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| **Network Infrastructure**  Diploma in CSF/IT  Year 2 (2022/23) Semester 3 | Week 12 |
| **2** hours |
| **Windows Server 2016 & Active Directory** | |

**Part 1 – Introduction to Windows 2016 Server**

1. A PC machine is to be installed with Windows 2016 **Standard** Edition. It has the following resources:

INTEL CPU: 2.9 GHz

RAM: 8 GB

Disk Space: 500 GB

You need to configure DHCP, DNS, and Active Directory on this server. The server will also act as a print and FTP server. It will also have to support Microsoft SQL Service. There are about 100 users on the network.

1. Will you be able to install Windows 2016 software on the PC based on its hardware? Refer to this web site for your answers:

<https://docs.microsoft.com/en-us/windows-server/get-started/system-requirements>

1. Do you think that the hardware resources are adequate? What is your recommendation?

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| No, you will not be able to install Windows 2016 on the PC.  As there are 100 users on the network, the specs of the PC will be far too weak.  My recommendation would be to upgrade the CPU, RAM, and Disk Space to accommodate for 100 users.  For each user:  Processor minimum 1.4 GHz 64-bit  RAM minimum 512 MB  Disk space minimum 32 GB |

2. How many editions of Microsoft Windows 2016 servers are there and how many days can the evaluation copy be tested?

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| 3 editions. 180 days. |

1. Explore the following features in Windows 2016 Server :

a) Hyper-V

b) Server Core Installation / Power Shell

c) Dynamic Hardware Partitioning

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| 1. Enables virtualization on the server which helps improve server utilization and reduce costs. Very similar technology with the Hyper-V Server 2016. 2. Eliminates any services and features that are not essential for the support of certain commonly used server roles.   For example, a Hyper-V server doesn't need a graphical user interface (GUI), because you can manage virtually all aspects of Hyper-V either from the command line using Windows PowerShell or remotely using the Hyper-V Manager.    No desktop in server core, designed to be managed through the command line. Server core does not have any accessibility tools, OOBE (out-of-box-experience) and audio support.   1. It refers to the changing of hardware configuration of a server while the server is running. To update device drivers using DHP, the drivers must support dynamic changes to the hardware configuration of the server too.   It is a server that can be configured into one or more isolated hardware partitions. Each partition runs and independent instance on the OS.  A hardware partition consists of one or more partition units. A partition unit is the smallest unit of hardware that you can assign to a hardware partition. A partition unit can be a processor, a memory module, or an I/O host bridge. Typically, processors and memory modules are plugged into sockets that can be powered on or off independently.  On a dynamically partitionable server, you can change the configuration of the partition units that are assigned to each hardware partition while the server is running. This is known as dynamic hardware partitioning. If the operating system that is running on a hardware partition supports dynamic hardware partitioning, you can add, replace, or remove partition units without restarting the operating system. Depending on the capabilities of the operating system, you can perform one or more of the following dynamic hardware partitioning operations: |
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**Part 2 – Active Directory**

1. Explain the terms domain, tree and forest used in Active Directory.

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| Domain  A domain is a container object that has its own security, it has its own administrator and database which may be replicated. Lastly, it has an internet name and can have more than one but at least one domain controllers.  Tree  It is an arrangement of Active Directory domains that share a contiguous namespace  It can be made of single or multiple domains.  Forest  It is the entire active directory structure for an organization. It is a collections of tree where the hierarchy of domains forms either contiguous or disjoint and namespace. |

2. What are organization units (OUs)? What is the purpose of creating OUs?

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| They are Active Directory objects that serve as containers for other objects.  This allows administrators to easily organize and manage AD objects.  They are often used for delegation and group policies. |

3. What is a domain controller and what is its role in an Active Directory domain?

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| It maintains a copy of the active directory database, providing authentication to users as the long into the active directory domain  Furthermore, it can also act as fault tolerance when there are more than one domain controller in the domain. |

4. Whenever the Windows Server 2016 (acting as a domain controller) fails, all users are unable to log into the network to access network resources. Suggest a way to improve the reliability of the network.

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| Have multiple domain controllers. So that even if one fails, there will be another domain controller still up which will allows users to continue logging into the network. |

5. Design an Active Directory infrastructure based on the following scenario:

* A company called NAM Pte. Ltd is based in Singapore.
* It has altogether 500 users in Singapore and it has 3 departments:

SALES, MARKETING and ADMINSTRATION.

* It has regional offices in Kuala Lumpur, Manila and Jakarta.
* NAM Pte Ltd bought over a company called BOTAK Pte. Ltd in US.
* Botak Pte. Ltd. has an Active Directory domain network called Botak.com.

Recommend the minimum number of domain controllers required for this infrastructure.

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| Minimum number of domain controllers is 5.  A whiteboard with writing on it  Description automatically generated with low confidence |

*End of Tutorial*