



SQL Azure-Design Concepts

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What is Azure?

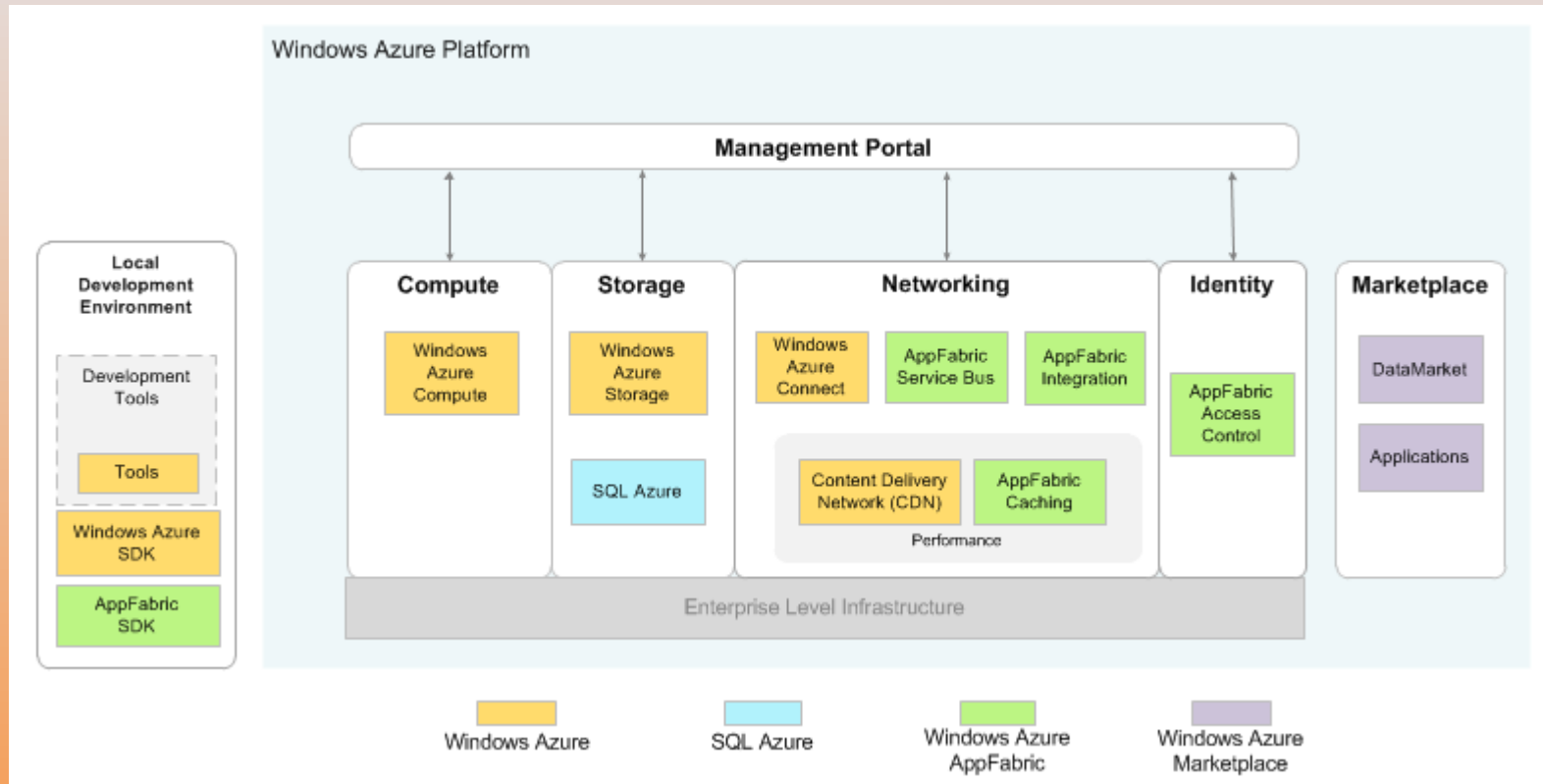


What is Azure?

- More than Virtual Machines – it is a Platform (PaaS)
- Pay-As-You-Go
- Guaranteed at least three copies of your VM
- Modified Server 2008 R2 Enterprise Edition

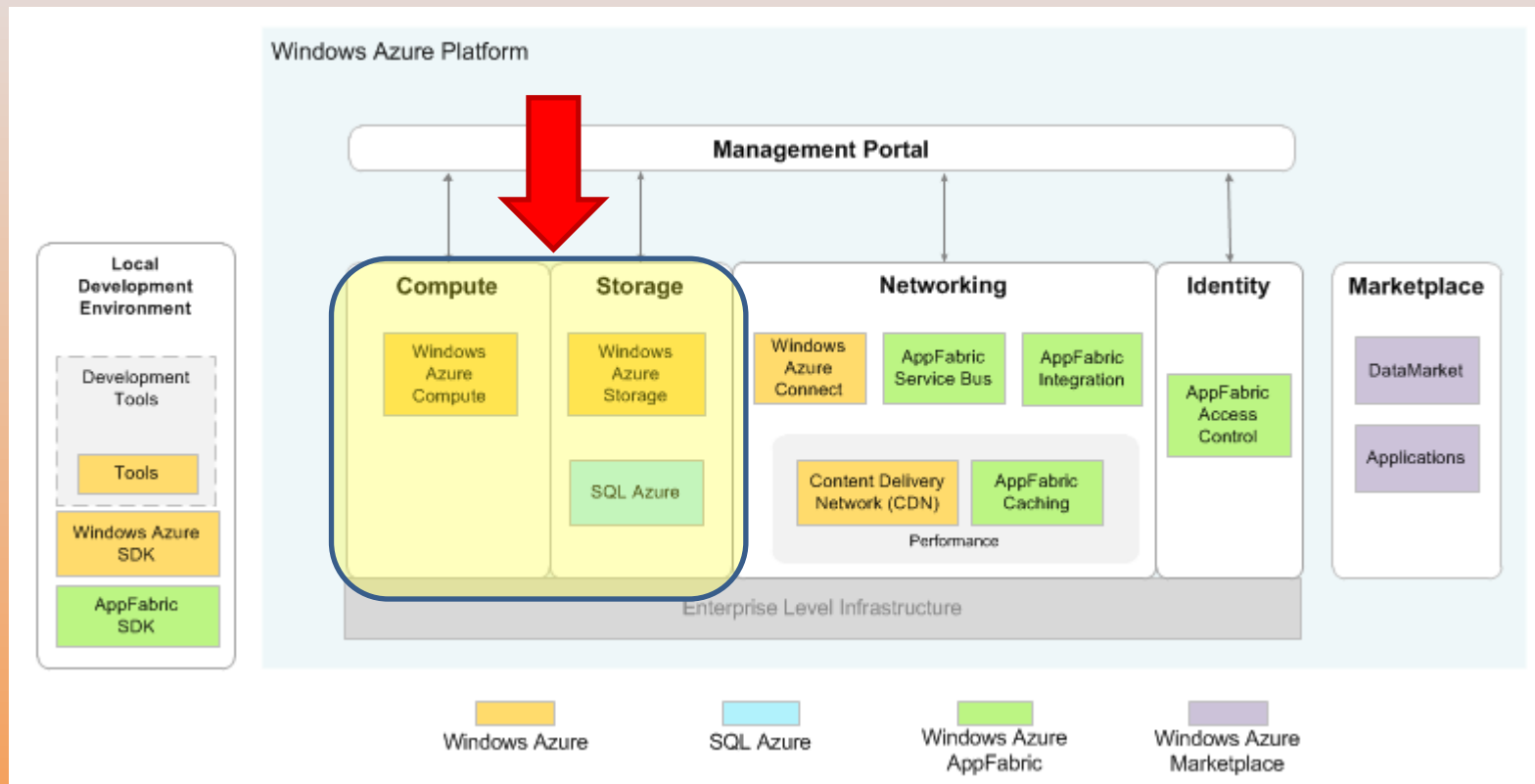


What is the Windows Azure Platform?



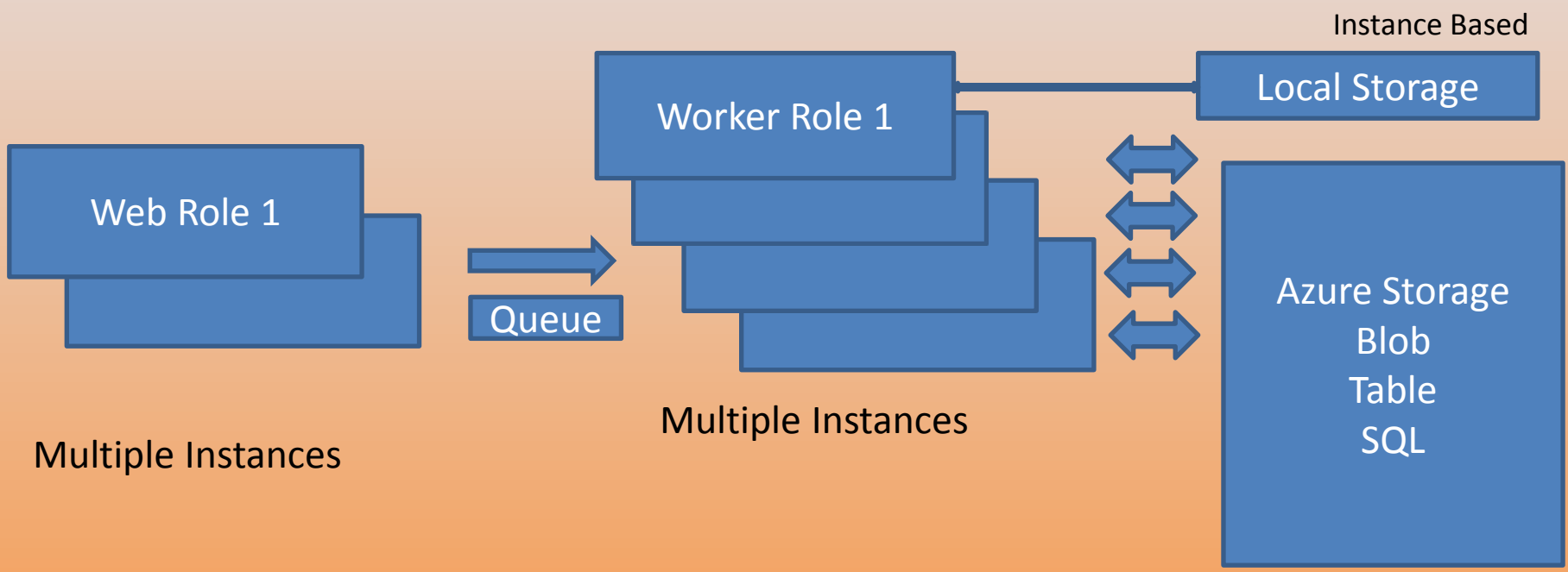


What is the Windows Azure Platform?





Azure Compute & Storage





How does SQL Azure fit into
Azure storage options?



Azure storage options

- Blobs - Blocks and Pages
- Azure Tables
- Queues
- Other – local storage, Azure Drive, remote storage including SQL Server.
- SQL Azure



Azure storage options: Blobs - Blocks and Pages

- Blobs
 - Large binary data – used for images, videos, documents
 - Also used to create NTFS drives
 - Blobs are organised as either blocks or pages



Azure storage options:

Blobs - Blocks

- These blocks allow parallel activity designed for performance/scalability.
- Block blobs are limited to 200GB in size. Max block is 4MB in size (x 50,000 blocks).
- blocks can be of different sizes.
- Updating blocks is a two stage process



Azure storage options:

Blobs - Pages

- A page blob is collection of pages.
- A Page blob and a pages max size 1 TB in multiples of 512 bytes.
- Pages can be randomly uploaded and accessed.
- Unlike block blobs, page writes to a page blob are committed immediately. One step to upload and commit a page blob.



Azure storage options: Azure Tables

- Storage of structured data
- No fixed schema
- No Indexes, relationships or constraints
- Different entities can be stored in same table



Azure storage options: Azure Tables

Structure

- Timestamp
- PartitionKey
- RowKey
- Property Bag of Simple Data Types



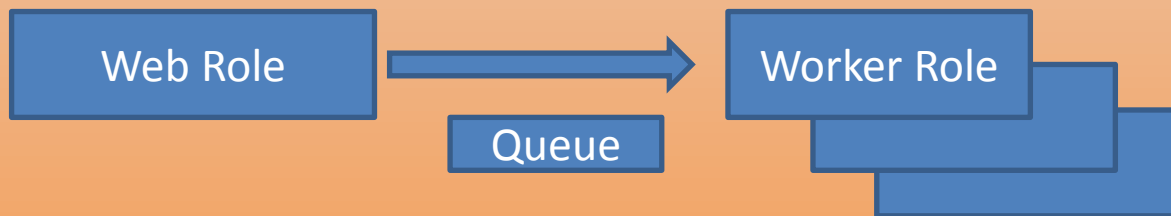
Azure storage options: Azure Tables

- Retrieve All entities, partition key or PartitionKey and RowKey
- Limited 'server-side' Filtering
 - ==, >, <, >=, <=, !=
 - On Booleans &&, ! And ||
- Use ADO.Net Services or Http Rest API Directly



Azure storage options: Queues

Queues provide reliable and durable message stores for loosely coupled services (akin to MSMQ)





What are the other options?

- Local storage
- Azure Drive
- Remote storage including SQL Server.



SQL Azure

“If your application works today against SQL Express edition and does not make use of some of the more advanced features of SQL Server, then your application should work in the cloud with little or no modification.”



SQL Azure <? SQL Server

- SQL Provisioning - Wow
- Security and Connecting - Pooling
- Unavailable Commands – No Surprises
- Debugging and tracing - Enough
- No DTC – Design Constraint
- Size Limits – Design Constraint



SQL Azure Storage – Design Challenges



SQL Azure Storage – Design Challenges

- SQL – Size Limits
- Costs
- Individual VM reliability
- Throttling Issues
- Backup



SQL - Size Limits

```
CREATE DATABASE database_name  
{  
  (<edition_options> [, ...n])  
}
```

```
<edition_options> ::=  
{  
  (MAXSIZE = {1 | 5 | 10 | 20 | 30 | 40 | 50} GB)  
  |(EDITION = {'web' | 'business'})  
}
```



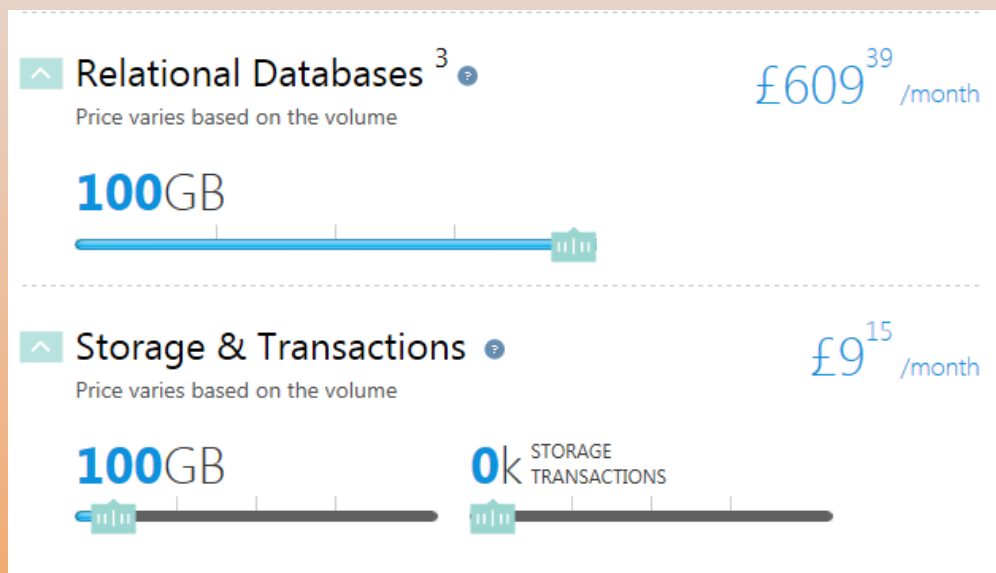
SQL – No DTC

No Distributed Transaction
Coordinator (DTC)

No cross database Transactions



Costs - Storage



<http://www.microsoft.com/windowsazure/pricing-calculator/?campaign=vw-calc>



VM Reliability & Throttling

- Excessive resource usage (5mins)
- Connections that have been idle for 30 minutes or longer
- Failover because of server failures



Missing Commands

- Backup & Restore
- Any File Level Commands
- Again think SQL Express
- MSDN lists supported, partially supported and not supported commands



Included DMVs

sys.dm_exec_connections

sys.dm_exec_requests

sys.dm_exec_sessions

sys.dm_tran_database_transactions

sys.dm_tran_active_transactions

sys.dm_db_partition_stats



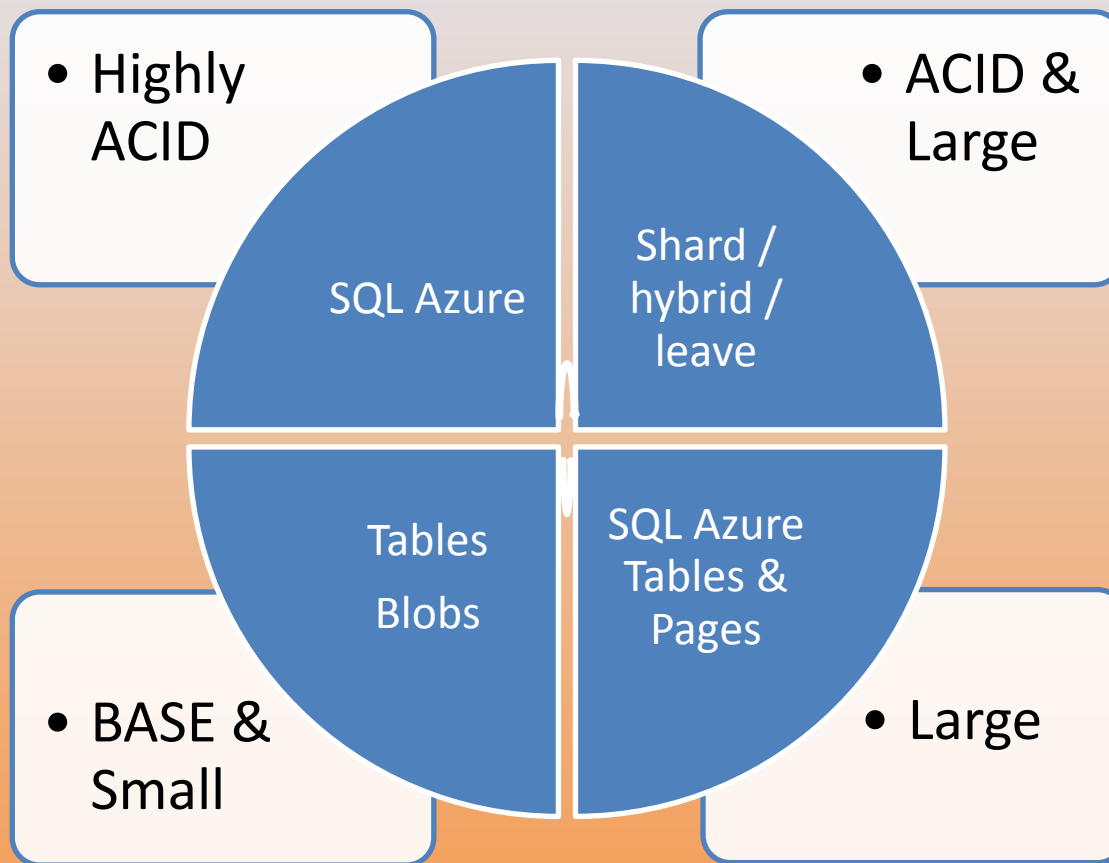
Azure Storage – Design Challenges



All the New Storage facilities are
there basically to help systems scale
out



Solutions





Further Reading

- **Azure in Action – Hay & Prince**
- **Microsoft SQL Azure Enterprise Application Development - Krishnaswamy**
- **Programming Windows Azure - Krishnan**
- **Scalability Rules: 50 Principles for Scaling Web Sites – Abbott & Fisher**

informit.com, manning.com, oreilly.com & packtpub.com



Useful Links

- **Azure main site**
<http://www.microsoft.com/windowsazure/>
- **Windows Azure Storage Team Blog**
<http://blogs.msdn.com/b/windowsazurestorage/archive/2010/03/28/windows-azure-storage-resources.aspx>
- **SQL Azure Database Concepts**
<http://msdn.microsoft.com/en-us/library/ee336256.aspx>
- **Port Bridge**
<http://vasters.com/clemensv/CommentView.aspx?guid=3e35d8bd-b755-453f-8c63-1a57c570eb4c>

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