

# Secure Azure Web App Integration with MySQL on Linux VM

## Objective

To deploy a PHP-based web application in Azure App Service connected securely to a MySQL database hosted on a Linux Virtual Machine through VNet integration, ensuring full governance, monitoring, and backup configurations.

## Tools & Technologies Used

- 1 Microsoft Azure Portal
- 2 Azure Virtual Network (VNet)
- 3 Azure App Service (Linux Plan)
- 4 Linux VM (Ubuntu) with MySQL Server
- 5 Azure Recovery Services Vault (RSV)
- 6 Azure Monitor & Log Analytics Workspace
- 7 Azure Alerts & Action Groups
- 8 NSG, Tags, Locks, and RBAC Roles

## AZ-104 Domains Covered

- 1 Manage Azure identities and governance (RBAC, Locks, Tags)
- 2 Implement and manage storage & compute resources (VM, Disks, Backup)
- 3 Configure and manage virtual networking (VNet, Subnets, NSG)
- 4 Manage App Services (Deployment, Monitoring, Alerts)

## Deployment Steps

- 1 Created Resource Group \*\*rg-webappintegration\*\* and applied resource lock (CanNotDelete) and tags.

The screenshot shows the Microsoft Azure portal interface. The user is navigating through the Resource Manager | Resource groups section, specifically within the rg-webappintegration resource group. On the left sidebar, the 'Locks' option is selected. The main content area displays a table of locks. There is one entry: 'do not delete' (Lock type: Delete, Scope: rg-webappintegration, Notes: prevent accidental deletion). A success message at the top right indicates that the lock creation was successful: 'Creating lock 'do not delete' in resource group 'rg-webappintegration' succeeded.'

The screenshot shows the Microsoft Azure portal interface. The user is navigating through the Resource Manager | Resource groups section, specifically within the rg-webappintegration resource group. On the left sidebar, the 'Tags' option is selected. The main content area displays a table of tags. Two tags are listed: 'owner' (Value: asad) and 'project' (Value: multtierdemo). Below the table, a summary box shows 'rg-webappintegration (Resource group)' with the tags 'owner : asad' and 'project : multtierdemo'. It also states 'No changes'. At the bottom, there are 'Apply' and 'Discard changes' buttons.

- 2 Added a new Azure AD user and assigned Reader role at the Resource Group level.

Name	Type	Role	Scope	Condition
MA Mohammed Asad Farha...	User	Owner	Subscription (Inherited)	None
MA Mohammed Asad Farha...	User	Owner	Management group (Inhe...	None
user01	User	Reader	This resource	None
Unknown	Unknown	StorageCustomReader	Subscription (Inherited)	None
MA Mohammed Asad Farha...	User	User Access Administrator	Root (Inherited)	None

- 3 Deployed Virtual Network \*\*vnet-webappintegration\*\* with two subnets: one for VM and one delegated to Microsoft.Web/serverfarms for App Service VNet integration.

Name	IPv4	IPv6	Available IPs	Delegated to	Security group	Route table
dbsubnet	10.0.1.0/24	-	250	-	-	
subnet-webappint...	10.0.2.0/24	-	251	Microsoft...	-	

- 4 Created Network Security Group \*\*dbserver-nsg\*\* and allowed inbound MySQL port 3306 only from the App Service subnet.

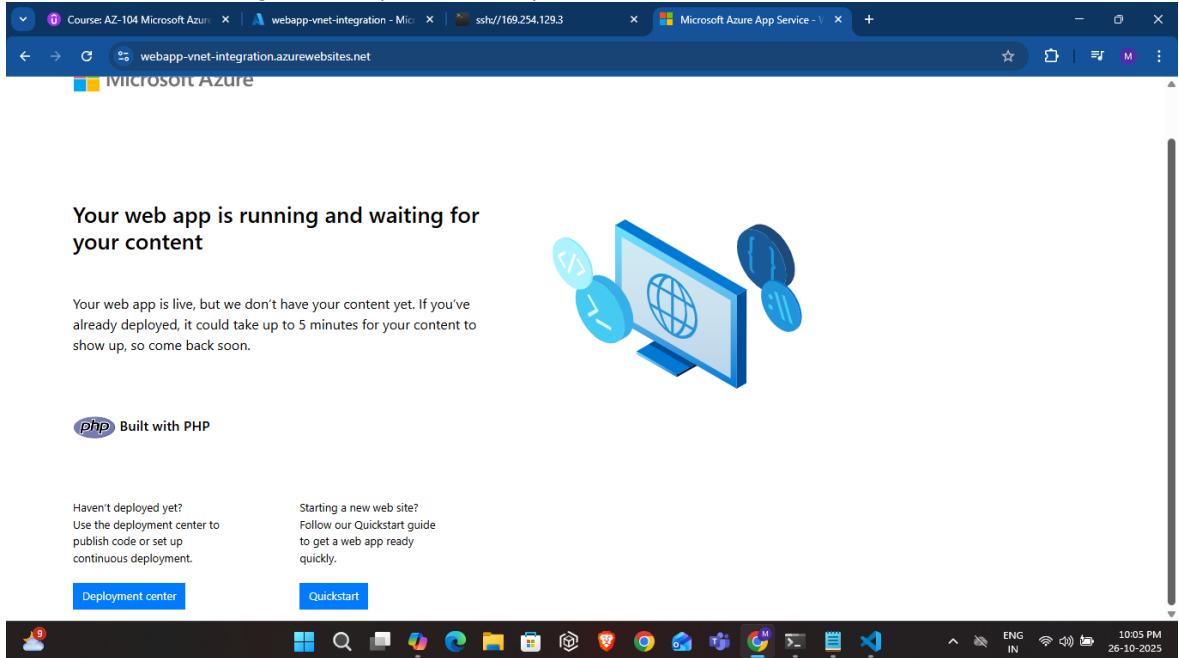
Prio...	Name	Port	Protocol	Source	Destination	Action
300	SSH	22	TCP	Any	Any	Allow
310	allow3306fromappsubnet	3306	TCP	10.0.2.0/24	Any	Allow
65000	AllowVnetInBound	Any	Any	VirtualNetwork	VirtualNetwork	Allow
65001	AllowAzureLoadBalancerIn...	Any	Any	AzureLoadBalancer	Any	Allow
65500	DenyAllInBound	Any	Any	Any	Any	Deny

- 5 Deployed Linux Virtual Machine \*\*dbserver\*\* with public IP \*\*dbserver-ip\*\*, and configured MySQL server.

- 6 Created MySQL user, granted privileges, and set bind-address to VM's private IP in MySQL configuration. Inserted sample data into the MySQL table and disassociate public ip of a vm.

➤ **view commands.**

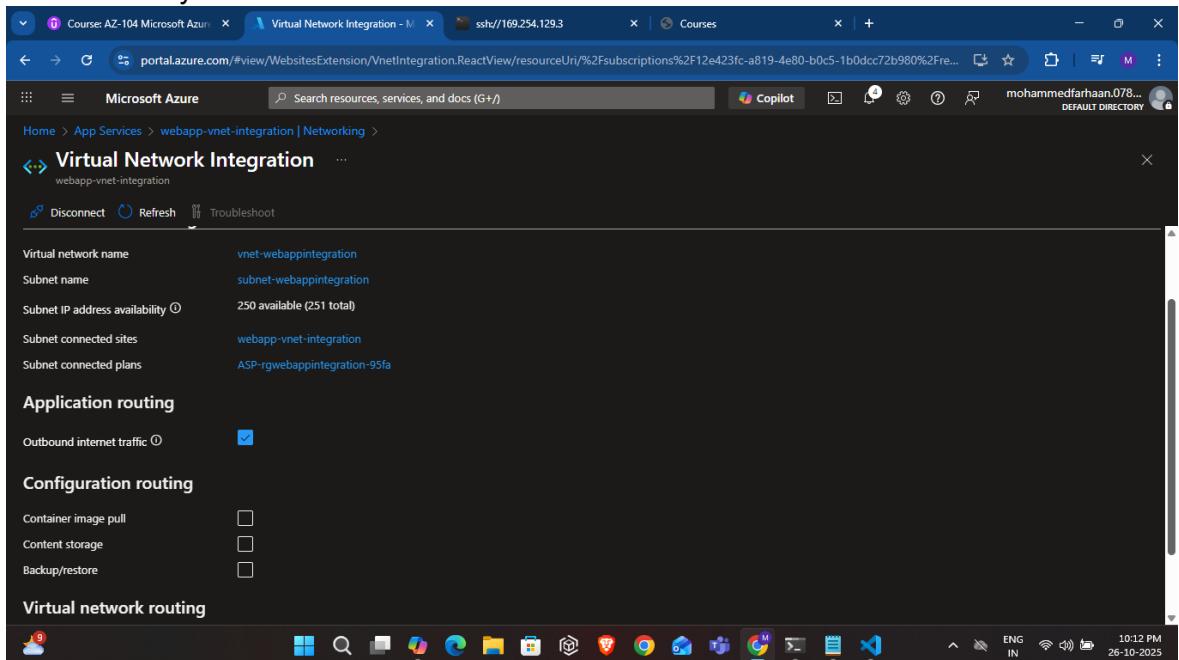
- 7 Deployed App Service Plan \*\*ASP-rgwebappintegration-95fa\*\* and Web App \*\*webapp-vnet-integration\*\* (Linux, PHP).



- 8 Manually deployed PHP application via SSH and configured DB connection in code with VM IP, user, DB name, and password.

➤ [view source code](#)

- 9 Enabled VNet Integration between App Service and delegated subnet to securely access the MySQL VM.



The screenshot shows a Microsoft Edge browser window with four tabs open. The active tab displays a table titled 'List of Courses' with three rows. The table has columns for 'Course ID', 'Course Name', and 'Rating'. The courses listed are Docker and Kubernetes (Rating 4.5), AI-102 Azure AI Engineer (Rating 4.6), and AZ-104 Azure Administrator (Rating 4.7). Below the table, there is a message: 'This is a list of Courses'. The taskbar at the bottom shows various pinned icons.

Course ID	Course Name	Rating
1	Docker and Kubernetes	4.5
2	AI-102 Azure AI Engineer	4.6
3	AZ-104 Azure Administrator	4.7

## 10 Configured custom domain \*\*anonymous.rest\*\* for the web app and verified successful data connection through index.php.

The screenshot shows the Microsoft Azure portal interface. The left sidebar is expanded, showing 'Custom domains' selected under 'Web App'. The main content area displays the 'Custom domains' blade for the 'webapp-vnet-integration' web app. It shows two custom domains: 'anonymous.rest' and 'webapp-vnet-integration.azurewe...'. Both domains are listed as 'Secured' with SNI SSL binding and the certificate 'anonymous.rest-webapp-vnet-int...'. A message at the top right states: 'Starting July 28, upcoming changes may impact the issuance and renewals of your App Service Managed Certificates. Review the guidance to ensure your certificates aren't impacted.' The taskbar at the bottom shows various pinned icons.

The screenshot shows a web browser window with multiple tabs open. The active tab displays a list of courses with the title "List of Courses". The content includes a heading "This is a list of Courses" and a table with three rows:

Course ID	Course Name	Rating
1	Docker and Kubernetes	4.5
2	AI-102 Azure AI Engineer	4.6
3	AZ-104 Azure Administrator	4.7

The browser interface includes a navigation bar with back, forward, and search buttons, as well as a tab bar with various open tabs. The system tray at the bottom shows network connectivity, battery status, and the date and time (10:22 PM, 26-10-2025).

## 11 Created Recovery Services Vault \*\*webapprsv\*\* and enabled VM backup with a manual restore point trigger.

The screenshot shows the Microsoft Azure portal with the URL [https://portal.azure.com/#view/Microsoft\\_Azure\\_DataProtection/V1JobsListBlade/vaultId/%2Fsubscriptions%2F12e423fc-a819-4e80-b0c5-1b0dcc72b980%2Fres...](https://portal.azure.com/#view/Microsoft_Azure_DataProtection/V1JobsListBlade/vaultId/%2Fsubscriptions%2F12e423fc-a819-4e80-b0c5-1b0dcc72b980%2Fres...). The page title is "Backup Jobs" under the "dbserver | Backup" section. The table lists two backup operations for the "dbserver" workload:

Workload name	Operation	Status	Type	Start time	Total Duration	Details
dbserver	Backup	In progress	Azure Virtual Machine	26/10/2025, 22:54:54	00:00:15	<a href="#">View details</a>
dbserver	Configure backup	Completed	Azure Virtual Machine	26/10/2025, 22:53:21	00:00:30	<a href="#">View details</a>

The browser interface and system tray are visible at the bottom.

**dbserver | Backup**

**Backup**

**Recovery points**

Creation time	Consistency	Recovery type
26/10/2025, 22:55:02	File-system Consistent	Snapshot

## 12 Deployed Log Analytics Workspace \*\*webapplaw\*\* and connected App Service diagnostics to send HTTP error logs.

**webapplaw**

**Overview**

**Logs**

**Get Started**

**Get started with Log Analytics**

Log Analytics collects data from a variety of sources and uses a powerful query language to give you insights into the operation of your applications and resources. Use Azure Monitor to access the complete set of tools for monitoring all of your Azure resources.

The screenshot shows the 'Diagnostic setting' configuration page for an App Service named 'webapp-vnet-integration'. Under the 'Logs' section, 'HTTP logs' is selected. In the 'Destination details' panel, 'Send to Log Analytics workspace' is checked, and the 'Subscription' is set to 'Azure subscription 1' and the 'Log Analytics workspace' is set to 'webapplaw ( centralus )'. Other destination options like 'Archive to a storage account', 'Stream to an event hub', and 'Send to partner solution' are also listed.

### 13 Configured Alert Rule \*\*webappcpuutilization\*\* with signal metric 'CPU Time' and Action Group \*\*webactiongrp\*\* linked to email notifications.

The screenshot shows the 'Alert rules' configuration page for the same App Service. A single alert rule named 'webappcpuutilization' is listed. It has the condition 'CpuTime greater or less than 3 - Informational', a severity of 'Informational', a target scope of 'webapp-vnet-integration', a target resource type of 'App Service', a signal type of 'Metrics', and is currently 'Enabled'. The alert rule is linked to an action group named 'webactiongrp'.

The screenshot shows the Microsoft Azure portal's Action groups blade. The URL is [https://portal.azure.com/#view/Microsoft\\_Azure\\_Monitoring\\_Alerts/ActionGroupsBlade/resourceGroupNames~/%5B%5D](https://portal.azure.com/#view/Microsoft_Azure_Monitoring_Alerts/ActionGroupsBlade/resourceGroupNames~/%5B%5D). The page displays a table of action groups. One row is selected, showing the details for 'webactiongrp'. The table columns include Name, Short name, Resource group, Subscription, Actions, and Status. The status is shown as 'Enabled' with a green checkmark.

Name ↑↓	Short name ↑↓	Resource group ↑↓	Subscription ↑↓	Actions	Status ↑↓
webactiongrp	webactiongrp	rg-webappintegration	Azure subscription 1	1 Email	Enabled

The screenshot shows a Gmail inbox with 2,010 messages. A new email from 'You've been added to an Azure Monitor action group' is highlighted. The subject line is 'You've been added to an Azure Monitor action group'. The message body contains information about the action group, including the Subscription ID (12E423FC-A819-4E80-B0C5-1B0DCC72B980), Resource group name (rg-webappintegration), and Action group name (webactiongrp). There is also a link to 'View details on Azure Monitor action groups >' and a note about desktop notifications.

You've been added to an Azure Monitor action group

Subscription ID: 12E423FC-A819-4E80-B0C5-1B0DCC72B980

Resource group name: rg-webappintegration

Action group name: webactiongrp

## Outcome

The PHP web application successfully connected to the MySQL database hosted on Azure Linux VM through secure VNet integration. All resources were governed, monitored, and protected with backup and alert configurations.

## **Skills Demonstrated**

- 1 Azure Networking (VNet, NSG, Subnets)
- 2 App Service Deployment & Configuration
- 3 Linux VM & MySQL Database Administration
- 4 Backup & Recovery Configuration using RSV
- 5 Monitoring & Alerts using Log Analytics and Action Groups
- 6 Governance using RBAC, Tags, and Locks

## **■ Subscription Used**

Microsoft Azure Subscription (pay as-you-go)