Azure Local

Lukáš Bašnák
Alanata a.s.

Agenda

Čo je Azure Local
Funkcie Azure Local
Licencovanie
Dell riešenie pre Azure Local
Ukážka prostredia
Q & A

Alanata
Technology Meets Business

Business požiadavky

Distribuovaná infraštruktúra

- Jednotný a flexibilný prístup k technológiám
- Zjednodušenie infraštruktúrnych operácií
- Urýchliť proces inovácie
- Spojiť cloud a lokálnu infraštruktúru (EDGE)

Azure Local

Čo je Azure Local?

- On-premises hyperkonvergovaná virtualizačná platforma s možnosťou hybridného prepojenia s Azure
- V minulosti Azure Stack HCI
- Nie je rozšírením datacentra v Azure (Azure Stack HUB)

Azure Local

Čo je Azure Local?

- **Rozširuje Azure služby na on-prem infraštruktúre**

Azure Local

Čo je Azure Local?

- Rozširuje Azure služby na on-prem infraštruktúre
- **Lokálny beh tradičných a moderných aplikácií**

Azure Local

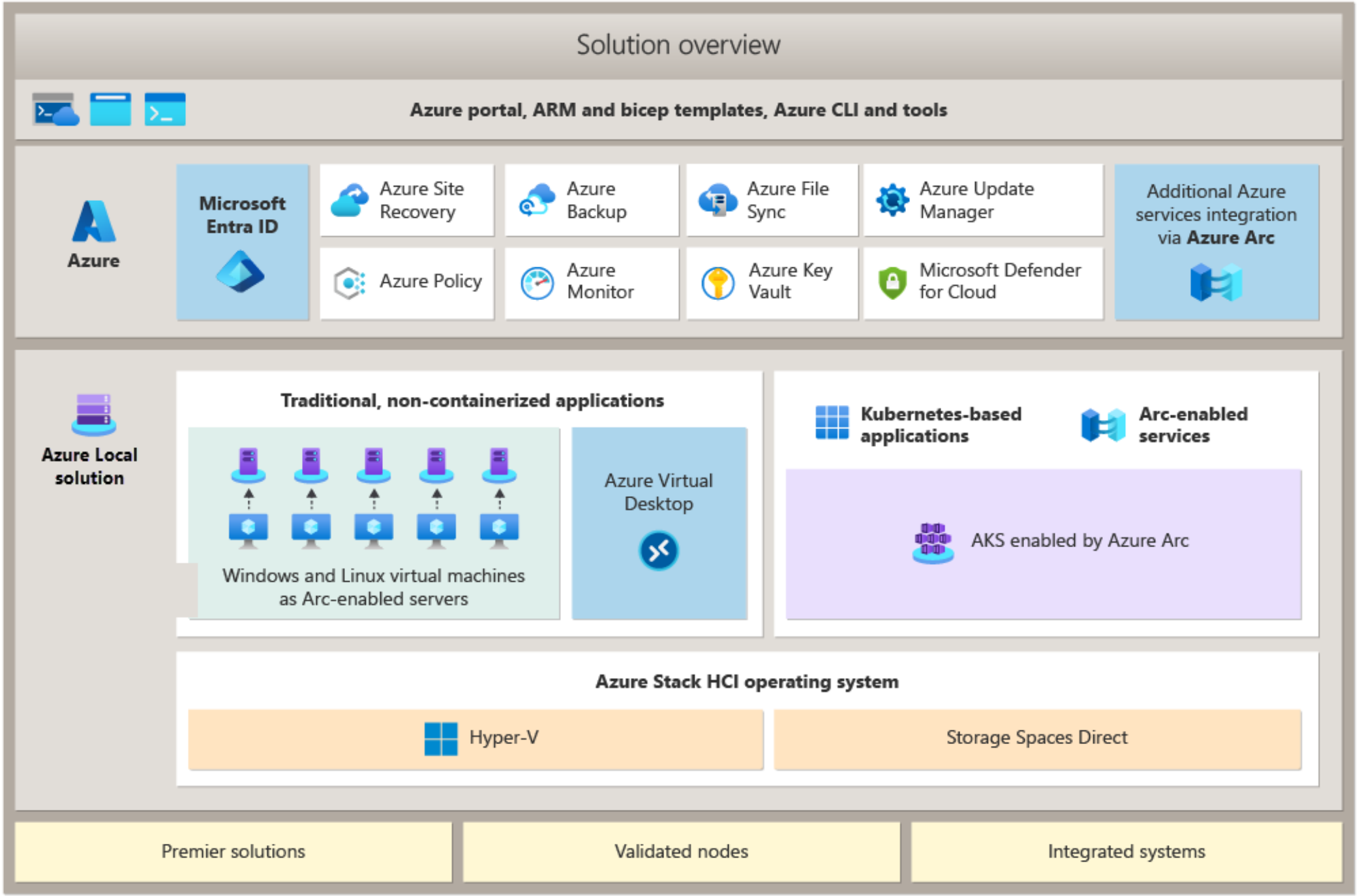
Čo je Azure Local?

- Rozširuje Azure služby na on-prem infraštruktúre
- Lokálny beh tradičných a moderných aplikácií
- **Centrálna správa pomocou Azure**

Azure Local

Čo je Azure Local?

- Rozširuje Azure služby na on-prem (EDGE) infraštruktúre
- Lokálny beh tradičných a moderných aplikácií
- Centrálna správa pomocou Azure
- **Azure Stack HCI (OS)**


Solution overview
Azure portal, ARM and bicep templates, Azure CLI and tools
Azure
Microsoft Entra ID
Azure Site Recovery
Azure Backup
Azure File Sync
Azure Update Manager
Azure Policy
Azure Monitor
Azure Key Vault
Microsoft Defender for Cloud
Additional Azure services integration via Azure Arc
Azure Local solution
Traditional, non-containerized applications
Windows and Linux virtual machines as Arc-enabled servers
Azure Virtual Desktop
Kubernetes-based applications
Arc-enabled services
AKS enabled by Azure Arc
Azure Stack HCI operating system
Hyper-V
Storage Spaces Direct
Premier solutions
Validated nodes
Integrated systems

Azure Local

Use case prepojenia s Azure

- Zálohovanie VMs do Azure cloudu
- Disaster recovery centrum v Azure
- Manažment cez Azure Arc

Azure Local

Azure Local manažment

- Azure Portal
- Azure API / Terraform
- Windows Admin Center (WAC)
- Powershell
- SCVMM

Storage Spaces Direct

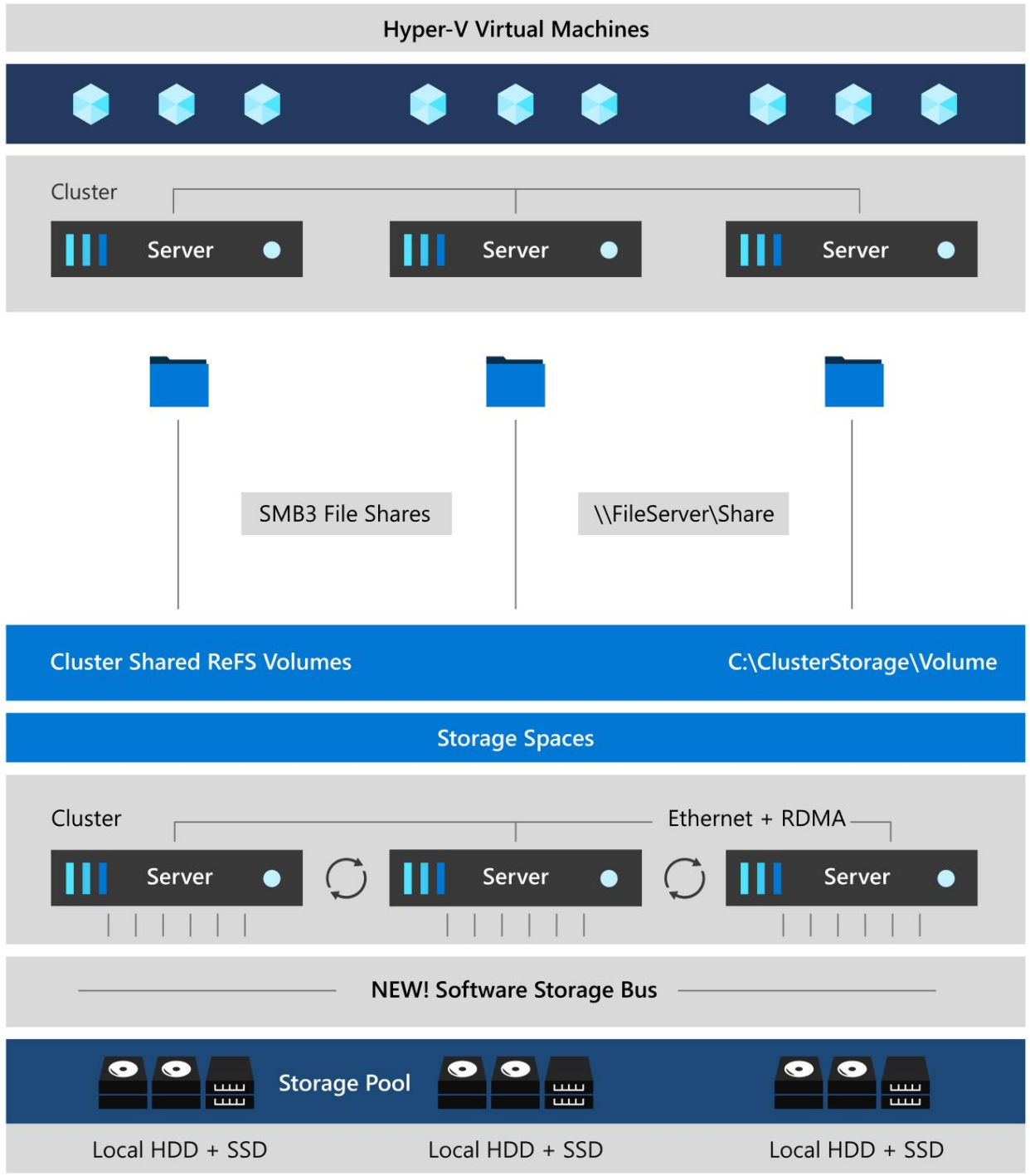
Hyper-konvergovaná infraštruktúra S2D

- Software-defined storage
- Lokálne disky (bez SAN a NAS)
- Cluster 2 až 16 nodov
- RDMA (remote direct memory access)
- Storage tiering, resiliency, flexibility

S ect

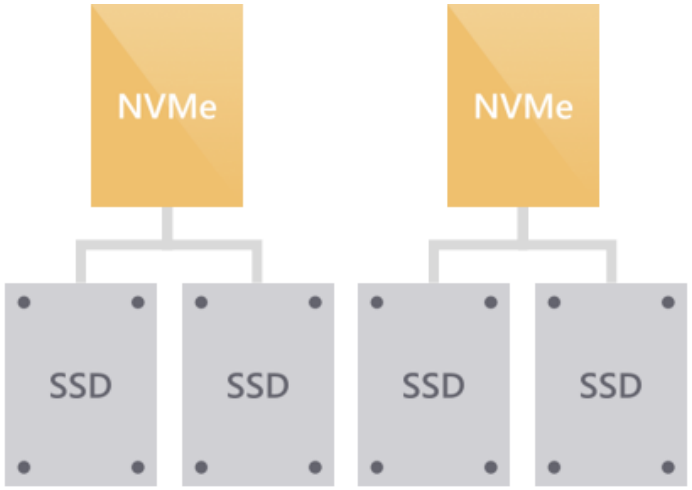
Hy

- S
- I
- C
- F
- S ty



NVMe *for* Capacity

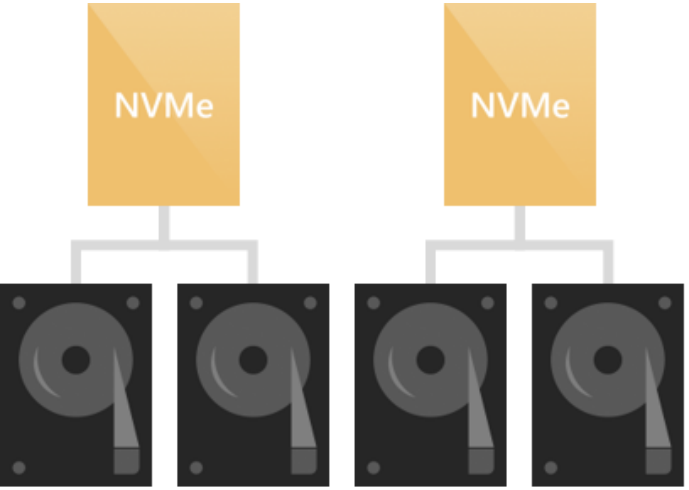
OR



NVMe *for* Cache **SSD** *for* Capacity

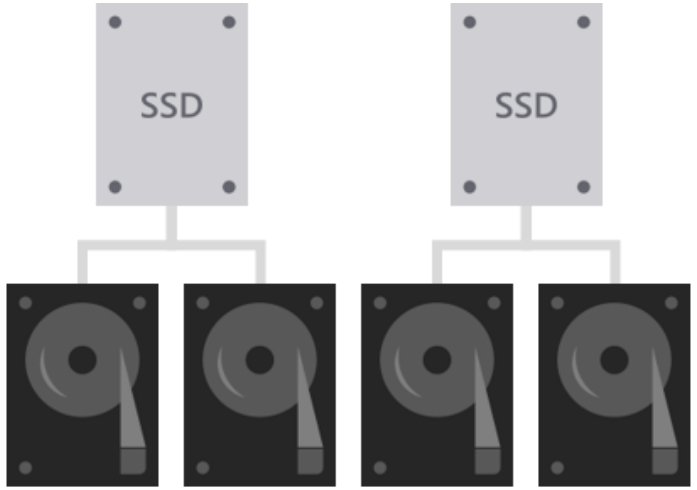
OR

SSD *for* Capacity



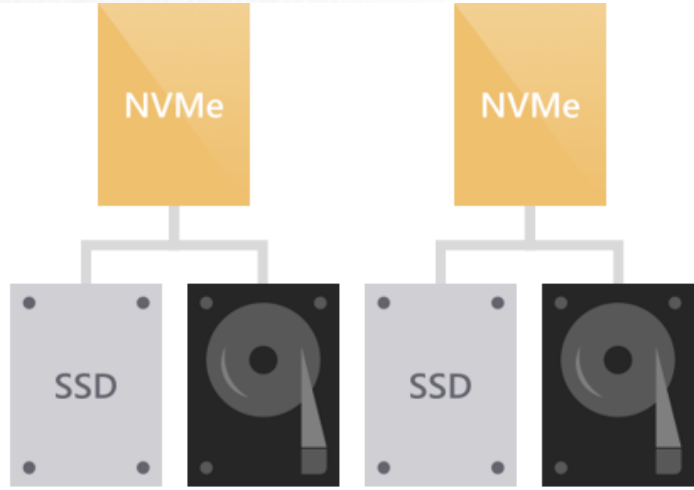
NVMe *for* Cache **HDD** *for* Capacity

OR



SSD *for* Cache **HDD** *for* Capacity

OR



NVMe *for* Cache **SSD + HDD** *for* Capacity

S2D – výkon

Hyper-konvergovaná infraštruktúra S2D – Zákazník1

- 4 Nodes
- 2x 1.6TB NVMe Cache SSD
- 8x 3.84TB 6Gbps SATA SSD
- Mellanox ConnectX-4 2 x 100GbE
- RDMA (RoCE)
- VM Fleet

CSV FS	IOPS	Reads	Writes	BW (MB/s)	Read	Write	Read Lat (ms)	Write Lat
Total	2 404 461	2 404 430	31	9 849	9 849	1		
SP1HPVR11	589 251	589 243	8	2 414	2 414		0,291	1,292
SP1HPVR12	592 393	592 386	6	2 427	2 426		0,282	1,247
SP1HPVR13	616 960	616 950	10	2 527	2 527		0,284	1,058
SP1HPVR14	605 857	605 850	7	2 482	2 482		0,292	1,195

SSB Cache	Hit/Sec	Miss/Sec	Remap/Sec	Cache (MB/s)	RdPop	WrPop	Destage (MB/s)	Update	Total (Pgs)	Standby	Dirty
Total				2		2			7,60E+8	2,97E+8	4,63E+8
SP1HPVR11				1		1			1,90E+8	7,04E+7	1,20E+8
SP1HPVR12									1,90E+8	7,13E+7	1,19E+8
SP1HPVR13				1		1			1,90E+8	7,15E+7	1,19E+8
SP1HPVR14									1,90E+8	8,36E+7	1,06E+8

SBL	IOPS	Reads	Writes	BW (MB/s)	Read	Write	Read Lat (ms)	Write Lat
Total	2 404 493	2 404 386	107	9 851	9 849	2		
SP1HPVR11	589 254	589 230	24	2 414	2 414	1	0,272	0,537
SP1HPVR12	592 377	592 357	19	2 427	2 426	1	0,263	0,556
SP1HPVR13	616 965	616 935	30	2 528	2 527	1	0,265	0,468
SP1HPVR14	605 898	605 863	34	2 482	2 481	1	0,273	0,510

SMB SRV	IOPS	Reads	Writes	Data BW (MB/s)	Read	Write	Total BW (MB/s)	Rcv	Snd
Total	634 439	634 344	61	2 600	2 598	1	2 735	85	2 650
SP1HPVR11	158 446	158 396	16	649	649		685	23	662
SP1HPVR12	163 542	163 528	15	670	670		704	21	683
SP1HPVR13	155 976	155 955	20	639	639		672	20	651
SP1HPVR14	156 475	156 465	10	641	641		674	20	653

S2D BW	CSV(MB/s)	CSVRead	CSVWrite	SBL(MB/s)	SBLRead	SBLWrite	Disk(MB/s)	DiskRead	DiskWrite	Cache(MB/s)	CacheRead	CacheWrite
Total	9 849	9 849	1	9 851	9 849	2	9 846	9 844	2	2		2
SP1HPVR11	2 414	2 414		2 414	2 414	1	2 408	2 407	1	1		1
SP1HPVR12	2 427	2 426		2 427	2 426	1	2 508	2 507				
SP1HPVR13	2 527	2 527		2 528	2 527	1	2 482	2 482	1	1		1
SP1HPVR14	2 482	2 482		2 482	2 481	1	2 449	2 448				

Hyper-V LCPU	Logical Total%	Guest%	Hypervisor%	Root Total%	Guest%	Hypervisor%	Remote%
Total	89,74	86,42	3,32	77,47	76,12	1,35	0,00
SP1HPVR11	89,73	86,46	3,27	77,69	76,36	1,33	0,00
SP1HPVR12	90,06	86,77	3,29	77,93	76,59	1,34	0,00
SP1HPVR13	89,48	86,09	3,39	76,94	75,56	1,38	0,00
SP1HPVR14	89,68	86,34	3,34	77,35	75,98	1,37	0,00

3-Way Mirror 4k
100% read random
0% write

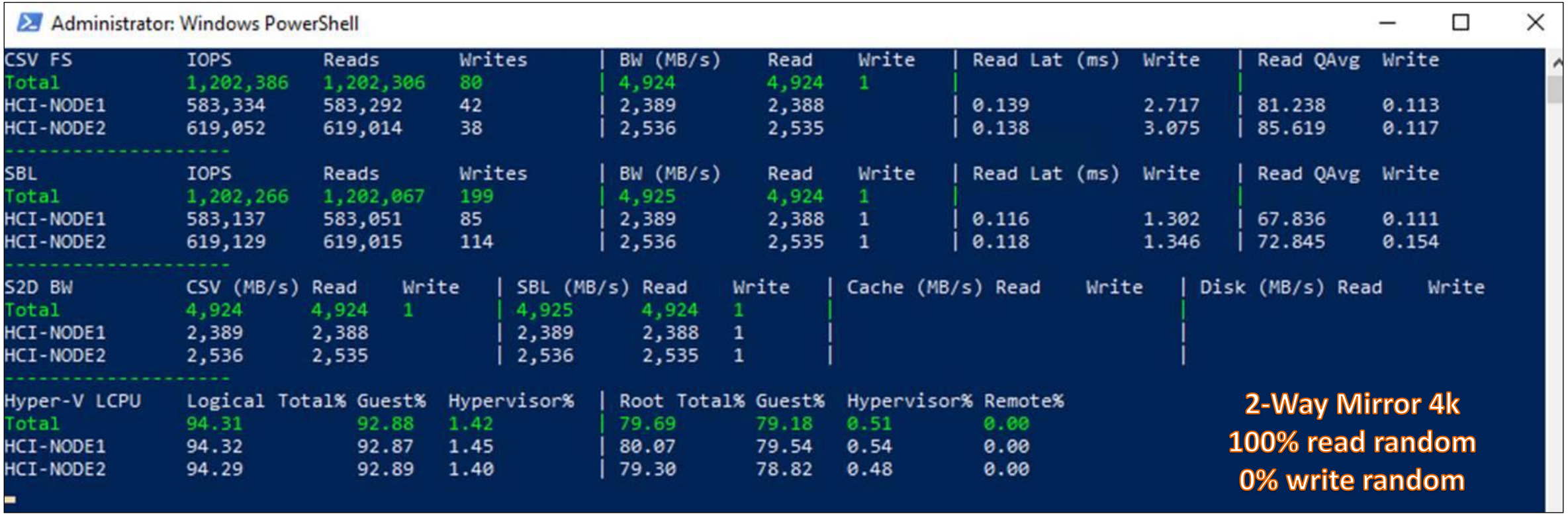
S2D – výkon

Hyper-konvergovaná infraštruktúra S2D – Zákazník 2

- 2 Nodes
- 16x 1.9TB NVMe SSD
- Mellanox ConnectX-4 2 x 100GbE
- RDMA (RoCE)
- VM Fleet

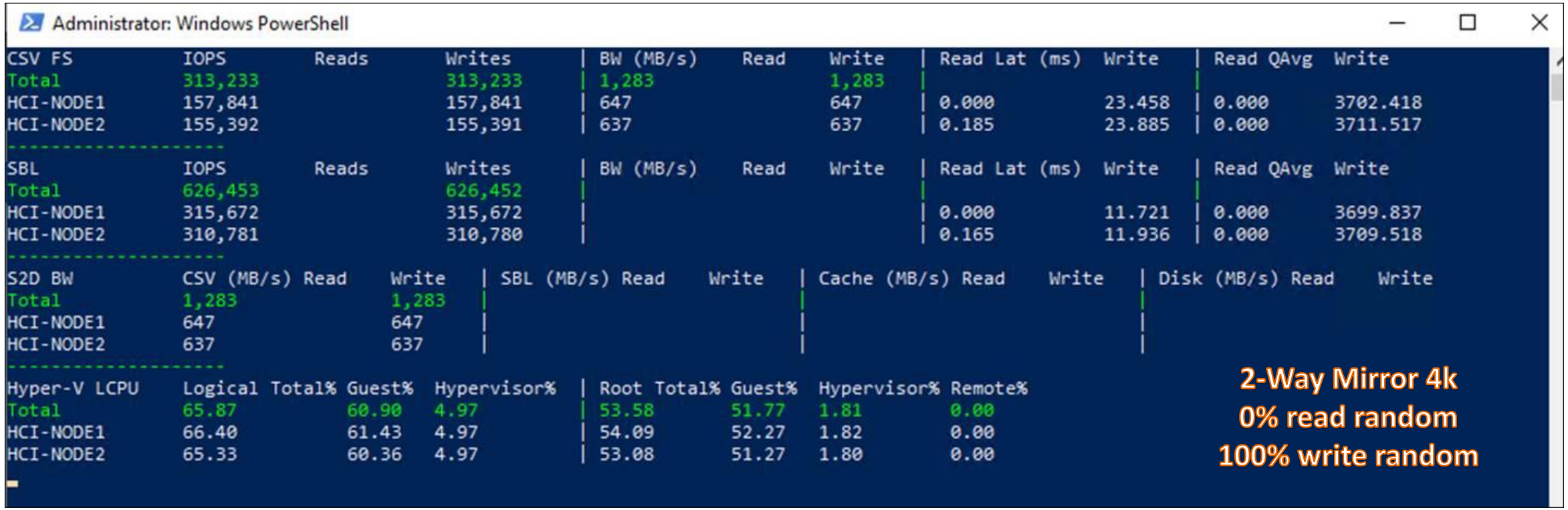
S2D – výkon

Hyper-konvergovaná infraštruktúra S2D – Zákazník 2



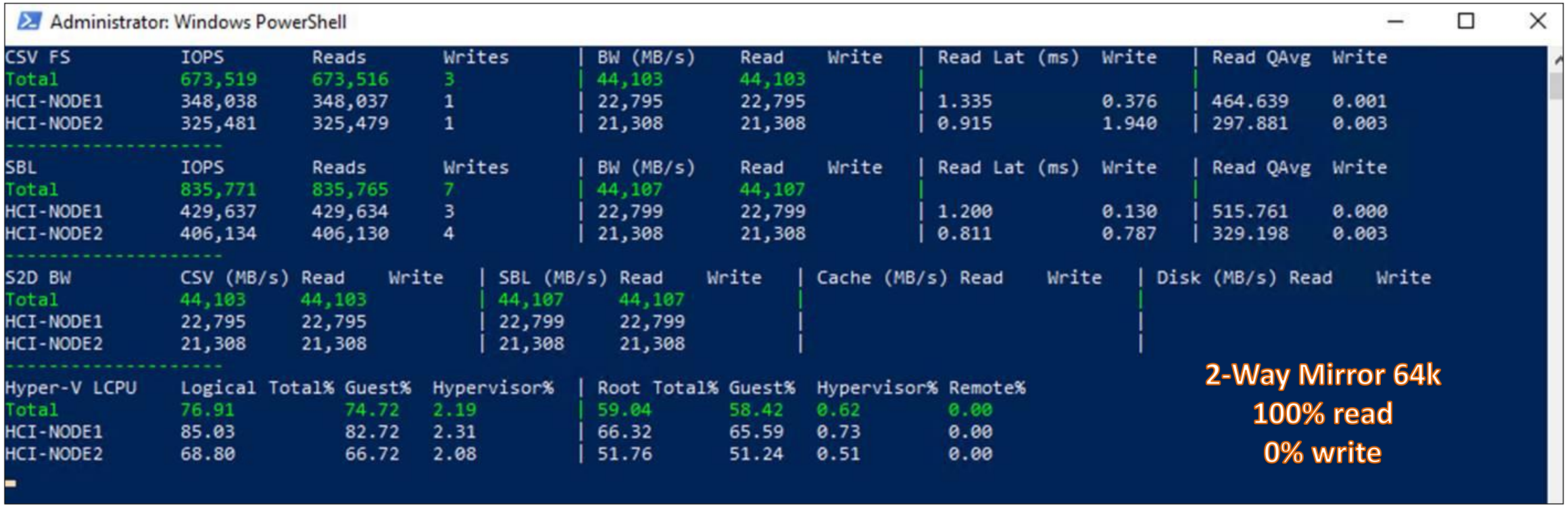
S2D – výkon

Hyper-konvergovaná infraštruktúra S2D – Zákazník 2



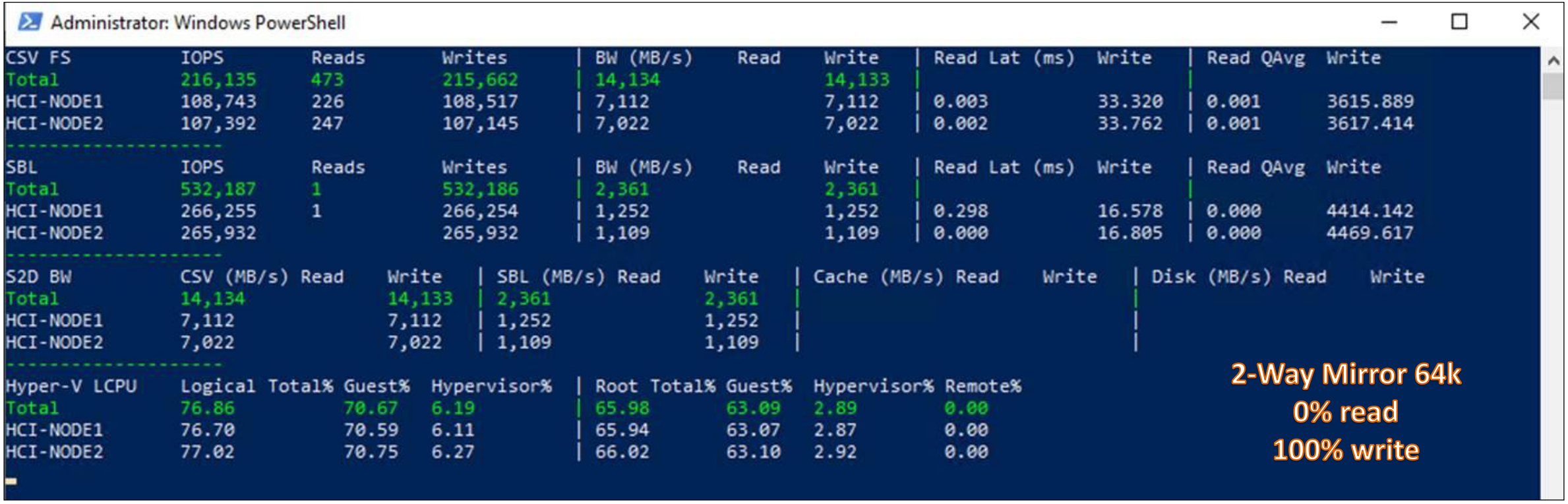
S2D – výkon

Hyper-konvergovaná infraštruktúra S2D – Zákazník 2



S2D – výkon

Hyper-konvergovaná infraštruktúra S2D – Zákazník 2



Kam Azure Local ?

Spracovanie dát blízko zdroja

- Lokálne AI spracovanie dát
- Biometrické dáta
  - Obchody
  - Letiská
  - Vstupné brány

Kam Azure Local ?

Kritické real-time latencie

- Automobilky
- Fabriky
- Nemocnice

Kam Azure Local ?

Limitované, regulované pripojenie

- Lode a ponorky
- Ropné stanice
- Veterné/solárne/vodné elektrárne
- Offline prostredia (preview)

Kam Azure Local ?

Dáta na území danej krajiny

- Dodržiavanie pravidiel o dátovej rezidencii
- Viacvrstvová bezpečnosť a šifrovacie protokoly
- Súlad s GDPR a inými reguláciami

Kam Azure Local ?

- Všade tam, kde chcete mať spoľahlivú a výkonnú virtualizačnú platformu

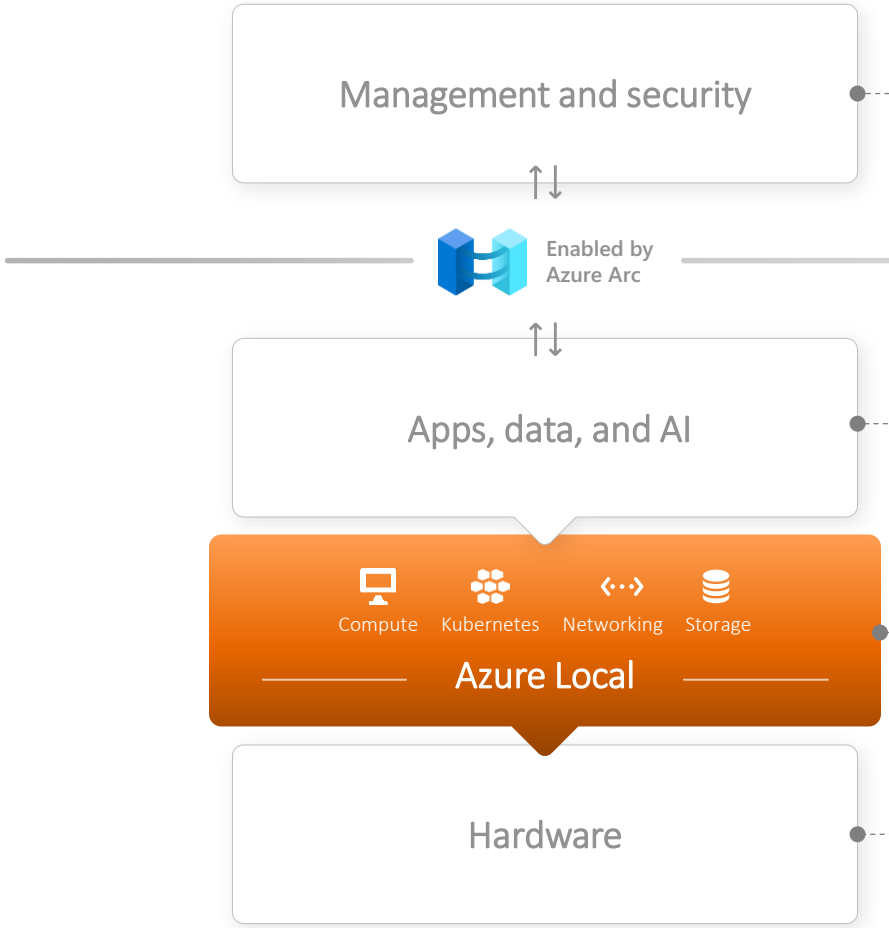
Azure Local

Gartner magic quadrant

- Distributed Hybrid infrastructure
- 50% enterprise spúšťa proces náhrady virtualizácie na DHI

Azure Local

Nasadenie Azure Local do Vašej infraštruktúry



4 Pracujete s jednotným riadením a zabezpečením všetkých vašich zdrojov

3 Nasadíte cloudovo konzistentné virtuálne počítače VMky, alebo aj Kubernetes AKS

2 Nainštalujete Azure Local operačný systém pre vytvorenie lokálnej cloudovej infraštruktúry

1 Obstaráte hardware od Vášho preferovaného vendora, pripojíte elektrinu a sieť

Azure Local

Certifikovaný Hardvér

Low-spec, low-cost edge servers

Simpler, smaller hardware for light computing requirements.

NEW PREVIEW

Connected servers
(formerly Azure Stack HCI)

Choose from over 100 hyperconverged server platforms from major OEMs.

✓ GA

Disconnected operations

Meet strict data residency regulations with a permanently disconnected option.

NEW PREVIEW

Azure

Certifikovaný

Low-spec, l
edge se

Simpler, smaller harc
computing requ

NEW PRE

ected
ons

regulations with
ected option.

IEW

Showing 1-11 of 11 platforms

Solution builder

- [ ] DataON
- [x] Dell Technologies
- [ ] Hewlett Packard Enterprise
- [ ] Lenovo

See More

Nodes per cluster

Purchase as a service

CPU

GPU support

Storage

Feature support

Regional availability

Platform lifecycle

- ○ Current
- ○ Limited support
- ○ Out of support

AX-760
Premier Solution

DELL Technologies
1 to 16 nodes
Intel® 5th Gen Xeon® Scalable Processor
4 solutions
Dell APEX Subscriptions

AX-7525
Integrated System

DELL Technologies
1 to 16 nodes
AMD 3rd Gen EPYC™
3 solutions

Dell APEX Cloud Platform MC-760
Premier Solution

DELL Technologies
1 to 16 nodes
Intel® 5th Gen Xeon® Scalable Processor
4 solutions
Dell APEX Flex on Demand

Dell APEX Cloud Platform MC-660
Premier Solution

DELL Technologies
1 to 16 nodes
Intel® 5th Gen Xeon® Scalable Processor
2 solutions
Dell APEX Flex on Demand

AX-6515
Integrated System

DELL Technologies
1 to 16 nodes
AMD 3rd Gen EPYC™
1 solution

AX-750
Integrated System

DELL Technologies
There's a newer solution available
1 to 16 nodes
Intel® 3rd Gen Xeon® Scalable Processor
4 solutions

AX-650
Integrated System

DELL Technologies
There's a newer solution available
1 to 16 nodes
Intel® 3rd Gen Xeon® Scalable Processor
3 solutions

AX-4000r/z with AX-4520c
Premier Solution

DELL Technologies
1 to 16 nodes
Intel® Xeon® D 27xx
1 solution
Dell APEX Subscriptions

Dell APEX Cloud Platform MC-4000r/z with MC-4510c
Premier Solution

DELL Technologies
1 to 16 nodes
Intel® Xeon® D 27xx
1 solution
Dell APEX Flex on Demand

AX-4000r/z with AX-4510c
Premier Solution

DELL Technologies
1 to 16 nodes
Intel® Xeon® D 27xx
1 solution
Dell APEX Subscriptions

Dell APEX Cloud Platform MC-4000r/z with MC-4520c
Premier Solution

DELL Technologies
1 to 16 nodes
Intel® Xeon® D 27xx
1 solution
Dell APEX Flex on Demand

Azure Local

Licencovanie riešenia

- Per-core licensing (Physical)
- OEM licensing
- Windows server Datacenter + SA (Azure Hybrid Benefits)
- On-prem software licencie

Azure Local

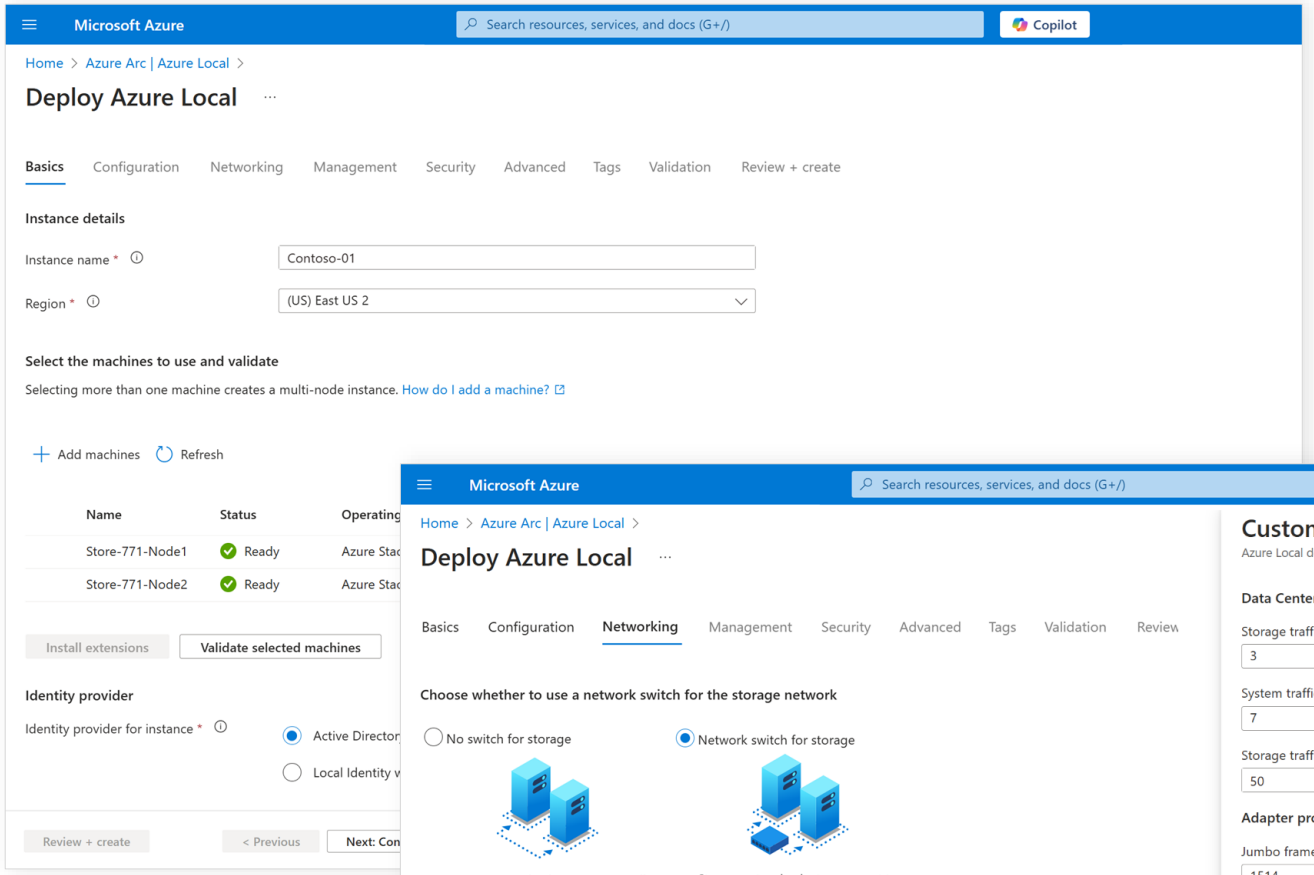
Aktivácia Windows Server VMs

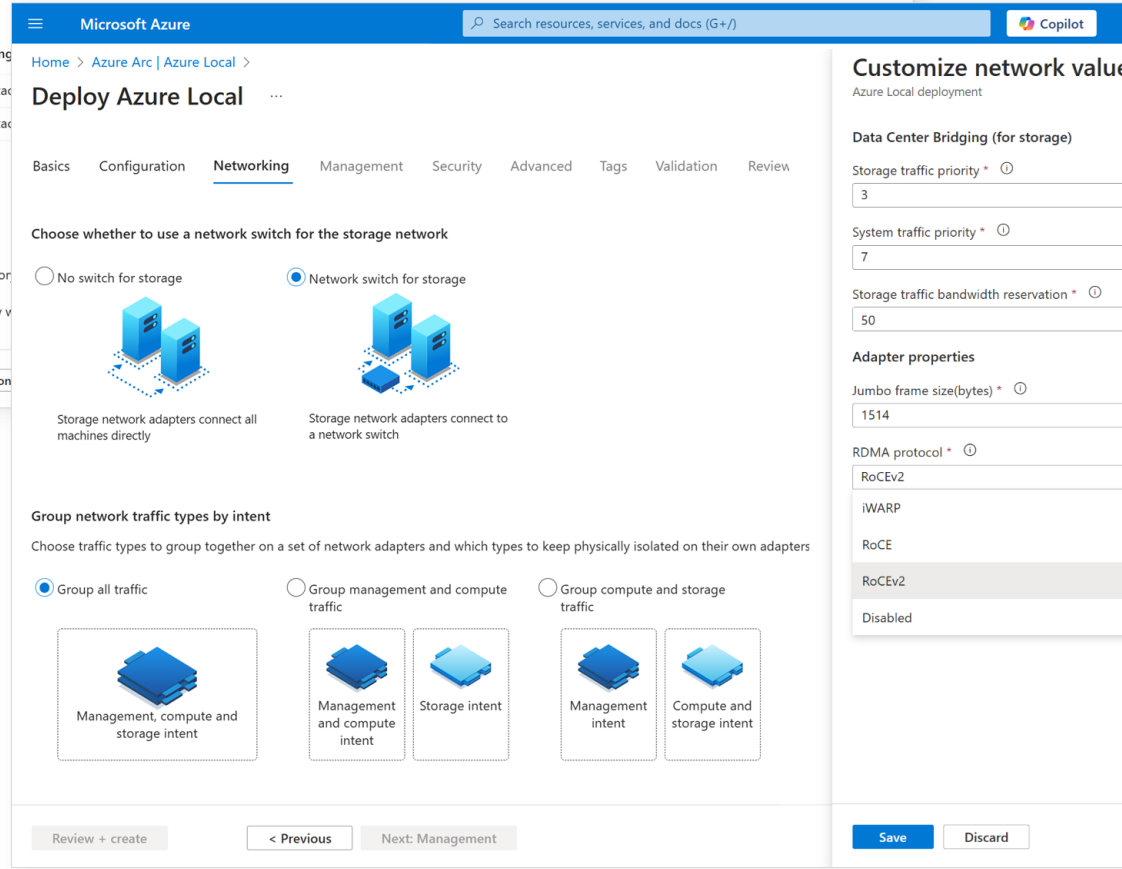
- Windows Server VMs musia byť aktivované, aby ste ich mohli používať v službe Azure Local
- **Windows Server subscription**: Aktivuje všetky virtuálne počítače s Windows Serverom pre Azure Local (len ako addon per physical core)
- **Azure Hybrid Benefit (AHB)**: Windows Server Datacenter so SA pre aktiváciu Windows Server VMs na Azure Local pri znížených nákladoch
- AVMA, KMS, License key

Azure Local

Deployment

- Jednoduchý wizard





Azure Local

Deployment

- Jednoduchý wizard
- **Terraform**

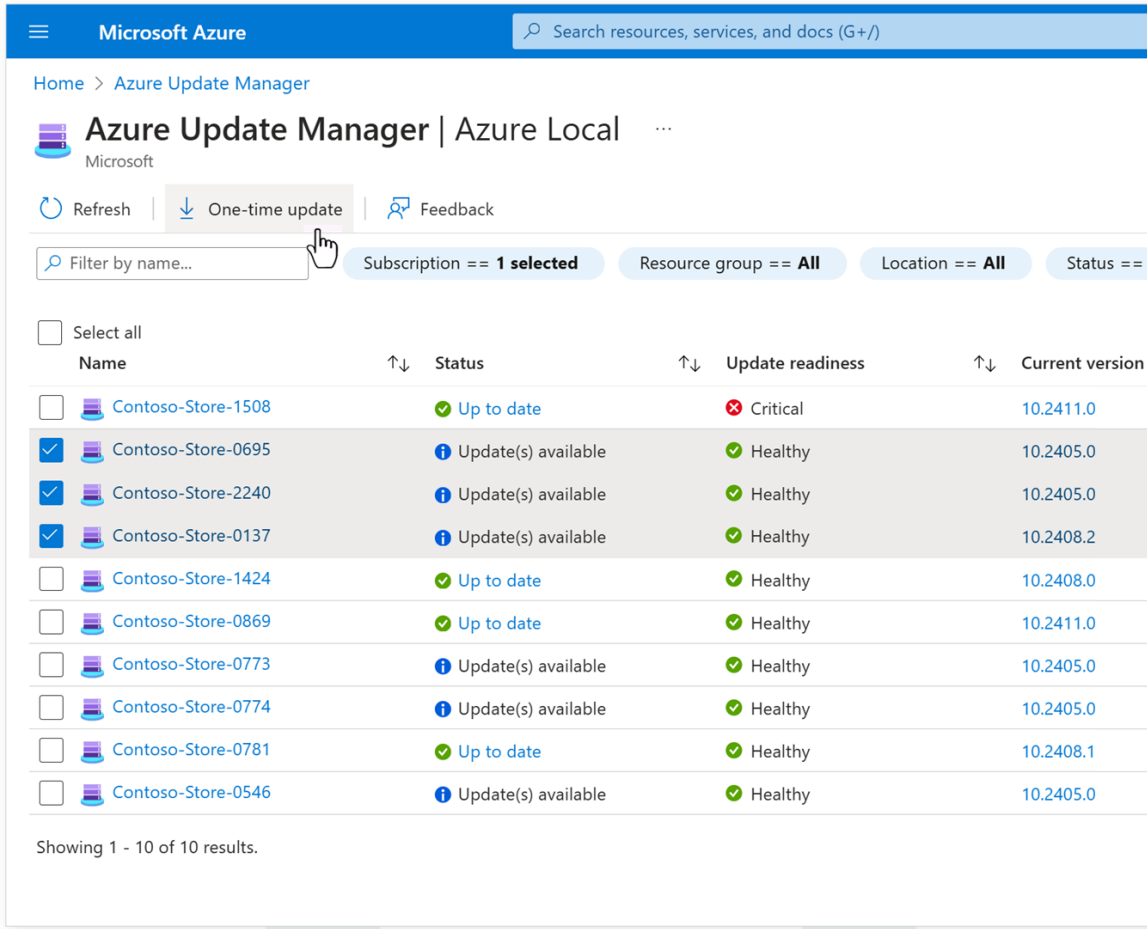
Contoso-Store-092.parameters.json

```
"parameters": {
  "clusterName": {
    "value": "Contoso-Store-092"
  },
  "useDhcp": {
    "value": false
  },
  "networkingPattern": {
    "value": "hyperConverged"
  },
  "physicalNodesSettings": {
    "value": [
      {
        "name": "Node1",
        "ipv4Address": "100.156.94.11"
      },
      {
        "name": "Node2",
        "ipv4Address": "100.156.94.12"
      },
      {
        "name": "Node3",
        "ipv4Address": "100.156.94.13"
      }
    ]
  },
  "securityLevel": {
    "value": "Recommended"
  },
  "clusterWitnessStorageAccountName": {
    "value": "contoso092storageaccount"
```

Azure Local

Azure Update Manager

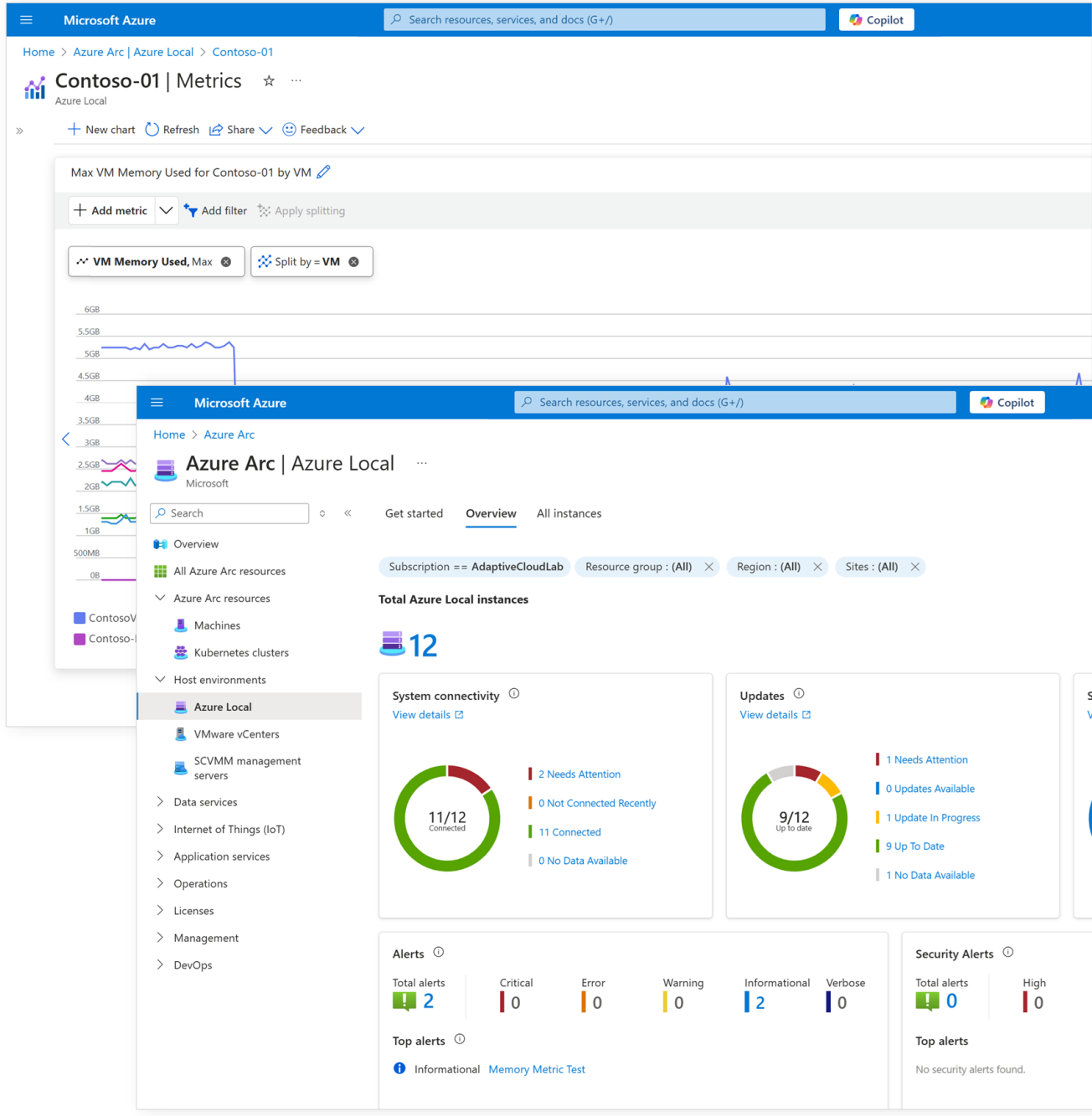
- Zobrazenie a správa aktualizácií v Azure Update Manager
- Full stack update Azure Local a OEM
- Bezvýpadkové patchovanie pod Vašou kontrolou



Azure Local

Azure Monitoring

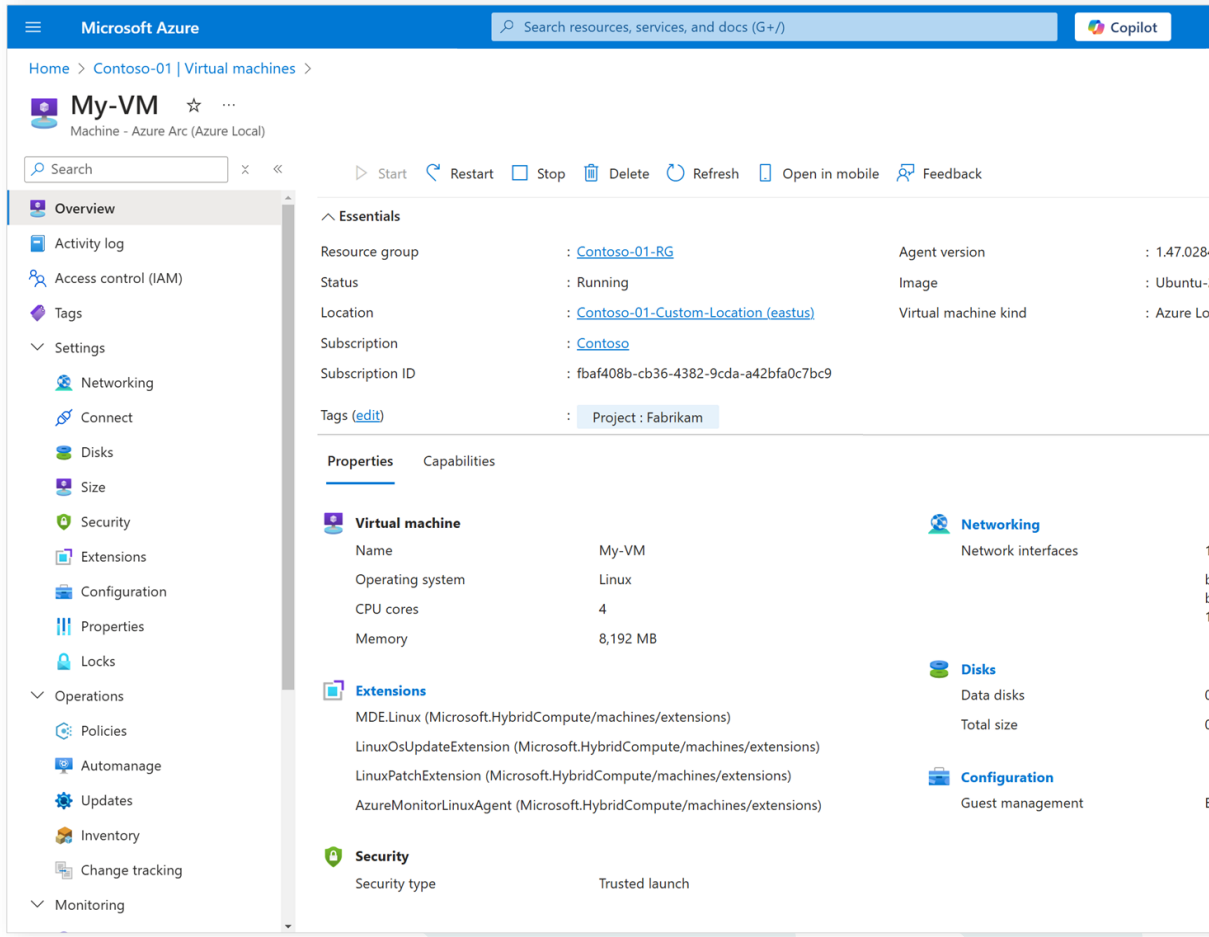
- Monitoring infraštruktúry, VMs, a Kubernetes z Azure portal
- Custom dashboardy
- Alerty



Azure Local

Azure Virtual machines

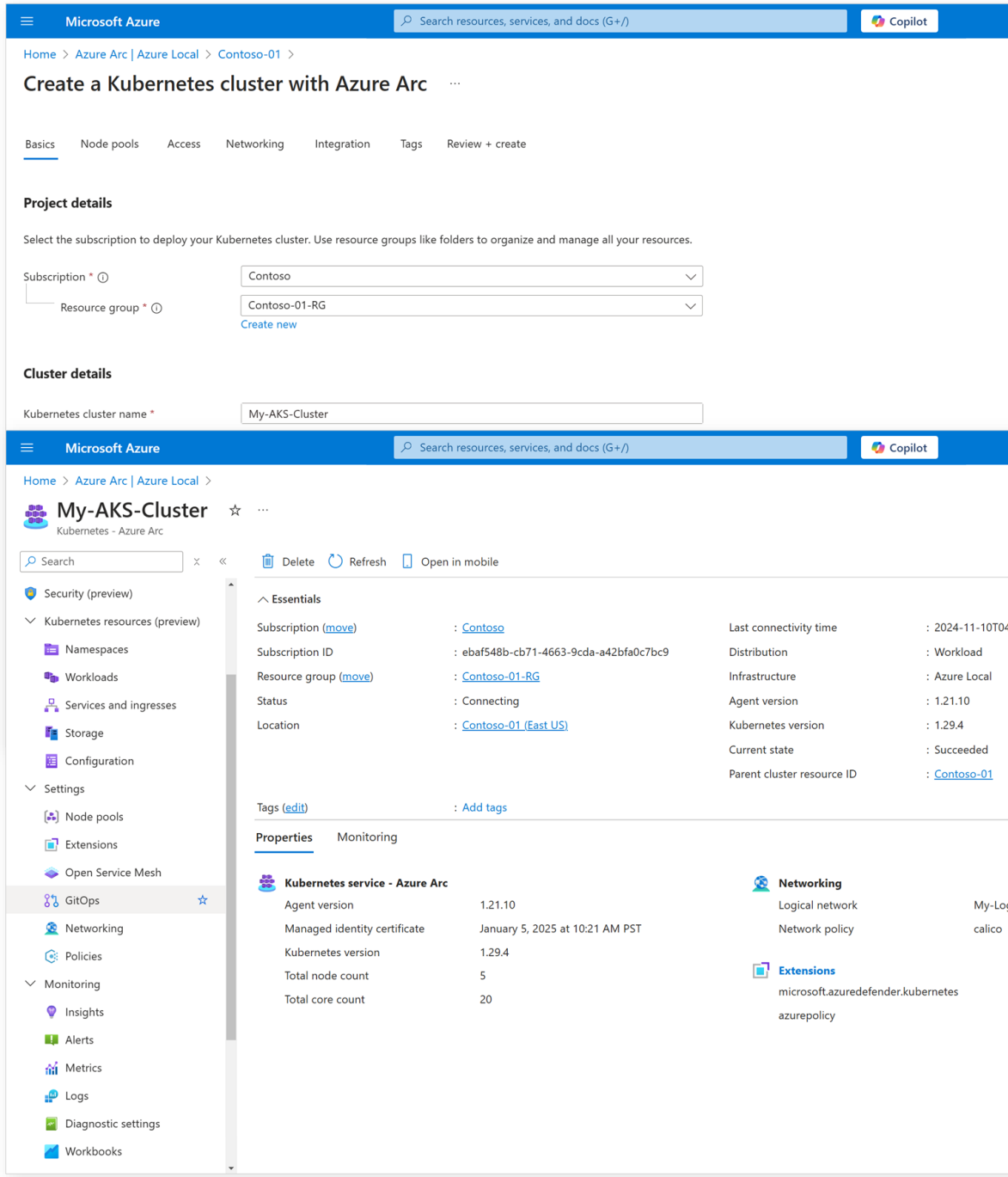
- VMs, vlastné obrazy, alebo Marketplace
- Nastavenie CPU, sietí, úložiska
- Automation pre cloud-consistent VM operácie
- VMs extensions pre monitoring, bezpečnosť, aktualizácie, AD join, custom scripty a viac



Azure Local

Azure Kubernetes Service

- Nasadenie kontajnerov a cloud-native aplikácií
- Manažment AKS-consistent portál a API
- Microsoft storage CSI driver a obrazy pre Linux a Windows
- Infra-as-code, nepretržitá správa pomocou Terraform a GitOps support



Azure Local

Low spec, low cost pre EDGE servery

Azure Stack HCI Requirements at launch	Azure Local Requirements at launch
Windows Server certified	Windows Server certified
~~Min. 2+ machines~~	1+ machine
~~Min. 4+ disks per machine~~	1+ SSD per machine
~~Min. 10 Gbps w/ RDMA~~	1 Gbps/2.5 Gbps Ethernet
~~Active Directory required~~	Doesn't require AD

Dell APEX Cloud Platform
MC-660

Dell MC-4000r/z + MC-4510c
Rugged two-sled chassis

HPE Edgeline EL8000
with e920 Server Blade

Lenovo ThinkEdge SE350v2
Half-width, half-depth 1U

Azure Local

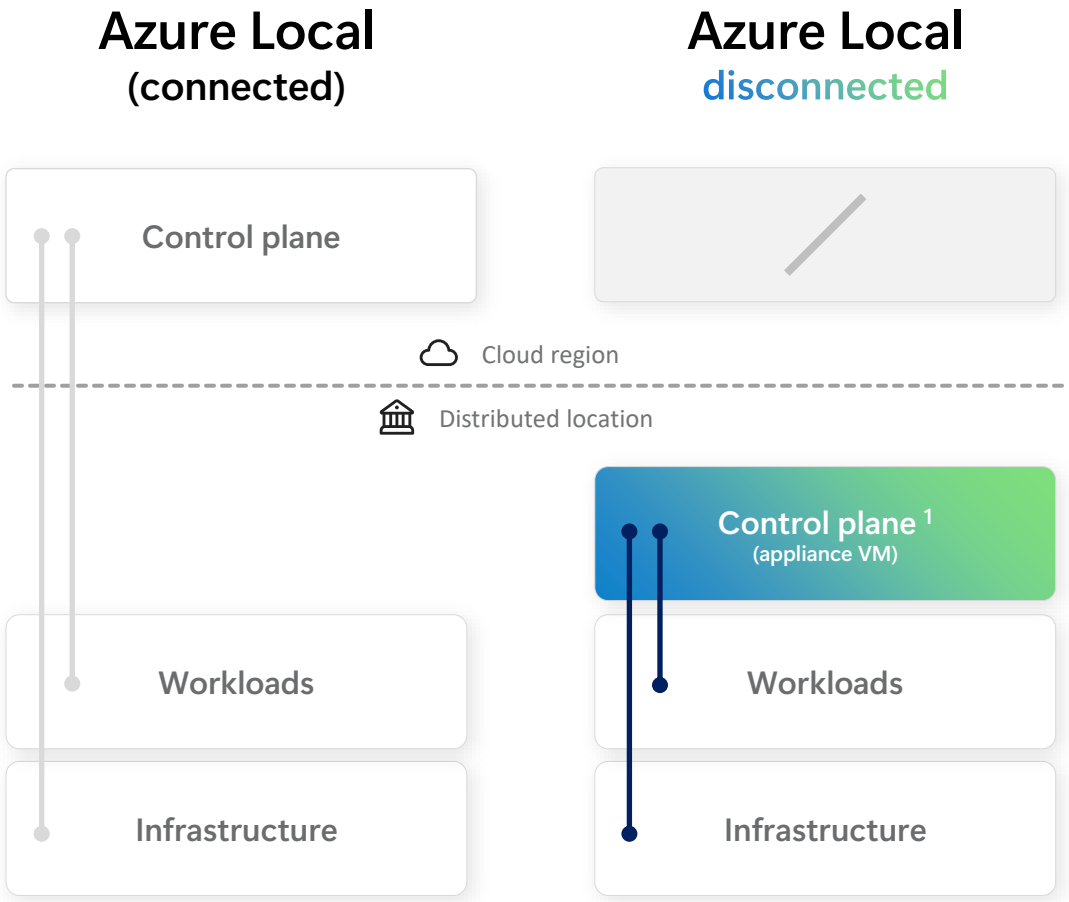
Disconnected Azure Local

Splnenie regulačných požiadaviek prevádzkou trvalo odpojenou od cloudu

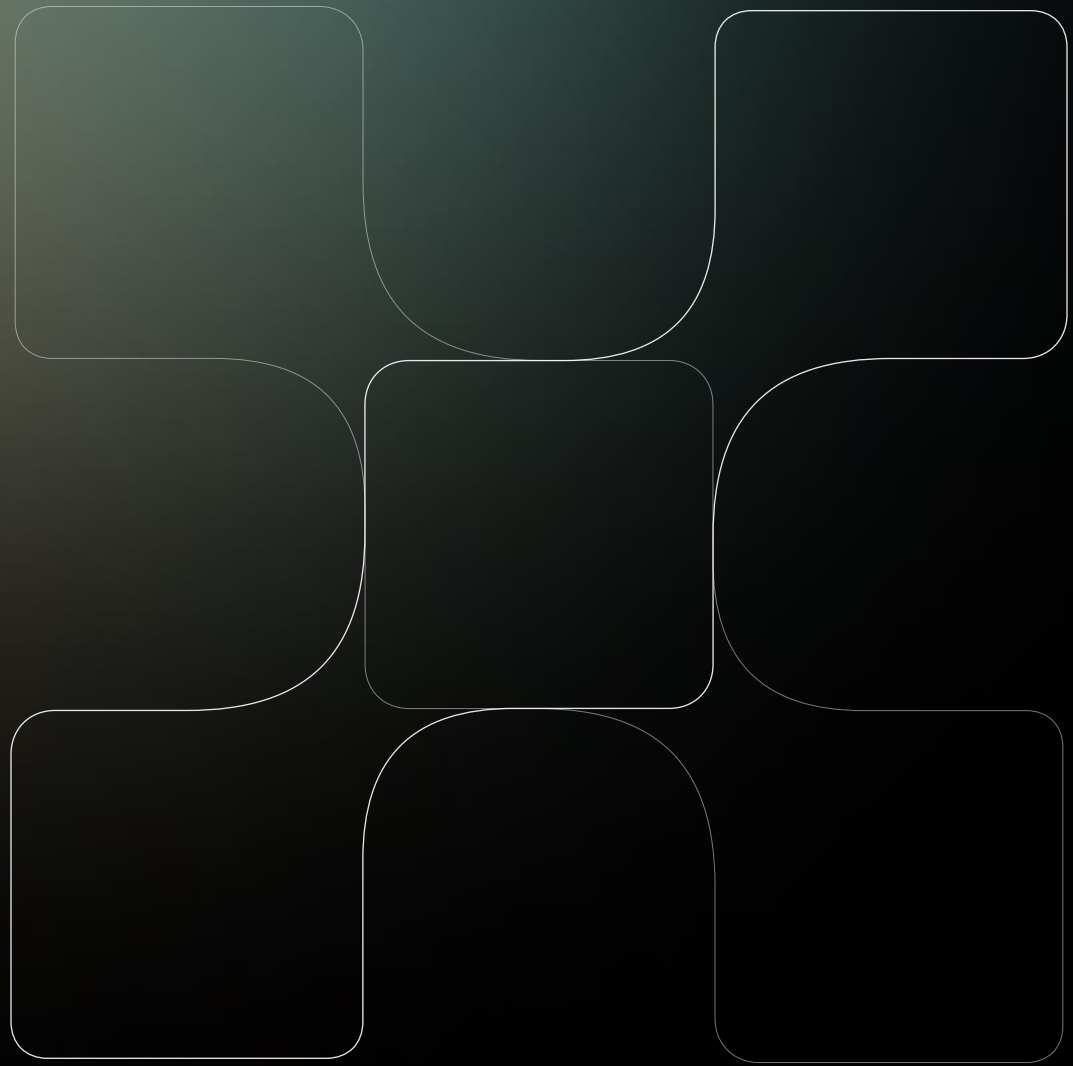
Správa prostriedkov Azure, portálu a služieb v lokálnej appliance VM

Podmnožina dostupných služieb:

Portal	ARM	Copilot	Key Vaults	Policy [2]	Defender
Local	Machines	Kubernetes	Registries	AVD	Others



Ďakujeme!



Alanata

Technology Meets Business

Alanata a.s.
Einsteinova Business Center
Krasovského 14
851 01 Bratislava 5
Slovenská republika

www.alanata.sk