

Module 1

Architecture and Installation

Objectives

In this module you will learn about the architecture of both Windows SharePoint Services 3.0 and Microsoft Office SharePoint Server 2007, and how to install both in desired topologies.

You will:

1. Learn about Windows SharePoint Services 3.0 architecture.
2. Learn about Microsoft Office SharePoint Server 2007 architecture.
3. Learn about topologies for deploying both.
4. Learn about installing SharePoint 2007.
5. Learn about scripting the installation of SharePoint 2007.

Section 1.1

Overview of Windows SharePoint Services 3.0

Windows SharePoint Services 3.0 is the underlying core of SharePoint 2007. Windows SharePoint Services 3.0 provides technologies to support collaboration, information management, document storage and communications.

Supporting collaboration is provided by Windows SharePoint Services 3.0 through the use of shared discussion boards, shared lists for contacts, issues and calendars, shared document workspaces, shared meeting workspaces, blogs and wikis. With the integration of Windows Messenger and Microsoft Exchange server, presence data can also be provided through the use of the presence web part.

To help with information management, Windows SharePoint Services 3.0 provides search and index capabilities for information and documents within a site collection, alerts for when information is changed within a site collection and the ability to feed data to lists by using RSS data feeds.

Windows SharePoint Services 3.0 provides controllable document management through the use of versioned document workspaces where multiple revisions of documents will be stored, allowing for point in time choice of versions of documents. Content types provide reusable collections of settings that can be applied to documents and sites. The recycle bin provides a means to recover recently deleted items without having to resort to backups. Workflows provide means to route documents between multiple users.

Architecturally Windows SharePoint Services 3.0 is a .NET framework 3.0 based application that provides the core services for SharePoint 2007. Data is stored in a backend database with one configuration database shared by all servers in the farm and one or possibly more content databases. There can be multiple front end servers to provide load balancing.

Section 1.2

Overview of Microsoft Office SharePoint Server 2007

Microsoft Office SharePoint Server 2007 builds upon the core functionality provided with Windows SharePoint Services 3.0 by providing two extra sets of components necessary to extend SharePoint services to Enterprise and Portal deployments. The extra components that are provided are Microsoft Office SharePoint Server 2007 Shared Service Provider and Microsoft Office SharePoint Server 2007 Features.

Microsoft Office SharePoint Server 2007 Shared Service Provider performs resource intensive tasks that are shared across multiple different sites and site collections at the portal level. It provides enterprise level search capabilities that can search and index across multiple sites and external data sources, Excel calculation services and user personalization services.

Microsoft Office SharePoint Server 2007 Features build upon what is already provided with Windows SharePoint Services 3.0 to extend it for visualizing Business Intelligence data. It provides web parts and connectors that can securely connect to data stores and display charts of that data and key performance indicators. Microsoft Office SharePoint Server 2007 Features also extend the workflow functionality to simplify authoring, managing and editing content and to allow for multilingual publishing.

Section 1.3

Planning for a Portal Deployment

To be able to correctly plan for a portal deployment you have to understand the logical and physical architecture of Microsoft Office SharePoint Server 2007.

Portal Logical Architecture

The logical architecture of the portal is the functional units that define how the portal application is grouped together. There are four levels in the logical architecture:

1. **The Server Farm**
The server farm is a logical grouping of web servers that provide access to the portal and share a common configuration database.
2. **The Web Application**
The web application corresponds to a website in Internet Information Server that has been extended with SharePoint, providing the access point to the portal.
3. **The Site Collection**
The site collection logically groups a set of sites and subsites sharing similar contexts and settings.
4. **The Site**
The site logically groups content.

Microsoft Office SharePoint Server 2007 features are typically used at the site collection and site levels, but they can be deployed at the web application and server farm level also.

Portal Physical Architecture

The physical architecture of the portal breaks down into three components:

1. **The Database Server**
The database server contains all of the content, configuration, metadata and indexes for a server farm. All members of the server farm must use the same database server, as the configuration table is shared by all of the members of a server farm.
2. **The Application Server**
The application server handles all of the back end processes for the portal such as search, indexing and user profiles. There can be multiple application servers within a server farm to allow for the distribution of processing load.

3. **The Web Front End Server**

The web front end server handles all of the front end rendering processes for the portal, providing application features to users. It handles templates, themes, web part assemblies, and management pages. There can be multiple web front end servers to allow for load balancing and redundancy.

Section 1.4

Topologies

Deployment topologies will vary depending on the size of organization for which the portal is being deployed. Microsoft Office SharePoint Server 2007 has a very flexible and easily scalable topology.

Small Deployments

For small deployments, all of the physical components can be placed on the same server. The server will host the database, the web front end and the application services. This is only really suitable for the smallest of deployments.

This stand-alone deployment does not have an upgrade path to a server farm. If you will be expanding the deployment at any point in the future then you should use a deployment where the database is placed on its own server and a second server hosts that application services and the web front end.

Medium Deployments

For medium deployments, the database will be placed on its own server, the application services will be placed on their own server and the web front end will have its own server as well. The web front end can be scaled out to provide redundancy as necessary.

The application services server will handle indexing and Excel calculation services, and the web front end servers will handle servicing search queries and providing access to content.

Large Deployments

For the largest deployments, the database should be placed on a cluster to provide both redundancy and performance. The application services should be placed on multiple servers available to each geographic location. Multiple front end web servers should be configured as a load balanced cluster.

Each of the application servers provide a specific service and the web front end servers are dedicated to providing content only.

Considerations for a Farm

There are a number of considerations for a SharePoint Server farm.

Technologies

All of the web servers within a server farm must have the same SharePoint Products and Technologies installed. For example, if servers in your farm are running Microsoft Office SharePoint Server 2007 then

you cannot add just one server that is running Microsoft Office Project Server 2007; you would have to install Microsoft Office Project Server 2007 on all of the web servers within your farm.

Languages

All of the web servers within a server farm must have the same language packs installed, and all instances of Microsoft Office SharePoint Server 2007 must be in the same language. Once language packs are installed, you will have to rerun setup on your web front end servers.

Site templates are language specific, and to render correctly will require the correct languages to be installed. If the correct language is not installed then the page will raise a 500 server error.

Licensing

There are two available licenses for Microsoft Office SharePoint Server 2007.

1. *Microsoft Office SharePoint Server 2007 Server License*
This is the standard license to run Microsoft Office SharePoint Server 2007. To use this license you also need to purchase the required number of Client Access Licenses for your organization.
2. *Microsoft Office SharePoint Server 2007 Internet Server License*
This license allows you to run Microsoft Office SharePoint Server 2007 for Internet facing websites. This is a per server license that does not require the purchase of Client Access Licenses, but all access must be by non employees only.

For partner extranets you have the option of using the standard Microsoft Office SharePoint Server 2007 Server License and purchasing the required number of Client Access Licenses for your partner employees, or deploying the partner extranet using the Microsoft Office SharePoint Server 2007 Internet Server License, as long as none of the sites on the extranet are exclusively used by internal employees.

Considerations for a Child Farm

A child server farm can be set up to consume Shared Services from a parent server farm. In this configuration, the service account for the child server farm must be granted the db_owner database role on the parent server farms configuration database. The child farm will have to be able to manipulate this database to consume shared services.

Section 1.5

Installation

There are a number of requirements that have to be met before installing Microsoft Office SharePoint Server 2007. There are requirements for the operating system, the database and the installed components.

Operating System Requirements

Microsoft Office SharePoint Server 2007 can be installed on the following operating systems.

Operating System	Notes
Windows Server 2003 Standard Edition, Windows Server 2003 Enterprise Edition, Windows Server 2003 Datacenter Edition	No restrictions, Requires Service Pack 1 or later to be installed
Windows Server 2003 Web Edition	Microsoft Office SharePoint Server 2007 can only be installed as a web front end server, Requires Service Pack 1 or later to be installed
Windows Server 2003 Small Business Server	Microsoft Office SharePoint Server 2007 needs to be installed side by side with the installed Windows SharePoint Services 2.0, Requires Service Pack 1 or later to be installed

Database Requirements

Microsoft Office SharePoint Server 2007 can be installed on the following databases.

Database	Notes
SQL Server 2000	Requires Service Pack 3a or later, performance is slower for search and index than SQL 2005
SQL Server 2005	Requires Service Pack 1 or later
SQL Server 2005 Express	Requires Service Pack 1 or later, not suitable for large deployments
WMSDE	Performance is slower for search and indexing, not suitable for large deployments

Installed Component Requirements

Microsoft Office SharePoint Server 2007 requires the following operating system components to be installed.

Component	Notes
Internet Information Services 6.0	Internet Information Services must be installed in worker process isolation mode, ASP .NET 2.0 must be enabled
.NET Framework 3.0	This provides the ASP .NET 2.0 rendering framework and the Windows Workflow Foundation services

The .NET Framework 3.0 redistributable can be downloaded from the Microsoft Download site.

Active Directory is required to provide authentication in farm deployments of Microsoft Office SharePoint Server 2007. It is recommended to have one domain controller for every three authenticating web front end servers.

Service Accounts

For server farm deployments there are a number of administrative and service accounts that need to be setup for use across the farm when deploying and running Microsoft Office SharePoint Server 2007. As a security best practice, you will want to set these accounts up with the least required privileges.

Server Farm Accounts

Account	Purpose	Privileges
SQL Server Service	Account with which Microsoft SQL Server executes database and agent services; prompted for during installation of Microsoft SQL Server	Use either Local System or a standard Domain User account
Setup User Account	User account used to execute the setup process on each server computer, also used by the SharePoint Products and Technologies Configuration Wizard, the PSCONFIG command line tool and the STSADM command line tool	Use a standard domain user account that is a member of the local Administrators group on the servers where SharePoint will be installed, and has a SQL Server login that is a member of the securityadmin and dbcreators fixed roles
Server Farm Account	User account used for database access once SharePoint is installed, the application pool identity for the SharePoint Central Administration website and the process account for the Windows SharePoint Services Timer service	Use a standard domain user account. This account will be granted the following rights when the server is joined to a farm: The account is added to the SQL Logins for the SQL Server and granted dbcreator, securityadmin and dbowner rights for all databases in the server farm. If the server farm is a child farm consuming shared services in a parent farm then this account must be a member of db_owner for the configuration database of the parent farm

Shared Service Provider Accounts

Account	Purpose	Privileges
SSP Service Account	User account used by SSP Web Services for inter server communication, SSP Timer Service, Application pool identity for virtual directory associated with a given SSP	Use a standard domain account. The user should not be a member of the Administrators group on any computer within the server farm. No manual configuration is necessary – this account is granted the same rights as the SSP Application Pool Account
SSP Application Pool Account	User account used for the Application Pool associated with the Shared Services Administration web application	No configuration is necessary – this is automatically granted the following: Db_owner role for the SSP content database, Read and write access to the SSP content database, Read and write access to content databases for Web Applications associated with the SSP, Read access to the server farm configuration database, Read access to the Central Administration content database
Office SharePoint Server Search Service Account	User account used for the Office SharePoint Server Search Service; there is only one instance of this server per server farm and it is used by all SSPs	Must be a domain user account. Must not be a member of the Farm Administrators group. The account is automatically granted read access to the configuration database for the server farm
Default Content Access Account	User account used to crawl content by default within a specific SSP unless another is specified by a crawl rule	Must be a domain user account. Must not be a member of the Farm

		Administrators group. Requires read access to external content that you will use this account to crawl. The account is automatically granted read access to all content databases in the server farm
Profile Import Default Access Account	User account used to connect to a directory service and to import profile data from a directory service; if none is specified then the default content access account is used	Requires read access to the directory service, requires Manage User Profiles personalization services permission, requires view permissions on entities used in Business Data Catalog import connections
Excel Services	User account used by Excel Calculation Services to connect to external data sources that require a non Windows username and password	Must be a domain user account. Configure access to external data.

Windows SharePoint Services Help Search Accounts

Account	Purpose	Privileges
Windows SharePoint Services Help Search Service Account	User account used for the Windows SharePoint Services Help Search service; this is used to provide search capability for help; there is only one instance of this service per farm	Must be a standard domain user account, Must not be a member of the Farm Administrators group, Automatically granted read access to the server farm configuration database and the SharePoint_Admin content database. Automatically granted db_owner role for the Windows SharePoint Services Search database

Recommended Installation Order

This order is designed to make configuration easier and ensures that services are in place before they are required for installation of the later server types.

Server Type	SharePoint Server Installation Type
Support Servers – Domain Controller, Database	SharePoint Not Installed on these
Application Server containing the Central Administration Site	Complete
All Front End Web Servers	Either Web Front End or Complete
Index Application Server	Complete
Query Application Servers	Complete
Other Application Servers (such as Excel Calculation Servers)	Complete

It should be noted that if you configure more than one query server for a server farm then you cannot configure the index server to also be a query server.

Manual Installation

Installing Internet Information Services

This installation procedure requires that you have access to the Windows Server 2003 installation files.

1. From the Start menu, choose Control Panel and then choose Add or Remove Programs.
2. Click Add/Remove Windows Components.
3. Select Application Server and click Details.
4. Check ASP.NET.
5. Select Internet Information Services (IIS) and click Details.
6. Verify that Common Files, Internet Information Services Manager, SMTP service and World Wide Web Service are checked and that FrontPage 2002 Server Extensions is not checked.
7. Click OK twice.
8. Click Next.
9. Click Finish.
10. Close Add or Remove Programs.

Installing the Microsoft .NET Framework 3.0

This installation procedure requires that you have access to the Microsoft .NET Framework 3.0 setup file. This can be downloaded from the Microsoft website.

1. Double click on the dotnetfx.exe file you downloaded (note well the filename may be different).
2. If a security warning dialog box appears, verify that the file is the correct file and then click Run.
3. Read the license agreement, then select I have read and ACCEPT the terms of the License Agreement.
4. Click Install.
5. The installation will now proceed and may take a little while to complete.
6. Click Exit.

Installing Microsoft Office SharePoint Server 2007 as a Server Farm

This installation procedure requires that you have access to the Microsoft Office SharePoint Server 2007 source files.

1. Run setup.exe from the Microsoft Office SharePoint Server 2007 source files.
2. At the Enter Your Product Key page, fill in your SharePoint product key and click Continue.
3. At the Software License page, read the software license and then select I Accept The Terms Of This Agreement and click Continue.
4. At the Choose Your Installation page, click Advanced.
5. On the Server Type tab, select Complete or Web Front End as appropriate.
6. To install SharePoint to a custom location, select the File Location tab and fill in the appropriate installation directory to use.
7. Click Install Now.
8. Setup will now install Microsoft Office SharePoint Server 2007.
9. Once setup completes, select Run the SharePoint Products and Technologies Configuration Wizard Now and click Close.

Once Microsoft Office SharePoint Server 2007 is installed you will then use the SharePoint Products and Technologies Configuration Wizard to either create a new farm or add a server to an existing farm.

Creating a New Server Farm

This installation procedure assumes that you have just installed Microsoft Office SharePoint Server 2007 on the first server of the farm you wish to create, and have opened up the SharePoint Products and Technologies Configuration Wizard.

1. On the Welcome page, click Next.
2. Click Yes at the warning dialog box – some services will need to be restarted during configuration.
3. On the Connect to a Server Farm page, select No, I want to create a new server farm and then click Next.
4. A dialog box will appear asking you to specify the database connection settings.
5. In the Database Server box fill in the name of the database server for the server farm.
6. In the Database Name box fill in the name for the configuration database for the server farm.
7. In the Username box fill in the user account details for the Server Farm Account.
8. In the Password box fill in the password for the Server Farm Account.
9. Click Next.
10. At the Configure SharePoint Central Administration Web Application page, select the Specify Port Number checkbox and fill in the port that you want the Central Administration Web Application to run on.
11. To use NTLM authentication, Click Next. To use Kerberos, click Negotiate (Kerberos) and then click Next. Note well that Kerberos requires additional configuration of the domain controller.
12. On the Completing SharePoint Products and Technologies page, click Next.
13. Click Finish.

Adding a Server to an Existing Farm

This installation procedure assumes that you have an existing SharePoint server farm and have opened up the SharePoint Products and Technologies Configuration Wizard.

1. On the welcome page, click Next.
2. Click Yes at the warning dialog box – some services will need to be restarted during configuration.

3. On the Connect to a Server Farm page, select Yes, I want to connect to an existing server farm, and then click Next.
4. A dialog box will appear asking you to specify the database connection settings.
5. In the Database Server box fill in the name of the database server for the server farm.
6. Click Retrieve Database Names and then from the database name list select the configuration database for the server farm.
7. In the Username box fill in the user account details for the Server Farm Account.
8. In the Password box fill in the password for the Server Farm Account.
9. Click Next.
10. Click Finish.

Scripted Installation

Installing Microsoft Internet Information Services

Internet Information Services is installed by creating a text file to tell Windows what components to add to the operating system, and then invoking the setup routine.

The text file you create, `iis.txt`, will look like this:

```
[Components]
iis_common=on
iis_inetmgr=on
iis_www=on
iis_ftp=off
iis_smtp=on
[InternetServer]
PathFTPRoot=C:\inetpub\FTPRoot
PathWWWRoot=C:\inetpub\WWWRoot
```

Once created, the component additions can be invoked using the following command:

```
Sysocmgr /i:%windir%\inf\sysoc.inf /u:c:\iis.txt
```

Installing the Microsoft .NET Framework 3.0

There are a number of command line switches that can be used to alter the behavior of the framework installer. The `/Q` switch specifies that the installer is to use quiet mode to deploy and the `/C` switch overrides the standard install command. Both of these switches need to be used in combination to provide a silent scripted install:

```
Dotnetfx.exe /q /c:"install /q"
```

Once the framework is installed, you then have to enable ASP.NET for IIS:

```
%windir%\Microsoft.NET\Framework\v2.0.50727\aspnet_regiis -i -enable
```

Installing Microsoft Office SharePoint Server 2007

Examining the Microsoft Office SharePoint Server 2007 Installation source files you will find a folder named Files. Within the Files folder there are a number of Setup folders, one of which is SetupFarmSilent. Files\SetupFarmSilent contains a config.xml file. Copy this file to a network accessible location and use notepad or any other text editor to modify the <PIDKEY Value="Enter PID Key Here"> line with the correct product key for your SharePoint distribution. The product key should be entered as a string of letters and numbers only, do not enter the – characters.

Once the config.xml file is edited, the following command can be used from the folder containing the Microsoft Office SharePoint Server 2007 installation source files to install SharePoint:

```
Setup.exe /config \\path\to\config.xml
```

Where \\path\to is replaced with the correct network path to your edited config.xml file.

Configuring SharePoint Products and Technologies

As an alternate to using the graphical SharePoint Products and Technologies configuration wizard, the psconfig.exe command can be used. After Microsoft Office SharePoint Server 2007 is installed, this command can be found in the %systemdrive%\Program Files\Common Files\Microsoft Shared\web server extensions\12\bin folder.

To create a new farm you would use the following command:

```
Pconfig –cmd configdb –create –server dbservername –database configdbname –user  
DOMAIN\SPServiceUser –password "SPServicePassword" –admincontentdatabase  
admindbname –dbuser DOMAIN\SQLService –dbpassword "SQLServicePassword"
```

Where dbservername is the name of the database server, configdbname is the name for the farm configuration database, SPServiceUser is the username for the server farm account, SPServicePassword is the password for the server farm account, admindbname is the name for the SharePoint central admin content database, SQLService is the database access user and SQLServicePassword is the password for the database access user.

To provision the SharePoint Central Administration site you would use the following command:

```
Pconfig –cmd adminvs –provision
```

To join an existing farm you would use the following command:

```
Pconfig –cmd configdb –connect –server dbservername –database configdbname –dbuser  
DOMAIN\SQLService –dbpassword "SQLServicePassword"
```

Lab 1.1

Installing Microsoft Office SharePoint Server 2007

Before You Begin

In this lab you will install Microsoft Office SharePoint Server 2007 as a new farm.

The instructor machine is a domain controller for the COMPANY.LOCAL domain, and each of the student machines are member servers in the COMPANY.LOCAL domain. SQL Express 2005 is installed on each of the student machines.

Students each have their own user account in the domain – SPUserXX, where XX is a unique number from 01 to 24. Your instructor will inform you of the number to use for your user account.

Scenario

You will login to your student machine, install the required components to support the installation of Microsoft Office SharePoint Server 2007, configure the required SQL settings and then install Microsoft Office SharePoint Server 2007 configured as a new server farm.

Action	Detailed Steps
Login to the student machine	<ol style="list-style-type: none"> Press CTRL+ALT+DELETE Fill in the username as 'SPUserXX', where XX is your student number Fill in the password as 'P@ssw0rd' Click Login
Install Internet Information Services	<ol style="list-style-type: none"> From the Start Menu, click on Control Panel Click on Add or Remove Programs Click on Add/Remove Windows Components Select Application Server and click Details Check ASP.NET Select Internet Information Services(IIS) and click Details Verify that Common Files, Internet Information Services Manager, SMTP service and World Wide Web service are checked Verify that FrontPage 2002 Server Extensions are not checked Click OK twice Click Next Click Finish Close Add or Remove Programs
Install the Microsoft .NET Framework 3.0	<ol style="list-style-type: none"> From the Start Menu, click on Run Fill in \\london\Software\dotnetfx.exe and click OK Select 'I have read and accept the terms of the License Agreement' Click Install

	<ul style="list-style-type: none"> e. Click on the icon in the task bar to review the installation as it proceeds f. Once the installation completes click Exit g. From the Start Menu, click on Run h. Fill in %windir%\Microsoft.NET\Framework\v2.0.50727\aspnet_regiis -i -enable and click OK
<p>Configure SQL Express 2005 for Server Farm installation</p>	<ul style="list-style-type: none"> a. From the Start Menu, in the Programs, click on Microsoft SQL Server 2005→Configuration Tools→SQL Server Surface Area Configuration b. Click on Surface Area Configuration for Services and Connections c. Click on Stop d. In the left hand pane, under Database Engine, click on Remote Connections e. Select Local and Remote Connections f. Select Using both TCP/IP and named pipes g. Click Apply h. Click OK i. In the left hand pane, under Database Engine, click on Service j. Click Start k. Click OK l. Close SQL Server Surface Area Configuration
<p>Install Microsoft Office SharePoint Server 2007</p>	<ul style="list-style-type: none"> a. From the Start Menu, click on Run b. Fill in \\london\software\moss2007\setup.exe and click OK c. Fill in your Microsoft Office SharePoint Server 2007 Product Key – your instructor will provide this d. Click Continue e. Check I Accept the Terms on this Agreement f. Click Continue g. Click Advanced h. Click Complete i. Click Install Now j. Once the installation completes, click Close
<p>Create the new Server Farm</p>	<ul style="list-style-type: none"> a. In the SharePoint Products and Technologies Wizard, click Next b. Click Yes in the service warning window c. Check No – I want to create a new server farm d. Click Next e. Fill in STUDENTXX\SQLEXPRESS as the database server name, where XX is your student number f. Change the database name to FarmXX_Config, where XX is your student number g. Fill in COMPANY\SPFarmXX as the username, where XX is your student number

	<ul style="list-style-type: none">h. Fill in P@ssw0rd as the passwordi. Click Nextj. Check Specify Portk. Fill in 10240 as the port numberl. Click Nextm. Review the settings for the new farm and click Nextn. Click Finisho. The SharePoint Central Administration website will open upp. Close the SharePoint Central Administration site
--	--

Module 1 Follow Up

In this module, you have learned about the architecture of both Windows SharePoint Services 3.0 and Microsoft Office SharePoint Server 2007, about recommended topologies for deployment based on scale, about installation requirements and about how to install Microsoft Office SharePoint 2007 both manually and through the use of a deployment script.

1. What are the logical units of SharePoint architecture ?

The Server Farm, The Web Application, The Site Collection and The Site.

2. What are the physical units of SharePoint architecture ?

The database server, the application server and the web front end server.

3. For the best performance, what database server should you use with SharePoint 2007 ?

SQL Server 2005.

4. What privilege level does the server farm account need on the domain ?

Domain User.

5. Describe the topology you would use for a server farm that would be supporting 500-1000 users?

Database would be on its own server, application services would be on its own server handling indexing and excel calculation services, and the web front end servers would be a cluster of three machines servicing content and search queries.

This document contains CourseDiscovery LLC trade secrets, and is intended solely for use by CourseDiscovery LLC customers. Any unauthorized distribution, modification or reproduction is strictly prohibited. All recipients of this document agree that the information contained herein is of a confidential nature and will treat it as such; they will not directly or indirectly disclose or permit their agents or affiliates to disclose information without written consent from CourseDiscovery LLC.

This document is provided for informational purposes only and does not represent a commitment on the part of CourseDiscovery LLC. The information in this document is subject to change without notice.