

# Microsoft Azure Solutions Architect: Step By Step Activity Guides

## 1) Create A Virtual Machine With Custom VM Images

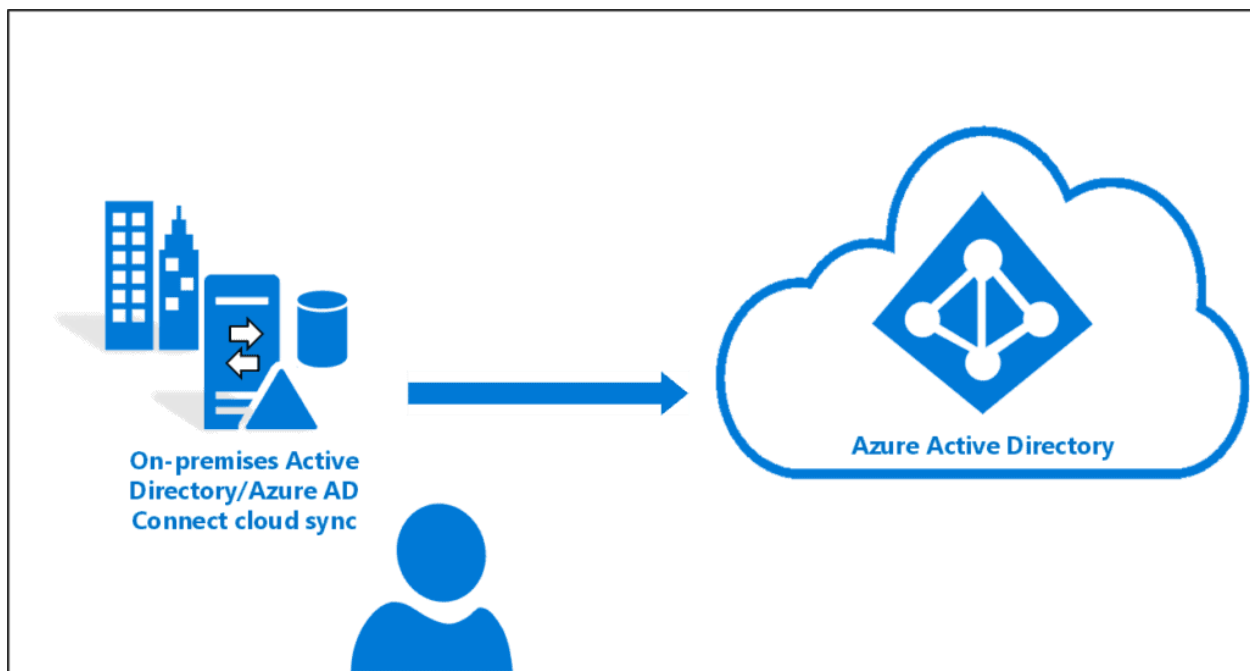
Using a **Packer Template**, you can create your custom VM images in this Activity Guide. We will configure a Packer template & build our Packer-based image. Then we will deploy a Virtual Machine based on that custom image and **validate its deployment**.

## 2) Azure Active Directory Synchronisation using AD Connect

Azure Active Directory is a Microsoft **cloud-based identity** and **access management** service, which helps your employees sign in and access resources in:

- **External resources**, such as Microsoft Office 365, the Azure portal, and thousands of other SaaS applications.
- **Internal resources**, such as apps on your corporate network and intranet, along with any cloud apps developed by your own organization.

Azure AD Connect is used to integrate the on-premise directories (Active Directories) with [Azure Active Directory](#) which provides a common identity for accessing both cloud and on-premise resources.



## 3) Azure AD Hybrid Identity Configuration

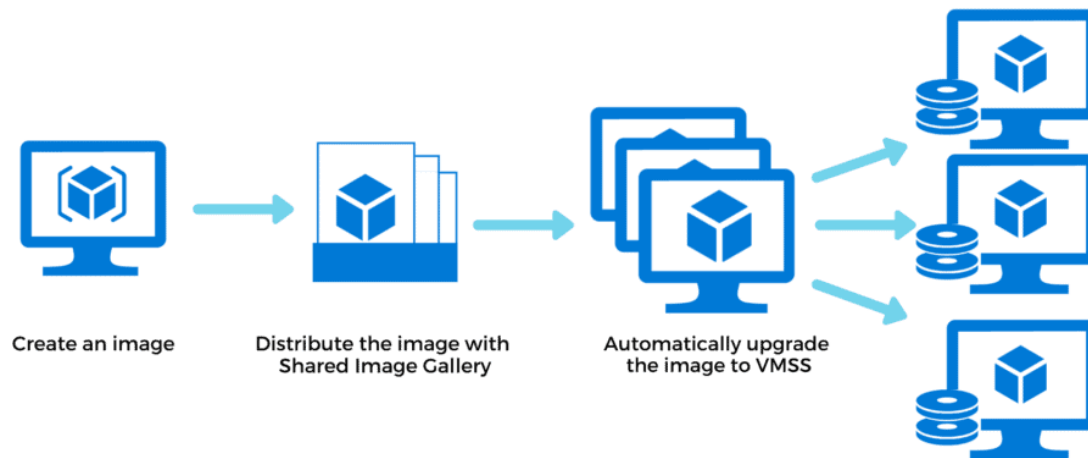
Hybrid identity is creating a **common user** identity for **authentication** and **authorization** to all resources, regardless of location. To achieve hybrid identity with Azure AD, one of **three authentication methods** can be used, depending on your scenarios.

- Password hash synchronization (PHS)
- Pass-through authentication (PTA)

- Federation (AD FS)

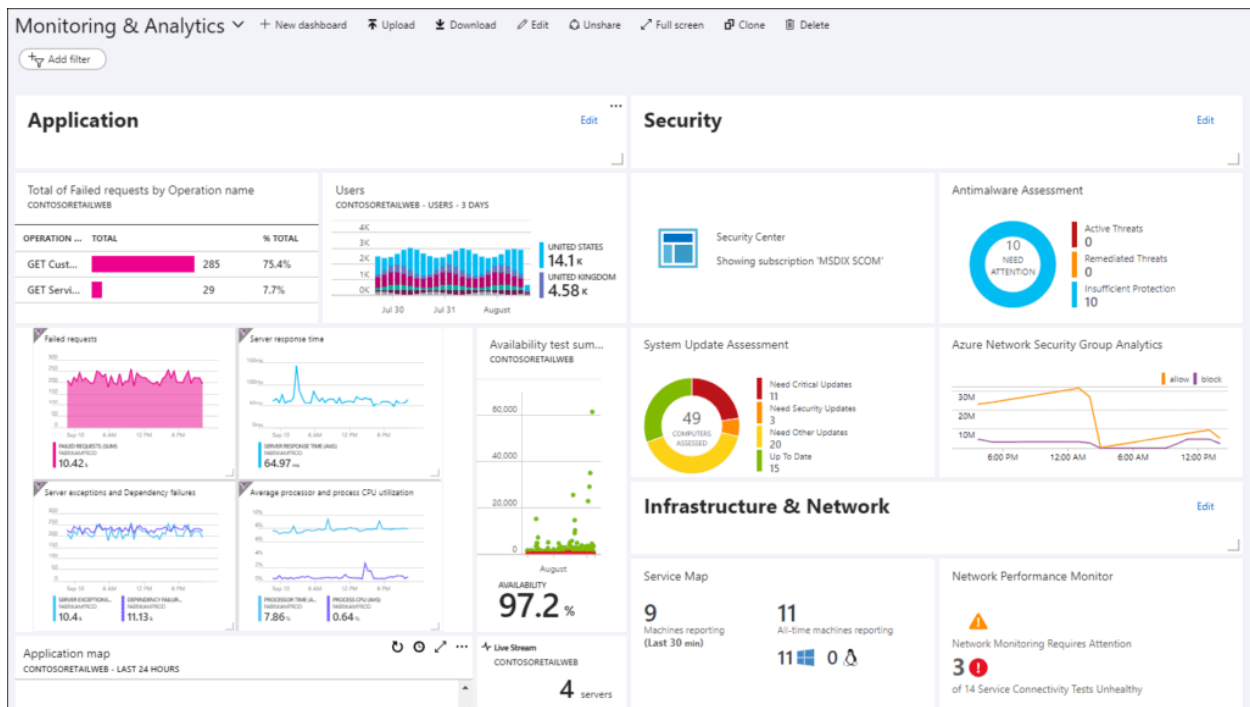
#### 4) Deploy A Virtual Machine Scale Set

Azure VM scale sets let you create and manage **a group of identical load-balanced VMs**. In response to demand schedule, the number of VM instances can automatically increase or decrease. Scale sets provides **high availability** to your applications and allow you to centrally manage, configure, and update a large number of **Virtual Machines**.



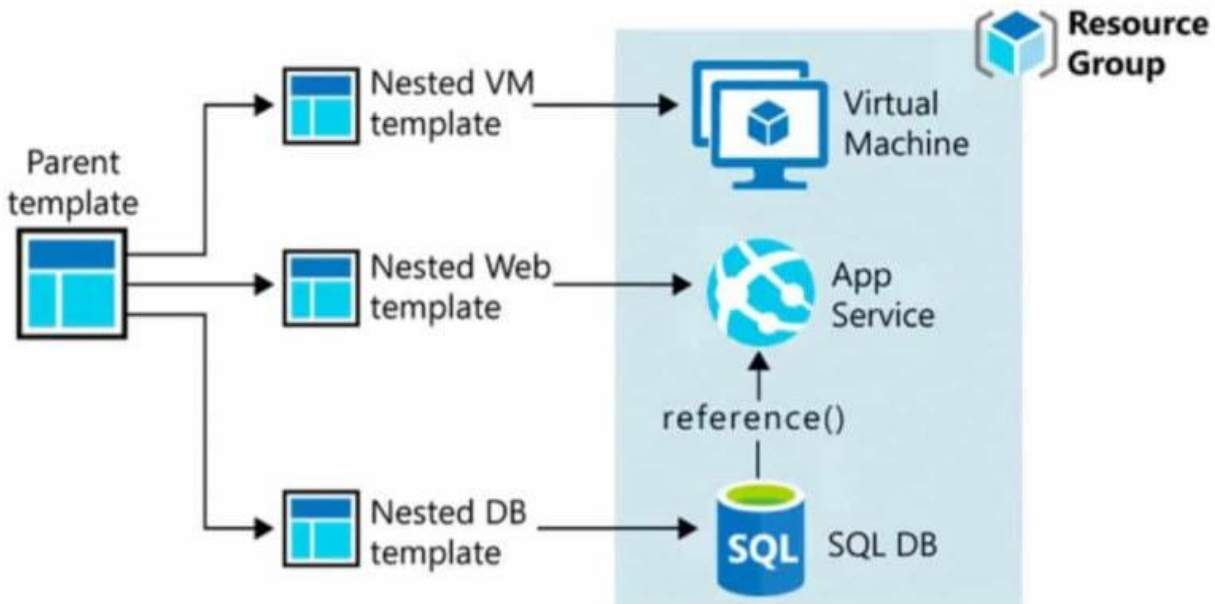
#### 5) Exploring Monitoring Capabilities In Azure

In this Azure Solutions Architect Activity Guide, you will learn to deploy VM scale sets and then implement monitoring & alerting using the Azure Monitor. Also, you'll learn to set up **autoscaling-based notifications, metric-based alerts, and testing**.



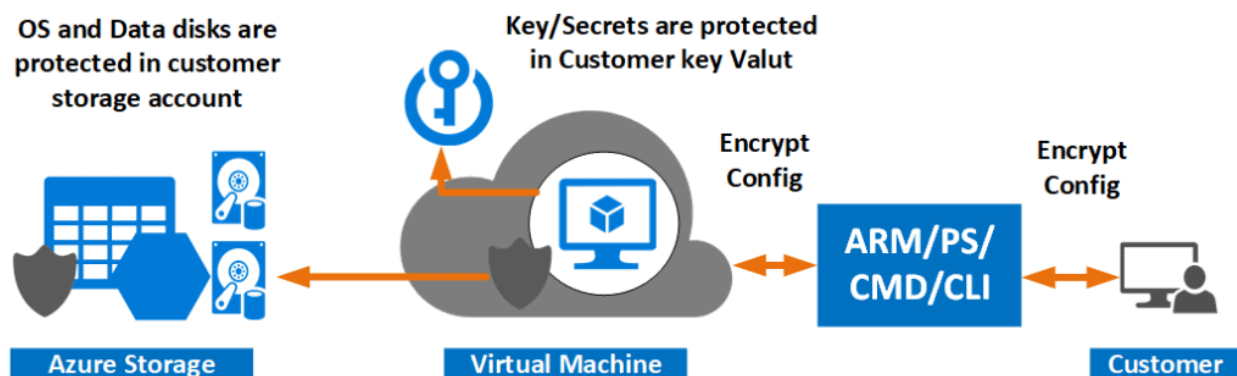
## 6) Create and Deploy an ARM Template

Here in **Azure Solutions Architect**, you will learn the major aspects of deployment and the configuration of resources. We have covered ARM templates, saving templates for VM, and evaluating the location of new resources. ARM is an Azure Resource Manager, interface for managing and organizing cloud resources. The Azure Resource Manager (ARM) organizes the RG (Resource Group) that lets you create, deploy, manage, and delete the resources together in a single action.



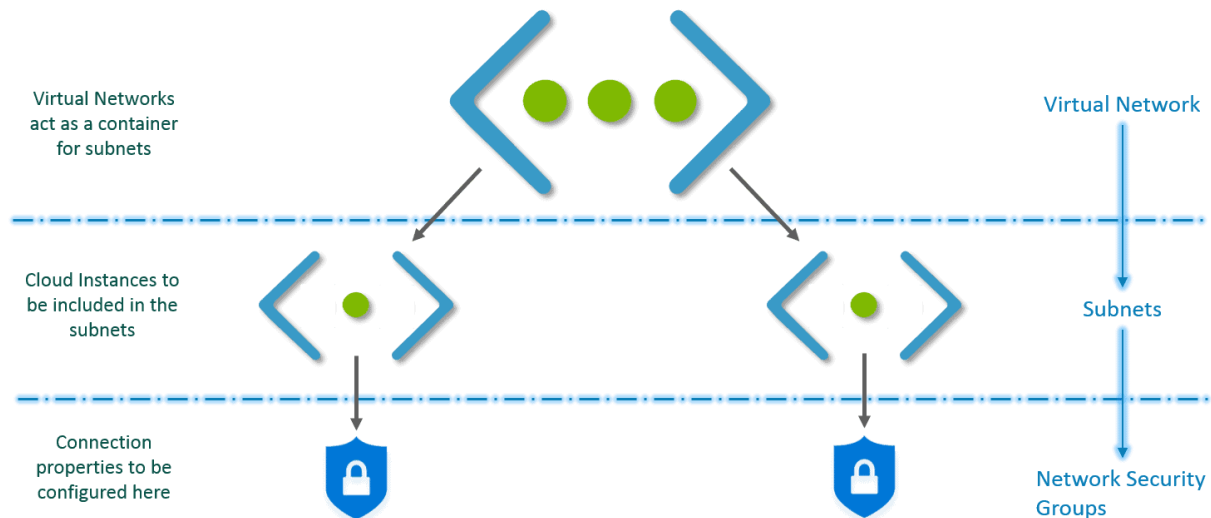
## 7) Encrypt A Virtual Machine

In this Azure Solutions Architect guide, we'll learn to safeguard our Virtual Machine's data. We will use Azure Disk Encryption to do so and Azure Disk encryption can be applied to both **Linux & Windows virtual machines and virtual machine scale sets**.



## 8) Creating a Virtual Network using Azure

Azure Virtual Network (VNet) is the fundamental building block for your private network in Azure. VNet enables many types of Azure resources, such as Azure Virtual Machines (VM), to securely communicate with each other, the internet, and on-premises networks. VNet is similar to a traditional network that you'd operate in your own data center, but brings with it additional benefits of Azure's infrastructure such as scale, availability, and isolation.

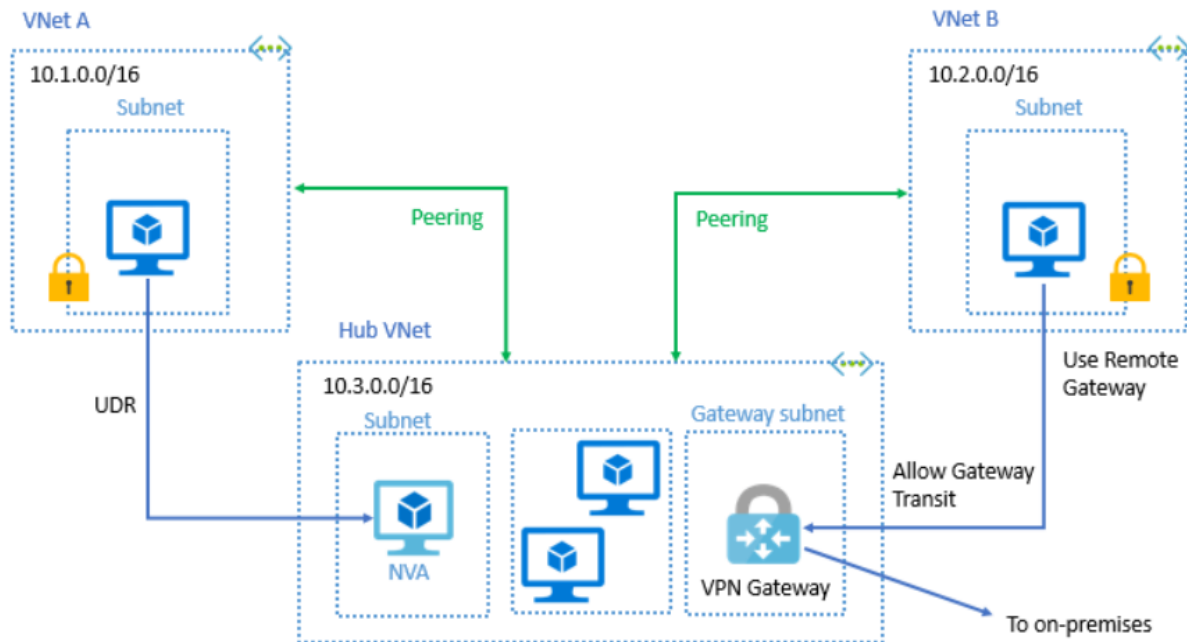


## 9) Configuring VNET Peering, Service Chaining

The Virtual network peering allows you to connect networks in Azure Virtual Network seamlessly.

Azure supports the following types of peering:

- **Virtual Network Peering:** It connects virtual networks within the same Azure region.
- **Global Virtual Network Peering:** It allows connecting virtual networks across Azure regions.

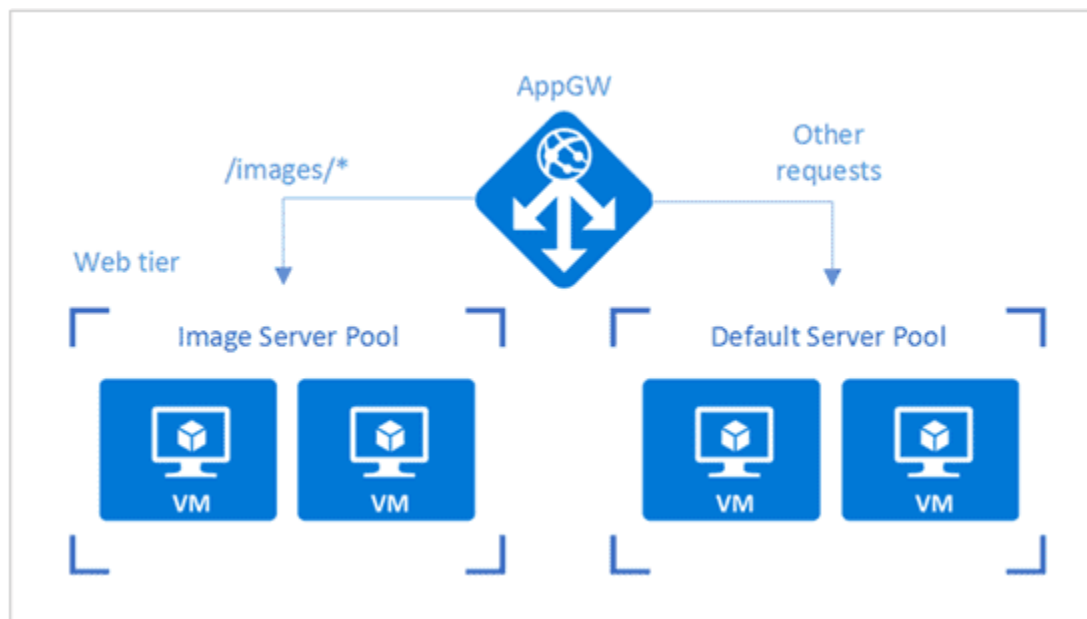


Service chaining allows you to direct the traffic from one virtual network to a virtual appliance or gateway in a peered system through user-defined routes.

## 10) Load Balancer And Traffic Manager In Azure

Using the Standard Load Balancer, you can **scale your applications and create highly available services**. The load balancer supports both scenarios the **inbound and outbound**.

Here, we will implement inbound load balancing and NAT by using the Azure Load Balancer Standard. Then by using Azure Load Balancer Standard, we will configure the outbound SNAT traffic and test it.

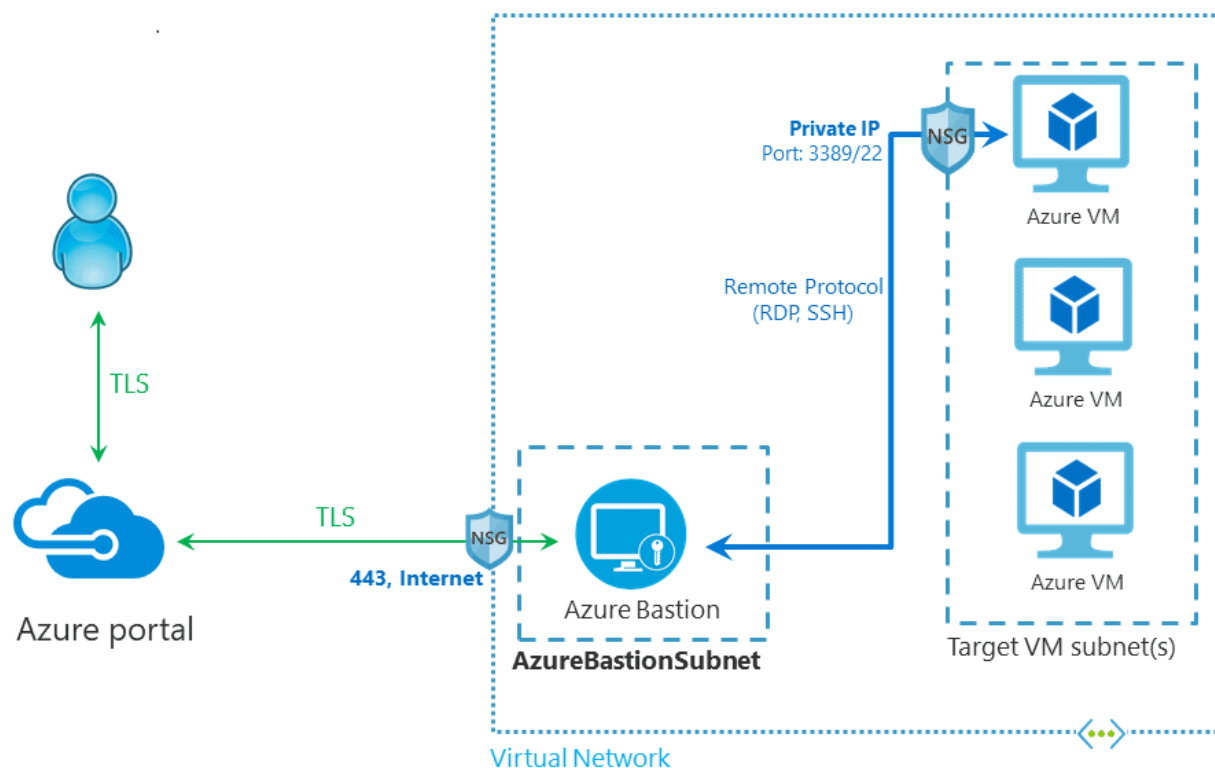


### 11) Creating Storage Accounts and accessing them via Storage Explorer

Using Azure Portal, we will be creating a container on our storage account and uploading data on it. Additionally, we will access the content of our storage account by using a **SAS Token**. This guide will give you step-by-step procedures on how you can do so.

### 12) Create an Azure Bastion host

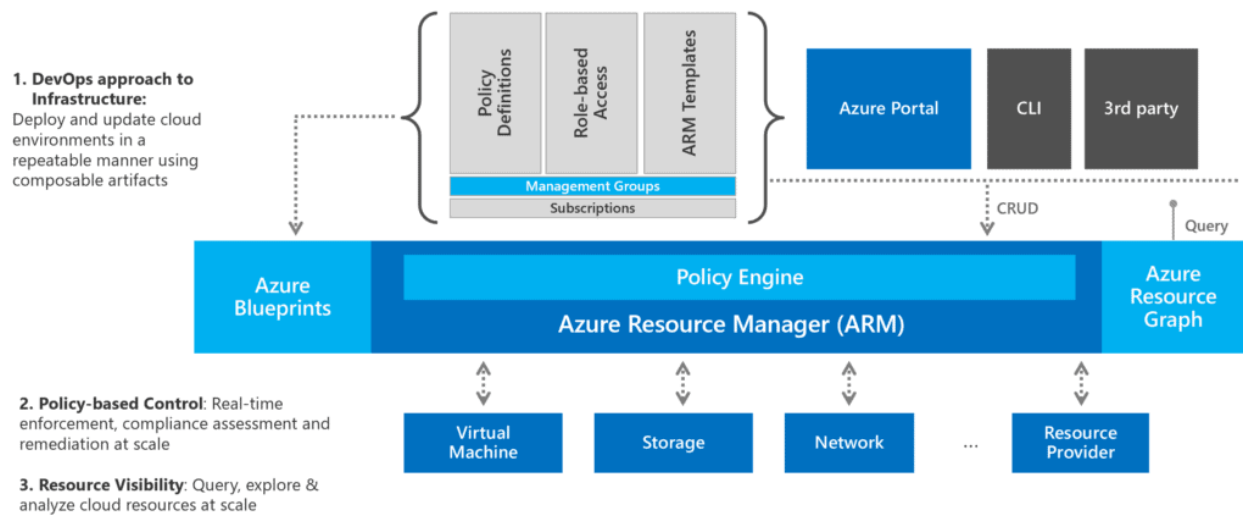
This Azure Solutions Architect guide will show you the ways to configure Azure Bastion based on your VM settings and connect to your Virtual Machine through the Azure portal. The Virtual Machine doesn't need a public IP address, agent, client software, or special configurations. Once the Azure service is provisioned, the RDP/SSH experience is available to all VMs in the same virtual network.



### 13) Governance and compliance

As you plan your governance strategies and establish corporate policy, you can use various tools and services like Azure Blueprints, Azure Policy, and Azure Security Center to enforce and automate your organization's governance decisions.

# Azure Governance Architecture



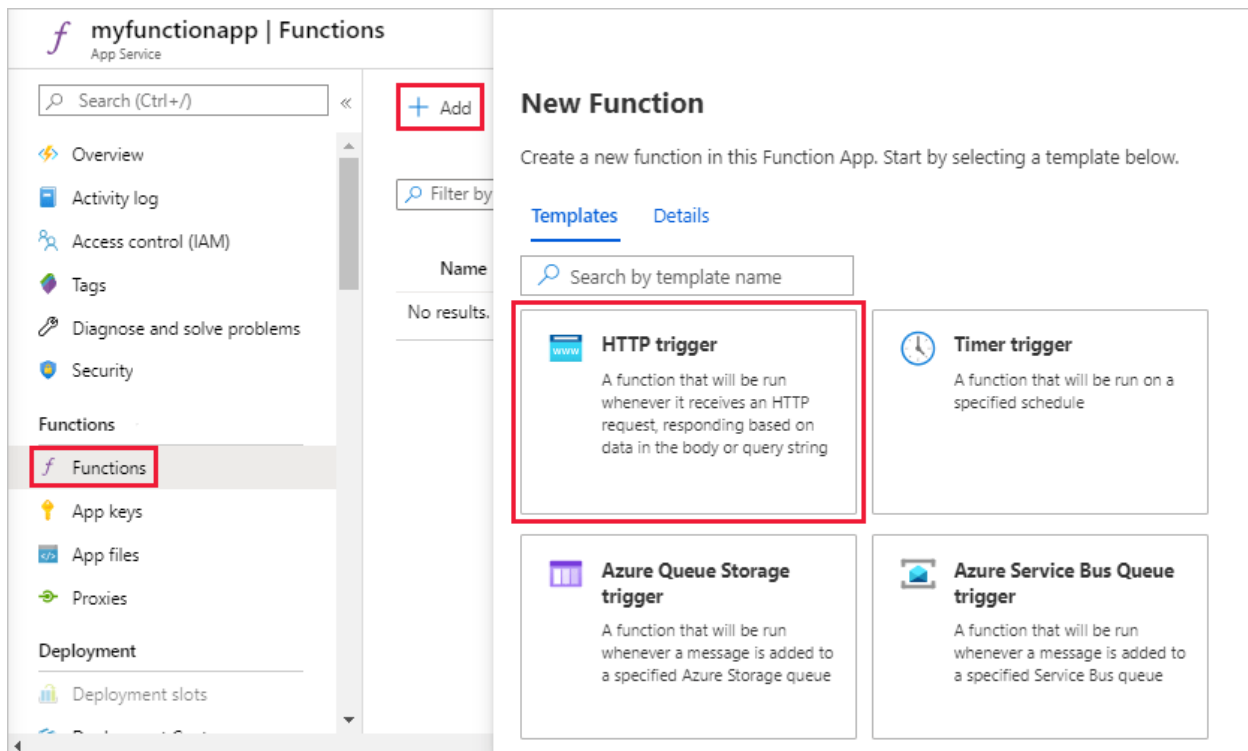
## 14) Virtual machine replication via ASR

In an organization, you need to adopt a business continuity and disaster recovery (BCDR) strategy that **keeps your data & apps safe and workloads online** when planned, and unplanned outages occur.

Site Recovery helps in **ensuring business continuity** by keeping business applications and workloads continuing during outages. Site Recovery replicates workloads that are running on Physical and Virtual Machines from a primary site to a secondary location.

## 15) How to Implement Azure Functions

For hosting the execution of your functions, you must have a function app. It lets your group function as a logical unit for easier **deployment, scaling, management, and resource sharing**. On winding up, you'll learn how to **create and group functions** inside the function app.



## 16) Implementing Custom Role-Based Access Control (RBAC)

Azure's role-based access control (RBAC) is an **identity and access management (IAM)** system for Azure resources. Using Azure role-based access control, **segregate duties within your team** and grant only the limited amount of access to the users that they really need to perform their jobs.

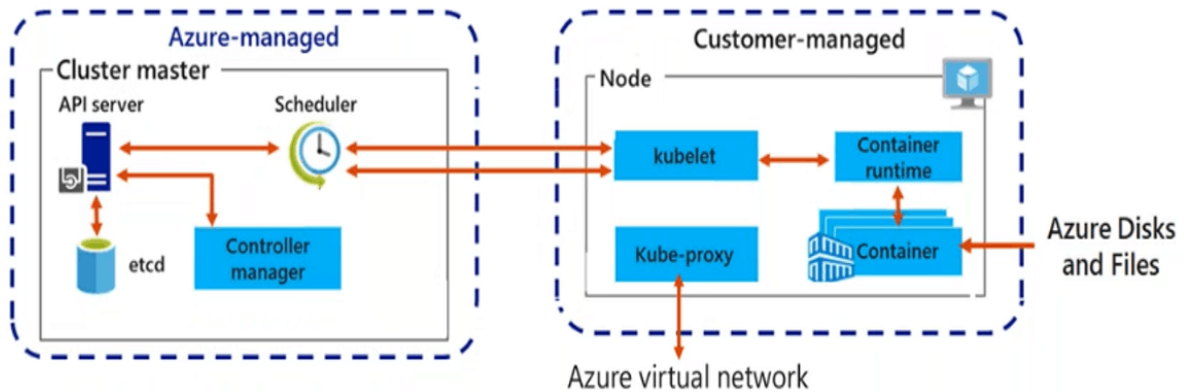
Therefore, we will define and assign an RBAC to delegate permissions for starting and stopping Azure VMs.

## 17) Create An Azure Kubernetes Service

Modern applications are increasingly built using containers. Containers are microservices packed with their configurations and dependencies. Kubernetes is an open-source service **for deploying and managing those containers at a high scale**. Furthermore, Azure Kubernetes Cluster allows you the same for the microservices you run on the Azure cloud.

Here, we will take you with the steps to go through the Azure Portal and to set up AKS, and manage your microservices without hassles on the cloud.

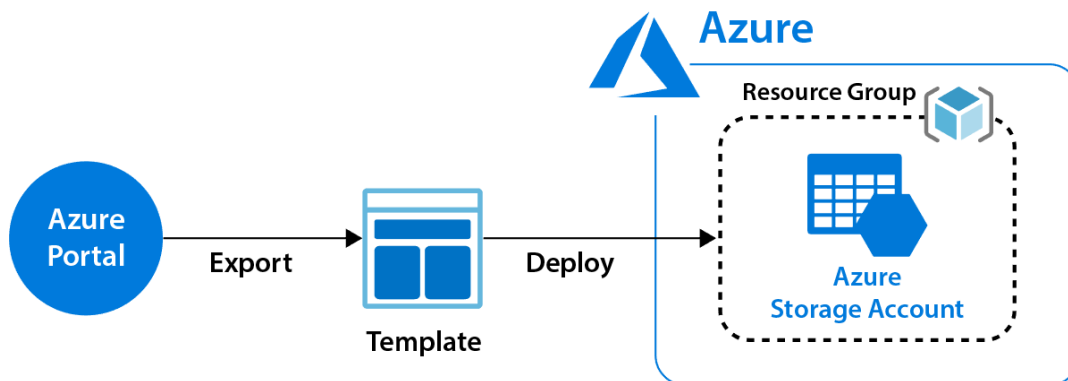




## 18) Deploying Database Instances In Azure

Here, you will see the **multiple types of deployment choices for our database**, and then you'll learn to use it to deploy your database.

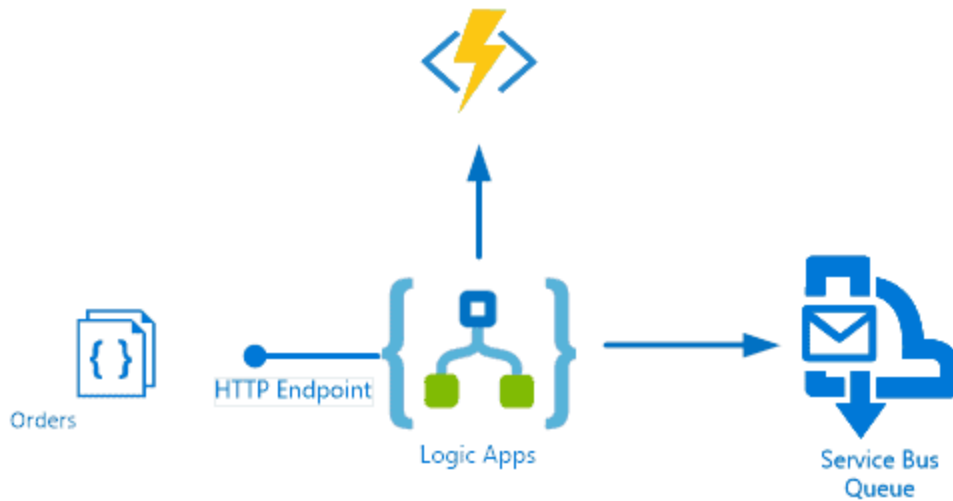
ARM (Azure Resource Manager) Templates are the simplest way of deploying **laas (Infrastructure-as-a-code)**.



Azure Resource Manager helps you deploy multiple resources in a single unit, and the deployments are idempotent as the user declares the type of resource, what name to use, and which properties it should have.

## 19) Implementing Azure Logic Apps

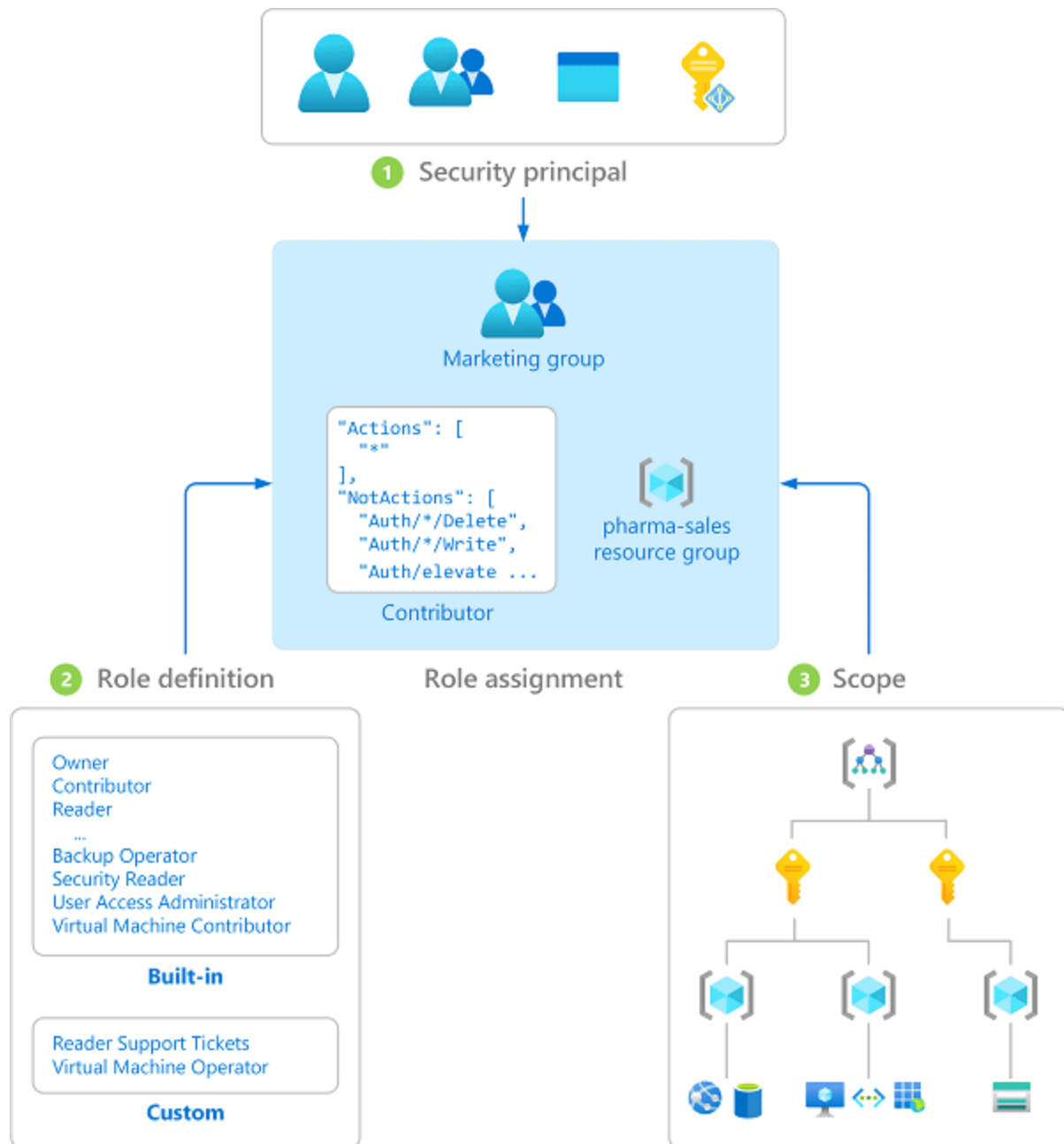
Azure Logic Apps is a service for building, hosting, scaling, managing, maintaining, and monitoring your apps. In this activity guide, you'll learn to implement an Azure Logic App.



## 20) Role-Based Access Control In Azure

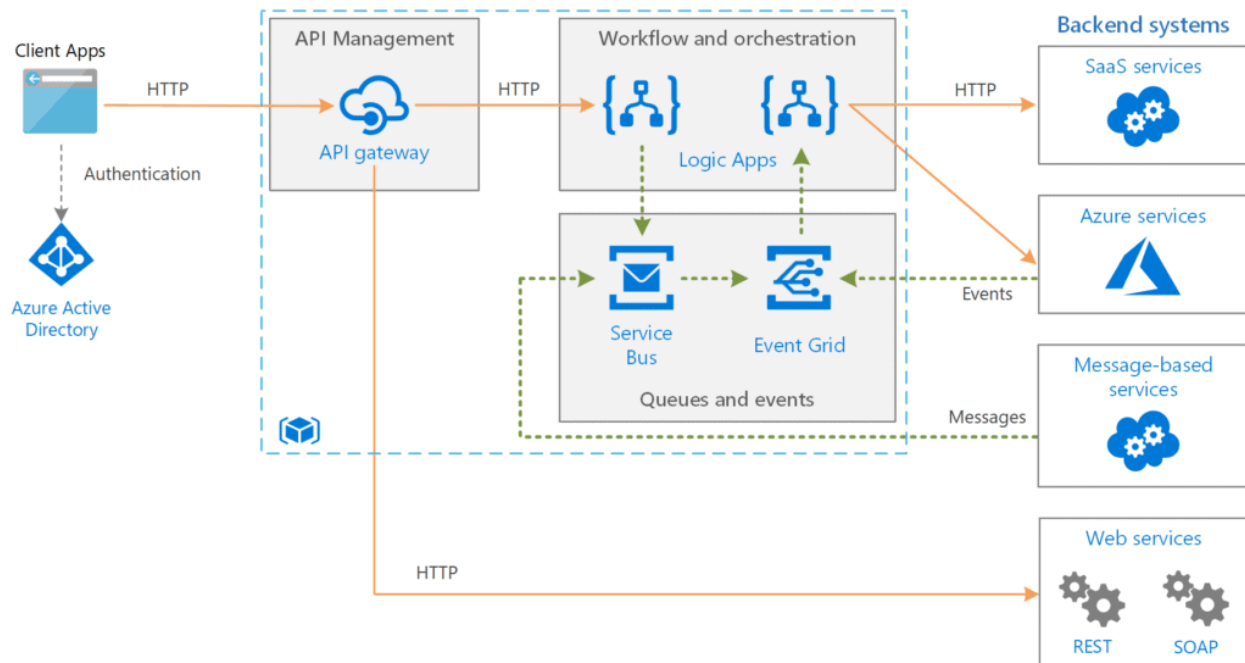
For an organization using the cloud, access management for cloud resources is a critical function. Azure **Role-Based Access Control** allows you to manage various things like who has access to the resources, what they can do with those Azure resources, and what areas they have access to. In this guide, you will see hands-on **RBAC**.

Azure Role-Based Access Control is an authorization system built on **Azure Resource Manager** that provides fine-grained access management of Azure.



## 21) Configuring a message-based integration architecture

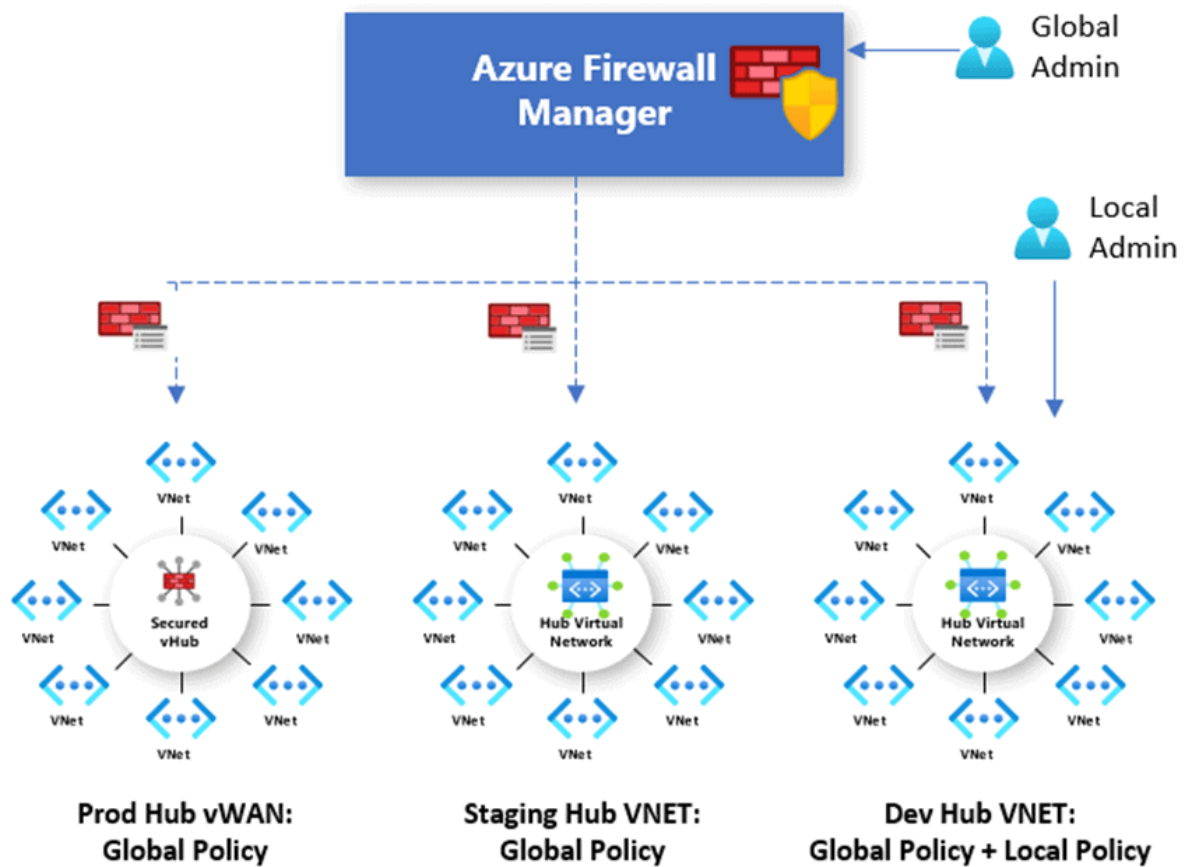
In this Azure Solutions Architect activity guide, you'll find out the ways to configure a message-based architecture integration. It integrates enterprise backend systems, using events and message queues to decouple services for high reliability and scalability. These backend systems may include software as a service (SaaS) systems, Azure services, and existing web services in your enterprise.



## 22) Implementation of Azure Firewall Manager

Azure Firewall Manager is a security management service that provides central security policy and route management for cloud-based security perimeters. Firewall Manager can provide security management for two network architecture types:

- **Secured virtual hub**
- **Hub virtual network**

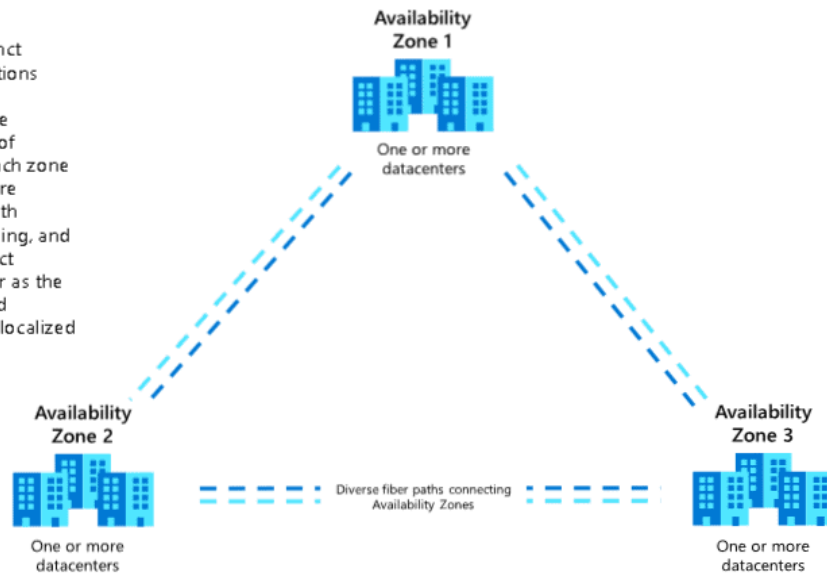


## 23) Implementing Highly Available Azure IaaS Compute Architecture

Building solutions that result in high availability using Availability Zones. High availability term refers to the set of technologies that minimize IT disruptions by providing business continuity of IT services through redundant, failover-protected, or fault-tolerant components inside the same data center. In our case, the data center resides in one Azure region.

## Azure Region

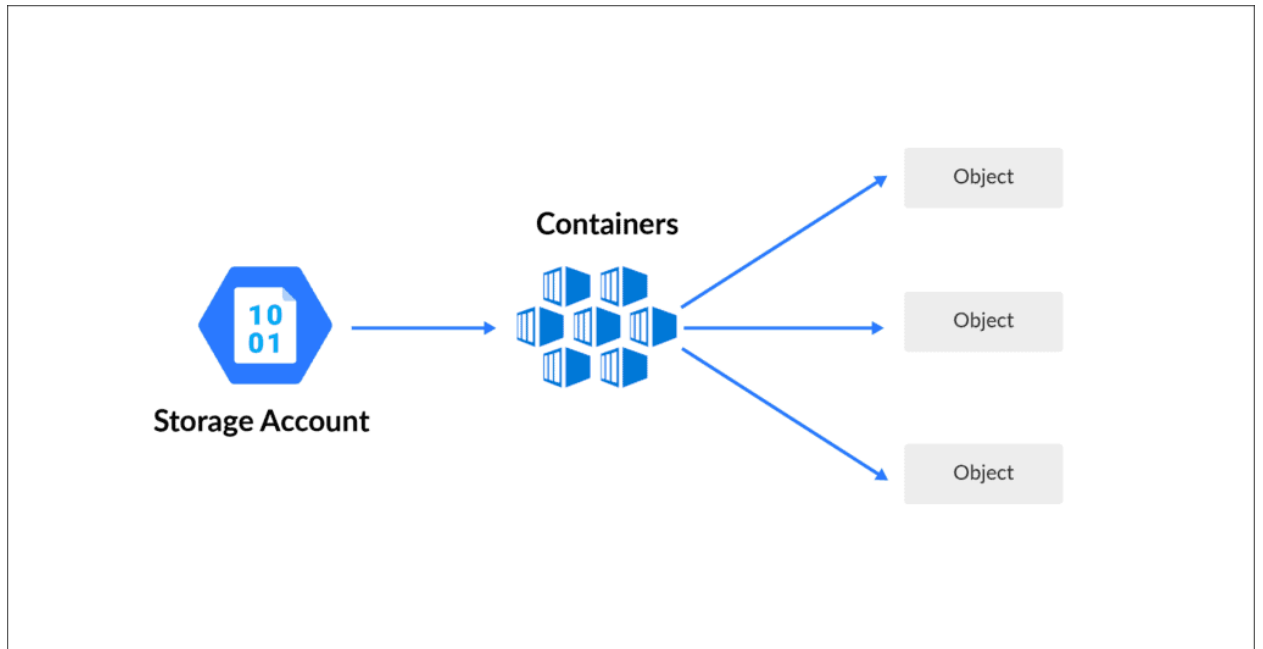
Composed of three distinct physical and logical locations within an Azure Region, Availability Zones provide synchronous replication of applications and data. Each zone is made up of one or more datacenters equipped with independent power, cooling, and networking. This construct eliminates the datacenter as the single point of failure and reduces the exposure to localized failure events.



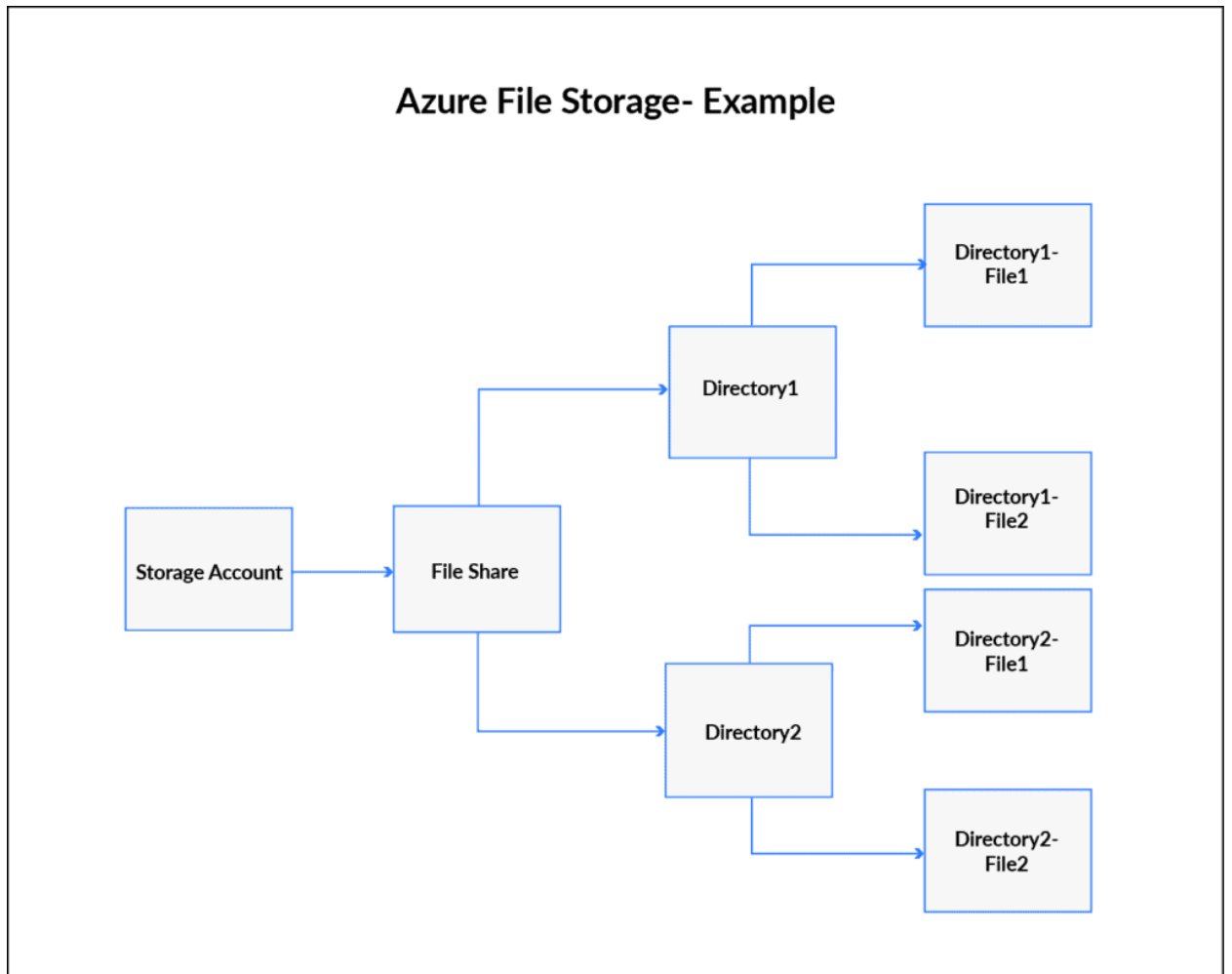
### 24) Implementing and Configuring Azure Storage File and Blob Services

Microsoft's Azure Storage platform is a storage solution for modern data storage. Core storage services offer a highly scalable object store for data objects, disk storage for Azure Virtual Machines, a file system service for the cloud, a messaging store for reliable messaging, and a NoSQL store. In this guide, you'll learn to implement and configure Azure storage services Blob and File share.

- **Azure Blobs:** It is a highly scalable object for storing binary and text data. It is ideal when you have storage solutions for files, log files, images, and videos.



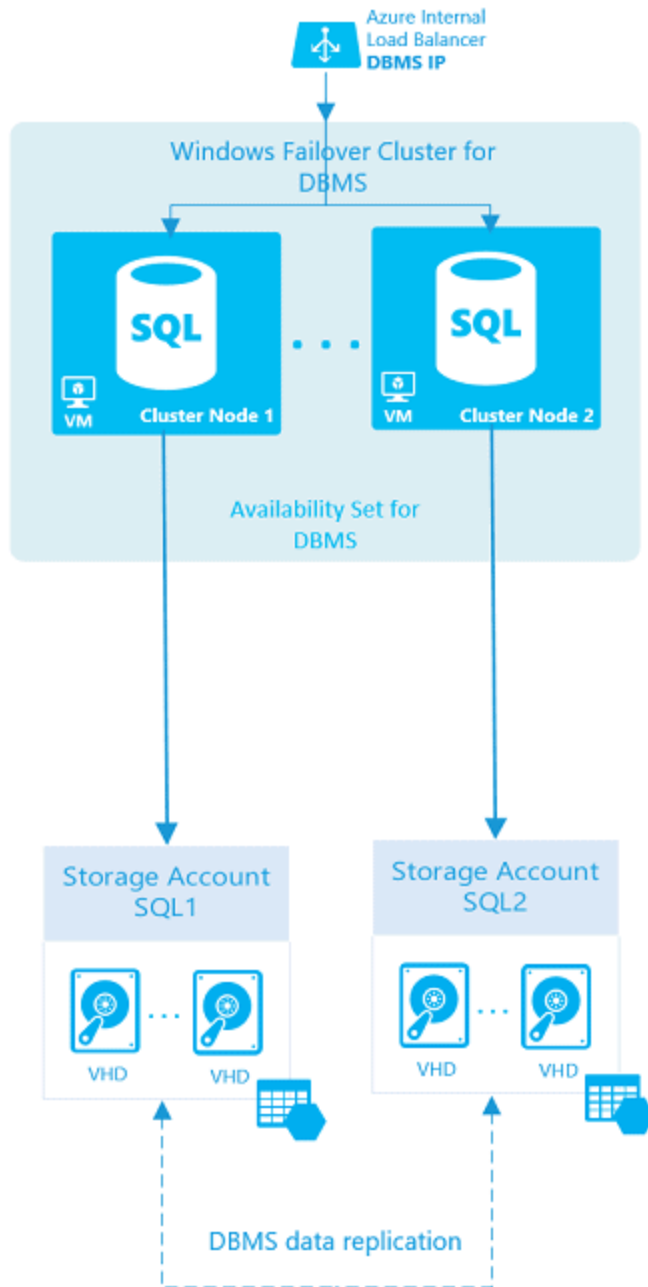
- **Azure Files:** Microsoft Azure File storage is designed to support the needs of the Azure VM environment.



## 25) Protecting Hyper-V VMs by using Azure Site Recovery

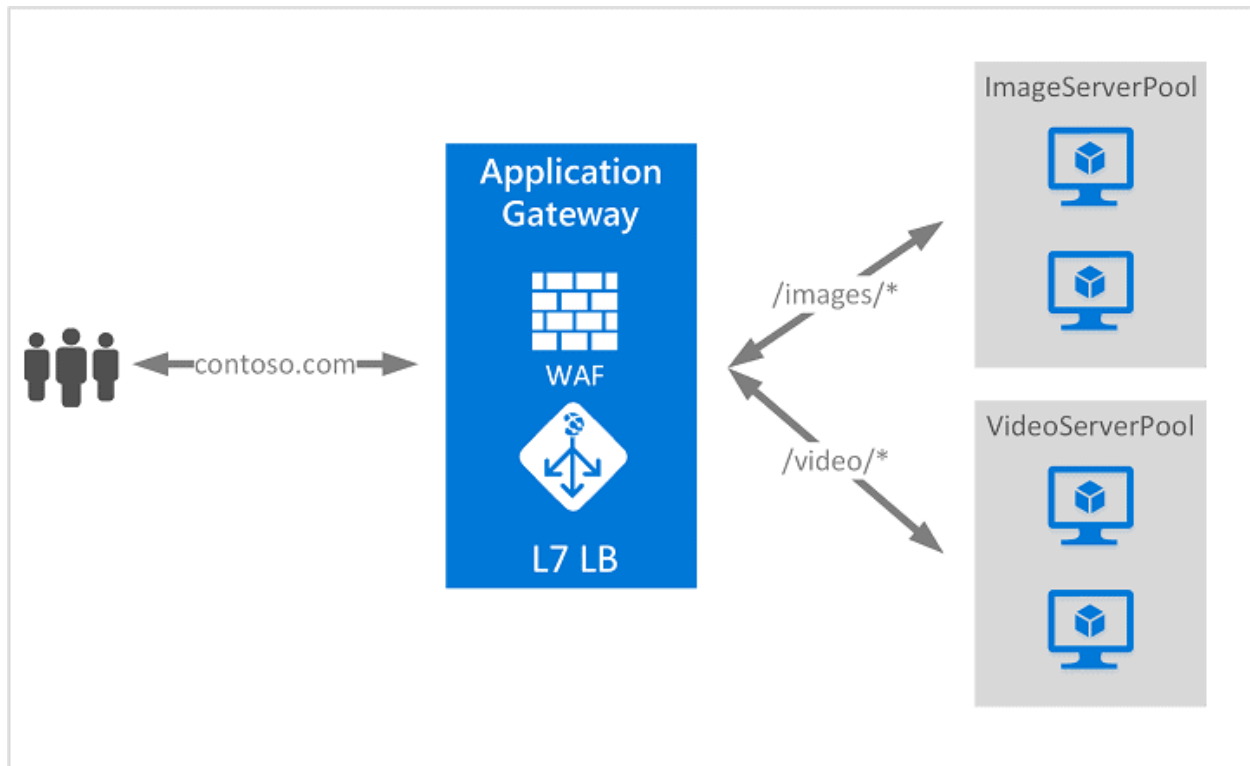
Here, you'll find out the ways to set up the disaster recovery of on-premises Hyper-V Virtual Machines to Azure, Select your replication source and target it, and Enable replication for a Virtual Machine. The Azure Site Recovery service helps in your disaster-recovery strategy by managing and orchestrating replication, failback, and failover of on-premises machines and Azure virtual machines (VMs).





## 26) Create an Application Gateway

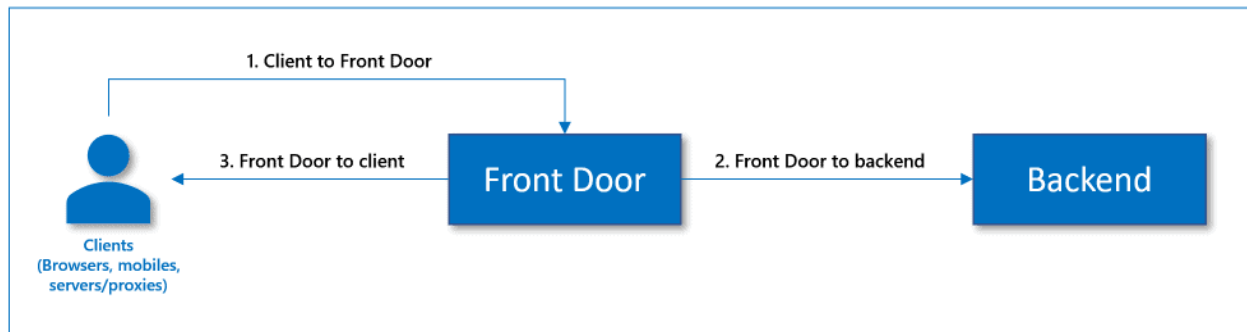
In this guide, you'll use the Azure portal to make an application gateway. The application gateway directs application traffic to specific resources in a backend pool. Here, you assign listeners to the ports, create rules, and add resources to the backend pool. Then you need to test it to make sure it works correctly as it is supposed to do.



## 27) Create an Azure Front Door

In this Azure Solutions Architect activity guide, Azure Front Door pools the two instances of a web application that runs in several Azure regions. Here, you create the Front Door configuration based on equal-weighted and same priority backends. This configuration directs traffic to the closest site that runs the applications.

Azure Front Door regularly monitors the web application. The service provides automatic failover to the subsequent available site when the closest site is unavailable.



**Multifactor authentication (MFA)** adds a layer of protection to the sign-in process. When accessing accounts or apps, users provide additional identity verification, such as scanning a fingerprint or entering a code received by phone. Azure AD offers a broad range of flexible multifactor authentication (MFA) methods—such as texts, calls, biometrics, and one-time passcodes—to meet the unique needs of your organization and help keep your users protected

