For next time

For OSS, specify to use Flexible Server

Postgresql - mention pg_stat_statements extension

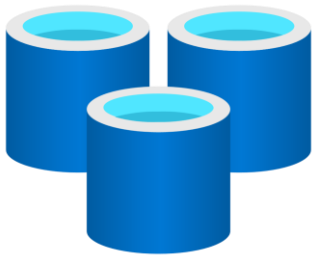
cosmos - mention on the first slide what cosmos is

Maybe use the API slide as a quick overview and 1 slide for each API - give more info for what they do and what they're for

Don't spend so much time on the different version upgrades per API option - time would be better spent digging into how each one works

You have a ton of links in the deck - maybe have a qr code that directs folks to all of the links and the slides. Maybe store this on github

Lots of detail on the details around the free trial - probably time better spent with more time on the different APIs or demo something, such as how to create one through the portal



Jes Schultz

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Which Azure Database Option Should I Choose?

Jes Schultz (she/her)

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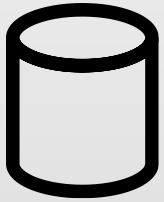
What we'll talk about today

IaaS vs. PaaS



Azure's PaaS OLTP database offerings

What makes each unique

What's managed for you with each offering

Let’s talk IaaS vs PaaS

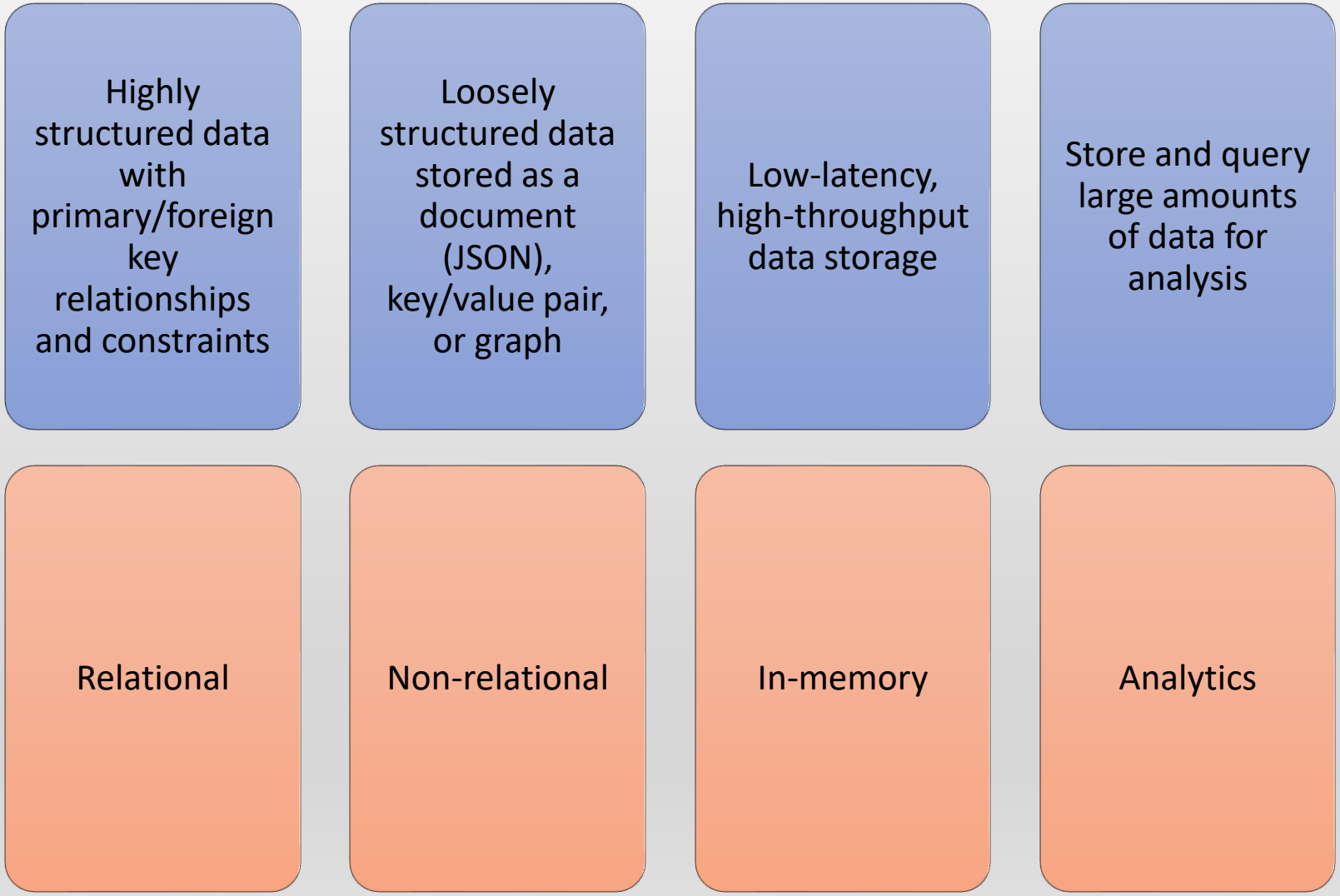
IaaS

- Infrastructure as a Service
- You “rent” infrastructure – VMs, compute, storage, networks, OSes
- You manage the VMs, OS, and any applications on them

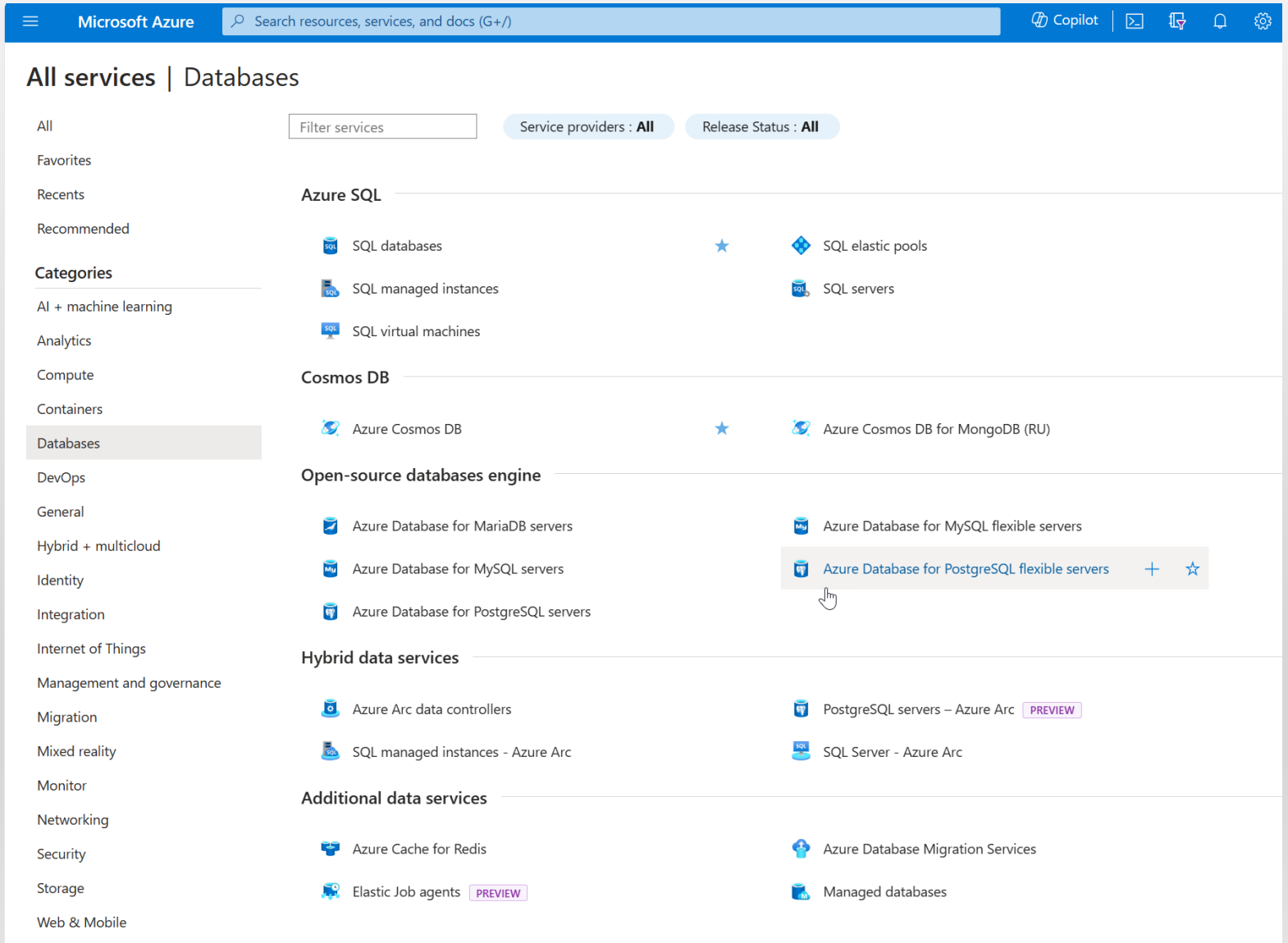
PaaS

- Platform as a Service
- You rent access to a ready-to-use platform (in this case a database)
- The provider manages the hardware, OS, upgrades, and many administrative tasks

Let’s talk about types of data stores



Azure Database Options



These roughly fall into several categories

Relational	Non-relational	In-memory	*Other*

• Azure **SQL**, SQL databases, SQL servers, SQL elastic pools, SQL managed instances
• Azure Database for **MySQL** servers
• Azure Database for **MariaDB** servers
• Azure Database for **PostgreSQL** servers
• Azure Cosmos DB
  • PostgreSQL (Citus)
	• Azure **Cosmos DB**
	  • NoSQL
	  • MongoDB
	  • Apache Cassandra
	  • Apache Gremlin
	  • Table
		• Azure Cache for **Redis**	• *Azure Database Migration Services*
			• *SQL Server stretch databases*
			• *Managed databases*
			• *Elastic Job agents*
			• *SQL virtual machines (Iaas)*

Choose your own adventure

Why choose Azure SQL?

- Microsoft's SQL Server database engine – now evergreen, no messy version upgrades required, ever
- Enterprise features, especially security (Ledger, Always Encrypted, Auditing)
- Developers: less time managing performance
  - Automatic tuning
  - Intelligent query processing
  - SQL DB Emulator for local development
- Integrated with Azure Functions

Managed Instance

- One or more databases managed as an instance with shared resources
- Nearly 100% compatibility with SQL Server
- Best for: lift-and-shift from on-prem or IaaS

SQL Database

- One database with dedicated resources
- Provisioned and serverless options available
- Best for: cloud-native apps

Elastic Pools

- A pool of resources shared by many SQL Databases
- Manage databases that have varying, unpredictable usage
- Best for: SaaS apps, ISV apps, multi-tenant databases

Why choose Azure Database for MySQL servers?

- Open source - based on MySQL **Community** edition
- Configurable server parameters
- Data-in and data-out replication supported from/to on-prem servers, Azure VMs, other Azure MySQL DBs, other cloud MySQL DBs
- Up to 10 read replicas for scale-out
- Storage engines available:
  - InnoDB (most similar to SQL Server's engine)
  - MEMORY

Why choose Azure Database for MariaDB servers?

- Open source – based on MariaDB **community** edition (which is a fork of MySQL)
  - Oracle-compatible
- Configurable server parameters
- Data-in replication supported from on-prem servers, Azure VMs, other Azure MariaDBs, other cloud MariaDBs
- Up to 5 read replicas for scale-out
- Storage engines available:
  - InnoDB
  - MEMORY

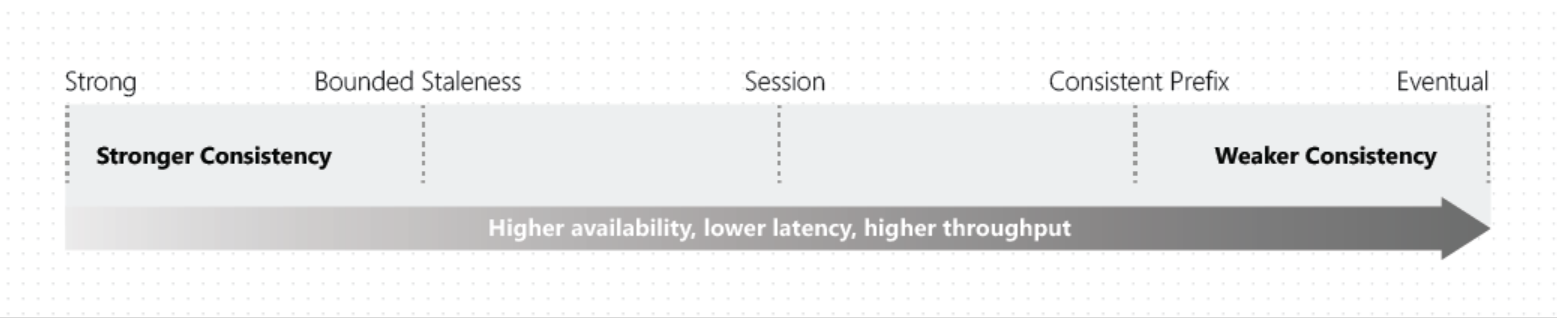
Being retired as of September 19, 2025

Why choose Azure Database for PostgreSQL servers?

- Open source - based on PostgreSQL **community** edition
  - Microsoft has a team of committers and contributors who work full time on the open-source Postgres project
  - Versions 11, 12, 13, 14, 15, 16
- Configurable server parameters
- Lots of supported extensions (vary by engine version)
  - Version 15 includes, but is not limited to, timescaledb, postgis, pgaudit, and pg_cron
- Built-in PgBouncer for connection pooling – public or private access
- Up to 5 read replicas for scale-out
- Query Store for performance troubleshooting
  - Runtime stats – how many times was a query run, average execution time, longest-running queries
  - Wait stats – what queries are waiting on what resource, what resource is a long-running query waiting on

Why choose Azure Cosmos DB?

- Globally distributed*
  - Read anywhere, write anywhere
- Flexible consistency levels*



- Integrated with Azure Functions, IoT Hub, AKS, App Service

* PostgreSQL (Citus) has slightly different options

Cosmos DB APIs

NoSQL

- Document storage (JSON)
- Use SQL to query
- Automatic indexing
- Offline emulator
- **Great for IoT, retail, gaming**

MongoDB

- Document storage (BSON)
- Compatible with MongoDB wire protocol
- Single and compound indexes
- Use familiar tools to query (Mongo Shell, etc)

Apache Cassandra

- Wide-column data store
- Compatible with existing Cassandra SDKs and tools
- **Great for apps where writes exceed reads** – logging, package tracking, IoT

Table

- Key/value storage
- Azure Table Storage on steroids
- **Great for app caching, gaming scores, shopping carts**

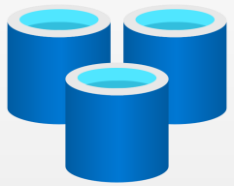
Apache Gremlin

- Graph data storage - think vertices and edges
- Automatic indexing
- **Great for relationships – recommendation engines, social networks, logistics**

PostgreSQL

- Community Postgres engine with the Citus extension
- Most recent engine versions (14, 15)
- Distributed data – coordinator and worker nodes
- **Great for high-throughput transactional apps and SaaS**

Why choose Azure Cache for Redis?



- Open-source Redis
  - Basic, Standard, Premium tiers
- Or Redis Enterprise
  - Enterprise, Enterprise Flash tiers
  - Modules supported
    - RediSearch, RedisBloom, RedisTimeSeries, RedisJSON
- Data or content caching, session store, job or messaging queue
- Redis persistence supported (available in Premium, in preview for Enterprise)
  - RDB (Redis database) – snapshots saved in Azure Storage account
  - AOF (Append only file) – write log stored in Azure Storage account

What's "managed" for these databases?

	Backups	Restores	High Availability (same region)	Disaster Recovery (different region)	Version upgrades
Azure SQL	Automatic	Point-in-time, geo-restore	Automatic	Geo-replicated backups, Geo-replication	Evergreen engine – no concept of versions. Incremental updates are automatic.
MySQL	Automatic	Point-in-time, geo-restore	Available	Geo-replicated backups, Read replicas	Patch updates – automatic. Major versions – dump and create new or perform manually through portal.
MariaDB	Automatic	Point-in-time, geo-restore	Automatic	Geo-replicated backups, Read replicas	Patch updates – automatic. Minor versions - dump and create new. Major versions - dump and create new.
PostgreSQL	Automatic	Point-in-time, geo-restore	Available	Geo-replicated backups, Read replicas	Patch and minor versions – automatic. Major versions – dump and create new.
Cosmos DB	Automatic	Point-in-time	Automatic	Scale out	Evergreen engine – no concept of versions. Incremental updates are automatic.
Redis	Set up data persistence	Load saved data	Available	Zone redundancy	Manual through portal, Azure CLI, or PowerShell.

Cool, how do I build my app using one of these PaaS databases?

- Sign up for a free trial!
  - Create Your Azure Free Account Today | Microsoft Azure
    - $200 credit for 30 days (Pro tip: provision serverless or burstable to get the most out of that)
    - After that, move to pay-as-you-go and get this every month for 12 months:
      - Azure SQL Database 10 DTUs, 250 GB storage
      - Azure Database for MySQL – 750 hours of burstable compute/32 GB storage
      - Azure Database for PostgreSQL – 750 hours of burstable compute/32 GB storage
      - Azure Cosmos DB 1,000 RUs, 25 GB storage
    - Cosmos DB has its own totally-free, no-credit-card-involved 30-day trial - Try Azure Cosmos DB free | Microsoft Learn
    - Azure SQL Database has a new free offer - serverless, 100,000 vCore seconds/month (equivalent to about 28 hours of one vCore per month) - per new subscription, renews monthly forever
- Find sample code @ github.com/azure-samples
- Check documentation of each service for Quick Starts, Templates, and Samples

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