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21BCSE27

1. Create a Resource group

The screenshot shows the 'Create a resource group' wizard in the Microsoft Azure portal. The 'Basics' tab is selected. In the 'Project details' section, the subscription is set to 'Azure for Students' and the resource group is named 'PROJECT-RG'. In the 'Resource details' section, the region is set to '(US) West US 3'. At the bottom, there are buttons for 'Review + create', '< Previous', and 'Next : Tags >'.

2. Create a Virtual Network

The screenshot shows the 'Create virtual network' wizard in the Microsoft Azure portal. The 'Basics' tab is selected. In the 'Subscription' section, the subscription is set to 'Azure for Students' and the resource group is named 'PROJECT-RG'. In the 'Instance details' section, the virtual network name is 'PROJECT-VNET' and the region is set to '(US) West US 3'. At the bottom, there are buttons for 'Previous', 'Next', and 'Review + create'.

Microsoft Azure Search resources, services, and docs (G+) Home > Virtual networks > Create virtual network

Basics Security IP addresses Tags Review + create

Add IPv4 address space | ↴

10.0.0.0/16 Delete address space
10.0.0.0 /16 (65,536 addresses)
10.0.0.0 - 10.0.255.255 (65536 addresses)

+ Add a subnet

Subnets	IP address range	Size	NAT gateway
WEB-SUBNET	10.0.1.0 - 10.0.1.255	/24 (256 addresses)	-
DB-SUBNET	10.0.2.0 - 10.0.2.255	/24 (256 addresses)	-

Previous Next Review + create Give feedback

3. Creating Virtual Machine Scale set

Microsoft Azure Search resources, services, and docs (G+) Home > Virtual machine scale sets > Create a virtual machine scale set

Basics Spot Disks Networking Scaling Management Health Advanced Tags Review + create

Azure virtual machine scale sets let you create and manage a group of load balanced VMs. The number of VM instances can automatically increase or decrease in response to demand or a defined schedule. Scale sets provide high availability to your applications, and allow you to centrally manage, configure, and update a large number of VMs.

Learn more about virtual machine scale sets ↗

Project details

Select the subscription to manage deployed resources and costs. Use resource groups like folders to organize and manage all your resources.

Subscription * Azure for Students
Resource group * PROJECT-RG Create new

Scale set details

Virtual machine scale set name * VMST
Region * (US) West US 3

Review + create < Previous Next : Spot > Give feedback

Microsoft Azure Search resources, services, and docs (G+) Home > Virtual machine scale sets > Create a virtual machine scale set

Orchestration mode * Flexible: achieve high availability at scale with identical or multiple virtual machine types Uniform: optimized for large scale stateless workloads with identical instances

Security type Standard

Instance details

Image * Ubuntu Server 20.04 LTS - x64 Gen2 See all images | Configure VM generation

VM architecture x64 Arm64

Run with Azure Spot discount

Size * Standard_B1s - 1 vcpu, 1 GiB memory (₹596.23/month) See all sizes

Administrator account

Authentication type Password SSH public key

Username * web-server

Password *

Review + create < Previous Next : Spot > Give feedback

Create a virtual machine scale set

Networking

Virtual network configuration

Virtual network * PROJECT-VNET

Network interface

+ Create new nic Delete

Review + create < Previous Next : Scaling > Give feedback

→ Creating Load Balancer

Create a virtual machine scale set

Load balancing

Load balancing options

- None
- Azure load balancer

Supports all TCP/UDP network traffic, port-forwarding, and outbound flows.
- Application gateway

Web traffic load balancer for HTTP/HTTPS with URL-based routing, SSL termination, session persistence, and web application firewall.

To allow traffic from your load balancing product, please update the appropriate port configuration on your network security group associated with your network interface.

Select a load balancer *

No existing load balancers in current subscription and location.

Create a load balancer

Load balancer name * MY-LB

Type * Public

Provides outbound connections for virtual machines inside your virtual network using public load balancers.

Internal

Used to load balance traffic inside a virtual network. A load balancer frontend can be accessed from an on-premises network in a hybrid scenario.

Protocol * TCP

< Previous Next : Scaling > Create Cancel

→ Setting autoscaling rules

Create a virtual machine scale set

Initial instance count * 2

Scaling

Scaling policy

- Manual
- Custom

Minimum number of instances * 2

Maximum number of instances * 10

Scale out

CPU threshold (%) * 50

Duration in minutes * 5

Number of instances to increase by * 1

Scale in

CPU threshold (%) * 25

< Previous Next : Management > Review + create Give feedback

4. Creating another VM for database setup

5. Connection to database vm using its temporary public ip

```

root@DB-VM: /home/azure ~ + -
Microsoft Windows [Version 10.0.22621.1992]
(c) Microsoft Corporation. All rights reserved.

C:\Users\ashis\Downloads>ssh -i DB-VM_key.pem azureuser@20.169.6.27
The authenticity of host '20.169.6.27 (20.169.6.27)' can't be established.
ED25519 key fingerprint is SHA256:jpdVDEUH97YH5/jZmgItabd+f5W/px0JlE/y6RMNT7Wg.
This key is not known by any other names
Are you sure you want to continue connecting (yes/no/[fingerprint])? yes
Warning: Permanently added '20.169.6.27' (ED25519) to the list of known hosts.
Welcome to Ubuntu 20.04.6 LTS (GNU/Linux 5.15.0-1042-azure x86_64)

 * Documentation:  https://help.ubuntu.com
 * Management:    https://landscape.canonical.com
 * Support:       https://ubuntu.com/advantage

 System information as of Wed Aug  9 10:16:56 UTC 2023

 System load:  0.47           Processes:          105
 Usage of /:   5.2% of 28.89GB  Users logged in:     0
 Memory usage: 30%            IPv4 address for eth0: 10.0.2.4
 Swap usage:  0%

 * Strictly confined Kubernetes makes edge and IoT secure. Learn how MicroK8s
 just raised the bar for easy, resilient and secure K8s cluster deployment.

 https://ubuntu.com/engage/secure-kubernetes-at-the-edge

Expanded Security Maintenance for Applications is not enabled.

0 updates can be applied immediately.

```

➔ Configuring mySql database on database VM

```
DB-Server x + v
Setting up mysql-server (8.0.33-0ubuntu0.20.04.4) ...
Setting up libcgi-fast-perl (1:2.15-1) ...
Processing triggers for systemd (245.4-4ubuntu3.22) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.9) ...
root@DB-VM:/home/azureuser# mysql_secure_installation

Securing the MySQL server deployment.

Connecting to MySQL using a blank password.

VALIDATE PASSWORD COMPONENT can be used to test passwords
and improve security. It checks the strength of password
and allows the users to set only those passwords which are
secure enough. Would you like to setup VALIDATE PASSWORD component?

Press y|Y for Yes, any other key for No: y

There are three levels of password validation policy:

LOW    Length >= 8
MEDIUM Length >= 8, numeric, mixed case, and special characters
STRONG Length >= 8, numeric, mixed case, special characters and dictionary      file

Please enter 0 = LOW, 1 = MEDIUM and 2 = STRONG: 2

Skipping password set for root as authentication with auth_socket is used by default.
If you would like to use password authentication instead, this can be done with the "ALTER_USER" command.
See https://dev.mysql.com/doc/refman/8.0/en/alter-user.html#alter-user-password-management for more information.
```

```
DB-Server x + v
#
# * Basic Settings
#
user          = mysql
# pid-file     = /var/run/mysqld/mysqld.pid
# socket       = /var/run/mysqld/mysqld.sock
# port         = 3306
# datadir      = /var/lib/mysql

# If MySQL is running as a replication slave, this should be
# changed. Ref https://dev.mysql.com/doc/refman/8.0/en/server-system-variables.html#sysvar_tmpdir
# tmpdir        = /tmp
#
# Instead of skip-networking the default is now to listen only on
# localhost which is more compatible and is not less secure.
bind-address    = 10.0.2.4
mysqlx-bind-address = 127.0.0.1
#
# * Fine Tuning
#
key_buffer_size   = 16M
# max_allowed_packet = 64M
# thread_stack     = 256K
# thread_cache_size = -1

# This replaces the startup script and checks MyISAM tables if needed
# the first time they are touched
-- INSERT --
```

31,25-35 28%

```

DB-Server
root@DB-VM:/etc/mysql/mysql.conf.d# mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.33-Ubuntu0.20.04.4 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> create user "aks"@"%" identified by "Singh@029";
Query OK, 0 rows affected (0.01 sec)

mysql> GRANT CREATE, ALTER, DROP, INDEX, SELECT, INSERT, UPDATE, DELETE ON *.* TO 'aks'@'%';
Query OK, 0 rows affected (0.01 sec)

mysql> flush privileges;
ERROR 1064 (42000): You have an error in your SQL syntax; check the manual that corresponds to your MySQL server version
for the right syntax to use near 'privileges' at line 1
mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.02 sec)

mysql> exit;
Bye
root@DB-VM:/etc/mysql/mysql.conf.d# systemctl restart mysql;
root@DB-VM:/etc/mysql/mysql.conf.d#

```

6. Dissociate Public ip of the VM(no need of public ip in database server)

The screenshot shows the Azure portal interface for managing a virtual machine. The left sidebar lists various sections like Overview, Activity log, Access control (IAM), Tags, Configuration, Properties, Locks, Insights, Alerts, Metrics, Diagnostic settings, and Automation. The main pane displays the 'DB-VM-ip' resource, specifically its 'Essentials' section. It shows the Resource group (PROJECT-RG), Location (West US 3), Subscription (Azure for Students), and Subscription ID (dbe477f-1d9c-49b3-8fb2-7157cc1b05). A 'Dissociation confirmation' modal is overlaid on the page, stating: 'This action will permanently dissociate the public IP address 'DB-VM-ip' from network interface card 'db-vm5''. It also mentions 'db-vm5 (Network interface card)'. There are 'Yes' and 'No' buttons at the bottom of the modal.

7. Installing php , php-apache2-lib-mod and sql client on both the Web servers for their interaction with the mysql sever configured on the DB-server VM

```

root@vmst7vxlz000000:/var/www/html# sudo cat 'Ram Ram' > index.html
cat: 'Ram Ram': No such file or directory
root@vmst7vxlz000000:/var/www/html# sudo vi index.html
root@vmst7vxlz000000:/var/www/html# ls
index.html
root@vmst7vxlz000000:/var/www/html# systemctl enable apache2
Synchronizing state of apache2.service with SysV service script with /lib/systemd/systemd-sysv-install.
Executing: /lib/systemd/systemd-sysv-install enable apache2
root@vmst7vxlz000000:/var/www/html# vi index.html
root@vmst7vxlz000000:/var/www/html# sudo su
root@vmst7vxlz000000:/var/www/html# sudo apt install mysql-client
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following additional packages will be installed:
  mysql-client-8.0 mysql-client-core-8.0 mysql-common
The following NEW packages will be installed:
  mysql-client mysql-client-8.0 mysql-client-core-8.0 mysql-common
0 upgraded, 4 newly installed, 0 to remove and 17 not upgraded.
Need to get 5215 kB of archives.
After this operation, 75.6 MB of additional disk space will be used.
Do you want to continue? [Y/n] y
Get:1 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client-core-8.0 amd64 8.0.33-0ubuntu0.20.04.4 [5176 kB]
Get:2 http://azure.archive.ubuntu.com/ubuntu focal/main amd64 mysql-common all 5.8+1.0.5ubuntu2 [7496 B]
Get:3 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client-8.0 amd64 8.0.33-0ubuntu0.20.04.4 [22.0 kB]
Get:4 http://azure.archive.ubuntu.com/ubuntu focal-updates/main amd64 mysql-client all 8.0.33-0ubuntu0.20.04.4 [9356 B]
Fetched 5215 kB in 1s (10.3 MB/s)

```

8. Connecting to the DB-Server through the client server and creating table and inserting records onto it

```

Server-1                               Server-2
Note, selecting 'php7.4-mysql' instead of 'php-mysqli'.
php7.4-mysql is already the newest version (7.4.3-4ubuntu2.19).
php7.4-mysql set to manually installed.
0 upgraded, 0 newly installed, 0 to remove and 17 not upgraded.
root@vmst7vxlz000000:/var/www/html# mysql -h 10.0.2.4 -u aks -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.33-0ubuntu0.20.04.4 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+--------------------+
| Database          |
+--------------------+
| information_schema |
| mysql              |
| performance_schema |
| sys                |
+--------------------+
4 rows in set (0.00 sec)

mysql> |

```

```
Server-1      Server-2      - □ ×
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.33-0ubuntu0.20.04.4 (Ubuntu)

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owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> show databases;
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
4 rows in set (0.00 sec)

mysql> create database my_databases;
Query OK, 1 row affected (0.02 sec)

mysql> use my_databases;
Database changed
mysql> |
```

```
Server-1      Server-2      - □ ×
+-----+
| Database |
+-----+
| information_schema |
| mysql |
| performance_schema |
| sys |
+-----+
4 rows in set (0.00 sec)

mysql> create database my_databases;
Query OK, 1 row affected (0.02 sec)

mysql> use my_databases;
Database changed
mysql> create table student(name varchar(30), roll int);
Query OK, 0 rows affected (0.04 sec)

mysql> insert into student values('Ashish Singh',16);
Query OK, 1 row affected (0.02 sec)

mysql> select * from student;
+-----+-----+
| name   | roll  |
+-----+-----+
| Ashish Singh |    16 |
+-----+-----+
1 row in set (0.00 sec)

mysql> |
```

9. Setting up zipped website files into their respective folder after installing apache2 web server on both the web-servers

```
Server-1      Server-2
Processing triggers for mime-support (3.64ubuntu1) ...
Processing triggers for man-db (2.9.1-1) ...
root@vmst7vxlz000000:/var/www/html# rm index.html
root@vmst7vxlz000000:/var/www/html# sudo unzip site-1.zip -d /var/www/html/
unzip:  cannot find or open site-1.zip, site-1.zip.zip or site-1.zip.ZIP.
root@vmst7vxlz000000:/var/www/html# sudo unzip /home/web-server/site-1.zip -d /var/www/html/
Archive:  /home/web-server/site-1.zip
  inflating: /var/www/html/about.html
  inflating: /var/www/html/css/bootstrap.css
  inflating: /var/www/html/css/font-awesome.min.css
  inflating: /var/www/html/css/popup.css
  inflating: /var/www/html/css/responsive.css
  inflating: /var/www/html/css/style.css
  inflating: /var/www/html/css/style.css.map
  inflating: /var/www/html/css/style.scss
  inflating: /var/www/html/fonts/fontawesome-webfont.ttf
  inflating: /var/www/html/fonts/fontawesome-webfont.woff
  inflating: /var/www/html/fonts/fontawesome-webfont.woff2
  inflating: /var/www/html/images/about-img.png
  inflating: /var/www/html/images/added-success.png
  inflating: /var/www/html/images/client.jpg
  inflating: /var/www/html/images/favicon.png
  inflating: /var/www/html/images/logo.jpg
  inflating: /var/www/html/images/nav-bullet.png
  inflating: /var/www/html/images/pay-img.jpg
  inflating: /var/www/html/images/s1.jpg
  inflating: /var/www/html/images/s1.png
  inflating: /var/www/html/images/s2.jpg
  inflating: /var/www/html/images/s2.png
  inflating: /var/www/html/images/s3.jpg
```

```
Server-1      Server-2
Processing triggers for man-db (2.9.1-1) ...
root@vmst7vxlz000001:/home/web-server# sudo unzip /home/web-server/site-2.zip -d /var/www/html/
Archive:  /home/web-server/site-2.zip
  inflating: /var/www/html/about.html
  inflating: /var/www/html/css/bootstrap.css
  inflating: /var/www/html/css/font-awesome.min.css
  inflating: /var/www/html/css/popup.css
  inflating: /var/www/html/css/responsive.css
  inflating: /var/www/html/css/style.css
  inflating: /var/www/html/css/style.css.map
  inflating: /var/www/html/css/style.scss
  inflating: /var/www/html/fonts/fontawesome-webfont.ttf
  inflating: /var/www/html/fonts/fontawesome-webfont.woff
  inflating: /var/www/html/fonts/fontawesome-webfont.woff2
  inflating: /var/www/html/images/about-img.png
  inflating: /var/www/html/images/added-success.png
  inflating: /var/www/html/images/client.jpg
  inflating: /var/www/html/images/favicon.png
  inflating: /var/www/html/images/logo.jpg
  inflating: /var/www/html/images/nav-bullet.png
  inflating: /var/www/html/images/pay-img.jpg
  inflating: /var/www/html/images/s1.jpg
  inflating: /var/www/html/images/s1.png
  inflating: /var/www/html/images/s2.jpg
  inflating: /var/www/html/images/s2.png
  inflating: /var/www/html/images/s3.jpg
  inflating: /var/www/html/images/s3.png
  inflating: /var/www/html/images/s4.jpg
  inflating: /var/www/html/images/s4.png
  inflating: /var/www/html/images/s5.jpg
```

10. The IP-address of the Load balancer is:

→ **20.118.168.126**

11. The Domain name is:

→ **singh-ashish.online**