find and import management packs from the console—so with the R2 release you can now import and install management packs using the integrated web service that automatically resolves dependencies on the fly. Users missed the MOM 2005 capability to right-click an alert and create a notification subscription—we added it. Users wanted the ability to view the Health Explorer from the Web console—we added that. Users wanted an Override summary to help manage their overrides—we added this as well.

Our Microsoft Management Pack ecosystem continues to thrive with over 100 application and server management packs, including key workloads such as Exchange, SQL, BizTalk, Hyper-V, Windows Server, IIS, and SharePoint. The external ISV partners are steadily growing in numbers. Solutions such as management packs, connectors, and tools help our customers monitor applications like Oracle, SAP, MySQL, VMware, JBoss, and Apache; devices like Cisco, APC, and Juniper; and hardware from IHVs. These connect to all sorts of other enterprise management products, help desks, and much more. We do this to enable you to have the best monitoring environment possible using the Microsoft platform!
—Justin Incarnato, Microsoft
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Preface

*System Center Operations Manager (OpsMgr) 2007*, released in March 2007, was a complete rewrite of the Microsoft Operations Manager 2005 product, monitoring Windows operating systems and applications. Unlike MOM 2005, Operations Manager 2007 focuses on the health of applications and components, as opposed to looking at the status of individual servers.

Its first service pack (March 2008; released just as *System Center Operations Manager 2007 Unleashed* was published) smoothed out some of the more glaring problems introduced with the base release. In May 2008, Microsoft announced the Cross Platform Extensions (X-Plat) for OpsMgr 2007 as part of a second service pack anticipated for 2009. The X-Plat capabilities enable monitoring non-Windows platforms (Linux/Unix), incorporated into the OpsMgr interface.

Microsoft later decided to bundle X-Plat with other enhancements and bug fixes into a R2 release, publicly announced at TechEd/ITForum in November 2008, and released on May 22, 2009. These other enhancements include, but are not limited to, the following:

- Windows 2008, IIS 7, and SQL Server 2008 platform
- Updated management packs for monitoring operating systems, services, and applications
- New templates for ease of use
- Improved process monitoring and maintenance mode support
- Additional functionality for the Web console, now able to access the Health Explorer to drill-down into health of individual components
- A more intuitive reporting interface, making it easier to generate reports
- Performance enhancements

This work, a supplement to *System Center Operations Manager 2007 Unleashed*, provides in-depth reference and technical information about Microsoft System Operations Manager 2007 including its R2 release, as well as information on other products and technologies on which its features and components are dependent.


The last two chapters take a “deep dive” into several areas of Operations Manager 2007. This includes authoring, discussed in Chapter 8, “Management Pack Authoring,” and high availability, business conti
nuity, the new Visio add-in, ACS in-depth, and targeting, covered in Chapter 9, “Unleashing Operations Manager 2007.” These topics are presented by subject-matter experts in each area.

In keeping with being supplemental to System Center Operations Manager 2007 Unleashed, Appendix A, “OpsMgr R2 by Example,” is an update of the OpsMgr by Example series published with the first book, and Appendix B, “Reference URLs,” updates reference URLs, with nearly 300 useful links. Several chapters reference additional online content, which is described in Appendix C, “Available Online.” You can download the online content from http://www.informit.com/store/product.aspx?isbn=0672333414.

System administrators in both Windows and Linux/Unix platforms should be interested in learning about the cross platform monitoring capabilities. The material will continue to be of interest for those shops that have not yet migrated from MOM 2005 to OpsMgr 2007, and the new material in this book will be of interest to those who previously purchased System Center Operations Manager 2007 Unleashed.
About the Authors

**Kerrie Meyler**, Operations Manager MVP, is an independent consultant and trainer with more than 15 years of Information Technology experience, including work as a senior technical specialist at Microsoft. Kerrie is the lead author of *Microsoft System Center Operations Manager 2007 Unleashed* (Sams, 2008), *System Center Configuration Manager 2007 Unleashed* (Sams, 2009), and *Operations Manager 2005 Unleashed* (Sams, 2006). She participated in the alpha walkthrough for Microsoft Certification Exam 70-400, “Configuring Microsoft System Center Operations Manager 2007.” Kerrie has presented at numerous Microsoft conferences, including TechEd 2007 and MMS 2009.


**Andy Dominey**, Operations Manager MVP from 2006 to 2009, is currently working as a Principal Operations Manager Consultant at 1E, a Microsoft Partner specializing in Windows Management. Andy is a contributing author to *System Center Operations Manager 2007 Unleashed* (Sams, 2008) and co-authored *Microsoft Operations Manager 2005 Field Guide* (Apress, 2006). Andy has written various magazine articles and hosted TechNet webcasts highlighting the technology. He has also worked with Microsoft, making substantial contributions to high-availability aspects of OpsMgr 2007. Andy co-presented with Kerrie at MMS 2009.
Dedication

To Justin Incarnato, the heartbeat of the OpsMgr community.
—With deep thanks from Kerrie, Cameron, John, and Andy

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This book would not be possible without the help of many individuals. The authors would like to thank (in alphabetical order) Jeremiah Beckett, Justin Incarnato, Cleber Marques, Steve Rachui, Marco Shaw, Alexandre Verkinderen, and Pete Zerger for assisting with content. Thanks also to Raymond Chou, Maarten Goet, Barry Shilmover, Marnix Wolf, and Alexey Zhuravlev for their input, and Rory McCaw for being our technical editor. And of course, thanks to the entire OpsMgr product team at Microsoft and our fellow Operations Manager MVPs!

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Thanks also go to the staff at Pearson, in particular to Neil Rowe, who has worked with us since Microsoft Operations Manager 2005 Unleashed (Sams, 2006).
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CHAPTER 1

Introduction and What’s New

In March 2007, Microsoft released System Center Operations Manager (OpsMgr) 2007, developed under the codename Microsoft Operations Manager (MOM) V3. OpsMgr 2007 is completely re-architected and is a total rewrite from its MOM 2005 predecessor. In fact, it is so much of a rewrite that many longtime MOM 2005 administrators and fans feared the worst for the new version in terms of stability and performance—and there were definitely some early issues with the released to manufacturing (RTM) build. However, OpsMgr 2007 has come of age, as evidenced by Gartner Group’s July 2009 Magic Quadrant for IT Event Correlation and Analysis report (https://h10078.www1.hp.com/bto/download/Gartner_Magic_Quarter_IT_Event_Corr_Analysis.pdf), which, similar to their December 2007 report (http://mediaproducts.gartner.com/reprints/microsoft/vol10/article2and3/article2and3.html), places Operations Manager 2007 R2 firmly in the Challengers quadrant (see Figure 1.1).

The gist of the Gartner report is that OpsMgr 2007 contains some major enhancements in comparison to the functionality in MOM 2005, with a focus in monitoring Windows environments. Gartner notes that the R2 release adds non-Windows management, but suggests it still has a way to go when managing non-Microsoft IT elements. This appears to be at least in part because Microsoft relies on third parties to provide management packs to monitor non-Microsoft applications. Microsoft provides the technology to manage Unix/Linux operating systems, but in terms of application monitoring chooses to focus on its own applications such as Exchange, SQL Server, Active Directory, and Internet Information Services. (See Chapter 2, Unix/Linux Management: Cross Platform Extensions,” for a discussion on Unix/Linux integration.)

System Center Operations Manager 2007 Unleashed, the predecessor to this book, was published in February 2008, just as Microsoft released OpsMgr 2007 Service Pack (SP) 1. Although
that book tried to the best of its ability to cover all the improvements in the service pack by discussing enhancements as of the SP 1 Release Candidate (RC). Microsoft added several changes to the released version that were not in the RC. Therefore, this book takes up where the previous leaves off—with a summary of the SP 1 changes, an in-depth look at the R2 release, and a “deep dive” into some of the key capabilities of OpsMgr 2007 through Cross Platform Cumulative Update 2 (CU2) for R2.

![Gartner's Magic Quadrants](image)

**FIGURE 1.1 Gartner’s Magic Quadrants for IT Event Correlation and Analysis, December 2007**

This chapter highlights the changes to Operations Manager 2007, beginning with the release of SP 1.

**Licensing Updates**

There are two areas to be cognizant of regarding licensing and OpsMgr 2007 R2—licensing for the System Center Server Management Suite and licensing of cross platform applications. The next sections discuss this information.
Licensing Changes to the System Center Server Management Suite

In conjunction with the R2 release, Microsoft is changing licensing for the System Center Server Management Suite. Here are the products included in this suite:

► System Center Operations Manager (SCOM) 2007 and SCOM 2007 R2
► System Center Data Protection Manager 2007
► System Center Virtual Machine Manager 2008
► System Center Virtual Machine Manager 2008 Management Server License
► System Center Configuration Manager 2007
► System Center Service Manager 2010

The July 2009 changes to Server Management Suite licensing include the following:

► The System Center Server Management Suite Enterprise (SMSE) offering changes from an unlimited operating system environment to a four-system operating system environment, limited license, with a corresponding 20 percent price decrease.
► A new suite offering System Center Server Management Suite Datacenter (SMSD) includes the same products as SMSE, but is licensed per processor and provides for managing an unlimited number of operating system environments.

OpsMgr 2007 will continue to use Standard and Enterprise Server management licenses (MLs). Here is when you do not need a ML:

► Any Operating System Environments (OSEs) running instances of the server software on your licensed servers
► Any OSEs in which no instances of software are running
► System Center Data Protection Manager 2007
► Any devices functioning only as network infrastructure devices (OSI Layer 3 or below)
► Any devices for which you are exclusively performing out-of-band management

Microsoft provides the following links with more detailed information. You will want to check them for updates:

► Product Licensing Web and Product Use Rights—
► Operations Management Licensing—
► Pricing and Licensing—
Licensing of Cross Platform Applications

The other area of consideration is whether cross-platform monitoring requires a Standard or Enterprise ML. According to Microsoft, if an application is monitored, the license required is Enterprise ML regardless if it is a Microsoft or non-Microsoft application. As an example, if you are just monitoring a Linux server, you need a Standard ML. If that Linux Server is running a Bridgeways MP for MySQL, you must purchase an Enterprise ML to monitor the application. This also means that should you create a monitor that monitors an application process or service (on any operating system), you would need to purchase an Enterprise ML to license it correctly.

New in Service Pack 1

Service Pack 1 is available from Microsoft both as a standalone executable file for upgrading an existing OpsMgr 2007 installation, and a slipstreamed installation enabling you to install both OpsMgr 2007 and the service pack at the same time. Both versions are available for x86 and x64 (32- and 64-bit) computer systems. The link at http://technet.microsoft.com/en-us/opsmgr/cc280350.aspx lets you download the slipstreamed evaluation copy of SP 1 and the SP 1 upgrade bits for existing installations.

Those bugs fixed with the SP 1 release are listed in Knowledge Base (KB) article 944443, at http://support.microsoft.com/default.aspx/kb/944443. In addition, Microsoft now has an update rollup for SP 1, available at http://www.microsoft.com/downloads/details.aspx?FamilyID=05d7785d-fe69-48bc-8dfa-72a77c8936bf&displaylang=en. This combines previous hotfix releases for SP 1 with additional fixes and support of SP 1 roles on Windows 7 and Windows Server 2008 R2. The update also provides database role and SQL Server Reporting Services upgrade support from SQL Server 2005 to SQL Server 2008.

SP 1 Highlights

OpsMgr 2007 SP 1 updates and enhancements include the following:

► Improved performance and stability for alerts, overrides, and searches:
  ► Improved fetching capabilities have increased the performance of alert views.
  ► Alert row selection is up to three times faster than in the base release.
  ► Search improvements enable the ability to perform advanced searches across monitors and rules by their overrides.

► Support for Simple Network Management Protocol (SNMP) v1 network devices. The base release supported SNMP v2 only. The discovery wizard allows you to select which SNMP version to use.
► Capability to export Operations Manager 2007 diagrams to Microsoft Visio XML Diagram (VDX) file format.

► A Visio button is located on the toolbar in the Diagram view. Diagram layouts can be saved and are remembered when that view is selected again.

► Support for copy and paste (CTRL C and CTRL V functions) from the Alert details pane.

► Support for earlier versions of email servers, correcting an issue that could result in malformed data in the subject line of email notifications.

► Ability to copy views from an existing management pack to an unsealed management pack.

► Overrides Summary Box enables you to view overrides for an object.

► Ability to use scripts with diagnostic tasks.

► Incorporates the OpsMgr VSS Writer Service, enabling you to create shadow copies.

► Ability to publish reports to multiple locations—for example, Microsoft Windows SharePoint Services websites.

► Ability to view performance data through the Operations Manager Web console, with filters for desired performance counters to ease searching and navigation.

► Increase in the number of command notifications that can be handled simultaneously from 5 in OpsMgr 2007 SP 1 to 200 in the R2 release. This is configurable in the Registry by creating a key at HKEY_LOCAL_MACHINE\Software\Microsoft\Microsoft OperationsManager\3.0\Modules\Global\Command Executer\AsyncProcessLimit REG_DWORD:0x0000000a. Note that every command notification triggered will start a monitoringhost.exe process on the root management server (RMS); this can lead to memory and processor issues if you do not have enough memory and processor power to support it.

► New discoveries and views added to the Audit Collection Services (ACS), along with new monitors and alerts to track the health of ACS collectors.

► Support for clustering the ACS database.

**Gateway Enhancements**

With the base release of OpsMgr 2007, gateway servers only supported a maximum of 200 agents, making them unsuitable for any purpose other than monitoring DMZs and small untrusted networks. Beginning with SP 1, gateways have been tested to 800 agents and, depending on the hardware configuration and WAN link specifics, could theoretically support many more. Although management servers are able to support up to 2,000 agents since SP 1, gateways are a welcome alternative in complex, distributed environments, as they forward compressed data from multiple agents to a management server using a sustained connection; the management server then manages the connection to the database. More information on how gateway servers can help in a distributed environment is available in Chapter 9, “Unleashing Operations Manager 2007.”
Clustered RMS Enhancements
With SP 1, Microsoft tried to make the RMS recovery story a bit better. New with the OpsMgr 2007 architecture, the RMS is a single point of failure; one approach to alleviate that is to cluster the RMS. However, if your clustered RMS failed in the RTM release and you then promoted a management server to become the RMS, you were unable to later repromote the failed cluster to the RMS role. This was remedied in SP 1. See Chapter 9 for a discussion on RMS high availability.

RMS Encryption Key Backup
One of the more vocal criticisms of the OpsMgr 2007 RTM was its single point of failure with the RMS. If the RMS fails and there is no backup of the encryption key, you must reinstall the entire management group! SP 1 adds the Secure Storage Backup Wizard at the end of the OpsMgr setup process, displayed in Figure 1.2, providing a backup of the RMS encryption key.

![FIGURE 1.2 Option to back up RMS key after OpsMgr installation](image)

You will use this key if you need to recover an Operations Manager management group; without a copy of the key, you cannot recover your Operations Manager environment. Prior to SP 1, there was no automated process to back up the encryption key.

OpsMgr 2007 SP 1 also introduces a CREATE_NEWKEY command switch to make recovery easier. Details on this application are available on the Manageability Team.

The best practice is to back up your RMS key, so accept the default configuration at the completion screen to start the Encryption Key Backup or Restore Wizard. The wizard first displays an introduction screen, and then asks if you want to back up or restore the key, as shown in Figure 1.3.

The wizard continues by asking where to back up the RMS key, asks for a password, and then completes the process. It is highly recommended to store a copy of the backup key on your other management servers so it is local in the event of an emergency. Also, ensure that the password for the key is stored with the key; otherwise, you will not be able to restore the key.

![Encryption Key Backup or Restore Wizard](image)

**FIGURE 1.3  Encryption Key Backup or Restore Wizard**

**R2 Highlights and Capabilities**

The Gartner Group report on OpsMgr 2007, referenced at the beginning of this chapter, notes the product’s greatest weakness to be its lack of monitoring non-Microsoft platforms. Historically, Operations Manager 2007’s strength is in monitoring the Windows environment and lessens when managing non-Microsoft IT systems and devices, whether using Microsoft or third-party add-ons to provide management capabilities. Enter the R2 release—which incorporates cross-platform monitoring!

At the Microsoft Management Summit (MMS) in 2008, Microsoft's annual conference on managing the Windows platform, Microsoft announced the upcoming enhancement of cross-platform monitoring, also known as X-Plat. Not only was OpsMgr going to change to encompass monitoring of non-Windows platforms, but the code would be open source. To add some humor to what was a seismic shift in direction by the company (pigs would fly!), Microsoft distributed pigs…with wings, an illustration of which is displayed in Figure 1.4.
FIGURE 1.4 Pigs flew when Microsoft announced cross-platform monitoring for OpsMgr.

X-Plat was initially going to be part of a service pack; however, at TechEd-Europe in November 2008, Microsoft announced that X-Plat and other changes would be bundled into an R2 release.

In addition to extending OpsMgr 2007 monitoring capabilities to Unix and Linux environments using the familiar Operations Manager console, R2’s integration with System Center Virtual Machine Manager (VMM) 2008 enables maximizing availability of virtual workloads. But that’s not all—in addition to getting a facelift with new skins (see Figure 1.5), the R2 release includes numerous other performance and functionality enhancements. R2 also resolves quite a few bugs and incorporates a number of hotfixes—see KB article 971410 at http://support.microsoft.com/kb/971410/ for the list.

FIGURE 1.5 The new skin of the R2 Operations console
NOTE: RENAMED COMPONENTS AND SERVICES
As part of the OpsMgr R2 release, Microsoft has renamed the Operations Manager Command Shell to Operations Manager Shell. The three Windows services used in OpsMgr deployments are renamed as well:

► The OpsMgr SDK Service is now System Center Data Access.
► The OpsMgr Health Service became System Center Management.
► The OpsMgr Config Service is System Center Management Configuration.

Successive chapters of this book cover in detail many of the new features in R2, with the remainder of this chapter discussing those topics not discussed elsewhere.

Importing Management Packs
Both MOM 2005 and OpsMgr 2007 support downloading management packs (MPs) from the System Center Management Pack Catalog (http://pinpoint.microsoft.com/en-US/systemcenter/managementpackcatalog) using a web browser outside the Operations Manager console. New with R2 is the capability to download MPs within the Administration node in the console. To download management packs from the OpsMgr console, perform the following steps:

1. In the OpsMgr console, navigate to Administration -> Management Packs. From the Actions pane on the right side, select the Download Management Packs task to open the Download Management Packs wizard.
2. The first screen of the wizard asks you to select a local folder in which to store the downloaded management packs. Click on the Browse button to browse to a folder such as c:\Management Packs.
3. Now, click the Add button in Figure 1.6 to find the management packs you want to download.
4. When selecting management packs, the search criterion in the View section of the Select Management Packs from Catalog page enables you to select one of the following search options:
   ► All management packs in the catalog
   ► Updates available for installed management packs
   ► All management packs released within three months
   ► All management packs released within six months

For this example, the search is for updates to installed management packs. Figure 1.7 shows the results.
FIGURE 1.6 Select the Add button to add management packs to the download list.

FIGURE 1.7 The list of installed management pack updates shows updates for Exchange, System Center, and Windows.
5. You can expand the categories to see the specific management packs available within each area. Click on the Add button in Figure 1.7 to select specific management packs.

If there are dependencies on other management packs or versions, you will be alerted to this in the download wizard and can select to download those to resolve the issue. Should a management pack contain potentially harmful content, it will alert you to this as well and allow you to view that content.

6. Complete your selection, and then select OK to view the download list and begin the download. Figure 1.8 shows the download list for the Hyper-V 2008 management pack.

7. After downloading the management packs to disk, you can use the Import Management Packs task in the Actions pane to import the management packs into your management group.

![Download Management Packs](image)

**FIGURE 1.8** The list of management packs to download

### New and Updated Templates

A template serves as a starting point. *OpsMgr* 2007 provides templates for several object types to help make it easier to create custom objects. R2 brings additions and enhancements to the templates existing in the RTM and SP 1 releases of *OpsMgr* 2007. The next sections discuss the Process Monitoring Template, Windows Service
Management Pack Template, and OLE DB Management Pack Template. You will find the list of Management Pack templates in the Authoring node of the Operations Manager console. This list will vary based on the management packs loaded into your management group. Other templates new to R2 include Unix/Linux LogFile and Unix/Linux Service. To initiate the wizard for any of the Management Pack templates, right-click on that template, choose Add Monitoring Wizard, and then select the monitoring type.

**Process Monitoring Template**

Prior to R2, there were ways to monitor processes, but they were a bit clunky and required custom monitors and scripts. The authors of *System Center Operations Manager 2007 Unleashed* have firsthand experience with this, as they wrote a process monitor available with that book! The new Process Monitoring template enables you to specify a number of criteria when monitoring a process, as follows:

- Defining scenarios both for processes you want and for unwanted processes.
- Targeting a group; this narrows the scope of the monitor.
- Specifying the minimum and maximum number of process instances and duration, and choosing to generate an alert if the process runs longer than that duration.
- Generating an alert if CPU usage or memory usage exceeds a specified threshold, and indicating the number of consecutive samples that should exceed a threshold before generating an alert.

Figure 1.9 shows part of the configuration of a monitor created using this template.

![FIGURE 1.9 Using the OpsMgr 2007 R2 Process Monitoring template](image)

**Windows Service Management Pack Template**

The Windows Service template lets you discover and monitor a Windows service by doing little more than typing in the service name. This template was first available with the RTM version of OpsMgr 2007 and performs the following two functions:

- Creates a new class (target) for your service
► Creates a discovery to find instances of that new class

The RTM release had several issues, as follows:

► There was no support for wildcards, although Brian Wren's article at http://blogs.technet.com/brianwren/archive/2008/03/07/using-wildcards-with-the-windows-service-template.aspx presents a solution replacing the discovery with a WMI discovery module providing wildcard support.

► The template only enabled you to select services created with SERVICE_WIN32_OWN_PROCESS; monitoring other services required creating a unit monitor.

The R2 version enables wildcard entry to select multiple, similarly named services.

**OLE DB Management Pack Template**

Enhancements to the OLE DB template allow operators to identify the database and set thresholds for connection, query, and fetch times (see Figure 1.10), and to type or paste a custom query to run against the remote OLE DB data source. You can use this template to simulate synthetic transactions from a user perspective.

Note that if you created an OLE DB monitor using an earlier release of OpsMgr 2007, you must upgrade it to the new template before saving any additional changes to the monitor. Open the Properties page to upgrade the template automatically; then click OK at the end of the upgrade process.
User Interface

Operations console performance is greatly improved in R2. Here are the areas where improvements are most evident:

► Opening new views in the monitoring space
► Pivoting between views
► Selecting multiple items in the Results view and rendering the Details pane more quickly
► Indicating that a view is in the progress of loading

Other interface enhancements include the Overrides Summary and a search tool to assist in creating dashboard views:

► The Overrides Summary View enables you to view all rule and monitor overrides for sealed and unsealed management packs, and you can customize it by grouping items by multiple column headers.
► When you create a dashboard view, you populate the different panes in the dashboard with individual, existing views. The R2 release provides a search tool you can use to find the views you want quickly. The search also includes views that you have created in My Workspace.

Run As

With Operations Manager 2007 R2, Microsoft added distribution and targeting features for Run As Accounts and Run As Profiles. When you associate a Run As Account with a particular Run As Profile, R2 lets you target the profile to any class available in Operations Manager and see the logical relationship between the two. Both Run As Account distribution and Run As Account targeting must be correctly configured for the Run As Profile to work properly.

You can specify which computers will receive the Run As Account credentials. You can choose to distribute the Run As Account credentials to every agent-managed computer (less secure) or only to selected computers (more secure). As an example, say you have a script that runs as a response to a monitor or a script that performs some level of monitoring against a SQL Server database. Rather than associating the profile with the agent, you can choose to associate the profile with a database instance or with the SQL Server Database Engine for that agent. This enables you to target the profile by group, object, or instance class. Chapter 9 discusses how targeting works. For additional information on Run As Profiles and Run As Accounts, see http://technet.microsoft.com/en-us/library/bb735423.aspx.

IIS 7 and ASP.NET 64-Bit Apps

R2 adds support for monitoring Internet Information Services (IIS) 7, without having to enable the backward compatibility APIs or legacy management features. Operations
Manager 2007 R2 also discovers and monitors 64-bit ASP.NET applications running on IIS servers.

**Large-Scale Monitoring of URLs**

R2 now supports up to 2,000 URL monitors per management server. The overall capacity of URL monitors increases commensurately for the management group.

**Maintenance Mode**

R2 streamlines the process of placing a computer and all its related objects into maintenance mode, as follows:

► You can put an entire computer into Maintenance mode—This automatically puts the Health Service and the associated Health Service watcher into maintenance mode, which suppresses all alerts on that computer.

► Management pack authors can specify what should be included in an alert and how it is formed when a monitor comes out of maintenance mode.

► Alerts are generated on HealthService heartbeat failures after exiting out of maintenance mode.

**32-Bit Performance Counter Support on 64-Bit Systems**

When running 32-bit applications on a 64-bit operating system (OS), unless the pre-R2 OpsMgr agent is 32-bit, you cannot monitor those applications. However, if you are running the 32-bit agent, you will not be able to monitor 64-bit applications or the OS itself. OpsMgr 2007 R2 incorporates a module change, allowing management packs to query the 32-bit registry hive on a 64-bit Windows installation to perform discoveries successfully. This change is also available in a SP 1 hotfix.

Configuration Manager (ConfigMgr) 2007 is one example of a 32-bit application that has trouble being monitored in a 64-bit environment prior to OpsMgr 2007 R2. The ConfigMgr 2007 management pack for OpsMgr 2007 R2 is updated to take advantage of the new discovery method. ConfigMgr 2007 SP 2 will also have native 64-bit performance counters added.

**Web Console (Health Explorer)**

R2 adds the Health Explorer to the Web console, giving the Web console operational parity with the Operations Manager console for monitoring capabilities. Figure 1.11 displays the Web Health Explorer for one of the servers in the domain used in this book: Odyssey.com.
Notification Subscription Wizard

R2 totally restructures the notification feature, making it easier to set up notifications. The Notifications folder in the Administration node contains folders for Channels, Subscribers, and Subscriptions:

- A notification is sent by channels; examples are SMTP, instant messaging, or command.
- Subscribers are the entities that receive a notification; an example is user@odyssey.com.
- Subscriptions describe what the subscriber will be notified of and the schedule for those notifications.

As before, you can create new channels and subscribers prior to configuring a subscription. However, the New Subscription Wizard enables creating new channels and subscribers if the one you want to use does not already exist. Figure 1.12 displays the Notification Subscription Wizard. After specifying the notification criteria, you can create new subscribers or select existing ones.

The next step of the wizard enables you to create a channel.

R2 also provides the capability to create a new subscription directly from an alert and to add the parameters from the selected alert to an existing subscription. This significantly improves efficiency and reduces human error in remembering and incorrectly typing the required string!
Service Level Monitoring

You can use the Service Level Tracking Wizard to define thresholds known as Service Level Objectives (SLOs), enabling you to classify monitors and rules to compare the availability and performance of monitored applications. In the Authoring node of the Operations console, navigate to Management Pack Objects -> Service Level Tracking to define thresholds for a Service Level Agreement (SLA) and create SLOs to represent this SLA. Figure 1.13 displays the Service Level Objectives page of the Service Level Tracking Wizard:

► The threshold definition for Availability is created using a Monitor State SLO (see Figure 1.14).
► The Threshold definition for Performance is created with a Collection Rule SLO (see Figure 1.15).

After creating these thresholds, the Service Level Tracking Summary Report will compare SLO thresholds with monitored data from the OpsMgr Reporting database.
NOTE: SERVICE LEVEL TRACKING PREREQUISITES

Using Service Level Tracking requires an OpsMgr 2007 R2 environment implemented with OpsMgr Reporting and defined service levels to ensure proper representation in reports and dashboards.

FIGURE 1.13 Adding a Service Level Objective while creating a SLA

FIGURE 1.14 Define the thresholds to track.
FIGURE 1.15 Define the Collection Rule for the Service Level Objective.

THE SERVICE LEVEL DASHBOARD

Service Level Dashboard (SLD) 2.0 is a Solution Accelerator. Solution Accelerators are tools with best practices used by Microsoft, its customers, and partners that provide prescriptive guidance. The Dashboard was introduced with OpsMgr 2007 SP 1 and is enhanced in R2 with version 2.0. Here are the new features:

► Monitoring in near real time (2–3 minutes)
► Integration with Windows SharePoint Services (WSS) 3.0 and Microsoft Office SharePoint Server (MOSS) 2007
► Utilization of OpsMgr 2007 R2 Service Level Objectives
► New metrics include Mean Time To Repair (MTTR) and Mean Time Between Failures (MTBF)

Here are the prerequisites to install SLD 2.0:

► Operations Manager 2007 R2 (with OpsMgr Reporting)
► WSS 3.0 SP 1 or MOSS 2007 SP 1
► SQL Server 2005 SP 2 or higher or SQL Server 2008
► Microsoft .NET Framework 3.5 and Internet Explorer 6.0 or higher


Reporting Enhancements

R2 adds a number of long-awaited and requested features for reporting users and authors, as follows:
Service Level Tracking Reporting—The “Service Level Monitoring” section discussed how R2 provides Service Level Tracking. After creating thresholds, you can run the tracking reports comparing thresholds with state and performance data collected by the system. To run these reports, navigate to the Microsoft Service Level Report Library under the Reporting node in the OpsMgr console. The Service Level Tracking Report compares SLOs with the monitored data. The Service Level Objective Detail Report is very flashy, and is displayed in Figure 1.16.

![Figure 1.16 Service Level Tracking Objective Detail Report](image)

Saving Reports to a Management Pack—You can save reports to an existing management pack, enabling you to share a report using a specific set of parameters. See [http://technet.microsoft.com/en-us/library/dd789017.aspx](http://technet.microsoft.com/en-us/library/dd789017.aspx) for details. As mentioned in this reference, a management pack with a saved report to another management group using a different data warehouse requires you to save the report again for it to function properly.

Report Object Picker—Object picker enhancements allow searching and filtering by name or class of object, making it easier to find the objects needed to retrieve data. Filter settings are applied under the Options button for both the Add Objects and Add Group functions, and the feature enables you to select only certain (meaningful) classes of objects. Figure 1.17 illustrates this using a report in the SQL Server 2008 management pack. The Options button was selected in the previous dialog, bringing up the SQL 2008 DB Engine as the only valid object to select for this report.

This feature has the most value when the list of supported classes is defined in a management pack. However, only newer releases of management packs take advantage of this capability.
► **Authoring Console Support**—The Authoring console now includes a Reporting space, exposing all available reporting elements.

► **Enhanced Most Common Events Report**—R2 adds multi-selection parameters to this report.

![Screenshot of the R2 Report Object Picker](image)

**FIGURE 1.17** The R2 Report Object Picker automatically displays the objects of interest for you to select.

### Recalculating and Resetting Monitor States

The Health Explorer includes the ability to force the agent to recalculate the health of a particular monitor. One of the most common uses for this is when you want to confirm that the action that you took actually fixed the problem. If the management pack is correctly implemented, all you need to do is select the unit monitor in Health Explorer and click on the “Recalculate Health” button.

Health Explorer also includes a Reset Health button. The behavior of these buttons has varied during the different updates of OpsMgr 2007, and has pretty much been a moving target:

► At OpsMgr 2007 RTM, the interface only had a Reset button, which actually did a Recalculate, but only if on-demand detection was defined by the management pack. It did not do a Reset (for further information, see Chapter 14, “Monitoring with Operations Manager,” in *System Center Operations Manager 2007 Unleashed*).

► SP 1 added a Recalculate button. The Recalculate button had a similar issue to the Reset button in RTM, as it actually worked only when there was on-demand detection. The Reset button worked as expected, and changed the monitor state to healthy regardless of its current state (even if it was already in a healthy state).
► R2 continues to have both the Reset and Recalculate buttons, and Recalculate works more accurately than it did in SP 1.

**Power Consumption Monitoring**


**Summary**

Operations Manager 2007 R2 brings “fit and finish” to the 2007 release. The R2 enhancements are quite substantial, perhaps more so than some of the “R2” releases with previous Microsoft server products. This chapter highlighted the changes in OpsMgr 2007 SP 1 and R2. The next chapter discusses one of the most publicized enhancements in R2: Cross Platform Extensions.
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