



Session 06

Azure IaaS

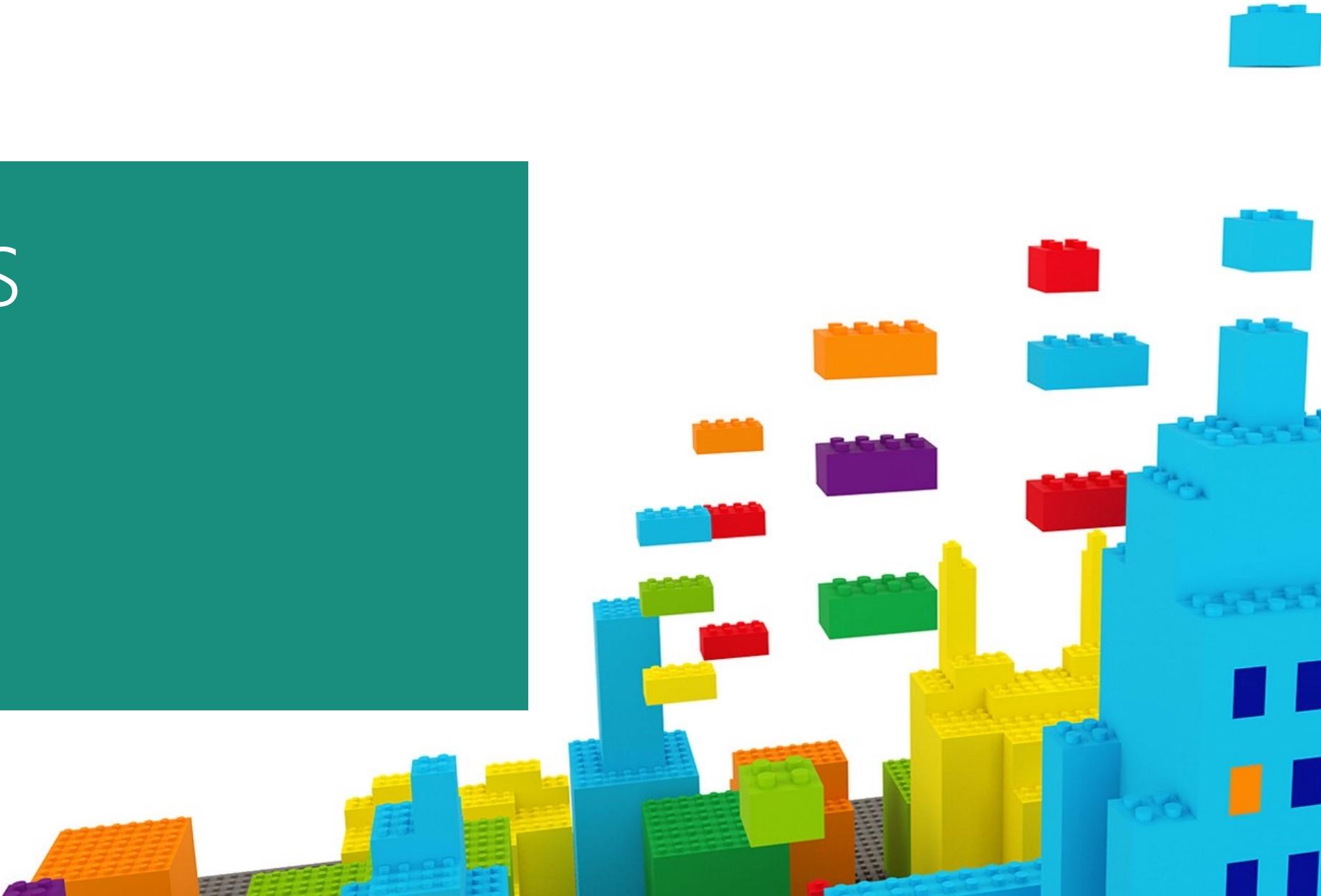
Anton Boyko
Microsoft Regional Director
Microsoft Azure MVP
me@boykoant.pro



Housekeeping

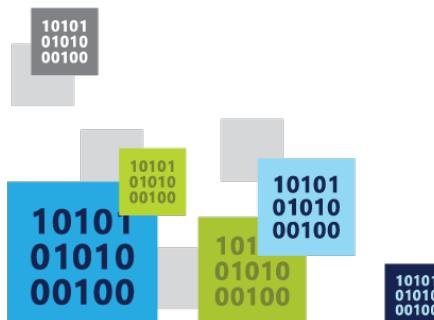
- Please keep yourself muted unless you are participating in the conversation, so we can have a more clear recording.
- If you have questions – don't hesitate and ask.

Azure VMs



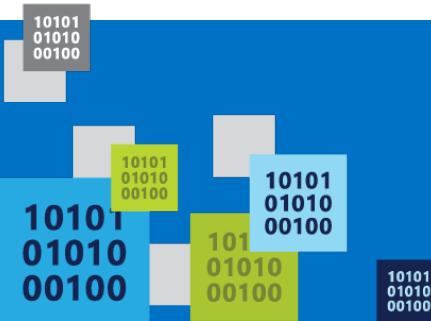
Azure Virtual Machines

- Launch Windows Server and Linux in minutes
- Scale from 1 to 1000s of VM Instances
- Save money with per-minute billing
- Open and extensible



Virtual Machine Sizes

- General Purpose compute: **Basic**
- General Purpose compute: **Standard**
- Optimized Compute
- Performance Optimized
- Network Optimized



BS

- **Burstable CPU**

Instance	Core(s)	RAM	Temporary storage	Pay as you go	1 year reserved	3 year reserved
B1ls	1	0.5 GiB	4 GiB	\$4.3800/month	\$2.5842/month	\$1.6425/month
					~41% savings	~62% savings
B1s	1	1 GiB	4 GiB	\$8.7600/month	\$5.0808/month	\$3.3069/month
					~42% savings	~62% savings
B1ms	1	2 GiB	4 GiB	\$17.5200/month	\$10.2492/month	\$6.5846/month
					~41% savings	~62% savings
B2s	2	4 GiB	8 GiB	\$35.0400/month	\$20.4984/month	\$13.1911/month
					~41% savings	~62% savings
B2ms	2	8 GiB	16 GiB	\$70.0800/month	\$40.9968/month	\$26.3895/month
					~41% savings	~62% savings
B4ms	4	16 GiB	32 GiB	\$140.1600/month	\$82.0009/month	\$52.7790/month
					~41% savings	~62% savings
B8ms	8	32 GiB	64 GiB	\$280.3200/month	\$164.0018/month	\$105.5288/month
					~41% savings	~62% savings
B12ms	12	48 GiB	96 GiB	\$420.4800/month	\$246.0830/month	\$158.3078/month
					~41% savings	~62% savings
B16ms	16	64 GiB	128 GiB	\$560.6400/month	\$328.0839/month	\$211.0868/month
					~41% savings	~62% savings
B20ms	20	80 GiB	160 GiB	\$700.8000/month	\$410.0848/month	\$263.8366/month
					~41% savings	~62% savings

Av2

- General purpose VM
- Performance baseline

Instance	Core(s)	RAM	Temporary storage	Pay as you go	1 year reserved	3 year reserved	Spot
A1 v2	1	2 GiB	10 GiB	\$29.9300/month	--	--	\$5.5217/month ~81% savings
A2 v2	2	4 GiB	20 GiB	\$63.5100/month	--	--	\$11.7180/month ~81% savings
A2m v2	2	16 GiB	20 GiB	\$90.5200/month	--	--	\$16.7009/month ~81% savings
A4 v2	4	8 GiB	40 GiB	\$133.5900/month	--	--	\$24.6477/month ~81% savings
A4m v2	4	32 GiB	40 GiB	\$189.8000/month	--	--	\$35.0181/month ~81% savings
A8 v2	8	16 GiB	80 GiB	\$279.5900/month	--	--	\$51.5847/month ~81% savings
A8m v2	8	64 GiB	80 GiB	\$398.5800/month	--	--	\$73.5380/month ~81% savings

Das

- 3rd Gen AMD EPYCTM 7763v (Milan)
- No local temp storage

Instance	vCPUs	RAM	Temporary storage	Pay as you go	1 year reserved	3 year reserved	Spot
D2as v5	2	8 GiB	0 GiB	\$75.9200/month	\$44.8366/month ~40% savings	\$28.8642/month ~61% savings	\$7.5920/month ~89% savings
D4as v5	4	16 GiB	0 GiB	\$151.8400/month	\$89.5856/month ~41% savings	\$57.6919/month ~62% savings	\$15.1840/month ~89% savings
D8as v5	8	32 GiB	0 GiB	\$303.6800/month	\$179.1639/month ~41% savings	\$115.3911/month ~62% savings	\$30.3680/month ~89% savings
D16as v5	16	64 GiB	0 GiB	\$607.3600/month	\$358.3351/month ~41% savings	\$230.8041/month ~61% savings	\$60.7360/month ~89% savings
D32as v5	32	128 GiB	0 GiB	\$1,214.7200/month	\$716.6702/month ~41% savings	\$461.5863/month ~62% savings	\$121.4720/month ~89% savings
D48as v5	48	192 GiB	0 GiB	\$1,822.0800/month	\$1,074.9980/month ~41% savings	\$692.3904/month ~62% savings	\$182.2080/month ~90% savings
D64as v5	64	256 GiB	0 GiB	\$2,429.4400/month	\$1,433.3331/month ~41% savings	\$923.1945/month ~61% savings	\$242.9440/month ~89% savings
D96as v5	96	384 GiB	0 GiB	\$3,644.1600/month	\$2,150.0836/month ~40% savings	\$1,384.7808/month ~62% savings	\$364.4160/month ~90% savings

Dads

- 3rd Gen AMD EPYCTM 7763v (Milan)
- With local temp storage

Instance	vCPU(s)	RAM	Temporary storage	Pay as you go	1 year reserved	3 year reserved	Spot
D2ads v5	2	8 GiB	75 GiB	\$91.2500/month	\$53.8302/month ~41% savings	\$34.6677/month ~62% savings	\$9.1250/month ~90% savings
D4ads v5	4	16 GiB	150 GiB	\$182.5000/month	\$107.6677/month ~41% savings	\$69.3646/month ~61% savings	\$18.2500/month ~90% savings
D8ads v5	8	32 GiB	300 GiB	\$365.0000/month	\$215.3354/month ~41% savings	\$138.6927/month ~62% savings	\$36.5000/month ~90% savings
D16ads v5	16	64 GiB	600 GiB	\$730.0000/month	\$430.6635/month ~41% savings	\$277.3854/month ~62% savings	\$73.0000/month ~90% savings
D32ads v5	32	128 GiB	1,200 GiB	\$1,460.0000/month	\$861.4146/month ~40% savings	\$554.8073/month ~61% savings	\$146.0000/month ~90% savings
D48ads v5	48	192 GiB	1,800 GiB	\$2,190.0000/month	\$1,292.0854/month ~41% savings	\$832.1927/month ~62% savings	\$219.0000/month ~90% savings
D64ads v5	64	256 GiB	2,400 GiB	\$2,920.0000/month	\$1,722.8365/month ~40% savings	\$1,109.6146/month ~61% savings	\$292.0000/month ~90% savings
D96ads v5	96	384 GiB	3,600 GiB	\$4,380.0000/month	\$2,584.1635/month ~41% savings	\$1,664.3854/month ~62% savings	\$438.0000/month ~90% savings

FS

- Intel Xeon Platinum 8272CL
- Intel Xeon Platinum 8168 (Skylake)

Instance	vCPU(s)	RAM	Temporary storage	Pay as you go	1 year reserved	3 year reserved	Spot
F2s v2	2	4 GiB	16 GiB	\$70.8100/month	\$41.9166/month ~40% savings	\$25.5573/month ~63% savings	\$7.8030/month ~88% savings
F4s v2	4	8 GiB	32 GiB	\$141.6200/month	\$83.9135/month ~40% savings	\$51.1146/month ~63% savings	\$15.6067/month ~88% savings
F8s v2	8	16 GiB	64 GiB	\$283.2400/month	\$167.7467/month ~40% savings	\$102.1927/month ~63% savings	\$31.2133/month ~88% savings
F16s v2	16	32 GiB	128 GiB	\$566.4800/month	\$335.5007/month ~40% savings	\$204.3854/month ~63% savings	\$62.4259/month ~88% savings
F32s v2	32	64 GiB	256 GiB	\$1,132.9600/month	\$671.0817/month ~40% savings	\$408.7781/month ~63% savings	\$124.8519/month ~88% savings
F48s v2	48	96 GiB	384 GiB	\$1,699.4400/month	\$1,006.5824/month ~40% savings	\$613.1635/month ~63% savings	\$187.2786/month ~88% savings
F64s v2	64	128 GiB	512 GiB	\$2,265.9200/month	\$1,342.1634/month ~40% savings	\$817.5562/month ~63% savings	\$249.7045/month ~88% savings
F72s v2	72	144 GiB	576 GiB	\$2,549.1600/month	\$1,509.9174/month ~40% savings	\$919.7489/month ~63% savings	\$280.9171/month ~88% savings

DEMO

Creating a VM

VM Extensions

- Installable components to customize VM instances
- Enable various DevOps scenarios
- Can be added, updated, disabled or removed at any time
- Managed via portal, PowerShell and Management APIs

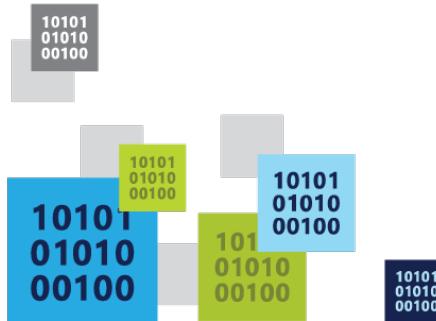


DEMO

Adding an extension
to a VM instance

Data Persistence

- Data Disks
- Azure Files



OS Images

- Microsoft
- Partner
- User



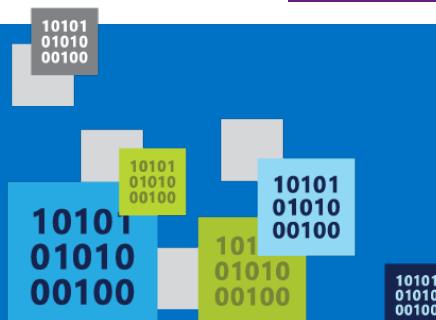
Base OS image for new Virtual Machines
Sys-Prepped/Generalized/Read Only
Created by uploading or by capture

Disks

- OS Disks
- Data Disks



Writable Disks for Virtual Machines
Created during VM creation or during upload of existing VHDs.



Disks and Images

VM disk layout

OS Disk

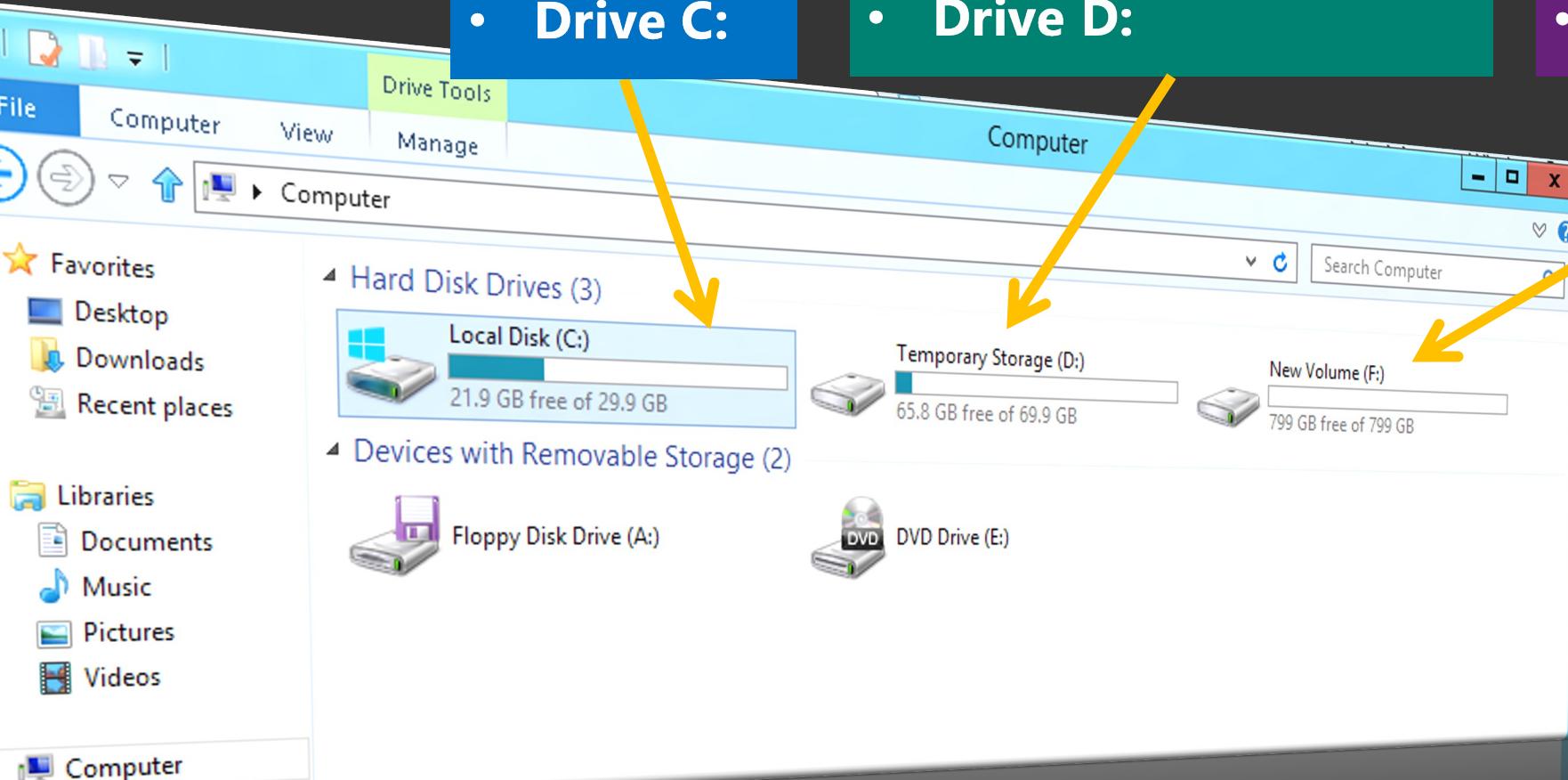
- Persistent
- SATA
- **Drive C:**

Temporary Storage Disk

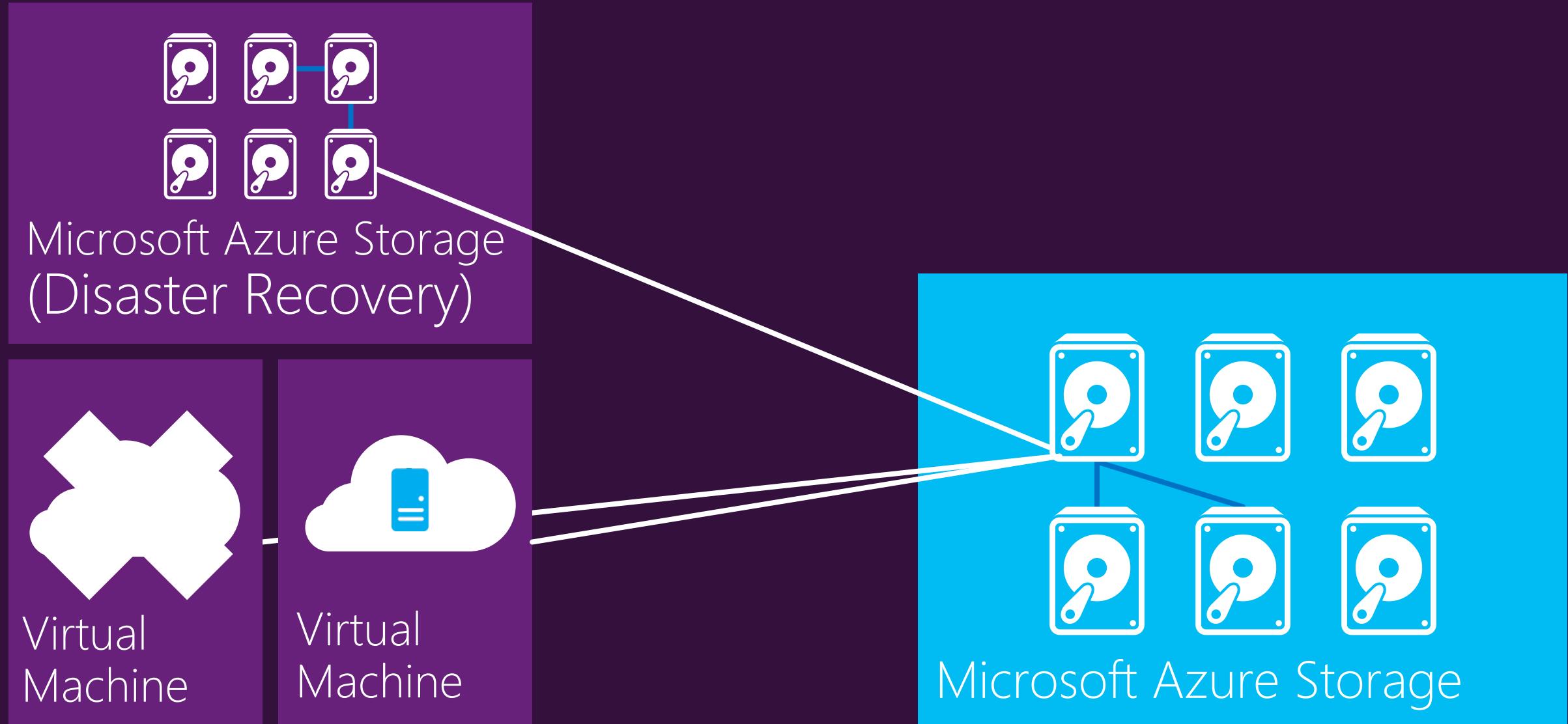
- Local (Not Persistent)
- SATA
- **Drive D:**

Data Disk(s)

- Persistent
- SCSI
- **Customer Defined Letter**

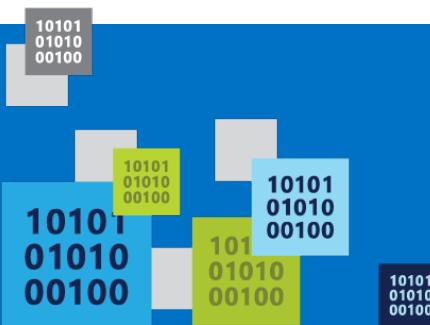
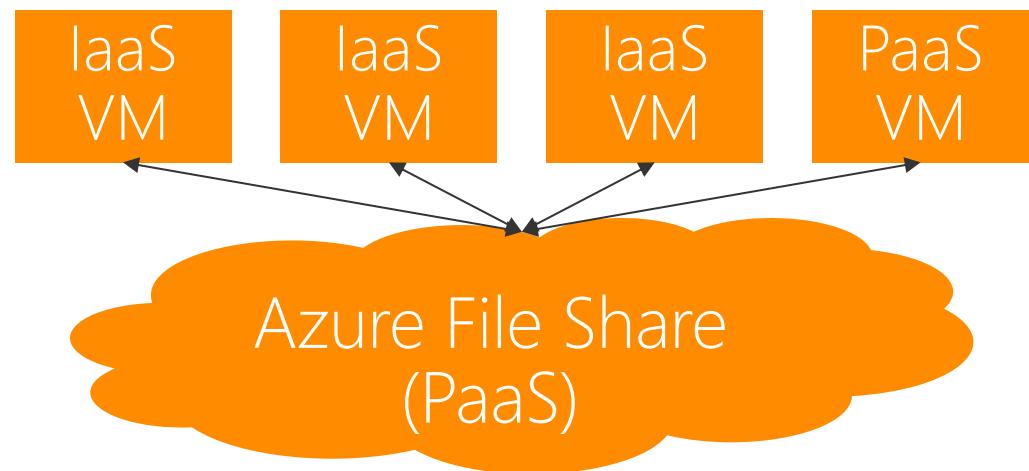


Persistent Disks and Highly Durable



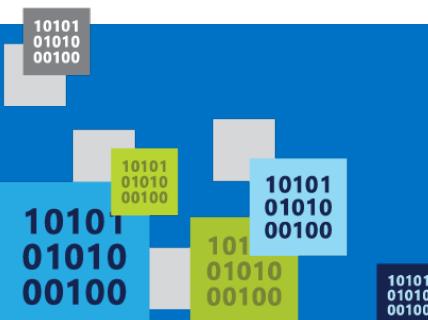
Azure Files

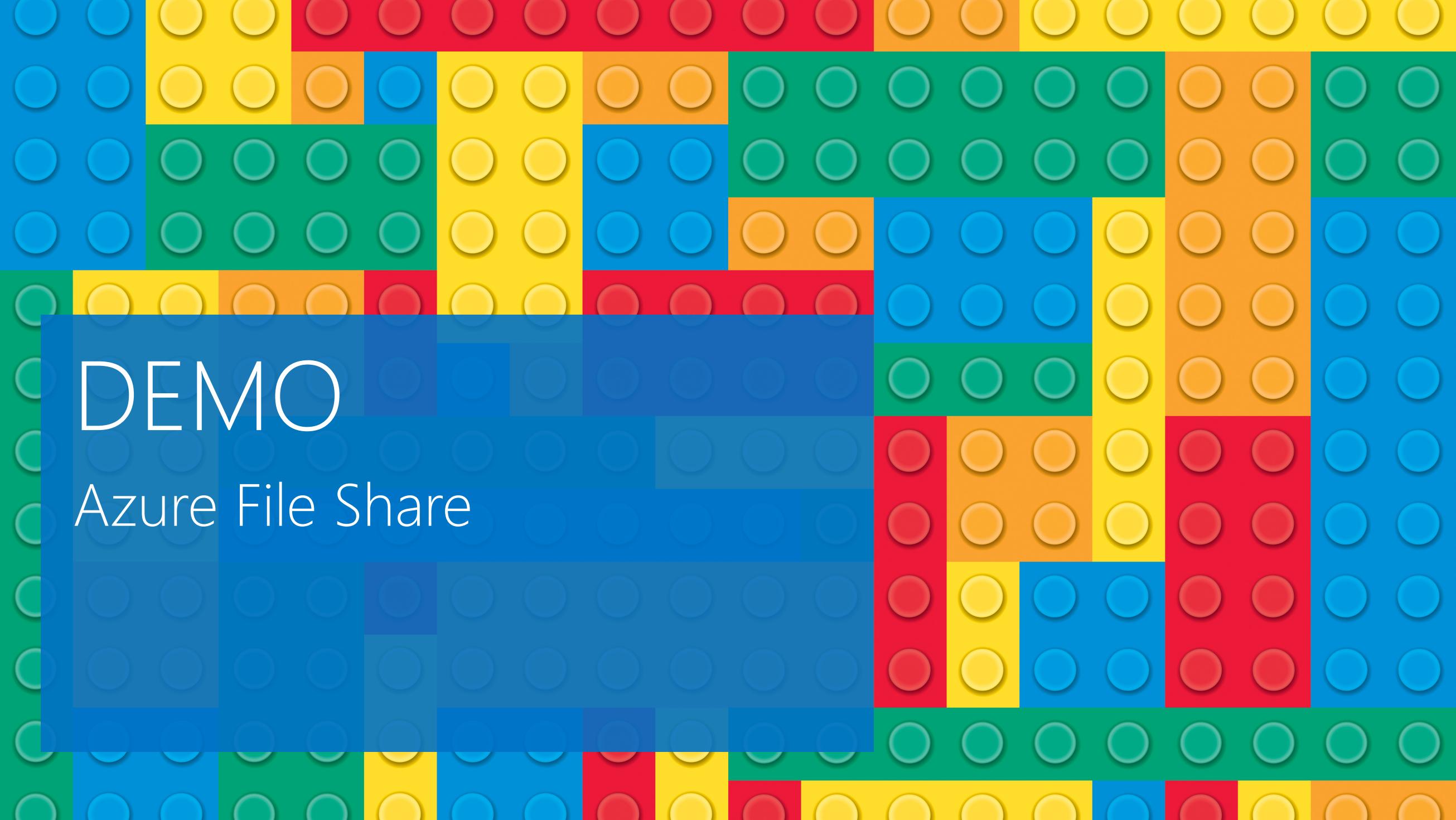
- Shared Network File Storage for Azure
- Availability, durability, scalability are managed automatically
- Supports two interfaces: SMB and REST



Azure Files Scenarios

- Share data across VMs and applications
 - Multiple writers, multiple readers using standard file system semantics.
- Share settings throughout services
 - VMs can read settings and files from a common, shared location. These can be updated externally via REST.
- Dev/Test/Debug
 - Very useful to have a shared location for installing applications, setting up VMs, running tools, and keeping notes while developing, testing, and debugging cloud services.





DEMO

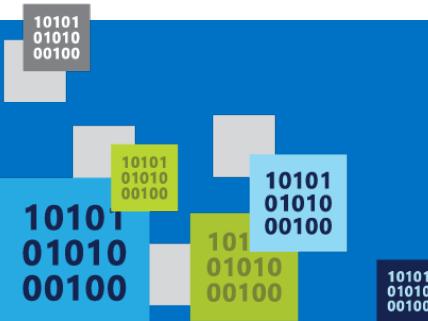
Azure File Share

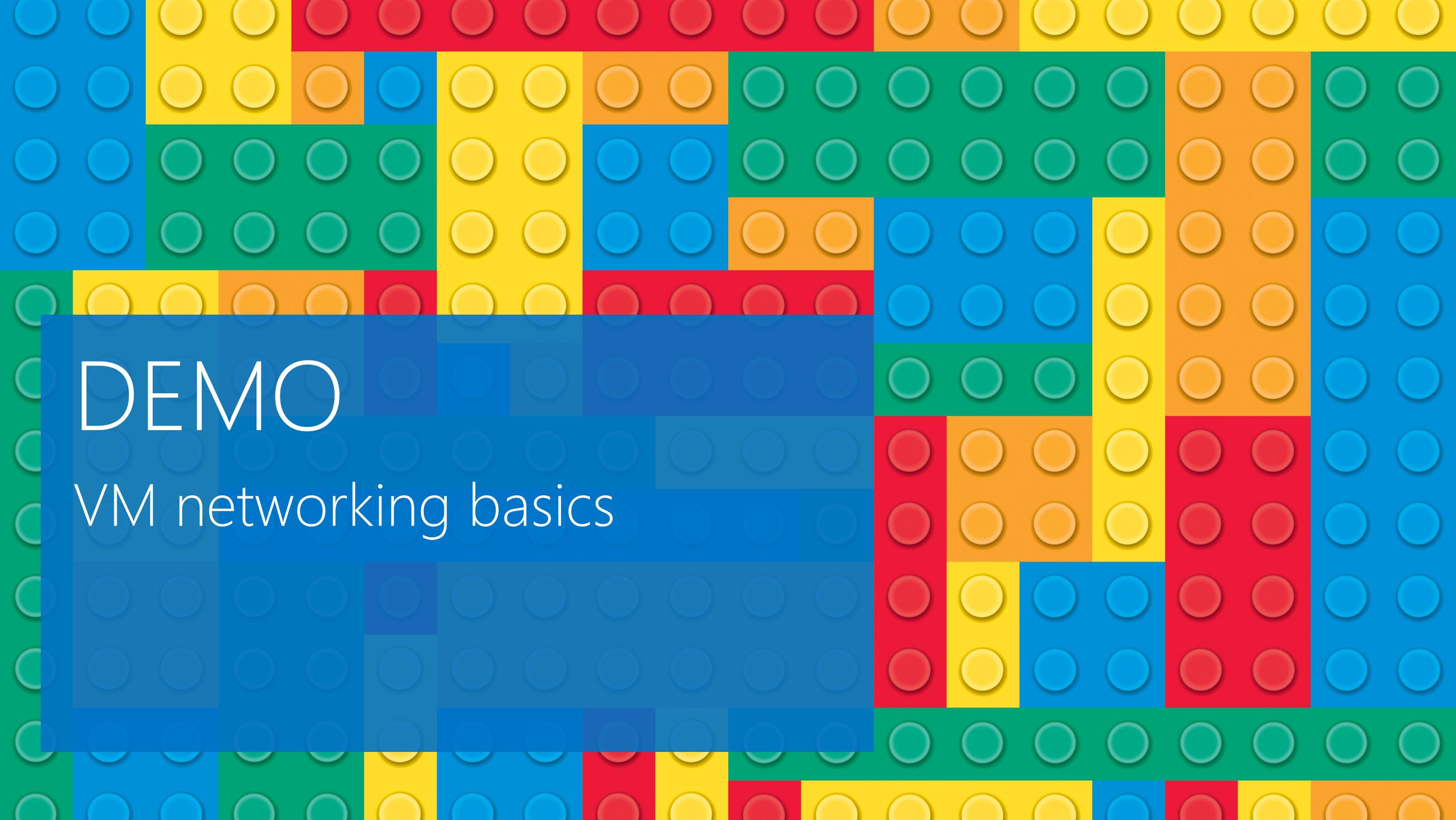
Azure VNets



Azure Virtual Networks

- A protected private virtual network in cloud
- Extend enterprise networks into Azure
- Cross-premises connectivity





DEMO

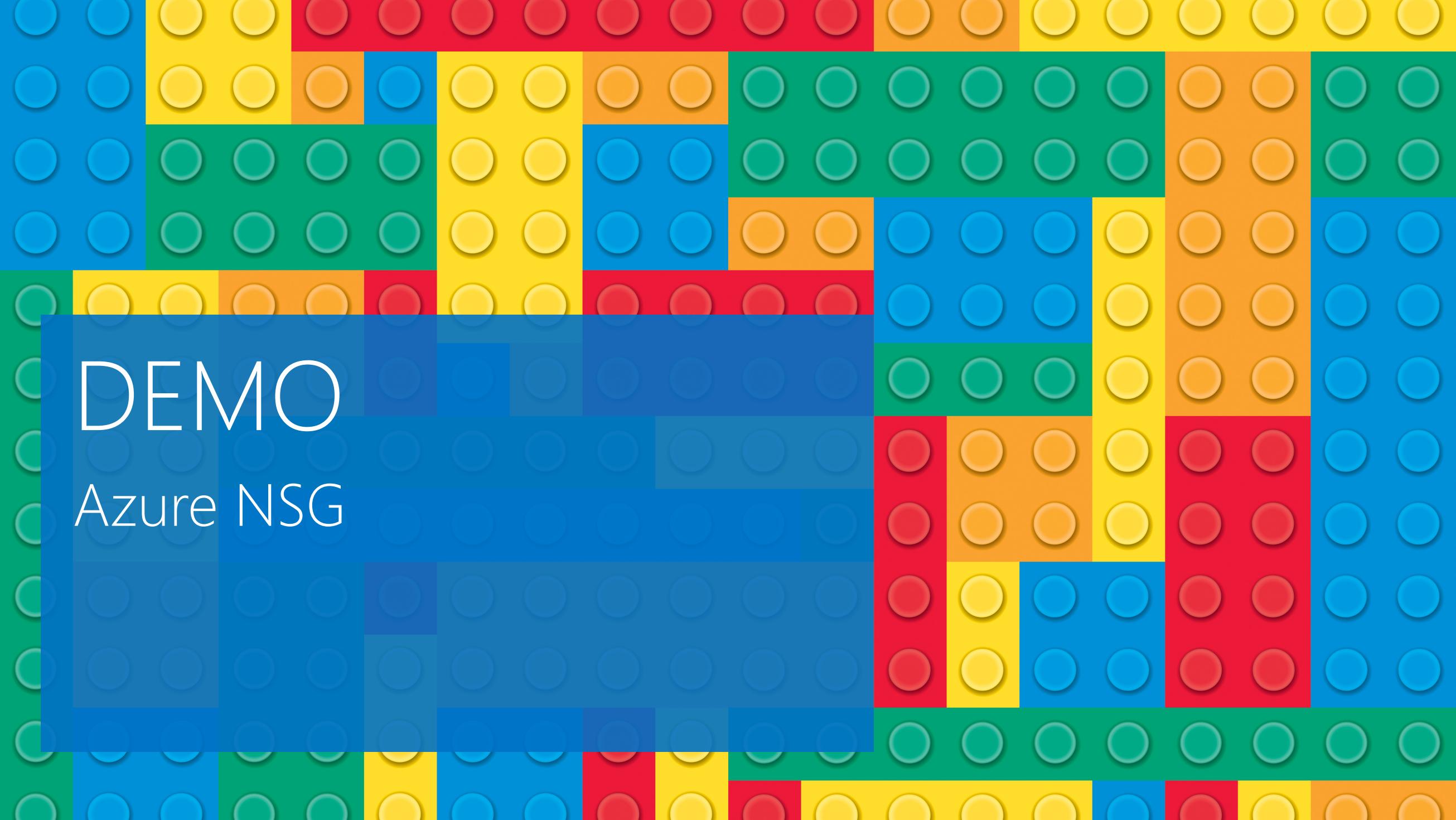
VM networking basics

Virtual Network Scenarios

- Hybrid Public/Private Cloud
Enterprise app in Microsoft Azure requiring connectivity to on-premise resources
- Enterprise Identity and Access Control
Manage identity and access control with on-premise resources (on-premises Active Directory)
- Monitoring and Management
Remote monitoring and trouble-shooting of resources running in Azure
- Advanced Connectivity Requirements
Cloud deployments requiring IP addresses and direct connectivity across services

Cross-premises Connectivity

- Site-to-site
 - Create a secure connection between your on-premises site and your virtual network
- Point-to-site
 - Create a secure connection via VPN to your virtual network
- ExpressRoute™
 - Create a private connection between Azure data centers and infrastructures on your premises or in a co-location environment.
 - Connect at an ExpressRoute location (Exchange Provider facility)
 - Direct connect via a Network Service Provider



DEMO

Azure NSG

Questions?



Homework

Do (1)

- Create new resource group in West Europe (name it build-agents-01).
- Create Virtual Network (build-agents-vnet) with 2 subnets (agents-subnet and jumpbox-subnet).
- Create 3 Ubuntu VMs (name them agent-01, agent-02, agent-03), place them in agents-subnet. Install both Azure DevOps and GitHub build agents on every VM. Block all incoming connections to those VMs, allow any outgoing connections.

Do (2)

- Create Windows VM (name it jumpbox-01), place it in jumpbox-subnet. Allow incoming RDP connections, allow any outgoing connections. Use this VM as a jumpbox to connect to Linux VMs.
- For all VMs configure automatic shutdown at 1AM UTC.
- For all Linux VMs configure public DNS names.
- For Windows VM use reserved IP address.

Deadline

Recommended – by the end of the day 19.08.2022



Maximum – by the end of the day 26.08.2022

