

Wong Ching (2208814)

by Ching Wong

Submission date: 09-Jan-2023 07:55PM (UTC+0000)

Submission ID: 194230764

File name: 41382_Ching_Wong_Wong_Ching__2208814__460444_305000540.docx (924.19K)

Word count: 1542

Character count: 8680

Name: Wong Ching

Student ID: 2208814

In this report, the topic of virtual machine would be discussed. It would be sperate as following parts. Virtual machine resources, vNets, network security groups, and virtual machine image.

To begin with, a virtual machine (VM) is a software-based simulation of a physical computer running on a host computer. It could be operating as an independent entity that is different from the host computer, such as its own operating system, and storage. It can be created and managed like a physical computer. And VM resource is a computer file or program, to act as a physical device in the VM. Which allocates computer resources to VM virtually, such as virtual CPU, virtual memory, and virtual hard drive.

One of the main resources associated with a virtual machine is the virtual Central Processing Unit (CPU). The CPU is used for executing commands and performing different tasks within the computer. In a VM, the virtual CPU is allocated with a certain number of virtual cores, which are a fraction of the host's physical CPU cores

dedicated to the VM. The number of virtual cores assigned to a VM can be adjusted easily in order to meet the workload of the VM.

Another resource associated with a VM is virtual memory. It can also call as virtual RAM. Memory is used to store data that is actively used or modified by the operating system and applications running in the VM. All the data stored would erase after the VM was turned off. The allocation of virtual memory can be adjusted for a VM virtually in order to meet the needs of your workload. Memory is an important resource to the VM, it would operate smoothly if there were enough memory allocated. Otherwise, the performance issue might have occurred.

Moreover, virtual storage is one of the resources of the VM. It could be a virtual hard drive. It acts the same function as a physical hard drive, to store data of the computer. Unlike the memory mentioned before, the stored data would keep maintaining after the VM is turned off. And it is the same as the other resources, it exists as a file on the computer. Users can adjust the amount of storage virtually.

There are different methods to create a virtual machine. One of them is using virtualization software. Such as VirtualBox, VMware, and Hyper-V. The software

would create a virtualization layer, which is on top of the host's physical devices. And it would allocate the hardware resources to the VM. The virtualization software would provide the interface for the users to configure and manage the VM.

Users can manage the VM by resizing the allocation of the resources. Users can simply adjust the resources through software or web application. By allocating enough resources to the VM, it would be able to run efficiently and smoothly.

For example, if a VM is running a workload that requires a lot of CPU power, users can increase the number of virtual cores in the VM in order to meet the demand.

Similarly, if the VM is running slow due to not enough amount of memory, users can increase the amount of memory allocated to the VM to improve performance. Users can scale up or down easily in the software in order to meet the need of the workload.

Furthermore, Users can manage the VM by configuring the virtual networks (vNets).

vNets is a virtualized version of a physical network that allows users to create and manage their own virtual networking environments. It is essential to every virtual machine, allowing communication between VM to other devices. Users are allowed to configure the network virtually, including routers, firewalls, and virtual switches.

There are various advantages to using virtual networks. First, virtual networks provide a quicker and easier way to deploy a network environment. Physical installation of hardware is not required by the features of virtual networks. Instead of building and configuring the network hardware, users can create and configure a network in a short amount of time virtually. Which is time-saving and cost-saving, users are able to scale up or down the network to meet their needs and demands easily.

Moreover, as the configuration of the network environment become easier, the control of the network becomes flexible. For each virtual network, users have control of the networking configurations, including its network protocols and security protocol. This allows users to develop a virtual network that suits their specific needs and workloads, which makes network configuration become flexible. Also, it is helpful for network development and testing. Users can develop a separate virtual network with different configurations and test it isolated without affecting the original network environment. It is especially useful for the organization to develop its network.

Network security groups are a component of network security. It controls inbound and outbound network traffic by consisting of security rules. The traffic would be allowed or denied by the rules. The rules could be specified by various criteria, such as ports, protocols, source and destination IP addresses. And the network security groups could be associated with virtual machines, network interface cards, or subnets.

One of the advantages of network security groups is it increases the security of the network traffic. Users can decide who can access their application and block unwanted traffic. For example, users can configure the network security groups that only allow certain IP addresses to access, if the access is not from those certain IP addresses, the access would be denied. The traffic is filtered, and unauthorized access would be blocked by the traffic. This could prevent unauthorized access, especially useful for reducing the risk of attacks like DDoS, which could increase the security of the network traffic. Another advantage of network security groups is users can adjust the security level of networks of different zones. Users can apply different security rules for different parts of the network base on the level of security needed.

A virtual machine image is a pre-configured virtual file, which included the needed data to create and run a virtual machine. It consists of the installed OS files, system files and the virtual hardware configuration, and any additional software or applications needed for the VM to run. VM images can be run on both Linux and Windows. Users can create VM from the VM image. In Azure, there is an online store called marketplace, users can get public images from there. Also, there is an Azure Computing Gallery. It can be considered a repository of images, which users can store and get images on it.

There are various types of virtual machine images, which include ISO images, OVF images, OVA images, VHD images, and VHDX images. All of them have different functions. For ISO images, it is mainly used for installing operating systems. For OVF and OVA images, they are mainly used for package virtual machines with the virtual hardware configuration, operation system, and application file. For VHD and VHDX images, they are mainly used for storing virtual hard drive files.

There are various advantages to using virtual machine images. One of them is it enhances the speed of disaster recovery. If a physical server is destroyed or damaged by nature disasters like earthquakes. Users can restore the data or system quickly

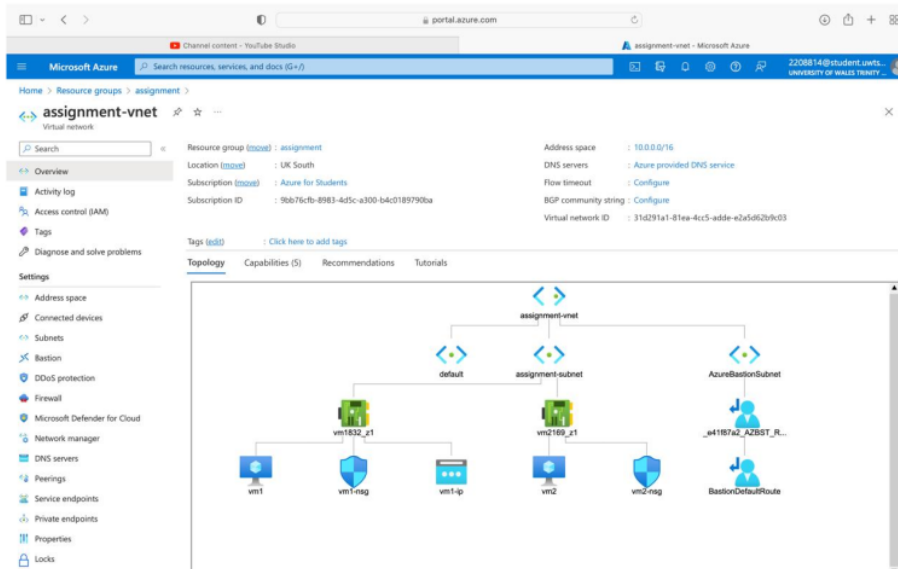
and easily by using VM images created before. The operation could continue, which is very important to services like hospital services. Or if the system is attacked by hackers. Users can reinstall the system by using VM images, which can reduce the loss. Due to the high portability, the speed of disaster recovery would be enhanced.

Moreover, using machine images can reduce the cost of physical machines. By using VM images, it could create multiple VMs on a physical device. For example, instead of purchasing multiple hardware, users can have multiple servers and databases in just one physical device by using VM images. The need for physical hardware would be dropped because of it. It could reduce the cost of buying hardware and maintenance.

Another benefit of using virtual machine images is the development and testing become easier. By using virtual machine images, developers can test the compatibility of the software and hardware without the need for physical hardware. It can be tested virtually. It is useful for testing software on different platforms and operation systems, and easier for developers to adjust the configuration.

Additional Exercise

(Screen shot of virtual network)



(Screen shot of bastion)

Microsoft Azure

Search resources, services, and docs (G+)

assignment-bastion - Microsoft Azure

2208614@student.uwts.
UNIVERSITY OF WALES TRINITY

Home > Resource groups > assignment >

assignment-bastion

Bastion

Search

Delete Refresh

Overview

Activity log

Access control (IAM)

Tags

Diagnose and solve problems

Settings

Sessions

Configuration

Properties

Locks

Monitoring

Metrics

Logs

Diagnostics settings

Connection Troubleshoot

Automation

Tasks (preview)

Export template

Support + troubleshooting

Essentials

Resource group (move) : assignment

Location : UK South

Subscription (move) : Azure for Students

Subscription ID : 9bb76c6b-6983-4d3c-a300-b4c0189790ba

Tags (edit) : [Click here to add tags](#)

Virtual network/subnet : assignment-vnet/AzureBastionSubnet

Public DNS name : bst-49797336-ac37-4007-ace6-63b1d089653e.bastion.azure.com

Public IP address : assignment-ip

Tier : Basic

Provisioning state : Succeeded

JSON View

Sessions

Tutorials

SessionId	StartTime (UTC)	TargetSubscriptionId	ResourceType	TargetHostName	TargetResourceGro...	UserName	TargetIPAddress
No results.							

(Screen shot of the first virtual machine (with nginx webserver))

The screenshot shows the Microsoft Azure portal interface. The top navigation bar includes the Microsoft Azure logo, a search bar, and user information. The main content area displays the details for a virtual machine named 'vm1'. The left sidebar contains a navigation menu with options like Overview, Activity log, Access control (IAM), Tags, Diagnose and solve problems, Settings, Networking, Connect, Disks, Size, Microsoft Defender for Cloud, Advisor recommendations, Extensions + applications, Continuous delivery, Availability + scaling, Configuration, Identity, Properties, Locks, and Operations. The main content area is divided into two sections: 'Essentials' and 'Properties'. The 'Essentials' section provides a high-level overview of the VM, including its resource group, status, location, subscription, and various identifiers. The 'Properties' section provides more detailed information about the VM, including its name, health state, operating system, publisher, offer, plan, VM generation, VM architecture, agent status, and agent version. The 'Networking' section shows the public IP address, private IP address, and virtual network/subnet. The 'Size' section shows the VM size, vCPUs, and RAM.

Category	Property	Value
Essentials	Resource group	assignment
	Status	Running
	Location	UK South (Zone 1)
	Subscription	Azure for Students
	Subscription ID	9bb76cb-8983-4d5c-a300-b4c189790ba
	Availability zone	1
	Tags	Click here to add tags
	Operating system	Linux (ubuntu 20.04)
	Size	Standard D2s v3 (2 vcpus, 8 GiB memory)
	Public IP address	20.68.248.12
Properties	Computer name	vm1
	Health state	-
	Operating system	Linux (ubuntu 20.04)
	Publisher	canonical
	Offer	0001-com-ubuntu-server-focal
	Plan	20_04-fs-gen2
	VM generation	V2
	VM architecture	x64
	Agent status	Ready
	Agent version	2.8.0.11
Networking	Public IP address	20.68.248.12
	Public IP address (IPv6)	-
	Private IP address	10.0.1.4
	Private IP address (IPv6)	-
Size	Size	Standard D2s v3
	vCPUs	2
	RAM	8 GiB

The screenshot shows the nginx web server welcome page. The page has a white background with a black border. At the top, there is a navigation bar with the text 'Welcome to nginx!'. Below the navigation bar, there is a main content area with the text 'Welcome to nginx!'. The text is centered and uses a serif font. The page is displayed in a web browser window with the address bar showing 'http://20.68.248.12'.

Welcome to nginx!

If you see this page, the nginx web server is successfully installed and working. Further configuration is required.

For online documentation and support please refer to nginx.org.
Commercial support is available at nginx.com.

Thank you for using nginx.

(Screen shot of the second virtual machine)

The screenshot displays the Microsoft Azure portal interface for a virtual machine named 'vm2'. The top navigation bar shows the user is logged in as '2208614@student.uwts. UNIVERSITY OF WALES TRIDENT'. The left sidebar contains various management tools like Activity log, Access control (IAM), Tags, and Settings. The main content area is divided into 'Essentials' and 'Properties' sections.

Essentials

Property	Value
Resource group	assignment
Status	Running
Location	UK South (Zone 1)
Subscription	Azure for Students
Subscription ID	9bb76c9b-8983-4d5c-a300-b4cd189790ba
Availability zone	1
Tags	Click here to add tags
Operating system	Linux (ubuntu 20.04)
Size	Standard D2s v3 (2 vcpus, 8 GiB memory)
Public IP address	-
Virtual network/subnet	assignment-vnet/assignment-subnet
DNS name	-

Properties

Property	Value
Computer name	vm2
Health state	-
Operating system	Linux (ubuntu 20.04)
Publisher	canonical
Offer	0001-com-ubuntu-server-focal
Plan	20_04-lts-gen2
VM generation	V2
VM architecture	x64
Agent status	Ready
Agent version	2.8.0.11

Networking

Property	Value
Public IP address	-
Public IP address (IPv6)	-
Private IP address	10.0.1.5
Private IP address (IPv6)	-
Virtual network/subnet	assignment-vnet/assignment-subnet
DNS name	-

Size

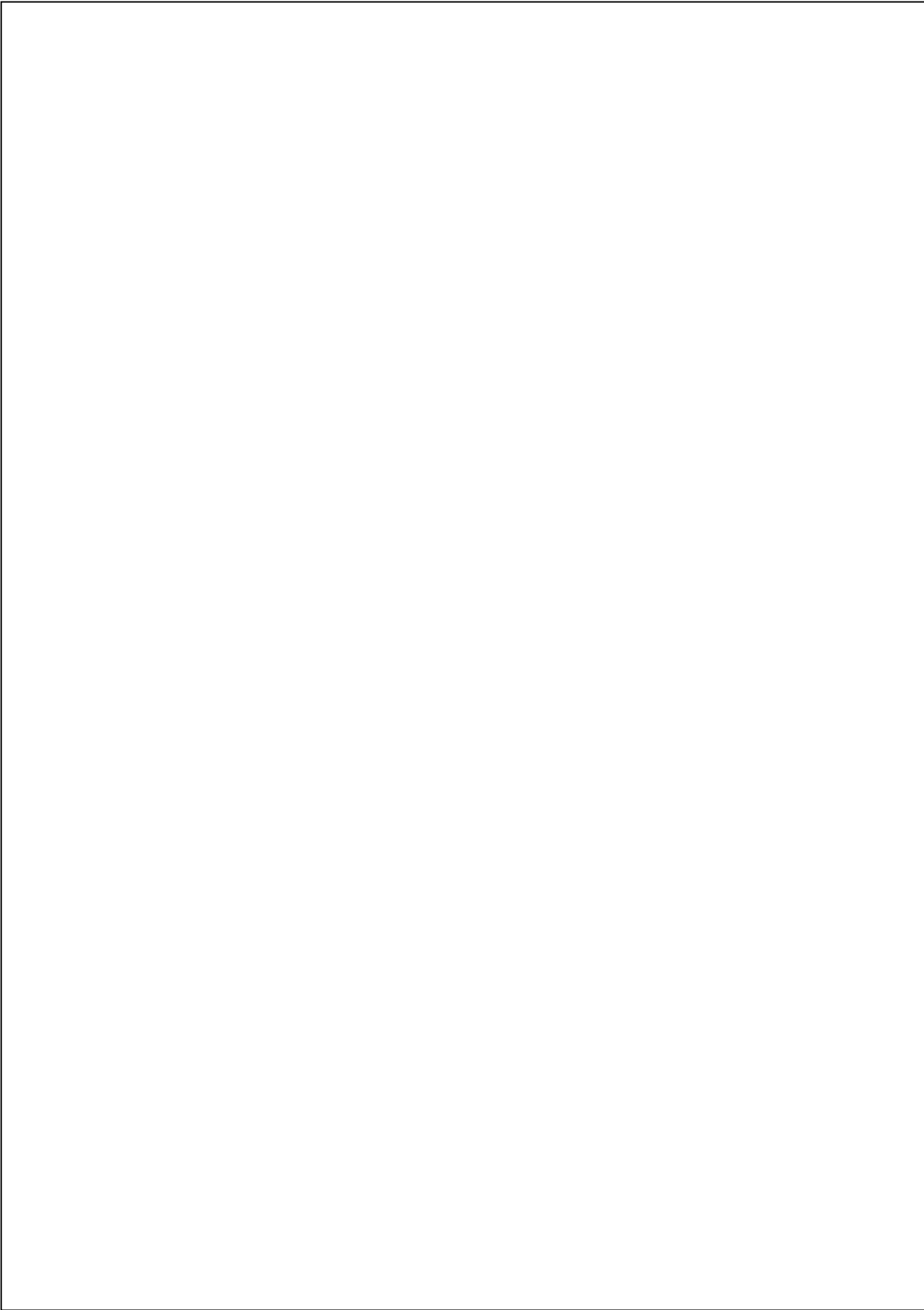
Property	Value
Size	Standard D2s v3
vCPUs	2
RAM	8 GiB

Youtube link

<https://youtu.be/HC2j80666dw>

Reference list

1. (2022). Packtpub.com. <https://subscription.packtpub.com/book/virtualization-and-cloud/9781782172185/1/ch01lv1sec11/the-primary-virtual-machine-resources>
2. *Virtual Machine (VM) Resource Allocation Guide - DNSstuff*. (2021, July 22). Software Reviews, Opinions, and Tips - DNSstuff. <https://www.dnsstuff.com/virtual-machine-resource-allocation>
3. mbender-ms. (n.d.). *Azure Virtual Network*. Learn.microsoft.com. <https://learn.microsoft.com/en-us/azure/virtual-network/virtual-networks-overview>
4. *Introduction To Azure Virtual Network(vnet) || Simplilearn*. (n.d.). Simplilearn.com. <https://www.simplilearn.com/tutorials/azure-tutorial/azure-virtual-network-vnet>
5. asudbring. (n.d.). *Network security group - how it works*. Learn.microsoft.com. Retrieved January 4, 2023, from <https://learn.microsoft.com/en-us/azure/virtual-network/network-security-group-how-it-works>
6. *Network Security Groups*. (n.d.). Docs.oracle.com. Retrieved January 4, 2023, from <https://docs.oracle.com/en-us/iaas/Content/Network/Concepts/networksecuritygroups.htm>
7. *Introduction — Virtual Machine Image Guide documentation*. (n.d.). Docs.openstack.org. Retrieved January 4, 2023, from <https://docs.openstack.org/image-guide/introduction.html>
8. sandeeprauchura. (n.d.). *Create an image definition and image version - Azure Virtual Machines*. Learn.microsoft.com. Retrieved January 4, 2023, from <https://learn.microsoft.com/en-us/azure/virtual-machines/image-version?tabs=portal>



FINAL GRADE

86 / 100

GENERAL COMMENTS

Instructor

VM Resources (40): 35

VM Images (35): 30

Config Exercise (20): 17

Demo (5): 4

Feedback:

=====

I was expecting some examples of commands that can be used to create a VM.

There was some details about images that you could have expanded upon but you have provided a discussion of their benefits.

The config exercise met the assignment requirements except the second VM should have had an application/service installed instead of just pinging it.

I would have liked some discussion during the demo.

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13
