

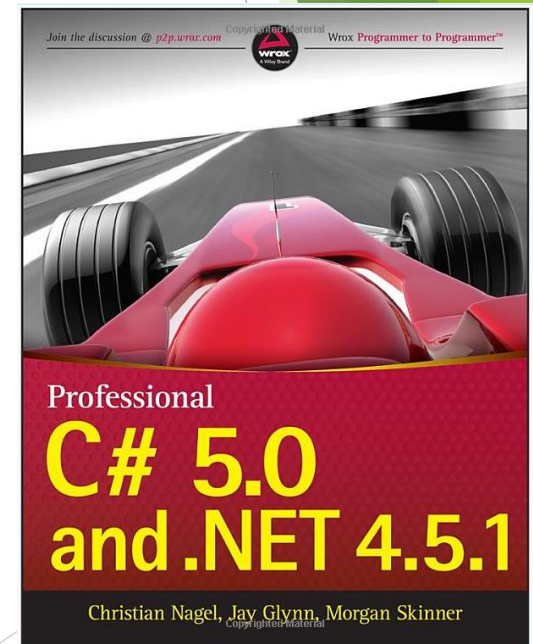
# Christian Nagel

## CN innovation

Windows Azure: Welche Storage  
Technologie soll ich jetzt verwenden?

# Christian Nagel

- ▶ Training, Coaching, Consulting
- ▶ Microsoft Regional Director
- ▶ Microsoft MVP .NET
  
- ▶ XAML + C#
- ▶ Windows Azure
- ▶ ASP.NET MVC + Web API



# Goals

- ▶ Einführung in Windows Azure Storage Technologien (PaaS)
- ▶ Code Beispiele
- ▶ Szenario: Multi-Tenant Menu Card Manager

# Agenda - 5 Steps



SQL Database



Storage



DocumentDb



Azure Search



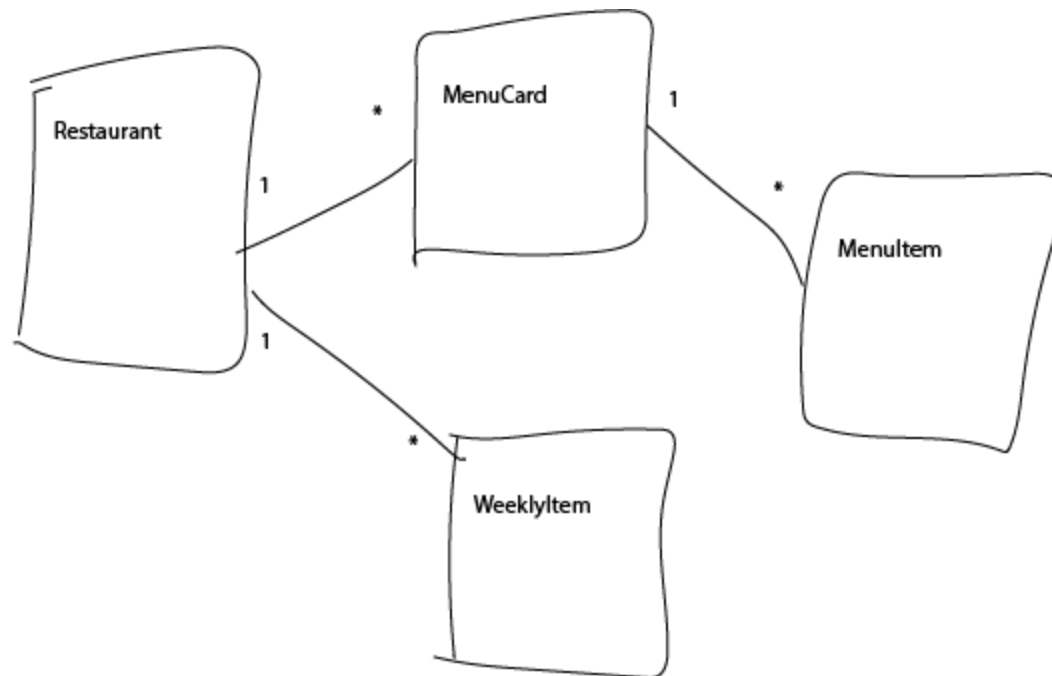
Vergleiche



# SQL Database

# Overview SQL Database

- ▶ Relational Store
- ▶ "Just like" SQL Server

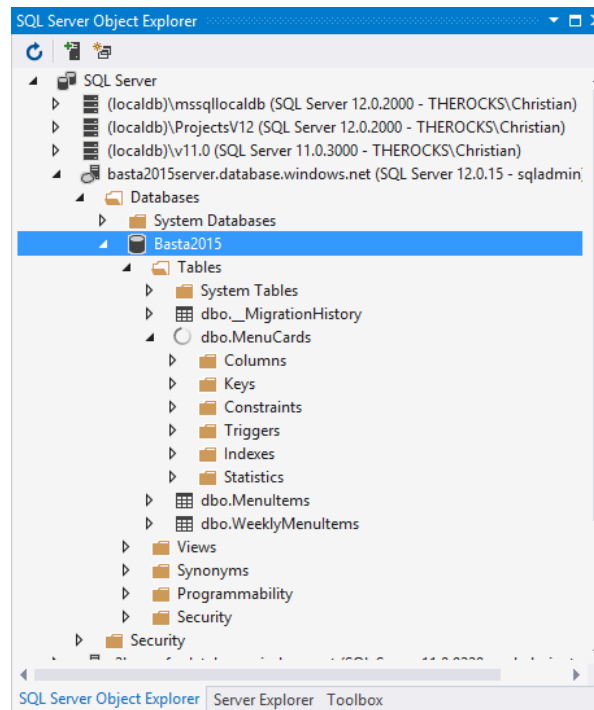


# APIs

- ▶ ADO.NET
- ▶ Entity Framework 7
  - ▶ Code First
  - ▶ Conventions, no Magic
  - ▶ Smaller Packages
  - ▶ Memory Provider
  - ▶ NoSQL

## Demo SQL Database

- ▶ Visual Studio
- ▶ Entity Framework
- ▶ Relations
- ▶ Resiliency





# Unterschiede zu On-Premise

- ▶ Resiliency
- ▶ Database Throughput Unit (DTU)
  - ▶ CPU
  - ▶ Physical Data Reads
  - ▶ Log Writes

# Limits / Scalability

- ▶ Premium Tier
  - ▶ 800 DTUs
  - ▶ Max DB Size **500 GB**
  - ▶ 1600 Worker Threads
  - ▶ 19200 Sessions
  - ▶ 735 Transactions per Second

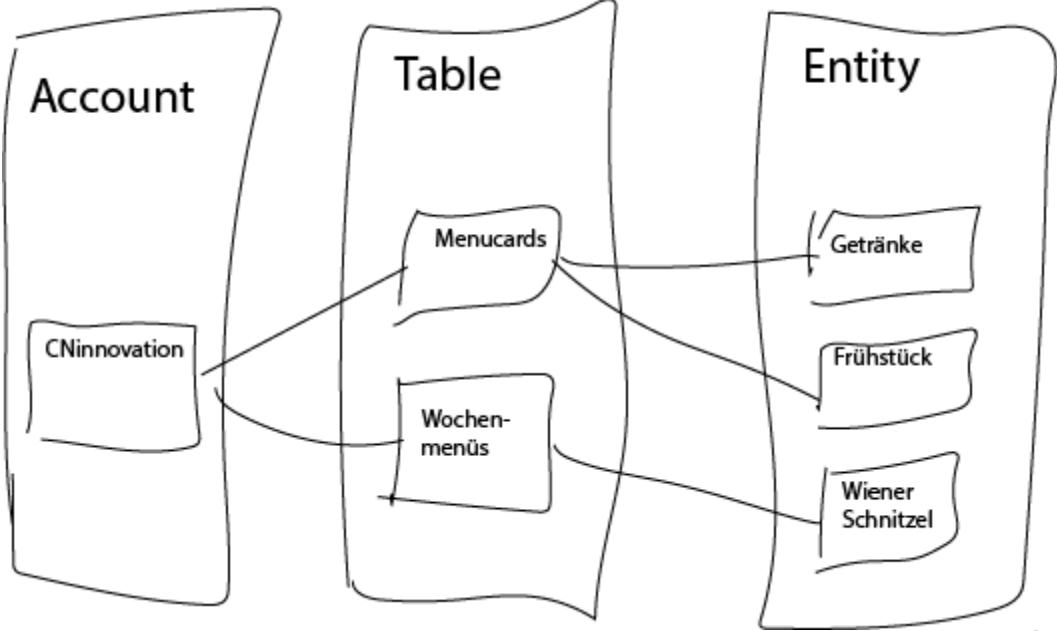


# Azure Storage

# Overview Azure Storage

- ▶ Table Storage
- ▶ Blob Storage
  - ▶ Page blob
  - ▶ Block blob
- ▶ Queues
- ▶ Files

# Table Storage



- ▶ Server Explorer
- ▶ Table Design
- ▶ Add/Update
- ▶ Fluent & Queryable Queries

## Demo Table Storage

Edit Entity

Use the grid below to edit the selected entity. The PartitionKey and RowKey of an existing entity cannot be modified.

Name	Type	Value
PartitionKey	String	58E16651-C423-461C-A697-AE7CA8187C3A
RowKey	String	card_44703f23-9273-4cda-a90c-ec36110a7703
MenuItems	String	[{"Title":"Apfelstrudel","Subtitle":null,"Price":2.6000,"Image":null}]
Title	String	Mittag

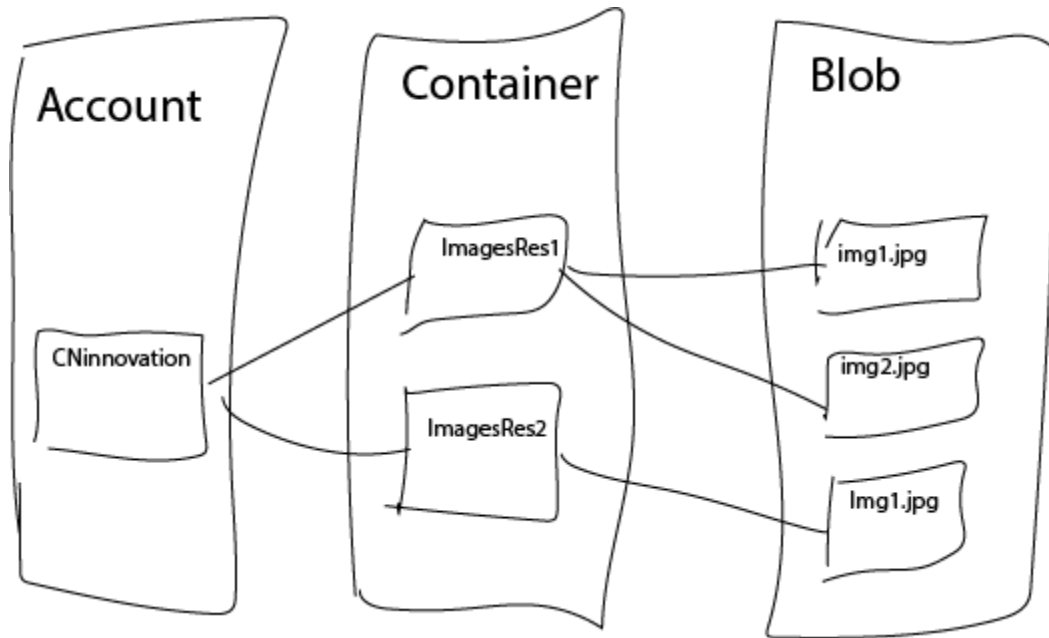
Add property

OK Cancel

# Table Storage Eigenschaften

- ▶ 255 Properties
- ▶ 1 MB per Entity
- ▶ 64k per String
- ▶ Wenig Datentypen
- ▶ Keine Relationen
- ▶ Index nur PartitionKey/RowKey
- ▶ 1 KB RowKey

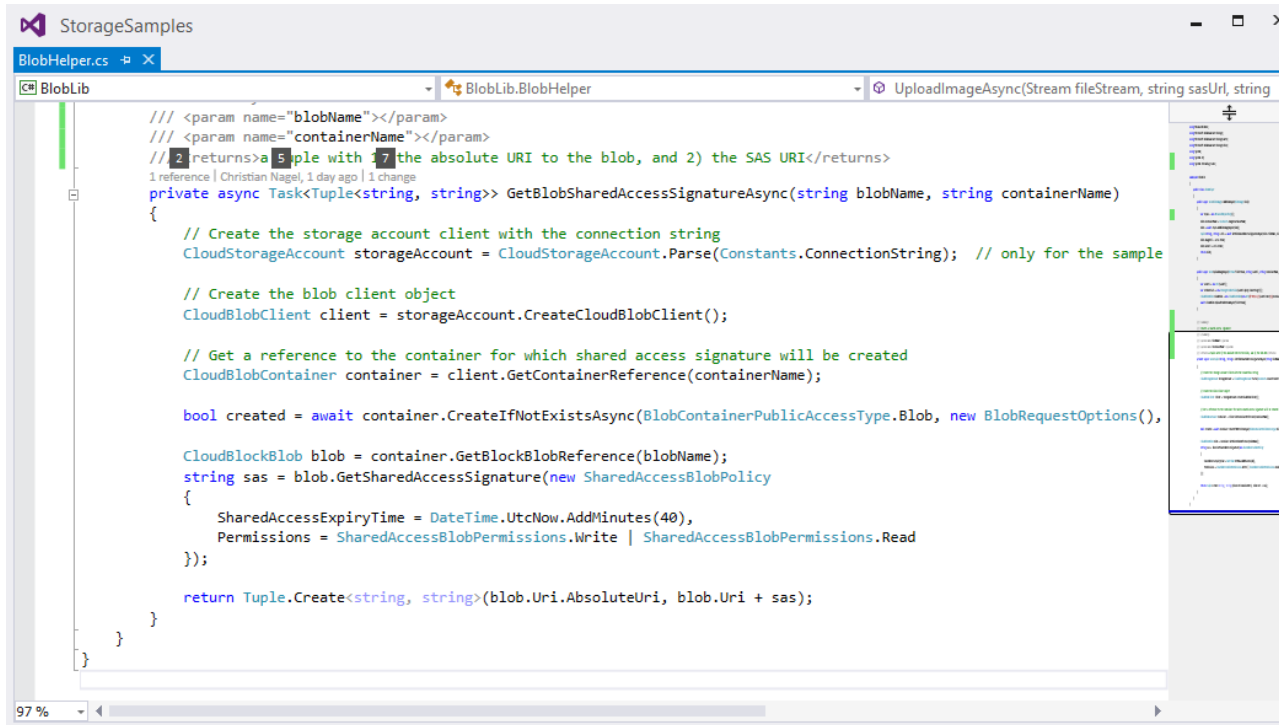
# Blob Storage





## ► Shared Access Signature

### Demo Blob Storage



```
StorageSamples
BlobHelper.cs
BlobLib
BlobLib.BlobHelper
UploadImageAsync(Stream fileStream, string sasUrl, string

/// <param name="blobName"></param>
/// <param name="containerName"></param>
/// <returns> Tuple with 1) the absolute URI to the blob, and 2) the SAS URI</returns>
1 reference | Christian Nagel, 1 day ago | 1 change
private async Task<Tuple<string, string>> GetBlobSharedAccessSignatureAsync(string blobName, string containerName)
{
    // Create the storage account client with the connection string
    CloudStorageAccount storageAccount = CloudStorageAccount.Parse(Constants.ConnectionString); // only for the sample

    // Create the blob client object
    CloudBlobClient client = storageAccount.CreateCloudBlobClient();

    // Get a reference to the container for which shared access signature will be created
    CloudBlobContainer container = client.GetContainerReference(containerName);

    bool created = await container.CreateIfNotExistsAsync(BlobContainerPublicAccessType.Blob, new BlobRequestOptions(),

    CloudBlockBlob blob = container.GetBlockBlobReference(blobName);
    string sas = blob.GetSharedAccessSignature(new SharedAccessBlobPolicy
    {
        SharedAccessExpiryTime = DateTime.UtcNow.AddMinutes(40),
        Permissions = SharedAccessBlobPermissions.Write | SharedAccessBlobPermissions.Read
    });

    return Tuple.Create<string, string>(blob.Uri.AbsoluteUri, blob.Uri + sas);
}
}
```

# Blob Storage Eigenschaften

- ▶ Shared Access Signatures
- ▶ 200 GB Block Blob
- ▶ 1 TB Page Blob
  
- ▶ 500 TB per Account (50 Accounts per Subscription)

# Verfügbarkeit

Locally redundant Storage (LRS)

- 3 Kopien
- In 1 Zone

Zone-redundant Storage (ZRS)

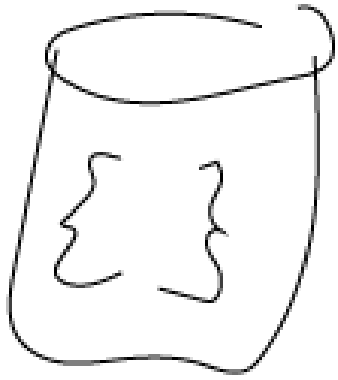
- 3 Kopien
- 2 oder 3 Zonen

Geo-redundant Storage (GRS)

- 3 + 3 Kopien
- 2 Regionen

Read-access geo-redundant (RA-GRS)

- 3 + 3 Kopien
- Read Access 2 Regionen

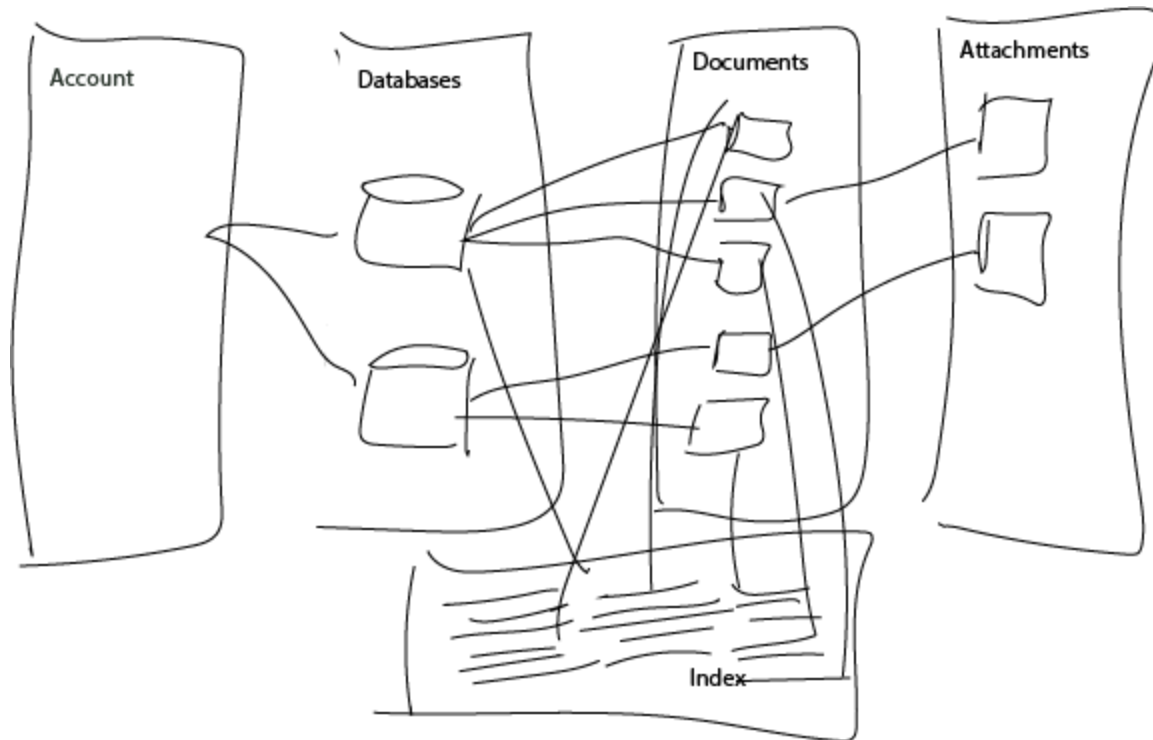


# DocumentDB

# Overview DocumentDB

- ▶ Schema-free data
- ▶ Queries with SQL Syntax
- ▶ Stores JSON documents
- ▶ Consistency levels for performance

# DocumentDB



- ▶ Collections
- ▶ Index
- ▶ Documents
- ▶ Query

## Demo DocumentDB

The screenshot shows the Azure portal interface for a DocumentDB instance named 'menucardtestdb'. The interface is divided into several sections:

- Summary:** Shows 'MenuCardTestResources' with 0 peer resources. It includes buttons for 'Add Database', 'Properties', 'Scale Up!', 'Keys', and 'Tags'.
- Monitoring:** Displays 'Total Requests' and 'Average Requests per...' with 'No available data' placeholders.
- Operations:** Shows 'Events' for 'MENUCARDTESTDB' and 'Alert rules' for 'MENUCARDTESTDB' with 0 rules and a green checkmark.
- Databases:** A table with columns 'ID', 'RESOURCE ID', and 'COLLECTIONS'.
- Document Explorer:** A side panel showing a list of documents and collections. The 'Collections' section lists:
 

ID	RESOURCE ID
MenuCards	IFmAMJDgA=
DateText	IFmAMQAQgE=
- Usage:** Shows 'Storage' usage at 0.06% (2.13 MB) and 'Threshold' at 3.33 GB.
- Developer Tools:** Includes 'Document Explorer' and 'Query Explorer'.

# Consistency Levels

- ▶ Strong
- ▶ Bounded staleness
- ▶ Session
- ▶ Eventual



# Document Collections

- ▶ Collection of JSON documents
- ▶ Boundary for queries and transactions
- ▶ Users/permissions for databases or collections
- ▶ Elastic SSD backed storage
- ▶ SQL Query Language

# Features

- ▶ Stored Procedures
- ▶ Triggers
- ▶ User Defined Functions
  
- ▶ using JavaScript

# Limits

- ▶ 5 Database Accounts\*
- ▶ 100 Collections per Account\*
- ▶ 2 GB Attachment Storage per Account
- ▶ 0-10 GB for One Collection
- ▶ 512 KB Max Size for Document and Attachment
- ▶ 1 MB Max Response Size
- ▶ Max 5 AND per query\*
- ▶ Max 5 OR per query\*
  
- ▶ \*) ask support for more



# Azure Search

# Overview

- ▶ People love search
- ▶ Windows Azure Service
- ▶ Independent of other Data Stores

- ▶ Create Index
- ▶ Add Elements
- ▶ Suggestions

## Demo Azure Search

The screenshot displays the Azure Search portal interface for a search service named 'menutest'. The main focus is on the configuration for an index named 'index1'. The interface is divided into several sections:

- Summary:** Shows the search service 'menutest' and a 'Quick start' button. It also displays 'Keys', 'Properties', and 'Tags' (0 tags).
- Indices:** A table listing the indices and their document counts and storage sizes.
- Usage:** Two circular progress indicators showing 'Document count' (95 current, 916 total, 0.95% used) and 'Storage size' (481 KB current, 50 MB threshold, 0.94% used).
- Fields:** A table defining the fields for the index.
- Scoring profiles:** A section indicating that no scoring profiles have been created.
- CORS options:** A section indicating that no allowed origins have been added.

NAME	DOCUMENT COUNT	STORAGE SIZE
index1	95	66 KB
weeklymenutemindex	821	415 KB

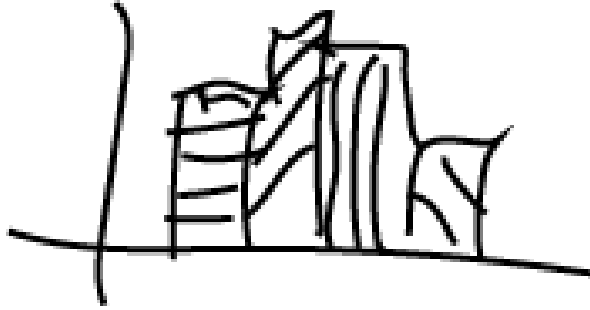
FIELD NAME	TYPE	ATTRIBUTES
menuid	Edm.String	Key, Filterable, Facetable, So...
title	Edm.String	Searchable, Filterable, Facet...
subtitle	Edm.String	Searchable, Filterable, Facet...

NAME	WEIGHTS	FUNCTIONS
You haven't created any scoring profiles. Click "Add scoring profile" to create one.		

ALLOWED ORIGINS
You haven't added any allowed origins yet.

# Features

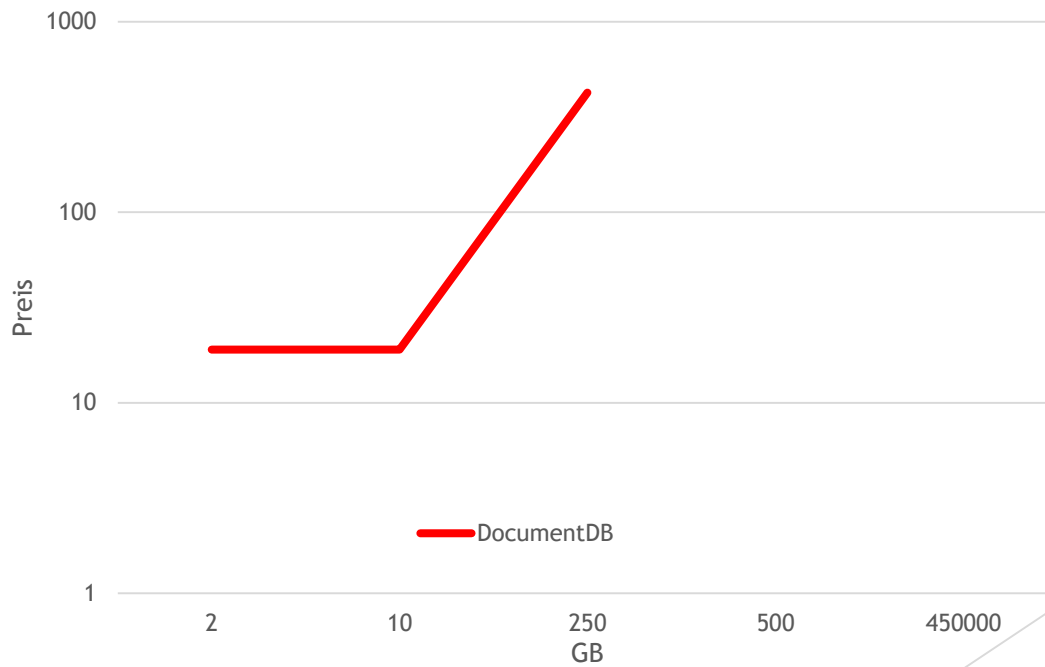
- ▶ Scoring Profiles
- ▶ Type-ahead suggestions
- ▶ Faceted navigation
- ▶ Hit highlighting



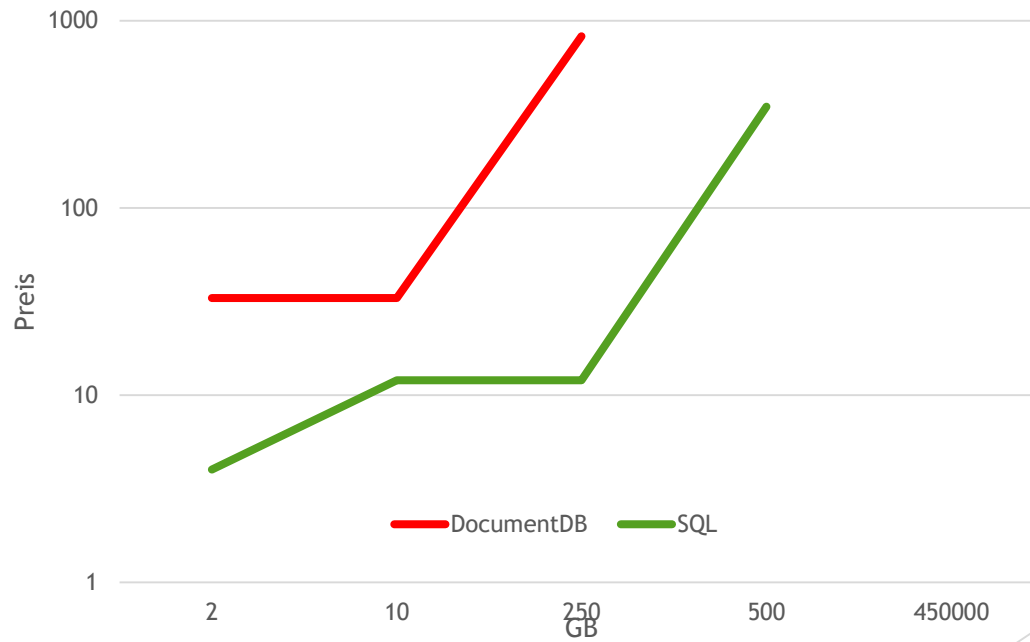
# Storage Vergleiche



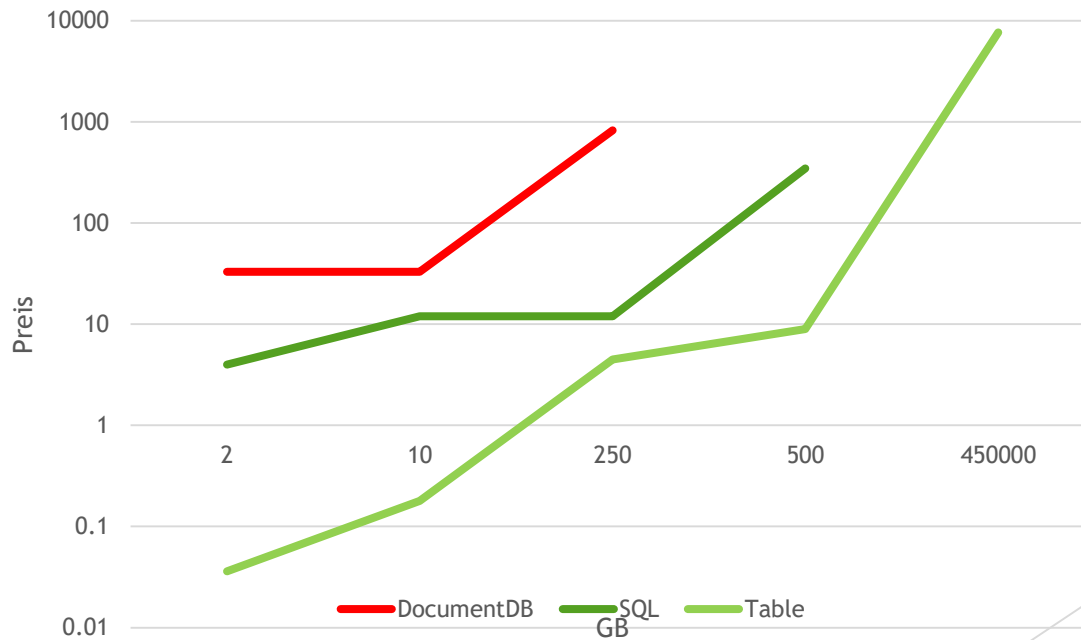
# Preis (pro Monat) / Size



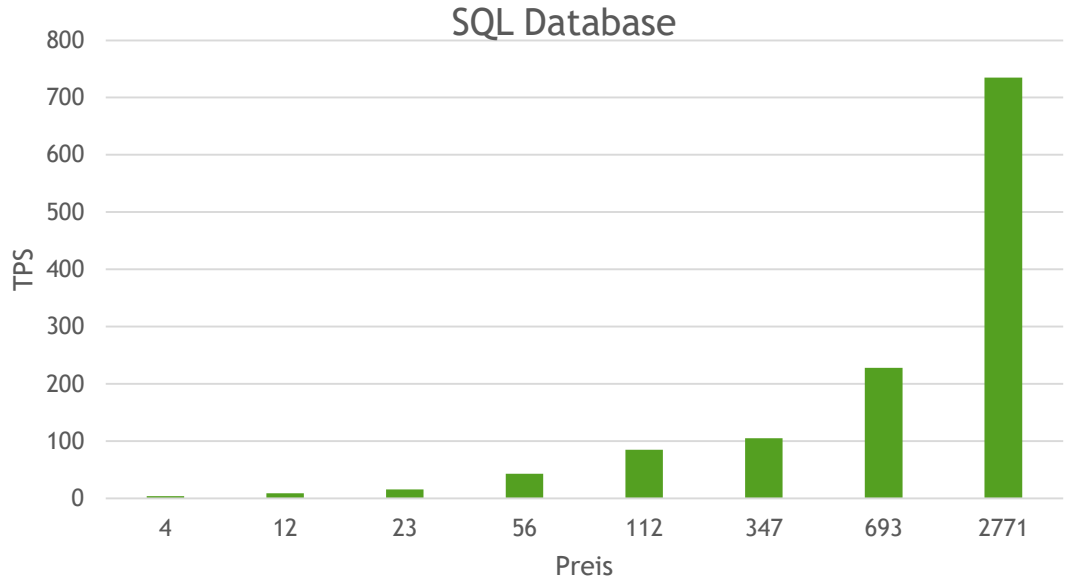
# Preis (pro Monat) / Size



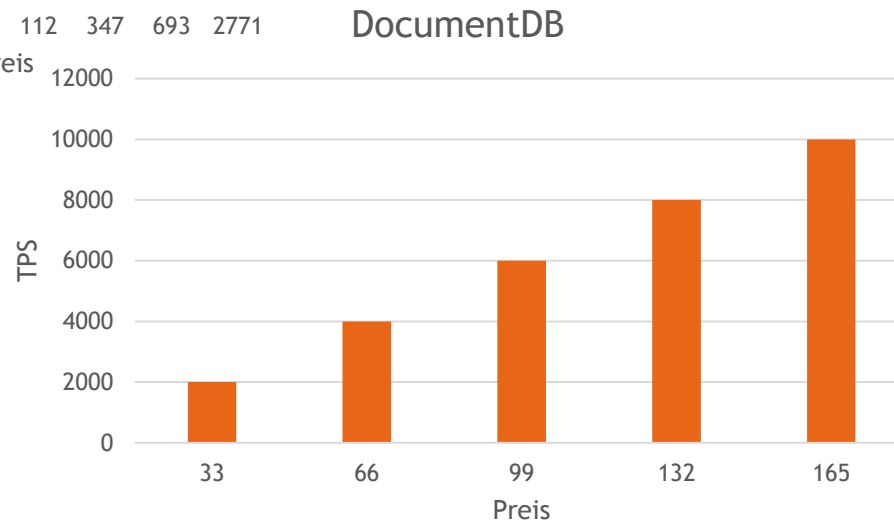
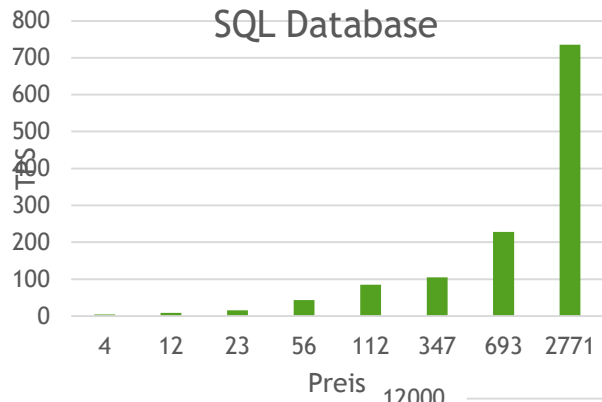
# Preis (pro Monat) / Size



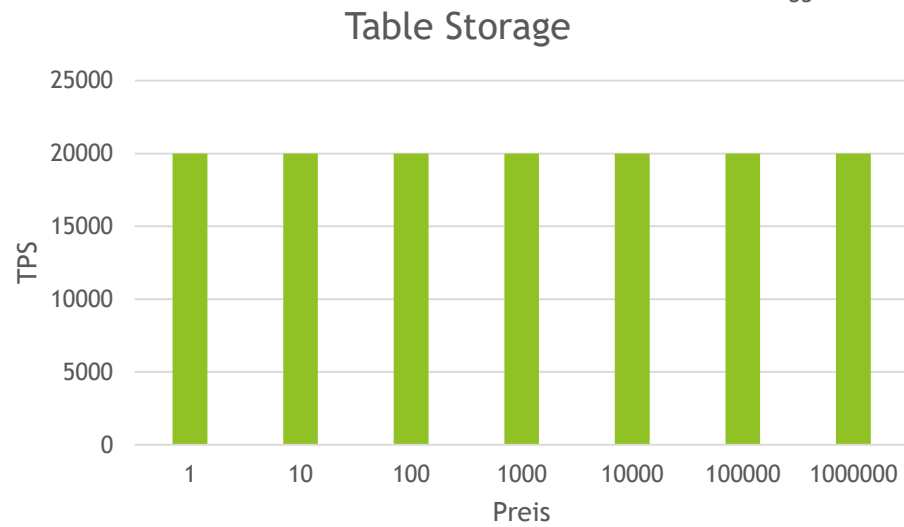
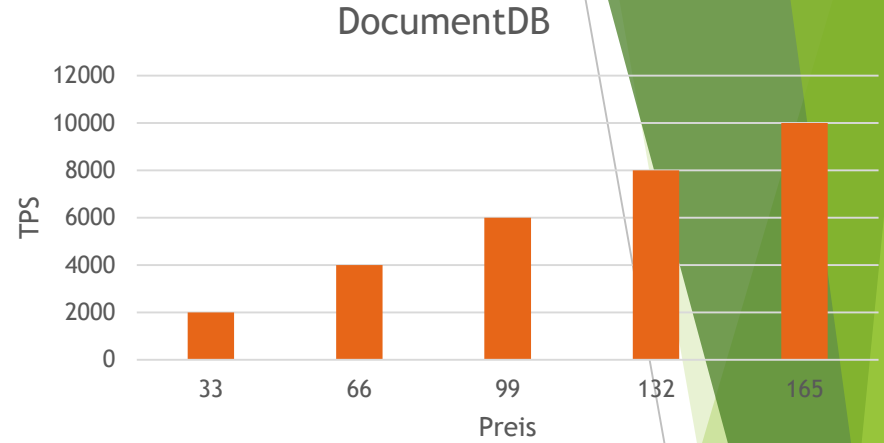
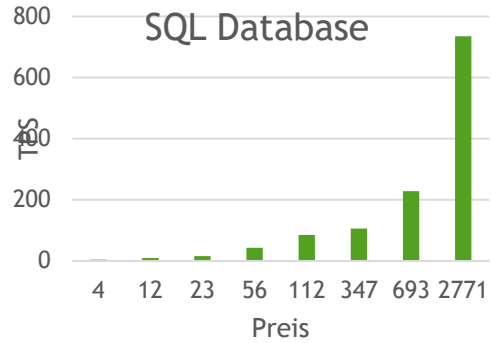
# TPS / Price



# TPS / Price



# TPS / Price



# Summary

## SQL Azure

- Tools
- Preis

## Table Storage

- Datenmengen
- Performance

## DocumentDB

- JSON
- Indexing

## Azure Search

- Full Text Search

# Questions?

- ▶ Source Code
  - ▶ <http://blog.cninnovation.com>
- ▶ Twitter: @christiannagel
- ▶ <http://www.cninnovation.com>



# More Information

- ▶ <http://www.windowsazure.com>
- ▶ Upcoming book: Professional C# 6
- ▶ Training by Christian Nagel