

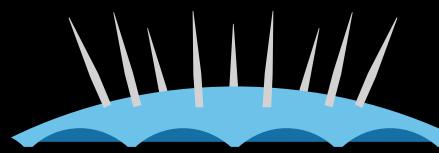
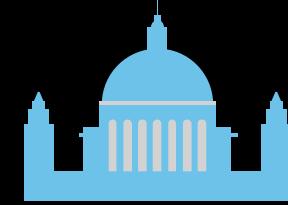
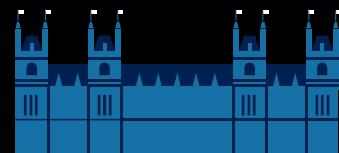
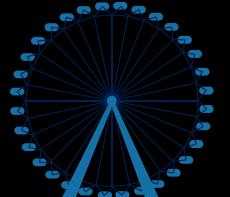
12 Things to Consider when Moving to the Microsoft Azure Cloud

David Gristwood,
Will Eastbury,
Mike Ormond,
Gabriel Nepomuceno

vipazure@microsoft.com



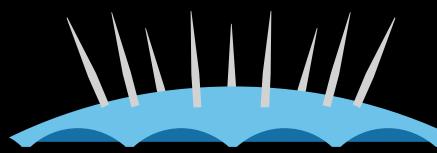
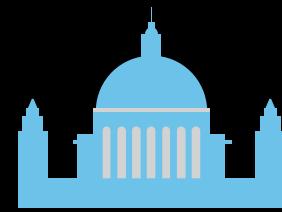
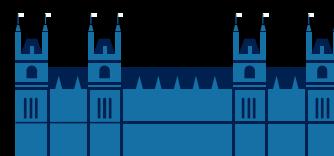
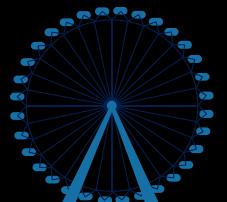
Welcome to Microsoft London ...



Welcome to Microsoft London ...



WE'VE BUILT ONE OF
THE MOST-CONNECTED



Introduction and Housekeeping

Fire Alarms + Emergency Exits

Toilets

Wireless Access

Lunch and Dietary Requirements

Presenters

Today's Brief and Agenda



Today's Presenters

Welcome from the Microsoft Technical Evangelism team for One Commercial Partner - ISV

Will Eastbury



Mike Ormond



Gabriel Nepomuceno



David Gristwood



Agenda

1. Introduction and Housekeeping
2. 12 things to consider when moving to the Microsoft Azure Cloud
3. Lunch
4. Interactive Workshop Scenario : Healthcare Innovation

Today's Brief

Have you been evaluating Azure as a possible platform for a software project?

Or perhaps you have an existing application you are considering moving to Azure?

If you develop software and are unsure about how to best proceed, or are going through the design process for a move to the cloud, then this interactive technical briefing could be just what you need, as we discuss the 12 most important things to consider.



Should I just “Lift and Shift” my workload ?



BYODC

Application
Data
Middleware
Operating System
Virtualisation
Storage
Hardware
Networking
Power

IaaS

Application
Data
Middleware
Operating System
Virtualisation
Storage
Hardware
Networking
Power

PaaS

Application
Data
Middleware
Operating System
Virtualisation
Storage
Hardware
Networking
Power

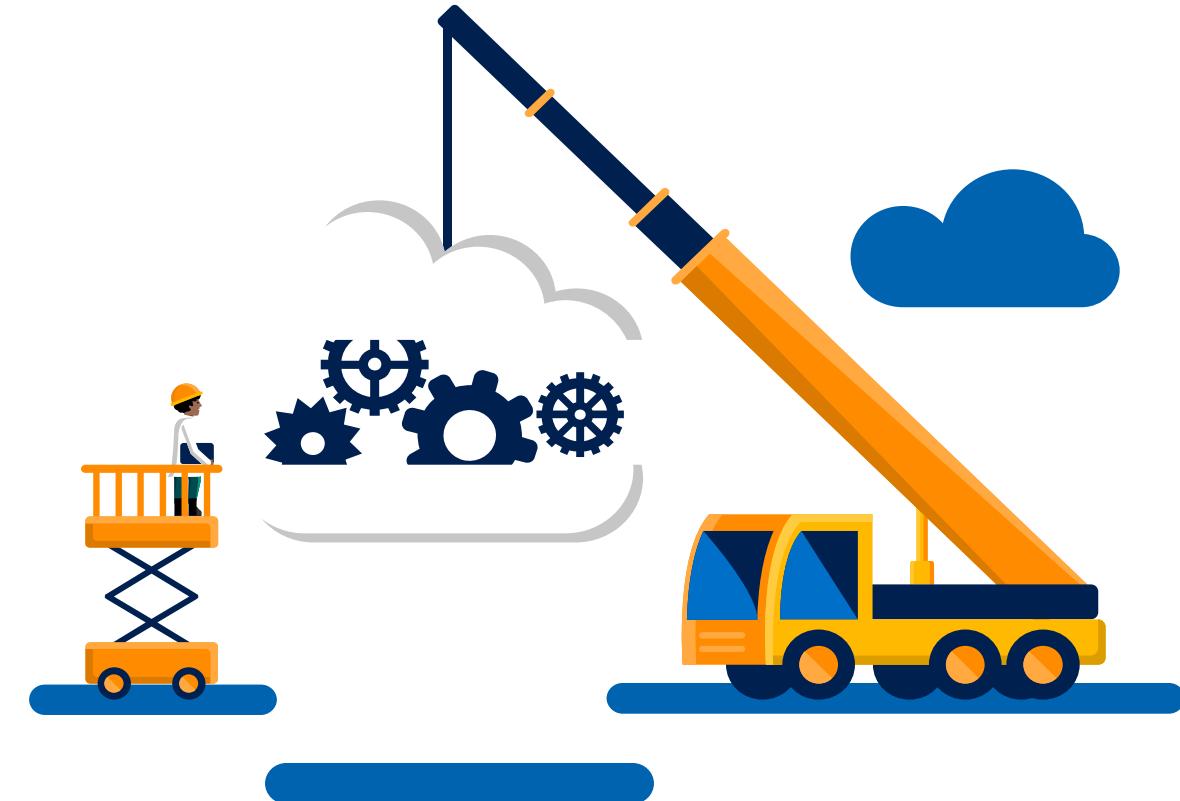
SaaS

Application
Data
Middleware
Operating System
Virtualisation
Storage
Hardware
Networking
Power

Increased Service Agility, Operational Efficiency, Reduced wastage

Reduced migration time, Reduced time to ROI, Increased Legacy Support

In the Lift and shift corner



Usually faster to implement, faster ROI.

Use technologies you already know, understand and trust.

No re-engineering needed.

You're just buying infrastructure, very little changes in deployment and management of the workload.

Azure Resource Manager and DSC Scripting



Infrastructure as Code, configuration as Code

Define scalable networks, firewall rules, storage, images, virtual machines and load balancers in JSON templates and PowerShell DSC scripts and check them into source control.

This works for both IaaS and PaaS, but really makes IaaS deployments both rapid and repeatable.

A photograph of a large green port crane against a clear blue sky. The crane has a white lattice boom with red and white diagonal stripes. The word "EVERGREEN" is printed on the side of the main mast. The crane is positioned on the left side of the frame, angled towards the right.

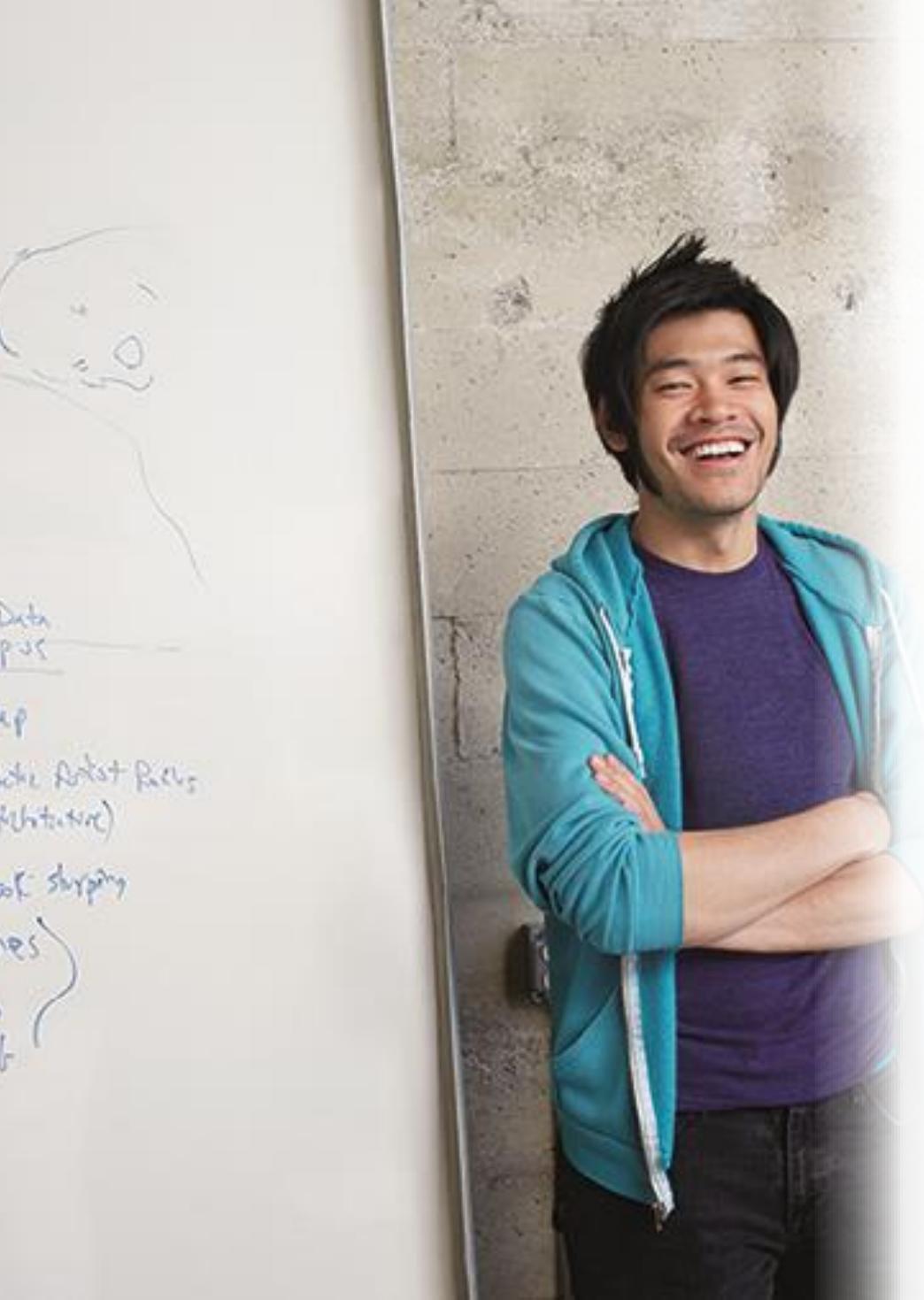
Containers in the Lift and Shift ?

Once we have a headless repeatable deployment, why not dispense with the VM part of infrastructure and simply run the workload in a containerised environment ?

If you are using Windows, consider using nanoserver as your container guest OS.

Consider our brand-new ACI instance type for Container-as-a-service, where we can run your containers for you.

Consider our ACS service or deploying infrastructure to deploy your own hosts to run your own containers

A photograph of a young man with dark hair, smiling broadly. He is wearing a teal zip-up hoodie over a purple t-shirt. He has his arms crossed. He is leaning against a light-colored wall. To the left of the image, there is some handwritten text in blue ink: "Data", "pass", "up", "the Artist Rels", "Whitewine)", "book shopping", "res", and a large brace symbol.

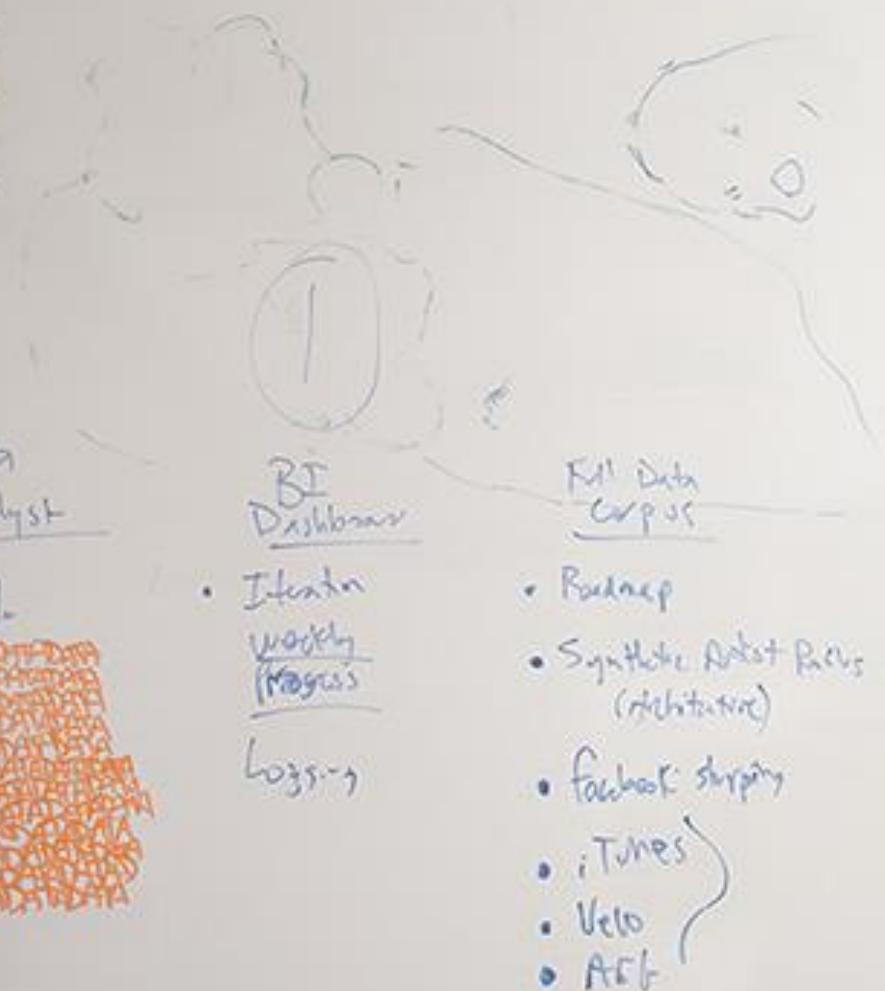
Or deploy to advanced platform services (PaaS)

The next stage is just to deploy a code package to our managed PaaS platforms.

If you're just hosting websites and databases this approach can be hit with zero code changes by using Azure App Service and Azure SQL Database.

You can still do this with *service executables* using WebJobs and Service Fabric guest executables.

Or rearchitect the workload



Or we can rebuild / implement the stack to take advantage of modern architectures and platforms.

At this point, think Microservices, Serverless, App Service, Functions, Service Fabric, CosmosDB, Azure Search, PowerBI.

Anytime you are building a new workload, consider these modern services / patterns as your starting point.

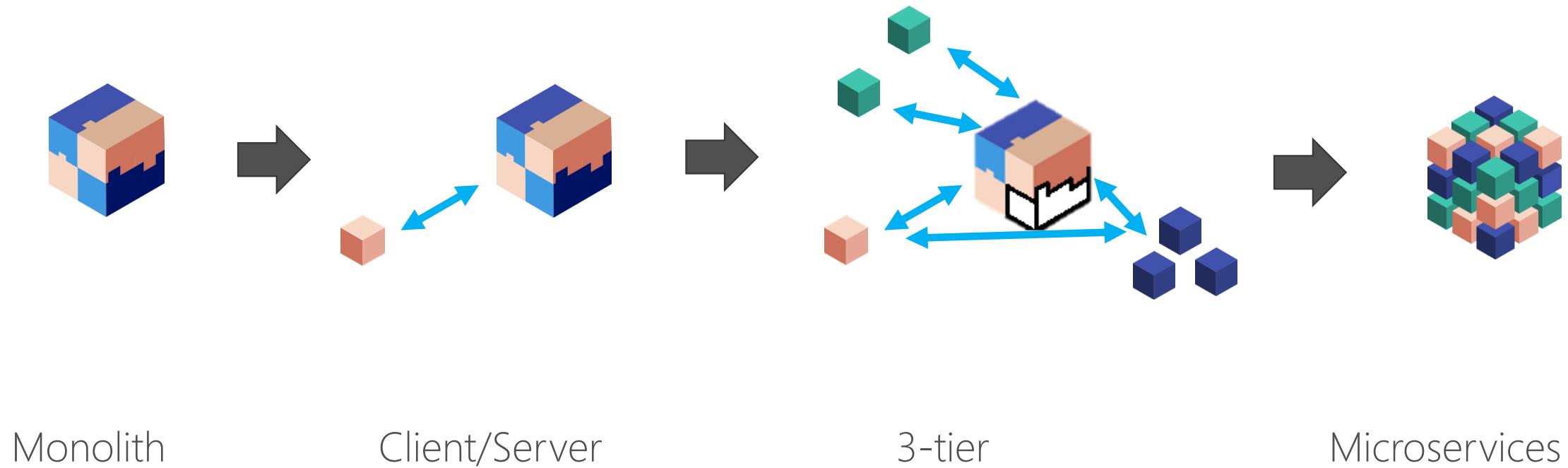
How Granular should my code and services be?

David Gristwood

Technical Evangelist (ISV)



Evolution to Microservices



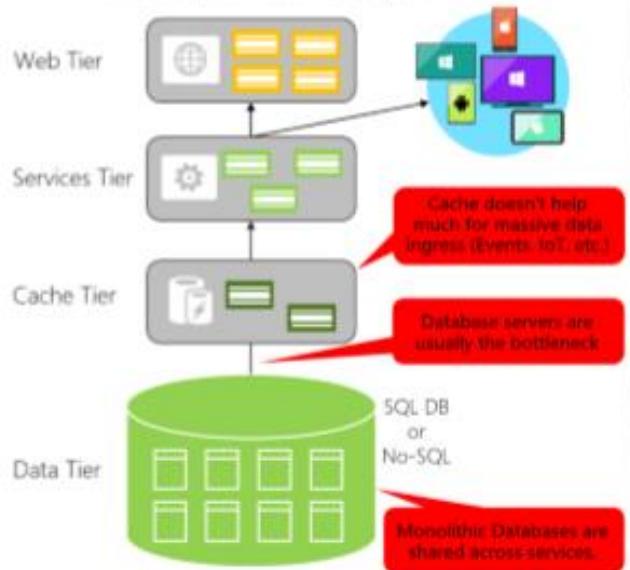
Data and Microservices

Challenges

- #1: How to define the boundaries of each microservice
 - “user” could be in CRM, a customer, logged on account, etc
- #2: How to create queries that retrieve data from several microservices
 - API Gateway, CQRS with query/reads tables, big data repository
- #3: How to achieve consistency across multiple microservices
 - CAP theorem
- #4: How to design communication across microservice boundaries
 - Blocking, chaining, coupling, etc

Data in Traditional approach

- Single monolithic database
- Tiers of specific technologies



Data in Microservices approach

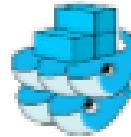
- Graph of interconnected microservices
- State typically scoped to the microservice
- Remote Storage for cold data



Orchestrating Microservices



- Managing large number microservices instances is a complex problem
- Orchestrating is needed to ensure high availability, addressability, resiliency, health, diagnostics etc



Docker Swarm



Mesosphere DC/OS

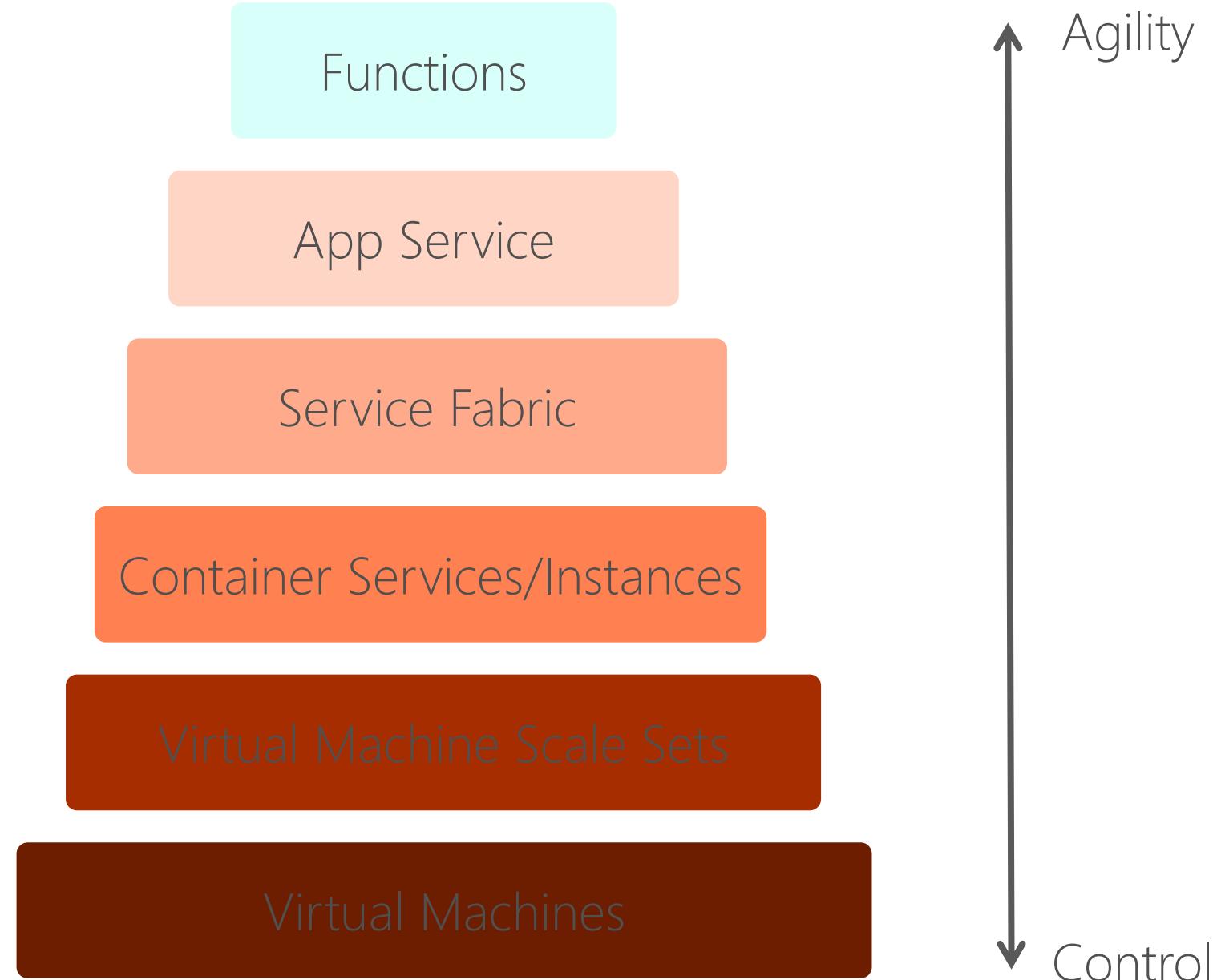


Kubernetes



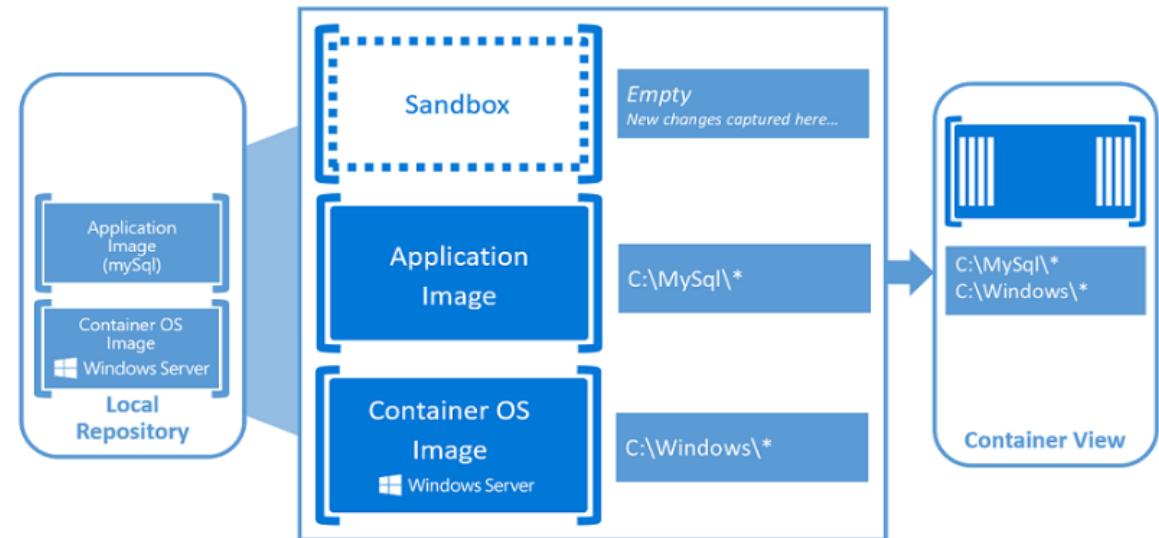
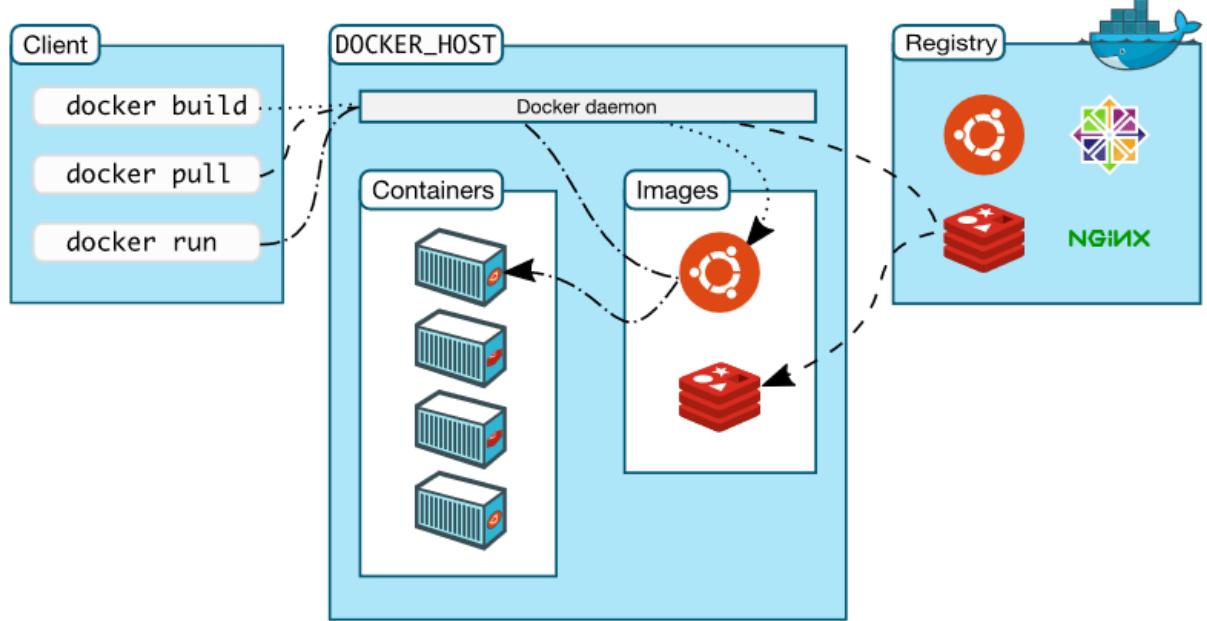
Azure Service Fabric

Azure



Containers

- New way of running applications in lightweight, isolated units
- Apps think they are running on a normal server, but it's sharing the operating system of the host
- Docker has defined the platform technology
- Great for underpinning digital transformations, such as modernizing traditional applications or new microservice architectures
- Originally Linux, now part of Windows Server 2016
- Azure Container Instances in preview

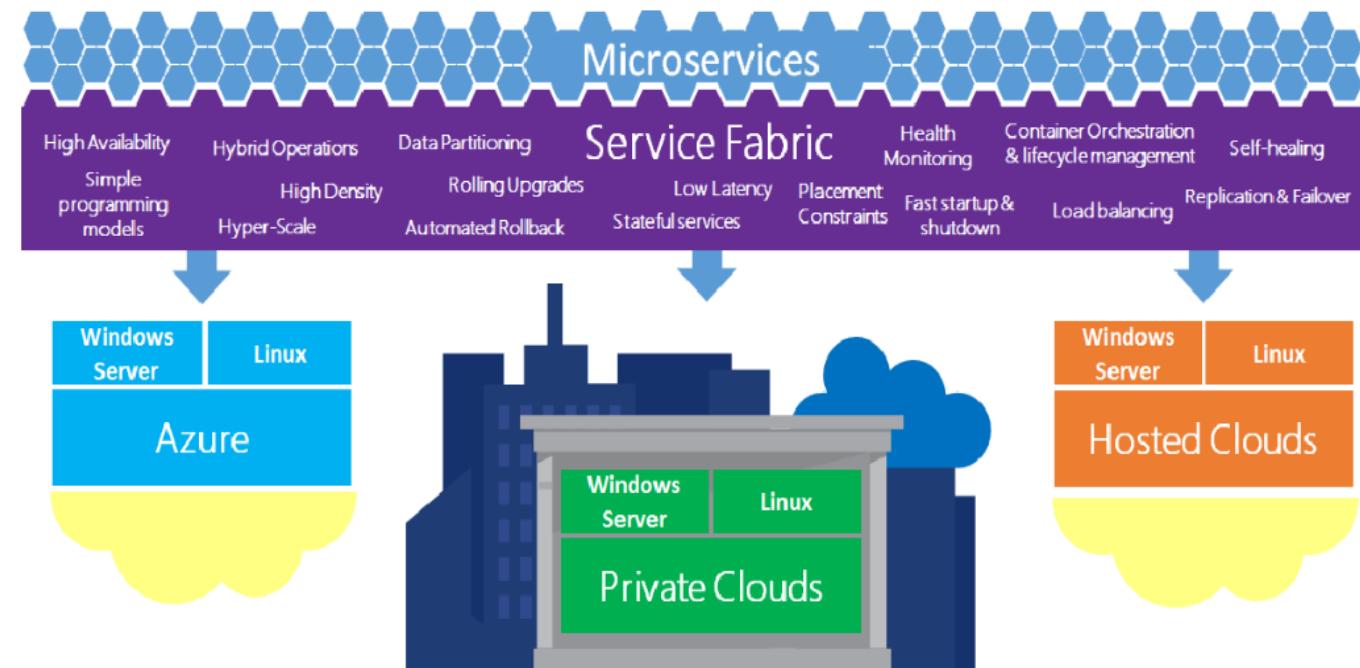


Service Fabric

A Microservices Platform



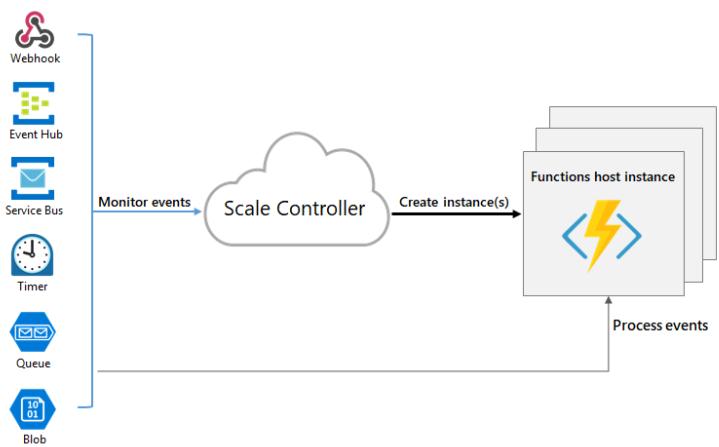
- Powers many Microsoft services
 - SQL Database, Azure DB, Cortana, Power BI, Intune, IoT Hub,
- Runs Windows and Linux, on-premise and cloud and dev
- Scale from a few to thousands of servers
- Stateless and stateful programming models
- Comprehensive runtime and lifecycle management capabilities
- Container deployment and orchestration





Azure Functions

- True serverless platform
 - No need to provision or manage infrastructure
 - Scaled on demand
- Pay for what you use or AppService plan
- C#, F#, JS, PowerShell, Python, Batch,...
- Proxies, Durable Functions on the roadmap
- Event driven model



How do I scale up, down, out and in?

Mike Ormond

Technical Evangelist (ISV)



Principles

Do as little as possible

Favour “Scale out” over “Scale up”

Design for scale out

Choose your data store

Partition workload

Be aware of the quotas / limits that Azure imposes



Principles

Do as little as possible

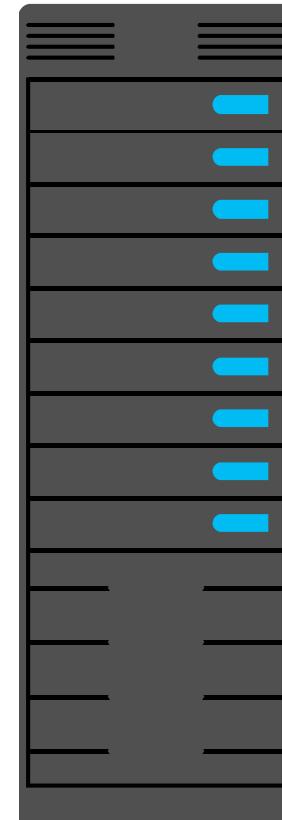
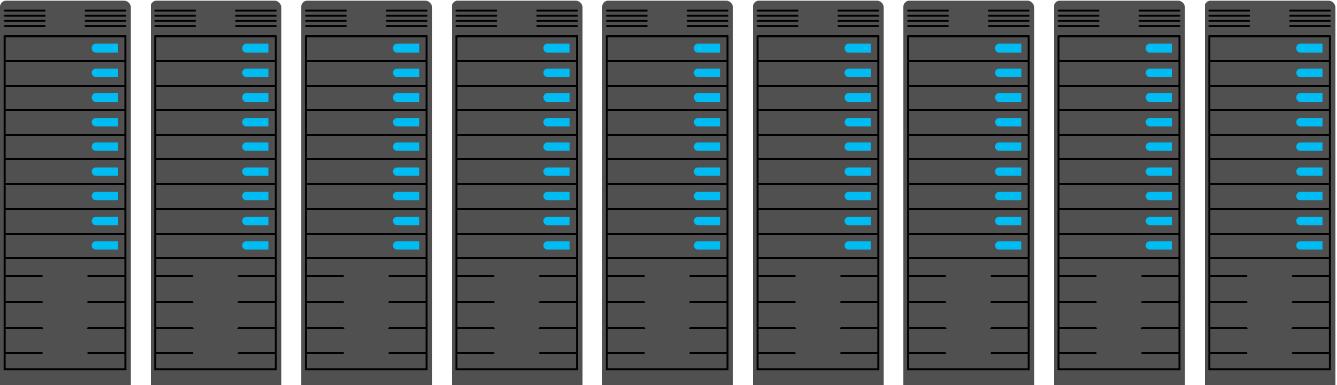
- The less you do the more you can scale
- Offload work
- Profile & monitor



Principles

Favour “Scale out” over “Scale up”

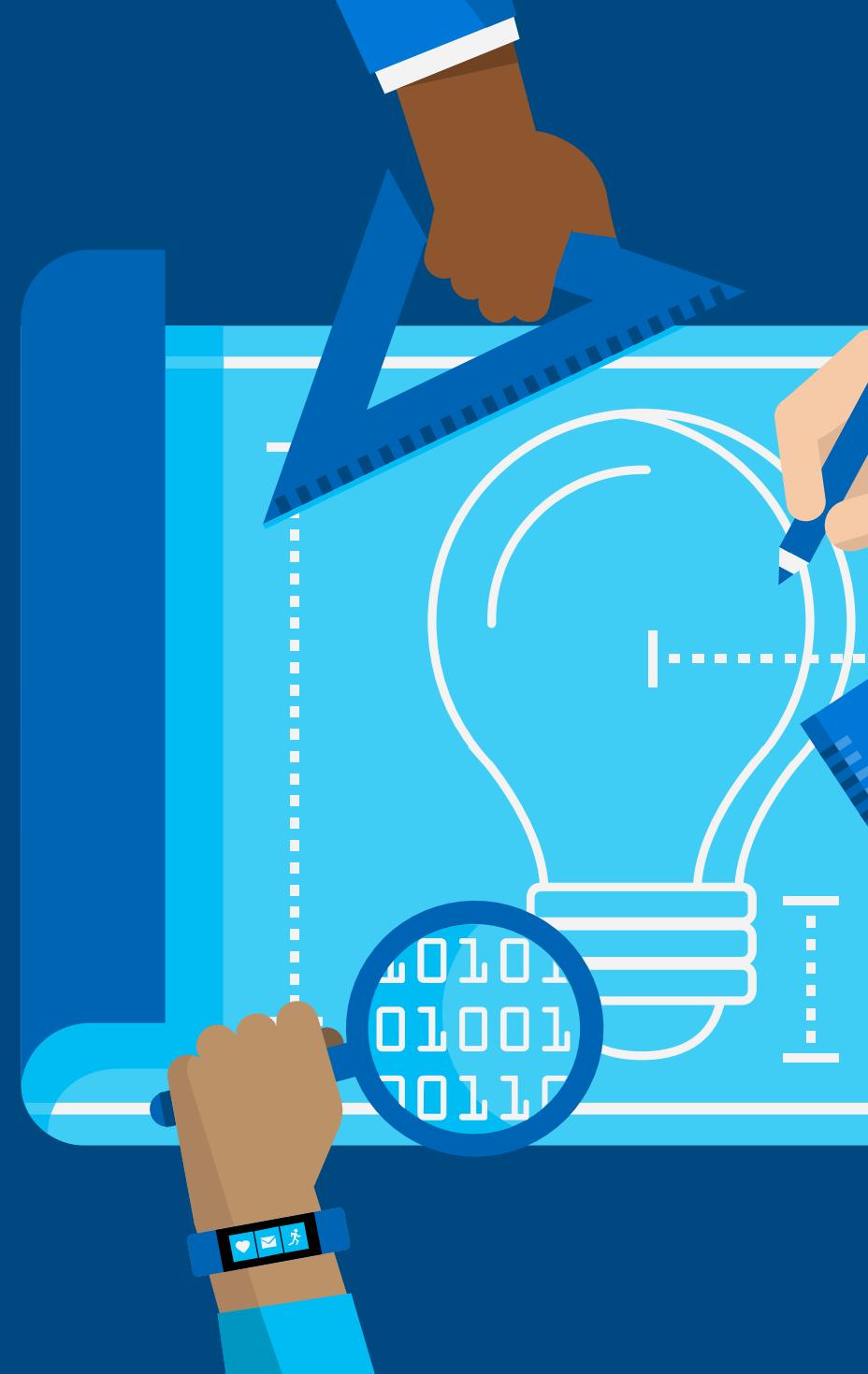
- More granular control
- Autoscale
- Removes upper limits
- More liquidity
- Favour services that designed for scale out



Principles

Design for scale out

- Minimise stateful services
- Decompose by scalability requirements
- Identify bottlenecks
- Offload resource intensive tasks
- Design for scale in



Principles

Choose your data store

- Don't use SQL for everything
- Embrace "polyglot persistence"
- By lead by the type of data
- Prefer availability over strong consistency

RDBMS – eg SQL Database

Key / Value Store – eg Azure Table Storage, Azure Redis Cache

Document DB – eg Cosmos DB

Analytics – eg Azure Data Lake

Object Storage – eg Azure Blob Storage

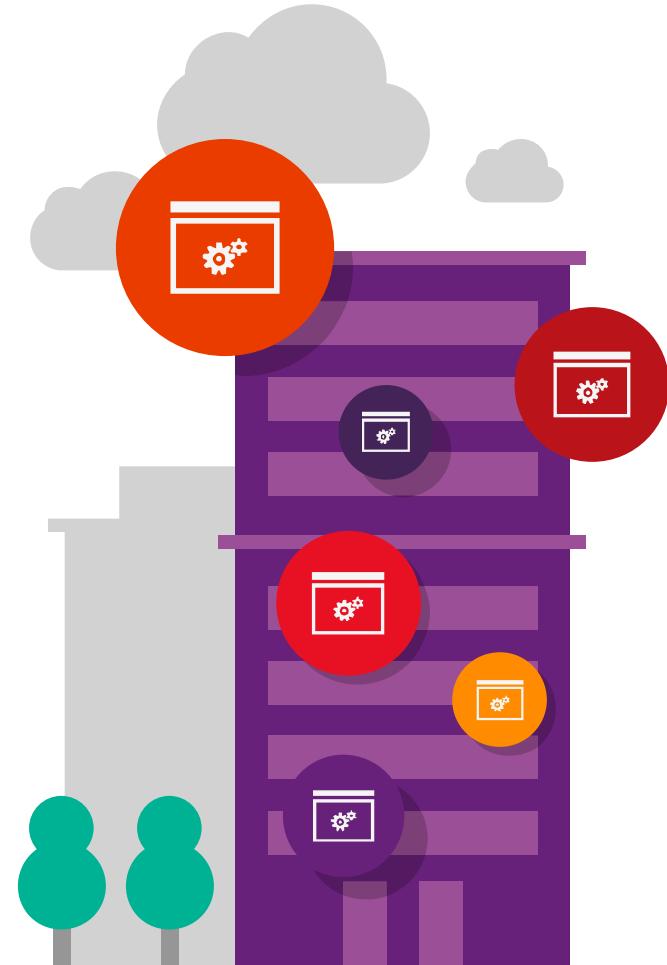
File Store – eg Azure File Storage



Principles

Partition workload

- Loosely couple components
- Greater flexibility
- Encapsulate change
- Scale where required
- Message-based communication
- Asynchronous pattern
- Queues / Service Bus



Principles

Be aware of the quotas / limits that Azure imposes

- These will inform partitioning choices

Managed virtual machine disks					
Standard managed virtual machine disks					
Standard Disk Type	S4	S6	S10	S20	S30
Disk size	32 GB	64 GB	128 GB	512 GB	1024 GB (1 TB)
IOPS per disk	500	500	500	500	500
Throughput per disk	60 MB/sec	60 MB/sec	60 MB/sec	60 MB/sec	60 MB/sec
Premium managed virtual machine disks: per disk limits					
Premium Disks Type	P4	P6	P10	P20	P30
Disk size	32 GB	64 GB	128 GB	512 GB	1024 GB (1 TB)
IOPS per disk	120	240	500	2300	5000
Throughput per disk	25 MB/sec	50 MB/sec	100 MB/sec	150 MB/sec	200 MB/sec
Premium managed virtual machine disks: per VM limits					
Resource	Default Limit				
Max IOPS Per VM	80,000 IOPS with GS5 VM ¹				
Max throughput per VM	2,000 MB/s with GS5 VM ¹				

¹Refer to [VM Size](#) for limits on other VM sizes.

Scalability targets for blobs, queues, tables, and files	
Resource	Default Limit
Number of storage accounts per subscription	200 ¹
Max storage account capacity	500 TB ²
Max number of blob containers, blobs, file shares, tables, queues, entities, or messages per storage account	No limit
Max size of a single blob container, table, or queue	Same as max storage account capacity
Max number of blocks in a block blob or append blob	50,000
Max size of a block in a block blob	100 MB
Max size of a block blob	50,000 X 100 MB (approx. 4.75 TB)
Max size of a block in an append blob	4 MB
Max size of an append blob	50,000 X 4 MB (approx. 195 GB)
Max size of a page blob	8 TB
Max size of a table entity	1 MB
Max number of properties in a table entity	252
Max size of a message in a queue	64 KB

Compute - PaaS

SETTINGS

- Application settings**
- Authentication / Authorization**
- Backups**
- Custom domains**
- SSL certificates**
- Networking**
- Scale up (App Service plan)**
- Scale out (App Service plan)**
- WebJobs**

* Autoscale setting name: ScaleSettings

Resource group: TestSkype

Default Auto created scale condition

Scale mode: Scale based on a metric Scale to a specific instance count

It is recommended to have at least one scale in rule

Rules

Scale out

When	Test	(Average) CpuPercentage > 70	Increase instance count by 1
------	------	------------------------------	------------------------------

+ Add a rule

Instance limits: Minimum 1, Maximum 1, Default 1

Schedule: This scale condition is executed when none of the other scale condition(s) match

+ Add a scale condition

Choose your pricing tier
Browse the available plans and their features

PV2_1 PremiumV2	PV2_2 PremiumV2	PV2_3 PremiumV2
1 Core	2 Core	4 Core
3.5 GB RAM	7 GB RAM	14 GB RAM
SSD and faster CPU Dv2 series workers	SSD and faster CPU Dv2 series workers	SSD and faster CPU Dv2 series workers
250 GB Storage	250 GB Storage	250 GB Storage
Custom domains / SSL SNI Incl & IP SSL Support	Custom domains / SSL SNI Incl & IP SSL Support	Custom domains / SSL SNI Incl & IP SSL Support
Up to 20 instance(s) * Subject to availability	Up to 20 instance(s) * Subject to availability	Up to 20 instance(s) * Subject to availability
20 slots Web app staging	20 slots Web app staging	20 slots Web app staging
Traffic Manager Geo availability	Traffic Manager Geo availability	Traffic Manager Geo availability
166.35 GBP/MONTH (ESTIMATED)	332.71 GBP/MONTH (ESTIMATED)	665.41 GBP/MONTH (ESTIMATED)

P1 Premium	P2 Premium	P3 Premium
1 Core	2 Core	4 Core
1.75 GB RAM	3.5 GB RAM	7 GB RAM
250 GB Storage	250 GB Storage	250 GB Storage
Custom domains / SSL SNI Incl & IP SSL Support	Custom domains / SSL SNI Incl & IP SSL Support	Custom domains / SSL SNI Incl & IP SSL Support
Up to 20 instance(s) * Subject to availability	Up to 20 instance(s) * Subject to availability	Up to 20 instance(s) * Subject to availability
20 slots Web app staging	20 slots Web app staging	20 slots Web app staging
50 times daily Backup	50 times daily Backup	50 times daily Backup
Traffic Manager Geo availability	Traffic Manager Geo availability	Traffic Manager Geo availability
166.35 GBP/MONTH (ESTIMATED)	332.71 GBP/MONTH (ESTIMATED)	665.41 GBP/MONTH (ESTIMATED)

S1 Standard	S2 Standard	S3 Standard
1 Core	2 Core	4 Core
1.75 GB RAM	3.5 GB RAM	7 GB RAM
50 GB Storage	50 GB Storage	50 GB Storage
Custom domains / SSL	Custom domains / SSL	Custom domains / SSL
Select		

Compute - IaaS

Virtual machines (classic)

Virtual machines

Virtual machine scale sets

Cloud services (classic)

Autoscale setting name: cpuautoscale
Resource group: 170803_VMSS_Test
Instance count: 1

Default Profile1

Scaling Rules

- Scale mode:** Scale based on a metric (radio button selected)
- Scale out:** When vmsstest (Average) Percentage CPU > 75, Increase instance count by 1
- Scale in:** When vmsstest (Average) Percentage CPU < 25, Decrease instance count by 1
- + Add a rule**
- Instance limits:** Minimum 1, Maximum 10, Default 1
- Schedule:** This scale condition is executed when none of the other scale condition(s) match
- + Add a scale condition**

SETTINGS

- Instances
- Scaling (selected)
- Storage
- Operating system
- Size
- Continuous delivery (Preview)
- Properties
- Locks
- Automation script

MONITORING

MyDockerVM Virtual machine

Choose a size
 Browse the available sizes and their features

Prices presented are estimates in your local currency that include only Azure infrastructure costs and any discounts for the subscription and location. The prices don't include any applicable software costs. If the virtual machine is currently running, changing its size will cause it to be restarted.

Supported disk type: HDD **Minimum cores:** 1 **Minimum memory (GiB):** 0

D2S_V3 Standard	D4S_V3 Standard	D8S_V3 Standard
2 Core	4 Core	8 Core
8 GB	16 GB	32 GB
2 Data disks	4 Data disks	8 Data disks
3200 Max IOPS	6400 Max IOPS	12800 Max IOPS
16 GB Local SSD	32 GB Local SSD	64 GB Local SSD
Premium disk support	Premium disk support	Premium disk support

66.54 GBP/MONTH (ESTIMATED)

D16S_V3 Standard	E2S_V3 Standard	E4S_V3 Standard
16 Core	2 Core	4 Core
64 GB	16 GB	32 GB
16 Data disks	2 Data disks	4 Data disks
25600 Max IOPS	3200 Max IOPS	6400 Max IOPS
128 GB Local SSD	32 GB Local SSD	64 GB Local SSD
Premium disk support	Premium disk support	Premium disk support

133.08 GBP/MONTH (ESTIMATED)

D16S_V3 Standard	E2S_V3 Standard	E4S_V3 Standard
16 Core	2 Core	4 Core
64 GB	16 GB	32 GB
16 Data disks	2 Data disks	4 Data disks
25600 Max IOPS	3200 Max IOPS	6400 Max IOPS
128 GB Local SSD	32 GB Local SSD	64 GB Local SSD
Premium disk support	Premium disk support	Premium disk support

266.16 GBP/MONTH (ESTIMATED)

D16S_V3 Standard	E2S_V3 Standard	E4S_V3 Standard
16 Core	2 Core	4 Core
64 GB	16 GB	32 GB
16 Data disks	2 Data disks	4 Data disks
25600 Max IOPS	3200 Max IOPS	6400 Max IOPS
128 GB Local SSD	32 GB Local SSD	64 GB Local SSD
Premium disk support	Premium disk support	Premium disk support

532.33 GBP/MONTH (ESTIMATED)

D16S_V3 Standard	E2S_V3 Standard	E4S_V3 Standard
16 Core	2 Core	4 Core
64 GB	16 GB	32 GB
16 Data disks	2 Data disks	4 Data disks
25600 Max IOPS	3200 Max IOPS	6400 Max IOPS
128 GB Local SSD	32 GB Local SSD	64 GB Local SSD
Premium disk support	Premium disk support	Premium disk support

88.72 GBP/MONTH (ESTIMATED)

D16S_V3 Standard	E2S_V3 Standard	E4S_V3 Standard
16 Core	2 Core	4 Core
64 GB	16 GB	32 GB
16 Data disks	2 Data disks	4 Data disks
25600 Max IOPS	3200 Max IOPS	6400 Max IOPS
128 GB Local SSD	32 GB Local SSD	64 GB Local SSD
Premium disk support	Premium disk support	Premium disk support

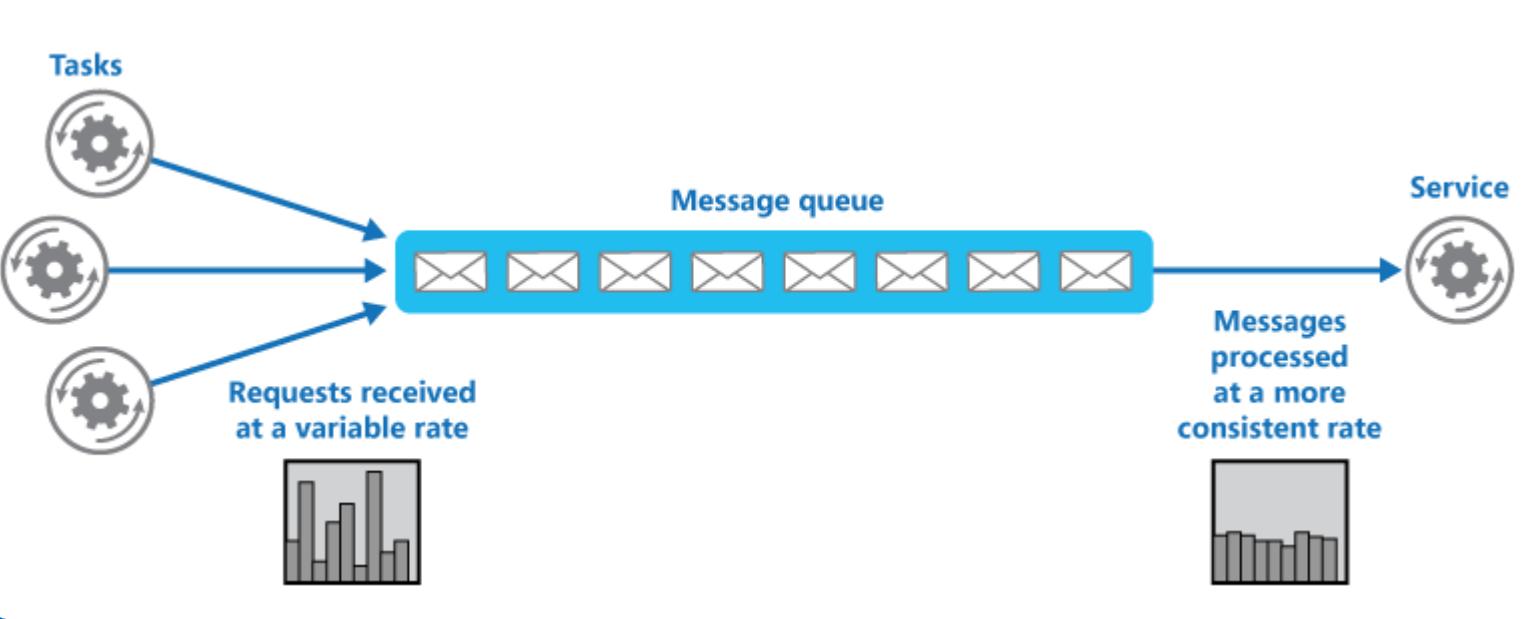
177.44 GBP/MONTH (ESTIMATED)

D16S_V3 Standard	E2S_V3 Standard	E4S_V3 Standard
16 Core	2 Core	4 Core
64 GB	16 GB	32 GB
16 Data disks	2 Data disks	4 Data disks
25600 Max IOPS	3200 Max IOPS	6400 Max IOPS
128 GB Local SSD	32 GB Local SSD	64 GB Local SSD
Premium disk support	Premium disk support	Premium disk support

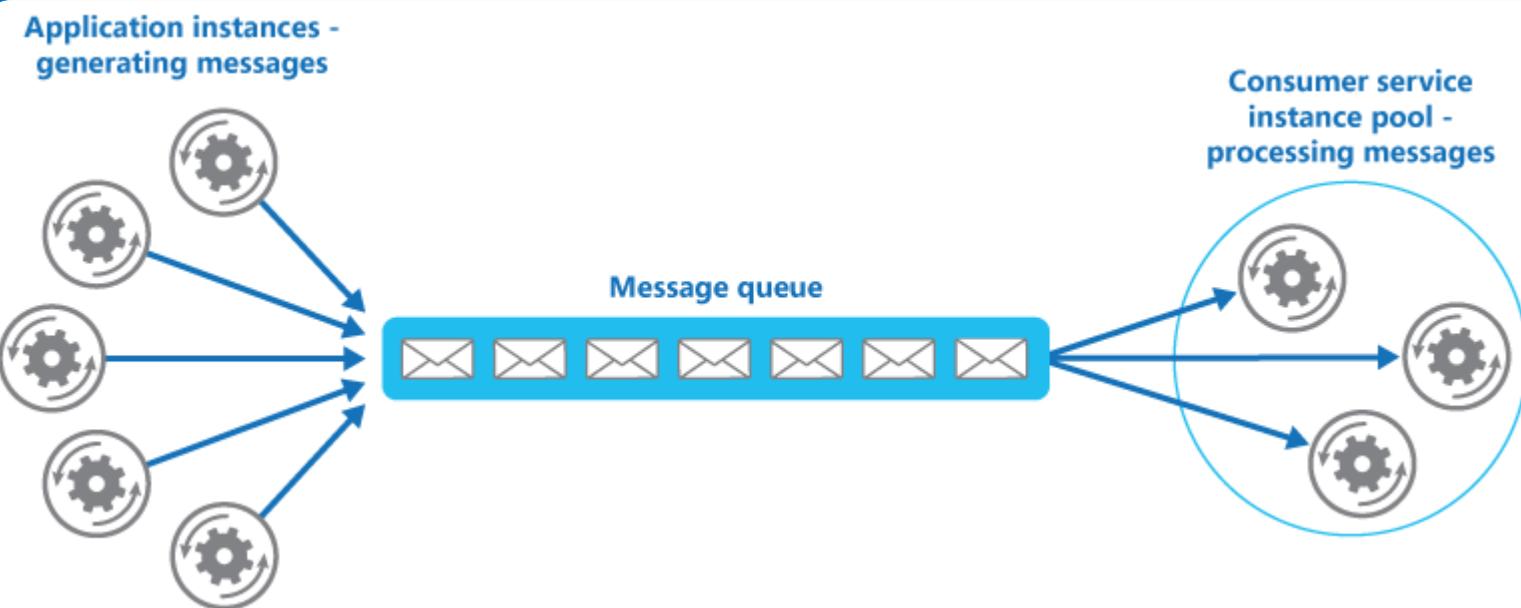
Select

Scale Design Patterns

<https://aka.ms/scalepatterns>

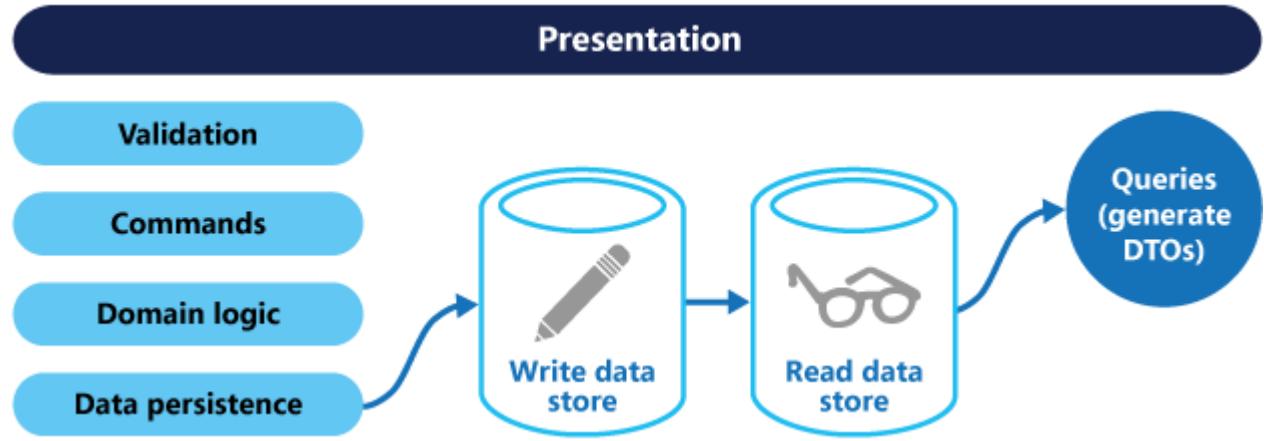


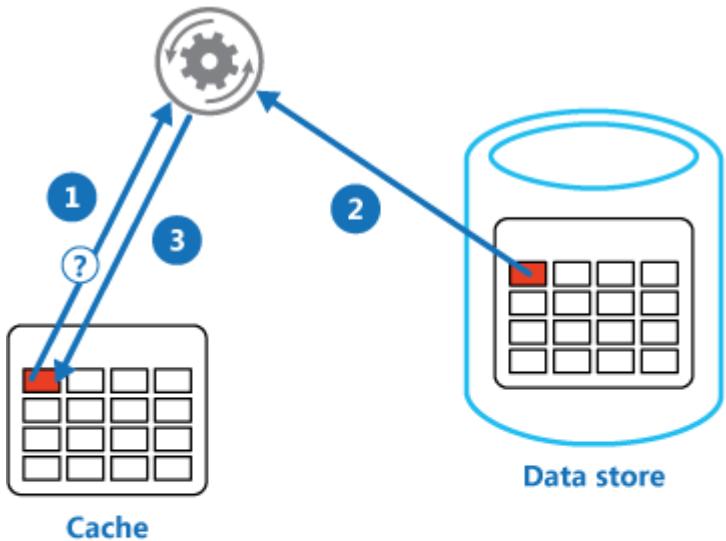
Queue-Based Load Leveling pattern



Competing Consumers pattern

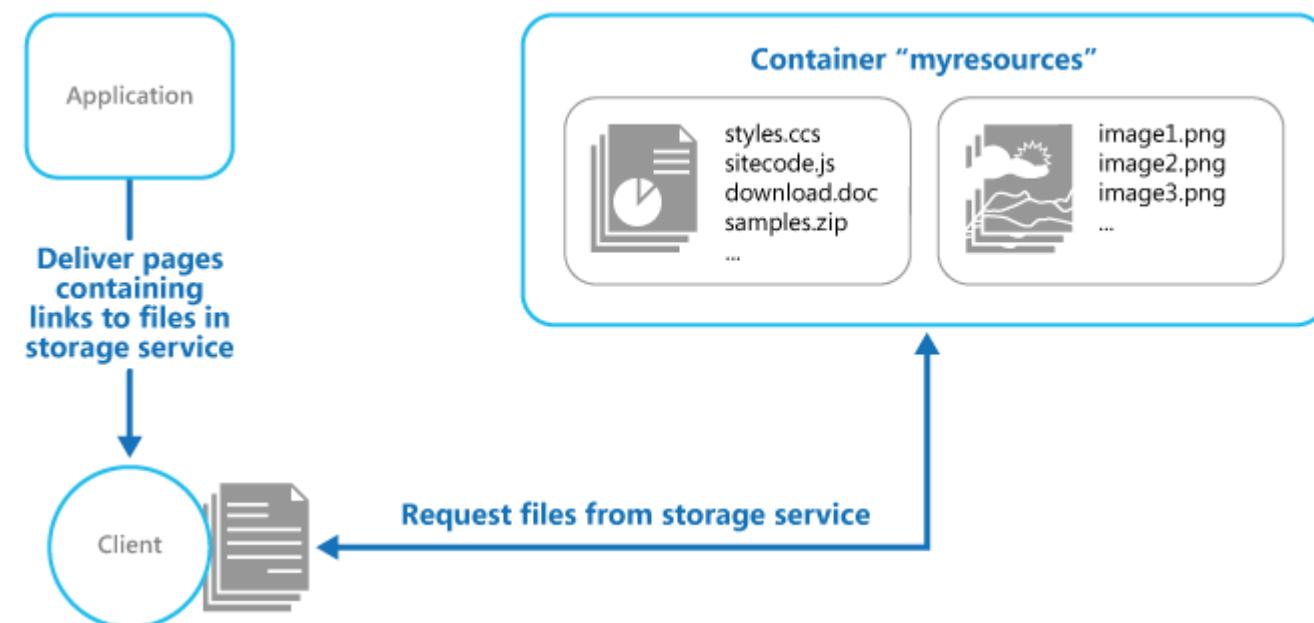
Command and Query Responsibility Segregation (CQRS) pattern



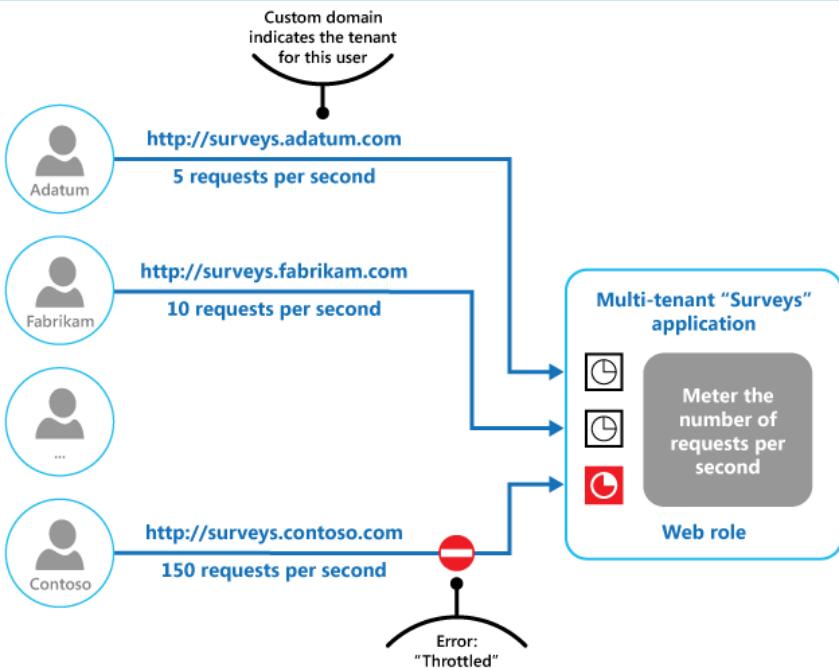
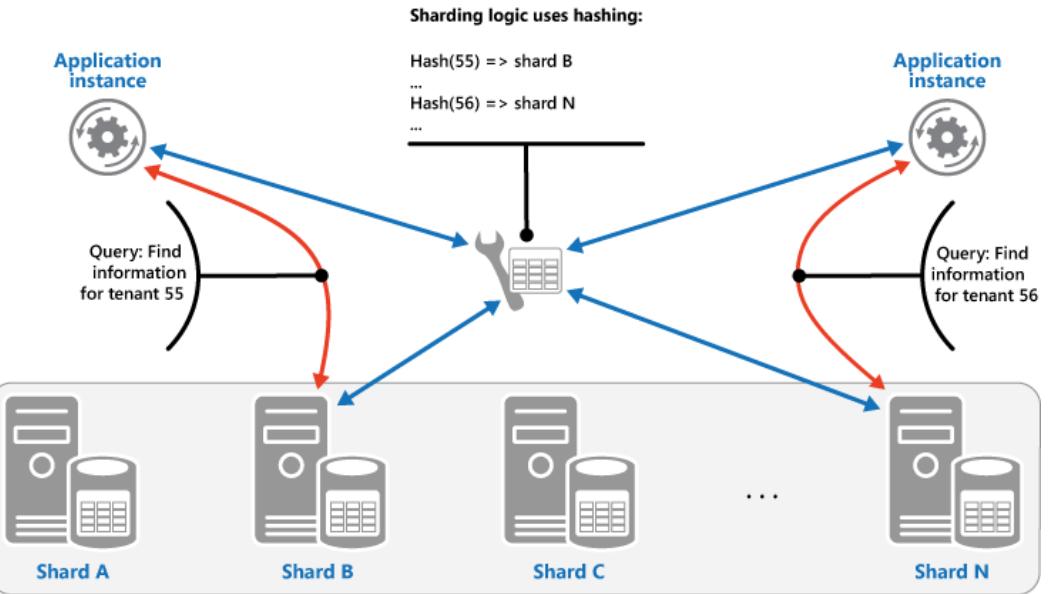


Cache-Aside pattern

Static Content Hosting pattern



Sharding pattern



Throttling pattern

Principles

Do as little as possible

Favour “Scale out” over “Scale up”

Design for scale out

Choose your data store

Partition workload

Be aware of the quotas / limits that Azure imposes



A photograph of a man with a shaved head and sunglasses, wearing a grey hoodie over a green t-shirt and blue jeans, sitting on a rocky ledge. He is looking down at a small device in his hands. The background is a vast, arid desert landscape with rolling hills and mountains under a clear sky.

Where should I
put my data?

David Gristwood

Technical Evangelist (ISV)

Polyglot Persistence

Human derived data
(sales, orders, parts, invoices,
inventory, etc)



Transactional integrity,
relational, etc.

Machine derived data
(telemetry, sensor, movement,
GPS, etc)



Stand alone, variable
quality, distributed, etc.

Data on Azure



Use an appropriate type of data store

Storage Mechanism	Interaction	Starts at*	Min GB	Max TB	Use Case
'Cool' Block Blob storage	REST (Blob), SDKs	£0.01/GB	0	500	Archive, nearline unstructured https storage
'Hot' Block Blob storage	REST (Blob), SDKs	£0.02/GB	0	500	Online unstructured https storage
Virtual Machine Disk / Page Blob Storage	VM Only	£0.05/GB	0	500 (Not per VM)	High Performance storage, up to 500 IOPS per disk volume (up to max volumes per VM type).
Table Storage	REST (Blob), SDKs	£0.07/GB	0	500	Tabular, non-relational (NoSQL) Mass-scale dictionary https lookup service, partitioned by default, no secondary indexes allowed.
Premium Virtual Machine Disk/ Page Blob Storage	VM Only	£0.13/GB	128	35	GUARANTEED High Performance storage, up to 5000 IOPS per disk volume (up to max volumes per VM type > 80,000 IOPS & 2TB / Second).
SQL Database Basic	T-SQL (TDS)	£2.33/GB *	2	1	Tabular, Scalable, Classic Relational DBMS, Always On
SQL Data Warehouse	T-SQL (TDS)	£1.03/GB *	1024	~250 Compressed (~1PB)	Scalable, Tabular, Parallelized, Relational DBMS, can be paused.
Cosmos DB	REST (Blob), SDKs	£4.62/GB *	1	0.01 (10GB)	JSON Indexed document storage, can be partitioned.
Data Lake Store	WebHDFS	£0.06/GB *	1024	1PB per file (!)	Hadoop based unstructured data storage layer. – Preview price includes 50% discount off US pricing, not available in Europe yet.

* These are indicative numbers, these numbers are variable on a number of factors. For example SQL DW starts billing at 1TB of capacity, storage has an access charge per million transactions.

Azure Storage

Cloud storage solution for modern applications that rely on durability, availability, and scalability

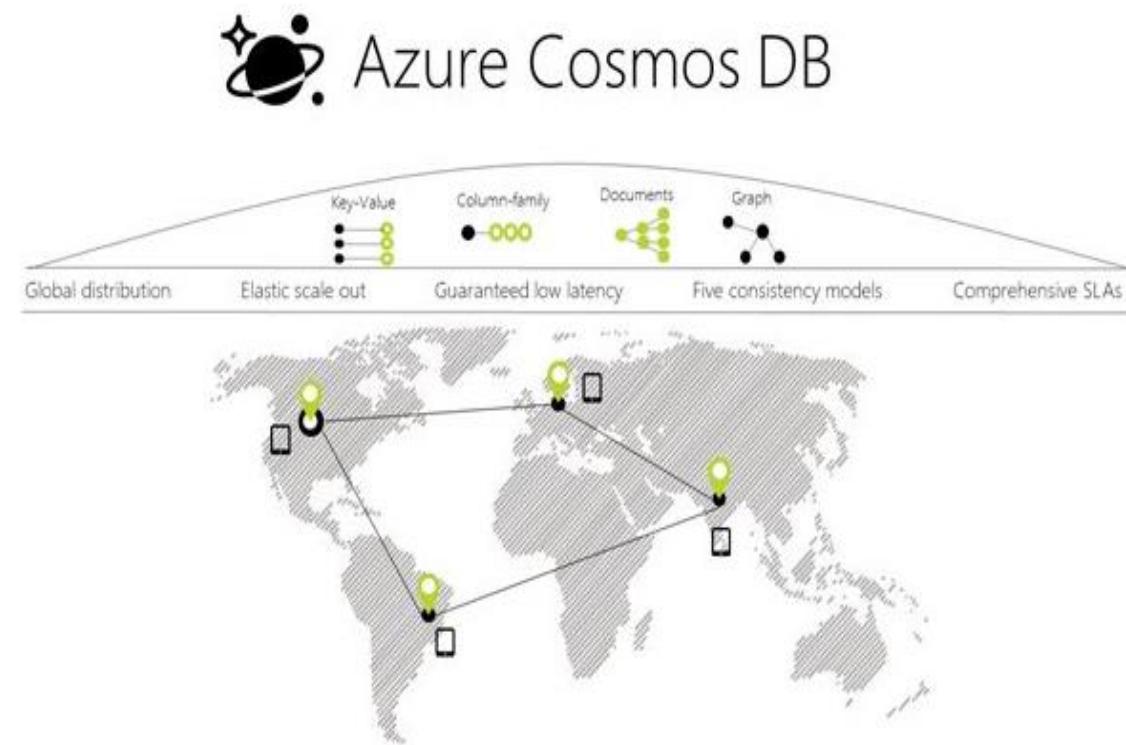
- Massively scalable, highly available data store for hundreds of terabytes of data
 - Used by Skype, Office 365, Xbox, OneDrive,...
- Pay for what you use
- Never lose your data - locally redundant through to read-access geo-redundant
- Hot (normal) and Cool (archive) blobs
- Encryption at rest
- Starts from \$0.02 per GB per month

Blobs Highly scalable, REST based cloud document store Block Blobs: Sequential file I/O Cool Tier Available Page Blobs: Random-write pattern data Append Blobs	Tables Massive auto-scaling NoSQL store Dynamic scaling based on load Scale to PBs of table data Fast key/value lookups	Queues Reliable queues at scale for cloud services Decouple and scale components Message visibility timeout and update message to protect against unreliable dequeuers
--	--	--



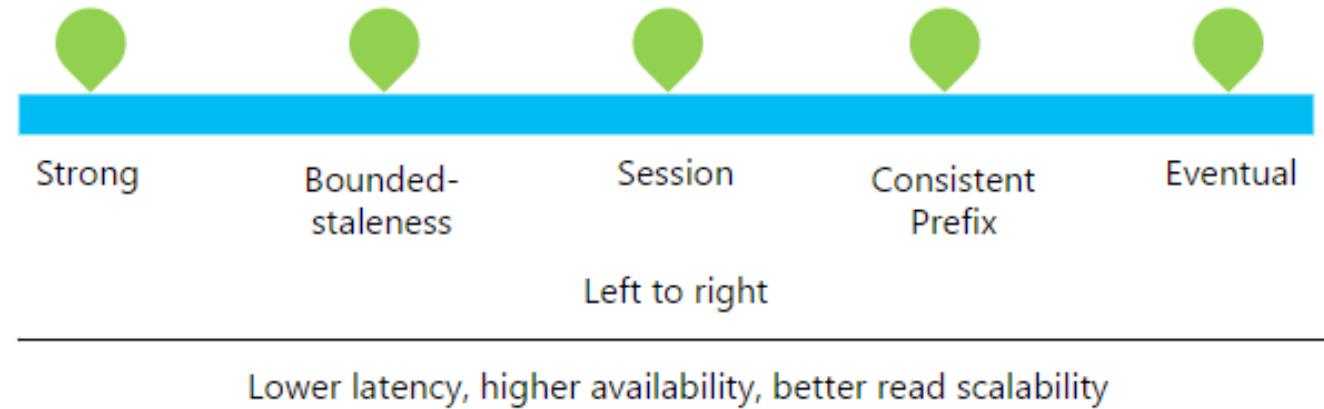
Azure Cosmos DB

- Replicate and scale data globally
 - Place data near users, seamlessly
- Multi-model + multi-API
 - Key-value, graph, and document data
 - SQL, JavaScript, MongoDB, Table storage, Gremlin Graph
- Guaranteed low latency at the 99th percentile
 - < 10 ms on reads, < 15 ms on writes
- Multiple, well-defined consistency choices
 - **strong**, bounded staleness, consistent-prefix, session, and **eventual**



Consistency and Performance

- Five consistency levels enable well-reasoned trade-offs between consistency, availability, and latency
 - Based on formal specification language TLA+ developed Turing award recipient by Leslie Lamport

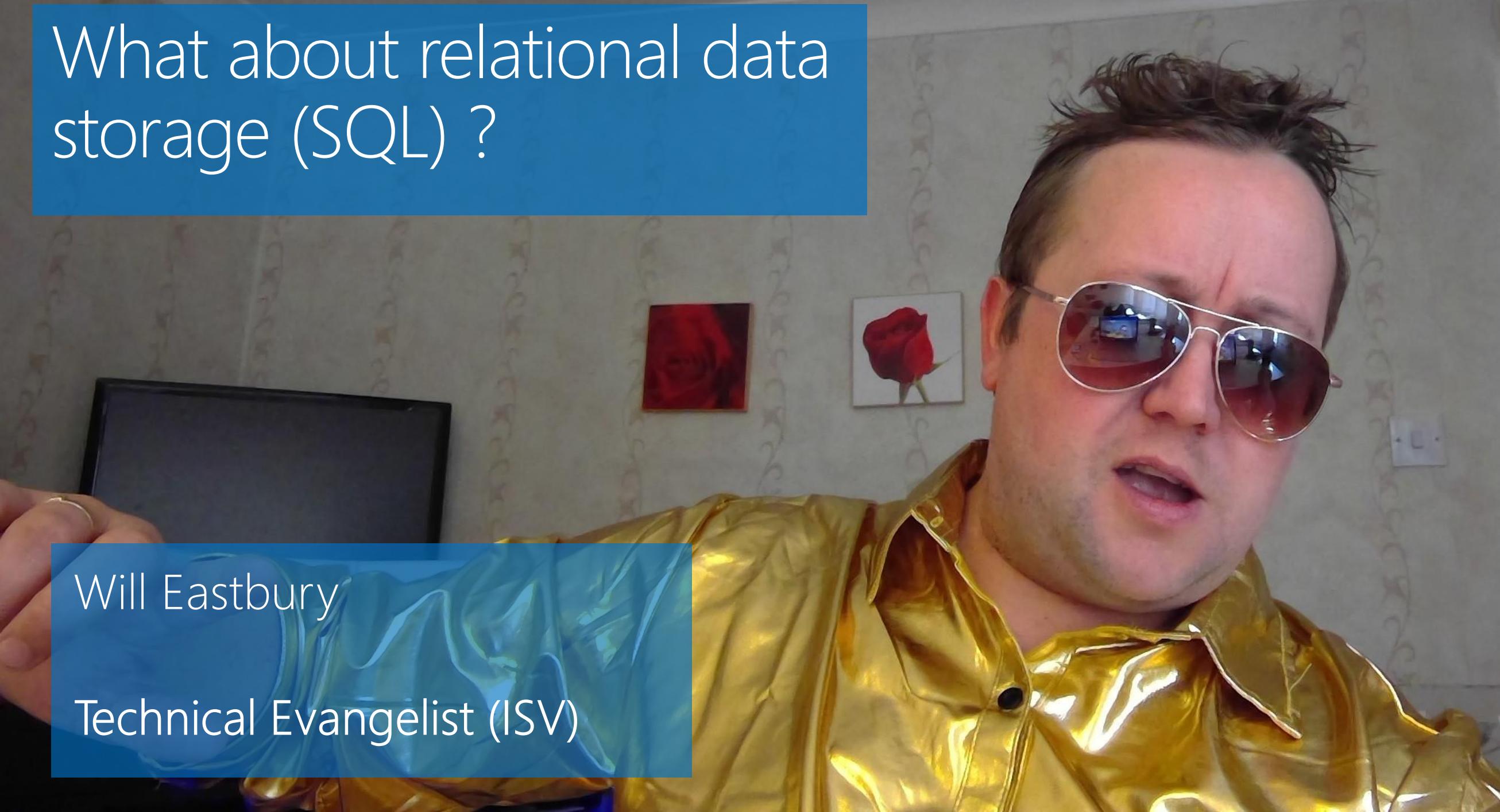


- CAP theorem (aka Brewer's) states It is impossible for a *distributed* system to simultaneously provide more than two out of three of the following guarantees:
 - Consistency - Every read receives the most recent write or an error
 - Availability - Every request receives a response, without guarantee that it contains the most recent write
 - Partition tolerance - System continues to operate despite an arbitrary number of messages being dropped (or delayed) by the network between nodes
- “strong” is fully CP and “Eventual” is fully AP

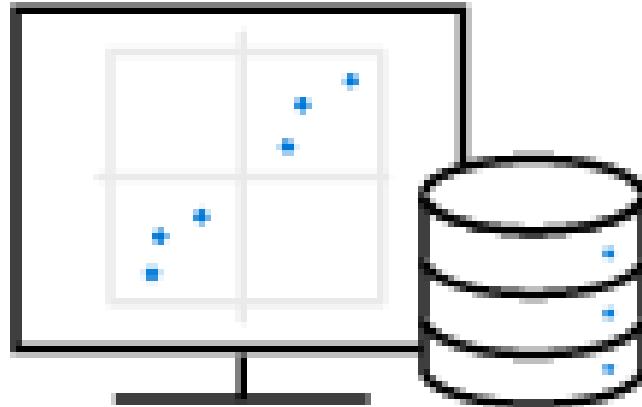
What about relational data storage (SQL) ?

Will Eastbury

Technical Evangelist (ISV)



We still have SQL Server IaaS as a fallback, for *any* SQL workload

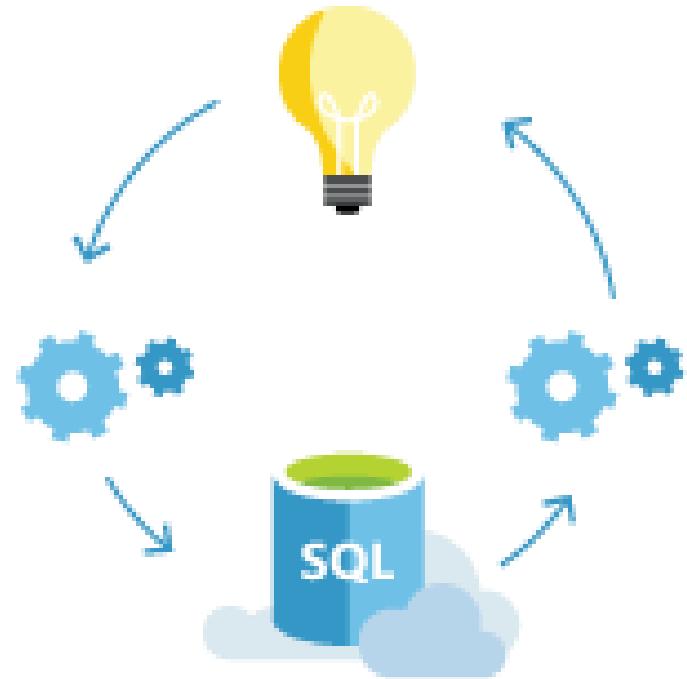


Any SQL server workload will run in the cloud in an IaaS based model, it's just a matter of choosing the correct template to deploy an appropriate instance with the correct storage configuration for your db workload.

This will still allow you to run multiple instances on one server (we provide the media, keys and a default instance, but you can install more of them) and you have full control over your instance.

We have ARM templates built into the portal that will automate the deployment of AlwaysOn Availability Group services with best practice settings.

Consider Azure SQL Database

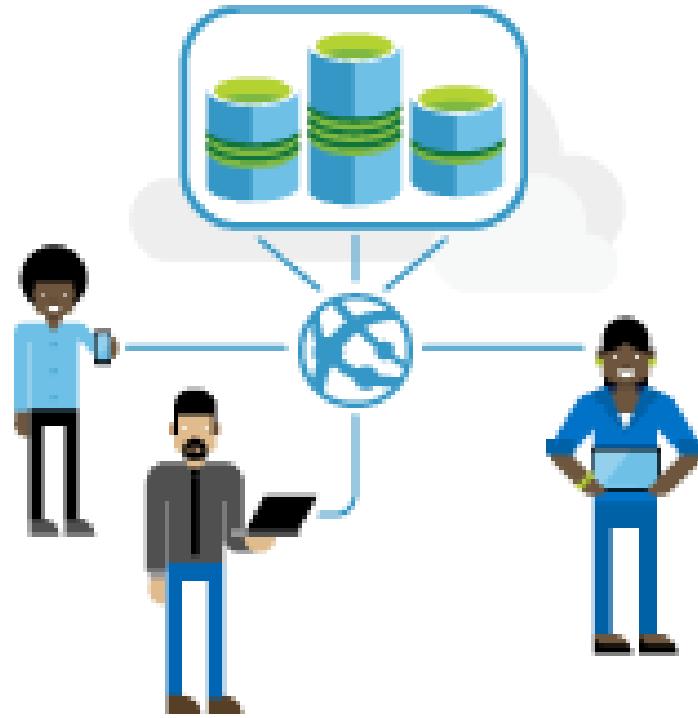


But, if you are not using SQL Agent, SSIS, SSAS multidimensional models, or SSRS ...

Then consider moving to Azure SQL Database, and allow the Azure SQL team to automate the management of your databases on a high-availability cluster of servers.

For cost comparisons: The configuration hosting a Single Azure SQL database in the standard tier is roughly equivalent to a SQL Enterprise Edition AlwaysOn HA cluster hosting a single database, with fully managed backups and managed point-in-time restore.

Azure SQL Database's HA level within a region is similar to a 4 replica cluster in an availability group with quorum commit.



How do I know which tier and DTU size to use?

DTUs are a synthetic benchmark, a blend of storage, cores and RAM to deliver performance levels that scale consistently.

Read this document – what is a DTU?
<https://docs.microsoft.com/en-us/azure/sql-database/sql-database-what-is-a-dtu>



Start with the DTU calculator
<http://dtucalculator.azurewebsites.net/>

If all else fails there is a relatively simple rule of thumb, doubling the DTUs by increasing the performance level equates to doubling the resources available to that database.

For example, a Premium P11 database with 1750 DTUs provides 350x more DTU compute power than a Basic database with 5 DTUs.



I have lots of tenant databases, what about Elastic Pools?

With elastic pools, DTUs assigned to a database become elastic (or eDTUs) and are assigned to a *pool* of databases.

This makes sense in scenarios where you want to contend resources between bursty workloads (that could be servicing either multiple microservices or multiple tenants) that are not all maxed out at the same time.

This gives you a higher potential peak resource consumption per database as the cost-per-dtu is shared across all databases.

What about SQL Data Warehouse?



Is a cloud-based parallel data warehouse solution, based on SQL Server, that scales to petabyte connected databases.

Allows you to scale storage and compute separately (and they are charged separately) to burst and consume extra compute when it is needed.

The SQL DW appears to SSMS as if it is a SQL Server, and supports a limited T-SQL surface area.

So you can use existing tools to connect to and deploy the schema and data in the DW.

Data + Intelligence

Gabriel Nepomuceno

Technical Evangelist (ISV)



Data + Intelligence ?

Not only big but smart

Event Hubs
Service Bus
Streaming
Analytics

Hadoop
Data Lake
Storage

Azure ML
Cognitive Services
Cortana Intelligent
Suite

Power BI
Application
Insights

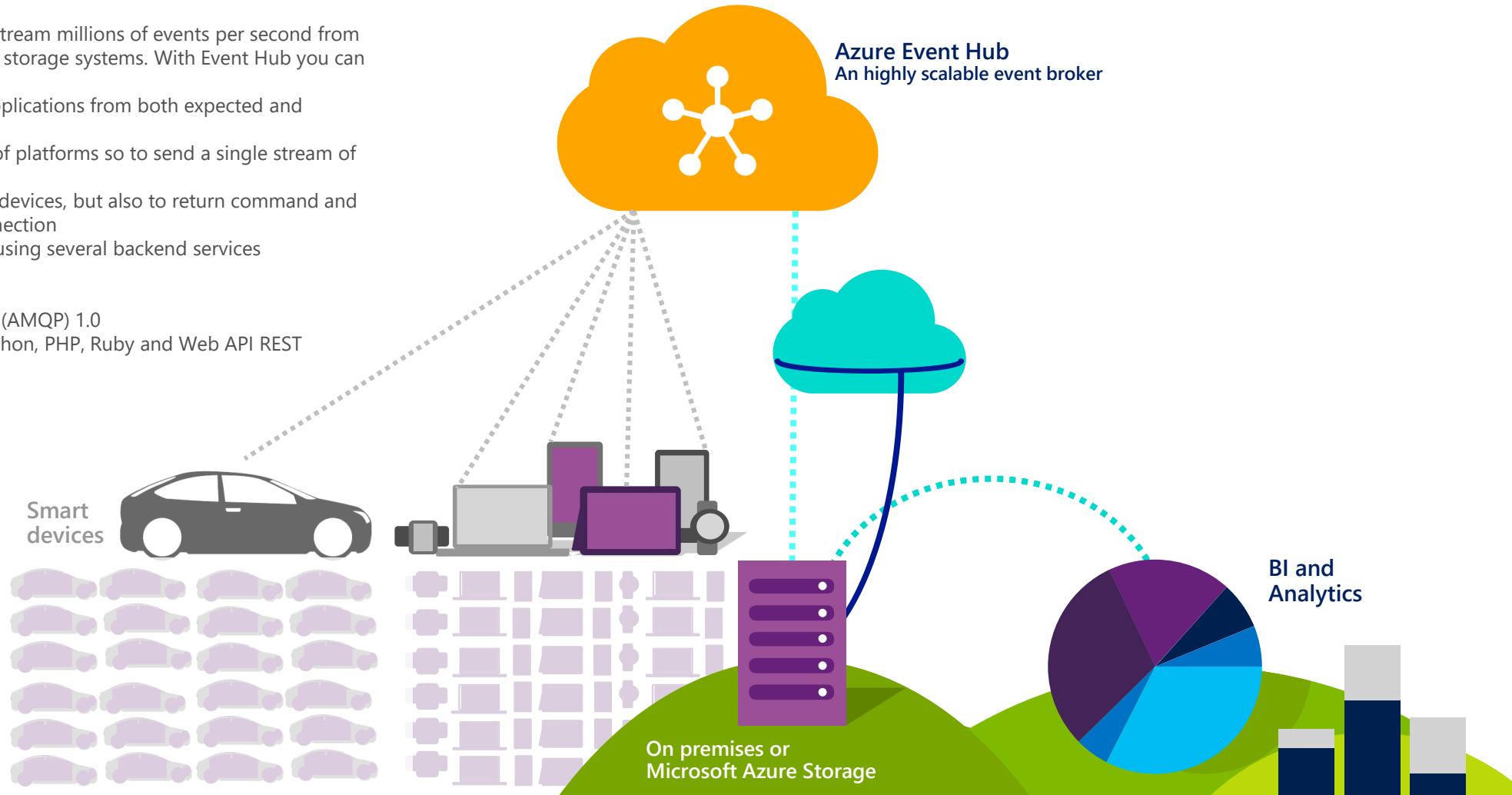
Event Hub

What is the feature?

Event Hub allows you to reliably and efficiently stream millions of events per second from millions of devices into multiple applications and storage systems. With Event Hub you can

1. Buffer your events durably, shielding your applications from both expected and unexpected peaks
2. Connect millions of devices across a variety of platforms so to send a single stream of data
3. Not only receive event data from millions of devices, but also to return command and control messages over a single network connection
4. Process event streams per device "in order" using several backend services (publish/subscribe.)

Supports Advanced Message Queueing Protocol (AMQP) 1.0
SDK for several language (.NET, Java, Node.js, Python, PHP, Ruby and Web API REST)



Stream Analytics

What is the feature?

Azure Stream Analytics is a fully-managed solution that takes the millions of real time events that are captured by a scalable event broker (e.g. Event Hub) and performs time-sensitive computations. **Pub-Sub model, low latency, scalable.**

- Hosted Cloud Service
- Higher level abstractions, declarative API
- Designed to scale and be fault tolerant

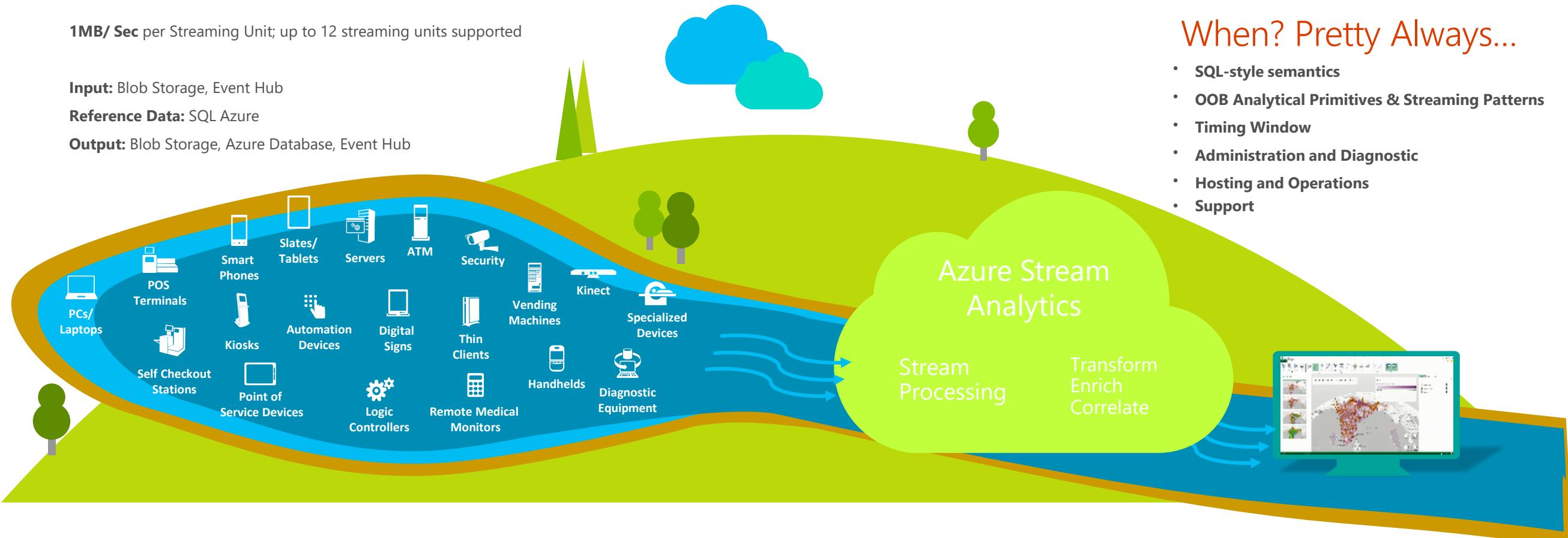
Event Ingestion	Storage	Transformation	Presentation & action
 Event Hubs (Service Bus)	 SQL Database	 Machine Learning	 Azure Websites
 Heterogeneous client agents	 Table/Blob Storage	 HD Insight	 Mobile Services
 Intelligent Systems Service	 DocumentDB	 Stream Analytics	 Power BI
 External Data Source	 External Data Source	 Cloud Services	 External Services

1MB/ Sec per Streaming Unit; up to 12 streaming units supported

Input: Blob Storage, Event Hub

Reference Data: SQL Azure

Output: Blob Storage, Azure Database, Event Hub



When? Pretty Always...

- SQL-style semantics
- OOB Analytical Primitives & Streaming Patterns
- Timing Window
- Administration and Diagnostic
- Hosting and Operations
- Support

HBase (HDInsight)

What is the feature?

HBase is an open-source, distributed, column-oriented database built on top of HDFS.

Distributed, non-relational database

Columnar, schema-free data model

NoSQL on top of Hadoop

Large scale

Linear scalability

Billions of rows X millions of columns

Many deployments with 1000+ nodes, PBs of data

Low latency

Real-time random read/writes

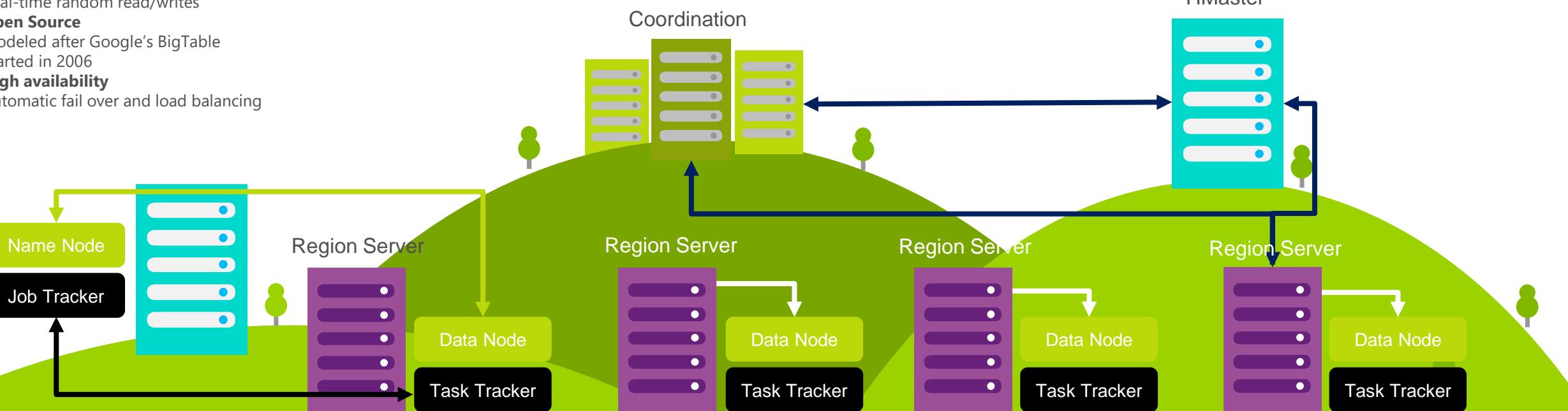
Open Source

Modeled after Google's BigTable

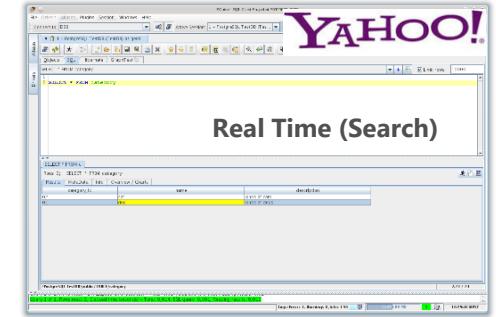
Started in 2006

High availability

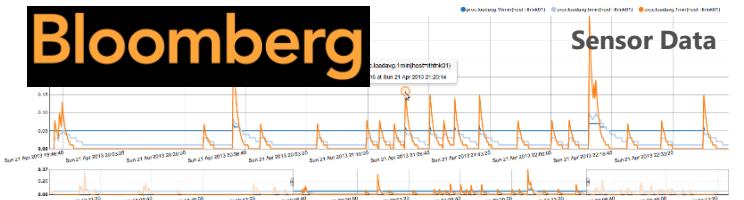
Automatic fail over and load balancing



Key-Value Store (Messages)



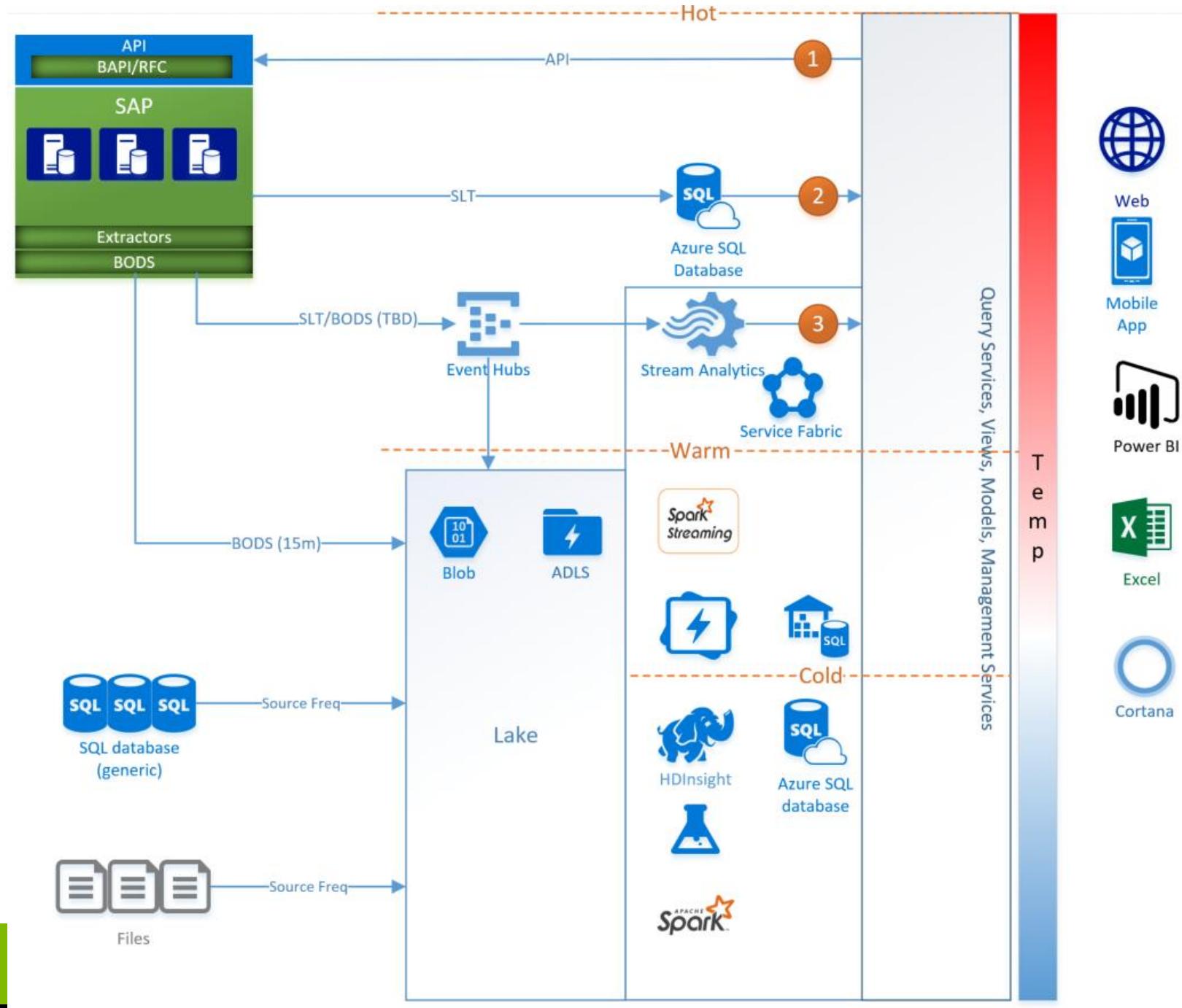
Real Time (Search)



Bloomberg

Sensor Data

Big Data



Hadoop (HDInsight)

What is the feature?

Azure HDInsight is Microsoft's cloud Hadoop as a Service

- 100% open source Apache Hadoop
- Built on the latest releases across Hadoop (2.4)
- Up and running in minutes with no hardware to deploy (PaaS)
- Fully managed, operated and supported by Microsoft
- Utilize familiar BI tools for analysis including Microsoft Excel

Comprises core services of MapReduce, HDFS, and YARN

Data services (Hive, HBase, Pig, Flume, Sqoop)

Operational services to manage the cluster (Ambari, Falcon, and Oozie)

- ODBC/JDBC connections to Hive
- Phoenix JDBC connectivity to Hbase
- REST control endpoints:
- Templeton – Job submission and management
- Ambari – Cluster monitoring
- YARN – YARN application submission
- Oozie – Orchestration and scheduling control

SPARK in memory 100x; framework only

	Hadoop in IaaS	HDP & CDH Gallery	HDInsight
OS Options	Any	CentOS	Windows, Ubuntu
Hadoop distribution	Any	Either HDP or CDH	HDP
Deployment	Up to user	From Azure Portal / Scripts	From Azure Portal / Scripts
Management	Up to user	Up to user	On your behalf
Support	Through vendor	Through vendor	Microsoft Azure
SLA (for Hadoop)	None	None	99.9%
OS Updates	Up to user	Up to user	Provided
Hadoop updates	Up to user	Up to user	Provided
Cluster Scaling	Up to user	No	Yes
Pricing	VM cost	VM Cost + Vendor support	HDInsight Cost



Storm (HDInsight)



What is the feature?

Storm is an **open-source**, Apache based, distributed, fault-tolerant real-time computation system.

- Real time event processing project built at Twitter
- Fast: 1Million 100 byte msgs per node / per second
- Scalable: Hundreds or Thousands of workers per cluster
- Interoperable: Connectors for many platforms
- Extensible: User code can be inserted anywhere, lower level APIs. Fully customizable.
- Designed to scale dynamically and be fault tolerant

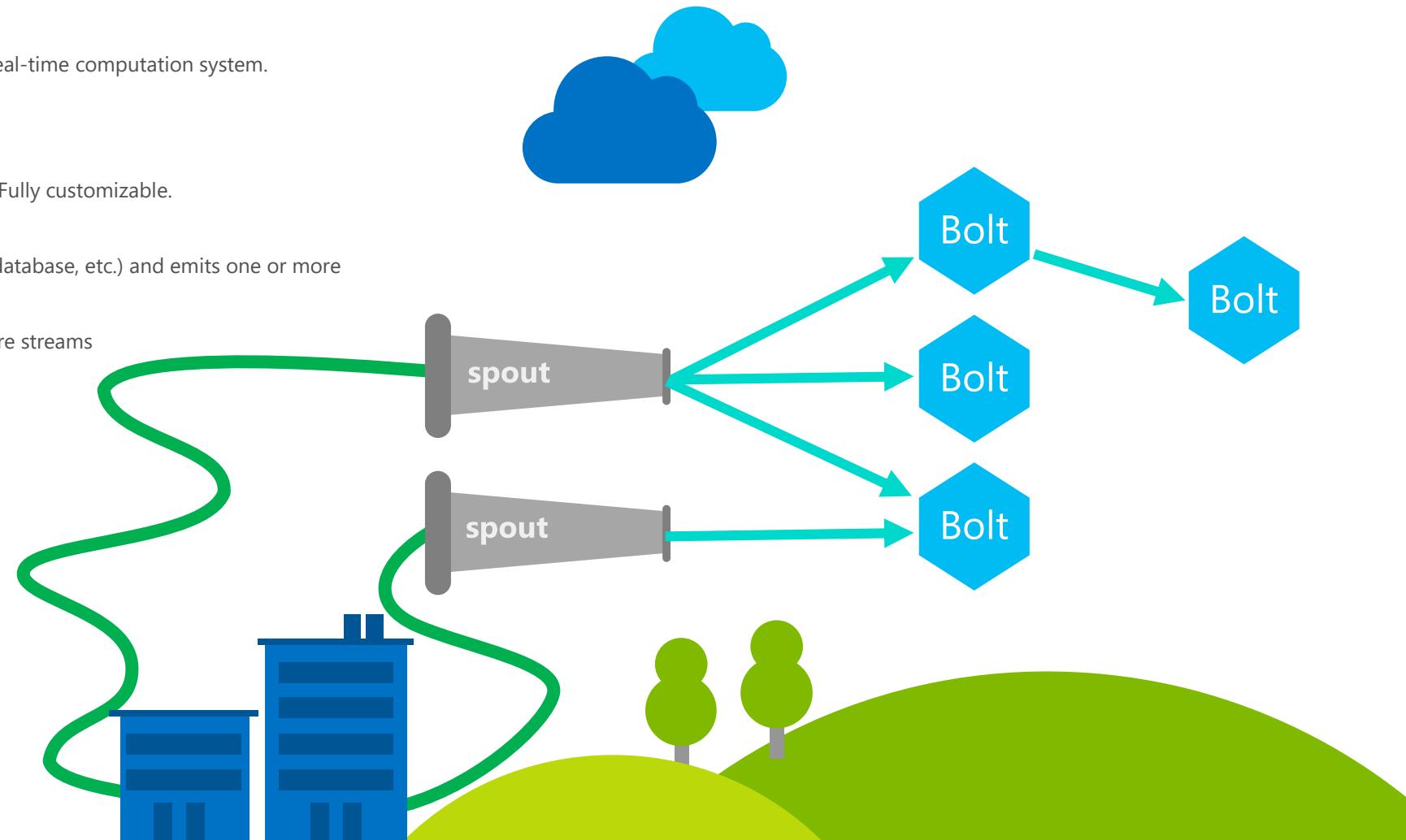
Spout consumes data from a source (Apache Kafka, Event Hub, file, database, etc.) and emits one or more streams of tuples (an ordered list of elements)

Bolt consumes one or more streams and optionally emits one or more streams

Topology defines how data flows between spouts and bolts

When?

- Customization
- Interoperability and Extensibility
- Custom Processing Functions / Transformation
- Pipelining/Arbitrary topologies



Data Factory

What is the feature?

Azure Data Factory is a fully-managed solution to orchestrate, manage, deploy, and govern the movement and transformation of raw data assets to produce trusted information.

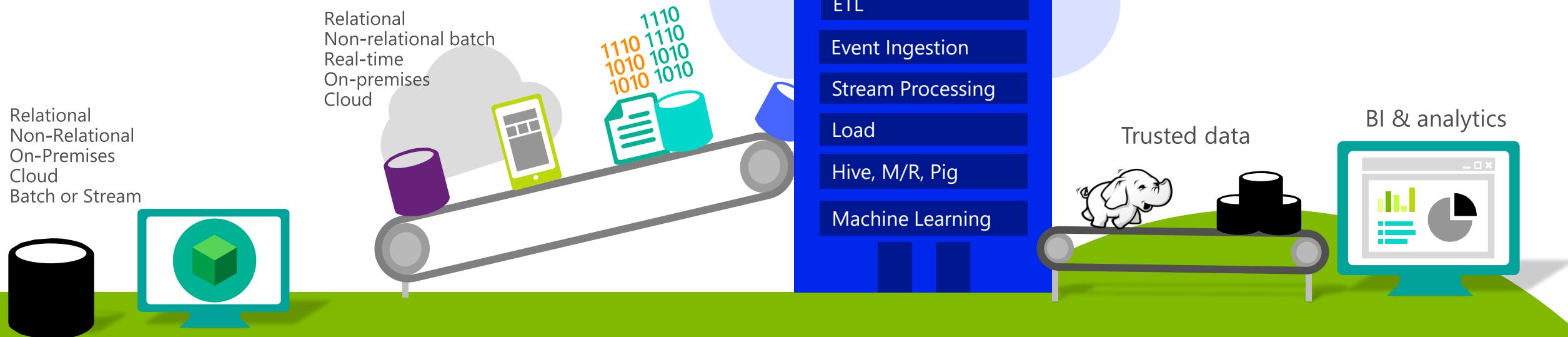
Building block: **data pipelines**

Pipeline processing activities accepting N input and producing N output datasets

Dataset is a named view of data (bytes, semi-structured like CSV, Tables or Models)

Activity is the unit of execution within the pipeline (transformation : import/export)

Data Hub is a pairing of collocated data storage and associated compute services. (e.g Hadoop cluster)



Top Use Cases

User and Product Profiling

Marketing Campaign Analysis

Customer Sentiment Analysis

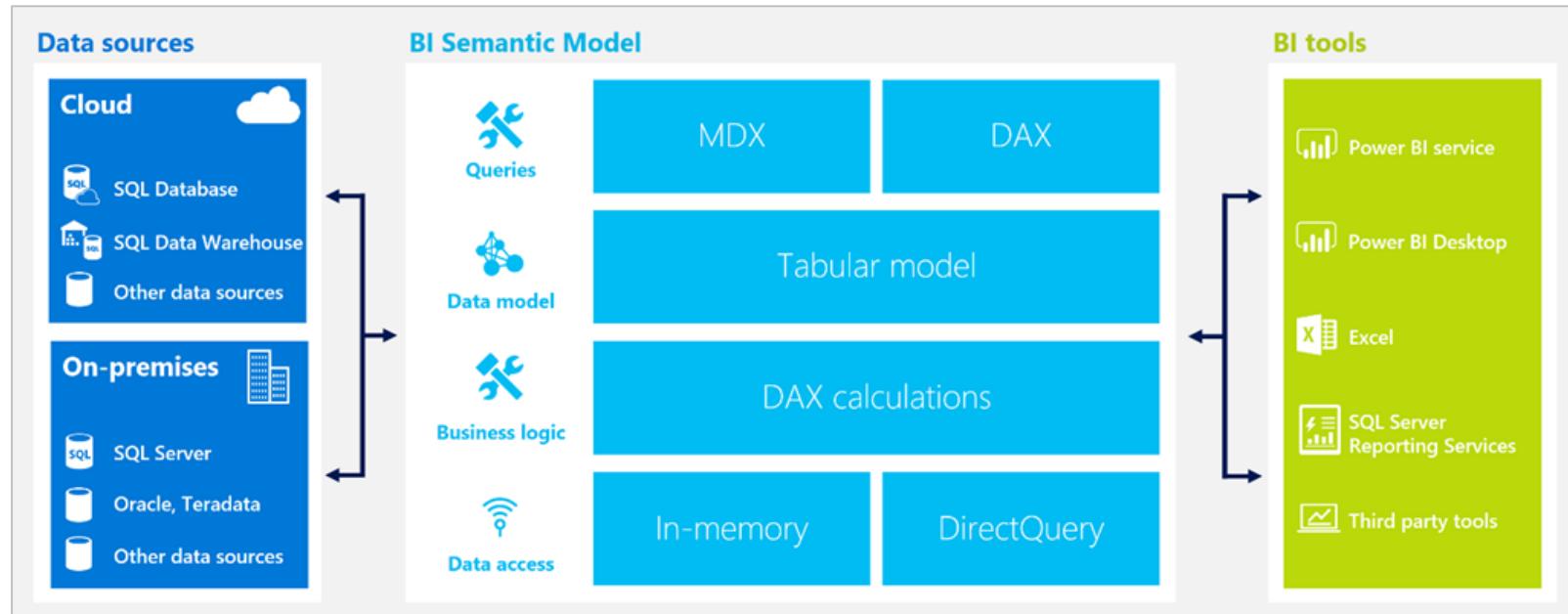
Corrective & Predictive Maintenance and Repairs

Personalized product recommendation



Azure Analysis Services

- **Proven technology**
Azure Analysis Services delivers enterprise-grade BI semantic modeling capabilities with the scale, flexibility and management benefits of the cloud
- **Cloud powered**
Easy to deploy, scale, and manage as a platform-as-a-service solution
- **Built for hybrid data**
Access and model data on-premises, in the cloud, or both
- **Interactive visualization**
Quick, highly interactive self-service data discovery with support of major data visualization tools



Why Big Compute on Azure?

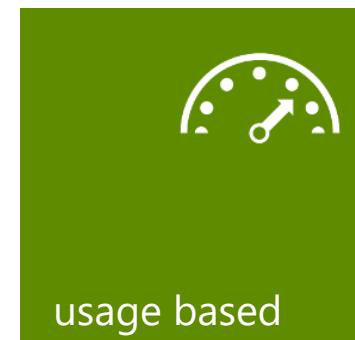
Big Compute enables **large-scale batch and Grid\HPC** applications to run in the Public or a Private Cloud with flexible resources, scale, schedule and cost.

Requirements

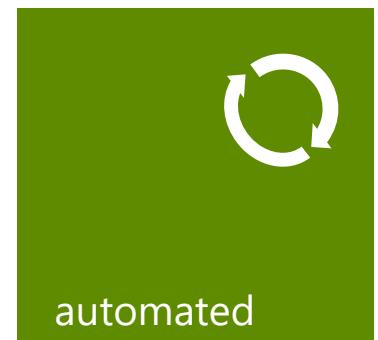
- Lots of compute: 100's, 1000's, or more cores
- Often highly parallel jobs/algorithms
- "Jobs" with finite lifetime
- May need low-latency communication
- Discrete work: not permanently running
- Ability to scale up and down
- May be existing applications or algorithms
- Pay for use



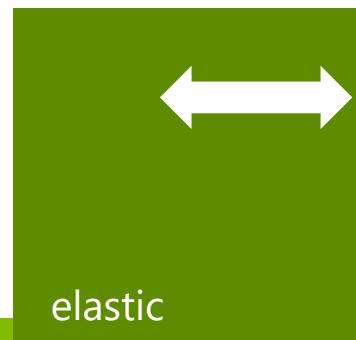
economics



usage based



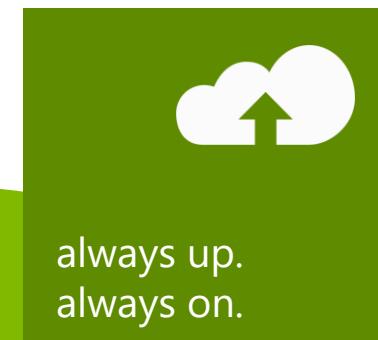
automated



elastic



managed



always up.
always on.

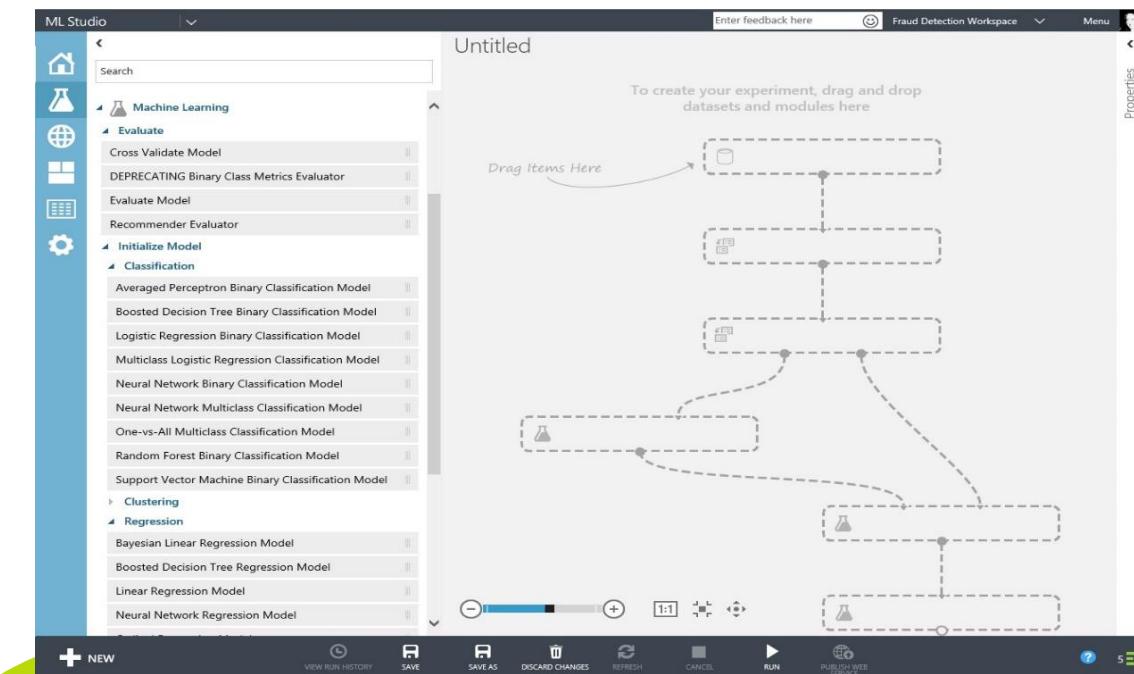
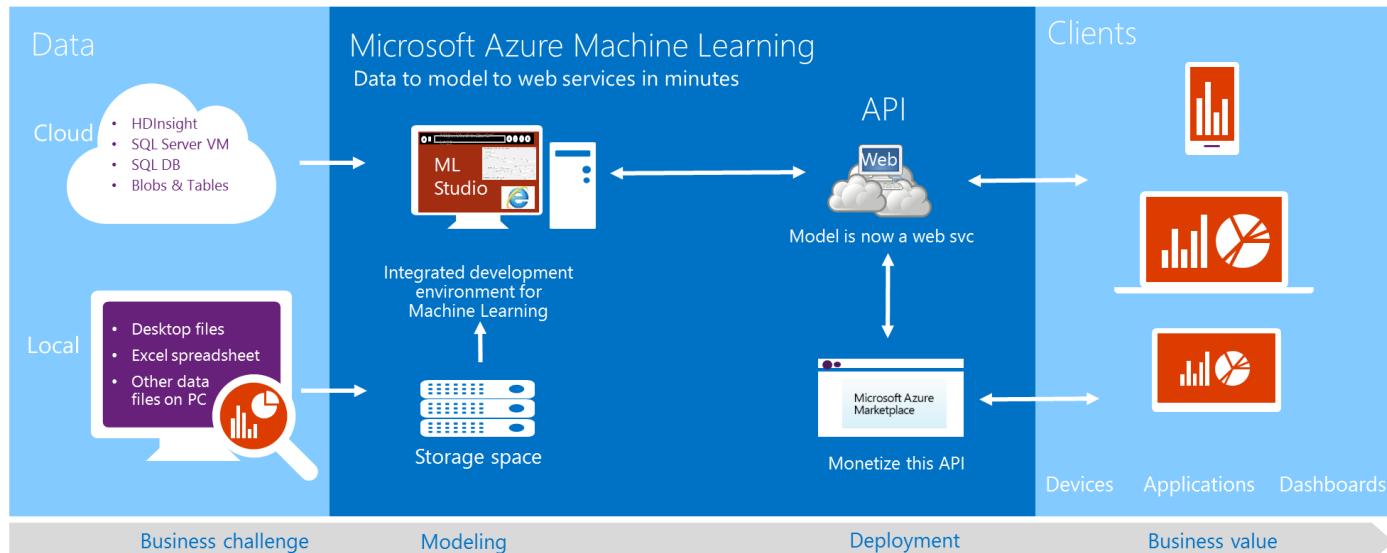
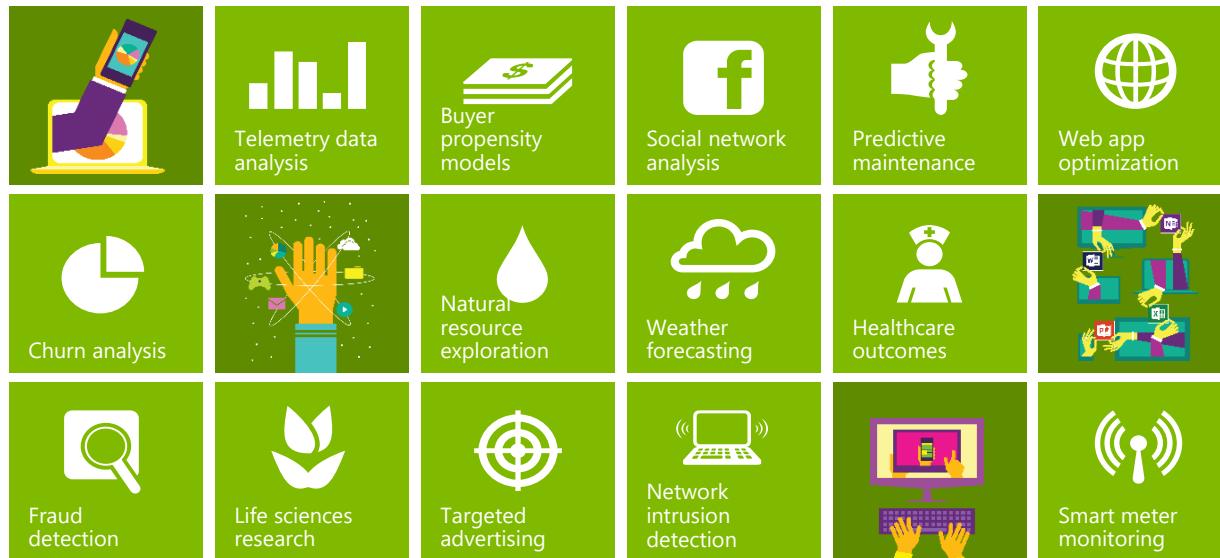
Machine Learning

What is the feature?

Azure Machine Learning is a fully managed Platform as a Service in the cloud, integrated with data sources like HDInsight, Azure SQL Database, SQL in a VM, etc.

Based mainly on the open source language **R**, it leverages algorithms from businesses like **Bing**, **Xbox**, etc., in more than 350 packages. The APIs can be then published in the marketplace.

Azure ML APIs at marketplace: Wealth Score, Giving Score, Frequently Bought Together, Recommendations, Anomaly Detection, Lexicon Based Sentiment Analysis, Forecasting-Exponential Smoothing, etc.



Learn and engage with artificial intelligence

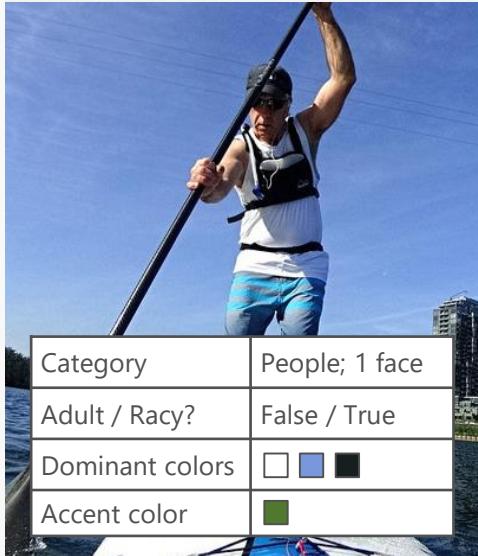


Data-driven intelligence

VISION

Computer Vision

What is in the image?

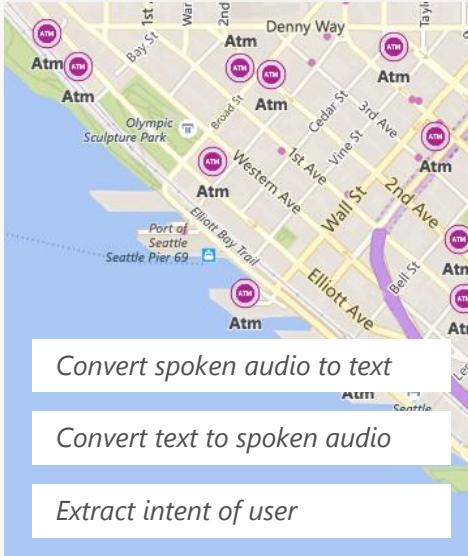


Category	People; 1 face
Adult / Racy?	False / True
Dominant colors	
Accent color	

SPEECH

Speech-to-Text and Text-to-Speech Service

Give me directions to the closest ATM



- Convert spoken audio to text
- Convert text to spoken audio
- Extract intent of user

LANGUAGE

Natural Language Processing

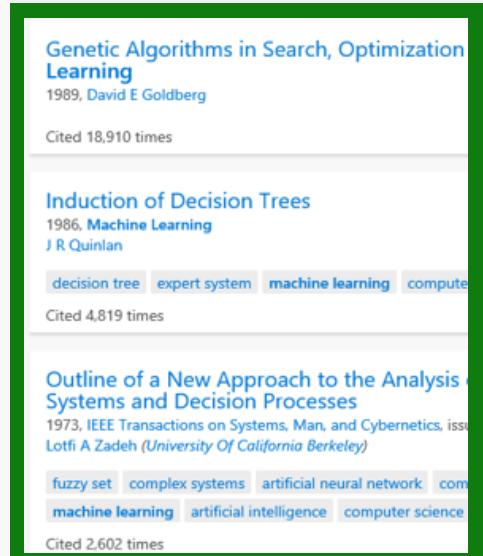
Play today's Daily Show



KNOWLEDGE

Knowledge Exploration Service

Top publications in AI?



SEARCH

Bing Search

Search for 'cute kittens'



Who are you? What can you do?



Potted History

In the beginning there was Kerberos

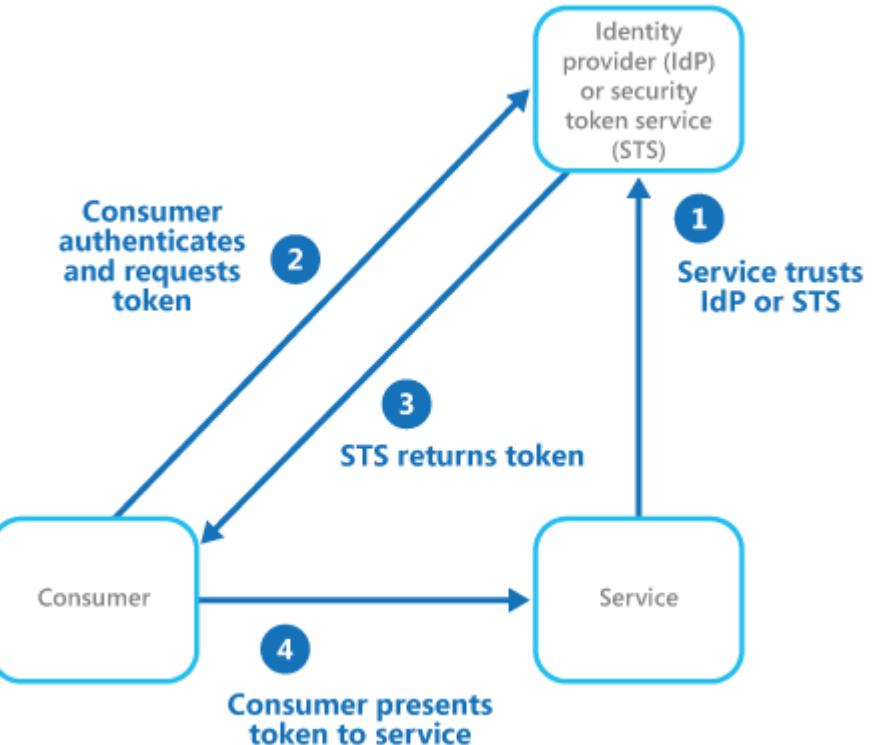
- ❑ Designed for intranet / client server world
- ❑ Depends on trust relationships
- ❑ Single point of failure
- ❑ Internet scale demands a different approach

Along comes Claims based auth

- ❑ Designed for internet scale
 - ❑ http based comms
 - ❑ Supports Federation
- ❑ Principal + Identity Provider (IdP)+ Service Provider

The mobile revolution demanded evolution

- ❑ OAuth – Authorization – Access Tokens
- ❑ OpenID Connect – ID Token
- ❑ Lighter weight
- ❑ Standardised flows
- ❑ Authentication isolation from application



Azure AD



Azure AD B2C

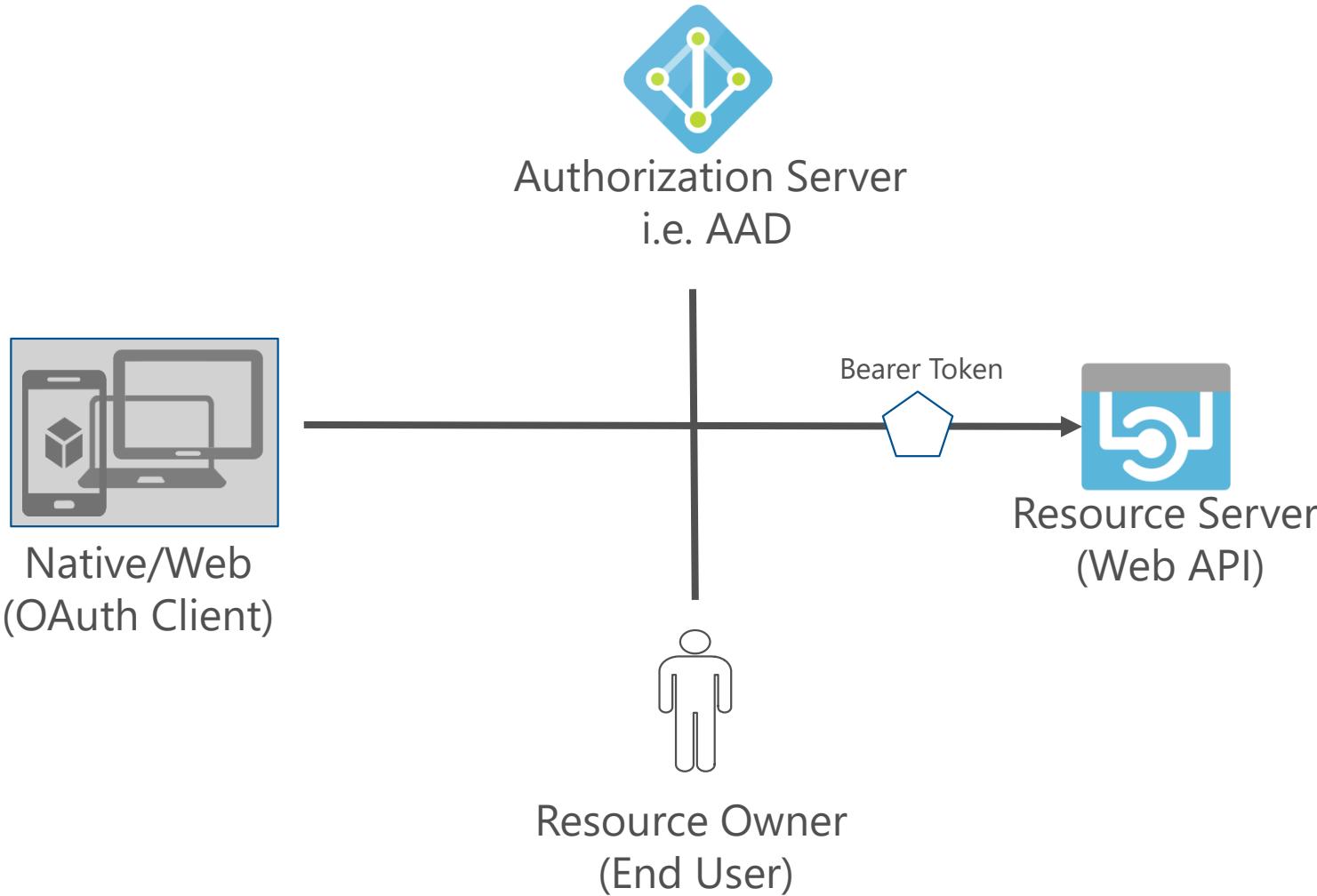


Azure AD



Azure AD B2B

Terminology



"Client" refers to device not user
OAuth has Public and Confidential clients
"Resource Owner" = User
"Resource Server" is where the data resides

AAD OAuth Flows

Authorization Code

The quintessential OAuth grant

Implicit

The bad boy of OAuth - Recommend for SPA - Browser-based (JavaScript)

Client Credentials

Run as a Service - Client (not user!)

Resource Owner Password
Credentials

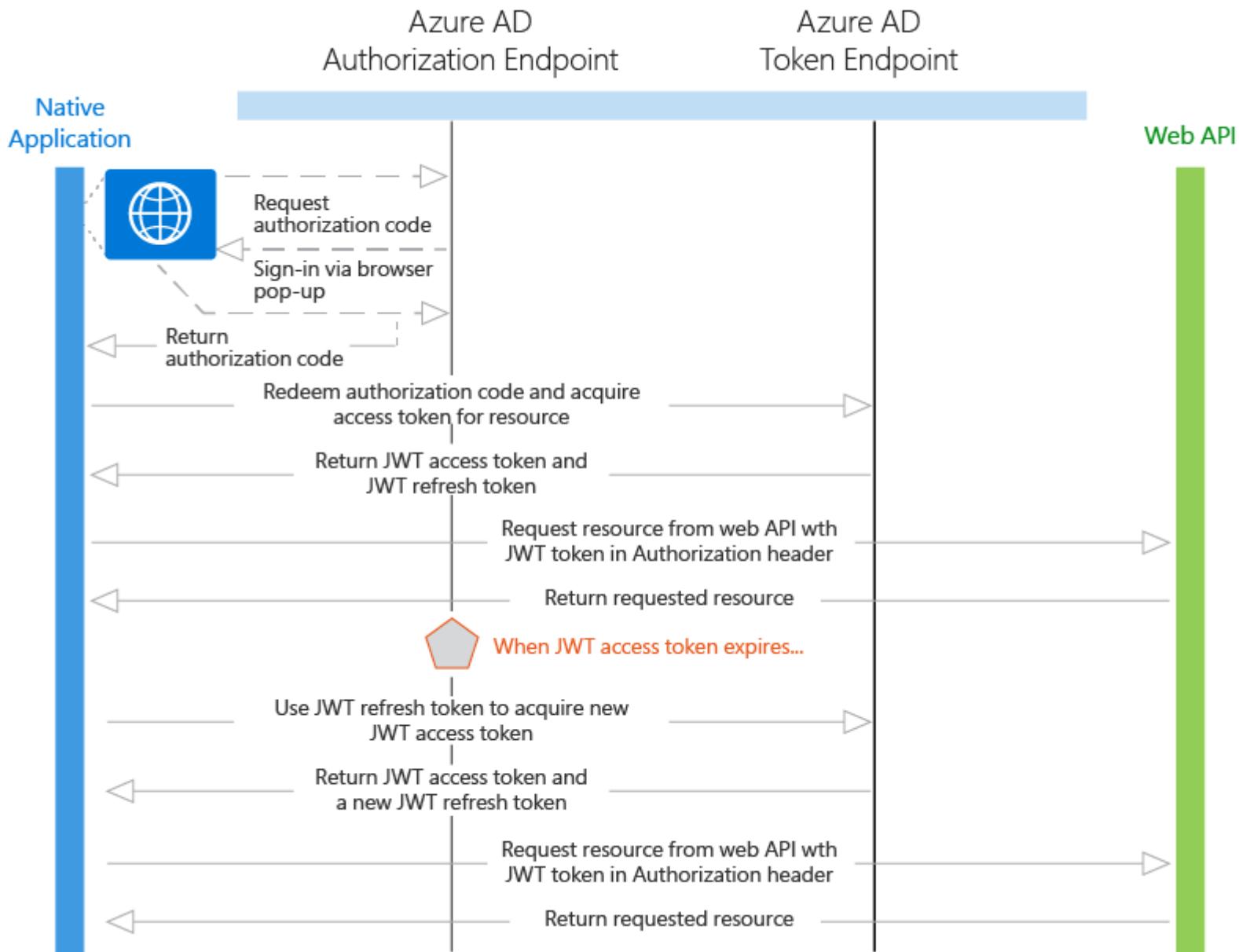
A bit like a service account - username and password

Refresh Token

Get Token without re-authentication

JWT Bearer

'on behalf of' – multiple hops between services



4 Steps for Implementing Solution Azure AD



Design



**Register
in AAD**



**Implement
Code**



Consent

Demo

Simple Graph Client

Points to note

Single Sign On

- Same identity can be used for many resources
- AAD can be linked to on-premise AD

AAD Authentication Libraries

- ADAL (Active Directory Authentication Library)
- MSAL (Microsoft Authentication Library) - Preview
- OWIN (Open Web Interface for .NET)

More information

- <https://aka.ms/aadinfo>
- <https://aka.ms/aaddev>
- <https://aka.ms/aadv1v2>

How do I estimate and track the cost of my services?

Will Eastbury

Technical Evangelist (ISV)



Pricing Calculator

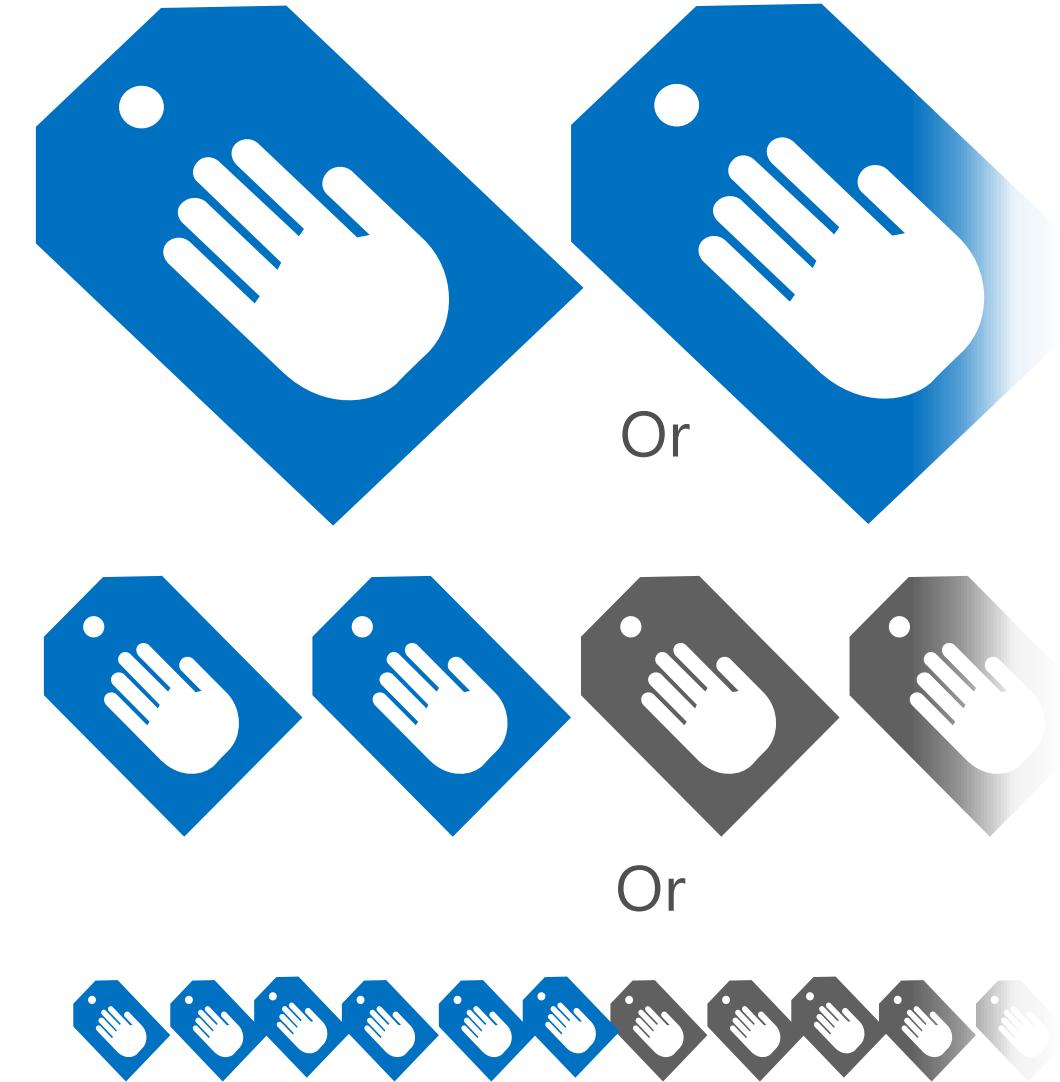


Found @ <https://azure.microsoft.com/en-us/pricing/calculator/>

Or <http://aka.ms/azpricecalc> for short

Provides a simple way to produce a cost estimation

Quick Demo.



SKU Design

Use the guidance of scale out, not up to reduce underutilized VM (wastage) costs.

Or even better, use PaaS services autoscaling to reduce wastage further as PaaS services scale up and down more quickly so can be autoscaled more aggressively.

Or Serverless to eliminate over-provisioning wastage altogether, by only paying for what you consume.

Billing and Rate Card APIs



We offer 3 primary APIs to allow you to track your usage and pricing programmatically.

- Download invoices using the [Invoice Download API](#).
- Get your estimated Azure consumption data with the [Resource Usage API](#)
- Get the list of available Azure resources and estimated pricing information for each of them with the [Resource RateCard API](#).

<https://docs.microsoft.com/en-us/azure/billing/billing-usage-rate-card-overview>

Enterprise Agreement Portal

If you have an Enterprise agreement with Microsoft (i.e. you agree to a minimum monthly commitment), then you gain access to a special portal (ea.azure.com).

Where you can run reports by account, by subscription and roll up by department etc.

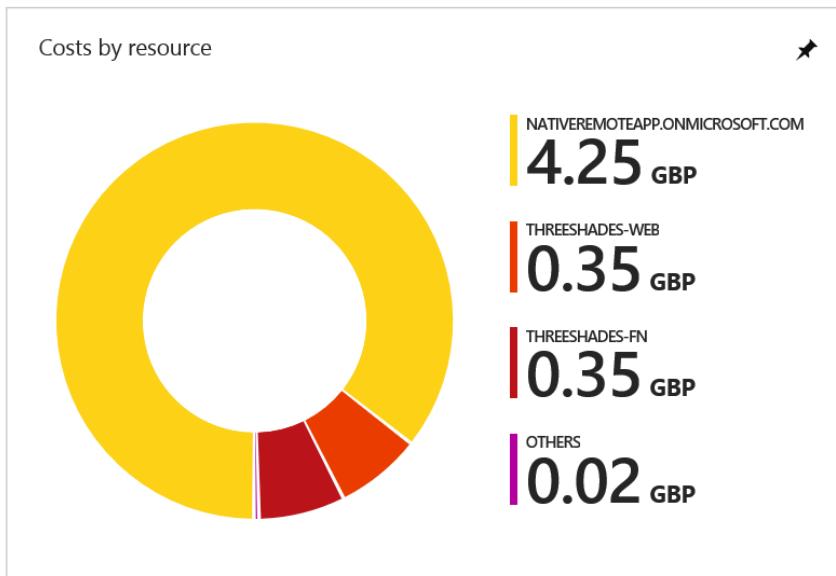




Subscriptions

The screenshot shows the "Cost analysis" tab within the "Subscriptions" blade. It features a large green circle icon with a dollar sign. Below it, the title "Cost analysis" is displayed in a large, bold, black font. The background is a light blue color.

Breakdown of current cost



Subscription Blade in the Azure Portal

In the Azure Resource Manager portal (portal.azure.com) you can view and track both billing and subscription consumption data.

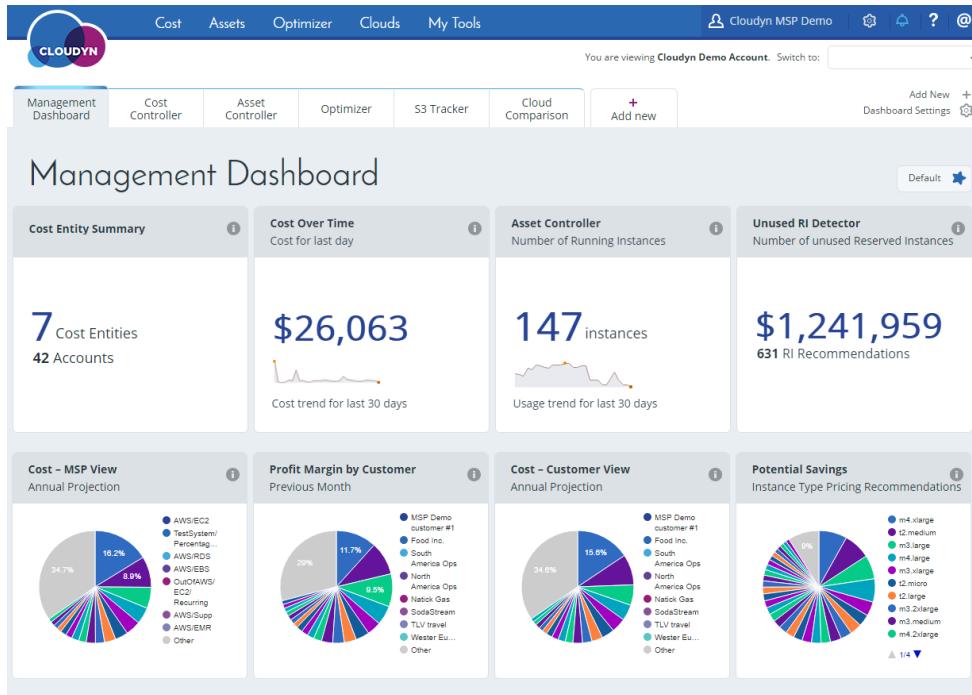
Simply select the “Subscriptions” blade, and select the “Cost Analysis” tab.

Total cost
4.97 GBP

Search to filter items...

NAME	TYPE	RESOURCE GROUP	COST (GBP)
► nativeremoteapp.onmicrosoft.com	Azure AD Domain Services	Default-AADDomainServices-NorthEurope	4.25
► threeshades-web	App Service	threeshades	0.35
► threeshades-fn	App Service	threeshades	0.35
► threeshades.co.uk	DNS zone	threeshades	0.02
► threeshades	Storage account	threeshades	0.00
► threeshadesfn	Storage account	threeshades	0.00

Cloudyn



A recently announced Microsoft acquisition, Cloudyn allows you to consume the Azure Billing APIs via a managed portal and dashboard approach.

It will also attempt predict your costs and aggregate them over a 12 month period.

Just log in to your Azure AD account and authorise the Cloudyn app to connect it to the Billing APIs

Enterprise Cloud Adoption Challenges

Lack of
Visibility

1



Granular, real-time visibility. Single pane of glass across all clouds

Governance of
Complex Cost Entities

2



Hierarchical enterprise level management of cloud resources and costs

Accountability for Cloud Spend and Usage

3



Chargeback & cost allocation through granular usage metrics and real-time alerting

Cloud Efficiency And ROI

4



Continuous optimization and actionable recommendations

For more info contact:
feazut@microsoft.com



In case of disaster, break what glass and where ?



David Gristwood

Technical Evangelist (ISV)

Business Continuity & Disaster Recovery

"an organization's ability to recover from a disaster and/or unexpected event and resume operations".

Includes:

- *hot/cold site location*
- *Data back up*
- *Emergency procedures, etc*

First rule of disaster recovery:

Test your disaster recovery. Regularly.



Why Business Continuity/DR?

Loss of Data & Service

Organizations experience **4+** disruptions each year

Recovery times range from **1hr** to **9hrs**

Cost of Disruption

Average cost of the disruption is **\$1.5M/hour**

4 in 10 businesses do not reopen after a major disaster

Brand & Equity

Loss of **reputation** is often irreparable

Customer trust and brand severely impacted

Compliance

Clients want to partner with orgs that have BCDR in place

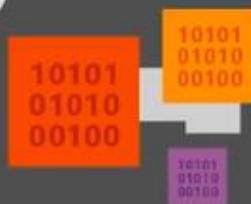
Protection & recovery key tenet in most compliances

Downtime = Loss of business to competition or closure

* Source: EMC Digital Universe with Research and Analysis by IDC, 2014

Source: IDC: Measuring Cost of Downtime and Recovery Objectives Among U.S. Firms, IDC QuickPoll Survey July 2013 and Storage User Demand Study 2013

Source: Federal Emergency Management Agency (FEMA)



Code and Data

- Code
 - Can you ensure your code is up and running, and process requests
 - Stateless, so more options to work with
 - Failover logic needed
- Data
 - Need to keep copies of data somewhere safe
 - Manage freshness of data and possible loss during failover
- The devil is in the detail, of course....
- May have Service Level Agreement in place to adhere to

A resilient & available architecture

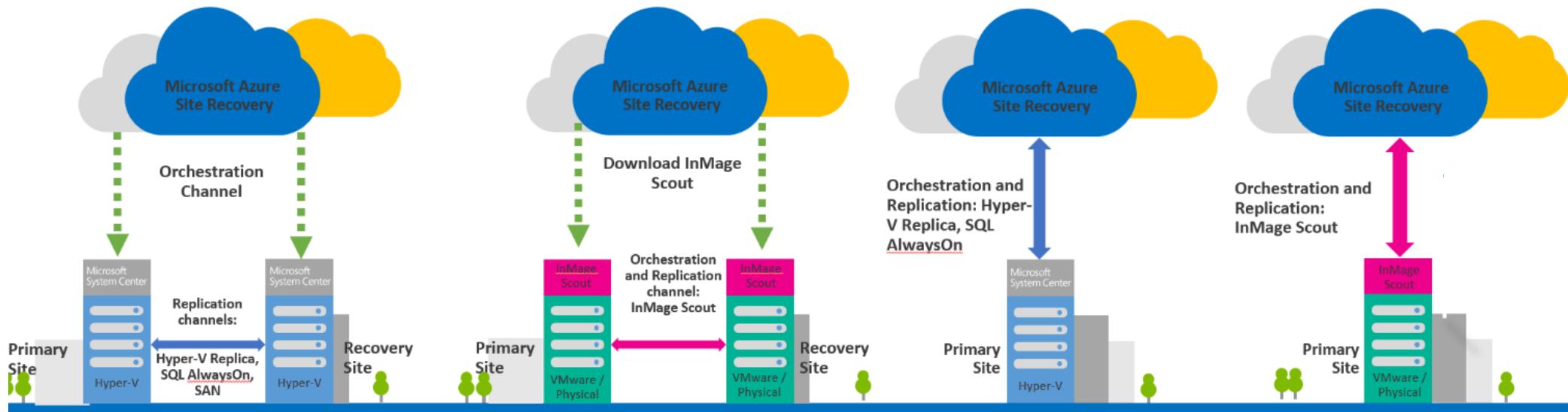
Understand the inter-dependencies between services inside and outside your solution
– and document them

- Could you list every component in the solution, along with its dependencies and sub-components?
- Could you draw a diagram of those components – i.e. your solution architecture on a whiteboard or piece of paper, marking key components ?
- Now could you annotate that diagram with performance and resilience data, i.e. Single points of failure and typical performance bottlenecks in day to day usage?
- Can you indicate where those components are geographically located on a map and if data is replicated elsewhere, indicate the mirrored region and the methodology of data movement / sync / mirroring etc?
- Can you show the entry point into your solution for a customer / end user (there may be multiple entry points) - i.e. which services are considered the 'front' of the stack - do the same on the geo map.
- Can you trace a path through the call stack of the application from that front end, stepping through each component used and region where data transits ?

Azure Site Recovery

- Replicates workloads running on VMs / physical servers so that they remain available in a secondary location if the primary site isn't available
 - You own datacenter or Azure
- Azure Backup service keeps data safe and recoverable by backing it up to Azure
- ~~•~~ ~~•~~ ~~•~~ ~~•~~ ~~•~~

On-premises to Azure protection
(Site-to-Azure)



Azure Service Availability

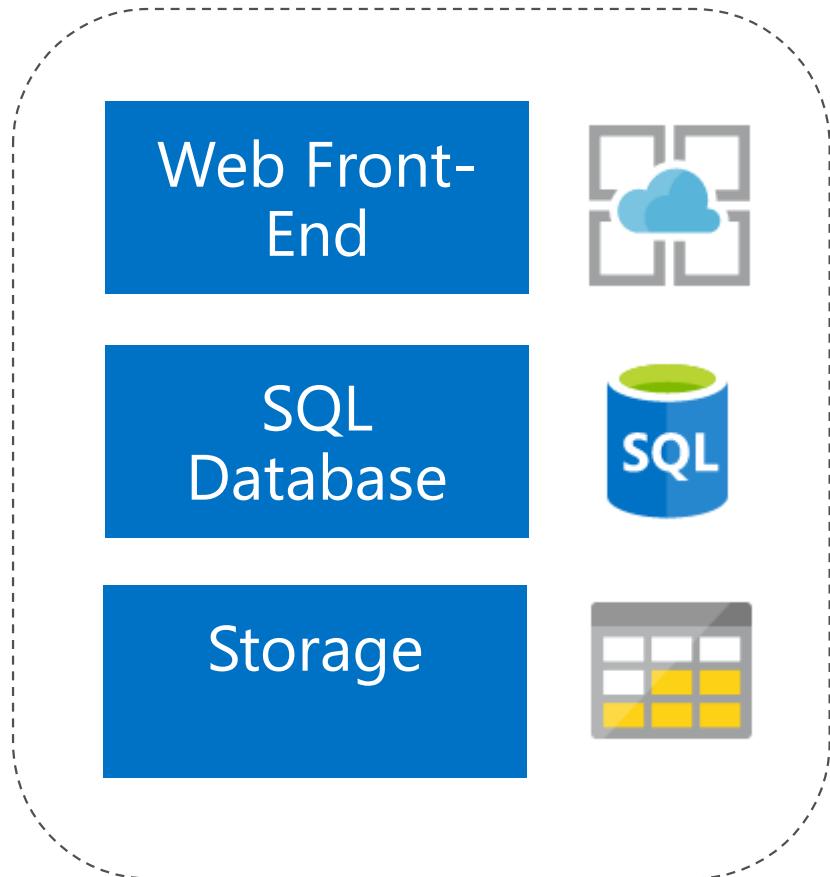
Service	Monthly Uptime %	Specifics
Virtual Machines	99.95% or 99.9%	Two or more instances, or single instance on premium storage
App Service	99.95%	No SLA for apps deployed in the free or shared tiers
Storage	99.99%, 99.9% or 99%	SLA depends on geo, local or zone redundancy and storage tier
SQL Database	99.99%	SLA is across the deployment options, excluding retired
Cosmos DB	99.99%	
Azure Active Directory	99.9%	No SLA on free tier

$(\text{User Minutes} - \text{Downtime}) / \text{User Minutes} * 100 = \text{monthly uptime \%}$

99% = 403 minutes/month

99.99% = 4 minutes/month

Using Azure – Thinking Resilience



ACME CORP

From an architecture and design perspective, what are the options for availability and resilience?

How can issues effecting an Azure region be avoided and recovered from?

What are the cost implications of my availability and resilience choices?

Using Azure – Storage



The application is using storage for image content and archiving data for future analysis.

Image content

High user impact, high read volume, needs high availability

HOT Read Access
Geo Redundant Storage (RAGRS – HOT)

Low cost to access data but higher cost to store due to HOT, automatically copied to another region which can be read by the application

Could use CDN

Archive Data

Not immediately useful but has longer term value that could be monetised

COOL Locally Redundant Storage (LRS – COOL) with manual backup

Very low cost storage due to COOL, may not be available occasionally but manually backed up on a monthly basis

Using Azure – SQL Datab



The application is using Azure SQL database to store transaction data. The application is non functional without the database and information loss has high impact.

Performance analysis
has selected the
standard tier service.

The impact to users if
the database is not
present has selected
active geo-replication to
a single secondary
region in Europe. Cost
concerns mean **lower
secondary performance**.

In the event of complete
loss of online capability,
standard tier service
offers **35 days of
backups** with **< 1 hour's
lost data**. We can
restore from the
replicated database.

Using Azure – App Serv



The application is using ASP.NET to serve a web UI and a REST service layer. Both UI and service layer need to be running for the application to be functional.

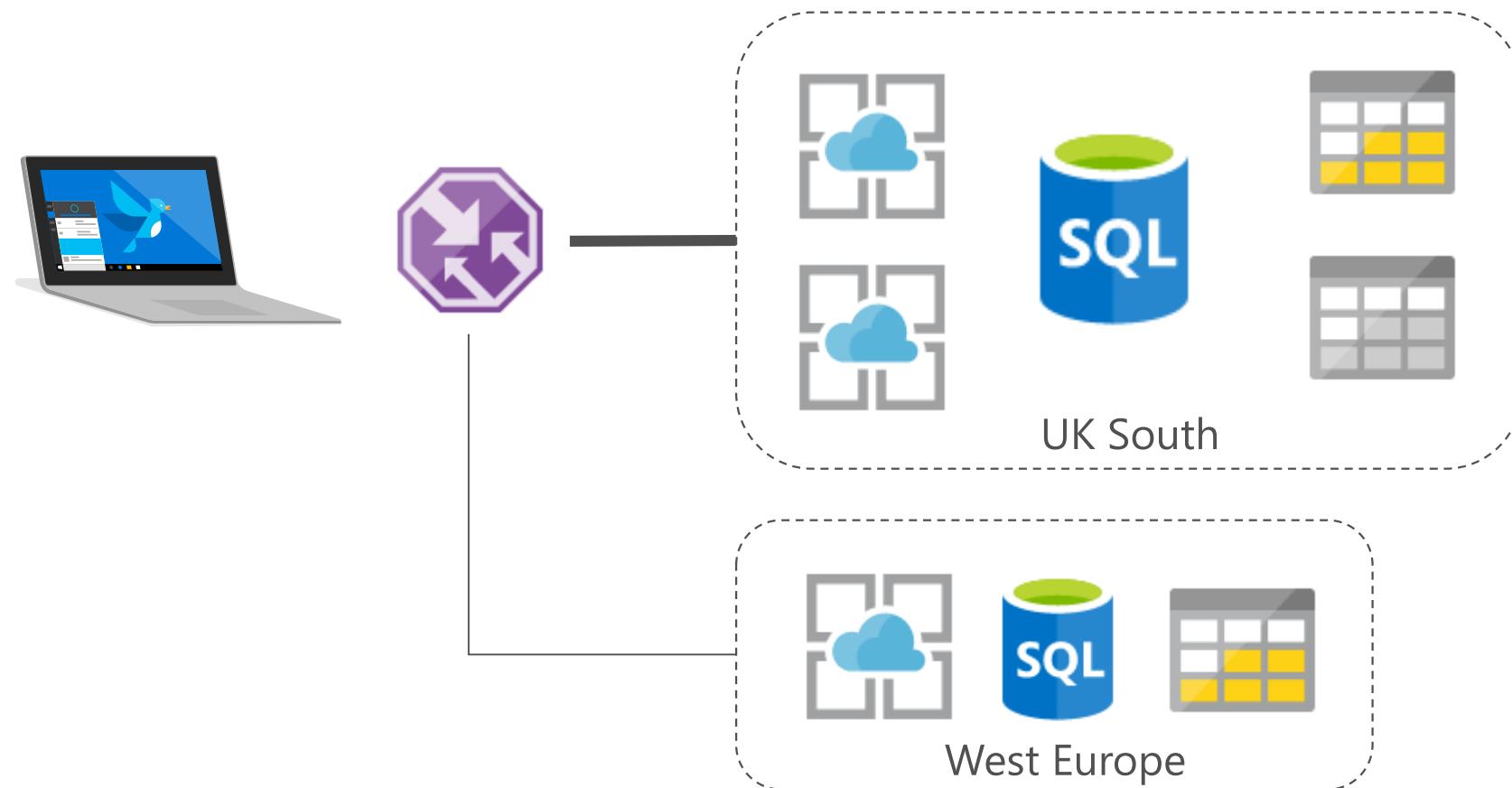
Performance analysis has determined **two instances** of our web tier. This does not benefit our resiliency, there is still a concern over user impact.

A **replica** of the web tier will be hosted in a **second data centre**, matching the location of our geo-replicated SQL database. We need to handle the second deployment as part of our **DevOps**. It will be scaled down to conserve cost.

Traffic manager will be used to allow users to switch over to the replica website. This will be configured to automatically switch over when failure is detected.

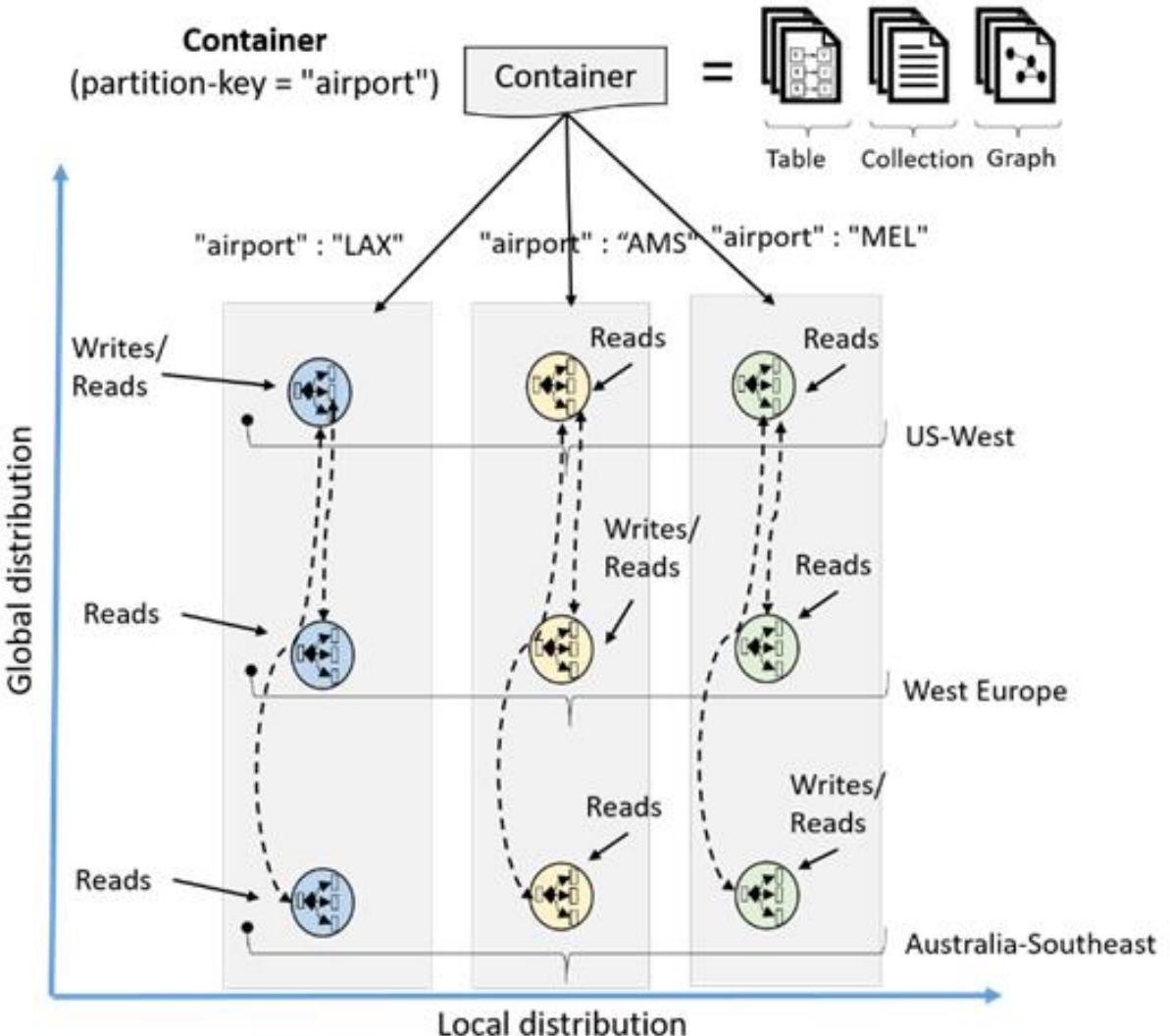
Using Azure – Active/Passive

Our design choices have led to an Active/Passive deployment model for our application.



Cosmos DB

- Transparent multi-homing
- Automatically failover in the order of priority
- Guarantees an upper-bound on data loss for system-triggered automatic failover during a regional disaster



It's Lunch time !



~



GDPR and Privacy, what's the impact?

Mike Ormond

Technical Evangelist (ISV)



Providing clarity and consistency for the protection of personal data

The **General Data Protection Regulation** (GDPR) imposes new rules on organizations in the European Union (EU) and those that offer goods and services to people in the EU, or that collect and analyze data tied to EU residents, no matter where they are located.

- **Enhanced** personal privacy rights
- **Increased** duty for protecting data
- **Mandatory** breach reporting
- **Significant** penalties for non-compliance

Microsoft believes the GDPR is an important step forward for clarifying and enabling individual privacy rights



PROTECT

DETECT

RESPOND

Does it affect me?
Does it affect my business?

Principles

1. Transparency, fairness and lawfulness in the handling and use of personal data
2. Limit the processing of personal data to specified, explicit and legitimate purposes
3. Minimize the collection and storage of personal data to that which is adequate and required for the intended purpose
4. Ensure the accuracy of personal data and enabling it to be erased or rectified
5. Limit the storage of personal data - must only be retained for as long as necessary to achieve the purpose for which it was collected
6. Ensuring the security, integrity and confidentiality of personal data. Must take steps to keep personal data secure through technical and organizational security measures.

I am not a lawyer

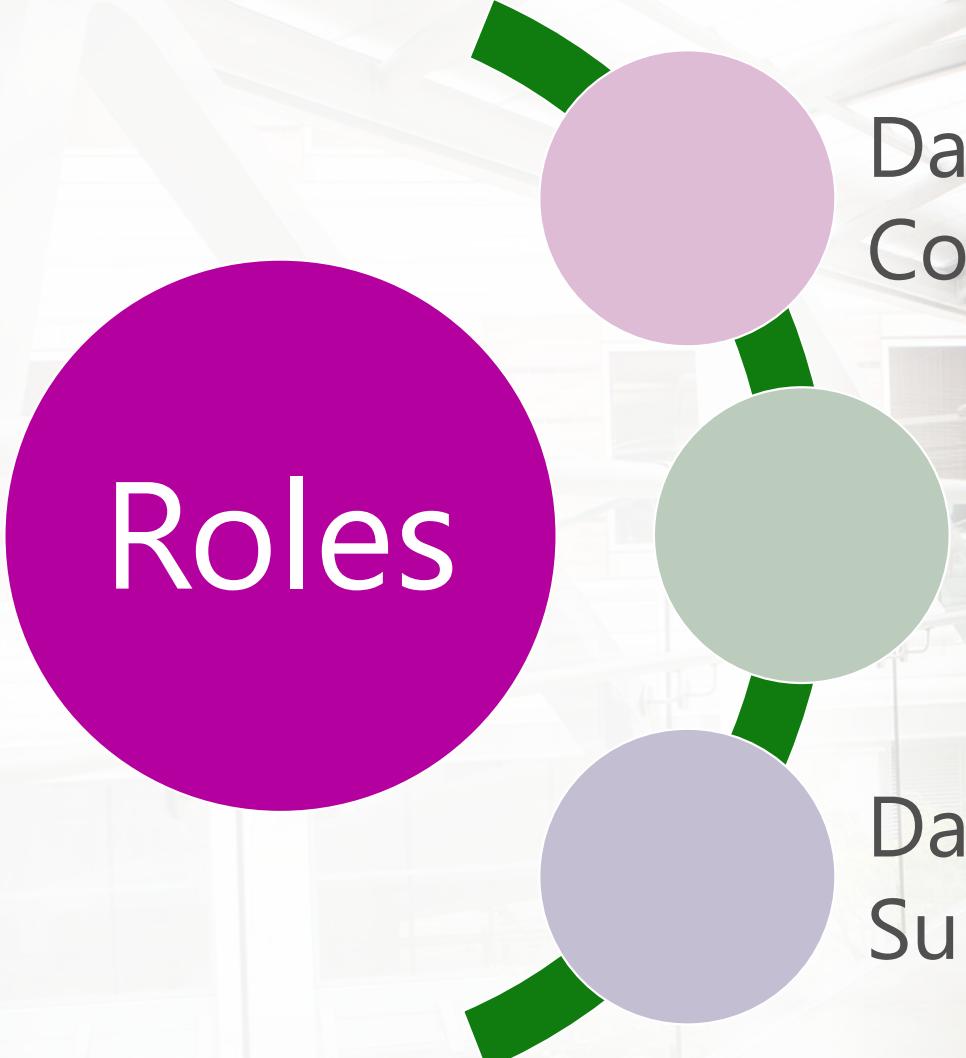


And also...

1. Individuals have the right to access / correct their personal data
2. They have the right to have it deleted (AKA "The right to be forgotten")
3. They can ask you to stop processing their data
4. Revoke consent for certain types of use and object to direct marketing
5. Demonstrate the measures taken to conform to the principles
6. Procedures for identifying and reporting data breaches

~~I have no legal training whatsoever~~





Roles

Data
Controller

Data
Processor

Data
Subject



SHARED RESPONSIBILITY
REQUIRES A PARTNER
YOU CAN **TRUST**

MICROSOFT IS **DOING MORE** TO EARN YOUR TRUST



HOLISTIC APPROACH
TO **SECURITY**



LEADERSHIP IN
COMPLIANCE



COMMITMENT TO
**TRANSPARENCY &
PRIVACY**

USING OUR INTELLIGENCE TO FIGHT CYBERTHREATS



Intelligence from billions of end points

300B

user authentications each month

1B

Windows devices updated

200B

emails analyzed for spam and malware

Privacy & Compliance boundary



CYBER DEFENSE OPERATIONS CENTER



Defend & respond to attacks

→ Improved defenses ←

Sort and analyze telemetry data for suspicious behavior

SECURITY TOOLS

SERVICE HEALTH DASHBOARDS

LOGGING & AUDITING



Secure Enterprise environment

Insights drive intelligent tools and health dashboards

THE TRUSTED CLOUD

Azure has the deepest and most comprehensive compliance coverage in the industry

GLOBAL



ISO 27001



ISO 27018



ISO 27017



ISO 22301



ISO 9001



SOC 1
Type 2



SOC 2
Type 2



SOC 3



CSA STAR
Self-Assessment



CSA STAR
Certification



CSA STAR
Attestation

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

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

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

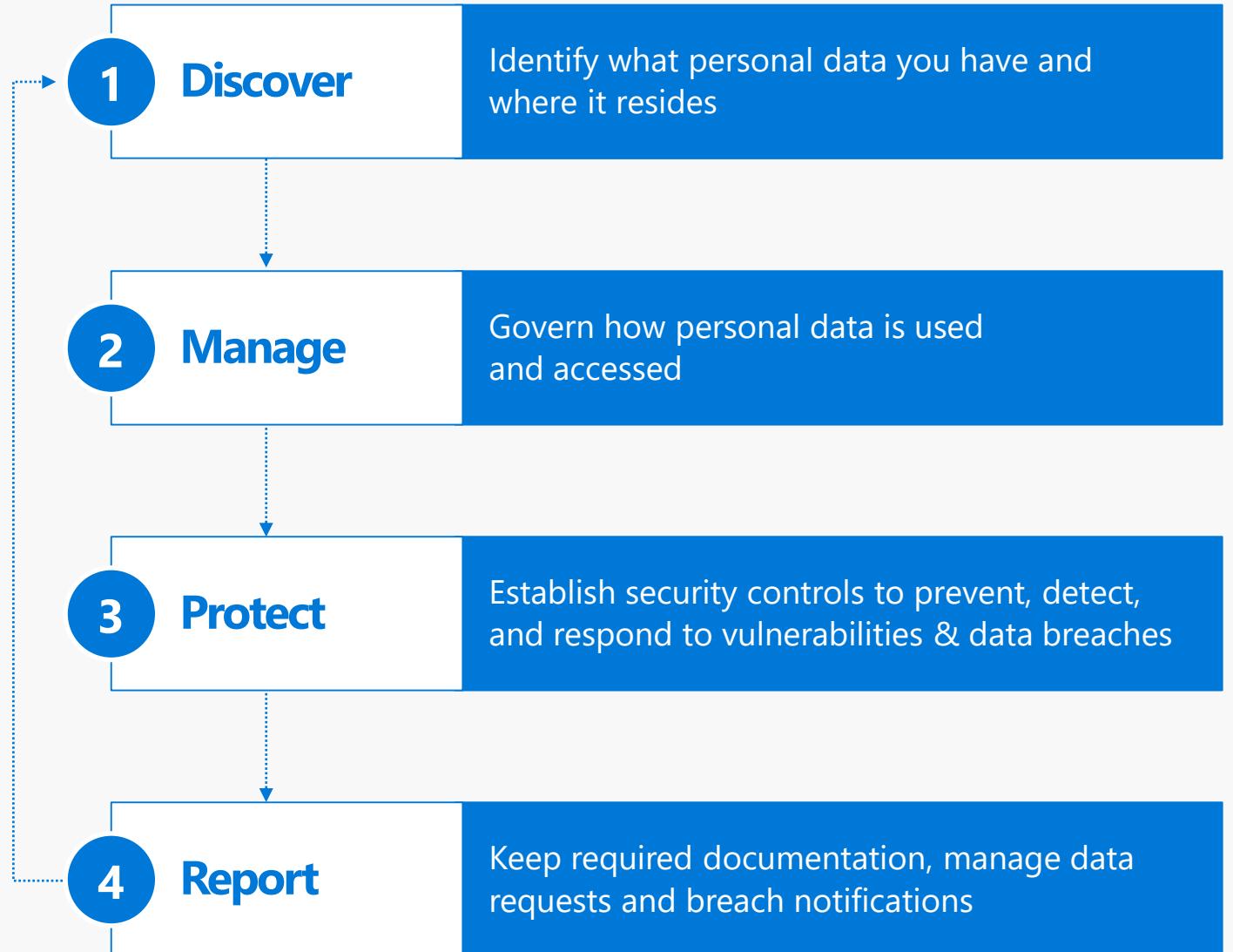
Our commitment to you

To simplify your path to compliance, we are committing to GDPR compliance across our cloud services when enforcement begins on May 25, 2018.

We will share our experience in complying with complex regulations such as the GDPR.

Together with our partners, we are prepared to help you meet your policy, people, process, and technology goals on your journey to GDPR.

How do I get started?





MICROSOFT AZURE

Safeguard customer data in the cloud, including personal data, with industry-leading security measures and privacy policies

Discover

- Azure Data Catalog

Manage

- Azure Active Directory
- Azure Information Protection
- Azure Role-Based Access Control (RBAC)

Protect

- Azure Key Vault
- Azure Security Center
- Azure Storage Services Encryption

Report

- Microsoft Azure Auditing and Logging
- Azure Monitor





OFFICE AND OFFICE 365

Secure your IT environment and achieve compliance with enterprise-grade user and administrative controls

Discover, Manage, and Protect

- Data Loss Prevention
- Advanced Data Governance
- Office 365 eDiscovery
- Threat Intelligence
- Advanced Security Management
- Office 365 Audit Logs
- Service Assurance
- Customer Lockbox





ENTERPRISE MOBILITY + SECURITY

Protect customer data both in the cloud, and on-premises, with industry-leading security capabilities

Discover, Manage, and Protect

- Microsoft Cloud App Security
- Microsoft Azure Information Protection
- Microsoft Azure Active Directory (Azure AD)
- Microsoft Azure Active Directory Premium
- Microsoft Intune





DYNAMICS 365

Safeguard customer data in the cloud, including personal data, with industry-leading security measures and privacy policies

Discover, Manage, and Protect

- Audit Data and User Activity
- Report & Analytics with Dynamics 365
- Dynamics 365 Metadata & Data Models
- Security concepts for Microsoft Dynamics 365 to protect, hide and separate customers sensitive data





SQL Server

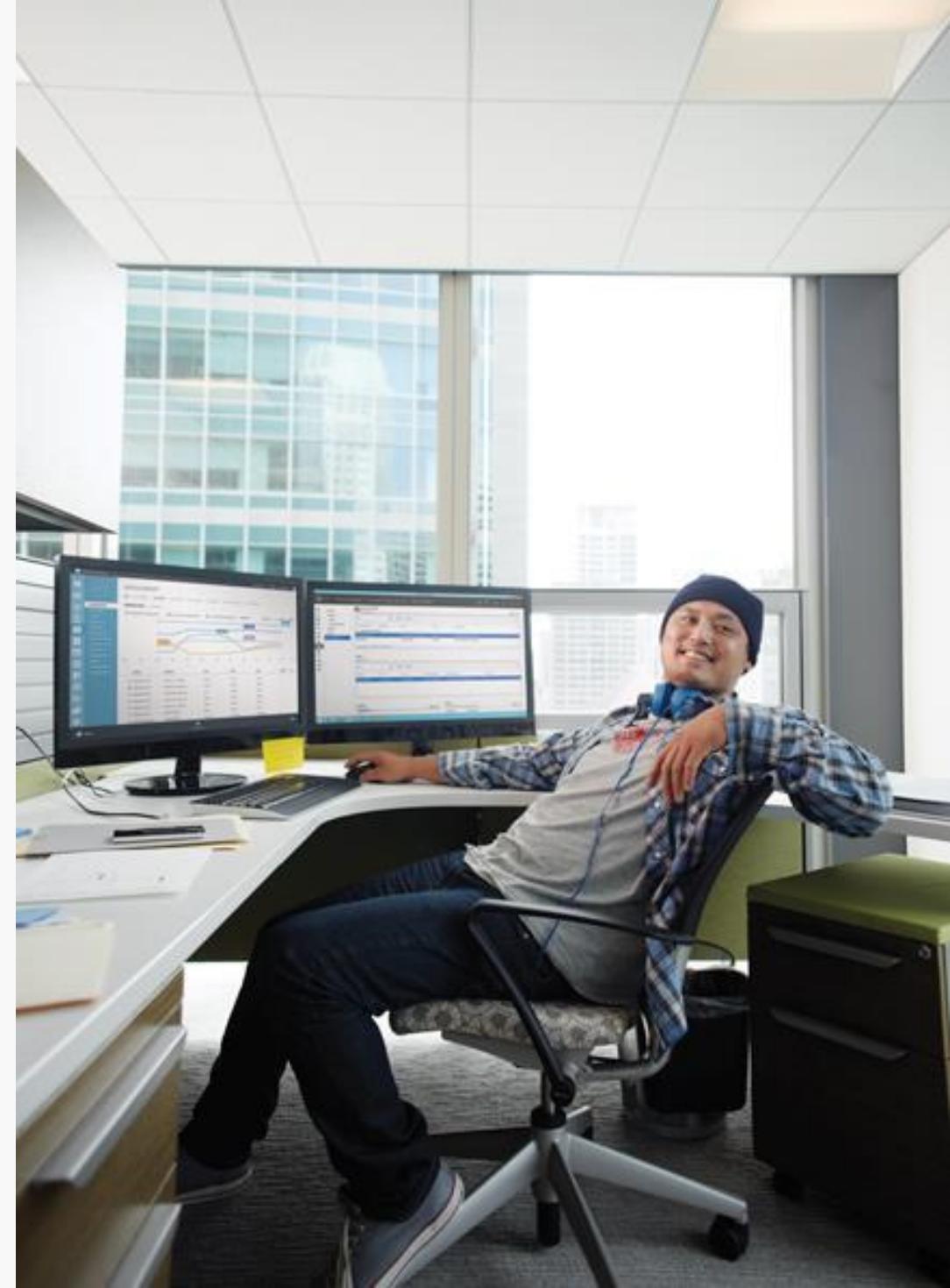
Protect the data inside your databases with controls for managing access and authorization at several levels

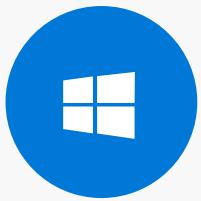
Discover

- SQL Query Language

Protect

- Azure SQL Database firewall
- SQL Server authentication
- Dynamic Data Masking (DDM)
- Row-Level Security (RLS)
- Transparent Data Encryption
- Always Encrypted
- Auditing for SQL Database and SQL Server audit
- SQL Database Threat Detection





WINDOWS AND WINDOWS SERVER

Protect devices with industry-leading encryption, anti-malware technologies, and identity and access solutions

Manage

- Microsoft Data Classification Toolkit

Protect

- Windows Hello
- Windows Defender Antivirus
- Windows Defender Advanced Threat Protection
- Device Guard
- Credential Guard
- BitLocker Drive Encryption
- Windows Information Protection
- Shielded Virtual Machines
- Just Enough Administration and Just in Time Administration



Think about...

1. Data controls + residency
2. Encryption
3. Managing secrets
4. Security & Access Control
5. Auditing, logging
6. Threat detection

<https://microsoft.com/trust>

<https://microsoft.com/gdpr>

<https://aka.ms/partnergdpr>

- Getting started
- Detailed guidance on 4 steps
- Assessment tool
- Lots more GDPR resources



How do I deploy that?

Gabriel Nepomuceno

Technical Evangelist (ISV)





How do I deploy this? aka DevOps

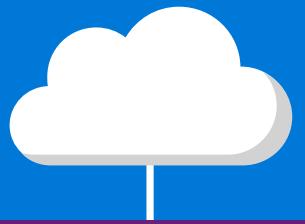
Integration and extension of your current tools

Deploy your Infra
With Arm
Templates

Deploy Direct
from Source
Control

Integrate with
your current tools

Test, Monitor and
Alert



Deploy your Infra With Arm Templates.

Immutable is the Keyword

Microsoft Azure



Deploy Direct from Source Control.

Poor man CI/CD but with rich man capabilities

Microsoft Azure



Web Sites



Visual Studio
Online



CodePlex



Git



GitHub



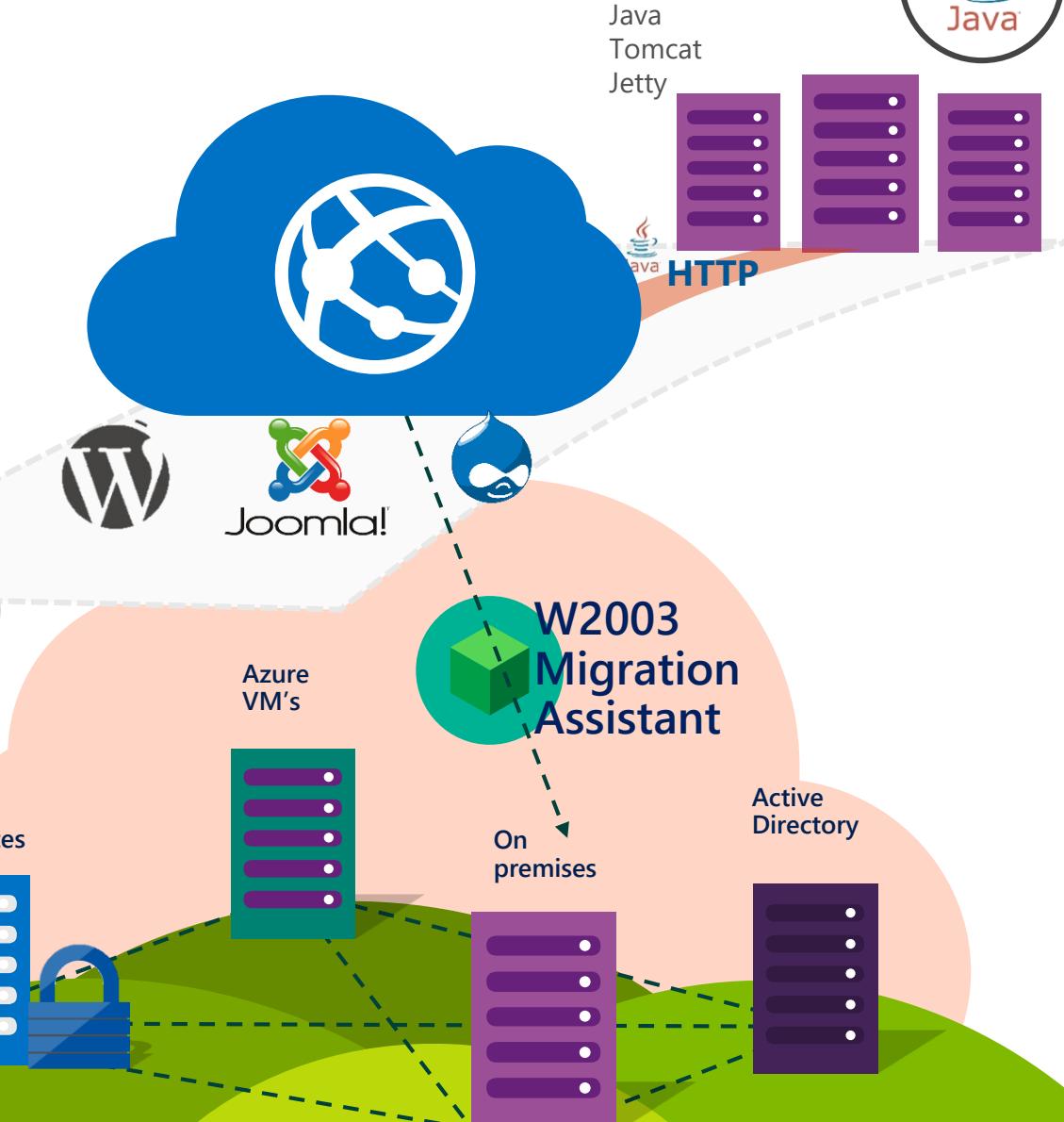
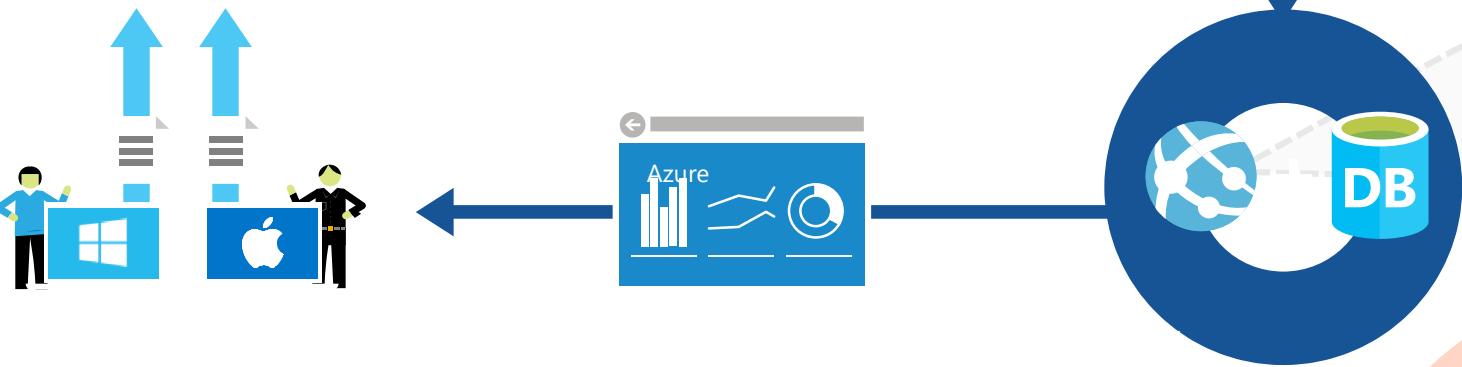
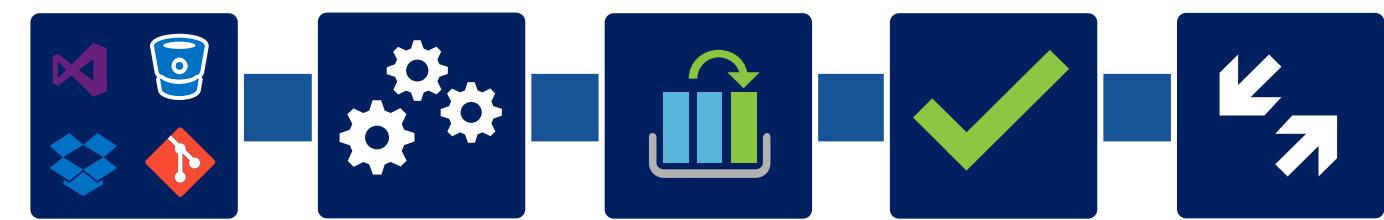
BitBucket



DropBox



FTP



What is the feature?

Designed for:

- Corporate Websites
- Enterprise Web Apps
- Digital Marketing
- DevOps and HyperScale

Test, Monitor and Alert.

Insights and alerts with power and consistency.

Microsoft Azure



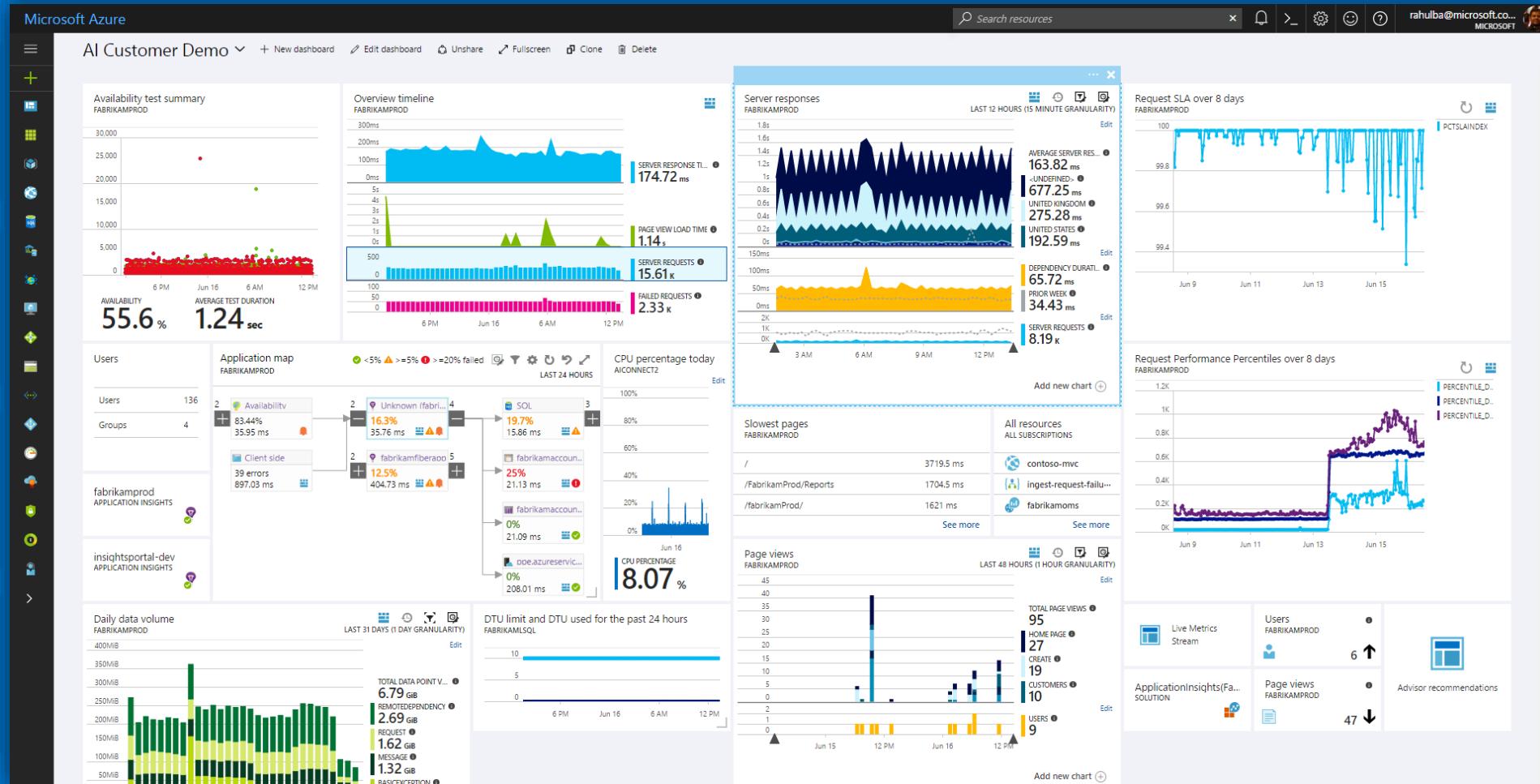
Azure Application Insights

Health Check

Monitor & Optimize

Detect & Debug

Data Analytics



Take Actions

Customer Insights

DevOps Workflows

Export & Correlate

Integrate with your
current tools.

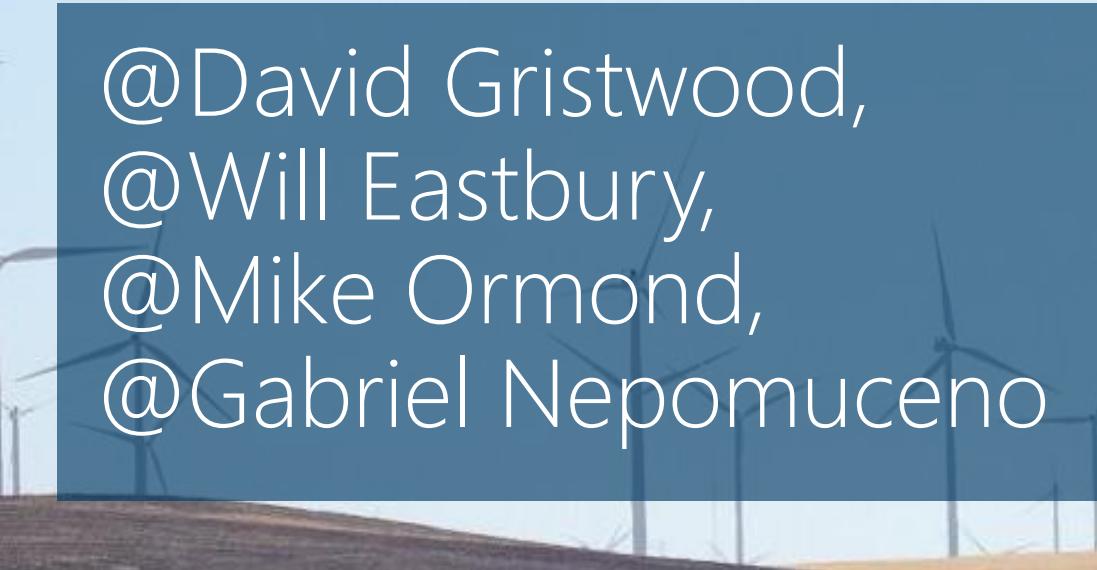
Come as you are
and be
embraced.

Microsoft Azure



What Else ?

@David Gristwood,
@Will Eastbury,
@Mike Ormond,
@Gabriel Nepomuceno



Workshop Scenario



Scenario Details: Health ISV

We are a solution vendor and have a piece of legacy software (an activity-focussed health app) which allows users to track and share their data in interesting ways.

Users currently track their activities with a mobile device and then review / plan their activities either with a mobile device or web browser.

The architecture of the service is currently a cross-platform mobile app and a website that are both connected to a large SQL Server database (which is getting larger by the day).

Primary Considerations

We are experiencing very rapid growth and our solution needs to scale very quickly on demand.

In addition, we would like to enable an ecosystem of innovation by making our data available through an API as well as potentially ingesting data from other partners.

Our database is getting very large due to the volume of telemetry we are capturing, how should we handle this?

We also want to aggregate that data to produce knowledge and insights which would otherwise not exist.

We need to control access and potentially charge for such access.

Can you apply what you have learned today with the 12 things to know and advise an approach to move this service to Azure with this in mind ?

Scenario Supplementary: Health ISV

I take my phone when I go for a run. The app tracks my route and timings and pushes them up to the cloud when complete. I can then review my performance against previous runs. I can even attach notes and photos from the route.

I want to plan a new cycle route. The app shows me popular routes in a given location as well as "challenges" (ie timed sections that others have identified for the purpose). When I go for my cycle, the app tracks my progress and notifies me as I approach the challenge sections. As the end of my cycle the app pushes my results to the cloud and allows me to compare with my previous performance and the performance of other users who have completed the same challenges.

Partner A is a very popular rowing machine manufacturer. They set their own challenges (in terms of format, age limits etc) as well as running regular challenges for a specific time period. They want to be able to create these challenges and allow users to log their results with *their* mobile app to our application.

Partner B is a very popular "action camera" manufacturer. They are keen to allow users to upload footage from their activities using our app. Once ingested and processed, other users from around the world would be able to view the activity from the comfort of their sofa.

Partner C is a very popular fitness retailer. They are keen to acquire purchase information from us that helps them understand the emerging market opportunity in particular locations, sports disciplines etc. Where there is a growing density of cyclists for example.

#AzureEvent #BuildWithAzure vipazure@microsoft.com
Deck is available for Download @ <http://aka.ms/azureevent>



Thank you for coming today. We hope you have enjoyed the session.

Please don't forget to fill in your feedback forms, and feel free to comment on social media using the tags above.