

Björn Peters



Azure Automation - Deployment, Backup und Skalierung von SQL Servern

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13:45 Track 1

„Das super nerdige Solisyon Film- und Serienquiz“



Save the date for exiting upcoming events

PASS Camp 2017

Main Camp **05.12. – 07.12.2017** (04.12. Kick-Off abends)
Lufthansa Training & Conference Center, Seeheim

SQL Konferenz 2018

PreCon: **26.02.2018**
MainCon: **27.02. – 28.02.2018**
Darmstadtium, Darmstadt

More information at PASS booth



About Me



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Agenda

- Ursachen / Gründe für einen Wechsel nach Azure
- SQL Server Deployment
- Automated Backup
- Resize SQL Server VM
- Azure SQL Database Deployment
- Azure SQL Database Resize
- Azure SQL Database Backup/Restore
- Q&A





Ursachen und Gründe

Ursachen für Änderungsbedarf

1. Konstantes oder temporäres Datenwachstum

On-prem:

konstantes Datenwachstum: mit entsprechendem Vorlauf

Speichererweiterungen

neue Server ...

temporäres Datenwachstum: Kaum Möglichkeiten, da Hardware für Maximalauslastung jederzeit kurzfristig verfügbar sein muss

Azure:

konstantes und temporäres Datenwachstum: gleichartige Möglichkeiten
Skalierung (up and down) innerhalb kürzester Zeit
Kein „Migrationsaufwand“



Gründe für einen Wechsel auf Azure

1. Flexibles Kostenmanagement:

Laufzeit nur zu Arbeitszeiten

Laufzeit nur an Arbeitstagen

Laufzeit nur an speziellen Lasttagen

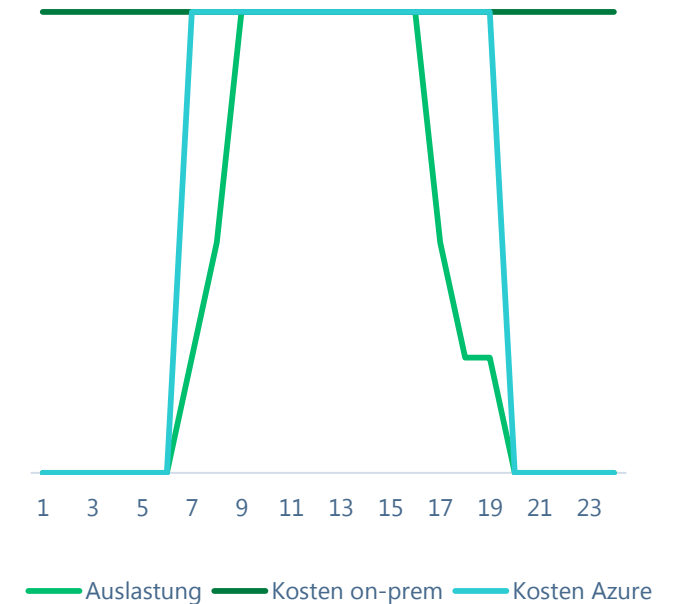
On-prem:

Im Prinzip nicht möglich

Azure:

Über Stop/Start jederzeit automatisierbar

Up-/Downscaling jederzeit möglich



Gründe für einen Wechsel auf Azure

2. Verringerung der Maintenanceaufwände:

- Einspielen von Updates

- Versionswechsel

- Versionsgleichheit über alle Systeme

On-prem:

- Konstanter manueller Aufwand erforderlich

Azure:

- Vieles über Service Agreement abgedeckt



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Azure Automation

mögl. Prozesse im Tagesgeschäft

neuen SQL Server / Azure SQL DBs deployen

vorhandenen SQL Server / Azure SQL DBs löschen

vorhandenen SQL Server / Azure SQL DBs skalieren

vorhandenen SQL Server / Azure SQL DBs stoppen

vorhandenen SQL Server / Azure SQL DBs wieder starten

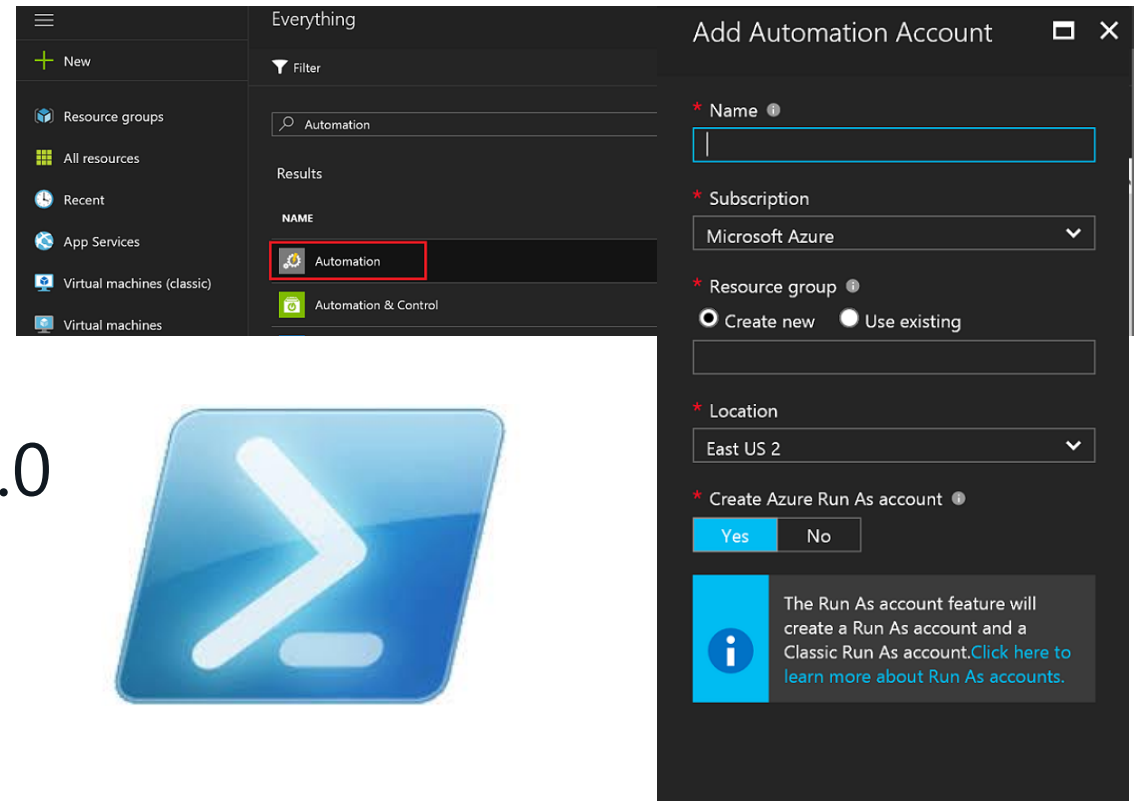


Azure Automation - Tools

Azure Automation

Powershell

Azure Command Line Interface 2.0



Szenario erstellen / Tasks vorbereiten

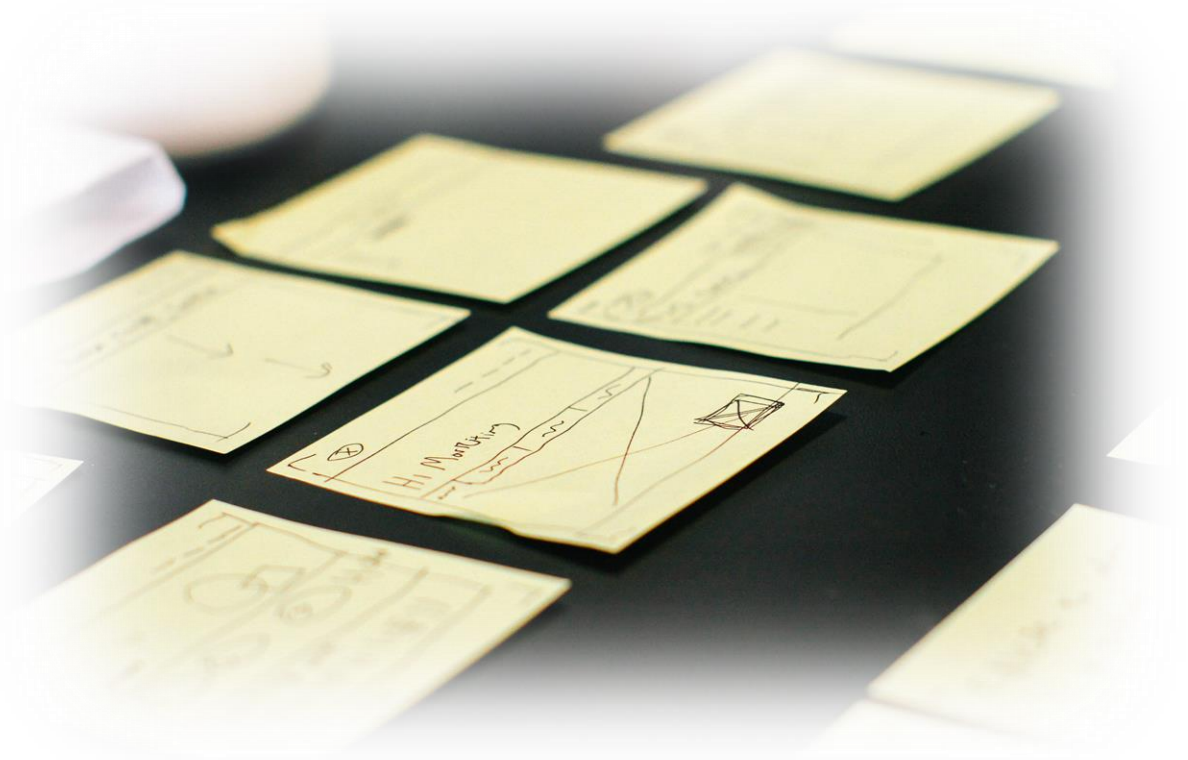
SQL Server / SQL Database Deployment

Wo deployen?

Hochverfügbarkeit ?

Backup?

generelle Verfügbarkeit



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SQL Server deployen

Deployment-Möglichkeiten

Azure-Portal

Powershell

Azure CLI 2.0

Microsoft Azure

My Dashboard ▾ + New dashboard Edit dashboard

All resources
ALL SUBSCRIPTIONS


SQLServer2016-ip	Public IP address
OH1-ip	Public IP address
bpdemo	SQL server
SQLServer2016	Virtual machine
installationstorage	Storage account
rgsqlsaturday2017505	Storage account
Backup1	Virtual machine
backup1296	Network interface
Backup1-ip	Public IP address
Backup-Vault	Recovery Services vault
DemoDB1	SQL database
bpsqlserverbackup	Storage account
DC1	Virtual machine
dc1552	Network interface

[See more](#)

```
obenz@MININT-HHBGSTM:~$ az vm -h
Group
  az vm: Provision Linux and Windows virtual machines in minutes.

Subgroups:
  availability-set      : Group resources into availability-sets for high-availability
                        requirements.
  boot-diagnostics      : Troubleshoot virtual machine start-up.
  diagnostics           : Configure the Azure VM diagnostics extension.
  disk                  : Manage VM data disks.
  extension             : Extend the functionality of your VMs with vm extensions.
  image                 : VM images available on the Azure marketplace.
  nic                   : Manage VM network interfaces, see also 'az network nic'.
  unmanaged-disk        : Manage VM unmanaged data disks.
  user                  : Manage users.

Commands:
  capture               : Captures the VM by copying virtual hard disks of the VM and outputs a
                        template that can be used to create similar VMs.
  convert               : Convert VM with unmanaged disks to use managed disks.
  create                : Create an Azure Virtual Machine.
  deallocate            : Shuts down the virtual machine and releases the compute resources.
  delete                : The operation to delete a virtual machine.
  generalize            : Sets the state of a virtual machine to generalized.
  get-instance-view     : Gets a VM instance view.
  list                  : List Virtual Machines.
  list-ip-addresses     : Get IP addresses of a virtual machine.
  list-sizes             : Lists all available VM sizes for a given location.
  list-usage            : Gets, for the specified subscription, the usage information as well as the
                        subscription.
  list-vm-resize-options: Lists all available VM resize options for a virtual machine.
  open-port             : Opens a VM to internet by adding a rule to the network interface.
  redeploy              : The operation to redeploy a virtual machine.
  resize                : Update vm size.
  restart              : The operation to restart a virtual machine.
  show                  : The operation to show a virtual machine.
  start                 : The operation to start a virtual machine.
  stop                  : The operation to power off (stop) a virtual machine.
  update                : Update VM properties.
  wait                  : Place the CLI in a waiting state until a condition of the VM is met.
```





Was wird benötigt?

Powershell – Step-by-Step

Location

RessourceGruppen(Namen)

Storage(Account)

Network

VM-Name / VM-Size

Image / Template



VM Deployment

<u>New-AzureRmResourceGroup</u>	Creates a resource group in which all resources are stored.
<u>New-AzureRmVirtualNetworkSubnetConfig</u>	Creates a subnet configuration. This configuration is used with the virtual network creation process.
<u>New-AzureRmVirtualNetwork</u>	Creates a virtual network.
<u>New-AzureRmPublicIpAddress</u>	Creates a public IP address.
<u>New-AzureRmNetworkSecurityRuleConfig</u>	Creates a network security group rule configuration. This configuration is used to create an NSG rule when the NSG is created.
<u>New-AzureRmNetworkSecurityGroup</u>	Creates a network security group.
<u>Get-AzureRmVirtualNetworkSubnetConfig</u>	Gets subnet information. This information is used when creating a network interface.
<u>New-AzureRmNetworkInterface</u>	Creates a network interface.
<u>New-AzureRmVMConfig</u>	Creates a VM configuration. This configuration includes information such as VM name, operating system, and administrative credentials. The configuration is used during VM creation.
<u>New-AzureRmVM</u>	Create a virtual machine.
<u>Remove-AzureRmResourceGroup</u>	Removes a resource group and all resources contained within.





Demo

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SQL Server Backup

Automated Backup

Notwendigkeit von SQL Server Backups

keine Notwendigkeit von SQL Server Backups um
Plattenausfälle abzusichern

Backup-2-Disc reicht aus

Backup-2-URL sinnvoller



SQL Server 2014 - Automated Backup v1.0

Automated Backup - Enable/Disable (Disabled)

Retention Period - 1-30 days (30 days)

Storage Account - Azure storage account

Encryption - Enable/Disable (Disabled)

Password - Password text



SQL Server 2016 - Automated Backup v2.0

Automated Backup - Enable/Disable (Disabled)

Retention Period - 1-30 days (30 days)

Storage Account - Azure storage account

Encryption - Enable/Disable (Disabled)

Password - Password text



SQL Server 2016 - Automated Backup v2.0

System Database Backups - Enable/Disable (Disabled)

Backup Schedule - Manual/Automated (Automated)

Full backup frequency - Daily/Weekly

Full backup start time - 00:00 – 23:00 (01:00)

Full backup time window - 1 – 23 hours (1 hour)

Log backup frequency - 5 – 60 minutes (60 minutes)



Was wird benötigt?

Powershell – Step-by-Step

Location

RessourceGruppenNamen

zusätzl. StorageAccount

VM-Name

Iaas-Agent-Extension

Automated Backup / Retention-Zeiten



Deployment / Konfig. – Autom. Backup

<u>Set-AzureRmVMSqlServerExtension</u>	Sets the Azure SQL Server extension on a virtual machine.
<u>Get-AzureRmStorageAccount</u>	Gets a Storage account.
<u>New-AzureRmStorageAccount</u>	Creates a Storage account.
<u>New-AzureRmVMSqlServerAutoBackupConfig</u>	Creates a configuration object for SQL Server automatic backup.





Demo



Stoppen / Starten

WICHTIG – Kosten sparen

Herunterfahren <> Deallocate



SQL Server im Betriebssystem herunterfahren

Kosten (Pay-as-you-go) laufen weiter

System muss gestoppt werden !!!





Demo

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SQL Server Resize

Notwendigkeit / Verfügbarkeit / Folgen

regelmäßige Lastspitzen

gestiegene Datenmengen => Laufzeiten

nicht alle Größen sind überall verfügbar

Konfiguration des SQL Servers muss angepasst werden



Was wird benötigt?

Powershell – Step-by-Step

Location

RessourceGruppenNamen

VM-Name

verfügbare VM-Größen



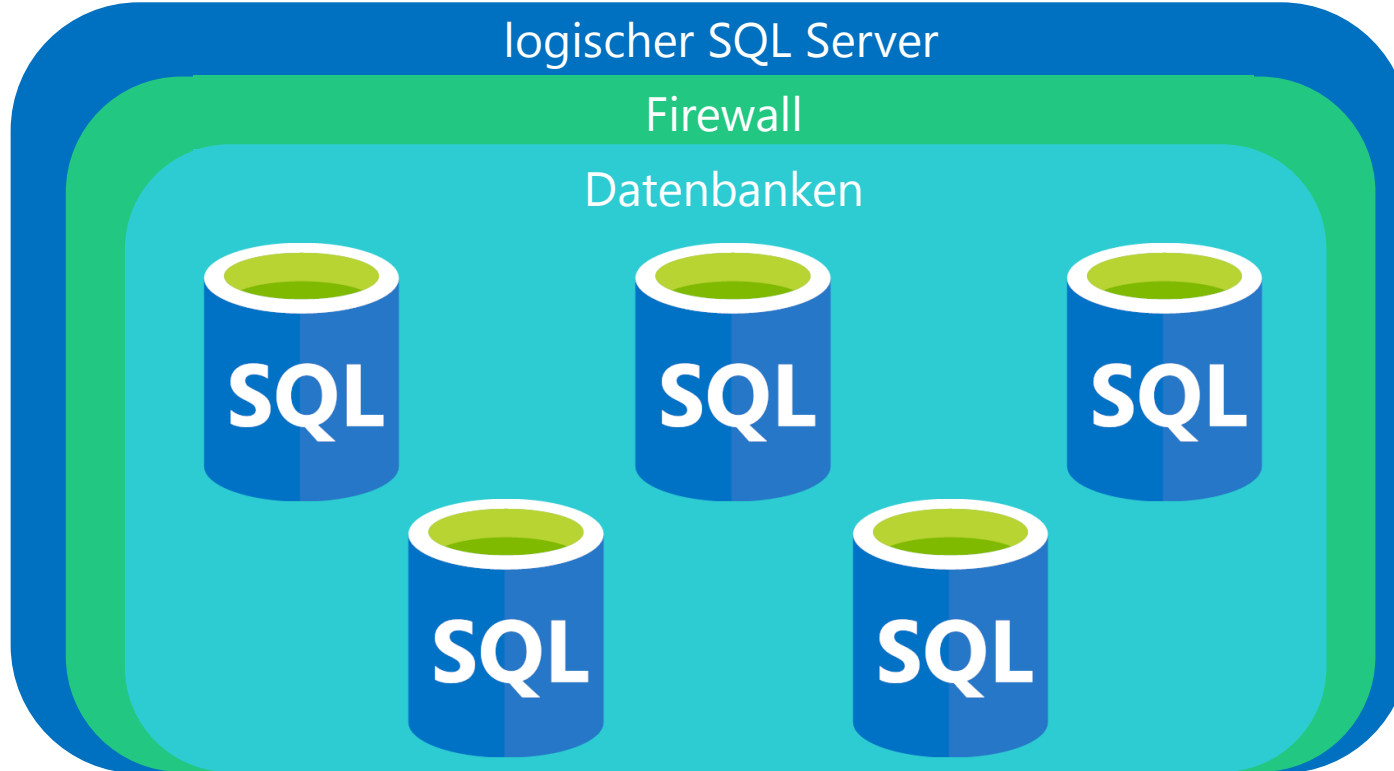


Demo

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Azure SQL Database

Allgemeines – Single Azure SQL Database



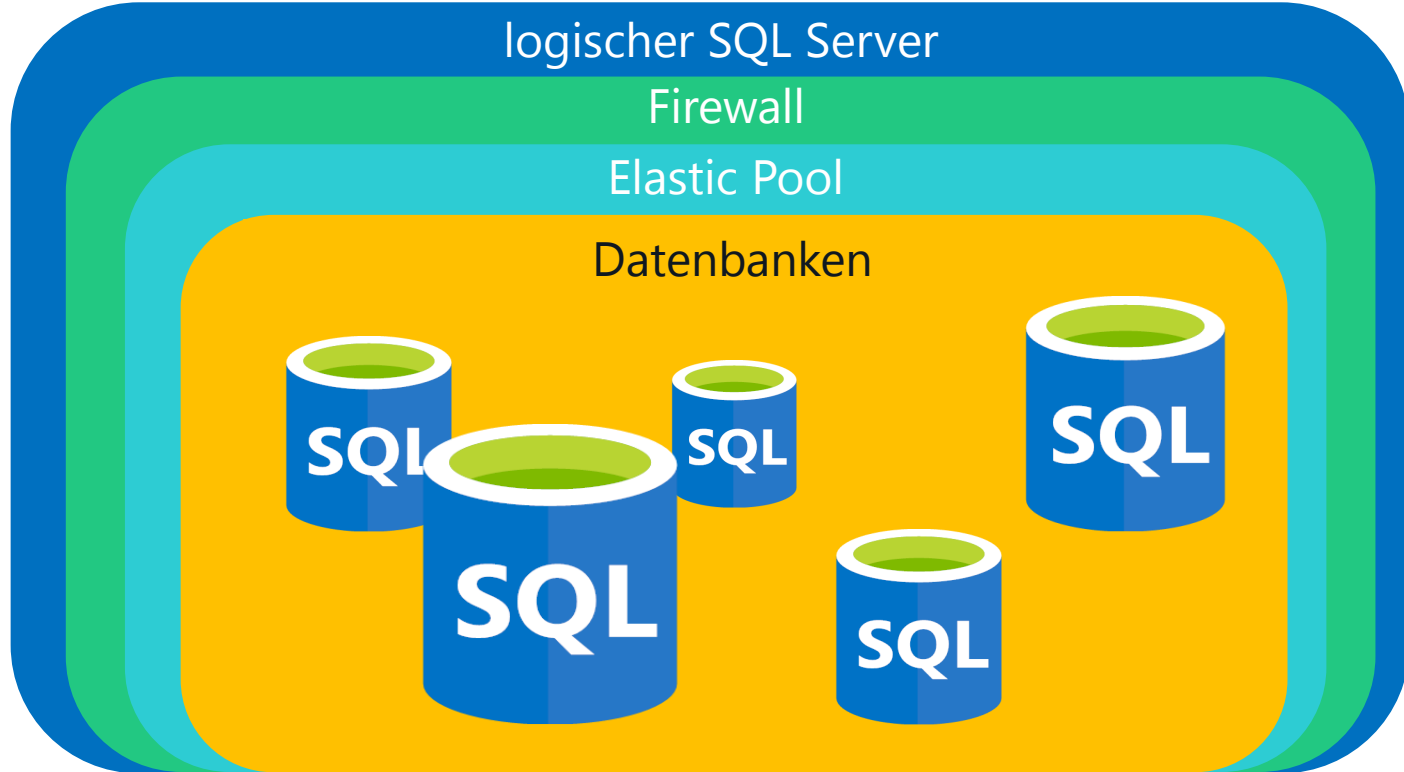
Default Backup Storage



LongTimeRetention Backup Storage



Allgemeines – SQL Database Elastic Pool



Default Backup Storage

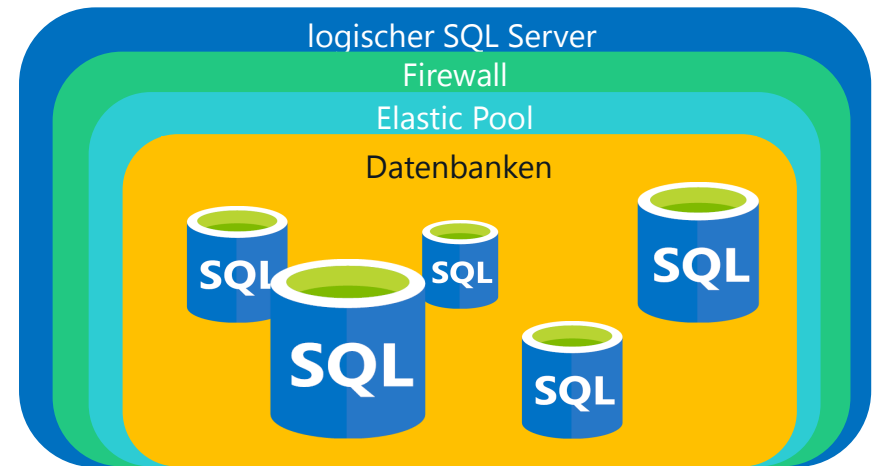
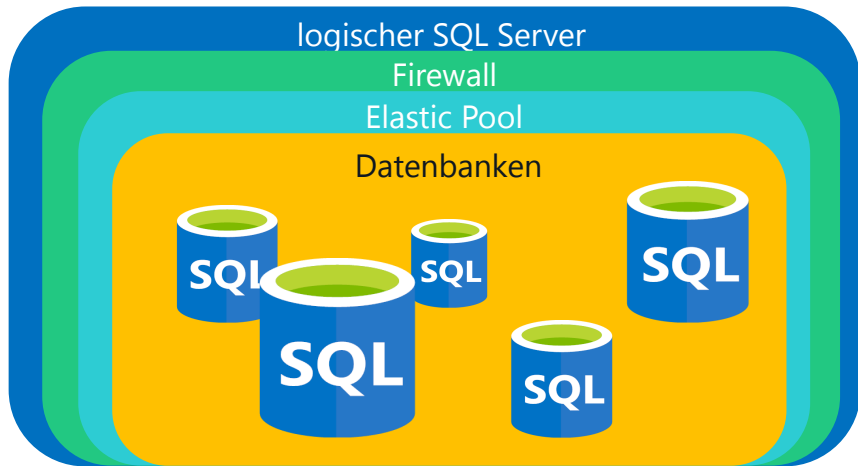


LongTimeRetention Backup Storage



Beispiel-Szenario

Backup / Restore
oder
Geo-Replikation



Single SQL Database Deployment

<u>New-AzureRmResourceGroup</u>	Creates a resource group in which all resources are stored.
<u>New-AzureRmSqlServer</u>	Creates a logical server that hosts a database or elastic pool.
<u>New-AzureRmSqlServerFirewallRule</u>	Creates a firewall rule to allow access to all SQL Databases on the server from the entered IP address range.
<u>New-AzureRmSqlDatabase</u>	Creates a database in a logical server as a single or a pooled database.
<u>Remove-AzureRmResourceGroup</u>	Deletes a resource group including all nested resources.



GeoRed. Azure SQL Database Deployment

<u>New-AzureRmResourceGroup</u>	Creates a resource group in which all resources are stored.
<u>New-AzureRmSqlServer</u>	Creates a logical server that hosts a database or elastic pool.
<u>New-AzureRmSqlElasticPool</u>	Creates an elastic pool within a logical server.
<u>Set-AzureRmSqlDatabase</u>	Updates database properties or moves a database into, out of, or between elastic pools.
<u>New-AzureRmSqlDatabaseSecondary</u>	Creates a secondary database for an existing database and starts data replication.
<u>Get-AzureRmSqlDatabase</u>	Gets one or more databases.
<u>Set-AzureRmSqlDatabaseSecondary</u>	Switches a secondary database to be primary to initiate failover.
<u>Get-AzureRmSqlDatabaseReplicationLink</u>	Gets the geo-replication links between an Azure SQL Database and a resource group or SQL Server.
<u>Remove-AzureRmSqlDatabaseSecondary</u>	Terminates data replication between a SQL Database and the specified secondary database.
<u>Remove-AzureRmResourceGroup</u>	Deletes a resource group including all nested resources.



Automated Backup

automatische Backups

Full – initial direkt nach Create Database
einmal wöchentlich

Differential – mehrfach am Tage

TransaktionsLog – alle 5-10 Minuten (je nach Size)



Automated Backup

Backup Retention

Basic service tier is 7 days.

Standard service tier is 35 days.

Premium service tier is 35 days

LongTimeRetention Backup Storage

LongTimeRetention Backup Storage



Besonderheit – Azure SQL Database

Kein Pause/Resume

Kein Stop/Start

Löschen der Datenbank (nicht des Servers) hilft beim Kostensparen!

Beispiel

Abends löschen – morgens wieder herstellen



Drop DB – Recreate/Restore DB

<u>Get-AzureRmSqlDatabase</u>	Gets one or more databases.
<u>Remove-AzureRmSqlDatabase</u>	Removes an Azure SQL database.
<u>Get-AzureRmSqlDeletedDatabaseBackup</u>	Gets a deleted database that you can restore.
<u>Restore-AzureRmSqlDatabase</u>	Restores a SQL database.





Don't forget ... After-Show-Party!!!

5 Jahre SQL Saturday

an der Hochschule Bonn-Rhein-Sieg



SQLSat Bruzzler - Grillparty

Wurstchen & Bier ab ca. **19.00 Uhr**
am Ende der Hochschulstraße



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