Module 1

## Introduction to SharePoint 2016

### Contents:

Module Overview **1-1**

**Lesson 1:** Core components of the SharePoint 2016 architecture **1-2**

**Lesson 2:** New, deprecated and removed features in SharePoint 2016 **1-10**

**Lesson 3:** SharePoint 2016 and SharePoint Online editions **1-14**

**Lab:** Reviewing the core Microsoft SharePoint 2016 concepts **1-16**

Module Review and Takeaways **1-27**

## Module Overview

The Microsoft SharePoint architectural components continue to evolve to meet the changing needs and environments. This module introduces the architectural features that underpin Microsoft SharePoint 2016, both for on-premises and online deployments. This includes an examination of the features that are new in this version, and features that have been deprecated or removed. This module reviews the basic structural elements of a farm deployment, and the different deployment options that are available in SharePoint 2016.

Objectives

After completing this module, you will be able to:

* Describe the architectural features of SharePoint 2016.
* Identify new, deprecated, and removed features in SharePoint 2016.
* Describe the editions for SharePoint 2016 on-premises and Microsoft SharePoint Online.

Lesson 1

## Core components of the SharePoint 2016 architecture

SharePoint 2016 is broadly built on the systems architecture developed with SharePoint Server 2010 and SharePoint Server 2013. SharePoint 2016 has enhancements in all areas, and radical redesigns in some. It is essential that you have a good understanding of the core SharePoint 2016 architectural components to successfully plan and design a SharePoint deployment. These core components include:

* Information architecture
* Logical architecture
* Service applications
* Search
* Physical architecture

### Lesson Objectives

After completing this lesson, you will be able to:

* Describe the role of information architecture in a SharePoint 2016 design.
* Describe the SharePoint 2016 logical architecture and the components that affect farm design.
* Describe the service application architecture and the new services available in SharePoint 2016.
* Describe the search architecture.
* Explain the physical architecture requirements in SharePoint 2016.

### Overview of SharePoint 2016 information architecture

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Information architecture defines the means by which information in an organization is cataloged. The most widely used information architecture in the world is the Dewey Decimal Classification system, which is used to structure books in libraries. The goals of an information architecture are to ensure the information:

* Usability. This balances the needs of storing content by contributors and ensuring its discoverability by consumers.
* Maintainability. New content types, such as new products, services, or functionality, must be easy to integrate into an information architecture. For all organizations, change is a constant. If your information architecture is too rigid, it might make it difficult to accommodate changes to content.
* Extensibility. Although your information architecture is platform-independent, you must ensure that it conforms to the software, security, and management boundaries of SharePoint Server 2013. There is no point in creating an information architecture solution that cannot fit into your organization’s chosen platform.

When planning your information architecture, it is important to understand the SharePoint 2016 container hierarchy. The term container refers to the logical structures that make up SharePoint 2016. The container hierarchy, from top to bottom, is as follows:

* Farm
* Web applications
* Site collections
* Sites
* List and libraries

The features of SharePoint 2016 that are most closely associated with information architecture include:

* The managed metadata service. This stores and publishes common metadata items for use by an entire organization or divisions of the organization. With SharePoint 2016, you can publish this information globally or for specific groups by deploying multiple instances of the managed metadata service.
* Site columns. You can create custom columns to contain information such as metadata or item data. Using custom columns, you can choose the data type for the column and specify the information that the column stores.
* Content types. These are a powerful method for creating content of a certain type, and then associating columns, metadata, document templates, information management policies, or workflows with that type of item.
* Term sets. These provide the ability to tag information to improve usage clarity by means of both managed and unmanaged lists of terms. Managed lists are provisioned and maintained by a central function; unmanaged lists provide flexibility for users to add personal comments. The term sets use the Managed Metadata column to add metadata information that is surfaced as part of a document’s properties.
* Information management policies. These enable you to specify settings for document or item behavior regarding retention, auditing, barcoding, and labeling.

Your information architecture also can be used to drive navigation. Metadata navigation presents users with navigation options that are based on tags applied by contributors to their content. This delivers results that are filtered or refined by the taxonomy that is delivered by managed metadata columns.

### Overview of SharePoint 2016 logical architecture

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Logical architecture is closely associated with information architecture. The logical architecture documents the nonphysical structure of a solution, which is designed to fulfill business requirements.

The logical architecture does not specify any server-related functionality, such as the amount or size of server hardware. Rather, it reflects how you structure the information architecture within the non-physical components of SharePoint 2016. Some might think that logical architecture is platform agnostic, but as a matter of practicality, you must develop your logical architecture based on the platform structures.

The SharePoint 2016 logical architecture has the following core components that will influence your design:

* Server farms. A server farm is a collection of servers acting as a single top-level logical unit. These represent the top-level element of a design. The number of farms needed to fulfill your logical requirements are affected by elements such as:
* Separate operational divisions of responsibility.
* Dedicated funding sources.
* Separate data center locations.
* Regulatory requirements for physical isolation between sites.
* Service applications. These provide resources that can be shared across web applications in a farm, or across multiple farms.
* Application pools. An application pool is a group of one or more URLs that a worker process or a set of worker processes serves.
* Web applications. A web application is an Internet Information Services (IIS) website that SharePoint 2016 creates and uses. You can extend a web application up to four times to create additional zones in SharePoint 2016, which results in up to five IIS websites that are associated with a single web application. Each IIS website is associated with a different zone, and you can assign a unique domain name and/or authentication mechanism to each.
* Zones. These represent different logical paths (URLs) to gain access to the same web application.
* Content databases. All content for a web application is stored in one or more content databases. You can separate content into multiple content databases at the site collection level. A content database can include one or more site collections.
* Site collections. This is perhaps the most important SharePoint logical design element. Site collections are a logical set of SharePoint sites that share the same top-level site and certain administrative settings. Site collections are the highest level of logical containment within SharePoint.
* Sites. A site is a logical unit of containment that contains lists and libraries, permission levels, and configuration settings.
* Lists and libraries. A list (or library) is a logical container that contains a collection of similar items such as contacts, appointments, and documents.
* Items. An item is the most granular logical element in SharePoint, and represents a singular unit of content.

### Overview of SharePoint 2016 service application architecture

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The service application architecture, which replaced the Shared Service Provider model of Microsoft Office SharePoint Server 2007, remains in SharePoint 2016. Service applications, as defined earlier, provide services to SharePoint 2016 users and other applications. These include access to application functionality with Microsoft Visio 2016, or underlying services such as the managed metadata service or Microsoft Business Connectivity Services (BCS). The framework of the service application architecture in SharePoint 2016 is designed to enable architects to select only the services that are required to deliver a business solution.

From a basic management viewpoint, a service application has the following components:

* An administrative interface, through which you can manage the associated service application
* An application pool
* A service instance, the process running on a physical server
* A service database or databases (optional), depending on the requirements of the service

SharePoint 2016 includes one new service:

* Project Server Service Application. Administrators now have the ability to provision Project Services within their SharePoint 2016 farm. In the past, administrators have had the ability to add Project Server into SharePoint, but now the Project Server bits are part of SharePoint 2016.

Services that have been deprecated or changed in SharePoint 2016 include:

* Excel Services Application. This functionality has been moved to the Office Online Server.
* Work Management Service. The management of tasks has been moved to Microsoft Exchange.
* User Profile Synchronization service (FIM): This has been removed from SharePoint and will require an external identity provider such as Microsoft Identity Manager (MIM) 2016 to achieve the same functionality.

### Overview of SharePoint 2016 search architecture

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The SharePoint Search service has been improved, but is basically the same Search service as SharePoint 2013.

Search combines a range of elements on application servers, which include the following components:

* Crawl
* Content processing
* Analytics processing
* Indexing
* Query processing
* Search administration

These components interact to build the search index and respond to queries. To ingest data, the crawl component interrogates the content sources that you have configured, either on the SharePoint farm or on external sources, such as Microsoft Exchange. The crawled items are processed by the content processing component to format them appropriately to be stored on the index. Information from the analytics processing component is used in this process to identify useful associated item information, such as previous user interaction. The data, or artifacts, are written to the index, which is a series of files and folders that are stored on disk and referred to, collectively, as the index file. The query processing component receives queries from the Web server. It processes the query, and then it sends it to the indexing component, which returns results sets. The query-processing component performs additional processing to aggregate and clean the results, and then sends the result sets back to the Web server to be rendered for the user. Several temporary and permanent storage databases are used throughout the process.

Search and farm administrators can manage the search environment at the service application level. Some search management is available also for site collection administrators and site owners. This means that the search management overhead for SharePoint 2016 farm and service application administrators is reduced, and that users can expect a more flexible response to change requests because core feature management is delegated to administrative users.

### SharePoint 2016 physical architecture and topologies

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The physical architecture of SharePoint 2016 is broadly consistent with that of SharePoint 2013, although there are some revised recommendations on deployment strategies. Introduced in SharePoint 2016 is the concept of MinRole, which is giving a server a specific role. In previous versions of SharePoint, you had a Web Server or an App Server, but with MinRole, you have the ability to choose other roles. In SharePoint 2016, you can assign the following roles to your server:

* Application
* Custom
* Distributed Cache
* Search
* Web Server

Server systems hardware requirements

The server system specification requires a 64-bit, 4-core processor with a minimum 12 gigabytes (GB) of random access memory (RAM), and a system drive of 80 GB. This is for a general purpose Web Server, and for Application Server roles. For database servers, you might need to adjust the specification for small, medium, or large farm deployments. You must monitor your server systems to ensure that they perform well.

Software requirements

Whenever possible, you should implement SharePoint 2016 on the latest operating system version with databases on the 64-bit edition of Microsoft SQL Server. SharePoint 2016 is supported on Windows Server 2012 R2 and Windows Server 2016 (Standard or Datacenter). SharePoint 2016 database servers can use SQL Server 2014 Service pack 1 (SP1) and SQL Server 2016.

Additional Reading Icon **Additional Reading:** For more information about hardware and software requirements, refer to Hardware and software requirements for SharePoint Server 2016 Release Candidate: <http://aka.ms/G976yx>

Storage requirements

The capacity of SharePoint 2016 as a content storage and management platform means that you need to review your storage and data access requirements thoroughly. The following storage architectures are suitable for SharePoint 2016:

* Direct-attached storage (DAS), where hard disks are attached directly to the computer running SQL Server.
* Storage area network (SAN), which uses a network infrastructure to connect the computer running SQL Server to the separate disk storage volumes.
* Network-attached storage (NAS) devices might be suitable, under certain circumstances such as for remote binary large object (BLOB) storage. However, this support is subject to precise NAS specifications.

SharePoint 2016 still utilizes Shredded Storage. This file-saving algorithm enhances performance by minimizing the size or disk writes in a file save operation. Shredded Storage enables incremental file updates, rather than always writing an entire file when saving, by breaking—or shredding—a file into pieces.

Single SharePoint farm topologies

The topology of your SharePoint 2016 farm is important to designing and deploying an effective solution. The general guidance for farm sizing is as follows:

* Small farms. These farms typically have between two to five servers, and they can have two or three tiers. In a small, two-tier farm, one server acts as both the Web server and the application server. A small farm can serve between 10,000 to 20,000 users depending on concurrent usage and service requirements.
* Medium farms. These farms have between 5–10 servers, separated into three tiers. In medium farms, service applications often are spread across a number of application servers, with dedicated search servers. A medium farm can manage up to 40 million items. You can extend a medium farm by having more than one database server, with the search databases separated from other SharePoint databases.
* Large farms. These farms typically start at approximately ten servers and scale out. The recommendation for scaling out a large farm is to group services or databases with similar performance characteristics onto dedicated servers and then scale out the servers as a group.

Multiple farm topologies and cross-farm services

In SharePoint 2013 and SharePoint 2016, you have the ability to create cross-farm service applications. These service applications give you the ability to unify or standardize certain service application–related elements between different farms in the same organization. Cross-farm services are applications that can be shared independently with other farms. For example, an organization might have two farms that both use the managed metadata service to define metadata. Farm A can use the local managed metadata service and consume the managed metadata service of Farm B, which makes both sets of metadata available. You can repeat this configuration on Farm B so that both farms can share metadata definitions.

SharePoint multi-tenancy deployment

Multi-tenancy means that different companies can share a single farm environment.

Multi-tenancy makes use of the following features:

* Using multiple web applications or host-header site collections to accommodate many disjointed namespaces
* Using site subscriptions to enable grouping and administration of site collections by tenant. Site subscriptions also help with service application connections
* Using service application partitioning to store service application data separately for different tenants

SharePoint hybrid deployment

A hybrid SharePoint environment is one where an on-premises deployment integrates with a SharePoint Online, a part of Microsoft Office 365 platform, to provide an integrated business environment. The level of integration is determined by your organization’s business requirements, but hybrid solutions most often provide:

* Federated search. You can provision access for users to business data from both cloud and on-premises environments.
* BCS. You can provision access to line-of-business data from applications in SharePoint and external lists in SharePoint Online.
* Single sign-on (SSO). You can enable a single authentication sign-in for both environments to streamline user access.
* Directory synchronization. You can synchronize user accounts in the on-premises Active Directory Domain Services (AD DS) domain automatically with Office 365.
* One-way or two-way server-to-server trust. You can configure trust relationships between the on-premises and online environments to provision data connections.

### Discussion: How does SharePoint 2016 architecture affect your organization?

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| A speech bubble pointing to a group of users contains the discussion questions. A clock icon with an arrow indicates that the discussion should take ten minutes. |

How do you think the changes to SharePoint 2016 architectures might affect your organization’s environment?

* Do you have a documented information architecture and logical architecture?
* Are you planning to implement 3rd party add-ins or enable the ability to purchase add-ins from Microsoft’s SharePoint Store? What will this provide?
* Do you provide search functionality at present? Do you think you will use the additional delegated administration in your organization?
* What SharePoint topology do you have currently or plan to have? Will you implement multiple farms?
* Does your organization currently use or plan to use SharePoint Online? What do you see as the advantages and disadvantages of SharePoint Online for your organization?
* Does your organization plan to deploy servers by using MinRole? If so, will they be highly available?

Lesson 2

## New, deprecated and removed features in SharePoint 2016

SharePoint 2016 extends the functionality delivered by SharePoint Server 2013. It does this by improving on the existing features, creating new features, and by removing features that are considered obsolete or redundant.

This lesson introduces the new MinRole feature and other new features in SharePoint 2016. In addition, you will learn about which features have been deprecated, and which features have been removed from SharePoint 2016.

### Lesson Objectives

After completing this lesson, you will be able to:

* List the new server roles in SharePoint 2016.
* Describe the new MinRole feature.
* List the main features that have been deprecated in SharePoint 2016.
* List the main features that have been removed from SharePoint 2016.

### Overview of SharePoint 2016 MinRole

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The concept of the MinRole feature in SharePoint 2016 is the major infrastructure advancement for SharePoint 2016. Its purpose is to simplify deployment and scalability for SharePoint and break down the server roles based on function. The MinRole feature provides predictable performance characteristics by enabling specific server roles based on the position and function within the SharePoint topology.

Note Icon **Note:** For more information, refer to What’s new in SharePoint Server 2016 Installation and Deployment: <http://aka.ms/nuix9h>

When adding a server to the SharePoint 2016 farm, you must select one of six roles based on the server role.

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| ****Role name**** | ****Description**** |
| Web Front End | This role services end user requests that are optimized for low latency. |
| Single Server Farm | Provides the ability to provision all services on a single server. Typically, this role is used for evaluation or development farms. SQL Server will need to be installed prior to installing SharePoint 2016. |
| Search | Use this role for the creation of search services |
| Application | This role is reserved for service applications and service application requests that are optimized for high throughput |
| Distributed Cache | Use this role for creating a distributed cache service. This server also can be load balanced to manage end user requests among the web front-end components. |
| Custom | If you do not want to have just one MinRole on a server, you would assign it to the custom role. This would allow farm administrators to assign any service to run on the server. |

### Other SharePoint 2016 improvements

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There are many other improvements to SharePoint 2016 in addition to MinRole. While they might seem like side notes, some of the improvements are important, particularly from a security aspect. Some of the security improvements in SharePoint 2016 include:

* Zero Downtime Patching: In highly available SharePoint 2016 farms, you can complete patching in read/write mode with zero downtime.
* Durable Links: The original link will stay persistent regardless of users moving files or changing names of the file.
* Larger file size: The maximum file upload size is now 10 Gigabytes. You can upload or download files by using the Background Intelligent Transfer Service (BITS) for faster asynchronous file transfer in the foreground or background
* Encrypted connections. SharePoint automatically uses TLS 1.2 encryption for connections, and crawling websites.
* Data loss prevention (DLP). From the Compliance Policy Center site collection, you now can search for documents that contain personal information such as credit card numbers and social security numbers.
* Sharing. Improvements have been made on how to share, who can share, and with whom the items are shared.
* Yammer integration: Users will be able to start a Yammer conversation within a document.
* Simplified Secure Sockets Layer (SSL) configuration of Central Administration. Central Administration can now use SSL over other ports, not just port 443. To do this, you use the following cmdlet:

Set-SPCentralAdministration -Port <number> -SecureSocketsLayer

* Simple Mail Transfer Protocol (SMTP) connection encryption. Now you can encrypt connections to the SMTP server on ports other than port 25.

Another improvement to SharePoint 2016 includes the incorporation of Project Server 2016. The Project Server 2016 service application is now built into SharePoint 2016. However, it has a licensing restriction. To use Project Server 2016, users will need a SharePoint license in addition to a Project Server license.

Note Icon **Note:** For more information, refer to New and improved features in SharePoint Server 2016 Release Candidate: <http://aka.ms/Vi2v52>

### Deprecated or removed features in SharePoint 2016

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SharePoint 2016 has some features and functions that are deprecated and some that are removed. Items that have either been deprecated or removed from SharePoint 2016 include:

Deprecated features:

* Stsadm.exe. This tool is deprecated.
* Tags and Notes. This functionality is now deprecated. Tags and Notes can no longer be accessed or created. However, existing notes can be exported.

Removed features:

* SharePoint Foundation. This has been removed as an installation option.
* Stand-alone installation mode. SharePoint will not install SQL Server Express or provision SharePoint. You still have the ability to create a two-node farm on a single-server. However, you will have to install SQL Server and SharePoint on the server.
* User Profile synchronization service. Forefront Identity Manager (FIM) has been removed from SharePoint 2016. You must now use an external identity provider to synchronize user profile information with SharePoint 2016.
* Excel Services Application. This service application has been removed and is now a part of Office Online Server.
* Work Management Service. Task management is now managed in Exchange 2016.

Additional Reading Icon **Additional Reading:** For a full list of features that have been deprecated in SharePoint 2016, refer to What's deprecated or removed from SharePoint Server 2016 Release Candidate: <http://aka.ms/Qcod72>

### Discussion: What features are you most excited to implement in SharePoint 2016?

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| A speech bubble pointing to a group of users contains the discussion questions. A clock icon with an arrow indicates that the discussion should take ten minutes. |

Is user profile management important to your organization?

Do you:

* Currently synchronize user profile information from AD DS?
* Currently synchronize user profile information from an external line-of-business system?
* Currently import profile images by using FIM?
* Have plans to evaluate or use SharePoint Online?

Lesson 3

## SharePoint 2016 and SharePoint Online editions

There are a number of versions of SharePoint 2016 and SharePoint Online available from Microsoft. It is important that you and your organization understand the functionality offered by each to ensure that you select the correct edition to meet your business needs.

In addition to on-premises and online SharePoint implementations, you also can deploy a hybrid SharePoint solution that integrates your on-premises SharePoint with a cloud-based SharePoint solution. The decision to stay on-premises or move your services to the cloud is something that many organizations are discussing already and all will face over the next few years. This lesson examines these options, along with their benefits and disadvantages.

### Lesson Objectives

After completing this lesson, you will be able to:

* List the SharePoint 2016 on-premises editions.
* List the SharePoint Online editions.
* Describe some of the options for hybrid deployment integration.

### SharePoint On-Premises editions

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For on-premises deployments, organizations can choose from two different editions of SharePoint 2016:

* SharePoint 2016 Standard edition. This edition offers Enterprise Content Management (ECM), Web Content Management (WCM), managed metadata, user profile synchronization, My Site, audience targeting, Secure Store Service, and social networking.
* SharePoint Server 2016 Enterprise edition. This edition offers PerformancePoint Services, Visio Services, Access Services, and InfoPath Forms Services in addition to the SharePoint 2016 Standard edition features.

Additional Reading Icon **Additional Reading:** For a comparison list of the features included in SharePoint 2013 on-premises solutions, refer to the section, SharePoint feature availability across on-premises solutions of the SharePoint Online Service Description page: <http://aka.ms/Mfu9v9>.

### Overview of SharePoint Online

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SharePoint Online provides organizations with an additional option for how they choose to deploy SharePoint. SharePoint Online is part of Office 365, but if you prefer, you can license only the SharePoint Online component.

The current subscription plans for Office 365 include, but are not limited to:

* Office 365 Business
* Office 365 Business Essentials
* Office 365 Business Premium
* Office 365 ProPlus
* Office 365 Enterprise E1, Office 365 US Government E1
* Office 365 Enterprise E3, Office 365 Education A3,
* Office 365 US Government E3
* Office 365 Enterprise E5, Office 365 Education A5
* Office 365 US Government E4
* Office 365 Enterprise K1, Office 365 Government K1,
* Office 365 Enterprise K2, Office 365 Government K2

In addition to these Office 365 plans, an organization can purchase SharePoint Online (Plan 1) and SharePoint Online (Plan 2) on a stand-alone basis or as part of an Office 365 subscription. SharePoint Online Plan 1 offers standard SharePoint capabilities plus the ability to view Office documents in the browser interface.

Additional Reading Icon **Additional Reading:** To review a complete list of SharePoint Online features per edition, refer to the section, SharePoint feature availability across on-premises solutions of the SharePoint Online Service Description page: <http://aka.ms/cyxwjh>

SharePoint Online benefits

One of the primary advantages of a SharePoint Online deployment is that infrastructure management and a service level agreement (SLA) are provided as part of the subscription. This provides administrators with more time to manage other SharePoint elements, such as site structure, permissions, and managed metadata. SharePoint Online also provides organizations with an extranet capability that is simple to provision and prevents external partners from having access to the internal corporate network.

Site customization is supported in SharePoint Online with SharePoint Designer. It provides the ability to connect to and edit sites and workflow in the SharePoint Online environment. However, Full Trust code solutions, also known as farm level solutions, are not supported in SharePoint Online, although sandboxed solutions are supported for declarative markup and JavaScript. In addition, the new SharePoint add-in model also is supported.

SharePoint Online also offers Active Directory integration through the use of Active Directory Federation Services (AD FS) and AD Sync. This enables users to sign in to the SharePoint Online environment using the same user name and password that they use to access their desktop environment.

## Lab: Reviewing the core Microsoft SharePoint 2016 concepts

Scenario

The IT team at Contoso has created a server farm for an initial deployment of SharePoint 2016. The server farm consists of three servers: a domain controller, a SQL Server 2014 server, and a SharePoint Server 2016 server. Your team has installed SQL Server 2014, and SharePoint 2016. Your IT team has already completed the core planning and design tasks for the SharePoint deployment, but you now need to implement some of the more advanced enterprise functionality.

Rather than working in a production environment, your team would like to set up a lab environment and have asked you to complete the SharePoint 2016 core configuration tasks. You have been tasked with configuring the SharePoint farm, and creating and configuring web applications and site collections for the farm.

Objectives

After completing this lab, you will be able to:

* Configure a SharePoint 2016 farm.
* Create and configure a site collection.
* Provision service applications by using the SharePoint 2016 Management Shell.

Lab Setup

Estimated Time: **90 minutes**

Virtual Machine: **20339-2A-NYC-DC1-A**, **20339-2A-NYC-DB1-A**, **20339-2A-NYC-SP1-A**

User Name: **administrator@contoso.com**

Password: **Pa$$w0rd**

For this lab, you will use the available virtual machine environment. Before you begin the lab, complete the following steps:

1. On the host computer, click **Start,** type **Hyper-V Manager**, and then press **Enter**.
2. In Microsoft Hyper‑V Manager, click **20339-2A-NYC-DC1-A**, and then in the Actions pane, click **Start**.
3. In the Actions pane, click **Connect**. Wait until the virtual machine starts.
4. Sign in by using the following credentials:
   * User name: **Contoso\Administrator**
   * Password: **Pa$$w0rd**

Repeat steps 2 through 4 for virtual machines 20339-2A-NYC-DB1-A and 20339-2A-NYC-SP1-A.

### Exercise 1: Configuring SharePoint 2016 farms

Scenario

In this exercise, you will configure a SharePoint server farm by using the SharePoint 2016 Management Shell.

In addition to creating the farm, you need complete the supplementary tasks necessary to make the SharePoint server function correctly. This includes creating necessary service accounts, and configuring Domain Name System (DNS). Finally, you need to create new web applications by using a host header, and ensure that you can browse SharePoint sites from the SharePoint server by selectively disabling loopback checking.

The main tasks for this exercise are as follows:

1. Create a server farm account in Active Directory Domain Services (AD DS).

2. Create service accounts for the web applications.

3. Configure Domain Name System (DNS) for the domains sharepoint.contoso.com and finance.contoso.com.

4. Enable TCP/IP connectivity in Microsoft SQL Server.

5. Create a SQL Server alias on the server running SharePoint Server 2016.

6. Create Central Administration by using the SharePoint 2016 Management Shell.

7. Register the web application service accounts as SharePoint managed accounts.

8. Create the web applications sharepoint.contoso.com and finance.contoso.com.

9. Disable loopback checking for the domains sharepoint.contoso.com and finance.contoso.com.

▶  Task 1: Create a server farm account in Active Directory Domain Services (AD DS)

1. Sign in to 20339-2A-NYC- DC1-A as **contoso\administrator** with the password **Pa$$w0rd**.
2. Start Active Directory Administrative Center.
3. Create a new user with the details listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Full**  **name** | SharePoint Farm |
| **UPN** | SPFarm@contoso.com |
| **UPN**  **logon** | SPFarm@contoso.com |
| **SAM Account Name logon** | Contoso\SPFarm |
| **Password** | Pa$$w0rd |
| **Password never expires** | Selected |
| **User cannot change password** | Selected |

▶  Task 2: Create service accounts for the web applications

1. Create a new user with the details listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Full name** | SharePoint Web Services Default |
| **UPN logon** | spServices@contoso.com |
| **SAM Account Name logon** | Contoso\spServices |
| **Password** | Pa$$w0rd |
| **Password never expires** | Selected |
| **User cannot change password** | Selected |

1. Create a new user with the details listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Full name** | finance.contoso.comApp Service Account |
| **UPN logon** | SPFinanceWebApp@contoso.com |
| **SAM Account Name logon** | contoso\SPFinanceWebApp |
| **Password** | Pa$$w0rd |
| **Password never expires** | Selected |
| **User cannot change password** | Selected |

1. Create a new user with the details listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Full name** | sales.contoso.comApp Service Account |
| **UPN logon** | SPSalesWebApp@contoso.com |
| **SAM Account Name logon** | contoso\SPSalesWebApp |
| **Password** | Pa$$w0rd |
| **Password never expires** | Selected |
| **User cannot change password** | Selected |

1. Create a new user with the details listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Full name** | SP Web Content App Pool Account |
| **UPN logon** | spWebContent@contoso.com |
| **SAM Account Name logon** | contoso\spWebContent |
| **Password** | Pa$$w0rd |
| **Password never expires** | Selected |
| **User cannot change password** | Selected |

▶  Task 3: Configure Domain Name System (DNS) for the domains sharepoint.contoso.com and finance.contoso.com

1. On the 20339-2A-NYC-DC1-A server, open DNS Manager.
2. Add a new host record to the contoso.com forward lookup zone with the details listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Name** | sharepoint |
| **IP address** | 172.16.1.21 |

1. Add a new host record to the contoso.com forward lookup zone with the properties listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Name** | finance |
| **IP address** | 172.16.1.21 |

1. Add a new host record to the contoso. forward lookup zone with the properties listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Name** | internal.finance |
| **IP address** | 172.16.1.21 |

▶  Task 4: Enable TCP/IP connectivity in Microsoft SQL Server

1. Sign in to the 20339-2A-NYC-DB1-A virtual machine as **CONTOSO\Administrator** with the password **Pa$$w0rd**.
2. Open SQL Server Configuration Manager.
3. Enable **TCP/IP** for the **MSSQLSERVER** server instance.
4. Restart the **MSSQLSERVER** server instance.

▶  Task 5: Create a SQL Server alias on the server running SharePoint Server 2016

1. Sign in to 20339-2A-NYC-SP1-A as **administrator@contoso.com** with the password **Pa$$w0rd**.
2. Open the **cliconfg.exe** application from the **C:\Windows\System32** folder.
3. Add a new server alias named **ContosoDB**, which uses the **TCP/IP** network library and connects to the **NYC-DB1** server.
4. Close SQL Server Client Network Utility.
5. Open the **cliconfg.exe** application from the **C:\Windows\SysWOW64** folder.
6. Add a new server alias named **ContosoDB**, which uses the **TCP/IP** network library and connects to the **NYC-DB1** server.
7. Close SQL Server Client Network Utility.

▶  Task 6: Create Central Administration by using the SharePoint 2016 Management Shell

1. On the 20339-2A-NYC-SP1-A server, open the SharePoint 2016 Management Shell .
2. Create a new SharePoint farm in SharePoint 2016 Management Shell by using the configuration settings listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Server farm** | New server farm |
| **Database server** | ContosoDB |
| **Database Name** | SharePoint\_Config |
| **Administration Content Database** | SharePoint Farm Content |
| **Database access account user name** | CONTOSO\SPFarm |
| **Database access account password** | Pa$$w0rd |
| **Farm passphrase** | Pa$$w0rd |
| **Server Role** | Custom |
|  |  |
|  |  |

1. To create the ACL resources, run the following command:

Initialize-SPResourceSecurity

1. To install the required services, run the following command:

Install-SPService

1. To install the SharePoint features, run the following command:

Install-SPFeature -AllExistingFeatures

1. Create a new SharePoint Central Administration site in SharePoint 2016 Management Shell by using the configuration settings listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Central Administration web application port number** | 50000 |
| **Central Administration web application authentication provider** | NTLM |

1. To install the Help Collection, run the following command:

Install-SPHelpCollection -All

1. To complete the installation of Central Administration, run the following command:

Install-SPApplicationContent

1. Verify that you can access Central Administration, but do not complete the Farm Configuration Wizard.

▶  Task 7: Register the web application service accounts as SharePoint managed accounts

1. Use Central Administration to register the **contoso\SPSalesWebApp** account that you created in the previous tasks as a managed account.
2. Register the **contoso\SPFinanceWebApp** account that you created in the previous tasks as a managed account.
3. Add the **spWebContent App Pool** account as a managed account.

▶  Task 8: Create the web applications sharepoint.contoso.com and finance.contoso.com

1. Use Central Administration to create a new web application with the properties listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Port** | 80 |
| **Port header** | sharepoint.contoso.com |
| **Application pool name** | SharePoint - 80 |
| **Application pool security account** | CONTOSO\spWebContent |

1. Use Central Administration to create a new web application with the properties listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Port** | 80 |
| **Port header** | finance.contoso.com |
| **Application pool name** | SharePointFinance - 80 |
| **Application pool security account** | CONTOSO\SPFinanceWebAPP |

1. In IIS, add a binding to the **SharePoint - finance.contoso.com** website that binds it to the **172.16.1.21** IP address on port **80**, with the host name **internal.finance.contoso.com**.
2. Close Internet Information Services (IIS) Manager.

▶  Task 9: Disable loopback checking for the domains sharepoint.contoso.com and finance.contoso.com

1. In Windows registry, disable loopback checking for the **sharepoint.contoso.com** domain.

Note Icon **Note:** This enables you to visit the site on the SharePoint server.

1. Disable loopback checking for the **finance.contoso.com** domain.
2. Disable loopback checking for the **internal.finance.contoso.com** domain.
3. Restart IIS.

**Results**: After completing this exercise, you should have completed the initial SharePoint configuration tasks, including provisioning the SharePoint Central Administration site. You also should have created a new web application for the sharepoint.contoso.com domain.

### Exercise 2: Creating and configuring site collections and sites

Scenario

In this exercise, you will create top-level site collections in the sharepoint.contoso.com and finance.contoso.com web applications. You will create two top-level site collections by using the Central Administration website, and you will create a host named site collection in the SharePoint 2016 Management Shell.

You will also create a subsite for the IT department in the sharepoint.contoso.com site collection.

The main tasks for this exercise are as follows:

1. Create a top-level site collection for the sharepoint.contoso.com web application.

2. Create a site in the sharepoint.contoso.com site collection.

3. Create a top-level site for the finance.contoso.com web application.

4. Use the SharePoint 2016 Management Shell to create a host named site collection in the finance.contoso.com web application.

▶  Task 1: Create a top-level site collection for the sharepoint.contoso.com web application

1. On **20339-2A-NYC-SP1-A**, use Central Administration to create a new top-level site collection in the **sharepoint.contoso.com** web application with the properties listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Title** | SharePoint |
| **URL** | http://sharepoint.contoso.com |
| **Template** | Team Site |
| **Primary site collection administrator** | CONTOSO\Administrator |

1. Use Internet Explorer to navigate to the **sharepoint.contoso.com** site collection to verify that it is configured correctly.

▶  Task 2: Create a site in the sharepoint.contoso.com site collection

1. Add a new site named **IT** with the URL **http://sharepoint.contoso.com/IT**
2. Verify that the IT site displays correctly.
3. Close Internet Explorer.

▶  Task 3: Create a top-level site for the finance.contoso.com web application

1. Use Central Administration to create a new top-level site collection in the **finance.contoso.com** web application with the properties listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Title** | Finance Extranet |
| **URL** | http://finance.contoso.com |
| **Template** | Team site |
| **Primary site collection administrator** | CONTOSO\Administrator |

1. Navigate to the **finance.contoso.com** site collection to verify that it is configured correctly.

▶  Task 4: Use the SharePoint 2016 Management Shell to create a host named site collection in the finance.contoso.com web application

1. Use the **New-SPSite** cmdlet in a SharePoint 2016 Management Shell to create a new host-named site collection in the **finance.contoso.com** web application with the properties listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **Title** | Finance Intranet |
| **URL** | http://internal.finance.contoso.com |
| **Template** | Team Site (STS#0) |
| **Primary site collection administrator** | CONTOSO\Administrator |

1. Navigate to the **finance** site collection to verify that it is configured correctly.

**Results**: After completing this exercise, you should be able to create and configure site collections and sites.

### Exercise 3: Provisioning service applications by using the SharePoint 2016 Management Shell

Scenario

In this lab, you will create a new managed account that will be the service account for your services. You will also provision the managed metadata service, Enterprise Search Service, and the User Profile Service.

The main tasks for this exercise are as follows:

1. Create the SharePoint web services default application pool.

2. Create the managed metadata service by using the SharePoint 2016 Management Shell.

3. Create SharePoint Enterprise Search using the SharePoint 2016 Management Shell.

4. Provision the User Profile Service using the SharePoint 2016 Management Shell.

▶  Task 1: Create the SharePoint web services default application pool

* + Create a managed account for **contoso\spServices** by using the SharePoint 2016 Management Shell.

▶  Task 2: Create the managed metadata service by using the SharePoint 2016 Management Shell

1. Get the **spServices** Service Application Pool.
2. Create the managed metadata service and the proxy by using the information listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **MMS Name** | Managed Metadata Service |
| **Instance Name** | MetadataWebServiceInstance |
| **Database Server** | ContosoDB |
| **Database Name** | Farm\_MMS |
| **App Pool Name** | SharePoint Web Services Default |

▶  Task 3: Create SharePoint Enterprise Search using the SharePoint 2016 Management Shell

1. Get the **spServices** Service Application Pool.
2. Create the Search service application and the proxy by using the information listed in the following table.

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| Search Server Name | **NYC-SP1** |
| Service Application Name | **Search Service Application** |
| Database Server | **ContosoDB** |
| Database Name | **Farm\_SSA** |
| App Pool Name | **SharePoint Web Services Default** |
| Index Root Directory | **c:\spSearchIndex** |

1. Create a clone of the new, blank search topology.
2. Create the search components and activate them.

▶  Task 4: Provision the User Profile Service using the SharePoint 2016 Management Shell

1. Get the **spServices** Service Application Pool.
2. Create the User Profile Service application and the proxy by using the following information:

|  |  |
| --- | --- |
| ****Property**** | ****Setting**** |
| **UPA Name** | User Profile Service |
| **UPA Instance Name** | User Profile Service |
| **Database Server** | ContosoDB |
| **Profile Database Name** | Farm\_UPA\_Profile |
| **Social Database Name** | Farm\_UPA\_Social |
| **Sync Database Name** | Farm\_UPA\_Sync |
| **App Pool Name** | SharePoint Web Services Default |

1. Revert Virtual Machines

**Results**: After you have completed this exercise, you should have been able to deploy one managed account and three service applications for your SharePoint 2016 farm.

▶  Task 5: Prepare for the next module

When you are finished with the lab, revert the virtual machine to its initial state. To do this, complete the following steps:

1. On the host computer, open Microsoft Hyper-V Manager.
2. In the Virtual Machines list, right-click **20339-2A-NYC-SP1-A**, and then click **Revert**.
3. In the **Revert Virtual Machine** dialog box, click **Revert**.
4. Repeat steps 2 and 3 for 20339-2A-NYC-DB1-A and 20339-2A-NYC-DC1-A.

## Module Review and Takeaways

In this module, you reviewed the architectural changes in SharePoint 2016. You also reviewed the new, enhanced, and deprecated features of SharePoint 2016.

Review Questions

Check Your Knowledge

|  |  |
| --- | --- |
| Question | |
| Which of the following service applications is no longer available with SharePoint Server 2016 Enterprise edition? | |
| Select the correct answer. | |
|  | Search |
|  | SharePoint 2010 Workflows |
|  | Translation Service |
|  | Work Management Service |
|  | App Management Service |

**Question**: Verify the correctness of the statement by placing a mark in the column to the right.

|  |  |
| --- | --- |
| Statement | Answer |
| User Profile Synchronization service (FIM) is used for synchronizing user profiles from Active Directory into SharePoint 2016 |  |