System Center Opalis Integration Server 6.3

UNLEASHED

FREE SAMPLE CHAPTER

SHARE WITH OTHERS
System Center Opalis Integration Server 6.3

UNLEASHED
Contents at a Glance

Introduction ................................................................................... 1

Part I  Opalis Integration Server Overview and Concepts
1 Introducing Opalis Integration Server 6.3 ............................................ 5
2 Inside Opalis Integration Server 6.3 ................................................... 29
3 Architectural Design ....................................................................... 55

Part II  Installation and Implementation
4 Installing Opalis Integration Server 6.3 .............................................. 79
5 Policy Basics ................................................................................ 115
6 Foundation Objects ...................................................................... 153
7 Implementation and Best Practices .................................................. 201

Part III  Integration Packs and the SDK
8 OIS Integration ............................................................................ 237
9 Integration with System Center Operations Manager ...................... 299
10 Integration with System Center Service Manager ........................... 313
11 Integration with System Center Configuration Manager ................ 331
12 Integration with System Center Virtual Machine Manager ............ 347
13 Integration with System Center Data Protection Manager ............. 367
14 Data Center Scenarios .................................................................. 381
15 The Quick Integration Kit ............................................................. 397

Appendixes
A Support and Troubleshooting ......................................................... 469
B Reference URLs ............................................................................ 495
C Available Online .......................................................................... 503

Index ............................................................................................... 505
# Table of Contents

## Introduction  
1

## Part I Opalis Integration Server Overview and Concepts

### 1 Introducing Opalis Integration Server 6.3  
5

- What Is Opalis?  
5
- Automation, Orchestration, and Integration  
6
- Workflow  
7
- OIS Connects the Data Center  
7
- Microsoft’s Automation Platform  
8
- Microsoft Before OIS  
8
- Adding OIS to the Picture  
8
- Making the Difference: The Data Bus  
9
- Flexibility  
9
- OIS in the Real World  
10
- Results  
11

- Where OIS Fits Within the System Center Suite  
11
- Enhancing, Extending, and Enabling System Center  
12
- Transforming the Data Center  
14

- The History of Opalis Software  
15
- Rendezvous with Destiny  
15
- Do the Robot!  
16
- What Rhymes with OIS?  
18
- Microsoft Acquires Opalis  
21
- Product Challenges  
21

- OIS 6.3 and Beyond  
22
- SCO 2012 Differences  
23
- SCO 2012 Similarities  
23
- Unknowns  
23

- Understanding IT Process Automation  
24
- A Brief History of IT Process Automation  
24
- Old Processes and Unwanted Artifacts  
27
- Not a Job Scheduler  
28
- An ITPA Tool, Not a Connector  
28

- Summary  
28

### 2 Inside Opalis Integration Server 6.3  
29

- Component Overview  
29
- Optional Components  
31
- Required Components  
32
3 Architectural Design

Basic Architecture

Policy Lifecycle and Mechanics

Check In

Dormant Policy

Starting the Policy

Action Servers and Policy Instantiation

PolicyModule.exe

Policy Limits and Queuing

Action Server Policy Throttle

Maximum Number of Policies to Run

Desktop Heap Limitations and Policies

Policy Maximums Based on Operating System

Policy Size and Complexity

CPU and Memory Resources Also Affect Policy Limits

Policy Queuing

Policy Spillover

Policies Assigned to Specific Action Servers

Policy Failover

Deployment Models

Simple Deployment
Resilient Deployment .............................................................. 68
Cross-Network Deployment ..................................................... 69
Cross-Network Action Servers ................................................... 70
Multisite Manual Policy Sync ................................................... 72
Multisite Invoke via Web Services ............................................. 73
Multisite Hybrid Solution ........................................................ 74
Multisite Isolated Deployment.................................................. 75

Security Models ............................................................................. 76
Single Domain Security ........................................................... 76
Federated Domains ................................................................. 76
Untrusted Security Model ........................................................ 77

Summary...................................................................................... 78

Part II  Installation and Implementation

4 Installing Opalis Integration Server 6.3 ............................................. 79
Dependences Explained ................................................................ 79
OIS 6.2.2 Dependency ............................................................. 80
Java and JBoss Dependency ...................................................... 80

Installation Prerequisites ................................................................. 80
Server Requirements ............................................................... 80
User Account Requirements ..................................................... 81
Trust But Verify...................................................................... 83
Download the Installation Media.......................................... 83

Running the Installer ............................................................... 84
Installing the Management Server ..................................................... 85
Database Creation and Population .................................................... 87

Licensing ...................................................................................... 90
Patching for 6.3 ............................................................................. 93
Deployment Manager ............................................................. 94
Action Server Installation ........................................................... 94
OIS Client Installation ............................................................. 97

Integration Pack Installation ........................................................ 99
Registering the IPs ................................................................ 100
Deploying the IPs .................................................................... 102

Manual Installation ...................................................................... 105
The Opalis Operator Console.................................................. 106
Gathering Files ................................................................. 107
Installing Java ............................................................. 108
Setting Environment Variables ................................................ 108
Extracting Files..................................................................... 108
Using the PowerShell Script to Install the Opalis
Operator Console ............................................................. 110
Securing the Opalis Operator Console ............................................ 111
5 Policy Basics

Navigating the OIS Client .............................................................. 115
Understanding the Connections Window ......................................... 116
   Policies ............................................................................... 116
   Computer Groups ................................................................. 117
   Action Servers .................................................................... 117
   Global Settings ..................................................................... 118
Using the Workspace Window........................................................ 120
Accessing the Objects Window ....................................................... 120
Reviewing the Events Window ........................................................ 121
Viewing Status in the Log Window .................................................. 122
The Log History Window: Looking Back ........................................... 123
Audit History Window .................................................................. 124
Configuring the Client Using the Options Menu ............................... 124
   Show Link Labels .................................................................. 124
   Show Tooltips ...................................................................... 125
   Show Legacy Objects (Requires Client Restart) ....................... 125
   Automatic Check Out ............................................................ 125
   Prompt for Comment on Check In .......................................... 126
   Allow Empty Comment on Check In ....................................... 126
Creating Policies ........................................................................... 126
   Objects ............................................................................... 126
   Monitor Objects ................................................................... 126
   Link Handles ....................................................................... 126
   Links .................................................................................. 127
   Dragging and Dropping Objects .............................................. 127
   Configuring Objects ................................................................ 127
   Linking Objects .................................................................... 128
The Policy Testing Console ............................................................. 129
   Running a Policy .................................................................. 130
   Examining the Logs ................................................................ 130
   Stepping Through a Policy ...................................................... 130
   Setting Breakpoints ............................................................... 131
   Differences Between the PTC and the OIS Client ................. 131
Policy Check In and Check Out ....................................................... 132
   Starting a Policy in the OIS Client ........................................ 132
   Checking Logging in the OIS Client ....................................... 133
# Part III Integration Packs and the SDK

## 8 OIS Integration

Integration Overview .......................................................................................................................... 237

The IP for BladeLogic Operations Manager .......................................................................................... 238
  BladeLogic Operations Manager IP Typical Use Case ........................................................................ 238
  BladeLogic Operations Manager IP Object List ................................................................................ 239
  BladeLogic Operations Manager IP Installation Notes ....................................................................... 239
  BladeLogic Operations Manager IP Supported Versions .................................................................. 239
  BladeLogic Operations Manager IP Configuration Settings .............................................................. 239

The IPs for BMC Tools ........................................................................................................................ 240
  The IP for BMC Atrium CMDB ........................................................................................................ 240
  The IP for BMC Event Manager ....................................................................................................... 243
  The IP for BMC Patrol ..................................................................................................................... 245
  The IP for BMC Remedy AR System ................................................................................................ 247

The IPs for CA Tools ........................................................................................................................... 250
  The IP for CA AutoSys .................................................................................................................... 250
  The IP for CA eHealth ...................................................................................................................... 252
  The IP for CA Spectrum .................................................................................................................. 254
  The IP for CA Unicenter NSM .......................................................................................................... 256
  The IP for CA Unicenter Service Desk ............................................................................................ 257

The IP for EMC Smarts InCharge ......................................................................................................... 260
  EMC Smarts InCharge IP Typical Use Case ....................................................................................... 260
  EMC Smarts InCharge IP Object List ................................................................................................ 260
  EMC Smarts InCharge IP Installation Notes ..................................................................................... 261
  EMC Smarts InCharge IP Supported Versions ................................................................................ 261
  EMC Smarts InCharge IP Configuration Settings ........................................................................... 261

The IPs for HP Tools ............................................................................................................................ 262
  The IP for HP Asset Manager .......................................................................................................... 262
  The IP for HP iLO and OA .............................................................................................................. 264
  The IP for HP Network Node Manager ............................................................................................. 266
  The IP for HP OpenView Operations (Unix - HPUX) ...................................................................... 268
  The IP for HP OpenView Operations (Unix - Solaris) ..................................................................... 270
  The IP for HP OpenView Operations (Windows) ............................................................................. 273
  The IP for HP OpenView Service Desk ............................................................................................ 275
  The IP for HP Service Manager ....................................................................................................... 278

The IPs for IBM Tools .......................................................................................................................... 280
  The IP for IBM Tivoli Enterprise Console ......................................................................................... 280
  The IP for IBM Tivoli Netcool Omnibus ............................................................................................ 282
  The IP for IBM Tivoli Storage Manager ............................................................................................ 284

The IP for Microsoft Active Directory .................................................................................................. 286
  Microsoft Active Directory 2 IP Typical Use Case .......................................................................... 286
  Microsoft Active Directory 2 IP Object List .................................................................................... 287
  Microsoft Active Directory IP 2 Installation Notes .......................................................................... 288
9 Integration with System Center Operations Manager

Requirements

Opalis Integration Server 6.3

System Center Operations Manager 2007

Installing the SCOM IP

Configuring the SCOM IP

Connectivity Requirements

Granting Access to the Connection Account

Configuring the Connection Account

Objects at a Glance

Objects in Depth

Use Case Scenarios

Incident Remediation

Server Maintenance Mode

Branch Office Maintenance Mode

Summary

10 Integration with System Center Service Manager

Requirements

Opalis Integration Server 6.3
11 Integration with System Center Configuration Manager

Requirements ................................................................. 331
Opalis Integration Server 6.3 ............................................... 331
System Center Configuration Manager 2007 ........................................ 332
Installing the SCCM IP .......................................................... 332
Configuring the SCCM IP .................................................. 332
Creating the Connection Account ........................................ 332
Granting Access to the Connection Account ......................................... 333
Connectivity Requirements .................................................. 335
Objects at a Glance ............................................................ 335
Objects in Depth ............................................................... 335
Use Case Scenarios ............................................................ 338
Creating and Populating a Collection .................................... 338
Checking Compliance .......................................................... 341
Advertising Software .......................................................... 344
Summary ........................................................................... 346

12 Integration with System Center Virtual Machine Manager

Requirements ................................................................. 347
Opalis Integration Server 6.3 ............................................... 347
System Center Virtual Machine Manager 2008 ........................................ 348
Security Credentials ......................................................... 348
Installing the VMM IP .......................................................... 348
Configuring the VMM IP .................................................. 348
Connectivity Requirements .................................................. 348
Granting Access to the Connection Account ......................................... 349
Configuring the Connection Account ........................................ 349
Objects at a Glance ............................................................ 351
Objects in Depth ............................................................... 352
Use Case Scenarios ............................................................ 355
## 13 Integration with System Center Data Protection Manager

### Requirements

- Opalis Integration Server 6.3
- System Center Data Protection Manager 2010
- Windows Management Framework

### Installing the DPM IP

### Configuring the DPM IP

### Objects at a Glance

### Objects in Depth

### Use Case Scenarios

- Creating a Recovery Point
- Protecting a Data Source
- Recovering a SQL Database
- Checking DPM Server Storage Capacity

### Summary

---

## 14 Data Center Scenarios

### Requirements in the Dynamic Data Center

### Use Case Scenarios

- Server Maintenance and Reboot
- Virtual Machine Provisioning and Configuration
- Bulk User Account Provisioning

### Summary

---

## 15 The Quick Integration Kit

### Overview of QIK

- Options and More Options
- Planning Your QIK Project

### Installing QIK

- Installation Prerequisites
- Running the Installer
- Actions Performed by the Installer
- Your IDE and the QIK Resources
- Installing the QIK Integration Packs

### QIK CLI Wizard

### QIK SDK
<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>SDK Prerequisites</td>
<td>433</td>
</tr>
<tr>
<td>SDK Features and Functionality</td>
<td>433</td>
</tr>
<tr>
<td>QIK API</td>
<td>434</td>
</tr>
<tr>
<td>QIK Programming Models</td>
<td>435</td>
</tr>
<tr>
<td>QIK Project Process</td>
<td>436</td>
</tr>
<tr>
<td>QIK Code Samples</td>
<td>437</td>
</tr>
<tr>
<td>Creating Integration Packs</td>
<td>445</td>
</tr>
<tr>
<td>The QIK Wizard</td>
<td>445</td>
</tr>
<tr>
<td>Using the QIK Wizard</td>
<td>445</td>
</tr>
<tr>
<td>Deploying QIK Objects</td>
<td>456</td>
</tr>
<tr>
<td>Test Mode</td>
<td>456</td>
</tr>
<tr>
<td>Ready for Production</td>
<td>462</td>
</tr>
<tr>
<td>Summary</td>
<td>467</td>
</tr>
</tbody>
</table>

**Appendixes**

<table>
<thead>
<tr>
<th>Section</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>A Support and Troubleshooting</td>
<td>469</td>
</tr>
<tr>
<td>Product Footprint</td>
<td>469</td>
</tr>
<tr>
<td>File System</td>
<td>469</td>
</tr>
<tr>
<td>Registry Structure</td>
<td>473</td>
</tr>
<tr>
<td>Running Processes and Services</td>
<td>475</td>
</tr>
<tr>
<td>Start Menu Programs</td>
<td>475</td>
</tr>
<tr>
<td>Background Executables</td>
<td>476</td>
</tr>
<tr>
<td>Datastore</td>
<td>477</td>
</tr>
<tr>
<td>Basic Troubleshooting</td>
<td>477</td>
</tr>
<tr>
<td>Common Questions</td>
<td>482</td>
</tr>
<tr>
<td>OOC Questions</td>
<td>485</td>
</tr>
<tr>
<td>Foundation Object Questions</td>
<td>486</td>
</tr>
<tr>
<td>Versions</td>
<td>488</td>
</tr>
<tr>
<td>Log History</td>
<td>489</td>
</tr>
<tr>
<td>Data Items Logged</td>
<td>490</td>
</tr>
<tr>
<td>Log Purging</td>
<td>491</td>
</tr>
<tr>
<td>Logging Levels</td>
<td>492</td>
</tr>
<tr>
<td>TraceLogger Options</td>
<td>493</td>
</tr>
<tr>
<td>Checking Logs</td>
<td>493</td>
</tr>
<tr>
<td>B Reference URLs</td>
<td>495</td>
</tr>
<tr>
<td>General Resources</td>
<td>495</td>
</tr>
<tr>
<td>Microsoft’s OIS Resources</td>
<td>496</td>
</tr>
<tr>
<td>Section</td>
<td>Page</td>
</tr>
<tr>
<td>----------------------------------------------</td>
<td>------</td>
</tr>
<tr>
<td>Additional Resources</td>
<td>498</td>
</tr>
<tr>
<td>Blogs</td>
<td>500</td>
</tr>
<tr>
<td>The System Center Family</td>
<td>501</td>
</tr>
<tr>
<td>Public Forums</td>
<td>501</td>
</tr>
<tr>
<td><strong>C Available Online</strong></td>
<td>503</td>
</tr>
<tr>
<td>PowerShell Resources for Maintenance Mode</td>
<td>503</td>
</tr>
<tr>
<td>Live Links</td>
<td>503</td>
</tr>
<tr>
<td><strong>Index</strong></td>
<td>505</td>
</tr>
</tbody>
</table>
About the Authors and Contributors

Charles Joy, senior technology evangelist at Microsoft, began working at small start-up firms and moved on to companies such as Raytheon, Unisys, and later Opalis Software. Charles was responsible for implementing the world’s largest OIS deployments. Charles has been a frequent presenter on OIS at MMS, TechEd (U.S., AU, and NZ), and numerous internal Microsoft conferences. He is also a frequent contributor on TechNet with a blog at http://blogs.technet.com/b/charlesjoy/.

Mark Gosson, senior technology evangelist at Microsoft, has worked in IT for more than 18 years. He worked at Opalis Software, Inc., from 2004 until its acquisition by Microsoft. At Opalis, he managed Field and Pre-Sales Engineering and was responsible for implementations at Opalis’s largest customers. Mark has been a frequent presenter on OIS at MMS, TechEd (U.S., AU, and NZ), and numerous internal Microsoft conferences.

Kerrie Meyler, System Center 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. She has presented at TechEd, MMS, and Microsoft product launches. Kerrie is the lead author of a number of books in the Unleashed series, including Microsoft System Center Operations Manager 2007 Unleashed (Sams, 2008), System Center Operations Manager 2007 R2 Unleashed (Sams, 2010), System Center Configuration Manager 2007 Unleashed (Sams, 2009), and System Center Service Manager 2010 Unleashed (Sams, 2011).

Pete Zerger, System Center MVP, focuses on System Center management and data center automation. He presents at Microsoft conferences such as MMS and TechEd and manages System Center Central (http://www.systemcentercentral.com). Pete was a contributing author to System Center Operations Manager 2007 R2 Unleashed and System Center Configuration Manager 2007 Unleashed. He also writes courseware for Microsoft Learning, including Course 50507A, “Designing and Automating Workflows with Microsoft System Center Opalis.”

Marcus Oh, System Center MVP, has more than 15 years of IT industry experience and is a technical manager for a large telecommunications provider. He specializes in Configuration Manager and Operations Manager. Marcus has written numerous articles for technology websites and blogs on OIS and other System Center products at http://marcusoh.blogspot.com/. Marcus runs the Atlanta Systems Management User Group (http://www.atlsmug.org) and coauthored Professional SMS 2003, MOM 2005, and WSUS (Wrox, 2006).

David Allen, System Center MVP, has more than 10 years of experience in the IT industry and is a systems management specialist. He has worked with OIS since the Microsoft acquisition, designing workflows and overseeing various levels of implementation. David presents at MMS, TechEd, and TechDays. He blogs at http://wmug.co.uk/blogs/aquilaweb/default.aspx and is the founder of http://www.scdpmonline.org.
Dedication

To IT professionals worldwide who use the System Center suite

Acknowledgments

Writing a book is an all-encompassing and time-consuming project, and this book certainly meets that description. The authors and contributors would like to offer appreciation to those who helped with System Center Opalis Integration Server 6.3 Unleashed.

Special thanks to Kaj Wierda, founding member and longtime Opalis employee, for his insight into the early years of ITPA. Thanks also to Akos Technology Services for lab assistance, to Scott Weisler of Akos for environment support, and to Michelle Cohen of Microsoft. Jeff Fanjoy, also of Microsoft, was invaluable as our technical editor.

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).
We Want to Hear from You!

As the reader of this book, you are our most important critic and commentator. We value your opinion and want to know what we’re doing right, what we could do better, what areas you’d like to see us publish in, and any other words of wisdom you’re willing to pass our way.

As an associate publisher for Sams Publishing, I welcome your comments. You can email or write me directly to let me know what you did or didn’t like about this book—as well as what we can do to make our books better.

Please note that I cannot help you with technical problems related to the topic of this book. We do have a User Services group, however, where I will forward specific technical questions related to the book.

When you write, please be sure to include this book’s title and author as well as your name, email address, and phone number. I will carefully review your comments and share them with the author and editors who worked on the book.

Email: feedback@samspublishing.com

Mail: Neil Rowe
Executive Editor
Sams Publishing
800 East 96th Street
Indianapolis, IN 46240 USA

Reader Services

Visit our website and register this book at informit.com/register for convenient access to any updates, downloads, or errata that might be available for this book.

ITPA is a powerful capability that can assist in streamlining Information Technology (IT) operations by removing much of the overhead associated with manual responses to IT problems. OIS enables you to capture and document processes that integrate across an entire IT organization. This is a core building block for the future of IT and is the foundation for the automation necessary to deliver cloud computing—self-adjusting tools of computing resources that can be tuned based on real-time events.

Microsoft acquired Opalis Software to augment its System Center line of management software. The Opalis purchase enables Microsoft to integrate Opalis’s process automation into its vision of the data center of the future. Microsoft does not sell Opalis as a separately licensed product; those of you already licensed for System Center with SMSE/D have the licensing rights for Opalis—you simply have to learn how to integrate it into your environment. That is the purpose of this book.

As part of the acquisition, Opalis Software released OIS 6.2.2, a remediated version of 6.2.1. Microsoft followed up with the release of OIS 6.3 in November 2010, which includes Windows Server 2008 support and Integration Packs (IPs) for products in the System Center suite. Because Microsoft chose to bring out a version of Opalis Integration Server without rebranding the software and while Opalis Software was still a subsidiary, it relies heavily on its 6.2.2
roots, particularly during the installation process. Moving forward, OIS 6.3 will be the last version of OIS. In March 2011, Microsoft announced System Center Orchestrator 2012, which will be the next version of the software it obtained with the Opalis acquisition.

How This Book Is Organized

This book is divided into four sections:


Part II, “Installation and Implementation,” steps through the product installation. Because Microsoft released version 6.3 of OIS while Opalis Software was still a subsidiary of Microsoft, there are some inherent differences installing OIS 6.3 compared with the rest of the System Center suite. These are covered in Chapter 4, “Installing Opalis Integration Server 6.3.” Chapter 5, “Policy Basics,” begins the discussion of the different objects you can use to create your own policies. This goes into further depth in Chapter 6, “Foundation Objects,” and Chapter 7, “Implementation and Best Practices.”

Part III, “Integration Packs and the SDK,” focuses on integrating OIS into the data center through IPs. IPs are software components that plug into the larger OIS framework and are designed around a series of atomic tasks targeted to a specific application. OIS 6.2.2 ships with 28 IPs on the installation media integrating third-party software with the OIS engine, and with the 6.3 update, Microsoft added six additional IPs for System Center integration. The OIS 6.2.2 IPs are discussed in Chapter 8, “OIS Integration.” The System Center IPs are discussed in the following chapters:

- Chapter 9, “Integration with System Center Operations Manager”
- Chapter 10, “Integration with System Center Service Manager”
- Chapter 11, “Integration with System Center Configuration Manager”
- Chapter 12, “Integration with System Center Virtual Machine Manager”
- Chapter 13, “Integration with System Center Data Protection Manager”
Chapter 14, “Data Center Scenarios,” takes the System Center IPs to the next level by presenting examples that integrate objects from these IPs together in workflows and incorporate PowerShell to achieve true end-to-end automation. Just in case you still don’t have all the objects you need to accomplish your own integrations, Chapter 15, “The Quick Integration Kit,” gives you the tools to create your own IPs using the Quick Integration Kit (QIK).

By this time, you should have all the tools at your disposal necessary to become an OIS expert. The last section of the book includes three appendixes. Appendix A, “Support and Troubleshooting,” includes resources to assist you with problem solving, Appendix B, “Reference URLs,” incorporates useful references you can use for further information, and Appendix C, “Available Online,” is a guide to supplementary resources offered with the book that you can download from http://www.informit.com/store/product.aspx?isbn=9780672335617.

This book provides in-depth reference and technical information about Opalis Integration Server 6.3, as well as information on orchestrating with System Center and third party products through IPs. The material will be of interest for those shops using the System Center suite, Opalis Integration Server, and anyone interested in ITPA. Visit our website and register this book at informit.com/register for convenient access to any updates, downloads, or errata that might be available for this book.
This page intentionally left blank
When determining the best approach to deploy Opalis Integration Server (OIS), there are several factors to consider as you design an OIS instance. Before designing your instance, you should answer a number of questions about your environment, including network, domain structure, and location of your automation targets.

This chapter expands on the basic OIS architecture from Chapter 2, “Inside Opalis Integration Server 6.3,” and explains how the components interact with one another during policy execution. It also discusses the major deployment models and identifies where each model would be most beneficial. In addition to architecture, this chapter reviews how the various security models affect an OIS deployment. You can use OIS in a wide range of environments and security models, from small networks to managed service providers. Each presents different challenges and requires different solutions.

**Basic Architecture**

Chapter 2 discussed the OIS components and explained their purpose. This chapter examines those same components as they work together to create, check-in, and execute policies. Because the policy is the core element of all automation, orchestration, and integration, this chapter looks into the lifecycle of a policy and examines how the OIS components support the phases of that lifecycle. Figure 3.1 shows the main components of OIS.
columns in the Policies table. This updates the Published column from False to True and adds the current time to the Publishing Time column. (The term Published used by the datastore in this context is now archaic. In early versions of OIS 5.x, the Start button was labeled Publish, and because the database structure has not been fundamentally altered since then, the term Published remains.)

**Action Servers and Policy Instantiation**

Action Servers are designed to regularly update the datastore to report their heartbeat (every 15 seconds) and check if any new policies need to be executed (every 2 seconds). If there are no policies for the Action Server to run, it closes the connection and will retry in several seconds. However, if the Action Server finds a policy it can run, it gathers all the details about the policies from the related tables and then uses that information to instantiate an executable in memory. The name of the executable is always PolicyModule.exe (or PolicyModule.exe*32 on Windows 2008 systems as the PolicyModule.exe is a 32-bit application).

**PolicyModule.exe**

The Action Server instantiates one PolicyModule.exe for every submitted request to execute a policy. If a policy does not start with a Monitor object and a Start request is issued more than once, multiple instances of that policy can potentially run concurrently. This means if a given Action Server is running 17 policies, as viewed from the Operator Console, there will be 17 instances of PolicyModule.exe in memory at that time. Both active and idle (or monitoring) policies are in memory as PolicyModule.exe. As policies start, the Process ID (PID) of the policy is recorded to the datastore and is viewable from clients. In this way, a client can use the PID reported through logging to determine which instance of PolicyModule.exe belongs to a given policy.

There are two types of policies:

- **Ad hoc**
- **Monitored**

The mechanism is identical to check-in and start either type of policy, although the two behave differently when they execute. These policies are discussed in the following sections.

**Policy Behavior (Ad hoc)**

An *ad hoc policy* is any policy that does not begin with a monitor object. Ad hoc policies will load into memory as PolicyModule.exe and execute each object within the policy in turn until the policy runs out of objects along its given execution path. After the policy reaches its conclusion, the PolicyModule.exe exits and the policy terminates. An ad hoc policy does not reinstantiate until someone starts the policy again. However, if the policy is not permitted to finish normally (meaning it ends prematurely while there are still more objects along its given execution path)—perhaps caused by a server abend—the Action Server will not report the policy as completed to the datastore. As long as the
A policy runs until it is complete; if interrupted before finishing, it will start again. Every policy starts with the first object, regardless of whether it failed previously. It is possible to design a policy to check to see if it previously ended prematurely, reload the relevant data, and start again; however, this is not the default policy behavior. For more information on building restartable policies, see Chapter 7.

Policy Behavior (Monitor)

A monitored policy is any policy that begins with a monitor object. (These policies can only contain one monitor object.) Monitored policies are sometimes referred to as long running policies. A monitored policy begins like an ad hoc policy, started by a user or external trigger; but because the first object in the policy is a monitor, the conditions of that monitor will dictate when the rest of the policy will trigger.

As an example, if the first object in a monitored policy is a File Monitor configured to wait for a file named datalog.xls to appear in C:\Drop, the policy loads and begins monitoring the C:\Drop folder for datalog.xls. Until that file appears, the remaining objects in the workflow will not run. This policy might stay in memory indefinitely waiting on the desired condition to occur.

After the desired condition occurs, two things take place:

- As soon as the monitor condition for the first object is satisfied, a new PolicyModule.exe instantiates to replace the monitoring activity.
- The policy executes just as an ad hoc job would, following all the objects along its given execution path.

By instantiating a new PolicyModule.exe as soon as the monitor condition is satisfied, the monitoring is constant and uninterrupted. If you are familiar with how a Transmission Control Protocol (TCP) port listener behaves, you can use this as an analogous behavior. As soon as the socket on port 3389 is filled by an incoming Remote Desktop Protocol (RDP) connection, a new socket on the same port is created. Monitored polices behave in a similar fashion.

After a monitored policy is running, it will not stop on its own. The user or an external trigger will have to stop the policy.

In both situations (monitored and ad hoc), the desired outcome of the policy is not the relevant measure. Regardless of whether the desired outcome is success or failure as long as the policy executes all of objects in its path, the Action Server reports the policy as successfully completed. In terms of policy management by the datastore and the Action Servers, this completion is the only one that matters.
Figure 3.2 shows the registry location of the desktop heap, highlighting the Shared Windows Section. The value of the desktop heap for the noninteractive desktops is 768 in Windows Server 2008 (Figure 3.2) and 512 on Windows Server 2003.

**Estimating the Maximum Policy Count and Desktop Heap Size**

Before setting the desktop heap, estimate the maximum number of policies you expect an Action Server to run.

The desktop heap for the noninteractive desktops can be estimated by

\[(\text{Maximum # of concurrent policies}) \times 10 = (\text{Desktop Heaps})\]

As an example, if you want to run 100 concurrent policies, \(100 \times 10 = 1000\), rounding that number to the next highest memory size gives you 1024. The new value for the desktop heap in the registry segment would look like this:

```
SharedSection=1024,20480,1024
```

This example uses the estimate of 10K for a policy. After you have working examples of your policies, determine the actual value for your policies and revise the desktop heap size based on the actual value.

You will also want to consider that because the Service Control Manager creates a new desktop in the noninteractive window station for each service process running under a user account, increasing the desktop heap for non-interactive desktops reduces the number of user account services that can run on the system.
CAUTION: MAXIMUM TOTAL HEAP SIZE 48MB FOR WINDOWS 2003

On Windows 2003, the total desktop heap size must fit into the 48MB systemwide buffer. This means the total for all three heaps must be less that 48MB. On Windows 2008, the heap size is a dynamic kernel address range and not limited by the SessionViewSize.

Noninteractive sessions only have 20MB of the 48MB total available because Terminal Services are automatically enabled—which cuts the 48MB in half to 24MB. In addition, the System Interactive default allocation is 1024 (first value in the Shared attribute) and the Interactive Desktop is 3072 (second value in the Shared attribute), leaving only 20MB for all the noninteractive windows stations. SessionViewSize can be increased on a Windows Server 2003 computer; however, it has potentially significant impacts to other kernel memory resources and is not recommended.

Note that any command line interfaces (CLI) executed by the policies will consume desktop heap in the same Windows station as well. If you are a heavy user of Run Program objects or IPs that utilize CLI applications, consider increasing the 10KB value in your calculations to 15KB to ensure this is taken into account.

Increasing the Action Server's Desktop Heap
To increase the number of policies an Action Server can run, perform the following steps:

1. Increase the size of the desktop heap for noninteractive window stations on your Action Servers.
2. Modify the value of the ASPT on your Action Servers.
3. Reboot the Action Servers. Increasing the desktop heap is a Windows systemwide change and requires a reboot. Altering the ASPT requires you restart the Action Server Service.

You can find additional information about desktop heap in Knowledge Base (KB) article 184802, available at http://support.microsoft.com/kb/184802.

Policy Maximums Based on Operating System
OIS 6.3 Action Servers can run on Windows Server 2003 or 2008; the total number of concurrent policies supported by each operating system (OS) will differ. As the maximum total heap size for a Windows 2003 server is limited to 48MB, Action Servers on Windows 2003 are not able to run as many policies as those on Windows 2008 (assuming the heap size is maximized for each). The exact number of policies you can run should be determined by testing; however, you can use the following guidelines when estimating the maximum number of concurrent policies per Action Server:

- Windows 2003—250 concurrent policies
- Windows 2008—500 concurrent policies

These are only suggested maximums. Your Action Servers might not be able to run the maximums listed given other constraints. (As an example, if you have large policies, you might not be able to run 250 concurrent policies on a Windows 2003 Action Server.) You
might be able to run more policies than these maximums, but if you attempt to do so, be sure you understand the performance aspects and implications involved. Normally, you would want to add more Action Servers rather than risk over committing those Action Servers you have.

**NOTE: OIS 6.3 IS A 32-BIT APPLICATION**

OIS 6.3 runs on Windows 2008; however, the applications, including policymodule.exe, are 32-bit applications. Because of this, the OIS resources will not be able to take full advantage of the 64-bit operating system.

---

**Policy Size and Complexity**

The total number of objects and type of objects in a policy will change the memory footprint and resource consumption considerably. There are no good sizing guidelines, as policies can vary incredibly in size. A four-object policy that creates help desk incidents based on a SQL query easily consumes more resources than a user provisioning policy with 20 objects. Imagine if the SQL query produces 5,000 rows, which in turn creates 5,000 incidents in the help desk. That four-object policy is far more resource intensive than passing one set of user data through the 20-object policy.

**CPU and Memory Resources Also Affect Policy Limits**

CPU and memory resources and other typical performance metrics are more likely to apply to Windows 2008 Action Servers rather than those running on Windows 2003. The reason for this is Windows 2003 servers are limited to about 250 concurrent policies, and modern server hardware can generally handle that load quite easily. As Windows 2008 can run about twice as many policies, it is possible that normal performance resources might become strained.

All the performance aspects—heap size, operating system, policy size, and performance metrics—should be methodically tested using real-world data. This is the best and most reliable method to understand what impact your policies will have on your Action Servers. The estimates provided in this chapter are only the starting point for your calculations.

**Policy Queuing**

The ASPT sets the total number of concurrent policies an Action Server can run. When the ASPT is reached, if there is only one Action Server and it is running the maximum number of policies, any additional policies that are started will be queued. Policies that are queued remain in the queue until a running policy completes its execution, freeing up a policy slot. After there is a free policy slot, the first policy in the queue is instantiated on the Action Server. Policies are taken from the policy queue in a first in, first out (FIFO) model. Unfortunately, there is no easy way to see how many policies are queued or which policies are queued. Queued policies are stored in the POLICY_PUBLISH_QUEUE table in the data-
base; to determine how many policies were queued, you can view the contents of that table. The OOC policy view totals include queued policies, but there is no way to filter on queued policies as you can with those that are running.

**Policy Spillover**

When you have more than one Action Server, policies begin executing on the Primary Action Server (PAS), and continue to execute on the PAS until the ASPT for that server is reached. After the PAS reaches its ASPT (and only then), policies begin executing on the Standby Action Server (SAS). The SAS is used only when the PAS reaches its ASPT. As soon as there is at least one free policy slot on the PAS, new policies resume executing there. Figure 3.3 shows the list of Action Servers and their priority, which can be set in the OIS Client.

As an example, if your ASPT is set to 50 for all Action Servers and the PAS is running 50 policies, the next policies that start will run on the SAS. However, if at any point one or more of the PAS's policies complete, the PAS would then be assigned policies again until it again reaches its ASPT.

There is no consideration given to the fact that the SAS might be idle when assigning policies. The PAS must reach its ASPT before policies “spillover” onto the SAS. Should you have more than one SAS, policies begin loading on the PAS, then spillover to the first SAS, and only then to the second SAS. Policies always attempt to load on the highest-ranking Action Server. (You can change the ranking order and role of Action Servers using the OIS Client.)

Regardless of how many Action Servers are available, policies will fill the PAS before spilling over to the SAS and will fill the first SAS before spilling over to the second SAS.
and so on. This is not a load balancing mechanism; it is much more helpful to think about the mechanism as spillover.

After all the Action Servers have reached their ASPT, any additional policies that are started will be queued. These queued policies will run as soon as a policy slot frees up on any of the Action Servers, but will always prefer the highest-ranking Action Server if more than one become free.

**Policies Assigned to Specific Action Servers**

The only time policy execution does not follow the standard spillover model is when a policy is set to Override Default Action Server Roles. This setting changes which Action Server acts as the PAS and SAS for the context of that specific policy. If a policy is configured to run only on one Action Server, the effect would be the same as running the policy in a single Action Server environment.

Exercise caution when using Override Default Action Server Roles. If a policy is set to run on a specific Action Server and that server has reached its ASPT, the policy must wait for a free policy slot regardless of how many other Action Servers have availability. If more than one Action Server is set using Override Default Action Server Roles, you can configure the rankings between the servers (and those will spill over according to the normal spill over rules), but the policy will run only on Action Servers in that list, even if others are free. Figure 3.4 shows a policy using the Override Default Action Server Roles feature.

![Pictire 3.4 A Policy that is overriding the default Action Server settings](image)

**Policy Failover**

When a policy is running and the Action Server where it is running fails, the policy restarts on another Action Server if one exists. When a policy fails over from one Action Server to another, it always restarts at the beginning of the policy, regardless of how many objects might have already completed in the policy that was lost when the Action Server failed.
Deployment Models

There are a number of ways to deploy OIS in your environment. However, most implementations of OIS will fit into a small set of deployment models. The following sections will list the most common models for deploying OIS, explain where each model is best suited, and present the relative advantages and disadvantages of each.

Simple Deployment

The simple deployment model is the simplest and most basic deployment model for OIS. This model has all the OIS components installed on one server and can use either an existing SQL server or it might also have SQL running on the OIS server. Figure 3.5 shows a diagram of a simple OIS deployment.

![Simple deployment model](image)

This model is best suited for a proof of concept, or a limited pilot, and you can use it in a testing environment. However, the simple deployment model is not recommended for a production environment, as it does not provide any fault tolerance for the OIS components. In this model, you normally install all the OIS components on a single server and use an existing SQL instance to host the OIS datastore. If the datastore is also installed on the OIS server, the entire system is at risk if there is a failure.

NOTE: HAVING A POLICY PICK UP WHERE IT LEFT OFF

When a policy starts or is restarted, it always begins with the first object in policy. In some situations, this can be quite problematic, especially when executing the same objects again will cause issues in the infrastructure. In these cases, you can build your policy to check to see if it was running previously and include logic to determine what step it was on and then jump to the appropriate step. This will require a good deal of customization, but it is certainly possible.
Here are advantages of this model:

- Simplest model to install and configure
- Can run every component on a single server or virtual machine (VM)
- Limits licensing required

Here are the disadvantages:

- Does not provide policy failover
- All automation stops when server is offline
- Becomes a single point of failure especially if SQL is installed on the same server

**Resilient Deployment**

The resilient deployment model is most commonly used. This model is suitable from small businesses to large enterprises. The resilience is provided by having two or more Action Servers and clustering SQL Server. In this model the OIS components, the datastore, and automation targets are all on a centralized high-speed network.

For the purposes of this book, a centralized high-speed network is one in which average communication takes place in less than 50ms, and there is little or no data loss. Figure 3.6 shows a diagram of a resilient deployment model.

![Resilient deployment model](image)

**FIGURE 3.6** Resilient deployment model

---

**NOTE: USE N+1 FOR ALL IMPLEMENTATION MODELS**

This model, as with all those that follow, should use an N+1 formula to determine how many Action Servers are required (where \( N = \) the total number of Action Servers required to handle your maximum policy load). This provides an extra Action Server to take the policy load of any other Action Server that might fail.

This model is well suited for any implementation where the OIS components, datastore, and automation targets are all a centralized high-speed network.
Here are advantages of this model:

- Provides policy failover by having multiple Action Servers
- Provides resilient SQL through SQL clustering
- Provides a separate server to run the Action Server Watchdog service and provides alerting if an Action Server should fail
- Offers greater flexibility with additional Action Servers

Here are disadvantages:

- Additional resource demands because of extra Action Servers
- Additional resource demands from SQL clustering
- Additional management burden

**Cross-Network Deployment**

The cross-network deployment model is one in which Action Servers can reach across the network to perform automation on targets. This model is suitable for mid-size businesses or enterprises where remote sites have targets that require automation and are connected by a high-speed remote network, but these remote sites are ones in which it would be impractical or impossible to deploy an Action Server. Resilience is provided by having two or more Action Servers and by clustering SQL. In this model, the OIS components and the datastore are all on a centralized high-speed network and the automation targets are on high-speed remote networks.

For the purposes of this book, a high-speed remote network is one in which average communication takes places in less than 200ms, and there is little or no data loss. Figure 3.7 shows a diagram of a cross-network deployment model.
CAUTION: NOT ALL OBJECTS WILL PERFORM PROPERLY IN THIS MODEL

The cross-network model requires the remote automation target be within a 200ms latency bubble with the Action Server, but it is critical to note not every object within OIS will tolerate these connection latencies. If you want to implement this model, you will need to test the policies in your environment to confirm the objects do not timeout before they complete their primary functions.

This model is suited for any implementation where the OIS components and datastore are on a centralized high-speed network and where automation targets are on high-speed remote networks. Because not all objects will work over a remote network (see the “Caution” note in this section), this model might not be possible in every environment where it is desired.

Here are advantages of this model:

- Provides policy failover by having multiple Action Servers
- Allows Action Servers to reach into other networks to perform automation, especially when the Action Server cannot be placed in the remote network
- Provides resilient SQL through SQL clustering
- Provides a separate server to run the Action Server Watchdog service and provides alerting if an Action Server should fail
- Offers greater flexibility with additional Action Servers

Here are disadvantages:

- Additional resource demands because of extra Action Servers.
- Additional resource demands from SQL clustering.
- Not all policy objects can tolerate this model.
- Requires additional configuration of firewalls to allow traffic from any of the objects used to pass between sites.
- Additional management burden.

Cross-Network Action Servers

The cross-network action server model is one in which Action Servers are placed on a remote network to perform automation on targets there. This model is suitable for mid-size businesses or enterprises where remote sites have targets that require automation and they are connected by a high-speed remote network; these remote sites are ones in which it is possible deploy an Action Server. Resilience is provided by having two or more Action Servers and by clustering SQL. In this model, the Management Server, Action Server Watchdog, and the datastore are all on a centralized high-speed network, and the Action Servers are on high-speed remote networks with the automation targets. Figure 3.8 shows a diagram of a cross-network action server model.
3. Deployment Models

This model is suited for any implementation where the Management Server, Action Server Watchdog, and datastore are on a centralized high-speed network and where the Action Servers can be placed on the same high-speed remote network where the automation targets are located. This model requires that the remote network latency be less than 200ms. There must be little or no data loss; otherwise, this model will fail. Latency speeds in the 10-30ms range are recommended.

Here are advantages of this model:

- Provides policy failover by having multiple Action Servers
- Allows Action Servers to reside on remote networks to perform automation, assuming the network performance allows this
- Provides resilient SQL through SQL clustering
- Provides a separate server to run the Action Server Watchdog service and provides alerting if an Action Server should fail
- Can be used in some environments where the cross-network deployment model cannot

Here are disadvantages:

- Additional resource demands because of extra Action Servers
- Additional resource demands from SQL clustering
- Action Servers will tolerate only excellent network conditions in this model; without excellent conditions they will lose connectivity to the datastore
- Requires additional configuration of firewalls to allow SQL traffic between the sites
- Additional management burden
Multisite Manual Policy Sync

In some environments, the network performance will not be suitable to separate Action Servers from the datastore. If this is the case, it will be necessary to have one installation of the OIS components, including the datastore, at each location that requires automation. OIS installations are always standalone, and they will not communicate natively or share any data between installations (even when on the same network).

A multisite manual policy sync model is one where two or more installations of OIS are in use and there is a requirement or desire to use the policies on all installations. Because these installations will not be able to communicate with one another natively, policies that need to be shared must be exported manually and imported at the target OIS installation. This model provides a method to transfer policies but not policy data. Figure 3.9 shows a diagram of multisite manual policy synchronization.

![Diagram of Multisite Manual Policy Synchronization](image)

**FIGURE 3.9 Manual policy sync model**

**NOTE: USE CARE WHEN IMPORTING POLICIES**

There are a number of considerations when importing policies from other installations, just as when you promote a policy from testing to production. Refer to Chapter 7 for information.

This model is best suited for environments where network conditions require several installations of OIS and these installations need to transfer policies with one another. Using a manual process to transfer policies between is not a desirable solution given the effort involved, but if more than one installation is required, there is no other way to transfer the policies.
This model is best suited for environments where data needs to be shared between OIS installations or where one OIS installation provides a critical service to others (such as trouble ticket creation).

Here are advantages of this model:

- Allows policies to interact with remote installations and networks
- Allows OIS data to be shared between remote installations
- Has all the advantages of a resilient model
- Allows any networked OIS instance to trigger a specific function on another OIS instance
- Offers flexibility in having differing policies at different locations
- Allows policy execution across untrusted environments by providing credentials at the connection point using the Invoke Web Services object

Here are disadvantages:

- Requires special development of all policies to accept or transfer data
- Requires the Operator Console be installed on target OIS systems
- At risk for failure if network connection is lost

**Multisite Hybrid Solution**

The multisite hybrid solution is a combination of both the multisite manual sync and the invoked Web Services model. It provides a method to use the same policies in separate installations while also allowing those installations to communicate with one another at runtime and share data. Figure 3.11 shows a diagram of a multi-site hybrid solution.
This model is best suited for environments where data needs to be shared between OIS installations or where one OIS installation provides a critical service to others (such as trouble ticket creation) while also providing common policies to multiple installations.

Here are advantages of this model:

- Provides a method for using the same policies on remote OIS installations
- Can provide uniform automation to several remote sites
- Has all the advantages of a resilient model
- Allows policies to interact with remote installations and networks
- Allows OIS data to be shared between remote installations
- Offers flexibility in what policies are loaded to which installation

Here are disadvantages:

- Requires special development of all policies to accept or transfer data
- Requires the OOC be installed on target OIS systems
- Requires manual effort to import or export
- At risk for failure if network connection is lost
- Installations have potential to become out of sync with one another

**Multisite Isolated Deployment**

If your environment’s network performance is not suitable to separate your Action Servers from the datastore or security limitations make this a necessity, but you still need automation on remote sites, you will use an isolated deployment. In this situation, you will need to use a multisite isolated deployment model. This model is simply several unrelated installations that share no information or policy imports. Figure 3.12 shows a diagram of an isolated multisite OIS deployment model.

This model is used only when there is no desire or no way to share data or policies between installations. This model is rarely used.

Here are advantages of this model:

- Each installation is highly available
- Provides resilient SQL through SQL clustering
- Has all the advantages of a resilient model
- Provides a separate server to run the Action Server Watchdog service and provides alerting if an Action Server should fail

Here are disadvantages:

- No data is shared between installations
- All policies are designed and implemented separately
Security Models

There are a number of security models to use with your OIS implementation. The following sections list the most common security models for OIS implementations and explain the limitations of each model. The discussion does not list advantages or disadvantages, as the existing security infrastructure is not likely to change because of the addition of OIS.

Single Domain Security

The single domain security model is where all OIS components are used within a single Active Directory domain. This is the normal model used by most installations and the one for which OIS was primarily designed. There are no special considerations for using this model; the account used by Action Server service is the default privilege for all policies and should not present any challenges because all the resources are within the same domain. Figure 3.13 shows a diagram of a single domain security model.

Federated Domains

The federated domain security model is where all OIS components are used within a single Active Directory domain but the Action Servers act against automation targets in a second domain for which a trust relationship exists. This model is less common, although used by
A

accessing OOC (Opalis Operator Console), 140
Action Server Policy Throttle (ASPT), 60
Action Server section (OIS Client Connections window), 117-118
Action Server view (OOC), 142
Action Server Watchdog Service, as required component, 32. See also OpalisActionServerWatchdog
Action Servers, 39-45
  clustering, 484-485
  connectivity, 40-43
  cross-network Action Servers deployment model, 70-71
  installation, 94-97
  number needed, 484
  OpalisActionService, 39-40
  policy failover, 66-67
  policy lifecycle
    policy instantiation, 58
    PolicyModule.exe, 58-59
  policy limits
    desktop heap limitations, 61-63
    operating system limitations, 63-64
  policy spillover, 65-66
  PolicyModule.exe, 43-44
  redundancy, 44-45
  as required components, 32
  service account, 82
Action Servers tab (policy properties), 147-148
ad hoc policies, 58-59, 214-215
Add Computer to Collection object, 335
Add/Edit Parameter dialog, CLI Wizard (QIK), 422-424
adding
  link filters, 134-135
  Published Data (PD) to Data Bus, 137-139
Advanced tab (object properties)
  Invoke Web Services object, 168
  Run .Net Script object, 165-166
  Run Program object, 160-161
  Run SSH Command object, 172
  Send Email object, 174-176
Advertise Task Sequence object, 336
advertising software use case, SCCM IP, 344-345
Allow Empty Comment on Check In option (OIS Client), 126
Alternate Icon tab (object properties), 155-156
API for QIK SDK, 434
Append Line object, 182
Apply XSLT object, 194
architecture design. See also components of OIS (Opalis Integration Server)
  deployment models, 67-76
    cross-network Action Servers, 70-71
    cross-network deployment, 69-70
    multisite hybrid solution, 74-75
    multisite invoke via Web Services, 73-74
    multisite isolated deployment, 75-76
    multisite manual policy sync, 72-73
    resilient deployment, 68-69
    simple deployment, 67-68
  policy failover, 66-67
  policy lifecycle, 56-59
    check in, 56-57
    dormant policy, 57
    policy instantiation, 58
  policyModule.exe, 58-59
    starting policy, 57-58
  policy limits, 60-64
    ASPT (Action Server Policy Throttle), 60
    CPU and memory resource limitations, 64
    desktop heap limitations, 61-63
    maximum running policies, 60-61
    operating system limitations, 63-64
    policy size and complexity, 64
  policy queueing, 64-65
  policy spillover, 65-66
  security models, 76-77
    federated domains, 76-77
    single domain security, 76
    untrusted security, 77
Arguments tab (Add/Edit Command dialog), CLI Wizard (QIK), 421-422
ASPT (Action Server Policy Throttle), 60
aspt.exe utility, 33
Assembly Details screen, CLI Wizard (QIK), 416
Assembly Information screen, CLI Wizard (QIK), 417-419
atlc.exe utility, 33
Audit History window (OIS Client), 124
Audit Trail, file system locations, 473
Authoring Console. See OIS Client
Automatic Check Out option (OIS Client), 125
automating change use case, SCCM IP, 323-330
automation
  Microsoft automation platform, 8-11
    Data Bus, 9
    flexibility of, 9-10
    ITPA (Information Technology Process Automation), 10-11
    after OIS acquisition, 8-9
    prior to OIS acquisition, 8
    results of, 11
    in OIS (Opalis Integration Server), 6
AVIcode, product description, 12
background executables, in product footprint (OIS), 476-477
backing up policies, 229-230
backup management, OIS (Opalis Integration Server) integration with, 14
Basic PD, 137
best practices
  backing up policies, 229-230
  complex link logic, 210-211
  data manipulation and parsing, 216-221
    data manipulation functions, 217-218
    Query Database object, 219
    Run .Net Script object, 219-221
  error handling, 222-225
  external data persistence, 231-235
  hardcoded versus dynamic data, 221-222
  looping, 212-213
    object-level looping, 212-213
    policy-level looping, 213
  naming conventions, 226-227
  permissions, 225-226
  promotion, 230-231
  scheduling, 214-216
    applying to policies, 214-216
    Check Schedule object, 214
  versioning, 228-229
BladeLogic Operations Manager IP, 238-240
“Blank” variable, 119
blogs for information, 500
BMC Atrium CMDB IP, 240-243
BMC Event Manager IP, 243-244
BMC Patrol IP, 245-247
BMC Remedy AR System IP, 247-249
BPA (Business Process Automation), 24-25
BPM (Business Process Management), 24-25
branching policies, 134-136
  adding filters, 134-135
  default filter, 134
  include/exclude filters, 135
breakpoints, setting, 131
bulk processing in dynamic data center, 382
bulk user account provisioning use case, 391-394
Business Process Automation (BPA), 24-25
Business Process Management (BPM), 24-25

C

CA AutoSys IP, 250-252
CA eHealth IP, 252-254
CA Spectrum IP, 254-256
CA Unicenter NSM IP, 256-257
CA Unicenter Service Desk IP, 257-259
CAP (Connector Access Pack), 18
capacity and lifecycle management use case, VMM IP, 363-366
categories of OIS components, 30-31
change management
  in dynamic data center, 382
  OIS (Opalis Integration Server) integration with, 13
check in, in policy lifecycle, 56-57
Check Schedule object, 192, 214
checking compliance use case, SCCM IP, 341-344
checking DPM server storage capacity use case, DPM IP, 378-379
checking policies in/out, 132
CLI scripting support, in QIK (Quick Integration Kit), 399
CLI Wizard (QIK), 415-432
  Add/Edit Parameter dialog, 422-424
  Arguments tab (Add/Edit Command dialog), 421-422
Assembly Details screen, 416
Assembly Information screen, 417-419
Command Line syntax, 424-426
Commands screen, 419-421
Published Data tab (Add/Edit Command dialog), 426-430
client user interface for OIS (Opalis Integration Server), 6. See also OIS Client
close resolved incidents use case, SCSM IP, 318-320
clustering Action Servers, 484-485
CMDBs, 26
“code or script” objects, 154
Command Line syntax, CLI Wizard (QIK), 424-426
Command mode, Program mode versus, 160
Commands screen, CLI Wizard (QIK), 419-421
Common PD, 137-138
Compare Values object, 194
complex link logic, 210-211
components of OIS (Opalis Integration Server), 29-32, 55. See also architecture design
   Action Servers, 39-45
categories of, 30-31
Management Server, 48-52
OIS Client, 45-48
Opalis Operator Console (OOC), 52-54
optional components, 31, 471-473
required components, 32, 470-471
SQL Datastore, 32-39
trace logging, 493
versions of, 488-489
Compress File object, 193
Computer Groups section (OIS Client Connections window), 117
configuration management, OIS (Opalis Integration Server) integration with, 13
Configuration Manager. See also SCCM IP
   OIS (Opalis Integration Server) integration with, 13
product description, 12
as SCCM IP requirement, 332
configuration objects in SQL Datastore, 33-34
configuration settings
   BladeLogic Operations Manager IP, 239-240
   BMC Atrium CMDB IP, 242-243
   BMC Event Manager IP, 244
   BMC Patrol IP, 247
   BMC Remedy AR System IP, 249
   CA AutoSys IP, 251-252
   CA eHealth IP, 253-254
   CA Spectrum IP, 256
   CA Unicenter Service Desk IP, 259
   EMC Smarts InCharge IP, 261-262
   HP Asset Manager IP, 263-264
   HP iLO and OA IP, 265
   HP Network Node Manager IP, 267-268
   HP OpenView Operations HPUX IP, 269-270
   HP OpenView Operations Solaris IP, 272
   HP OpenView Operations Windows IP, 274-275
   HP OpenView Service Desk IP, 277
   HP Service Manager IP, 279-280
   IBM Tivoli Enterprise Console IP, 281-282
   IBM Tivoli Netcool Omnibus IP, 284
   IBM Tivoli Storage Manager IP, 286
   Microsoft Active Directory 2 IP, 289
   Unix IP, 292-293
   Veritas NetBackup IP, 294
   VMware vSphere IP, 297
configuring
   DPM IP, 369-370
   objects, 127-128
   QIK objects, 458-461
   SCCM IP, 332-335
   SCOM IP, 300-301
   SCSM IP, 314-315
   VMM IP, 348-350
Connect tab (object properties), Send Email object, 174-176

Connection account
- SCCM IP
  - creating, 332-333
  - granting access to, 333-334
- SCOM IP
  - configuring, 301
  - granting access to, 301
- VMM IP
  - configuring, 349-350
  - granting access to, 349

Connection tab (object properties), Query Database object, 161-163

Connections window (OIS Client), 116-120
- Action Server section, 117-118
- Computer Groups section, 117
- Global Settings section, 118-120
- Policies section, 116-117

Connectivity
- of Action Servers, 40-43
- SCCM IP requirements, 335
- SCOM IP requirements, 300
- VMM IP requirements, 348

Connector Access Pack (CAP), 18

Connectors, ITPA (Information Technology Process Automation) versus, 28

Copy File object, 182

Counters, 118, 184-187
- Get Counter Value object, 185-186
- Modify Counter object, 185
- Monitor Counter object, 186-187
  - as semaphores, 118

CPU limitations, policy limits, 64

Create Advertisement object, 336
Create Alert object, 303
Create Change with Template object, 316
Create Checkpoint object, 352
Create Collection object, 336
Create Disk from VHD object, 352
Create Folder object, 183
Create Incident with Template object, 316
Create Network Adapter object, 352
Create New Disk object, 352
Create Object object, 316
Create Recovery Point object, 371
Create Related Object object, 316
Create Relationship object, 316
Create VM from Template object, 353
Create VM from VHD object, 353
Create VM from VM object, 353

Creating a recovery point use case, DPM IP, 372-375
Creating and populating a collection use case, SCCM IP, 338-341
Cross-network Action Servers deployment model, 70-71
Cross-network deployment model, 69-70

Custom Start object, 145, 178

Data Bus, 9, 484
- Published Data (PD) on, 136-140
  - adding, 137-139
  - subscribing to, 139-140
  - types of, 139

Data Center Integration, 17
data centers
- Dynamic data center
  - bulk user account provisioning use case, 391-394
  - requirements, 382-383
  - server maintenance and reboot use case, 383-386

How can we make this index more useful? Email us at indexes@samspublishing.com
virtual machine provisioning and configuration use case, 386-391
transformation with System Center Suite, 14-15
data manipulation and parsing, 216-221
data manipulation functions, 217-218
Query Database object, 219
Run .Net Script object, 219-221
data persistence, 231-235
Data Protection Manager. See also DPM IP
as DPM IP requirement, 368
OIS (Opalis Integration Server) integration with, 14
product description, 12
Database Configuration Utility, 33
database integration, troubleshooting, 483
dat astore. See SQL Dat astore
Declarative model (QIK SDK), 435, 437-442
Decompress File object, 193
default filter, 134
Delete Collection object, 336
Delete File object, 183
Delete Folder object, 183
Delete Line object, 182
Delete Relationship object, 316
dependencies, OIS 6.3 installation, 79-80
Dependencies screen (QIK Wizard), 450-451
Deploy Software Update object, 337
deploying IPs (Integration Packs), 102-104
Deployment Manager, 33
Action Server installation, 94-97
IP (integration pack) installation, 99-104
OIS 6.3 installation, 94
OIS Client installation, 97-99
deployment models, 67-76
for Action Servers, 42-43
cross-network Action Servers, 70-71
cross-network deployment, 69-70
multisite hybrid solution, 74-75
multisite invoke via Web Services, 73-74
multisite isolated deployment, 75-76
multisite manual policy sync, 72-73
resilient deployment, 68-69
simple deployment, 67-68
deployment styles in QIK (Quick Integration Kit), 399, 456-467
production mode deployment, 462-467
test mode deployment, 456-461
desktop heap limitations, 61-63
Details tab (object properties), 154-155
Custom Start object, 178
Get Counter Value object, 185-186
Invoke Web Services object, 167-168
Junction object, 179-180
Modify Counter object, 185
Monitor Counter object, 186-187
Publish Policy Data object, 180
Query Database object, 161-163
Query WMI object, 170
Run .Net Script object, 164-165
Run Program object, 159-160
Run SSH Command object, 171
Send Email object, 174-176
Send Event Log Message object, 176-177
Send Platform Event object, 176
Trigger Policy object, 178-179
development methods in QIK (Quick Integration Kit), 398
disaster recovery, OIS (Opalis Integration Server) integration with, 14
Disconnect Network Path object, 194
Do Not Exit tab (object-level looping), 213
documentation
folder location in QIK installation, 408-409
of processes, 26-27
dormant policy, 57
downloading
  OIS 6.3 installation media, 83-84
  OOC installation files, 107

DPM IP
  configuring, 369-370
  objects, 370-372
  requirements, 367-368
  use cases, 372-379
    checking DPM server storage capacity, 378-379
    creating a recovery point, 372-375
    protecting a data source, 375
    recovering a SQL database, 375-378

dragging and dropping objects, 127

dynamic data center
  requirements, 382-383
  use cases
    bulk user account provisioning, 391-394
    server maintenance and reboot, 383-386
    virtual machine provisioning and configuration, 386-391

dynamic versus hardcoded data, 221-222

E

e-mail and notification objects, 174-177
  Send Email object, 174-176
  Send Event Log Message object, 176-177
  Send Platform Event object, 176
EMC Smarts InCharge IP, 260-262
End Process object, 192
environment variable setup, OOC installation, 108
%ENVVAR% variable, 119
error handling, 222-225, 382
Event Notifications tab (policy properties), 149
  events in OOC (Opalis Operator Console), 144
  Events window (OIS Client), 121-122
examples, folder location in QIK installation, 409-410
exclude filters, 135
executables, folder location in QIK installation, 406-407
Execution mode, Run Program object, 161
Exit tab (object-level looping), 212-213
exporting
  policies, 151
  policy groups, 151
  policy XML exports, 229-230
extensibility objects, 157-173
  Invoke Web Services object, 167-168
  Query Database object, 161-163
  Query WMI object, 169-170
  Run .Net Script object, 163-166
  Run Program object, 158-161
  Run SSH Command object, 170-172
  SNMP objects, 172-173
external data persistence, 231-235
extracting files, OOC installation, 108-109

F

federated domains security model, 76-77
File Information Data Storage, Foundation objects use case, 196-197
file management objects, 181-184, 193
file system for OIS files, 469-473
Filter Email object, 191
filters. See link filters
Find Text object, 194
“flattened objects do not produce multi-value data” policy engine rule, 205-206
flattening multi-value PD items, 207-208
flexibility of OIS (Opalis Integration Server), 9-10

How can we make this index more useful? Email us at indexes@samspublishing.com
folder locations, QIK (Quick Integration Kit) installation, 406-410

footprint (OIS). See product footprint (OIS)

Format Date/Time object, 194

Foundation objects, 153. See also objects
  anatomy of, 153-156
  counters, 184-187
    Get Counter Value object, 185-186
    Modify Counter object, 185
    Monitor Counter object, 186-187
  email and notification objects, 174-177
    Send Email object, 174-176
    Send Event Log Message object, 176-177
    Send Platform Event object, 176
  extensibility objects, 157-173
    Invoke Web Services object, 167-168
    Query Database object, 161-163
    Query WMI object, 169-170
    Run .Net Script object, 163-166
    Run Program object, 158-161
    Run SSH Command object, 170-172
  SNMP objects, 172-173

Legacy objects, 187-191
  alternate usage, 188-189
  Filter Email object, 191
  Process Email object, 191
  Read Email object, 190
  Wait object, 189-190

miscellaneous objects, 191-194
  file management objects, 193
  monitoring objects, 193
  notification objects, 194
  scheduling objects, 192
  system objects, 192
  text file management objects, 194
  utilities, 194
  properties, 154

functions, data manipulation, 217-218

G

General tab
  object properties, 155
  policy properties, 147

Generate Random Text object, 194
Get Activity object, 317
Get Advertisement Status object, 337
Get Alert object, 303
Get Checkpoint object, 353
Get Collection Member object, 337
Get Computer/IP Status object, 193
Get Counter Value object, 185-186
Get Data Source object, 371
Get Disk object, 353
Get Disk Space Status object, 193
Get DPM Server Capacity object, 371
Get File Status object, 183
Get Internet Application Status object, 193
Get Lines object, 182

text and file management objects, 181-184
troubleshooting, 486-488
use cases, 195-199
  File Information Data Storage, 196-197
  password reset and service account synchronization, 195
  ticketing system synchronization, 195-196
  Web Services TerraServer Querying, 197
  Windows Event Scan with Query WMI, 198-199
workflow control objects, 177-181
  Custom Start object, 178
  Junction object, 179-180
  Publish Policy Data object, 180-181
  Trigger Policy object, 178-179
Get Monitor object, 303-304
Get Network Adapter object, 353-354
Get Object object, 317
Get Process Status object, 193
Get Recovery Point object, 371
Get Relationship object, 317
Get Service Status object, 193
Get SNMP Variable object, 173
Get Software Update Compliance object, 337
Get VM object, 354
global configuration, QIK objects, 456-458
Global Settings section (OIS Client Connections window), 118-120
groups of policies, exporting, 151

H
haltable/restartable policies, 232-235
hardcoded versus dynamic data, 221-222
history
  of ITPA (Information Technology Process Automation), 24-27
  of Opalis Software, 15-22
    challenges in transition to Microsoft, 21-22
    introduction of OIS, 18-21
    Microsoft acquisition of, 21
    OpalisRendezVous, 15-16
    OpalisRobot, 15, 16-18
HP Asset Manager IP, 262-264
HP iLO and OA IP, 264-265
HP Network Node Manager IP, 266-268
HP OpenView Operations HPUX IP, 268-270
HP OpenView Operations Solaris IP, 272
HP OpenView Operations Windows IP, 273-275
HP OpenView Service Desk IP, 275-277
HP Service Manager IP, 278-280

IBM Tivoli Enterprise Console IP, 280-282
IBM Tivoli Netcool Omnibus IP, 282-284
IBM Tivoli Storage Manager IP, 284-286
IDE, QIK (Quick Integration Kit) installation, 410-415
Imperative model (QIK SDK), 436, 442-445
impersonation, Action Servers and, 42
importing policies, 151-152
incident remediation use case, SCOM IP, 305-307
incident/change management, OIS (Opalis Integration Server) integration with, 13
include filters, 135
Information Technology Process Automation (ITPA), 10-11
  connectors versus, 28
  history of, 24-27
  process review, 27-28
  transition to, 19
Insert Line object, 182
installation
  BladeLogic Operations Manager IP, 239
  BMC Atrium CMDB IP, 242
  BMC Event Manager IP, 244
  BMC Patrol IP, 246
  BMC Remedy AR System IP, 248-249
  CA AutoSys IP, 250
  CA eHealth IP, 253
  CA Spectrum IP, 255
  CA Unicenter NSM IP, 257
  CA Unicenter Service Desk IP, 258
  EMC Smarts InCharge IP, 261
  HP Asset Manager IP, 263
  HP iLO and OA IP, 265
  HP Network Node Manager IP, 267
  HP OpenView Operations HPUX IP, 269

How can we make this index more useful? Email us at indexes@samspublishing.com
HP OpenView Operations Solaris IP, 271-272
HP OpenView Operations Windows IP, 274
HP OpenView Service Desk IP 277
HP Service Manager IP, 279
IBM Tivoli Enterprise Console IP, 281
IBM Tivoli Netcool Omnibus IP, 283
IBM Tivoli Storage Manager IP, 285
Microsoft Active Directory 2 IP, 288
OIS 6.3
  Action Server installation, 94-97
  database creation and population, 87-90
  dependencies, 79-80
  Deployment Manager, 94
  downloading installation media, 83-84
  IP (integration pack) installation, 99-104
  licensing, 90-92
  Management Server installation, 85-87
  manual installation, 105-106
  OIS Client installation, 97-99
  OOC installation, 106-113
  patching, 93-94
  requirements, 80-83
  running installer, 84-85
  troubleshooting, 113-114
QIK (Quick Integration Kit), 401-415
  folder locations, 406-410
  IDE, 410-415
  IPs (Integration Packs), 415
  requirements, 401-402
  running installer, 402-405
SCOM IP, 300
Unix IP, 291
Veritas NetBackup IP, 293-294
VMware vSphere IP, 297
installation objects in SQL Datastore, 33-34
integration
  in OIS (Opalis Integration Server), 6
  options for, 397-398
Integration Packs (IPs). See IPs (Integration Packs)
Invoke .NET object,
Invoke Web Services object, 167-168
IPs (Integration Packs)
  BladeLogic Operations Manager IP, 238-240
  BMC Atrium CMDB IP, 240-243
  BMC Event Manager IP, 243-244
  BMC Patrol IP, 245-247
  BMC Remedy AR System IP, 247-249
  CA AutoSys IP, 250-252
  CA eHealth IP, 252-254
  CA Spectrum IP, 254-256
  CA Unicenter NSM IP, 256-257
  CA Unicenter Service Desk IP, 257-259
  creating, with QIK (Quick Integration Kit), 445-455
  described, 237-238
DPM IP
  configuring, 369-370
  objects, 370-372
  requirements, 367-368
  use cases, 372-379
EMC Smarts InCharge IP, 260-262
  folder location in QIK installation, 407
HP Asset Manager IP, 262-264
HP iLO and OA IP, 264-265
HP Network Node Manager IP, 266-268
HP OpenView Operations HPUX IP, 268-270
HP OpenView Operations Solaris IP, 272
HP OpenView Operations Windows IP, 273-275
HP OpenView Service Desk IP, 275-277
HP Service Manager IP, 278-280
IBM Tivoli Enterprise Console IP, 280-282
integer variables, counters as, 184
link filters, 134-136
  adding, 134-135
  default filter, 134
  include/exclude filters, 135
link handles, 126-127
links
  complex link logic, 210-211
  creating, 128
  defined, 127
  “links filter execution data” policy engine rule, 204
  properties, 136
“links filter execution data” policy engine rule, 204
Live Links, 503-504
locale settings, as SCSM IP requirement, 314
log history, 489-492
Log History window (OIS Client), 123
log purging, 491-492
Log window (OIS Client), 122-123
logging levels, 492-494
Logging tab (policy properties), 148
logs, viewing
  in OIS Client, 133
  in PTC, 130
looping, 212-213
  object-level looping, 212-213
  policy-level looping, 213
M
maintenance mode, PowerShell scripts for, 503
Manage Checkpoint object, 354
manage incidents use case, SCSM IP, 320-322
Management Server, 48-52
  additional components, 50-52
  installation, 85-87
OpalisActionServerWatchdog, 49-50
  policy lifecycle, check in, 56-57
  primary services, 48-49
  as required component, 32
  service account, 82
manual OIS 6.3 installation, 105-106
Map Network Path object, 194
Map Published Data object, 194
maximum running policies, 60-61
memory resource limitations, policy limits, 64
methods for policy execution process, 36
Microsoft
  acquisition of Opalis Software, 5, 21-22
  automation platform, 8-11
    Data Bus, 9
    flexibility of, 9-10
    ITPA (Information Technology Process Automation), 10-11
  after OIS acquisition, 8-9
  prior to OIS acquisition, 8
  results of, 11
  OIS resources for information, 496-498
  Opalis forums, 501
Microsoft Active Directory 2 IP, 286-289
Modify Counter object, 185
Monitor Alert object, 304
Monitor Computer/IP object, 193
Monitor Counter object, 186-187
Monitor Date/Time object, 192
Monitor Disk Space object, 193
Monitor Event Log object, 193
Monitor File object, 183
Monitor Folder object, 183, 193
Monitor Internet Application object, 193
Monitor .NET object, 458
Monitor Object object, 317
Monitor Process object, 193
Monitor Service object, 193
Monitor SNMP Trap object, 173
Monitor State object, 304
Monitor WMI object, 193
monitored policies, 59, 60, 216
monitoring objects, 126, 193
Move File object, 193
Move Folder object, 193
Move VM object, 354
multiplication effect (policy engine), 209-210
multisite hybrid solution deployment model, 74-75
multisite invoke via Web Services deployment model, 73-74
multisite isolated deployment model, 75-76
multisite manual policy sync deployment model, 72-73
multi-value PD items
  “flattened objects do not produce multi-value data” policy engine rule, 205-206
  flattening, 207-208
  handling, 206-207
  “run once for each multi-value PD item” policy engine rule, 203-204

nesting data manipulation functions, 218
.NET attributes in QIK (Quick Integration Kit), 435
.NET support in QIK (Quick Integration Kit), 398
notification objects, 174-177, 194
  Send Email object, 174-176
  Send Event Log Message object, 176-177
  Send Platform Event object, 176
NOW() variable, 119

OBJECTINSTANCEDATA table (OIS datastore), 38
object-level looping, 212-213
objects. See also Foundation objects
  in BladeLogic Operations Manager IP, 239
  in BMC Atrium CMDB IP, 241
  in BMC Event Manager IP, 244
  in BMC Patrol IP, 246
  in BMC Remedy AR System IP, 248
  in CA AutoSys IP, 250-251
  in CA eHealth IP, 253
  in CA Spectrum IP, 254-255
  in CA Unicenter NSM IP, 257
  in CA Unicenter Service Desk IP, 258
  configuring, 127-128
  defined, 126
  in DPM IP, 370-372
  dragging and dropping, 127
  in EMC Smarts InCharge IP, 260-261
  in HP Asset Manager IP, 262-263
  in HP iLO and OA IP, 264
  in HP Network Node Manager IP, 266
  in HP OpenView Operations HPUX IP, 268-269
  in HP OpenView Operations Solaris IP, 270-271
  in HP OpenView Operations Windows IP, 273-274

naming conventions, 226-227
navigating OIS Client, 115-116
  Audit History window, 124
  Connections window, 116-120
  Events window, 121-122
  Log History window, 123
  Log window, 122-123
  Objects window, 120-121
  Options menu, 124-126
  Workspace window, 120

How can we make this index more useful? Email us at indexes@samspublishing.com
in HP OpenView Service Desk IP, 275-277
in HP Service Manager IP, 278-279
in IBM Tivoli Enterprise Console IP, 280-281
in IBM Tivoli Netcool Omnibus IP, 283
in IBM Tivoli Storage Manager IP, 285
link handles, 126-127
links
creating, 128
defined, 127
properties, 136
in Microsoft Active Directory 2 IP, 287-288
monitor objects, 126
QIK object deployment, 456-467
production mode deployment, 462-467
test mode deployment, 456-461
QIK project process, 436
“run as often as object before you” policy engine rule, 202
“run once for each multi-value PD item” policy engine rule, 203-204
in SCCM IP, 335-338
in SCOM IP, 302-305
in SCSM IP, 315-317
in Unix IP, 290-291
in Veritas NetBackup IP, 293
in VMM IP, 351-355
in VMware vSphere IP, 295-296

Objects window
OIS Client, 120-121
QIK Wizard, 448-450

Object-Specific PD, 138-139
oedc.exe utility, 33

OIP files. See IPs (Integration Packs)

OIS (Opalis Integration Server)
advantages of, 7-8
automation, orchestration, integration in, 6
client user interface, 6
components, 29-32, 55
Action Servers, 39-45
categories of, 30-31
Management Server, 48-52
OIS Client, 45-48
Opalis Operator Console (OOC), 52-54
optional components, 31, 471-473
required components, 32, 470-471
SQL Datastore, 32-39
trace logging, 493
versions of, 488-489

history of Opalis Software, 15-22
challenges in transition to Microsoft, 21-22
introduction of OIS, 18-21
Microsoft acquisition of, 21
OpalisRendezVous, 15-16
OpalisRobot, 15, 16-18
job schedulers versus, 28
product description, 12
product footprint, 469-477
background executables, 476-477
in datastore, 477
file system, 469-473
Registry structure, 473-475
running processes/services, 475
Start Menu programs, 475-476
purpose of, 5-8
resources for information, 495-501
SCO (System Center Orchestrator) versus, 23-24
in System Center Suite, 11-12
troubleshooting
common questions, 482-488
policy troubleshooting, 477-482
workflows versus policies, 7

OIS 5.0, 18
Opalis forums, 501
Opalis Integration Pack File screen (QIK Wizard), 451-452
Opalis Integration Server. See OIS (Opalis Integration Server)
Opalis Operator Console (OOC). See OOC (Opalis Operator Console)
Opalis Software, history of, 15-22
    challenges in transition to Microsoft, 21-22
    introduction of OIS, 18-21
    Microsoft acquisition of, 5, 21
    OIS (Opalis Integration Server) integration with, 14
    OIS 6.3 installation, 93-94
    OIS 6.3 installation, 93-94
    OIS 6.3 installation, 93-94
    Operations Manager. See also SCOM IP
        OIS (Opalis Integration Server) integration with, 14
        as SCOM IP requirement, 299
optional components, 31, 471-473
Options menu (OIS Client), 124-126
orchestration in OIS (Opalis Integration Server), 6
Orchestrator. See SCO (System Center Orchestrator)

P

parsing data, 216-221
    data manipulation functions, 217-218
    Query Database object, 219
    Run .Net Script object, 219-221
PAS (Primary Action Server), policy spillover, 65-66
password reset and service account synchronization, Foundation objects use case, 195
patching
    OIS (Opalis Integration Server) integration with, 13
    OIS 6.3 installation, 93-94
Pause VM object, 355
PD. See Published Data (PD)
performance monitoring, OIS (Opalis Integration Server) integration with, 14
permissions
    for Action Servers, 41-42
    list of, 225-226
    for OOC (Opalis Operator Console), 142-144
persistence, 231-235
PGP Decrypt File object, 193
PGP Encrypt File object, 193
pic.exe utility, 34
pipeline mode, legacy mode versus, 209-210
planning QIK (Quick Integration Kit) projects, 400
policies
    applying schedules to, 214-216
    automatic import/export, 484
    best practices
        backing up policies, 229-230
        complex link logic, 210-211
        data manipulation and parsing, 216-221
        error handling, 222-225
        external data persistence, 231-235
hardcoded versus dynamic data, 221-222
looping, 212-213
naming conventions, 226-227
permissions, 225-226
promotion, 230-231
scheduling, 214-216
versioning, 228-229
branching, 134-136
adding filters, 134-135
default filter, 134
include/exclude filters, 135
checking in/out, 132
creating, 126-128
configuring objects, 127-128
dragging and dropping objects, 127
link handles, 126-127
linking objects, 128
links, 127
monitor objects, 126
objects, 126
execution. See policy engine
exporting, 151
exporting groups of, 151
importing, 151-152
log history, 489-492
log purging, 491-492
properties, 147-150
Action Servers tab (policy properties), 147-148
Event Notifications tab (policy properties), 149
General tab (policy properties), 147
Logging tab (policy properties), 148
Policy Data tab (policy properties), 149-150
Run Behavior tab (policy properties), 149
running in PTC, 130
searching for, 142
starting, 132-133, 141
stepping through, 130-131
stopping, 141
testing, 129-132
triggering, 145-147
Custom Start object, 145
Trigger Policy object, 146-147
troubleshooting, 477-482
use cases. See use cases
viewing execution of, 141-142
viewing logs, 133
workflows versus, 7
Policies section (OIS Client Connections window), 116-117
POLICIES table (OIS datastore), 35
policy authoring objects in SQL Datastore, 34-36
policy complexity, 64
policy creation process in OIS Client, 47-48
Policy Data tab (policy properties), 149-150
policy engine, 201-202
Junction object, 208-209
multiplication effect, 209-210
multi-value PD items
flattening, 207-208
handling, 206-207
pipeline mode, legacy mode versus, 209-210
rules, 202-206
“flattened objects do not produce multi-value data”205-206
“Junction object limits or truncates PD stream”204-205
“links filter execution data”204
“run as often as object before you”202
“run once for each multi-value PD item”203-204
policy execution objects in SQL Datastore, 36-37
policy failover, 66-67
policy history and log objects in SQL Datastore, 38-39
policy instantiation, 58
policy lifecycle, 56-59
    check in, 56-57
dormant policy, 57
    policy instantiation, 58
PolicyModule.exe, 58-59
release processes, importance of, 56, 83
starting policy, 57-58
policy limits, 60-64
    ASPT (Action Server Policy Throttle), 60
    CPU and memory resource limitations, 64
desktop heap limitations, 61-63
    maximum running policies, 60-61
    operating system limitations, 63-64
    policy size and complexity, 64
policy queueing, 64-65
policy size, 64
policy spillover, 65-66
Policy Testing Console (PTC), 129-132
    OIS Client versus, 131-132
    running policies, 130
    setting breakpoints, 131
    stepping through policies, 130-131
    viewing logs, 130
policy XML exports, 229-230
POLICY_PUBLISH_QUEUE table (OIS datastore), 36
policy-level looping, 213
PolicyModule.exe, 43-44, 58-59. See also policy engine
PowerShell script
    for maintenance mode, 503
    OOC installation, 110-111
prerequisites. See requirements
Primary Action Server (PAS), policy spillover, 65-66
Print File object, 193
Process Email object, 191
processes
    documentation of, 26-27
    reviewing, 27-28
    running processes/services, in product footprint (OIS), 475
Product Details screen (QIK Wizard), 446-448
product footprint (OIS), 469-477
    background executables, 476-477
    in datastore, 477
    file system, 469-473
    Registry structure, 473-475
    running processes/services, 475
    Start Menu programs, 475-476
production mode deployment, QIK objects, 462-467
Program mode, Command mode versus, 160
programming language support in QIK (Quick Integration Kit), 398-399
programming models for QIK SDK, 435-436
promoting policies, 230-231
Prompt for Comment on Check In option (OIS Client), 126
properties
    Foundation objects, 154
    of links, 136
    of policies, 147-150
    Action Servers tab (policy properties), 147-148
    Event Notifications tab (policy properties), 149
    General tab (policy properties), 147
    Logging tab (policy properties), 148
    Policy Data tab (policy properties), 149-150
    Run Behavior tab (policy properties), 149
Protect Data Source object, 371
   protecting a data source use case, DPM IP, 375

PTC (Policy Testing Console), 129-132
   OIS Client versus, 131-132
   running policies, 130
   setting breakpoints, 131
   stepping through policies, 130-131
   viewing logs, 130

public forums, 501

Publish Policy Data object, 180-181

Published Data (PD)
   on Data Bus, 136-140
      adding, 137-139
      subscribing to, 139-140
      types of, 139
   “Junction object limits or truncates PD stream” policy engine rule, 204-205
   multi-value PD items
      “flattened objects do not produce multi-value data” policy engine rule, 205-206
      flattening, 207-208
      handling, 206-207
      “run once for each multi-value PD item” policy engine rule, 203-204

Published Data tab
   Add/Edit Command dialog, CLI Wizard (QIK), 426-430
   object properties, Run.Net Script object, 164-165

Purge Event Log object, 192

Q

QIK (Quick Integration Kit)
   CLI Wizard, 415-432
      Add/Edit Parameter dialog, 422-424
      Arguments tab (Add/Edit Command dialog), 421-422
   Depends on, 453
   Development methods, 398
   file system locations, 471-472
   installation, 401-415
      folder locations, 406-410
      IDE, 410-415
      IPs (Integration Packs), 415
      requirements, 401-402
      running installer, 402-405
   IPs (Integration Packs), creating, 445-455
   object deployment, 456-467
      production mode deployment, 462-467
      test mode deployment, 456-461
   planning projects, 400
   programming language support, 398-399
   SDK, 432-445
      API, 434
      code samples, 437-445
      features and functionality, 433
      programming models, 435-436
      project process, 436
      requirements, 433
   QIK Wizard, 445-455
      Dependencies screen, 450-451
      Objects screen, 448-450
      Opalis Integration Pack File screen, 451-452
      Product Details screen, 446-448
   Query Database object, 161-163, 219
   Query WMI object, 169-170
   Query XML object, 194
queuing policies, 64-65
Quick Integration Kit (QIK). See QIK (Quick Integration Kit)

R
RBA (Runbook Automation), 16-17, 25
Read Email object, 190
Read Line object, 182
Read Text Log object, 194
Recover SharePoint object, 372
Recover SQL object, 372
Recover VM object, 372
recovering a SQL database use case, DPM IP, 375-378
redundancy
  of Action Servers, 44-45
  SQL Datastore, 230
Refresh Client object, 337
Refresh Collection object, 338
registering IPs (Integration Packs), 100-101
Registry structure, 473-475
release processes, importance of, 56, 83
Remote Trigger, file system locations, 472-473
Remove VM object, 354
Rename File object, 193
Repair VM object, 354
required components, 32
  Action Servers, 39-45
    connectivity, 40-43
    OpalisActionService, 39-40
    PolicyModule.exe, 43-44
    redundancy, 44-45
  file system locations, 470-471
Management Server, 48-52
  additional components, 50-52
  OpalisActionServerWatchdog, 49-50
  primary services, 48-49
OIS Client, 45-48
  connection to OIS datastore, 47
  operating system support, 46
  policy creation process, 47-48
Opalis Operator Console (OOC), 52-54
SQL Datastore, 32-39
  installation and configuration objects, 33-34
  policy authoring objects, 34-36
  policy execution objects, 36-37
  policy history and log objects, 38-39
requirements. See also required components
  DPM IP, 367-368
  dynamic data center, 382-383
  OIS 6.3 installation, 80-83
    server requirements, 80-81
    trusted accounts, 83
    user account requirements, 81-82
  QIK (Quick Integration Kit) installation, 401-402
  QIK SDK, 433
  SCCM IP, 331-332, 335
  SCOM IP, 299-300
  SCSM IP, 313-314
  VMM IP, 347-348
resilient deployment model, 68-69
resources for information, 495-501, 503-504
Restart System object, 192
restartable policies, 232-235
Resume VM object, 354
reviewing processes, 27-28
rules, policy engine, 202-206
  “flattened objects do not produce multi-value data”205-206
  “Junction object limits or truncates PD stream”204-205
  “links filter execution data”204
  “run as often as object before you”202
  “run once for each multi-value PD item” 203-204
“run as often as object before you” policy engine rule, 202
Run Behavior tab
  object properties, 155
  policy properties, 149
Run .Net Script object, 163-166, 219-221
“run once for each multi-value PD item” policy engine rule, 203-204
Run Program object, 42, 158-161
Run SSH Command object, 170-172
Runbook Automation (RBA), 16-17, 25
running
  OIS 6.3 installer, 84-85
  policies in PTC, 130
  QIK (Quick Integration Kit) installer, 402-405
running processes/services, in product footprint (OIS), 475

S
sanitized policies
  defined, 231
  steps in, 231
SAS (Standby Action Server), policy spillover, 65-66
Save Event Log object, 192
SCCM IP
  configuring, 332-335
  objects, 335-338
  requirements, 331-332
  use cases, 338-345
    advertising software, 344-345
    checking compliance, 341-344
    creating and populating a collection, 338-341
schedules, 120, 214-216
  applying to policies, 214-216
  Check Schedule object, 214
scheduling objects, 192
SCO (System Center Orchestrator), OIS (Opalis Integration Server) versus, 23-24
SCOM 2007, as SCOM IP requirement, 299
SCOM IP
  configuring, 300-301
  installation, 300
  objects, 302-305
  requirements, 299-300
  use cases, 305-312
    branch office maintenance mode, 309-312
    incident remediation, 305-307
    server maintenance mode, 307-309, 383-386
SCSM IP
  configuring, 314-315
  objects, 315-317
  requirements, 313-314
  use cases, 317-330
    automating change, 323-330
    close resolved incidents, 318-320
    manage incidents, 320-322
SDK for QIK (Quick Integration Kit), 432-445
  API, 434
  code samples, 437-445
  features and functionality, 433
  folder location in QIK installation, 406
  programming models, 435-436
  project process, 436
  requirements, 433
Search and Replace Text object, 182
searching for policies, 142
security
  OOC installation, 111
  release processes, importance of, 56, 83
  security credentials, as VMM IP requirement, 348

How can we make this index more useful? Email us at indexes@samspublishing.com
Security Credentials tab (object properties), 155, 161
security models, 76-77
  federated domains, 76-77
  single domain security, 76
  untrusted security, 77
Security tab (object properties), Invoke Web Services object, 168
semaphores, counters as, 118, 184
Send Email object, 174-176
Send Event Log Message object, 176-177
Send Page object, 194
Send Platform Event object, 176
Send SNMP Trap object, 173
Send Syslog Message object, 194
server maintenance mode use case, SCOM IP, 307-309, 383-386
server requirements, OIS 6.3 installation, 80-81
service accounts
  Action Servers, 82
  Management Server, 82
  password reset and service account synchronization use case, 195
Service Manager. See also SCSM IP
  OIS (Opalis Integration Server) integration with, 13
  product description, 12
  as SCSM IP requirement, 314
services
  configuring OOC as, 113
  running processes/services, in product footprint (OIS), 475
Set SNMP Variable object, 173
Show Legacy Objects option (OIS Client), 125
Show Link Labels option (OIS Client), 124
Show Tooltips option (OIS Client), 125
Shut Down VM object, 354
simple deployment model, 67-68
single domain security model, 76
SNMP objects, 172-173
software deployment, OIS (Opalis Integration Server) integration with, 13
solution areas
  backup management, OIS integration with, 14
  configuration management, OIS integration with, 13
  incident/change management, OIS integration with, 13
  performance monitoring, OIS integration with, 14
    in System Center Suite, 11-12
virtualization, OIS integration with, 13
SQL Datastore, 32-39
  database creation and population, 87-90
  installation and configuration objects, 33-34
  OIS Client connection to, 47
  policy authoring objects, 34-36
  policy execution objects, 36-37
  policy history and log objects, 38-39
  product footprint (OIS) in, 477
  redundancy, 230
    as required component, 32
Standard OIS Logging IP, 234-235
Standby Action Server (SAS), policy spillover, 65-66
Start Maintenance Mode object, 304
Start Menu programs, in product footprint (OIS), 475-476
Start VM object, 354
starting policies, 57-58, 132-133, 141
Start/Stop Service object, 192
state information, maintaining, 231-235
stepping through policies, 130-131
Stop Maintenance Mode object, 304
Stop VM object, 354
stopping policies, 141
stored procedures
  for log purging, 38-39
  for OIS datastore data modification, 35-36
  for policy execution process, 36-37
subscribing to Published Data on Data Bus, 139-140
System Center Configuration Manager IP. See SCCM IP
System Center Data Protection Manager IP. See DPM IP
System Center Operations Manager IP. See SCOM IP
System Center Orchestrator. See SCO (System Center Orchestrator)
System Center Service Manager. See SCSM IP
System Center Suite
data center transformation with, 14-15
products in, 11-12
resources for information, 501
System Center Virtual Machine Manager IP. See VMM IP
system objects, 192

T

tables
for policy authoring process, 34-35
for policy execution process, 36
for policy logging process, 38
technical support. See resources for information; troubleshooting
test mode deployment, QIK objects, 456-461
configuring, 458-461
global configuration, 456-458
testing. See also release processes
OOC installation, 111-113
policies, 129-132
troubleshooting, 482
text file management objects, 181-184, 194
ticketing system synchronization, Foundation objects use case, 195-196
trace logging, logging levels, 492-494
Trigger Policy object, 146-147, 178-179
triggering policies, 145-147
Custom Start object, 145
Trigger Policy object, 146-147
troubleshooting
Foundation objects, 486-488
OIS (Opalis Integration Server)
common questions, 482-488
policy troubleshooting, 477-482
OIS 6.3 installation, 113-114
OOC (Opalis Operator Console), 485-486
resources for information, 495-501
trusted accounts, OIS 6.3 installation, 83

Unix IP, 289-293
“Unknown Object” error, troubleshooting, 483-484
untrusted security model, 77
Update Activity object, 317
Update Alert object, 304
Update Disk object, 355
Update Network Adapter object, 355
Update Object object, 317
Update VM object, 355
Upload Attachment object, 317
URLs for information, 495-501
use cases
BladeLogic Operations Manager IP, 238
BMC Atrium CMDB IP, 240
BMC Event Manager IP, 243
BMC Patrol IP, 245
BMC Remedy AR System IP, 248
CA AutoSys IP, 250
CA eHealth IP, 252-253

How can we make this index more useful? Email us at indexes@samspublishing.com
CA Spectrum IP, 254
CA Unicenter NSM IP, 256
CA Unicenter Service Desk IP, 257-258
DPM IP, 372-379
  checking DPM server storage capacity, 378-379
  creating a recovery point, 372-375
  protecting a data source, 375
  recovering a SQL database, 375-378
EMC Smarts InCharge IP, 260
  Foundation objects, 195-199
    File Information Data Storage, 196-197
    password reset and service account synchronization, 195
    ticketing system synchronization, 195-196
    Web Services TerraServer Querying, 197
    Windows Event Scan with Query WMI, 198-199
HP Asset Manager IP, 262
HP iLO and OA IP, 264
HP Network Node Manager IP, 266
HP OpenView Operations HP UNIX IP, 268
HP OpenView Operations Solaris IP, 270
HP OpenView Operations Windows IP, 273
HP OpenView Service Desk IP 275
HP Service Manager IP, 278
IBM Tivoli Enterprise Console IP, 280
IBM Tivoli Netcool Omnibus IP, 282-283
IBM Tivoli Storage Manager IP, 284
Microsoft Active Directory 2 IP, 286-287
SCCM IP, 338-345
  advertising software, 344-345
  checking compliance, 341-344
  creating and populating a collection, 338-341
SCOM IP, 305-312
  branch office maintenance mode, 309-312
  incident remediation, 305-307
  server maintenance mode, 307-309, 383-386
SCSM IP, 317-330
  automating change, 323-330
  close resolved incidents, 318-320
  manage incidents, 320-322
Unix IP, 289-290
Veritas NetBackup IP, 293
VMM IP, 355-366
  capacity and lifecycle management, 363-366
  virtual machine provisioning, 356-359, 386-391
  VM checkpoint and recovery, 360-363
VMware vSphere IP, 295
user account requirements, OIS 6.3 installation, 81-82
user interface for OIS (Opalis Integration Server), 6. See also OIS Client utilities, 194

V

variables, 119, 221-222
Veritas NetBackup IP, 293-294
version compatibility, 483
versioning policies, 228-229
versions
  BladeLogic Operations Manager IP, 239
  BMC Atrium CMDB IP, 242
  BMC Event Manager IP, 244
  BMC Patrol IP, 246
  BMC Remedy AR System IP, 249
  CA AutoSys IP, 251
  CA eHealth IP, 253
  CA Spectrum IP, 255
CA Unicenter NSM IP, 257
CA Unicenter Service Desk IP, 259
EMC Smarts InCharge IP, 261
HP Asset Manager IP, 263
HP iLO and OA IP, 265
HP Network Node Manager IP, 267
HP OpenView Operations HPUX IP, 269
HP OpenView Operations Solaris IP, 272
HP OpenView Operations Windows IP, 274
HP OpenView Service Desk IP, 277
HP Service Manager IP, 279
IBM Tivoli Enterprise Console IP, 281
IBM Tivoli Netcool Omnibus IP, 283
IBM Tivoli Storage Manager IP, 285
Microsoft Active Directory 2 IP, 288
OIS components, 488-489
Unix IP, 291
Veritas NetBackup IP, 294
VMware vSphere IP, 297
viewing
  policy execution, 141-142
  policy logs, 133
  PTC logs, 130
Virtual Machine Manager. See also VMM IP
  OIS (Opalis Integration Server) integration with, 13
  product description, 12
  as VMM IP requirement, 348
virtual machine provisioning use case, VMM IP, 356-359, 386-391
virtualization, OIS (Opalis Integration Server) integration with, 13
VM checkpoint and recovery use case, VMM IP, 360-363
VMM IP
  configuring, 348-350
  objects, 351-355
  requirements, 347-348
use cases, 355-366
  capacity and lifecycle management, 363-366
  virtual machine provisioning, 356-359, 386-391
  VM checkpoint and recovery, 360-363
VMware vSphere IP, 295-297

W
Wait object, 189-190
watchdog services. See OpalisActionServerWatchdog
Web Services, multisite invoke via Web Services deployment model, 73-74
Web Services TerraServer Querying, Foundation objects use case, 197
websites for information, 495-501
Windows Event Scan with Query WMI, Foundation objects use case, 198-199
Windows Management Framework, as DPM IP requirement, 368
Windows PowerShell 2.0, as DPM IP requirement, 368
WinRM 2.0, as DPM IP requirement, 368
workflow control objects, 177-181
  Custom Start object, 178
  Junction object, 179-180
  Publish Policy Data object, 180-181
  Trigger Policy object, 178-179
workflow engines, OIS 5.0 to OIS 6.0, 19-20
workflows
  in dynamic data center, 382-383
  policies versus, 7
  use cases. See use cases
Workspace window (OIS Client), 120
Write To Database object, 194
Write Web Page object, 194