# Chapter 5: Configuring Indexing and Search

**Maintaining a SharePoint Environment**

**Configure Service Applications**

**Configure Indexing and Search**

**Managing a SharePoint Environment**

**Manage Operational Settings**

Search is a SharePoint service that has needed improvement for some time and in SharePoint Server 2010 it has certainly gotten the required attention. Not only has enterprise search been improved in the basic version, but FAST Search for SharePoint has been added to the mix to satisfy more sophisticated requirements.

Both basic enterprise search and FAST Search for SharePoint bring a richer search experience to the user by offering more flexible navigation and refinement of related searches. Query completion, spell checking, and wildcard use have also been added or improved for SharePoint Server 2010. Relevance of social data factors such as tagging and usage or clicks is new as well.

Enterprise search also recognizes that a lot of significant information lives outside of SharePoint, so expanded and improved connectors to index web sites, file servers, Exchange, Lotus Notes, and many others have been added. Business Connectivity Services (BCS) now makes it easier to index arbitrary sources of data such as custom databases and you can create a search connection without coding, using SharePoint Designer. Compared to its predecessors, search in SharePoint Server 2010 is a whole new world.

The Basic Enterprise Search features and tasks will be presented first, then managing search farm topology, and finally, FAST Search for SharePoint.

# Enterprise Search Overview

There's a lot that's new for SharePoint Enterprise Search, both from the point of view of the end user and for the SharePoint administrator. As a SharePoint administrator, you'll be interested in both. Not only will you need to be able to install, configure, and manage search in SharePoint, but you'll have to do so with an eye on the needs of your consumers.

## SharePoint Search for Users

From a user's perspective, there are only two aspects to search that matter: the search query and the results.

### Understanding Search Queries for Users

Anyone who uses web search in any capacity knows that that quality of the answers you get back depends on how well you ask the question. That said, an end user shouldn't have to worry about how well they craft a query in a search engine and it's up to the designers of search to make the process as easy and transparent as possible. Here's what Enterprise Search in SharePoint currently offers.

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- SharePoint Server 2010 search now supports Boolean operators AND, OR, and NOT in search strings for both free-text queries and for property queries such as in the example ("SharePoint Search" OR "Bing Search") AND (title:"Keyword Syntax" OR title:"Query Syntax")
- SharePoint search queries now support using the asterisk symbol (*) as a wildcard at the end of a text string for both search keywords and document properties, such as in the example "micro*" returning documents containing words such as "Microsoft" and "microchip". A query "author:ja*" will return documents containing "James" and "Japanese". If you use the query "micro* author:ja*", you will find documents containing both "Microsoft" and "James Pyles".

- Search query suggestion provides suggestions to the user as they are typing their query in the search field in the Search Center, and these suggestions are based on past queries from other users.
- The Search Center also offers suggestions after the search results have been returned to help users refine their search further, such as "did you mean".
- After completing a search in SharePoint, users can create a connector for the same search in Windows 7 so that the same search from Windows 7 will find relevant documents from the most recent SharePoint Sites search crawl.

## Understanding Search Results for Users

Perhaps you only get as much out of search as you put into it, but then again, SharePoint has added some improvements so that the user doesn't have to work so hard to get meaningful information from a search result.

- SharePoint Server 2010 search offers improved search results for people, particularly in locating specific names and expertise.
- When users search for themselves as a way to test the people search process, SharePoint recognizes this as "self-search" and returns all of the related metadata including the number of times the user's My Site profile was viewed and the search strings that were used to locate the user's name.
- Search also has improved results for queries on nickname and phonetic name searches, such as the results for "James" and "Jim" as well as "Lynn" and "Lin".
- Search relevance improvements allow a higher ranking to be assigned documents that have been accessed more often from a search results page.
- SharePoint now can add relevance based on inferred metadata so that, after a crawl, document metadata can include the content of the document, to assist when explicit metadata is missing or incorrect.

# SharePoint Search for Administrators

While it's important for you to understand the benefits of enterprise search for the end user, the real news is what SharePoint Server 2010 Enterprise Search has to offer you in terms of the UI, new features, and new functionality.

- The Farm Configuration Wizard automates a variety of deployment functions after the SharePoint installation or upgrade, including creating the fully functional search system on the server, creating the search topology that supports an index for up to 100 million crawled documents, and creating a Search Center that users can access to issue queries.

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> The Search Center is created automatically only if you select the Search Center option during the wizard process.

- The improved UI for Central Administration collects the different farm-wide search tasks in a single location on the General Application Settings page as shown in Figure 5.1.

**Figure 5.1 [f0501.tif]**

- Search administration is now an independent service rather than being bundled with other services in a Shared Services Provider (SSP) as you may have experienced in Microsoft Office SharePoint Server 2007 (MOSS 2007), thus you can now create search service applications that operate independently of one another.
- Search crawl components can now be configured to increase crawl frequency and volume, increase performance by distributing the crawl load, and provide redundancy should a search server fail.
- Search query component performance is improved by allowing an increase in the number of queries search can manage at any one time, by reducing the amount of time it takes to return search results, and by the provision of failover capacity for query components.
- You can now tune search operations while users continue to access search.
- Search operations can be monitored by SharePoint Health and Performance monitoring and customized reports can assist in analyzing search system operations.
- SharePoint search can now search for external content outside of SharePoint sites by crawling and federating, such as crawling file shares and Lotus Notes, as well as using federation for access to search results gathered by other crawlers or search engines.
- Administrative tasks for search can now be automated using Windows PowerShell scripts.

# Managing Enterprise Search from General Application Settings

When you run the Farm Configuration Wizard, you can select the Search Service Application option to enable search in SharePoint. Once search is enabled, in Central Administration, you can configure a number of features in search by accessing the General Application Settings page. The following activities illustrate working with basic search in SharePoint. There are two general features you will work with in this section: Farm-Wide Search Administration and *Crawler Impact Rules*.

## Administering Farm-Wide Search

As you read previously, all of the configuration settings for search have been gathered together in a single area of Central Administration. The following tasks will show you the most common ways to administer search. Exercise 5.1 shows you how to enable a proxy server for search.

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### Exercise 5.1 Configuring a Search Proxy Server

1. Navigate to Central Administration, click **General Application Settings**.
2. On the General Application Settings page under Search, click **Farm-Wide Search Administration**.
3. On the Farm-Wide Search Administration page, to configure a proxy server, to the right of the Proxy server row, click **None**.
4. When the Search Proxy Setting dialog box appears, under Proxy Server Settings select **Use the proxy server specified**.
5. In the **Address** field, enter the URL of the proxy server.
6. In the **Port** field, enter the port number used by the proxy server.
7. If you so desire, select the **Bypass proxy server for local (intranet) addresses** check box if you want to enable that function.
8. If you don't want to use a proxy server for some web addresses you administer, enter the beginning of their addresses in the **Do not use proxy server for addresses beginning with** field, separating them with semi-colons.
9. Select the **Use these proxy setting for access to federated sites** if you want to enable that function.
10. When finished, click **OK**.

The connection timeout setting for search and the request for acknowledgement time are both set for 60 seconds. Exercise 5.2 will show you how to change the default settings.

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### Exercise 5.2 Configuring the Search Time-out Settings

1. Navigate to Central Administration, click **General Application Settings**.
2. On the General Application Settings page under Search, click **Farm-Wide Search Administration**.
3. On the Farm-Wide Search Administration page, at the right of the Time-out (seconds) row, click the **60, 60** link.
4. When the Search Time-out Setting dialog box appears, change the default value of 60 in the Connection time (in seconds) field to the desired value.
5. Change the default value of 60 in the Request acknowledgement time (in seconds) field to the desired value.
6. Click **OK**.

Normally, search will not automatically trust that sites are legitimate, particularly if the certificate name does not exactly match. Exercise 5.3 shows you how to override this behavior.

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### Exercise 5.3 Modifying the Search SSL Settings

1. Navigate to Central Administration, click **General Application Settings**.
2. On the General Application Settings page under Search, click **Farm-Wide Search Administration**.
3. On the Farm-Wide Search Administration page, at the right of the Ignore SSL warnings row, click **No**.
4. In the Search SSL Setting dialog box, to allow search to ignore SSL warnings, select the **Ignore SSL certificate name warnings** check box and then click **OK**.

# Administering Crawling Features

There are a large number of tasks you can perform to administer enterprise search features in SharePoint, and Exercise 5.4 will show you how to review and manage general elements in search configuration.

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## Exercise 5.4 Reviewing and Managing the Search Administration Page

1. Navigate to Central Administration, click **General Application Settings**.
2. On the General Application Settings page under Search, click **Farm-Wide Search Administration**.
3. On the Farm-Wide Search Administration page, under Search Service Applications, click the desired application (there is only one by default).
4. On the Search Administration page for the selected application, Under System Status, review the information available such as Crawl status, Background activity, Recent crawl rate and so on, as shown in Figure 5.2

**Figure 5.2 [f0502.tif]**

5. To change the Default content access account, click the account name and, when the Default Content Access Account dialog box appears, enter the desired content name, enter and confirm the password for the account, and then click **OK**.
6. To change the Contact e-mail address, click on the default email address and, on the Search Email Setting box, enter the new contact email address and then click **OK**.
7. If you want to configure a proxy server, click the **None** link next to Proxy Server and, in the Search Proxy Setting box, configure the proxy server settings (see **Exercise 5.1 Configuring a Search Proxy Server** for details).
8. To change the Scopes update schedule, click the link for the schedule and, on the Specify Update Schedule box, select either **On demand updates only** or **Automatically scheduled update**, and then click **OK**.
9. To enable or disable Search alerts status, click the link next to the heading.
10. To enable or disable Query logging, click the link next to the heading.
11. Under Crawl History, review the items in the view.
12. Under Search Topology, review the items available (see **Managing the Enterprise Search Topology** section later in this chapter for details).
13. When finished on this page, navigate back to the Central Administration main page.

There are other ways to perform some of these tasks by accessing links found on the Search Administration page under Search Server Application that will be covered in subsequent exercises.

Before continuing to administer search, you want make sure the Search Service Application is connected to the desired web application. Exercise 5.5 will illustrate how this is done.

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## Exercise 5.5 Connecting the *Search Service Application* to a Web Application

1. In Central Administration, click **Application Management**.
2. On the Application Management page, under Service Applications, click **Configure service application associations**.
3. On the Service Applications Associations page, click the link in the Application Proxy Group for the desired web application, which is usually called **default**.
4. On the Configure Service Application Associations page, select the **Search Services Application** check box, making sure it is the only selected Search Service Application Proxy, and then click **OK**.

This allows the service to connect to the web application containing the sites to be crawled.

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Both Search Service Application and FAST Query SSA cannot be set as the Search Service Application Proxy at the same time. You'll learn more about the FAST Search Service later in this chapter.

The next step is creating a content source to be crawled. Exercise 5.6 will show you how to do this in Central Administration. This task can be done for both the standard SharePoint search application or for FAST search, which you'll learn about later in the chapter.

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## Exercise 5.6 Creating a Content Source

1. In Central Administration, click **Application Management** and then click **Manage Service Applications**.
2. On the Manage Service Applications page, select the desired Search Service Application.
3. In the left-hand menu under Crawling, click **Content sources** and on the Manage Content Sources page, select **New Content Source**.
4. On the next page, under Name, give the content source a name in the available field.

5. Under Content source type, select the desired content type from the available radio buttons.

- SharePoint sites
- Web sites
- File Shares
- Exchange public folders
- Line of Business Data
- Custom Repository

6. Under Start addresses, enter the name of the URLs from search should begin the crawl in the **Type start addresses below (one per line)** field, as shown in Figure 5.3.

**Figure 5.3 [f0503.tif]**

7. Under Crawl Settings, select either **Crawl everything under the hostname for each start address** or **Only crawl the Site Collection of each start address**.
8. Under Crawl Schedules, use the Full Crawl menu to select **None** or the default value, or click **Create schedule** and in the Manage Schedules box, select the days and times when you want to start for Full Crawls.
9. Use the Incremental Crawl menu to select **None** or the default value, or click **Create schedule** and in the Manage Schedules box, select the days and times when you want to start for Incremental Crawls.
10. Under Content Source Priority, either accept **Normal** as the default crawl priority or select **High** priority.
11. To start a crawl immediately, select **Start full crawl of the content source.**
12. When you are finished, click **OK**.

When you are selecting the content source type, you can crawl only one type of content for a content source. This means you can add URLs for multiple SharePoint sites or you can add URLs for multiple file shares but you cannot add URLs for both SharePoint sites and file shares in a single content source.

A number of other routine search administration tasks are performed on the Search Administration page of the desired Search Service Application by accessing links on the left side menu of the page.

*Crawl rules* allow you to include or exclude specific paths in a URL from being crawled as well as specifying authentication accounts. Rules are applied in the order in which they are written during a content crawl. You

must conduct a full crawl of the content source for the new rule to be implemented. Exercise 5.7 will show you how to configure a crawl rule.

Begin this and the following exercises on the Search Administration page of the default Search Service Application.

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## Exercise 5.7 Creating a Crawl Rules

1. On the Search Administration page of the default Search Service Application, under Crawling on at the left of the page, click **Crawl Rules**.
2. On the Manage Crawl Rules page, click **New Crawl Rule**.
3. On the Add Crawl Rule page under Path, enter the hostname or hostnames of the sites on which you want the rule to apply, specifying the sites on the URLs to be affected by the rule, and using the format: `http://hostname/*; http://*.*; *://hostname/*`
4. Either accept the default and make no selection or select the check box **Follow regular expression syntax**, **Match case**, or both.
5. Under Crawl Configuration, decide to include or exclude all items in the path you used in the previous set.
6. If you chose to exclude all items, you can choose to select **Exclude complex URLs, such as those containing question marks**.
7. If you chose to include all times, you can also use one or more the available check boxes or none of them:

- Follow links on the URL without crawling the URL itself.
- Crawl complex URLs such as those containing question marks.
- Crawl SharePoint content as http pages.

8. If you chose to include all items in the path, under Specify Authorization, you can also choose the method of authorization to access the sites in question as you can see in Figure 5.4

**Figure 5.4 [f0504.tif]**

9. When you are done, click **OK**.
10. When the rule is configured, on the Manage Crawl Rules page, you can enter the URL in the test field and click the **Test** button to verify the rule matches the URL.

Content crawls can and will have an impact on web sites and the servers hosting them. You can set up Crawler Impact Rules to minimize that impact if you feel they are required. Exercise 5.8 shows you this simple process.

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### Exercise 5.8 Creating a Crawler Impact Rules

1. On the Search Administration page of the default Search Service Application, under Crawling on at the left of the page, click **Crawler Impact Rules**.
2. On the Crawler Impact Rules page, in the Site column, click to the right of the desired site to open the menu and then click **Edit**.
3. On the Edit Crawler Impact Rule page, Under Site in the available field, enter the site's name without entering the protocol, (i.e. http://) such as Testsite.aspx.
4. Under Request Frequency, select either **Request up to the specified number of documents at a time** radio button and then enter a number in the **Simultaneous requests** field, or select **Request one document at a time and wait the specified** time radio button, and then enter a value in seconds in the available field.
5. To create the rule, click **OK**.
6. If there is more than one rule configured, on the Crawler Impact Rules page, in the Order column, use the menus to select which rule will be evaluated first, second, and so on.

## Other Crawling Rules

There are a number of other links under Crawling, but most of the tasks performed on those pages are relatively straightforward. Here's a summary:

**Crawl Log:** Click this link to see the log files for crawls for each content source. Columns on the page show the number of Successes, Warnings, Errors, Top Level Errors, and Deletes. Click the number in the desired row and column to see the details for that value. For instance, Figure 5.5 shows you the details of a crawl error.

**Figure 5.5 [f0505.tif]**

On this page, you can search crawl logs by Content Source or URL and further refine your search by Status, Message, and start and end times. The error message is displayed at the bottom of this page. Click to the right of the URL of the content source in the error message and choose to open the item in a new window, re-crawl the item, or remove it from the index.

**Server Name Mappings:** When you click this link, if no mappings exist, you can create one by clicking New Mapping. On the Add Server Name Mapping page, you can indicate the address of the content to be

crawled and then specify an address that will be shown in the search results to make the address more recognizable or more "human readable".

**Host Distribution Rules:** These rules cannot be configured on a single server with built-in database deployment and require more than one crawl database be available. Later in this chapter, in the section **Administrating Crawl Databases and Components**, see **Adding and Removing a Host Distribution Rule** for more details.

**File Types:** When you click this link, you are taken to a page with a list of all the content file types that are included in a content search by default. Such file name extensions include aspx, docx, html, php, and so on. To add a new file extension type, click the New File Type link, and on the Add File Type page, enter the file extension in the available field and then click OK. On the Manage File Types page, click to the right of a file extension name to open the menu and select Delete if you want to remove the file type from the page. This will mean that file type will not be included during content crawls.

**Reset All Crawled Content:** Click on this link to erase the content index. If you do this, no search results will be available until you run another crawl. If you do not want to receive an email alert regarding this action, verify that the Deactivate search alerts during reset check box is selected. Click Reset Now to perform the action.

# Administering Query and Result Features

The Search Administration page for any Search Service Application also contains a section called Queries and Results with links to various features that can be configured. The following will show what each feature does and how to use it.

Exercise 5.9 tells you how to set up authoritative pages. *Authoritative web pages* are those pages you determine link to the most relevant information and search uses these pages to determine the search rank of every page in the index. You use the Authoritative Pages utility to organize most authoritative to non-authoritative sites.

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### Exercise 5.9 Configuring Authoritative Web Pages

1. On the Search Administration page of the default Search Service Application, under Queries and Results on at the left of the page, click **Authoritative Pages**.

2. On the Specify Authoritative Pages page, under Authoritative Web Pages, in the **Most authoritative pages** field, enter the URLs of the most important URLs by content relevancy, entering one URL per line.
3. If necessary, in the **Second-level authoritative pages** field, enter the URLs of pages that have a lesser relevancy than most authoritative.
4. In the **Third-level authoritative pages** field, enter the URLs of pages that have a lesser relevancy than the Second-level pages.
5. Under Non-authoritative Sites, in the **Sites to demote** field, enter the URLS of those sites and pages that you want to have content marked as least relevant.
6. To make sure ranking recalculation will occur when you click OK, select the **Refresh now** check box or clear the check box to have the ranking calculated at a later time.
7. When ready, click **OK**.

*Federated locations* is a way for you to expand the field of SharePoint search. Search federation lets your users not only search content in the search index on the server, but many other locations as well. Adding federated locations lets queries be sent to remote search engines and feeds such as `www.bing.com` as well as databases and other external content sources. Users can take advantage of this by adding and setting up either Federated Search Results web parts or Top Federated Results web parts on desired web part pages to display specified search results. Results will also be displayed on the default search results page.

You can either import a federated search connector or add a location manually. Exercise 5.10 will start you off by showing you how to import a search connection.

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## Exercise 5.10 Importing Federated Locations Search Connectors

1. On the Search Administration page of the default Search Service Application, under Queries and Results on at the left of the page, click **Federated Locations**.
2. On the Manage Federated Locations page, click **Online Gallery** to find a new location for downloading and importing.
3. When the Enterprise Search from Microsoft page opens up in a separate browser tab or window, on the left-hand menu, click **Federated Search Connectors**.
4. In the Download Sample Connectors menu on the right of the page, expand the category of your choice and click the desired connector as shown in Figure 5.6.

**Figure 5.6 [f0506.tif]**

5. When the File Download dialog box appears, click **Save**, and then navigate to the location the server where you want to save the file and click **Save**, closing the dialog after the file is downloaded, if necessary.
6. Unless you plan to download more FLD files. Close the Enterprise Search from Microsoft web page.
7. On the Manage Federated Locations page, click **Import Location**.
8. On the Import Federated Location page, under Location Definition File, click **Browse** and navigate to the location where you saved the FLD file.
9. In the Choose File to Upload dialog, select the FLD file and then click **Open**.
10. When the path to the FLD file populates the Federated Location Definition File, click **OK**.
11. On the success page, you can either click **Edit Location** to modify the settings for the location or click **Done** if you're finished.
12. If you click Edit location, on the Edit Federated Location page, you can choose to modify items such as the Display Name, Description, the Trigger which determines how the user's query matches the location, Location information, and so on. When you're done here, click **OK** to complete the import and return to the Manage Federated Locations page.

In Step 11, if you had clicked on Done, the file import would have been immediately completed. You only need to edit the location if you want to change the default configuration.

Exercise 5.11 shows you how to add a location manually.

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## Exercise 5.11 Manually Configuring Federated Locations Search Connectors

1. On the Search Administration page of the default Search Service Application, under Queries and Results on at the left of the page, click **Federated Locations**.
2. On the Manage Federated Locations page, click **New Location**.
3. On the Add Federated Location page, you must create all of the information that is normally added when you import a federated location.
4. Under General Information, add the required items **Location Name**, **Display Name** and **Description** in the available fields.
5. Under Author, add an optional author for the location, which can be a person or an organization.
6. Under version, add a version number which is typically **1.0.0.0** for the first version of a location connector.
7. Under Trigger, either accept the option **Always: Query should always match,** or select **Prefix: Query must begin with a specified prefix** and

then enter the prefix in the **Add Prefix** field, or select **Pattern: Query must match a specified pattern**, and then add the pattern, which can be a regular expression in the **Add Pattern** field.

8. Under Location Information, select a Location Type such as **Search Index on this Server (the default), FAST Index**, or **OpenSearch 1.0/1.1**.
9. In the Query Template field, open the editor and add a template for passing queries to the Location type's URL, which specifies not only the location but the specific data to be queried, such as the example "{searchTerms} scope:Targeted_Best_Bets".
10. Open the More Results editor and add an optional URL for a web page that offers additional search results for the query such as the example http://server/SearchCenter/Pages/Results.aspx?k={searchTerms}.
11. Under Display Information, either accept the default format for Federated Search Results Display Metadata, or clear the **User Default Formatting** check box and manually configure the formatting in the **XSL**, **Properties**, and **Sample Data** editors as shown in Figure 5.7.

**Figure 5.7 [f0507.tif]**

12. For Core Search Results Display Metadata, either accept the default formatting, or clear the **Use Default Formatting** check box and manually configure the formatting in the **XSL**, **Properties**, and **Sample Data** editors.
13. For Top Federated Results Display Metadata, either accept the default formatting, or clear the **Use Default Formatting** check box and manually configure the formatting in the **XSL**, **Properties**, and **Sample Data** editors.
14. Under Restrictions and Credentials, select either **No Restrictions** if anyone can access and use the location or select **Use restriction of only site administrators from specific URLs can use the location**, and then use the Allowed Sites editor to add a list of URL domains separated by semi-colons such as `http://firstsite;httpsecondsite` and so on.
15. Under Specify Credentials, depending on the federated location, you may have no selections with the Default authentication text being displayed, or you may have authentication selections under categories such as **Common** or **User**, with some authentication types being **Basic Authentication**, **Digest Authentication**, **Kerberos**, or similar items.
16. When you are finished, click **OK** to add the federated location.

As you can see, importing a location is much faster, more efficient, and has much less likelihood of introducing errors into the federated location configuration. Once you have the federated locations imported and configured, you will still need to specify the location in the properties of any federated location web parts you choose to add to specific sites.

*Metadata property mappings* are used to map properties taken from crawled documents and managed properties that users employ in their search queries. For instance, various document types will have different names for the crawled property that identifies the document's authors. You can map these various crawled properties to a single managed property "Author" so that when a user searches for a document's author, the search for "author" will pull results from the different mapped crawled properties. The process of adding and editing a metadata property mapping is virtually the same. Exercise 5.11 takes you through the steps.

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## Exercise 5.11 Editing a Metadata Property Mapping

1. On the Search Administration page of the default Search Service Application, under Queries and Results on at the left of the page, click **Metadata Properties**.
2. On the Metadata Property Mappings page, under the Property Name column, click to the right of the desired property name to open the menu and then click **Edit/Map Property**.
3. On the Edit Managed Property page, under Name and type or edit the Property name and description in the available fields and either select or clear the **Has Multiple Values** check box.
4. Under Mappings to crawled properties, you can select either the **Include values from all crawled properties** radio button or the **Include values from a single crawled property base on the order specified** radio button.
5. In the Crawled properties mapped to this managed properties field, you can select any of the crawled properties present and then use the **Move Up,** or **Move Down** buttons to change the list order, or use the **Remove Mapping** button to remove the crawled property from the list.
6. Use the **Add Mapping** button to open the Crawled property select box, select the desired category and Crawled property name, and then click **OK** to add the new crawled property.
7. Under Use in scopes, select or clear the **Allow this property to be used in scopes** check box depending on your requirements.
8. Under Optimize manage property storage, you can select or clear the **Reduce storage requirements for text properties** check box or **Add**

**managed property to custom results** check box depending on your requirements.

9. When finished adding or editing the managed property mapping, click **OK**.

Mapped properties are categorized by Managed and Crawled Properties. On the Metadata Properties Mappings page, click Categories and on the Categories page, click to the right of a category name to open the menu and then click Edit Category. You'll be able to edit the category name and the bulk crawled property settings.

On the Metadata Property Mappings page, under the Total column, you can click on any of the crawled property names to open them for editing and then add or edit managed properties to be mapped to the crawled property.

You can set one or more scopes for search that refine searches on specific locations or content, limiting the field of the search, which saves time and resources. *Scopes* can be used in addition to location and property rules to provide users with more accurate results. For instance, creating a scope for a particular site in SharePoint, limits the search to that site and its subsites, offering more results from the desired content providers. The default All Sites scope on the other hand, applies no focus for searches of all the SharePoint site collections.

There are two basic tasks related to scopes. The first is to add or edit a scope and the second is to add or edit rules within the scope. Exercise 5.12 teaches you how to add or edit a scope.

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## Exercise 5.12 Adding a Search Scope

1. On the Search Administration page of the default Search Service Application, under Queries and Results on at the left of the page, click **Scopes**.
2. On the View Scopes page, click **New Scope**.
3. On the Create Scope page, give the scope a name in the **Title** field and a description in the **Description** field.
4. Under Target Results Page, select either **Use the default Search Results page** or **Specify a different page for searching this scope and then enter the desired URL in the Target results** page such as `testing.aspx`.
5. Click **OK** when finished.

To also edit an existing scope on the View Scopes page by click to the right of the scope name to open the menu, select Edit Properties and Rules, and then click Change scope settings.

In addition to creating a scope from scratch, you can open the menu to the right of an existing rule, and select the copy option. Once you've created a copy of the scope, you can give it a different name, and edit the properties and rules for the scope as you require.

Once a scope has been created, you can add one or more rules to the scope to define its behavior. Exercise 5.13 shows you how this is done.

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### Exercise 5.12 Adding a Search Scope Rule

1. On the Search Administration page of the default Search Service Application, under Queries and Results on at the left of the page, click **Scopes**.
2. On the View Scopes page, click to right of the name of the scope you created in the previous exercise and in the list that appears, click **Edit Properties and Rules.**
3. On the Scope Properties and Rules page, under Rules, click **New rule**.
4. On the Add Scope Rule page, under Scope Rule Type, select the type of rule you want to define such as **Web Addresses**, **Property Query**, **Content Source**, or **All content**.
5. Depending on what option you selected in the previous step, you will have to add different information types, such as selecting Web Address and adding either the URL or path to the resource, or selecting Property Query and then adding an Add property restriction using the available menu and field such as Author = James Pyles.
6. Under Behavior, select **Include**, **Require**, or **Exclude** to determine what action is applied to the web address, property, or content source rule.
7. When you are done, click **OK**.

You can also edit existing rules in a similar fashion.

The final option under Queries and Results on the Search Service Application Search Administration page is **Search Result Removal**. This page contains a simple field where you can enter the URLs to sites you want to remove from any search results returned in SharePoint. Adding a URL to this field will also automatically create a crawl rule that will exclude the specified URL from any future crawls. Just add the desired URL to the field and then click Remove Now.

# Administering Reporting Features

On the Search Service Application Search Administration page, the final category in the left-hand menu is Reports and by default, two report types are displayed: *Administration Reports* and *Web Analytics Reports*.

## Administration Reports

Under Reports, when you click on Administration Reports, you can view the different default report types to determine the health and functioning of the search service. The default folder is the Search administration reports folder. Clicking that link takes you to a list of the available reports for search:

- CrawlRatePerContentSource: This is the graphic view of recent crawl activity aggregated by content course.
- CrawlRatePerType: This offers you a graphic view of recent crawl activity by items and actions for specific URLs.
- QueryLatency: This is the graphic view of recent query activity displaying latency from the major segments of the query pipeline, as well as the query averages per minute.
- QueryLatencyTrend: This is the graphic view of recent query activity as trending.
- SharepointBackendQueryLatency: This is the graphic view of recent query activity with latency details for the index and property database portion of the query pipeline as well as query averages per minute.

There is also another folder on that page called Advanced Reports which contains:

- CrawlProcessingPerActivity: This is the graphic view of where crawl processing happens in the pipeline.
- CrawlProcessingPerComponent: This is the graphic view of where crawl processing happens in the pipeline per minute.
- CrawlQueue: This is the graphic view of the state of the crawl queue.

You can click to the right of any of these reports to view or modify the report properties or permissions as shown in Figure 5.8.

**Figure 5.8 [f0508.tif]**

Click on the name of a report to open it, such as Crawl Rate Per Content Source. On this page, you can see the report of crawl rate activity for the past 12 hours by default. You can filter the results by application type, individual content sources, and the date and time range, and then click Apply filters on the right side of the page to view your selections as shown in Figure 5.9.

**Figure 5.9 [f0509.tif]**

On the All Documents page for Search administration reports, you can also click to the left of a particular report and select a check box in order to activate the Library Tools ribbon and perform various actions as shown in Figure 5.10. You can select either the Documents or Library tabs under Library Tools to access different features.

**Figure 5.10 [f0510.tif]**

type="caseStudy"

## Researching Errors in SharePoint Search Services

You are a SharePoint administrator for the Acme Development Company. Over the last 30 days, you and your staff have installed and configured SharePoint Server 2010 as a fresh install and deployed it across your organization's enterprise environment.

You come to work on Monday morning and learn your department has been getting calls from some users stating that the search function doesn't seem to be working. You review the crawl logs and they show no new crawled documents. You start investigating and see in the event log **Event ID: 92** with a description stating that a crawl component for a particular search application could not communicate with the query server.

You go to Microsoft's TechNet site and run a search on the error message. When the search results are displayed, you select the most likely result and discover the relevant information about the error including potential solutions at http://technet.microsoft.com/en-us/library/ee513077(office.14).aspx

After reviewing the information and continuing your investigation, you discover that the search service credentials were not up to date and you solve the problem by rebooting the servers that are experiencing this difficulty.

### Web Analytics Reports

Along with reports on search features, you can view reports on usage data for the different SharePoint sites and site collections on the Search Administration page under Reports by clicking Web Analytics Reports. On the Web Analytics Reports page, click the desired web application and then on the Summary page, click the name of the desired report. The following reports are available:

- Summary
- Number of Page Views
- Number of Daily Unique Visitors

- Number of Referrers
- Top Pages
- Top Visitors
- Top Referrers
- Top Destinations
- Top Browsers
- Number of Queries
- Number of Collections
- Top Site Collection Templates
- Customized Reports

You can filter these reports by date range and export them to spreadsheet format.

---

# Managing the Enterprise Search Topology

Enterprise Search in SharePoint Server 2010 is made up of a number of topological components which provide the different elements required for Search to operate correctly. The following information and task lists will illustrate how search indexing, crawling, and other functions are configured.

## Administering an Index Partition and Query Components

In the world of SharePoint Server 2010 Search, index partitions are groups of query components, each used to contain a subset of the full text index and which return search results to the submitter of the search query. Each of these index partitions is associated with a specific property database which contains the metadata associated with a specific set of crawled content. You can construct the topology for search by creating query components on selected servers in your server farm.

You can add an *index partition* to a Search Service Application and place query components on different farm servers to distribute the load of query services. The following task takes you through the steps. The first query component is created automatically when a new index partition is created.

type="note"

On a single server installation with built-in database, the SharePoint Search topology cannot be changed. You will not be able to perform this exercise on the SharePoint Server 2010 installation configured for this book.

**Adding an Index Partition to a Search Service Application**

1. In Central Administration under Application Management, click **Manage service applications**.
2. On the Service Applications page, click the link for the Search Server Application on which you want to add an index partition.
3. On the Search Administration page, under Search Application Topology, click the **Modify** button.
4. When the Add Query Component dialog box appears, in the Server list, click the farm server on which you want to add the first query component for the new index partition.
5. In the Associated Property Database list, click the name of the property database for which you want to associate the new index partition.
6. In the Location of Index field, enter an optional location on the server for the storage of the index files after they're received from the crawl components, or accept the default location.
7. Under Failover-only Query Component, leave the **Set this query component as failover-only** check box empty since you are creating a new index partition.
8. When you are done, click **OK**.
9. On the Manage Search Topology page, click **Apply Topology Changes** to start the SharePoint timer jobs that will add the new index partition and the first query component to the server you selected.

You can not only add an index partition, but you can remove it as well. The following goes through the process of removing an index partition from a Search Service Application. This task also cannot be performed on a SharePoint Server 2010 single server installation with built-in database

**Removing an Index Partition to a Search Service Application**

1. In Central Administration under Application Management, click **Manage service applications**.
2. On the Service Applications page, click the link for the Search Server Application on which you want to remove an index partition.

3. On the Search Administration page, under Search Application Topology, click the **Modify** button.
4. On the Manage Search Topology page, click the query component in the index partition you want to remove, and then click **Delete**.
5. In the dialog box that appears, click **OK** to confirm your decision.
6. On the Manage Search Topology page, click **Apply Topology Changes** to start the SharePoint timer jobs that will remove the index partition and the query components from the server

If you choose to delete all of the query components from an index partition, you will also remove the index partition from the farm. All the data from the partition will automatically be copied and distributed to the remaining partitions. If there is only one index partition for a Search Service Application, you will be unable to remove it.

As you learned earlier, a query component is a container for a particular subset of the full text index and is used to return search results to the query submitter. A query component is part of an index partition and is also associated with a specific property database containing the metadata associated with a set of crawled content. Just as you can add or remove an index partition to a Search Service Application, you can also add and remove a query component to an index partition. The next task will show you how. As with the tasks involving adding and removing an index partition, adding and removing a query component cannot be performed on a SharePoint Server 2010 single server installation with built-in database.

**Adding a Query Component to an Index Partition**

1. In Central Administration under Application Management, click **Manage service applications**.
2. On the Service Applications page, click the link for the Search Server Application on which you want to remove an index partition.
3. On the Search Administration page, under Search Application Topology, click the **Modify** button.
4. On the Manage Search Topology page, click a query component in the index partition you want to modify and then click **Add Mirror**.
5. In the Location of Index field, you can add an optional location on the server to use for storage of index files after receiving them from crawl components, or you can use the default location.
6. Under Failover-only Query Component, select the **Set this query component as failover-only** check box only if you want the

query component to receive queries in the event of the primary query component failing in this index partition. Otherwise, do not select the check box.

7. Click **OK** when you are finished.
8. On the Manage Search Topology page, click **Apply Topology Changes** to start the SharePoint timer job that will add the new mirror query component for the index partition you selected.

Removing a query component from an index partition is very much like **Removing an Index Partition to a Search Service Application**, except after you click the Modify button in Step 3, on the Manage Search Topology page, click the query component you want to remove and then click Delete. After that, click OK and on the Manage Search Topology page, click Apply Topology Changes.

type="warning"

> Remember, if you remove all of the query components from an index partition, you remove the index partition and all of the data will be copied to other partitions. You cannot remove the last index partition.

# Administrating Crawl Databases and Components

*Crawl databases* are used by a specific Search Service Application to store information about the location of content sources as well as crawl schedules and other crawl operation-related data. As you previously read, you can distribute the database load by adding crawl databases on different servers running SQL Server. Crawl databases are associated with crawl components and you can dedicate a component to a specific host by creating host distribution rules.

The following task will show you how to add or remove a crawl database to a Search Service Application. You will be unable to perform this task on a SharePoint single server with built-in database deployment.

## Adding and Removing a Crawl Database

1. In Central Administration under Application Management, click **Manage service applications**.
2. On the Service Applications page, click the link for the Search Server Application on which you want to remove an index partition.
3. On the Search Administration page, under Search Application Topology, click the **Modify** button.

4. On the Manage Search Topology page, click **New** and then click **Crawl Database**.
5. When the Add Crawl Database dialog box appears, under Add Crawl Database, point to the database server on which you want to add the crawl database by entering the database name and the database authentication credentials or accept the default values in these areas.
6. If you so desire, enter the information for a failover database server in the Failover Database Server field, but you must have SQL Server database mirroring enabled to select this option.
7. Under Dedicated Database, if you so desire, select the **Dedicate this crawl store to hosts as specified in Host Distribution Rules** check box.
8. Once you have finished, click **OK**.
9. On the Manage Search Topology page, click **Apply Topology Changes** to start the SharePoint timer job that will add the new crawl database to the SQL Server computer.
10. To delete the crawl database, follow Steps 1 through 3 and then after clicking the **Modify** button, on the Manage Search Topology page, click the desired crawl database and then click Delete.
11. When the verification box appears, click **OK**.
12. On the Manage Search Topology page, click **Apply Topology Changes** to start the SharePoint timer job that will delete the new crawl database from the SQL Server computer.

Type="note"

Before you can delete a crawl database, you must first disconnect any associations between the crawl components and the crawl database, either by assigning the components to a different crawl database or by removing the crawl components. If you do not do so, the Delete button will not appear as expected in Step 10 of the previous task.

A crawl component is the portion of a crawl database that processes the crawls of content sources, then propagates the resulting index files to query components and adds the data about the location and crawl schedule to the associated crawl database.

As you learned in the previous task, you can add or remove a crawl component from a crawl database associated with a Search Service Application. The following set of steps outlines how to do so. Like all other search topology tasks, you will not be able to complete these steps if you are using a SharePoint single server with built-in database deployment.

**Adding and Removing a Crawl Component to a Crawl Database**

1. In Central Administration under Application Management, click **Manage service applications.**
2. On the Service Applications page, click the link for the Search Server Application on which you want to remove an index partition.
3. On the Search Administration page, under Search Application Topology, click the **Modify** button.
4. On the Manage Search Topology page, click **New** and then click **Crawl Component**.
5. When the Add Crawl Component dialog box appears, use the Server list to select the farm server on which you want to add the crawl component.
6. Use the Associated Crawl Database list to select the crawl database you want to associate with the new crawl component.
7. If you so desire, you can use the **Temporary Location of Index** field to enter the location of the server you want to use for creating index files before propagating them to the query components, or you can accept the default location.
8. When you are finished, click **OK**.
9. On the Manage Search Topology page, click **Apply Topology Changes** to start the SharePoint timer job that will add the new crawl component to the specified server.
10. To remove the component, follow Steps 1 through 3 and after clicking the **Modify** button, on the Manage Search Topology page, select the crawl component you want to remove and then click **Delete**.
11. When the confirmation box appears, click **OK** to add the crawl component to the removal job queue.
12. On the Manage Search Topology page, click **Apply Topology Changes** to start the SharePoint timer job that will delete the crawl component from the server.

# Administering Property Databases and Host Distribution Rules

In addition to crawl databases, SharePoint search also uses *property databases*, which contain metadata associated with crawled content. These property databases can be added to and removed from SQL database servers in the server farm in much the same way as crawl databases. Since

this is a search topology task, it cannot be performed on a SharePoint single server with built-in database deployment.

## Adding and Removing a Property Database

The steps for adding the property database are almost identical to the task Adding and Removing a Crawl Database. Follow Steps 1 through 3 on that task and after clicking the Modify button, on the Manage Search Topology page, click New and then click Property Database. Then, when the Add Property Database dialog box appears, either accept the defaults or add your own information for the database server name, database name, and authentication credentials. You can also choose to specify a Failover Database Server if you wish, but you must have SQL Server database mirroring enabled to do so. After that, follow the final steps of clicking OK and then Apply Topology Changes to start the SharePoint timer job.

The process of removing the property database is identical to that of removing a crawl database, including the requirement that any associations with query components must be removed before the property database can be successfully deleted.

## Adding and Removing a Host Distribution Rule

The final task in managing search topologies is adding and removing a host distribution rule. Host distribution rules are used to associate a server computer with a specific crawl database. The default distribution rule is to load balance hosts across crawl databases based on the availability of space, however you can choose to override this behavior and connect a host to a specific crawl database. This is sometimes done based on availability and performance requirements. There must be more than one crawl database available in the Search Service Application to add a host distribution rule.

1. In Central Administration, under Application Management, click **Manage service applications**.
2. On the Service Applications page, click the Search Service Application on which you want to add the host distribution rule.
3. On the Search Administration page, in the left navigation bar, click **Host Distribution Rules**.
4. On the Host Distribution Rules page, click **Add Distribution Rule**.
5. On the Add Host Rule page, enter the name of the desired host in the Hostname field.
6. Use the Distribution Configuration list to select the crawl database you want to be involved in the crawling action on the selected host.
7. Click **OK** to add the new job to the queue.

8. On the Host Distribution Rules page, click **Apply Changes**.
9. Click **OK** to apply the rule.
10. To remove a rule, follow Steps 1 through 3 and on the Host Distribution Rules page, hover your cursor over the host distribution rule you want to remove, click the down arrow that becomes available, and then click **Delete**.
11. In the confirmation box, click OK to add the job to the queue.
12. Click **Apply Changes** and then click **OK**.

---

# Managing FAST Search for SharePoint

The "FAST" part of FAST Search for Microsoft was originally a recursive acronym: Fast Search and Transfer ASA. FAST is actually FAST ESP or Enterprise Search Platform, a service-oriented architecture development platform that offers a foundation on which to build an application noted for efficient indexing of searchable content across an enterprise-level data space.

While SharePoint Server 2010's out-of-the-box search solution is quite capable of servicing the enterprise, FAST Search Server 2010 for SharePoint is an add-on based on FAST search that is integrated into SharePoint, combining the best of SharePoint and FAST. FAST brings SharePoint search to a whole new level representing a superset to the off-the-rack SharePoint search tool.

As an administrator, you now have two search options to choose from within SharePoint. Here's what you need to know about FAST.

## Installation and Configuration of FAST Search Server 2010 for SharePoint

FAST Search Server isn’t installed on any of the servers that contain SharePoint Server 2010, so you cannot use the same physical computer containing SharePoint for the FAST Search Server. While adding and configuring FAST Search Server as a back-end for SharePoint is part of the material you are responsible for in the 70-668 PRO: SharePoint 2010, Administrator exam, the actual installation and post-installation

configuration of FAST Server itself probably is not. Nevertheless, this information will be presented in summary here as background.

Type="note"

There are actually two separate FAST search server products that can be downloaded and installed: **Microsoft FAST Search Server 2010 for SharePoint Internet Sites:** http://www.microsoft.com/downloads/details.aspx?familyid=AA37E8B0-C4D6-4452-A476-B81EE0BFBDA5&displaylang=en and **Microsoft FAST Search Server 2010 for SharePoint:** http://www.microsoft.com/downloads/details.aspx?familyid=BCC37C48-11FB-40A2-8CFB-743DE20260F6&displaylang=en

Also, just as you must purchase SharePoint under a licensing agreement, FAST Search Server is a separate server product and is purchased independently of SharePoint.

## Installation Requirements

A necessary prerequisite for installing FAST Search Server 2010 for SharePoint is to first install SharePoint and SQL Server. SharePoint must be installed with the Farm install option and the Complete (Advanced Installation) option must be selected. Further, if you want to enable the document preview option so you can preview Word and PowerPoint documents in search results before opening them, you must install Microsoft Office Web Applications before running the SharePoint product configuration wizard.

You can only install FAST search server on Windows Server 2008 SP2 x64 or Windows Server 2008 R2 x64. You can use any version including Standard, Enterprise, and Datacenter. You cannot run any other server roles on the computer besides FAST Search Server.

Type="note"

To avoid query timeout errors for the period of time around midnight on daylight savings time (DST) dates, it's recommended that you turn off the automatic DST adjustment on the computer or computers running FAST search server.

## Deployment Scenarios

FAST Search Server 2010 for SharePoint can be deployed either as a stand-alone installation or in a multiple server deployment. Usually you

install FAST as a stand-alone either to test or evaluate the search server or for a very small production environment.

The multiple server deployment is more typical for a production environment. One server is deployed as the admin server and is responsible for providing administrative services. Other FAST servers are deployed as non-admin servers which provide search, indexing, and document processing. You can install any number of non-admin servers to scale out the deployment.

## Installation Procedures

The full installation process for FAST search server involves three parts:

- Running the Prerequisite Installer
- Installing FAST Search Server 2010 for SharePoint
- Running the Post-Installation Configuration

Type="note"

This is not a comprehensive guide to installing and configuring FAST Search Server 2010 for SharePoint. To find detailed information, visit http://technet.microsoft.com/en-us/enterprisesearch/ee441234.aspx

### Running the Prerequisite Installer

You must be a member of the local administrators group on the server you are performing this task.

1. Download the Prerequisite installer file `prerequisiteinstaller.exe` and launch the file.
2. On the welcome page, click **Next**.
3. During the prerequisite software installation, you may have to restart the computer.
4. On the Prerequisite installer Installation Complete screen, click **Finish**.

You may have to install the following after the Prerequisite installer finishes:

- For Windows Server 2008 with SP2, FIX: A hotfix that provides a method to support the token authentication without transport security or message encryption in WCF is available for the .NET Framework 3.5 SP1

(http://go.microsoft.com/fwlink/?LinkID=160770).

- For Windows Server 2008 R2, FIX: A hotfix that provides a method to support the token authentication without transport security or message encryption in WCF is available for the .NET Framework 3.5 SP1 (http://go.microsoft.com/fwlink/?LinkID=166231).

**Installing FAST Search Server 2010 for SharePoint**

1. This installation process must be run on every server computer on which you want to operate FAST search server. You must be the local administrator on those computers.
2. Download the installation file for FAST search server and launch it, then allow the installation process to progress to completion.
3. After the installation is complete, go to `c:\FASTsearch`, which is the default location for the FAST search server and manually create the directories:
    - data
    - data\data_security
    - data\data_security\admin
    - data\data_security\worker
4. Perform an antivirus scan on the directory containing FAST search server.

## Performing Post-Installation Configuration

Once FAST search server is installed, there are three post-installation configuration scenarios:

- Configuring a Stand-alone Server Deployment
- Configuring an Admin Server in a Multiple Server Deployment
- Configuring a Non-admin Server in a Multiple Server Deployment

All three post-installation configuration scenarios are managed by a post-installation configuration script located in `c:\FastSearch\installer\scripts`.

**Configuring a Stand-alone Server Deployment**

1. On the computer with FAST Search Server installed, click **Start**, right-click Windows PowerShell and select **Run as**

**administrator**.

2. Navigate to `C:\FASTSearch`, type the following and then press **ENTER**.

```
Set-ExecutionPolicy RemoteSigned
```

3. If prompted, press **Y** for Yes.
4. Navigate to `C:\FastSearch\installer\scripts`
5. Type the following and then press **ENTER**, replacing the sample values with their real counterparts.

```
.\psconfig.ps1 -action i -roleName single -
userName domain\user -localMachineName
fully_qualified_local_server_name –
databaseConnectionString
database_connection_string -databaseName
database_name
```

6. When prompted, enter a password for the FAST Search Server user and a certificate password.
7. Add yourself or the appropriate user or group to the local FASTSearchAdministrators group that was created when you ran the **psconfig** command.
8. Restart the server.
9. When the server has restarted, open Windows PowerShell again, navigate to `C:\FASTSearch` , type the following, and press **ENTER** in order to verify that all modules are running.

```
nctrl status.
```

As this is a stand-alone FAST search server, your next step is to add FAST Search Server 2010 for SharePoint as back-end for Microsoft SharePoint Server.

To configure a multiple server deployment of FAST Search Server, your first task is to configure the admin server to run administrative services, and then add one or more non-admin servers, which will connect to the admin server. Prior to setting up the admin server, you must configure a deployment file, which is usually an XML file that specifies how components and services are distributed in the multiple server environment.

Type="note"

> The specifics of the file are beyond the scope of this chapter so an example will not be provided.

**Configuring a FAST Search Server as an Admin Server for a Multiple Server**

**Environment.**

1. Follow steps 1 through 4 from Configuring a Stand-alone Server Deployment and on the next step, enter the following code at the prompt, and then press **ENTER**.

```
.\psconfig.ps1 -action i -roleName admin –
userName domain\user – localMachineName
fully_qualified_local_server_name –
databaseConnectionString
database_connection_string –databaseName
database_name –deploymentFile deployment_file_name
```

2. Follow the rest of the steps from Configuring a Stand-alone Server Deployment.

**Configuring a FAST Search Server as a Non-Admin Server for a Multiple Server Environment**

1. This task is almost the same as the last two except that you must ensure the admin server is running first and then, at the same step as the previous two tasks, at the command prompt, enter the following code and then press **ENTER**.

```
.\psconfig.ps1 -action i -roleName nonadmin -
userName domain\user -localMachineName
fully_qualified_local_server_name -
adminMachineName fully_qualified_local_server_name
```

2. Perform all of the rest of the steps required for the previous two exercises.

Now that your FAST Search Server environment is installed and configured, it's time to add FAST Search Server as a back-end for SharePoint Server 2010.

# Adding FAST Search Server 2010 as a Back-end for SharePoint

You can expect to be responsible for the following content on the 70-668 PRO: SharePoint 2010, Administrator exam. There are a number of tasks required to set up FAST Search Server as a back-end resource for SharePoint, both in SharePoint's Central Administration and in FAST Search Server. This section will exclusively address the tasks that can be performed on SharePoint:

- Creating and Configuring the Content Search Service Application for FAST Search Server
- Creating and Configuring the Query Search Service Application for FAST Search Server
- Enabling Queries from SharePoint to FAST Search Server

Each of these general tasks has one or more exercises associated with it.

## Creating and Configuring the Content Search Service Application for FAST Search Server

In order to crawl content that will be indexed in FAST Search Server, you must create and configure the content search service application, which is used to crawl and send content to FAST for use by SharePoint. Exercise 5.13 will show you the process.

Type="activity"

### Exercise 5.13 Configuring a Content Search Service Application

1. In Central Administration, click Application Management and then click **Manage Service Applications**.
2. On the Manage Service Applications page, click **New** and select **Search Service Application**.
3. When the Create New Search Service Application page appears, under Name, in the Service Application name field, give the application a name.
4. Under FAST Service Application, select the **FAST Search Connector** radio button.
5. Under Search Service Account, either select an account from the drop-down list, or click **Register new managed account** to create a new account.
6. Under Application Pool for Search Admin Web Service, either select **Use existing application pool** to accept the default, or click **Create new application pool** and then enter a name in the Application pool name field.
7. For a security account, either accept the default by clicking **Predefined**, or select **Configurable** and select or create a managed account.
8. Under Base Port, enter the desired port number or accept the default.
9. Under Content Distributors, in the available field, enter the location or locations of content distributors using the format FQDN:port, separated by semi-colons.

10. Under Content Collection Name, enter a name for the content collection containing the content to be crawled such as sp.
11. When finished, click **OK**.

There are a number of other tasks that can be performed, but they are common to both the standard SharePoint search option and FAST search, and include creating a content source, resetting the content index, limiting content to be crawled, and changing crawler impact rules.

## Creating and Configuring a Query Search Service Application

The query search service application provides the query results from crawled content and the creation and configuration process is almost the same as Exercise 5.13 Configuring a Content Search Service Application. Follow steps 1 through 3 to get to the Create New Search Service Application page. The actions you take for Steps 4 through 8 are the same except on Step 4, you choose FAST Search Query rather than FAST Search Connector. After setting the Base Port, perform the following in Exercise 5.14.

Type="activity"

### Exercise 5.14 Configuring a Query Search Service Application

1. Under Query Service Location, enter one or more locations of the query service in the format protocol://FQDN:port, such as `http://BackEndSearch:13098`.
2. Under Administration Service Location, enter the location of the administration service in the format protocol://FQDN:port, such as `Net.tch://BackEndSearch:12043`
3. Under Resource Store Location, enter the location of the resource store in the format protocol://FQDN:port, such as `Net.tch://BackEndSearch:12011`
4. Under Account for Administration Service, enter the account name.
5. When you are done, click **OK**.

The query service application you just added to the service applications list must now be connected to the desired web application or applications. See **Exercise 5.5 Connecting the Search Service Application to a Web Application** for details.

## Enabling queries from SharePoint to FAST Search Server

The final set of tasks involved in configuring FAST as the back-end search server for SharePoint is to enable communications channels for the HTTP and HTTPS protocols. This must be done using Windows PowerShell on the SharePoint server containing Central Administration.

The task for enabling http and https protocols is essentially the same. You must create a SharePoint Server STS certificate on the SharePoint Server computer containing Central Administration and then transfer that certificate to all of the FAST Search Server query servers (if you have only one query server, only that server requires the certificate).

On the SharePoint Server with Central Administration, open Windows PowerShell and run as administrator. To generate the STS certificate enabling queries over HTTP, run the following at the command prompt, replacing the example values with the true values for the FAST Search Server.

```
$currentdir = pwd

$sharepointSTSCertFilename = Join-Path -Path
$currentdir -ChildPath 'MOSS_STS.cer'

$fastsearchqrserver =
'fs14qrserver.mydomain.com'

$fastSSAName = 'FASTSearchServiceApplication'


$stsCert = (Get-
SPSecurityTokenService).LocalLoginProvider.Signing
Certificate

$stsCert.Export("cert") | Set-Content -
encoding byte $sharepointSTSCertFilename


$queryServiceLocationValue = "http://" +
$fastsearchqrserver + ":13287"

Set-SPEnterpriseSearchExtendedQueryProperty -
SearchApplication $fastSSAName -Identity
"FASTSearchQueryServiceLocation" -Value
$queryServiceLocationValue
```

```
    Set-SPEnterpriseSearchExtendedQueryProperty -
SearchApplication $fastSSAName -Identity "
FASTSearchQueryServiceWinAuth" -Value “false”

    Get-SPEnterpriseSearchExtendedQueryProperty -
SearchApplication $fastSSAName

    IISReset
```

The certificate for HTTP will be created in the directory where the command was run. You will need to copy the file to a location that is accessible to the FAST Search Server and from there; the administrator for FAST Search Server will need to perform the import procedure.

To generate the STS certificate enabling queries over HTTPS, run the following at the command prompt, replacing the example values with the true values for the FAST Search Server.

```
    $currentdir = pwd

    $sharepointSTSCertFilename = Join-Path -Path
$currentdir -ChildPath 'MOSS_STS.cer'

    $fastsearchqrserver =
'fs14qrserver.mydomain.com'

    $fastSSAName = 'FASTSearchServiceApplication'

    $sharepointServicesCertFilename = Join-Path -
Path $currentdir -ChildPath 'MOSS_SERVICES.pfx'

    $sharepointServicesCertPassphrase =
$host.ui.PromptForCredential("Need Credentials",
"Please enter a passphrase for the SharePoint
Services Cert", "CERT_PASSPHRASE", "")

    $tempStringValue =
[System.Runtime.InteropServices.Marshal]::SecureSt
ringToBSTR($sha
repointServicesCertPassphrase.Password)

    $plainTextPassPhrase =
[System.Runtime.InteropServices.Marshal]::PtrToStr
ingAuto($tempSt ringValue)


    $stsCert = (Get-
SPSecurityTokenService).LocalLoginProvider.Signing
Certificate
```

```
    $stsCert.Export("cert") | Set-Content -
encoding byte $sharepointSTSCertFilename

    $sharePointCertStore = new-object
System.Security.Cryptography.X509Certificates.X509
Store('SharePoi nt',

    [System.Security.Cryptography.X509Certificates
.StoreLocation]::Lo calMachine)

    $sharePointCertStore.Open([System.Security.Cry
ptography.X509Certi ficates.OpenFlags]::ReadOnly)

    $servicesCert =
$sharePointCertStore.Certificates.Find([System.Sec
urity.Cryptogra
phy.X509Certificates.X509FindType]::FindBySubjectN
ame,'SharePoint Services', $false)

    $servicesCert.Export("pfx",
$plainTextPassPhrase) | Set-Content -encoding byte
$sharepointServicesCertFilename

    $servicesCert2 = new-object
System.Security.Cryptography.X509Certificates.X509
Certificate2

    $servicesCert2.Import($sharepointServicesCertF
ilename, $plainTextPassPhrase,
[System.Security.Cryptography.X509Certificates.X50
9KeyStorageFlag s]::DefaultKeySet)

    $trustedPeopleCertStore = new-object
System.Security.Cryptography.X509Certificates.X509
Store('TrustedP eople',
[System.Security.Cryptography.X509Certificates.Sto
reLocation]::Lo calMachine)

    $trustedPeopleCertStore.Open([System.Security.
Cryptography.X509Ce
rtificates.OpenFlags]::ReadWrite)

    $trustedPeopleCertStore.Add($servicesCert2)

    $trustedPeopleCertStore.Close()

     $queryServiceLocationValue = "https://" +
$fastsearchqrserver + ":13286"

    Set-SPEnterpriseSearchExtendedQueryProperty -
SearchApplication $fastSSAName -Identity
```

```
"FASTSearchQueryServiceLocation" -Value
$queryServiceLocationValue

    Set-SPEnterpriseSearchExtendedQueryProperty -
SearchApplication $fastSSAName -Identity
"FASTSearchQueryServiceWinAuth" -Value false

    Get-SPEnterpriseSearchExtendedQueryProperty -
SearchApplication $fastSSAName

    IISReset
```

Two files will be created in the directory where you run this command: The STS certificate and the MOSS_SERVICES.pfx file. Copy them both to a location where they can be accessed by the FAST Search Server. From there, the administrator for the FAST Search Server will need to perform the import procedure.

From the SharePoint Administrator's point of view, FAST Search Server is now set up as a back-end for SharePoint Server 2010.

At this point, the SharePoint Server 2010 major features have been configured and available. Of course there's plenty to manage and maintain in the day-to-day operations of SharePoint, which is how you'll spend much of your time.

# Summary

In this chapter, you learned a great deal about setting up enterprise search and FAST Search Server for SharePoint, including:

- Understanding the new features in SharePoint Enterprise Search for users.
- Learning the wide variety of crawl features to be managed for enterprise-search.
- Configuring the query and result features for search.
- Reviewing the health and functionality reports for search.
- Managing the enterprise-search topology in the server farm.
- Adding FAST Search Server as a back-end for SharePoint.

# Exam Essentials

### Understand the various tasks associated with administering farm-wide search

Demonstrate the ability to manage all of the required tasks to enable and refine search services for SharePoint, including crawl, query, and report related utilities.

### Understand the activities to be performed to manage the enterprise-search topology

Perform the mandatory activities to enable and manage crawl databases and database components on the SQL servers in the server farm.

### Understand what has to be done to add FAST Search Server as a back-end for SharePoint

Enable the connection between SharePoint and FAST Search Server to allow for a more enhanced search service for SharePoint users.

# Review Questions

1. You are a SharePoint administrator for your company. You have recently deployed SharePoint Server 2010 in your organization and are in the process of configuring Enterprise search. You receive a message from one of the people in Research who uses search extensively and is asking what has improved in SharePoint search. Of the following, what are correct answers for SharePoint's search features and capacities? (Choose all that apply.)Set up usage and health data collection for the server farm using Central Administration.

   A. SharePoint 2010 search now supports Boolean operators.

   B. SharePoint 2010 search now supports the use of a wildcard character.

   C. SharePoint 2010 search now provides a search center on all sites by default.

   D. After completing a search in SharePoint, a user can create a connector for the same search in Windows 7.

   1. A, B, and D

While you can add search web parts to any web part page on a site, the Search Center remains a specialized site in SharePoint and is not added to any other site template.

2. You are a SharePoint administrator for your company. You have recently deployed SharePoint Server 2010 in your organization and are in the process of configuring Enterprise search. You receive a message from one of the people in Research who uses search extensively and is asking specifically about what has improved in search results. Of the following, what are correct answers for SharePoint's search features and capacities? (Choose all that apply.)

   A. SharePoint relevance improvements allow a higher ranking to be assigned to documents that users have tagged as being important.

   B. SharePoint recognizes "self-search" as when a user searches for their own name and returns all related metadata, including the number of times the user's My Site has been viewed.

   C. Search offers improved results on queries for nicknames and phonetic names such as "James" and "Jim".

   D. Document information returned by a search can now include content of a document to assist when metadata is missing or incorrect.

   2. B, C, and D

   Higher rankings are assigned to documents that have been accessed more frequently in search but not by any sort of manual tagging process.

3. You are a SharePoint administrator for your organization. You and your staff are about to deploy SharePoint Server 2010 in the work environment and you are currently planning how to deploy search. You have come to the conclusion that deploying search using the Farm Configuration Wizard would be the quickest and most effective method. Of the following, what reasons for this do you give your staff? (Choose all that apply.)

   A. The Farm Configuration Wizard automates the creation of search scopes, crawl impact rules, and federated locations.

B. The Farm Configuration Wizard creates the search topology.

C. The Farm Configuration Wizard supports a search index for up to 100 million crawled documents.

D. The Farm Configuration Wizard creates a Search Center by default for users to access and from which they can issue queries.

3. B and C

While the Farm configuration Wizard does a lot of the heavy lifting for post installation configuration, including deploying search, it cannot automate the creation of specific search scopes, crawl impact rules, and federated locations. Also, the search center is created by the Farm Configuration Wizard only if you select the Search Center option while running the wizard. This is not a default process.

4. You are a SharePoint administrator for your organization. You and your staff are about to deploy SharePoint Server 2010 in the work environment and you are currently planning how to deploy search. You are reviewing some of the features and capacities of search. Of the following, what is true about SharePoint 2010 search? (Choose all that apply.)

A. Federated locations allows search to crawl external sources such as Lotus Notes and Google News.

B. Administrative tasks for search can now be automated using Windows PowerShell scripts.

C. You can now tune search operations while users continue to access search.

D. You can monitor search health by adding a Health and Performance monitoring web part to a web part page.

4. A, B, and C

While you can view customized reports on search in a Search Service Application, you cannot view this data in a web part on a web part page.

5. You are a SharePoint administrator for your organization and you are currently deploying enterprise search in SharePoint. You have created a search service application, and are currently creating a content source to be crawled. During the process, you are offered a list of options for content types. Of

the following, which are valid content types? (Choose all that apply.)

A. Line of Business Data

B. Lotus Notes public folders

C. SharePoint Sites

D. Web Sites

5. A, C, and D

While you can select Exchange public folders as a content type when creating a content type to be crawled, Lotus Notes public folders is not a valid option. You can also choose File Shares and Custom Repository.

6. You are a SharePoint administrator for your organization and you are currently deploying enterprise search in SharePoint. You have created a search service application, and are currently creating a crawl rule. A new member of your staff who is not familiar with SharePoint or how enterprise search functions asks the purpose of a crawl rule. Of the following, what are valid answers? (Choose all that apply.)

   A. Crawl rules let you include specific paths in a URL to be crawled.

   B. Crawl rules let you exclude specific paths in a URL from being crawled.

   C. Crawl rules must be listed in the order they are to be applied during the crawl.

   D. You can initiate a crawl rule during either a full crawl or an incremental crawl.

   6. A, B, and C

   You must conduct a full crawl of the content source for a new rule to be implemented. This cannot be done during an incremental crawl.

7. You are a SharePoint administrator for your organization and you are currently deploying enterprise search in SharePoint. You have created a search service application and have performed your first full crawl of the configured content sources, but the crawl hasn't functioned they way you had hoped. You consult the crawl log for one of the content sources to see if you can find the problem. On the selected

page, what columns do you expect to see? (Choose all that apply.)

A. Errors

B. Warnings

C. Failures

D. Successes

7. A, B, and D

Columns on the crawl log page are Successes, Warnings, Errors, Top Level Errors, and Deletes.

8. You are a SharePoint administrator for your organization and you are currently deploying enterprise search in SharePoint. A new member of your staff who is not familiar with SharePoint or how enterprise search functions asks about the various file types search crawls by default. In Central Administration, you navigate to a Search Service Application and to the File Types page. Of the following, what file types on this page are crawled by default? (Choose all that apply.)

A. aspx

B. docx

C. odt

D. php

8. A, B, and D

ODT or Open Document Template is typically used by OpenOffice.org and is not a file type crawled by default.

9. You are a SharePoint administrator for your organization and you are currently deploying enterprise search in SharePoint. A new member of your staff who is not familiar with SharePoint or how enterprise search functions asks about federated locations. Of the following, what do you say is true about federated locations? (Choose all that apply.)

A. Federated locations are used to crawl external content sources such as Google News.

B. You can import FLD files for a specific federated location search connection.

C. You can manually create a a federated location search connection.

D. You can use Windows PowerShell to either import or create a federated location search connection.

9. A, B, and C

To download and import an FLD file from an Internet source, you cannot use Windows PowerShell.

10. You are a SharePoint administrator for your organization and you are currently deploying enterprise search in SharePoint. A new member of your staff who is not familiar with SharePoint or how enterprise search functions asks about why you are mapping managed metadata properties Of the following, what is the most valid answer?

A. Since different content sources may use different names for a specific metadata property such as "Author", you must map the SharePoint Managed metadata property to those different names used by different content sources so that a search for a SharePoint metadata property will return data from the mapped sources.

B. Since SharePoint can use different specific metadata property names depending on the site or site collection, you must map the different SharePoint metadata properties to those metadata properties used by various content sources, so that searches from different sites and site collections will return data from all the mapped sources.

C. While SharePoint uses a set of standardized managed metadata property names, those names are proprietary Microsoft names and do not comply to the standards used on the web. You must create mapping so that search queries using the proprietary metadata names will return data from the mapped sources.

D. Usually, various content sources will use metadata property names that are not human readable, you must map those content names to human readable SharePoint managed property names.

A.

10. All of the other answers are bogus.

11. You are a SharePoint administrator for your organization and you are currently deploying enterprise search in SharePoint.

A new member of your staff who is not familiar with SharePoint or how enterprise search functions asks about the advantage of configuring search scopes. Of the following, which are valid answers you can give? (Choose all that apply).

A. Search scopes limit the field of a search in order to conserve resources.

B. Search scopes limit the field of a search in order to produce more accurate results.

C. Search scopes limit the field of a search in order to prohibit search results from inappropriate or adult related sites.

D. Search scopes limit the field of a search in order to return a single content type and restrict all other types.

11. A and B

Answers C and D are bogus.

12. You are a SharePoint administrator for your organization and you are currently deploying enterprise search in SharePoint. You have created a search service application and have performed your first full crawl of the configured content sources, but the crawl hasn't functioned they way you had hoped. On the Search Administration page for the selected Search Service Application, you open the Administration Reports page and start reviewing the various documents present. On any specific document, what actions can you perform? (Choose all that apply.)

A. You can filter the results by date range, with 12 hours being the default range.

B. You can filter the results by application type.

C. You can filter the results by search service application.

D. You can filter the results by content source.

12. A, B, and D

Since you are performing this action within a single search service application, you cannot filter the results based on other applications that exist outside of the one you are currently using.

13. You are a SharePoint administrator for your organization and you have recently deployed enterprise search in SharePoint. You have been tasked by the CIO with gathering statistics on web sites searched by SharePoint users. You visit the Web Analytics page in Search Administration for the default Search Service Application. On this page, what reports can you view? (Choose all that apply.)

    A. Top Browsers

    B. Top Destinations

    C. Top Queries

    D. Top Visitors

    13. A, B, and D

    There is no Top Queries option, but you can choose Number of Queries and view that report.

14. You are a SharePoint administrator for your organization and you have recently a single server with built-in database SharePoint installation to test SharePoint Server 2010 prior to making a recommendation for a enterprise wide installation. You have just deployed search in your test environment and you want to add an index partition to your default search service application. You find that you are unable to accomplish this task. What is the most likely cause of the problem?

    A. You have attempted to accomplish this task in Central Administration but it can only be done using Windows PowerShell.

    B. This task can only be accomplished in a server farm environment using one or more separate SQL servers.

    C. You have failed to create one or more content sources prior to configuring the index partition.

    D. You are not logged into SharePoint as the local server administrator.

    14. B.

    Adding an index partition and then placing query components on different farm servers is done to distribute the load of query services and requires a server farm environment with one or more SQL servers. The task cannot be performed on a single-server deployment with built-in database. You do not

need to use Windows PowerShell to accomplish this task and the task isn't dependent on having a content source created. While not being logged in with the proper credentials could be a problem, answer B is the most likely issue, given the stated deployment.

15. You are a SharePoint administrator for your company and you have recently deployed a SharePoint Server 2010 server farm. You have configured enterprise search and have set up and tested a crawl database for the default search service application. You've finished testing the crawl database and want to delete it, since you're planning on deploying crawl databases for production in the next few days. You've selected the test database on the Manage Search Topology page but cannot find the Delete button to remove the database. What could be the problem? (Choose all that apply.)

    A. You must first disconnect any associations between the crawl components and the crawl database by any appropriate means.

    B. You must first assign the crawl components to a different crawl database.

    C. You must first remove the crawl components before deleting the crawl database.

    D. You must first delete all of the content from the crawl database.

    15. A, B, and C

    Before you can delete a crawl database, you must disconnect any associations between the crawl components and the crawl database, either by assigning the crawl components to a different crawl database or removing the crawl components. In this case, answers A, B, and C are correct. Answer D is bogus.

16. You are a SharePoint administrator for your organization and you've been tasked by your CIO to implement FAST Search Server 2010 for SharePoint. Another administrator has been tasked with specifically managing the installation and deployment of FAST Search Server and you must perform the work within SharePoint to add FAST as a back-end service for SharePoint. You are consulting with the FAST Search Server admin and she is discussing the general requirements for installing and deploying FAST. Of the following, which

does she say are valid steps in this process? (Choose all that apply.)

A. Running the Prerequisite Installer

B. Installing FAST Search Server 2010 for SharePoint

C. Running the FAST Search Server Products and Tools Wizard.

D. Running the Post-Installation Configuration.

16. A, B, and D

Answer C is bogus. All other answers are valid parts of the process.

17. You are a SharePoint administrator for your organization and you've been tasked by your CIO to implement FAST Search Server 2010 for SharePoint. Another administrator has been tasked with specifically managing the installation and deployment of FAST Search Server and you must perform the work within SharePoint to add FAST as a back-end service for SharePoint. You are consulting with the FAST Search Server admin and she is discussing the general process of post-installation configuration. Of the following, which does she say are valid configuration options? (Choose all that apply.)

A. Configuring a Stand-alone Server Deployment

B. Configuring an Admin Server in a Multiple Server Deployment

C. Configuring a Member Server in a Multiple Server Deployment

D. Configuring a Non-admin Server in a Multiple Server Deployment

17. A, B, and D

The Member Server deployment is bogus. All other answers are valid options, depending on the desired topology.

18. You are a SharePoint administrator for your organization and you want to set up FAST Search Server 2010 as a back-end for SharePoint. The FAST Search Server admin has finished deploying the server set up on his end. What is the first thing you need to in SharePoint?

A. You need to create a new Search Service Application that points to the FAST search connector.

B. You need to edit the default Search Service Application so that it points to the FAST search connector.

C. You need to create a new Search Service Application that points to the FAST search connector and then delete the default Search Service Application.

D. You need to point the default Search Service Application to SharePoint Search and create a new Search Service Application pointing to the FAST search connector.

18. A.

You cannot use both the basic "out-of-the-box" SharePoint enterprise search and FAST search in the same deployment, so you need to create a new Search Service Application pointing to the FAST search connector. You do not need to delete the default Search Service and editing the default Search Service to point to the FAST search connector is not an option.

19. You are a SharePoint administrator for your organization and you want to set up FAST Search Server 2010 as a back-end for SharePoint. You have almost completed the configuration process but need to enable queries from SharePoint to the FAST Search Server. Of the following, which are the valid communication protocols you can configure? (Choose all that apply.)

A. FTP

B. HTTP

C. HTTPS

D. ASPX

19. B and C

You must configure HTTP and HTTP communication channels between SharePoint and FAST Search Server, making the STS certificate for HTTP available to the FAST server and making the STS certificate and the MOSS_SERVICES.pfx file for HTTPS available to the FAST server.

20. You are a SharePoint administrator for your organization and you want to set up FAST Search Server 2010 as a back-end for SharePoint. You have almost completed the configuration process but need to enable queries from SharePoint to the FAST Search Server. By what process do you enable the communication channels?

    A. You must use Central Administration.

    B. You must use Windows PowerShell.

    C. You can use either Central Administration or Windows PowerShell.

    D. You must use a combination of Central Administration and Windows PowerShell.

    20. B.

    On the SharePoint Server 2010 computer containing Central Administration, you must open Windows PowerShell, run as administrator, and run different scripts depending on the type of communications protocol you are enabling.

---

# Glossary Terms

**Administration reports**

A set of documents you can view in Central Administration that report on the health and functioning of different aspects of Search.

**Authoritative web pages**

In search you can configure web pages as authoritative indicating they contain the most relevant information.

**Crawl databases**

These are used by a specific Search Service Application to store information about the location of content sources as well as crawl schedules and other crawl operation-related data.

**Crawl rules**

These are rules you can apply to crawls that include or exclude specific paths in a URL from being crawled as well as specifying authentication accounts.

**Crawler impact rules**

These are rules you can apply to crawls that minimize the impact of crawls on server resources.

**Federated locations**

This is a method of allowing SharePoint Search to crawl external content sources such as Google news.

**Index partition**

These are groups of query components that are used to contain a subset of the full text index which returns search results.

**Metadata property mappings**

This process is used to map properties taken from crawled documents and managed properties that users employ in search queries.

**Property databases**

These contain the metadata associated with crawled content and can be added to or removed from SQL database servers.

**Scopes**

These are used with scope rules to limit search queries to specific content and property types in order to return more accurate search results.

**Search Service Application**

The specific service application in SharePoint responsible for providing search functionality.

**Web Analytics Reports**

A set of documents you can review in Central Administration that provide information about how the amount and type of search requests for different pages and sites in SharePoint.