



Christopher Bennage
patterns & practices
AzureCAT

Azure Reference Architectures

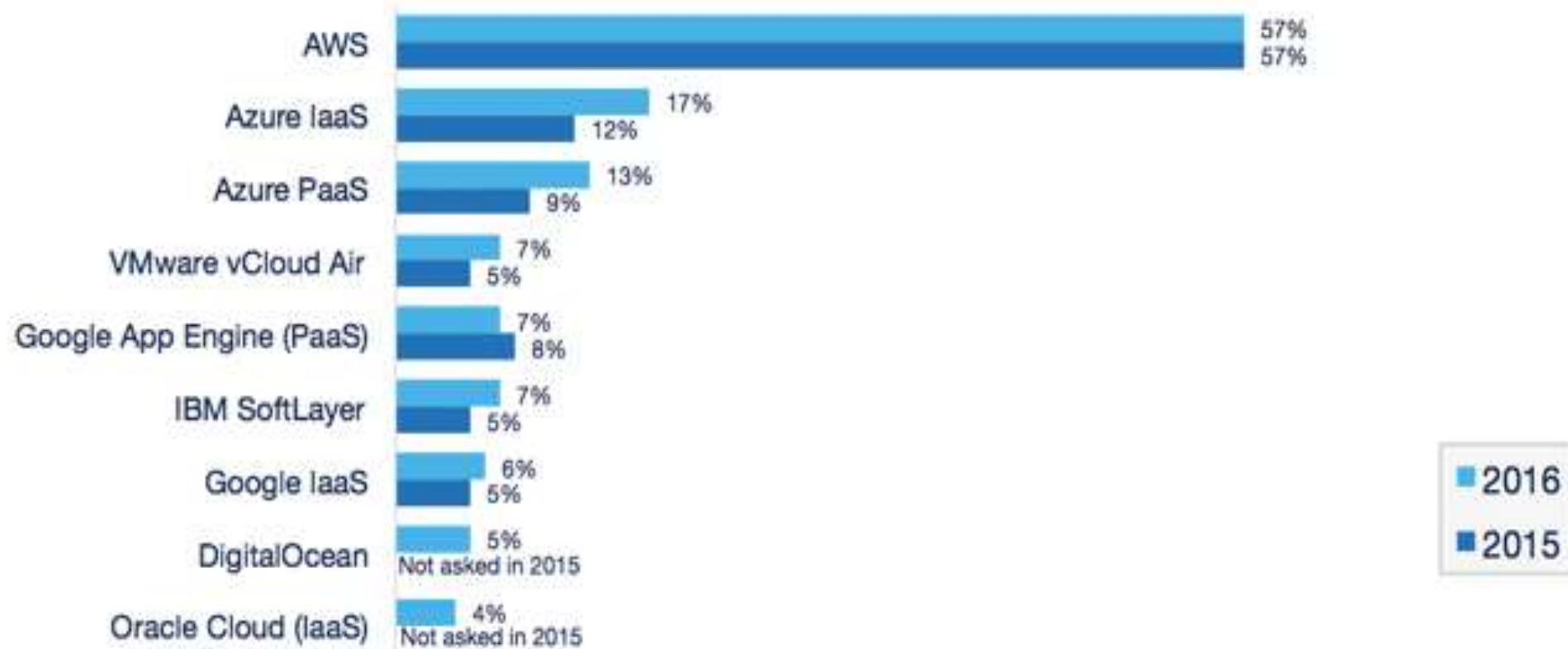


What do
customer find
confusing?



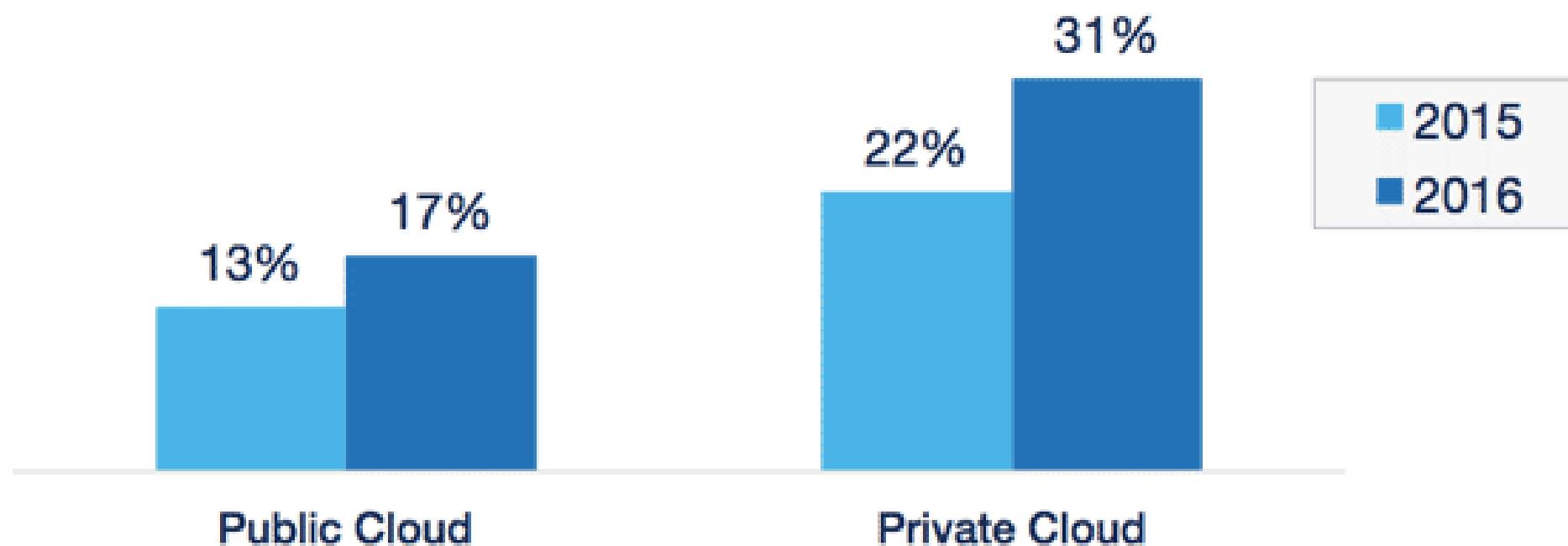
Public Cloud Adoption 2016 vs. 2015

% of Respondents Running Applications



Source: RightScale 2016 State of the Cloud Report

Enterprise Respondents with 1000+ VMs in Cloud



Source: RightScale 2016 State of the Cloud Report

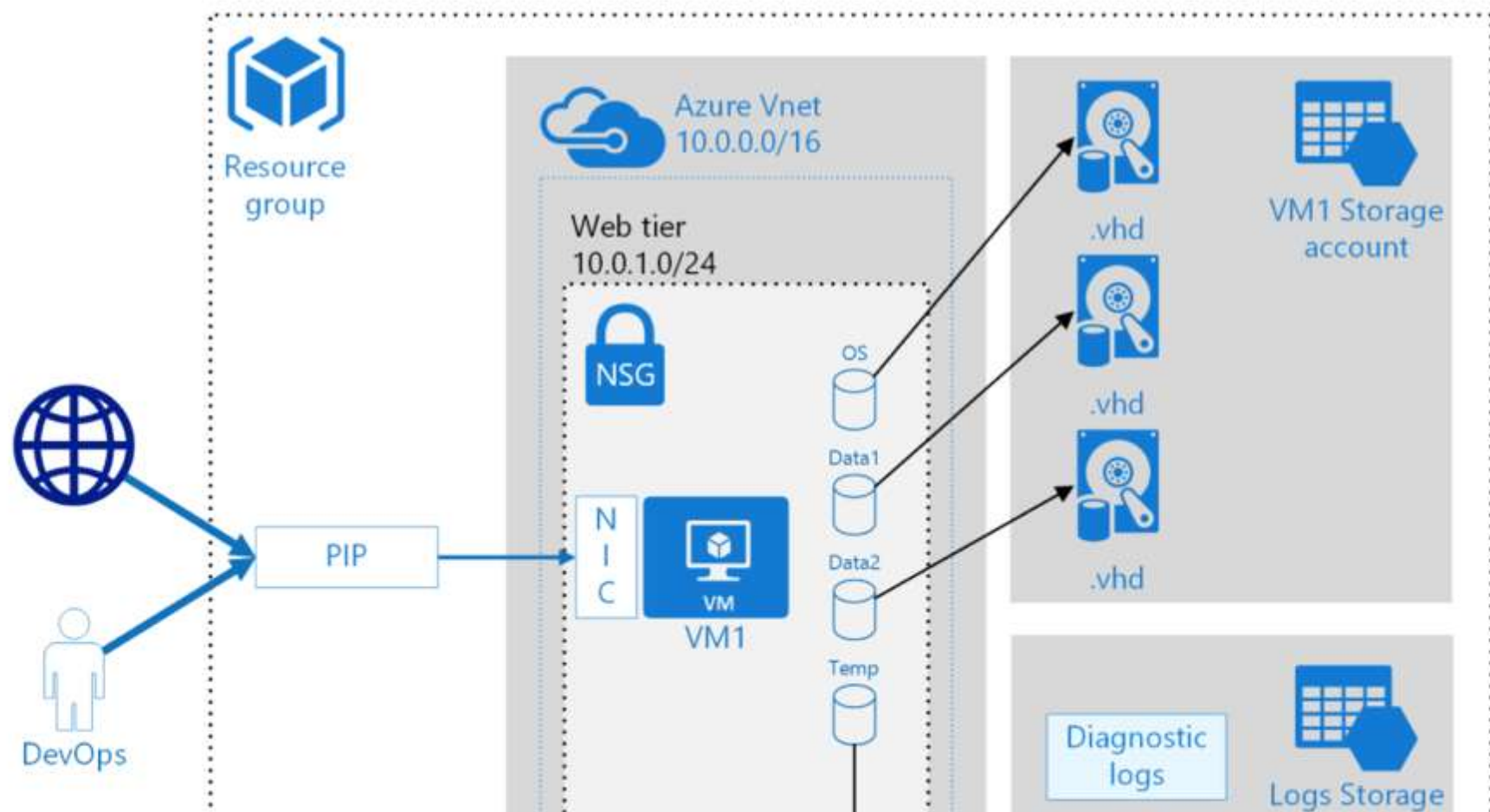


Recipe

- 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.



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Theme

Light

In this article

[Architecture diagram](#)

[Recommendations](#)

[Scalability considerations](#)

[Availability considerations](#)

[Manageability considerations](#)

[Security considerations](#)

[Solution deployment](#)

[Customize the deployment](#)

[Next steps](#)

Scenarios

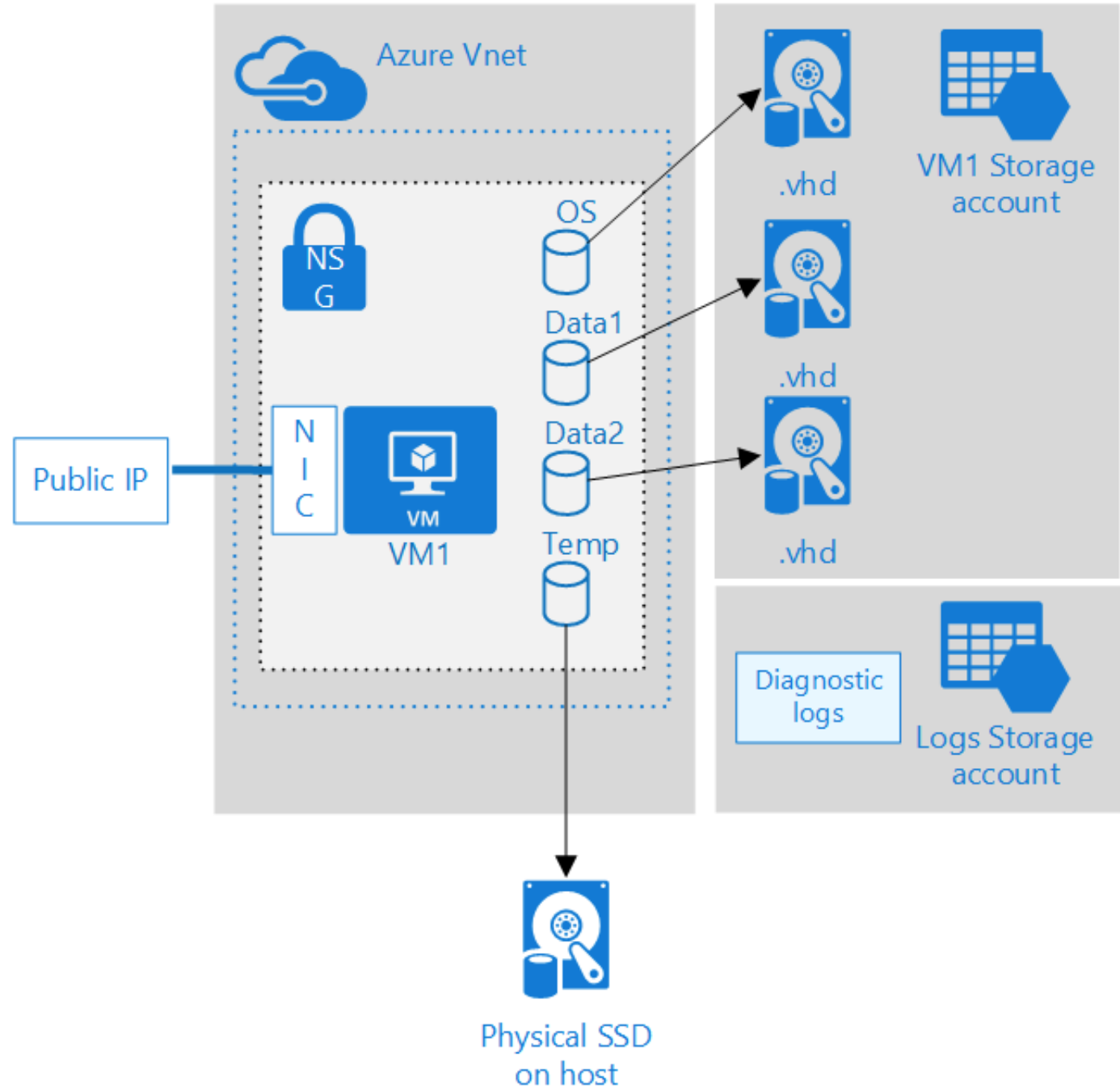
- Running VM workloads in Azure
- Web application architectures for Azure App Service
- Connecting your on-premises network to Azure
- Extending on-premises identity to Azure
- Protecting the cloud boundary in Azure

VM workloads

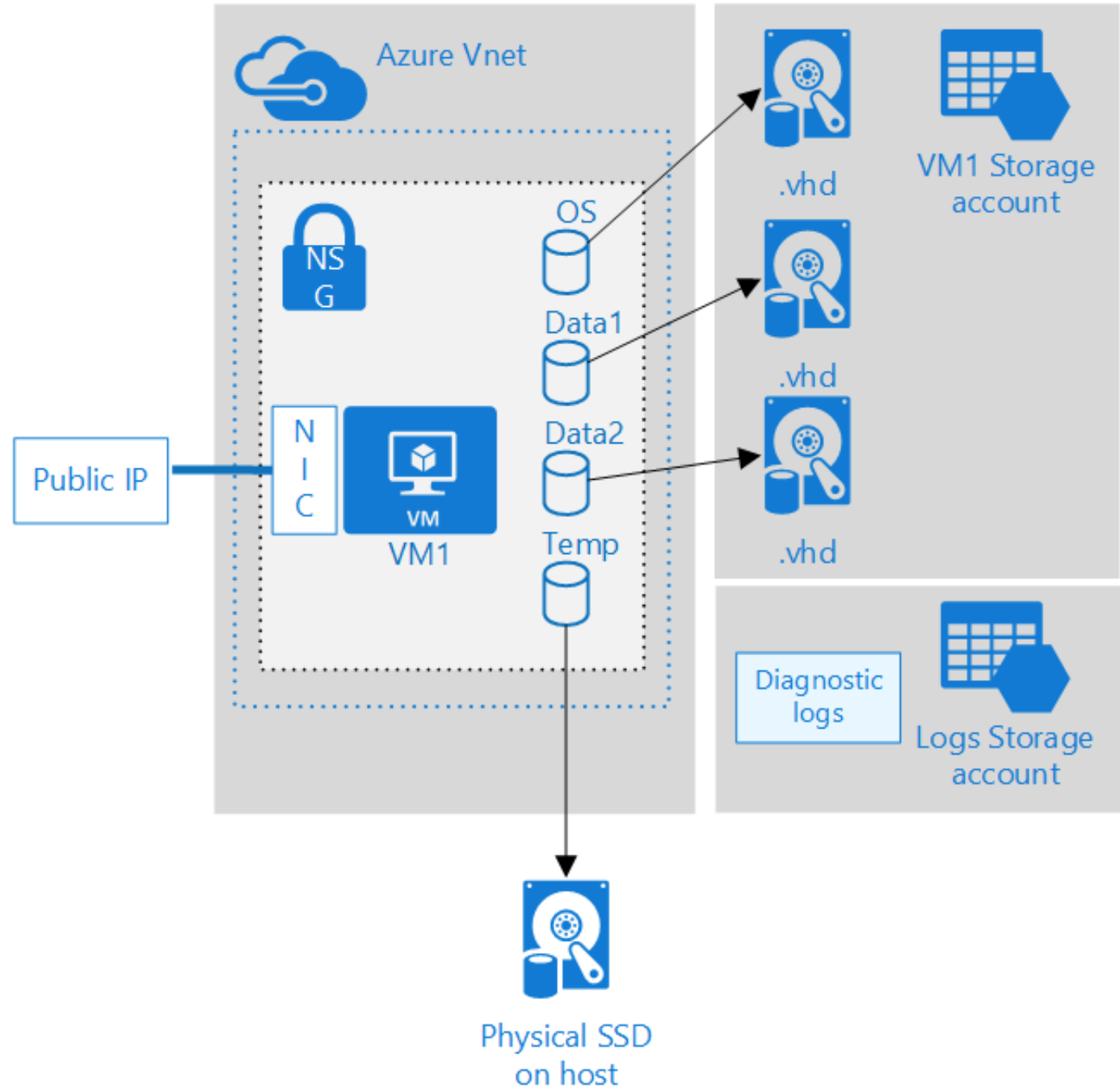
- Single VM
- Multiple VMs with load balancing
- Supporting typical N-tier
- Multiple region active-passive with failover



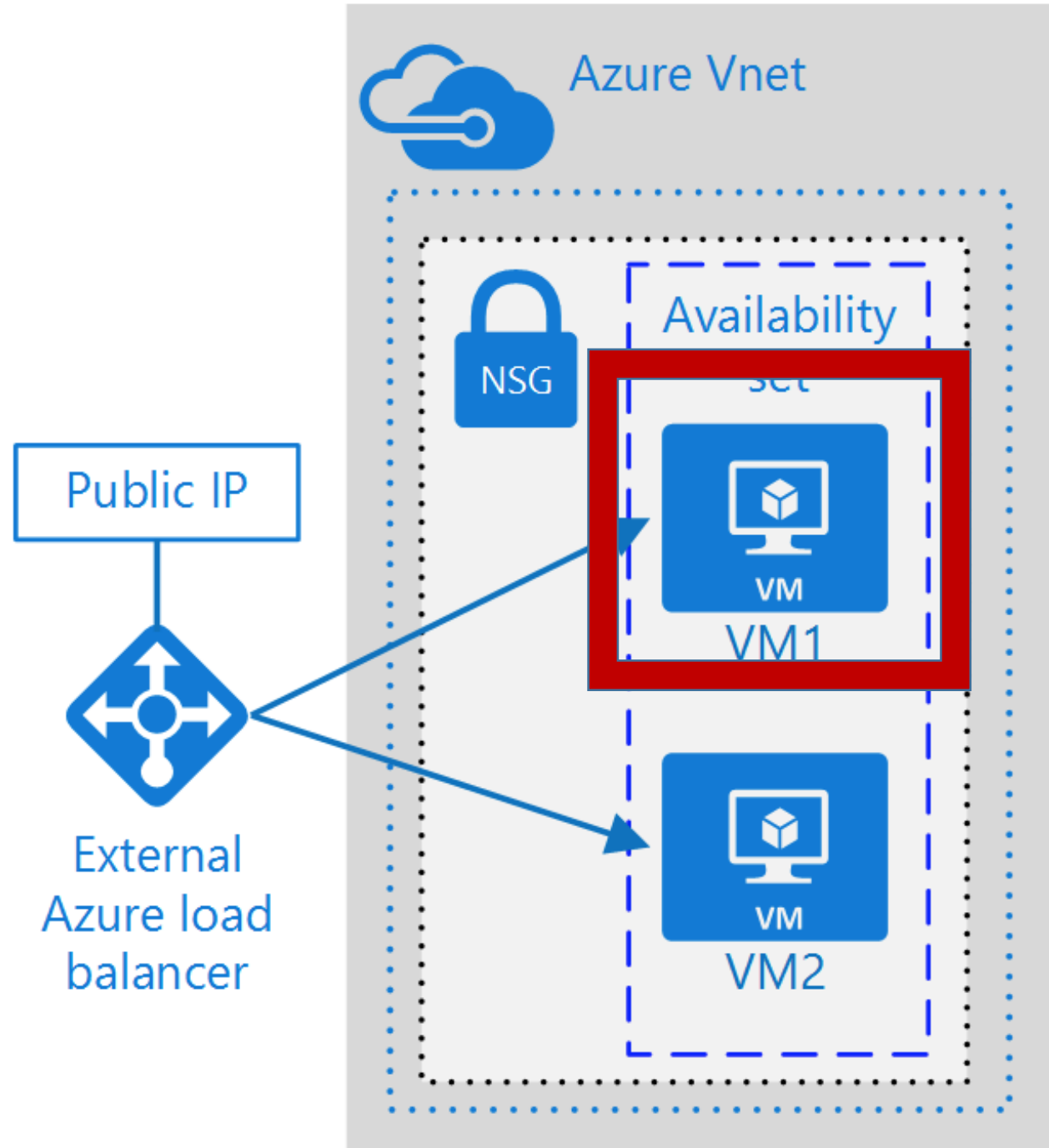
Running a single VM



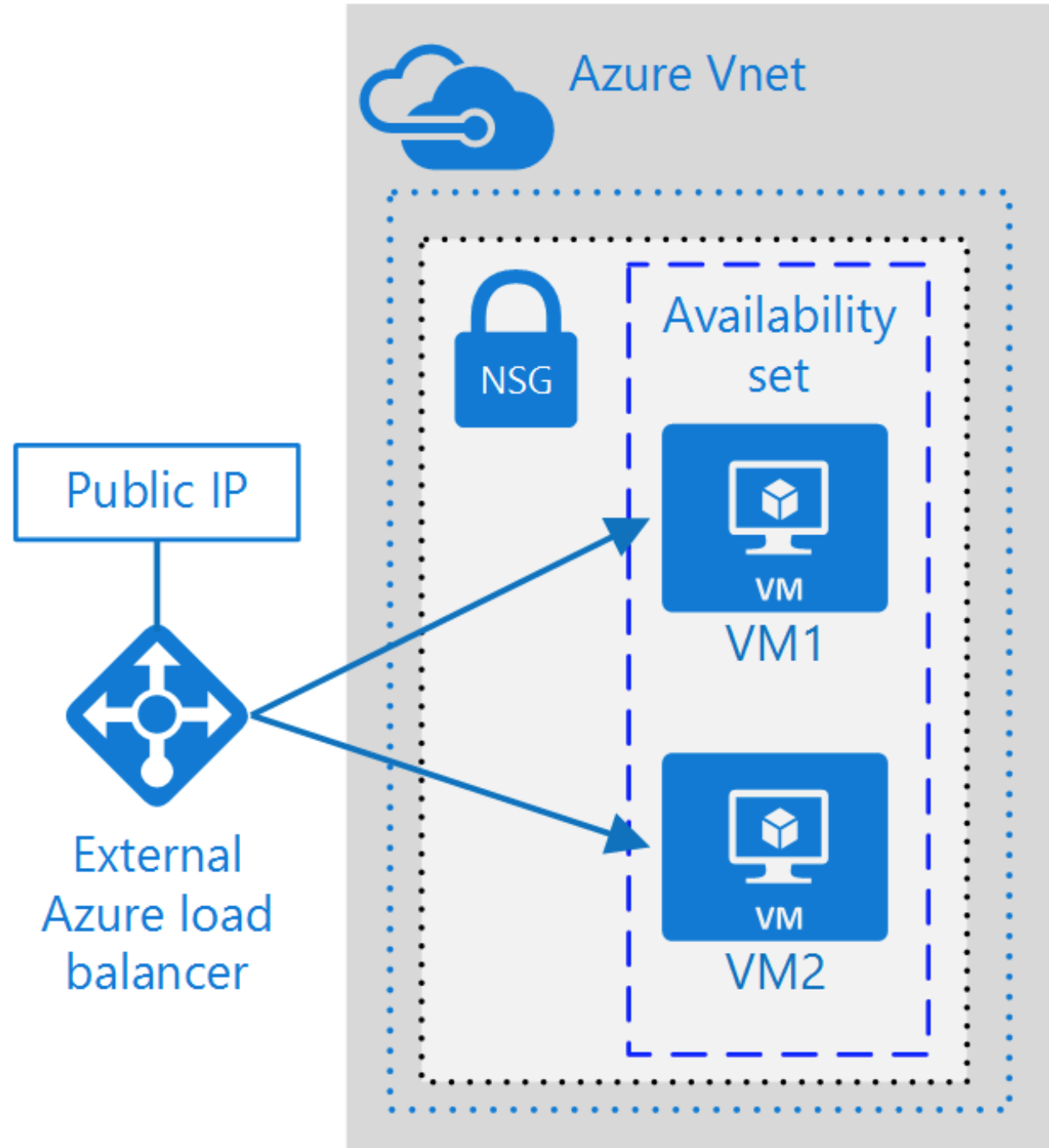
Running a single VM



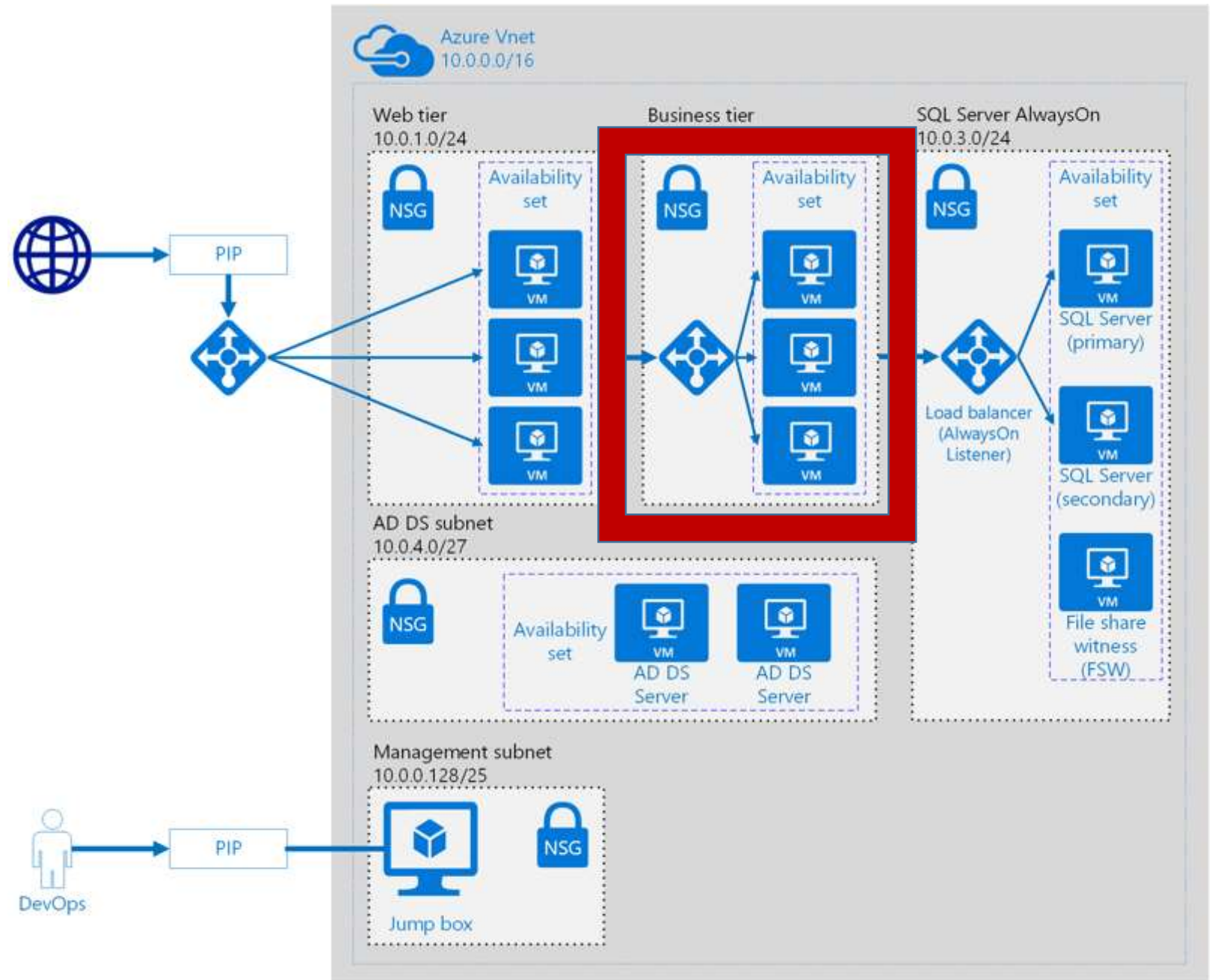
Running
multiple
VMs behind
a load
balancer



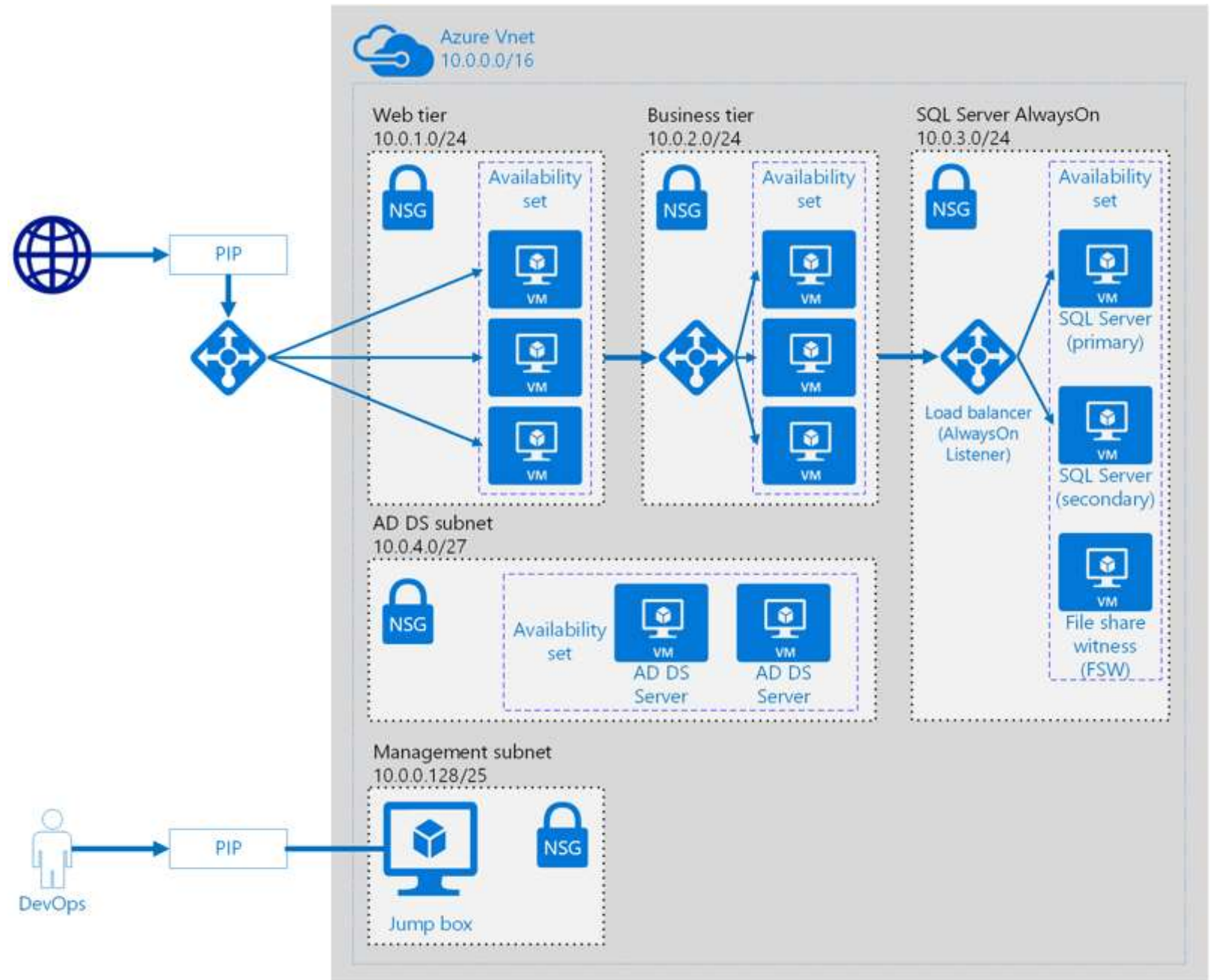
Running
multiple
VMs behind
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balancer



Running N-tier workloads



Running N-tier workloads

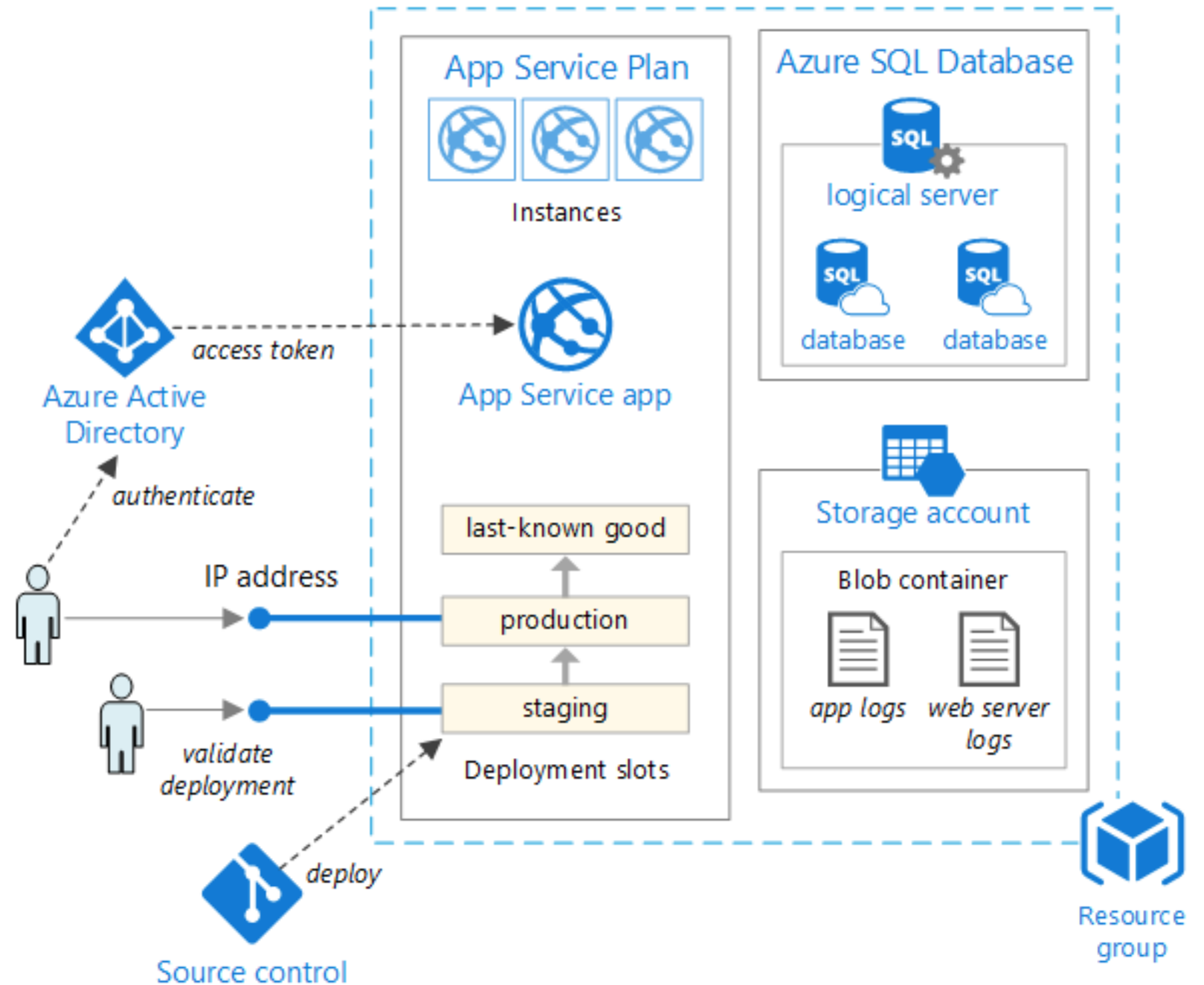


Managed Services workloads

- Basic web app
- Improving scalability
- Improving availability



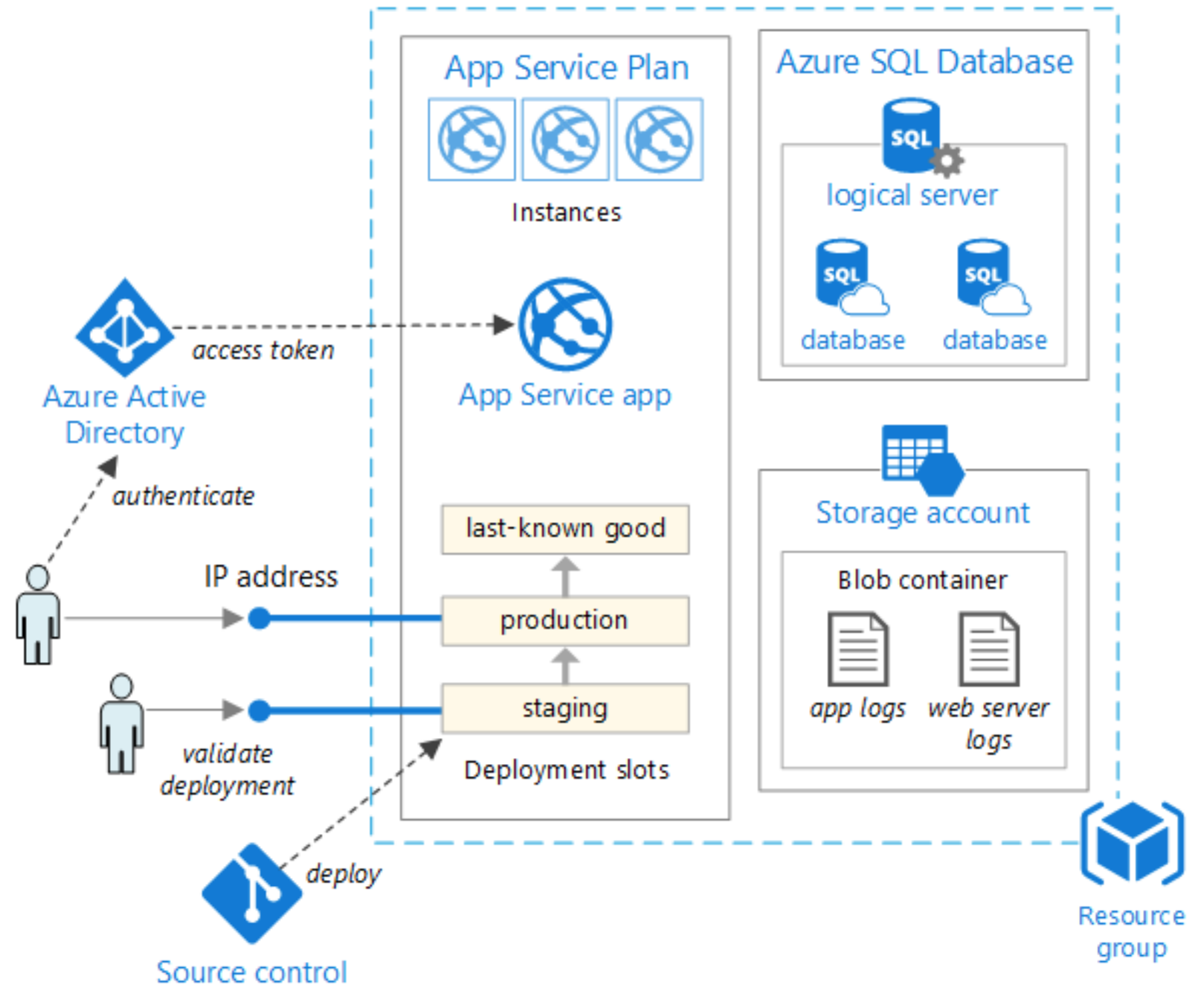
Basic Web App

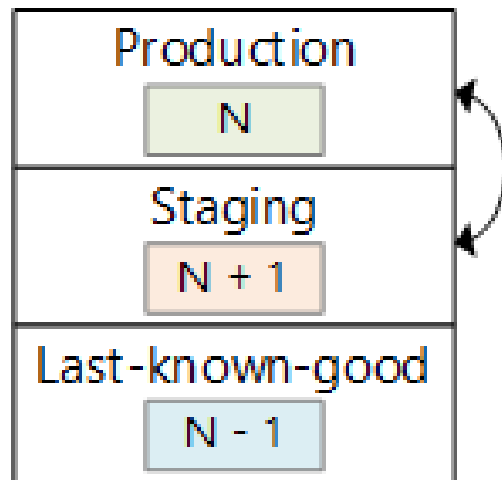




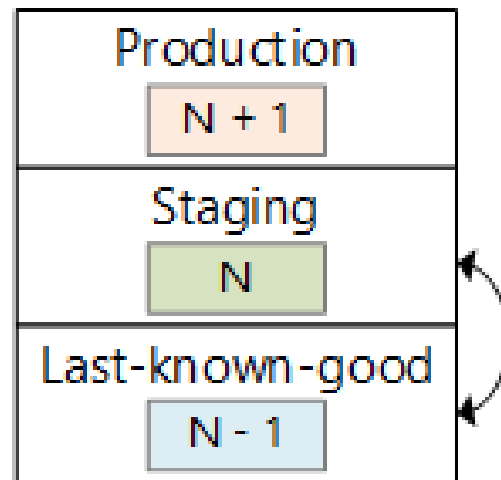


Basic Web App

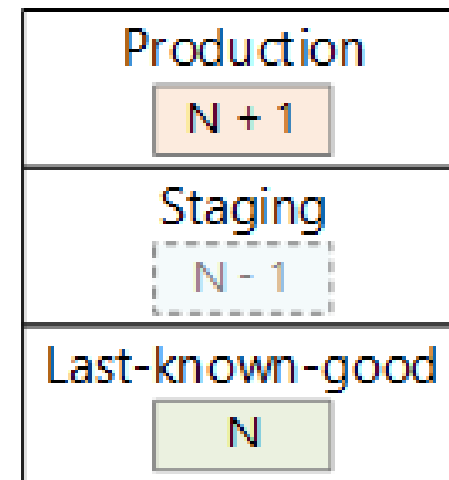




*Swap production
with staging*

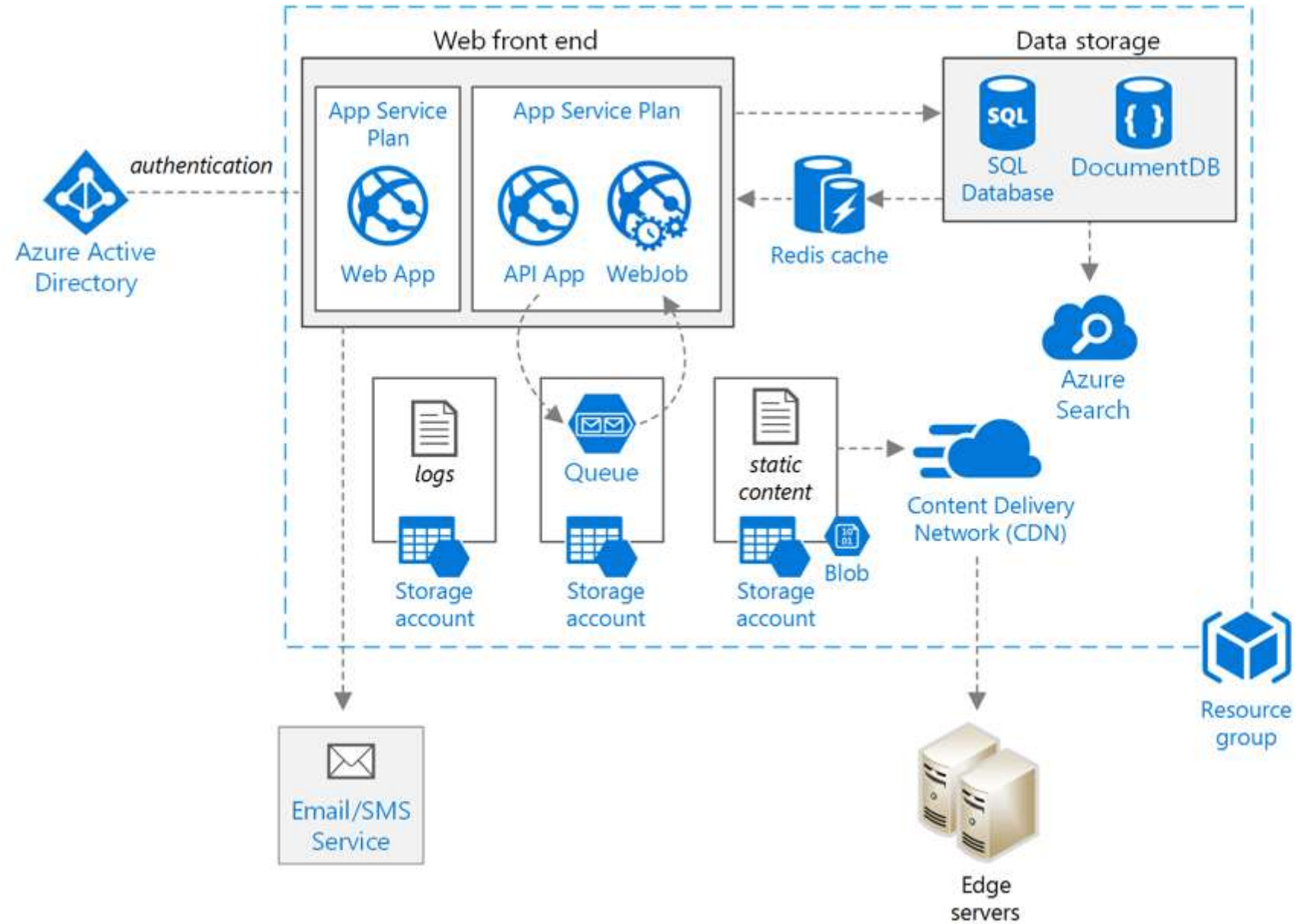


*Swap staging with
last-known-good*



*Ready to stage next
update*

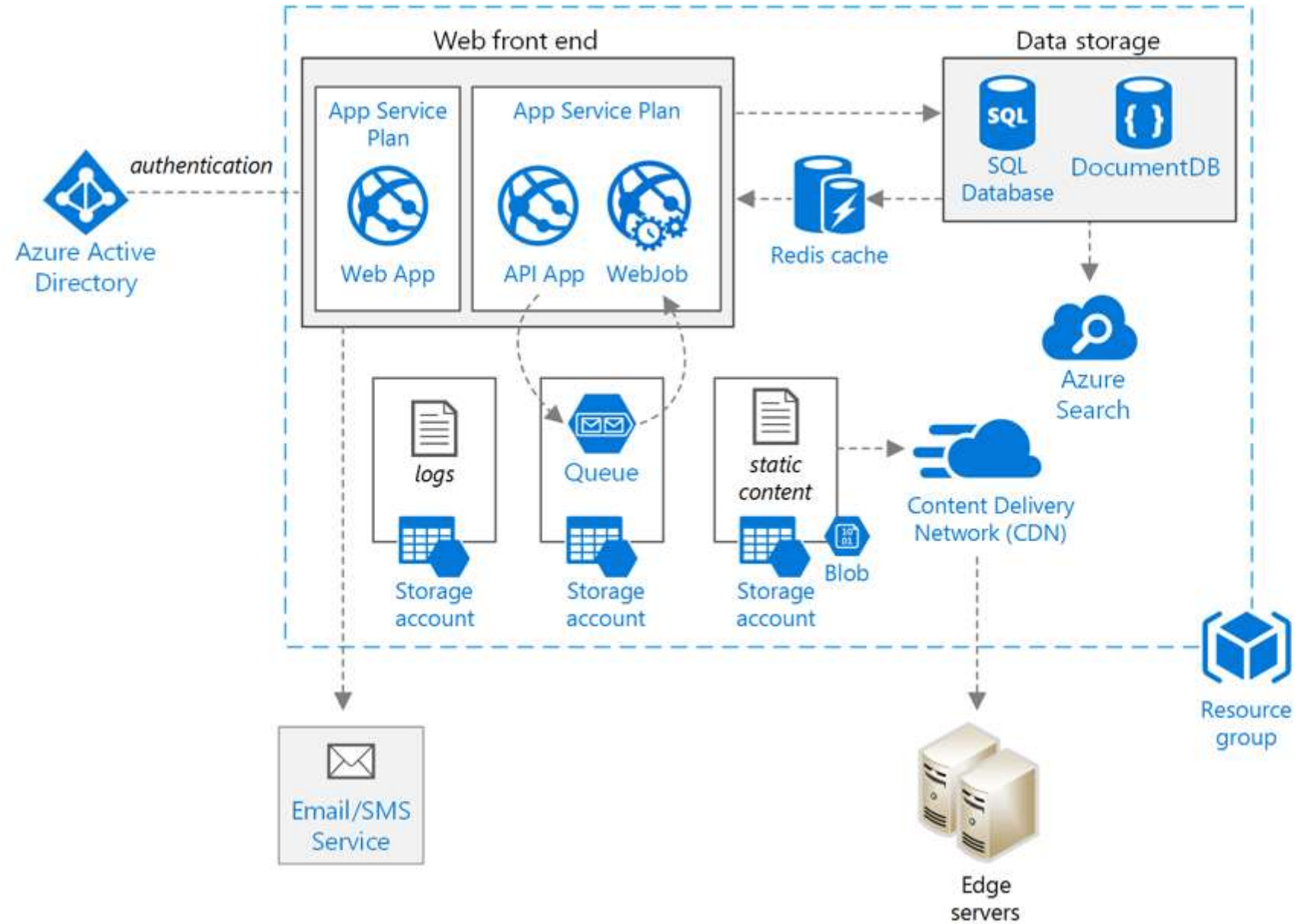
Improving Scalability



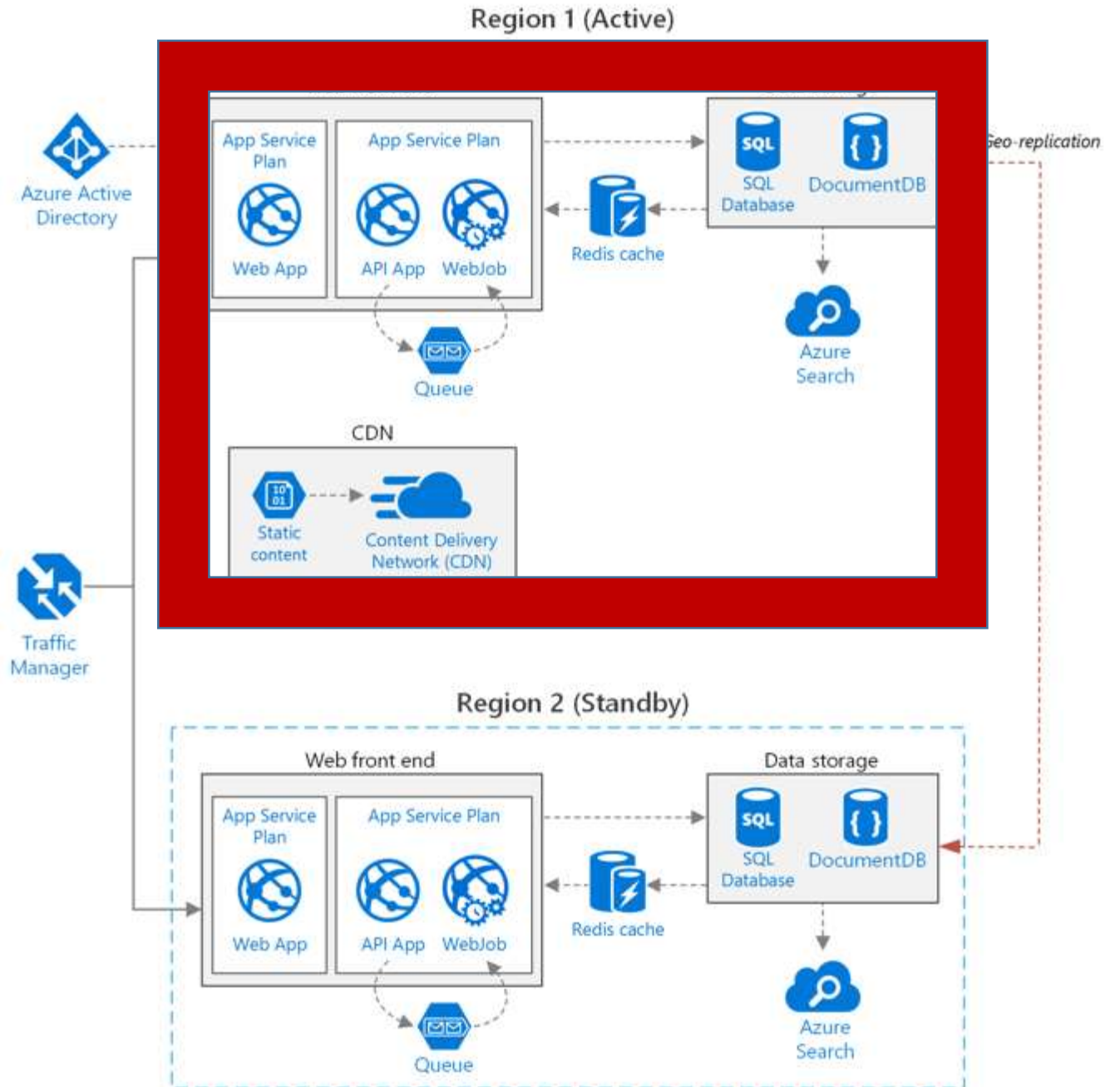
What you want to store	Example	Recommended storage
<i>Files</i>	Images, documents, PDFs	Azure Blob Storage
<i>Key/Value pairs</i>	User profile data looked up by user ID	Azure Table Storage
<i>Short messages intended to trigger further processing</i>	Order requests	Azure Queue Storage, Service Bus Queue,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

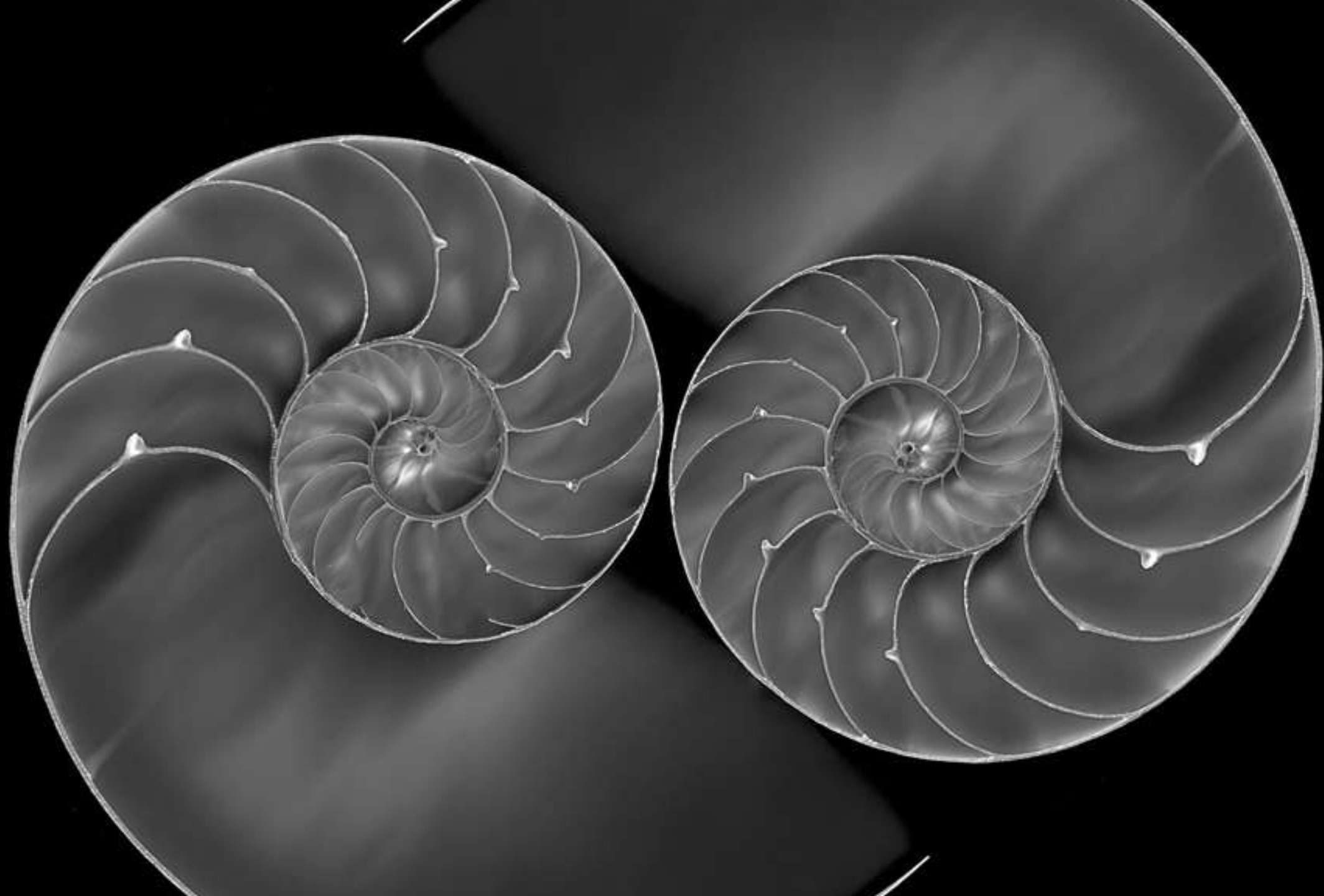


Improving Scalability



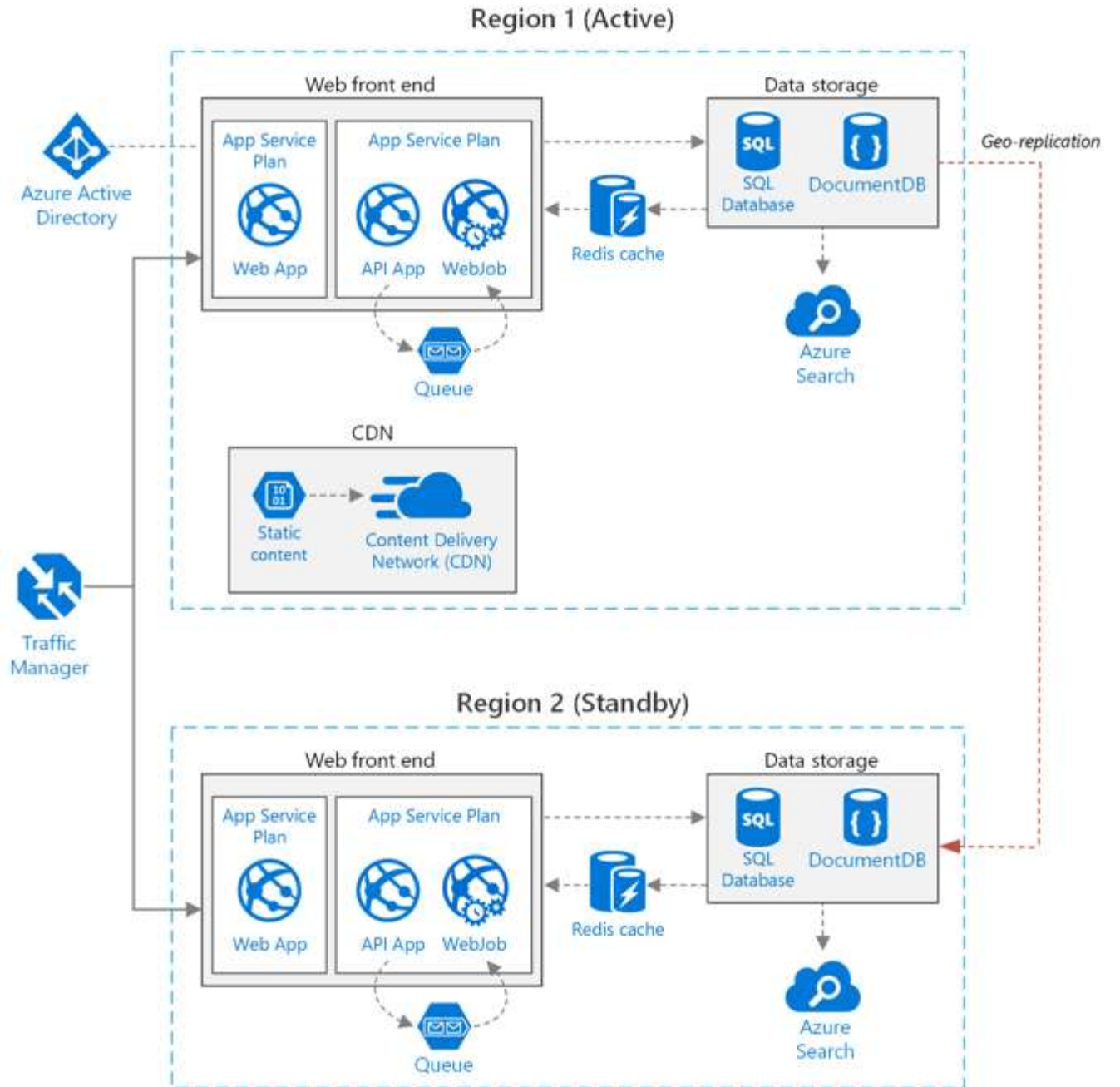
Improving Availability





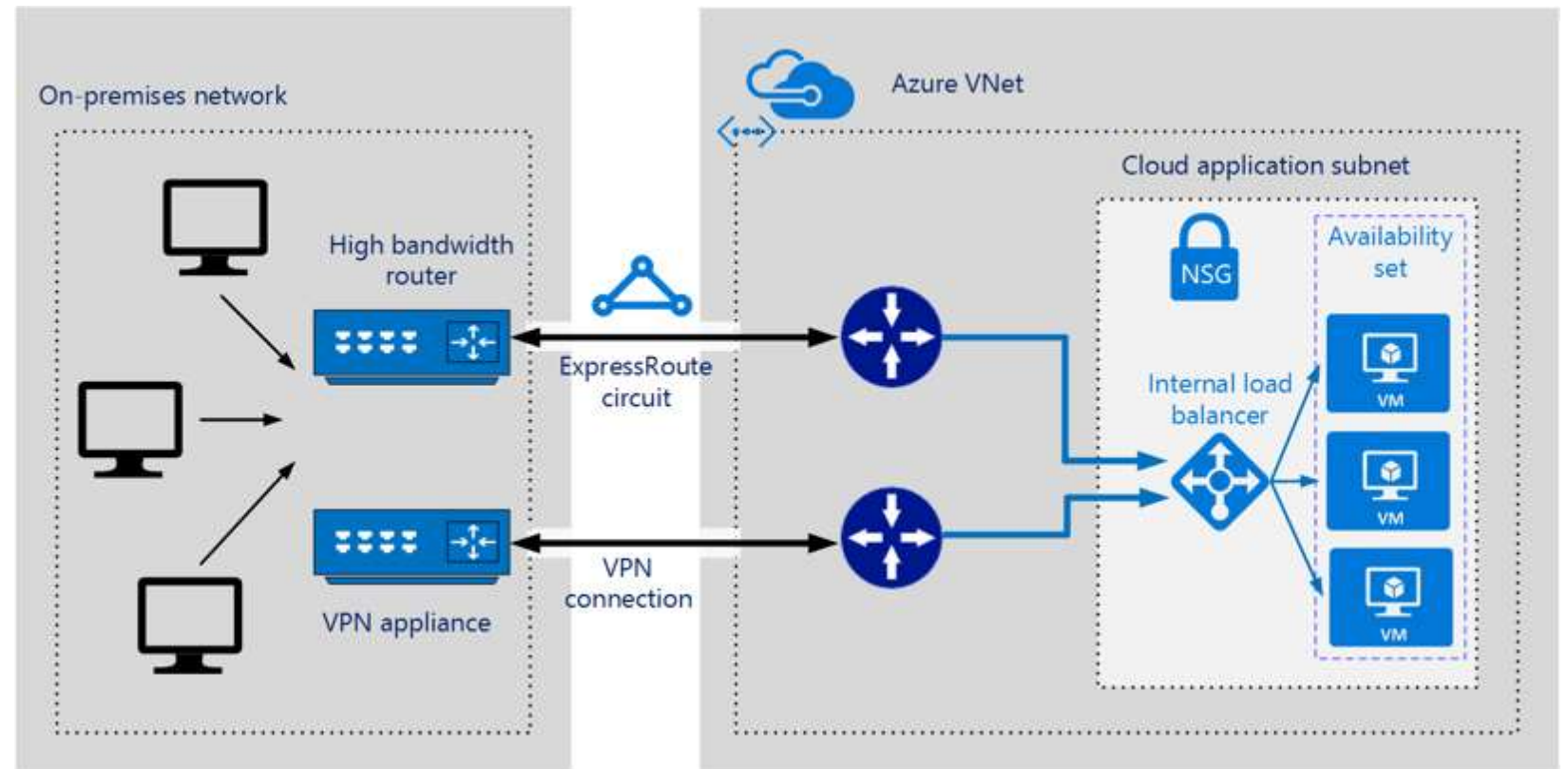


Improving Availability



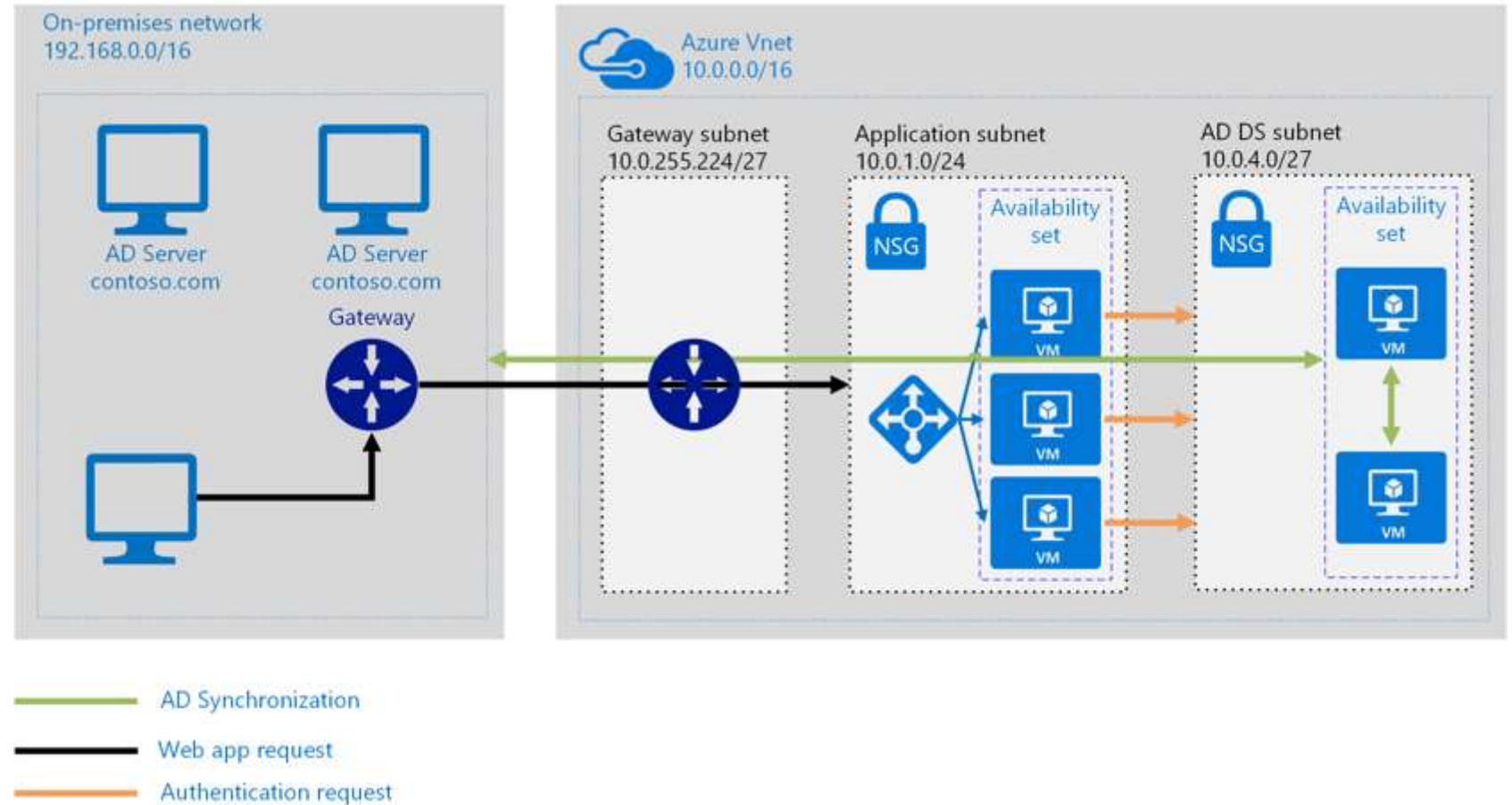
Connecting your on-premises network to Azure

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



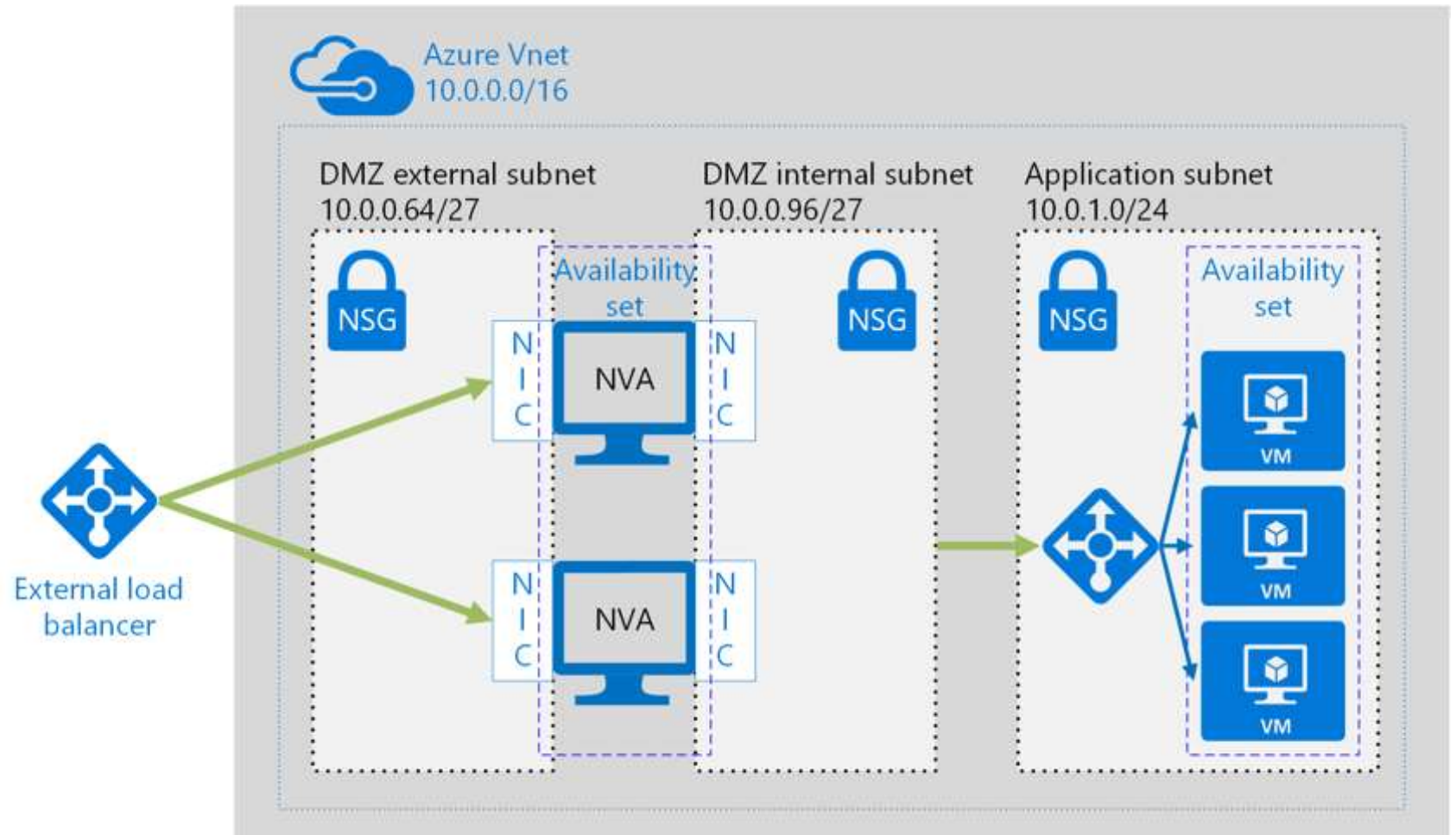
Extending on-premises identity to Azure

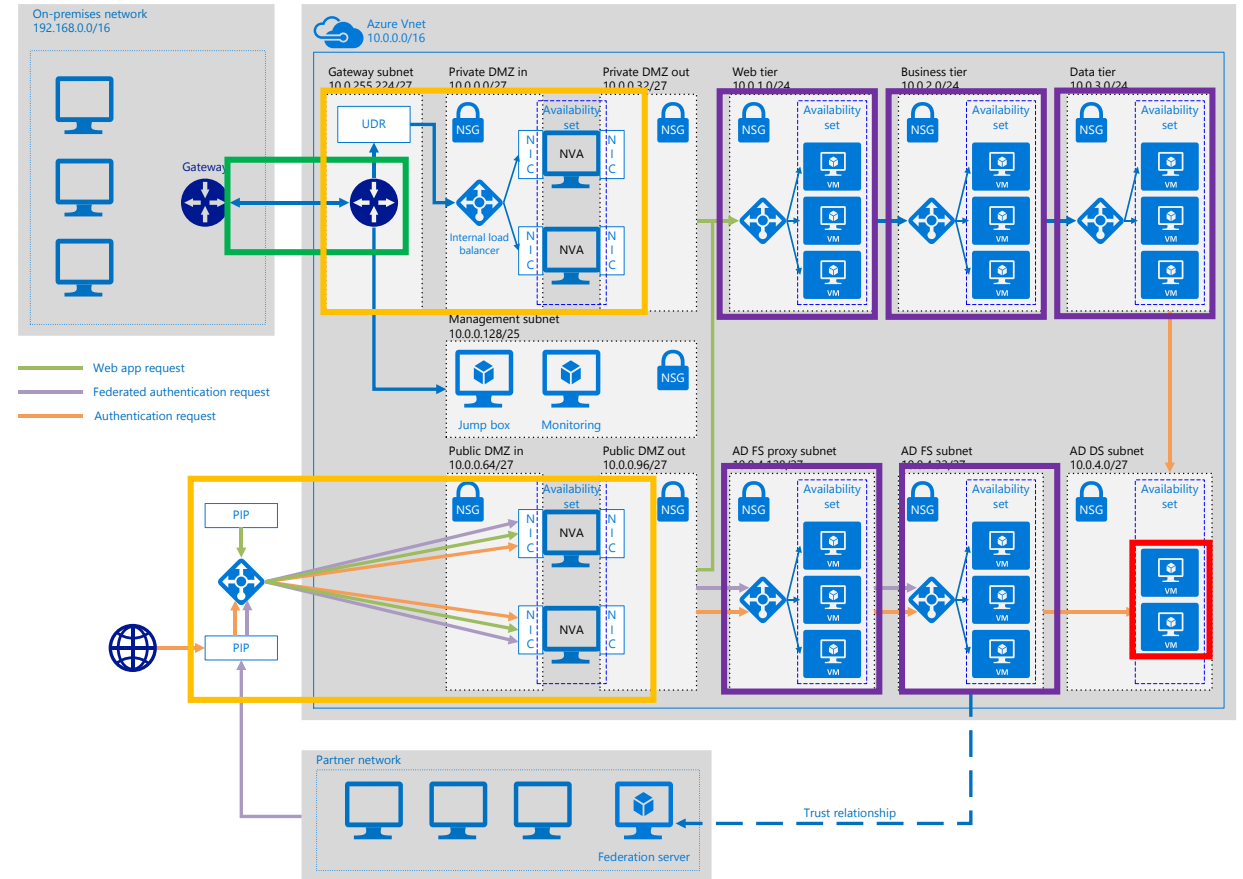
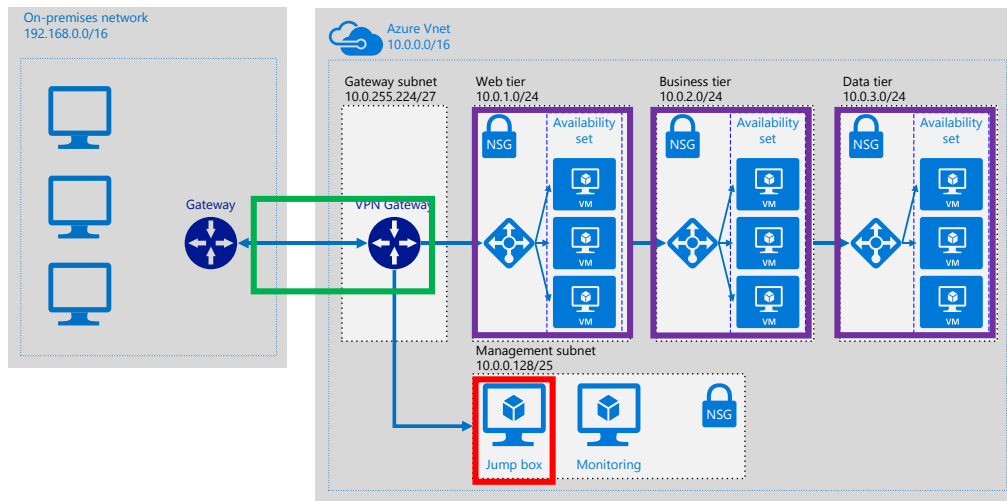
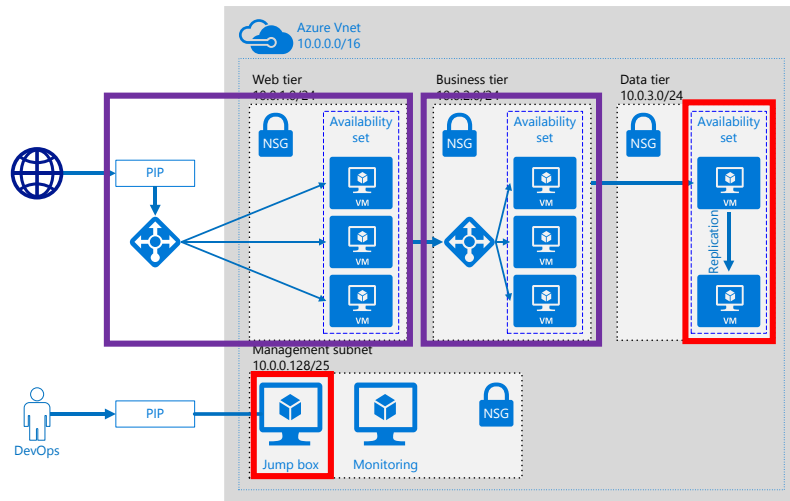
- Azure AD
- AD in Azure, joined to a forest
- AD in Azure, separate forest
- AD Federation Services



Protecting the cloud boundary in Azure

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







Sample - VMs

- [Windows VM recommendations](#)
- [Parameter files](#)
- [Script](#)

```
$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
```

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



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>