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10233B

**Designing and Deploying Messaging
Solutions with Microsoft® Exchange
Server 2010 Service Pack 2**

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Introduction to Designing a Microsoft Exchange Server 2010 Deployment

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Lesson 1

Gathering Business Requirements

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Questions and Answers

Discussion: Identifying Regulatory and Organizational Compliance Requirements

Question: In what type of business does your organization participate? What are the legislated compliance requirements for your organization?

Answer: Answers will vary depending on the type of business in which your organization participates. Examples of legislation restricting how organizations manage information include:

- United States:
 - Sarbanes-Oxley Act of 2002 (SOX)
 - Gramm-Leach-Bliley Act (Financial Modernization Act)
 - Health Insurance Portability and Accountability Act of 1996 (HIPAA)
 - Uniting and Strengthening America by Providing Appropriate Tools Required to Intercept and Obstruct Terrorism Act of 2001 (USA Patriot Act)
- Canada: The Personal Information Protection and Electronic Documents Act
- Australia: Federal Privacy Act
- Europe: European Union Data Protection Directive (EUDPD)
- Japan: Japan's Personal Information Protection Act

Question: What additional compliance requirements does your organization have?

Answer: Answers will vary. For example, organizations may impose strict requirements for managing email. Some may add legal disclaimers to outgoing communications, or require that certain messages include an intellectual property disclosure disclaimer. Additionally, the organization may have requirements for message retention that require certain messages are retained, while others are deleted after a specific amount of time.

Question: What issues do regulatory and organizational compliance requirements raise for your organization? How are you addressing these issues? What are the gaps between the requirements and the solutions?

Answer: Answers will vary. Traditionally, it is difficult to address regulatory and organizational compliance requirements. Answers may include:

- Archiving all messages using a third-party tool.
- Specifying policies to regulate the types of information sent via email.
- Enforcing policies through auditing.
- Scanning messages for content, and applying necessary disclaimers.

Question: Are the compliance solutions based on policy or technology? In other words, does your organization only have written policies that define what users can do, or is there a technological solution in place to enforce some or all of the requirements? If you are using a policy-based solution, how do you enforce policies?

Answer: Answers will vary. Typically, organizations have policy-based solutions for cases where a technology-based solution does not exist. Additionally, policy-based solutions are difficult to enforce, and policy violators often are detected only through difficult investigations.

Lesson 2

Identifying Additional Requirements

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Questions and Answers

Discussion: Dealing with Conflicting Requirements

Question: What examples have you seen where requirements conflicted?

Answer: There are many possible answers. In some cases, business requirements may conflict with the IT requirements. For example, the business requirement may state that all users have full access to their mailboxes via mobile clients, while IT requirements may state that only approved mobile devices should be used by a small user subset.

Question: One of the most common scenarios for incompatible requirements occurs between security and business requirements. How can security requirements be balanced with other requirements?

Answer: These types of conflicting requirements typically are the most difficult to resolve. It is hard to assign a dollar value to a security breach, so business sponsors may view security requirements as a project cost that adds no value. Some general guidelines for addressing security requirements include:

- Express security requirements in business terms. For example, the business sponsor may not understand when you state that all messages must be encrypted using at least 128-bit encryption. However, you can explain that sending messages over the Internet is similar to sending a post card, rather than a letter in a sealed envelope. Ask what types of business data are sent via email to Internet clients, and discuss the implications of someone being able to capture and read that email.
- Be clear about which security requirements are non-negotiable, and which are open to discussion. Every organization typically has non-negotiable security requirements, such as the mandates for secure authentication traffic on the Internet, or mandates that prohibit sending of private customer information in a format that others can easily read. Other security requirements may be negotiable, or there may be available options that partially address both security and business requirements.

Question: What guidelines would you suggest for addressing conflicting requirements?

Answer: Answers will vary, but some suggestions are:

- Keep discussions related to requirements at a professional, rather than personal level.
- Be prepared to suggest and discuss alternatives. Instead of rejecting a requirement, propose an alternative solution that may be more compatible with conflicting requirements.
- Be clear on the implications of each requirement. Some requirements may be very difficult to implement from a technical standpoint, or prohibitively expensive. Ensure that all parties understand each requirement's implications.

Module Reviews and Takeaways

Review Questions

Question: In relation to functional requirements, what is a use case?

Answer: A use case describes an activity performed within an organization, and the activity's intended outcome.

Question: What are the key areas addressed by an SLA?

Answer: Key areas addressed are availability, performance, and recovery.

Question: What are some typical project constraints?

Answer: Typical project constraints are resource, schedule, and feature constraints.

Question: A. Datum has 50 databases. In a five week period, each database is unavailable for 30 minutes each. What is the percent service availability as measured by the proportional uptime of the databases?

Answer:

- Total downtime is 1,500 database minutes.
- 5 weeks is a total of 50,400 minutes.
- There are a total of 2,520,000 database minutes.
- $1,500/2,520,000 * 100$ is .06%.
- The availability is therefore 99.94%.

Question: What would the database unavailability need to drop to—per database—to achieve 99.99% uptime?

Answer:

- 5 minutes per database would yield an uptime of 99.99%.
- Total downtime is 250 database minutes.
- 5 weeks is a total of 50,400 minutes.
- There are a total of 2,520,000 database minutes.
- $250/2,520,000 * 100$ is .01%.
- The availability is therefore 99.99%.

Best Practices

Supplement or modify the following best practices for your own work situations:

- If an organization does not have any written SLAs, it is very important when beginning any deployment project to identify and document informal SLAs. Clearly identifying the expected system performance enables future validation of the project's success.
- As much as possible, ensure that your messaging solution addresses the needs of your users—if the first user experience of a new system is positive, the system is more likely to be accepted.
- It is critical that the monitoring, reporting, and reviewing tasks in the service level management process are performed; without these tasks, the value of an SLA is reduced significantly
- Ensure that the information you collect that relates to your existing infrastructure remains current; that is, it includes any planned changes to the environment that may impact the Exchange Server 2010 deployment.

Lab Review Questions and Answers

Lab: Introduction to Designing an Exchange Server 2010 Deployment

Question: In Exercise 1, what additional information may be required to complete a design for the A. Datum messaging infrastructure? How would you get that information?

Answer: Answers will vary. Additional requirements might include: storage groups and stores information (including the storage mechanism used to store the databases) message flow statistics, message security settings, and antivirus and anti-spam settings.

Compiling this information may require meeting with other people or performing additional research and documentation.

Question: In Exercise 2, which requirements discussed in Task 1 have the potential to cause conflicts? What solutions would you propose to resolve these conflicts?

Answer: It is possible that the reluctance to modify the AD DS configuration could cause problems; however, Exchange Server 2010 can either support the existing AD DS infrastructure, or if unsuitable, you can configure Exchange-specific site links and hub sites for message delivery.

Module 2

Designing Microsoft Exchange Server 2010 Integration with the Current Infrastructure

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Lesson 2

Designing the AD DS Infrastructure

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Questions and Answers

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Questions and Answers

Discussion: Considerations for Modifying the Current AD DS Design

Question: What impact might result from changing the AD DS design in a large, complex company?

Answer: Answers will vary. In some cases, modifying the AD DS design may be fairly simple. For example, it may be easy to create or remove an AD DS site in an organization that does not have many deployed, site-aware applications. In other cases, it can be very difficult to modify the AD DS design, such as adding or removing domains or forests.

Question: How can you balance the complications of modifying the current AD DS design with the optimal Exchange Server-based design?

Answer: Answers will vary. The optimal AD DS design for Exchange Server 2010 may be different than the current AD DS design. However, there may be many good reasons for the current design, and it may take a significant amount of effort to modify the current AD DS infrastructure. If the current AD DS design is optimized for another reason, or if the necessary change is too difficult, modifying the current design may not be an option.

In some cases, the maintenance costs of, or functionality loss from the current AD DS design may make it feasible to modify the design. For example, if you have multiple forests that contain your organization's user accounts, it will be very difficult to merge the forests into a single forest. However, Exchange Server 2010 provides the most functionality in a single forest, so the effort required to merge the forests may be worth it.

Question: How can you help an organization determine whether to modify the AD DS design?

Answer: When addressing this question, you must first decide what to change in the AD DS design to make Exchange Server 2010 more efficient. Then you must determine the difficulty associated with making the changes, and determine whether the benefits that result are worth the effort. Present this information to the appropriate stakeholders to help them make the decision.

Lesson 4

Planning Exchange Server Administration

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Questions and Answers

Exchange Server 2010 Permissions

Question: What requirements does your organization have for assigning Exchange Server permissions? Does your organization use a centralized or decentralized administration model? What special permissions will you need to configure?

Answer: Answers will vary. In most organizations, a central team of Exchange Server administrators likely will maintain full control of the Exchange Server environment, while another team may need permissions to create mailboxes. Other organizations may have complicated administrative scenarios in which different groups need many different permission levels.

Demonstration: How to Manage Exchange Server 2010

Question: Does the Exchange Management Console organization seem logical to you? Why or why not?

Answer: Depending on student experience, answers will vary. However, students should see that the management structure correlates to the server roles.

Question: Does the Exchange Management Console have the same functionality as it did in previous Exchange Server versions? What is different about this version?

Answer: In Exchange Server 2010, you use the Exchange Management Console to configure computers running Exchange Server. Exchange Server organizes all configuration options in the Exchange Management Console logically into role-based settings. In versions prior to Exchange Server 2007, users could configure Exchange Server with the Exchange System Manager. In Exchange System Manager, all options are available in the **Properties** dialog box of the server or the organization. Therefore, the Exchange System Manager is not role-oriented.

Detailed Demonstration Steps

Demonstration: How to Manage Exchange Server 2010

Detailed Demonstration Steps

Use the Exchange Management Console

1. On VAN-EX1, click **Start**, click **All Programs**, click **Microsoft Exchange Server 2010**, and then open **Exchange Management Console**.
2. Expand **Microsoft Exchange On-premises**. Explore the console's layout: The console tree on the left, the **Content** pane in the middle, and the **Actions** pane on the right.
3. Notice that the console tree has four nodes: Organization Configuration, Server Configuration, Recipient Configuration, and Toolbox.
4. Expand each of the nodes in the console tree to view the available information.
5. In the console tree, expand **Organization Configuration**, click **Mailbox**, and then view the available information in the **Content** pane.
6. In the console tree, expand **Server Configuration**, click **Mailbox**, and then view the available information in the **Content** pane.
7. In the console tree, expand **Recipient Configuration**, click **Mailbox**, and then view the available information in the **Content** pane.

Use the Exchange Management Shell

1. On VAN-EX1, click **Start**, click **All Programs**, click **Microsoft Exchange Server 2010**, and then click **Exchange Management Shell**.
2. Run **Get-Mailbox**, and then view the output.
3. Run **Get-Mailbox | Format-List**, and then view the output.
4. Run **Get-Mailbox | fl**, and then verify that it is identical to the previous output, since **fl** is an alias for **Format-List**.
5. Run **Get-Mailbox | Format-Table**, and then view the output. Notice that the format differs from the previous output.
6. Run **Get-Mailbox | ft Name, Database, IssueWarningQuota**. Notice that the table output shows only the fields you specify.
7. Run **Get-Help New-Mailbox** to view the basic help for **New-Mailbox**.
8. Run **Get-Help New-Mailbox -detailed** to view the detailed help for **New-Mailbox**.
9. Run **Get-Help New-Mailbox -examples** to view just the examples that the help provides.
10. Create a variable by running **\$Temp = "Text"**.
11. Run **\$Temp** to view the variable's contents.
12. Run **\$password = Read-Host "Enter password" -AsSecureString** to prompt the user for a password. Understand that to assign a password to a new user, you must specify the **Read-Host** cmdlet with the **-AsSecureString** switch, because you cannot store passwords as simple strings. Type **Pa\$\$wOrd**, and then press **Enter**.

13. Run **New-Mailbox -UserPrincipalName chris@adatum.com -Alias Chris -Database "Mailbox Database 1" -Name ChrisAshton -OrganizationalUnit Users -Password \$password -FirstName Chris -LastName Ashton -DisplayName "Chris Ashton" -ResetPasswordOnNextLogon \$false** to create a new and secure mailbox for user Chris Ashton.

Use the Exchange Control Panel

1. On VAN-EX1, open **Internet Explorer**, in the **address bar**, type **https://van-ex1.adatum.com/ecp**, and then press Enter.
2. In the Outlook Web App window, in the **Domain\user name** box, type **adatum\chris**.
3. In the **Password** box, type **Pa\$\$w0rd**, and then click **Sign in**.
4. On the **Language options** page, click **OK**.
5. In Outlook Web App, click each of the items in turn, and describe their settings.
6. In Outlook Web App, click **My Mail**, and notice how you can switch between the Exchange Control Panel and Outlook Web App.
7. Close Internet Explorer.
8. Open **Internet Explorer**, in the address bar, type **https://van-ex1.adatum.com/ecp**, and then press Enter.
9. In the Outlook Web App window, in the **Domain\user name** box, type **adatum\administrator**.
10. In the **Password** box, type **Pa\$\$w0rd**, and then click **Sign in**.
11. On the **Language options** page, click **OK**.
12. In Outlook Web App, scroll through the list of mailboxes.
13. Click **Distribution Groups**, click **Branch Managers**, and then click **Details**.
14. Review the options, and then click **Cancel**.
15. In the left pane, click **Roles and Auditing**, and then click **Administrator Roles**.
16. Scroll through the roles in the Name list.
17. Click **Organization Management**, and then review the assigned roles in the right pane.
18. Click **User Roles**. In the **Name** list, click **Default Role Assignment Policy**, and then click **Details**.
19. Review the options, and then click **Cancel**.
20. Close Outlook Web App.

Module Reviews and Takeaways

Review Questions

Question: If you determine that your current site configuration does not support your Exchange Server routing requirements, what options do you have?

Answer: You could modify the site configuration to suit your Exchange Server needs, or you could overlay an Exchange Server-specific routing infrastructure by assigning Exchange-specific site link costs, and/or assigning a Hub site.

Question: What command might you use to configure a site as a Hub site?

Answer: Use the **Set-ADSite –Identity sitename –HubSiteEnabled \$true** cmdlet to configure a site as Hub site.

Question: What is the main reason for deploying Exchange Server in a multi-tree forest?

Answer: The main reason for deploying multiple trees in a forest is to create separate namespaces for different organizational business units.

Question: What issue does configuring a split DNS solution resolve?

Answer: Split DNS means that you can use the same host names and domain names on the internal and external network. That means that clients on the internal network can use the same URL to access—for example, a Client Access server—as those clients connected to the Internet.

Best Practices

Supplement or modify the following best practices for your own work situations:

- Avoid using IP addresses to define servers on clients. If the server providing an email client service changes, you must update the configuration of all affected client computers to match the new IP address. Additionally, digital certificates that are provided to enable authentication and encryption between clients and servers are configured with a subject name that matches the designated server's published FQDN. If an IP address is used, this will at best raise an error on the client, and at worst, prevent email retrieval.
- Only open required ports on your firewalls. Aim to minimize the open ports by being selective about what client types you will support.
- Use a self-signed certificate only for small deployments, or for testing purposes. Replace the self-signed certificate as soon as possible after deployment.
- A single forest means that the Exchange Server 2010 design and deployment is significantly simpler than any other option. Therefore, you should always use a single forest unless there are highly compelling reasons to use multiple forests.

Lab Review Questions and Answers

Lab: Designing Exchange Server Integration with the Current Infrastructure

Question: In exercise 1, Contoso is using a unified namespace—i.e. the internal and external domain names are the same—Contoso.com. If the internal domain name was different—for example, Contoso.priv—what issues would this raise when you deployed Exchange Server 2010?

Answer: You must configure the accepted domain Contoso.com. By default, only the forest root domain, Contoso.priv, is established as an accepted domain.

Question: Instead of deploying an Edge Transport server in the head office to handle e-mail to and from the Internet, what other options could you consider?

Answer: You could:

- Configure the hub transport servers with the necessary connectors to facilitate e-mail routing to and from the Internet; the default connectors are inappropriately configured for these tasks.
- Implement a third party smart host—perhaps provided by an Internet Service Provider (ISP). You would need to configure the connectors on the Hub Transport servers to route messages via this third-party smart host.
- Consider implementing a third-party hosting solution; the hosted solution could offer relaying and also message hygiene capabilities. Once again, you must configure the transport to connect to this service.

Module 3

Planning and Deploying Mailbox Services

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Lesson 1

Overview of Mailbox Services in Exchange Server 2010

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Questions and Answers

New Mailbox Services Features in Exchange Server 2010

Question: Do you expect that these new features will have an impact on your organization?

Answer: Answers will vary depending on the organizational needs of the students.

Storage Changes in Exchange Server 2010

Question: How will changes to storage in Exchange Server 2010 affect your organization?

Answer: Answers will vary. In general, you should evaluate the suitability of cheaper, direct access storage (DAS), such as SATA drives.

Information Required for Designing Mailbox Services

Question: What other information would you want to gather before designing mailbox servers?

Answer: You may want to gather some other information related to budget, retention limits, expectations for growth, and size limits.

Additional Reading

New Mailbox Services Features in Exchange Server 2010

- [New Mailbox and Recipient Functionality](#)

Storage Changes in Exchange Server 2010

- [New Exchange Core Store Functionality](#)
- [Understanding the Exchange 2010 Store](#)

Designing Storage for Large Mailboxes

- [Exchange 2010 Large Mailbox Vision Whitepaper](#)

Lesson 2

Designing Mailbox Servers

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Questions and Answers

Designing Mailbox Sizing

Question: How many clients in your organization use Cached Exchange Mode?

Answer: Answers will vary. Cached Exchange Mode is almost always used on laptops, and for users in remote offices. Cached Exchange Mode is also the default when creating a new user profile. However, some organizations prefer not to use Cached Exchange Mode if they have roaming users.

Designing Mailbox Disk Storage

Question: Which disk configuration do you use in most of your servers?

Answer: Answers will vary. Many organizations use mirrored drives for the operating system and RAID 5 for data storage. However, this varies depending on what the server is being used for. RAID 10 is often used in high-performance environments.

Designing Mailbox Servers for High Availability

Question: Will you consider implementing a DAG for your organization?

Answer: Answers will vary. A DAG is more suitable for a wider range of organizations than the high availability solutions in previous versions of Exchange Server. If you decide to provide high availability, the cost to implement is minimal.

Designing a Test Plan for Server Performance

Question: Do you test server performance before implementation?

Answer: Answers will vary. You should test server performance before implementation. If you do not, you may find that the hardware is not suitable for your purpose, and subsequently experience degraded performance.

Additional Reading

Designing Mailbox Sizing

- [Plan an Exchange deployment in Outlook 2010](#)

Designing Mailbox Disk Storage

- [Understanding Storage Configuration](#)
- [V18.9 of the Exchange 2010 Mailbox Server Role Requirements Calculator](#)

Designing Mailbox Server Processor and Memory Requirements

- [Understanding Processor Configurations and Exchange Performance](#)
- [Understanding Memory Configurations and Exchange Performance](#)

Virtualizing Mailbox Servers

- [Exchange 2010 System Requirements](#)
- [Best Practices for Virtualizing Exchange Server 2010 with Windows Server 2008 R2 Hyper V](#)
- [Server Virtualization Validation Program](#)

Designing a Test Plan for Server Performance

- [Exchange Load Generator 2010 \(64 bit\)](#)
- [Microsoft Exchange Server Jetstress 2010 \(64 bit\)](#)
- [Jetstress Field Guide](#)

Lesson 3

Designing Recipient Management**Contents:**

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Questions and Answers

Designing Email Address Policies

Question: Do you see a need for multiple email address policies in your organization?

Answer: Answers will vary. Some larger organizations need multiple email address policies, but most organization can just modify the Default Policy.

Designing System Messages

Question: Will you customize quota messages for your organization?

Answer: Answers will vary.

Designing Distribution Groups

Question: Will you use moderated groups in your organization?

Answer: Answers will vary. Many organizations can use moderated groups as an alternative to restricting which users can send messages to a group.

Designing Resource Mailboxes

Question: Does your organization need to implement resource mailboxes?

Answer: Answers will vary, depending on the organizational requirements.

Designing Mailbox Moves

Question: Do you see a need for online mailbox moves in your organization?

Answer: In most cases, yes. Online mailbox moves allow you to perform mailbox moves during regular business hours without impacting users.

Additional Reading

Designing Recipient Management Processes

- [Understanding Management Role Scopes](#)
- [Built-in Management Roles](#)

Designing Address Lists

- [Understanding Hierarchical Address Books](#)

Designing Address Book Policies

- [Understanding Address Book Policies](#)

Designing Mailbox Moves

- [Understanding Move Requests](#)

Lesson 4

Designing Public Folder Architecture

Contents:

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Questions and Answers

Analyzing Business Requirements for Public Folders

Question: Does your organization use public folders, and if it does, what is the purpose?

Answer: Organizations often use public folders for sharing data. However, many organizations use SharePoint for that purpose instead of public folders. Any organization that has clients running Office Outlook 2003 or earlier needs public folders to support free/busy searches and offline address book downloads.

Designing Public Folder Replication

Question: Why would you replicate the content of public folder?

Answer: For an organization that has multiple locations, you can use replication to place the content closer to the user, which speeds up access. You can also use replication for high availability of public folders. If one replica becomes corrupted, you can still access content on the second replica.

Designing Client Permissions

Question: Which users in your organization have permission to create new public folders?

Answer: Answers will vary. Many organizations do not allow users to create their own public folders, or they restrict public folder creation to departmental users.

Alternatives to Public Folders

Question: Does your organization use SharePoint?

Answer: Answers will vary. Many organizations have started to use SharePoint Server 2010 and SharePoint Foundation 2010 for collaboration.

Module Reviews and Takeaways

Review Questions

Question: Why might you choose to use SATA drives instead of a SAN or SCSI drives for your Mailbox servers?

Answer: SATA drives are much less expensive than a SAN or SCSI drives for data storage. However, they do have lower performance, at least in part due to slower spindle speeds. Exchange Server 2010 makes it possible to consider using lower performing SATA drives because of changes to the store that improves disk performance.

Question: When deciding between editions of Exchange Server 2010, you need to consider the number of databases you require. How many databases does the Standard edition of Exchange Server 2010 support?

Answer: Exchange Server 2010 Standard Edition supports 5 databases.

Question: Which administrative tool should be used by a user who is configured as a group manager?

Answer: The Exchange Control Panel allows group managers to modify group membership without the complexity of the Exchange Management Shell or the Exchange Management Console.

Question: Which clients require the presence of public folders?

Answer: Office Outlook 2003 clients require the presence of public folder to perform free/busy searches and to download the offline address book. Office Outlook 2007 can use Exchange Web Services on a Client Access server instead.

Best Practices Related to Designing Mailboxes

Supplement or modify the following best practices for your own work situations:

- Use Cached Exchange Mode to increase client performance over slow connections.
- Do not use Cached Exchange Mode to increase Mailbox server performance. In Exchange Server 2010, the use of Cached Exchange Mode by clients does not affect Mailbox server performance.
- Use personal archives to reduce the size of the cached mailbox when using Cached Exchange Mode.
- Use personal archives instead of PST files.
- Use quotas to enforce size limits on mailboxes.

Lab Review Questions and Answers

Lab: Planning and Deploying Mailbox Services

Question: What is the difference between a distribution group owner and a distribution group moderator?

Answer: A distribution group owner can manage group membership, while a moderator approves messages that are sent to the group.

Question: Why do you not need to provide a password for the user account when creating a resource mailbox?

Answer: The user account associated with a resource mailbox is disabled. Therefore, Exchange Server does not require a password to create the user account.

Module 4

Planning and Deploying Client Access Services in Microsoft Exchange Server 2010

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Lesson 2

Designing Client Access Server Deployment

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Additional Reading

Designing Client Throttling

- [Understanding Client Throttling Policies](#)

Lesson 3

Designing Client Access

Contents:

Additional Reading

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Additional Reading

Designing Outlook Web App and Exchange Control Panel

- [Simplify the Outlook Web App URL](#)

Module Reviews and Takeaways

Review Questions

Question: When a user attempts to connect to an Internet-facing client access server, the petitioned server determines that the user's mailbox is located in another site. The Client Access server in the other site is not configured with an external URL. What happens next?

Answer: The Client Access server receiving the request proxies the client request to the Client Access server in the appropriate site.

Question: You have deployed a single Internet-facing Client Access server to support all sites in your organization. Which authentication method must you configure on all other Client Access servers?

Answer: You must enable Integrated Windows authentication on all of the Client Access servers that are not Internet accessible.

Question: Your users seem to be experiencing problems when trying to access their mailboxes using Outlook Web App. You realize they are typing the incorrect URL, and are forgetting the https prefix. What can you do to assist?

Answer: Simplify the Outlook Web App URL. Redirect users that use the form `http://servername/` to use SSL and connect to the Outlook Web App virtual directory. For example, when a user types `http://servername/`, IIS redirects them to `https://servername/owa`.

Best Practices

Supplement or modify the following best practices for your own work situations:

- Never deploy a Client Access server in your perimeter network.
- As a general guideline, deploy three Client Access server processor cores in an AD DS site for every four Mailbox server processor cores.
- Do not run the Security Configuration Wizard on servers that support Exchange Server 2010 server roles.
- If your organization has deployed Exchange servers in multiple AD DS sites, consider configuring site affinity for the Autodiscover service.
- If you have multiple Client Access servers—each in a different site and with different names—be sure to obtain a certificate that can support multiple names.

Lab Review Questions and Answers

Lab: Planning and Deploying Client Access Services in Exchange Server 2010

Question: Currently, your mobile users use the URL `https://van-ex1.adatum.com/owa` to connect to Outlook Web App. If you wanted to use `https://mail.adatum.com/owa` instead, what would you need to consider?

Answer: You must ensure you have a certificate that supports the new proposed name. If you propose to use only a single URL irrespective of the site location of the Mailbox database of the connecting user, you must also consider proxy and redirection issues.

Question: In exercise 3, you assigned an Exchange ActiveSync mailbox policy to a collection of users. If you had an Outlook Web App mailbox policy called "Sales Policy" to assign to members of the Sales OU, what would be the Exchange Management Shell syntax?

Answer: `Get-Mailbox -OrganizationalUnit Sales | Set-CASMailbox -owamailboxpolicy "Sales Policy."`

Module 5

Planning and Deploying Message Transport in Microsoft Exchange Server 2010

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Lesson 2

Designing Hub Transport Servers

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Additional Reading

Troubleshooting Internal Message Delivery

- [Microsoft Exchange Analyzers](#)

Module Reviews and Takeaways

Review Questions

Question: In which folder are the routing table logs stored?

Answer: The routing table logs are located in the %Program Files%\Microsoft\Exchange Server\Transport\Logs\Routing folder.

Question: When would you consider implementing Exchange Server-specific routing costs?

Answer: Answers will vary. Typically, though, you would implement Exchange-specific site link costs when the underlying AD DS site link costs are not ideally suited to support your message routing infrastructure, and you are unable to reconfigure those costs—perhaps because other AD DS-aware applications rely on the existing costs to function correctly.

Question: When you add an accepted domain for other than your forest root domain, what else must you configure in order for recipients within your organization to receive email using the new accepted domain?

Answer: Answers will vary. However, it is likely you must configure DNS MX records to enable remote SMTP hosts to route messages into your organization for the designated accepted domain. You must also configure email address policies within your organization.

Lab Review Questions and Answers

Lab: Planning and Deploying Message Transport in Exchange Server 2010

Question: In Exercise 4, task 7, you examined the routing topology. You discovered that there were new connectors. Where did these connectors come from?

Answer: You manually created one connector—Contoso Connector—to support the secure partner communication with the Contoso organization; the other two connectors are used to route messages to and from the Edge Transport server, and then to the Internet.

Question: In Exercise 4, task 7, there is an address space entry under SMTP, which is denoted with a single asterisk. What does this mean?

Answer: This is a wildcard and means that all SMTP domain names will pass through the defined connectors, with the exception of those with the Contoso.com suffix, as there is also a specific address space entry for that partner organization.

Module 6

Planning and Deploying Messaging Security

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Lesson 2

Designing Antivirus and Anti-Spam Solutions

Contents:

Questions and Answers

3

Questions and Answers

Recommendations for Monitoring the Anti-Spam Solution

Question: Will you be deploying anti-spam filtering using an Edge Transport server in Exchange Server 2010? What is the reasoning behind your decision?

Answer: Answers will vary. Many organizations already have a very good anti-spam solution in place, and may be hesitant to change to a different system. Edge Transport servers may provide some features that other spam filtering solutions do not support. However, other solutions also provide features that are not available with an Edge Transport server. In some cases, organizations may consider maintaining the current system, and adding an Edge Transport server to take advantage of the ways that the Edge Transport server can integrate with AD DS through Edge synchronization.

Designing Antivirus Solutions

Question: How will you modify your antivirus solution when you deploy Exchange Server 2010?

Answer: Answers will vary. When you deploy an antivirus solution in Exchange Server 2010, you should consider replacing or supplementing the VSAPI-based scanning on Mailbox servers with transport agent-based scanning on Hub Transport and Edge Transport servers.

Module Reviews and Takeaways

Review Questions

Question: On the Edge Transport server, which service holds the Edge Transport rules?

Answer: The Active Directory Lightweight Directory Services (AD LDS) holds the Edge Transport rules.

Question: You have established the required Edge Transport rules on one of the Edge Transport servers in your perimeter network. Now you wish to duplicate the configuration. What is one way to easily duplicate the Edge Transport rules?

Answer: Use the closed configuration feature to duplicate the Edge Server configuration.

Question: When selecting Basic authentication on a receive connector, what additional option should you select?

Answer: Offer Basic authentication only after starting TLS. When you select this option, the connector starts TLS first, and then after TLS encryption is complete, the connector offers Basic authentication.

Question: What is the purpose of the permissions groups on a Receive connector?

Answer: A permission group is a predefined set of permissions granted to well-known groups of users, computers, or security groups. Members of the selected permission groups on the **Permissions Group** tab are allowed to submit messages to this Receive connector.

Best Practices

- Supplement or modify the following best practices for your own work situations:
- Always consider implementing TLS when configuring Basic authentication on Send or Receive connectors.
- Deploy an Edge Server in your perimeter network to more easily secure your organization against the threats posed by viruses and malicious software contained in email messages.
- Consider implementing an antivirus solution that can use multiple scan engines from multiple vendors to maximize your chances of obtaining updates as quickly as possible.
- Implement attachment stripping at the email gateway layer, and match the gateway-layer attachment stripping policy with the attachment blocking policy that the client enforces.

Lab Review Questions and Answers

Lab: Planning and Deploying Messaging Security

Question: In Exercise 3, you configured S/MIME by deploying a suitable certificate to all users in the Adatum.com domain. Using this method, could you exchange S/MIME—secured messages with partner organizations?

Answer: It depends. The partner organization must trust the certificates used by Adatum.com users, and vice versa. If the adatum.com certification authority (CA) is chained to a public certificate server, then this should be possible.

Question: What alternatives could you use instead of S/MIME to secure communications between partner organizations?

Answer: Domain Security could be used. Domain Security uses Transport Layer Security (TLS) with mutual authentication to provide session-based authentication and encryption. This functionality enables authentication of all connections between partner organizations, and encrypts all messages while they are in transit on the Internet.

Module 7

Planning and Deploying Messaging Compliance

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Lesson 1

Designing Transport Compliance

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Questions and Answers

Planning Message Classifications

Question: How could you distribute the XML file for message classifications?

Answer: The XML file can be distributed by using logon scripts or System Center Configuration Manager.

Planning Message Moderation

Question: What are some groups that you might want to moderate message transport for?

Answer: Typically, you want to moderate messages sent to groups with large membership or groups used for delivery of sensitive information. For example, you might moderate a group used for a customer list.

Additional Reading

Planning Transport Rules

- [Regular Expressions in Transport Rules](#)
- [Export and Import Transport Rules](#)

Planning Message Classifications

- [Create a Message Classification](#)

Lesson 2

Designing AD RMS Integration with Exchange Server 2010

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Question and Answers

Options for Integrating AD RMS and Exchange Server 2010

Question: How is AD RMS different from S/MIME?

Answer: S/MIME is an industry standard for encrypting and digitally signing email messages. It is more widely supported by email clients. AD RMS has the ability to limit use of messages which S/MIME does not.

Additional Reading

Planning AD RMS Integration with External Organizations

- [Sharing Documents with External Users](#)

Lesson 3

Designing Message Journaling and Archiving

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Question and Answers

Planning Message Journaling

Question: Is message journaling a suitable mechanism for monitoring compliance in your organization?

Answer: Answers will vary. Some organizations are required to use specific third party software for compliance.

Additional Reading

Planning Personal Archiving

- [License requirements for Personal Archive and retention policies](#)

Planning a Litigation Hold

- [Understanding Litigation Hold](#)

Planning Multi-Mailbox Search

- [Advanced Query Syntax](#)
- [Understanding Exchange Search](#)
- [Understanding Mailbox Audit Logging](#)

Lesson 4

Designing Messaging Records Management

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Question and Answers

Planning a Managed Folder Deployment

Question: Why are retention policies preferred over managed folder mailbox policies?

Answer: Retention policies are capable of using personal archives and managed folder mailbox policies are not. Also, any future enhancements will be made to retention policies rather than managed folder mailbox policies.

Additional Reading

Identifying MRM Requirements and Options

- [Understanding Retention Tags and Retention Policies](#)
- [Understanding Managed Folders](#)

Planning Migration from Managed Folder Mailbox Policies to Retention Policies

- [Migrate from Managed Folders](#)

Module Reviews and Takeaways

Review Questions

Question: What is the relationship between retention policy tags and retention policies?

Answer: A retention policy tag consists of a collection of retention settings that you apply to a specific folder, or in the case of a personal tag, directly to items. You cannot apply retention policy tags directly to mailboxes. You combine multiple retention policy tags into a retention policy, and then apply the retention policy to the mailboxes.

Question: Does a personal archive decrease the size of a mailbox database?

Answer: It depends on whether the personal archive is in the same mailbox database as the user's mailbox. If the personal archive is in a separate database, it may reduce the size of the mailbox database containing the user's mailbox. However, overall Exchange Server storage is likely to increase if existing PST files are imported into the personal archive.

Question: Can you apply message moderation to recipients other than distribution groups?

Answer: Yes, but you must use a transport rule to moderate the message flow. This differs from using distribution groups, in which you configure moderation in the properties of the distribution group.

Question: Can Exchange Server 2010 prevent messages that meet specific criteria from being forwarded to other users?

Answer: Yes. AD RMS integration with Exchange Server 2010 allows transport rules to apply AD RMS templates, which you can use to prevent a message from being forwarded by the recipient.

Best Practices Related to Messaging Records Management

- Supplement or modify the following best practices for your own work situations:
- Replace managed folder mailbox policies with retention policies as you migrate mailboxes to Exchange Server 2010 and Outlook 2010.
- Implement Outlook 2010 to allow users to apply personal tags.
- Provide users with training on how to apply personal tags and use AutoTagging.
- Minimize the number of personal tags to simplify the user experience.
- Base retention policies on business needs.

Lab Review Questions and Answers

Lab: Planning and Deploying Messaging Compliance

Question: What is the relationship between a retention policy and a retention policy tag?

Answer: A retention policy is a collection of retention policy tags that you can apply to mailboxes. A retention policy tag is settings that define what actions are taken on messages in a mailbox folder.

Question: How can you use a message classification to prevent specific messages from being sent to the Internet?

Answer: You can configure a transport rule that prevents messages with a specific classification from being delivered to users outside the organization. Before applying the classification to messages, you need to create it. The classification is automatically available to Outlook Web App users, but you must export an XML file to make it available to Outlook users.

Module 8

Planning and Deploying High Availability

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Lesson 1

Introduction to High Availability Planning in Exchange Server 2010

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Questions and Answers

Components of High Availability

Question: Which infrastructure is highly available in your organization?

Answer: Answers will vary. In general, smaller organizations have less highly available infrastructure than larger organizations. Data center infrastructure is more likely to be highly available than the infrastructure supporting desktop computers.

How DAGs Work

Question: Do you anticipate using replay lag in your organization?

Answer: Answers will vary. Replay lag prevents a risk of logical corruption that is relatively low. However, larger organizations with multiple database copies may want to implement replay lag to mitigate this risk. Organizations that perform backups are unlikely to use a replay lag, because they can restore a corrupted database from backup.

How High Availability Works for Client Access Servers

Question: Why is high availability important for Client Access servers?

Answer: High availability is important for Client Access servers because all client communication passes through Client Access servers. If a Client Access server is unavailable in a site, no users in that site can access their mailboxes.

Additional Reading

How Shadow Redundancy Works

- [Understanding Shadow Redundancy](#)
- [Shadow Redundancy Mail Flow Scenarios](#)

Lesson 2

Designing High Availability for Mailbox Databases

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Question and Answers

Designing the Storage Components for a DAG

Question: Are you willing to consider using JBOD instead of RAID for database copies?

Answer: Answers will vary. You may be uncomfortable with the idea of using JBOD instead of RAID. However, redundancy is provided by the database copies rather than fault tolerant disk systems.

Additional Reading

Designing Monitoring and Management for a DAG

- [Monitoring High Availability and Site Resilience](#)

Lesson 3

Designing High Availability for Other Server Roles

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Questions and Answers

Designing High Availability for Hub Transport Servers

Question: Is high availability for Hub Transport more important for some sites than others?

Answer: It depends on the needs of the organization. However, hub sites and other sites with a high level of message transport traffic are typically considered more important than a branch office.

Designing High Availability for Client Access Servers

Question: Is high availability for Client Access servers more important for some sites than others?

Answer: It depends on the needs of the organization. However, sites with a large number of users, or Internet accessible sites that proxy client access for other sites are good candidates for highly available Client Access servers.

Designing High Availability for Edge Transport Servers

Question: Is high availability for Edge Transport servers important for your organization?

Answer: In most cases, yes. Modern businesses rely on email communication with external vendors and customers. Any significant outage is a problem.

Additional Reading

Designing High Availability for Servers with Multiple Roles

- [Understanding Multiple Server Role Configurations in Capacity Planning](#)
- [Hub Transport and Mailbox Server Roles Coexistence When Using DAGs](#)
- [Robert's Rules of Exchange: Multi-Role Servers](#)

Lesson 4

Designing Site Resilience

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Questions and Answers

What Is Site Resilience?

Question: Does your organization plan for site resilience as part of its disaster recovery planning?

Answer: Answers will vary. Large organizations typically have a plan for site resilience. Smaller organizations typically do not.

Designing DAGs for Site Resilience

Question: Why is the DAC mode important?

Answer: DAC mode prevents split-brain syndrome in the DAG when the primary data center comes back online.

Discussion: Failure Scenarios

Question: If the WAN link between Site A and Site B fails, what impact does it have on the active databases in Site A?

Answer: None. The two Mailbox servers in site A maintain a quorum, and the active databases in Site A continue to function normally. Replication to the passive database copies in Site B is interrupted, but it catches up when the WAN link is reestablished.

Question: How can you ensure that mailbox databases fail over between the Mailbox servers in Site A rather than failing over to the Mailbox server in Site B?

Answer: You can set the activation preference number for database copies in Site A to be lower than Site B. If the database copies in Site A are up to date, then failover remains within Site A. To ensure that database copies in Site B are never activated automatically, you can set the DatabaseCopyAutoActivation parameter to blocked on the database copies in Site B.

In scenario 2, Site A has one Mailbox server and a witness server. Site B has a single Mailbox server and an alternate witness server. All active mailbox databases are on the Mailbox server in Site A. A passive copy of each mailbox database is on the Mailbox server in Site B.

Question: If the WAN link between Site A and Site B fails, what impact does it have on the active databases in Site A?

Answer: None. The Mailbox server and the witness server in Site A maintain the quorum, and the active databases in Site A continue to function.

Question: If there were active mailbox databases in Site B when the WAN link failed, how would they be affected?

Answer: When the WAN link failed, there would be no quorum in Site B. Therefore, any active databases would be dismounted and the Mailbox server in Site A would mount the databases.

Question: If the Mailbox server in Site A fails, does the Mailbox server in Site B mount the databases automatically?

Answer: Yes. The Mailbox server in Site B can still communicate with the witness server in Site A to maintain a quorum. All Mailbox databases in Site B are mounted and service user requests.

Question: If all of the data center infrastructure in Site A fails, does the Mailbox server in Site B mount the databases automatically?

Answer: No. The Mailbox server in Site B does not have quorum. You need to initiate failover to the alternate data center. When you do, the alternate file share witness is used (if there is an even number of nodes).

Question: If you want two locations to have highly available mailbox databases, how many DAGs should you have?

Answer: You should have one DAG for each location. If there is only one DAG and a WAN link fails, the database copies in the data center without the quorum are dismounted. If there are two DAGs and the WAN link fails, then each DAG can maintain a quorum in separate data centers.

Additional Reading

How DAC Mode Works

- [Understanding Datacenter Activation Coordination Mode](#)

Module Reviews and Takeaways

Review Questions

Question: To make a highly available Exchange Server organization, which components must be highly available?

Answer: All components need to be highly available. If one component in the Exchange Server organization is not highly available, then the entire Exchange Server organization is not highly available. You need to consider high availability for all Exchange Server roles, supporting services, and infrastructure.

Question: Which Exchange Server 2010 feature provides fault tolerance for message delivery?

Answer: Shadow redundancy is a new feature in Exchange Server 2010 that ensures messages are not lost when a Hub Transport server fails. The sending Hub Transport server keeps a copy of a message until the next hop reports the message as delivered.

Question: How many networks should be used for a DAG?

Answer: A DAG should have at least two networks. The first network is dedicated to replication of transaction logs; the second network is primarily used for MAPI communication, but can also be used for replication if the replication network fails.

Question: What are the requirements for using the DAC mode?

Answer: To use the DAC mode, the DAG must have at least two members and span two Active Directory sites. Support for two-member DAGs is added in Exchange Server 2010 with SP2.

Best Practices Related to High Availability for Client Access Servers

Supplement or modify the following best practices for your own work situations:

- Use a client access server array and load balancing to make client access highly available.
- If a Client Access server is also a member of a DAG, then use hardware-based load balancing.
- Ensure that Internet-accessible sites that proxy Client Access for multiple sites are highly available, because their outage will affect many users.
- When a DAG fails over to an alternate site for a short period of time, allow the clients to continue using the client access array in the original site.
- When a DAG fails over to an alternate site for an extended period of time, reconfigure the `RPCClientAccessServer` property of the databases to direct clients to a client access array in the alternate site.

Lab Review Questions and Answers

Lab: Planning and Deploying High Availability

Question: How does the number of database copies influence your design for storage?

Answer: As you increase the number of database copies, there is less need for redundancy in the storage system of each server. Redundancy is achieved with multiple database copies on separate servers, rather than multiple copies on the disks of a single server. If there are 3 or more database copies, JBOD is recommended for the disks to minimize costs of each server.

Question: What need, related to data recovery, cannot be addressed by high availability?

Answer: High availability does not allow for the recovery of deleted data. High availability allows the current state of the mailbox database to remain accessible, but it is not suitable for archiving or data recovery.

Module 9

Planning a Disaster Recovery Solution

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Lesson 1

Planning for Disaster Mitigation

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Questions and Answers

Identifying Data Loss Scenarios

Question: Can you think of any other ways that Exchange Server data can be lost?

Answer: Answers will vary, and may include a:

- Rogue administrator deleting data.
- Virus deleting data.
- Virus scanner deleting data.
- Store.exe crash corrupting a database.
- Disk corruption corrupting a database.
- Data center loss due to an infrastructure failure, such as power.

Data Loss Mitigation Features

Question: Which of these data loss mitigation features do you think you will use most often?

Answer: Answers will vary. However, single-item recovery will be commonly used by most organizations to avoid the need to restore a small amount of data from backup.

Designing a High Availability Solution for Disaster Mitigation

Question: Which of these high availability methods do you think your organization will implement?

Answer: Answers will vary. Smaller organizations may have only one server and implement none of the high availability methods, while larger organizations may implement all of them.

Discussion: When Is Exchange Native Data Protection Appropriate?

Question: When compared to traditional backups, how does Exchange native protection affect recovery time?

Answer: Exchange native data protection stores all data in mailbox databases that are then replicated in a DAG. Recovery to a passive database copy happens so quickly that many users do not even notice that there has been a problem. Administrators can typically recover deleted items more quickly than they can from tape backups. Be aware that when an entire folder structure has been deleted, you can recover the individual deleted items, but not the folder structure.

Question: How does using Exchange native data protection affect the backup window?

Answer: The concept of a backup window is obsolete when using Exchange native data protection. No specific backup event occurs.

Question: Does Exchange native data protection meet the archiving needs of your organization?

Answer: Answers will vary. Some organizations have regulatory requirements that require all email to be kept for a period of time. Often the time period for retention is years. Most of these organizations have non-Microsoft archiving software.

Organizations with less stringent requirements for archiving can use personal archives to store messages long term. Journaling can also be used to capture data that needs to be archived. The larger mailboxes supported by Exchange Server 2010 can also reduce the need for long-term archiving. You can also use Exchange Online (part of Microsoft Office 365) for online archives.

Question: Does your organization have formally defined RTOs and RPOs for messaging?

Answer: Answers will vary. Many smaller organizations do not have formally defined RTOs and RPOs. Most larger organizations have formally defined RTOs and RPOs, even if they are defined with different terminology.

What Are the Timelines for Disaster Recovery?

Question: Does your organization have formally defined RTOs and RPOs for messaging?

Answer: Answers will vary. Many smaller organizations do not have formally defined RTOs and RPOs. Most larger organizations have formally defined RTOs and RPOs, even if they are defined with different terminology.

Scenarios Requiring Backup and Restore

Question: When did you last restore an Exchange server? Why did you need to restore it?

Answer: Answers will vary. For most organizations, this is a rare event. It may have been years since an entire server was restored.

Additional Reading

Data Loss Mitigation Features

- [Single Item Recovery in Exchange Server 2010](#)

Lesson 2

Planning Exchange Server Backup

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Choosing Exchange Server Backup Software

- [Using Windows Server Backup to Back Up and Restore Exchange Data](#)

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Planning Exchange Server Recovery

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Questions and Answers

Options to Recover Mailbox Data and Databases

Question: Which recovery method is preferable?

Answer: If you can afford to maintain a DAG, it is the fastest and easiest way to recover from a server or database failure.

Planning the Recovery of Mailbox Data and Databases

Question: Will you allocate space for database recovery on each Mailbox server?

Answer: Answers will vary. If you allocate space for database recovery on each Mailbox server, then recovery times may improve because the data is locally accessible. However, there is an extra cost for disk space if you allocate space on each Mailbox server.

Additional Reading

Planning the Recovery of Edge Transport Servers

- [Edge Transport Server Cloned Configuration](#)

Module Reviews and Takeaways

Review Questions

Question: Why might older backup software not support Exchange Server 2010?

Answer: Exchange Server 2010 supports only VSS backups. Some existing backup software may only support streaming backups. Also, some older backup software may not properly support DAG backups.

Question: How does Recovery mode help restore an Exchange server?

Answer: When you use Recovery mode to install an Exchange server, Setup reads the Exchange configuration information associated with the computer account from AD DS. Based on the Exchange Server configuration information, Setup automatically installs the correct server roles.

Question: Is it possible to use a DAG to archive mailbox information and to meet compliance requirements?

Answer: No, DAGs do not archive data. Use single-item recovery to retain messages for a specified number of days, and make a backup for long-term archival. Users can move messages to a personal archive, but that will not meet compliance requirements to retain data for a specific period of time in most cases.

Question: Why is it important to have a formal disaster recovery plan?

Answer: Creating a formal disaster recovery plan ensures that your organization has methodically attempted to document the recovery processes for all systems in the organization. Planning and testing recovery processes makes them easier and more effective to use when they are required.

Best Practices Related to Recovery of Mailbox Databases and Data

Supplement or modify the following best practices for your own work situations:

- Whenever possible, use a DAG to protect mailbox databases. DAG recovery is faster and easier than backup recovery.
- When you lose a database, use a dial-tone database to quickly recover basic messaging functionality.
- Use a recovery database to retrieve specific items from a backup.
- Allocate disk space for a recovery database when designing server storage.
- Use single-item recovery to prevent users from purging messages before they reach the item-retention limit.

Lab Review Questions and Answers

Lab: Planning a Disaster Recovery Solution

Question: How does the number of database copies influence your design for storage?

Answer: As you increase the number of database copies, there is less need for redundancy in the storage system of each server. Redundancy is achieved with multiple database copies on separate servers, rather than multiple copies on the disks of a single server. If there are 3 or more database copies, JBOD is recommended for the disks to minimize costs of each server.

Question: What need, related to data recovery, cannot be addressed by high availability?

Answer: High availability does not allow for the recovery of deleted data. High availability allows the current state of the mailbox database to remain accessible, but it is not suitable for archiving or data recovery.

Module 10

Planning Microsoft Exchange Server 2010 Monitoring and Troubleshooting

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Lesson 1

Planning Exchange Server Monitoring

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Additional Reading

Options for Monitoring Exchange Server

- [Additional Changes in Exchange 2010 Management Pack](#)

Lesson 2

Planning Exchange Server Troubleshooting

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Questions and Answers

Discussion: Developing a Message Delivery Troubleshooting Plan

Question: Users are reporting non-deliverable and slow-to-deliver outbound email. What process can you use to troubleshoot the problem?

Answer: Answers may vary. The following is one suggested answer:

1. Identify which users are experiencing the problem, and when the problem started.
2. Use the Mail Flow Troubleshooter, message tracking system, Queue Viewer, Routing Log Viewer, and Telnet to pinpoint the problem.
3. Review the probable causes of the problem.
4. Rank causes by probability, and review possible solutions.
5. Rank solutions by ease of resolution, and impact to complete.
6. Try the most probable and easily implemented resolutions first, and progress through the solution options until you resolve the problem.

Discussion: Developing a Client Access Troubleshooting Plan

Discussion Question

Question: Office Outlook users can no longer connect to the system. What process can you use to troubleshoot the problem?

Answer: Answers may vary. The following is one suggested answer:

1. Identify which users are experiencing the problem, and when the problem started.
2. Review logs for any involved Client Access servers.
3. Run the Exchange Best Practices Analyzer.
4. Review the probable causes of the problem.
5. Rank causes by probability, and review possible solutions.
6. Rank solutions by ease of resolution and impact to complete.
7. Try the most probable and easily implemented resolutions first, and progress through the solution options until you resolve the problem.

Discussion: Developing a Mailbox Database Troubleshooting Plan

Discussion Question

Question: A database has gone offline. What process can you use to troubleshoot the problem?

Answers may vary. The following is one suggested answer:

1. Identify which database has the problem.
2. Review logs, and run the Database Troubleshooter tool.
3. Review the probable causes of the problem.
4. Rank causes by probability, and review possible solutions.
5. Rank solutions by ease of resolution and impact to complete.
6. Try the most probable and easily implemented resolutions first, and progress through the solution options until you resolve the problem.

Module Reviews and Takeaways

Review Questions

Question: What is an advantage of using automated monitoring systems such as System Center Operations Manager 2010?

Answer: By using automated systems, you can monitor servers proactively, and possibly reduce the overall number of staff that are required to perform monitoring. Additionally, System Center Operations Manager 2010 automatically monitors and fixes some problems.

Question: In terms of monitoring Mailbox server performance, what is the most likely performance bottleneck you will encounter?

Answer: Disk response time is the most critical factor; poorly performing disk subsystems may result in degraded Mailbox server performance

Question: Which components' responsiveness can you monitor to ensure adequate performance of Outlook Web App clients?

Answer: Outlook Web App and the Exchange Web Services rely heavily on the Microsoft .NET Framework and ASP.NET files, which are read, processed, and rendered for the end users. Monitoring the response time and the number of times the application has had to restart can help you verify the overall health of the services

Question: Which transport logs should you enable in order to troubleshoot message flow?

Answer: The connectivity logs and protocols logs are both disabled by default. Enabling these logs might help diagnose mail flow issues. The Message tracking log would be helpful because it is enabled by default.

Question: Why is it important to analyze performance trends?

Answer: By analyzing performance trends, you can predict when existing capacity is likely to be exhausted.

Lab Review Questions and Answers

Lab: Planning Exchange Server 2010 Monitoring and Troubleshooting

Question: During the lab, you established a performance baseline. What is the purpose of a performance baseline?

Answer: You establish a performance baseline in order to determine threshold values for performance objects and counters under initial system load conditions. You can then compare subsequent measured performance objects and counters with these baseline statistics, and draw conclusions about system performance under current load conditions.

Question: In exercise 2, you determined that processor resources were affected by the increased load during your test. What would you suggest to mitigate this?

Answer: Examine the performance of the other two servers in the system: VAN-EX2, and VAN-EX3. If they do not show similar values, consider moving mailboxes from VAN-EX1. If the other servers are similarly affected, measure and examine other Exchange Server performance counters to attempt to determine what is generating this additional processor load. The use of dynamic distribution lists, MailTips, or other features, might be generating the load. Depending upon your findings, consider deploying additional server roles appropriate to the feature. If your Exchange Server roles are virtualized, consider allocating more processor resource to those virtual machines.

Module 11

Upgrading to Microsoft Exchange Server 2010

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Module Reviews and Takeaways

Review Questions

Question: Contoso, Ltd., currently utilizes servers running Exchange 2000 Server in their organization. They are excited about the features available in Exchange Server 2010, and want to upgrade to the new platform. How would you recommend that they proceed?

Answer: There is no direct upgrade from Exchange 2000 Server to Exchange Server 2010; consequently, Contoso should consider deploying the new Exchange organization alongside their existing organization in a different AD DS forest. Alternatively, Contoso could upgrade their existing Exchange organization to Exchange Server 2003, and then upgrade the resulting organization to Exchange Server 2010. Be aware that the hardware deployed to support Exchange 2000 Server, and the underlying operating systems, may be insufficient to support an upgrade even to Exchange Server 2003.

Question: A. Datum Corporation has recently acquired Trey Research, an organization that implements Novell GroupWise for messaging. A. Datum Corporation has Exchange Server 2003 installed, and it implements the Novell GroupWise connector to ensure directory synchronization and message flow between the two organizations. As A. Datum Corporation is planning to upgrade to Exchange Server 2010, how would you advise they proceed with handling the Trey Research GroupWise messaging system?

Answer: Answers may vary. However, if the Trey Research organization is intending to continue with Novell GroupWise, a mechanism must be provided for both directory synchronization and mail flow. The latter is relatively easy, because SMTP connectors can be configured to provide the required mail flow. However, the directory synchronization is more complex. A manual mechanism for extracting the contents of one directory and importing it into the other could be devised. Alternatively, retaining an Exchange Server 2003 server with the Novell GroupWise connector installed would enable both mail flow and directory synchronization.

Common Issues Related to Upgrading to Exchange Server 2010

Identify the causes for the following common issues related to upgrading to Exchange Server 2010.

Issue	Troubleshooting tip
When you try to remove an Exchange Server 2003 server, you receive an error message that you cannot remove the server because it is a bridgehead server for a routing-group connector. You have upgraded all external message routing to Exchange Server 2010.	The Exchange Server 2003 server may be the designated routing group bridgehead server for the routing-group connector between the Exchange Server 2003 routing group and the Exchange Server 2010 routing group. If this is the last Exchange Server 2003 server, you can remove it from the routing-group connector. If you have other Exchange Server 2003 servers deployed, you need to designate one of them as the routing-group connector bridgehead server.

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Issue	Troubleshooting tip
<p>You are upgrading your Exchange Server 2007 organization to Exchange Server 2010, and you have configured Client Access servers for Internet access. Users with mailboxes on Exchange Server 2010 Mailbox servers can access their mailbox by using Outlook Web App from the Internet, but users with mailboxes on the Exchange Server 2007 Mailbox servers cannot.</p>	<p>Check the DNS configuration to ensure that users from the Internet can resolve the host name for the alternate or legacy URL that you have configured. Also, check the reverse proxy or firewall configuration to ensure that all client requests to the legacy URL are directed to the Exchange Server 2007 Client Access server.</p>
<p>You have deployed Exchange Server 2010 servers in your Exchange Server 2007 organization. You need to modify the settings on both Exchange Server 2007 and Exchange Server 2010 servers, but you cannot see both servers in the Exchange Management Console.</p>	<p>You need to use the same version of the Exchange Management Console as the server that you are managing.</p>

Best Practices Related to Upgrading to Exchange Server 2010

- Supplement or modify the following best practices for your own work situations:
- If your Exchange Server 2003 organization has multiple routing groups, consider creating additional routing group connectors between each of the routing groups, and an Exchange Server 2010 Hub Transport server in each office location. By doing this, you can ensure that all messages are sent from the Exchange Server 2003 servers to the Exchange Server 2010 servers without crossing the wide area network (WAN) links between the routing groups.
- Plan to increase the number of Client Access servers as you upgrade to Exchange Server 2010. For Exchange Server 2003 and Exchange Server 2007 deployments, Microsoft recommends a 1:4 ratio of Client Access server or front-end server processor cores to Mailbox server or back-end server cores. In Exchange Server 2010, Microsoft recommends a 3:4 ratio.

Lab Review Questions and Answers

Lab: Upgrading to Exchange Server 2010

Question: You identified the steps required to upgrade the organization to Exchange Server 2010. The first step is to prepare the schema. What command do you use to perform this task?

Answer: setup.com /PrepareSchema

Question: Which permissions do you need to prepare the schema?

Answer: To prepare the schema, you must be a member of the Enterprise Admins and Schema Admins group.

Module 12

Integrating Microsoft Exchange Server 2010 with Other Messaging Systems

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Lesson 1

Designing Exchange Server 2010 Integration with Other Messaging Systems

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Questions and Answers

Designing Message Routing with the Same SMTP Namespace

Question: When a namespace is shared between two messaging systems, is it possible for one of the messaging systems to also have an additional domain name that is unique to that messaging system?

Answer: Yes. If two organizations are merging messaging systems, it is likely that they will have a unique namespace for one of the organizations until the merger is complete. For example, if A. Datum Corporation buys Contoso, Ltd., the Contoso users will retain their existing contoso.com email address, and have an adatum.com email address added. The contoso.com messaging system needs to be configured to accept messages for adatum.com.

Designing Global Address List Synchronization

Question: Which GAL synchronization methods should you use to migrate 5,000 users from an external messaging system to Exchange Server 2010?

Answer: You should use Forefront Identity Manager or another automated solution for GAL synchronization. Automation reduces the work required by administrators, and reduces the risk of errors.

Designing Calendar Interoperability

Question: Can you think of an advantage for using federated delegation over the Exchange Server Availability service between organizations?

Answer: Federated delegation has fine-grained control that lets you control which user's calendar information can be shared. It is also designed for long-term interoperability, and therefore better suited for integration with partner organizations.

Additional Reading

Designing Message Routing with Unique SMTP Namespaces

- [Understanding Address Rewriting](#)

Designing Message Routing with the Same SMTP Namespace

- [Understanding Accepted Domains](#)

Lesson 2

Designing Exchange Server 2010 Integration with Federated Partners

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Questions and Answers

Designing Organization Relationships

Question: Can you vary the users that share calendar information as part of each organization relationship?

Answer: Yes. You can control which users can participate in an organization relationship by specifying a security distribution group for the organization relationship. Participation in the organization relationship is restricted to users in the group. You can specify a different group for each organization relationship.

Designing Sharing Policies

Question: Can you create a sharing policy to enable GAL synchronization between two users?

Answer: No. GAL synchronization is not part of federated delegation. Only user contacts can be shared.

Additional Reading

What Is Federated Delegation?

- [Understanding Federated Delegation](#)
- [Understanding Federation](#)
- Appendix B in 10135B: "Configuring, Managing, and Troubleshooting Microsoft Exchange Server 2010"

Considerations for Designing Federation Trusts and Certificates

- [Understanding Federation](#)
- [Trusted Root Certification Authorities for Federation Trusts](#)
- [Create a Federation Trust](#)

Designing Sharing Policies

- [Understanding Federated Delegation](#)

Lesson 3

Designing Exchange Server 2010 Integration with Office 365

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Additional Reading

Designing Mailbox Moves for Non-Hybrid Deployments

- [E-Mail Migration Overview](#)

Module Reviews and Takeaways

Review questions

Question: Does Exchange Server 2010 include specialized connectors for other messaging systems?

Answer: No. Exchange Server 2010 includes support for foreign connectors, but does not include any foreign connectors.

Question: How can Forefront Identity Manager help with GAL synchronization between two Exchange Server organizations?

Answer: Unlike other solutions, such as scripts, that must be scheduled, Forefront Identity Manager can recognize directory changes as they happen, and can replicate them to the other Exchange Server organization. This means that contacts in each Exchange Server organization will always be up-to-date.

Question: Which option for sharing calendar information can you use for between and Exchange Server 2010 organization and an Exchange Server 2007 organization?

Answer: Both Exchange Server 2010 and Exchange Server 2007 have the Availability Web Service for sharing free/busy information between organizations.

Question: Can Exchange Online be integrated with an on-premises Exchange Server organization?

Answer: Yes. In fact, both can be managed from the Exchange Management Console and the Exchange Management Shell when you implement a hybrid deployment.

Best Practices Related to Federated Delegation

Supplement or modify the following best practices for your own work situations:

- Use organization relationships for a large number of users to share calendar information with an external organization such as a partner or subsidiary.
- Specify a security distribution group in an organization relationship to limit the sharing of calendar data to specific users.
- Use sharing policies to allow users to share information directly with external users, and control the information that can be shared.
- Provide users with Outlook 2010 or Outlook Web App to allow them to send sharing invitations.

Appendix A

Unified Messaging in Microsoft Exchange Server 2010

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Lesson 1

Planning the Unified Messaging Infrastructure

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Infrastructure Requirements

- [PBX Configuration Notes Tested by Microsoft or IP Gateway Vendor Partners](#)

Planning Considerations for VoIP Gateways

- [PBX Configuration Notes Tested by Microsoft or IP Gateway Vendor Partners](#)

Appendix B

Planning a Virtualization Strategy for Exchange Server 2010

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Lesson 1

Hyper-V Overview

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Question and Answer

Identifying Server Virtualization Candidates

Question: What server workloads will you be virtualizing in your organizations? How will you make the decisions about what to virtualize?

Answer: Most organizations begin by virtualizing test and development servers, because these servers do not usually have the same availability and performance requirements that production servers have. The first servers that are virtualized in production are usually lightly-used servers such as Web servers. In many organizations, virtualization has become the default configuration. That is, all servers are virtualized unless there is a good reason why the servers should not be virtualized.

Additional Reading

Requirements and Limits for Hyper-V Hosts

- [Windows Server Catalog - Hardware](#)

Identifying Server Virtualization Candidates

- [Microsoft server software and supported virtualization environments](#)
- [Microsoft Assessment and Planning \(MAP\) Toolkit](#)

Using Virtual Machine Manager to Manage Virtual Environments

- [Microsoft System Center Virtual Machine Manager 2008 R2](#)

Lesson 2

High Availability Options with Hyper-V

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Additional Reading

Failover Cluster Functionality in Windows Server 2008 R2

- [Using Windows PowerShell Cmdlets on Failover Clusters in Windows Server 2008 R2](#)

Requirements for Failover Clustering in Hyper-V

- [Hyper-V: Using Hyper-V and Failover Clustering](#)

Lesson 3

Planning a Virtualization Strategy for Exchange Server 2010

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Additional Reading

Exchange Server 2010 Virtualization Support

- [Exchange 2010 System Requirements](#)
- [Server Virtualization Validation Program](#)

Design Virtualization for Mailbox Servers

- [Understanding Database Availability Groups](#)

Module Reviews and Takeaways

Review Questions

Question: You are planning to deploy a server running Exchange Server 2010 in a virtual machine running on Hyper-V. You are trying to decide whether to deploy the virtual machine on Windows Server 2008 Hyper-V or Windows Server 2008 R2 Hyper-V.? What are some reasons to choose Windows Server 2008 R2?

Answer: Windows Server 2008 R2 provides some important performance improvements related to CPU, networking, and storage. In addition, if you are considering failover clustering, Windows Server 2008 R2 provides CSV and live migration.

Question: You are planning to deploy Exchange Server 2010 Mailbox servers in a virtual machine running on Hyper-V. How should you configure the virtual disks for the virtual machine?

Answer: You will need to configure a virtual hard disk for the operating system and the Exchange Server installation. This disk must be attached to the virtual machines on the IDE controller, and must be at least 15 GB plus the size of the virtual machine RAM. Then you should attach additional disks using the SCSI controller in the virtual machine. The number and size of disks will depend on the size of the databases, transaction logs, and whether you are providing high availability through DAGs.

Real-world Issues and Scenarios

Question: You are planning to deploy Exchange server in virtual machines. Your organization only has 500 mailboxes, but high availability is a very important consideration. How should you design the Exchange Server 2010 deployment?

Answer: You could deploy two virtual machines running the Mailbox server role on two different servers running Hyper-V, and configure a DAG using the two Mailbox servers. You could also install both the Hub Transport server role and Client Access server role on the same virtual machines, but that would require that you have a hardware load balancer to enable load balancing for the Client Access servers. You could deploy a single virtual machine running the Client Access and Hub Transport server roles, and then configure the virtual machine as highly available, or you could deploy two Client Access and Hub Transport servers as virtual machines.

Question: You are deciding whether to implement server virtualization for Exchange 2010 servers. You currently have Exchange Server 2003 deployed entirely on physical servers, with a total of 7,000 mailboxes in the organization. You have deployed Exchange Server 2003 servers both in the primary data center at the organization's main office, and in a data center at a branch office. What factors should you consider when deciding whether to implement server virtualization for Exchange Server 2010 servers?

Answer: You should consider factors such as:

- Current utilization on the Exchange Server 2003 servers. One of the primary drivers for server virtualization is server consolidation. If you have similar hardware deployed for the Exchange Server 2003 servers that you would use for Exchange Server 2010, and those servers are fully utilized, then this may not be a reason to virtualize. You may also have the opportunity of decreasing the number of physical computers just because of the performance enhancements in Exchange Server 2010.

- Virtualization experience. If your organization has extensive experience with virtualization, you are more likely to be able to deploy a stable and well-managed Exchange environment in the virtual machines. If your organization does not have experience with virtualization, then you should probably consider deploying other, less critical, services in the virtual machines before virtualizing Exchange servers.
- Network and storage infrastructure. If your organization already has the required network and storage infrastructure to implement virtualization, it will be easier to build on that infrastructure. If your organization does not have this infrastructure, your deployment may be delayed.

Best Practices Related to Planning Virtual Machine Deployments

Supplement or modify the following best practices for your own work situations:

- Apply the best practices for optimizing performance for Hyper-V virtual machines. Regardless of the server workload that you deploy on a virtual machine, there is a consistent set of recommendations that you should apply for all virtual machines, including:
 - Use Windows Server 2008 or Windows Server 2008 R2 as the guest operating system whenever possible.
 - Install the virtual machine integration components.
 - Avoid over-committing CPU processor cores on heavily utilized virtual machines.
 - Use pass-through disks or fixed-size virtual hard disks attached to SCSI controllers for best performance.
- Provision and manage virtual machines just like physical machines. In almost all cases, virtual machines require the same hardware resources as are required to run the server workload on a physical machine. The benefit of deploying virtual machines is that you can easily deploy the right level of hardware. For example, if the server workload is using only a fraction of a physical computer's resources, you can assign less hardware to the virtual machine without affecting server performance.
- Avoid over-provisioning the physical hosting environment as you start deploying virtual machines. When you design the physical hosting environment, ensure that you allow some excess capacity in case you need to add more capacity to some of the virtual machines. It is much easier to increase the hardware available to a virtual machine if you have extra resources available.
- Do not assume that you can virtualize all Exchange Server 2010 roles and workloads. As you look at virtualizing Exchange Server 2010 servers, make sure that you understand all performance characteristics of the server you are virtualizing. In some cases, it may make more sense to deploy a physical server and use the Exchange Server 2010 consolidation options rather than deploying the server on a virtual machine.
- Carefully consider both Exchange Server 2010 features and Hyper-V functionality when designing virtual machine deployments. For example, Exchange Server 2010 provides built-in functionality to enable high availability. Hyper-V also provides high availability options. When choosing between the two options, ensure that you understand the benefits and disadvantages of each option.