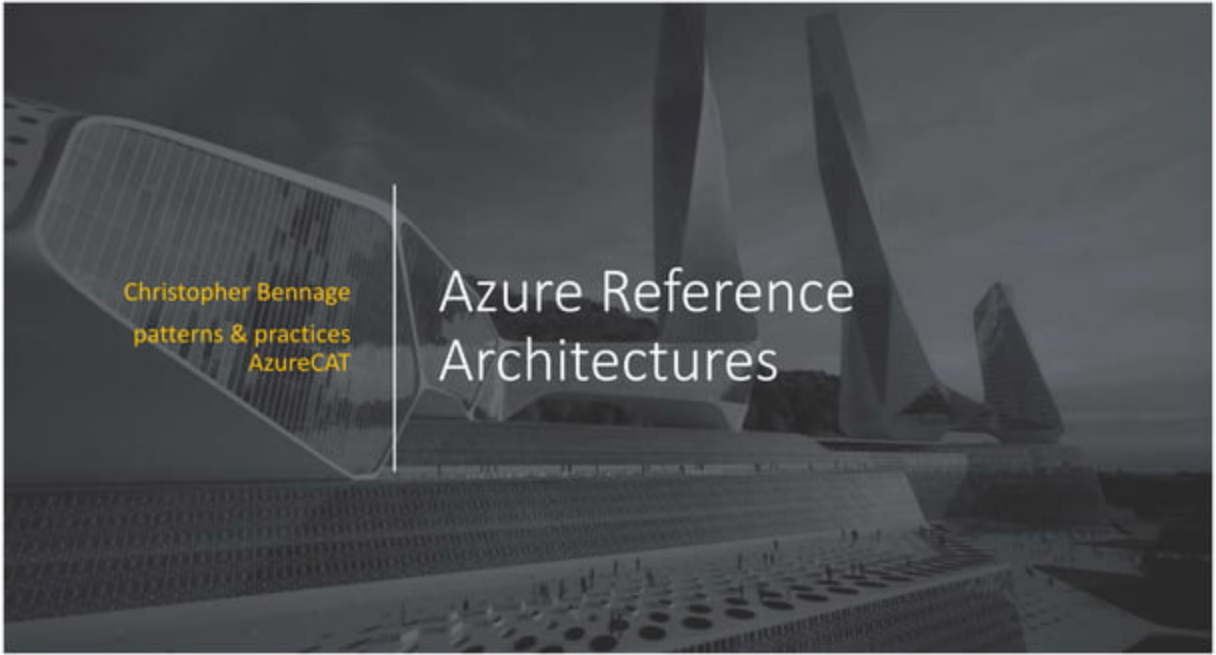
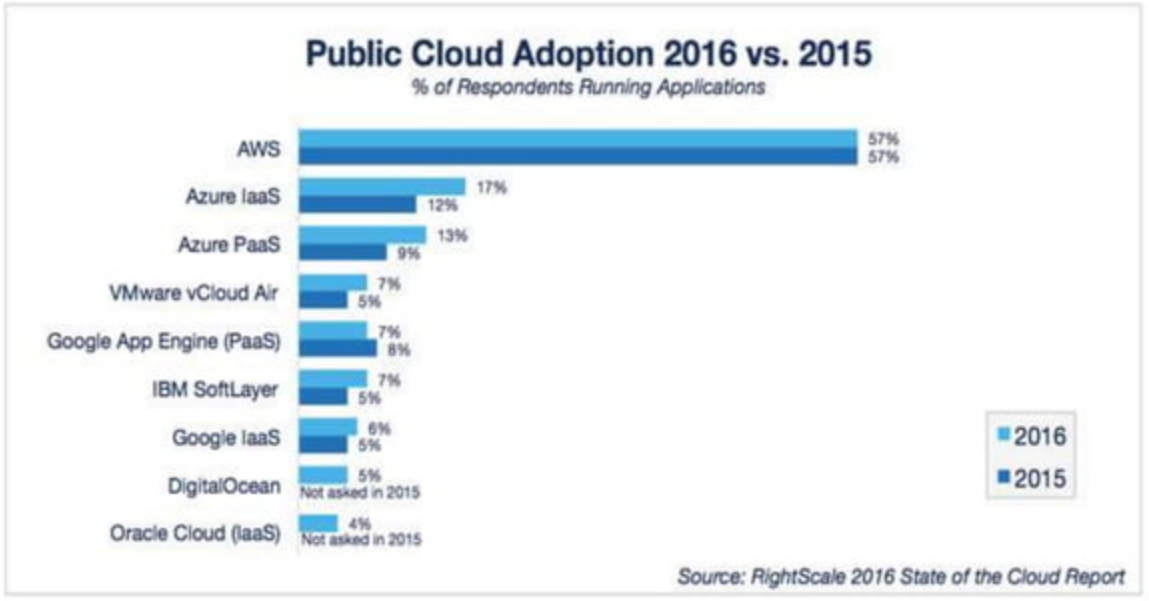
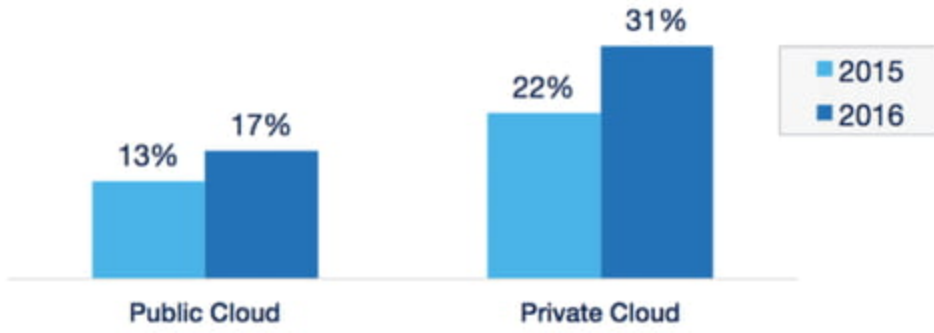

Christopher Bennage
patterns & practices
AzureCAT
Azure Reference Architectures

What do customer find confusing?
Town Centre
Alternative route
Town Centre
Town Centre


Public Cloud Adoption 2016 vs. 2015
% of Respondents Running Applications
AWS
57%
57%
Azure IaaS
17%
12%
Azure PaaS
13%
9%
VMware vCloud Air
7%
5%
Google App Engine (PaaS)
7%
8%
IBM SoftLayer
7%
5%
Google IaaS
6%
5%
DigitalOcean
5%
Not asked in 2015
Oracle Cloud (IaaS)
4%
Not asked in 2015
2016
2015
Source: RightScale 2016 State of the Cloud Report

Enterprise Respondents with 1000+ VMs in Cloud



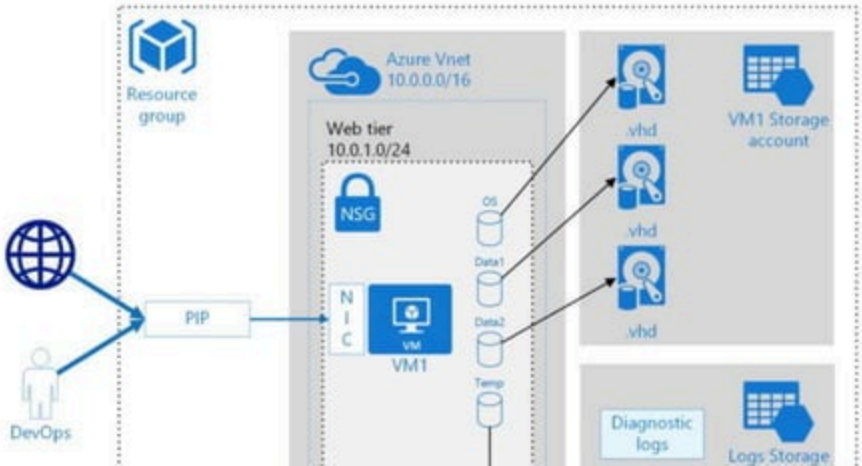
Source: RightScale 2016 State of the Cloud Report

Recipe

- Proven
- Prescriptive
- Standardized
- Episodic
- Executable
- Open

Provisioning a VM in Azure involves more moving parts than just the VM itself. There are compute, networking, and storage elements.

> A Visio document that includes this architecture diagram is available for download from the Microsoft download center. This diagram is on the "Compute - single VM" page.



SHARE

Theme

Light

In this article

- Architecture diagram
- Recommendations
- Scalability considerations
- Availability considerations
- Manageability considerations
- Security considerations
- Solution deployment
- Customize the deployment
- Next steps

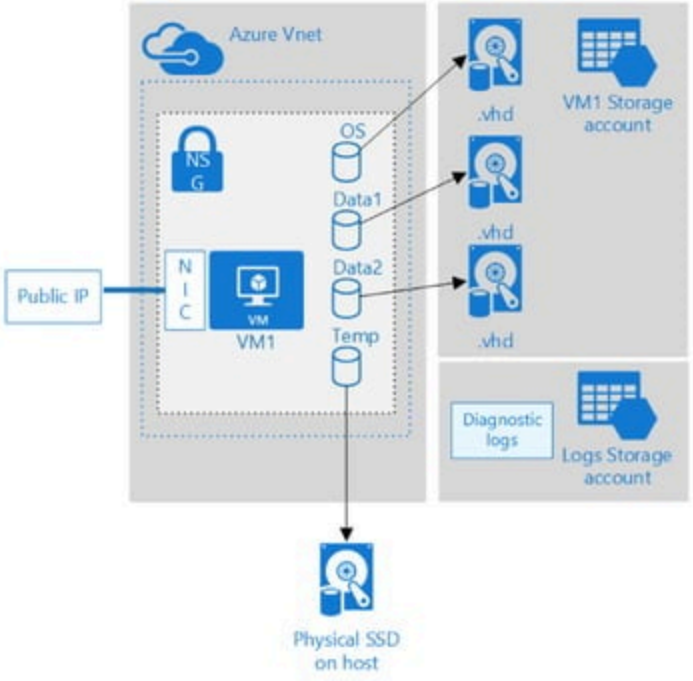
Scenarios

- Running VM workloads in Azure
- Web application architectures for Azure App Service
- Connecting your on-premises network to Azure
- Extending on-premises identity to Azure
- Protecting the cloud boundary in Azure

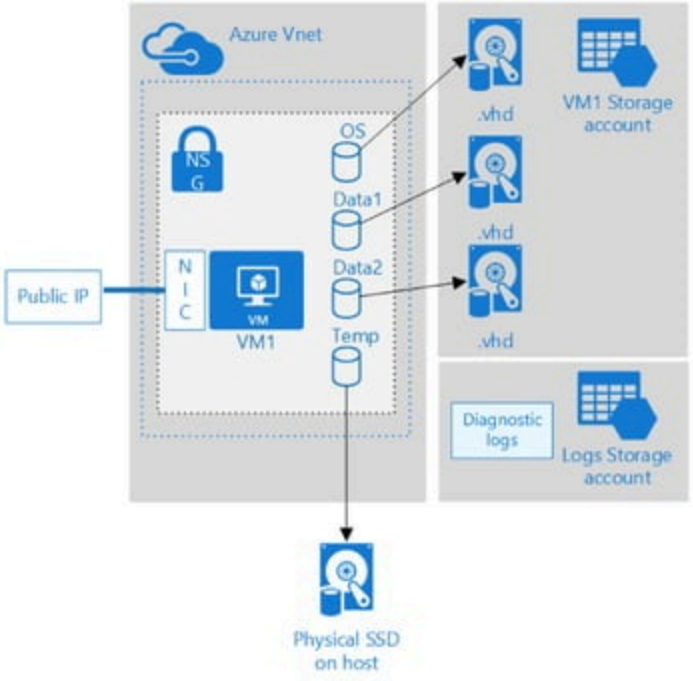
VM workloads

- Single VM
- Multiple VMs with load balancing
- Supporting typical N-tier
- Multiple region active-passive with failover

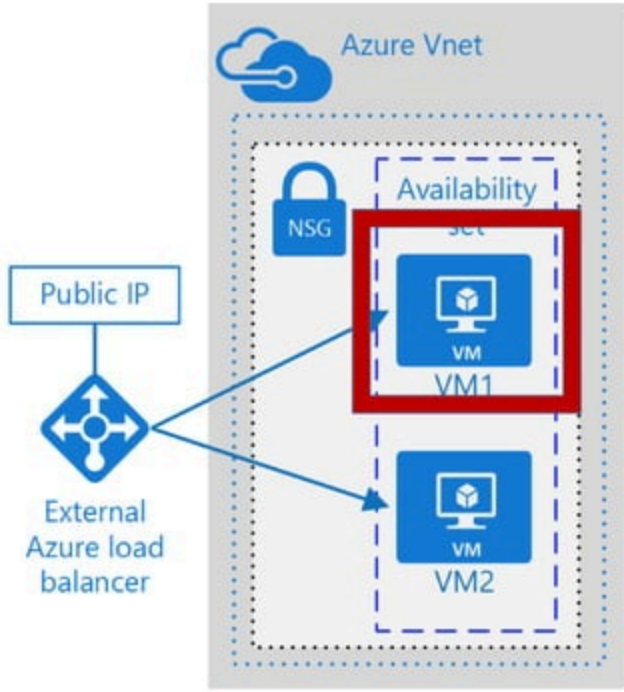
Running a single VM



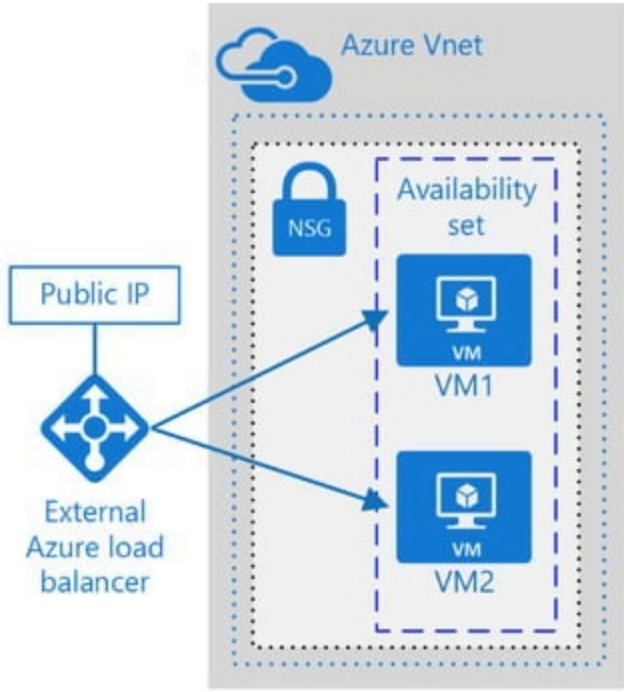
Running a single VM



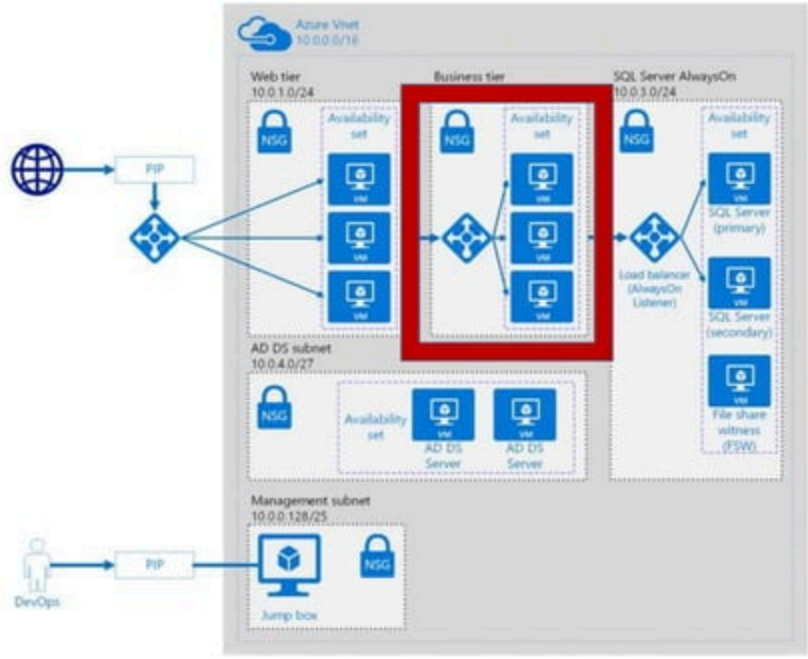
Running multiple VMs behind a load balancer



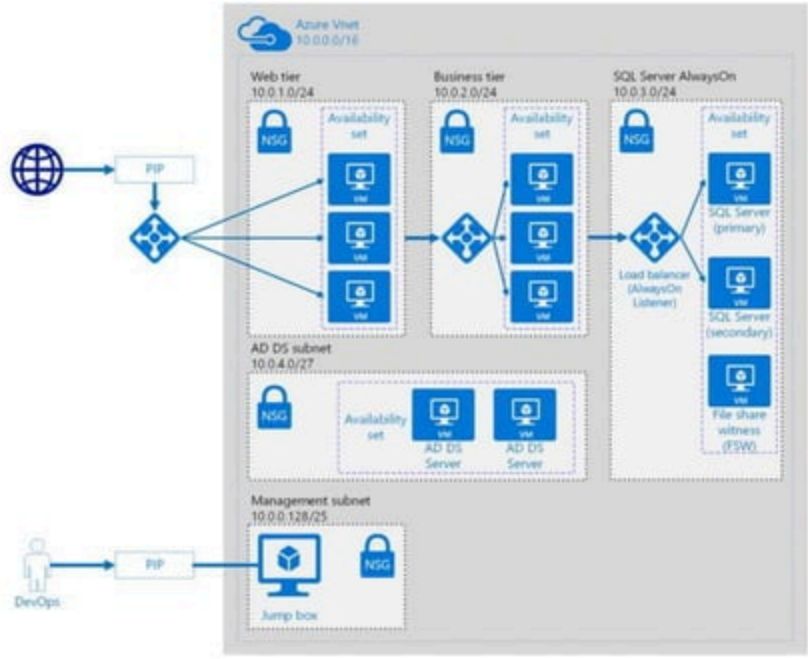
Running multiple VMs behind a load balancer



Running N-tier workloads



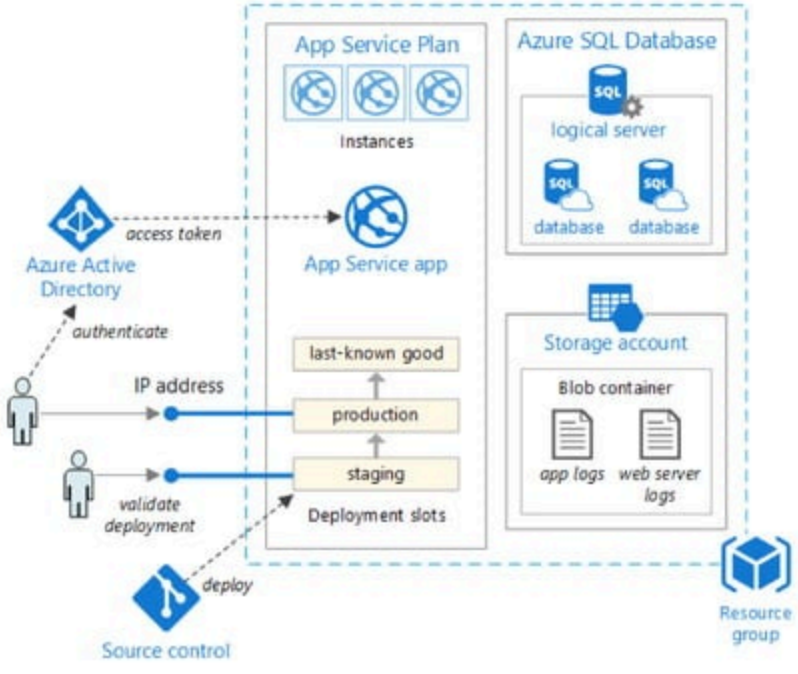
Running N-tier workloads



Managed Services workloads

- Basic web app
- Improving scalability
- Improving availability

Basic Web App



-10
0
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120
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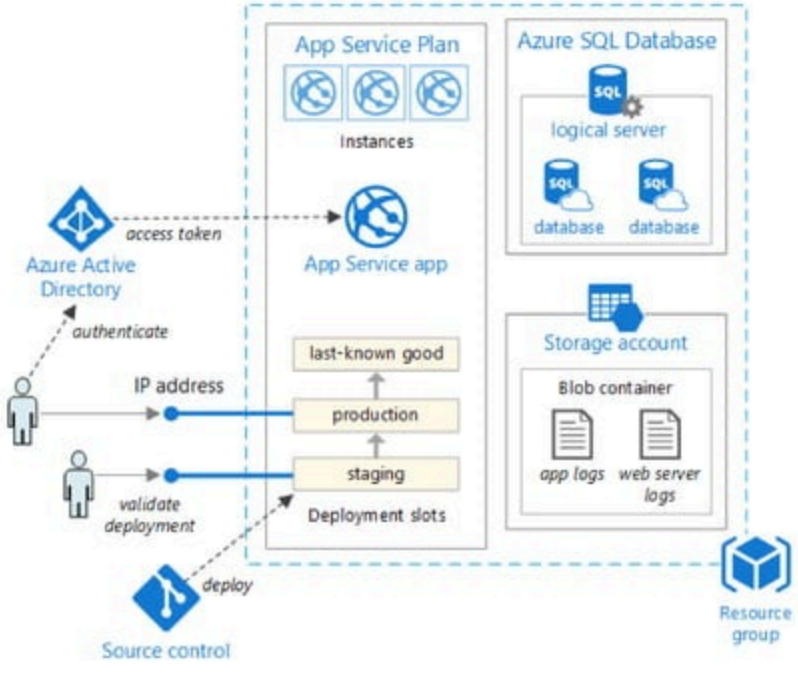
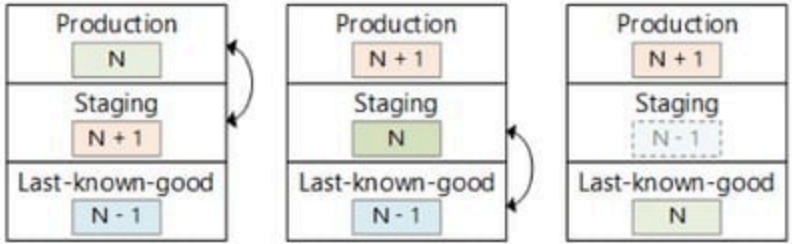
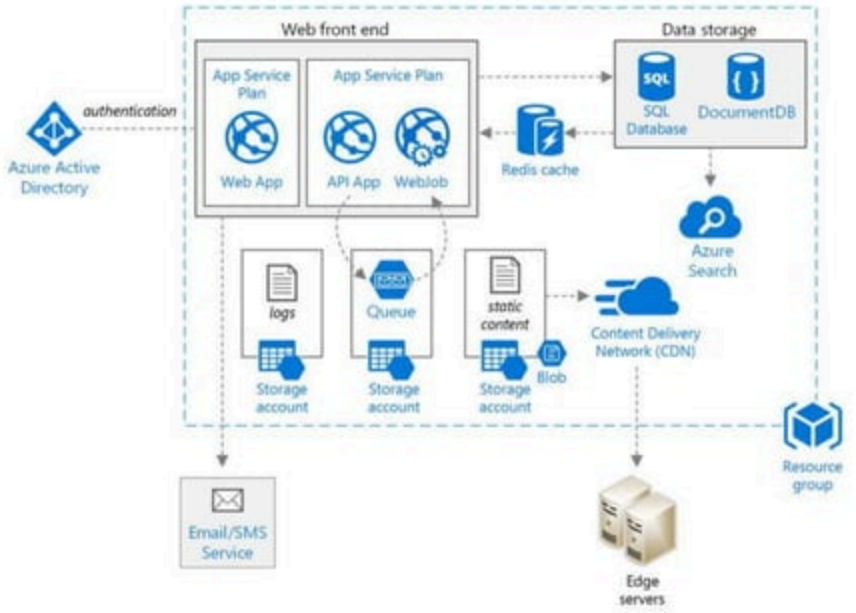
50

Basic Web App



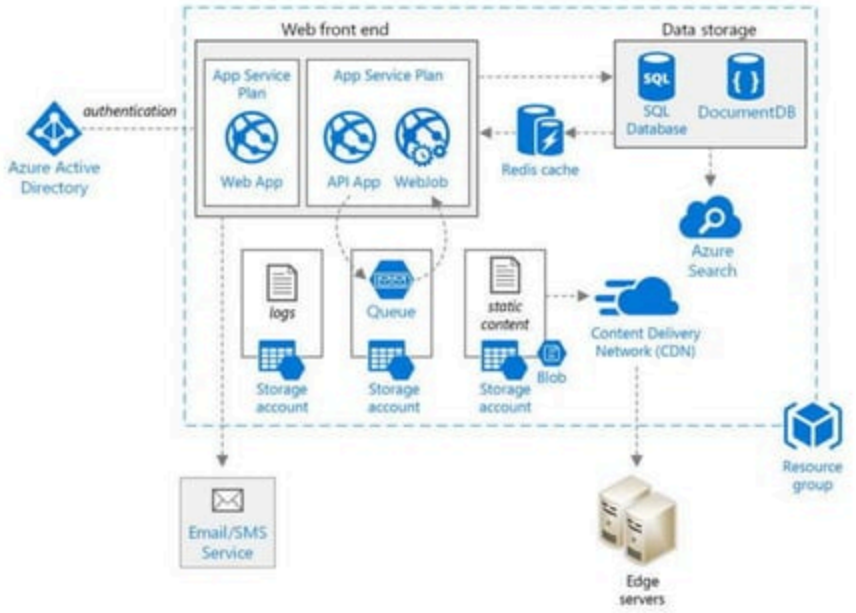

Production
N
Staging
N + 1
Last-known-good
N - 1
Swap production with staging
Production
N + 1
Staging
N
Last-known-good
N - 1
Swap staging with last-known-good
Production
N + 1
Staging
N - 1
Last-known-good
N
Ready to stage next update

Improving Scalability

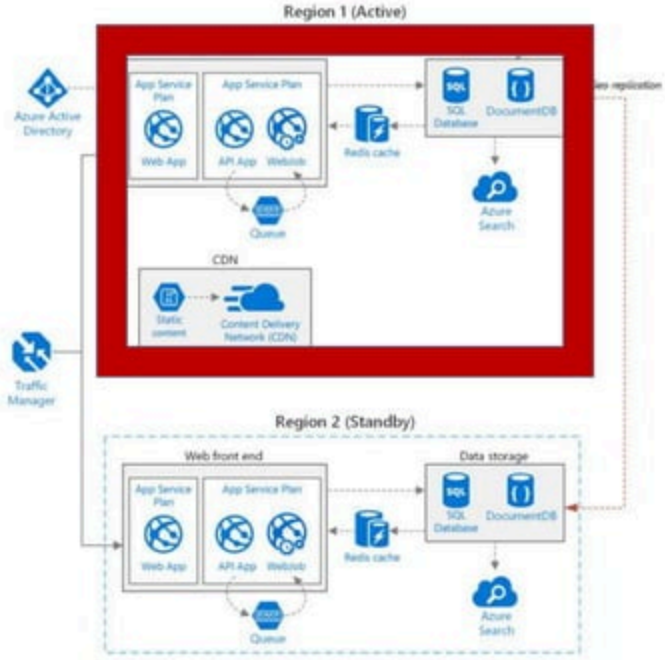


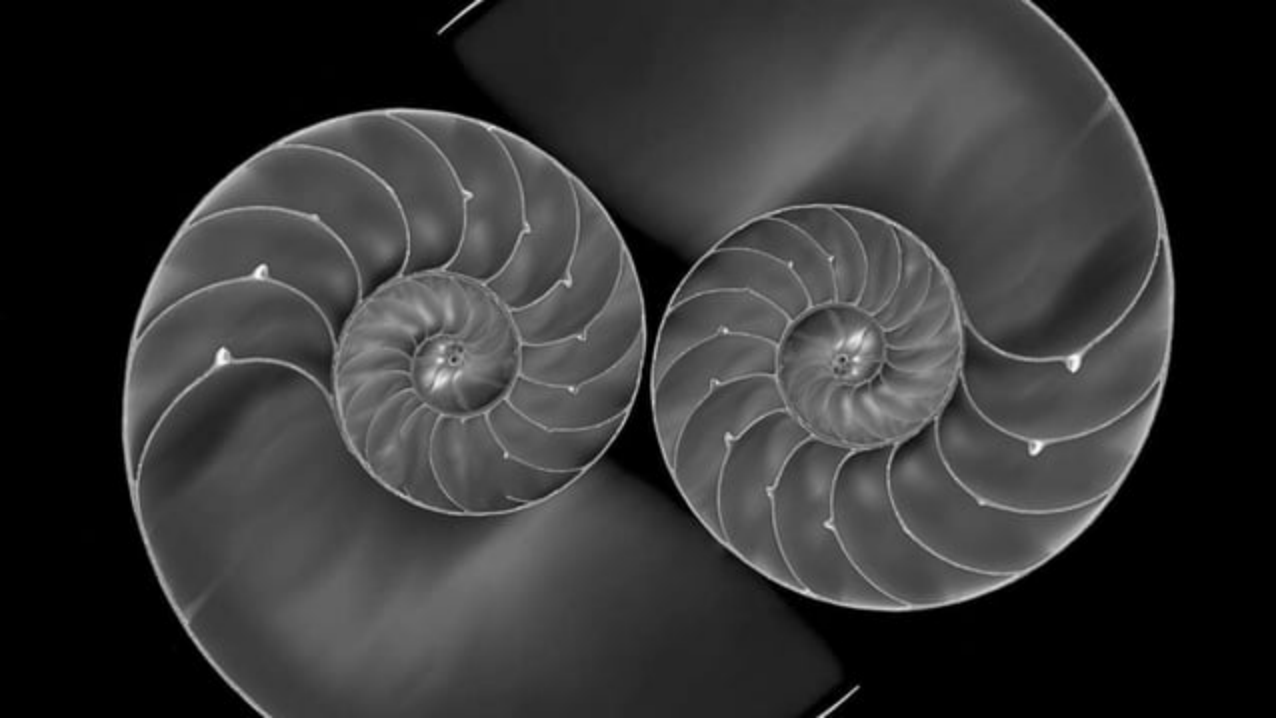
What you want to store	Example	Recommended storage
Files	Images, documents, PDFs	Azure Blob Storage
Key/Value pairs	User profile data looked up by user ID	Azure Table Storage
Short messages intended to trigger further processing	Order requests	Azure Queue Storage, Service Bus Queue, or Service Bus Topic
Non-relational data with a flexible schema requiring basic querying	Product catalog	Document database, such as Azure DocumentDB, MongoDB, or Apache CouchDB
Relational data requiring richer query support, strict schema, and/or strong consistency	Product inventory	Azure SQL Database

Improving Scalability



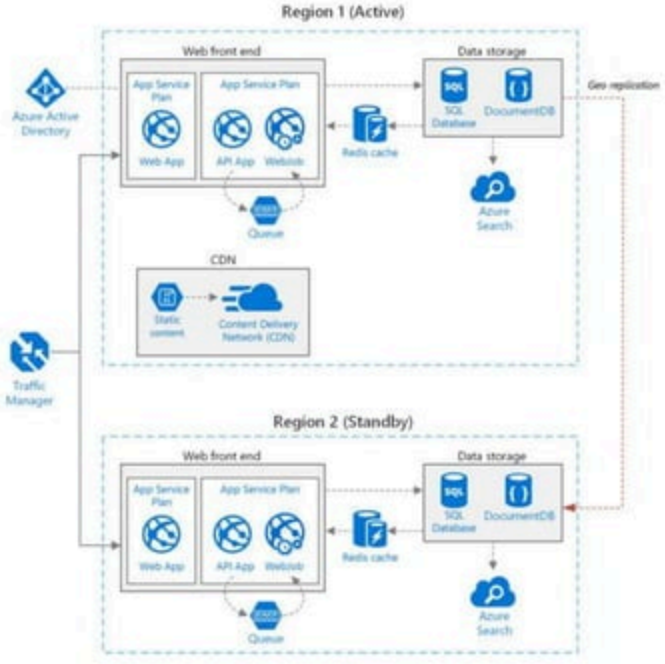
Improving Availability





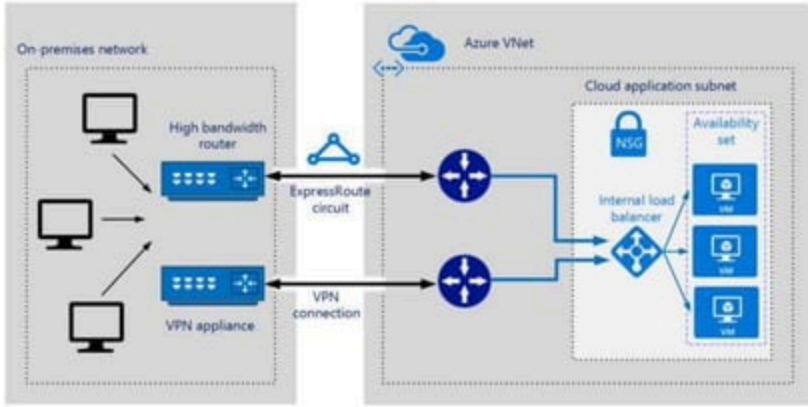
TRAFFIC

Improving Availability



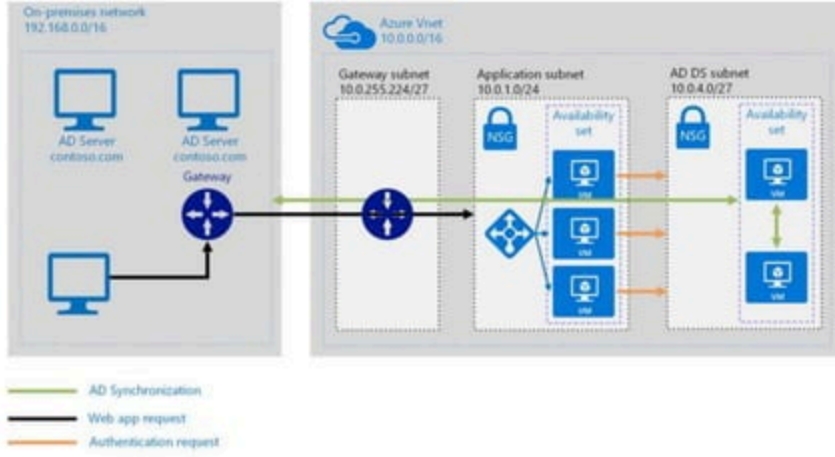
Connecting your on-premises network to Azure

- Site-to-Site VPN
- ExpressRoute
- High Availability



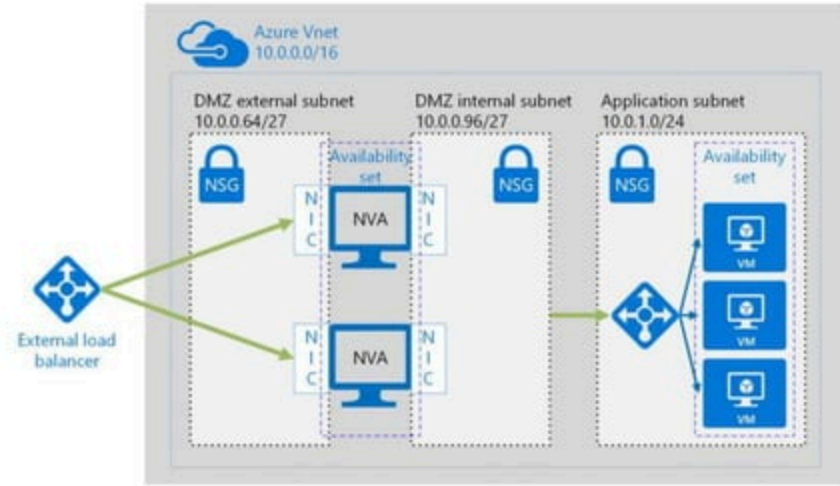
Extending on-premises identity to Azure

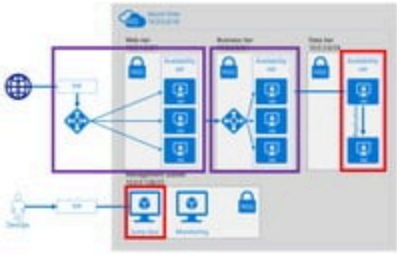
- Azure AD
- AD in Azure, joined to a forest
- AD in Azure, separate forest
- AD Federation Services

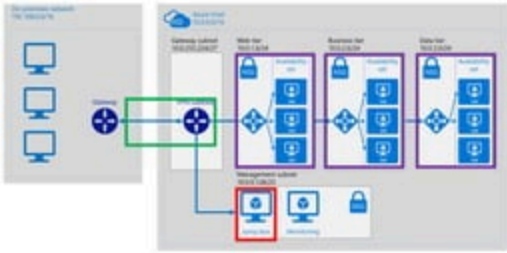


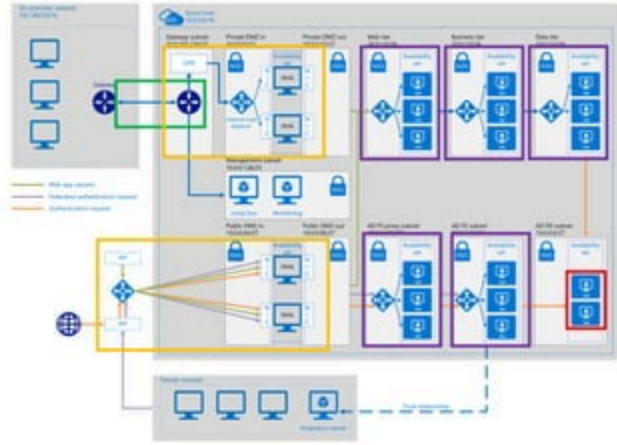
Protecting the cloud boundary in Azure

- Between Azure and the Internet
- Between Azure and On-Prem









Sample - VMs

- Windows VM recommendations
- Parameter files
- Script

- Pren
- Stan
- No r
  stora

```
"parameters": {
  "virtualMachinesSettings": {
    "value": {
      "namePrefix": "app1",
      "computerNamePrefix": "cn",
      "size": "Standard_DS1",
      "osType": "windows",
      "adminUsername": "testuser",
      "adminPassword": "AweS0me@PW",
      "sshPublicKey": "",
      "osAuthenticationType": "password",
      "nics": ...,
      "imageReference": ...,
      "dataDisks": ...,
```

```
$resourceGroupName = "app1-dev-rg"
# Login to Azure and select your subscription
Login-AzureRmAccount | Out-Null
Select-AzureRmSubscription -SubscriptionId $subscriptionId | Out-Null

# Create the resource group
$resourceGroup = New-AzureRmResourceGroup -Name $resourceGroupName -Location $Location

Write-Host "Deploying virtual network..."
New-AzureRmResourceGroupDeployment -Name "ra-single-vm-vnet-deployment" -ResourceGroupName $resourceGroup.ResourceGroupName `
    -TemplateUri $virtualNetworkTemplate.AbsoluteUri -TemplateParameterFile $virtualNetworkParametersFile

Write-Host "Deploying virtual machine..."
New-AzureRmResourceGroupDeployment -Name "ra-single-vm-deployment" -ResourceGroupName $resourceGroup.ResourceGroupName `
    -TemplateUri $virtualMachineTemplate.AbsoluteUri -TemplateParameterFile $virtualMachineParametersFile

Write-Host "Deploying network security group"
New-AzureRmResourceGroupDeployment -Name "ra-single-vm-nsg-deployment" -ResourceGroupName $resourceGroup.ResourceGroupName `
    -TemplateUri $networkSecurityGroupTemplate.AbsoluteUri -TemplateParameterFile $networkSecurityGroupParametersFile
```

github
SOCIAL CODING

What’s next?

Resources

- https://aka.ms/arch-diagrams
- https://aka.ms/architecture
- https://github.com/mspnp/reference-architectures
- https://github.com/Microsoft/azure-docs/tree/master/articles/guidance