Microsoft®
SharePoint 2010
Administrator’s Pocket Consultant

Ben Curry with
SharePoint Community Experts
For my dedicated and loving wife. She continues to stand by me through the good times and the bad. I love you, Kim.
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Acknowledgments

One of the challenges when writing a *Pocket Consultant* is that you don’t have the space to fully explain all aspects of a product. This is true with any product, but even more so with a product as large as SharePoint Server 2010. Therefore, I have left out information unessential to administrative tasks and provided a technically dense, daily reference guide. This narrow scope allowed the book to be very detailed in the areas that are poorly documented or poorly understood. I really wanted to provide an accurate reference guide that could also be read cover to cover, and I think it fills that bill.

I first want to thank Bill English, who gave me the opportunity to begin my writing career and has helped me immensely through the years. I consider him a mentor and a friend. Thank you, Bill. I also want to thank Martin DelRe, acquisitions editor, because he believed in this book from the very beginning. Karen Szall was the project editor, and she kept me on track and on schedule throughout. She is a wonderful editor, and I learned a great deal from her. Thanks also to Valerie Woolley who helped get chapters through the editing process. Although it is difficult to write original content, answering the technical edits is sometimes harder! Microsoft Press has the most thorough editing review processes in the business, and though they create more work for the author, they result in a better book for the reader. Bob Hogan was the technical reviewer for this book; his input and assistance were invaluable in creating a relevant and accurate book. He was top notch and made sure things worked as expected.

Because there were so many new features in the product, it was impossible for a single person to write this book. To assist me, I asked several SharePoint Products industry experts to contribute content to the book. Core to the success of this book were the contributing authors, and you can find their full bios in the back of the book. Thank you to Josh Meyer, Jim Curry, Philip Greninger, Daniel Webster (one of the best SharePoint professionals I know), Fred Devoir, Michael Mukalian, and Darrin Bishop. Each of these authors provided a unique contribution in their area of specialty. This allowed me to focus on the core features of the product and still deliver top-notch content throughout.

Because of the late release of the beta versions of the product and the depth of the product stack, it took several people to get this book content written. Thanks to Joy Curry, Lori Gowin, Cathy Dew, Spencer Harbar, Mike Watson, Jenn Parry, and the product team at Microsoft for answering a ton of questions and providing content!

Thank you to all of the staff at Microsoft who helped along the way; there are too many of you to count. I also want to thank my father; he has helped me along my writing career and served as a wonderful role model. If I forgot someone, it was truly an accident!
Introduction

From the beginning of the project, the *SharePoint Server 2010 Administrator’s Pocket Consultant* was written to be a concise and accurate guide that you can use when you have questions about SharePoint Server 2010 administration. The purpose of the *Administrator’s Pocket Consultants* series is to give you valuable, real-world information in an easily referenced format. A thorough index has been provided to help you quickly find the information you need. This is a guide you will want close by when working with the new versions of SharePoint Products and Technologies.

This book provides administrative procedures, quick answers, tips, and tested design examples. In addition, it covers some of the most difficult tasks, such as scaling out to a server farm and implementing disaster recovery. It also covers many of the new Windows PowerShell commands now needed for building and maintaining SharePoint Server. The text contains illustrative examples of many advanced tasks required to implement a SharePoint Products solution for almost any size of organization.

**Who Is This Book For?**

*SharePoint Server 2010 Administrator’s Pocket Consultant* covers SharePoint Server 2010 Standard and SharePoint Server 2010 Enterprise editions. This book is designed for the following:

- Administrators migrating from Windows SharePoint Services 3.0 and SharePoint Server 2007
- Administrators who are experienced with Windows Server 2008 and Internet Information Services
- Current SharePoint Foundation 2010 and SharePoint Server 2010 administrators
- Administrators who are new to Microsoft SharePoint 2010 Technologies
- Technology specialists, such as site collection administrators, search administrators, and Web designers

Because this book is limited in size, and I wanted to give you the maximum value, I assumed a basic knowledge of Windows Server 2008, Active Directory, Internet Information Services (IIS), SQL Server, and Web browsers. These technologies are not presented directly, but this book contains material on all of these topics that relate to the administrative tasks of SharePoint Products.
How Is This Book Organized?

SharePoint Server 2010 Administrator’s Pocket Consultant is written to be a daily reference for administrative tasks. The ability to quickly find and use information is the hallmark of this book. For this reason, the book is organized into job-related tasks. It has an expanded table of contents and an extensive index for locating relevant answers. In addition, there is an appendix for many of the new SharePoint Server 2010 Windows PowerShell cmdlets. If you are looking for a comprehensive guide to implementing SharePoint Products, you should consider purchasing the Microsoft Office SharePoint Server 2010 Administrator’s Companion, since the books in the Administrator’s Pocket Consultant series are stripped to the bare essentials required to complete a task.

The book is organized into three parts and eighteen chapters: Part I, “Deploying SharePoint Server 2010,” introduces you to the new features, functionality, and deployment options of SharePoint Server 2010. Chapter 1 provides instructions for preparing for and installing SharePoint Server 2010, implementing database best practices, and creating the required server farm service applications. Chapter 2 shows you the basics of scaling to a multi-server farm for availability and performance. Chapter 3 covers the management of core server farm operations. Chapter 4 guides you through Web application creation and management, a foundational part of SharePoint Server 2010. Chapter 5 is an administrator’s guide to creating and managing site collections. Chapter 6 is an installation guide and design overview of the new SharePoint Server 2010 service application architecture.

Part II, “Configuring SharePoint Server 2010,” dives deeper into the product stack and extends the basic functionality configured in Part I. Chapter 7 is a guide to installing and managing Web parts, features, and solutions. Chapter 8 is a step-by-step guide to configuring and scaling the search service application. Chapter 9 provides detailed configuration on managing the search experience for users. Chapter 10 is an introduction to Enterprise Content Management (ECM) and a good start for most SharePoint Server 2010 administrators new to ECM. Chapter 11 shows you the new features of Document Management, such as Document Sets and Document IDs. Chapter 12 is an administrator-focused chapter on Records Management. It is not an exhaustive guide for all things Records related; only the administrative tasks to operate and maintain them. Chapter 13 is a configuration guide for creating portals, most importantly the publishing infrastructure. Chapter 14 covers the new and exciting areas of Social Collaboration and profile management.
Part III, “Operating SharePoint Server 2010,” primarily deals with operational tasks having to do with service level agreements and upgrades. Chapter 15 will show you how to configure Web application and site collection security policies, in addition to recommended Permissioning guidelines. Chapter 16 details the areas of SharePoint Server 2010 you should monitor and the available tools to do so. Chapter 17 is a basic SharePoint Server 2007 upgrade installation guide, and covers many of the new upgrade tools available in SharePoint Server 2010. Chapter 18 includes the new backup and restore tools, including granular backups. The book completes with Appendix A, an introduction to Windows PowerShell for SharePoint Server 2010.

Conventions Used in This Book

A variety of elements are used in this book to help you understand what you need to know and to keep it easy to read.

- **Note** A Note points out an easily overlooked detail or design issue.
- **Tip** A Tip provides helpful information or spotlights the command-line option available for an administrative task.
- **Caution** When you see a Caution, you should look out for potential problems. Many Cautions were learned through real-world experience.

In addition, terms that are new are in *italics*.

I really hope you find the SharePoint Server 2010 Administrator’s Pocket Consultant useful and accurate. I have an open door policy for e-mail at curry@summit7systems.com. Because my inbox stays quite full, please be patient; replies sometimes take a week or longer. You may also visit http://pocketconsultant.mindsharp.com for updates and discussion boards concerning the latest in SharePoint Products and Technologies news.

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CHAPTER 3

Configuring Core Operations

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- Configuring Send To Connections 105

Core operations refers to farm-level settings and applications such as Central Administration, server services settings, and e-mail configuration. There are items—such as Service Applications, Search, and Web Applications—that are such large and important topics that they have dedicated chapters. This chapter will cover the core farm operations not covered elsewhere in the book. Much of this chapter will show you how to set up farm operations that are configured only once, such as Short Messaging Service (SMS) mobile services. Although the interaction with other Microsoft SharePoint Server functional areas will be discussed, please reference the chapter for each of those functional areas for detailed information.

Introducing Central Administration

At the heart of every server farm is the configuration database. This database stores the majority of your core server farm configuration. The association of Service Applications, configuration of Web Applications and content databases, e-mail settings, server services architecture, farm solutions, and farm features are stored in this database. To manage all of this configuration data, you need a tool to do so. Central Administration is the primary administrative tool available to you. The Central Administration interface can be started by clicking Start, All Programs, Microsoft SharePoint Server 2010 Products, SharePoint Server 2010 Central Administration. Figure 3-1 shows Central Administration as installed out of the box.
As you can read in the Appendix, Microsoft Windows PowerShell can also be used to manage your farm configuration in addition to Central Administration. The Windows PowerShell console can be started by clicking Start, All Programs, Microsoft SharePoint Server 2010 Products, SharePoint Server 2010 Management Shell. Additionally, \stsadm.exe\ is an administrative tool that can be used for basic farm administration tasks. Note that \stsadm.exe\ is slated for removal in the next version of SharePoint Server. Therefore, it is wise to begin transitioning from \stsadm.exe\ to Windows PowerShell.

**TIP** You can find \stsadm.exe\ in C:\Program Files\Common Files\Microsoft Shared\Web Server Extensions\14\bin. You can either include this directory in your system path or create a shell script to navigate to the directory to make it easier to execute. It can also be executed from the SharePoint Server Management Shell.

**Central Administration Architecture**

It’s important to understand that Central Administration is a site collection contained in a dedicated Web application. As such, it has an associated content database for the Web application. If you use the SharePoint 2010 Products Configuration Wizard, the content database will be named `SharePoint_AdminContent_<GUID>`, as can be seen in Figure 3-2. Note that this...
database is not easily changed after the fact. Therefore, if you want a different name for your Central Administration content database, you need to use Windows PowerShell to create your server farm.

![Microsoft SQL Server Management Studio](image)

**FIGURE 3-2** You can view your Central Administration content database using Microsoft SQL Server Management Studio.

Because Central Administration requires write access to your server farm configuration database, you should never use this Web application or associated application pool for collaborative Web applications. Doing so could provide a hacker with potential write access through another Web application. Central Administration was created automatically when you ran the SharePoint 2010 Products Configuration Wizard and should not be modified. Although Central Administration is technically just another site collection and can be modified as such, a best practice is to leave it in the default state. Only administrators access the site collection, so branding and customization shouldn’t be an issue.

As seen in Figure 3-1, Central Administration has eight primary areas:

- **Application Management**  Hosts administrative links to Web applications, site collections, service applications, and databases. Chapter 4, “Building and Managing Web Applications,” explains this section and associated tasks in depth.

- **System Settings**  Contains your server and server service management, e-mail and text messaging, and other farm management settings. Most of the functionality discussed in this chapter can be found in System Settings.
Monitoring  Has been greatly expanded in SharePoint Server 2010 and includes Reporting, Analytics, Timer Jobs, Health Analyzer, and Usage information. Chapter 16, “Monitoring, Logging, and Availability,” covers Reporting and the Health Analyzer in detail. Only the server farm timer jobs are discussed in this chapter.

Backup And Restore  Location where both farm and granular backups and restores are performed. Chapter 18, “Backup and Restore,” provides more information.


Upgrade And Migration  Upgrade-specific information can be found in Chapter 17, “Upgrading to SharePoint Server 2010.”

General Application Settings  Includes external service connections, document conversions, InfoPath forms services, site directory, SharePoint Designer, farm-scoped search settings, and content deployment.

Configuration Wizards  Contains configuration wizards for your installation. Depending on additionally installed products, this screen can present multiple options for the automated configuration of your farm.

As you manage a SharePoint Server 2010 farm, there will be administrative tasks you perform on a regular basis. Remember that Central Administration is a Web-based interface, so you can create favorites in your Web browser to save time. Additionally, you will see multiple locations to manage the same item, such as Web application general settings, within Central Administration.

Working with the Central Administration Web Application

Although Central Administration is a SharePoint Server Web application, it differs from others because you don’t create and deploy the Web application. Because the deployment of other Web applications is done from Central Administration, the provisioning of Central Administration itself is performed at either the command line or via the SharePoint 2010 Products Configuration Wizard. To deploy Central Administration to a server other than the one on which you first installed SharePoint Server, you must install the SharePoint Server binaries and run the SharePoint 2010 Products Configuration Wizard. You can run this wizard at any time by clicking Start, All Programs, Microsoft SharePoint Server 2010 Products, SharePoint Server 2010 Products Configuration Wizard. Be very careful not to disconnect from the server farm, which can be specified with the option shown in Figure 3-3.
FIGURE 3-3 If provisioning Central Administration, be sure to *not* disconnect from the server farm.

After you click Next twice, select Advanced Settings to provision Central Administration. Select Use This Machine To Host The Web Site as seen in Figure 3-4.

FIGURE 3-4 Select Use This Machine To Host The Web Site, and click OK.

You must wait for the farm timer job to complete and the Web application to provision before use. Upon completion, the wizard will take you to Central Administration.
You can also use the SharePoint 2010 Products Configuration Wizard to repair a broken Central Administration, assuming it is an Internet Information Services (IIS) configuration error causing the fault. To unprovision Central Administration, simply choose Yes, I Want To Remove The Web Site From This Machine. You should wait a few minutes to allow the farm configuration to update and also to allow time for the local IIS configuration to update. When the Web application is no longer visible from IIS, you can re-run the SharePoint 2010 Products Configuration Wizard to reprovision the Central Administration on that server.

**NOTE** A Web application problem with Central Administration might require you to make a technical support call. The actual content of Central Administration is contained in the associated content database, and farm configuration is contained in the configuration database.

### System Settings

The System Settings area of Central Administration contains crucial settings that you need to plan and carefully control modification of. Most of the system settings affect all Web applications and associated users in your server farm. System Settings is divided into three sections:

- **Servers**
- **E-Mail And Text Messages (SMS)**
- **Farm Management**

### Servers

The Servers section of System Settings gives you, at a glance, visibility into your server farm topology, including your application services topology. It also provides the SharePoint Foundation 2010 configuration database version and SQL Server name. Much of the same information is contained in both the Manage Servers In This Farm and Manage Services On Server areas.

### Servers In Farm

From the Manage Servers In This Farm link, you can see all the servers in your farm, as contained in the configuration database. You’ll see five headings beneath the configuration database information:

- **Server** Lists all servers in your server farm. You can click on the Server text itself to sort the list alphabetically.
- **SharePoint Products Installed** Displays the relevant SKU information about that server.
- **Services Running** Is a valuable tool when discovering and troubleshooting a SharePoint Server server farm. You are able to quickly see where specific application services are provisioned. If you were troubleshooting the User
Profile Service as an example, you could find what server or servers were processing that data. You can then go to the relevant server and begin troubleshooting. Figure 3-5 shows an example of a multiserver farm and the Services Running column.

![Figure 3-5](image)

**Figure 3-5** Services on servers can be seen quickly from the Servers In Farm page.

**NOTE** Figure 3-5 shows the services provisioned on a server and not necessarily the current status. It’s possible that a service is nonfunctional and still shows as running on this screen. It’s also possible that a server is completely offline, because that status is not displayed.

- **Status** Displays whether a server action is required or is being performed. Examples of this are service packs, language packs, and platform additions such as Office Web Server.
- **Remove Server** Use this option if you want to remove a server’s entry in the configuration database. Use this option with caution because it is irreversible. You should need to remove a server using Central Administration only if that server is no longer operational. The best way to remove a server from a farm is using the SharePoint 2010 Products Configuration Wizard on the server you want to remove, and then selecting to disconnect it from server farm.

### Manage Services On Server

The Manage Services On Server page is used to stop and start farm server services. These services are not Windows Server services. Although turning one of these services on or off in the configuration database might result in a Windows Service being turned on or off, the consequences of mistakenly stopping a SharePoint service are much worse than stopping a Windows Server service. For example, turning off the SharePoint Server Search service will update the configuration database and remove all entries related to that search server. Therefore, all relevant
search content, such as the index, will be deleted and the associated Windows Server service will be stopped. Basically, everything you start or stop in this screen is making configuration database changes. The timer job will subsequently pick up those changes from the database and modify application services accordingly.

The Manage Services On Server page also controls where processing of information is performed in your server farm. For example, you could have multiple servers in your farm performing the task of Managed Metadata Services, with each one processing a different Managed Metadata Services Term Store. This allows for scalability of processing. Each server in the farm can process different server farm services. To stop or start services, you can select the Start or Stop hyperlink. If configuration is required to start, you will be automatically taken to the configuration screen. Don’t confuse these services with service applications. Although service applications might use a service on a server, service applications apply across a server farm and exist a level above services on the server. Always verify you are modifying the correct server, as shown in Figure 3-6.

![FIGURE 3-6](image)

**FIGURE 3-6** Verify you are configuring the correct farm server before starting or stopping services.

### E-mail and Text Messages

SharePoint Server 2010 provides many ways to communicate via e-mail and mobile text messaging. Pay close attention to the configuration of both incoming e-mail messages and text messages (SMS). There are possible cost and security issues associated with external, automated farm communications.

#### Outgoing E-mail Settings

Outgoing e-mail is primarily used for system alerts. Alerts allow users to be updated when an object changes, such as a list or document. Depending on the users’ choice, they can be alerted immediately, daily, or weekly. Additionally, the system generates messages for workflows and other system content that leverages outgoing e-mail. To configure outgoing e-mail, you need to specify an outbound SMTP server, as seen in Figure 3-7.
Although the From and Reply-to addresses can be different, they usually are not. Allowing a different From address might help you with current UCE (Unsolicited Commercial E-Mail) white lists, as an example. You can also change the character set if needed for a different language. Be sure both the SharePoint Foundation 2010 and SharePoint Server 2010 language packs are loaded for the selected language.

**NOTE** SharePoint Server 2010 cannot send credentials for outbound SMTP. Therefore, you must allow relaying on your SMTP server from SharePoint Server 2010 servers that will send mail. Always confirm that the required TCP ports and DNS entries are correct before troubleshooting a problem with SharePoint Server 2010 outgoing e-mail.

### Incoming E-mail Settings

Configuring incoming e-mail is more complex than configuring outgoing e-mail and requires changes to both your Windows servers and Active Directory configuration. First, you must have an SMTP server loaded on the servers that will accept incoming e-mail. SharePoint Server 2010 does not include an SMTP service, but the default Windows Server SMTP server should work quite well. In Windows Server 2008, you add the SMTP server from Server Manager, Features.

You also need to configure Active Directory if you want to use the Directory Management Service. An Active Directory organizational unit (OU) should be created to store SharePoint Server 2010 contacts and distribution lists. The server farm account defined in the setup should be delegated the Create, Delete, And Manage User Accounts permission in this OU. To delegate permissions to the OU, do the following:

2. Right-click the Organizational Unit you want to integrate with SharePoint Server 2010, and choose Delegate Control.
3. Choose Next in the wizard, click Add, and select your SharePoint Server 2010 farm account. If you aren’t sure what account this is, check the application pool identity for Central Administration.
4. Under Delegate The Following Common Tasks, select Create, Delete, And Manage User Accounts.

5. Click Next and then click Finish.

After you have created and delegated permissions in Active Directory, you can proceed with configuring Central Administration Incoming E-Mail settings. If you have enabled the Directory Management Service, distribution lists can be created automatically when enabled for SharePoint Server sites. Creating distribution lists automatically creates a distribution list in Active Directory and keeps it synchronized from SharePoint Server to Active Directory. Doing so allows users to easily send e-mail to SharePoint Server groups when needed.

**NOTE** The Directory Management Service is a one-way service. In other words, users are added to the Active Directory distribution list when they are added to a SharePoint group, but users are not added to the SharePoint group when they are added directly to the Active Directory distribution list.

An additional function of the Directory Management Service is that it automatically creates an Active Directory contact when e-mail–enabling a list or library. Although it is not required or always desired, you can have the e-mail address available in the Global Address List (GAL) after e-mail enabling a list. If you have not enabled the Directory Management Service, you must manually, or through a custom process, create an entry for each mail-enabled document library and list you want to receive e-mail.

To configure incoming e-mail, select Configure Incoming E-mail Settings in the System Settings area. You must then fill out the configuration page as follows:

1. Select Yes to enable sites on this server to receive e-mail.

2. Select Automatic unless you are using an SMTP server other than the native Windows Server SMTP Service. If you are using a third-party SMTP server, be sure to define the e-mail drop folder at the bottom of the page. Be aware that many third-party SMTP servers will not integrate with SharePoint Server 2010.

3. Select Yes to create a distribution group or contact, or select Use Remote if you already have an existing Directory Management Service. Note that if you do not have Microsoft Exchange Server installed in this Active Directory, you need to extend the schema with both the ms-Exch-mail-Nickname and ms-Exch-RequireAuthToSendTo attributes. You can add these by using the Exchange Server installation media. For more information on extending the Active Directory schema, please reference [http://technet.microsoft.com/exchange](http://technet.microsoft.com/exchange). Note that you do not have to install Exchange Server binaries to enable Directory Management Services integration; you need only to extend the schema.

4. This step requires you to have previously configured the OU in Active Directory. In this example, we are using OU=SharePointDMS, DC=contoso,
DC=com. SharePointDMS is the OU in Active Directory. Figure 3-8 shows an example of the OU and SMTP server settings. Observe that you might not be able to view the entire container path and you might need to scroll to the right with the mouse.

5. Next, type the name of the SMTP server where you will accept incoming e-mail. This server must be a member of the server farm. The Microsoft SharePoint Foundation Timer on this SMTP server will monitor the default e-mail drop folder. When it discovers an e-mail with a corresponding incoming e-mail address in SharePoint Server 2010, it will route the e-mail constrained by the list or library settings.

6. You must decide whether to accept messages from authenticated users or all users. If you decide to accept messages from authenticated users, a Send-to e-mail address must match that of a user with write access on the destination list or library.

7. Next, select whether or not to allow the creation of distribution lists. You can configure SharePoint Server 2010 to create contacts in Active Directory without creating distribution lists for synchronization with SharePoint Groups. If you decide to create distribution lists, you also need to decide what level of scrutiny the list names will have. You have four options when managing the creation and modification of distribution groups:
   - Create New Distribution Group
   - Change Distribution Group E-mail Address
   - Change Distribution Group Title And Description
   - Delete Distribution Group

   Note that there is no approval option when creating contacts. Approval settings exist only for distribution groups.

**TIP**  Consider carefully whether to select any of the change options, because selecting them causes any previous e-mail messages sent on the distributions list to bounce when replied to.
8. You can also define the incoming e-mail server display address. Figure 3-9 shows an example of setting the value. Be aware that only defining the display address will not route e-mail correctly. In this example, the server name is app02.contoso.com, but the display address is contoso.com. Care must be taken to correctly route the e-mail from the SMTP server servicing the contoso.com domain.

![Figure 3-9](image)

**Figure 3-9** Verify you first have a routing rule on the SMTP server when configuring the incoming e-mail display address.

9. Ensure that DNS has the correct records for routing e-mail. SMTP and SharePoint Server 2010 both need to have the correct DNS configuration before incoming e-mail will function correctly.

10. If you will be accepting e-mail from external sources, it is wise to configure the Safe E-Mail Servers setting. This setting can force incoming e-mail to route through your safe mail servers that perform antivirus and antispam scanning. It can also reduce the surface area for Internet-based attacks. To specify a safe server, enter the IP address—for example, 10.1.1.200. Entering the fully qualified domain name (FQDN) of the mail server will not work.

11. Last, you can now enable lists and libraries for incoming e-mail. Figure 3-10 shows an example of configuring incoming e-mail for a document library contained in a team site collection. You can edit the library settings from **Document Library, List Settings, Incoming E-Mail Settings**.

![Incoming E-Mail Configuration](image)

**Figure 3-10** To enable a list or library for incoming e-mail, configure the Incoming E-Mail settings.
Mobile Account

The Mobile Alert feature allows users to subscribe to alerts with their mobile phones. The idea behind the functionality is many professionals prefer to get important alerts via mobile text (SMS) rather than via e-mail. Not all users have smart phones or smart phones that are compatible with their corporate e-mail system. Configuring mobile alerts allows notification to almost any cellular telephone. The feature does come with some drawbacks, however. First of all, you must have a subscription with a third-party SMS provider. The SMS provider acts as a “man in the middle” to relay mobile messages to cellular providers. This comes at a cost. Although the future of this space is widely unknown, current prices range from $.02 USD to $.06 USD. You can find a list of SharePoint Server 2010–compatible providers at http://messaging.office.microsoft.com/HostingProviders.aspx?src=O14&lc=1033. There is a constantly changing list, and your costs will vary based on your geographic location and volume of prepaid SMS alerts.

**NOTE** There is no method to throttle alerts at the Web-application level. If you have a user who subscribes to hundreds of alerts or you have a system error, you could quickly increase the costs associated with your third-party provider. Most administrators will want to configure throttling with the third-party provider to mitigate these risks.

To configure the text message (SMS) service, do the following:

1. Subscribe to an online SMS provider, and note the URL and user name and password given by the provider.
2. Browse to Central Administration, System Settings, Configure Mobile Account.
3. Enter the URL provided by the SMS provider.
4. Enter the user name and password given to you by the SMS provider.
5. Test account settings.

Farm Timer Jobs

The Microsoft SharePoint Foundation Timer service runs on each server in the farm and is the master process for all timer jobs. It is not configurable—that is, it cannot be started and stopped from within Central Administration. It can, however, be restarted if you suspect a problem from Windows Server services from Start, All Programs, Administrative Tools, Services. It is listed as SharePoint 2010 Timer. You should not directly modify the logon account or other settings directly from Windows Server. You should restart only if necessary.

Timer jobs are created and deleted by SharePoint Server 2010 features or by developers via custom code. If your developers will deploy timer jobs to support custom code, be sure to test on an environment other than your production servers, and test for 24 hours or longer. Many timer jobs do not immediately display errors.
Only time will show if the custom timer job has a problem. Third-party products that create timer jobs should be tested to the same level as customer code. Be sure to test any custom timer jobs before a major service pack or SharePoint Server 2010 version change.

To see the currently defined timer jobs, browse to Central Administration, Monitoring, Review Timer Jobs, and look at the job definitions. When opening the Service Job Definitions page, you’ll notice approximately 180 timer job definitions in a fully configured SharePoint Server 2010 server farm. This number will vary depending on the number of Web applications, configured service applications, and the configuration of core operations. Figure 3-11 shows a portion of the timer jobs in the Server Job Definitions page.

<table>
<thead>
<tr>
<th>Immediate Alerts</th>
<th>Content Type Hub</th>
<th>Minutes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Immediate Alerts</td>
<td>Contoso Portal</td>
<td>Minutes</td>
</tr>
<tr>
<td>Immediate Alerts</td>
<td>My Site Provider</td>
<td>Minutes</td>
</tr>
<tr>
<td>Indexing Schedule Manager on APR92</td>
<td>Minutes</td>
<td></td>
</tr>
<tr>
<td>InfoPath Forms Services Maintenance</td>
<td>Daily</td>
<td></td>
</tr>
<tr>
<td>Information management policy</td>
<td>Content Type Hub</td>
<td>Weekly</td>
</tr>
<tr>
<td>Information management policy</td>
<td>Contoso Portal</td>
<td>Weekly</td>
</tr>
<tr>
<td>Information management policy</td>
<td>My Site Provider</td>
<td>Weekly</td>
</tr>
<tr>
<td>Licensing Synchronizer Job</td>
<td>Hourly</td>
<td></td>
</tr>
<tr>
<td>Microsoft SharePoint Foundation Diagnostics Service Configuration</td>
<td>One-time</td>
<td></td>
</tr>
<tr>
<td>Microsoft SharePoint Foundation Diagnostics Service Configuration</td>
<td>One-time</td>
<td></td>
</tr>
<tr>
<td>Microsoft SharePoint Foundation Diagnostics Service Configuration</td>
<td>One-time</td>
<td></td>
</tr>
<tr>
<td>Microsoft SharePoint Foundation Get Incoming E-Mail Configuration</td>
<td>One-time</td>
<td></td>
</tr>
<tr>
<td>Microsoft SharePoint Foundation Incoming E-Mail</td>
<td>Minutes</td>
<td></td>
</tr>
<tr>
<td>Microsoft SharePoint Foundation Site Inventory Usage Collection</td>
<td>Content Type Hub</td>
<td>Daily</td>
</tr>
<tr>
<td>Microsoft SharePoint Foundation Site Inventory Usage Collection</td>
<td>Contoso Portal</td>
<td>Daily</td>
</tr>
<tr>
<td>Microsoft SharePoint Foundation Site Inventory Usage Collection</td>
<td>My Site Provider</td>
<td>Daily</td>
</tr>
</tbody>
</table>

FIGURE 3-11 Every Web application you create will instantiate several timer jobs.

Some of these timer job definitions will be minutes, while others are hourly, daily, weekly, or monthly. New in this version of SharePoint Server is the ability to easily change the timer job’s schedule from the user interface. Caution should be used when modifying the default schedule because it can affect server farm and application functionality. For the most part, you should leave the timer jobs in the default state. For some timer job definitions, such as the Content Type Hub and Content Type Subscriber, you will be very tempted to increase the frequency of the timer job. Although this action will make enterprise content types more available and give the subscribing site collections more frequent updates, it comes with a compromise in performance. Timer jobs take both processor power and memory, so you need to weigh the benefits with the performance penalty. Figure 3-12 shows an example of changing the Content Type Hub frequency. Also notice that you can always click Run Now. This option often negates the need for increasing the frequency of a timer job because you can force an update manually.
Co nfiguring Core Operations

CHAPTER 3

FIGURE 3-12 Click Run Now to manually start a timer job.

BEST PRACTICE  Be careful when creating multiple Web applications. Although it is often necessary to create multiple Web applications for requirements such as My Sites and the Content Type Hub, keeping your Web applications to a minimum will increase system performance. Every Web application you create will automatically generate many timer jobs that consume system resources. So in addition to the memory space used by the application pool and associated management overhead, you now also have more timer jobs and potential issues with the SharePoint Foundation Timer service.

Although timer jobs run on every server in the farm by default, you can select a preferred server to execute timer jobs on per-content-database basis. Workflows were one of the driving factors to include this functionality. Using this example of workflows will help you understand why server timer job affinity is important.

SharePoint Server 2010 executes workflow actions on the Web server that the client was connected to when started. If this workflow must wait to continue because of a scheduled time delay or inaction by the user, the SharePoint 2010 Timer service will handle the workflow execution. In a multiple Web server configuration, you can set the preferred server for executing the workflow via the content database that hosts the site collection in question. To set the preferred server for timer jobs, do the following:

1. Browse to Central Administration, Application Management, Databases, Manage Content Databases.
2. Select the database you want to modify.
3. Select the physical server you want to associate as the preferred server. See Figure 3-13 for an example of setting affinity.
FIGURE 3-13 You can select any server farm member to be the preferred server for a content database.

**NOTE** If the preferred server is unavailable, another will be selected automatically until the preferred server is back online.

In addition to managing timer jobs, you can also check the job status from Central Administration, Monitoring, Timer Jobs, Check Job Status. (See Figure 3-14.)

![Timer Job Status page](image)

**FIGURE 3-14** The Timer Job Status page.

The Timer Job Status page allows you to view the status of scheduled jobs, see running jobs, and view timer job history. You’ll find this page useful when troubleshooting problems within your farm. Hung processes, such as workflows or backup and restore, can be deleted to allow for future instances. It is recommended that you not delete timer jobs when you are not sure of the consequences of that action. The product team has removed the option for you to delete platform-level jobs that would have dire consequences. Instead, they have replaced the delete option with a disable option. Always document your action for future reference if you delete or disable a timer job.

**Farm Management**

The Farm Management area, located under System Settings, is essentially a bucket for items that are associated with the configuration database or didn’t fit neatly elsewhere. The Farm Management functional areas are as follows:

- **Alternate Access Mappings** Details about this configuration option can be found in Chapter 4.
- **Manage Farm Features, Manage Farm Solutions, and Manage User Solutions** Details on these options are presented in Chapter 7, “Web Parts, Features, and Solutions.”
- **Configure Cross-Firewall Access Zone**  This option is discussed in Chapter 15.
- **Configure Privacy Options**  This configuration option allows you to decide whether your server farm will automatically connect to Microsoft for the Customer Experience Improvement Program (CEIP), error reporting, and external Web-based help. Be careful when turning these on if you are in a secure environment. Many times, servers in a secure environment will not have outbound HTTP enabled. If that is the case, Web-based help will not function.

### Database Management

The bulk of SharePoint Server 2010 content is almost entirely contained in SQL Server. As such, a properly designed and managed SQL Server infrastructure is critical to a well-running SharePoint Server environment. Because SQL Server has many books dedicated to the product, you’ll be introduced only to the topics every SharePoint Server administrator should know in this section. Database management is contained in the Application Management section of Central Administration. The majority of Application Management deals with Web applications, service applications, and site collections. Although databases are used with all three of these, there is a dedicated section for database management, as seen in Figure 3-15.

![Central Administration ➔ Application Management](image)

**FIGURE 3-15** Databases are contained in the Application Management grouping.
Content Databases

There are many farm-level settings and configuration options you should be aware of with content databases. While the first content database is created during the Web application creation, it is created with several default options. The following configuration options should be taken into consideration when managing content databases:

- Size of the content database
- Number of site collections per content database
- Status of content databases
- Read-only content databases
- Location on SQL Server physical disk

Controlling Database Sizes

SharePoint Server 2010 does not provide direct functionality to limit the content database size. Although SQL Server can provide this option, it is generally recommended that you control the content database sizes with SharePoint Server 2010 site quotas. First, you need to know that site quotas are actually site collection quotas. There is no native method to limit site quotas. Second, you can limit the number of site collections in a database, but you cannot limit the number of sites. Once again, the Central Administration interface is ambiguous on sites vs. site collections. When we’re discussing items within Central Administration, the word “sites” always references site collections. To limit the size of a content database using SharePoint Server options, you need to combine the following three SharePoint Server 2010 settings:

- **Maximum Number Of Sites That Can Be Created In This Database**
  
  This setting is found in Central Administration, Application Management, Manage Content Databases, after selecting a content database:
- **Quotas of the sites (site collections) contained in the database**  
  These settings can be found in Central Administration, Application Management, Configure Quotas And Locks:

  - **Site Collection**  
    Select a site collection.

  - **Site Lock Information**  
    Use this section to view the current lock status, or to change the lock status.

  - **Site Quota Information**  
    Use this section to modify the quota template on this Web site collection, or to change one of the individual quota settings.

- **Percent of site (site collection) used for the second-stage Recycle Bin**  
  These settings are located in Central Administration, Manage Web Applications, and General Settings on the Web Applications tab.

  - **Recycle Bin**  
    Specify whether the Recycle Bin of all the sites in this web application are turned on. Turning off the Recycle Bin will empty all the Recycle Bins in the web application.

  - The second-stage Recycle Bin stores items that end users have deleted from their Recycle Bin for seven days before restoring or needed to learn about configuring the Recycle Bin.

  Using the settings just shown, you define the maximum database size by using the following formula:

  \[
  \text{(Maximum number of sites) \times (site quota) \times (1 + \% \text{ of live site quota for second stage})}
  \]

- **Number of Site Collections per Content Database**
  The default number of sites (site collections) per content database should almost assuredly be changed. The default settings of 9000 sites before a warning and 15,000 sites as the maximum is entirely a fail-safe mechanism in the product. Using the formula previously mentioned, here is the result for a 15,000-site maximum:

  \[
  15,000 \text{ sites} \times 10-\text{GB site quota} \times 1(50 \text{ second stage}) = \text{possible database size of 219 terabytes}
  \]
A more likely scenario is this:

20 sites x 10-GB site quota x 1 (.20 second stage) = possible database size of 250 GB

The maximum database size recommended is somewhere between 200 GB and 300 GB. Your databases can be much larger in theory, but the practical daily management becomes difficult beyond the recommended limit.

**TIP** You should be very careful with maximum site collection sizes (the site quota settings). Large, busy site collections are likely to have SQL locking/blocking errors. A rule of thumb is to have large site collections and a few users, or small site collections with a large user population.

If you must have large content databases, try to isolate very busy site collections in a dedicated content database. This gives you the flexibility of managing the disk I/O of the site collection at the SQL level. Note that this does not scale, however. It is recommended that you have no more than 100 content databases per Web application.

**Content Database Status**

The Content Database Status can be set to either Ready or Offline. The status of Offline is a bit confusing because the real purpose of taking a content database offline is to not allow more site collections to be created therein. In fact, site collections contained in an offline content database can still be seen and written to. However, there were unexpected problems with this in SharePoint Server 2007 and there might be again in SharePoint Server 2010. The safest way to limit the number of site collections in a content database is by following these steps:

1. Turn off warning events by setting the threshold to zero.
2. Set the maximum number of site collections to the current number listed in the user interface. Be sure to create a new content database before creating a site collection; otherwise, the creation will fail.

**Read-Only Content Databases**

SharePoint Server 2010 now supports read-only SQL Server content databases. When you set a content database to Read-Only, the permissions in all site collections will automatically be reflected in the users' Web browser. For example, Figure 3-16 shows an example of a document library contained in a read/write content database, and Figure 3-17 is the same document library after setting the content database to Read-Only.
You can see the current state of a content database by browsing to Central Administration, Application Management, Manage Content Databases, and selecting the relevant database. SharePoint Server 2010 displays only the status, however, and cannot be used to set the database state. To set a database to Read-Only, you must do so from SQL Server Management Studio. To configure a database to be Read-Only, do the following on the SQL Server console:

1. Open SQL Server Management Studio. (Its location will vary based on your version and edition of SQL Server.)
2. Locate the SQL Server database you want to modify, right-click, and select Properties.
3. Select the Options page, and under Other Options scroll down until you see the State options.
4. Locate Database Read-Only, and click False, as seen in Figure 3-18.
5. Change the status from False to True, and click OK.
Database Location on SQL Server Physical Disk

Although SharePoint Server 2010 can create databases and perform a minimal SQL Server database setup, you still want to do basic configuration of the databases on the SQL Server physical disks. Maintenance plans and recovery models can be quite extensive and are not covered in this section. It is recommended that you leave the recovery model as it is set by the SharePoint Server configuration wizard, unless you have advanced SQL Server experience and can verify that you’ll be in a supported configuration.

**MORE INFORMATION** For detailed information on SQL Server maintenance plans and system configuration, see [http://technet.microsoft.com/sqlserver](http://technet.microsoft.com/sqlserver).

If your SQL Server content will need to be highly available, service a significant number of requests, or both, you should separate the transaction log files and data files. Content is always written to the transaction log first, regardless of the recovery model. This allows the database to be brought back into a consistent state if you need to recover the database using SQL Server restore tools. Next, a SQL Server checkpoint process runs at regular intervals and writes the transactions to the data file.

**NOTE** In the Full recovery model, transaction log records are retained until you back up the database and truncate the transaction log.
When users are viewing your Web applications, they are almost always consuming the data file on SQL Server. By contrast, write actions are processed in the transaction log. Therefore, it is safe to assume that in a read-only server farm the data file physical disk will be the most utilized. Because of the nature of SharePoint Server transactions, the transaction log and data file are usually equally used in a collaborative environment.

By default, SQL Server places both the data files and transaction logs on the same volume on SQL Server. You can change this default behavior by modifying the default SQL Server settings. To change the default location for new databases, do the following on your SQL Server console:

1. Open SQL Server Management Studio.
2. Right-click the server name and select Properties.
3. Select Database Settings.
4. In the Database Default Locations settings, choose a previously created volume.

Note that if multiple volumes share the same physical disks you will not see a performance increase. If possible, you should separate the transaction logs and the data files on separate physical disks and not on the system volume. Figure 3-19 shows an example of changing the data file location to the D: volume and the transaction logs to the L: volume.

![Figure 3-19](image.png)

**FIGURE 3-19** You can change the database default locations in SQL Server Properties.


### Default Database Server
When you installed SharePoint Server 2010, you selected a database server for the configuration database. The SQL Server you selected became the default content database server. You can change this default at any time from Central Administration, Application Management, Specify The Default Database Server. Unless you are in a specialized environment, do not use SQL Server authentication. Windows authentication is almost always the correct choice. Do not fill in the Database Username and Password fields when using Windows authentication. SharePoint Server 2010 automatically configures the SQL Server permissions when using Windows authentication.

### Data Retrieval Service
The Data Retrieval Service was first introduced in Windows SharePoint Services 2.0 and allowed for a connection to internal or external data sources via Web services. SharePoint Server 2010 continues to build on the service, and it can be configured for the entire server farm or on a per–Web application basis. For the most part, you leave this configuration set to default unless you are requested to change it by a designer or developer. For example, you might need to change it when requiring access to stored procedures on a non–SharePoint Server database, external content source (OLEDB), or XML and SOAP Web services from within SharePoint Server 2010.

To configure the Data Retrieval Service, browse to Central Administration, Application Management, Configure The Data Retrieval Service. There are seven configuration options:

- **Web Application** Be sure you are selecting the correct Web application before continuing. Note that the user interface refers to Global Settings—those are also selected in the Web application drop-down menu, as seen in Figure 3-20.

  ![Web Application](https://portal.contoso.com/)

  ![Customize Web Application](https://portal.contoso.com/)

  ![Inherit the global settings](https://portal.contoso.com/)

  **FIGURE 3-20** Select Change Web Application or Global Settings using the drop-down menu.
- **Customize Web Application**  If you want to use Web-application scoped settings, clear this option. If you want to override prior Web-application changes, you can also select this box to reapply the global settings. This is useful if you made a mistake configuring a specific Web application.

- **Enable Data Retrieval Services**  Be careful when deciding whether to turn off this option. Both SharePoint Designer 2010 and Visual Studio 2010 might leverage these services via Web parts and custom code. Check with your development team before disabling these services.

- **Limit Response Size**  Unless directed by your development team, the default OLEDB response size should be selected. You should monitor your server’s memory utilization if you increase the defaults, and you should do so over a period of several days. Large OLEDB queries can quickly use server memory.

- **Update Support**  This option is disabled by default, but many developers will want to enable this option. A common reason for doing so is that custom code might call a stored procedure in a non–SharePoint Server 2010 database. This is often more efficient than bringing the data into .NET for processing.

- **Data Source Time-Out**  Unless you are calling data sources over a wide area network (WAN), the default time-outs should be sufficient.

- **Enable Data Source Controls**  Data Source Controls allow controls to bind to other controls, without the need for custom code. This option is usually enabled.

## Configuring Send To Connections

SharePoint Server 2010 has dramatically improved an administrator’s ability to connect services and site collections without custom code. If you worked with SharePoint Server 2007, you’ll recognize the Web service used for connections, officialfile.asmx. That was the Records Center connection, and it was scoped to the farm level. SharePoint Server 2010 allows connections between many site collections, not just the Records Center. Connections can also be scoped to Web applications instead of to the farm. The most common uses of Send To connections are Records Management and Published Documents. This section will walk you through the configuration options of an external service connection in Central Administration, and how to connect to a site collection for the purpose of publishing a document.

Before you can use Send To connections in a site collection, you must first configure the service in Central Administration. The connection is valid for an entire Web application, but you must configure an entry to each site collection you want to connect to. In the following example, the destination site collection is http://portal.contoso.com/sites/ISO.
To begin configuration, browse to Central Administration, General Application Settings, External Service Connections, Configure Send To Connections. Always verify you are configuring the correct Web application before continuing.

Site Subscription Settings
SharePoint Server 2010 allows for multitenancy and was primarily targeted at SharePoint Server hosting providers. This allows for isolation of hosted site collections, as well as the ability to consume service applications at the site collection level. This segmentation is known as a site subscription. Although most readers will not have their implementation configured in such a fashion because of the complexity involved, you can limit the ability of these tenants to create connections beyond their environment. If you do not have multitenancy configured, this option can be left as the default. If you do have multitenancy enabled, you must decide whether to allow connections between tenants. This decision is a business, process, and security decision.

Configuring the Content Organizer in the Destination Site
Before you can configure Central Administration for Send To connections, you must first enable the Content Organizer feature in the destination site. The Content Organizer feature allows settings and rules to route inbound files to the site. Based on the defined settings and rules, the destination site will sort and route files to the appropriate library, or even to other site collections. To enable the Content Organizer in the destination site, do the following:

1. Browse to the site where you want files to be routed to.
2. From the Site Actions menu, select Site Settings.
3. Under the Site Actions grouping, select Manage Site Features.
4. Locate the Content Organizer feature, and click Activate.
5. From Site Actions, Site Settings, configure Content Organizer Settings And Rules.

MORE INFORMATION For more details on configuring the Content Organizer, see Chapter 12, “Records Management.”

Send To Connections
You can configure multiple Send To connections and even create multiple connections to the same site using different rules. If this is your first connection, just continue completing the form. If this is a subsequent connection, either choose New Connection or select one for editing. Note that you can select the Add Connection control if you’ll configure multiple Send To connections. This prevents the configuration screen from closing and allows you to immediately add another connection.
Figure 3-21 shows an example of the Send To Connections configuration page while adding the http://portal.contoso.com/sites/ISO connection.

### NOTE
Before you can add a new Send To connection, you must first activate the Content Organizer feature in the destination site.

## Allow Manual Submissions

A commonly configured option is to Allow manual submissions from the Send To menu, as seen in Figure 3-21. Selecting this option allows users to manually send to the destination site from the user menu in a library. If you do not select this option, you’ll have to use another mechanism, such as custom code or SharePoint Designer 2010, to enable the file transfer. If you select to allow manual submissions, the user experience is similar to that shown in Figure 3-22.

### FIGURE 3-21
Highlight New Connection when creating a new Send To connection.

### FIGURE 3-22
Select the external connection defined in Central Administration to test.
CHAPTER 9

Managing the Search Experience

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When a user executes a search query, the goal is quite simple—to get a results set that includes everything relevant to the search and nothing else. Achieving this goal is not so simple, but this chapter will show how to configure search so that users can easily define and refine both the query and the results. The chapter is organized according to the scope of the configurations: starting with the file systems and then moving on to the search services application, the site collection, and the search centers.
Configuring the Thesaurus and Noise Word Files

Microsoft SharePoint 2010 continues to provide thesaurus and noise word files to manipulate the search process, but the scope of their usage has been changed in this product. In this section, we discuss the more common ways to configure these elements.

Crawl components no longer use the files to eliminate words from the index. However, query components use both the noise word files to remove words from query terms and thesaurus files to modify queries.

Noise Word Files

A noise word file is a text file that contains all the words that have little or no refinement value in a search query in your environment. Such words often include your organization’s name, product names, registered names, and so on. Noise words apply only to text content, not metadata.

SharePoint Server 2010 provides noise word and thesaurus files in 54 languages. They are located in a number of directories named Config. The hierarchy of these directories is significant because the installation and implementation of SharePoint Server determine which set of files is used during a query.

Files located in the %ProgramFiles%\Microsoft Office Servers\14.0\Data\Config folder are for SharePoint Foundation Server installations. This folder is not used in SharePoint Server 2010.

For a SharePoint Server 2010 standalone server farm or Microsoft Search Server 2010, the files under %ProgramFiles%\Microsoft Office Servers\14.0\Data\Office Server\config are copied to the Microsoft Office Servers\14.0\Data\Office Server\Applications\(serviceGUID)\Config folder to be used at query time.

When you are setting up a complete server farm, whether it contains one server or more, files under %ProgramFiles%\Microsoft Office Servers\14.0\Data\Office Server\config are copied to all %ProgramFiles%\Microsoft Office Servers\14.0\Data\Office Server\Applications\(service and service component GUID)\Config folders. However, only files under query component GUIDs are used at query time.

For consistent query responses, all files under all query components on all servers should be identical. If noise word and thesaurus file modifications are known before you create search service applications, the set of files in the %ProgramFiles%\Microsoft Office Servers\14.0\Data\Office Server\config folder can be modified prior to the copy process. These files must be identical on all members of the farm because any member can host the search service components.

To configure a noise word file, perform the following steps:

1. Go to the appropriate noise word file, and open it using a text editor such as Notepad.
2. Enter the words you do not want used in queries, one word per line. Maintaining the list in alphabetical order makes reviewing terms easier.
3. Save the file.

**IMPORTANT** A noise word file must have at least one entry in it, even if the entry is only a period (.) character.

**Configuring the Thesaurus**

The thesaurus provides a mechanism to assist users in constructing a query by expanding or replacing query terms as the query is executed against the index. It differs from search suggestions in that the changes are transparent to the user and are not optional for the user. You can create expansion or replacement sets, as well as weight or stem the terms within the expansion or replacement sets.

You can use thesaurus file entries to correct commonly misspelled query terms, add synonyms to queries, or replace query terms. Because modifying these files requires access to the file system of all Web front ends, you probably will find the new functionality of search suggestions easier to maintain.

The thesaurus is configured via an XML file, which has the format of TS<XXX>.XML, where XXX is the standard three-letter code for a specific language. For English, the file name is Tsenu.xml.

The default code for the file is as follows:

```xml
<XML ID="Microsoft Search Thesaurus">
<!-- Commented out
<thesaurus xmlns="x-schema:tsSchema.xml">
<diacritics_sensitive>0</diacritics_sensitive>
<expansion>
  <sub>Internet Explorer</sub>
  <sub>IE</sub>
  <sub>IE5</sub>
</expansion>
<replacement>
  <pat>NT5</pat>
  <pat>W2K</pat>
  <sub>Windows 2000</sub>
</replacement>
<expansion>
  <sub>run</sub>
  <sub>jog</sub>
</expansion>
</thesaurus>
-->
</XML>
```

To create new expansion sets, perform the following steps:

1. Open Windows Explorer, and go to the location of the thesaurus XML file.
2. Open the XML file using Notepad or some other text editor.
3. Enter your expansion terms within the tags using well-formed XML, as illustrated here:

```xml
<expansion>
  <sub>term1</sub>
  <sub>term2</sub>
  <sub>term3</sub>
</expansion>
```

4. Save the file.

5. Restart the Mssearch.exe service.

To create new replacement sets, perform the following steps:

1. Open My Computer, and go to the location of the thesaurus XML file.
2. Open the XML file using Notepad or some other text editor.
3. Enter your replacement terms within the tags using well-formed XML. Note that the terms being replaced are in the `<sub>` extensions, and the term to replace them is in the `<pat>` extension. This is illustrated here:

```xml
<replacement>
  <sub>term1</sub>
  <sub>term2</sub>
  <pat>term3</pat>
</replacement>
```

4. Save the file.

5. Restart the SharePoint Server Search 14 service (Net stop/start osearch14).

**Defining Authoritative Pages**

Search results relevance settings can be managed through the authoritative pages in the search service. The relationship of individual documents or content items to authoritative pages is defined in terms of *click distance*. Click distance is not based on URL depth. If all other ranking elements are equal, the more clicks that are required to traverse from the authoritative page to the content item, the less relevant that item is for a given query. Placing a link to an object on an authoritative page elevates that object in search results, with no regard to the actual location of the object.

Your farm will have some locations that contain official, approved content for your organization. These locations are the URLs you should enter into the Authoritative Web Pages input boxes, which are shown in Figure 9-1.
You can achieve levels of granularity by entering primary, secondary, and tertiary URLs, thereby formulating an overall hierarchical relevance topology for your search application. URLs within the same input box are grouped equally, meaning that there is no hierarchical order implied by the URL list. In addition, wildcards, such as http://foo/*, are not accepted in these boxes.

You can also insert file shares as authoritative page sources. Use the file:// protocol scheme when defining file systems. For example, file://filesrvr1/archive specifies the archive file share as an authoritative location.

You can also set some sites to be the lowest on the relevance scale by placing their URLs in the Sites To Demote input box, which is shown in Figure 9-2. You should consider the resource implications of recalculating the ranking of your indexes immediately rather than recalculating them during normal schedules.
To set relevance settings, perform the following steps:

1. Open the Administration page for your search service.
2. In the Quick Launch area, click the Specify Authoritative Pages link under the Queries And Results heading.
3. Input the URLs in the appropriate boxes as required to configure relevance settings for your environment.
4. Select the Refresh Now check box if you want to have the relevance settings recomputed immediately.
5. Click OK.

Federated Queries

Federated queries permit end users to search for and retrieve content from an OpenSearch 1.1–compliant search server. These content sources can be enterprise content repositories, other search engines (including remote SharePoint search), or your SharePoint Server 2010 search services. With a federated query, the server sends the queries to the federated locations, retrieves the results from the location feed, and then formats and renders the results to your users on the same page as results from your crawled content. With SharePoint Server 2010, all queries (including those to the local search service applications) are federated.

Federated Location Management

To access the management page for the federated locations shown in Figure 9-3, click Federated Locations on the Search Service Application page. This discussion will focus primarily on actions available from the Manage Federated Locations page:

- Add a federated location by using the provided New Location UI or by importing existing definition files.
- Edit a federated location using the UI.
- Copy a federated location to use as the basis for another location.
- Delete a federated location.
- Export a federated location into a portable file.
Add New Location or Edit a Location

To add and configure a new location in the UI, click the New Location link on the Manage Federated Locations page as shown in Figure 9-3. This opens the Add Federated Location page, where the properties of the location will be configured. Editing an existing location opens essentially the same page except that the location name cannot be changed. Most, but not all, information entered on this page will be included in the Federated Location Definition (FLD) file itself. The configuration entries are grouped under headings that can be expanded or collapsed.

GENERAL INFORMATION

The first three items shown in Figure 9-4 are required information.

The Location Name text box is used to identify this location, and the name chosen must be unique within your organization. It cannot be modified after the FLD has been created. This name is used only by service administrators and developers. More than one FLD can connect to the same search server with different parameters as long as each one has a unique name. This name cannot contain spaces or any punctuation.

The name entered in the Display Name text box for this location should also be unique. Site collection administrators will be the primary users of this name, but they can choose to display this name to end users in federated-enabled Web parts.

The description entered in the Description text box will be visible to service administrators, site administrators, and developers. It should include all information defining how the queries will be run, such as the source (and any limitation or refinements), who can access this location, and what triggers or macros are provided.
The next two items, the Author and Version text boxes, are shown in Figure 9-5. Providing this information is optional.

Information entered in the Version text box is purely optional information. If you choose to enter a value, it must contain at least one period (.). This information is included in the file and simply provides a way to track change history, because there is no way to upgrade a location based on its version.

The Trigger configuration shown in Figure 9-6 is very much functional information and controls whether the location is used in a query and how much of the query term is forwarded to the search server. The location Web part will be displayed on the results page only if results are returned from the query.
The default setting, Always, sends all queries to this location. Bandwidth utilization of the traffic generated by all queries being forwarded externally and the latency of results sets being returned should be considered before using this option.

If you choose to use the Prefix trigger, an exact match of a term listed as a prefix is required. Use of prefixes requires users to be trained. The first consideration is that the word used as a prefix will not be forwarded to the federated location search engine but will be used in searching your local content. If users are properly trained, however, the use of prefixes will enable the selective use of federated locations controlled by users’ query constructions.

For example, a prefix trigger for “medicine” will match “medicine Benadryl.” In this case, only “Benadryl” will be sent to the location as a search term, because the prefix is not included in {searchTerms}. If you want to send both “medicine” and “Benadryl” to the location, you need to use a pattern trigger instead.

A pattern query will probably be transparent to your users. Patterns are defined as .NET regular expressions (REGEX). If the query or part of the query matches the pattern defined, the entire query is forwarded to the location. This pattern-matching of regular expressions quickly parses text to find specific character patterns, which triggers the use of the federated location. It can also add the extracted strings to a capture group or collection, which will store it in a named variable for later use in the query template.

For example, the pattern (^([\w.-]+)@([\w.-]+)(\[[a-zA-Z]{2,4}\]$) searches the location for e-mail queries such as email@contoso.com. For more information on .NET Framework regular expressions, see http://go.microsoft.com/fwlink/?LinkId=100710.

If the pattern were medicine(?<drug>.*).?) and the user query was medicine Benadryl, the pattern would match medicine and store Benadryl in the capture group (or variable) <drug>. You could then configure the FDL to send only this capture group to the location by replacing {searchTerms} with {drug} in the query template. This example behaves just like a prefix trigger in that it does not forward medicine from the original query in the federated query.

LOCATION INFORMATION

The next section of configuration settings for the location is grouped under Location Information, as shown in Figure 9-7.

![Figure 9-7 Location Information settings.](image)

The location type determines the protocol used to connect to this location, and several configuration options change depending on your choice:

- **Search Index On This Server** Used to run a standard query to get results from the local index. Selecting this option will display results from a pre-defined scope or a managed property with all the specified parameters, including triggers and query templates.

- **FAST Index** Used to query a FAST server.

- **OpenSearch 1.0/1.1** Used to display results from another search engine that can receive a query by using a URL and return results as structured XML, including remote search indexes on other SharePoint farms.

A search query is sent to a federated location as URL parameters in a format called a *query template*. This is called the *URL template* in the OpenSearch specification, and the query template syntax is based on the URL template syntax. When using the local index as a federated location, no query template is required because the protocol uses the object model to execute the query.

The default query template simply includes the case-sensitive `{searchTerms}` capture group as a variable, which represents the keywords entered into the search box by users. As we discussed in pattern triggers, you can replace `{searchTerms}` with capture groups created by your pattern. You can include other parameters in the template to specify additional query restrictions. These parameters are managed properties of the index that are probably not known to your users. If a parameter is optional, include a question mark character (?) after the parameter name. Common parameters are the following:

- **scope:<name of scope>** Limits the search to a particular scope. Multiple entries are permitted to combine more than one scope.

- **type:.doc type.docx type.docm** Returns Microsoft Office Word document results for the keywords entered into the Search box. Other content types can be added to further refine the results—for example, to include only contracts.
Parameters that you specify in the URL template must be URL-encoded. For example, a space must be represented by `%20`.

An example of an OpenSearch template is `http://www.bing.com/search?q={searchTerms}&go=&form=QBLH&qs=n&format=rss`.

The More Results Link Template option specifies the URL of the Web page that displays results for a search query. When this link is configured in the Web part, a More Results link displays beneath the search results from this location. This link opens a page that presents the full list of results from the location, not just the number specified in the results Web part. An example is `http://www.bing.com/search?q={searchTerms}`.

**Display Information**

The configurations in this grouping control how the results will be displayed within the Web part.

Microsoft federated queries require that federated locations return results in structured XML, which must then be transformed into HTML by XSL before it can be displayed in the Federated Results Web part. The Top Federated Search Results Display Metadata section presents the options to use the default XSL or to edit it for a customized display of results, text, and images as shown in Figure 9-8.

Properties determine the metadata returned with the search results. If you modify the default list of metadata in the list of returned properties, you must also update the XSL to display the new properties.

Sample data is included so that a visual preview is available when editing the Federated Results Web part.

![FIGURE 9-8 Federated Search Results Display Metadata.](image)

The Core Search Results Display Metadata and Top Federated Results Display Metadata sections present the same options as the Federated Search Results Display Metadata section shown in Figure 9-8 except that these settings apply when different Web parts present results from the location.
RESTRICTIONS AND CREDENTIALS INFORMATION

The final section controls the usage of the location and what type of authentication is required by the location.

As shown in Figure 9-9, the Restrict Usage section permits the search administrator to control whether all site collections can use an individual federated location or whether the location is restricted to a list of one or more site collections. The default is No Restriction, which permits site administrators from any site to use this location.

Selecting Use Restriction activates the box for listing by URL the specific site collections that can use this location. With this option, you can do the following:

- Restrict access to confidential data
- Limit the number of people who can access the location
- Provide access to the same search server configured differently as unique federated locations for different site collections within your enterprise

A semicolon must be used to separate the start addresses of URLs in the Allowed Sites list. For example, the list http://team1;http://team2 ensures that the location can be used only in sites starting with http://team1 or http://team2.

In some instances, authentication might be required. Most Internet search engines do not require credentials. If Search Index On This Server is selected as the Location Type for the federated location, no additional authentication information is required. Results from this federated location will be security trimmed based on user credentials after they have been returned to the Web front-end server. However, if the location type selected is FAST Index or OpenSearch 1.0/1.1, you must specify the authentication method and provide security credentials as shown in Figure 9-10.

In some instances, authentication might be required. If Search Index On This Server is selected as the Location Type for the federated location, no additional authentication information is required. Results from this federated location will be security trimmed based on user credentials after they have been returned to the Web front-end server. However, if the location type selected is FAST Index or OpenSearch 1.0/1.1, you must specify the authentication method and provide security credentials as shown in Figure 9-10.
These authentication options are grouped as follows:

- **Anonymous Access** Indicates that the location does not require authentication.

- **Common Authentication** Provides a single user name and password to the location. If you enable this option, you must select the authentication method required by the search server and provide the credentials to be used. Each authentication method, as selected, presents the appropriate dialog boxes for entering the credentials to be used. These dialog boxes are not illustrated here.

- **User-Level Authentication** Passes individual user credentials to the location using the method that you select.

**Download and Import an FDL file**

You can download federated search connectors from the Search Connectors Gallery at [http://go.microsoft.com/fwlink/?LinkId=95798](http://go.microsoft.com/fwlink/?LinkId=95798), or you can use custom connectors that you have built and exported to your file system to quickly import a preconfigured connector into your Search Server configuration. The Import Location link on the Manage Federated Locations page opens a page where you can browse to a local file system and select the appropriate .fld file. After importing a location that requires authentication, you must edit the location and re-enter the credentials that were not saved during an export operation.

**Copy a Federated Location**

The Copy Location option shown in Figure 9-3 copies all the settings of the location except the name, which needs to be unique. This is the easiest way to change the name. It is also useful when you want the same location available with modified parameters for different site collections.

**Delete a Federated Location**

When you select Delete Location from the context menu shown in Figure 9-3, you will be given one warning. If you click OK, all information about the location is deleted. You might want to export the location before deleting it so that it will be available if you need to restore it later.

**Export a Federated Location**

Exporting a location from the context menu shown in Figure 9-3 gives you a portable configuration file with an .fld extension, which can be used to restore the location locally or imported onto another search server. However, when you export a federated location to a definition file, your security credentials or settings are not included with the file.
Managed Properties

Although a search query across the full text of a document might be useful, the power of an enterprise search query comes from its ability to query attributes or properties of objects, whether it can crawl the actual content or not. The Search schema contains two types of properties:

- Crawled properties are automatically extracted from crawled content, and the metadata field is added to the search schema. The text values of crawled properties that are included in the index are treated the same as text content unless they are mapped to a managed property.
- Managed properties are created to group common properties with dissimilar names under standardized names and expose this grouping to search tools. Users can perform specific queries over managed properties.

Crawled properties can be columns on a list or document library, metadata for a content type, or properties within the properties of a document created in a Microsoft Office application. If your users use custom names in these scenarios, mapping crawled properties to a managed property will be more difficult than if they used existing properties or columns. Determining which custom properties should be grouped into a managed property is frequently a time-consuming research job, particularly if there is no naming convention established.

The value in mapping crawled properties to managed properties is that it groups metadata into usable units. The metadata (crawled properties) are grouped into a logical, single unit (managed properties). Multiple crawled properties can be mapped to a single managed property, or a single crawled property can be mapped to multiple managed properties. Managed properties can then be used to create search scopes and enable your users to focus their search to a limited portion of the corpus. Managed properties can also be included in the Advanced Search Web part interface to narrow a query to specific properties and in the Refinement Web part for focusing on specific search results. We will discuss these uses later in this chapter.

**REAL WORLD** Grouping crawled properties into managed properties is essential for many search functionalities. For example, suppose you have three document types: document type A, which lists the author in the Author metadata field; document type B, which lists the author in the Creator metadata field; and document type C, which lists the author in the Originator metadata field. In this scenario, you have (essentially) the same metadata for three different document types residing in three different metadata fields. When these documents are crawled, each metadata field is entered into the property store as separate crawled properties. However, you can group these three crawled properties into a single managed property so that you can use them as a single unit when querying for author names across these three different document types.
To administer metadata properties, navigate to the Metadata Property Mappings page shown in Figure 9-11 by clicking the Metadata Properties link under the Queries And Results heading of the Search Service Application page.

FIGURE 9-11 Metadata Property Mappings page.

Use this page to create and modify managed properties and map crawled properties to managed properties. Changes to properties of existing content take effect after the next full crawl, but they are applied to new content during incremental crawls.

On this page, several properties of each managed property are displayed, including a linked name and linked crawled properties mapped to the managed property. If you need to configure a new managed property, click the New Managed Property link to open the property page shown in Figure 9-12. Editing from the context menu opens essentially the same page. There are several sections to configure:

- **Name And Type**   The name must be unique and should follow a naming convention that is meaningful and easy to remember. The data type must match that of the crawled properties that will be mapped to this managed property. Your choices are Text, Integer, Decimal, Date And Time, or Yes/No. There is also a Has Multiple Values check box you can select to indicate that the property has multiple values.

- **Mappings To Crawled Properties**   This is the collection of crawled properties that will be represented by this managed property. This configuration section also includes the option of including values from all mapped crawled properties or including values from a single crawled property determined by the order in which the mapped properties are listed.

- **Use In Scopes**   This Boolean choice determines whether the managed property will be available in the drop-down list when defining search scopes.
Optimize Managed Property Storage  The first of two choices here determines whether the text properties are automatically treated as a hash, which reduces the size but limits comparisons to equal or not equal instead of less than, greater than, order by, and so on. The next choice determines if the managed property will be added to the restricted set of managed properties that are shown in custom search results pages.

Central Administration » Search Service Application: New Managed Property

Use this page to view and change the settings of this property.

Name and type

Type a name for this property, and select the type of information you want to store in this property.

Property name: *
Description:
The type of information in this property:
- Text
- Integer
- Decimal
- Date and Time
- Yes/No
- Has Multiple Values

Mappings to crawled properties

A list of crawled properties mapped to this managed property is shown. To use a crawled property in the search system, map it to a managed property. A managed property can get a value from a crawled property based on the order specified using the Move Up and Move Down buttons. The crawled properties mapped to this managed property:
- Include values from all crawled properties mapped
- Include values from a single crawled property based on the order specified

Crawled properties mapped to this managed property:
- Property
- Property
- Property
- Add Mapping
- Remove

Use in scopes

Indicates whether this property will be available for use in defining search scopes.
- Allow this property to be used in scopes

Optimize managed property storage

To reduce storage requirements, new text properties are automatically treated as a hash which limits comparisons (including sorting) to equality/inequality. Uncheck this option to enable other types of comparisons (less than, greater than, order by).
- Reduce storage requirements for text properties by using a hash for comparisons
- Add managed property to custom results set retrieved on each query. Note: Only the first 2 kilobytes of data is available for display by default

FIGURE 9-12 New (Edit) Managed Property page.

Other settings for managed properties can be configured programmatically using the Microsoft.Office.Server.Search.Administration.ManagedProperty class or the Windows PowerShell cmdlets for SPEnterpriseSearchMetadataManagedProperty:

MappingNotAllowed  Indicates whether a crawled property can be mapped to this managed property.

Retrieve  Affects whether the property can be displayed, sorted, or used with operators. The two settings under Optimize Managed Property Storage also influence this setting.
- **FullTextQueriable**  Governs whether this managed property is stored in the index and can be used in a CONTAINS or FREETEXT clause so that the property is specified through a query.

- **NoWordBreaker**  Controls whether the values for this managed property go through a word breaker.

- **RemoveDuplicates**  Determines whether the managed property receives multiple values, if there are duplicates.

- **Weight**  Adjusts the relevance configuration.

To see all the crawled properties, from the Metadata Property Mappings page click the Crawled Properties link to open the page shown in Figure 9-13. This page presents a view of crawled properties in alphabetical order by name and displays the type, managed property mappings, whether a particular property is included in the index, and whether a particular property is multivalued.

![Crawled Properties page](image)

**FIGURE 9-13**  Crawled Properties page.

To edit a crawled property, select Edit/Map Property from the context menu, which opens the page shown in Figure 9-14.
Use this page to view and change the settings of this property.

**Name and Information**

Name and descriptions of the crawled property. The information on the crawled property is derived by the filter or protocol handler.

- **Property Name**: 4
- **Category**: Office
- **Property Set ID**: 4948b5cd-4f85-1600-af95-9a002b273a69
- **Variant Type**: 31
- **Data Type**: Text
- **Multi-valued**: No

**Content using this property**

This is a small sample of documents containing this property:

- Sample documents: http://portalenvironment.com
- http://portalenvironment.com/sites/team1

**Mappings to managed properties**

This crawled property is mapped to the following managed properties:

- **Author (Text)**
- **MetadataAuthor (Text)**

Select the checkbox to enable querying against the values of this crawled property. This will place these values in the search index.

**FIGURE 9-14** Edit Crawled Property page.

Within this page, you can manage the mappings of the crawled property to one or more managed properties. The Include Values For This Property In The Search Index option controls whether the property values is included in queries if the crawled property is not mapped to a managed property. Not including the values reduces the size of the index and the query efficiency but impacts the relevance ranking.

For instance, if this option is not selected and the crawled property is *author*, simple queries such as *Smith* return documents containing the word *Smith* in the body but do not return items whose author property is *Smith*. However, a query against the managed property with the keyword filter *author:Smith* returns the documents. The existence of *Smith* in a property is more relevant than a single instance within the body of a document.

**NOTE** A change in metadata does not trigger a crawl of an item. Existing items must be re-crawled for changes to take effect, while new items are affected with their initial crawl. A full crawl will provide consistent search results.

Crawled properties are organized into categories. The Categories link opens a page of hyperlinked categories, which are shown in Figure 9-15:

- **Basic** Contains metadata associated with the gatherer, search, core, and storage property sets. In my environment, there are 10 different GUIDs (property sets) in the Basic Crawled Property Category.
- **Business Data** Contains metadata associated with content in the Business Data Catalog.
- **Internal** Contains metadata internal to SharePoint.
- **Mail** Contains metadata associated with Microsoft Exchange Server.
- **Notes** Contains metadata associated with Lotus Notes.
- **Office** Contains metadata contained in Microsoft Office documents such as those created with Word, Excel, PowerPoint, and so on.
- **People** Contains metadata associated with the people profiles in SharePoint. The majority of this metadata is also mapped to various managed properties from Active Directory and SharePoint information.
- **SharePoint** Contains metadata that is part of the Microsoft Office schema available out of the box.
- **Tiff** Contains metadata associated mainly with documents that have been scanned or faxed, along with word-processing and Optical Character Recognition (OCR) information.
- **Web** Contains HTML metadata associated with Web pages.
- **XML** Contains metadata associated with the XML filter.

![Central Administration » Search Service Application: Categories](image)

Use this page to edit categories and view crawled properties in a particular category.

<table>
<thead>
<tr>
<th>Managed Properties</th>
<th>Crawled Properties</th>
</tr>
</thead>
<tbody>
<tr>
<td>Category Name</td>
<td>Number of Properties</td>
</tr>
<tr>
<td>Basic</td>
<td>14</td>
</tr>
<tr>
<td>Business Date</td>
<td>3</td>
</tr>
<tr>
<td>Category 1</td>
<td>1</td>
</tr>
<tr>
<td>Internal</td>
<td>0</td>
</tr>
<tr>
<td>Mail</td>
<td>Edit Category</td>
</tr>
<tr>
<td>Notes</td>
<td>Delete</td>
</tr>
<tr>
<td>Office</td>
<td>42</td>
</tr>
<tr>
<td>People</td>
<td>2</td>
</tr>
<tr>
<td>SharePoint</td>
<td>154</td>
</tr>
<tr>
<td>Tiff</td>
<td>0</td>
</tr>
<tr>
<td>Web</td>
<td>50</td>
</tr>
<tr>
<td>XML</td>
<td>0</td>
</tr>
</tbody>
</table>

**FIGURE 9-15** Categories page.

Each category can be opened to expose just the crawled properties within that group. You can open the page to edit the properties of each category from its context menu.

Bulk actions on all properties within the category can be taken on the category’s property page, shown in Figure 9-16.
Enabling all these options not only ensures that crawled properties for this category will be discovered, but also that managed properties are automatically created when new SharePoint columns are created.

Your solution can use these new managed properties to present to the user. Unfortunately, the name of the automatically generated managed property is not user friendly. Because SharePoint crawled properties are prefixed with ows_, the auto-generated managed property is also prefixed with ows. For example, if a user creates a new column in a document library called CostCenter, the crawled property will be ows_CostCenter and the managed property will be owsCostCenter. If the column name includes a space, as in Cost Center, the crawled property will be ows_Cost_x0020_Center and the managed property will be owsCostx0020Center.

The programming effort to correct the naming scheme can exceed the cost of manual administration of managed properties.

From the context menu or from the Edit Category page, you can delete an empty category. New categories can be created only programmatically or with the Windows PowerShell SPEnterpriseSearchMetadataCategory cmdlets.

Creating and Managing Search Scopes

A search scope provides a mechanism to group items logically within the index based on common elements. They are used to target a query to only a precompiled portion or slice of the corpus to provide a more efficient query and more relevant results.

Essentially, there are two types of scopes. Authored scopes are created by search or site collection administrators. Contextual scopes are created automatically and presented as This Site or This List. The This And Related Sites scope available in team sites is just a collection of contextual scopes.
To begin to manage search scopes at the search application level, click the Scopes link in the Queries And Results group of the Quick Launch area of the Search Administration page for your search application. This opens the View Scopes page as shown in Figure 9-17.

The People and All Sites scopes were created automatically, but they are authored scopes and can be managed. Because contextual scopes cannot be managed, they are not displayed on the View Scopes page. However, all scopes authored at the service application level or at associated site collections are stored in the search service database and are displayed on this page.

Scopes created at the service application level are known as *shared* scopes and are available for use in any site collection subscribing to the search service application. Scopes created at a site collection are available for use only in that site collection unless they are copied as a shared scope at the service application level. In Figure 9-17, the Team One scope, which was created at the team1 site collection, presents the same context menu as scopes created at the search service application level. However, that scope can be copied only as a shared scope at this level and must be managed at the original site collection location.

![Central Administration > Search Service Application: View Scopes](image)

Use this page to view and manage search scopes. The order in which the search scopes appear in this list is the order in which they will appear in the search scope list next to the Search box.

<table>
<thead>
<tr>
<th>Title</th>
<th>Update Status</th>
<th>Items</th>
</tr>
</thead>
<tbody>
<tr>
<td>People</td>
<td>Ready</td>
<td>24</td>
</tr>
<tr>
<td>All Sites</td>
<td>Ready</td>
<td>106</td>
</tr>
</tbody>
</table>


Team One

![Edit Properties and Rules](image)

![Make Copy as Shared](image)

![Delete](image)

**FIGURE 9-17** The View Scopes page.

To create a new scope, click the New Scope link, which is shown in Figure 9-17. The Create Scope page, as illustrated in Figure 9-18, presents the same options as the Edit Scope page. Complete the following steps before clicking OK:

1. Enter a name, in the Title field, that is unique across your enterprise and that clearly defines the content for users. In Figure 9-18, we used Contracts.
2. Enter a description that defines the usage for search administrators. This field is blank by default.
3. Ignore the Last Modified By field, which cannot be edited.
4. Change the Target Results Page settings if you have a custom results page for this scope.
CHAPTER 9  Managing the Search Experience

Because the new scope has no rules applied, it appears on the View Scopes page with a status of Empty – Add Rules, as shown in Figure 9-19. A scope is not functional until you add rules to define the common elements that delineate the boundaries of the scope. The Add Rules link shown in Figure 9-19 is available only for adding the first rule.

When you click the Add Rules link, the Add Scope Rule page opens, as shown in Figure 9-20.

FIGURE 9-18 The Create Scope page.

FIGURE 9-19 The View Scopes page with the new scope added.

FIGURE 9-20 Add Scope Rule page for the Web Address type.
A scope rule comprises a rule type and any definition of the rule type required, plus the behavior of the rule.

Available rule types are these:

- **Web Address**  This type can be any location addressable with a URL in a browser, including Web sites, file shares, public folders, and so on. These addresses can be defined as specific locations called *folders*, any locations on a specific host, or even all locations in a specific domain.

- **Property Query**  This type can be any managed property enabled for use in a search scope. The definition section of the Add Scope Rule page changes to that shown in Figure 9-21 for property query rules. Select the managed property from the drop-down list, and enter the value for that property that will be used in the rule. In Figure 9-21, we chose ContentType, which by default is not enabled for use in scopes, and then entered Contract as the value.

- **Content Source**  This rule type presents a drop-down list of content sources for the search application. Be careful when choosing this option because changes to the content source could be made without regard to their impact on the scope rules.

- **All Content**  This type has no additional configuration options.

Scopes can have multiple rules. The Behavior configuration of the rule shown in Figure 9-20 defines how this rule will be applied in compiling the scope. The definitions are straightforward. Both the Include and Require options include content meeting the rule definition, but if the scope has multiple rules all items included must meet the condition of the Require behavior rules.

**REAL WORLD** Scopes can be quickly created to exclude specific content. First create a rule and choose the All Content option. Then add a rule using other rule types to exclude the content not desired. This approach is sometimes much easier than using a long list of Include rules. The order of rule creation or appearance is irrelevant in scope compilation.

After creating the first rule, you must click the scope name in the View Scopes page to open the Scope Properties And Rules page shown in Figure 9-22. From this page, you can manage the scope rules and edit the scope properties.
Tip: Add rules to define what items users will be searching over when they search inside this scope.

### Scope Settings

<table>
<thead>
<tr>
<th>Title:</th>
<th>Contracts</th>
</tr>
</thead>
<tbody>
<tr>
<td>Description:</td>
<td></td>
</tr>
<tr>
<td>Update status:</td>
<td>New scope - Ready after next update (starts in 9 minutes)</td>
</tr>
<tr>
<td>Target results page:</td>
<td>(Empty)</td>
</tr>
<tr>
<td>Change scope settings</td>
<td></td>
</tr>
</tbody>
</table>

### Rules

<table>
<thead>
<tr>
<th>Rule</th>
<th>Behavior</th>
<th>Item Count (approximate)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ContentType = Contract</td>
<td>Include</td>
<td>1</td>
</tr>
</tbody>
</table>

**FIGURE 9-22** Scope Properties And Rules page.

Note in Figure 9-22 that the new scope Update Status is New Scope - Ready After Next Update (Starts in 9 Minutes) and the Item Count Total shows “(not yet compiled).” Items in the index are matched to their scope with a compilation process that is separate from the crawl and indexing process. This process is a scheduled timer job that runs every 15 minutes by default, but it can be initiated manually from the search service application management page when scopes need updating, as shown in Figure 9-23.

**FIGURE 9-23** Scope update information from the Search Management page.

This process can also be changed to manual by clicking the Automatically Scheduled link to open the Specify Update Schedule dialog box shown in Figure 9-24 and then selecting the On Demand Updates Only option. The timer job schedule cannot be managed from Central Administration.

**FIGURE 9-24** Specify Update Schedule dialog box for the scope compilation process.
Search Results Removal

If content will be crawled by your search engine that should not be presented in search results, you need to immediately remove it from search results. Remember that search results are derived from the index, so removal of the content itself is not sufficient. The information must be removed from the index.

To remove content from search results, open the Remove URLs From Search Results page shown in Figure 9-25 by clicking the Search Result Removal link in the Queries And Results group of the Quick Launch area of the Search Administration page for your search application.

Enter the URLs of the content to be removed in the URLs, one per line, and click Remove Now. The URLs will be added to a file in the index that will remove them from search results until a crawl can update the index. In addition, crawl rules will be created to prevent the content from being indexed in subsequent crawls.

REAL WORLD Sometimes only the permissions were wrong on content that was crawled. If the error has been corrected on the content but it has not been recrawled, search results might still expose inappropriate information to users even if they cannot access the complete documents. In this case, remove the content from the index using the search results removal tool and delete the crawl rule after the permissions have been corrected. Because changes to permissions trigger a recrawl even on file share content in SharePoint Server 2010, the next incremental crawl will update the index.

FIGURE 9-25 Remove URLs From Search Results page.
Site Collection Search Management

Most of the customization with which users interact is created and managed at the site collection level. Even sites, lists, and libraries present settings that control and affect search results. This section will begin a series of discussions on customizations controlled by local administrators and users.

Configuring the Master Page Query Box Control

The first decision for the site collection administrator is whether to use the default context scopes only, such as Windows SharePoint Foundation, or to use custom scopes with a search center in the search query box that appears on all pages. To change from the default settings, open the Search Settings page shown in Figure 9-26 from the Site Collection Administration group in Site Settings.

This page is required because the search query box that appears on each page is a control presented by the master pages. The same configurations are directly available in all Search Query Web parts.

The default configuration, Do Not Use Custom Scopes, executes queries for This Site, including subsites, and presents no scope options. Your design can include leaving the default settings for this query box and creating a search center site for enterprise content searches.

The results are displayed on the results pages defined in the Site Collection Search Results Page section at the bottom of the page. The default location of the page is a generic page in the _layouts directory that is common across all site collections. You can create a custom search results page for local searches and direct queries to it in this section.
If you choose to use custom scopes, you must direct the queries to a search center. The example in Figure 9-26 assumes a search center with tabs, which is a publishing site and has all search pages in a pages library. You can also point to a simple search site. The entry in this dialog box normally is a path relative to the application name such as /Search or /SearchCenter/pages, but it can also be a full path such as http://portal.contoso.com/Search Center/pages. You do not need to include the page because the query will be directed to the appropriate results page.

The default setting is to not display a scope drop-down box and to use the contextual scope. The other choices are as follows:

- **Do Not Show Scopes Dropdown, And Default To Target Results Page**  
  Does not display a scope drop-down list, and sends the query to the results page with no scope selected. Normally, this will be a custom results page with Web parts configured to use one or more scopes.

- **Show Scopes Dropdown** Displays the scopes defined in the search drop-down display group and the contextual scopes in the scopes list. This option is shown in Figure 9-27.

- **Show, And Default To ‘S’ URL Parameter** Displays the scopes defined in the search drop-down display group and the contextual scopes in the scopes list. The selected scope will be added to the query passed to the results page using the ‘s’ parameter.

- **Show, And Default To Contextual Scope** Displays the search drop-down list, and automatically selects the This Site or This List scope as the default. Contextual scopes cannot be managed in the search drop-down list.

- **Show, Do Not Include Contextual Scopes** Displays only the scopes in the search drop-down list that do not include This Site and This List contextual scopes.

- **Show, Do Not Include Contextual Scopes, And Default To ‘S’ URL Parameter** Displays only the scopes defined in the search drop-down display group in the scopes list. The selected scope will be added to the query passed to the results page using the ‘s’ parameter.

![FIGURE 9-27 Search box control configured with the Show Scopes Dropdown option.](image)

**Site Collection Search Scope Management**

Search scopes that you create at the service level are considered shared scopes. These scopes are available across all the Web application’s site collections that are associated with the service. Site collection owners then have the option to use the scopes within their site collection.
Site collection scopes are managed from the View Scopes page, shown in Figure 9-28. To open this page, from the Site Collection Administration menu in Site Settings, click the Search Scopes link. Notice the Unused Scopes section at the bottom of the page.

![The Site Collection View Scopes page.](image)

New local scopes are created from the View Scopes page by clicking the New Scope link and following the same steps as creating a shared scope at the search service level. The only differences between a local scope and a shared scope is that a local scope cannot contain a rule using a content source and that it can be used only in the local site collection.

To select how both local and shared scopes are displayed in the site collection, follow these steps:

1. Click the Display Groups link to open the page shown in Figure 9-29.

![The Display Groups page.](image)

2. Click the display group that you want to modify. You are then presented with the Edit Scope Display Group page, shown in Figure 9-30.
3. Now you can add unused scopes by selecting their check box in the Display column, change the order in which the scopes are listed, and choose the default scope.

4. Click OK.

Now your scope display group will appear correctly when selected for query controls or Web parts.

**NOTE** Create additional scope display groups by clicking the New Display Group link, shown in Figure 9-29, and completing steps 3 and 4. When configuring Web parts to use the display group, you have to type in the exact display group name because it will not appear in the drop-down list choices.

### Working with Keywords and Best Bets

*Keywords* are terms identified and managed by site collection (search) administrators. When terms have more than one meaning within an organization, keywords can be used to clarify their usage and meaning. More commonly, they are used to display search results so that the results recommend the most appropriate source of information related to the term. These recommended results are known as *Best Bet* locations.

When a keyword is used in a query term, both the keyword definition and the Best Bet location appear in the Best Bet Web part on the search results page. Keywords and Best Bets are configured at the site collection level by the site collection administrator. They are not configured as part of the search service, nor are they transferable between site collections.
To open the Manage Keywords page, shown in Figure 9-31, from the Site Actions menu at the root of a site collection, select Site Settings. The Search keywords link in the Site Collection Administration group will open the page.

**FIGURE 9-31** Manage Keywords page.

In the Quick Launch area are links to three views: All Keywords (the default), Expired Keywords, and Keywords Requiring Review. Two links to usage reports are Best Bet Usage and Best Bet Suggestions. These will be covered later as part of the usage reports discussion.

Because the number of keywords can be quite large, these filter views are useful, as is the keyword search tool shown in Figure 9-32. Using this tool, you can locate keywords by choosing either Keyword, Synonyms, Best Bet Title, Best Bet URL, or Contact.

**FIGURE 9-32** Keyword search tool.

Click the Add Keyword link to open the Add Keyword page. The first section of the page, as seen in Figure 9-33, manages the keyword phrase and any synonyms. Any phrase entered in either box will return the keyword results when used as a search term. Synonyms should be separated by semi-colons.

**NOTE** The Edit Keyword page uses the same.aspx page as the Add Keyword page.

**FIGURE 9-33** Keyword Phrase and Synonyms text boxes.
The next section of the page, shown in Figure 9-34, manages the keyword definition, which is the optional editorial text that will appear in the keyword result. Use this rich text editor control to enter a keyword definition that will help explain the keyword result in the result set. The text can include hyperlinks.

**FIGURE 9-34**  Keyword Definition rich text editor.

The display of a keyword definition in a search results page when the keyword has no associated Best Bet configured is shown in Figure 9-35. This definition is presented on the results page even though there are no search results to display.

**FIGURE 9-35**  Presentation of a keyword definition only.

The next section of the page, shown in Figure 9-36, manages Best Bets. A keyword can have multiple associated Best Bets. They will appear in the order specified in this section up to the limits determined by the Best Bets Web part on the results page.

**NOTE**  This screen shot was created from a prerelease version of the product. The blue letters “Remo” next to the Order number selection box will be replaced with two hyperlinks, Remove and Edit, in the released product.

**FIGURE 9-36**  Best Bet management section of Manage Keyword page.

Clicking the Add Best Bet or Edit links opens the Best Bet management dialog box shown in Figure 9-37. The URL and Title fields are required, while the description is optional. For Best Bets, the description is a text-only entry.
FIGURE 9-37 The Add Best Bet dialog box.

The next section, displayed in Figure 9-38, is management information for the keyword. Enter information for the person to be contacted on the review date. You must schedule a publishing date, but the review and expiration dates are optional.

FIGURE 9-38 Keyword contact and publishing information.

After configuring a keyword, you must run a full crawl of all your content indexes so that the new keyword entry is properly associated with content.

The keyword definition and Best Bet will be displayed in search results, as shown in Figure 9-39, even if no other results are located for your search term. The keyword definition and Best Bet display will be the same whether the search term was the keyword phrase or a synonym but, of course, the search results would differ.

FIGURE 9-39 Keyword Definition and Best Bet illustration.
Creating and Customizing Search Centers

The location and number of search centers to use are major decisions in your enterprise search design. You might choose to centralize all searches at a single location, or an organization might choose to customize and control search with local search centers. With either scenario, these customizations will be managed at the site collection level using the resources provided by at the application level.

**REAL WORLD** In a centralized search environment, you can establish a team dedicated to managing search without giving them control over other content by creating a search center at the root of a separate site collection. Place the site collection in the desired URL location using an explicit managed path.

SharePoint Server 2010 offers three search center site templates in the Enterprise tab, as shown in Figure 9-40:

- **Enterprise Search Center** This was named Search Center With Tabs in the previous version. This publishing site requires the Publishing Infrastructure feature to be activated for the site collection, but it does not require that its parent be a publishing site.
- **Basic Search Center** This template is appropriately named because it offers only three basic search pages and is more difficult to use if you want to add search pages.
- **FAST Search Center** This template is available even without FAST for SharePoint installed, but it requires a FAST search server for functionality. We will not cover this search center or its Web parts in this book.

![Search Center template selections](image)

**FIGURE 9-40** Search Center template selections.

### Customizing the Enterprise Search Center

As a publishing site, the Enterprise Search Center is designed for customization for three significant reasons:

- All three search pages templates provided within the UI are page layout templates for the publishing process that are based on the Welcome page content type.
- All pages are stored in a publishing Pages library with full publishing processes, approvals, and workflows available.
Within the page layouts of the search and results pages is a special field control, which organizes links to other search pages within customiz-able tabs. Advanced Search pages do not have a tab field control. The link information used by the tabs field control is stored in one of two link lists:

- Tabs in Search Pages
- Tabs in Search Results Pages

The three search pages of the Basic Search Center (default, advanced, and results) are Web part pages designed like the publishing templates, but there is no provision for creating additional pages based on that design.

Creating New Search Pages

From any page of the Enterprise Search Center, you can create a new search page from the Site Actions menu. However, do not select New Page because this creates a new page without presenting options to select a template. Follow these steps:

1. Select More Options, which opens the Create page. The presentation of this page varies greatly depending on whether you have Microsoft SilverLight installed.
2. Select Publishing Page to open the Create Page page shown in Figure 9-41.
3. Enter the appropriate information in the Title, Description, and URL Name text boxes.
4. Select the appropriate page template.
5. Click the Create button.

![Figure 9-41 The Create Page page.](image)

Plan your pages carefully. You will not always need a set of three pages for each customization. For instance, a single Search Box (query) page can contain multiple search boxes, each pointing to a unique Search Results page or People search results page. All search box Web parts do not need to have a corresponding Advanced Search page.
Creating New Tabs

In the edit page mode, the Tabs field control exposes links to management pages for adding new tab links or editing existing tab links, as shown in Figure 9-42. In this example, a custom tab has been added for a search page that returns only contracts in the result set.

![Tab field control](image)

**FIGURE 9-42** Tab field control.

Clicking Edit Tabs opens the Tabs In Search Pages list shown in Figure 9-43, from which the control builds the tabs. The results pages also have a tab control that uses another list, named Tabs In Search Results. These lists can also be accessed from View All Site Content.

![Tabs In Search Pages list](image)

**FIGURE 9-43** Tabs In Search Pages list page.

Clicking the Add New Item link or Add New Tab from the control on the page opens the page shown in Figure 9-44.

![New Item page for the Tabs In Search Pages list](image)

**FIGURE 9-44** New Item page for the Tabs In Search Pages list.
The Tab Name field should be self-explanatory to users. The Page field can point to an existing or future custom page. The Tooltip field should briefly explain the purpose of the custom page.

After the custom set of search pages and tabs are created, the new query page can be accessed from its custom tab. The query Web part can then point to the appropriate custom results page, and the Advanced query link can point to the appropriate custom advanced query page.

When a query opens one results page, it will be automatically passed to the results page opened by another tab on the results page.

This combination of UI tools for creating custom search pages plus the control that presents a series of tabs within the pages presents a search center that can be quickly and easily customized for multiple search business needs.

Configuring Custom Page Access
Although we have not yet discussed them all, here are some of the ways that these custom pages can be accessed:

- Site collections can be configured to use a custom set of search pages, even those located elsewhere.
- Scopes, both local and shared, can be configured for a specific results page.
- Query Web parts can be configured to use a specific results page.
- More Results links can point to custom results pages.
- Advanced Search links can point to custom advanced search pages.
- Links placed anywhere within your pages or link lists can point to custom query pages.
- Favorite links in Internet Explorer can be prepopulated with links to custom query pages using Active Directory group policies.
- Internet Explorer and Desktop Search can be configured to use custom query pages.
- Office applications can be configured to use search pages by URL.

Customizing Search Pages
Because the basic three search pages are essentially the same in the Basic and Enterprise search centers, we will first discuss customizing each of these pages and their corresponding Web parts and then discuss the extended customizations available in the Enterprise search center.
Search Web Parts in SharePoint 2010 are based on the federation object model (OM) and are used by both SharePoint Search and FAST Search. The Web parts on a page communicate through a shared query manager identified in the Web parts as the Cross Web Part Query ID. To add new Web parts that interact with existing Web parts, the new Web parts simply need to use the same query ID. Because the out-of-the-box Web parts are no longer sealed, your developers can extend their functionality instead of writing a new one from scratch.

Query Pages
The welcome page of all search centers is a basic query page named default.aspx. Although this page seems rather simple, as shown in Figure 9-45, it supports a number of customization options, even in the basic search center site.

![FIGURE 9-45 Portion of the basic query page in edit mode.](image)

The page has two Web part zones but only a single Search Box Web part. You can choose to add other Web parts, such as a content editor where instructions on how to search more effectively can be presented. Because Web parts might be targeted by audience, you can add multiple instances of the same Search Box Web part on the same page customized for different groups of users.

The appearance of the Preferences link is controlled by the Search Box configuration and opens the page shown in Figure 9-46, where users can configure personal preferences for the configuration of the Web part.

Users can choose to prevent the search suggestions from being displayed as they type in query terms. These suggestions are retrieved from the history of queries executed by previous searches. Users can also choose to override the default behavior of searching in the language of the browser and instead choose up to five languages to include in the search results. From that list, they can choose the default language, which is given a higher relevance ranking in the results list.
Search Box Web Part

The search Web parts have many configuration sections in common with other Web parts. Because these are discussed in another chapter of this book, we will not cover those sections. The Search Box Web part is used in both search and results pages and has the same functionality as the search box control on the master pages.

To configure the properties of a Web part on the Search page, perform the following steps:

1. From the Site Actions menu or the Page ribbon of the page, select Edit Page.
2. In the Web Part zone, click the small down arrow for the Web part to expose the context menu and select Modify Shared Web Part.
3. Expand the appropriate sections to configure properties as needed.
4. Click OK.
5. For publishing pages, you need to save, check in, and publish the page. For standard pages, the action is simply Stop Editing.

The Scopes Dropdown section of the Search Box Web part is shown in Figure 9-47. The Dropdown mode options are the same as those of the Site Settings Search Settings page discussed earlier. Normally, you do not need to enter text in the Dropdown Label box or modify the default automatic Fixed Dropdown Width setting (0).
FIGURE 9-47 Scopes Dropdown section of the Search Box Web part properties.

The Query Text Box Label and Query Text Box Label Width text boxes, shown in Figure 9-48, are straightforward. Additional query terms can be added to the user-entered query. This text box is usually empty. The entered text shown in Figure 9-48 limits the results to documents. Any keyword query can be placed here, including scope definitions. Because these terms modify the query transparently to the user, appropriately labeling the query box will inform the user of its functionality. The prompt string will appear in the query box unless the focus is set there automatically or the cursor is placed there manually. The Append Additional Terms To Query check box is critical because the terms entered in this section are not used unless it is selected.

FIGURE 9-48 Query Text Box section of the Search Box Web part properties.

The search query box, shown in Figure 9-49, displays the configurations set in Figure 9-48.

FIGURE 9-49 Customized search query box.

The Query Suggestions section, shown in Figure 9-50, offers global control over the suggestions process, where the preferences page let users specify individual preferences. This section offers more granular control of the search parameters. The
Minimum Prefix Length setting determines how many characters must be typed before suggestions are offered. The Suggestion Delay setting controls the response time, and the Number Of Suggestions To Display setting controls the maximum number of suggestions.

**FIGURE 9-50** Query Suggestions section of the Search Box Web part properties.

Despite the name, the Miscellaneous section shown in Figure 9-51 is probably the most often used in customizing search. The first two switches, Use Site Dropdown Mode and Use Site Level Defaults, override the settings in the Scope Dropdown section. Use these options to establish centralized control of multiple Web parts from the Search Settings of the site collection.

**FIGURE 9-51** Miscellaneous section of Search box Web part properties.
The next two switches control the links at the end of the query box. You might choose not to offer an advanced search page for some searches, such as the People Query page in the Enterprise Search Center. Obviously, if you did not select the Show Query Suggestions check box in the previous section, you also might choose to remove the user preferences link. Remember that user preferences also control query languages.

The next four entries control the Search button images. Although customization of the query Web part does permit appending terms to the query, it does not offer the sophistication of an advanced query Web part, nor can it modify the presentation of results as the various search results Web parts do. We will cover those customizations later in this chapter.

In the Advanced Search Page URL box, you can direct the advanced search link to the appropriate custom page. This text box is active even if the Display Advanced Search Link check box is not selected. The text displayed in this box in Figure 9-51 shows a relative path for a page in a Basic Search Center.

The Target Search Results Page URL setting configures the target page for the query from this search query. Because the actual work of the search query is accomplished by the results page, you might configure custom query pages or custom query Web parts where the only customization is the target results page.

The Display Submitted Search check box affects only query Web parts placed on the results page. If these Web parts display the query submitted to the page, the user can easily modify the query without retyping it in its entirety.

If you need to change the scope display group, you must type the name exactly as it appears in the site collection scope management page.

The Appearance, Layout, and Advanced sections are standard for SharePoint Web parts. If you need to target to audiences, you can find the Audiences configuration in the Advanced section. By having multiple Search Box Web parts targeted to different audiences on the same page, you can have a single query page customized to the user opening it.

Advanced Search Pages

The Advanced Search page of the Basic Search Center has only a single Web part zone, although the advanced search pages of the Enterprise Search Center have two additional zones at the top of the page. In both instances, the pages contain the single advanced search Web part shown in its default configuration in Figure 9-52.
Managing the Search Experience

Although much of the Web part can be customized easily in the property UI, three critical portions require modifying XML. We will walk through the properties as they appear. To edit the Web part, first place the page in Edit mode from either the Site Actions menu or the Page ribbon. Then to the upper right of the Web part, from the drop-down arrow menu choose Edit Web Part.

The first section of the Advanced Search Web part is shown in Figure 9-53. These Search Box settings affect the query terms. All of these query terms can be entered directly in the basic query box if the user knows how to construct the query. Each option includes a text label box and a selection to enable it.

---

**FIGURE 9-52** Default Advanced Search Web part.

**FIGURE 9-53** Advanced Search Web part properties Search Box section.
The next section, displayed in Figure 9-54, is named Scopes and controls a series of query filters. Again, options are presented for labels with enabling selections. Although the Display Group used by the scope picker is configured within this section, both the Language and Result Type pickers are controlled by an XML section that will be discussed later.

![FIGURE 9-54 Advanced Search Web part properties Scopes section.]

The Properties section, shown in Figure 9-55, continues to manage query filters using managed properties. An XML string contained in the Properties text box controls the managed properties available for use here, as well as the languages exposed in the language picker and the file types defined in the result type picker.

To edit this code, place the cursor in the text box to expose the blue builder text editor button to the right of the text box. Because the file is a single line in this editor, you might want to copy the entire text to your favorite XML editor, make the changes, and paste the modified text back into the builder for saving to the Properties settings.

![FIGURE 9-55 Advanced Search Web part Properties section.]

We will examine the portions of this file in the order of appearance. The first section defines the languages supported by search. For each language definition (LangDef), the display name is given in quotes, and the assigned language ID is given in quotes. You do not need to modify this portion. A small portion of the code follows.
The next section of the code specifies the languages by LangID to be displayed in the language picker, as shown in the following code sample. To change the languages displayed, simply add or remove lines from these default settings and save the code back to the Properties text box.

```
<Languages>
  <Language LangRef="en" />
  <Language LangRef="fr" />
  <Language LangRef="de" />
  <Language LangRef="ja" />
  <Language LangRef="zh-cn" />
  <Language LangRef="es" />
  <Language LangRef="zh-tw" />
</Languages>
```

The next portion of the XML string is the Property Definition section, as shown in the following code block. These properties must be managed properties. Additional property entries must include the real managed property name, the data type, and the name to display in the Web part.

```
<PropertyDefs>
  <PropertyDef Name="Path" DataType="text" DisplayName="URL" />
  <PropertyDef Name="Size" DataType="integer" DisplayName="Size (bytes)" />
  <PropertyDef Name="Write" DataType="datetime" DisplayName="Last Modified Date" />
  <PropertyDef Name="FileName" DataType="text" DisplayName="Name" />
  <PropertyDef Name="Description" DataType="text" DisplayName="Description" />
  <PropertyDef Name="Title" DataType="text" DisplayName="Title" />
  <PropertyDef Name="Author" DataType="text" DisplayName="Author" />
  <PropertyDef Name="DocSubject" DataType="text" DisplayName="Subject" />
  <PropertyDef Name="DocKeywords" DataType="text" DisplayName="Keywords" />
  <PropertyDef Name="DocComments" DataType="text" DisplayName="Comments" />
  <PropertyDef Name="CreatedBy" DataType="text" DisplayName="Created By" />
  <PropertyDef Name="ModifiedBy" DataType="text" DisplayName="Last Modified By" />
</PropertyDefs>
```
You can add other managed properties to these definitions. Managed properties do not have to be designated for use in a scope to be used in the Advanced Search Web part. After they are defined, these properties can then be used in the result types filter definitions and in the managed properties filters:

```xml
<ResultType DisplayName="Word Documents" Name="worddocuments">
  <KeywordQuery>FileExtension="doc" OR FileExtension="docx" OR FileExtension="dot" OR FileExtension="docm" OR FileExtension="odt"</KeywordQuery>
  <PropertyRef Name="Author" />
  <PropertyRef Name="DocComments" />
  <PropertyRef Name="Description" />
  <PropertyRef Name="DocKeywords" />
  <PropertyRef Name="FileName" />
  <PropertyRef Name="Size" />
  <PropertyRef Name="DocSubject" />
  <PropertyRef Name="Path" />
  <PropertyRef Name="Write" />
  <PropertyRef Name="CreatedBy" />
  <PropertyRef Name="ModifiedBy" />
  <PropertyRef Name="Title" />
</ResultType>
```

There are result types for the following categories:

- Default
- Documents
- Word Documents
- Excel Documents
- Presentations

You can enter new managed properties as property definitions, and then create new result types or modify existing ones in this file. After you edit the string, save it back into the Property text box.

The Miscellaneous section contains a single, but very important, setting for the target results URL, as shown in Figure 9-56. In particular, a custom Advanced Query Web part might need to point to a custom results page where the presentation of the results Web parts has been customized to meet business needs. This custom results page can also contain non-search Web parts that connect to the search Web parts.

![Figure 9-56](image-url)
A sample search query constructed by the advanced search Web part can be passed as the following:

\[
\text{ALL(searchterm) (DetectedLanguage="en") (IsDocument="True") Write} >= 02/01/2010
\]

A knowledgeable user can enter the search in a basic query box as the following and achieve the same results:

\[
\text{searchterm DetectedLanguage="en" IsDocument="True" Write} >= 02/01/2010
\]

However, most users will find the UI of the advanced search easier to use.

Results Pages

The results pages are the most complex of the three default search pages, with a total of eight Web part zones and up to 12 Web parts, depending on the results page type. Each of these Web parts is responsible for a different view of the results or information about the results. Figure 9-57 displays the default results page from the Enterprise Search Center.

![Results page from Enterprise Search Center](image)

The People Search Results page, shown in Figure 9-58, shares six of the same Web parts, but with different configurations.
Two Web parts are not displaying on the People Search Results page. The Summary Web part displays only to suggest search terms when the query contains a term that is only close to those contained in the index, such as misspelled words. Despite its name, the results appear prefaced with “Did you mean,” as shown in Figure 9-59.

The People Search Results page does not need this Web part because the fuzzy logic and phonetic searches in people searches make the corrections for the user. In Figure 9-58, the search term “li” retrieved people named “Lee” and “Low.”

The Related Queries Web part is located in the zone on the right of the results page, and it suggests other search terms that have been used and contains terms within the current query.

**MORE INFORMATION** For more information on adding and configuring Web parts, see Chapter 7, “Web Parts, Features, and Solutions.”

**Results Pages Functionality**
Core Results Web parts and their derivatives instantiate an object called the Query Manager and send their query requirements to their Query Manager. These Web parts all have a Cross-Web Part Query ID property that identifies the Query Manager that they share.
The Query Manager object executes the query for local results, receives the search results as XML data, and passes the appropriate results to the different search Web parts on the results page. The content and format of the XML data that is passed depends on the Web part that is receiving the data based upon the parameters originally sent to the Query Manager. Each Web part then displays the XML data, formatted according to the XSL Transform specified for that Web part’s XSL property.

Federated Results Web parts using OpenSearch 1.1 pass the query to the target search engine directly and format the results according to the XSL configured for the Web part. Because these Web parts are not participating with the Query Manager, they can load asynchronously.

Search Web Parts Configurations
Search Web parts have many configurations that are common to all SharePoint Web parts. Because those were covered in Chapter 7, we will not include those in this discussion. Our focus will be the configurations that are unique to each Web part or that affect the functionality of the Web part. Because FAST Search for SharePoint uses the same Web parts, there seem to be some options that have functionality only with that product.

SEARCH CORE RESULTS
This same Web part with different configurations is used in multiple locations on results pages. We will show only the properties of the Core Search Results from the Results.aspx and indicate the variations between that and the People Core Results and Search Action Links uses.

- **Location Properties**  
  Because SharePoint Server 2010 search uses the Federated Search object model, the first section is Location Properties, which is shown in Figure 9-60. For Core Results, the location is Local Search Results as defined in Federated Search Locations. For both People Search Results and Search Action Links, the location is None.
  
The Description box is populated from the location selected. Enter the name in the Scope box if you want to filter the results to a particular scope. You need to type the exact scope name because there is no drop-down list.
The next list of check boxes appears only if Show Action Links is selected in the Miscellaneous section. By default, these options are used in the Search Action Links Web part but not in others. Figure 9-61 shows the results of all options selected in both Web parts. Two options, Display “Search From Windows” Link and Allow Users To Display Language Picker, seem to have no functionality in Beta code and might work only with FAST Search for SharePoint.

**Display Properties** The first six configurations of this section, shown in Figure 9-62, are straightforward. The setting of 4 in the Results Per Page box is not the default; instead, it is a modification made to produce smaller pages for the screen shots in this chapter.
The Use Location Visualization check box must be cleared if you need to customize the Web part from the default settings defined in Federated Locations. It is the XML string contained in the Fetched Properties text box that defines much of the functionality of the Web part. These managed properties are sent to the Query Manager as managed properties to be retrieved for each search result in the result set.

The code in the Core Results and Search Action Links Web parts follows:

```xml
<Columns>
  <Column Name="WorkId" />
  <Column Name="Rank" />
  <Column Name="Title" />
  <Column Name="Author" />
  <Column Name="Size" />
  <Column Name="Path" />
  <Column Name="Description" />
  <Column Name="Write" />
  <Column Name="SiteName" />
  <Column Name="CollapsingStatus" />
  <Column Name="HitHighlightedSummary" />
  <Column Name="HitHighlightedProperties" />
  <Column Name="ContentClass" />
  <Column Name="IsDocument" />
  <Column Name="PictureThumbnailURL" />
  <Column Name="PopularSocialTags" />
  <Column Name="PictureWidth" />
  <Column Name="PictureHeight" />
</Columns>
```
The code for the People Core Results Web part code follows:

```xml
<Columns>
  <Column Name="WorkId" />
  <Column Name="UserProfile_GUID" />
  <Column Name="AccountName" />
  <Column Name="PreferredName" HitHighLight="true" />
  <Column Name="YomiDisplayName" HitHighLight="true" />
  <Column Name="JobTitle" HitHighLight="true" />
  <Column Name="Department" HitHighLight="true" />
  <Column Name="WorkPhone" HitHighLight="true" />
  <Column Name="OfficeNumber" HitHighLight="true" />
  <Column Name="PictureURL" />
  <Column Name="HierarchyUrl" />
  <Column Name="WorkEmail" HitHighLight="true" />
  <Column Name="Path" />
  <Column Name="HitHighlightedSummary" />
  <Column Name="HitHighlightedProperties" />
  <Column Name="Responsibility" HitHighLight="true" />
  <Column Name="Skills" HitHighLight="true" />
  <Column Name="SipAddress" HitHighLight="true" />
  <Column Name="Schools" HitHighLight="true" />
  <Column Name="PastProjects" HitHighLight="true" />
  <Column Name="Interests" HitHighLight="true" />
  <Column Name="OrgNames" HitHighLight="true" />
  <Column Name="OrgUrls" />
  <Column Name="OrgParentNames" HitHighLight="true" />
  <Column Name="OrgParentUrls" />
  <Column Name="Memberships" HitHighLight="true" />
  <Column Name="AboutMe" HitHighLight="true" />
  <Column Name="BaseOfficeLocation" HitHighLight="true" />
  <Column Name="ServiceApplicationID" />
  <Column Name="SocialDistance" />
</Columns>
```

If you add managed properties to these lists, you must also modify the XSL to specify how the property is to be displayed. There are two options for modifying the style sheet for the Web part. In this section, you can click the XSL Editor button to expose the XSL code within the Web part. You will probably find it easier to copy the code into your favorite editor for
modification and then paste the modified code back into the editor to save it. In the Miscellaneous section, you can enter the URL for an external style sheet used by one or more Web parts.

Finally, the Parameters Editor permits the addition of parameters to the Web part.

- **Results Query Options**  The Query Language picker shown in Figure 9-63 appears only if the Show Action Links is check box is not selected in the Miscellaneous section. The default setting, Browser Locale, probably should read “Default” because using the language of the browser locale configuration can be overwritten by a user preference in the search box.

![Results Query Options](image)

**FIGURE 9-63** Results Query Options section.

The Cross-Web Part Query ID picker options are User Query, Query 2, Query 3, Query 4, and Query 5. As discussed earlier in Results Pages Functionality, this ID is used by results Web parts to identify the Query Manager that they share. Web parts with the User Query option selected share the query sent to the results page. Those with Query IDs 2 through 5 share a Fixed Keyword Query and can be placed on any page where they process the query when the page loads.

Remove Duplicate Results causes “duplicate” results to be merged. “Duplicate” in this case does not mean exact matches, particularly in the case of large files, because the crawler indexes only the first 16 megabytes (MB) of a file. Sometimes, if the content is the same, even a variation in file name does not disqualify a file as a duplicate.

You can select Enable Search Term Stemming to link word forms to their base form. For example, variations of “run” include “running,” “ran,” and “runs.” Stemmers are not available for all languages.

When the Ignore Noise Words check box is selected, any words listed in the noise word file for the query language are eliminated from queries. In SharePoint 2010, noise words are indexed and can be used for searches if this option is not selected.

The Fixed Keyword Query text box can specify that the query contain any search term, including filters such as managed properties and scopes. Do not enter anything in this box if using the User Query Cross-Web Part query
ID as the entry will cause the Web part to reject the user query. Core Results Web parts become powerful tools to roll up and display information from across boundaries that restrict other Web parts. For example, a simple entry of “announcements:1” in the Fixed Keyword Query box would cause the Web part to display links to all announcements in the search application index that the user had permissions to see. When placing multiple results Web parts with Fixed Keyword Query entries, they must all use a unique Cross-Web Part query ID.

The value entered in the Append Text To Query text box differs from a value entered in the Fixed Keyword Query box in that it adds the terms and filters to the query entered by the user. Unlike the Additional Query Terms setting of the Search Box Web part, this entry is transparent to the user because it is added on the results page, not passed to the results page as part of the query.

The More Results List Options section (not shown) is irrelevant to Results Web parts on a results page because the page uses the Paging Web part to expose other results. However, if it’s used independently on a separate page, you might want to enter a link to a full results page to receive the query and present a full results list.

The Appearance, Advanced, and AJAX Options sections are common to all Web parts and were discussed in Chapter 7. Remember that if you need to target a Web part to an audience, that configuration is found in the Advanced section.

- Miscellaneous  Appropriately named, the Miscellaneous section, shown in Figure 9-64, contains some vital configurations for this Web part. First, the default 1000 count for the Highest Result Page setting is the count for pages, not items in the result list. Given the default 10 results per page, 10,000 items in a result list is probably more than any user will examine even with the new Refinement Web part filtering capability. Lowering this number when permissible will improve performance.

Discovered definitions appear in the lower portion of the results Web part as “What people are saying about <term>”. These results are automatically extracted by the linguistic processing built into the indexing process. The process is seeking any phrase that infers a meaning. The smaller your index, the less likely you are to get a discovered definition.

If you deselect the Show Search Results check box and configure the action links, you now have an Action Links Web part. The Search Actions Links Web part does not have this option.

As discussed previously, selecting Show Action Links exposes the action links options in the Location Properties section and hides the Query Language picker in the Results Query Options section.
The Show Messages setting enables the Web part to display error messages if an error occurs. This setting is useful when troubleshooting; otherwise, the Web part might not display at all when it has no results.

The Sample Data setting is present only for testing the XSL presentation, but the XSL Link setting permits centralizing style sheets to control the presentation of multiple Web parts of the same type.

Consider changing the Data View Caching Time-Out setting in a dynamic environment. Although a 24-hour cache improves performance on common queries, it might not present accurate results with frequent crawls.

Search Web parts using the same Cross-Web part Query ID communicate with the Query Manager and not through connections. Although the Send First Row To Connected Web Parts When Page Loads option is selected, it is not required unless you have another Web part to connect to this one. Deselect this option to improve the performance of the Web part.

**Federated Result**

This Web part is similar to the Core Results Web part, so we will discuss only the differences. It is also used as people matches when using the Local People Search Federated location. First, it is not interacting with the Query Manager for local results but directly sending the query to another OpenSearch 1.1–compliant search engine. Any configurations relevant to manipulating local results are missing.

In Figure 9-60, all configurations in the Location Properties below Description are removed. In Figure 9-62, the Default Results Sorting setting is no longer controlled by the Web part because the results are received already sorted by the search engine. New options, shown in Figure 9-65, are added.

---

**FIGURE 9-64** Miscellaneous

<table>
<thead>
<tr>
<th>Setting</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Maximum Result Page</td>
<td>1000</td>
</tr>
<tr>
<td>Display Discovered Definition</td>
<td></td>
</tr>
<tr>
<td>Show Search Results</td>
<td></td>
</tr>
<tr>
<td>Show Action Links</td>
<td></td>
</tr>
<tr>
<td>Show Messages</td>
<td></td>
</tr>
<tr>
<td>Sample Data</td>
<td></td>
</tr>
<tr>
<td>XSL Link</td>
<td></td>
</tr>
<tr>
<td>Enable Data View Caching</td>
<td></td>
</tr>
<tr>
<td>Data View Caching Time-Out</td>
<td>86400</td>
</tr>
<tr>
<td>Send first row to connected Web Parts when page loads</td>
<td></td>
</tr>
</tbody>
</table>
Selected by default, Retrieve Results Asynchronously permits the page to load without waiting for this Web part to receive and display its results. Show Loading Image is not selected by default but will display the animated gif specified in Loading Image URL while the Web part is waiting for a response from the remote search engine. If you want to change this image, place the replacement in the same location as the default.

![Retrieve Results Asynchronously](image)

![Show Loading Image](image)

![Loading Image URL](image)

**FIGURE 9-65** Federated Result Web part Display Properties addition.

In Figure 9-63, the only options left in the Results Query Options list are Fixed Keyword Query and Append Text to Query, which operate the same as in the Core Results Web part. For the Miscellaneous section, shown in Figure 9-64, only the configuration options below Show Messages are available.

**Top Federated Result**

As shown in Figure 9-66, you can configure multiple federated locations for this Web part. However, it displays only the results from the first federated location to return search results. Otherwise, it is a Federated Results Web part.

![Top Federated Results](image)

**FIGURE 9-66** Top Federated Results location properties.

**Search Best Bets**

The Best Bets Web part does interact with the Query Manager object, but most of the configurations are substantially different from the Core Results Web part, as shown in Figure 9-67.
The Results Display section has a configuration only for the query ID. This Web part has no configuration for a fixed query, but it will use the fixed query from a results Web part on the page that uses the same query ID even if it is hidden or has no results to display.

For Keywords, choose whether to display the keyword, keyword definitions, or both. For Best Bets, you can modify the display without changing the style sheet. Your options are Display Title, Display Description, Display URL, and Best Bets Limit. Displaying only the description does not give the user a hyperlink to access the Best Bet object.

This Web part was called the High Confidence Results Web part in previous versions of SharePoint Search. This section is configured to display an exact match in a people search. Much of this functionality has been replaced and enhanced by the Local People Search Federated Location, which is used by a Federation Results Web part.

Search Paging
For a search results page, this Web part extends the capabilities of a simple More Results link to a new page by providing a series of paging links before and after the current page of results within the Core Results Web part. Although the Results Web part controls the number of results in each page, the Paging Web part presents a common interface for scrolling through the results set. The properties, shown in Figure 9-68, are straightforward and easy to understand. Labels for the Previous and Next links are probably not necessary, and if you choose to change the images, be sure to place your images in the same location to avoid permissions issues. The only
configuration that seems out of place is the Cross-Web part query ID, which is in the Miscellaneous section. This Web part must share the query ID of the Results Web part.

**FIGURE 9-68** Search Paging properties.

**Search Statistics**

The Search Statistics Web part is also easy to understand and configure as shown in Figure 9-69. The display mode options are One Line or Two Lines. Selecting Display Total Number Of Results produces a disturbing “of about ## results.”

**FIGURE 9-69** Search Statistics properties.

This number changes if the user re-sorts the results or scrolls through pages of results. Security trimming of the results list is performed on the results page. With the default potential results list being 10,000 items, the overhead of security trimming the entire list prior to displaying 10 items would be tremendous. So the
trimming is done as the items are prepared to be displayed. Because the Statistics Web part total number of results will include items that might be trimmed due to security, the count cannot be accurate until all items are viewed.

If your server response time is really good, you can choose Display Search Response Time. Again, this Web part must share the query ID of the Results Web part.

**Related Queries**

This Web part displays user queries that contain the term that the current query contains. The more search is used, the more valuable this Query Suggestions tool becomes. The configuration options are very limited, as shown in Figure 9-70. Probably the only change that you might make will be the Results Per Page setting.

![Related Queries properties](image)

**Search Summary**

The simplest Web part to configure is Search Summary, shown in Figure 9-71. Other than the standard Appearance, Layout, and Advanced sections, there is only a Show Messages check box and the Cross-Web Part query ID section. Deceptively named, this Web part is located just below the Search Query Web part and presents terms from the index that are similar to the query term passed to the results page. It is probably most useful for correcting misspelled query terms.

![Search Summary properties](image)
Refinement Panel

Although the Related Queries Web part presents a tool to expand your query on the right side of the results page, the Refinement Panel on the left side presents dynamic options to refine or drill down into the search results without initiating a new query.

Configuration of this “faceted search” Web part has both simple and complex components. The simple, properties piece is shown in Figure 9-72. For the term Category, think Manage Property.

This Web part must share the query ID with the core results Web part. If you prefer to use another name, type it in the Refinement Panel Caption box. We will address the Filter Category Definition setting later. The Accuracy Index setting determines how far down the results list the Web part will collect metadata to use in “faceting” its results. The Number Of Categories To Display setting is straightforward, and the Number Of Characters To Display setting refers to each line in the display. The character count is not exact as the ellipses at the end of an incomplete word counts as two characters.

Editing the Filter Category Definition setting is the more complex part. Before beginning to edit the XML string, clear the Use Default Configuration check box or the Web part will not save your changes.

Place your cursor in the Filter Category Definition text box to activate the Builder text editor blue button. Click the button to open the editor. It will be easier to copy the entire contents and use your favorite XML editor to make changes, and then paste the modified string back into the Builder text editor to save the changes.
The first portion of the code that specifies a category based on file extensions follows:

```xml
<?xml version="1.0" encoding="utf-8" ?>
<FilterCategories>
  <Category Title="Result Type" Description="The file extension of the item" Type="Microsoft.Office.Server.Search.WebControls.ManagedPropertyFilterGenerator" MetadataThreshold="5" NumberOfFiltersToDisplay="4" MaxNumberOfFilters="0" SortBy="Frequency" SortDirection="Descending" SortByForMoreFilters="Name" SortDirectionForMoreFilters="Ascending" ShowMoreLink="True" MappedProperty="FileExtension" MoreLinkText="show more" LessLinkText="show fewer">
    <CustomFilters MappingType="ValueMapping" DataType="String" ValueReference="Absolute" ShowAllInMore="False">
      <CustomFilter CustomValue="Word">
        <OriginalValue>doc</OriginalValue>
        <OriginalValue>docm</OriginalValue>
        <OriginalValue>docx</OriginalValue>
        <OriginalValue>dot</OriginalValue>
        <OriginalValue>nws</OriginalValue>
      </CustomFilter>
    </CustomFilters>
  </Category>
</FilterCategories>
```

If you have additional file types that are not included in the XML, you can add them by carefully following the structure given, where `CustomValue` is the display name of the application and the multiple entries of `OriginalValue` are all the possible file extensions for this application.

The following string identifies a specific managed property to be used as a facet for filtering search results. This construct can be used to add any custom managed property. Text managed properties must not be stored as a hash to be used in the Refinement Web part. The managed property must also have the Add Managed Property To Custom Results Set Retrieved On Each Query option selected.

```xml
<?xml version="1.0" encoding="utf-8" ?>
<FilterCategories>
  <Category Title="Author" Description="Use this filter to restrict results authored by a specific author" Type="Microsoft.Office.Server.Search.WebControls.ManagedPropertyFilterGenerator" MetadataThreshold="5" NumberOfFiltersToDisplay="4" MaxNumberOfFilters="20" SortBy="Frequency" SortByForMoreFilters="Name" SortDirection="Descending" SortDirectionForMoreFilters="Ascending" ShowMoreLink="True" MappedProperty="Author" MoreLinkText="show more" LessLinkText="show fewer" />
</FilterCategories>
```

Following the examples in the default XML string, even nonprogrammers can easily modify the metadata used to refine the search results if it exists for the objects in the results list.

Use the XSL Editor to customize the style sheet where needed.
Working with Query Reporting

Within the search service and at the site collection level, you can view query activities to help you understand the words and phrases used in search queries and the usage within the results. These reports also assist in determining what sites and keywords to configure as Best Bets. In addition, you might be able to discover how to better train your users in using the search features by learning about their past behavior.

At the site-collection level, Search Web Analytics reports include the following:

- Number of Queries
- Top Queries
- Failed Queries
- Best Bet Usage
- Best Bet Suggestions
- Best Bet Suggestions Action History
- Search Keywords

**MORE INFORMATION** For more information on Query Reports, see Chapter 14 in SharePoint Server 2010 Administrator’s Companion (Microsoft Press, 2010).

Local Search Configuration Options

Site owners and list or library owners have configuration options that have an impact on search results.

**Searchable Columns**

At the site level, any column created within the site can be excluded from search results. For the root site of a site collection, this means all columns can be managed except those created at a subsite level. At the subsite level, only columns created at that level can be managed.

There is no granularity for this setting. The metadata contained in the column for any object within the site will be affected. To configure these settings, from the Site Actions menu, select Site Settings. On the Site Settings page, under Site Administration, select Searchable Columns to open the page shown in Figure 9-73. Locate the appropriate column, and select the box beside it.
Site-Level Crawl Rules

At the site level, a site owner can set “do not crawl” rules for the entire site and set rules for crawling ASPX pages. To configure these settings, open Site Settings for the site and under the Site Administration heading, click Search And Offline Availability.

In the page shown in Figure 9-74, configure the appropriate indexing settings for the site in the Indexing Site Content section. Although not explicitly stated in the page documentation, the reason that the content does not appear in search results is that it is no longer crawled.

Crawl Options for Lists and Libraries

Each list and library can be configured with crawl rules by users who can manage the list or library. For the list or library, open the settings page and select Advanced settings. The fourth section down is the Search section, shown in Figure 9-75. Selecting No in the Allow Items From This Document Library (List) To Appear In Search Results will set do not crawl rules for the library or list.
Related Links Scope

At each site level, site owners can create a collection of contextual scopes that can be used as a single contextual scope at that site level only. Like all scopes, this configuration is stored at the search application level and requires the scope update to run before it is usable.

To open the Manage Search Scope For Related Links page shown in Figure 9-76, open Site Settings for the site and select Related Links Scope Settings under the Site Administration heading.

Type the full URL of the site in the Add URL box, including the protocol and with a slash “/” at the end. Click Add to add the link to the Selected Links list. Highlighting the URL and selecting Remove will move the link to the Available Links list. As you can see from Figure 9-76, the page will accept invalid URLs, which will simply not be added to the collection of contextual scopes when it is built.

After it is built, the scope will be available in the scope picker for searches only if the drop-down configuration includes contextual scopes. It will be available only for the single site where it was configured. This tool permits site owners a limited capability for building one additional scope for the users of the site.
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