

3-tire architrcture using Network security group

Created 3-tire architrcture using network security group

1.created three virtual machines

The screenshot shows the Microsoft Azure Compute Infrastructure Virtual machines page. The left sidebar has 'Virtual machines' selected. The main table lists four VMs:

Name	Subscription	Resource Group	Location	Status	Operating system	Size
appserver	Azure subscription	kirang	Central India	Running	Linux	Standard_D2s_v3
dbserver	Azure subscription	kirang	East Asia	Running	Linux	Standard_D2s_v3
linuxvm	BRAHMAJI-RG01	South Africa N...	Running	Linux	Standard_D2s_v3	
webserver	Azure subscription	kirang	Central India	Running	Linux	Standard_D2s_v3

2.added inbound rules according to our requirements

The screenshot shows the Microsoft Azure webserver Network settings page. The left sidebar has 'Network settings' selected. The main area shows the 'Inbound port rules' section with six entries:

Prio...	Name	Port	Protocol	Source	Destination	Action
300	SSH	22	TCP	Any	Any	Allow
320	HTTP	80	TCP	Any	Any	Allow
330	allow	80	Any	Any	20.219.35.200	Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInB...	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInbound	Any	Any	Any	Any	Deny

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Network security group appserver-nsg (attached to networkInterface: appserver(26))

Prio...	Name	Port	Protocol	Source	Destination	Action
300	SSH	22	TCP	Any	Any	Allow
310	allow	8080	Any	172.16.0.4	172.16.0.5	Allow
65000	AllowVnetBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInbound	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInbound	Any	Any	Any	Any	Deny

Network security group dbserver-nsg (attached to networkInterface: dbserver(26))

Prio...	Name	Port	Protocol	Source	Destination	Action
300	SSH	22	TCP	Any	Any	Allow
310	allow	3306	Any	172.16.0.5	172.17.0.4	Allow
320	deny	8080	Any	172.16.0.4	172.17.0.4	Deny
65000	AllowVnetBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerInbound	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInbound	Any	Any	Any	Any	Deny

3.installed nginx in webserver

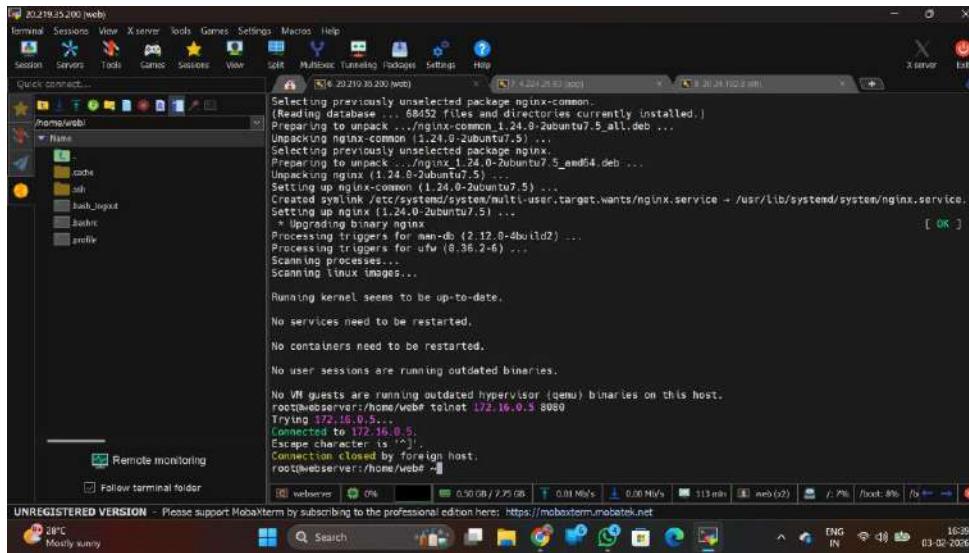
4.Installed tomcat in appserver

5.Installed mysql in dbserver

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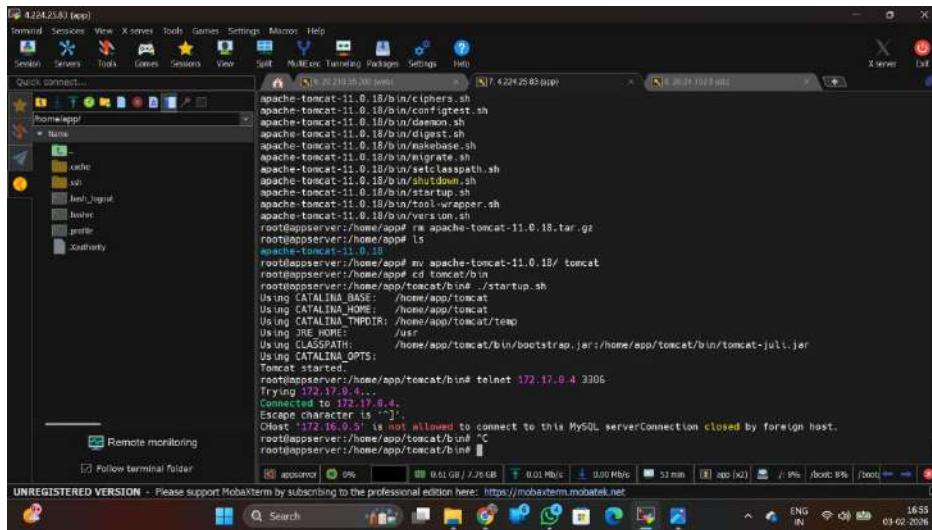
6.checked connections between servers using telnet command and port number

Webserver to app server



```
20.219.85.200 [web]
Terminal Sessions View Xserver Tools Games Settings Macros Help
Session Servers Tools Games Sessions View
SPLIT MultTerm (running) Packages Settings Help
Quick connect...
20.219.85.200 [web] 4.224.25.83 [app] 20.219.85.200 [app]
Selecting previously unselected package nginx-common...
Preparing to unpack .../nginx-common_1.24.0-2ubuntu7.5_all.deb ...
Unpacking nginx-common (1.24.0-2ubuntu7.5) ...
Selecting previously unselected package nginx...
Preparing to unpack .../nginx_1.24.0-2ubuntu7.5_amd64.deb ...
Unpacking nginx (1.24.0-2ubuntu7.5) ...
Setting up nginx-common (1.24.0-2ubuntu7.5) ...
Created symlink /etc/systemd/system/multi-user.target.wants/nginx.service → /usr/lib/systemd/system/nginx.service.
Setting up nginx (1.24.0-2ubuntu7.5) ...
* Upgrading binary nginx
Processing triggers for man-db (2.12.0-2build2) ...
Processing triggers for ufw (0.36.2-6) ...
Scanning processes...
Scanning Linux images...
Running kernel seems to be up-to-date.
No services need to be restarted.
No containers need to be restarted.
No user sessions are running outdated binaries.
No VM guests are running outdated hypervisor (qemu) binaries on this host.
root@webserver:/home/web# telnet 172.16.0.5 8080
Trying 172.16.0.5...
Connected to 172.16.0.5.
Escape character is '^J'.
Connection closed by foreign host.
root@webserver:/home/web#
```

Appserver to dbserver



```
4.24.25.81 [app]
Terminal Sessions View Xserver Tools Games Settings Macros Help
Session Servers Tools Games Sessions View
SPLIT MultTerm (running) Packages Settings Help
Quick connect...
4.24.25.81 [app] 20.219.85.200 [app] 20.219.85.200 [db]
apache-tomcat-11.0.18/bin/ciphers.sh
apache-tomcat-11.0.18/bin/configtest.sh
apache-tomcat-11.0.18/bin/digest.sh
apache-tomcat-11.0.18/bin/makebase.sh
apache-tomcat-11.0.18/bin/migratate.sh
apache-tomcat-11.0.18/bin/setclasspath.sh
apache-tomcat-11.0.18/bin/startupdb.sh
apache-tomcat-11.0.18/bin/startup.sh
apache-tomcat-11.0.18/bin/tool-wrapper.sh
apache-tomcat-11.0.18/bin/version.sh
root@appserver:/home/app# apache-tomcat-11.0.18.tar.gz
root@appserver:/home/app# ls
root@appserver:/home/app# cd apache-tomcat-11.0.18/
root@appserver:/home/app/apache-tomcat-11.0.18# ./bin/startup.sh
Using CATALINA_BASE: /home/app/tomcat
Using CATALINA_HOME: /home/app/tomcat
Using CATALINA_TMPDIR: /home/app/tomcat/temp
Using CATALINA_PID: /home/app/tomcat.pid
Using CLASSPATH: /home/app/tomcat/bin/bootstrap.jar:/home/app/tomcat/bin/tomcat-juli.jar
Using CATALINA_OPTS:
Tomcat started.
root@appserver:/home/app/tomcat/bin# telnet 172.17.0.4 3306
Trying 172.17.0.4...
Connected to 172.17.0.4.
Escape character is '^J'.
Ohost '172.16.0.5' is not allowed to connect to this MySQL serverConnection closed by foreign host.
root@appserver:/home/app/tomcat/bin#
```

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Web server to dbserver

