

Michael Noel
Colin Spence

Sharepoint® 2013

UNLEASHED



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Michael Noel
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SharePoint® 2013

UNLEASHED



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Microsoft® SharePoint® 2013 Unleashed

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About the Authors

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Colin Spence, MCP, MCTS SharePoint, is a partner at Convergent Computing (www.cco.com) and manages the SharePoint practice for the organization. He has worked with SharePoint technologies for more than a decade and has worked with hundreds of clients architecting, implementing, configuring, and supporting SharePoint solutions that meet their unique business requirements. Colin has authored several best-selling books on SharePoint products for the Sams Publishing Unleashed series, including *SharePoint 2003*, *2007*, *2010*, and now *2013*. He presents regularly on SharePoint technologies, and frequently writes white papers and articles for a wide range of clients.

Dedications

I dedicate this book to my daughter Julia: my angel, my inspiration, and my greatest source of pride. Papa loves you very much.

—Michael Noel

My work is dedicated to my wonderful wife Nancy, and our bundle of joy: Logan Christopher Jonathan Spence.

—Colin Spence

Acknowledgments

Michael Noel: It's almost become cliché for me to swear off writing these books and, at the exhaustive end of each one of them, harbor fantasies of disappearing into the woods to live in a cave in the companion of various woodland creatures. But inevitably time passes, a new version of SharePoint is released, and I get the crazy idea to torture myself once again with the bleary late-night lab work, marathon writing sessions, and subsequent tearing of hair and wringing of hands. So once again here I stand at the end of this process, bloodied and bruised, glancing furtively back at the carnage behind me and reflecting on the madness of it all. In this moment of clarity, I can see clearly that I could never have made it to this point without the help of the phenomenal team I have helping me along the way.

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Colin Spence: My father wrote a book called *The Memory Palace of Matteo Ricci* that I read a long time ago. It is a historical account of a Jesuit priest who visited China in the 16th century and taught young students tricks to increase their memory skills. This process involved the creating of virtual rooms in a mental construct (a “memory palace”) as a means of remembering and organizing large amounts of information. The concept has stuck with me over the years and I find is applicable to the process of writing something as complex as a 1,000-page technology book. Each chapter is a room of sorts that contains information on a focused topic, and these rooms need to form a structure which needs to be “stable” and complete for the book to have integrity. I’ll end the metaphor there (since I tend to stretch metaphors too far), but looking back over the writing process over the last decade, I can definitely see the evolution of the book into an entity that will hopefully meet the expectations of its readers.

I have found that once the structure of the SharePoint Unleashed book was fully vetted, which to me took place in the last edition on SharePoint 2010, the project became a lot less daunting. It was, however, still a massive, yearlong undertaking, even with the structure in place and the “veteran’s” perspective of having worked with the material previously. The challenge became one of ensuring value in every chapter, focusing on what “really matters” to a very diverse audience.

Fortunately, I’ve worked with hundreds of companies interested in SharePoint products over the years, and have seen many different sizes and shapes of SharePoint environments. Increasingly, I’ve been involved in more projects that use SharePoint as a development platform for workflows, forms, full blown applications, business intelligence, and many other purposes. These continuing experiences from my “day job” have assisted

immensely in the tuning of the content contained in this Unleashed book. A key learning point for me has been the importance of “right-sizing” the SharePoint solution to an organization’s unique needs and internal resources. It doesn’t help a company by selling them on the most complex features in SharePoint that are clearly beyond their ability to develop, let alone support.

It also helps that I’ve had a lot of assistance in the process of writing this fifth book in the series. At the beginning of the timeline, I have to thank Rand Morimoto, who got me involved in the writing process all those years ago, and understands the impact on my “day job” as one of his partners and practice leads. Tremendous thanks to Michael Noel, who has gone through this process with me numerous times now and who understands the functionality and integration points of SharePoint at a level that I never will.

Neil Rowe at Sams Publishing continues to make the process a breeze logistically as we moved through the process of creating an Unleashed tome yet again. Many thanks also to the team at Sams Publishing/Pearson Education who assisted with the editing, formatting, and fine-tuning of the content.

In addition, I’d like to thank my loving wife Nancy and our toddler Logan for their support. Because all this work needed to be done after hours from my home office (“the cave”), my wife needed the patience of a saint to deal with my permanent status of unavailability for normal activities (such as walking the dog and eating dinner), and assorted mood swings, rants, and diatribes. Often, I think, the writing process is tougher for her than me, so I thank her from the bottom of my heart! I could tell that Logan understood as well, when I patted him on the head and slunk off to the cave.

There are also several contributing writers who assisted with a number of the chapters in my half of the book. These include: Ulysses Ludwig, Ben Nadler, Anthony Adona, Alex Kirchmann, Ken Lo, and Mona Zhao. Their individual experiences, skill sets, and insights on what was most important in different topic areas were invaluable:

Ulysses Ludwig and Ben Nadler enabled me to confidently expand the scope of the book to cover the topics of application development and business intelligence in more detail. I consider Ulysses to be my right-hand man in the day-to-day delivery of services to clients and can confidently say he is the most accomplished SharePoint developer and expert I know. Ben’s expertise with PerformancePoint and Business Connectivity Services was once again very welcome. Jonathan Chen played double duty as both technical editor and contributing writer as we wrapped up the book, for which I am grateful.

Anthony Adona assisted with ensuring the Using Libraries and Lists in SharePoint 2013 chapter truly met the needs of end users and administrators alike, while Alex Kirchmann provided his experience with metadata and content types. Ken Lo and Mona Zhao assisted with some of the finer points of Office applications’ integration with SharePoint and SkyDrive Pro. I can’t list all the other friends, clients, and sources of knowledge that assisted in this final product, but my thanks go out to you as well!

We Want to Hear from You!

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

You can email or write me directly to let me know what you did or didn't like about this book—as well as what we can do to make our books stronger.

Please note that I cannot help you with technical problems related to the topic of this book, and that due to the high volume of mail I receive, I might not be able to reply to every message.

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

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Reader Services

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

Introduction

When we sat down to write the original *SharePoint 2003 Unleashed* book more than a decade ago, we had a hunch that the technology would be popular, but did not anticipate how quickly the product would take off and how much interest the IT industry would end up taking in SharePoint products and technologies. In the interim years, as we worked with implementing the product in companies of all sizes, we learned what the product did well and what it didn't do so well, and further refined our knowledge of SharePoint best practice design, deployment, and administration.

Our exposure to the latest version of SharePoint started well before its release when SharePoint v15 was still being developed. We developed experience through our company, Convergent Computing (CCO), deploying it for early adopters through our close relationship with Microsoft as a Gold Partner. In addition, we collaborated with and provided input to the SharePoint development team and the broader SharePoint community through Microsoft's Most Valuable Professional (MVP) program. The richness of features and the capabilities of what became the SharePoint 2013 version became evident to us during this time, and we used our hands-on experience with the early stages of the product to begin designing this book, which provides a comprehensive look at SharePoint 2013 functionality, administration, and infrastructure.

A major challenge of this book was trying to identify and cover the most important tools, topics, practices, and skills that the range of our readers will find valuable in their interactions with SharePoint 2013. To do this, we drew upon our experiences over the last decade with hundreds of different organizations and distilled out the most common requirements in the areas of design, architecture, integration, and customization.

We endeavored to provide value to readers who may never have used SharePoint products before and those who are well versed with the products and may currently be using SharePoint. You might be an IT manager, IT architect, SharePoint administrator, SharePoint power user, developer, and, of course, a SharePoint end user. Therefore, we carefully crafted the book to cover what we felt would add the most value to our audience. A key piece of this strategy is to expand beyond the out-of-the-box features of SharePoint 2013 and share our experience on some of the most common integration points of SharePoint 2013, such as SQL Server 2012; Exchange Server 2010 or 2013; Edge Security products; and tools such as SharePoint Designer, Visual Studio, and PerformancePoint. Since SharePoint is such a powerful development platform, we made sure to include content that educates readers on a number of development processes and

best practices. In this way, the book becomes more than a treatise on what SharePoint 2013 can do in a vacuum, but what it can do in a complex technology ecosystem.

This book is the result of our experience and the experiences of our colleagues at CCO and our clients in working with SharePoint 2013 products and technologies, both in the beta stages and in production deployments. We wrote this book to be topical so that you can quickly browse to a particular section and follow easy-to-understand, step-by-step scenarios. These exercises, instead of just giving simple examples of a feature, are designed to give examples of real-world applications of the technologies and tools that provide you with business value. In addition, if you need a comprehensive overview on SharePoint 2013, the book can be read in sequence to give you a solid understanding of the higher levels of security and functionality SharePoint can provide. Topics in the book are divided into six sections, each with topics in similar categories.

How This Book Is Organized

This book is organized into the following sections:

- ▶ Part I, “Planning for and Deploying SharePoint Server 2013,” provides an introduction to the products in the SharePoint 2013 stack and includes prescriptive advice for how to architect and implement them. In addition, it covers upgrade advice from legacy versions of SharePoint and also details advanced installation scenarios with SharePoint 2013.
- ▶ Part II, “Administering and Maintaining SharePoint Server 2013,” focuses on the day-to-day administration and monitoring required for a SharePoint back-end environment. It details how to use new tools, including Windows PowerShell for SharePoint 2013 Administration, and covers backup and restore. It also focuses in particular detail on how to administer and maintain the SQL databases used by SharePoint.
- ▶ Part III, “Securing, Protecting, and Optimizing SharePoint Architecture,” covers security concepts in detail that focus on edge, transport, and content security. Topics such as SQL Transparent Data Encryption, Secure Sockets Layer (SSL) Certificates, Internet Protocol Security (IPsec) encryption, Active Directory Rights Management Services, Edge Security, and more are detailed. In addition, this part includes information on how to virtualize a SharePoint 2013 farm using server virtualization technology.
- ▶ Part IV, “Using SharePoint 2013 Technologies for Collaboration and Document Management,” starts with a comparison of SharePoint Foundation and SharePoint Server 2013, then moves to the tools and capabilities provided by libraries and lists, customization of libraries and lists, and then to managing the sites and pages that house these components. One chapter is dedicated to metadata and content types; another chapter focuses on the greatly improved social networking tools; and another covers the process of SharePoint 2013 governance.

- ▶ Part V, “Leveraging Office Applications with SharePoint,” focuses on key features in Office 2013 applications that power users and administrators should be familiar with, including protecting documents, document versions, and coauthoring. The SkyDrive Pro product line is demystified, and Outlook connectivity is reviewed. Next, topics including Excel Services, Access Services, Visio Graphics Services, the new and improved Office Web Apps 2013 product, and out-of-the-box as well as SharePoint Designer 2013 workflows are covered.
- ▶ Part VI, “Extending the SharePoint Environment,” dedicates one chapter to the topic of application development with SharePoint Designer 2013 and Visual Studio 2013, one chapter to PerformancePoint Services, and one chapter to Business Connectivity Services. This part is written with power users and developers in mind, and contains more complex exercises and examples that will be of great value to these readers.

If you, like many out there, were recently tasked with administering a SharePoint environment, or are looking for ways to bring document management and collaboration to the next level and need to understand how SharePoint 2013 can fit into your IT ecosystem, this book is for you. We hope you enjoy reading it as much as we’ve enjoyed creating it and working with the product.

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CHAPTER 2

Architecting a SharePoint 2013 Deployment

Many organizations have made the decision to use SharePoint for one or more reasons but are not sure how to start deploying the infrastructure needed by the platform. There are many misconceptions about SharePoint, and further confusing the issue is that the architecture and terminology of SharePoint 2013 has changed over the years.

Many SharePoint 2013 products and technologies are extremely powerful and scalable, but it is critical to properly match the needs of the organizations to a design plan. Matching these needs with a properly planned and implemented SharePoint farm is highly recommended and will go far toward ensuring that deployment of SharePoint is a success.

This chapter covers SharePoint 2013 design and architecture. The structural components of SharePoint are explained and compared. Server roles, database design decisions, and application server placement are discussed. This chapter focuses specifically on physical SharePoint infrastructure and design. Logical design of SharePoint user components, such as site layout and structure, are covered in the chapters in Part IV, “Using SharePoint 2013 Technologies for Collaboration and Document Management.”

IN THIS CHAPTER

- ▶ Understanding the SharePoint Server Roles
- ▶ Understanding the Reasons for Deploying Multiple Farms
- ▶ Choosing the Right Hardware for SharePoint
- ▶ Determining Optimal Operating System Configuration
- ▶ Planning for Database and Additional Software
- ▶ Examining Real-World SharePoint 2013 Deployments
- ▶ Addressing Common Business Issues with SharePoint Features
- ▶ Deploying a Team Collaboration Solution with SharePoint
- ▶ Deploying a Corporate Intranet Solution with SharePoint
- ▶ Deploying a Customer Extranet Solution with SharePoint

Understanding the SharePoint Server Roles

What an end user of a SharePoint environment sees on a SharePoint page is the result of a complex interaction that occurs on one or more servers performing varying tasks. Information is stored in complex databases, web rendering is displayed courtesy of the web role, and searches and processes are driven by the Search service application role on servers.

Depending on the size of the environment, these roles may be on one or many servers. In very small environments, all roles may exist on a single server, whereas in very large-scale farms, the roles may be spread across tens or even hundreds of servers. These server roles are the base architectural elements in a SharePoint farm, or collection, of servers that provide for SharePoint services in an environment. It is subsequently critical to understand what these server roles are and how they are used in a SharePoint farm.

NOTE

There may be more than one SharePoint farm per organization. Best practices stipulate that there should be at least one farm used for testing in any environment. Chapter 4, “Advanced SharePoint 2013 Installation and Scalability,” deals with scenarios in which more than one farm is deployed.

Understanding the Three Tiers of SharePoint Architecture

One of the most important points to understand about SharePoint architecture is that it is fundamentally a three-tiered application, as illustrated in Figure 2.1. The Web tier is composed of a server or servers running Windows Server’s Internet Information Services (IIS) that respond directly to end user requests for information and deliver the content to the user.

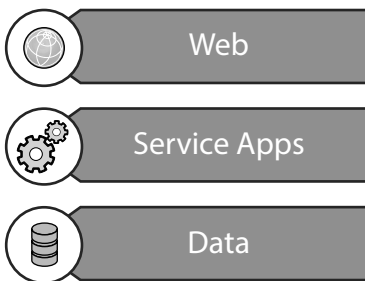


FIGURE 2.1 Understanding the three tiers of SharePoint architecture.

The second tier of SharePoint architecture is the Service Application tier, which includes a list of what Microsoft calls service applications that run various services that are shared between farm members. This includes obvious services such as Search, but also includes an entire list of additional service applications such as the Managed Metadata Service, the

User Profile Synchronization Service, and others. More information on this tier is provided in later sections of this chapter.

The third tier of SharePoint is the Database tier, a critical tier that runs on Microsoft's SQL Server and that stores all content within a SharePoint environment, as well as serving as a location for shared data for service applications. Each of these tiers has unique architectural and functional requirements, and it is subsequently critical to understand these three layers before beginning design of a SharePoint farm.

Understanding the Database Server Role

Nearly all SharePoint content is stored in databases, including all document library content, list items, document metadata, and web parts. There are only two exceptions to this. The first is if the database server uses a concept known as Remote BLOB Storage (RBS), which allows for the storage of the documents, or BLOBs (Binary Large Objects), in another storage medium such as a file server or an archive. This concept is discussed in detail in Chapter 9, "Managing and Maintaining SQL Server in a SharePoint Environment." The other exception to this rule is the full-text search index, which is stored in flat-file format. (See the following sections on the Search service application role.) In some rare cases, certain web part solutions may store flat files on web front ends as well, which is a good idea in any case, but in reality the vast majority of SharePoint content is stored on the database server role, making it highly critical both for high availability (HA) and for disaster recovery (DR).

The only supported database format for SharePoint is Microsoft SQL Server, and at least one SQL Server database role server must exist in a farm for SharePoint to function.

Supported versions of SQL Server for SharePoint 2013 are as follows:

- ▶ SQL Server 2008 R2 x64
- ▶ SQL Server 2012 x64

CAUTION

Although SQL Server Express is supported, it is not recommended for most modern SharePoint environments because it does not scale well. Any production SharePoint environment should consider using either the full Standard or Enterprise Editions of SQL Server.

There may be more than one database server role in a SharePoint farm, because a SharePoint administrator can define where a particular SharePoint database resides. In large environments, for example, there may be multiple SharePoint database role servers, each serving multiple databases as part of the farm. You can find more detailed information about the Database tier in SharePoint, including how to enable new features such as SQL Server 2012 AlwaysOn Availability Groups (AOAGs) for SharePoint farms, in Chapters 4 and 9.

Understanding the Web Server Role

The Web Server role is the most obvious of the SharePoint roles, as most people understand the concept of a server running an application that serves up web pages to users that request them. In SharePoint's case, that application is Windows Server's IIS application. A SharePoint farm member running the Web Server role is responsible for rendering SharePoint content, including web parts, page layout, and all other information displayed to the user.

A SharePoint Web Server role runs on either Windows Server 2008 R2 IIS 7.0 or, preferably, Windows Server 2012 IIS. In both cases, SharePoint 2013 requires specific roles to be installed in advance of installation, including the following components:

- ▶ Web server (IIS) role
- ▶ Application server role
- ▶ Windows .NET Framework version 4.5
- ▶ SQL Server 2008 R2 SP1 Native Client
- ▶ Microsoft WCF Data Services 5.0
- ▶ Microsoft Information Protection and Control Client (MSIPC)
- ▶ Microsoft Sync Framework Runtime v1.0 SP1 (x64)
- ▶ Windows Management Framework 3.0 (includes Windows PowerShell 3.0)
- ▶ Windows Identity Foundation (WIF) 1.0 and Microsoft Identity Extensions
- ▶ Windows Server AppFabric
- ▶ Cumulative Update Package 1 for Microsoft AppFabric 1.1 for Windows Server (KB 2671763)

Each of these components can be installed using the SharePoint 2013 media by clicking the Install Prerequisites link on the initial splash screen. This operation requires Internet connectivity. If Internet access is not available, each individual component needs to be manually installed.

TIP

Multiple web role servers may be set up in a SharePoint environment to scale out the number of users that can use the platform or to provide for HA access to the environment. In this case, load balancing of the connections made to a SharePoint environment allows for a larger number of users to access the content. Load balancing can be either hardware based or software based using Windows Network Load Balancing (NLB), fully supported for SharePoint web role servers.

Service Application Roles

The most significant architectural change that was introduced originally with SharePoint 2010 was the addition of service applications, which replaced the SharePoint 2007 concept of shared services providers (SSPs). Service applications, which are still a critical element in SharePoint 2013, are independent services that can be shared across web applications or, in some cases, across farms.

Table 2.1 lists the service applications available with SharePoint 2013 and which version of SharePoint 2013 software they are available in.

TABLE 2.1 SharePoint 2013 Service Applications

	SharePoint Foundation 2013	SharePoint Server 2013 Standard Edition	SharePoint Server 2013 Enterprise Edition	Can Be Consumed Cross-Farm
Machine Translation Service	X	X	X	X
Managed Metadata service application	X	X	X	X
Search service application	X (non-FAST, limited)	X	X	X
Business Data Connectivity Service	X	X	X	X (Caution cross-WAN)
Secure Store Service	X	X	X	X (Not cross-WAN)
User Profile service application	X	X	X	X (Not cross-WAN)
App Management Service	X	X	X	
Work Management service application	X	X	X	
State Service		X	X	
Web Analytics Service		X	X	
Word Automation Services		X	X	
PowerPoint Automation Services		X	X	
Access Services			X	
Excel Services Application			X	
PerformancePoint service application			X	
Visio Graphics Service			X	

In addition, because the service application framework is extensible, it is possible to install third-party applications that have their own service applications. Indeed, developers themselves can also design and deploy their own applications, a concept which is beyond the scope of this book.

Service applications can be resource intensive and are often deployed on their own dedicated servers to separate their impact from the web role servers. This allows for the service application tier to run within its own contained space, rather than sharing memory, processor, and disk input/output (I/O) with the web/database roles.

NOTE

Just because you've purchased access to a service application does not mean that you should turn it on. Every service application running on a server consumes a significant percentage of that server's resources, and turning on all the available service applications is a bad idea unless you've planned accordingly. Turn on only those service applications that need to run a service that satisfies a specific business need.

Search Service Application Role

One of the most commonly used service application roles in SharePoint 2013 is the Search service application role, because it is responsible for running the Enterprise Search functionality that enables you to search both within and outside of SharePoint.

The Search service application differs from the way it was in SharePoint 2010, and drastically differs from what was provided in SharePoint 2007. SharePoint 2013 retains the capability to have multiple redundant indexes, something that was not possible in SharePoint 2007. In addition, the major change made from SharePoint 2010 was the addition of FAST Search functionality directly in all SharePoint Search engines except for SharePoint Foundation Search. FAST Search, previously a separate licensed engine, allows for new features such as thumbnail views for search results, automatic metadata tagging, and other improvements.

Notice a few key things when architecting for the SharePoint Search service application role. First, the index corpus used to store the full-text copy of all documents crawled can grow large in size based on the amount of content being indexed. The size of the corpus is directly related to the size of the actual document data being crawled. Depending on what is being indexed, and how much actual text is included in that data, the index corpus can range from 5% to 30% of the size of content being indexed, so be sure to include a large enough index disk drive for your index server.

Note a few things about SharePoint search:

- Search in SharePoint is security-trimmed for supported content, excluding some external content sources. This means that end users get search results only from content that they have rights to access. This is a highly useful feature that prevents users from seeing content to which they don't have access.

- ▶ Although search is security-trimmed, the permissions are reevaluated only after performing a full crawl of content. Subsequently, if someone is removed from having permissions to a document, she can still see the text of that document as part of a search until a full, not an incremental, crawl has been performed.
- ▶ Because SharePoint 2013 allows for redundant search and indexing capability, any one server being down does not take down the entire environment, assuming the Search service application is running on more than one server.

For detailed information on configuring search in SharePoint 2013, see Chapter 8, “Leveraging and Optimizing Search in SharePoint 2013.”

Inbound Email Server Role and Team Mailboxes

For scenarios where SharePoint is configured to be email enabled, various SharePoint servers can be assigned to the inbound email server role. Servers with this role have the Simple Mail Transfer Protocol (SMTP) service installed directly on them and are configured to enable inbound emails to be sent directly into SharePoint document libraries and lists. This functionality is critical for an environment looking to use SharePoint for records management or enterprise content management.

TIP

Don't forget to load balance the SMTP service across multiple inbound email role servers in environments with HA requirements! If this is not done, inbound email functionality will not be redundant and will be down for users if an outage of the primary server occurs.

SharePoint 2013 also introduces team mailbox functionality for environments running both SharePoint 2013 and Exchange 2013. The team mailboxes concept takes collaboration with email mailboxes to the next level, allowing for communications to be archived within SharePoint sites that are represented by mailboxes that adhere to the security of the site itself. For more information on how to configure SharePoint for inbound email functionality and team mailbox functionality, see Chapter 16, “Configuring Email-Enabled Content, Site Mailboxes, and Exchange Server Integration.”

SharePoint Central Admin Server Role

The server or servers that hold the SharePoint Central Administration service, the main management application for SharePoint, is also considered a server role. In some large environments, this role may be separated onto dedicated servers to provide for Central Administration functionality without affecting existing server functionality.

TIP

It is best practice to make the Central Administration role highly available by installing it on multiple servers, usually on multiple servers that also run the web role. Not doing this runs the risk of a server outage causing a loss of access to the tools necessary to

troubleshoot the outage. Although PowerShell can still be used for administration in the event of an outage, it is still useful to have redundancy built in for this role, despite guidance on the Internet that may tell you to install this role on a single server.

Understanding the Reasons for Deploying Multiple Farms

A SharePoint farm is fundamentally a collection of SharePoint role servers that provide for the base infrastructure required to house SharePoint sites and provide for other services, such as Enterprise Search. The farm level is the highest level of SharePoint architecture, providing a distinct operational boundary for a SharePoint environment. Each farm in an environment is a self-encompassing unit made up of one or more servers, such as web role servers, service application role servers, and SharePoint database servers.

In many cases, a single SharePoint farm is not enough to provide for all the needs of an organization. Some deploy multiple SharePoint farms to provide for test environments, farms where development can occur, or farms for extranet users or Internet use. In addition, other farms may be created to provide for centralized services for other farms within the organization. You need to define how many farms are required for an organization when beginning the design process, because the number of farms created can directly reflect on the physical architecture of the servers in a SharePoint environment. Of course, the more farms required, the more hardware is needed, so a full understanding of what can be gained by deploying multiple farms is first required.

Deploying Test Farms

Any production SharePoint environment should have a test environment in which new SharePoint web parts, solutions, service packs, patches, and add-ons can be tested. This applies to all organizations, regardless of size. It is critical to deploy test farms, because many SharePoint add-ons could potentially disrupt or corrupt the formatting or structure of a production environment, and trying to test these new solutions on site collections or different web applications is not enough because the solutions often install directly on the SharePoint servers themselves. If there is an issue, the issue is reflected in the entire farm.

Because of these reasons, many organizations create a smaller SharePoint farm just for testing. The farm should be similar to the existing environments, with the same add-ons and solutions installed and should ideally include restores of production site collections to make it as similar as possible to the existing production environment. All changes and new products or solutions installed into an environment should subsequently be tested first in this environment.

NOTE

The SharePoint server or servers used for a test farm or even a production farm do not necessarily need to be installed on physical hardware; many scenarios with SharePoint servers installed on virtual server infrastructure are possible. See Chapter 12, “Virtualizing SharePoint Components,” for more information on this topic.

Deploying Development Farms

Developers in an organization that makes heavy use of SharePoint often need environments to test new applications, web parts, solutions, and other SharePoint customization. These developers often need a sandbox area where these solutions can be tested, and potentially one with different characteristics from production. These environments are also usually quickly provisioned and deprovisioned, so test environments are not the best location for them.

For these organizations, it might make sense to deploy one or more development farms so that developers have the opportunity to run their tests and develop software for SharePoint independent of the existing production environment. When developed, these applications can first be tested in the test farm and then finally deployed into production. For information on automating the creating of test farms using virtual host management software, see Chapter 12.

Deploying Extranet or Intranet Farms

Another reason to deploy multiple farms is for security. For security reasons, it is not generally recommended to have an internal SharePoint document management or intranet environment directly accessible from the Internet unless it is secured by an advanced reverse proxy platform such as Microsoft's Forefront Unified Access Gateway (UAG).

Even for environments properly secured for inbound access, there may be scenarios in which SharePoint content needs to be made accessible by external users, such as in anonymous Internet portal scenarios or for extranet partner scenarios. Because a SharePoint farm requires high connectivity between farms members, it subsequently becomes necessary in these cases to deploy dedicated SharePoint environments in the demilitarized zone (DMZ) of a firewall or in another isolated network. For an in-depth look at SharePoint extranets, including step-by-step guidance for how to set them up using claims-based authentication using various authentication providers, see Chapter 13, "Deploying SharePoint for Extranets and Alternate Authentication Scenarios."

NOTE

SharePoint content deployment can be used to push site content from one farm to another (for example, when content from an internal farm is pushed to an external extranet farm on a regular basis). The extranet farm remains secure and cannot access content on the internal farm, but users can still access required content that has selectively been chosen for publishing.

Deploying Global or Distributed Multifarm Environments

For environments with multiple geographic locations, it might make sense to deploy multiple farms in different geographic locations. This enables SharePoint content to be consumed locally and is what is recommended in scenarios in which WAN links are not as robust. Consider several key points before deciding where to deploy geographic farms:

- ▶ A single SharePoint farm should not span a WAN link and should ideally be limited to one geographic location. In some organizations, in which the definition of WAN includes at least 1Gb of bandwidth with less than 10ms of latency between offices located relatively close to one another, it may be possible to stretch a farm across locations, but this is the only scenario in which this would be supported. If you need to consume content locally, it must be part of a separate farm.
- ▶ There is no native way to do two-way replication of content between farms with SharePoint 2013. However, several third-party companies on the market enable this type of functionality, which can be advantageous in disaster recovery scenarios in which content is replicated to multiple farms.
- ▶ For many organizations, it might make more sense to deploy a single, centralized SharePoint farm in one location rather than to deploy siloed SharePoint farms in multiple locations. Clients access SharePoint using the latency tolerant Hypertext Transport Protocol (HTTP)/HTTPS protocols, so access to a centralized infrastructure might make sense. In addition, SharePoint 2013 has new minimal download features that allow a page to render much more quickly across slower WAN links. This means that centralizing SharePoint becomes much easier, and it also has the advantages of providing a single URL to access SharePoint and keeps data in one location. Organizations need to decide if the level of service accessing SharePoint across a WAN is sufficient for this to be a possibility.

Planning for Multiple Farms

Consider several key points when designing a SharePoint environment to include multiple farms:

- ▶ All SharePoint server roles, with the exception of the database role, can only be members of a single farm. You cannot have a SharePoint server reside in more than one farm at a time.
- ▶ A single database server can contain databases from multiple farms, dependent on the available capacity of the SQL instance.
- ▶ If deploying multiple farms on a single SQL server, be sure to use a common naming convention for each farm database so they can be logically organized on the SQL server. For example, naming all databases with the prefix SP_Farm1, SP_Farm2, and so on can help identify which databases belong to which farm.
- ▶ All farm members must have near-full network connectivity (1Gb+ bandwidth, <10ms latency) to all other farm members, with a large number of open ports with nearly all of them open. This effectively limits scenarios in which firewalls separate farm members, unless the proper ports are open between hosts.
- ▶ Although not required to have a test environment exactly match production in terms of the number of servers or the type of server roles, it is critical that the web role servers in each environment match each other so that more effective testing can take place.

Choosing the Right Hardware for SharePoint

When farm architecture has been outlined, it is critical to properly size the hardware environment that makes up your SharePoint farm. As illustrated in Table 2.2, the hardware requirements for SharePoint 2013 servers are much higher than earlier versions required.

TABLE 2.2 Hardware Requirements for the Various Server Roles of SharePoint 2013

Type	Memory	Processor
Dev/stage/test server	8GB RAM	4 CPU
All-in-one Database/Web/Service Application	24GB RAM	4 CPU
Web/SA server	12GB RAM	4 CPU
DB server (medium environments)	16GB RAM	8 CPU
DB server (small environments)	8GB RAM	4 CPU

In addition, each SharePoint server role has different hardware requirements, so it is important to first understand those requirements before beginning the procurement process.

Hardware Requirements for the SQL Database Role Servers

The heaviest hitter of all the SharePoint roles is the SQL database server role. This server role houses the SharePoint databases, where nearly all content in a SharePoint environment is stored. The databases house document libraries, documents, lists, sites, site collections, and their contents. For obvious reasons, this server role is highly critical for SharePoint and requires a significant amount of hardware resources. Following are several key hardware requirements for the SQL database role:

- ▶ **Disk space:** Because SharePoint content is stored in the databases, the SQL database role server requires a large amount of disk space. How much disk space depends on how much content is stored in SharePoint, but assume the worst: When document versioning is turned on, SharePoint can consume much more space than people realize, even with new features in SharePoint 2013 such as Shredded Storage.
- ▶ **Disk performance:** The amount of disk I/O power required can be fairly substantial. Microsoft requires at least 0.25 input/output operations per second (IOPS) per gigabyte (GB) of storage, and recommends around 2.0 IOPS per GB for optimal performance.
- ▶ **Processor:** The SQL database role works best when multiple processor cores are allocated to the database role. SQL Server is built to be multithreaded and can use whatever you give it. Today's multicore processors and virtualization platforms that provide for up to eight cores to be allocated (such as Hyper-V 2012) are the perfect fit for SharePoint.

- **Memory:** Server memory requirements are also high for the database role. The same general rule of thumb applies: The more memory allocated, the better an SQL server performs. The total amount of memory recommended varies depending on how heavily utilized the server is, but it is common to have SQL servers with 24GB, 32GB, 64GB, or more.

Hardware Requirements for Service Application Roles

The service application roles, depending on how many run on an individual server, can have serious hardware requirements. The Search service application role, for example, which is responsible for creating a full-text searchable index for search, is the heaviest hitting of the SharePoint roles, excluding, of course, the database role. Search service application servers usually consume more memory and processor capacity because they are constantly engaged in the process of crawling content and making it searchable. Depending on the number of content sources crawled, there can be significant memory requirements, and index servers have been known to use at least 12GB, 16GB, or 24GB of memory and take advantage of multiple processor cores as well.

Other service application role servers may require an equal amount of memory and processor cores allocated as well. It's a general rule of thumb that SharePoint 2013 memory and processor requirements are much higher than for SharePoint 2007 and SharePoint 2010, and many people underestimate the required resources.

In addition to its processor and memory requirements, the Search service application role requires enough drive space to physically store the index files, which are essentially copies of all text that has been crawled across all data sources. The size of this index can range from 5% to 20% of the total size of the searchable content being crawled. For example, if SharePoint is configured to search a file share, and that file share contains 1TB of office documents, the index size may total between 50GB and 200GB, depending on how much actual text is stored in the documents. Large graphical documents with little text do not bloat the index by much, but simple text files can consume a much larger percentage.

NOTE

Remember to calculate your index size based on the total size of all crawled content. Because SharePoint is an Enterprise Search application, the total size of all content may include not only documents in SharePoint, but also file servers and external websites that are crawled.

Hardware Requirements for Web Role Servers

The web role server is the most utilitarian role, requiring a reasonable amount of memory and processor power, but nothing excessive. Indeed, better performance can often be gained by adding additional web role servers to a farm rather than by increasing the size of memory and processor power added to a system. Web role servers usually have between 12GB and 16GB RAM in most cases, and at least two cores allocated to it.

Determining Optimal Operating System Configuration

The core of a functioning SharePoint environment is the operating system that SharePoint runs on. All servers in a SharePoint farm require the Windows Server operating system. The following versions of Windows Server are supported:

- ▶ Windows Server 2008 R2, Standard, Enterprise, or Datacenter, x64 with Service Pack 1
- ▶ Windows Server 2012, Standard or Datacenter, x64

2

Windows Server 2012 Operating System for SharePoint

The most optimal, secure, and performance-tuned operating system for SharePoint is Windows Server 2012, which has built-in security enhancements to Kerberos and also handles client/server communications traffic better than earlier versions of Windows, making it ideal to host SharePoint servers. For any new SharePoint farm deployments, you should highly consider the use of Windows Server 2012 for these reasons where possible. An alternative to Windows Server 2012 is Windows Server 2008 R2 w/SP1.

Planning for Database and Additional Software

In addition to the operating system, a SharePoint farm requires software for the database, and preferably other add-ons such as backup and antivirus software. Although these are the most common software add-ons, there can be multiple third-party and other add-ons installed into SharePoint, depending on the needs and scale of the deployment. Consult with third-party vendors to determine any potential needs for your farm.

Database Software

The only supported database for SharePoint is Microsoft SQL Server. SharePoint databases must be installed on 64-bit SQL servers, and they can be successfully installed on the following types of SQL servers:

- ▶ SQL Server 2008 R2 x64 with SP1, Standard or Enterprise
- ▶ SQL Server 2012 x64, Standard or Enterprise

It is highly recommended to consider SQL Server 2012 for the SharePoint database role because it provides for the most robust, capable, and secure platform for SharePoint. In addition, it includes features that are useful for SharePoint, such as AOAGs, PowerPivot, and Transparent Data Encryption (TDE), which enables the SharePoint databases to be stored in encrypted format. You can find information about these features in Chapter 9.

With so many new features to discuss and so little space, this section focuses on a number of different components that, together, make up the entire new SQL Server product. This discussion introduces SQL's many components and purpose. The components consist of the following:

- ▶ **Database engine:** The database engine component is the heart of SQL Server. It is responsible for storing data, databases, stored procedures, security, and many more functions, such as full-text search, replication, and HA.
- ▶ **Analysis services:** Analysis services delivers online analytical processing (OLAP) and data mining functionality for business intelligence applications. Analysis services allows organizations to aggregate data from multiple heterogeneous environments, and transform this data into meaningful information that can then be analyzed and leveraged to gain a competitive advantage in the industry.
- ▶ **Integration services:** Provides businesses the opportunity to integrate and transform data. Businesses can extract data from different locations, transform data that may include merging data together, and move data to different locations, such as relational databases, data warehouses, and data marts. Integration services is the official SQL server extract, transform, and load (ETL) tool.
- ▶ **Reporting services:** Includes tools such as Report Manager and Report Server. This component is built on standard IIS and .NET technology and enables businesses to design report solutions, extract report data from different areas, customize reports in different formats, manage security, and distribute reports.
- ▶ **Notification services:** Consists of a notification engine and client components meant for developing and deploying applications that generate and send notifications to subscribers. Notifications are generated when they are either prompted by an event or triggered by a predefined or fixed schedule. Notifications can be sent to email addresses or mobile devices.

Backup Software

Although SharePoint 2013 products include built-in backup capability, the tools used are not enterprise level and do not have built-in scheduling, item-level restore, or robust alerting capabilities. It is subsequently recommended to purchase and install enterprise backup software. This may include software from a number of third-party vendors, or it may include a solution from Microsoft such as System Center Data Protection Manager (DPM) 2012. Backup and restore is discussed in more detail in Chapter 10, “Backing Up and Restoring a SharePoint Environment.”

Antivirus Software

SharePoint 2013 includes an antivirus application programming interface (API) that enables all documents to be scanned for viruses by a compliant antivirus engine. It is highly recommended to include SharePoint-specific antivirus as part of a SharePoint deployment, because client-specific antivirus cannot disinfect documents in SharePoint, and alternatively, viruses could be uploaded into SharePoint if the client antivirus is missing or out of date.

There are multiple third-party antivirus vendors in the SharePoint space. For more information on antivirus products for SharePoint, see Chapter 14, “Protecting SharePoint with Advanced Edge Security Solutions.”

Index iFilters

The most common add-on for SharePoint search are iFilters. Index iFilters provide specific knowledge for the SharePoint indexer on how to break open specific file types and index the text content within them. The most common iFilter in earlier versions of SharePoint was the PDF iFilter, which is fortunately included in the FAST Search engine that is used in SharePoint search in SharePoint 2013. Other iFilters may be needed, however, so it is subsequently important to determine which file types will be stored in SharePoint and to determine whether iFilters are available for those file types so that the files can be properly indexed.

Examining Real-World SharePoint 2013 Deployments

Conceptually speaking about a SharePoint environment is not the same as actually viewing some real-design scenarios with the product. Therefore, the last section of this chapter focuses on viewing some sample real-world deployment scenarios that are supported and give insight into the architecture and design concepts surrounding SharePoint 2013.

Deploying Single-Server SharePoint

The most straightforward deployment of SharePoint 2013 is one that involves a single all-in-one server that runs the database components and the web and all service application roles. This type of server deployment, shown in Figure 2.2, has the distinct advantage of being simple to deploy and administer.



FIGURE 2.2 Viewing a sample single-server SharePoint farm.

In this type of deployment, the server takes on all the roles of the environment, including the following:

- ▶ SharePoint Central Administration tool
- ▶ Content databases and other SharePoint databases

- ▶ All site collections and sites
- ▶ All service application roles

This environment works well for those environments with a small number of users. Its biggest disadvantage is that there is a great deal of contention between the database role and the SharePoint roles, which can cause performance constraints.

Deploying Small SharePoint Farms

For those organizations with a greater number of users or whose users are more active and require a separate server, the next step up in SharePoint design is a small farm model, as shown in Figure 2.3.



FIGURE 2.3 Viewing a sample small SharePoint farm.

In this type of deployment, two servers are set up. The first holds all the databases and is essentially a dedicated SQL server box for SharePoint. The second server runs the SharePoint roles. By separating the database role from the SharePoint roles, significant performance increases can be obtained.

Deploying Mid-Sized SharePoint Farms

As an organization's document management and collaboration needs to grow, the SharePoint farm needs to grow with it. Figure 2.4 illustrates a mid-sized SharePoint farm with four total servers, which is the minimal number of servers that can be deployed to provide for full HA of all SharePoint components.

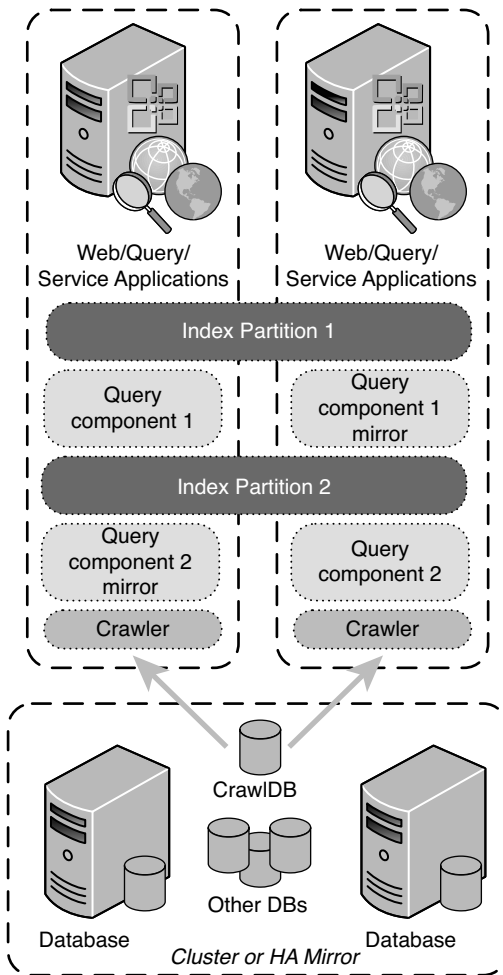


FIGURE 2.4 A four-server mid-sized SharePoint farm.

For best performance and scalability, however, many organizations may choose instead to separate the web and service application tiers of SharePoint and deploy a mid-sized six-server environment, such as what is shown in Figure 2.5.

In this configuration, the web role is now separate from the service application roles, which increases performance. In addition, NLB is used between the web role servers to provide for availability, and the SQL servers are clustered using either AlwaysOn Failover Cluster Instances (FCIs) or AOAGs to provide for HA and DR of the database tier. This type of environment can easily scale into the tens of thousands of users.

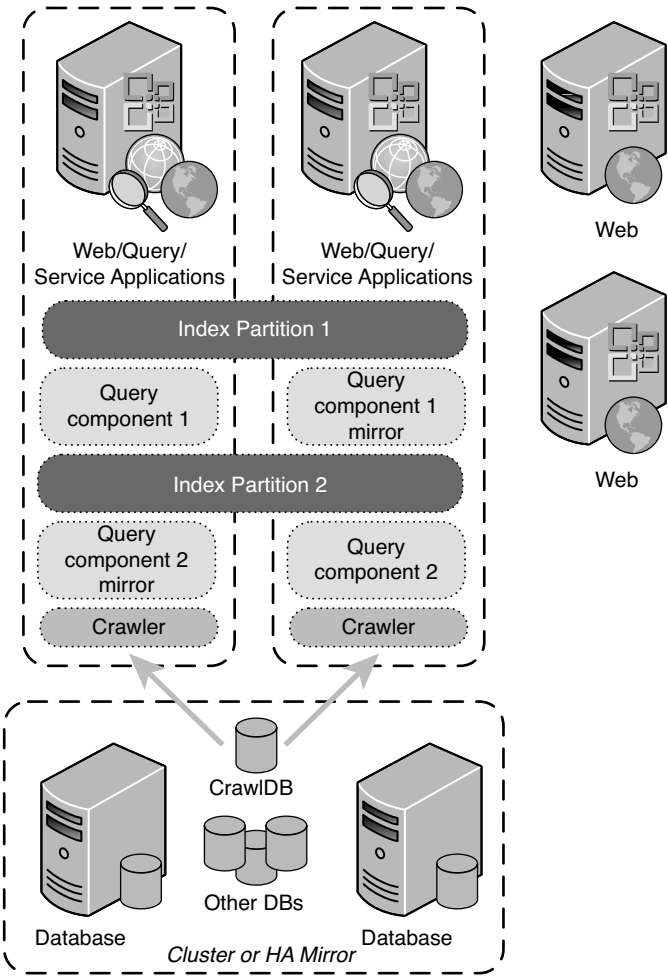


FIGURE 2.5 A six-server mid-sized SharePoint farm.

Taking a look at one final mid-sized design (see Figure 2.6), some organizations may instead choose to separate those six servers into two separate farms, one for the service applications and the other for the content. This has the advantage of keeping the two farms completely independent of each other for patching and maintenance, and the content farm (or farms) can consume services provided on the services farm, such as Search and the Managed Metadata Service.

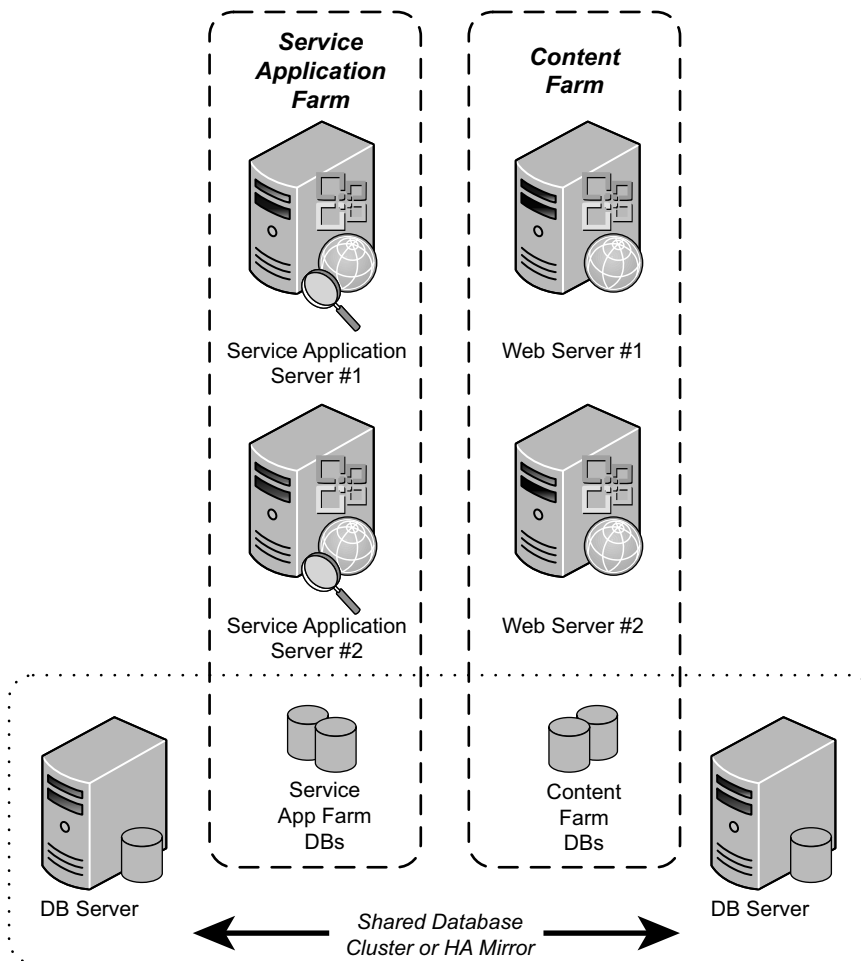


FIGURE 2.6 A six-server mid-sized SharePoint multifarm environment.

Deploying Large SharePoint Farms

SharePoint operates under design principles that are massively scalable if needed. Using redundancy and load-balancing techniques such as the SQL AlwaysOn and NLB, you can obtain more performance from an environment simply through the addition of other servers to provide redundancy and load balancing to specific roles. For example, in a large farm, such as the one shown in Figure 2.7, multiple servers in cluster and NLB configurations enable the environment to be scaled into a large numbers of users. In addition, multiple Search service servers and striped index partitions enable the Search

infrastructure to scale into the tens of millions of documents indexed. New features such as SharePoint 2013 Resource Management (RM) automatically allow for content to be intelligently distributed between web servers. RM is a concept discussed in more detail in Chapter 4.

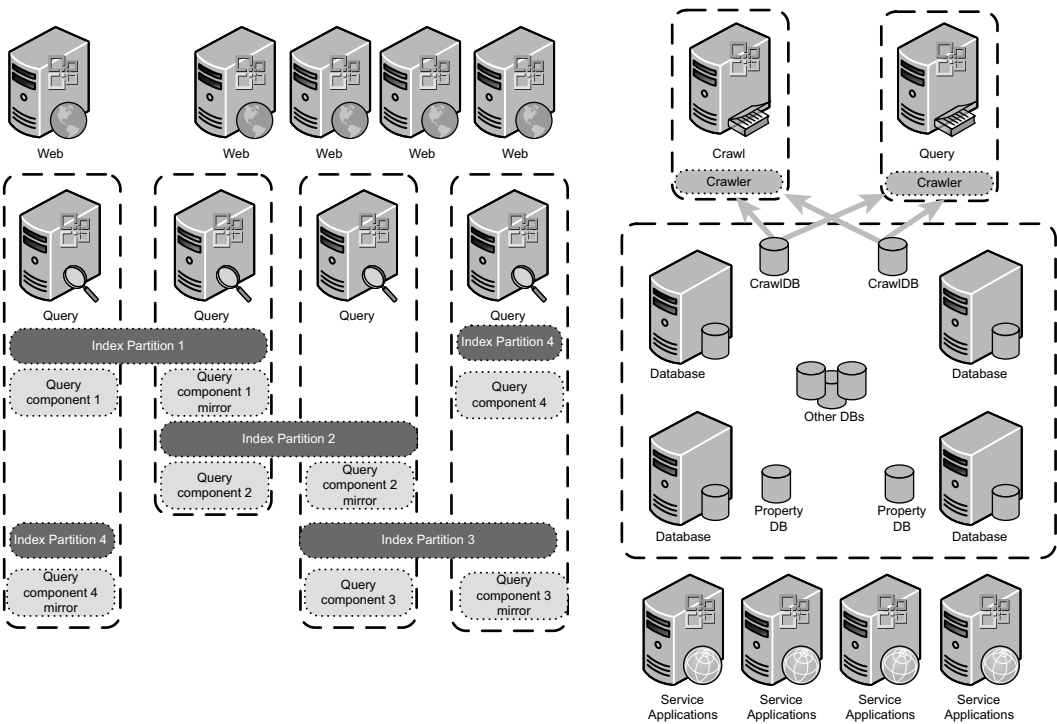


FIGURE 2.7 Deploying a large multiple-farm SharePoint environment.

Addressing Common Business Issues with SharePoint Features

SharePoint 2013 was designed to address business needs and issues that commonly arise in organizations. This section pulls together the information about SharePoint features described in other chapters of this book to summarize some of the common business issues and how features of SharePoint can address those issues. Scenarios that represent these issues are described, along with the specific SharePoint technologies that can address the issues.

Addressing the Redundant Re-Creation of Documents with SharePoint

In many organizations, users duplicate efforts or reinvent the wheel creating documents or gathering information previously used by someone else in the organization either because

they didn't know the information existed or couldn't find it. This results in an inefficient use of time.

SharePoint solution: Full-text indexing and search of SharePoint document libraries, workspaces, metadata information, and lists.

SharePoint Search service application indexing of SharePoint 2013 sites enables indexing and searching site content so that users can quickly find the documents or information they need.

Addressing the Inability to Efficiently Search Across Different Types of Content

Users need information, and often the only way they can get it is to perform multiple different types of searches on multiple content sources and then manually consolidate the results. This results in the possibility of content not being searched (either because it is overlooked or just takes too much time) and an inefficient use of time.

SharePoint solution: SharePoint 2013 content sources that can be indexed and searched.

Adding frequently used sources of information as content sources in a SharePoint 2013 environment provides a means for users to perform one search request and have the results from many different content sources displayed together. For example, a single SharePoint search request could span other SharePoint sites, websites external to the organization, file shares, and Microsoft Exchange public folders. This enables users to easily search across many sources to find the information they need.

Addressing Inefficient Means of Document Collaboration with SharePoint Document Libraries

A team of people need to collaborate on a project and produce a set of documents to be sent to a client. User A works on the first document and saves it as Doc1. User A emails User B to let User B know the document is available for review. User B makes changes and additions and saves the document as Doc1 R1. User B creates an email with a list of ideas about additional changes that could be made and emails User A and User C. User C replies to User A and User B about User B's email about proposed changes, makes her own changes, saves it as Doc1 R2, and emails Users A and B to let them know changes have been made. User A also replies about the proposed changes, makes "final" changes to the document, saves it as Doc1 Final, and emails the document to the client. Two days later, the client emails back with the list of changes the client wants to see in the document. User A edits the document again and saves it as Doc1 Final R1. The process continues until there are suddenly 10 versions of the document and 16 emails floating around about what should be in the document. At this point, the team isn't sure what changes have been made; the folder where the document is stored is cluttered with various versions of the document (and taking up a lot of space), and nobody knows which versions were sent to the client.

SharePoint solution: SharePoint team site with a shared document library, document-versioning enabled, and document discussions.

Instead of having multiple versions of multiple documents floating around with different names, a team site for the project with a shared document library could be used. Each client document would be stored in the library, and by using versions and entering version comments, the team would know who made changes, be provided with a brief overview of what or why changes were made, and know which one was sent to the client. By using document discussions in place of emails to have an online discussion of the document, all comments are stored in one place, with the document right there for easy access as opposed to sifting through multiple emails.

Addressing the Excessive Use of Email Attachments/Ability to Know When Documents Have Been Modified

A user emails an attachment to a group, revises the attachment, and then emails it to the group again, and so on. This results in excess email traffic, excess storage, and the potential that recipients won't see the current version of the attachment if it is modified after the email is sent.

SharePoint solution: Document workspaces/libraries and alerts.

Use document workspaces and libraries storing documents in a centralized document library, accessible by all team members. Alerts set up by team members notify them when the document changes. Team members know where the most current version of the document is located and are notified automatically when the document changes.

Addressing Difficulty Organizing or Classifying Content

In a traditional file system environment, a user creates a document. For future reference, should the document be stored in a folder based on the subject of the document, in a folder based on document type, in a folder based on the client the document was created for, or in all three places? Decisions of this type need to be made all the time, weighing the consequences of storing the document in one place versus another versus storing multiple copies of the document.

SharePoint solution: Use of topics and global document metadata using the Managed Metadata Service search.

When using SharePoint, using document metadata and topics prevents the document creator from having to worry about where the document is stored. Metadata or specific fields of information that can be stored with the document can be used for information such as subject, client, and document type. Metadata can be enforced across all documents in a farm using the Managed Metadata Service available in SharePoint 2013. Because these fields are searchable, a document can be easily found regardless of what folder it is in.

Addressing Access to Line-of-Business Application Information

An organization may use a business application such as SAP or Microsoft Dynamics. Some individuals in the organization need to access information stored in these applications, but it would be costly to install and maintain the application on each desktop and to train all the users.

SharePoint solution: ASP.NET web parts and single sign-on.

ASP.NET web parts can be developed and used to access and display information from other applications and data sources. Single sign-on can also be enabled to provide seamless integration with the application. This provides the user with an easy, usable method for accessing information, and the IT department can maintain the code centrally and not have to worry about desktop deployment and specific training for the line-of-business applications. SharePoint 2013 also supports web parts, which opens it to the ability to view content from multiple third-party software and web part vendors.

Using SharePoint for Sharing Information with Partners, Vendors, and Clients

An organization needs to collaborate with another organization (for example, a marketing company doing research and developing collateral for the organization, or a client that the organization is working with on a specific project). The users from both organizations email documents and other information back and forth. Usually, these emails are sent to *all* people involved with the project so as to not leave anyone out. This can result in excess email traffic and emails being sent to users that they may not need (or want) to see.

SharePoint solution: Team site with extranet access.

The SharePoint team site template fits the needs of groups of people working collaboratively. The site can be set up for extranet access, enabling outside parties to participate as team members. Using a team site over a traditional email-based method of communication provides all kinds of benefits, including giving people the ability to review only what they want to review, set up alerts to be notified when specific information changes, set up a process for approving final documents, participate in online real-time discussions, and look at earlier document versions.

Deploying a Team Collaboration Solution with SharePoint

A team collaboration site is used by a group of people working together for a common end result, or to complete a project. The success of the team or project depends on the effectiveness of the team and its ability to efficiently collaborate to complete the project. Therefore, the site is designed to facilitate team communications and sharing project information.

Usually, a team collaboration site is an internal, decentralized site that has a relatively small number of members. However, it can be configured to provide access for members external to the organization. When the site is implemented, it replaces the traditional file share-based storage, use of email, and use of other traditional applications the organization may have for storing and accessing documents and other information.

Outlining Business Needs for the Team Collaboration Solution

The general categories of business needs for this group are communications, project management, and document management. These needs can be mapped to SharePoint features, as presented in this section:

- ▶ **Communications:** Interacting with other team members electronically using workspace instant-messaging capabilities. Finding out when information has changed through the use of alerts. Having discussions on issues or documents using the general or document discussion components.
- ▶ **Project management:** Assigning major project tasks to individuals using a tasks list. Tracking and following up on tasks using a tasks list and various views of the list. Centralizing and distributing information such as objectives, agendas, and decisions for project meetings in one place using meeting workspaces. Providing status reports to management based on information in task items.
- ▶ **Document management:** Having a common place for storing documents by using shared document libraries. Managing document revisions using the check-in/check-out and version retention features. Controlling document publication using content approval. Enhancing the ability to find and feature specific documents by assigning them to topics and best-bets classifying documents for retrieval using metadata attached to the document.

Implementing a Team Collaboration Solution with SharePoint

The team collaboration site is implemented using a SharePoint team site. A shared document library is created in the team site for document management and a tasks list for assigning responsibilities. Content approval is enabled for the document library with the project manager assigned the role of approver. Document workspaces are also used for individual documents to incorporate direct access from SharePoint 2013 applications. The team uses document discussions to communicate ideas about document contents and a general discussion for items relating to the project. The team site is part of a SharePoint implementation that has content sources defined for searching relevant information and archived documents.

Outlining Ideas for Using the Team Collaboration Solution

This section includes some ideas to incorporate into the team site solution with the elements previously discussed. The major project milestone tasks can be entered into a tasks list, assigned to individual team members, and then tracked by the project manager. The tasks list can also be used for status reporting.

Users can initially create documents using Microsoft Office 2007/2013 applications and then save them to a document workspace. The document workspace can be used by the team members as a conduit for instant messaging on project-related issues. Discussions within the document can be used for providing feedback and recommendations for document content.

When the document is ready for publishing, it can be moved to the shared library where it is reviewed by the approver. The approver can set up an alert to be notified when the new documents are added or modified within the library.

Deploying a Corporate Intranet Solution with SharePoint

The corporate intranet is used for communicating information to employees and providing them with access to corporate line-of-business applications. The primary goals of a corporate intranet are to provide resources to employees that can help improve performance and to provide employees with centralized electronic access to corporate-based information for things such as policies, procedures, and roles and responsibilities. The benefits of the corporate intranet include providing an electronic means of accessing information as opposed to reliance on human intervention, providing an easier way of finding information, automating processes, and eliminating duplication of effort. The end result is a reduction in operational costs.

Meeting Business Needs with the Corporate Intranet Solution

The general business needs of this group include searching for information, corporate communications, workflow processing, management of web-based content, and application integration. These needs can be mapped to SharePoint features as presented in this section.

Corporate communications:

- ▶ Notifying employees about company events using an events list
- ▶ Notifying employees about changes in policies and procedures using announcements
- ▶ Obtaining feedback from employees using discussion boards and surveys
- ▶ Providing access to company policies, procedures, and forms through shared document libraries
- ▶ Providing access to company-maintained information, such as employee directories, using lists such as the contacts list

Searching:

- ▶ Finding location-specific information by having the ability to search across local sites, division-based sites, and the corporate portal

- ▶ Having a means for searching content external to the SharePoint infrastructure, such as external websites, file systems, and other internal application databases, and SharePoint-based information and displaying the results together by using content sources and source groups

Workflow processing:

- ▶ Requiring documents to be approved before publishing using content approval
- ▶ Notification of outstanding items using alerts
- ▶ Simplifying processing using approve/reject views

Managing web content:

- ▶ Providing non-IT staff with the ability to create team-based sites when necessary through the self-service site creation
- ▶ Standardizing the look and feel of sites by creating site templates
- ▶ Enabling users to create a place for collaboration when needed through the use of shared document workspaces
- ▶ Providing a way to make meetings more effective and meaningful by using meeting workspaces
- ▶ Removing the dependency on IT departments for updating sites and site content by using the web-based customization features and document library concept
- ▶ Enabling users to tailor the view of the intranet to accommodate their specific needs using personal sites

Application integration:

- ▶ Providing a single interface for intranet capabilities and access to applications by using link lists
- ▶ Providing a way for users to view application data without having to load the application on the desktop by creating web parts that retrieve and display application data
- ▶ Minimizing the problems associated with providing multiple user accounts and passwords for various applications by using single sign-on for application access

Implementing the Corporate Intranet Solution

The corporate intranet site is implemented using SharePoint 2013 sites. Features used on the site home page include announcements, links (to other major corporate sites and applications), search, events, and discussions. In the quick launch area are links to lists such as the corporate directory and to shared libraries including policies and procedures, newsletters, training, and benefits. Areas can be configured for operational groups within

the organization and geographic groups within the organization, depending on the organizational requirements. Content sources that contain information useful to employees for doing their job can be added for indexing and search. Security and content approval can be implemented to enable controlled creation of sites and site content by a wide group of users. Integration can be provided for SharePoint-compatible applications by using preexisting integration web parts and developing custom web parts. Single sign-on can also be used for making it easier for users to access applications from within the site collection.

Ideas for Using the Corporate Intranet Solution

This section includes some ideas to incorporate into the corporate intranet site solution with the elements previously discussed.

Disseminate important corporatewide information such as policy and procedure changes using announcements. Put an expiration date on the announcements. If users see the same ones day in and day out, they have a tendency to ignore them.

Use a general discussion for obtaining employee feedback on policies, procedures, events, and other items of interest to employees. Moderate the discussion; have the human resources department or legal department responsible for approving all items submitted to the discussion group to ensure they are appropriate. Maintain a separate discussion forum for non-company-related items, such as employees selling candy for their children's youth groups. This type of discussion should not take up valuable home page space but provide a link to it from the home page. Surveys can also be used to get specific input on a topic.

Maintain a corporate events list in a calendar view to provide visual impact for upcoming events. Depending on the corporate climate, things such as birthdays and vacations can be maintained on the corporate calendar as well as company events and holidays.

Store company policies, procedures, and forms in shared document libraries for ease of maintenance and accessibility. The department responsible for maintaining the documents should also be responsible for the publishing of documents (approve contents) and read access provided to other users.

Create content source groups for logical breakdown of content for searching to prevent an inordinate amount of time from being spent performing searches.

Using Active Directory as the basis for the company directory assists in keeping the SharePoint-viewed company directory synchronized with it. A customized view of the directory can be created that filters and displays only relevant columns of information.

Using an application such as InfoPath 2013 or InfoPath Forms Services, InfoPath forms can be created, filled out, and stored in document libraries for access and processing. Alerts can be set up in the library for people who need to process the documents so that when something is submitted, they are notified and can review the items. Approval processing can also be used to approve and reject the documents. This concept could be used for things such as expense reports and other workflow documents. For an end-to-end solution, application code can be developed to feed the data from the form documents into the appropriate external application (for example, the accounting system) for final processing.

Because there is generally a great deal of information on a corporate intranet, users should take advantage of the ability to create and customize their own personal sites to include information they find useful. By using web parts that interface with Microsoft Outlook 2007/2013, the Windows SharePoint Services (WSS) personal site can become the primary user interface.

Deploying a Customer Extranet Solution with SharePoint

The primary purpose of the customer extranet portal is to service the needs of customers. The customer extranet enables customers to find information about products and services, and place help desk calls. In some customer extranets, client access is provided for things such as invoice payment and viewing account status and payment history. The customer extranet can also be used for document collaboration and managing joint projects with the customer. The content for this type of portal can originate from internal and external sources.

Meeting the Business Needs of the Customer Extranet Solution

The business needs of this group include searching for information, aggregating content from multiple sources, providing a dynamic view of relevant business information, collaborating on documents, sharing documents, managing joint projects, resolving issues, and providing a means for business transactions. The SharePoint features used to meet these needs are outlined as follows:

Searching:

- ▶ Providing customers with a means for viewing information about their account by using web parts that access line-of-business applications to retrieve and display customer-related information
- ▶ Enabling customers to find product/service information using the search features of SharePoint without having to speak with a service representative
- ▶ In addition to searching, providing the ability to view the results in a variety of ways depending on the needs using the filtering and sorting features of SharePoint

Content aggregation:

- ▶ Combining information from various sources into a single source for searching using content sources
- ▶ Accessing information from multiple business applications into one view using web parts

Dynamic views:

- ▶ Using filters to display subsets of information such as product-specific or location-specific data
- ▶ Using sort capabilities to present the information in a different order

Document collaboration:

- ▶ Sharing documents with clients using shared document libraries
- ▶ Controlling publication of documents using content approval
- ▶ Categorizing documents so that they can be easily found using document metadata
- ▶ Finding documents on a specific subject by searching the document text or the metadata attached to the document

Working on joint projects:

- ▶ Assigning/delegating tasks between parties using a tasks list
- ▶ Following up on overdue tasks by using views such as the Due Today view
- ▶ Sharing project-related information using a team site
- ▶ Discussing and resolving project issues using discussion boards
- ▶ Managing the overall project and reporting on status using a recurring event or multiple meeting workspace site

Resolving issues:

- ▶ Submitting issues/questions to a help desk using the issues list
- ▶ Responding to issues in a timely manner by using the alert feature on the issues list
- ▶ Having the ability to check the status of outstanding issues by using the My Issues view
- ▶ Managing and tracking issue resolution using views of the issues list

Business interaction:

- ▶ Providing clients with access to business information such as invoice/payment status using customized web parts
- ▶ Enabling clients to perform business transactions by providing links to web-based application interfaces or customized web parts

Implementing the Customer Extranet Solution

The customer extranet site is implemented using SharePoint 2013 Sites. In addition, integration for SharePoint-compatible applications can be provided using existing web parts, developing custom web parts, and providing links to web-based front ends to business applications. Single sign-on can also be implemented to make it easier for users to access applications.

Features available on the extranet portal home page include a links list, announcements, discussion board, and search. The quick launch area can contain links to lists such as a limited corporate directory (with the listings for the salespeople and other people who customers usually deal with, such as accounting personnel) and frequently accessed shared libraries such as newsletters, training documents, and product information. Areas can be configured for support, product/service information, and billing information. A content source group can be created for the content in each area to make searches more targeted.

Document workspaces can be used to collaborate on documents. Team sites can be used when working with the customer on a joint project. Content sources can be created for product/service documentation and historical accounting information.

Security needs to be tight to ensure the integrity of customer-specific information. Restrictions need to be in place to prevent one customer from obtaining access to another customer's data.

Outlining Ideas for Using the Corporate Extranet Solution

This section includes some ideas to incorporate into the customer extranet site solution with the elements previously discussed. In addition to providing standard content, use audiences to target specific content to an individual or group of users.

Use the support area for linking to an issues list and a document library containing technical information. Links to supporting websites could also be in this area. Other possibilities would be to include a top 10 issues list and a download library.

Include a shared library with documents relating to products and services offered and links to corporate or other websites that have this information in the product/service information area. There could also be a discussion board on this area page so that clients could submit product- or service-related questions or requests and provide their ideas and feedback on products and services. When there is a need to get specific client feedback, a survey can be used.

Use team sites when working on projects with the customer. Include a tasks list to document division of responsibility, a contacts list for maintaining the contact information for members from both sides of the team, a custom punch list to document items yet to be completed, a general discussion area as an alternative to email for documenting project-related correspondence in a central location, and create a weekly status meeting event or use a multiple meeting workspace for tracking and managing project status.

Summary

Microsoft SharePoint Server 2013 is a powerful tool that can enable knowledge workers to become more productive with a wide array of built-in tools and web parts. To take advantage of these features, however, the SharePoint environment must be properly designed and all the SharePoint components fully understood by the administrator in charge of designing the environment.

With SharePoint 2013 design knowledge, an administrator can properly scope and scale the infrastructure to handle anywhere from a handful of users to a large, distributed deployment of hundreds of thousands of users, enabling those users to take full advantage of the productivity gains that can be realized from the platform.

Best Practices

The following are best practices from this chapter:

- ▶ Become familiar with SharePoint 2013 design terminology, particularly in how it relates to service application architecture.
- ▶ Use the latest version of SQL Server, SQL Server 2012, whenever possible, particularly to take advantage of features such as SQL AlwaysOn, Transparent Data Encryption, and PowerPivot.
- ▶ Consider separating the service application roles from the web role servers to improve performance.
- ▶ Separate the database role from the SharePoint roles whenever possible to improve performance.
- ▶ Take an in-depth look at virtualization technologies, at a minimum for development and test farms, and potentially for production farms.
- ▶ Consider best-practice security approaches such as SQL Server TDE for storage security, IPsec and Secure Sockets Layer (SSL) certificates for transport security, and Active Directory Rights Management Services (AD RMS) for data loss prevention.
- ▶ Consider database mirroring for the content databases to provide for both high availability and disaster recovery of SharePoint content.
- ▶ Remember to purchase and install any necessary third-party web parts, iFilters, backup, and antivirus software, or use some of the Microsoft offerings such as System Center DPM 2013.
- ▶ Allocate a significant amount of memory and processor cores to SharePoint servers because they are resource intensive. SharePoint 2013's resource requirements are much higher than in earlier versions of SharePoint. Start with 12GB RAM and two CPUs for a simple web server.

- ▶ Be sure to allocate enough hard drive space for the Search service application roles for the index corpus; allocate 5% to 30% of the size of the data being indexed.
- ▶ Use SQL AlwaysOn technologies and network load balancing to scale the SharePoint server environment and provide redundancy.

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