

Why SAP and Azure!

Oliver Klausen, SAP CSA

Bernhard Friess, SAP Specialist

SAP and Azure

- Your Expectations
- SAP and Azure – More than IaaS / Economic Impact
- Architectural Considerations
- Customer Examples
- Your Questions?

SAP and Azure

- **Your Expectations**
- SAP and Azure – More than IaaS / Economic Impact
- Architectural Considerations
- Customer Examples
- Your Questions?

Your Expectations / your questions

- Erfahrungsaustausch mit anderen Kunden??
- Dos & Don'ts with SAP & Azure
- RISE with SAP?
- Marktbegleiter? Azure vs AWS vs GCP?
⇒ Why Azure?
- Edent & Innovate?
- I4A ohne ANF
- SAP Deployment auf Azure
- DTP - Anbindung?

SAP vs D365?

- Wie gelingt ein SAP POC auf Azure!
- ⇒ SAP CAL

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- **SAP and Azure – More than IaaS / Economic Impact**
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The Expanded Microsoft and SAP Partnership

SAP customers broadly favor Azure as their choice to run SAP S/4HANA in the cloud

25+

year
partnership



Extensive customer overlap,
serving most of today's
largest enterprises*



SAP runs on Microsoft
Azure and Microsoft
runs on SAP



Ongoing global
investments and an
aligned ecosystem

"The case for digital transformation has never been more urgent. By bringing together the power of Azure and Teams with SAP's solutions, we will help more organizations harness the power of the cloud so they can more quickly adapt and innovate going forward"

Satya Nadella
CEO of Microsoft



"New ways of working, collaborating and interacting completely transform how we operate. By integrating Microsoft Teams across our solution portfolio, we will bring collaboration to the next level, jointly determining the future of work and enabling the frictionless enterprise"

Christian Klein
CEO of SAP SE



Microsoft Azure provides multiple benefits for SAP workloads:

- **Operations**

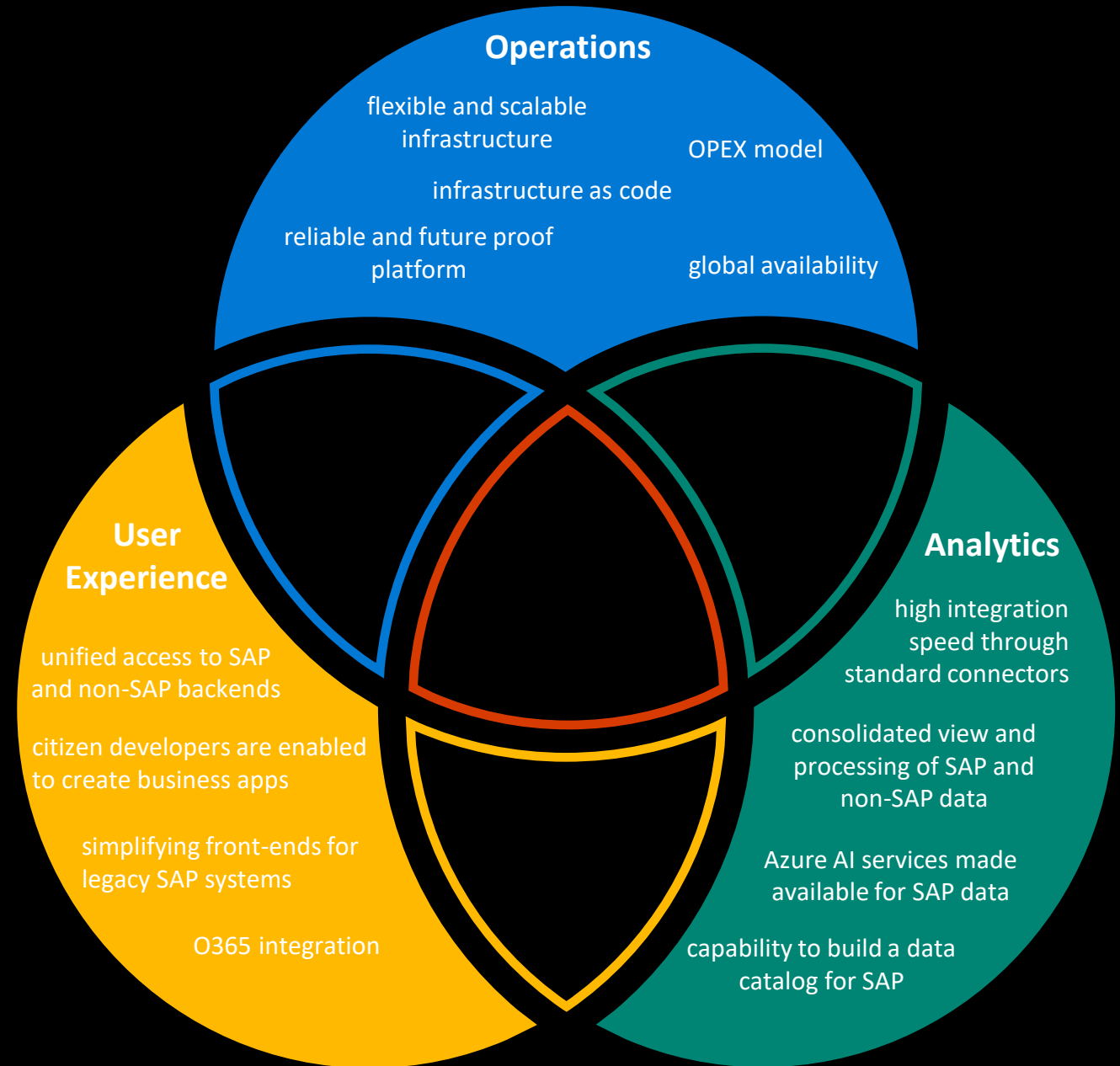
The reliable infrastructure services of Microsoft Azure are certified by SAP. Automation and worldwide availability enables rapid deployment of global SAP landscapes while flexible scale saves cost.

- **Analytics**

Azure Data Services simplify big data and provide machine learning models for SAP and non-SAP data.

- **User Experience**

Microsoft Power Platform enables business users to create simple front-ends, automated workflows and analytical dashboards with a unified view of SAP and non-SAP backends.



Running the SAP systems and the analytical stack together on Azure **increases performance and security.**

The same is true when the SAP systems are accessed via Power Apps. Its front-ends can also be used to provide a **self-service for SAP system operations.**

Data services and Power Platform use the same set of connectors which **reduce the integration effort.**



Bringing all aspects together

Using Microsoft Azure infrastructure, analytics and user-focused services in the context of SAP enables organizations to establish a **unified governance framework** for all workloads.

Centralized operation and monitoring capabilities **increase security and data protection**. Business-critical applications together with their connected services can **quickly adapt** to changes in demand on a global scale.

Simplified cost allocation with a high level of granularity can be achieved through a centralized cost management, providing **full cost control** throughout the whole landscape.



Gartner Leader across enterprise priorities

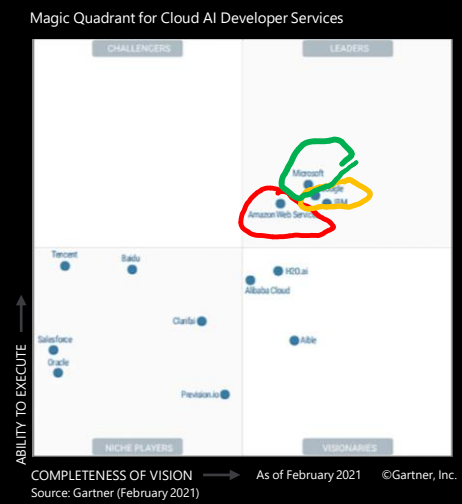
Analytics and Business Intelligence



Access Management



Cloud AI Developer Services



Full Life Cycle API Management



*These graphics were published by Gartner, Inc. as part of a larger research document and should be evaluated in the context of the entire document. The Gartner documents are available upon request from Microsoft.

Click on each category for more information.

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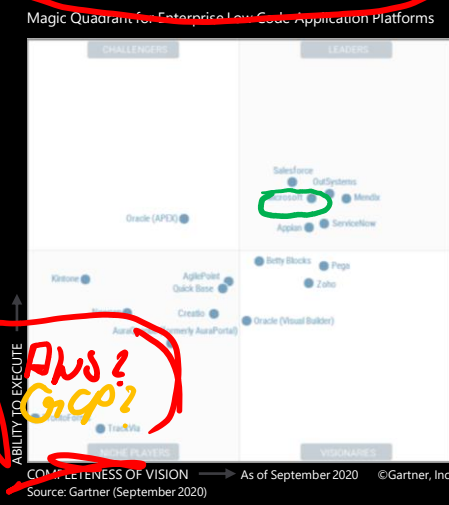


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Industrial IoT Platforms



Enterprise Low Code Application Platforms



Operational Database Management Systems

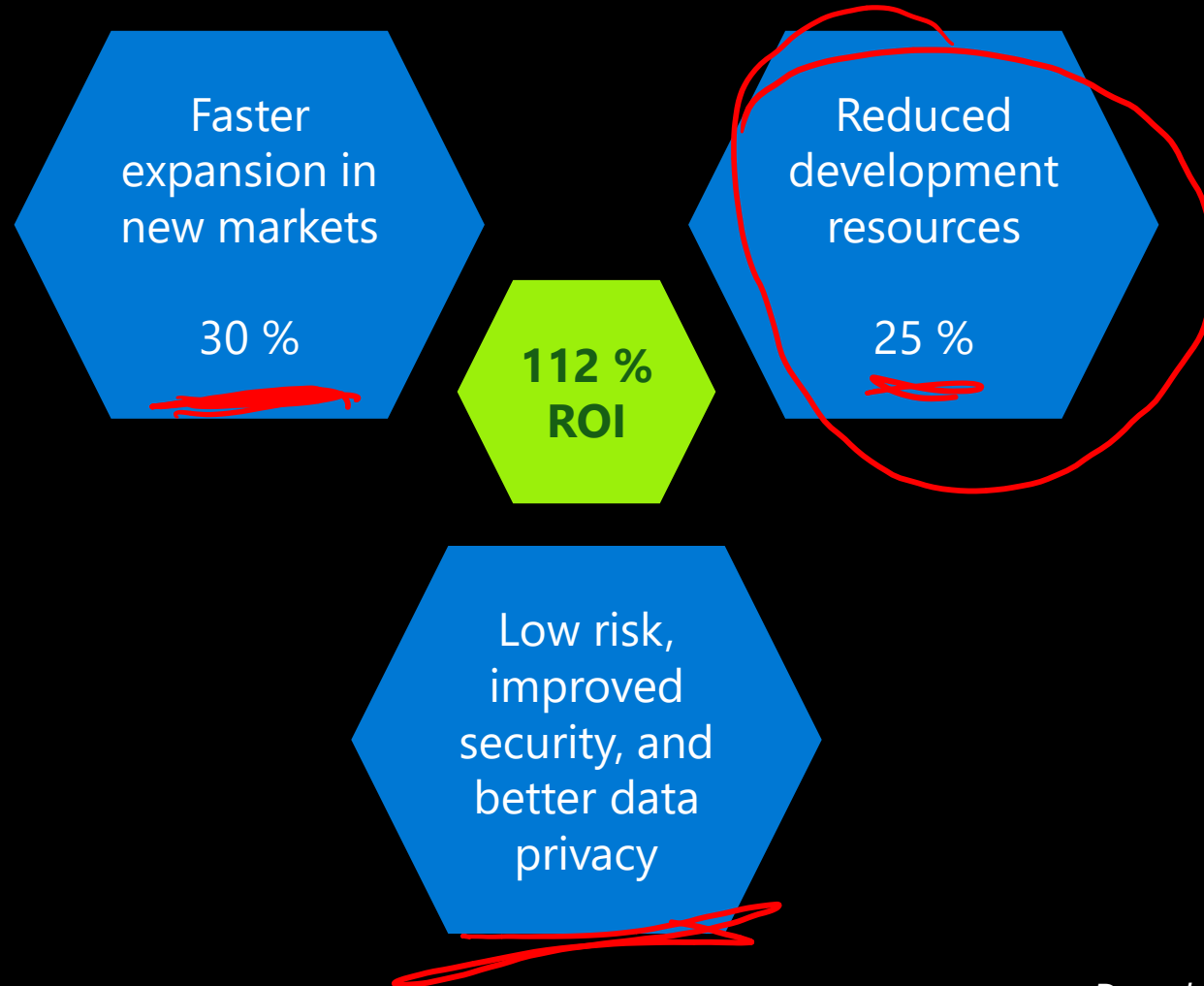


Meeting Solutions



SAP on Azure

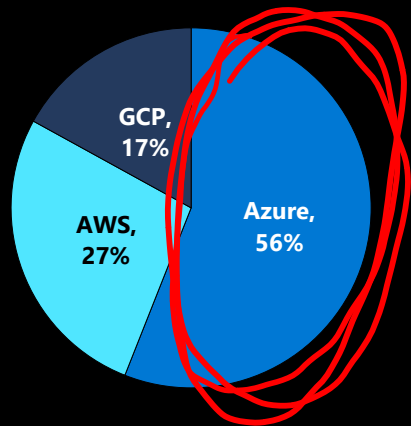
Total Economic Impact™ Study by Forrester



SAP-Entwickler

The Microsoft Difference: Why SAP Customers Choose Microsoft Azure

SAP customers broadly favor Microsoft Azure*



Global cloud platform optimized for SAP HANA

- Virtual Machine's, large instances with Intel Optane, storage, and networks certified to run mission-critical SAP workloads delivering high performance and business continuity (up to 99.99% SLA at the IaaS layer)
- Azure offers more regions (>65) than any other hyperscaler, increasing flexibility
- Proven ability to run the largest SAP HANA workloads for organizations

Unmatched security and compliance

- Azure Active Directory for secure user authentication and single sign-on, integrated into SAP Business Technology Platform for authentication simplification and governance
- Azure Security Center and Azure Sentinel offer hybrid cloud threat detection and security monitoring for SAP infrastructure
- SAP Data Custodian integration with Azure services for complete organizational data compliance management
- Azure offers 90+ industry-specific and global certifications, more than any other cloud

Advanced data analytics and insights

Comprehensive data analytics platform designed to work with SAP data & analytics components:

- Virtualize, combine and govern SAP data and Azure data via SAP Business Technology Platform data management
- Combine with cloud technologies from Azure Blob, Data Lake and Data Explorer, ML and AI via SAP Data Warehouse Cloud and SAP Analytics Cloud
- Take advantage of developed use case patterns for combined data platform usage

Integrate and extend SAP applications

- Integrate SAP applications with Microsoft Teams and Office 365 for productivity and collaboration
- Use SAP Business Technology Platform to build intelligent integration and workflows, that connect to Microsoft automation components across non-SAP areas
- Joint roadmap for continued innovation and integration to future-proof your investment

Support app innovation

- Unleash innovation with low-code/no-code Microsoft Power Platform for professional and citizen developers
- Extend into SAP context by integrating with SAP complementary development tools and integration mechanisms such as SAP Graph
- Support continuous DevOps innovation with GitHub and Azure services
- Design and develop engineering patterns that integrate both innovation technologies for faster and more secure delivery at the innovation layer

Leading hybrid and multi-cloud options

- Microsoft provides leading [hybrid cloud solutions](#) – From the edge to your local datacenter to the public cloud
- SAP Digital Supply Chain designed to leverage Azure Stack for SAP Edge Services.
- Hybrid and multi-cloud management capabilities include Azure Arc, Azure Monitor, Azure Governance, and security services
- Integrated with SAP Landscape Management Cloud and SAP Cloud Appliance Library for comprehensive landscape management

A partnership you can trust

- Jointly serving our enterprise customers for 25+ years
- Microsoft & SAP run SAP on Azure
 - ✓ 120K internal Microsoft users access SAP on Azure
 - ✓ SAP migrated 30+ internal business landscapes to Azure
 - ✓ Extending collaboration beyond platforms to collaboration and application tier

*Source: <https://www.dsag.de/externe-news/dsag-investitionsreport-2020-wachablosung-zu-s4hana-vollzogen> and [DSAG Jahreskongress 2019](#), Nürnberg

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Put the power of Azure to work for you



60+

Azure regions

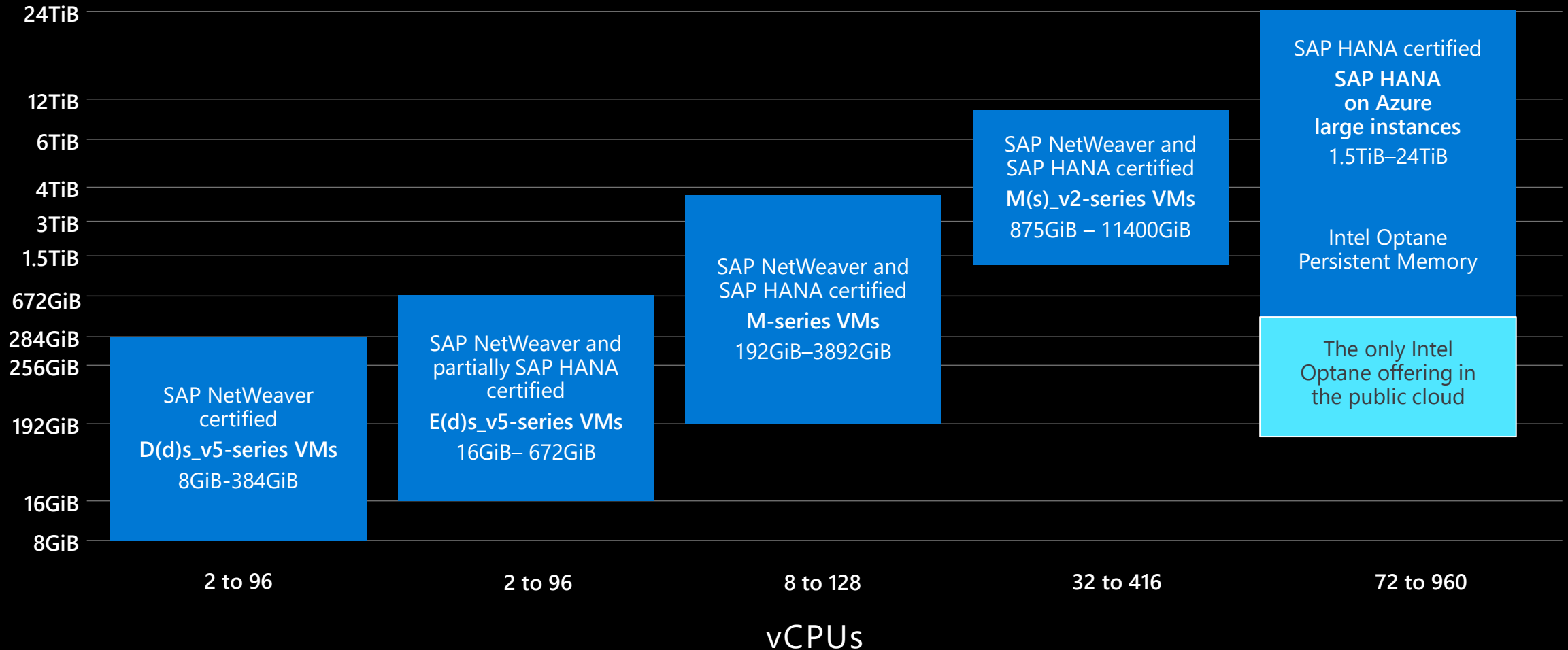
More than AWS & Google combined

165k+ miles of fiber

● SAP Business Technology Platform ● Available region ⚙️ Announced region ⦿ Availability zones

Scalable compute options for all SAP workloads & sizes*

Memory


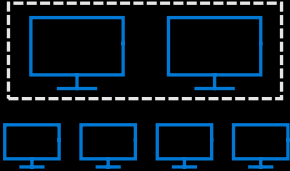
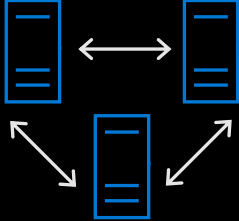
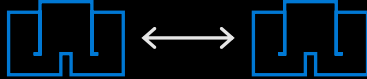


Up to 99.99% SLAs for VMs and large instances

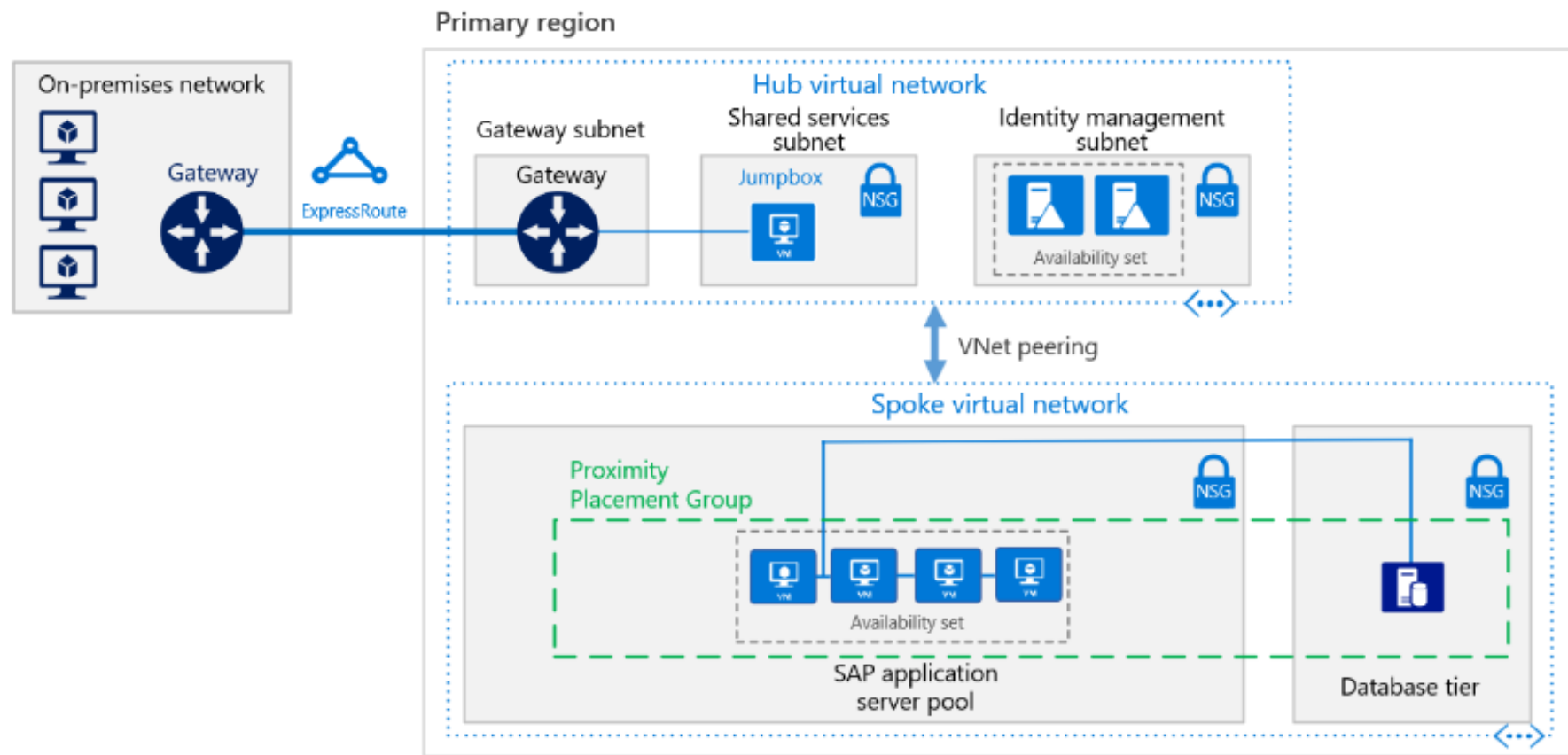
*SAP Note - 1928533 - SAP Applications on Microsoft Azure: Supported Products and Azure VM types

Azure VM | availability and recoverability

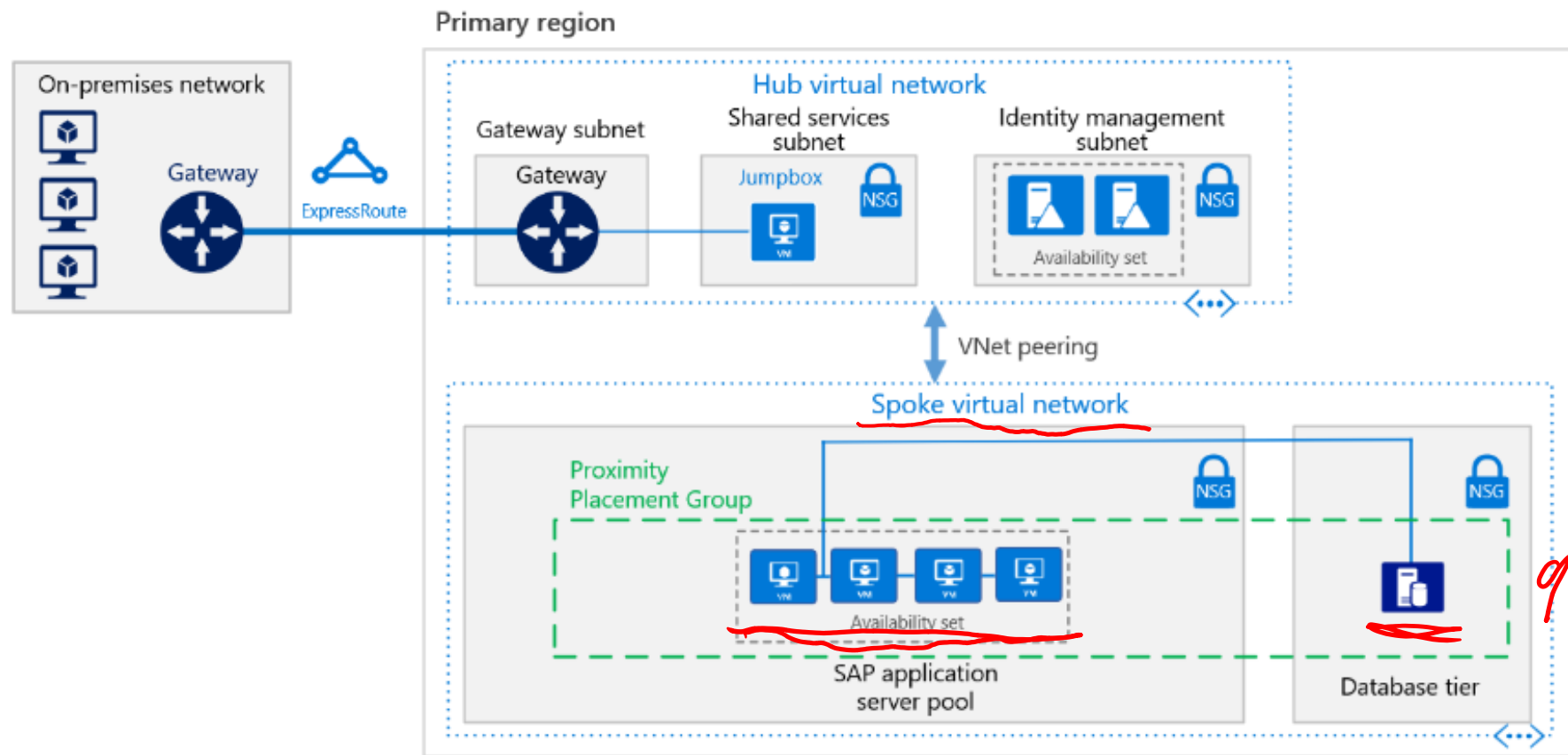
Industry-leading high availability SLA

Industry-only	Industry-leading high availability SLA	Industry-leading high availability SLA	Industry-leading broadest choice of data residency
VM SLA 99.9%	VM SLA 99.95%	VM SLA 99.99%	Regions 65
			
Single VM	Availability sets	Availability zones	Region pairs
Protection with premium storage	Protection against failures within datacenters	Protection from entire datacenter failures	Protection from disaster with data residency compliance
<ul style="list-style-type: none">› Ideal for dev / test› Cost-conscious non business-critical systems	<ul style="list-style-type: none">› AV sets for app servers› DB replication with HA in region and AZ for database	<ul style="list-style-type: none">› AV sets for app servers› DB replication across AZs with HA for Database	<ul style="list-style-type: none">› Azure site recovery for app servers› Asynchronous DB replication from primary to DR site

Sample 1

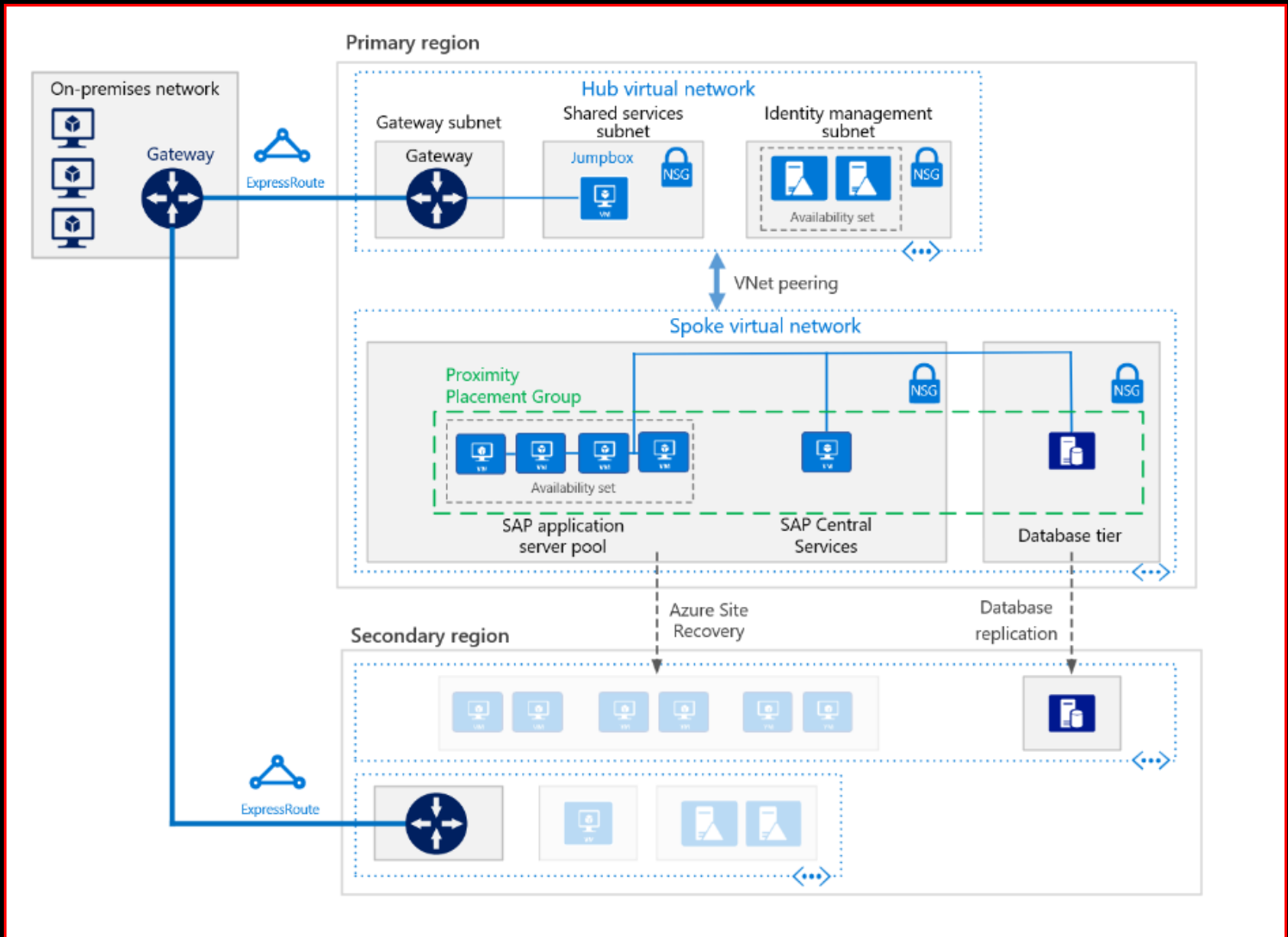


Sample 1

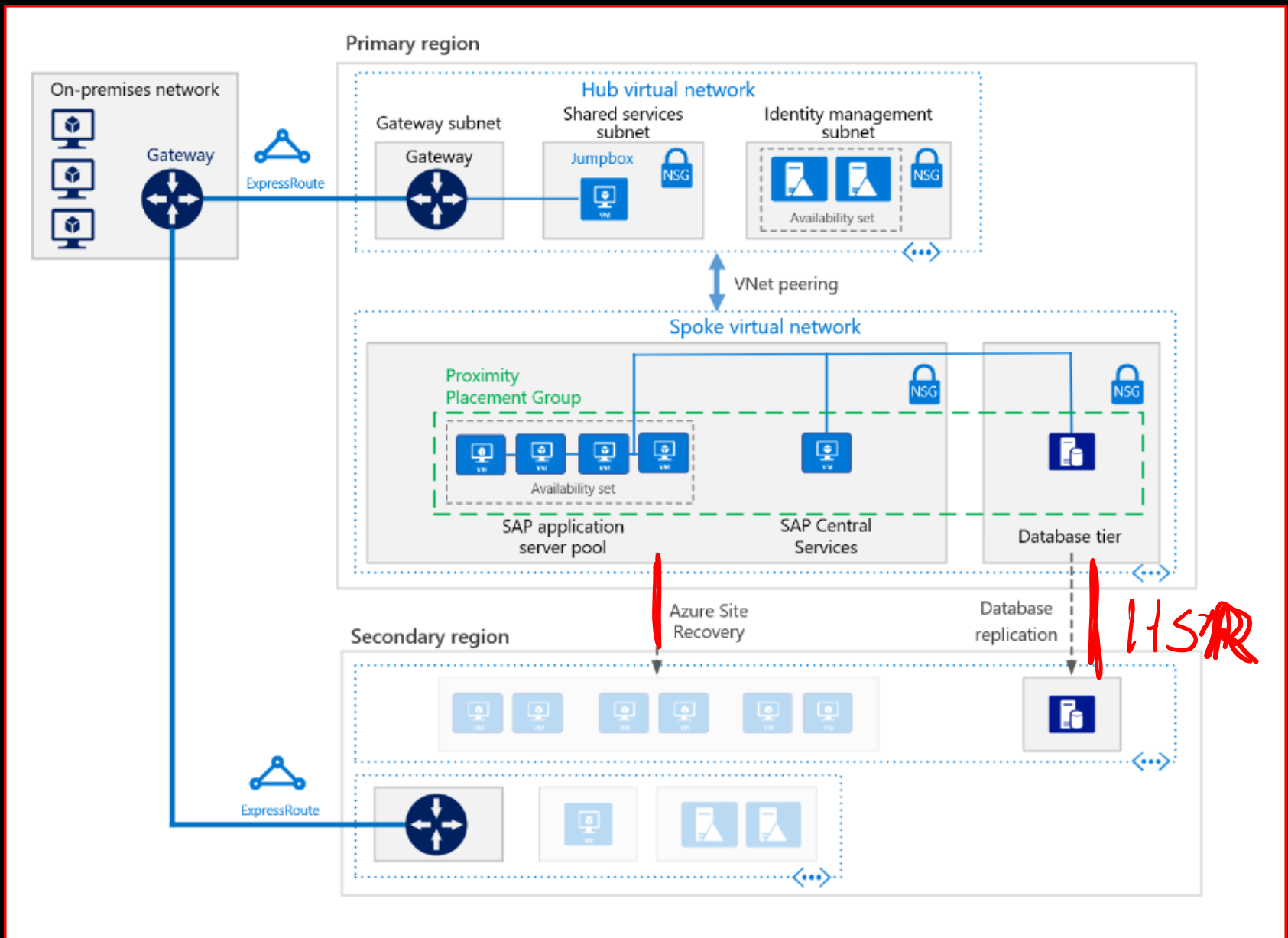


94,9%

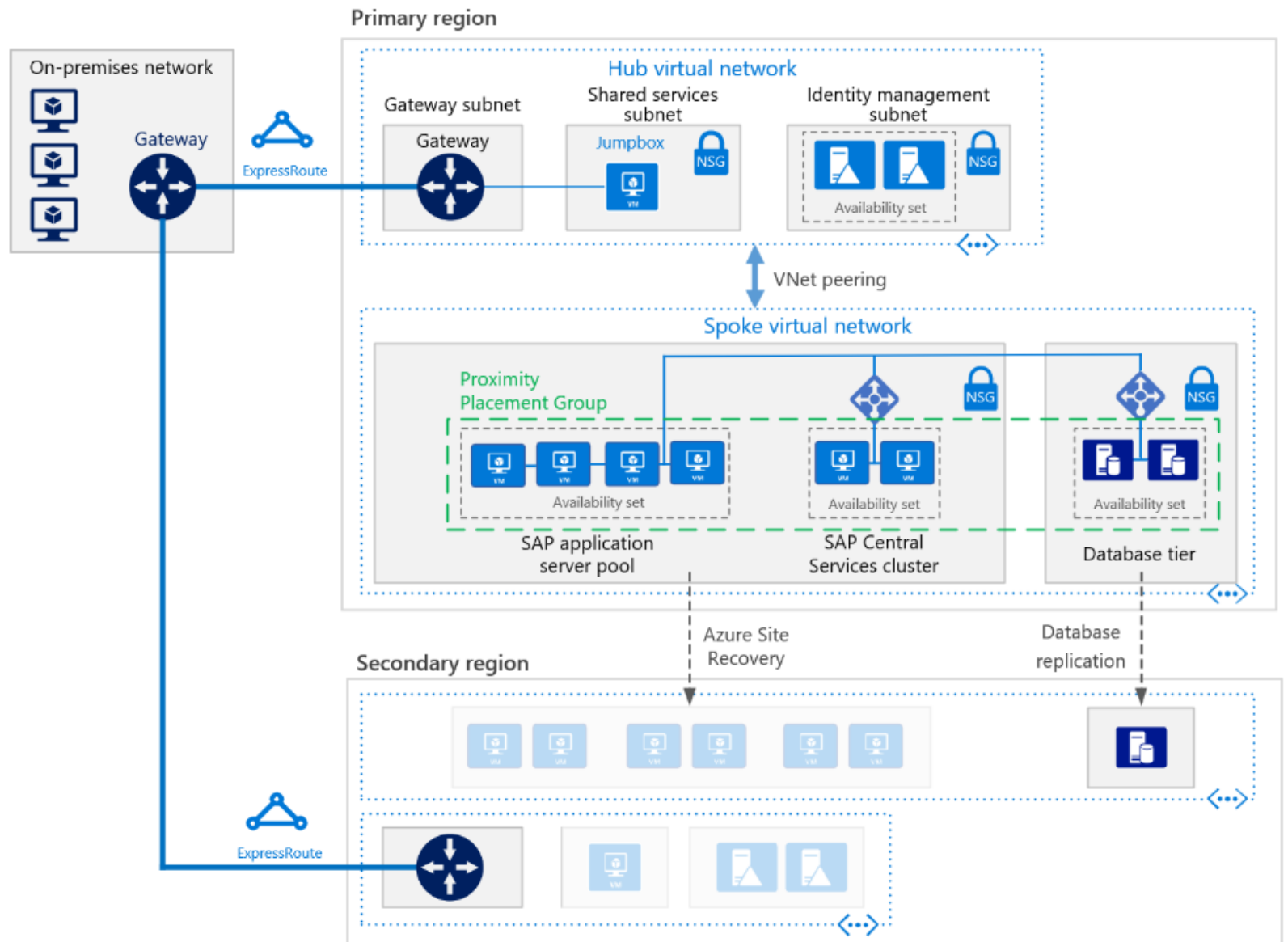
Sample 1 - DR



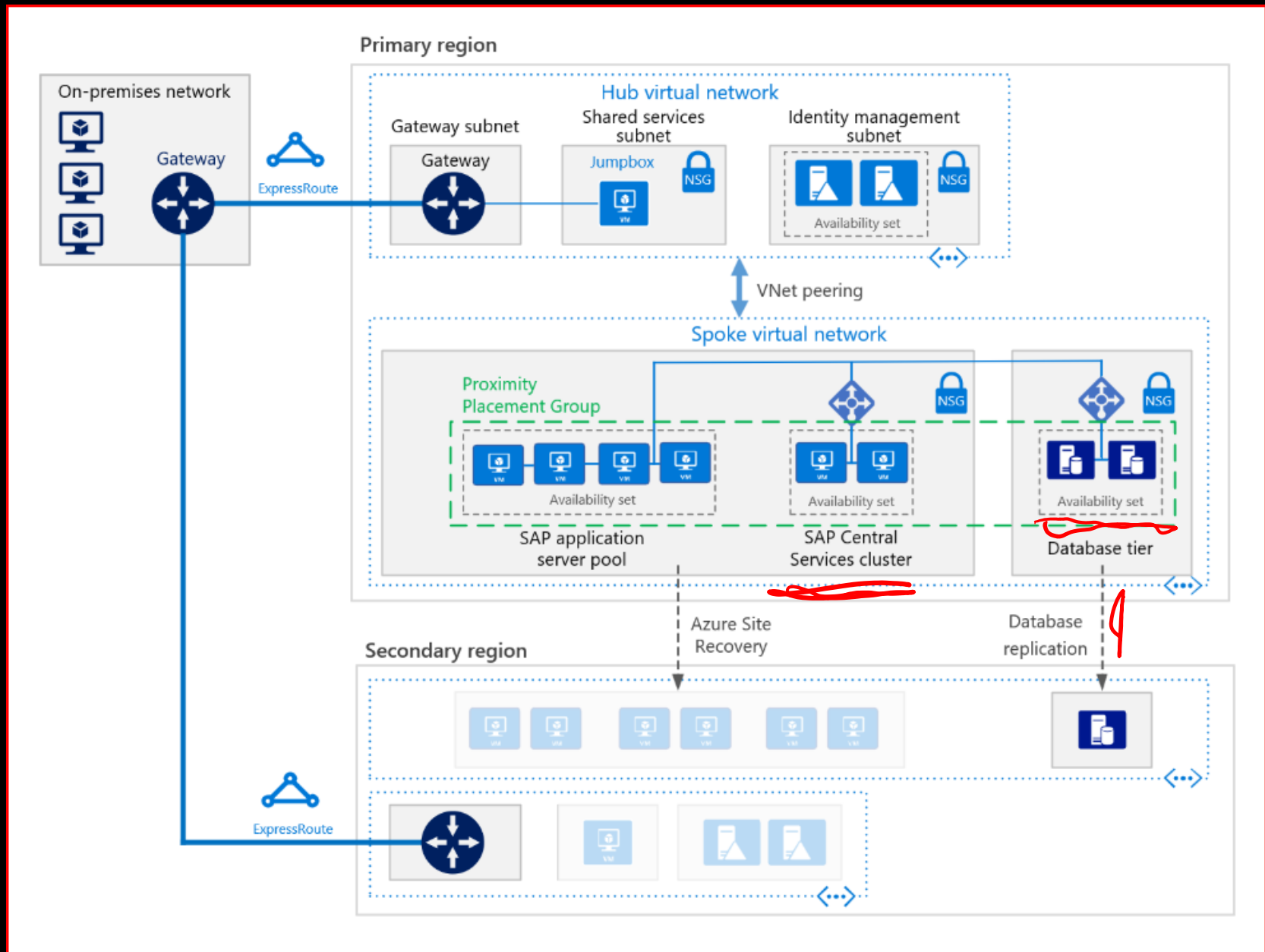
Sample 1 - DR



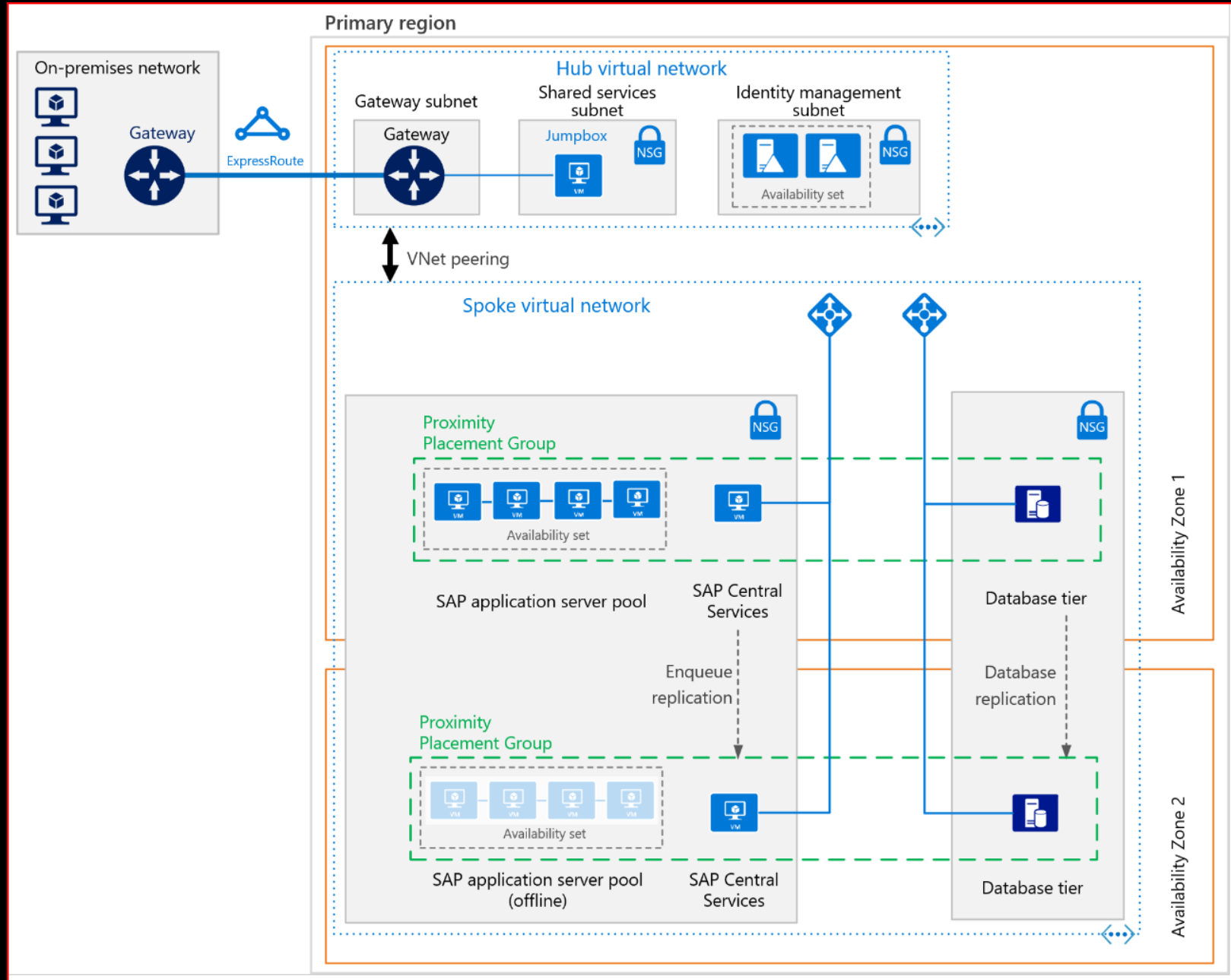
Sample 2



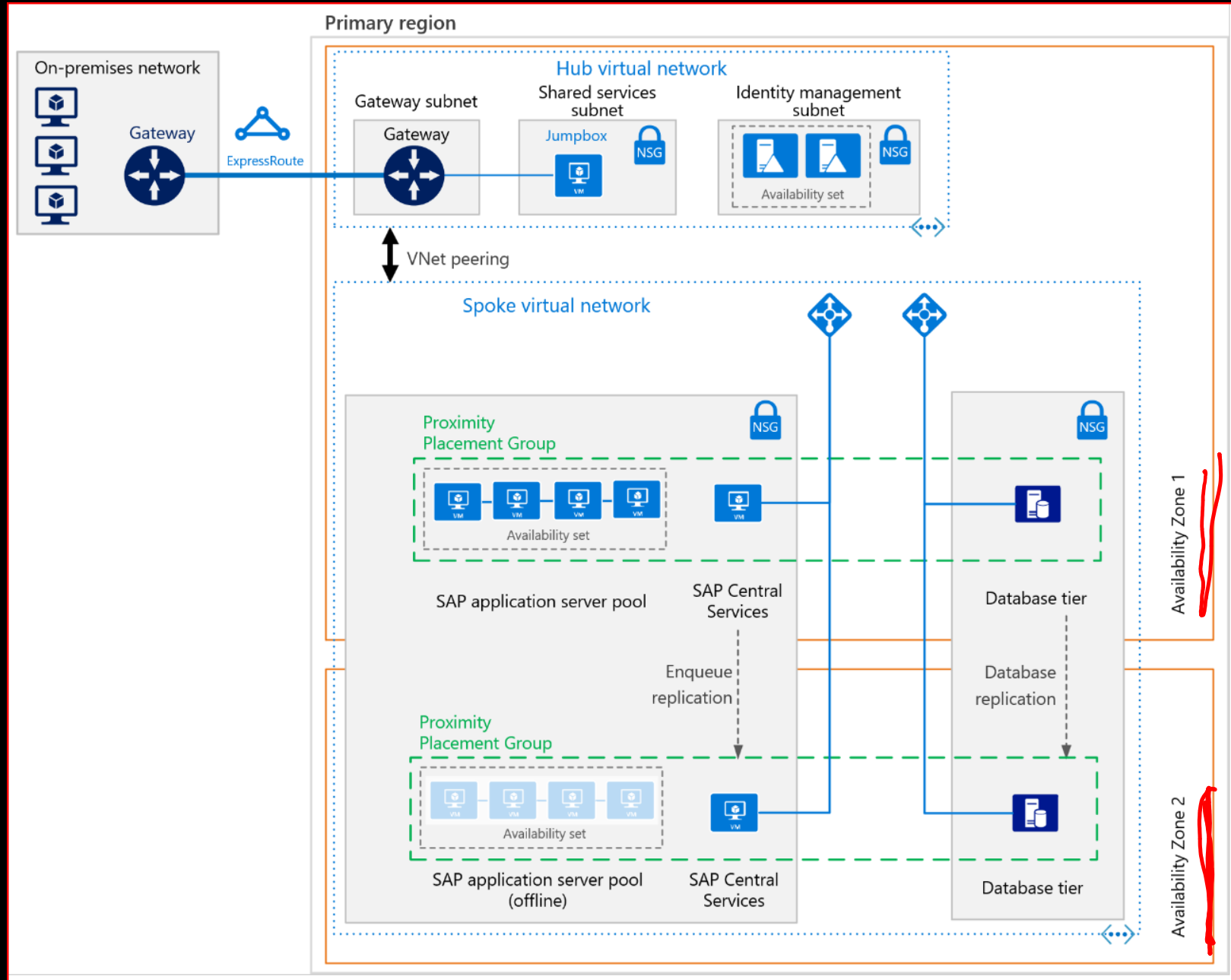
Sample 2



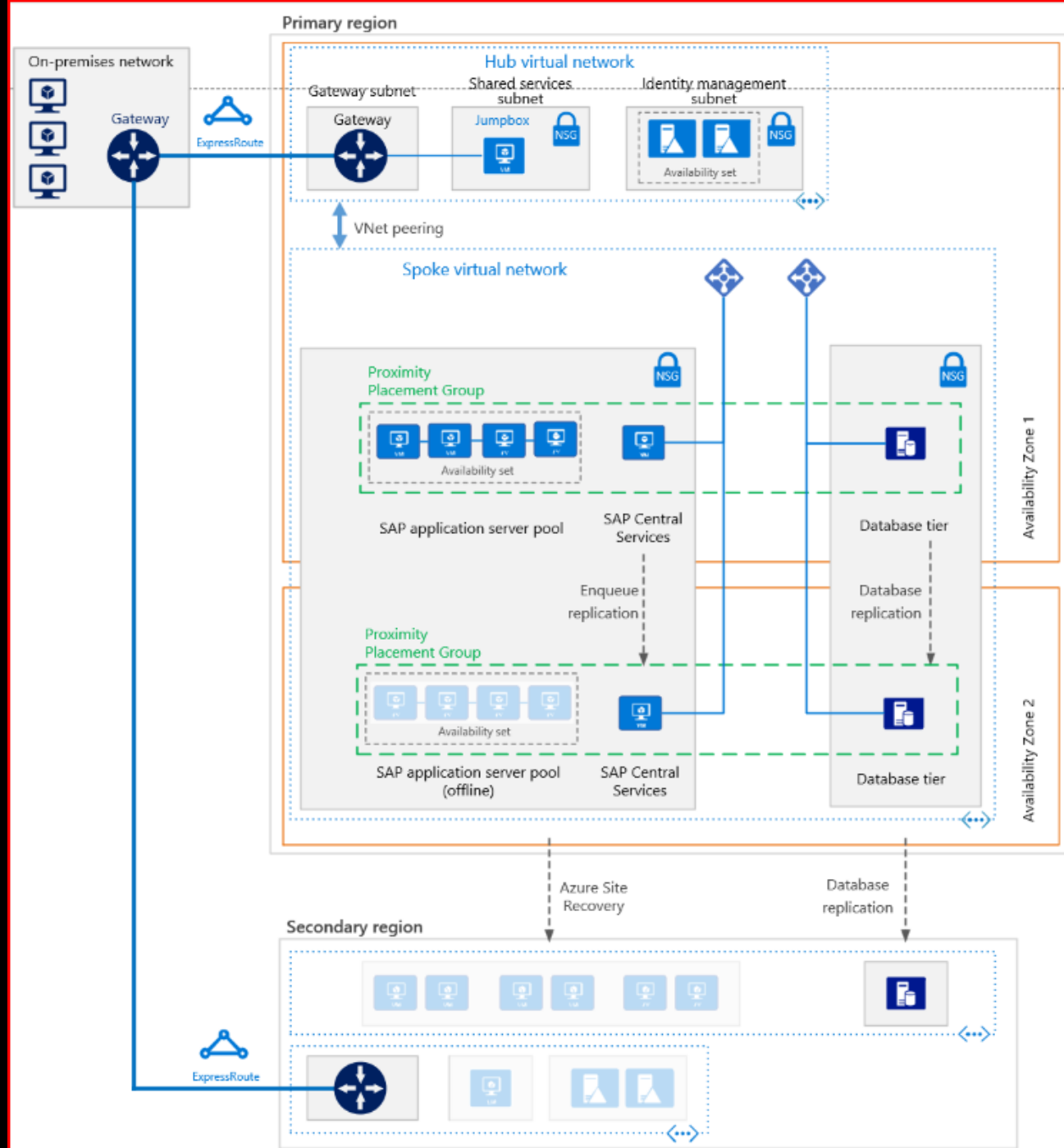
Sample 3 - HA



Sample 3 - HA / DR



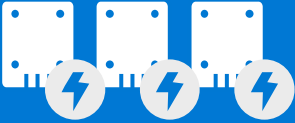
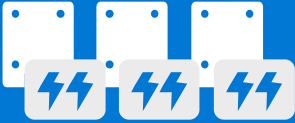



Sample 3 - DR



Unique storage options to meet demanding SAP performance needs

Only with Azure!

	Block storage				NFS Storage
	 <p>Standard HDD</p>	 <p>Standard SSD</p>	 <p>Premium SSD</p> <p>SAP HANA certified</p>	 <p>Ultra Disk</p> <p>SAP HANA certified</p>	 <p>NetApp files</p> <p>SAP HANA certified</p>
Workloads	Suitable for storing backups	Suitable for SAP application layer and non-prod DBMS	Production SAP DBMS	Production SAP DBMS	SAP HANA VM Scale-Out with standby node
Features	<ul style="list-style-type: none"> > 32GiB-32TiB > Up to 500 to 2000 IOPS / disk 	<ul style="list-style-type: none"> > 4GiB-32TiB > Up to 120 to 6000 IOPS / disk 	<ul style="list-style-type: none"> > 4GiB-32TiB > 120 to 20,000 IOPS / disk > Write Latency < 1ms > Read latency 2+ms 	<ul style="list-style-type: none"> > I/O latency < 1ms > 4GiB-64TiB > 100 to 160,000 IOPS / disk > Offers dynamic scaling of IOPS and throughput 	<ul style="list-style-type: none"> > The only SAP HANA-certified cloud native NFS storage of all hyperscale clouds > I/O latency < 1ms > 4,000 IOPS / TiB > SAP HANA disk snapshot backup offered

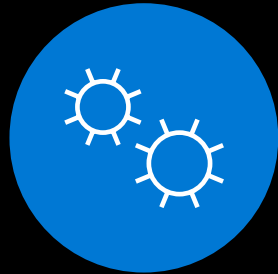
Azure management for SAP

Built-in Azure options to keep your Azure and on-premises resources secure and well-managed



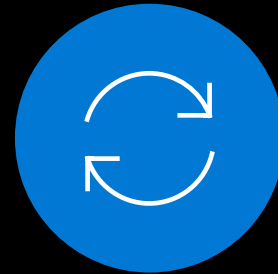
Monitoring

- › Azure Monitor for SAP HANA
Only with Azure!
- › Azure Log Analytics



Automation

- › Infrastructure and SAP HANA
- › Terraform, Ansible Scripts
ARM Templates
Only with Azure!



High availability

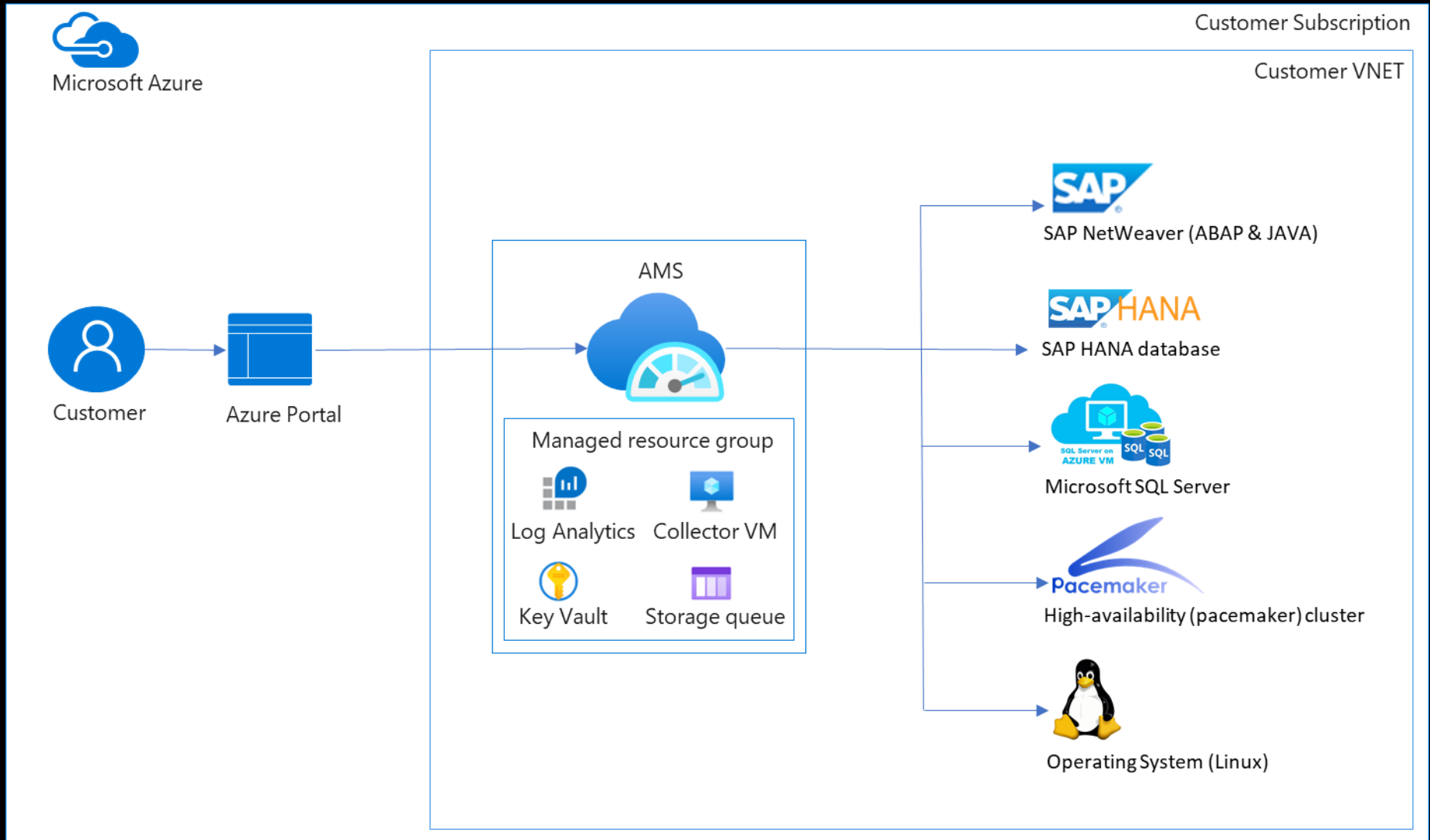
- › Azure Backup for SAP HANA
Only with Azure!
- › Azure Site Recovery



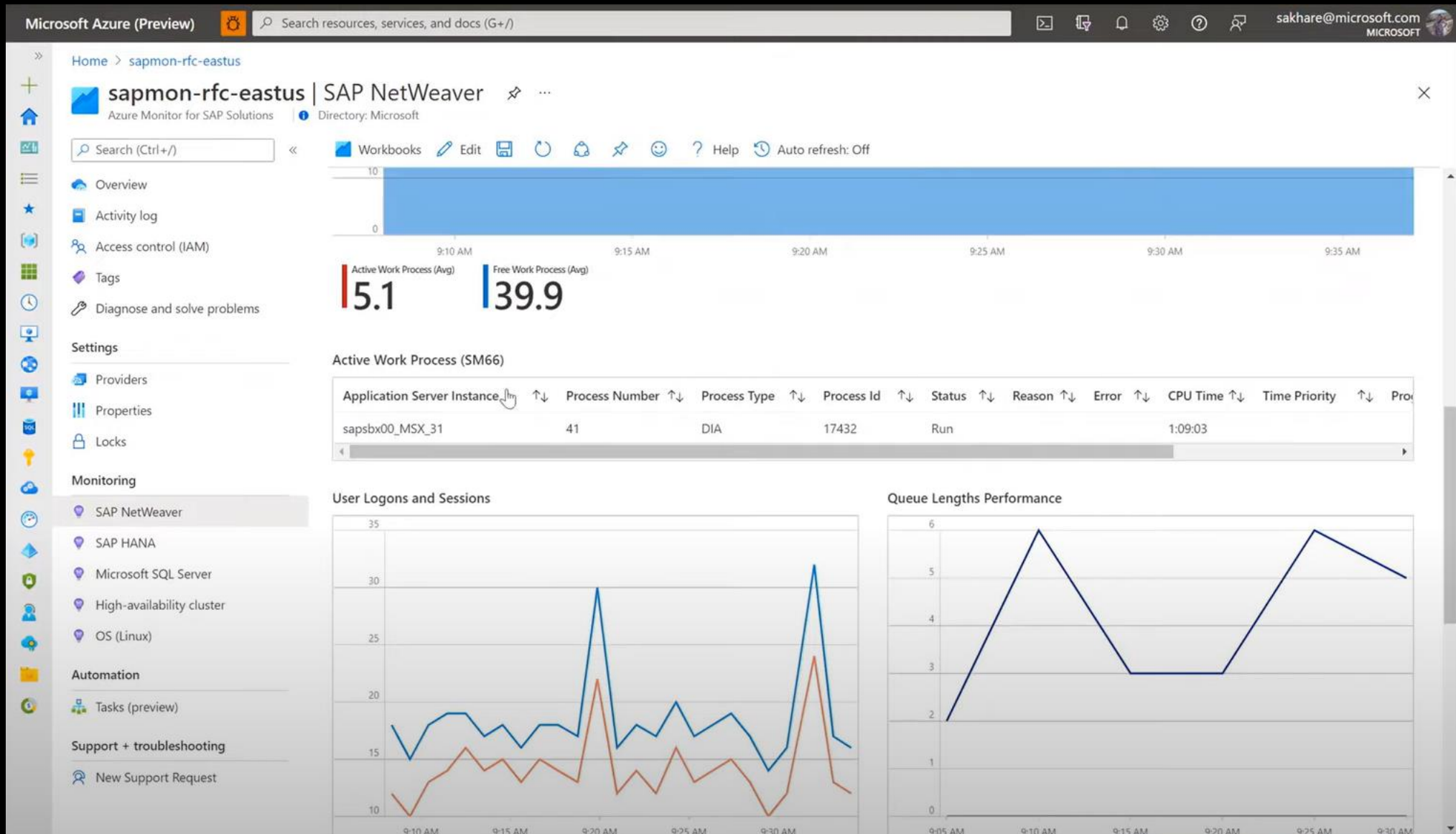
Governance

- › Azure Blueprints
- › Azure Policy
- › Role-Based Access Control (RBAC) via Active Directory
Only with Azure!

Current Architecture



Azure Monitor for SAP NetWeaver



- Create a resource
- Home
- Dashboard
- All services
- FAVORITES
- Resource groups
- All resources
- Recent
- Virtual machines (classic)
- App Services
- Virtual machines
- SQL databases
- Subscriptions
- Cloud services (classic)
- Monitor
- Azure Active Directory
- Security Center
- Help + support
- Advisor
- Resource Explorer
- Cost Management + Billing

Home > sapmon-all2

sapmon-all2 | Microsoft SQL Server

Azure Monitor for SAP Solutions | Directory: Microsoft

Search (Ctrl+)

Workbooks Edit Save Refresh Alerts Share Smile

- Overview
- Activity log
- Access control (IAM)
- Tags
- Diagnose and solve problems

Settings

- Providers
- Properties
- Locks

Monitoring

- SAP NetWeaver
- SAP HANA
- Microsoft SQL Server
- High-availability cluster
- OS (Linux)

Automation

Tasks (preview)

Support + troubleshooting

New Support Request

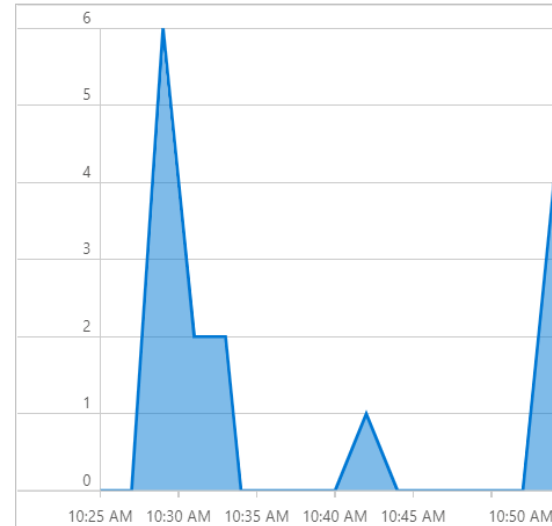
Days: Last 30 minutes
 Provider: clashmom

Azure Monitor for SAP Solutions on MS SQL Server

OS Hostname: SERVER01 on Windows Server 2016 or higher (Server Datacenter) - English
 SQL Instance: SERVER01 - Enterprise Edition (64-bit) Version 15.0.2070.41
 SAP Instance: MOM

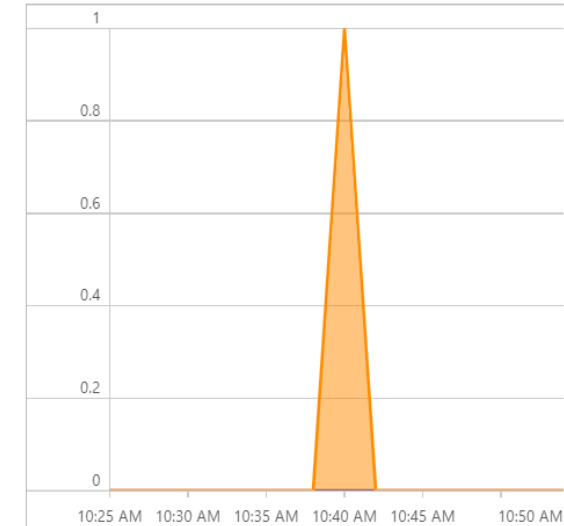
Current Load | Statistics | Resources | Problems | AlwaysOn | Backup

Batch Request/sec (Last 30 minutes - Grain: 1m)



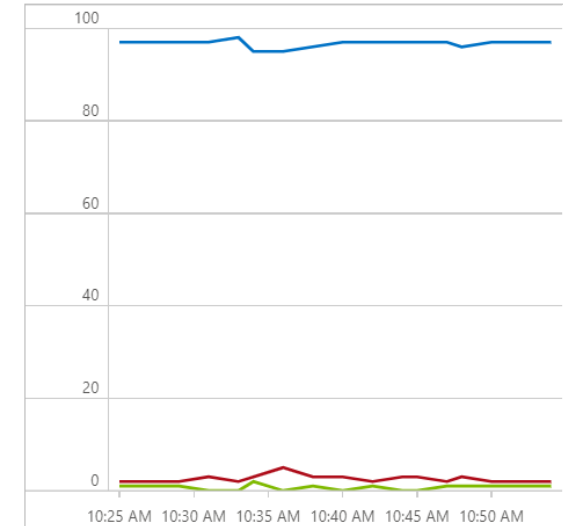
Batch Requests/sec (Avg)
0.938

Compilations and Re-Compilations/sec (Last 30 minutes)



SQL Compilations/sec (Avg) | SQL Re-Compilations/sec (Avg)
0.0625 | **0**

CPU Usage (Last 30 minutes - Grain: 1m)



SQL Server (Last) | Idle (Last) | Others (Last)
1 | **97** | **2**

avg. DB IO Read Latency (Last 30 minutes - Grain: 1m)



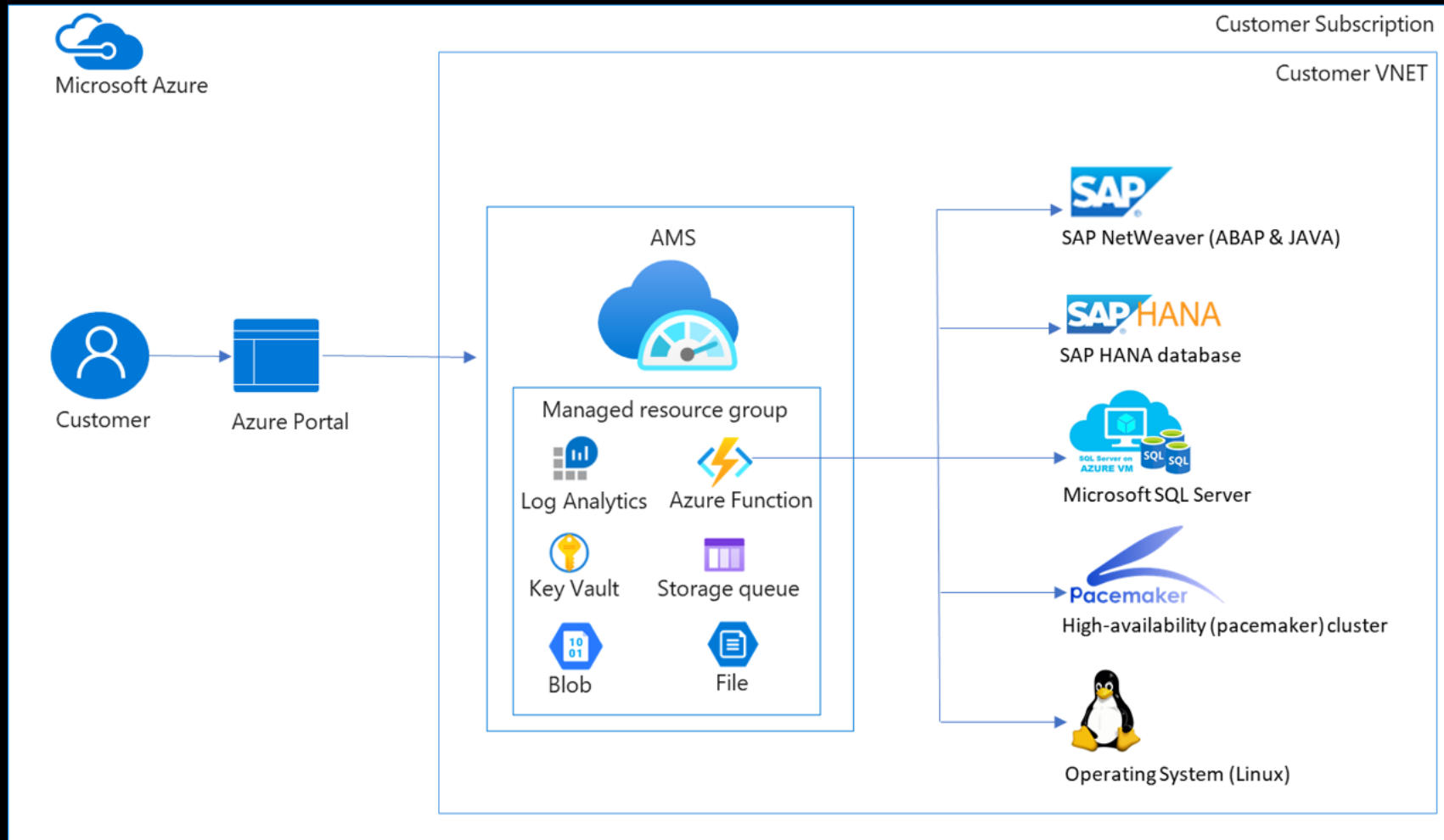
avg. DB IO Write Latency (Last 30 minutes - Grain: 1m)



avg. DB IO Total Latency (Last 30 minutes - Grain: 1m)



Architecture (AMS 2.0)





Benefits of AMS 2.0

- **No patching/maintenance overhead on customers.** Customers are no longer required to patch/maintain collector VM since it is replaced with Azure Functions
- **No-outbound internet access scenario is addressed.** Customers who do not allow outbound internet access from their SAP network can use a standard Azure Functions feature called [route-all](#) to redirect traffic Azure Function with one click & successfully deploy AMS 2.0
- **Platform improvements** AMS 2.0 is backed up by end-to-end automated test suite and unit tests to ensure that engineering team catch issues before customer finds them.
- **Customize name for managed resource group.** Customers can choose the name of managed resource group which is deployed as part of AMS 2.0
- **New features** will be available only in AMS 2.0 such as DB2 database monitoring, single-pane-of-glass dashboard to provide drill-down capabilities, Integration with BPaaS, AIOPs (for auto-RCA) etc.

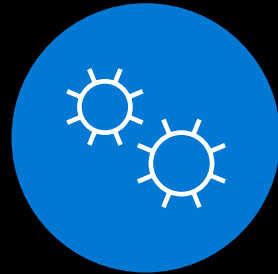
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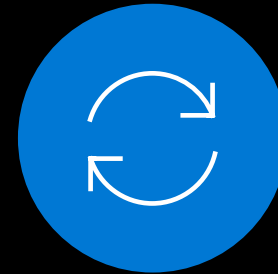
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Enterprise Scale for SAP speeds end-to-end deployment

Accelerated

Helps define a strategic design path and target technical state.

Guides review of critical design considerations and recommendations

Expedites a modular production-grade SAP deployment by building on the Azure Enterprise Landing Zone

Automation helps you get to production faster

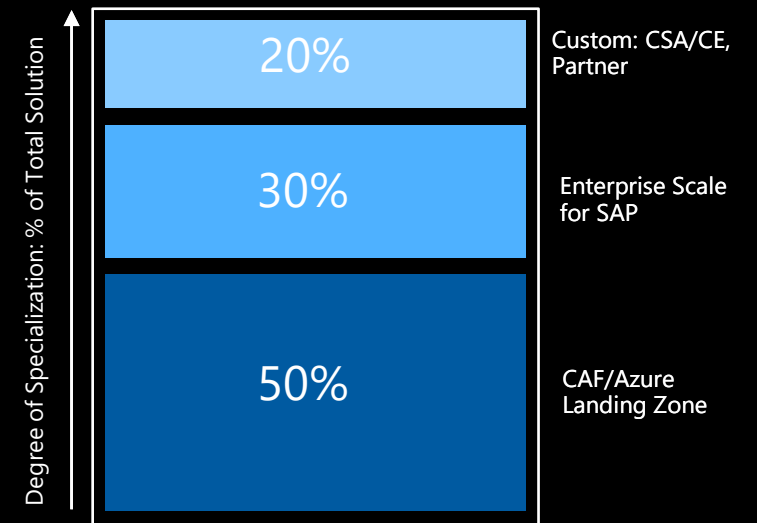
Scalable, Flexible

Sustainable and scalable foundation helps you meet SAP performance requirements while allowing customization based on business requirements

Trusted Technical Guidance

Tap into Microsoft's technical and prescriptive guidance from experts

Access reference architectures and reference implementation to automate and scale SAP workloads



Builds on Cloud Adoption Framework foundation

1. Start with CAF best practices, documentation, and tools

Cloud Adoption Framework (CAF) helps build business and technology strategies to succeed in the cloud.

Guidance helps you meet short-term and long-term objectives of cloud architects, IT professionals, and business decision makers.

CAF with Azure landing zones enables application migration, modernization, and innovation at enterprise-scale in Azure

2. Operationalize CAF with Enterprise-scale for SAP

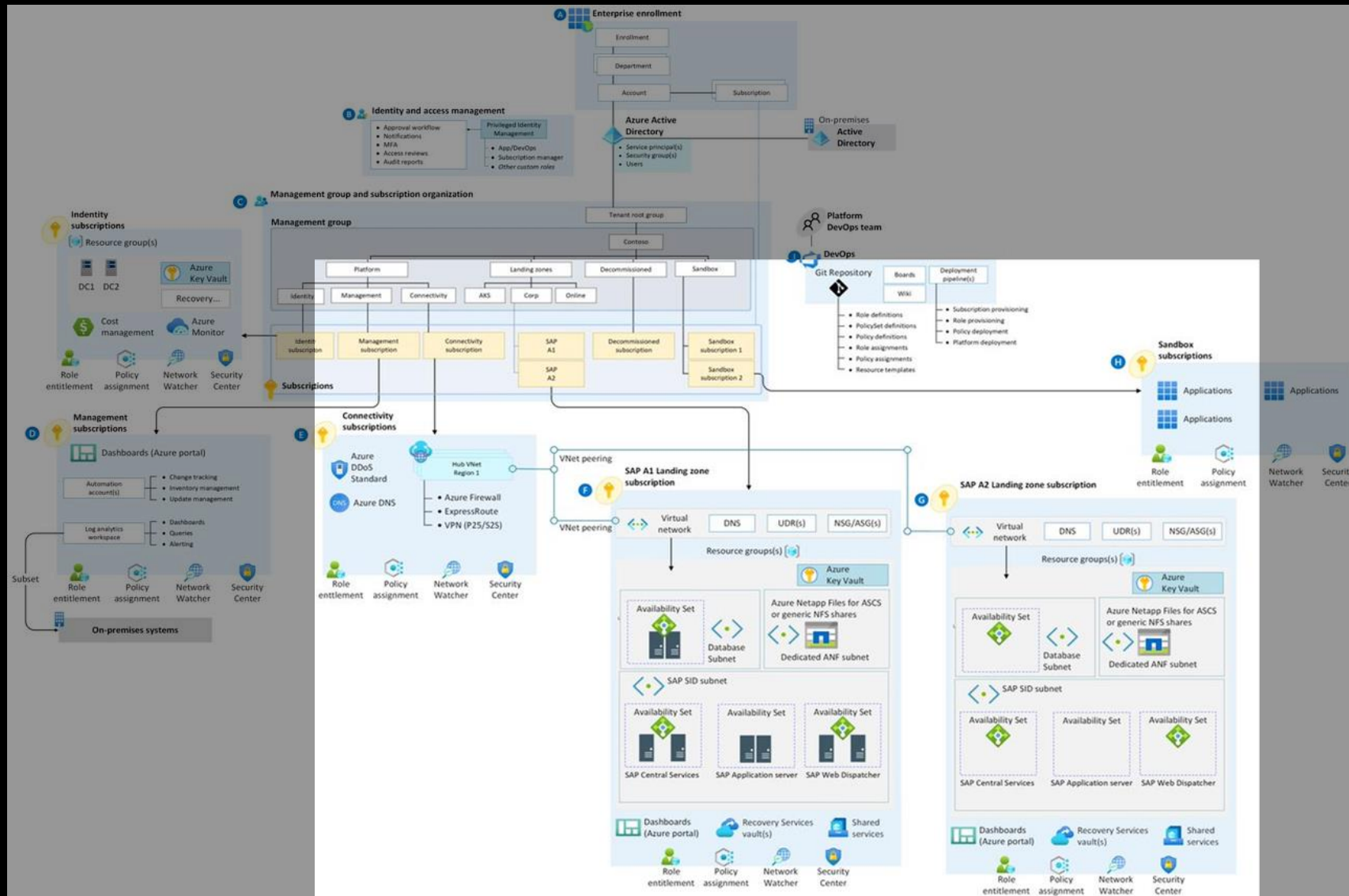
Rely on an SAP-specific approach to the CAF framework stages "Plan," "Ready," and "Adopt"

Accelerate onboarding with automated deployment of a best practice architecture

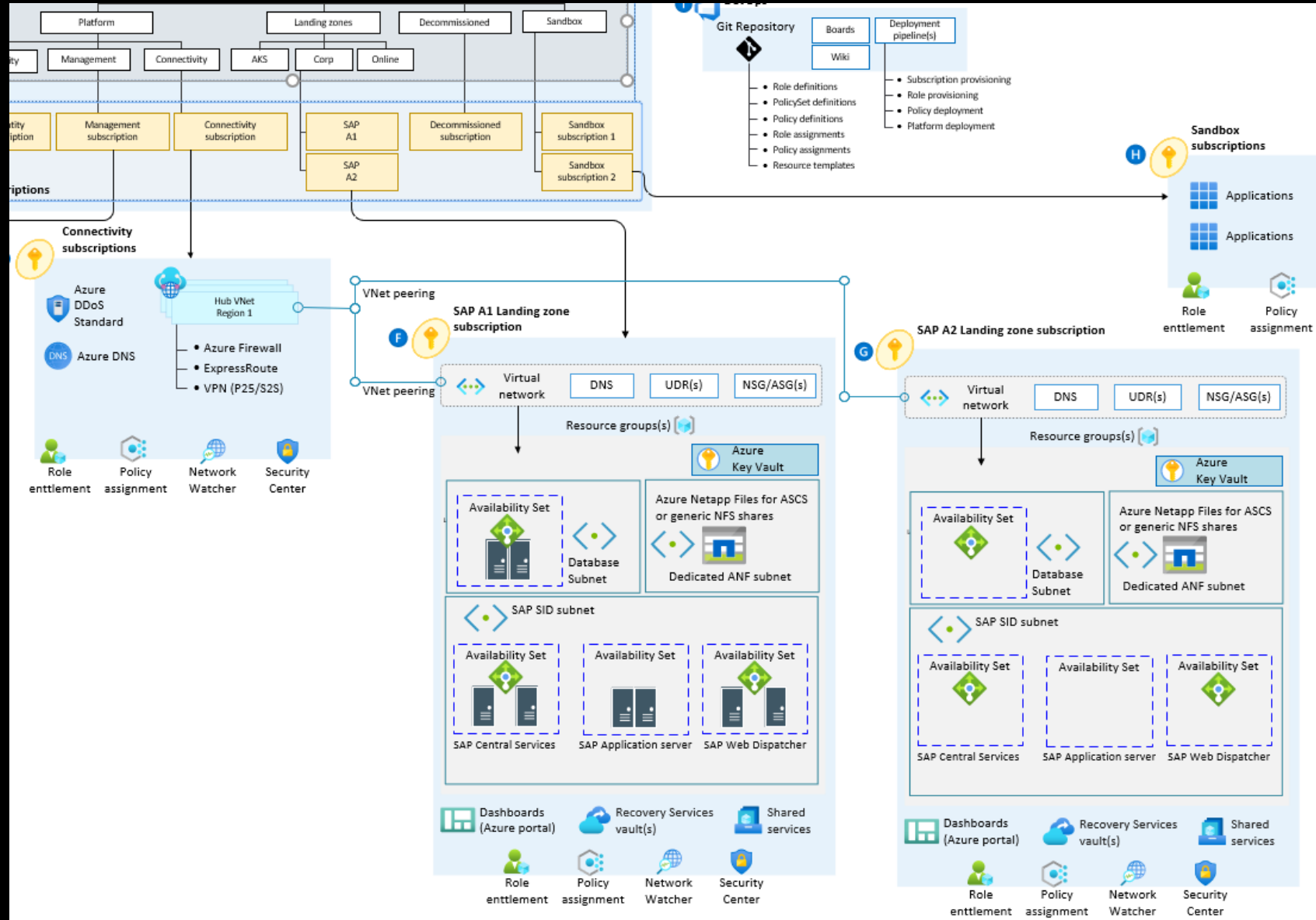


The Cloud Adoption Framework offers guidance through each phase and proven methodologies to overcome blockers.

Enterprise-scale for SAP reference architecture



SAP Enterprise Landing Zone– Reference Architecture



Incorporate best practices across critical design areas



Identity and Access Management (SSO)



Business Continuity and Disaster Recovery
(example: storage, SAPet, AvZone Regions)



Network Topology and Connectivity
(example: ANF, HLI)



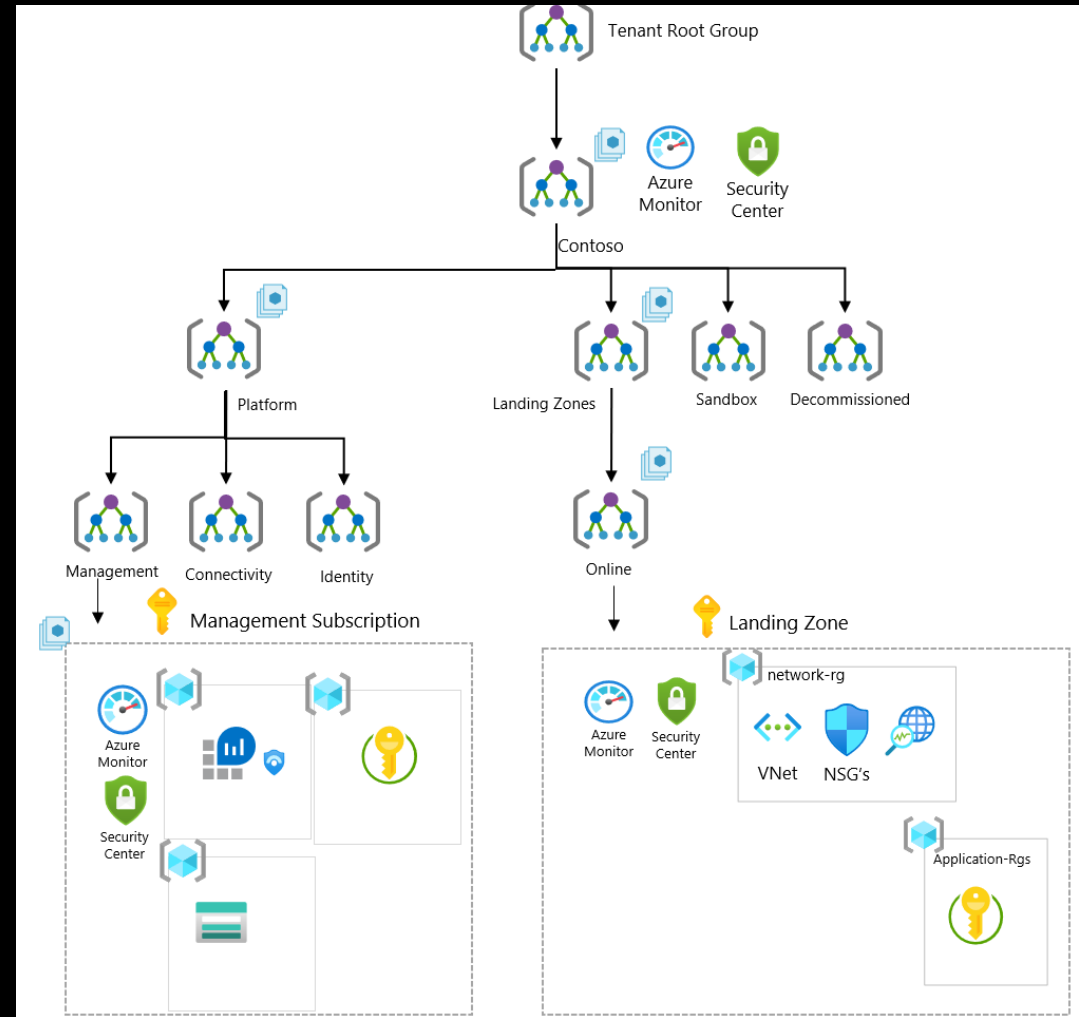
Security, Governance, and Compliance
(example: NSG)



Operations Baseline for SAP on Azure (example: Azure Monitor)




Deployment Options for SAP in Azure



Documentation + Repo

Enterprise-scale for SAP on Azure

Article • 10/28/2021 • 2 minutes to read •  +2

Is this page helpful?  

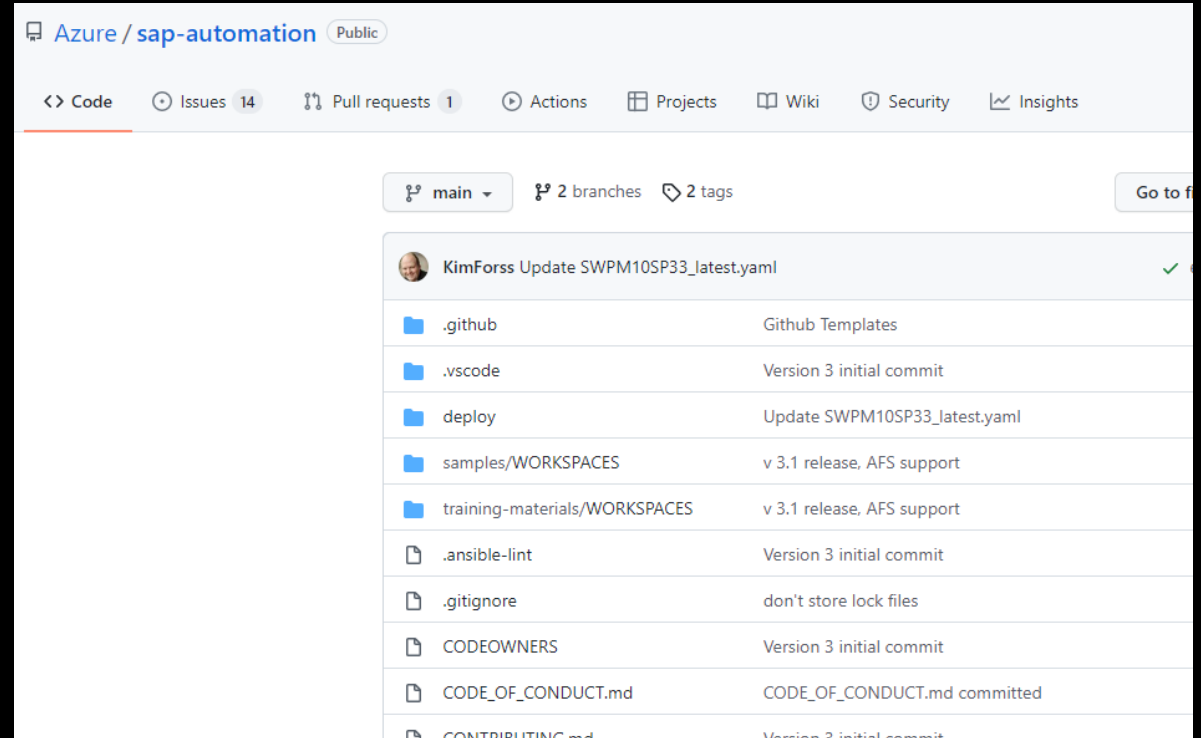
Enterprise-scale for SAP on Azure provide specific architectural approach and reference implementation that enables effective construction and operationalization of platform workload landing zones within the Cloud Adoption Framework enterprise-scale landing zone. After you have successfully implemented an enterprise-scale landing zone, they can use enterprise-scale for SAP on Azure. Review the enterprise-scale [overview](#) and [implementation guidance](#) before deploying enterprise-scale for SAP on Azure.

Adopt enterprise-scale for SAP on Azure

Not all customers adopt SAP on Azure in the same way. The enterprise-scale for SAP on Azure architecture varies between customers. The technical considerations and design recommendations of enterprise-scale for SAP on Azure might lead to different trade-offs based on your organization's scenario. If you follow the core recommendations, the resulting architecture sets your organization on a path to a sustainable scale. The enterprise-scale for SAP on Azure is modular by design. You can customize environmental variables. This solution approach to landing zones includes three sets of assets to support cloud teams:

- [Design guidelines](#)
- [Architecture](#)
- [Implementation](#)

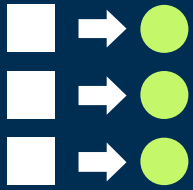
<https://aka.ms/sapaccelerator>



The screenshot shows the GitHub repository page for `Azure/sap-automation`. The repository is public and has 14 issues, 1 pull request, and 2 tags. The current branch is `main`. The repository contains several files and folders, including `.github`, `.vscode`, `deploy`, `samples/WORKSPACES`, `training-materials/WORKSPACES`, `.ansible-lint`, `.gitignore`, `CODEOWNERS`, `CODE_OF_CONDUCT.md`, and `CONTRIBUTING.md`. The most recent commit is by `KimForss` titled "Update SWPM10SP33_latest.yaml".

File/Folder	Commit Message
<code>.github</code>	Github Templates
<code>.vscode</code>	Version 3 initial commit
<code>deploy</code>	Update SWPM10SP33_latest.yaml
<code>samples/WORKSPACES</code>	v 3.1 release, AFS support
<code>training-materials/WORKSPACES</code>	v 3.1 release, AFS support
<code>.ansible-lint</code>	Version 3 initial commit
<code>.gitignore</code>	don't store lock files
<code>CODEOWNERS</code>	Version 3 initial commit
<code>CODE_OF_CONDUCT.md</code>	CODE_OF_CONDUCT.md committed
<code>CONTRIBUTING.md</code>	Version 3 initial commit

<https://github.com/Azure/sap-automation>



DEPLOYMENT

Realize your migration plan and communicate it to the business

Deploy environment across compute, networking, security, and database needs

Test for recovery and performance

Migrate to bring your technology to life

Infrastructure Deployment

- ✓ Framework for deployment of Ref. Architecture
- ✓ Scalable from Regional to Global Deployment
- ✓ Networking support
- ✓ **HA Ready Architecture**
- ✓ Availability Sets Support
- ✓ **Availability Zone support**
- ✓ Proximity Placement Groups
- ✓ Customizable disk configuration
- ✓ Custom Image Support
- ✓ Extendable naming convention
- ✓ Disk encryption support
- ✓ Key Vault Support
- ✓ DB Tier: HANA & AnyDB support
- ✓ Application Tier: Linux and Windows
- ✓ Azure NetApp Files – App Tier.

Configuration and Installation

Base OS Configuration activities, such as:

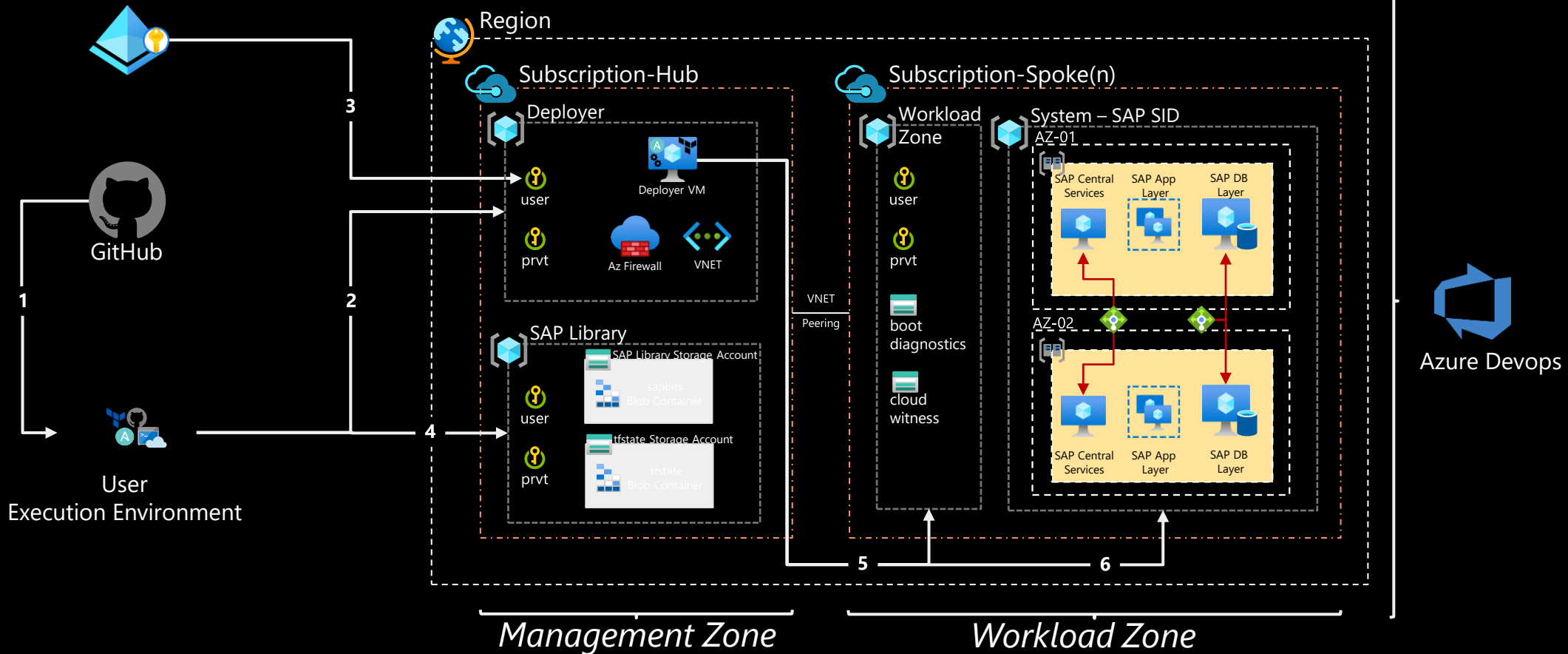
- sudoers, host file, CIS recommendations, time synchronization, os package installation

SAP specific OS Configuration activities, such as:

- Disk/LVM/Filesystem configuration, OS packages for SAP installation, User Creation, Kernel Tuning, SAP OS Note application

SAP Software Installation

- Software downloaded from SAP, persisted in customer repository
- Ability to repeatable install S/4, at a target Version, Support Stack, and Patch level
- Delivers a running S/4 single install. in ~2 hours and **S/4 HA install in ~3 hours (HSR, Pacemaker) - ready for Basis post-installation activities.**



Deployment Phases

Preparation phase

- Creating the control plane

Configuration/Planning phase

- Software acquisition
- Virtual network (existing/new)
- Subscriptions (existing/new)
- Credentials

Deployment phase

- SAP Systems (SIDs)



Infrastructure deployment

- Deployment environment
- Storage components
- Workload artifacts
- System (SID) artifacts



Configuration and Software Deployment

- Operating system configuration
- Installation media management
- Software installation

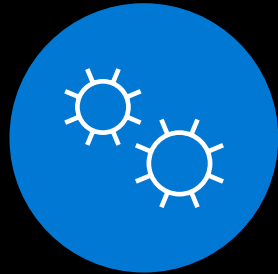
Azure management for SAP

Built-in Azure options to keep your Azure and on-premises resources secure and well-managed



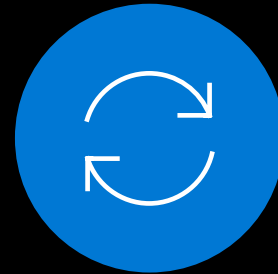
Monitoring

- › Azure Monitor for SAP HANA
Only with Azure!
- › Azure Log Analytics



Automation

- › Infrastructure and SAP HANA
- › Terraform, Ansible Scripts
ARM Templates
Only with Azure!



High availability

- › Azure Backup for SAP HANA
Only with Azure!
- › Azure Site Recovery

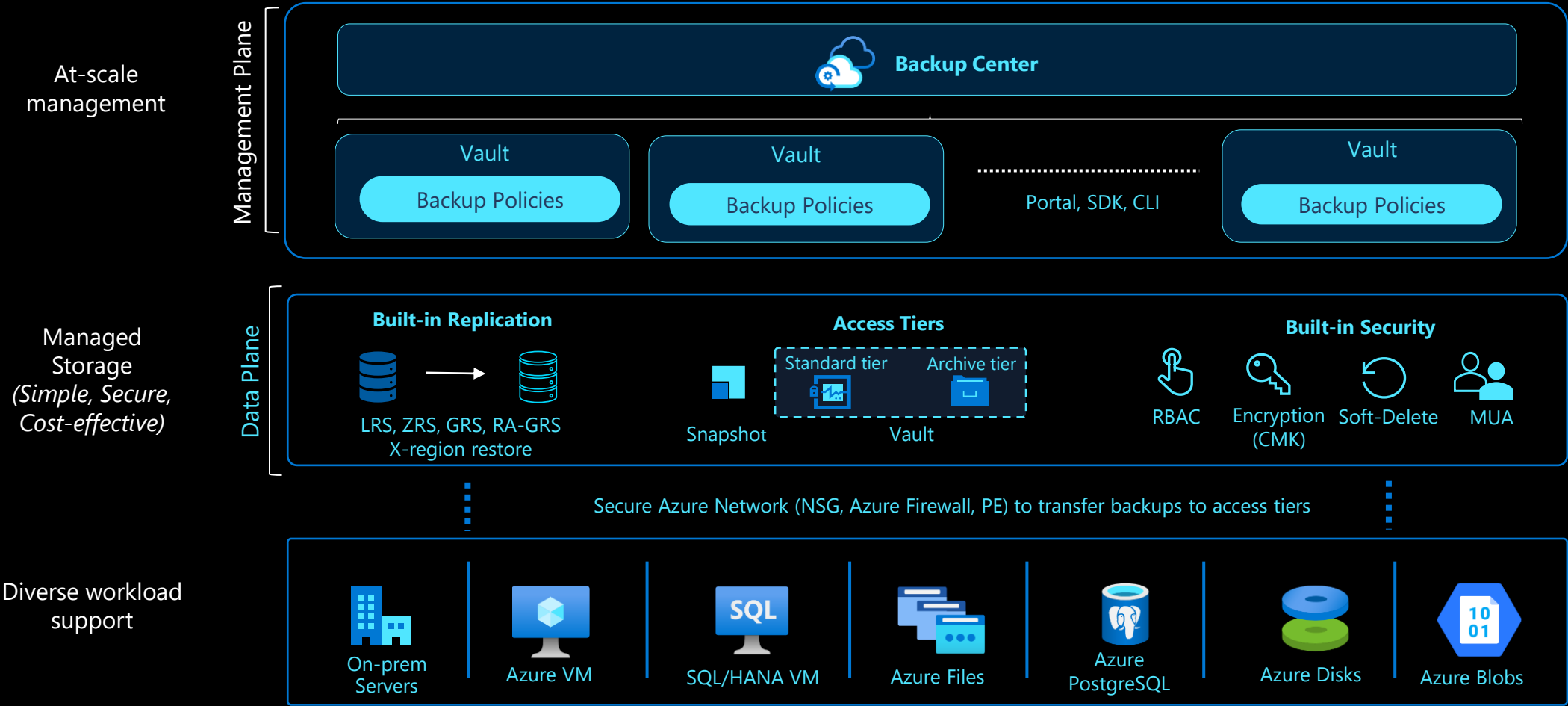


Governance

- › Azure Blueprints
- › Azure Policy
- › Role-Based Access Control (RBAC) via Active Directory
Only with Azure!

Azure Backup Overview

Backups (snapshots or stream-based) are transferred over secure network to Azure Backup managed storage where they are retained as per the user defined backup policy in the standard or archive tier. Backup data is then encrypted and copied to multiple zones or regions for greater durability. Backup center enables the user to manage and monitor everything backup-related from a single console.



Backup Databases running in the Azure VM

App-consistent backups are generated using managed disk snapshots and/or stream-based backups based on the RPO/RTO

ALL databases

(including Oracle, MySQL, SQL, HANA)



(Auto) coordination with VSS to quiesce all VSS-aware apps (databases)



Database specific pre/post-scripts **to be written by the user** to freeze and thaw the application.



Pre-packaged database specific pre/post-scripts to freeze and thaw the application so user doesn't have to write them.

More databases to be added to this list.

ORACLE
DATABASE



SQL
SAP HANA

Use specially devised end-to-end backup solution for better RPO and RTO (recommended for production workloads)-

High fidelity stream-based backups : Full/copy-only full/ differential/ incremental/ log backups are streamed using VDI stream for SQL and 'backint' for HANA.

Self service restores with 15 mins RPO: Trigger point-in-time restores, without having to manually apply a chain of logs over differential and full backups.

Database level protection: Granular control with database level backup/restores with an option to automatically protect all the existing and incoming DBs in a server.

Long-term retention in standard or archive tier: Retain backups for 10 years+ with recovery points getting pruned automatically by the built-in lifecycle management, while maintaining dependencies amongst backups.

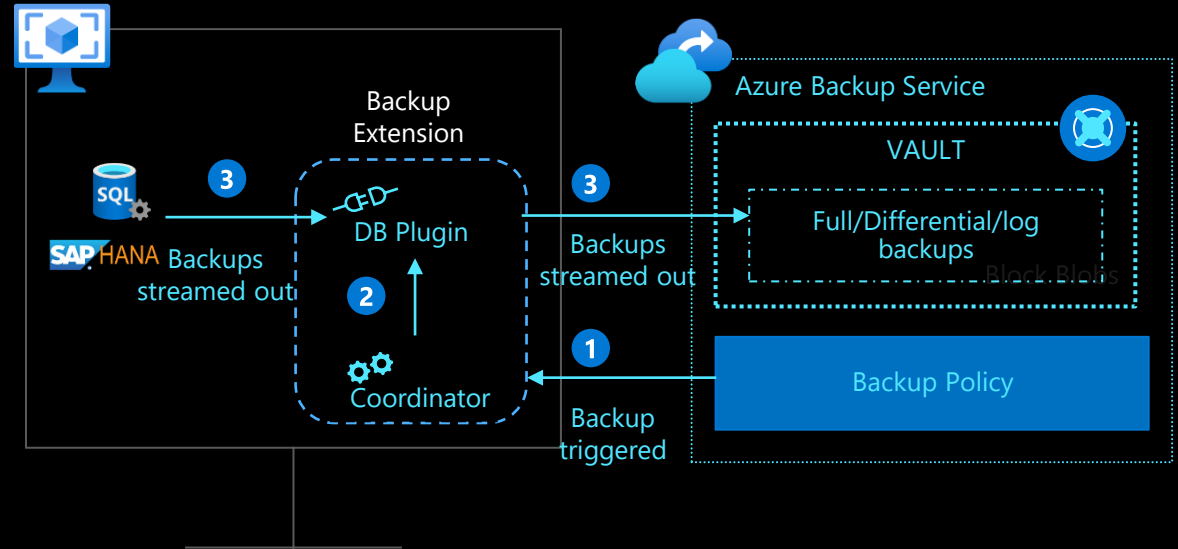
Restore anywhere: Restore as **.bak** files to a network share to port the backup data across Azure subscriptions or regions and even to an on-prem server.

Backup Databases in Azure VM | Stream-based

Backups are streamed out from the database engine and written to the Azure Backup managed storage.

	SAP HANA	SQL Server
Supported DB and OS versions	<ul style="list-style-type: none"> • SDC on HANA 1.x, MDC on HANA 2.x SPS04, SPS05 Rev <= 55 • SLES 12; SLES 15; • RHEL 7.4, 7.6, 7.7, 7.9, 8.1 & 8.2 	<ul style="list-style-type: none"> • SQL Server 2008 and above • Windows Server 2008 R2 and above
Supported deployment	<ul style="list-style-type: none"> • Standalone Azure VMs • HSR – to be added soon 	<ul style="list-style-type: none"> • Standalone Azure VMs, • SQL Always on availability group • SQL FCI – to be added soon
*Performance	420 MBps 100 MBps (logs) i.e., 4-6 hours for 6-8 TB backups	200 MBps
Key call outs	<ul style="list-style-type: none"> • All recovery models • TDE encrypted DBs could be backed up. • Could be used with Azure VM backup 	<ul style="list-style-type: none"> • All recovery models • SQL native compression • TDE encrypted DBs backup • In-built checksum used • SQL sys-admin permission required for backups

**The actual speed depends on the underlying disk(s) and VM throughput along with the number of backups running at a time.*



- The backup extension gets temporary access to write to specific blobs. In this way, even in a compromised environment, existing backups can't be tampered with or deleted by the guest.
- Stream-based DB backup solution should not be used along with any other backup solution to prevent LSN breaks. However, Azure VM backup can be used along with them

[SQL VM backup- Demo Video](#)

Backup Databases running in Azure VM | Snapshot-based

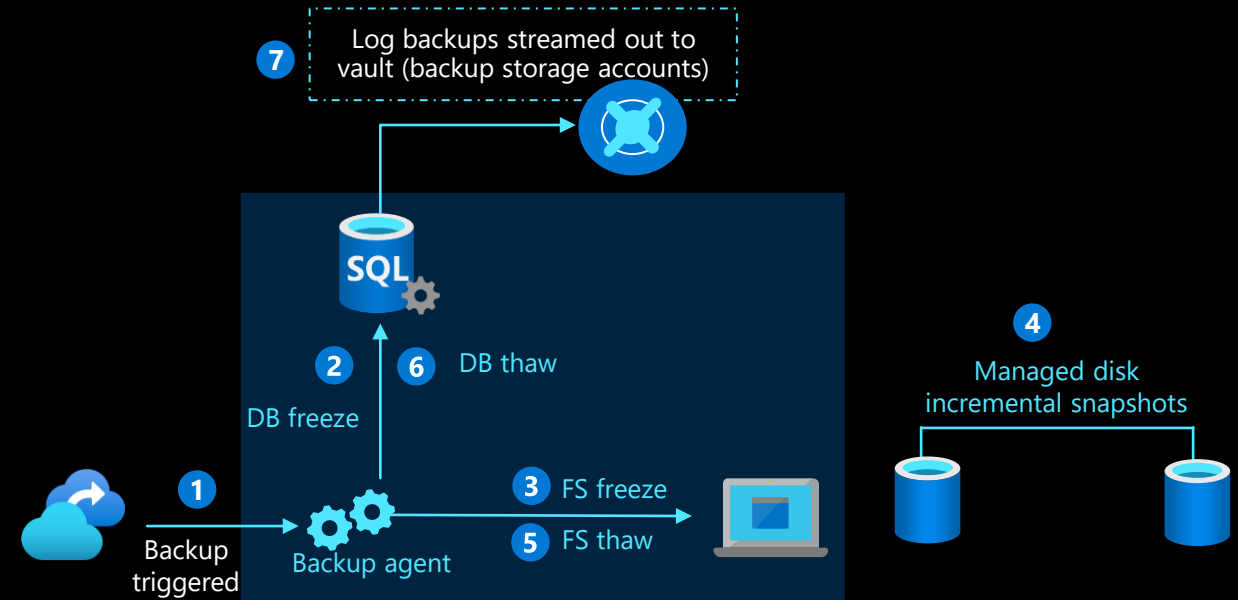
Large databases are effectively backed up using a combination of app-consistent, managed-disk incremental snapshots along with the log backups

Recommended for large databases (6-8 TB+) to make backup a low performance impacting activity and improve backup and restore speeds.

Snapshots happen in a matter of seconds and since they are incremental in nature, they ensure cost efficiency.

Snapshots provide instant restore where disks could be created immediately from snapshots stored in the customer's subscription and then attached to the target VM.

Log backups (streamed every 15 mins) are applied on top of these restored snapshots.



Backup HANA System Replication| Stream-based

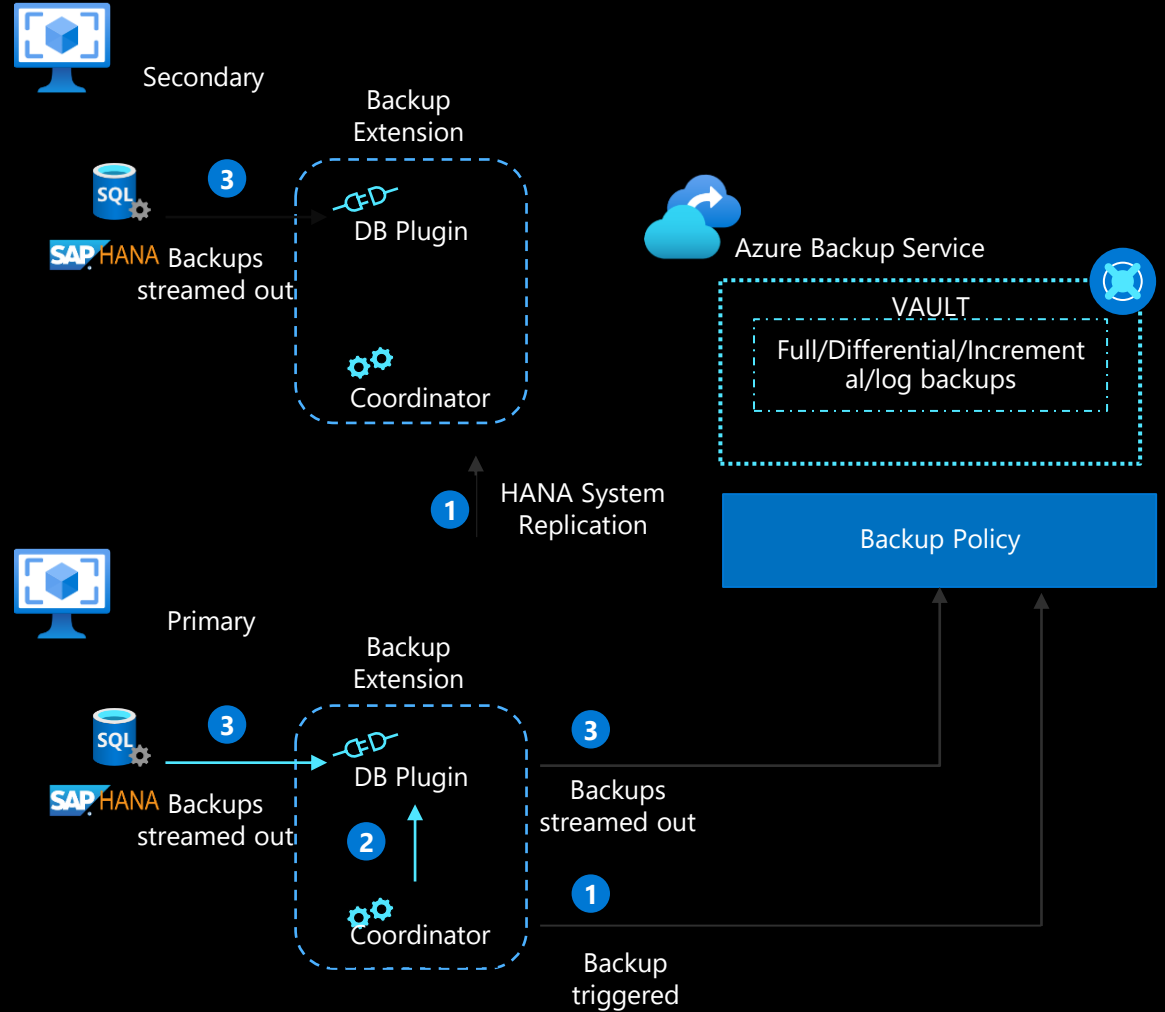
Stream-based backup support for HSR set ups without any manual intervention after every takeover and failback

Backups from HSR nodes are managed in a single backup chain, making restorability simple.

No mandatory full backups after every takeover and failback unless there is a log chain break.

Un-register and re-register the HSR set up to restore database(s) on the primary node – SAP recommendation.

Backups are streamed from Database to Azure managed backup storage.





Azure Health Check (In-a-box) for SAP Product

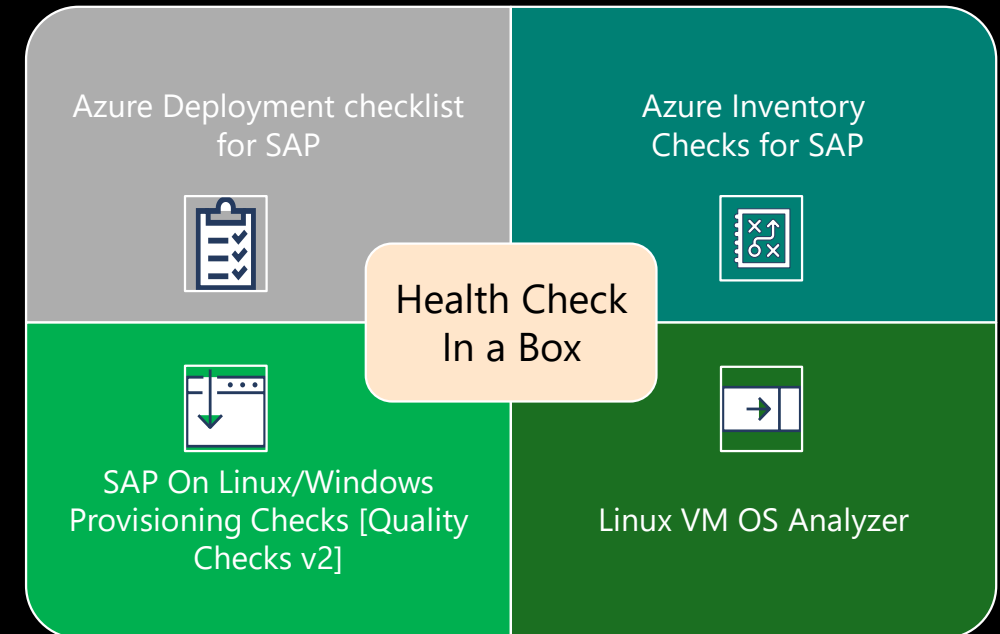
Azure SAP "Health Check-In-Box" is a product of the ACES (**Azure Cloud Excellence for SAP**) to promote a framework that provides

- holistic approach to capturing inventory,
- run checks which highlight configuration deviation from the identified best practices from SAP Partner Ecosystems and Microsoft for Azure SAP,
- opportunities to identify optimizations and cost-savings measures.

Key Drivers:

Quality, Simplification, Customisation, Value-add & Collaboration.

- **SAP Deployment Checklist** to start the respective phases in line with Microsoft deployment best practices. It will provide a starting point for the Azure SAP program and help along the way. Customers will have the ability to customize for their use-cases.
- **Azure SAP Inventory Workbook** aims at providing configuration and visibility of Azure resources per subscription or through optional tags. Customers will have ability to customize for their use-cases, and scheduling is available for recurring checks.
- **Azure SAP Provisioning checks [Quality Checks]** aims at capturing configuration drift from Operating System, SAP & Database.
- **SupportConfig Analyzer** allows the customer to create a SUSE SupportConfig and review the configuration in-house. It is suited for customers with no policy to execute PowerShell on production virtual machines. Customers will have the ability to customize for their use-cases.



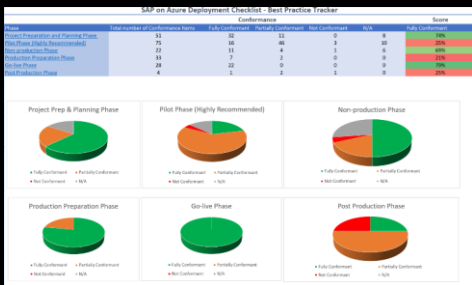
Health Check process and outcomes



1

Azure Deployment checklist for SAP [Excel]

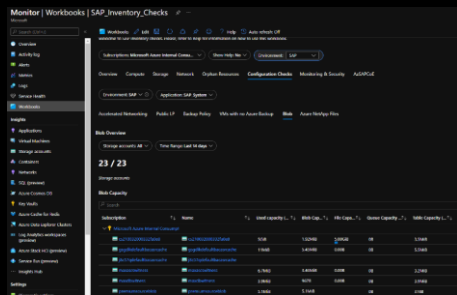
- Customer reviews the deployment preparation and identify gaps.
- Microsoft team updates the deployment guidance to keep <https://docs.microsoft.com> & excel sheet updated (every ~3-6 months).



2

Azure Inventory Checks for SAP [Azure Workbook]

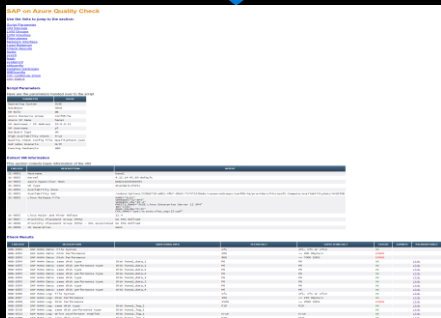
- Customer imports the Azure workbook from gallery or from GitHub.
- SAP inventory workbook allows review of all SAP Resources at Platform Level for Insights.



3

SAP On Linux/Windows Provisioning Checks [Quality Checks v2] [PowerShell]

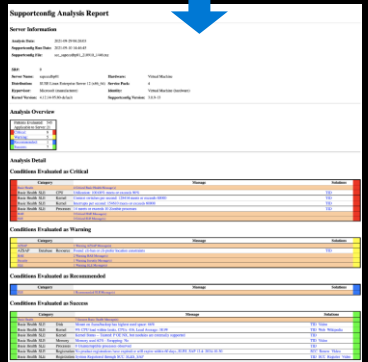
- Execute PowerShell to collate and then review the configuration of the SAP system on Linux & Windows with AnyDB.
- The output will be in HTML format for review.



4

Linux VM OS Analyzer [Custom tool]

- Customers planning to review SLES, use the Supportconfig tools to gather and analyse information easily.



Deploy and maintain Zero Trust architecture






















































“Our end-to-end security capabilities, inclusive of identity, security, compliance, and management—across all clouds and all client platforms—have been key as we help customers strengthen their security posture and mitigate impact.”

—Satya Nadella

Microsoft Cyber Defense Operations Center

- **>3,500** full-time security professionals
- **8 trillion** global signals daily
- **\$1 billion** annual cybersecurity investment

90+ compliance certifications – more than any other public cloud provider

Global	 ISO 27001	 ISO 27018	 ISO 27017	 ISO 22301	 SOC 1 Type 2	 SOC 2 Type 2	 SOC 3	 CSA STAR Self-Assessment	 CSA STAR Certification	 CSA STAR Attestation								
Regional	 Argentina PDPA	 EU Model Clauses	 UK G-Cloud	 China DJCP	 China GB 18030	 China TRUCS	 Singapore MTCS	 Australia IRAP / CCSL	 New Zealand GCIO	 Japan My Number Act	 ENISA IAF	 Japan CS Mark Gold	 Spain ENS	 Spain DPA	 India MeitY	 Canada Privacy Laws	 Privacy Shield	 Germany IT Grundschutz workbook
Industry	 PCI DSS Level 1	 CDSA	 MPAA	 FACT UK	 Shared Assessments	 FISC Japan	 HIPAA / HITECH Act	 HITRUST	 GxP 21 CFR Part 11	 MARS-E	 IG Toolkit UK	 FERPA	 GLBA	 FFIEC				
US Gov	 Moderate JAB P-ATO	 High JAB P-ATO	 DoD DISA SRG Level 2	 DoD DISA SRG Level 4	 DoD DISA SRG Level 5	 SP 800-171	 FIPS 140-2	 Section 508 VPAT	 ITAR	 CJIS	 IRS 1075							

Cloud-based security controls



Identity & access

Unify identity management and secure identities to reach zero trust

Azure Active Directory



App and data security

Encrypt data, and protect keys and secrets used by apps

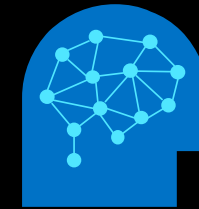
Azure Key Vault



Network security

Enhance the protection of your virtual networks

Azure Firewall & DDoS



Threat protection

Access cloud-native SIEM and AI-driven security analytics

Azure Sentinel



Security management

Manage security state of hybrid workloads with a single view

Azure Security Center

SAP threat monitoring for Microsoft Sentinel - Preview

- Continuously monitor SAP systems for threats at all layers: business logic, application, database, and OS
- Detect threats like privilege escalation, unapproved change and more with out-of-the-box detections
- Correlate SAP monitoring with other signals across your organization
- Build your own detections to monitor sensitive transactions and other business risks

36 Active rules

Rules by severity: High (16), Medium (18), Low (2), Informational (0)

Active rules | Rule templates

Search: [] Severity: All Rule Type: All Status: All Tactics: All

SEVERITY	NAME	RULE TYPE	STATUS	TACTICS
High	Advanced Multistage Attack Detection	Fusion	Enabled	
High	SAP - High - HANA DB - Assign Admin Authorizations	Scheduled	Enabled	
High	SAP - High - Client Configuration Change	Scheduled	Enabled	
High	SAP - High - HANA DB - User Admin actions	Scheduled	Enabled	
High	SAP - High - RFC Execution of a Sensitive Function Module	Scheduled	Enabled	
High	SAP - High - HANA DB - Deactivation of Audit Trail	Scheduled	Enabled	
High	SAP - High - HANA DB - Audit Trail Policy Changes	Scheduled	Enabled	
High	SAP - High - Deactivation of Security Audit Log	Scheduled	Enabled	
High	SAP - High - Sensitive privileged user change	Scheduled	Enabled	
High	SAP - High - System Configuration Change	Scheduled	Enabled	
High	SAP - High - Execution of a Sensitive ABAP Program	Scheduled	Enabled	
High	SAP - High - Sensitive privileged user logged in	Scheduled	Enabled	
High	SAP - High - Function Module tested	Scheduled	Enabled	
High	SAP - High - Login from unexpected network	Scheduled	Enabled	

Azure Sentinel Coverage for SAP

SAP Business Logic

- Sensitive transaction monitoring
- Access monitoring, UEBA
- User profiles
- Role management
- End-to-End SOD matrix controls monitoring

SAP Application Layer

- Authentication
- Privilege user access
- Sensitive system actions
- Change control – changes to audit logging setting, ABAP debug on production...
- Audit logs anomalies monitoring

Database Layer (HANA)

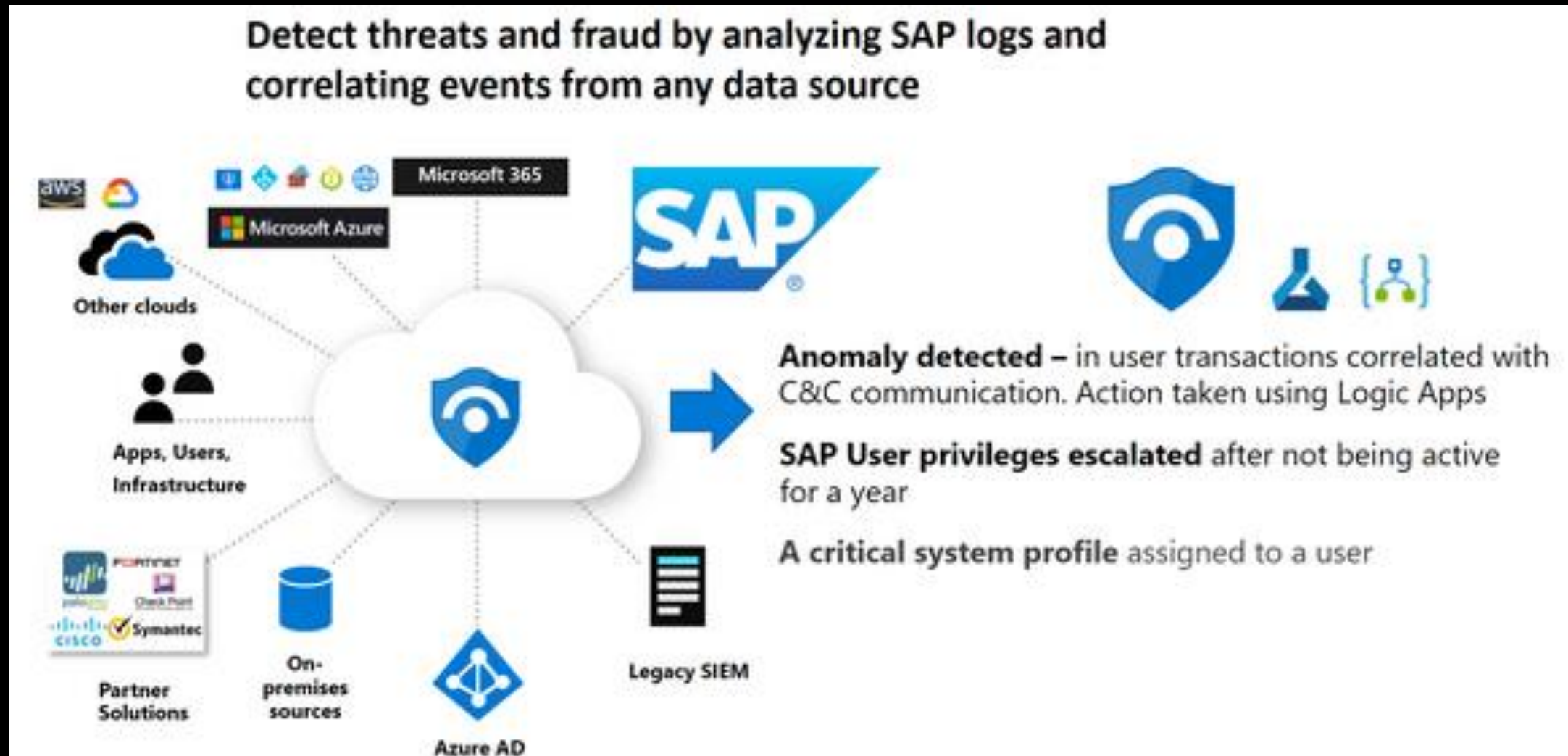
- DB access monitoring (incl. DB clients access monitoring)
- User and roles change monitoring
- Backup and restore monitoring
- DB change control

OS & Network Layer

- Change monitoring
- File permissions monitoring (FIM -> properly configure)
- Job processing monitoring
- Access monitoring
- Access control
- Cloud security monitoring
- Perimeter access monitoring
- Network firewall monitoring

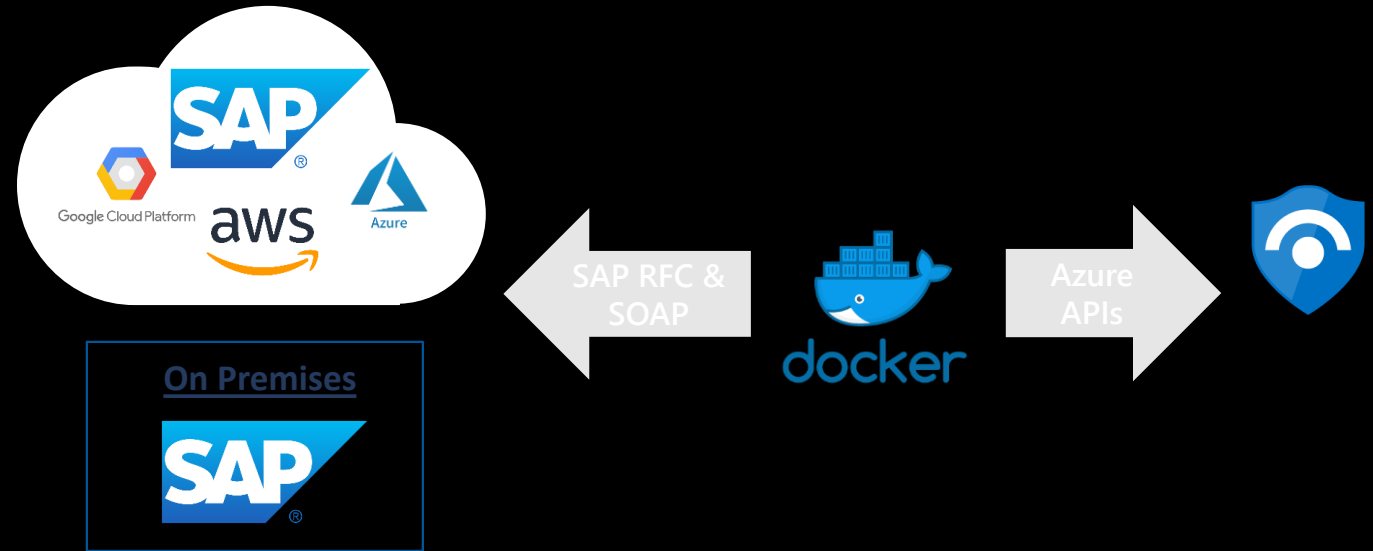
Threat detection powered by cross-correlation

More accurately detect SAP threats by cross correlating across all your data sources.



SAP deployment and content details

- Deployed as a Docker container on a VM or any Kubernetes, on any cloud or on-premise
- SAP access requires SAP ABAP user and CRs (transport)
- Credentials stored in Azure Key Vault
- Includes an automation connector for automating responses with SOAR
- Out-of-the-box detections include:
 - System configuration changes
 - Assignment of admin authorizations
 - Execution of a sensitive ABAP programs
 - ...and more.



Rich SAP Log Sources

- ABAP Security Audit Log
- ABAP Change Documents Log
- ABAP Spool Log
- ABAP Spool Output Log
- ABAP Job Log
- ABAP Workflow Log
- ABAP DB Table Data
- SAP User Master Data
- Log ABAP CR Log*
- ICM Logs
- JAVA Webdispatcher Logs
- Syslog







*SAP CR required for some log sources

Roadmap

- GA by end of April '22
- Adding new content – additional 100 analytic rules by end of June '22.
- Simplify the deployment process, new connector page with new UI pages.

Configuration
1. Des + call to action opens a context blade

Search

System	↑↓	Health	↑↓	
A4H		●		 
NPL		⚠ Not configured		 
MSS		●		 

Add new system

Add system

Subtitle

[System settings](#) Authentication Logs Deploy

Select system

BD4

System identifier

System IP *

1.1.1.1

System IDs *

1234

System Number *

1234

Client ID * ⓘ

1234

Type *

1234

Time-zone *

1234

System type *

1234

Logon group

Message server host

Message server service

Next: Authentication Save for later

SAP Business Technology Platform + Azure

• A set of services that allow SAP customers to develop custom apps and integration

- **Integration:**
Accelerate enterprise-grade integration of hybrid, heterogeneous landscapes to seamlessly integrate end-to-end processes, data, people, and devices.
- **Extension:**
Extend LoB apps or build new business apps quickly to fit your specific needs without disrupting your key business processes, while leveraging existing investments and expertise.

SAP Intelligent Enterprise



S/4HANA
HEC (Managed)
ECC / BW / HANA (Legacy)



SAP Business Technology
Platform

Microsoft Intelligent Cloud

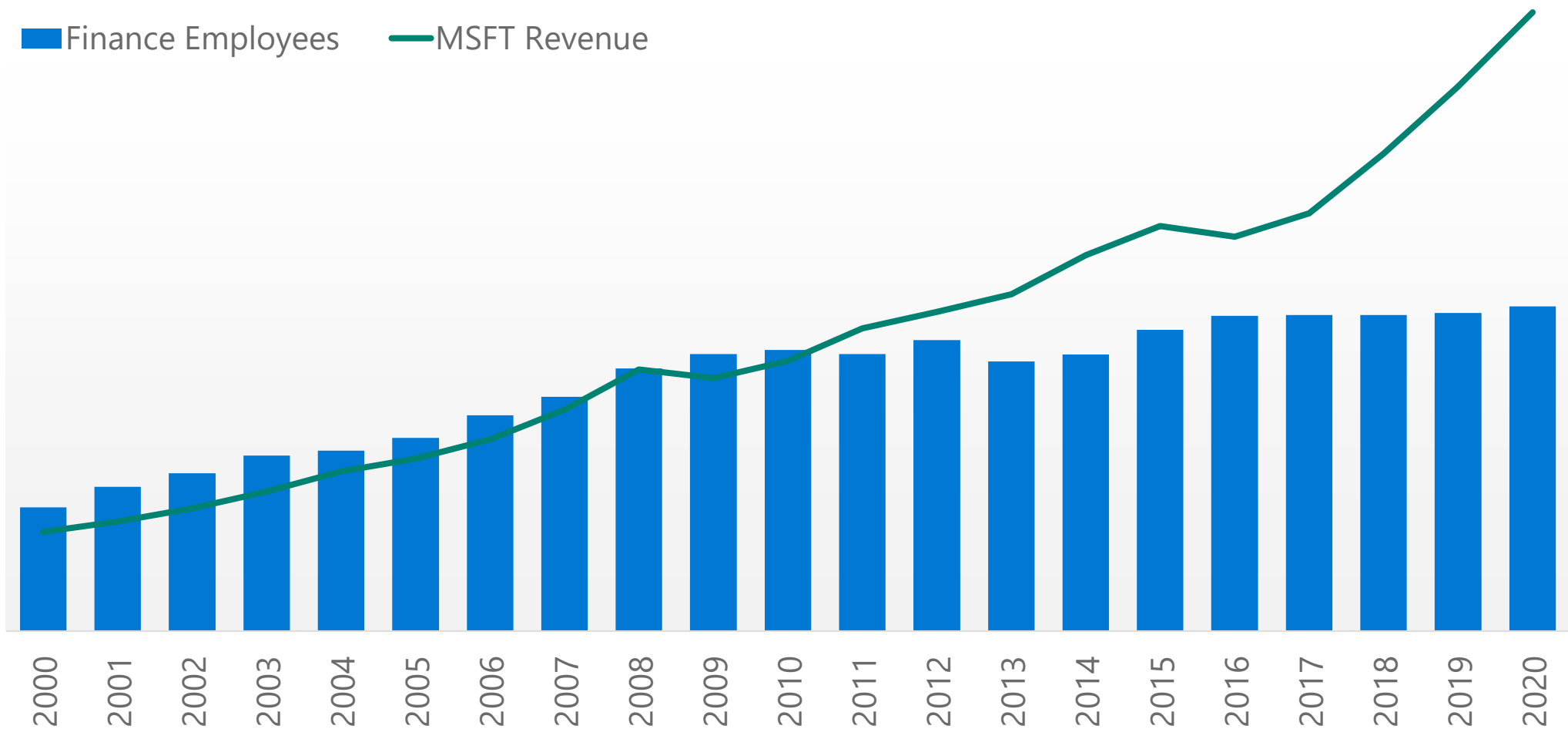


SAP and Azure

- Your Expectations
- SAP and Azure – More than IaaS / Economic Impact
- Architectural Considerations
- **Customer Examples**
- Your Questions?

Modern Finance empowering us to achieve more

Since 2009 headcount has only grown 15% while revenue is up 145%



Secure platform for difficult times

Critical infrastructure company Uniper migrates SAP systems to Microsoft Azure

The challenge: Stability in an industry where security is paramount

The solution: Improved performance and security with Azure

“Stability and complete data security are paramount in our industry, and rightly so. By moving to Microsoft Azure, we are now ideally positioned and have created a system unit that increases our performance potential and ultimately benefits our customers.” - Stephan Parthier, Senior Vice President Corporate IT, Uniper



Products and Services

Azure Cloud Services
SAP on Azure
Microsoft 365
Azure Machine Learning

Organization Size

Corporate
(10,000+
employees)

Industry

Energy

Country

Germany



CAMPARI GROUP

Customer:

Campari Group

Industry:

Consumer Goods

Size:

1,000–9,999 employees

Country:

Italy

Products and services:

Microsoft Azure

Microsoft Graph

Microsoft Dynamics 365

- Dynamics 365 Customer Insights

- Dynamics 365 Marketing

Microsoft Power Platform

- Power Apps

- Power Automate

- Power BI

[Read full story here](#)



“In just two weeks, we connected all of the data points in Customer Insights and deployed our first email marketing automation campaign against those segments.”

— Chad Niemuth, Vice President, Global IT - Marketing and Sales, Campari

Situation:

After growing through numerous acquisitions, Campari Group had a fragmented data landscape that made it difficult to get a 360-degree customer view and personalize marketing campaigns and communications for maximum effect.

Solution:

Campari Group built a customer data platform using Microsoft Dynamics 365 Customer Insights to unify its data, gain AI-driven insights from that data, and facilitate customized, multichannel campaigns and email automation with Dynamics 365 Marketing.

Impact:

Campari Group has increased participation in brand training events for bartenders and offers useful resources to wedding planners affected by COVID-19. The company can now support end-to-end customer journeys across marketing, sales, and customer service.

Faster system deployment with SAP on Azure

thyssenKrupp Steel Europe bids farewell to data centers

The challenge: Taking SAP services out of the black box

The solution: Migrating the entire SAP landscape to the cloud

"We were faced with time and economic pressures, plus the challenges that come with working remotely. Despite this, we managed to quickly migrate all our SAP systems to Azure—thanks to meticulous planning and the high level of transparency afforded by the new landscape." - Ritchie Fomm, Head of ERP Template, thyssenkrupp Steel Europe AG



thyssenkrupp

Products and Services

Microsoft Azure

Organization Size

Corporate
(10,000+ employees)

Industry

Manufacturing

Country

Germany





“Microsoft understands the hybrid world; it’s in its DNA. It provides a unique enterprise readiness that works best for us while also pressing on with innovation.”

—Joerg Bruch, Global Vice President for IT Operations, SAP

Customer:
SAP SE

Industry:
Other

Size:
10,000+ employees

Country:
Germany

Products and services:
Microsoft Azure
Microsoft Azure Active Directory

[Read full story here](#)

Situation:

Renowned for its enterprise application solutions, SAP offers its software for on-premises, hybrid, and cloud environments. It sought the agility, security, and cost-effectiveness of the cloud. Which hyperscaler would SAP IT trust with its own critical business systems?

Solution:

The company chose Microsoft Azure. So far, SAP has shifted 42 landscapes to the Azure cloud platform, with 21 more slated for migration in 2021.

Impact:

SAP IT achieved the agility and heightened security it sought, in addition to saving about 10 percent of its previous operating expenses. And as a bonus, its IT teams are captivated by the technology and enjoy the ease of use. As always at SAP, innovation continues.



SAP and Azure

- Your Expectations
- SAP and Azure – More than IaaS / Economic Impact
- Architectural Considerations
- Customer Examples
- **Your Questions?**

Your Questions?



Thank you

