Module 12 Installation, Storage, and

Compute with Windows Server

**Install Windows Servers 2016**

1. **Windows Server 2016 installation requirements**

* System requirements:

1. Processor: 1.4Ghz 64-bit processor.
2. RAM: 512 MB.
3. Disk Space: 32 GB.
4. Network: Gigabit (10/100/1000baseT) Ethernet adapter.
5. Optical Storage: DVD drive (if installing the OS from DVD media)
6. Video: Super VGA (1024 x 768) or higher-resolution (optional)
7. Input Devices: Keyboard and mouse (optional)
8. **Describe Windows Server 2016 editions**

* Includes new datacenter functionality including shielded virtual machines, software-defined networking, storage spaces direct and storage replica. Windows Server 2016 Standard: for physical or minimally virtualized environments.

1. **From which menu we can add and remove server roles?**

* Add and Remove Roles and Features on Windows Server :

To open Server Manager, click the Server Manager icon in the taskbar or select Server Manager in the Start Menu.

Click Manage in the upper right portion of the screen and click Add Roles and Features to open a wizard.

1. **What is workgroup?**

* In computer networking a work group is collection of computers connected on a LAN that share the common resources and responsibilities. Workgroup is Microsoft's term for a peer-to-peer local area network.

1. **What is domain?**

* A domain is a part of a web address that's used to find a website or a page of a website.

1. **What is powershell?**

* PowerShell is a task automation and configuration management program from Microsoft. It is a command-line shell and scripting language built on the .NET Framework.

1. **Upgradation v/s migration**

* Upgrading does not directly affect user data; no data is touched, changed, or moved during an upgrade. Migrating data refers to moving data from one Oracle Database into another database previously created for migrating or moving the data.

1. **License and activation model**

* In standard licensing model each license requires valid Client, Program and Order data in activation center. This means that you need to set Program, Client and Order data in order to be able to generate valid licenses for end users (clients).

1. **Precaution of upgradation**

* Before attempting to upgrade you should backup all your stuff. Or even make a disk snapshot to an external drive. If something goes wrong you can easily revert.

1. **Migration limitation**

* There are several migration limitations, including:

1. File size: The migration tool only supports individual files up to 15 GB in size.
2. Shell type: The shell type must be a WBS shell.
3. Shell name and description: The shell name is limited to 128 characters, and the shell description is limited to 250 characters.
4. System properties: Migration Manager does not migrate system-defined system properties.
5. Database mode: During migration, the destination Cloud SQL database is in read-only mode.
6. **What is the advantages of server core**

* Server Core consumes less disk space, memory, and CPU than Server with Desktop Experience, improving efficiency and scalability. There is also reduced maintenance since there are fewer patches and updates than Server with Desktop Experience, leading to less downtime and complexity of server management.

1. **What is Nano server**

* It is similar to Windows Server in Server Core mode, but significantly smaller, has no local logon capability, and only supports 64-bit applications, tools, and agents. Windows Nano Server can deliver greater speed, stability and security, as well as dramatically reduce resource consumption.

1. **Purpose of Nano server**

* "Nano Server is a remotely administered server operating system optimized for private clouds and datacentres. It is similar to Windows Server in Server Core mode, but significantly smaller, has no local logon capability, and only supports 64-bit applications, tools, and agents.

1. **Compare GUI v/s core v/s Nano server**

* **A graphical user interface (GUI)** is a computer program that allows a user to interact with a computer using visual metaphors, symbols, and pointing devices. A GUI is a visual representation of communication that makes it easier for the user to interact with the machine.

**Nano Server** is a stripped-down version of the full Windows Server OS. It doesn't have a GUI, and it lacks the core server components. Nano Server is easier to deploy and manage in cloud environments because it has a smaller attack surface, uses fewer resources, and has a smaller footprint.

**Server Core** is a minimal installation option for Windows Server. It only includes the essential components and services required to run specific server roles and features. Server Core doesn't have a GUI, and it must be managed with PowerShell or command-line utilities or remote user interface tools.

* **Practical**

1. **Install server 2016 GUI**

* Done.

1. **Install server 2016 server core**

* Done.

1. **Assign dual IP address on Lan card**

* Done.

1. **Upgrade server 2012 to server 2016**

* Done.

1. **Change computer name**

* Done.

1. **install nano server**

* Done.

1. **manage and configure a nano server**

* Done.

1. **configure network in nano server**

* Done.

1. **join nano server in domain**

* Done.

**Storage solution**

1. **compare GPT and MBR**

* Differences between MBR and GPT Partition:

MBR is the most common format and is compatible with BIOS systems. GPT is a newer type that works with UEFI systems. MBR may accommodate up to four primary or three primary partitions plus one extended partition. GPT can accommodate an infinite number of partitions.

1. **different between VHD and VHDX**

* Providing larger file blocks for dynamic and differential disks and storing custom metadata features are the differences between VHD and VHDX.

1. **what is SMB and NFS**

* Network File System (NFS) and Server Message Block (SMB) are file access storage protocols or rules for efficient file sharing over a network.

1. **What is sharing permission**

* Share permissions control access to shared folders and their files and subfolders when accessed over a network. They do not apply to users accessing locally.

1. **What is NTFS permission**

* NTFS permissions are used to manage access to the files and folders that are stored in NTFS file systems. To see what kind of permissions you will be extending when you share a file or folder: Right click on the file/folder. Go to “Properties” Click on the “Security” tab.

1. **what is resource ownership**

* In Windows, the owner of a resource controls how permissions are set and who is granted permissions. The owner can change permissions even if they are denied access to the resource.

1. **what is storage pool**

* A storage pool is a collection of physical disks. A storage pool enables storage aggregation, elastic capacity expansion, and delegated administration. From a storage pool, you can create one or more virtual disks. These virtual disks are also referred to as storage spaces.

1. **what is basic disk and dynamic disk**

* A basic disk is a type of disk that uses partitions to organize data. A dynamic disk is a type of disk that uses volumes to organize data. Volumes can span multiple disks, provide fault tolerance, and offer more flexibility than partitions.

1. **what is simple volume , spanned volume**

* Simple volumes are used when you have enough disk space on a single drive to hold your entire volume. Spanned Volumes. A spanned volume consists of disk space on two or more dynamic drives; up to 32 dynamic drives can be used in a spanned volume configuration.

1. **describe RAID 0 , RAID 1 , RAID 5, RAID 6 ,**

**RAID 10**

* Simple volumes are used when you have enough disk space on a single drive to hold your entire volume. Spanned Volumes. A spanned volume consists of disk space on two or more dynamic drives; up to 32 dynamic drives can be used in a spanned volume configuration.

1. **describe DAS, NAS and SAN**

* The major differences between DAS, NAS, and SAN are costs, scalability, and how storage is shared. The three systems also use different storage mechanisms: DAS primarily uses hard-drive storage with sectors, NAS uses shared files, and SAN uses block storage.

1. **what is iscsi initiator and target?**

* In a storage network, an iSCSI initiator is a client machine that connects to a storage machine, also known as an iSCSI target. The initiator can send iSCSI commands to the target.

1. **what is data duplication?**

* Data duplication, also known as data redundancy, is when the same data is stored in two or more places. It can occur accidentally, for example, if an individual's data is entered more than once in the same database.
* **Practical**

1. **share “data” a folder and give read / write permission to first user**

* Done.

1. **share “data” folder and give read permission to another user**

* Done.

1. **share a “data” folder create a file in that folder and remove inheritance permission and give different ntfs permission to different user**

* Done.

1. **configure RAID 1 and check redundancy**

* Done.

1. **configure RAID 5 and check redundancy**

* Done.

1. **configure iscsi target and iscsi initiator and allocate remote storage**

* Done.

1. **configure data deduplication**

* Done.

**Implement Hyper-V**

1. **what is virtualization**

* Virtualization is the process of creating a virtual version of something, such as a computer application, storage device, or network resource. It uses software to simulate hardware functionality to create a virtual system.

1. **types of virtualization and compare it**

* Operating System Virtualization – hosting multiple OS on the native OS. Application Virtualization – hosting individual applications in a virtual environment separate from the native OS. Service Virtualization – hosting specific processes and services related to a particular application.

1. **Describe hyper v**

* Hyper-V specifically provides hardware virtualization. That means each virtual machine runs on virtual hardware. Hyper-V lets you create virtual hard drives, virtual switches, and a number of other virtual devices all of which can be added to virtual machines.

1. **what is remote management of hyper v**

* There are two types of remote management when it comes to Hyper-V. First, you can remotely manage the Windows Server Core installation with the Hyper-V Role installed (Windows itself), and then you can manage the Hyper-V Role and Hyper-V specific actions, configuration, and management.

1. **what is hyper v manager**

* Microsoft Hyper-V Manager is an administrative tool to create, change and delete virtual machines (VMs). An administrator can manage a local Hyper-V host and a limited number of remote hosts from a single Hyper-V Manager tool.

1. **what is virtual machine and nested virtualization**

* Nested virtualization lets you run virtual machine (VM) instances inside of other VMs so you can create your own virtualization environments.

1. **what is dynamic memory**

* Dynamic memory is an enhancement to Hyper-V R2 which pools all the memory available on a physical host and dynamically distributes it to virtual machines running on that host as necessary.

1. **what is NUMA**

* Non-uniform memory access (NUMA) is a computer memory design that's used in multiprocessing systems.

1. **describe Virtual Machine functions**

* A virtual machine (VM) is a digital version of a physical computer. Virtual machine software can run programs and operating systems, store data, connect to networks, and do other computing functions, and requires maintenance such as updates and system monitoring.

1. **describe Hyper v functions**

* A Hyper-V server can help individual VMs to connect to different networks. As a virtualization platform, it can help your organization virtualize workloads, improve security, and more. It can also allow Windows users to run a Mac OS or Linux on their physical system.

1. **what is check point**

* Hyper-V checkpoints capture the virtual machine's state at a particular moment, allowing you to revert the virtual machine to that state later if needed.

1. **hyper v networking—virtual nic , hyper v switch**

* his is the virtual ethernet component where the Hyper-V virtual machine NICs plug into.

**13. hyper v storage---vhd ,vhdx , fixed size, dynamic expanding**

* Fixed-size disks offer better performance and are recommended for production workloads, while dynamically expanding disks are more flexible and easier to manage.
* **Practical**

1. **install hyper v and configure a virtual switch**

* Done.

1. **install virtual machine and install windows 10**

* Done.

1. **create a checkpoint**

* Done.

1. **P4 create a virtual hdd (vhd) and attach to virtual machine**

* Done.

**Windows containers**

1. **describe containers**

* Containers are packages of software that contain all of the necessary elements to run in any environment. In this way, containers virtualize the operating system and run anywhere, from a private data center to the public cloud or even on a developer's personal laptop.

1. **what is docker?**

* Docker is a set of platform as a service products that use OS-level virtualization to deliver software in packages called containers. The service has both free and premium tiers. The software that hosts the containers is called Docker Engine.

1. **hyper v containers and windows containers**

* Hyper-V containers are a type of container that provides a higher level of isolation and security than Windows Server Containers. Hyper-V containers have their own kernel, while Windows Server Containers share the kernel.
* **Practical**

1. **install windows container**

* Done.

1. **install container in core server**

* Done.

1. **install container in nano server**

* Done.
* **Practical**

1. **Install and configure failover cluster for hyper v**

* Done.

1. **install and configure NLB for web server**

* Done.

**Maintain and monitor server**

1. **need of updates**

* A Software update improves functionality, enhances user experience, fixes issues, introduces new features, and optimizes performance.

1. **what is WSUSand importance of WSUS 3 WSUS architecture**

* Windows Server Update Services (WSUS) enables information technology administrators to deploy the latest Microsoft product updates.

1. **4 synchronization of update, product and classification 5 wsus group**

* To specify update products and classifications for synchronization
* In the WSUS Administration Console, click the Options node.
* Click Products and Classifications, and then click the Products tab.
* Select the check boxes of the products or product families you want to update with WSUS, and then click OK.

1. **wsus port number and wsus policy**

* The default HTTP port for WSUS is 8530, and the default HTTP over Secure Sockets Layer (HTTPS) port is 8531.

1. **what is backup and restore 8 type of backup**

* Backup and restore types include:

Incremental-forever incremental backup

Incremental-forever full backup

File restore

Instant restore

Full VM restore

1. **difference between incremental and differential backup**

* A differential backup strategy only copies data changes since the last full backup. On the other hand, an incremental data backup strategy copies data changes since the last backup.

1. **what is full server backup**

* What is full backup? A full backup is a complete copy of a business or organization's data assets in their entirety. This process requires all files to be backed up into a single version.

1. **what is use of performance monitor**

* It monitors various activities on a computer such as CPU or memory usage. This type of application may be used to determine the cause of problems on a local or remote computer by measuring the performance of hardware, software services, and applications.
* **Practical**

1. **install and configure wsus server**

* Done.

1. **apply update to particular client group through wsus**

* Done.

1. **Take customize backup of data**

* Done.

1. **restore backup original location and also another location**

* Done.

1. **backup schedule and check it.**

* Done.

1. **take full backup**

* Done.

1. **performance monitor of current process**

* Done.

1. **performance monitor of cpu, memory**

* Done.