INFO813 Practical project documentation template (Engineering journal)

Stage Number

Student name: Raine Roberts

When doing practical work it is common practice and extremely useful to document the steps you took. This assists you make your learning more tangible and organize it. The more detail you can provide the better it is so that if ever you want to configure it in the future you have a personal record documented.

The project book gives the main implementation steps. However this documentation report requires you document what you did at each implementation step as you are doing the practical project. It is not advised to do this at the end otherwise you are likely to forget what you did. You can alter the format of this template as long it includes all the relevant information

Please write this in your own words as it is a record of your work. Copied material is not accepted.

Describe the Design of your project and justify your design. (100 words)

My project includes a Windows 10 22H2 Pro client, a Windows Server 2022, and a FortiGate firewall for routing and security. The setup enables creating a Windows Server domain, joining the Windows 10 client, and managing a fictional organization with departments and roles. Active Directory and PowerShell were used to create users, groups, and role-specific folder access. Permissions were carefully designed and tested to ensure users could log into the domain and access their assigned resources securely. Using Hyper-V Manager and my home lab instead of VMware Workstation provided flexibility and practical experience while meeting project requirements.

Describe the key features of one competing/alternative technology and compare it to the one implemented in the project (Pros and Cons). (200 words)

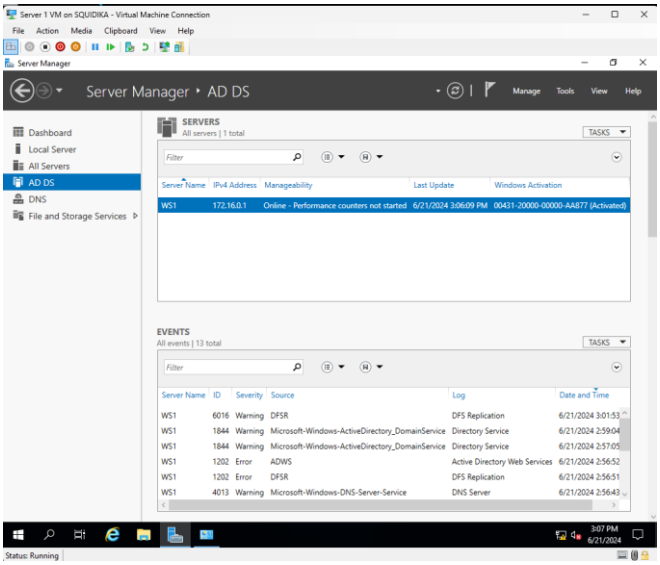
Comparison of Active Directory Domain Services (AD DS) and Azure Active Directory (Azure AD)
Key Features of Azure Active Directory (Azure AD):
Azure AD is a cloud-based identity and access management service provided by Microsoft. It is designed to support modern, cloud-first environments and offers features like Single Sign-On (SSO), multi-factor authentication (MFA), and seamless integration with Microsoft 365 and other cloud services. Azure AD also supports advanced security features like conditional access and identity protection.
Comparison with AD DS:

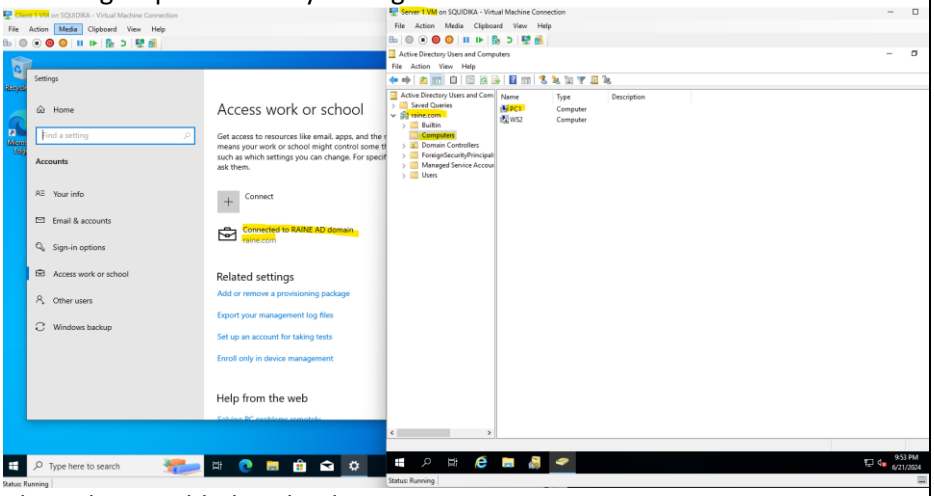
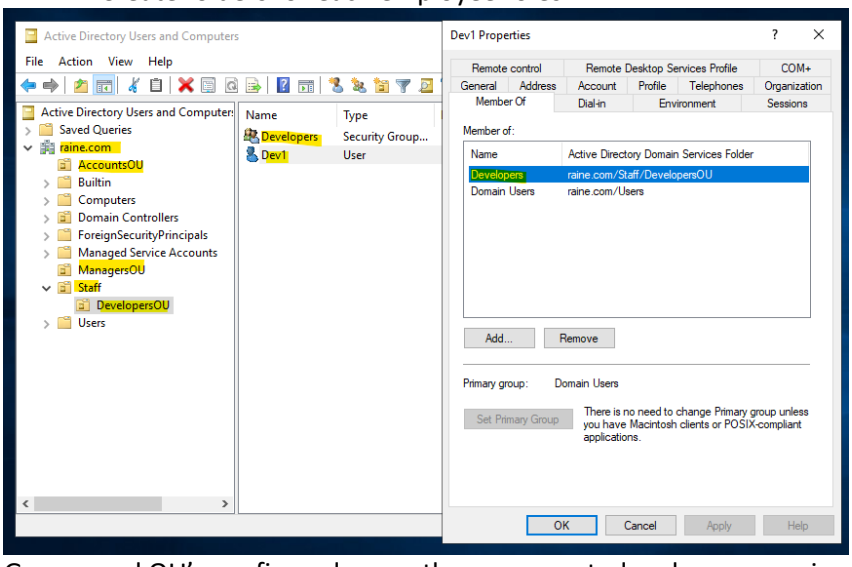
- **Deployment Model:** AD DS is an on-premises directory service, whereas Azure AD is fully cloud-based, making it better suited for organizations with distributed or remote workforces.
- **Identity Management:** Azure AD focuses on managing user identities for cloud resources and SaaS applications, while AD DS manages local domain environments, including devices, users, and applications.
- **Integration:** AD DS integrates deeply with on-premises Windows environments, while Azure AD excels in connecting to cloud services like Microsoft 365 and third-party SaaS.

- **Scalability:** Azure AD offers greater scalability and requires less infrastructure management compared to AD DS, which depends on physical or virtual servers.
- **Cost:** Azure AD eliminates the need for maintaining hardware, making it cost-effective for cloud-centric organizations, while AD DS requires hardware and maintenance investment.

Conclusion:

AD DS is ideal for traditional, on-premises setups requiring full control over domain management. Azure AD caters to cloud-focused organizations, emphasizing simplicity, scalability, and integration with modern applications. Both can complement each other in hybrid environments.

Section summary	**Implementation details at each step** e.g. screenshots, written steps, value of settings, commands used, results, answers to questions etc where applicable.	**Justification if needed**
TASK 1	• Create a Windows Server domain  AD DS was added to the server using the Server Roles feature. **Functional Levels:** • Functional levels determine the Active Directory features available based on the Windows Server version in the domain or forest. • **Purpose:** Ensure compatibility and enable advanced features. Higher levels require all domain controllers to use the same or newer Windows Server version. • **Defaults:** The setup wizard usually sets the functional level to match the server version (e.g., Windows Server 2019 may default to Windows Server 2016 levels). **Local User Accounts After Domain Controller Promotion:**	

	• Local user accounts are removed, and the server becomes part of the domain. • Authentication switches to domain accounts. • The local Administrator account becomes the Domain Administrator account.	
TASK 2	• Join the Windows 10 client to the domain • Create a fictional organisation with departments and employee roles • Use Active directory and Powershell to create network users and groups to reflect your organisation  Client device added to the domain raine.com on WS1.	
	• Ensure users can log into the domain from the Windows 10 client • Create folders for each employee roles  Groups and OU's configured correctly, users created and groups assigned to users	

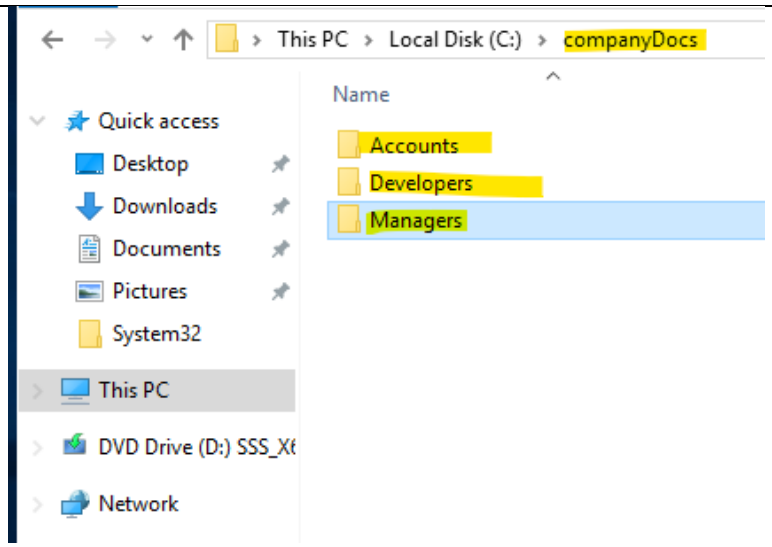
Design and scheme for access rights of each employee role to each folder. Justify your design

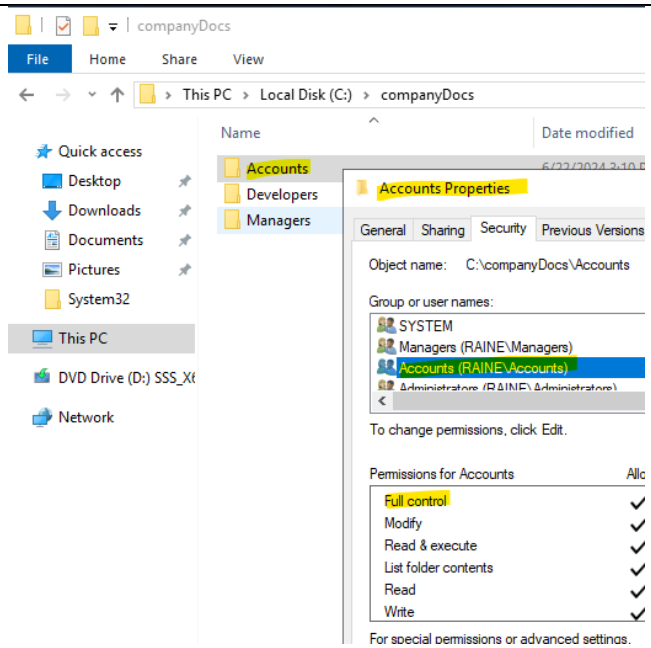
	Developers group	**Manager Group**	**Accounts Group**
Developers folder	Full	Full	Read only
Managers folder	No Access	Full	Read only
Accounts folder	No Access	Read only	Full

Justification:

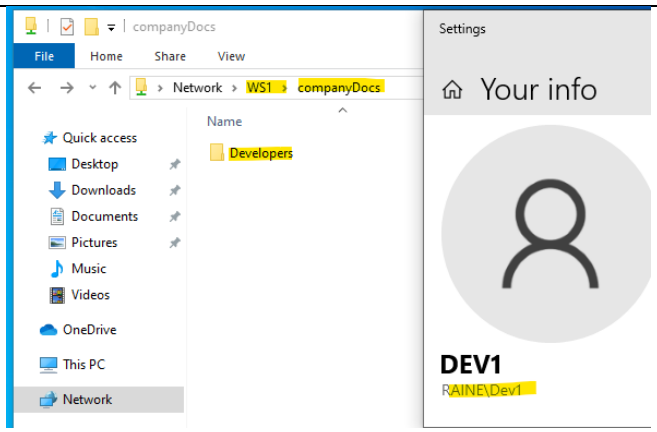
1. **Developers Group**:
    - **Developers Folder:** Full access is granted as developers need the ability to create, modify, and manage files in their working directory.
    - **Managers Folder:** No access ensures developers remain focused on their work without interfering in managerial tasks.
    - **Accounts Folder:** Read-only access allows developers to view financial data if needed but prevents them from altering sensitive accounting information.
2. **Manager Group**:
    - **Developers Folder:** Full access allows managers to oversee and review development work.
    - **Managers Folder:** Full access is necessary for managers to manage their resources and data effectively.
    - **Accounts Folder:** Read-only access ensures they can review financial data without the risk of unauthorized changes.
3. **Accounts Group**:
    - **Developers Folder:** Read-only access enables accountants to refer to development data while maintaining its integrity.
    - **Managers Folder:** Read-only access provides visibility into managerial information without allowing modifications.
    - **Accounts Folder:** Full access ensures accountants can manage and edit all financial records and processes critical to their role.

This scheme ensures role-based access control, maintaining security, accountability, and efficiency while minimizing the risk of unauthorized access or data modification.

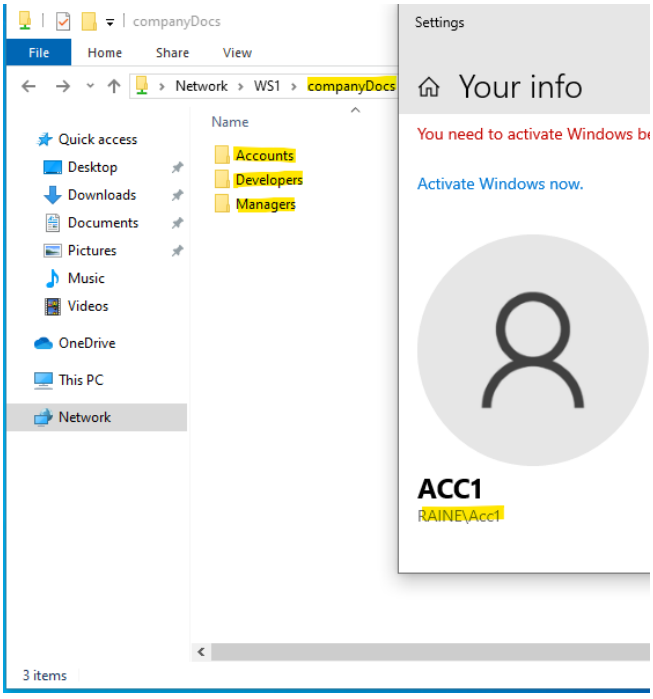
<table>
<tr><td></td><td> 

Folders created</td><td></td></tr>
<tr><td></td><td> 

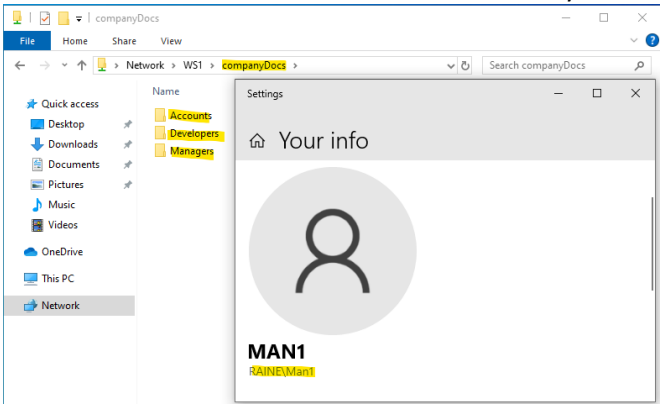
Accounts Folder Permissions</td><td></td></tr>
<tr><td>TASK 3</td><td>• Test access of each user to each folder to ensure the rights have been implemented correctly.</td><td></td></tr>
</table>



User Dev1 full access to Developers and no access to Acc and Man



User Acc1 full access to Accounts and Read Only to Dev and Man



User Man1 full access to Man and Dev, Read Only to Acc

List the three most useful Internet resources that you used (provided by the tutor)

Server Manager • https://www.youtube.com/watch?v=mpQZVYPuDGU
Create Domain controller • https://www.youtube.com/watch?v=Wa7yqCNAlBo
Create AD objects: OU, groups, users • https://www.youtube.com/watch?v=cETbT22TWEE

List all (at least three) Internet resources that you found and used that were not provided by the tutor)

Publishing a Shared Folder Microsoft Server (youtube.com)
How to configure Windows Server 2019 Data Deduplication (youtube.com)
How to add CHAP encryption to an ISCSI connection in Windows Server 2019 (youtube.com)

Reflect on at least two significant problems you came across during the implementation of this section and the solution you found. Use at least five sentence to describe each problem and five sentences to describe each solution. Demonstrate your critical thinking and problem-solving abilities.

Problem	Solution
Problem: During the AD DS setup, setting functional levels caused issues due to compatibility concerns with older domain controllers. Misconfigured levels risked rendering some systems non-functional, delaying implementation and creating uncertainty about the best choice.	**Solution:** I researched functional levels and reviewed server compatibility. I selected Windows Server 2016 as the domain functional level to ensure compatibility and access to necessary features. Testing confirmed the choice, and I documented the process for future reference, balancing current needs with potential upgrades.
Problem: Assigning access rights created conflicts, as managers needed oversight across folders, while developers required access without compromising sensitive data. Initial configurations led to either insufficient or excessive permissions.	**Solution:** I applied the principle of least privilege, granting each group the minimum access needed. Managers received read-only access to sensitive folders and full access to their own. Testing and stakeholder input ensured the setup was secure and functional, resolving conflicts efficiently.