

Task 3: Multi-Cloud Architecture

- **Objective:**

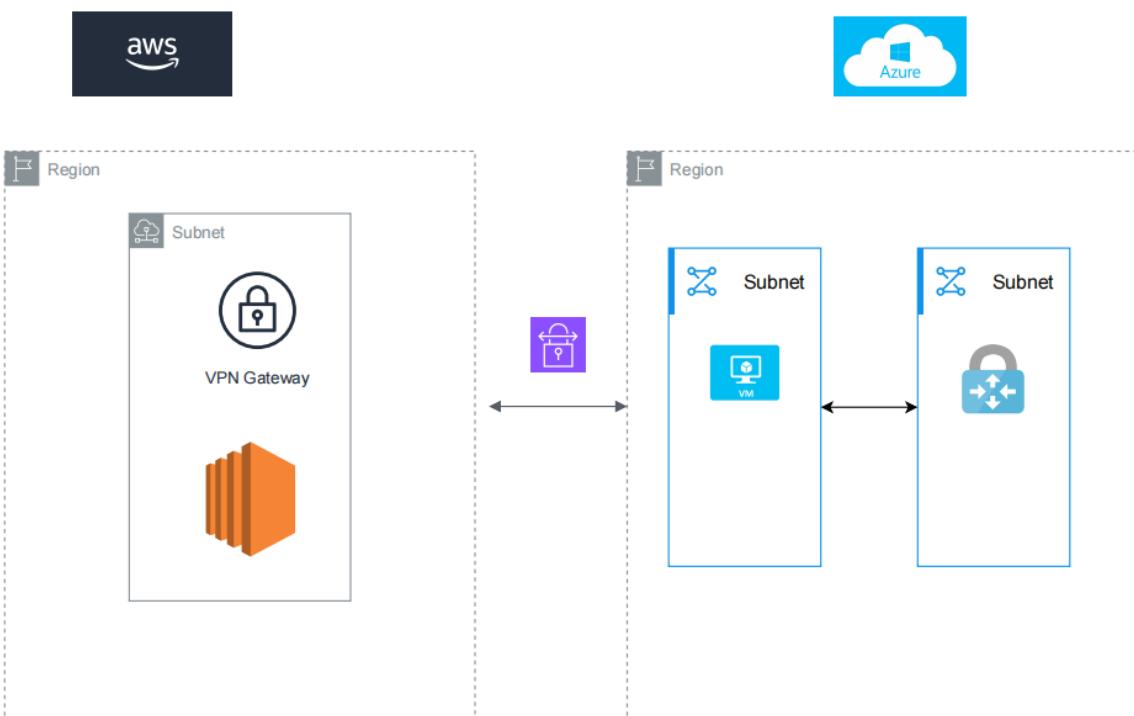
Design and demonstrate a **multi-cloud architecture** using at least **two cloud providers**.

- **Instructions:**

- Distribute application/services between two platforms (e.g., AWS and Azure)
- Show how the systems interact

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Multi Cloud Connection



Screenshot of the Azure portal showing the configuration of a virtual network (vnet-azure) within a resource group (DefaultResourceGroup-CID).

Overview: The virtual network is associated with a Resource group (DefaultResourceGroup-CID), Location (East US), Subscription (Azure for Students), and a Subscription ID (bee691fe-8f5a-4117-b06b-8abff86df979). The Address space is 172.10.0.0/16, DNS servers are Azure provided DNS service, and the BGP community string is Configure. The Virtual network ID is e9376b81-8907-4ed6-aa9a-c2b38e95aa5c. Tags are listed as Add tags.

Capabilities: The page lists four capabilities: DDoS protection, Azure Firewall, Peering, and Microsoft Defender for Cloud. All are currently Not configured.

Bottom Navigation: Includes links for Switch to PowerShell, Restart, Manage files, New session, Editor, Web preview, Settings, Help, and standard browser controls.

Home > DefaultResourceGroup-CID >

vpn-azure-aws

Virtual network gateway

Search Refresh Move Delete JSON View

Overview Activity log Access control (IAM) Tags Diagnose and solve problems Resource visualizer Settings Monitoring Automation Help

Resource group (move) : DefaultResourceGroup-CID Location : East US SKU : VpnGw1 Subscription (move) : Azure for Students Gateway type : VPN VPN type : Route-based Subscription ID : beeb91fe-8f5a-4117-b06b-8abff86df979 Virtual network : vnet-azure Public IP address : 172.178.42.1 (ipe-vpn-azure-aws)

Tags (edit) Add tags

Health check Advisor Recommendations Advanced troubleshooting Go to Resource health Go to Advisor Go to VPN Troubleshooting

Show data for last 1 hour 6 hours 12 hours 1 day 7 days 30 days

Add or remove favorites by pressing Ctrl+Shift+F

Switch to PowerShell Restart Manage files New session Editor Web preview Settings Help

The screenshot shows the Azure portal interface for a virtual machine named 'AZURE-VM'. The main content area displays the VM's configuration, including its resource group ('azuresql'), status ('Running'), location ('West US (Zone 2)'), subscription ('Azure for students'), and availability zone ('2'). It also lists its operating system ('Ubuntu Server 20.04 LTS'), size ('Standard Dv2 v1 (2 vcpus, 8 GB memory)'), public IP address ('40.67.112.162'), and network settings ('azuresql-vm01.net/default'). The 'Networking' tab is selected, showing the public IP address '40.67.112.162' and the network interface 'azuresql-vm01_22'. The left sidebar contains navigation links like Home, Overview, Activity log, Access control (IAM), Tags, Diagnostic and solve problems, Resource visualizer, Connect, and Networking.

Resources

Recent Favorite

Name	Type	Last Viewed
Ing-azure-aws	Local network gateway	an hour ago
 rg-azure-aws	Resource group	2 hours ago

[See all](#)

Home > DefaultResourceGroup-CID Resource group

Search Create Manage view Delete resource group Refresh Export to CSV Open query Assign tags Move Delete Export template ...

Overview Essentials

Activity log Access control (IAM) Tags Resource visualizer Events Settings Cost Management Monitoring Automation Help

Resources Recommendations (1)

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

Showing 1 to 4 of 4 records. Show hidden types

	Type	Location	Actions
<input type="checkbox"/> connection-azure-aws	Connection	East US	...
<input type="checkbox"/> pip-vpn-azure-aws	Public IP address	East US	...
<input type="checkbox"/> vnet-azure	Virtual network	East US	...
<input type="checkbox"/> vpn-azure-aws	Virtual network gateway	East US	...

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

VPC > Your VPCs

VPC dashboard

EC2 Global View ▾ Filter by VPC

Virtual private cloud

Your VPCs

Sубnets
Route tables
Internet gateways
Egress-only internet gateways
Carrier gateways
DHCP option sets
Elastic IP's
Hosted endpoints lists
NAT gateways
Peering connections
Route services New

Security

Network ACLs
Security groups

PrivateLink and Lattice

Your VPCs (1/2) Info

Find VPCs by attribute or tag

Name	VPC ID	State	Block Public Access	IPv4 CIDR	IPv6 CIDR	Last updated	Actions	Create VPC
vpc-05554480511c44fb	vpc-0517cb8e002f843b4	Available	Off	172.51.0.0/16	-	less than a minute ago	1 ▾	DHCP option set dopt-0f529ff
my-vpc-01	vpc-0517cb8e002f843b4	Available	Off	10.10.0.0/16	-	dopt-0f529ff	2 ▾	dopt-0f529ff

vpc-0517cb8e002f843b4 / my-vpc-01

Details Resource map CIDRs Flow logs Tags Integrations

Details

VPC ID	vpc-0517cb8e002f843b4
State	Available
Region resolution	us-east-1
Main network ACL	Default VPC

Block Public Access

Off

DHCP option set

dopt-0f529ff

IPv4 CIDR

10.10.0.0/16

IPv6 CIDR

-

DNS hostnames

Disabled

Main route table

rtt-0f529ff

Rules

subnet-01b63e2ad9be6c0ab / my-subnet-01

Details | Flow logs | Route table | Network ACL | CIDR reservations | Sharing | Tags

Details

Subnet ID: subnet-01b63e2ad9be6c0ab
 IPv4 CIDR: 10.10.1.0/24
 Availability Zone: us-east-1a
 Route table: rtb-038e8fac3be223fd7
 Auto-assign IPv6 address: No
 IPv4 CIDR reservations:

Subnet ARN: arnawssec2:us-east-1:474274979636:subnet/subnet-01b63e2ad9be6c0ab
 Available IPv4 addresses: 249
 Availability zone ID: use1-aZ6
 Network ACL: acl-00cd61a72635dd99d
 Auto-assign customer-owned IPv4 address: No

State: Available
 IPv6 CIDR:
 Network border group: us-east-1
 Default subnet: No
 Customer-owned IPv4 pool:
 Auto-assign customer-owned IPv4 address: No
 IPv6-None

Block Public Access: Off
 IP CIDR association ID:
 VPC: vpc-0517cb8e002f843b4 | my-vpc-01
 Auto-assign public IPv4 address: Yes
 Outpost ID:
 Hostname type:

VPC > Internet gateways

VPC dashboard | EC2 Global View | Filter by VPC
 Virtual private cloud | Your VPCs | Subnets | Route tables | Internet gateways | Egress-only internet gateways | Carrier gateways | DHCP option sets | Elastic IPs | Managed prefix lists | NAT gateways | Peering connections | Route servers | Security | Network ACLs | Security groups | PrivateLink and Lattice

Internet gateways (1/2) Info

Name	Internet gateway ID	State	VPC ID	Owner
my-internet-gateway	igw-0648d2b559fdd090d	Attached	vpc-0517cb8e002f843b4 my-vpc-01	474274979636
-	igw-0d8bef832a5a13fb5	Attached	vpc-0c55440b511ca4db	474274979636

igw-0648d2b559fdd090d / my-internet-gateway

Details | Tags

Details

Internet gateway ID: igw-0648d2b559fdd090d | State: Attached | VPC ID: vpc-0517cb8e002f843b4 | my-vpc-01 | Owner: 474274979636

GLOBAL SERVICES

Resource configurations | New
 Resource gateways | New
 Target groups
 DNS firewall | Rule groups | Domain lists
 Network Firewall | Firewalls | Firewall policies | Network Firewall rule groups | TLS inspection configurations | Network Firewall resource groups | VPC endpoint associations
 Virtual private network (VPN) | Customer gateways | Virtual private gateways | Site-to-Site VPN connections | Client VPN endpoints
 AWS Verified Access | Verified Access instances

Customer gateways (1/1) Info

Name	Customer gateway ID	State	BGP ASN	IP address	Type	Certificate ARN
cw-aws-azure	cgw-0a40cdd8bf1115f56	Available	65000	172.178.42.1	ipsec.1	-

Customer gateway cgw-0a40cdd8bf1115f56 / cw-aws-azure

Details | Tags

Details

Customer gateway ID: cgw-0a40cdd8bf1115f56 | State: Available | Type: ipsec.1 | IP address: 172.178.42.1
 BGP ASN: 65000 | Certificate ARN: - | Device: -

Virtual private gateways (1/1) Info

Name	Virtual private gateway ID	State	VPC attachment state	Type	VPC	Amazon VPC
vpg-aws-azure	vgw-00ec1cc48a4735642	Available	Attached	ipsec.1	vpc-0517cb8e002f843b4	my-vpc... 64512

Virtual private gateway vgw-00ec1cc48a4735642 / vpg-aws-azure

Details Tags

Details

Virtual private gateway ID vgw-00ec1cc48a4735642	State Available	Type ipsec.1
Amazon ASN 64512	VPC attachment state Attached	VPC vpc-0517cb8e002f843b4 my-vpc-01

VPN connections (1/1) Info

Name	VPN ID	State	Virtual private gateway	Transit gateway	Customer gateway	Customer gateway
vpn-aws-azure	vpn-004a04dae71a97ed6	Available	vgw-00ec1cc48a4735642	-	cgw-0a40cd8bf1115f56	172.178.42.

VPN connection vpn-004a04dae71a97ed6 / vpn-aws-azure

Details Tunnel details Static routes Tags

Details

VPN ID vpn-004a04dae71a97ed6	State Available	Virtual private gateway vgw-00ec1cc48a4735642	Customer gateway cgw-0a40cd8bf1115f56
Transit gateway -	Customer gateway address 172.178.42.1	Type ipsec.1	Category VPN
VPC vpc-0517cb8e002f843b4	Routing Static	Acceleration enabled Disabled	Authentication Pre-shared key
Local IPv4 network CIDR	Remote IPv4 network CIDR	Local Pv6 network CIDR	Remote IPv6 network CIDR

VPN connections (1/1) Info

Name	VPN ID	State	Virtual private gateway	Transit gateway	Customer gateway	Customer gateway
vpn-aws-azure	vpn-004a04dae71a97ed6	Available	vgw-00ec1cc48a4735642	-	cgw-0a40cd8bf1115f56	172.178.42.

VPN connection vpn-004a04dae71a97ed6 / vpn-aws-azure

Details Tunnel details Static routes Tags

Tunnel state

Tunnel number	Outside IP address	Inside IPv4 CIDR	Inside IPv6 CIDR	Status	Provisioning status	Last status change	Details	Certificate AF
Tunnel 1	3.220.175.230	169.254.43.208/30	-	Up	Available	May 31, 2025, 11:18:48 (UTC+05:30)	-	-
Tunnel 2	35.168.177.37	169.254.15.244/30	-	Down	Available	May 31, 2025, 11:04:43 (UTC+05:30)	-	-

Tunnel 1 options

Tunnel 2 options