ITSA2005

Planning and Implementing Server

Assignment

Assignment Type	Group Assignment (4 students in each group)
Week Issued	5

Total Marks	100
Weight	20%
Submission Deadline	Week 12 via Moodle
Submission files	Only **one** submission per group (group member name and ID should be included in the report) Word document
Penalties	Penalties for late submission and plagiarism in accordance with VIT guidelines
The purpose of the assessment is to test students on their ability to design a suitable server infrastructure for different use cases	

Marking Guide

Task	Description	Marks
Task 1	Planning an Upgrade and migration to Windows Server 2012 R2	25
Task 2	Designing a fault tolerant DHCP System	25
Task 3	Planning a VPN Solution	25
Task 4	Planning a Group Policy	25

Overview

Suppose that you are the new administrators for the Contoso Corporation, which is a leading company in producing smart devices for the home. You need to read the background information for the Contoso Corporation provided in Appendix, then read the information provided in Task1, Task2, Task3 and Task4, and then describe your solution for all of them.

For each task you will be creating a proposal that includes the following sections:

- Purpose of the Project
- Requirements of the Project
- The Proposed Solution

When writing the proposal, you must explain the reasoning behind your choices.

This is a group assignment with maximum 4 students in each group and tasks should be distributed among all group members equally (e.g. one task per student).

Task 1 - Planning an Upgrade and migration to Windows Server 2012 R2

As part of a test system, you administer a test domain consisting of four servers running Windows Server 2008 R2. You have been tasked with upgrading the entire domain and all four servers to Windows Server 2012 R2, including the domain and forest functional levels.

Currently, the systems are used by various groups to test various applications before they are deployed to production. Therefore, you need to devise an upgrade plan to move the domain to Windows Server 2012 R2.

Task 2 - Designing a fault tolerant DHCP System

The Contoso Corporation has a DHCP cluster running on Windows Server 2008 R2 and the call center has a Windows Server 2008 R2. You need to create a plan to upgrade the DHCP services to run on Windows Server 2012 R2. In addition, you need to figure out the best configuration for the DHCP server and scopes to provide high availability and robust system.

Task 3 - Planning a VPN Solution

Now that you examined the Contoso Corporation and its infrastructure, and you have researched the VPN technology you want to deploy; you will develop a plan to implement a VPN solution.

When designing a VPN solution, you want to ensure that you maintain security for the corporation and the corporation resources. In addition, you must specify all components that are needed to implement the VPN solution and how you are going to configure the clients so that they can use the VPN server.

Task 4 – Planning a Group Policy

As a system engineer for Contoso Corporation, your manager wants you to review the GPOs and determine the best strategy to deploy when using and managing GPOs. He also wants you to recommend GPO settings that should be applied. Provide your solution for implementation of GPOs in your proposal.

Appendix

Contoso Corporation Overview

The Contoso Corporation is a leading company in producing smart devices for the home including smart doors, smart vacuums, smart lamps, smart heating and cooling systems, smart windows, smart shades, smart clocks, smart exercise equipment, smart dishwashers, smart refrigerators, smart televisions, smart radios, smart beds, smart chairs, and smart sinks. The Contoso Corporation began as a security system consultant company consisting of 5 workers and has grown to an international company with 8,000 employees.

Physical Sites

The Corporate office is in Sacramento, California with a campus consisting of three buildings.

Building Sacramento-A: Offices for 400 employees. Sacramento-A hosts a large number of executives including the president, most of the vice-presidents, the chief financial officer, and chief information officer. It also includes corporate marketing team, corporate accounting team, and corporate legal team. The main information technology is located in Building Sacramento-A as well as the largest data center from the company.
Building Sacramento-B: Offices for 320 employees consisting of the corporate design and testing teams.
Building Sacramento-C: Offices for 420 employees consisting of the marketing team, corporate sales team, and miscellaneous staff positions.

The Contoso Corporation has grown quickly by purchasing other companies so that they could access patents, designs, and technical staff for various products and technology. As a result, the Contoso Corporation has 8 manufacturing sites containing between 300–500 employees each. Each of the manufacturing sites consists of a server room. The Manufacturing sites include:

- Detroit
- Miami
- Dallas
- Pittsburgh
- Phoenix
- Seattle
- Oklahoma City
  Portland

The call center, which handles customer questions and problems, is located in Cleveland. The call center is open 24/7 with 380 to 560 users depending on the volume and season. There are 4 distribution centers in Reno, Austin, Albany, and Denver. Each site has 300 to 400 employees.

The majority of the other employees are sales personnel and in-house consultants, who create customized solutions for homeowners throughout the United States. They reside in 78 sites, each containing between 10 and 25 employees.

Recently, the Contoso Corporation has purchased a company called Adatum Incorporated, which is located in Chicago. Adatum Incorporated employs 130 users. However, since some of the positions will be redundant, you should expect that approximately 30 users will be terminated.

Active Directory

The Contoso Corporation uses two forests. The primary forest/domain is contoso.com. There is also a subdomain called support.contoso.com.

In the Contoso.com domain, you have the following organizational units:

- Executives
- Marketing
- Accounting
- Legal
- Design
- Testing
- Information Technology
- Sales
- Distribution

In the support.contoso.com domain, you have the following organizational units:

- Managers
- Call Personnel

The forest/domain for Adatum Incorporated is adatum.com. While Adatum Incorporated has its own IT team, you will be taking over their resources and eventually merge the Adatum resources into the contoso.com forest.

The Contoso.com domain has the following domain controllers:

- CRWDC01 (Windows Server 2012 R2) – Sacramento – GC and DNS*
  CRWDC02 (Windows Server 2012 R2) – Sacramento – PDC Emulator, Infrastructure Master, RID

Master, Schema Master, Domain Naming Master, and DNS*

- CRWDC03 (Windows Server 2012) – Detroit – DNS
- CRWDC04 (Windows Server 2008 R2) – Miami – GC and DNS
- CRWDC05 (Windows Server 2008 R2) – Dallas – GC and DNS
- CRWDC06 (Windows Server 2008 R2) – Pittsburgh – DNS
- CRWDC07 (Windows Server 2008 R2) – Phoenix – GC and DNS
- CRWDC08 (Windows Server 2008 R2) – Seattle – DNS
- CRWDC09 (Windows Server 2008 R2) – Oklahoma City – GC and DNS
- CRWDC10 (Windows Server 2008 R2) – Portland – GC and DNS

*Virtual server running on Windows Server 2012 R2 Hyper-V

The support.contoso.com domain has the following domain controllers:

- CRWDC11 (Windows Server 2008 R2) – GC, PDC Emulator, Infrastructure Master, RID Master, and DNS

The Adatum.com forest/domain has two domain controllers:

- ARWDC01 (Windows Server 2008 R2) – GC and DNS
- ARWDC02 (Windows Server 2008 R2) – GC, PDC Emulator, Infrastructure Master, RID Master, Schema Master, Domain Naming Master, and DNS

Servers

For a large company with many products and designs, there are many servers throughout the various sites. As a new administrator at Contoso, file storage and access will have to be reevaluated so that the files are accessible to those users who need access while keeping the file secure. Each site (except the corporate office and call center) will have 2-4 file servers/print servers.

Within the data center are two chassis, each chassis with 4 blades running Windows Server 2012 R2 Datacenter and Hyper-V. In addition, the corporate office has the following servers:

- 4 mail servers running Microsoft Windows Server 2012 R2 and Microsoft Exchange 2013
- 4 database servers running Microsoft Windows Server 2012 R2 and Microsoft SQL 2012
- 4 content management servers running Microsoft Windows Server 2008 R2 and Microsoft SharePoint 2010 servers*
- 12 application servers running Windows Server 2008 R2, Windows Server 2012 and Windows Server 2012 R2*

8 internal web servers running Windows Server 2008 R2, Windows Server 2012, and Windows Server 2012 R2*

- 8 external web servers (placed in the DMZ) running Windows Server 2008 R2*
- 2 external DNS servers (placed in the DMZ) running Windows Server 2008 R2
- 2 internal DHCP servers in a failover cluster running Windows Server 2008 R2
- 5 file servers running Windows Server 2008 R2, Windows Server 2012, and Windows Server 2012 R2
- 5 file servers running Windows Server 2008 R2, Windows Server 2012, and Windows Server 2012 R2*
- 2 print servers running Windows Server 2008 R2*

* Virtual server running on Windows Server 2012 R2 Hyper-V

The call center has the following servers:

- 4 file/print servers running Windows Server 2008 R2
- 4 application servers running Windows Server 2008 R2
- 4 internal web servers running Windows Server 2008 R2
- 2 servers running Windows Server 2008 R2 and Microsoft SQL Server 2010 • 1 DHCP server running Windows Server 2008 R2

Adatum has the following virtual servers running on Hyper-V:

- 2 mail servers running Microsoft Windows Server 2008 R2 and Microsoft Exchange 2010*
- 2 database servers running Microsoft Windows Server 2008 R2 and Microsoft SQL 2008 R2*
- 2 application servers running Windows Server 2008 R2*
- 2 internal web servers running Windows Server 2008 R2*
- 2 external web servers (placed in the DMZ) running Windows Server 2008 R2*
- 1 internal DHCP server running Windows Server 2008 R2*
- 2 file servers running Windows Server 2008 R2, Windows Server 2012, and Windows Server 2012 R2*
- 2 print servers running Windows Server 2008 R2*

* Virtual server running on Windows Server 2012 R2 Hyper-V

External DNS is hosted by a web service.

Network

The three buildings are connected together via 1 Gbps links. Building A has the primary Internet connection, which runs at 100 Mbps. The following sites are connected to the corporate office using 10 Mbps circuit:

- Detroit
- Miami
- Dallas
- Pittsburgh
- Phoenix
- Seattle
- Oklahoma City
- Portland
- Cleveland
- Reno
- Austin
- Albany
- Denver

The sales/consultant offices are connected to the corporate office with 3 Mbps links. The sites are connected using Cisco routers and firewalls.

Maintenance Window

The call center must be able to assist customers 24/7. In addition, all external websites must be available 24/7. Maintenance and other tasks can be done only after coordinating with all stakeholders. The designated maintenance period for production systems is Saturday night. However, since some services or applications cannot be down, you may need to stage the application so that the service or application is functional. In addition, based on the needs of the various departments, sometimes systems cannot be taken down during the normal maintenance period.

This Assignment is assessing students based on the following highlighted learning outcomes specified in the unit descriptor:

Learning Outcome Number	Learning Outcome

LO 1	Apply fundamental concepts for planning server deployments and upgrades
LO 2	Analyse IT requirements and plan server management with delegated administration strategies
LO 3	Plan for network addressing with required internet protocols and services
LO 4	Develop user group policies and access strategies
LO 5	Plan and provision application servers
LO 6	Develop secure network access policies
LO 7	Plan and implement an update management strategy
LO 8	Critically analyse any issues and administer high availability and server performance
LO 9	Plan and implement a backup and recovery strategy