# **Assessment Cover Sheet**

### (Print all details and attach to front of assessment task/assignment before submitting)

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| Course code & name | ­­­­­­­­ ICT50220 - Diploma of Information Technology |
| Unit code & name | ­­­­­­­­ ICTNWK540 - Design, build and test network servers |
| Name of assessment | ­­­­­­­­ Assessment Task 2: Backups and Network Services |
| Due Date | 5 / 8 / 2024 |
| Teacher name | ­­­­­­­­ |
| Instructions |  |
| Comments | ­­­­­­­­ |

Declaration: Read, tick and sign below

* I declare that the attached assessment I have submitted is my own original work and any contributions from and references to other authors are clearly acknowledged and noted.
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Student signature …WangYiZhuo……………………… Date 22/ 7 / 2024

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| Please note that your assignment will not be accepted unless you have:   * completed all sections of the assignment * acknowledged all sources of other people’s contributions including references and students’ names for group work assessments * filled in all areas of this student assignment cover sheet. |

## 

Assessment Task 2: Backups and Network Services

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| Course code and title | **ICT50220 Diploma of Information Technology** |
| Unit code and  title | **ICTNWK540 Design, build and test network servers** |
| Due date | DD / MM / 2022 (Students have 2 weeks to complete this task) |
| Resources  required | Learner to provide:   * The learner may use his own laptop provided it meets the minimum requirements (refer to lab setup instructions in in Moodle)   Provided:   * Learner resources in Moodle * Access to computer and Internet * The computer used when working on tasks must have VirtualBox 6.x virtualisation software installed |
| Learner  instructions | This task involves demonstrating skills in deploying a server. Refer to the Task Details below, for further information.   * This assessment will be conducted using a simulated environment where the conditions are typical of those in a working environment in the ICT industry. * This assessment task is a practical project that must be completed individually * It is to be completed in classroom delivery of this unit * You have two weeks to complete this task. * Reasonable adjustments can be made if special circumstances apply, provided the integrity of the assessment is maintained and the intent is not compromised. E.g., extension of time, oral questions and answers etc. * You must complete the coversheet. * All questions must be answered. * You have to replace all occurrences of '99' in this document with the lab ID that was assigned to you at the beginning of the unit. * Naming conventions for the lab environment must be followed. * Unless stated otherwise, all virtual machines must use only the 'Internal Network' adapter. * The Windows Firewall must be enabled for all profiles on the host and on the virtual machines at all times. All inbound connections that do not match a rule must be blocked. * You have to complete the answers electronically and submit the completed assessment document electronically in Moodle by the due date. * If you have any questions about the task or concerns about your ability to complete the task, please discuss this with your Assessor. |

## Tasks and questions

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| This assessment is a continuation of the work completed in assessment 1. The systems W***99***-SERVER**1** and W***99***-CLIENT**1** must be fully operational. |

## Task Overview

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| In this assessment you have to demonstrate your ability to install, configure and manage the following services and features:   * Dynamic Host Configuration Protocol (DHCP) * Run Windows Server Backup and monitor the backup process * Domain Name System (DNS) * Internet Information Services (IIS) * File Transfer Protocol services (FTP) * SMTP proxy mail server   A basic understanding of IPv4 addressing is a prerequisite for completing this assessment. You must ensure that only roles and features explicitly named in this assessment are installed on the servers. |

#### Add Roles and Features on Windows Server 2019

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| Using the ‘Roles and Features’ wizard, add the functionality specified in the table below to W***99***-SERVER**1**: (make sure that only roles and features explicitly named below are ***added*** on the server):   |  |  |  |  | | --- | --- | --- | --- | | **Service** | **Type of functionality** | **Additional selection** | **Additional instructions** | | **DHCP Server** | Role | When prompted, add features that are required for the role | After the installation complete the post-deployment configuration by committing the default settings on the server | | **DNS Server** | Role | When prompted, add features that are required for the role | N/A | | **Web Server (IIS)** | Role | When prompted, add features that are required for the role | Add the following Role Services:   * HTTP Redirection * Basic Authentication * FTP Server (include all options) * IIS Management Scripts and Tools | | **SMTP Server** | Feature | When prompted, add features that are required for the feature | N/A | | **Windows Server Backup** | Feature | N/A | N/A |   Demonstrate that the required roles and features have been installed on the server. |

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| 1 | To demonstrate the required roles and features have been added on the server, open a PowerShell prompt with ‘Run as Administrator’ and issue the command set (all on one line):  whoami ; Get-WindowsFeature | where-object {$\_.Installed -eq $True} ; Get-Date | Select DateTime   |  |  | | --- | --- | | ***Note:*** | ***Review the output carefully. If it does not match the given specification, go back and resolve the issue before continuing further.*** |   Take a screenshot of the PowerShell window showing the output of the whole command set and complete PowerShell output (the screenshot must also show the VM title bar).  Paste the screenshot in the answer area below this line. | | |
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#### Configure DHCP

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| Complete the DHCP configuration on W***99***-SERVER**1** by creating a basic scope according to the following specification:   |  |  |  | | --- | --- | --- | | **Parameter** | **Value / Description** | | | **Scope name** | W***99***-Scope | | | **IP Address Range** | Start IP address: | 10.21.***99***.101 | | End IP address: | 10.21.***99***.129 | | Subnet mask | 24 bits | | **Exclusions** | N/A | | | **Lease Duration** | 5 Days | | | **DHCP Options** | Router: | 10.21.***99***.254 | | DNS server: | 10.21.***99***.**1** | | WINS: | N/A | | **Scope state** | Active | | | **Reservations** | Reservation name | W***99***-CLIENT**1** | | IP address | 10.21.***99***.111 | | MAC address | <W***99***-CLIENT**1** ethernet adapter physical address> | | Do not configure any other DHCP options or settings at this stage | | |   You are to demonstrate successful DHCP scope creation and confirm that DHCP is operational. You are also to save the DHCP scope to allow restoration if needed. A restoration may be required in case of a disaster or in preparation of a planned migration. |

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| 2 | Complete the following steps and answer the corresponding questions. | | | |
| 1. **To demonstrate the DHCP scope is correctly configured, open a PowerShell prompt with ‘Run as Administrator’ and issue the command set (all on one line):**   Get-Date ; whoami ; Get-DHCPServerv4Scope | ft ; Get-DhcpServerv4Reservation -ComputerName "W***99***-SERVER**1**" -ScopeId 10.21.***99***.0   |  |  | | --- | --- | | ***Note:*** | ***Review the output carefully. If it does not match the given specification, go back and resolve the issue before continuing further.*** |   **Take a screenshot of the PowerShell window showing the output of the of the command set (the screenshot must also show the VM title bar).**  **Paste the screenshot in the answer area below this line.** | | | | | |
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| 1. **To demonstrate the DHCP scope is operational, sign in on W*99*-CLIENT1 as Administrator and change all IPv4 settings to be automatically assigned. Open a PowerShell prompt with ‘Run as Administrator’ and issue the command set (all on one line):**   whoami ; ipconfig /all ; Get-Date | Select DateTime   |  |  | | --- | --- | | ***Note:*** | ***Review the output carefully. If it does not match the scope settings, go back and resolve the issue before continuing further.*** |   **Take a screenshot of the PowerShell window showing the output of the of the command set (the screenshot must also show the VM title bar).**  **Paste the screenshot in the answer area below this line.** | | | | | |
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| 1. **Create the folder D:\W*99*-DHCP on W*99*-SERVER1. You are to save the DHCP scope configuration in this folder for backup purposes. Open a PowerShell prompt with ‘Run as Administrator’ and issue the command set (all on one line):**   whoami ; Export-DhcpServer -ComputerName W***99***-SERVER**1** -File "D:\W***99***-DHCP\W***99***-SERVER**1**-DHCP-Export.xml" -ScopeId 10.21.***99***.0 ; Dir D:\W***99***-DHCP ; Get-Date | Select DateTime   |  |  | | --- | --- | | ***Note:*** | ***Review the output carefully. If it contains an error or the XML scope file is not listed, your configuration is not right (e.g., target folder missing) or you have mistyped the command set. Go back and resolve the issue before continuing further.*** |   **Take a screenshot of the PowerShell window showing the output of the of the command set (the screenshot must also show the VM title bar).**  **Paste the screenshot in the answer area below this line.** | | | | | |
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#### Prepare backup storage

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| You plan to take backups of the Windows Server 2019 and save them on a network share. This will allow you to restore the system and data in the event of a disaster. For testing purposes, you will configure your Windows 10 system to act temporarily as a file server and provide the network storage required for these backups.   * Using the specification below add a second virtual disk to W***99***-Win-10-Eval-**1**:  |  |  | | --- | --- | | **Parameter** | **Value / Description** | | **Virtual disk file name:** | W***99***-Win10-Eval-**1**-Backup.vdi | | **Size:** | 50GB | | **Hard disk file type** | VDI | | **Storage on physical hard disk** | Dynamically allocated |  * Modify the computer settings of W***99***-CLIENT**1** as follows:  | **Parameter** | **Value / Description** | | --- | --- | | **Sharing options** | ‘Network discovery’ and ‘File and printer sharing’ Must be enabled for ‘Private’ and ‘Guest or Public’ networks | | **Configure the added disk** | |  |  | | --- | --- | | **Partition style:** | MBR | | **Volume type:** | Simple volume | | **Disk space:** | <Maximum disk space that can be allocated> | | **Drive letter:** | D: | | **Size:** | 50GB | | **File system:** | NTFS | | **Allocation unit:** | Default (4K) | | **Volume label:** | Backups | | **Format** | 'Perform a quick format' ***MUST*** be selected | | | **Create two folders and share them on the network** | |  |  | | --- | --- | | **Folder Location/Name** | D:\W***99***-Baremetal | | **Security** | ***Add*** group 'Everyone' with 'Full control' permissions | | **Sharing** | Enable sharing and set share permissions for group 'Everyone' to 'Full control' | | | |  |  | | --- | --- | | **Folder Location/Name** | D:\W***99***-Data | | **Security** | ***Add*** group 'Everyone' with 'Full control' permissions | | **Sharing** | Enable sharing and set share permissions for group 'Everyone' to 'Full control' | |   Demonstrate that the Windows 10 system is configured in line with the given requirements. |

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| 3 | To demonstrate W*99*-CLIENT1 is configured according to the specification, open a PowerShell prompt with ‘Run as Administrator’ and issue the command set (all on one line):  whoami ; Get-Volume | ft ; Get-Acl -Path D:\W*99*\* | ft ; Get-SmbShare | Get-SmbShareAccess| Where-Object {$\_.name -Like "W*99*\*"} | ft ; Get-Date | Select DateTime   |  |  | | --- | --- | | ***Note:*** | ***Review the output carefully. If it does not match the specification, go back and resolve the issue before continuing further.*** |   Take a screenshot of the PowerShell window showing the output of the command set (the screenshot must also show the VM title bar).  Paste the screenshot in the answer area below this line. | | |
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#### Backup and monitor Windows Server 2019

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| Your server design calls for testing the storage system to confirm it meets acceptable performance levels. Prior to running the backups, you must establish a performance baseline. You are to confirm that the disk queue lengths are less than 2 when the storage system on W***99***-SERVER**1** is ***not*** under extreme load.  You are to prototype the backup process by running a data backup and a bare metal backup on the server while monitoring the storage performance. The backups will be stored on the network shares you have previously prepared.  You are to demonstrate that the benchmark for your storage system complies with the requirements and that the backup pilot testing was successful. |

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| 4 | Provide answers in the three sections below (two screenshots and a written answer). | | | |
| 1. **To establish a disk performance baseline on W*99*-SERVER1, start the ‘Resource Monitor‘ and select the ‘Disk’ tab. Make sure all columns in the left pane and the graphs in the right pane are clearly visible (if necessary, expand the VM window).**   **Wait 2 minutes and then take a screenshot of the Resource Monitor window. The ‘*Processes with Disk Activity*’ entries, the ‘*Queue Length*’ for C: and D: as well as the VM title bar must be visible in your screenshot.**  **Paste the screenshot in the answer area below this.**  ***Note:* *Leave the Resource Monitor open and running until all backups are completed.*** | | | | | |
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| 1. **Check the disk queue length in the screenshot you took for the previous question and then answer the question shown below. Select your answer from the dropdown list the light-blue highlighted cell.**  |  |  | | --- | --- | | ***Note:*** | ***If you screenshot does not show the disk queues, you must go back and correct your answer to the previous question.*** | | | | | | |
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| |  |  | | --- | --- | | ***Are the disk queues in your screenshot within the acceptable range?*** | **Yes** | | | | | | |
| 1. **Configure and run a bare metal 'Windows Server Backup' job on W*99*-SERVER1 as specified below:**  |  |  |  | | --- | --- | --- | | **Backup Parameter** | **Value / Description** | | | **Local Backup Options:** | Run backup once (do not setup a scheduled backup) | | | **Backup Configuration:** | Custom | | | **Select Items for Backup** | Add ‘Bare metal recovery’ (include ‘System state’, ‘System Reserved’ and ‘Local disk (C:)’.  ***Do not select any other items.*** | | | **Specify Destination Type:** | Remote shared folder | | | **Specify Remote Folder:** | Location: | \\W***99***-CLIENT**1**\W***99***-Baremetal | | Access control | Inherit | | Provide user credentials for backup | If prompted, provide the Administrator credentials on W***99***-CLIENT**1** | | **Confirmation:** | Review settings and start the backup | | | **During the backup** | Wait until about 60% of C: has been backed up and then switch to the Resource Monitor window to record the disk queue length. | |     **Monitor the progress of the backup. When the backup of C: is about 60% complete, take a screenshot of the Resource Monitor window showing the disk queue length value for C: (the screenshot must also show the ‘Processes with Disk Activity’ pane, the disk queues and the VM title bar). Paste the screenshot below this line.** | | | | | |
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| 1. **First explain the importance of the disk queue length. Next explain why the disk queue length recorded before the backup on drive C: is much lower than the disk queue length recorded during the backup. Finally explain why in your screenshot the process activity for the backup program wbengine.exe shows that the read operations are significantly higher than the write operations.**   **Type your response below this line in the light-blue highlighted cells and limit your explanations to between 50 – 150 words in total (excluding references).** | | | | | |
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| |  |  |  | | --- | --- | --- | |  | ***Explain the importance of the disk queue length:*** | ***The disk queue length is crucial as it indicates the number of I/O operations waiting to be processed by the disk. A high disk queue length suggests that the disk is overwhelmed, leading to potential performance bottlenecks and slower system performance.*** | | ***Provide the source(s) you used for your research:*** | ***https://learn.microsoft.com/en-us/azure/virtual-machines/disks-benchmarks*** | |  | ***Explain why the disk queue length recorded before the backup on drive C: is much lower than the disk queue length recorded during the backup.*** | ***Before the backup, the disk is under typical usage with fewer I/O operations, resulting in a lower queue length. During the backup, a large number of read and write operations occur, significantly increasing the disk queue length.*** | |  | ***Explain why in your screenshot the process activity for the backup program wbengine.exe shows that the read operations are significantly higher than the write operations:*** | ***The backup program wbengine.exe reads a large amount of data from the source disk to create the backup, which results in higher read operations compared to write operations, where only the changes or the backup data itself are written.*** | | | | | | |
| 1. **Configure and run a data 'Windows Server Backup' job on W*99*-SERVER1 as specified below:**  |  |  |  | | --- | --- | --- | | **Backup Parameter** | **Value / Description** | | | **Local Backup Options:** | Run backup once (do not setup a scheduled backup) | | | **Backup Configuration:** | Custom | | | **Select Items for Backup** | Add ***only***: D:\W***99***-DHCP | | | **Specify Destination Type:** | Remote shared folder | | | **Specify Remote Folder:** | Location: | \\W***99***-CLIENT**1**\W***99***-Data | | Access control | Inherit | | Provide user credentials for backup | If prompted, provide the Administrator credentials on W***99***-CLIENT**1** | | **Confirmation:** | Review settings and start the backup | | | **Backup Progress** | Select ‘Close’ once the backup has finished | |     **In the messages listing of the backup program window select the most recent ‘Local Backup’ and view the details. Take a screenshot of the ‘Details – Last Backup’ window (the screenshot must also show the VM title bar). Paste the screenshot below this line.** | | | | | |
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#### Configure and Manage DNS

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| The DNS design caters for many computers and services that your organisation provides. The design provides the DNS specification shown below, referring to details such as the Fully Qualified Domain Name (FQDN) as needed. You are to configure the DNS service according to the specification shown below.   * Sign in as w***99***-admin**1** on W***99***-SERVER**1** and using ‘DNS Manager’ create the two DNS zones specified below.  |  |  | | --- | --- | | **Zone** | **Values / Description** | | **Forward Lookup Zone (FLZ)** | Zone Type: Primary  Zone name: z***99***.local  All other settings: <keep the defaults> | | Zone Type: Primary  Zone name: website**1**.local  All other settings: <keep the defaults> | | Zone Type: Primary  Zone name: website**2**.local  All other settings: <keep the defaults> | | **Reverse Lookup Zone (RLZ)** | Zone Type: Primary  RLZ Name: IPv4 Reverse Lookup Zone  Network ID: <First three octets of your subnet>  All other settings: <keep the defaults> |  * Add the following records to your zones:  |  |  |  | | --- | --- | --- | | **Zone** | **DNS Record Type** | **Values / Description** | | **z*99*.local** | **Host** | Name: W***99***-SERVER**1**  IP address: <Fill in the IPv4 address of W***99***-SERVER**1**>  Create PTR record: Selected | | **Host** | Name: W***99***-CLIENT**1**  IP address: <Fill in the IPv4 address of W***99***-CLIENT**1**>  Create PTR record: Selected | | **Alias (CNAME)** | Name: server**1**  FQDN for target host: <browse to and select W***99***-SERVER**1**> | | **Alias (CNAME)** | Name: ftp  FQDN for target host: <browse to and select W***99***-SERVER**1**> | | **Alias (CNAME)** | Zone: z***99***.local  Name: workstation**1**  FQDN for target host: <browse to and select W***99***-CLIENT**1**> | | **website1.local** | **Host** | Zone: website**1**.local  Name: W***99***-SRV**1**  IP address: <Fill in the IPv4 address of W***99***-SERVER**1**>  Create PTR record: ***Not*** Selected | | **Alias (CNAME)** | Zone: website**1**.local  Name: www  FQDN for target host: <browse to and select w***99***-srv**1**> | | **website2.local** | **Host** | Zone: website**2**.local  Name: w***99***-srv**1**  IP address: <Fill in the IPv4 address of W***99***-SERVER**1**>  Create PTR record: ***Not*** selected | | **Alias (CNAME)** | Zone: website**2**.local  Name: www  FQDN for target host: <browse to and select w***99***-srv**1**> |   Demonstrate that you have successfully configured DNS and validated the configuration over the network. |

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| 5 | To demonstrate successful installation and configuration of DNS on W*99*-SERVER1, provide the screenshot evidence as described below. | | | | |
| 1. **To demonstrate successful installation and configuration of DNS on W*99*-SERVER1, open a PowerShell prompt with ‘Run as Administrator’ and issue the four commands to list the records in the DNS zones you have created.**   Get-DnsServerResourceRecord -ZoneName "z***99***.local"  Get-DnsServerResourceRecord -ZoneName "***99***.21.10.in-addr.arpa"  Get-DnsServerResourceRecord -ZoneName "website**1**.local"  Get-DnsServerResourceRecord -ZoneName "website**2**.local"   |  |  | | --- | --- | | ***Note:*** | ***Review the output carefully. If it does not list all specified DNS records, go back and resolve the issue before continuing further.*** |   **Take a screenshot of the PowerShell window showing the output of the four commands (the screenshot must also show the VM title bar).**  **Paste the screenshot in the answer area below this line.** | | | | | | |
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| 1. **Your test plan calls for using the nslookup tool to validate a number of DNS aliases and PTR records. You are to execute the listed predefined nslookup commands over the network and record outcomes as evidence for completing the test plan successfully.**   **On W*99*-CLIENT1 sign in as local Administrator, open a PowerShell prompt, run nslookup and execute the test plan commands (shown in the table below). Carefully check each command output to confirm the validity of the DNS records.**   |  |  | | --- | --- | | **Test Plan for DNS** | | | **Run nslookup on a client computer** | **Purpose / Description of the nslookup command** | | set type=CNAME | *Sets the query type to Alias (CNAME) records.* | | ftp.z***02***.local | *Lists the DNS server that is being queried.*  *Lists the alias record entry and the corresponding canonical name as FQDN.* | | server**1**.z***02***.local | | workstation**1**.z***02***.local | | set type=PTR | *Sets the query type to PTR records.* | | 10.21.***2***.**1** | *Lists the DNS server that is being queried.*  *Lists Reverse Lookup Zone (RLZ) record entry and corresponding canonical name as FQDN.* | | 10.21.***2***.111 |  |  |  | | --- | --- | | ***Note:*** | ***Review the output carefully. If a command generates an error or the result does not match the record specification, you must go back to correct the issue before proceeding any further.*** |   **To demonstrate that you have successfully validated the DNS records according to the test plan, take a screenshot of the PowerShell window showing the output of the nslookup commands (the screenshot must also show the VM title bar).**  **Paste the screenshot in the answer area below this line.** | | | | | | |
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#### Configure and manage web sites

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| You are to setup two web sites as specified below.   * Download the two preconfigured web site folders from Moodle to your host PC and then copy them to your server. To copy the files to your server you can use Drag’n Drop or VirtualBox ‘Shared Folders’. * On W***99***-SERVER**1**: copy the two websites ***folders*** to C:\ * Using IIS Manager on W***99***-SERVER**1**, add two websites as specified in the table below.  |  |  |  |  |  | | --- | --- | --- | --- | --- | | ***Note:*** | ***Do not change any settings in IIS before you attempt to create the two web sites.*** | | | | | **Parameter name** | | | **First web site** | **Second web site** | | **Web site name** | | | W***99***-Website**1** | W***99***-Website**2** | | **Physical path (create the folders on W*99*-SERVER1 as needed)** | | | C:\Website**1** | C:\Website**2** | | **TCP port used:** | | | 444***99*** | 80 | | **All other settings** | | | <keep the defaults> | <keep the defaults> | | ***Note:*** | ***Assuming the default IIS configuration was not changed, you will encounter some issues when creating one of the websites. Take note of the issues and resolve the problem. Record what you had to do to successfully start the web site.*** | | | |  * Change the ***default document*** for each website to use ***only*** the web page in its physical path:   + W***99***-Website**1**: Point to the web page located in C:\Website**1**   + W***99***-Website**2**: Point to the web page located in C:\Website**2**  |  |  | | --- | --- | | ***Note:*** | ***When specifting the default document make sure you provide the full file name including the extension.*** |  * Enable directory browsing for both web sites (W***99***-Website**1** and W***99***-Website**2**). * In the Windows Firewall configure a rule to allow inbound requests on TCP ports 80 and 444***99***.   On W***99***-SERVER**1** demonstrate successful setup of the two web sites. |

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| 6 | To demonstrate successful setup of the two web sites on W*99*-SERVER1, answer the knowledge questions provide the screenshot evidence as described below. | | | | |
| 1. **Explain why you receive a warning or an error when trying to create web site W*99*-Website2. Then document how you resolved the issues for your colleagues.**   **Type your response in the answer area below and limit your explanation to between 25 – 100 words in total (excluding references).** | | | | | |
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| When creating W99-Website2 on port 80, an error occurs because the default website in IIS already uses port 80, causing a conflict. To resolve this, stop the default website by selecting it in IIS Manager and clicking "Stop" in the Actions pane. Then proceed with creating W99-Website2 on port 80, ensuring no conflicts. This allows W99-Website2 to start successfully. | | | | | |
| 1. **You are to demonstrate that website1 is accessible over the network. Using a browser on W*99*-CLIENT1 open the web site: http://www.website1.local:444*99*/**  |  |  | | --- | --- | | ***Note:*** | ***You must use the URL exactly as shown above with your lab ID substituted in the port number. If the correct website is not shown, you have made an error in your configuration. You must resolve any issues before continuing any further.*** |   **Take a screenshot of the browser window (the screenshot must also show the VM title bar). Paste the screenshot in the answer area below this line.** | | | | | |
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| 1. **You are to demonstrate that you have resolved the initial issue and the website2 is now accessible over the network. Using a browser on W*99*-CLIENT1 open the web site: http://www.website2.local/**  |  |  | | --- | --- | | ***Note:*** | ***You must use the URL exactly as shown above with your lab ID substituted in the port number. If the correct website is not shown, you have made an error in your configuration. You must resolve any issues before continuing any further.*** |   **Take a screenshot of the browser window (the screenshot must also show the VM title bar). Paste the screenshot in the answer area below this line.** | | | | | |
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| 1. **Explain why you must specify a port number for website1 whereas you do not need to specify a port number when connecting to website2.**   **Type your response in the answer area below and limit your explanation to between 20 – 40 words (excluding references).** | | | | | |
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| ***Website1 uses port 44499, a non-default port, requiring specification in the URL. Website2 operates on port 80, the default HTTP port, which browsers automatically use, eliminating the need for explicit port specification.*** | | | | | |

#### Configure and manage an FTP services

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| You are to setup and configure the FTP service and use it to upload and download files. Your design states that for ordinary users, access to FTP must be restricted to a single group of users to prevent unauthorised access to system. These access restrictions must be implemented via folder permissions and FTP service permissions.  You are to deploy FTP based on the following specification:   * Create the folders listed below  |  |  | | --- | --- | | **Folder name and location** | **Property / Security tab settings** | | C:\W***99***-FTP | * Using the ‘Advanced’ settings, disable inheritance and convert inherited permissions into explicit permissions on the object * Remove the 'Users' group * Make sure w***99***-admin has full control permissions * Leave all other permissions unchanged | | C:\W***99***-FTP\root | * ***Add*** the group W***99***-FTP-Users with ***Modify*** permission * Leave all other permissions unchanged |  * In IIS Manager on W***99***-SERVER**1** use ‘Add FTP Site…’ to create and configure FTP according to the following specification:  |  |  |  | | --- | --- | --- | | **Category** | **Parameters and values** | | | **FTP site name:** | W***99***-FTP | | | **Physical path:** | C:\ W***99***-FTP\root | | | **Binding and SSL Settings:** | IP Address | All Unassigned | | Port | 21 | | Start FTP site automatically | <selected> | | SSL: | No SSL | | **Authentication** | Anonymous | <**NOT** selected> | | Basic | <selected> | | **Authorization** | Allow access to: | Specified roles or user groups | | <specify the group> | W***99***-FTP-Users | | **Permissions:** | Read | <selected> | | Write | <selected> |  * On W***99***-SERVER**1** check and if required, modify the firewall to allow FTP connections:   + Open ‘Control Panel / Windows Defender Firewall’, click on ‘Allow an app or feature through Windows Firewall’, scroll down to ‘FTP Server’ and verify that the checkboxes for all profiles are selected. If they are not selected, select them.   + In the ‘Advanced settings’, select ‘Inbound Rules’ and scroll down to verify that all three FTP rules are selected for all Profiles. If not enabled, enable them.   + In the left pane of IIS Manager select the newly created site W***99***-FTP and in the right pane double-click on ‘FTP Authentication’. Make sure that ‘Basic Authentication’ is enabled and ‘Anonymous Authentication’ is disabled.   + Restart the server   Demonstrate successful setup of FTP on W***99***-SERVER**1**. |

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| 7 | To demonstrate successful setup of the FTP site on W*99*-SERVER1, answer the screenshot evidence as described below and answer the knowledge questions. | | | | |
| 1. **To demonstrate successful creation of the FTP site, select ‘Sites’ in the left pane of the IIS Manager and in the middle pane expand the Name, Binding and Path columns to clearly show all entries for the FTP site.**   **Take a screenshot of the IIS window (the screenshot must also show the VM title bar). Paste the screenshot in the answer area below this line.** | | | | | |
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| 1. **Your test plan requires that you test the service by transferring a file from a Windows 10 client to the server using FTP. Relevant steps are to be recorded as evidence for the successful testing of the FTP service.**  * **Sign in as *THE* local Administrator on W*99*-CLIENT1, start Notepad, type some text and save the file in the *Administrator’s Documents folder* using the file name w*99*-testfile1.txt** * **To test your FTP server, open a PowerShell prompt (do *NOT* use ‘Run as Administrator’)) on W*99*-CLIENT1 and execute the following commands:**  |  |  |  |  | | --- | --- | --- | --- | | **Execute PowerShell Command** | | **Purpose** | | | cd Documents | | Change the prompt to the Documents folder | | | whoami ; dir | | Show the identity of the currently signed in user and list the contents of the Documents folder   |  |  | | --- | --- | | ***Note:*** | ***If you cannot see the file that you previously created, retrace your steps to resolve the issue before proceeding any further.*** | | | | ftp ftp.z***99***.local | | Connect to your FTP server using its FQDN | | | When prompted for credentials, ***sign in as*** w***99***-user**2** | | |  | **Execute FTP command** |  | | |  | dir | Lists the folder content on the FTP server | | |  | ***Note:*** | ***If a firewall warning screen pops up, select all available networks and click on ‘Allow access’.*** | | put w***99***-testfile**1**.txt | Transfers the file from the client to the server   |  |  | | --- | --- | | ***Note:*** | ***If the command fails, you have made an error and you must resolve the issues before continuing any further. You may need to repeat the FTP command sequence if the connection times out.*** | | | | dir | Lists the folder content on the FTP server to confirm the file was successfully transferred | | | quit | Exit FTP prompt | |   **To demonstrate you have successfully completed the FTP testing, take a screenshot of the PowerShell window showing the results of all commands listed in the above table. The screenshot must also show the VM title bar. Paste the screenshot in the answer area below this line.** | | | | | |
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| 1. **To test the security configuration, open another connection to the FTP services from the PowerShell window by issuing the command**   ftp ftp.z***99***.local  **When prompted for credentials sign in w*99*-user1.**  **To demonstrate that w*99*-user1 was *NOT* able to sign in take a screenshot of the PowerShell window showing the FTP error message (the screenshot must also show the VM title bar).**  **Paste the screenshot in the answer area below this line.** | | | | | |
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| 1. **Explain what you would have to do to allow w*99*-user1 to successfully connect to the FTP server without having to chage any permissions on the FTP site.**   **Type your response below this line and limit your explanation to between 25 – 100 words (excluding references).** | | | | | |
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| ***There is only the W02-FTP-Users group in the FTP authorization rules, and w02-user1 is not in this group. Only after w02-user1 is added to the W02-FTP-Users group can he access the FTP server.*** | | | | | |
| 1. **Make changes to the system to allow w*99*-user1 to successfully connect to the FTP server. To demonstrate that w*99*-user1 can successfully connect to the FTP server from W*99*-CLIENT1 complete the following commands using a *new* PowerShell prompt:**  * **Connect to the FTP server using its FQDN and sign in as w*99*-user1** * **Retrieve a file from the server using the FTP command:**   get w***99***-testfile**1**.txt   |  |  | | --- | --- | | ***Note:*** | ***If the command fails, make sure you resolve the issue before proceeding any further. You may need to repeat the FTP command sequence if the connection times out.*** |  * **Quit FTP** * **Confirm successful retrieval of the file by issuing the command set**   whoami ; dir \*.txt  **Take a screenshot of the PowerShell window showing the results and successful completion of all the commands you executed above (the screenshot must also show the VM title bar). Paste the screenshot in the answer area below this line.** | | | | | |
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#### Configure proxy mail

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| You are to configure SMTP proxy mail on W***99***-SERVER**1**.   * Using ‘Internet Information Services (IIS) ***6.0*** Manager’ configure the properties of your ‘SMTP Virtual Server #1’ according to the specification below.  |  |  |  |  |  | | --- | --- | --- | --- | --- | | **SMTP Virtual Server Specification** | | | | | | **Tab** | **Section / Button** | | **Parameter and value** | | | **Access** | **Access control** | Authentication | Only Anonymous access must be selected | | | Connection | Computers that may access this virtual server | 127.0.0.1  10.21.***99***.0/24 | | Relay | Computers that may relay through this virtual server | 127.0.0.1  10.21.***99***.0/24 | | Allow all computers which successfully authenticate … | ***NOT*** selected | | **Messages** | Send copy of NDR to: | | w***99***-admin**1**@z***99***.local | | | **Delivery** | **Advanced** | | Fully-qualified domain name | w***99***-server**1**.z***99***.local | | Any values not explicitly listed must be left at their default settings. | | | | |  * Set the SMTP service to automatic start-up and start the service   You are to demonstrate that the SMTP server proxy is operational on W***99***-SERVER**1**.   * While logged in as w***99***-admin**1**, using Notepad, create a text file with the following content and save it in your Documents folder using the file name w***99***-admin**1**-SMTP-test-#1.txt:   From: W***99***-SERVER**1**@z***99***.local  To: w***99***-user**1**@z***99***.local  Subject: Email test #1  This is the test email to w***99***-user**1**   * Copy the file to ‘C:\inetpub\mailroot\Pickup’ (when prompted to provide administrator permission select ‘Continue’). The file will be promptly processed and an outgoing email message file will be created in ‘C:\inetpub\mailroot\Queue’.  |  |  | | --- | --- | | ***Note:*** | ***Once the outgoing message file was successfully created, the original file placed in ‘C:\inetpub\mailroot\Pickup’ is automatically removed.*** |   Provide evidence that your SMTP proxy successfully processed the submitted message. |

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| 8 | To demonstrate that your SMTP proxy successfully processed the submitted message, open a PowerShell prompt wit ‘Runs as Administrator’ and issue the command set (all on one line):  whoami ; Get-Date | Select DateTime ; dir C:\inetpub\mailroot\Queue | Get-Content   |  |  | | --- | --- | | ***Note:*** | ***Review the output carefully. If you get an error or the email message listing does not include a message ID showing your server details, go back and resolve the issue before continuing further.*** |   Take a screenshot of the PowerShell window showing the output of the command set (the screenshot must also show the VM title bar).  Paste the screenshot in the answer area below this line. | | |
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#### Manage services with PowerShell

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| You are to stop, start and modify the Web service (World Wide Web Publishing Service) on W***99***-SERVER**1** using PowerShell.   * Research and find the PowerShell commands required to stop, start and modify a service. * Open a PowerShell prompt with 'Run as Administrator' on W***99***-SERVER**1** and complete the following steps using the PowerShell commands:   1. List the current status of the Web service (showing status, name, display name and start type) to demonstrate the service is running.   2. Stop the Web service.   3. List the current status of the Web service (showing status, name, display name and start type) to demonstrate the service was stopped.   4. Start the Web service.   5. List the current status of the Web service (showing status, name, display name and start type) to demonstrate the service was successfully started.   6. Modify the Web services to use 'Manual' start type.   7. List the current status of the Web service (showing status, name, display name and start type) to demonstrate the service start type was successfully modified.   8. Change the Web services back to use 'Automatic' start type.   Demonstrate you have successfully completed all the above steps. |

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| 9 | To demonstrate you have successfully completed the eight commands on W*99*-SERVER1, take a screenshot of the PowerShell window showing the output of the commands.   |  |  | | --- | --- | | ***Note:*** | ***Review the output carefully. If the output contains errors, go back and resolve the issue before continuing further.*** |   Paste the screenshot in the answer area below this line. | | |
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## Learner Declaration (hard copy submission only)

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| Please read, tick and sign below | | | |
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