Batch: B1 Roll No.: 16010121045
Experiment / assignment / tutorial No._____
Grade: AA / AB / BB / BC / CC / CD /DD
Signature of the Staff In-charge with date

Experiment No: 7

Title: SQL Server on Windows Azure Virtual Machines

Aim and Objective of the Experiment:
SQL Server on Windows Azure Virtual Machines

Abstract:

SQL Server on Azure Virtual Machines (VMs) provides a cloud-based solution for deploying full versions of SQL Server without the need for managing on-premises hardware. This service simplifies licensing costs through a pay-as-you-go model and offers flexibility in terms of geographic regions and machine sizes. The virtual machine image gallery allows users to select the appropriate version, edition, and operating system for their SQL Server workloads. This overview covers the essentials of setting up, connecting to, and managing SQL Server on Azure VMs, including data migration, storage configuration, performance optimization, and pricing guidance. It also discusses related Azure products and services that enhance the SQL Server on Azure VM ecosystem, such as Windows virtual machines, Azure Storage, and networking solutions. Additionally, it highlights resources for troubleshooting common issues and optimizing SQL Server performance on Azure VMs, including the SQL Server IaaS Agent extension and Azure Monitor Metrics.

Related Theory: -

Introduction to SQL Server on Azure Virtual Machines

SQL Server on Azure Virtual Machines (VMs) represents a significant shift in the deployment and management of SQL Server databases. This service allows organizations to leverage the full capabilities of SQL Server in the cloud, without the need for onpremises hardware management. This approach simplifies licensing costs through a payas-you-go model and offers flexibility in terms of geographic regions and machine sizes, making it a suitable option for a wide range of SQL Server workloads [1].

Integration with Azure Ecosystem

SQL Server on Azure VMs is deeply integrated into the Azure platform, enabling seamless interaction with other Azure services. This integration includes Windows virtual machines, Azure Storage, and networking solutions, which collectively enhance the overall performance, scalability, and manageability of SQL Server deployments on Azure. The SQL Server IaaS Agent extension, for instance, automates management tasks and optimizes performance, while Azure Monitor Metrics provides insights into the health and performance of SQL Server VMs [1].

Deployment and Management

Deploying SQL Server on Azure VMs involves several steps, including creating the VM, connecting to it, migrating data, configuring storage, optimizing performance, and understanding pricing. The Azure portal, Azure PowerShell, and ARM templates offer various methods for creating and managing SQL Server VMs. Additionally, there are resources available for troubleshooting common issues and optimizing performance, such as the Performance best practices checklist and the FAQ section [1].

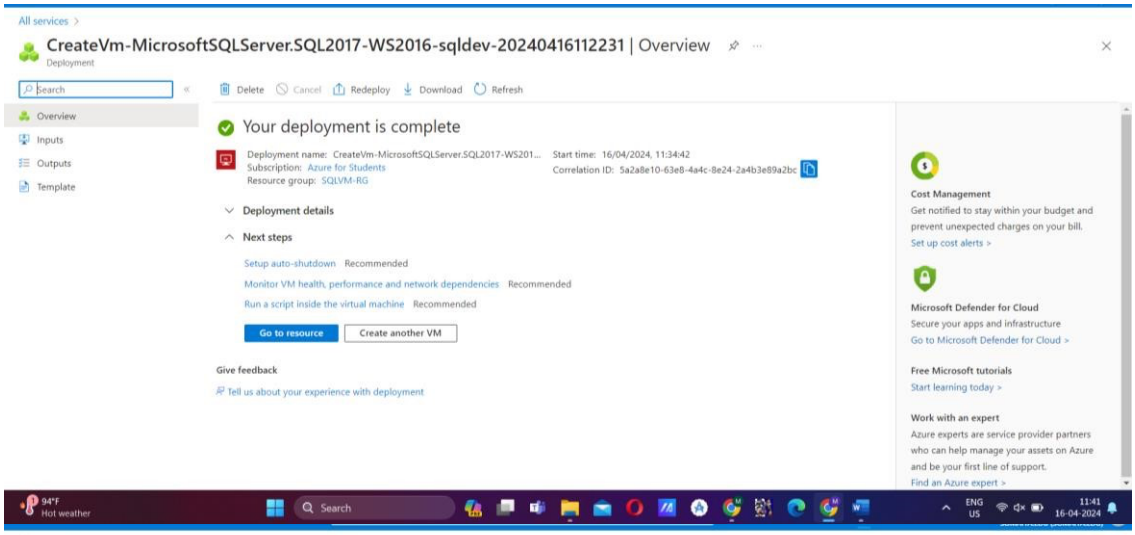
High Availability and Disaster Recovery

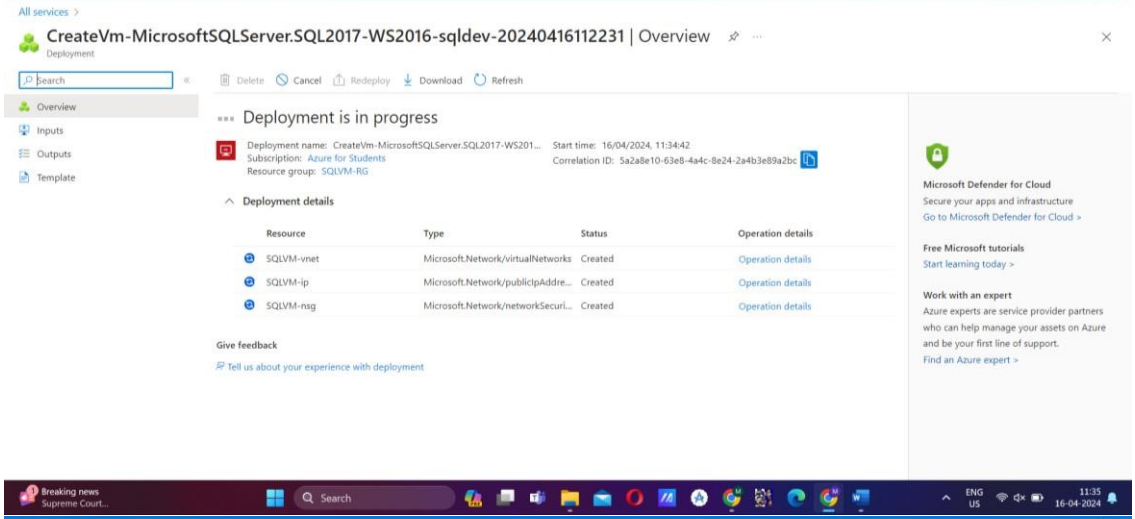
High availability and disaster recovery are critical aspects of any SQL Server deployment. Azure provides mechanisms for ensuring that SQL Server VMs are highly available and can recover from failures. This includes running N-tier applications in multiple Azure regions for high availability and using Azure's built-in tools for backup and recovery [2].

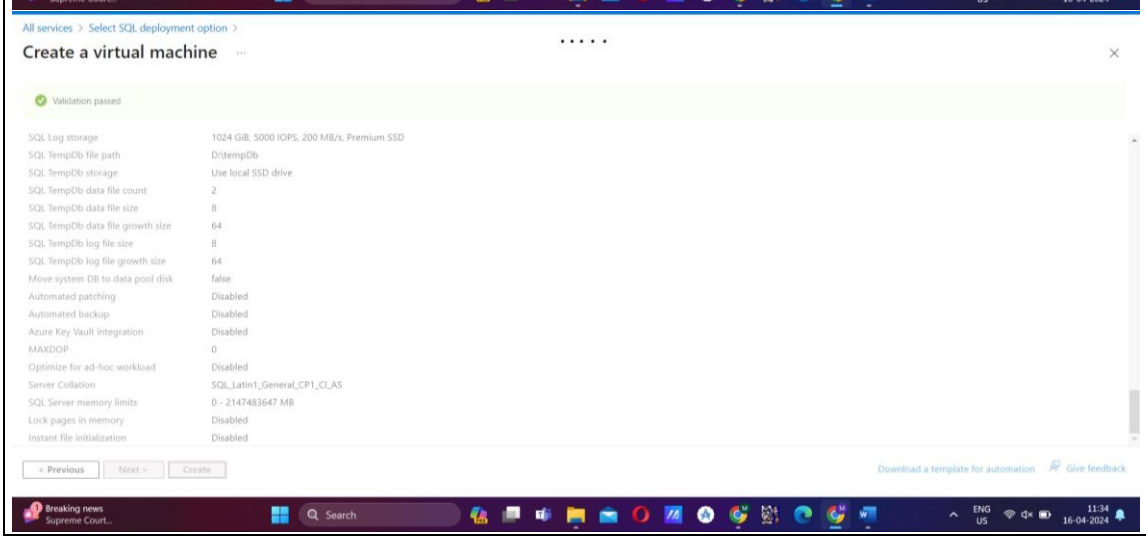
Performance Optimization

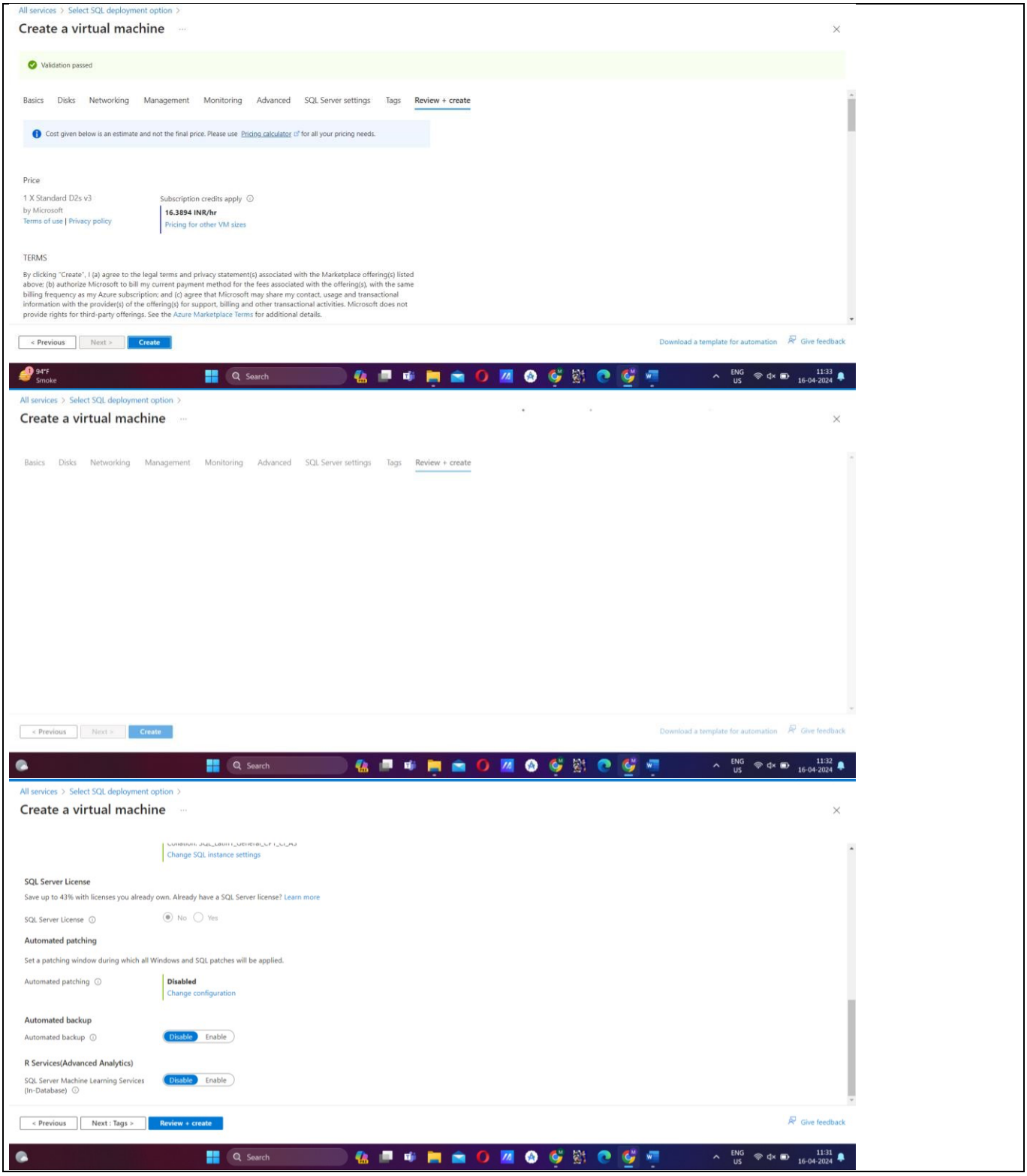
Optimizing the performance of SQL Server on Azure VMs is crucial for achieving the best price-performance ratio. This involves fine-tuning the VM size, storage configuration, and SQL Server settings. Tools like PerfInsights can help evaluate resource health and troubleshoot performance issues, while the SQL Assessment feature provides recommendations for optimally configuring SQL Server on Azure VMs [1].

Refer to the lab instruction and add your screenshots





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Create a virtual machine
Validation passed
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Cost given below is an estimate and not the final price. Please use Pricing calculator for all your pricing needs.
Price
1 X Standard D2s v3
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Pricing for other VM sizes
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By clicking "Create", I (a) agree to the legal terms and privacy statement(s) associated with the Marketplace offering(s) listed above; (b) authorize Microsoft to bill my current payment method for the fees associated with the offering(s), with the same billing frequency as my Azure subscription; and (c) agree that Microsoft may share my contact, usage and transactional information with the provider(s) of the offering(s) for support, billing and other transactional activities. Microsoft does not provide rights for third-party offerings. See the Azure Marketplace Terms for additional details.
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Change SQL instance settings
SQL Server License
Save up to 43% with licenses you already own. Already have a SQL Server license? Learn more
SQL Server License
No
Yes
Automated patching
Set a patching window during which all Windows and SQL patches will be applied.
Automated patching
Disabled
Change configuration
Automated backup
Automated backup
Disable
Enable
R Services(Advanced Analytics)
SQL Server Machine Learning Services (In-Database)
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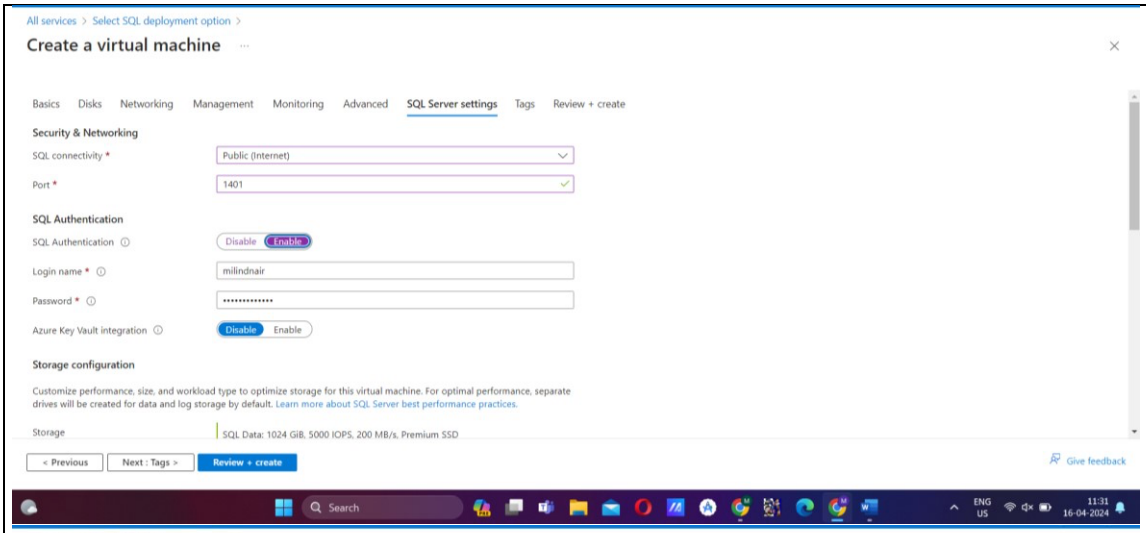
All services > Select SQL deployment option >
Create a virtual machine
Basics Disks Networking Management Monitoring Advanced SQL Server settings Tags Review + create
Security & Networking
SQL connectivity * Public (Internet)
Port * 1401
SQL Authentication
SQL Authentication Disable Enable
Login name * milindnair
Password * ••••••••••••
Azure Key Vault integration Disable Enable
Storage configuration
Customize performance, size, and workload type to optimize storage for this virtual machine. For optimal performance, separate drives will be created for data and log storage by default. Learn more about SQL Server best performance practices.
Storage SQL Data: 1024 GiB, 5000 IOPS, 200 MB/s, Premium SSD
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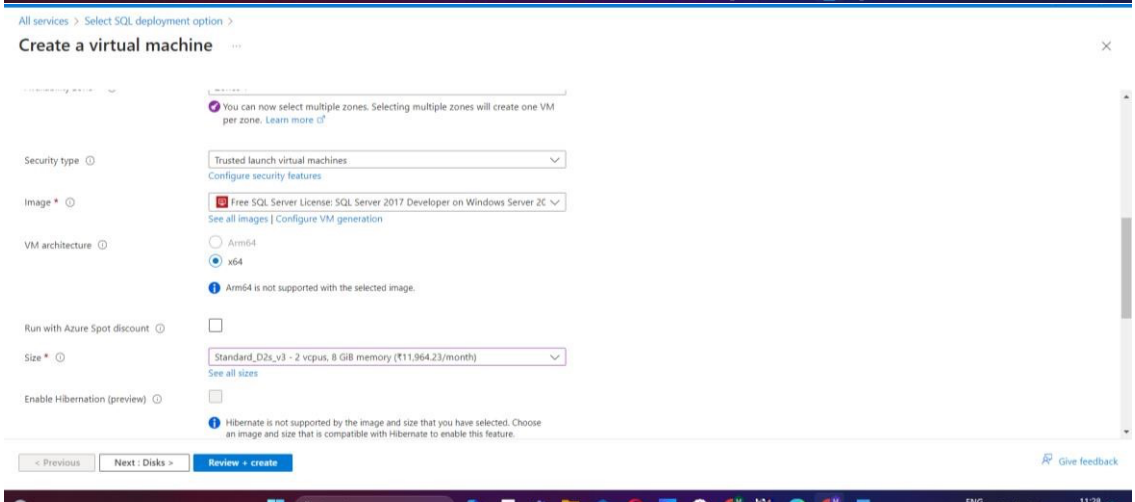
All services > Select SQL deployment option >
Create a virtual machine
You can now select multiple zones. Selecting multiple zones will create one VM per zone. Learn more
Security type Trusted launch virtual machines
Configure security features
Image * Free SQL Server License: SQL Server 2017 Developer on Windows Server 2(
See all images | Configure VM generation
VM architecture Arm64 x64
Arm64 is not supported with the selected image.
Run with Azure Spot discount
Size * Standard_D2s_v3 - 2 vcpus, 8 GiB memory (₹11,964.23/month)
See all sizes
Enable Hibernation (preview)
Hibernate is not supported by the image and size that you have selected. Choose an image and size that is compatible with Hibernate to enable this feature.
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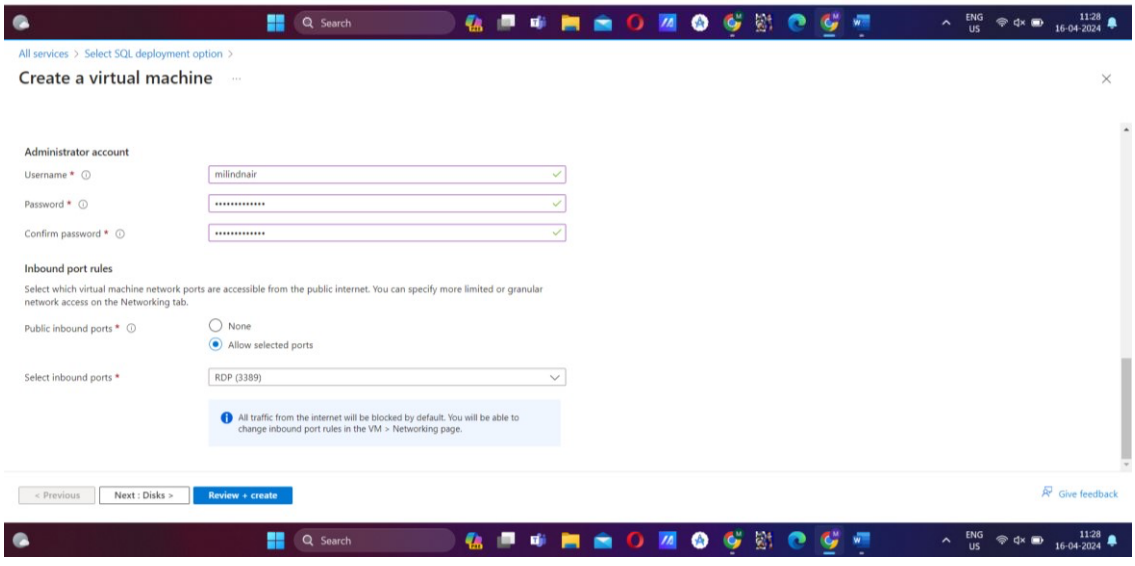
All services > Select SQL deployment option >
Create a virtual machine
Administrator account
Username * milindnair
Password * ••••••••••••
Confirm password * ••••••••••••
Inbound port rules
Select which virtual machine network ports are accessible from the public internet. You can specify more limited or granular network access on the Networking tab.
Public inbound ports * None Allow selected ports
Select inbound ports * RDP (3389)
All traffic from the internet will be blocked by default. You will be able to change inbound port rules in the VM > Networking page.
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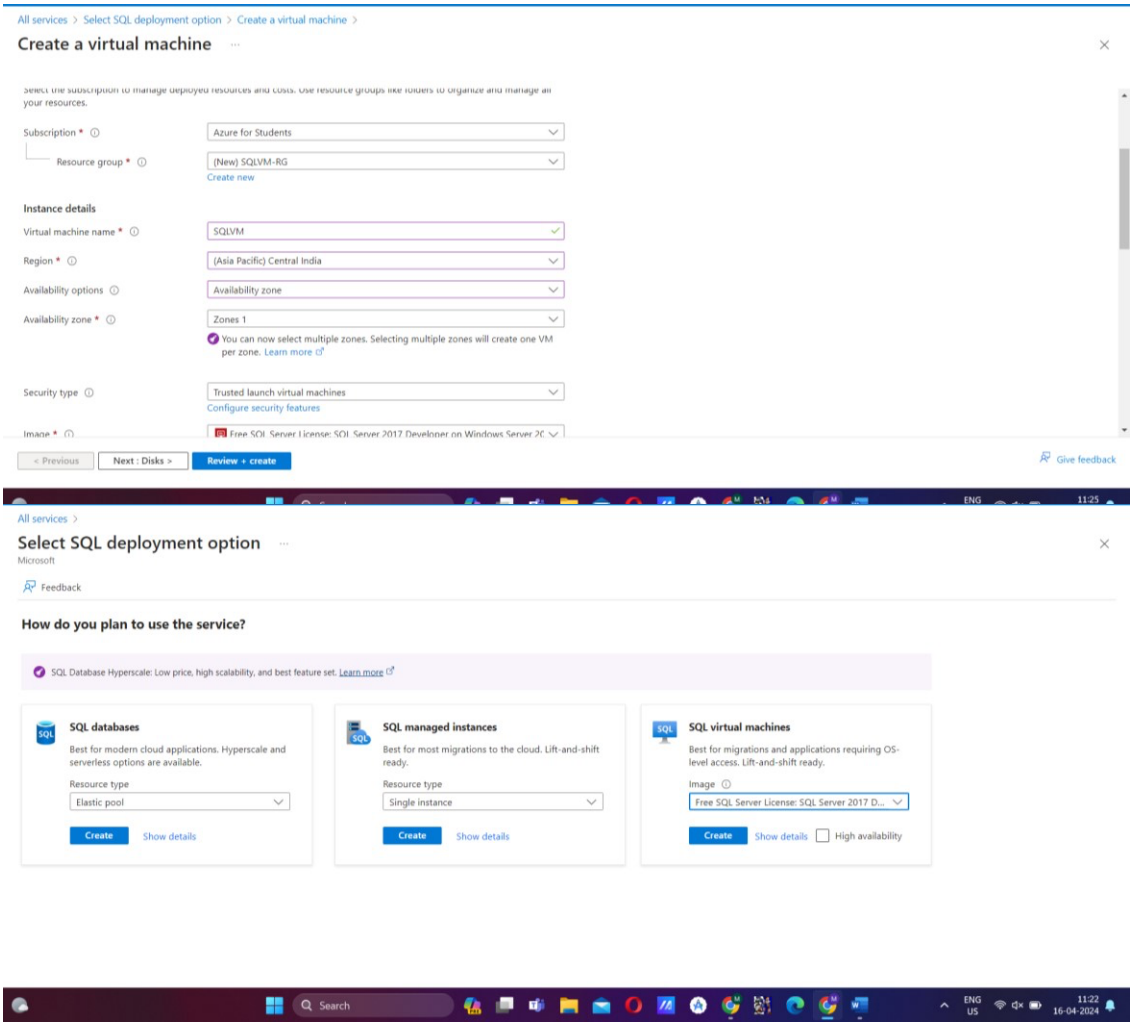
All services > Select SQL deployment option > Create a virtual machine >
Create a virtual machine
Subscription * Azure for Students
Resource group * (New) SQLVM-RG
Create new
Instance details
Virtual machine name * SQLVM
Region * (Asia Pacific) Central India
Availability options Availability zone
Availability zone * Zones 1
You can now select multiple zones. Selecting multiple zones will create one VM per zone. Learn more
Security type Trusted launch virtual machines
Configure security features
< Previous
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Give feedback
All services >
Select SQL deployment option
Microsoft
Feedback
How do you plan to use the service?
SQL Database Hyperscale: Low price, high scalability, and best feature set. Learn more
SQL databases
Best for modern cloud applications. Hyperscale and serverless options are available.
Resource type
Elastic pool
Create
Show details
SQL managed instances
Best for most migrations to the cloud. Lift-and-shift ready.
Resource type
Single instance
Create
Show details
SQL virtual machines
Best for migrations and applications requiring OS-level access. Lift-and-shift ready.
Image
Free SQL Server License: SQL Server 2017 D...
Create
Show details
High availability
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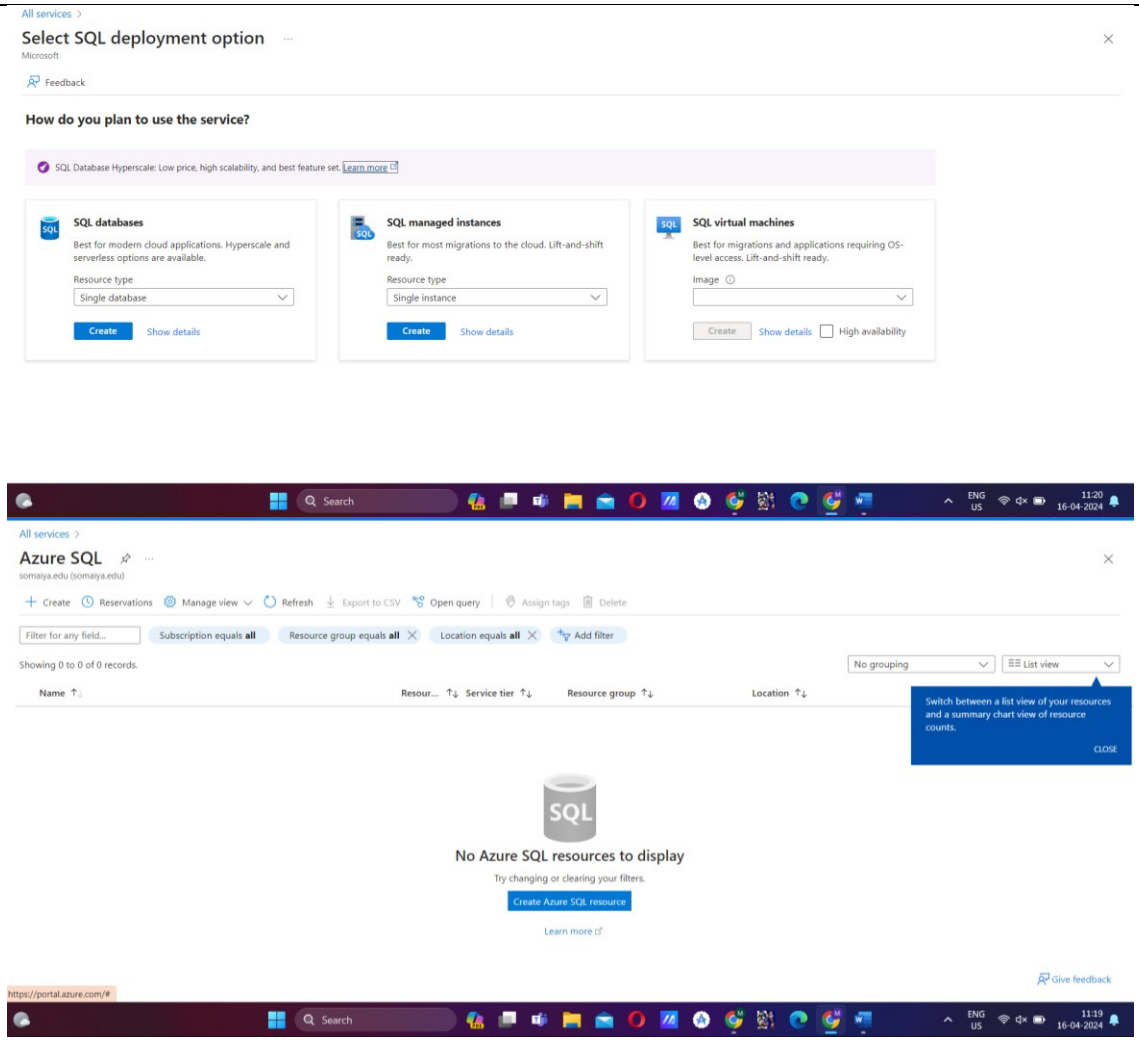
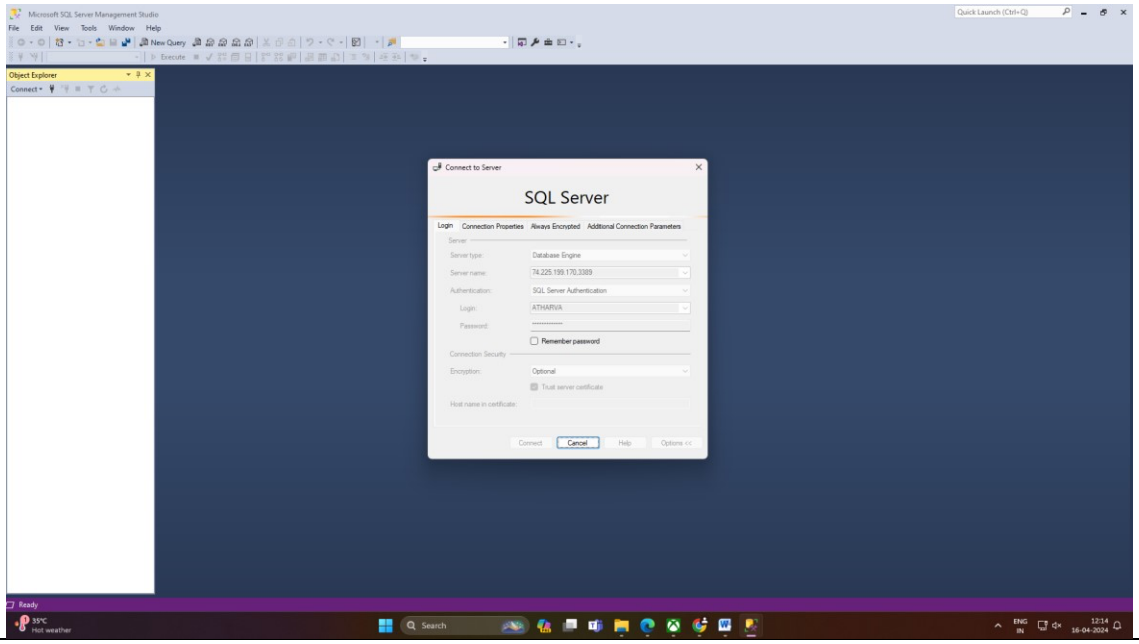


2.Connecting to microsoft SQL Studio



Conclusion:-

SQL Server on Azure VMs offers a powerful and flexible solution for deploying and managing SQL Server databases in the cloud. By leveraging the Azure ecosystem and following best practices for deployment, management, and optimization, organizations can achieve high performance, scalability, and reliability for their SQL Server workloads.