Scaling and High Availability

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Overview

What you need to think about to be successful

Availability sets

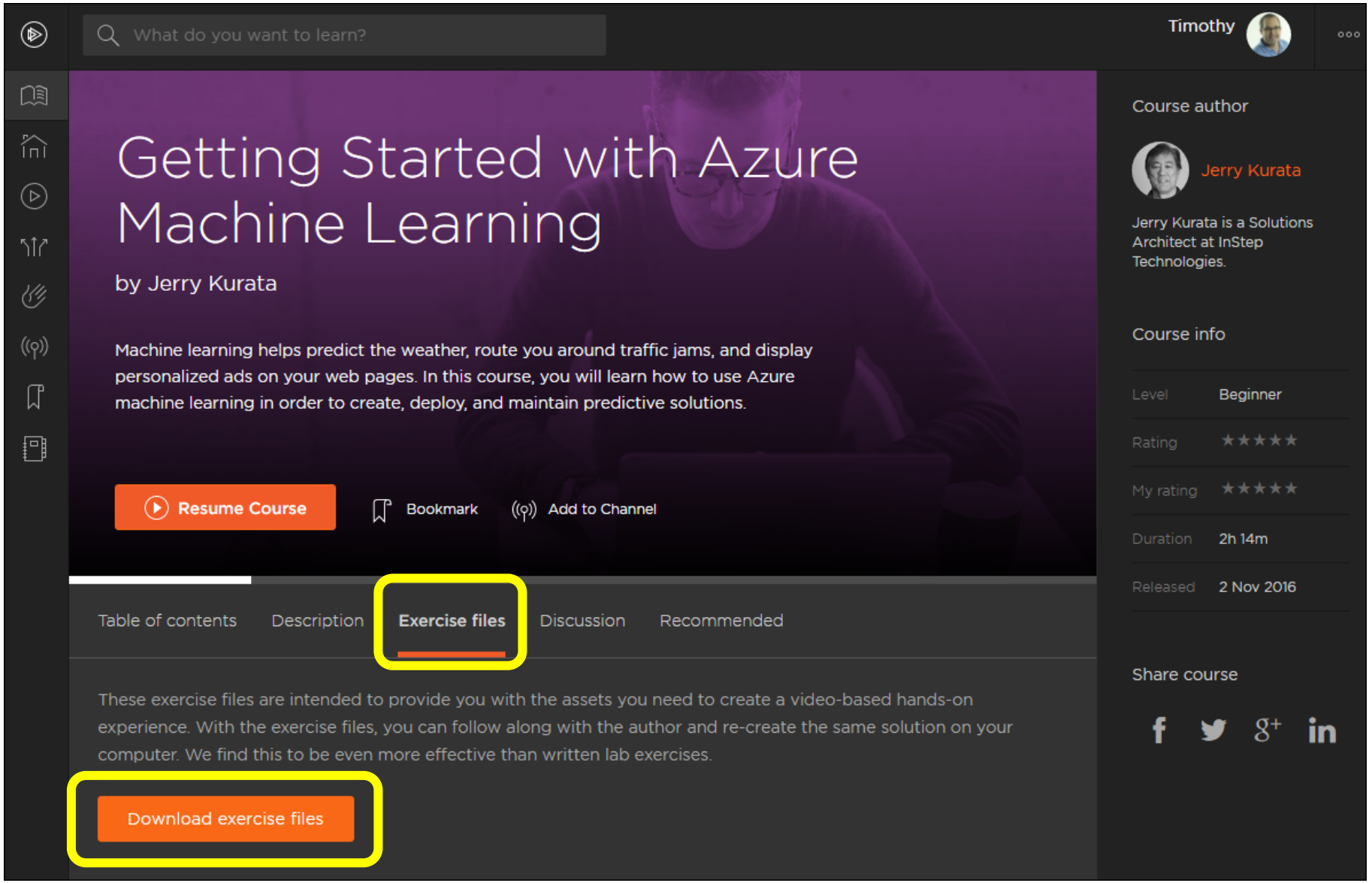
- Azure SLA

Scale Sets

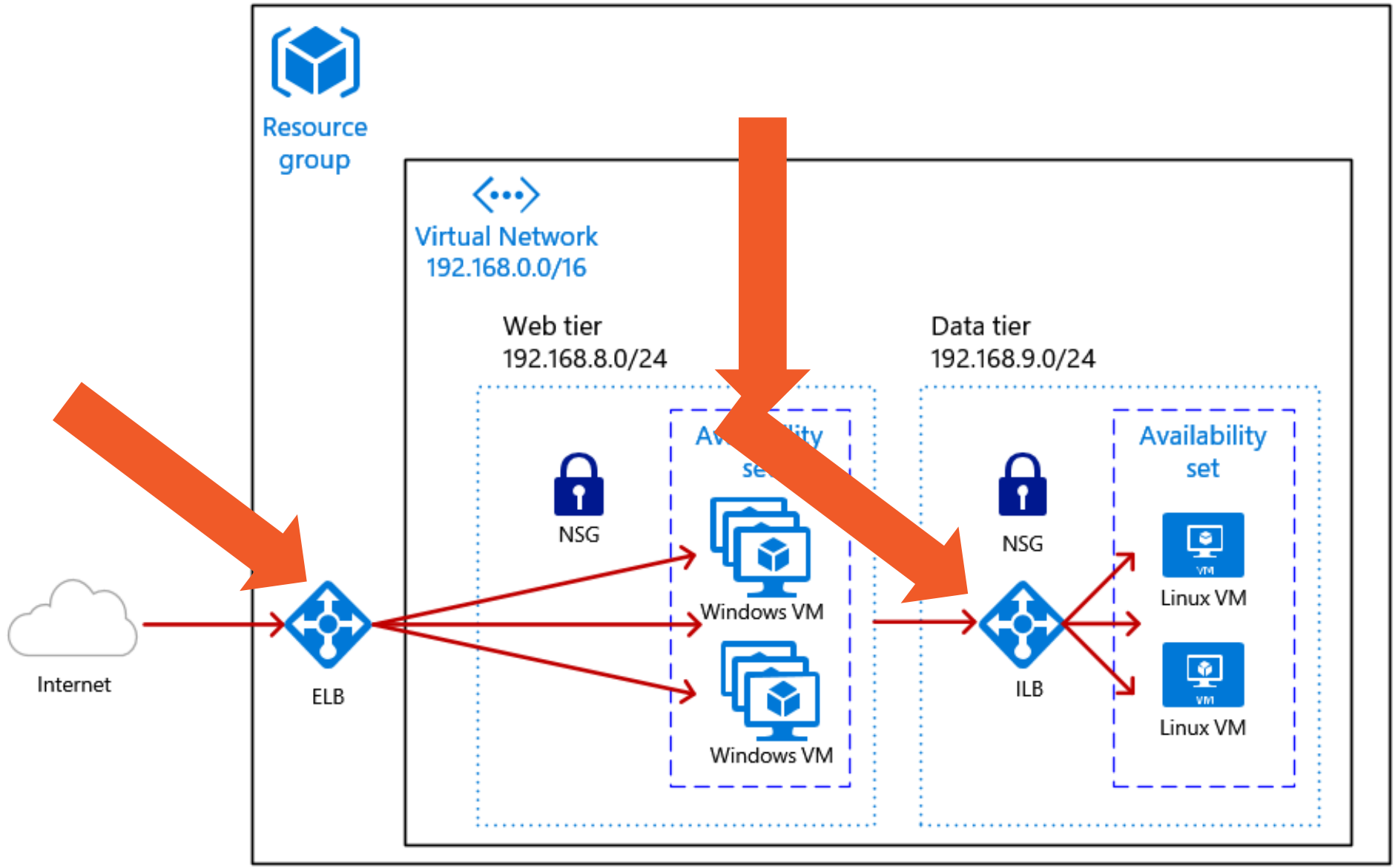
Load balancers

- Internal
- External

Exercise Files



Our Solution



What You Need to Think About to Be Successful

Things to Keep in Mind Regarding Scaling and High Availability

- Group related VMs into availability sets
- Use separate storage accounts for each AS
- Know that AS and SS both incur runtime charges
- Combine a load balancer with availability sets
- Consider Scale Sets for bigger compute jobs
- Premium storage supports single-instance SLA

Availability Sets

Azure Maintenance Events

Planned

The Azure team gives you advance notification

Unplanned

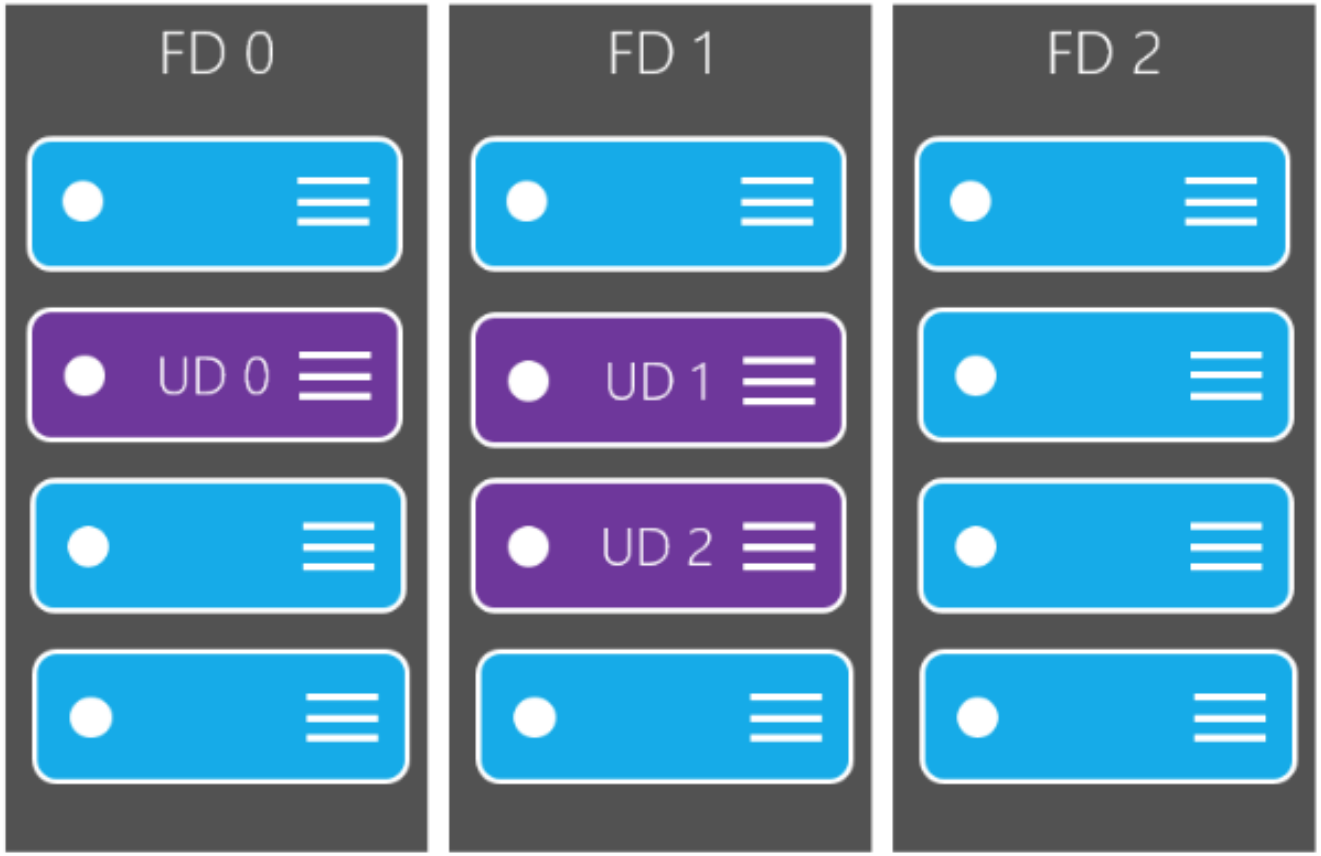
Rack- or datacenter-level failures

Fault and Update Domains

99.95% SLA

Fault domains are VMs that share the same power source and switch

3 fault domains available



Update domains are VMs that share the same hardware host

5-20 update domains available

Place VMs of each app tier into their own availability sets

http://timw.info/fud

Demo

1

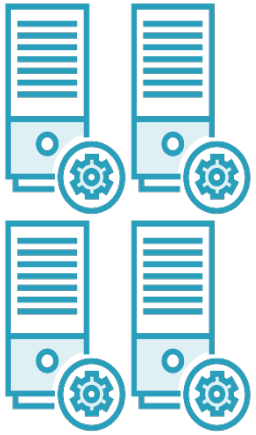
- Stick to the portal
- Create 1 set for web servers
- Another set for database servers
- View properties to show FD, UD

Scale Sets

Virtual Machine Scale Sets

Platform-independent PaaS

Azure App Service is known for elastic autoscaling



Method for:

Deploying and managing Azure VMs as a set

Scalable compute platform

Integrated with:

Azure Load Balancer

Azure Autoscale

Scale Set Use Cases

- Hyperscale workloads
- Stateless web front ends
- Container orchestration
- Microservices clusters

Demo

2

Show portal

Examine instances using Resource Explorer

Show Quickstart Template:

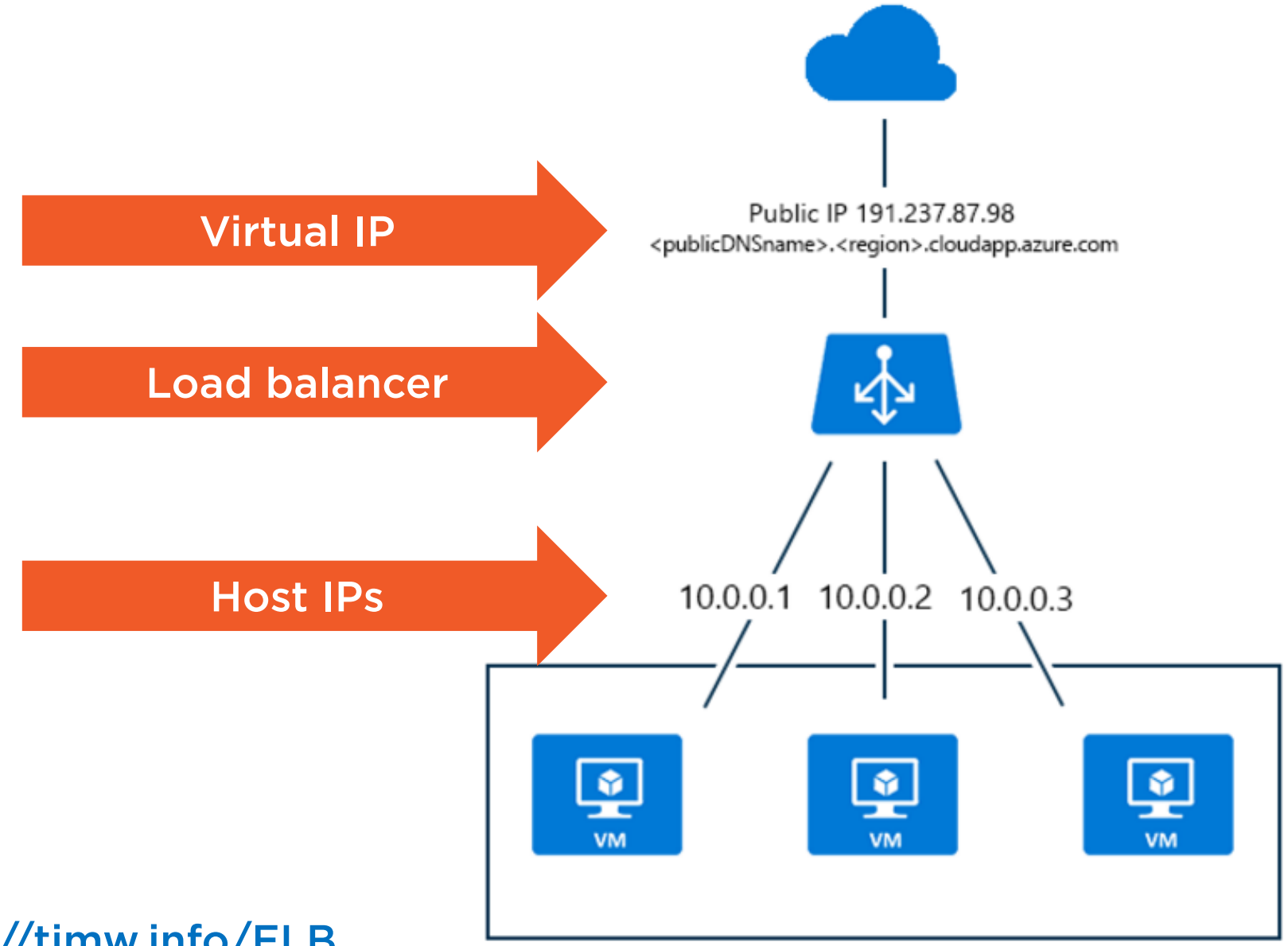
Show visualizer

Show launch in azure button

Put jumpbox on same virtual network and show how you can connect to the instances

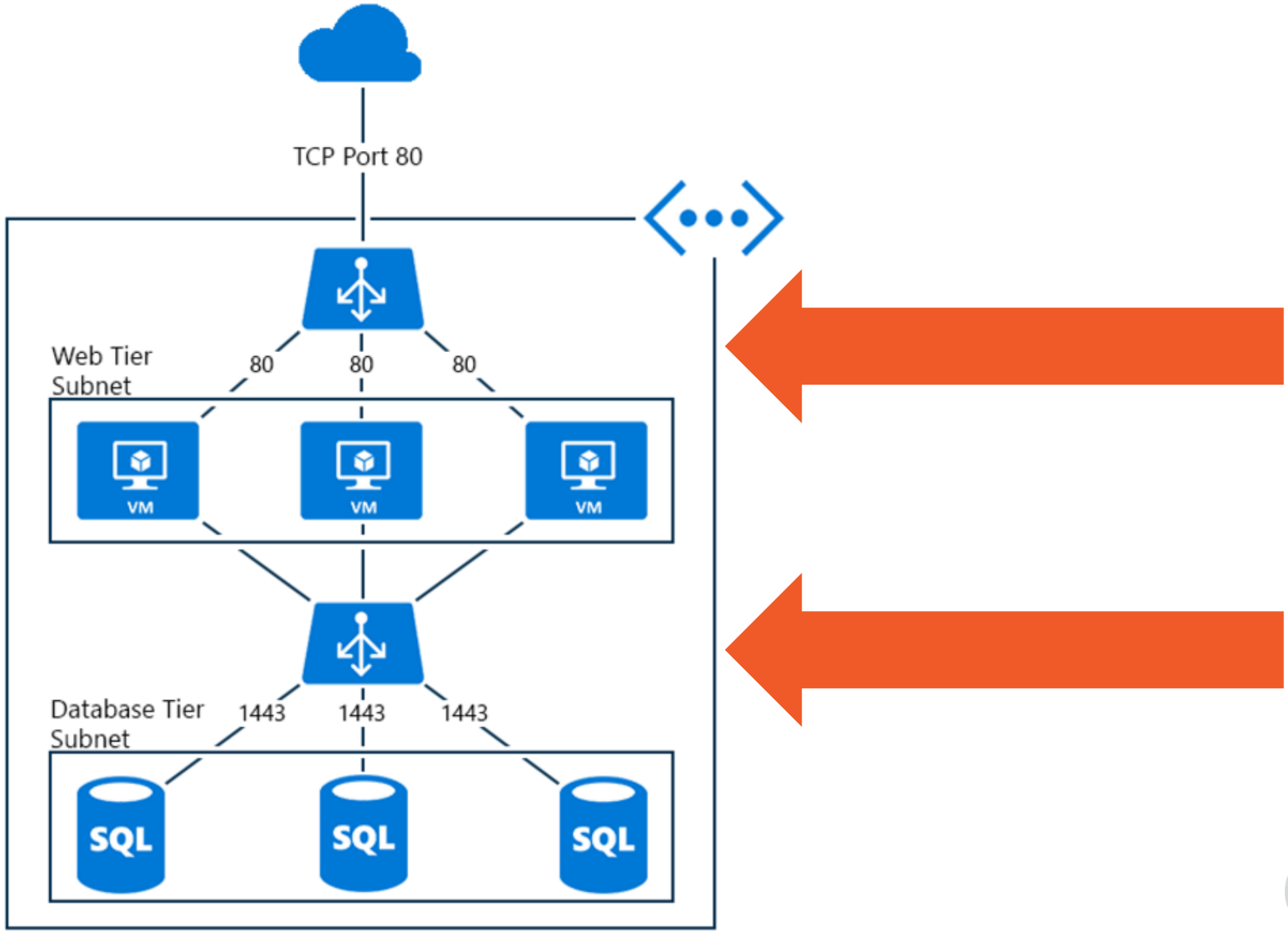
Load Balancers

Azure External Load Balancer



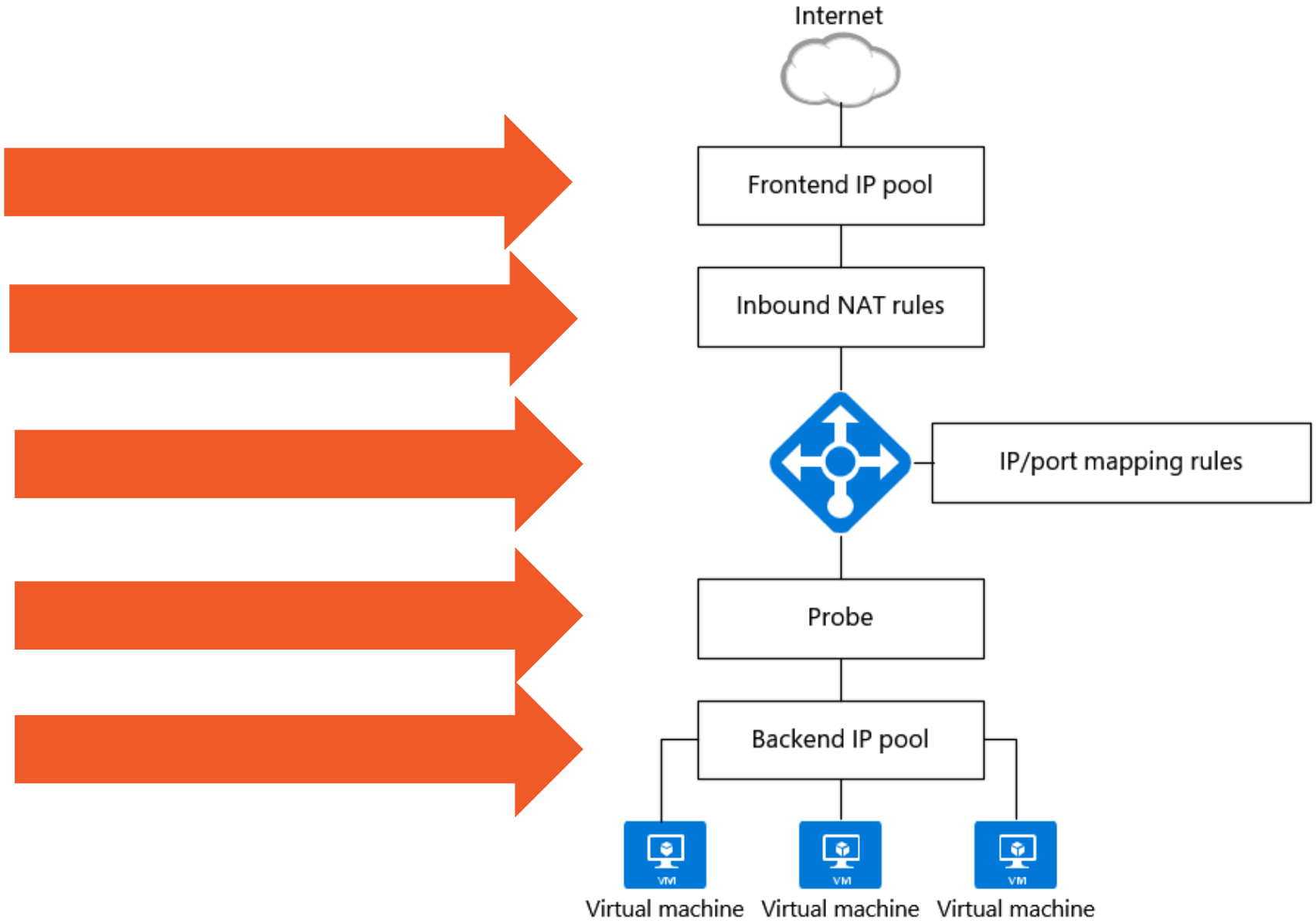
http://timw.info/ELB

Azure Internal Load Balancer



http://timw.info/ILB

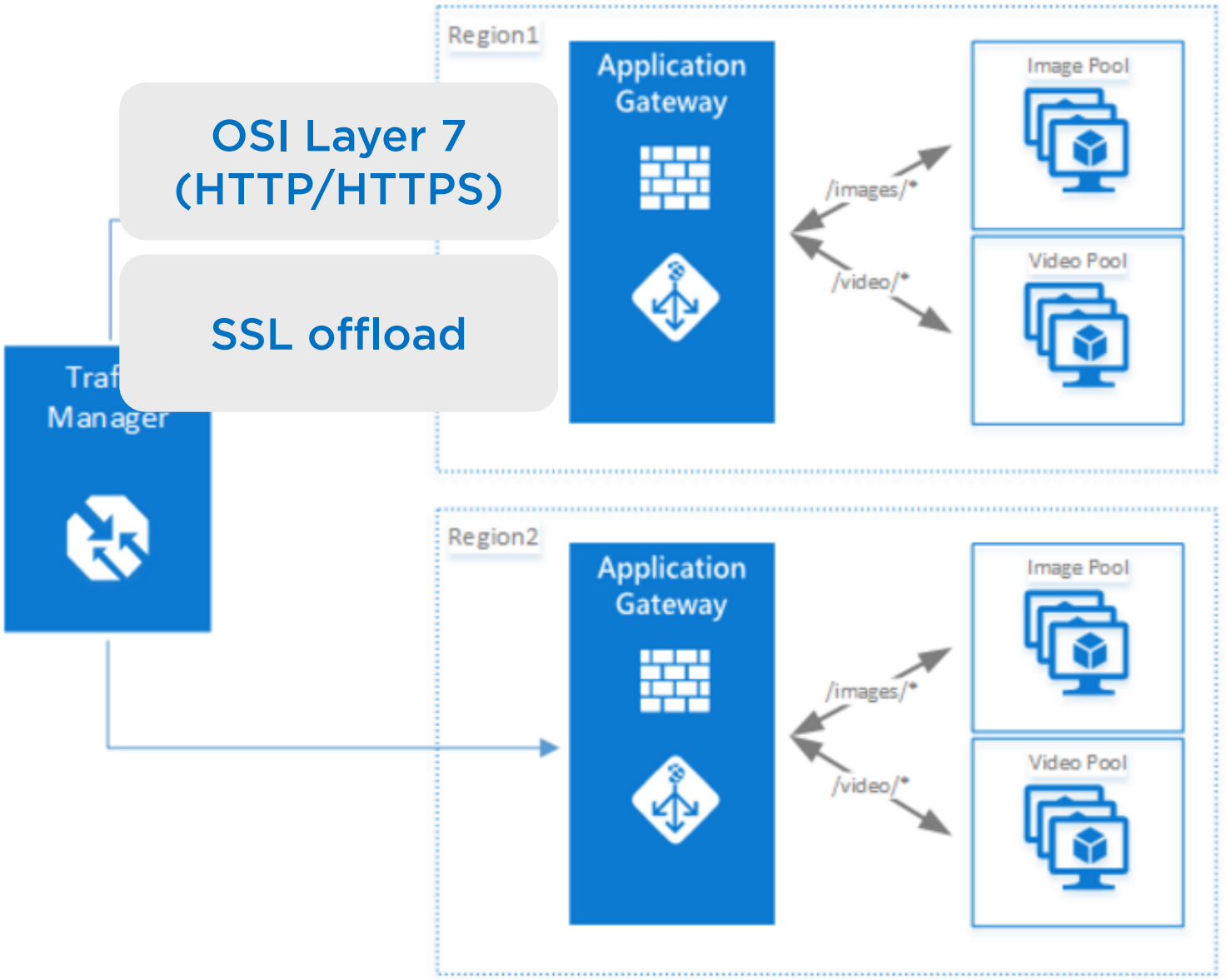
Azure Load Balancer Resources



Other Load Balancing Options

DNS

Geo-distributed services



OSI Layer 7 (HTTP/HTTPS)

SSL offload

Azure LBs work at OSI Layer 4 (TCP/UDP)

Uses 5-tuple hash algorithm

http://timw.info/oo

Demo

3

Deploy external load balancer

- port 80 for VMs
- random port mapping to 3389

Deploy internal load balancer

- port TCP 3306

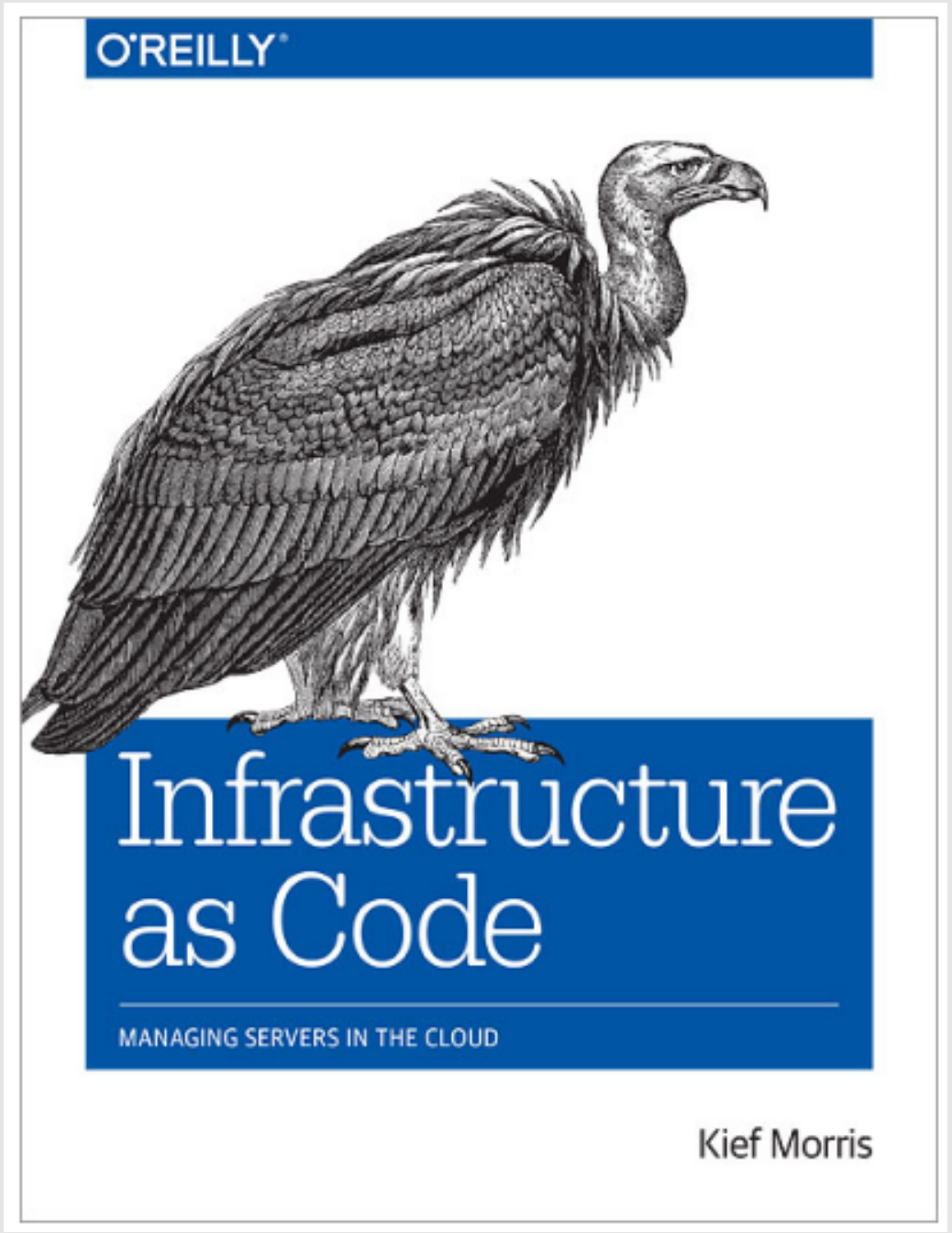
For Further Learning

Architecting and Implementing Azure Networking (John Savill)

See the module "Enabling External Access with Load Balancers and Public IPs"

SQL Server on Microsoft Azure IaaS - Optimizations & High Availability (Mike McKeown)

Uses ASM, but the underlying principles are current



Book Reference

Published June 2016

Great jump start into DevOps and administrative automation (ARM templates)

See Chapter 7, "Patterns for Managing Server Templates"

Summary

High availability is a great example of the "shared responsibility model" of cloud computing

Remember that Azure is an unmanaged cloud service provider

- Don't be afraid to reach out for architectural guidance

Next module: Networking