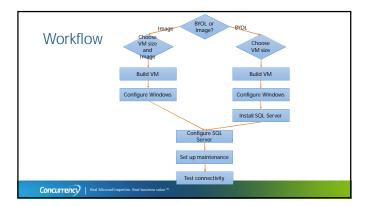
laaS	
Considerations before beginning Concurrence Part Microeff reporting Real business value**	
A bad query is always worth tuning	

Deployment model Service Management – classic (old) Resource Manager Deploy, manage, monitor all related services together Consistent deployment – for example, Dev to QA and QA to Prod Reference: Resource Manager Overview https://azure.microsoft.com/en-us/documentation/articles/resource-group-overview/ Reference: Understanding Resource Manager deployment and classic deployment https://azure.microsoft.com/en-us/documentation/articles/resource-manager-deployment-	
us/documentation/articles/resource-manager-deployment-model/ Concurrence Real Microsoft expertise. Real business value **	
Region	
 Are the services you want available in the region you want? Reference: Services by region https://azure.microsoft.com/en-us/regions/#services 	
Concurrency Real Microsoft expertise. Real business value **	
	1
VM size	
Understand what you need for your workload Minimums for SQL Server Standard - DS2 2 cores	
• 7 GB RAM • 4 d disks @ 6400 max IOPS • Enterprise - DS3 • 4 cores • 14 GB RAM • 8 disks @ 12,800 max IOPS	
Reference: Sizes for virtual machines: https://azure.microsoft.com/en-us/documentation/articles/virtual-machines/ Reference: Virtual Machines Pricing: https://azure.microsoft.com/en-us/pricing/details/virtual-machines/	
CONCURRANCE Deal Microsoft constitue Deal buriness value **	

Storage

- VM size determines max number & speed of disks, regular vs premium storage
- Starts with C: and D:
 - D: is temporary and Microsoft warns to never store anything you want to keep on it!
- You can and should add more disks and stripe them we'll talk about that later
 - o When you do that, you're paying for additional storage

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BYOL Bring Your Own Licensing Concurrency Red Microsoft appetite fixed business value**

Build the VM	
 Reference: Performance best practices for SQL Server in Azure Virtual Machines <a <="" href="https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-sql-server-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/documentation/articles/virtual-machines-us/doc</td><td></td></tr><tr><td>performance-best-practices/ • VM size</td><td></td></tr><tr><td>StorageDisks</td><td></td></tr><tr><td>o I/O
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You will have to enter	
VM Name Size	
Storage account Virtual Network	_
• VII tuai Network	
	-
Concurrency Read Microsoft operative. Read business value "	
	_
Demo	
Bonio	-
Concurrency Real Microsoft operation. Real business value **	

PowerShell Open New-AzureRmVM.ps1 Resource: Create and configure a Windows Virtual Machine with Resource Manager and Azure PowerShell https://azure.microsoft.com/enus/documentation/articles/virtual-machines-ps-create-preconfigure-windows-resource-manager-vms/	
Prep Windows Check power setting Enable Perform volume maintenance tasks, Lock pages in memory (maybe!) Join to domain	
Concurrency Seal Microsoft expertise. Real business value.**	
Create and attach storage • Attach from Portal or PowerShell • Stripe or pool in File & Storage Systems • Add in Disk Management	
Concurrency Real Microsoft expertise. Real business value.**	

Install SQL Server • Mount media, follow your normal checklist • You have a setup checklist, right?! • You choose what features and services are installed • You control service accounts • You can specify data directories Concurrence Med Microsoft apertine. Red basiness value.**	
Images	
Concurrence) Real Microsoft apportise. Real business value **	
Build the VM • Follow the same best practices	
Concurrency Real Microsoft experies: Real business value **	

Name Size Storage Account Virtual Network Connectivity Port Authentication mode Auto patching Auto backups Concurrency Real Macrosoft reportise. Real Desirons violan.**	
Demo Concurrency Real Microsoft coportice Real business value.**	
PowerShell • Same script, different image	
Concurrency Real Microsoft appertise. Real business value. **	

V	V	'inc	OWS	and	SQL	Server	are	insta	lled
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- SQL Server features installed
- Service account used
- Data directories • What if you wanted something different?

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Prep Windows

- Check power setting
- Enable Perform volume maintenance tasks, Lock pages in memory (maybe!)
- Join to domain

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Comparing storage using diskspd

• BYOL – I added two SSD and mirrored

Total IO thread	bytes	į	I/Os	í	MB/s	I/O per s	ı	AvgLat	LatStdDev	ı	file
0 1 2 3	55853056 98484224 59940864 56385536	İ	6818 12022 7317 6883		26.61 46.93 28.56 26.87	3406.65 6006.86 3655.98 3439.13		1.172 0.665 1.092 1.162	4.202 3.216 4.075 4.194	İ	d:\diskspd\io.dat (20GB) d:\diskspd\io.dat (20GB) d:\diskspd\io.dat (20GB) d:\diskspd\io.dat (20GB) d:\diskspd\io.dat (20GB)
total:	278663688	÷	33040	÷	128 97	16508 61		0 968 1	3 847	-	

• Image – I selected IOPS and let Azure handle set-up

Total I thread		- 1	I/Os	1	MB/s	į	I/O per s	i	AvgLat	i	LatStdDev	file	
0 1 2 3	9583	6768 5392 6544 3360	700- 1160: 698; 720:	į	27.32 45.25 27.23 28.10	Ì	3497.04 5792.29 3486.06 3597.40	I	1.143 0.690 1.147 1.112	Ï	3.196 4.043	d:\diskspd\io.da d:\diskspd\io.da d:\diskspd\io.da d:\diskspd\io.da	(20GB t (20GB
total:	26863	2064	32792	2	127.91	i	16372.80	ī	0.977	ï	3.768		

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Concurrency Real Microsoft apertice. Real business value.**	 Set up and schedule maintenance 	
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	Concurrency Real Microsoft expertise. Real business value.**	

Yes, you still need to do maintenance!	
Backups	
BYOL Recommend backup to Azure blob storage COL Sowner became allow you to get out a backup.	
SQL Server Images does allow you to set auto-backups Uses SQL Server Managed Backup in the background Backup to Anyue block storage.	
Backs up to Azure blob storage CHECKDB	
• Indexes/Statistics	
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	1
Tools for maintenance	
10013 for maintenance	
Maintenance PlansT-SQL scripts	
• 3 rd party tools	
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]
Connectivity	
Connect applications to the new server	
 In the same vnet? Specify server name and integrated security in the connection string. Over the internet? 	
Open TCP ports in Windows Firewall Configure SQL Server to listen on TCP Configure mixed mode authentication	
Configure a Network Security Group inbound rule for port 1433 Configure DNS name Verity connectivity	
Resource: Connect to a SQL Server Virtual Machine on Azure (Resource Manager) https://azure.microsoft.com/en-us/documentation/articles/virtual-machines-sql-server-connectivity-	
ùs/documentatiŏn/árticles/virtual-machines-sql-server-connectivity- resource-manager/	
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Set	u	o H	łA/	'DI	R
	- 1				

- Azure options like Availability Sets only protect the Windows VM
- No HA or DR for your databases!

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HA/DR options HA Azure VMs – same region Availability Groups Yes Database Mirroring Yes Failover Cluster Instances Yes – with caveats DR Hybrid – On-prem to Azure Azure VMs – same region Azure Availability Groups Yes Yes Yes Yes Yes Yes

Backup/restore Yes Yes Yes
Log shipping Yes Yes Yes
Yes

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Availability Groups

- All servers in the AG have to be in the same resource group
- You have to create a WSFC and set a static IP address
- In order to have a listener, you have to create an Internal Load Balancer to create a load-balanced endpoint
- Resource: 3 Keys to Configuring Azure Virtual Machines for Use in SQL Server Availability Groups http://www.concurrency.com/blog/w/3-keys-to-configuring-azure-virtual-machines-for-u

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Failover Cluster Instances Azure doesn't support shared storage Option 1: use SIOS DataKeeper, a 3 rd party utility Uses synchronous data replication between two storage volumes Option 2: remote iSCSI Target shared block storage via ExpressRoute Concurrency Red Monocol toperfore Peal Ecologica value **	
Moving data into the database • No easy button • Back up and restore a database • Create an SSIS package to move the schema and/or data • Export and import a Data-tier Application (DACPAC)	
Changing VM size	

FAQ	
Can I upgrade or downgrade?	
o Yes!	
Is it an online operation?Yes!	
 How long does it take? It depends 	
• How?	
o Portal o PowerShell	
CONCLITYENC) Neal Microsoft repertise. Real Equations value. **	
PowerShell	
Open Change Azure vm size.ps1	
	-
Concurrency Real Microsoft operfise. Real Equipment value.**	
Г	1
Ctanning the V/V	
Stopping the VM	
Concurrency Real Microsoft expertise. Real business value **	

When	do	you	get	char	aed?

- "If the status says "Stopped (Deallocated)," you're not being billed. If it says "Stopped Allocated," you're still being billed for allocated virtual cores (not the software license itself)."
- virtual cores (not the software license itself)."

 *To ensure you're not being billed, always stop virtual machines from the management portal. You can also stop the VM through Powershell by calling ShutdownRoleOperation with "PostShutdownAction" equal to "StoppedDeallocated". If you shut down a VM from inside (using Windows power options) or through PowerShell by calling ShutdownRoleOperation with "PostShutdownAction" equal to "Stopped"."
- https://azure.microsoft.com/en-us/pricing/details/virtual-machines/

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BYOL or Image?

- Which will be more cost-effective? • This is a question I can't answer!
- How much control do you want over SQL Server setup? • Hint: PowerShell helps a lot!

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