

ASSIGNMENT NO.6

Aim: Case study on Microsoft azure to learn about Microsoft Azure is a cloud computing platform and infrastructure, created by Microsoft, for building, deploying and managing applications and services through a global network of Microsoft-managed datacenters. How it work, different services provided by it

Objectives: 1. To learn Microsoft Azure Cloud computing platform.
2. To case study the Microsoft Azure cloud services.

Theory:

Microsoft Azure is a [cloud computing](#) service created by [Microsoft](#) for building, testing, deploying, and managing applications and services through Microsoft-managed [data centers](#). It provides [software as a service \(SaaS\)](#), [platform as a service \(PaaS\)](#) and [infrastructure as a service \(IaaS\)](#) and supports many different [programming languages](#), tools and frameworks, including both Microsoft-specific and third-party software and systems.

Execution Environment:

The Windows Azure execution environment consists of a platform for applications and services hosted within one or more roles. The types of roles you can implement in Windows Azure are:

- Azure Compute (Web and Worker Roles)- A Windows Azure application consists of one or more hosted roles running within the Azure data centers. Typically there will be at least one Web role that is exposed for access by users of the application. The application may contain additional roles, including Worker roles that are typically used to perform background processing and support tasks for Web roles.
- Virtual Machine (VM role)- This role allows you to host your own custom instance of the Windows Server 2008 R2 Enterprise or Windows Server 2008 R2 Standard operating system within a Windows Azure data center.

Data Management:

Windows Azure, SQL Azure, and the associated services provide opportunities for storing and managing data in a range of ways. The following data management services and features are available:

Azure Storage: This provides four core services for persistent and durable data storage in the cloud. The services support a REST interface that can be accessed from within Azure hosted or on-premises (remote) applications.

- The Azure Table Service provides a table-structured storage mechanism based on the familiar rows and columns format, and supports queries for managing the data. It is

primarily aimed at scenarios where large volumes of data must be stored, while being easy to access and update.

- The Binary Large Object (BLOB) Service provides a series of containers aimed at storing text or binary data. It provides both Block BLOB containers for streaming data, and Page BLOB containers for random read/write operations.
- The Queue Service provides a mechanism for reliable, persistent messaging between role instances, such as between a Web role and a Worker role.
- File Service allows storing and access of data on the cloud using the [REST](#) APIs or the [SMB protocol](#).

SQL Azure Database: This is a highly available and scalable cloud database service built on SQL Server technologies, and supports the familiar T-SQL based relational database model. It can be used with applications hosted in Windows Azure, and with other applications running on-premises or hosted elsewhere.

Data Synchronization: SQL Azure Data Sync is a cloud-based data synchronization service built on Microsoft Sync Framework technologies. It provides bi-directional data synchronization and data management capabilities allowing data to be easily shared between multiple SQL Azure databases and between on-premises and SQL Azure databases

Networking Services

Windows Azure provides several networking services that you can take advantage of to maximize performance, implement authentication, and improve manageability of your hosted applications.

These services include the following:

- **Content Delivery Network (CDN).** The CDN allows you to cache publicly available static data for applications at strategic locations that are closer (in network delivery terms) to end users. The CDN uses a number of data centers at many locations around the world, which store the data in BLOB storage that has anonymous access.
- **Virtual Network Connect.** This service allows you to configure roles of an application running in Windows Azure and computers on your on-premises network so that they appear to be on the same network. It uses a software agent running on the on-premises computer to establish an IPsec-protected connection to the Windows Azure roles in the cloud, and provides the capability to administer, manage, monitor, and debug the roles directly
- **Virtual Network Traffic Manager.** This is a service that allows you to set up request redirection and load balancing based on three different methods. Typically you will use Traffic Manager to maximize performance by redirecting requests from users to the instance in the closest data center using the Performance method.

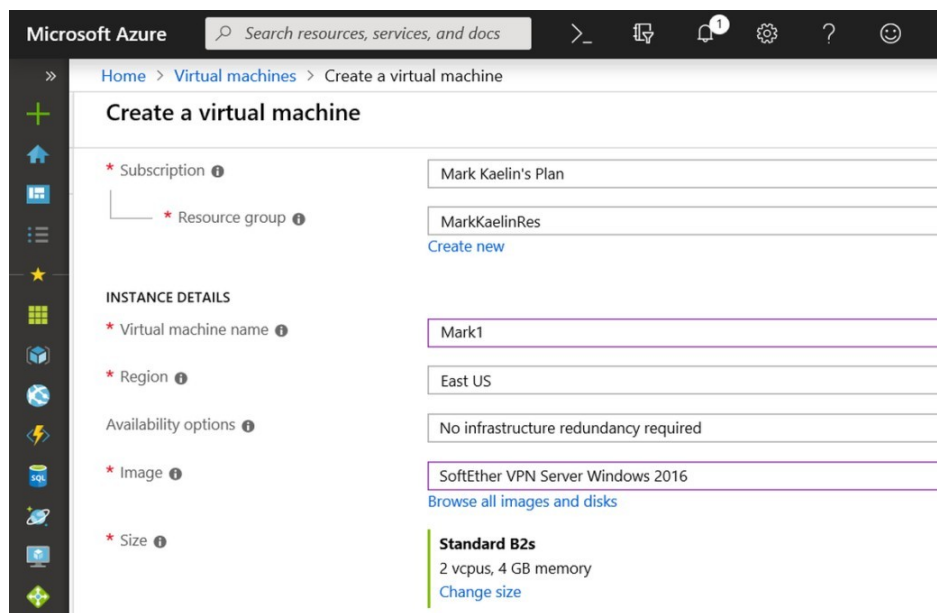
- Access Control. This is a standards-based service for identity and access control that makes use of a range of identity providers (IdPs) that can authenticate users. ACS acts as a Security Token Service (STS), or token issuer, and makes it easier to take advantage of federation authentication techniques where user identity is validated in a realm or domain other than that in which the application resides. An example is controlling user access based on an identity verified by an identity provider such as Windows Live ID or Google.

- Service Bus. This provides a secure messaging and data flow capability for distributed and hybrid applications, such as communication between Windows Azure hosted applications and on-premises applications and services, without requiring complex firewall and security infrastructures. It can use a range of communication and messaging protocols and patterns to

provide delivery assurance, reliable messaging; can scale to accommodate varying loads; and can be integrated with on-premises BizTalk Server artifacts.

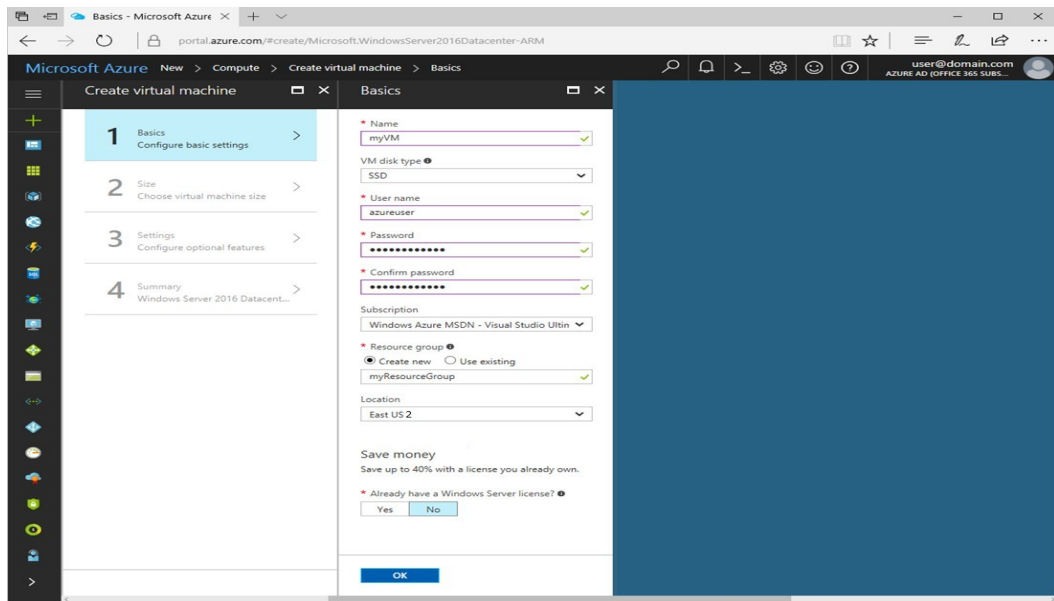
Steps to create a virtual machine in Microsoft azure:

1) Click Create a resource in the upper left-hand corner of the Azure portal.

The screenshot shows the 'Create a virtual machine' page in the Microsoft Azure portal. The breadcrumb trail at the top reads 'Home > Virtual machines > Create a virtual machine'. The page is divided into two main sections. The top section contains fields for 'Subscription' (Mark Kaelin's Plan) and 'Resource group' (MarkKaelinRes, with a 'Create new' link). The bottom section, titled 'INSTANCE DETAILS', contains fields for 'Virtual machine name' (Mark1), 'Region' (East US), 'Availability options' (No infrastructure redundancy required), 'Image' (SoftEther VPN Server Windows 2016, with a 'Browse all images and disks' link), and 'Size' (Standard B2s, 2 vcpus, 4 GB memory, with a 'Change size' link). A left-hand navigation pane shows various Azure services, and a top navigation bar includes a search bar and several utility icons.

2) Select Compute, and then select Windows Server 2016 Datacenter.

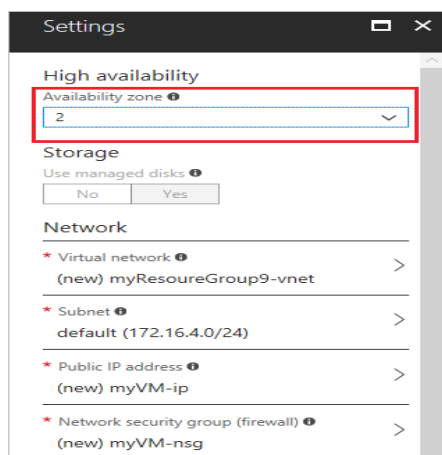
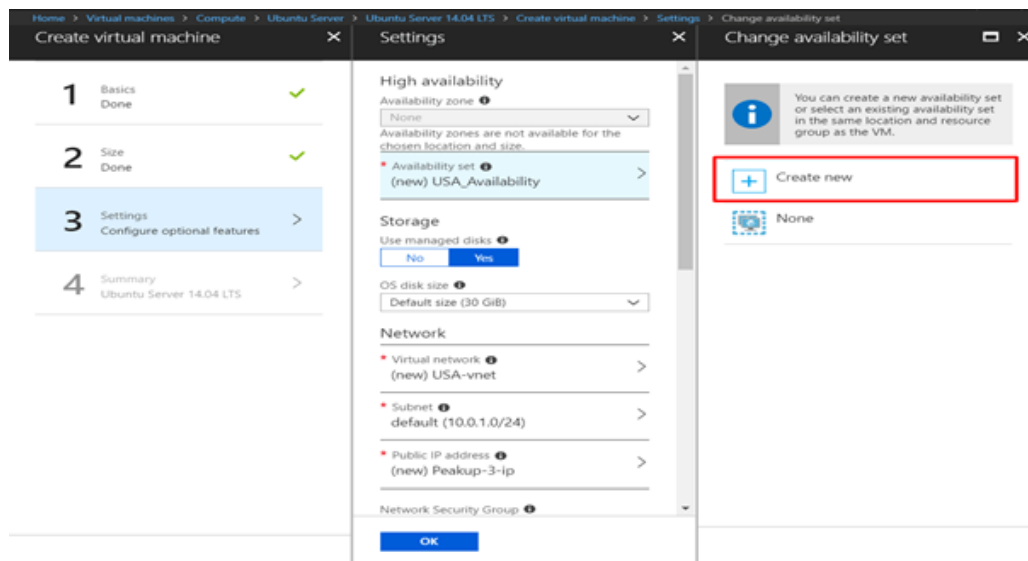
3) Enter the virtual machine information. The user name and password entered here is used to sign in to the virtual machine. The password must be at least 12 characters long and meet the [defined complexity requirements](#). Choose a Location such as East US 2 that supports availability zones. When complete, click OK



4) Choose a size for the VM. Select a recommended size, or filter based on features. Confirm the size is available in the zone you want to use

RECOMM...	SKU	TYPE	VCPUS	GB RAM	DATA DI...	MAX IOPS	LOCAL SS...	RDMA S...	PREMIU...	GRAPHICS	ZONES	USD/MO...
★	DS1_v2	Standard	1	3.5	4	3200	7 GB		✓		1,2,3	\$91.51
	DS2_v2	Standard	2	7	8	6400	14 GB		✓		1,2,3	\$183.02
	DS3_v2	Standard	4	14	16	12800	28 GB		✓		1,2,3	\$365.30
	DS4_v2	Standard	8	28	32	25600	56 GB		✓		1,2,3	\$731.35
	DS5_v2	Standard	16	56	64	51200	112 GB		✓		1,2,3	\$1,392.77
	DS2_v2	Promo	2	7	8	8000	14 GB		✓		1,2,3	\$156.98
	DS3_v2	Promo	4	14	16	16000	28 GB		✓		1,2,3	\$313.97
	DS4_v2	Promo	8	28	32	32000	56 GB		✓		1,2,3	\$628.68
	DS5_v2	Promo	16	56	64	64000	112 GB		✓		1,2,3	\$1,257.36
	DS1	Standard	1	3.5	4	3200	7 GB		✓		2,3	\$96.72
	DS2	Standard	2	7	8	6400	14 GB		✓		2,3	\$193.44
	DS3	Standard	4	14	16	12800	28 GB		✓		2,3	\$386.88
	DS4	Standard	8	28	32	25600	56 GB		✓		2,3	\$773.76

5) Under Settings > High availability, select one of the numbered zones from the Availability zone dropdown, keep the remaining defaults, and click OK.

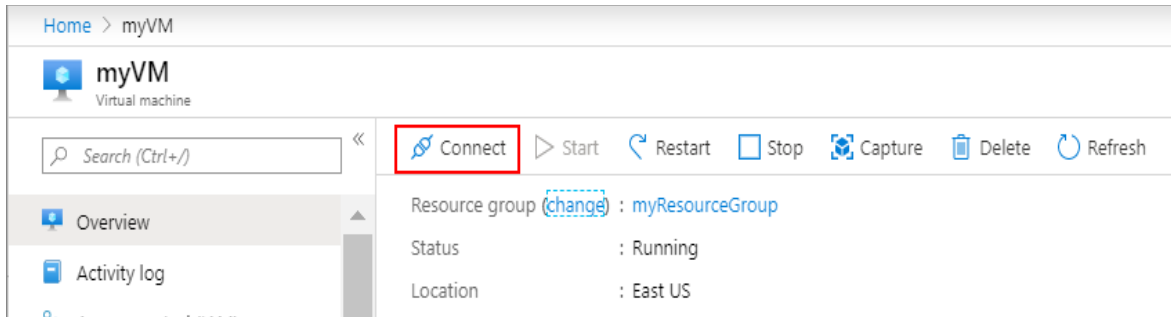


6) On the summary page, click Create to start the virtual machine deployment

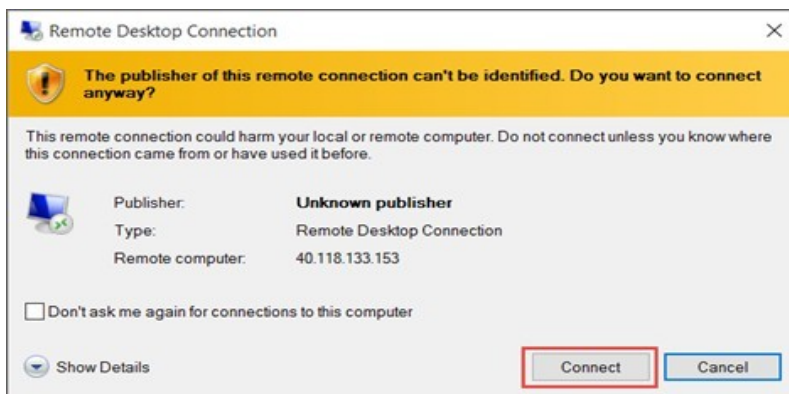
Connect to virtual machine

Create a remote desktop connection to the virtual machine. These directions tell you how to connect to your VM from a Windows computer. On a Mac, you need an RDP client such as this [Remote Desktop Client](#) from the Mac App Store.

1. Click the Connect button on the overview page for your virtual machine.



2. In the Connect to virtual machine page, keep the default options to connect by IP address, over port 3389, and click Download RDP file.
3. Open the downloaded RDP file and click Connect when prompted.



4. In the Windows Security window, select More choices and then Use a different account. Type the username as `localhost\username`, enter password you created for the virtual machine, and then click OK.
5. You may receive a certificate warning during the sign-in process. Click to create the connection and finish logging on.

Conclusion:

Performed case study of Microsoft Azure Cloud computing platform and services.