Disks and Storage

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MVP
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Professional

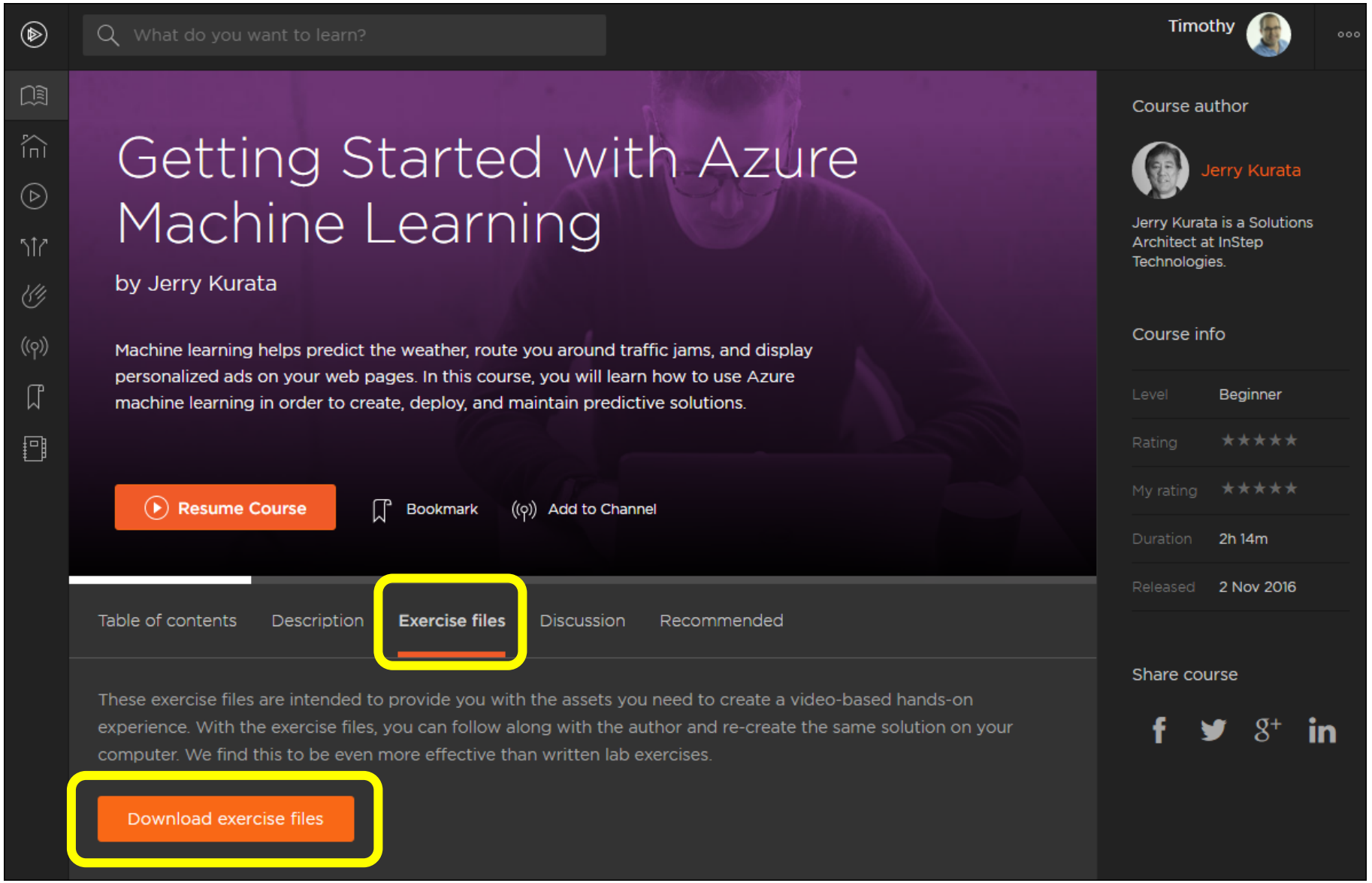
Course at a Glance

- Foundational Concepts
- Virtual Machines
- Disks and Storage
- Inside the VM
- Scaling and High Availability
- Networking
- Security
- Monitoring
- Troubleshooting and Support
- Cost Management
- Managed Disks

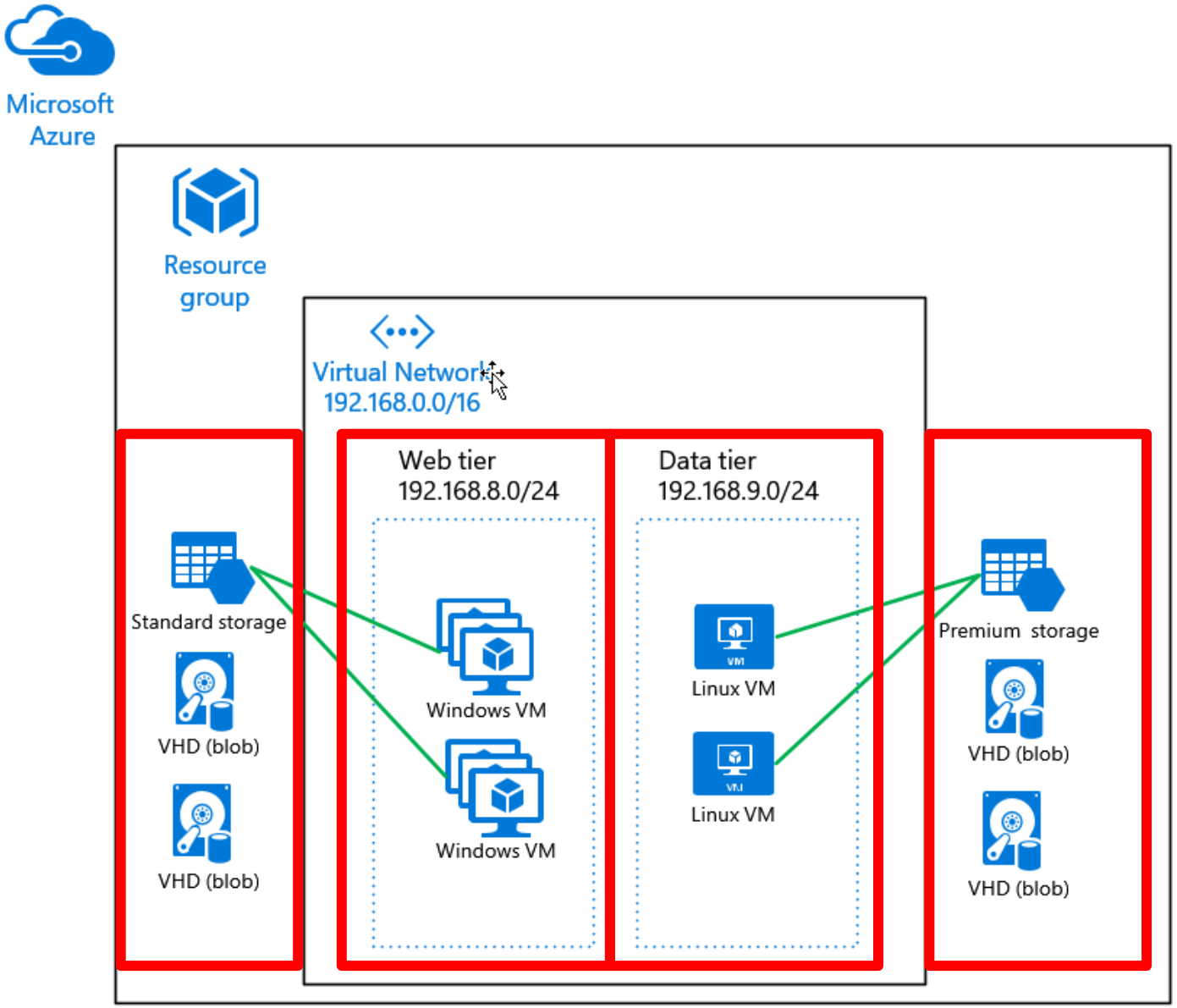
Overview

- What you need to think about to be successful
- Standard vs. premium storage
- Managing OS and data disks
- Capturing OS images

Exercise Files



Our Solution



What You Need to Think About to Be Successful

Things to Keep in Mind Regarding Azure Storage for IaaS VMs

Standard disks cost per transaction and per GB

Azure holds an infinite lease on page blobs

Premium storage supports only LRS

Premium disks aren't charged by transaction

Blob storage namespace is flat

99.9% read/write availability SLA

Azure Storage Types

Azure Storage Types

Blob storage: Unstructured file data

Table storage: NoSQL semi-structured data

Queue storage: Pub/sub messaging data

File storage: SMB file shares

Binary Large Object (Blob)

A collection of binary data stored as a single entity in a storage system. Blobs are typically images, audio or other multimedia objects, or binary executable code. VM VHDs are stored as page blobs.

Replication Options

Locally Redundant Storage (LRS)	3 copies within single data center
Zone-Redundant Storage (ZRS)	3 copies across 2-3 data centers
	Block blobs only; available only during SA creation
Geo-Redundant Storage (GRS)	3 copies in primary region
	3 copies in secondary region
Read-Access Geo-Redundant Storage (RA-GRS)	RO access to secondary region data

Premium storage

Demo

1

Hit pricing page quickly

Show existing storage accounts

Select the azurestorage2 account

Show essentials, settings (esp keys)

Click Open in Explorer and explain the tool

Back to the portal, show blobs

Access policy - explain containers

Show properties - copy URL field

OS and Data Disks

Azure VM Disk Types

OS Disks	Data Disks
Fixed disk VHD files stored as page blobs	D: is a temporary disk that holds pagefile/swapfile
Generation 1	Attached VHD
Registered as SATA	Registered as SCSI
Maximum size 1023 GB (1 TB)	Maximum size 1023 GB

Azure Storage Account Types

Standard	Premium
HDD	SSD
Default for some instance sizes; others use SSD	IOPS values represent expected performance levels
IOPS values represent maximum values	Great for I/O intensive workloads like Dynamics, Exchange Server, SQL Server, SharePoint Server
Can use any redundancy option (Premium is LRS only)	Not available in all Azure regions
	Need a DS-, DSv2-, GS-, or FS-series VM
	Available in 3 sizes (128 GB, 512 GB, or 1024 GB)

Host Caching

None

Default

Disable on IaaS DCs

Good for random I/O

Read only

Write-through

Stored on disk and RAM of host OS

Read/write

Write-back

Stored in memory of host OS

Demo

2

Add data disk to a VM (caching)

Go into VM

- Disk Management
- Storage Spaces, striping,

Capturing OS Images

Demo

3

PowerShell

Explain sysprep and sudo waagent -deprovision+user (SHUT DOWN VM)

Show VHD download

do VHD capture to a container

Create VM from captured image

https://azure.microsoft.com/en-us/resources/templates/101-vm-from-user-image/

Click edit to explain

For Further Learning

Understanding and Using Azure Storage (John Savill)

See the module "Azure IaaS VM Types of Storage"

Windows Azure Storage In-Depth (Alan Smith)

Developer-focused, but contains great info for IT operations pros

Book Reference

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Chapter 3, "Customizing VM Storage"

Summary

Due to the pricing difference, analyze whether you truly need premium storage

Each subscription is allowed 200 storage accounts and 500 TB per account

- Consider isolation requirements

Next module: Inside the VM