

AZ-104 : Backup & Disaster Recovery Implementation

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Cloud Platform: Microsoft Azure

Overview

This Project demonstrates a complete Azure Backup and Disaster Recovery implementation, aligning with the AZ-104 Administrator certification objectives. It simulates a real-world scenario where an organization must protect virtual machines and ensure business continuity in case of failure or accidental data loss.

Problem Statement

Organizations face the risk of data loss and service downtime due to accidental deletion, corruption, or regional failures. The challenge is to design and implement a resilient Azure backup and recovery strategy that protects workloads and allows rapid restoration with minimal data loss (RPO) and downtime (RTO). This project addresses those needs using Azure Recovery Service Vault, Backup Policies, and Restore operations.

Step 1: Create a Resource Group To group all related resources

Home >

rg-az104-p2 Resource group

Generate Bicep code to duplicate this resource group. Help me generate Terraform for this resource group configuration. Export resource groups using Bicep or Terraform

Search

+ Create Manage view Delete resource group Refresh Export to CSV Open query Assign tags Group by none

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Cost Management

Monitoring

Automation

Help

Essentials

Resources Recommendations

Filter for any field... Type equals all Location equals all Add filter

No resources match your filters

Try changing or clearing your filters.

+ Create Clear filters

Learn more

Add or remove favorites by pressing Ctrl+L+Shift+F

Step 2: Create Virtual Network & Subnet

Set up a Vnet and subnet for network isolation

[Home](#) > [Network foundation](#) | [Virtual networks](#) >

Create virtual network ...

✓ Validation passed

Basics Security IP addresses Tags Review + create

Name vnet-pz
Region South Africa North

Security

Azure Bastion Disabled
Azure Firewall Disabled
Azure DDoS Network Protection Disabled

IP addresses

Address space 10.0.0.0/16 (65,536 addresses)
Subnet subnet-app (10.0.0.0/24) (256 addresses)

Tags

Previous

Next

Create

[Download a template for automation](#)

Step 3: Create Virtual Machine

To simulate production workloads.

Create a virtual machine



Help me choose the right VM size for my workload

Help me create a VM optimized for high availability

Help m

✓ Validation passed



Help me create a low cost VM

Help me create a VM optimized for high availability

Help me choose the right VM size for my workload

Basics

Subscription	ZEMBE
Resource group	rg-az104-p2
Virtual machine name	vm-db-test
Region	South Africa North
Availability options	No infrastructure redundancy required
Zone options	Self-selected zone
Security type	Trusted launch virtual machines
Enable secure boot	Yes
Enable vTPM	Yes
Integrity monitoring	No
Image	Windows Server 2025 Datacenter - Gen2
VM architecture	x64
Size	Standard B1s (1 vcpu, 1 GiB memory)
Enable Hibernation	No
Username	zembe
Public inbound ports	RDP
Already have a Windows license?	No
Azure Spot	No

< Previous

Next >

Create

Networking

Virtual network	vnet-p2
Subnet	subnet-app
Public IP	(new) vm-db-test-ip
Accelerated networking	Off
Place this virtual machine behind an existing load balancing solution?	No
Delete public IP and NIC when VM is deleted	Disabled

Home > CreateVm-MicrosoftWindowsServer.WindowsServer-2025110112440 | Overview >

vm-db-test Virtual machine

Help me copy this VM in any region Manage this VM with Azure CLI

vm-db-test virtual machine agent status is not ready. Troubleshoot the issue →

Help me copy this VM in any region

Connect Start Restart Stop Hibernate Capture Delete Refresh Open in mobile Feedback CLI / PS

Essentials

Resource group (move)	: rg-az104-p2	Operating system	: Windows
Status	: Running	Size	: Standard B1s (1 vcpu, 1 GiB memory)
Location	: South Africa North	Primary NIC public IP	: 4.221.136.67
Subscription (move)	: ZEMBE		1 associated public IP
Subscription ID	: 4cd547c-69e8-48d9-bed1-3bd001fa344d	Virtual network/subnet	: vnet-s2/subnet-ase
		DNS name	: Not configured
		Health state	: -
		Time created	: 11/10/2025, 9:33 AM UTC

JSON View

Tags: Add tags

Properties Monitoring Capabilities (2) Recommendations Tutorials

Virtual machines

Computer name	vm-db-test
Operating system	Windows

Networking

Public IP address: 4.221.136.67 (Network interface: vm-db-testNIC) 1 associated public IP

Step 4: Create (RSV) Recovery Service Vault

To store and manage backups.

Home > Microsoft.RecoveryServicesV2-1762767369121 | Overview >

rsv-p2 Recovery Services vault

Increase security level of this vault Analyze all job failures for this vault Summarize security posture of this vault

Backup Enable Site Recovery Update Vault Security Delete Refresh Feedback

Help me copy this vault settings in any region Show me virtual machines that can be protected Analyze all backup job failures for this vault

JSON View

Essentials

Overview Backup Site Recovery

What's new

- Azure Site Recovery support for Windows Azure Trusted launch VMs is generally available →
- SAP HANA Database Backup with Lower Protected Instance Fees Starting September 1, 2024. →
- SAP ASE Database on Azure VM backup is now generally available. →
- SAP HANA database instance snapshots on Azure VMs is now generally available. →
- HANA System Replication (HSR) support for SAP HANA DB on Azure VM backup is now generally available. →
- Cross Subscription Restore for Azure Virtual Machines is now generally available. →
- Site Recovery replicated items and jobs views across subscriptions, regions and vaults are now available. →
- Azure Backup Metrics are now in public preview →
- Migration for Azure VM backups from standard policy to enhanced policy is now in public preview →

Add or remove favorites by pressing Ctrl+Shift+F

Step 5: Configure Backup Goal and Discovery VM

Set up backup goal for protection

Configure backup

rsv-p2

Policy sub type *



Enhanced

- ✓ Multiple backups per day
- ✓ Up to 30 days operational tier retention
- ✓ Support for Trusted Launch Azure VM
- ✓ Support for VMs with Ultra Disks and Premium SSD v2



Standard

- ✓ Once-a-day backup
- ✓ Up to 5 days operational tier retention

Backup policy *

(new) policy-daily-14d

[Edit this policy](#)

i Protecting a VM with enhanced policy can incur additional snapshot charges. Please note that once you enable a VM backup with enhanced policy, changing to standard policy type is not possible. [Learn more](#).

Policy details

Full backup

Backup frequency

Every 4 hour(s) starting 8:00 AM UTC for 12 Hour(s)

Instant restore

Retain instant recovery snapshot(s) for 7 day(s)

Retention of daily backup point

Retain backup taken every day for 14 Day(s)

Consistency type

Application or file-system consistent

Virtual machines

[Enable backup](#)

[Download a template for automation](#)

[Give feedback](#)

Step 6: Apply Backup Policy

Configure daily backup policy with 14-day retention.

Create policy

Azure Virtual Machine



Recovery points can be automatically moved to the vault-archive tier using backup policy. [Learn more](#). →

Policy name

policy-daily-14d

Backup schedule

Frequency *

Hourly

Start time *

8:00 AM

Schedule *

Every 4 Hours

Duration *

12 Hours

Timezone *

(UTC) Coordinated Universal Time

Instant restore

Retain instant recovery snapshot(s) for

7

Day(s)

Retention range



Azure Backup transfers the data from instant restore point to vault once a day. [Learn more](#)



Retention of daily backup point

For

14

Day(s)



Retention of weekly backup point

OK

Step 7: Enable and run manual backup

Enable protection on vm-db-test

Home > ConfigureProtection-1762767938007 | Overview > rsv-p2 | Backup items > Backup items (Azure Virtual Machine) >

vm-db-test ...

Backup Item

[Backup now](#) [Restore VM](#) [File Recovery](#) [Stop backup](#) [Resume backup](#) [Delete backup data](#) [Restore to Secondary Region](#) [Undelete](#) [Feedback](#)

Essentials JSON View

Recovery services vault : [rsv-p2](#)

Subscription ([move](#)) : [ZEMBE](#)

Subscription ID : 4cd547c-69e8-48d9-bed1-3bd001fa344d

Alerts (in last 24 hours) : [View alerts](#)

Jobs (in last 24 hours) : [View jobs](#)

Backup Pre-Check : Passed

Last backup status : Warning (Initial backup pending)

Backup policy : [policy-daily-14d \(Enhanced\)](#)

Oldest restore point : -

Included disk(s) : [All disks](#)

Recovery points

This list is filtered for last 30 days of recovery points. To recover from recovery point older than 30 days, as well as vault-archive, [click here](#).

Long term recovery points can be moved to vault-archive. To move all 'recommended recovery points' to vault-archive tier, [click here](#).

CRASH CONSISTENT

0

APPLICATION CONSISTENT

0

FILE-SYSTEM CONSISTENT

0

Creation time ↑↓

Consistency

Recovery type

No restore points available.

Home > ConfigureProtection-1762767938007 | Overview > rsv-p2 | Backup items > Backup items (Azure Virtual Machine) > vm-db-test > Backup Jobs >

Configure backup ...

vm-db-test

[Refresh](#) [Cancel](#) [Resume](#) [Deploy Create VM Template](#) [Deploy Cleanup Template](#) [Feedback](#)

Job details

VM Name	vm-db-test
Policy Name	policy-daily-14d
Activity ID	847683e8-e1f0-405e-bd89-7e1bd13c9482
Start time	11/10/2025, 11:49:14 AM
End time	11/10/2025, 11:49:45 AM

Sub tasks

Name	Status
No results	

Step 8: Validate Recovery points

(NO SNAP TAKEN)

Step 9: Restore Virtual Machine

(NO SNAP TAKEN)

Step 10: Configure Alerts & Soft Delete

Enabled email alerts and soft delete to prevent accidental loss.

rsv-p2 | Backup Alerts ☆ ...

Recovery Services vault

Search Choose columns Filter Configure notifications Refresh Feedback

Resource visualizer

> Settings

> Getting started

> Protected items

> Manage

> Monitoring

Alerts

Metrics

Diagnostic settings

Advisor recommendations

Backup Jobs

Site Recovery jobs

Backup Alerts


Site Recovery events

> Automation

> Help

Add or remove favorites by pressing Ctrl+L+Shift+F

Filtered by: Status - All, Severity - All, Start time - 11/9/2025, 12:00:25 PM, End time - 11/10/2025, 12:00:25 PM

 You are currently viewing alerts fired by the classic backup alerts solution which is an older alerting solution. It is recommended to switch to using Azure Monitor based alerts for your alerting requirements. [Learn more.](#) All data fetched from the service.

Filter items...


Alert	Backup item ↑↓	Protected server ↑↓	Severity	Duration
-------	----------------	---------------------	----------	----------

No items found.

< Previous Page 1 of 1 Next >

Configure notifications ×

rsv-p2

 The below notification settings are only applicable to the classic alerts solution. It is recommended to switch to using Azure Monitor based alerts for your alerting requirements. [Learn more.](#)Email notifications ☒ On ☐ Off

Recipients (Email) *

zembecloudcomputing@gmail.com

[Privacy statement](#)

Notify

☐ Per alert☒ Hourly digest

Severity *

2 selected

Save


Cancel

[Give feedback](#)**Soft delete Settings** ×

rsv-p2

Your vault and its data are protected with guaranteed recovery from accidental or malicious deletions with soft delete. You can customize the soft delete retention period based on your requirements. [Learn more.](#)

Soft delete retention period (for cloud and hybrid workloads)

 days This is the number of days for which deleted data is retained before being permanently deleted. Retention period till 14 days is free of cost, however, retention beyond 14 days may incur additional charges. [Learn more.](#)

Update

Cancel

[Feedback](#)**Step 11: Resources Group with all the content**

rg-az104-p2

Resource group

Help me generate Terraform for this resource group configuration.

+2

Search

Create

Manage view

Delete resource group

Group by none

Overview

Activity log

Access control (IAM)

Tags

Resource visualizer

Events

Settings

Cost Management

Monitoring

Automation

Help

Essentials

JSON View

Resources

Recommendations

Filter for any field...

Type equals all

Location equals all

Add filter

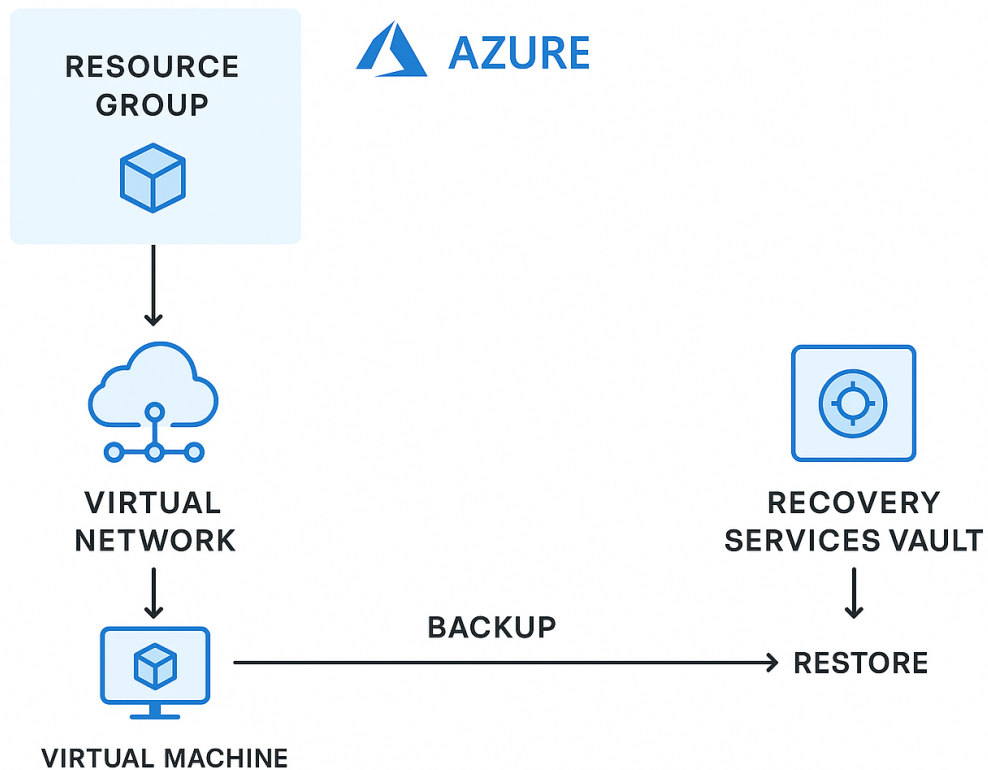
<input type="checkbox"/>	Name ↑	Type	Location
<input type="checkbox"/>	rsv-p2	Recovery Services ...	South Africa North
<input type="checkbox"/>	vm-db-test	Virtual machine	South Africa North
<input type="checkbox"/>	vm-db-test-ip	Public IP address	South Africa North
<input checked="" type="checkbox"/>	vm-db-test-nsg	Network security g...	South Africa North
<input type="checkbox"/>	vm-db-test808	Network Interface	South Africa North
<input type="checkbox"/>	vm-db-test_OsDisk_1_4a196d0cc2f94t	Disk	South Africa North
<input type="checkbox"/>	vnet-p2	Virtual network	South Africa North

Showing 1 - 7 of 7. Display count: au...

Give feedback

Add or remove favorites by pressing Ctrl+Shift+F

DIAGRAM



Conclusion

This hands-on lab showcases proficiency implementing backup and disaster recovery solutions using Azure services. It highlights essential Azure Administrator skills - resource organization, security, automation, recovery strategy, and cost governance - proving readiness for real-world cloud infrastructure management.