Microsoft®

6437A

Designing a Windows Server 2008 Applications Infrastructure

Companion Content

MICROSOFT LICENSE TERMS

OFFICIAL MICROSOFT LEARNING PRODUCTS COURSEWARE – STUDENT EDITION – Pre-Release and Final Versions

These license terms are an agreement between Microsoft Corporation and you. Please read them. They apply to the licensed content named above, which includes the media on which you received it, if any. The terms also apply to any Microsoft

- updates,
- supplements,
- Internet-based services, and
- support services

for this licensed content, unless other terms accompany those items. If so, those terms apply.

By using the licensed content, you accept these terms. If you do not accept them, do not use the licensed content.

If you comply with these license terms, you have the rights below.

1. **OVERVIEW.**

   Licensed Content. The licensed content includes software, printed materials, academic materials (online and electronic), and associated media.

   License Model. The licensed content is licensed on a per copy per device basis.

2. **INSTALLATION AND USE RIGHTS.**

   a. **Licensed Device.** The licensed device is the device on which you use the licensed content. You may install and use one copy of the licensed content on the licensed device.

   b. **Portable Device.** You may install another copy on a portable device for use by the single primary user of the licensed device.

   c. **Separation of Components.** The components of the licensed content are licensed as a single unit. You may not separate the components and install them on different devices.

   d. **Third Party Programs.** The licensed content may contain third party programs. These license terms will apply to your use of those third party programs, unless other terms accompany those programs.

3. **PRE-RELEASE VERSIONS.** If the licensed content is a pre-release ("beta") version, in addition to the other provisions in this agreement, then these terms also apply:

   a. **Pre-Release Licensed Content.** This licensed content is a pre-release version. It may not contain the same information and/or work the way a final version of the licensed content will. We may change it for the final, commercial version. We also may not release a commercial version. You will clearly and conspicuously inform any Students who participate in an Authorized Training Session and any Trainers who provide training in such Authorized Training Sessions of the foregoing; and, that you or Microsoft are under no obligation to provide them with any further content, including but not limited to the final released version of the Licensed Content for the Course.

   b. **Feedback.** If you agree to give feedback about the licensed content to Microsoft, you give to Microsoft, without charge, the right to use, share and commercialize your feedback in any way and for any purpose. You also give to third parties, without charge, any patent rights needed for their products, technologies and services to use or interface with any specific parts of a Microsoft software, licensed content, or service that includes the feedback. You will not give feedback that is subject to a license that requires Microsoft to license its software or documentation to third parties because we include your feedback in them. These rights survive this agreement.

   c. **Confidential Information.** The licensed content, including any viewer, user interface, features and documentation that may be included with the licensed content, is confidential and proprietary to Microsoft and its suppliers.

      i. **Use.** For five years after installation of the licensed content or its commercial release, whichever is first, you may not disclose confidential information to third parties. You may disclose confidential information only to your employees and consultants who need to know the information. You must have written agreements with them that protect the confidential information at least as much as this agreement.

      ii. **Survival.** Your duty to protect confidential information survives this agreement.

iii. **Exclusions.** You may disclose confidential information in response to a judicial or governmental order. You must first give written notice to Microsoft to allow it to seek a protective order or otherwise protect the information. Confidential information does not include information that

- becomes publicly known through no wrongful act;

- you received from a third party who did not breach confidentiality obligations to Microsoft or its suppliers; or

- you developed independently.

d. **Term.** The term of this agreement for pre-release versions is (i) the date which Microsoft informs you is the end date for using the beta version, or (ii) the commercial release of the final release version of the licensed content, whichever is first ("beta term").

e. **Use.** You will cease using all copies of the beta version upon expiration or termination of the beta term, and will destroy all copies of same in the possession or under your control.

f. **Copies.** Microsoft will inform Authorized Learning Centers if they may make copies of the beta version (in either print and/or CD version) and distribute such copies to Students and/or Trainers. If Microsoft allows to such distribution, you will follow any additional terms that Microsoft provides to you for such copies and distribution.

4. **ADDITIONAL LICENSING REQUIREMENTS AND/OR USE RIGHTS.**

   a. **Media Elements and Templates.** You may use images, clip art, animations, sounds, music, shapes, video clips and templates provided with the licensed content solely for your personal training use. If you wish to use these media elements or templates for any other purpose, go to www.microsoft.com/permission to learn whether that use is allowed.

   b. **Academic Materials.** If the licensed content contains academic materials (such as white papers, labs, tests, datasheets and FAQs), you may copy and use the academic materials. You may not make any modifications to the academic materials and you may not print any book (either electronic or print version) in its entirety. If you reproduce any academic materials, you agree that:

   - The use of the academic materials will be only for your personal reference or training use

   - You will not republish or post the academic materials on any network computer or broadcast in any media;

   - You will include the academic material's original copyright notice, or a copyright notice to Microsoft's benefit in the format provided below:

     Form of Notice:

     © 2008 Reprinted for personal reference use only with permission by Microsoft Corporation. All rights reserved.

     Microsoft and Windows are either registered trademarks or trademarks of Microsoft Corporation in the US and/or other countries. Other product and company names mentioned herein may be the trademarks of their respective owners.

   c. **Distributable Code.** The licensed content may contain code that you are permitted to distribute in programs you develop if you comply with the terms below.

      i. **Right to Use and Distribute.** The code and text files listed below are "Distributable Code."

      - REDIST.TXT Files. You may copy and distribute the object code form of code listed in REDIST.TXT files.

      - Sample Code. You may modify, copy, and distribute the source and object code form of code marked as "sample."

      - Third Party Distribution. You may permit distributors of your programs to copy and distribute the Distributable Code as part of those programs.

      ii. **Distribution Requirements.** For any Distributable Code you distribute, you must

      - add significant primary functionality to it in your programs;

      - require distributors and external end users to agree to terms that protect it at least as much as this agreement;

      - display your valid copyright notice on your programs; and

      - indemnify, defend, and hold harmless Microsoft from any claims, including attorneys' fees, related to the distribution or use of your programs.

    iii. Distribution Restrictions. You may not

- alter any copyright, trademark or patent notice in the Distributable Code;

- use Microsoft's trademarks in your programs' names or in a way that suggests your programs come from or are endorsed by Microsoft;

- distribute Distributable Code to run on a platform other than the Windows platform;

- include Distributable Code in malicious, deceptive or unlawful programs; or

- modify or distribute the source code of any Distributable Code so that any part of it becomes subject to an Excluded License. An Excluded License is one that requires, as a condition of use, modification or distribution, that

  - the code be disclosed or distributed in source code form; or

  - others have the right to modify it.

5. **INTERNET-BASED SERVICES.** Microsoft may provide Internet-based services with the licensed content. It may change or cancel them at any time. You may not use these services in any way that could harm them or impair anyone else's use of them. You may not use the services to try to gain unauthorized access to any service, data, account or network by any means.

6. **SCOPE OF LICENSE.** The licensed content is licensed, not sold. This agreement only gives you some rights to use the licensed content. Microsoft reserves all other rights. Unless applicable law gives you more rights despite this limitation, you may use the licensed content only as expressly permitted in this agreement. In doing so, you must comply with any technical limitations in the licensed content that only allow you to use it in certain ways. You may not

- disclose the results of any benchmark tests of the licensed content to any third party without Microsoft's prior written approval;

- work around any technical limitations in the licensed content;

- reverse engineer, decompile or disassemble the licensed content, except and only to the extent that applicable law expressly permits, despite this limitation;

- make more copies of the licensed content than specified in this agreement or allowed by applicable law, despite this limitation;

- publish the licensed content for others to copy;

- transfer the licensed content marked as 'beta' or 'pre-release' to any third party;

- allow others to access or use the licensed content;

- rent, lease or lend the licensed content; or

- use the licensed content for commercial licensed content hosting services.

- Rights to access the server software that may be included with the Licensed Content, including the Virtual Hard Disks does not give you any right to implement Microsoft patents or other Microsoft intellectual property in software or devices that may access the server.

7. **BACKUP COPY.** You may make one backup copy of the licensed content. You may use it only to reinstall the licensed content.

8. **TRANSFER TO ANOTHER DEVICE.** You may uninstall the licensed content and install it on another device for your personal training use. You may not do so to share this license between devices.

9. **TRANSFER TO A THIRD PARTY.** You may not transfer those versions marked as 'beta' or 'pre-release' to a third party. For final versions, these terms apply: The first user of the licensed content may transfer it and this agreement directly to a third party. Before the transfer, that party must agree that this agreement applies to the transfer and use of the licensed content. The first user must uninstall the licensed content before transferring it separately from the device. The first user may not retain any copies.

10. **EXPORT RESTRICTIONS.** The licensed content is subject to United States export laws and regulations. You must comply with all domestic and international export laws and regulations that apply to the licensed content. These laws include restrictions on destinations, end users and end use. For additional information, see www.microsoft.com/exporting.

11. **NOT FOR RESALE SOFTWARE/LICENSED CONTENT.** You may not sell software or licensed content marked as "NFR" or "Not for Resale."

12. **ACADEMIC EDITION.** You must be a "Qualified Educational User" to use licensed content marked as "Academic Edition" or "AE." If you do not know whether you are a Qualified Educational User, visit www.microsoft.com/education or contact the Microsoft affiliate serving your country.

13. **ENTIRE AGREEMENT.** This agreement, and the terms for supplements, updates, Internet-based services and support services that you use, are the entire agreement for the licensed content and support services.

14. **APPLICABLE LAW.**

    a. **United States.** If you acquired the licensed content in the United States, Washington state law governs the interpretation of this agreement and applies to claims for breach of it, regardless of conflict of laws principles. The laws of the state where you live govern all other claims, including claims under state consumer protection laws, unfair competition laws, and in tort.

    b. **Outside the United States.** If you acquired the licensed content in any other country, the laws of that country apply.

15. **LEGAL EFFECT.** This agreement describes certain legal rights. You may have other rights under the laws of your country. You may also have rights with respect to the party from whom you acquired the licensed content. This agreement does not change your rights under the laws of your country if the laws of your country do not permit it to do so.

16. **DISCLAIMER OF WARRANTY. THE LICENSED CONTENT IS LICENSED "AS-IS." YOU BEAR THE RISK OF USING IT. MICROSOFT GIVES NO EXPRESS WARRANTIES, GUARANTEES OR CONDITIONS. YOU MAY HAVE ADDITIONAL CONSUMER RIGHTS UNDER YOUR LOCAL LAWS WHICH THIS AGREEMENT CANNOT CHANGE. TO THE EXTENT PERMITTED UNDER YOUR LOCAL LAWS, MICROSOFT EXCLUDES THE IMPLIED WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NON-INFRINGEMENT.**

17. **LIMITATION ON AND EXCLUSION OF REMEDIES AND DAMAGES. YOU CAN RECOVER FROM MICROSOFT AND ITS SUPPLIERS ONLY DIRECT DAMAGES UP TO U.S. $5.00. YOU CANNOT RECOVER ANY OTHER DAMAGES, INCLUDING CONSEQUENTIAL, LOST PROFITS, SPECIAL, INDIRECT OR INCIDENTAL DAMAGES.**

    This limitation applies to

    - anything related to the licensed content, software, services, content (including code) on third party Internet sites, or third party programs; and
    - claims for breach of contract, breach of warranty, guarantee or condition, strict liability, negligence, or other tort to the extent permitted by applicable law.

    It also applies even if Microsoft knew or should have known about the possibility of the damages. The above limitation or exclusion may not apply to you because your country may not allow the exclusion or limitation of incidental, consequential or other damages.

Please note: As this licensed content is distributed in Quebec, Canada, some of the clauses in this agreement are provided below in French.

Remarque : Ce le contenu sous licence étant distribué au Québec, Canada, certaines des clauses dans ce contrat sont fournies ci-dessous en français.

EXONÉRATION DE GARANTIE. Le contenu sous licence visé par une licence est offert « tel quel ». Toute utilisation de ce contenu sous licence est à votre seule risque et péril. Microsoft n'accorde aucune autre garantie expresse. Vous pouvez bénéficier de droits additionnels en vertu du droit local sur la protection dues consommateurs, que ce contrat ne peut modifier. La ou elles sont permises par le droit locale, les garanties implicites de qualité marchande, d'adéquation à un usage particulier et d'absence de contrefaçon sont exclues.

LIMITATION DES DOMMAGES-INTÉRÊTS ET EXCLUSION DE RESPONSABILITÉ POUR LES DOMMAGES. Vous pouvez obtenir de Microsoft et de ses fournisseurs une indemnisation en cas de dommages directs uniquement à hauteur de 5,00 $ US. Vous ne pouvez prétendre à aucune indemnisation pour les autres dommages, y compris les dommages spéciaux, indirects ou accessoires et pertes de bénéfices.

Cette limitation concerne:

- tout ce qui est relié au le contenu sous licence , aux services ou au contenu (y compris le code) figurant sur des sites Internet tiers ou dans des programmes tiers ; et
- les réclamations au titre de violation de contrat ou de garantie, ou au titre de responsabilité stricte, de négligence ou d'une autre faute dans la limite autorisée par la loi en vigueur.

Elle s'applique également, même si Microsoft connaissait ou devrait connaître l'éventualité d'un tel dommage. Si votre pays n'autorise pas l'exclusion ou la limitation de responsabilité pour les dommages indirects, accessoires ou de quelque nature que ce soit, il se peut que la limitation ou l'exclusion ci-dessus ne s'appliquera pas à votre égard.

EFFET JURIDIQUE. Le présent contrat décrit certains droits juridiques. Vous pourriez avoir d'autres droits prévus par les lois de votre pays. Le présent contrat ne modifie pas les droits que vous confèrent les lois de votre pays si celles-ci ne le permettent pas.

Module 1

Designing IIS Web Farms

Contents:

Lab Answer Keys

Designing IIS Web Farms

Exercise 1: Design Hardware Platform

Scenario #1

You are the Enterprise Administrator for a publishing company. Your company has a website currently running on a single 32 bit server. A new version of the website written in asp.net 2.0 has been released and the number of customers and traffic on the website is rapidly increasing. Your company wants to capitalize on the popularity of the website and market it to a broader audience and add additional functionality to drive more sales.

The end user performance on the website has been declining as traffic has increased. Additionally there are frequent spikes in CPU utilization that occur in conjunction with application pool recycling.

You've been asked to design a web server infrastructure that will support 100 times the current traffic and provide high availability during planned and unplanned server outages and provide data center redundancy.

Scenario #2

Existing web farm supporting single website is going to be expanded to include an additional 2 major websites. The amount of traffic is expected to triple with the addition of these websites. Each website is expected to have large seasonal traffic spikes at different times of the year.

The main tasks for this exercise are as follows:

1.   Review hardware options and design hardware platform

Task 1: Review hardware options and design hardware platform

- Select 64 bit platform

> **Results:** After this exercise, you should have reviewed hardware options and platform and selected 64 bit platform.

Exercise 2: Design Web Farm Availability and Scalability

Scenario #1

You are the Enterprise Administrator for a publishing company. Your company has a website currently running on a single 32 bit server. A new version of the website written in asp.net 2.0 has been released and the number of customers and traffic on the website is rapidly increasing. Your company wants to capitalize on the popularity of the website and market it to a broader audience and add additional functionality to drive more sales.

The end user performance on the website has been declining as traffic has increased. Additionally there are frequent spikes in CPU utilization that occur in conjunction with application pool recycling.

You've been asked to design a web server infrastructure that will support 100 times the current traffic and provide high availability during planned and unplanned server outages and provide data center redundancy.

Scenario #2

Existing web farm supporting single website is going to be expanded to include an additional 2 major websites. The amount of traffic is expected to triple with the addition of these websites. Each website is expected to have large seasonal traffic spikes at different times of the year.

The main tasks for this exercise are as follows:

1. Create a design document consisting of multiple web farms.

Task 1: Create a design document consisting of multiple web farms.

*   Create a conceptual design diagram consisting of multiple web farms.

*   Evaluate Need for Web Farm

*   Design Load Balancing

> **Results:** After this exercise, you should have created a design diagram consisting of multiple web farms. Evaluated Need for Web Farm and Planned Load Balancing.

Exercise 3: Design Web Site Availability and Scalability

Scenario #1

You are the Enterprise Administrator for a publishing company. Your company has a website currently running on a single 32 bit server. A new version of the website written in asp.net 2.0 has been released and the number of customers and traffic on the website is rapidly increasing. Your company wants to capitalize on the popularity of the website and market it to a broader audience and add additional functionality to drive more sales.

The end user performance on the website has been declining as traffic has increased. Additionally there are frequent spikes in CPU utilization that occur in conjunction with application pool recycling.

You've been asked to design a web server infrastructure that will support 100 times the current traffic and provide high availability during planned and unplanned server outages and provide data center redundancy.

Scenario #2

Existing web farm supporting single website is going to be expanded to include an additional 2 major websites. The amount of traffic is expected to triple with the addition of these websites. Each website is expected to have large seasonal traffic spikes at different times of the year.

The main tasks for this exercise are as follows:

1. Create a design document consisting of multiple web farms with all websites hosted on each server.

Task 1: Create a design document consisting of multiple web farms with all websites hosted on each server.

*   Create a conceptual design diagram consisting of multiple web farms with all websites hosted on every server.

> **Results:** After this exercise, you should have created a design diagram consisting of multiple web farms. Evaluated Need for Web Farm and Planned Load Balancing.

Exercise 4: Design Website Configuration, Deployment and Consistency

Scenario #1

You are the Enterprise Administrator for a publishing company. Your company has a website currently running on a single 32 bit server. A new version of the website written in asp.net 2.0 has been released and the number of customers and traffic on the website is rapidly increasing. Your company wants to capitalize on the popularity of the website and market it to a broader audience and add additional functionality to drive more sales.

The end user performance on the website has been declining as traffic has increased. Additionally there are frequent spikes in CPU utilization that occur in conjunction with application pool recycling.

You've been asked to design a web server infrastructure that will support 100 times the current traffic and provide high availability during planned and unplanned server outages and provide data center redundancy.

Scenario #2

Existing web farm supporting single website is going to be expanded to include an additional 2 major websites. The amount of traffic is expected to triple with the addition of these websites. Each website is expected to have large seasonal traffic spikes at different times of the year.

The main tasks for this exercise are as follows:

1. Plan to automatically deploy website configuration using Xcopy deployment.

Task 1: Plan to automatically deploy website configuration using Xcopy deployment.

*   Design batch files using the new Xcopy command to plan automatic deployment of website configuration to Windows Server 2008 with IIS installed.

> **Results:** After this exercise, you should have planned to automatically deploy website configuration using batch files and Xcopy deployment.

Exercise 5: Design Website Content, Deployment and Consistency

Scenario #1

You are the Enterprise Administrator for a publishing company. Your company has a website currently running on a single 32 bit server. A new version of the website written in asp.net 2.0 has been released and the number of customers and traffic on the website is rapidly increasing. Your company wants to capitalize on the popularity of the website and market it to a broader audience and add additional functionality to drive more sales.

The end user performance on the website has been declining as traffic has increased. Additionally there are frequent spikes in CPU utilization that occur in conjunction with application pool recycling.

You've been asked to design a web server infrastructure that will support 100 times the current traffic and provide high availability during planned and unplanned server outages and provide data center redundancy.

Scenario #2

Existing web farm supporting single website is going to be expanded to include an additional 2 major websites. The amount of traffic is expected to triple with the addition of these websites. Each website is expected to have large seasonal traffic spikes at different times of the year.

The main tasks for this exercise are as follows:

1.   Plan to automatically deploy website content using Xcopy deployment.

Task 1: Plan to automatically deploy website content using Xcopy deployment.

- Design batch files using the new Xcopy command to plan automatic deployment of website content to Windows Server 2008 with IIS installed.

> **Results:** After this exercise, you should have planned to automatically deploy website content using batch files and Xcopy deployment.

Module 2

Optimizing IIS Performance and Stability

Contents:

Lab Answer Keys

Lab: Optimizing IIS Performance and Stability

Exercise 1: (Level 300) Design and Test Application Pools

Scenario

You are the Enterprise Administrator for a publishing company. Your company has multiple websites running on web farms spread across two data centers. All web servers are identical in configuration and content, hosting all websites.

The website applications consist of two written in asp.net 1.0, four written in asp.net 1.1 and two written in asp.net 2.0. Two of the asp.net 1.1 applications are maintained by an outside organization. These two applications are frequently updated and have been known to experience memory leaks from time to time (appropriate application pool separation).

You want to prevent large amounts of activity on any single website from seriously degrading the performance of other websites (using both bandwidth throttling and Windows System Resource Manager – the vendor should provide a table showing what the allocated bandwidth should be per application). There is a different group of website administrators for each site. They are responsible for continuous monitoring and website updates.

Sites	Application	Comments
2	ASP.net 1.0	Each site is monitored by a different group of administrators.
4	ASP.net 1.1	2 of these sites are maintained by an outside organization. Frequently updated and known to leak memory from time to time. Each site is monitored by a different group of administrators.
2	ASP.net 2.0	Each site is monitored by a different group of administrators.

The main tasks for this exercise are as follows:

1. Identify the necessary Application Pools to create.

2. Design auto deployment of Application Pools created

Task 1: Identify Application Pools

- Create the Application Pool and setting for ASP.NET 1.0 applications

- Create the Application Pool and settings for ASP.net 1.1 applications

- Create the Application Pool and settings for ASP.net 2.0 applications

- Create Application Pool and settings for ASP.net 1.1 Misbehaving applications.

Task 2: Design Deployment of Application Pools

- Create scripts to deploy App Pools and settings for each application pool create in Task 1.

> **Results:** After this exercise, you should have created a drawing showing application isolation and a document describing automatically deploying application isolation solution. Provide the results of the exercise so students will know when and if they have completed the lab exercise successfully.

Exercise 2: (Level 300) Design and Test Script Maps

Scenario

You are the Enterprise Administrator for a publishing company. Your company has multiple websites running on web farms spread across two data centers. All web servers are identical in configuration and content, hosting all websites.

The website applications consist of two written in asp.net 1.0, four written in asp.net 1.1 and two written in asp.net 2.0. Two of the asp.net 1.1 applications are maintained by an outside organization. These two applications are frequently updated and have been known to experience memory leaks from time to time (appropriate application pool separation).

You want to prevent large amounts of activity on any single website from seriously degrading the performance of other websites (using both bandwidth throttling and Windows System Resource Manager – the vendor should provide a table showing what the allocated bandwidth should be per application). There is a different group of website administrators for each site. They are responsible for continuous monitoring and website updates. Provide a description of the scenario here in normal text. The lab scenario is a fictitious business case and is specified in the CDS.

The main tasks for this exercise are as follows:

1. Identify the necessary script mappings for each type of application.

2. Design automatic deployment of script mappings.

Task 1: Identify Script Mappings

- Identify script mappings for each application file type.

Task 2: Design Auto Deployment of Script Mappings

- Create scripts to automatically deploy Script Mappings for each file type.

> **Results:** After this exercise, you should have created a design document identifying script mappings as well as a document with plans for auto deployment of script mappings. Provide the results of the exercise so students will know when and if they have completed the lab exercise successfully.

Exercise 3: (Level 250) Design and Test Bandwidth Allocation

Scenario

Provide a description of the scenario here in normal text. The lab scenario is a fictitious business case and is specified in the CDS.

You are the Enterprise Administrator for a publishing company. Your company has multiple websites running on web farms spread across two data centers. All web servers are identical in configuration and content, hosting all websites.

The website applications consist of two written in asp.net 1.0, four written in asp.net 1.1 and two written in asp.net 2.0. Two of the asp.net 1.1 applications are maintained by an outside organization. These two applications are frequently updated and have been known to experience memory leaks from time to time (appropriate application pool separation).

You want to prevent large amounts of activity on any single website from seriously degrading the performance of other websites (using both bandwidth throttling and Windows System Resource Manager – the vendor should provide a table showing what the allocated bandwidth should be per application). There is a different group of website administrators for each site. They are responsible for continuous monitoring and website updates.

The main tasks for this exercise are as follows:

- Identify the necessary bandwidth allocation for each application.

- Design automatic deployment of bandwidth allocation.

Task 1: Identify Bandwidth Allocation
- Identify bandwidth allocation per application.

Task 2: Design Auto Deployment of Bandwidth Allocation
- Create scripts to automatically deploy bandwidth allocation for each file application.

> **Results:** After this exercise, you should have created a design document identifying bandwidth allocation per application as well as a document with plans for auto deployment of bandwidth allocation. Provide the results of the exercise so students will know when and if they have completed the lab exercise successfully.

Exercise 4: (Level 250) Design and Test Website Logging

Scenario

You are the Enterprise Administrator for a publishing company. Your company has multiple websites running on web farms spread across two data centers. All web servers are identical in configuration and content, hosting all websites.

The website applications consist of two written in asp.net 1.0, four written in asp.net 1.1 and two written in asp.net 2.0. Two of the asp.net 1.1 applications are maintained by an outside organization. These two applications are frequently updated and have been known to experience memory leaks from time to time (appropriate application pool separation).

You want to prevent large amounts of activity on any single website from seriously degrading the performance of other websites (using both bandwidth throttling and Windows System Resource Manager – the vendor should provide a table showing what the allocated bandwidth should be per application). There is a different group of website administrators for each site. They are responsible for continuous monitoring and website updates.

You want to prevent large amounts of activity on any single website from seriously degrading the performance of other websites (using both bandwidth throttling and Windows System Resource Manager – the vendor should provide a table showing what the allocated bandwidth should be per application). There is a different group of website administrators for each site. They are responsible for continuous monitoring and website updates. Provide a description of the scenario here in normal text. The lab scenario is a fictitious business case and is specified in the CDS.

The main tasks for this exercise are as follows:

1. Identify the necessary bandwidth allocation for each application.

2. Design automatic deployment of bandwidth allocation.

Task 1: Identify Logging Options

- Identify logging options for each Web site.

Task 2: Design Auto Deployment of Logging Options

- Create scripts to automatically deploy logging options for each Web site

> **Results:** After this exercise, you should have created a design document identifying logging structure as well as a document with plans for auto deployment of logging structure and fields. Provide the results of the exercise so students will know when and if they have completed the lab exercise successfully.

Module 3

Designing IIS Security

Contents:

Lab Answer Keys

Lab: Designing IIS Security

Exercise 1: (Level 200) Design and Verify Transport Security

Scenario

You are the Enterprise Administrator for a publishing company. Your company has multiple websites running on web farms spread across two data centers. All web servers are identical in configuration and content, hosting all websites.

Website #1 is a commerce application where public users can purchase books. Users of this website create a login profile that is stored in a SQL Server database. Payment transactions occur using credit cards (SSL) and those transactions must be secured. Website #2 is a subscription industry research service where registered users can download materials with non-disclosure restrictions. Those materials are highly sensitive (certificate based client authentication should be required). A subset of the registered users regularly publish materials to the site.

There is a group of IIS administrators who are responsible for site performance and availability. There is a different group of website administrators for each site. They are responsible for website activity monitoring and website updates. You want to prevent administrators from making any changes to websites other than the one they are responsible for.

The main tasks for this exercise are as follows:

1. Design auto deployment of SSL Certificates.

2. Redirect websites for SSL.

Task 1: Design Auto Deployment of SSL Certificates

- Create scripts to deploy SSL Certificates to websites.

Task 2: Redirect Websites for SSL

- Plan to redirect websites to use SSL

- Verify redirection of websites to port 443

> **Results:** After this exercise, you should have a drawing showing a conceptual design of your plan to deploy and redirect SSL Transport.

Exercise 2: (Level 200) Design and Verify Authentication and Authorization Methods

Scenario

You are the Enterprise Administrator for a publishing company. Your company has multiple websites running on web farms spread across two data centers. All web servers are identical in configuration and content, hosting all websites.

Website #1 is a commerce application where public users can purchase books. Users of this website create a login profile that is stored in a SQL Server database. Payment transactions occur using credit cards (SSL) and those transactions must be secured. Website #2 is a subscription industry research service where

registered users can download materials with non-disclosure restrictions. Those materials are highly sensitive (certificate based client authentication should be required). A subset of the registered users regularly publish materials to the site.

There is a group of IIS administrators who are responsible for site performance and availability. There is a different group of website administrators for each site. They are responsible for website activity monitoring and website updates. You want to prevent administrators from making any changes to websites other than the one they are responsible for.

The main tasks for this exercise are as follows:

1. Plan to deploy Client SSL Certificate

2. Plan Access for Site #1

3. Plan Access for Site #2

Task 1: Plan to Deploy Client SSL Certificate

- Plan deployment of Client SSL Certificate

Task 2: Plan Access for Site #1

- Verify forms-based authentication is enabled for site #1 in web.config file.

Task 3: Plan Access for Site #2

- Plan user account for authentication

- Map client certificate to user account created

- Redirect requests to SSL

- Verify redirection and access to site.

> **Results:** After this exercise, you should have a drawing showing a conceptual design of your plan to deploy certificate based authentication for site #2 and initial anonymous access to site #1.

Exercise 3: (Level 250) Design and Verify Delegation Administration

Scenario

You are the Enterprise Administrator for a publishing company. Your company has multiple websites running on web farms spread across two data centers. All web servers are identical in configuration and content, hosting all websites.

Website #1 is a commerce application where public users can purchase books. Users of this website create a login profile that is stored in a SQL Server database. Payment transactions occur using credit cards (SSL) and those transactions must be secured. Website #2 is a subscription industry research service where registered users can download materials with non-disclosure restrictions. Those materials are highly sensitive (certificate based client authentication should be required). A subset of the registered users regularly publish materials to the site.

There is a group of IIS administrators who are responsible for site performance and availability. There is a different group of website administrators for each site. They are responsible for website activity

monitoring and website updates. You want to prevent administrators from making any changes to websites other than the one they are responsible for.

The main tasks for this exercise are as follows:

1. Plan Administrative Groups

2. Plan Permissions

Task 1: Plan Administrative Groups

- Plan administrative groups and global groups for IIS Administrators for website # 1 and 2 on the domain controller.

Task 2: Plan Permissions

- Design updated web.config files with administrative access permissions on web server.

> **Results:** After this exercise, you should have a conceptual document for web server and web site administration.

Module 4
Design IIS Maintenance and UDDI

Contents:

Module 4

Lab Answer Keys

Lab: Design IIS Maintenance and UDDI

Exercise 1: Design a Web Server Backup and Recovery Strategy

Scenario

Contoso has asked you to design and implement a web farm infrastructure for a distributed web farm based on service level agreements. It will include a backup and recovery plan. Each site will have a three node web farm, a SQL database, and SAN storage for the website content.

In this exercise you will identify what servers need to be deployed to two different sites, New York and London, to create a distributed web farm for an e-commerce site. The two web farms will run the same website and web application. They are connected through a dedicated WAN link.

All servers will be a member of the same Active Directory domain. Domain controllers already exist at both sites. The web farm servers will share identical configuration and content. The administrators at New York will be responsible for all management and updating. You will also identify what services and applications to install. Then, design a backup plan for both content and configuration information.

There are no legacy or SMTP applications, so no metabase will be necessary.

The main tasks for this exercise are as follows:

1. Specify the servers and storage at New York and London.

2. Create a backup strategy.

3. Design a recovery process.

Task 1: Specify the servers and storage at New York and London
- List the servers necessary to provide the service. For each device, list the services and applications required.

- The content and SQL database need to be highly available, so include a SAN installation at both sites.

- Determine how to best replicate configuration and content between the two sites.

Task 2: Specify a backup strategy
- Now, prepare the two sites for disaster recovery. What items need to be backed up?

- The organization would like to be able to recover either site completely should the entire location be lost. Prepare a backup scheme that would allow for either site to be restored completely.

Task 3: Design a recovery process
- One of the London servers has been compromised by a hacker. Create a process to restore the web farm member to its proper configuration.

- Create a process to follow should the London site need to be completely recovered from bare metal servers.

> **Results:** After this exercise, you should have architected the London and New York sites. Each site will contain three web farm members, a SAN, and a SQL server. The SAN will contain SQL data, content data, and a shared applicationhost.config. The data will replicate across a WAN link from New York to London. You will also have created a backup strategy for the SAN including off-site storage. Finally, you will have created a step-by step process for rebuilding a site in the case of a disaster.

Exercise 2: Design and test web server monitoring

Scenario

In this exercise we will identify how to monitor our new web farm. Contoso wants to be able to collect real time and historical data on the web service performance. In addition, they would like to be notified of problems such as application pool cycling, excessive requests, and, non-functioning servers.

The main tasks for this exercise are as follows:

1. Identify what System Center Management Packs Contoso needs to deploy to monitor the web services.

2. Create a deployment plan for monitoring the web services with System Center Operations Manager.

Task 1: Implementing a monitoring scheme

- List those network elements which the web farm relies upon.

- Identify management packs which should be deployed to monitor these items.

- Discuss what items could be included in a management console customized for web administrators.

- Along with server to server connectivity, It will be important that firewalls, storage, and Active Directory is available. Management packs for each of these items should be deployed and included in the management console.

Task 2: Create a deployment plan

- All management of the web farm is primarily performed by the New York administrators. However, the organization would like to be able to monitor each site should the link between the two fail.

- Create a plan to deploy System Center Operations Manager to monitor the web farm. Include server locations, management packs, and management consoles.

> **Results**: After this exercise, you should have listed the management packs that will be necessary for thorough monitoring of the web farm and created a plan for the deployment of Operations Manager.

Exercise 3: Design UDDI Deployment

Scenario

Contoso has been asked by some business partners if they utilize UDDI for service location. In addition, Contoso developers feel that they could benefit from the ability to locate existing services before they create new, overlapping ones.

We have decided to deploy UDDI that has both an internet facing and internal. For testing purposes, create a second, smaller UDDI service. Deploy the enterprise UDDI service on the existing web farm.

The main tasks for this exercise are as follows:

1. Identify changes to the infrastructure that will be necessary to deploy UDDI.

2. Create a deployment plan for a new UDDI infrastructure.

Task 1: Identify changes to the infrastructure for UDDI

- You have been tasked with managing the hardware and infrastructure deployment for UDDI at Contoso. Identify what services need to be deployed or changed.

- For the two UDDI services (testing and enterprise), list the security groups and place the following roles in the appropriate place:

- Domain Users

- Authorized user on web server

- Developers

- UDDI developer

- Network Administrator

- One stand alone UDDI can serve as the testing UDDI. It can be internal to the network with no access to the internet. The UDDI service can be deployed on the existing web farm.

Security Group	Testing Server Role	Testing Server Role
Domain Users	None	User
Authorized Web users	None	User
Developers	Publisher (can be user for greater control)	Coordinator
UDDI Developer	Coordinator	Coordinator
Network Administrator	Administrator	Administrator

Task 2: Create a deployment plan

- Create a plan to deploy both UDDI services in the enterprise. Identify security, network, and process changes.

- Develop a process for testing, approving, and migrating UDDI objects to the enterprise UDDI service.

> **Results**: After this exercise you will have developed a UDDI deployment plan that accounts for security, infrastructure, and process.

Exercise 4: Troubleshooting application pool instability

Scenario

A year later, a new web farm location is added in Paris. It was created using older repurposed servers. These servers have two processors on 32 bit hardware. Now, the web farms all contain 4 ASP.NET. applications.

Although the New York and London sites are functioning as normal, the Paris site is frequently non-responsive due to reaching virtual memory thresholds.

The local technical specialist configured automatic recycling to occur at a 2 GB threshold on the Paris web servers. This has increased the availability of the sites, but server performance is suffering because the application pool is frequently automatically recycling.

The main tasks for this exercise are as follows:

1. Identify and resolve the application pool problem at the Paris site.

Task 1: Identify and resolve the application pool problem.

- The New York and London sites are running identical applications to the Paris site and experiencing no problems. As a result, we can conclude that the applications do not have any memory leaks or other flaws.

- Although the Paris site was originally built with repurposed hardware, the problem is such that the organization needs to resolve the problem and is willing to invest in a solution.

- Create a plan to resolve the application pool issue on the Paris web farm.

- The applications and server load require the expanded memory thresholds of 64 bit hardware. Replace the older hardware in the Paris web farm with 64 bit servers.

> **Results**: After this exercise you will have identified the problem with the Paris servers and created a plan for resolving their performance issues.

Module 5

Designing a Terminal Services Infrastructure

Contents:

Lab Answer Keys

Lab: Designing a Terminal Services Infrastructure

Exercise 1: Design Terminal Services RemoteApp Programs

Scenario

In this exercise you are the Enterprise Administrator for a company that has recently upgraded all desktops to the Vista operating system. Your company wants to make two lines of business applications available to users. The application consists of a thick client and back end database systems. There is typically a large amount of network communication between the thick client and the back end systems. You want to make these applications accessible from the users' desktops without impacting network traffic on the client computer subnets. You want to avoid having users separately authenticate to these applications through RemoteApp and single sign-on.

The main tasks for this exercise are as follows:

1. Identify and document business and technical requirements from the scenario.

2. Generate a conceptual configuration for Terminal Services RemoteApp that meets the business and technical requirements of the scenario.

3. Generate a conceptual design for deploying Terminal Services RemoteApp Programs using a file share.

Task 1: Identify and document business and technical requirements from the scenario

-   Identify and document business requirements from the scenario.

-   IdIdentify and document technical requirements from the scenario.

Task 2: Generate a conceptual configuration for Terminal Services RemoteApp that meets the business and technical requirements of the scenario

-   Your company wants you to design a .p file that will be distributed to hundreds of client computers.

-   You You must design this conceptual configuration to meet the requirements of the scenario. Be sure to account for the line-of-business applications and single sign-on.

Task 3: Generate a conceptual design for deploying Terminal Services RemoteApp Programs using a file share

-   Draw a network architecture that accounts for all of the teApp deployment components involved in deploying Terminal Services RemoteApp Programs using a file share.

-   Identify how you would configure the server that is hosting the RemoteApp programs.

-   Identify how you would add RemoteApp programs, being sure to briefly describe how you would configure global deployment settings.

-   Be sure to describe how TS RemoteApp Manager can be used to fulfill this task.

    > **Results:** After this exercise, you should have identified the business and technical requirements from the scenario, described a .rdp file that includes the two LOB applications, described single

> sign-on configuration, and drawn and described a network architecture that includes a client computer, file share, and terminal server, and shown how the .rdp file is added to the file share using TS RemoteApp

Exercise 2: Design Terminal Services Corporate Desktop

Scenario

In this exercise you are the Enterprise Administrator for a company that has a wide variety of desktop operating systems in use. There are no immediate plans to upgrade all of the desktops. Your company wants to make several applications available to all users that will not run on many of the existing operating systems. You want to make all local desktop peripheral devices and hard drives available for use with these applications.

The main tasks for this exercise are as follows:

1. Identify and document business and technical requirements from the scenario.

2. Generate a conceptual design for deploying Terminal Services RemoteApp programs through TS Web Access.

Task 1: Identify andTask 1: Identify and document business and technical requirements from the scenario

- Identify and document business requirements from the scenario.

- Identify and document technical requirements from the scenario.

Task 2: Generate a conceptual design for deploying Terminal Services RemoteApp programs through TS Web Access

- Draw a network architecture that accounts for all of the components involved in deploying Terminal Services RemoteApp Programs using TS Web Access.

- Describe the tasks involved in deploying RemoteApp programs through TS Web Access, being sure to include the requirements from Task 1.

> **Results:** identified the business and technical requirements from the scenario, drawn and described a network architecture that includes a client computer, TS Web Access server, and Terminal Server, and described the five tasks involved in deploying RemoteApp programs through TS Web Access.

Exercise 3: Design Terminal Services Gateway and Web Access

Scenario

In this exercise, you are the Enterprise Administrator for Contoso, a global consulting company that has a highly mobile workforce. This workforce is often working at customer locations behind firewalls. Many of the consultants also utilize internet kiosks at airports. Your company wants to make several applications available to all users regardless of their location and client connectivity. When they are using company laptop computers, you want to make all local desktop peripheral devices and hard drives available for use with these applications.

The main tasks for this exercise are as follows:

1. Identify and document business and technical requirements from the scenario.

2. Generate a conceptual design for terminal TS Gateway and Web Access.

Task 1: Identify aTask 1: Identify and document business and technical requirements from the scenario

- Identify and document business requirements from the scenario.

- Identify and document technical requirements from the scenario.

Task 2: Generate a conceptual design for terminal TS Gateway and TS Web Access

- RemoteApp programs have already been deployed on the terminal server, and TS Web Access has already been deployed across the company intranet.

- Draw and describe a network architecture that allows users to access the TS Web Access server from the internet.

> **Results:**In this exercise, you should have identified the business and technical requirements from the scenario and drawn and described a network architecture that includes a TS Gateway server and TS Web Access server in the perimeter network, with terminal servers that host RemoteApp programs behind the company firewall

Exercise 4: Design Terminal Services Gateway Policies, Connection Authorization Policies, and Resource Access Policies

Scenario

Due to a company a data breach at Contoso, the company must now design a tighter security policy that will affect the TS Gateway and Web Access project you recently designed. When users are using other means of access you want to ensure maximum security of the corporate network through web access, TS gateway, connections authorization policies and resource access policies.

The main tasks for this exercise are as follows:

1. Identify and document business and technical requirements from the scenario.

2. Generate a detailed design document to improve security in TS Gateway and Web Access.

Task 1: Identify and document business and technical requirements from the scenario

- Identify and document business requirements from the scenario.

- Identify and document technical requirements from the scenario.

Task 2: Generate a detailed design document to improve security in TS Gateway and Web Access

- Contoso wants you to allow access by the Human Resources user group only to the HR Computers computer group and also wants you to disable client device redirection.

- Detail how you would use Terminal Services authorization policies to improve security given the above guidelines.

> **Results:** After this exercise, you should have identified the business and technical requirements from the scenario and generated a design document containing a TS connection authorization policy and TS resource authorization policy. The TS CAP and TS RAP should allow only the specific user and computer groups listed in the second task.

Module 6

Designing a Terminal Services Maintenance Strategy

Contents:

Lab Answer Keys

Lab: Designing a Terminal Services Infrastructure

Exercise 1: Design highly available Terminal Services

Scenario

You are the Enterprise Administrator for Contoso Corporation. Contoso plans to utilize Terminal Services exclusively to provide desktop environments to its workforce of 1,000 users. Contoso wants to make the desktop environment highly available and highly scalable. You also want user's data files and profiles to be highly available. You also want users to reconnect to their existing sessions in the event of a disconnection not accompanied by a log-off.

The main tasks for this exercise are as follows:

1. Identify and document business and technical requirements from the scenario

2. Generate a cGenerate a conceptual design for IP load balancing and failover session directory

Task 1: Identify and document business and technical requirements from the scenario

- Identify and document business requirements from the scenario class="ln1">Identify and document technical requirements from the scenario

Task 2: Generate a conceptual design for IP load balancing and failover session directory

- Draw a network architecture that includes all components required in deploying Network Load Balancing with terminal server.

- Describe how you will configure the NLB cluster to fulfill the business and technical requirements of the scenario.

  > **Results:** After this exercise, you should have identified the business and technical requirements from the scenario, drawn a network architecture that includes at least two computers, each on the same subnet and domain, and each only configured for TCP/IP. You should also have a NLB cluster configuration that includes host parameters, cluster parameters, and port rules that apply only to RDP traffic.

Exercise 2: Design Group Policy for Terminal Services

Scenario

Contoso needs to be able to rapidly deploy configuration changes to all of the terminal servers and ensure configuration consistency among the terminal servers. You want to enforce specific settings for users during terminal services sessions, specifically that Terminal Services clients can only connect to network resources through TS Gateway and that each terminal services session uses the Terminal Services Easy Print printer driver first.

The main tasks for this exercise are as follows:

1. Identify and document business and technical requirements from the scenario

2. Generate a conceptual design document for implementing group policy specific to terminal servers

Task 1: Identify and document business and technical requirements from the scenario

- Identify and document business requirements from the scenario
- Identify and document technical requirements from the scenario

Task 2: Generate a conceptual design document for implementing group policy specific to terminal servers

- Describe a Group Policy that configures, enables, and enforces the business and technical requirements of the scenario.
- The Group Policy setting Set the TS Gateway Server Authentication Method is already configured to enforce Windows authentication by passwords.

> **Results:** After this exercise, you should have identified the business and technical requirements from the scenario and described a group policy that enables and enforces the Group Policy settings Enable Connections Through TS Gateway and Set the TS Gateway Server Address on the TS Gateway server, and enables the Use Terminal Services Easy Print printer driver first setting on the terminal server.

Exercise 3: Design resource management for Terminal Services

Scenario

In this exercise, Contoso wants to prevent large amounts of activity on a single Terminal Services session from seriously degrading the performance of other sessions, and also want each session to be guaranteed a minimum of 5 percent server performance capability.

The main tasks for this exercise are as follows:

1. Identify and document business and technical requirements from the scenario
2. 2. Generate a conceptual design for server resource allocation among terminal services sessions

Task 1: Identify and document business and technical requirements from the scenario

- Identify and document business requirements from the scenario
- Identify and document technical requirements from the scenario

Task 2: Generate a conceptual design for server resource allocation among terminal services sessions

- Process-matching criteria have already been configured for Terminal Services sessions.
- Describe the resource-allocation policies you would create to fulfill the business and technical requirements of the scenario.

> **Results:** After this exercise, you should have identified the business and technical requirements from the scenario and generated a conceptual resource-allocation policy that includes CPU and memory allocations that fulfill the requirements of the scenario.

Exercise 4: Design monitoring for Terminal Services

Scenario

In this exercise, Contoso wants the Terminal Services administrative staff to be notified immediately upon the occurrence of any situation that causes an outage or severe performance degradation of any terminal server, and particularly the TS Web Access servers.

The main tasks for this exercise are as follows:

1. Identify and document business and technical requirements from the scenario

2. Generate a conceptual design for Terminal Services monitoring with specific monitoring definitions for the TS Web Access servers

Task 1: Identify and analyze the requirements as they relate to TS service level and performance monitoring

- Identify and document business and technical requirements from the scenario.

- Describe how the identified requirements apply to Terminal Services monitoring.

Task 2: Generate a conceptual design for Terminal Services monitoring with specific monitoring definitions for the TS Web Access servers

- No monitoring definitions are currently in place.

Describe the monitoring definitions you would implement to fulfill the business and technical requirements of the scenario.

> **Results:** After this exercise, you should have identified the business and technical requirements from the scenario and described how they apply to TS monitoring. You should also have generated a conceptual design for TS monitoring that includes a Service Health Check, a "Service Unavailable" notification, and multiple Performance Threshold alerts.

Module 7

Design Windows Media Services Infrastructure

Contents:

Lab Answer Keys

Lab: Design a Windows Media Infrastructure

Exercise 1: Design Windows Media Services for Live Streaming

Scenario

You are the Enterprise Administrator for Contoso, a multi-national company with locations in New York, London, Tokyo, and Seoul. Your company wants to broadcast live quarterly company meetings from the New York headquarters to the entire company. Several hundred will connect via dial-up.

The default stream averages 256 kbps.

In this exercise you will identify and analyze the requirements as they relate to Windows Media Services and optional components. Then you will create a conceptual design for WMS server placement and server roles and supported protocols.

The London site contains routers that will not broadcast multicast packets.

Site	Users	Comments
New York	500	Live stream source. Supports 200 dial-in clients.
London	250	No multicast capable routers. Connected to New York with a direct link.
Tokyo	100	Connected to New York with a direct link.
Seoul	100	Connected to Tokyo via internet link.

The main tasks for this exercise are as follows:

1. Identify the necessary servers required for each location.

2. Identify the transport protocols used between servers and by clients

3. Compute the bandwidth requirements between sites and within each site.

Task 1: Identify server requirements.

*   Identify the servers, including OS version and software, that will need to be sourced at the New York site to encode and deploy a live webcast. Design for high availability.

*   Identify the server resources required in London, including OS version and software, for the most efficient delivery of live content.

*   Identify the server resources required in Seoul and Tokyo, including OS version and software, for the most efficient delivery of live content. Design for affordability, identifying servers that could be used for other services as well.

*   Draw the network, including connections between servers.

Task 2: Identify Bandwidth and protocol

*   On the network map created in the previous task, identify the protocol used between each server.

Question: How should you secure the connection between Tokyo and Seoul?

Answer

- Calculate the bandwidth requirements for each link and for the cost on each local network for the clients to connect.

> **Results:** After this exercise, you should have created a drawing showing servers in the appropriate locations to successfully broadcast the live stream to all sites and dial up clients.

Exercise 2: Design WMS infrastructure for on-demand content.

Scenario

Contoso would now like to expand their WMS infrastructure to store the company meetings and make them available on demand. Upon the completion of the presentation, users should be able to immediately connect to a WMS distribution point and start viewing the meeting.

In this exercise we will add on-demand capabilities to the WMS installation we created in the previous exercise.

The main tasks for this exercise are as follows:

1. Identify changes to architecture for on-demand content.
2. Specify storage requirements.
3. Secure content.

Task 1: Modifying the installation for on-demand streaming

- Analyze the existing architecture and identify any changes necessary to provide on-demand streaming.
- Determine a high performance and high availability storage solution.

Question: How would you best secure the data both on the server and during delivery?

Answer

> **Results:** After this exercise, you should have made sure that all WMS servers, including the London servers, are capable of play while archiving. You should have written specifications for a highly available storage schema and protected the content with ACLs and DRM.

Exercise 3: Troubleshooting poor performance of on-demand content

Scenario

On-demand clients in the Seoul and Tokyo offices are experiencing excessive buffering and choppy streams, suggesting a performance problem. Whatever your recommendations were for those two offices, the corporation decided to employ existing 32 bit servers at both locations for all WMS services. The unicast and multicast services are provided from the same server. The stream is encoded at a 1 mbps standard. There is no apparent network congestion,

The main tasks for this exercise are as follows:

1. Identify ways to increase server performance
2. Prioritize performance increase options.

3.   Create an implementation plan.

Task 1: Troubleshooting poTask 1: Troubleshooting poor performance

- Identify how you would confirm that network capacity is definitely not the buffering issue.

- List actions that will increase the performance of the servers in Seoul and Tokyo.

Task 2: Implementing a solution

- Of the items in the list, which are most likely to cost effectively resolve the buffering issue? Prioritize the list on this criteria.

- Create an implementation plan for resolving the buffering problem.

- Substituting 64 bit machines will cause the most dramatic increase, if the budget is available.

> **Results:** After this exercise, you will be prepared to resolve the buffering problem by upgrading the hardware.

Exercise 4: Design and test monitoring of Windows Media Services.

Scenario

You need to implement a monitoring solution for Windows Media Services. Contoso is already using Microsoft Operations Manager, so will deploy the WMS management pack as well as other service packs to keep track of the other elements that WMS requires.

For this Exercise, refer to the Windows Media Services Management Pack Guide (WMS_MPGuide.doc) in the resource CD.

The main tasks for this exercise are as follows:

1.   Plan deployment of WMS service pack.

2.   Identify other network elements to monitor that WMS functions.

3.   Specify those objects that should be available to a WMS administrator's Operations Manager console.

Task 1: Deploy WMS management pack

- Looking at the network map you created in exercise 1, identify which publishing points are mission critical. List these as points which you need to engage the Critical Publishing Point stop rule.

- Create a naming convention for the critical publishing points rules so each rule is uniquely named.

Task 2: Implementing a monitoring scheme

- List those network elements which WMS relies upon to function.

- Identify management packs which should be deployed to monitor these items.

- Discuss what items could be included in a management console customized for WMS administrators.

- Along with server to server connectivity, It will be important that firewalls, storage, and IIS servers which are advertising WMS services be available

> **Results:** After this exercise, you will be prepared to use Operations Manager to monitor the WMS deployment

Module 8

Design Virtualization Infrastructure

Contents:

Lab Answer Keys

Lab: Design Virtualization Infrastructure

Exercise 1: Design a Test Server Consolidation Strategy

Scenario

You are an enterprise administrator for an organization with large web farms, development and test beds for those servers. You have noticed that a large amount of physical servers are being utilized as test and development environments for the web farm. By consolidating those servers onto a virtualized platform, you want to free up the investment in physical hardware and ease the management of a testing environment.
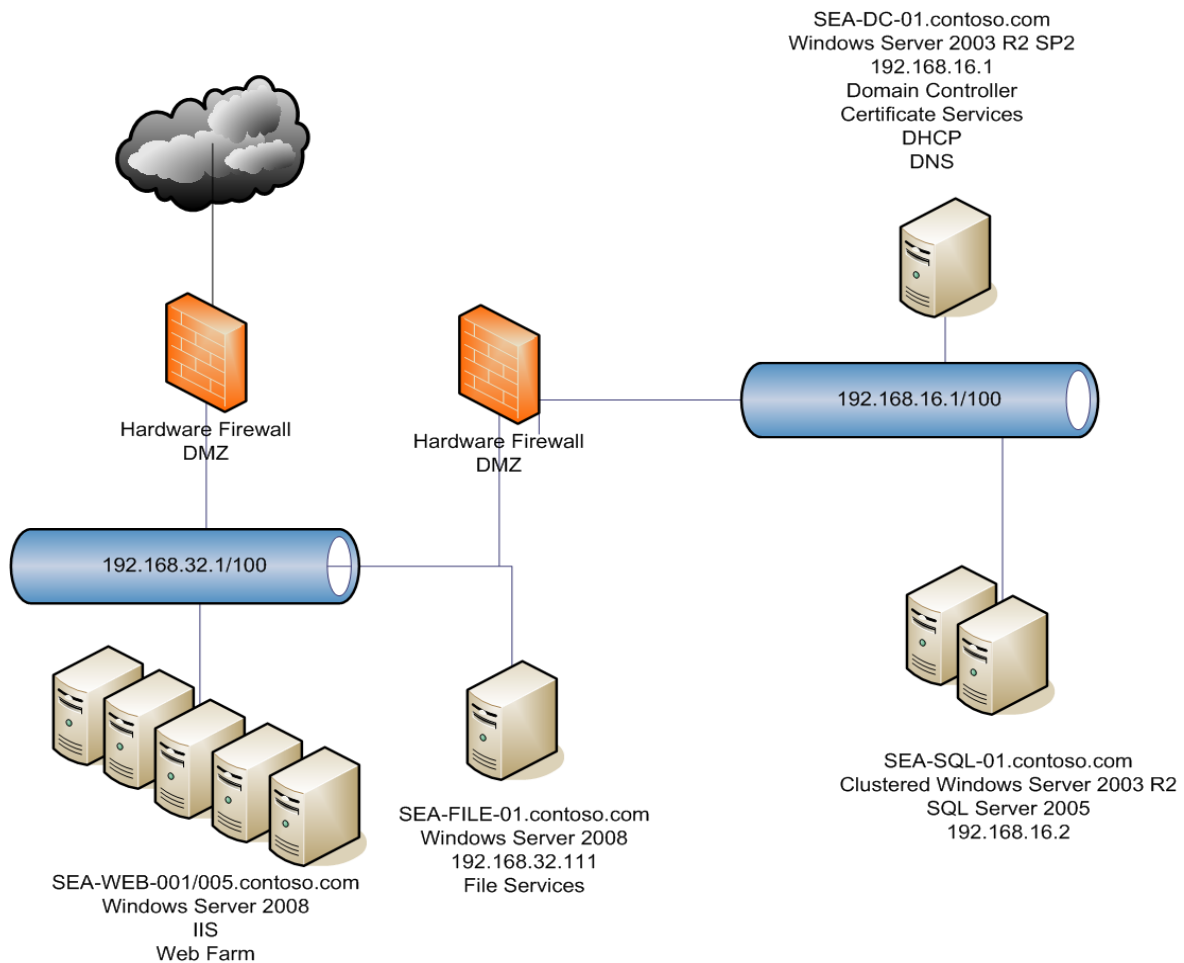

Figure 1: Production Web Farm Architecture

In this exercise, we will analyze the requirements for a test server infrastructure and plan that architecture.

The main tasks for this exercise are as follows:

1. Identify the elements of the production environment that need to be reproduced in the virtualized test environment.

2. Identify the required resources for a standard test environment.

3. Plan a test environment.

Task 1: Identify the Test Environment Elements

- Looking at the sample architecture, list each element that is required for the web farm and determine how to recreate it in the virtualized test environment.

Task 2: Identify the Required Resources for a Standard Test Environment.

- We have decided to use System Center Virtual Machine Manager to provision and manage our virtual environment.

- We have determined that each virtualized server in the test environment requires 512 MB. We can run four virtual machines on each virtual server. We want to make 512 MB of RAM also available for the host OS.

- Identify the physical servers that we will need to build our virtualized environment. Include the amount of RAM required for hosts.

- Identify security groups that will have access to the test environment. Include administrators, support personnel, and developers.

Task 3: Plan the Test Environment

- Create a schematic diagram of the test environment. Include physical and virtual machines.

- Create a process for migrating tested applications to the production environment.

> **Results:** After this exercise, you should have identified the required resources for a test environment and created a schematic design of that test environment.

Exercise 2: Design and Test Virtualization and Migration of Legacy Server

Scenario

The organization also has some legacy applications that you must continue to support. The hardware servers are past their supported life and are starting to fail. Examine the plausibility of migrating these services to a virtualized environment to ease their support requirements.

One server, running Windows Server 2003, provides a mission critical proprietary database. The hardware is now over 5 years old and is no longer supported by the manufacturer. Although the server must be constantly available, it averages 10% utilization of its processor. The service is not supported on a later OS.

In this exercise we will establish a legacy server virtualization environment and plan for the migration of the first legacy server.

The main tasks for this exercise are as follows:

1. Expand the VMM architecture to provide legacy server virtualization

2. Plan for the migration of the legacy server.

3. Plan backup and security for the virtualized legacy server.

Task 1: Expand the VMM architecture to provide legacy server virtualization

- The new server will require 1 GB of RAM but consumes negligible processor time on a modern server. The server needs dedicated connectivity to the local (192.168.16.x) network.

- Identify a location within the schematic that you created for lesson 1 that we can add the legacy server, assuming that we can expand an existing host for the RAM requirements of the legacy server.

Task 2: Plan for Migration of the Legacy Server

- We have determined that we can store the legacy database itself on a pre-existing iSCSI SAN and have already migrated it. The SAN is accessible on a different physical TCP/IP network We want to migrate the server with a minimum of downtime.

- Create a step by step plan for using VMM to migrate the server to the virtualized environment. Confirm that the image is healthy and accessible before the migration.

Task 3: Enumerate Backup and Security for the Virtualized Server

- Although the database is backed up on the SAN, we want to also be assured that the legacy server OS and application can be rapidly recovered if it becomes damaged or inoperable. There is no internal backup tool for the application. Create a strategy for backup and recovery of the virtualized legacy server.

- The original server is accessible by two groups: the LOBdev group, which has access to read and write on the database and can log directly in to the server, and the LOBuser group, which has only read access to the data. Assign rights to the virtual machine that will allow for continued business function.

> **Results:** After this exercise, you should have created a plan for the migration of a legacy line of business server to the virtual environment, including security and backup considerations

Exercise 3: Design Development Environment Isolation Using Virtual Server

Scenario

Now that the test environment is up and running, the developers would like to utilize it for isolation testing of new applications. They need to be able to create scenarios dynamically.

The main tasks for this exercise are as follows:

1. Discuss the roles of personnel in creating and using an isolated test bed.

2. Discuss implications to storage, resources, and software of a provisioned test bed.

Task 1: Implement Provisioning for VMM.

- The application development team are about to embark on a long term project. They will require extensive testing scenarios as they proceed. They believe that ultimately the application will run on a three server web farm, a SQL server, and a domain controller. They will also need to implement a perimeter firewall and users both inside the simulated environment and outside, in the "internet." All of these servers will run Windows Server 2008 or Windows Vista.

- As a group, discuss what roles the administrator, support personnel, and development team will assume in the VMM provisioning plan.

Task 2: Plan for Hardware and Software.

- As a group, discuss the storage, networking, and resource requirements. Determine what hardware and licenses will need to be purchased.

> **Results:** After this exercise, you should have identified the personnel roles required for a VMM provisioning scheme and planned for any additional hardware and software purchase.

Module 9

Designing Virtualization Provisioning

Contents:

Lab Answer Keys

Lab: Design Virtualization Provisioning

Exercise 1: Design virtual server host configuration

Scenario

You are the Enterprise Administrator for Contoso Corporation, which has recently consolidated servers from multiple test environments into a single shared, virtual test environment. The test environment needs to support web servers, application servers and SQL servers, and high availability configurations.

In this exercise you will identify and document business and technical requirements as they apply to virtual server host configuration. You will also generate a conceptual plan for the implementation of a virtual server host configuration.

The main tasks for this exercise are as follows:

1. Identify business and technical requirements from the scenario

2. Generate a conceptual plan for the implementation of a virtual server host configuration

Task 1: Identify business and technical requirements from the scenario

- Identify and document business requirements from the scenario

- Identify and document technical requirements from the scenario

Task 2: Generate a conceptual plan for the implementation of a virtual server host configuration

- Describe the methodology of sizing destination servers and indicate below what performance you would measure per metric and why:

Metric	Performance Measured	Reason
Processor		
Memory		
Network I/O		
Disk I/O		

Describe how you would plan the implementation of virtual server environment that includes web, application, SQL, and Terminal Services servers.

> **Results:** After this exercise, you should have identified the business and technical requirements from the scenario and completed the table above based on the concepts of virtual server host configuration. You should also have described the steps involved in planning a virtual server environment.

Exercise 2: Design virtual server provisioning using System Center

Scenario

Contoso now needs you to streamline deployment of several pre-defined virtual servers. The four virtual server hosts are configured with four hyper-threaded CPUs, 16 GB ram, with four network cards each. You want to allow for dynamic CPU resource allocation based on workloads.

In this exercise you will identify and document business and technical requirements as they apply to virtual server provisioning using System Center. You will also generate a conceptual design document outlining virtual server provisioning using System Center.

The main tasks for this exercise are as follows:

1. Identify business and technical requirements from the scenario

2. Generate a conceptual design document outlining virtual server provisioning using System Center

Task 1: Identify business and technical requirements from the scenario

- Identify and document business requirements from the scenario

- Identify and document technical requirements from the scenario

Task 2: Generate a conceptual design document outlining virtual server provisioning using System Center

- Each of Contoso's departments has its own files, scripts, and virtual disks that need to be accounted for and each department wants its own virtual machine host. The departments are as follows:

- Finance, Human Resources, Information Technology, Security

- Draw and describe a conceptual design document to outline how the virtual machine hosts and virtual machine libraries will be deployed assuming that placement defaults have not yet been set

> **Results:** After this exercise, you should have identified the business and technical requirements of the scenario. You should also have outlined the concept of adding virtual machine hosts and virtual libraries as well as the concepts of virtual machine placement and host ratings and how to set placement defaults for virtual machines to Resource maximization.

Send Us Your Feedback

You can search the Microsoft Knowledge Base for known issues at Microsoft Help and Support before submitting feedback. Search using either the course number and revision, or the course title.

Note Not all training products will have a Knowledge Base article – if that is the case, please ask your instructor whether or not there are existing error log entries.

Courseware Feedback

Send all courseware feedback to support@mscourseware.com. We truly appreciate your time and effort. We review every e-mail received and forward the information on to the appropriate team. Unfortunately, because of volume, we are unable to provide a response but we may use your feedback to improve your future experience with Microsoft Learning products.

Reporting Errors

When providing feedback, include the training product name and number in the subject line of your e-mail. When you provide comments or report bugs, please include the following:

- Document or CD part number

- Page number or location

- Complete description of the error or suggested change

Please provide any details that are necessary to help us verify the issue.

Important All errors and suggestions are evaluated, but only those that are validated are added to the product Knowledge Base article.