

# SQLdays konferenz

2 Tage, 28 Sessions, 11 Speaker

## SQL Server 2016 New Features Stretch Database

Let Your Database Do the Split Into the Cloud

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# ANDRE ESSING

Senior Consultant  
Trainer



**Microsoft**  
**CERTIFIED**

Solutions Expert

Data Platform

**Microsoft**  
**CERTIFIED**

Trainer



**Microsoft®**  
Most Valuable  
Professional



## Profile

**DBA and Senior Consultant, MVP,  
Microsoft Certified Solutions Expert,  
Trainer and SQL Server Enthusiast**

- Working in IT since 1998
- SQL Server since version 7.0
- Focus on SQL Server infrastructure and mission critical systems
- Microsoft Certified Trainer and MCSE: Data Platform
- Microsoft P-TSP Data Platform
- Microsoft Most Valuable Professional
- Friend of Redgate
- PASS Chapter Leader Bavaria and SQL Saturday Organizer

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LinkedIn [linkedin.com/in/aessing](https://linkedin.com/in/aessing)

### Publications

SlideShare [slideshare.net/AndreEssing](https://slideshare.net/AndreEssing)

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# PASS Deutschland e.V. SQL Server Usergroup

**sqlpass.de  
meetup.com/pass-bayern**

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How Much  
Free Space Is in Your Garage?

# Just Give Me a Reason

## Ever growing databases

- Massive tables (billions of rows / TBs size)
- Users need to retain data indefinitely
- Cold data accessed infrequently but must be online
- Maintenance and SLA challenges (e.g. re-index and restore times)



## Existing solutions

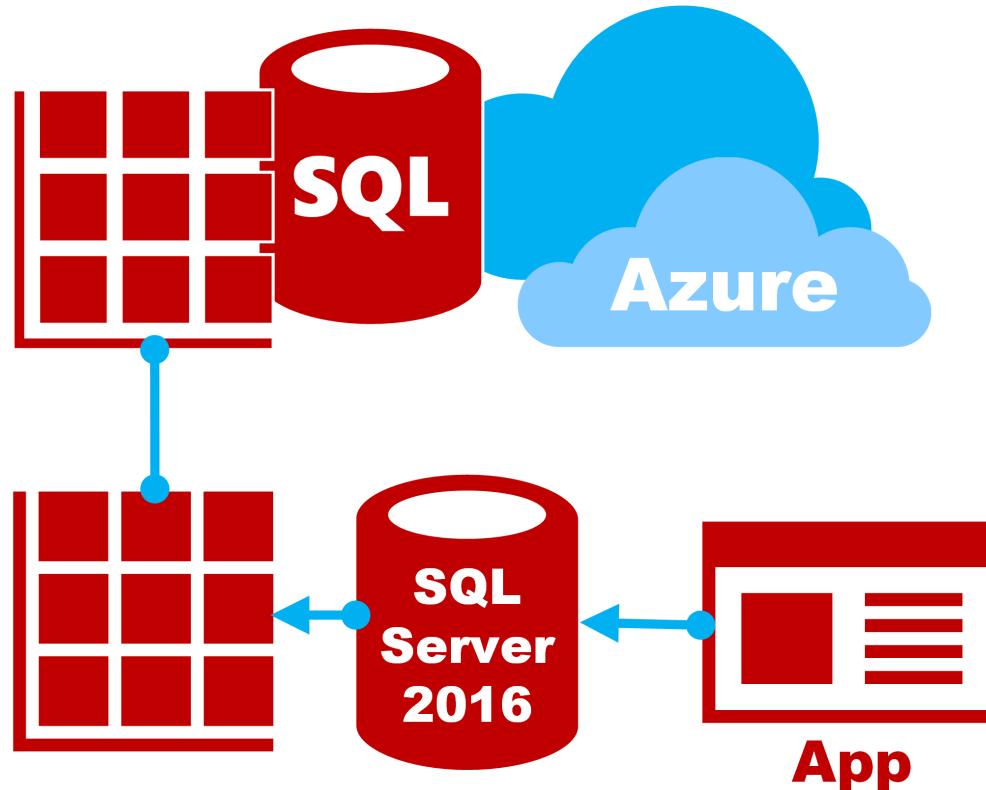
- Keep adding storage and datacenter capacity **Does not solve maintenance and SLA issues**
- Move data to another location (database, flat-files, Big Data, backups, tapes, ...) **Data is near- or offline**
- Delete older data **Unknown if data is valuable / Legal restrictions could apply**



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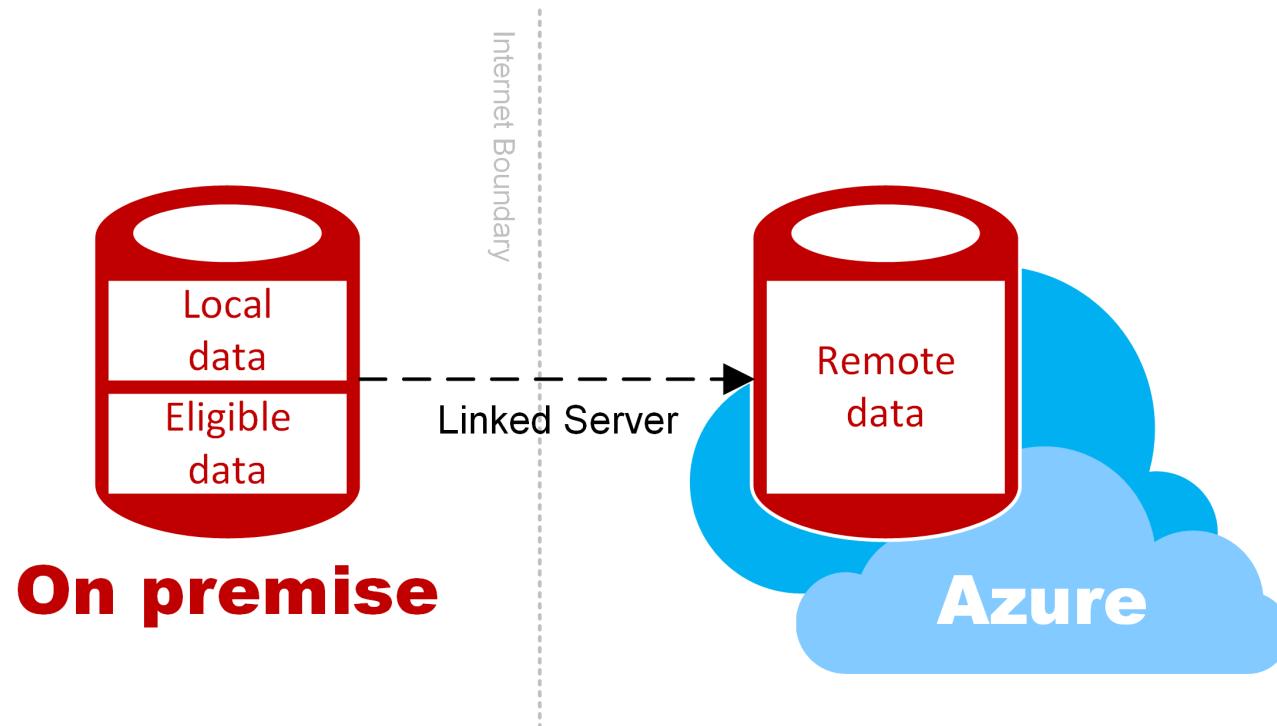


# The Solution is Just Around the Corner



- Entire table stays online and can be queried
- No application changes needed
- Reduces complexity
- Frees up on premise resources
- Supports Always Encrypted and row-level security
- Great in combination with Temporal Tables

# Know the Blueprint Before You Start Building a House



- Creates a secure linked server in the on premises SQL Server
- Linked server has the remote database as target
- Tables will be automatically provisioned in the remote database
- Queries run against the local and the remote database
- Watch out for “remote query” operator



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# Catch the Fish Technical Deep Dive



# Use the Right Ingredients

## Before you start

- Be sure the table is eligible for stretching
- You need an Azure account and subscription
- Create a Azure SQL Database Server
- Permit access to the server in Azure

## Permissions you need on premise

- SYSADMIN or SERVERADMIN (once per instance)
- ALTER ANY CREDENTIAL (to create credentials)
- DB\_OWNER (for databases and tables)



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# Showtime

## Prerequisites



# Stretch It Out

## Per instance

- Enable Stretch Database feature

## Per database

- Create a Database Master Key (DMK)
- Create credentials to connect to the Azure SQL Server
- Enable stretching on database level

## Per table

- Configure table for stretching



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# It's Your Choice

- Filter the data to be migrated to the cloud
  - Is based on inline table-valued functions
  - If your function is slow, data migration is slow
- Filter predicate can be exchanged
- There are some limitations and rules
  - The filtering function has to be deterministic
- Adds complexity to your database
  - Only use when there is no other way  
<https://msdn.microsoft.com/en-us/library/mt613432.aspx>



# Showtime

## Enable Stretching



# Take a Break

- Pause data migration for troubleshooting
- Pause is also good for maximizing network bandwidth
- Applies to each table individually



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# Personal Trainer

Remove the authenticated connection

- sys.sp\_rda\_deauthorize\_db

Reestablish the authenticated connection

- sys.sp\_rda\_reauthorize\_db

Reconcile local indexes on the remote table

- sys.sp\_rda\_reconcile\_indexes

Specifies how to query a Stretch Database

- sys.sp\_rda\_set\_query\_mode
- DISABLED, LOCAL\_ONLY, LOCAL\_AND\_REMOTE



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# Keep It Healthy

## Stretch Database configuration

- sys.databases
- sys.tables
- sys.database\_scoped\_credentials

## Remote database and tables

- sys.remote\_data\_archive\_databases
- sys.remote\_data\_archive\_tables

## Status of the migration

- sys.dm\_db\_rda\_migration\_status
- sys.dm\_db\_rda\_schema\_update\_status



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## Manage Stretching



# Relax

## Per table

- Decide if data is migrated back to on premise or not
- Disable stretching for the table
- Migrate data from cloud incurs data transfer costs
- Does not delete the remote table

## Per database

- Check if no more tables are stretched
- Disable stretching for the database
- Does not delete the remote database



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# Showtime

## Disable Stretching



# You Should Have a Plan B

- Backup does not include remote data
  - This is called a “shallow backup”
  - Deep backups are not supported yet
- Stretch Database fully supports point in time restore
- After a restore, reauthorize the connection to Azure
  - `sys.sp_rda_reauthorize_db`
- The remote data gets back into a consistent state
  - Runs automatically, no user intervention is required



# There Are Always Some Glitches

- Table properties
  - Tables containing FILESTREAM data, Replicated tables, Memory-optimized tables, ...
- Data types and column properties
  - XML, hierarchyid, timestamp, CLR user-defined types (UDTs), ...
- Column types
  - COLUMN\_SET, Computed columns
- Constraints
  - Check constraints, Foreign key constraints, ...
- Indexes
  - Full text indexes, XML indexes, Spatial indexes, ...
- Some other limitations
  - <https://msdn.microsoft.com/en-us/library/mt605114.aspx>



# Lets Wrap It Up

- Has a lot of restrictions
- Keep your configuration simple
  - Try to avoid filter predicates
  - Only DBAs should configure stretching
- Think about security
  - Encrypt your data
  - Secure the Azure SQL Database server
- Good solution for archiving data
- Available in SQL Server 2016 Express Edition



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The logo for ppedv (partner für enterprise data vault) features the company name in a bold, black, sans-serif font next to a blue square icon containing a white 'p' shape.

# Vielen Dank!

Ich freue mich auf Feedback! Euer Andre



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