Azure Basics for the IT Professional

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Who Am I?

- Leader of the Louisville SQL Server/Power BI User Group
- Organizer/Speaker of SQL Saturday's & other conferences
- Heavily involved with SQL PASS
- Microsoft Data Platform MVP
- Friend of Redgate 2015 - 2019
- Idera ACE 2016
- SentryOne Product Advisory Council

The vetted and certified experts at Denny Cherry and Associates Consulting assist companies with attaining IT goals such as HA, scalability, SQL Server virtualization, migration, and acceleration reliably while finding ways to save on costs. With clients ranging from Fortune 50 corporations to small businesses, their commitment to each is the same: to provide a deft, high-speed IT environment that leverages every aspect of their platform: from network, architecture, to infrastructure.

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Quick Check

- How many:
  - DBA's
  - Developers
  - BI/DWH
  - Other
- Please make sure to fill out evaluations
- Ask questions!!!

Agenda

- The Cloud
- Terminology
- Geographies/Regions
- Networking
- Data Security
- Azure Virtual Machines
- SQL DB
- Managed Instances (MI)
- Demos

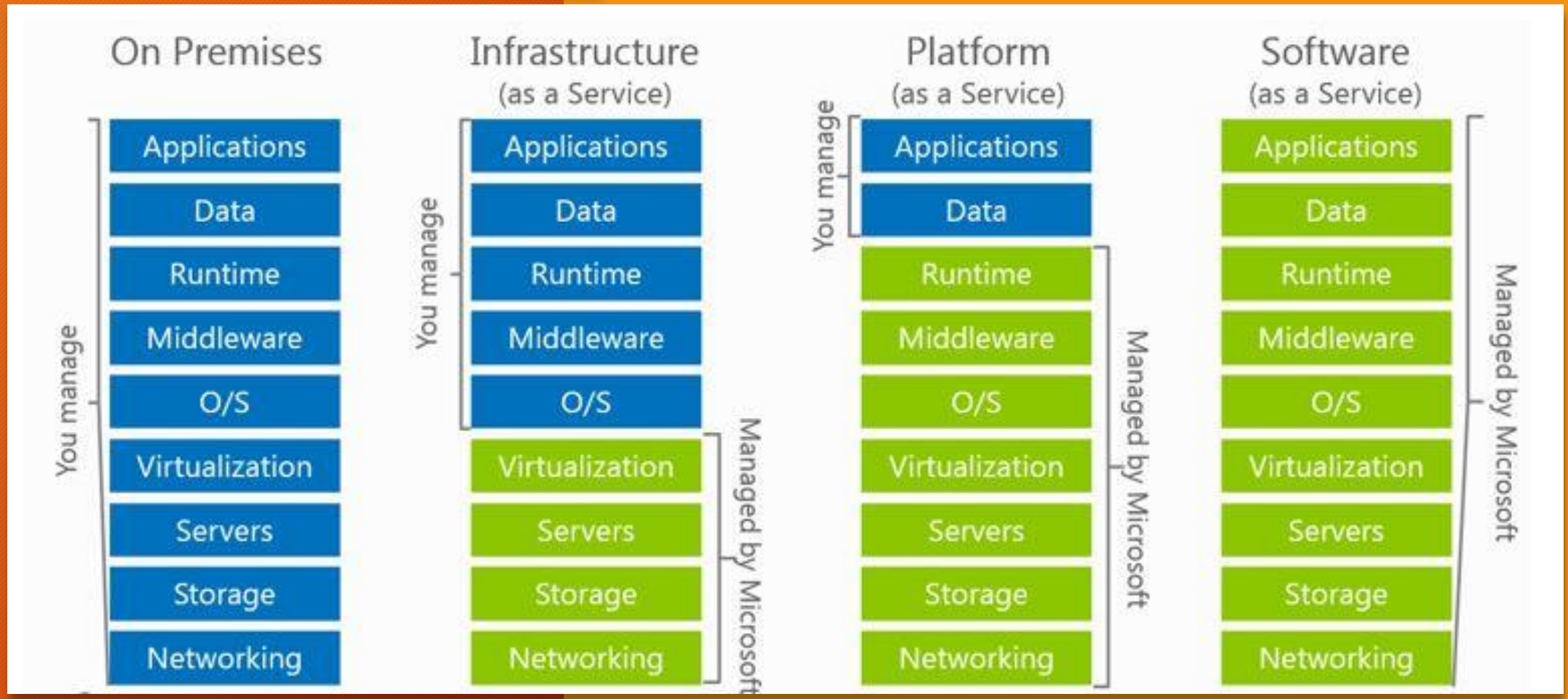
The Cloud

Terminology

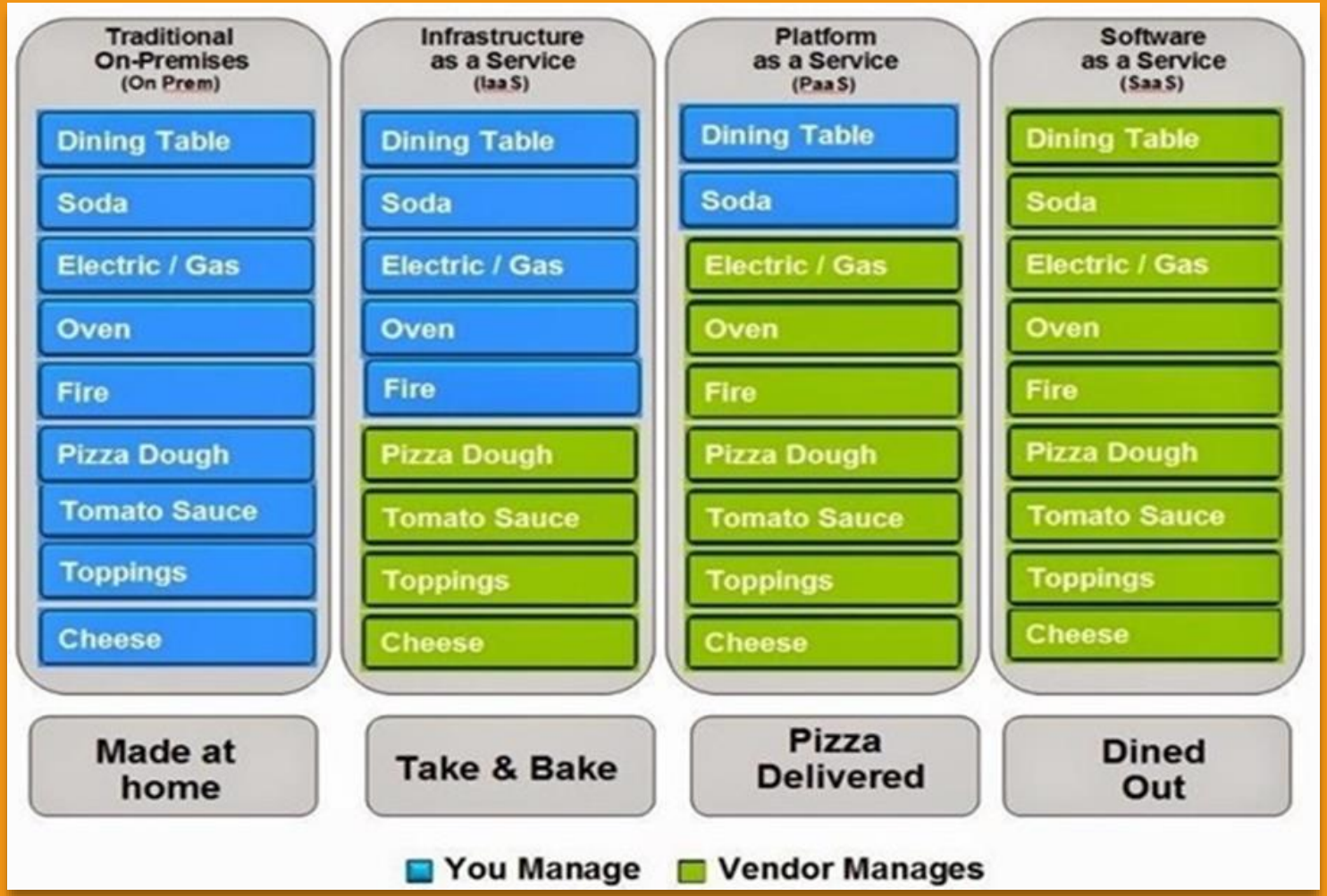
- “On Prem”
- IaaS – Infrastructure as a Services
- PaaS – Platform as a Service
- SaaS – Software as a Service
- AAD – Azure Active Directory
- ARM – Azure Resource Manager
- LRS/GRS/ZRS/RA-GRS
- Resource Groups
- Geographies/Regions

https://www.shutterstock.com/image-photo/jargon-word-cloud-concept-520216531

Terminology



Pizza as a Service



Geographies/Regions

The world is divided into geographies

Defined by geo-political boundaries or country borders

Defines the data residency boundary for customer data

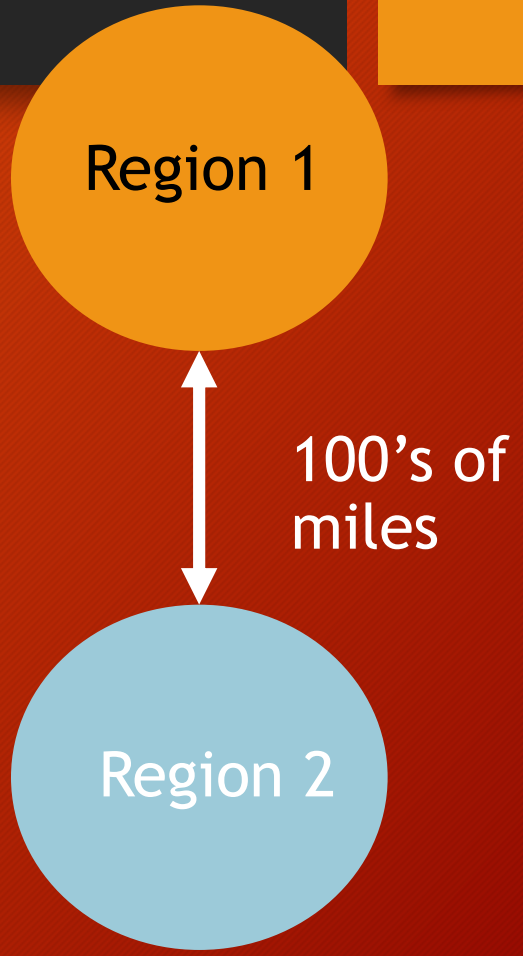
A region is defined by a bandwidth and latency envelope

<2ms latency diameter (round trip)

Customers see regions, not DCs

Different fault and flood zones, electrical grid, hurricane zone

Typically hundreds of miles apart



Quincy, WA

Quincy, WA

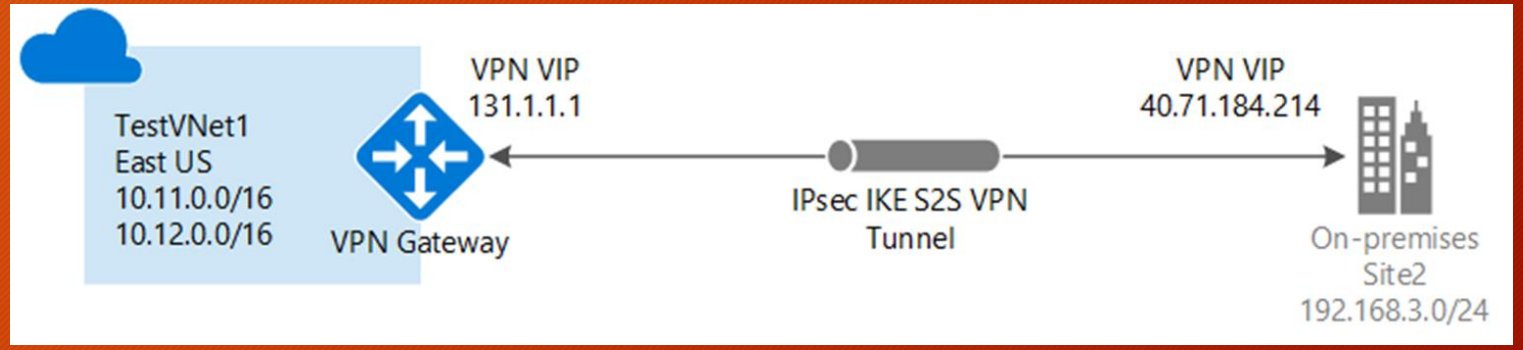
Networking

Virtual Network

- "Bring Your Own Network"
- Segment with subnets and security groups
- Control traffic flow with User Defined Routes

Backend Connectivity

- Point-to-site for dev / test
- VPN Gateways for secure site-to-site connectivity
- ExpressRoute for private enterprise grade connectivity



Data Security

- Transport Lay Security (TLS)
- Transparent Data Encryption (TDE)
- Always Encrypted
- Row-level security
- Dynamic Data Masking

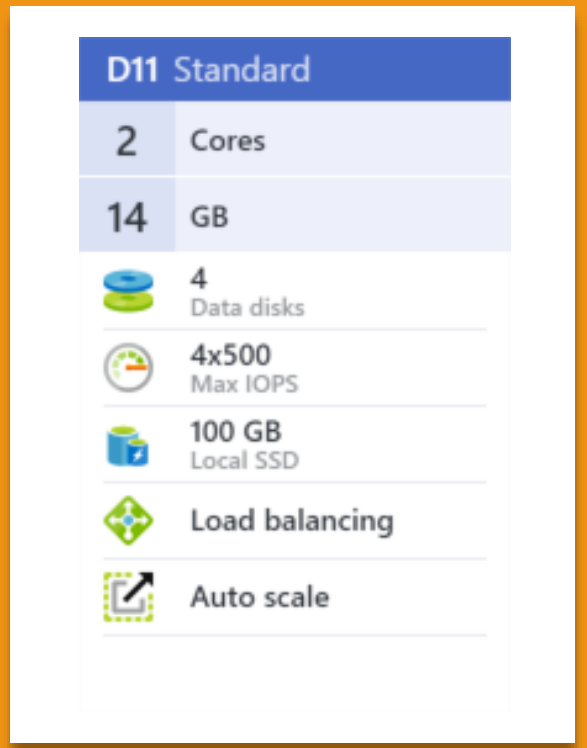
- Authentication
  - SQL Authentication
  - Azure Active Directory Authentication

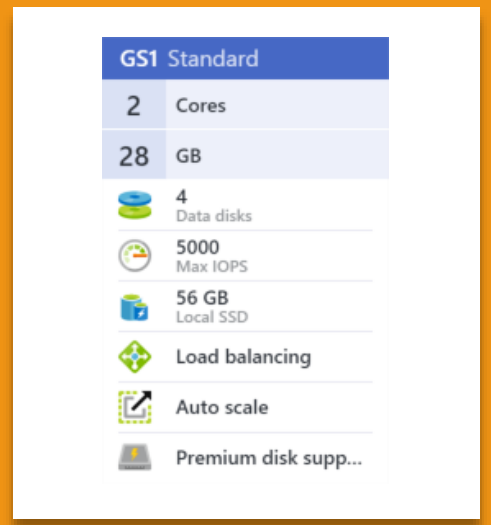
Azure Virtual Machines

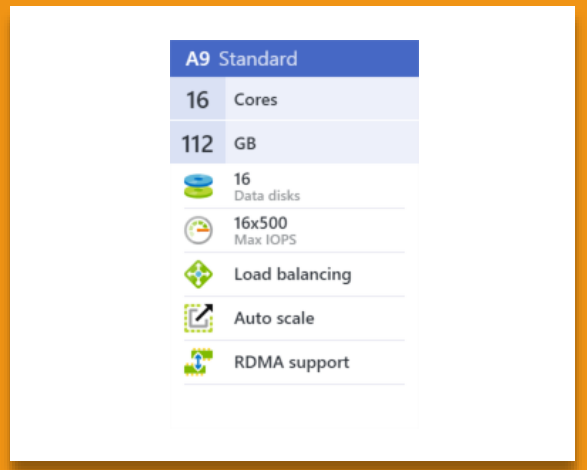
- VM hosted on Microsoft Azure Infrastructure (“IaaS”)
  - Fast provisioning (~15 minutes). Provision groups of servers with resource templates
  - Accessible via RDP and Powershell
- Pay per use
  - Per minute (only when running)
  - Cost depends on size and licensing
    - EA customers can use existing SQL licenses (BYOL)
  - Network: only outgoing (not incoming)
  - Storage: only used (not allocated)
- Elasticity
  - Grow as needed

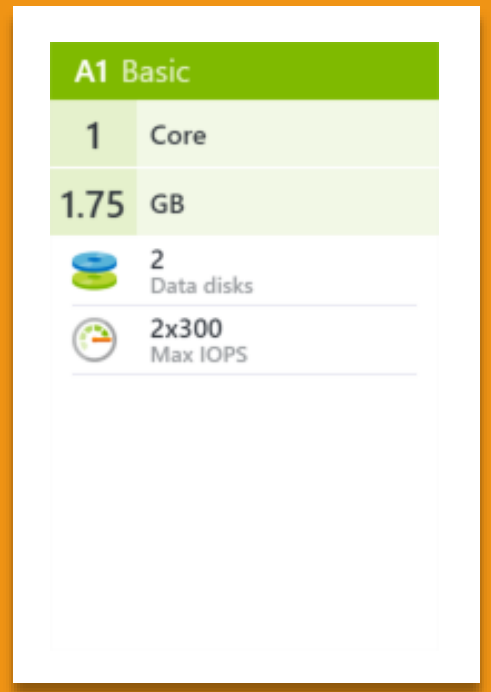
Azure Virtual Machines

- VM size determines compute capacity
  - # of cores, RAM, # of disks, local SSD
- VM size determines features
  - Auto-scale, load balancing, RDMA, Premium storage support



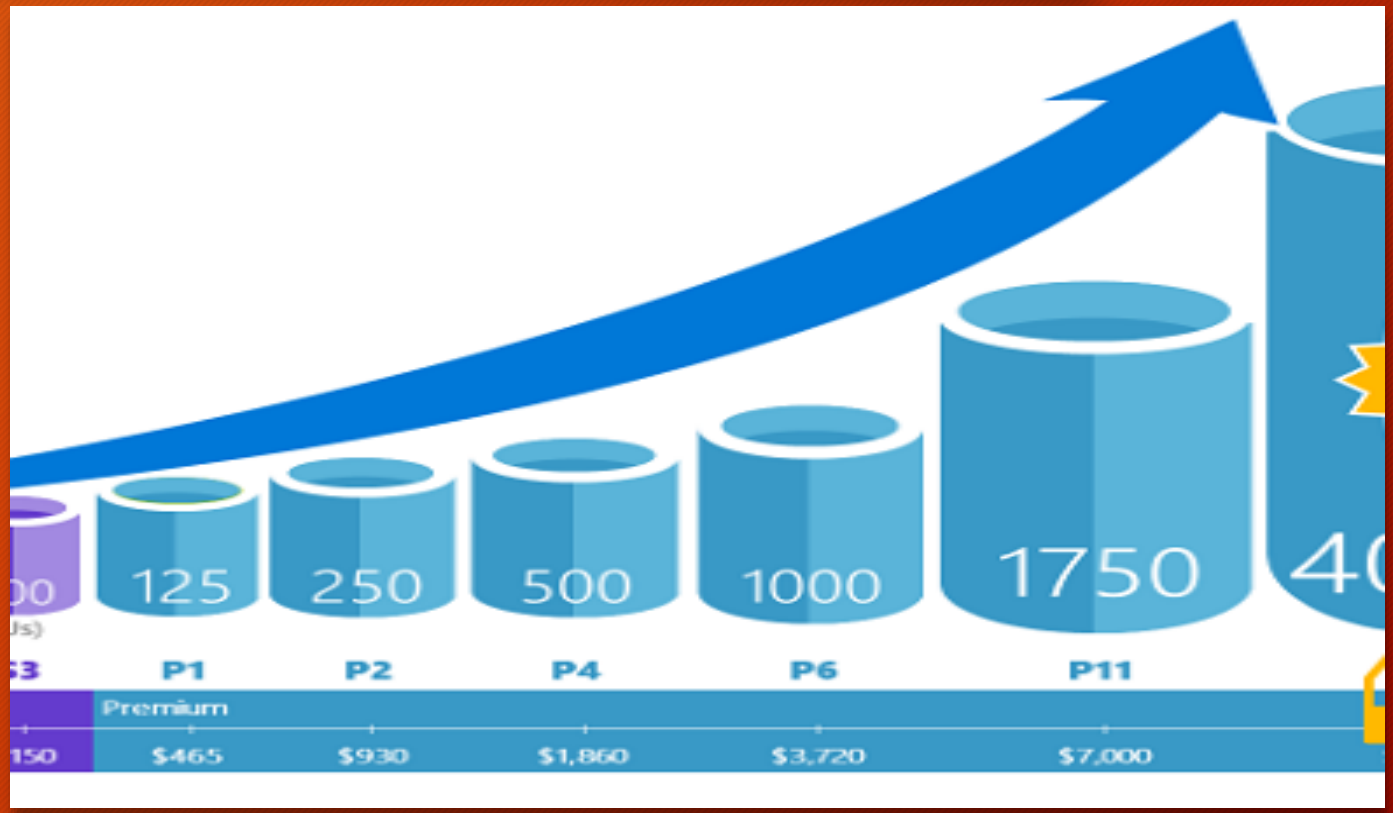






SQL DB

- Just a database in the cloud
- Sized differently than VMs
  - Different Size Labels
  - Database Transaction Unit (DTU)
  - https://sqlperformance.com/2017/03/azure/what-the-heck-is-a-dtu
  - Vcore licensing



https://docs.microsoft.com/en-us/azure/sql-database/sql-database-technical-overview

SQL DB

No physical access to database files

No need to upgrade

No need to patch

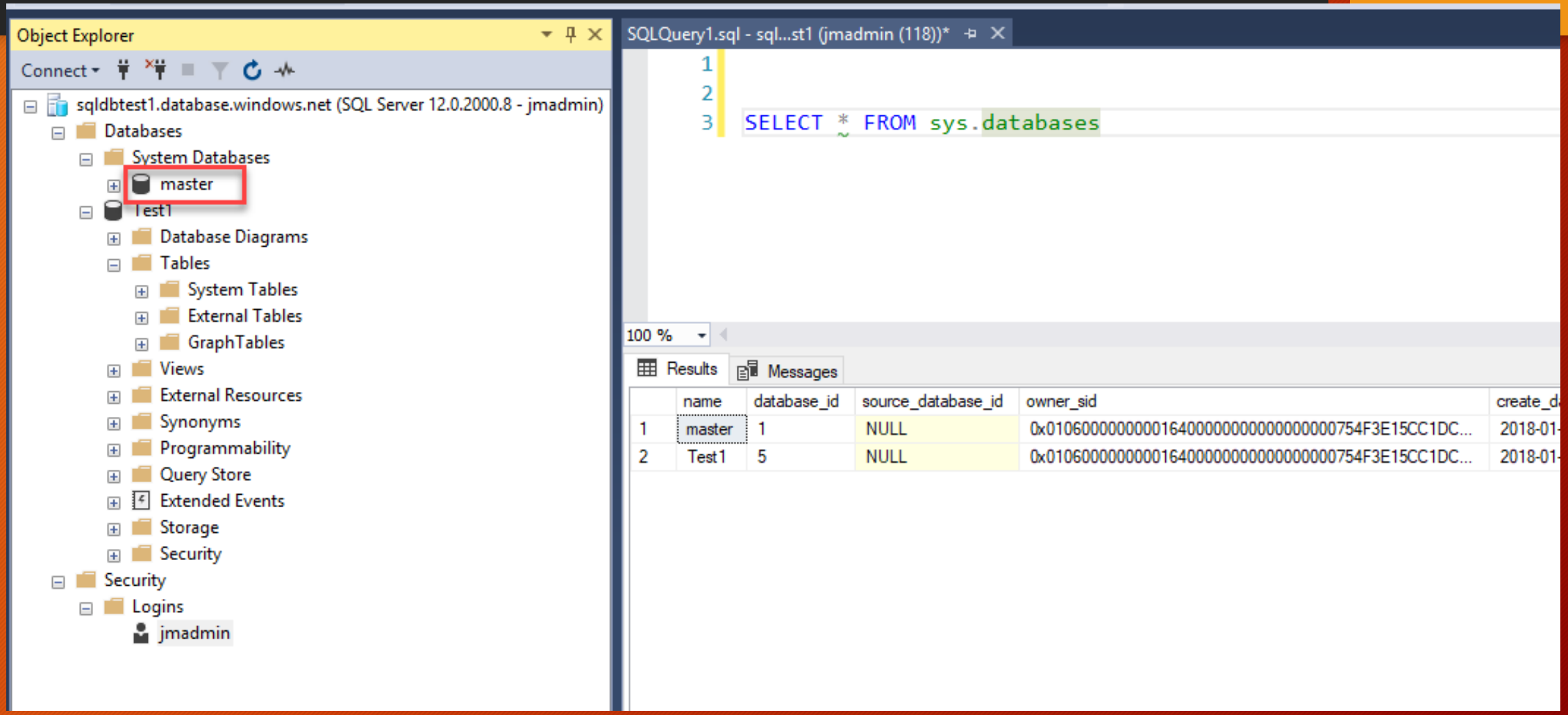
No need to reboot/restart

Automatic backups (yay!)

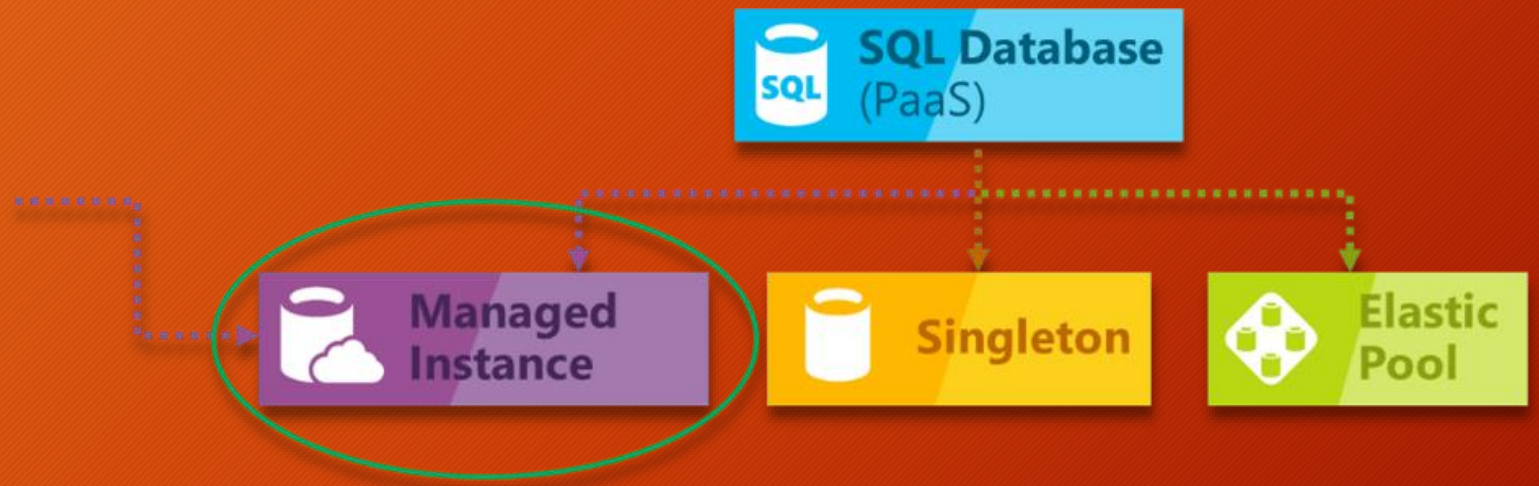
- TDE Enabled by default

Things get tested here first

SQL DB

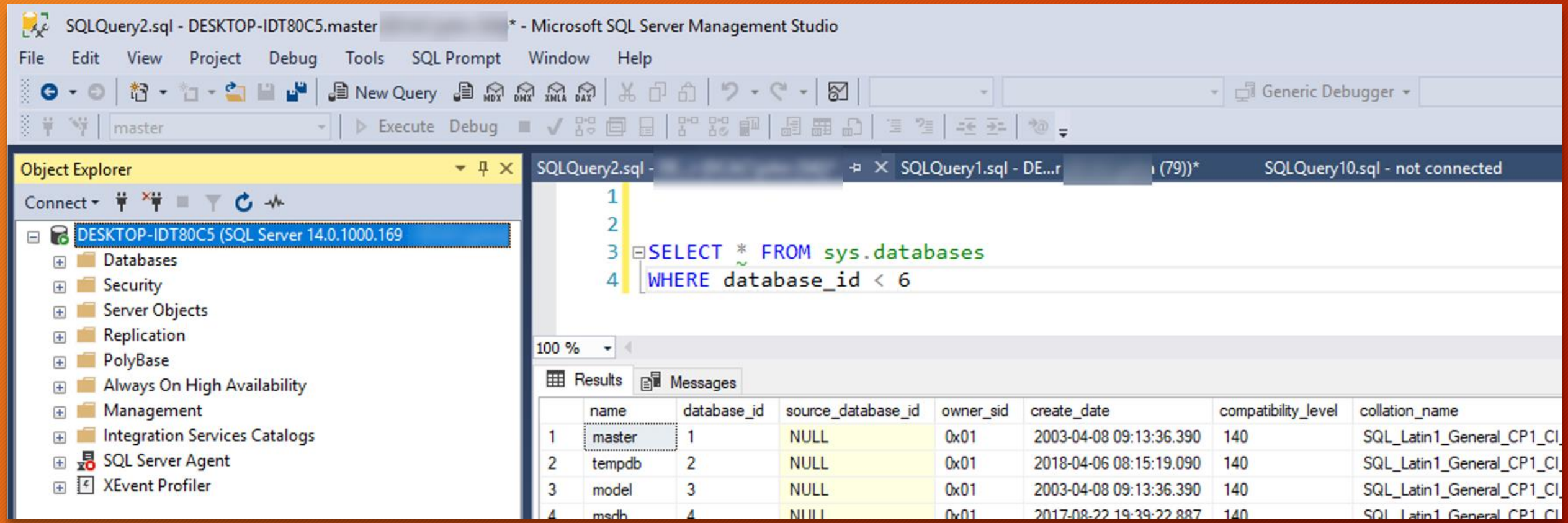

Object Explorer
Connect
sqldbtest1.database.windows.net (SQL Server 12.0.2000.8 - jmadmin)
Databases
System Databases
master
Test1
Database Diagrams
Tables
System Tables
External Tables
GraphTables
Views
External Resources
Synonyms
Programmability
Query Store
Extended Events
Storage
Security
Security
Logins
jmadmin
SQLQuery1.sql - sql...st1 (jmadmin (118))*
1
2
3
SELECT * FROM sys.databases
100 %
Results
Messages
name
database_id
source_database_id
owner_sid
1
master
1
NULL
0x010600000000016400000000000000000754F3E15CC1DC...
2
Test1
5
NULL
0x010600000000016400000000000000000754F3E15CC1DC...

New deployment option that enables frictionless migration for SQL apps and modernization in a fully managed service



Easy lift and shift	Fully managed PaaS	Full isolation and security	New business model
• Fully-fledged SQL	• Built on the same	• Native VNET	• Competitive

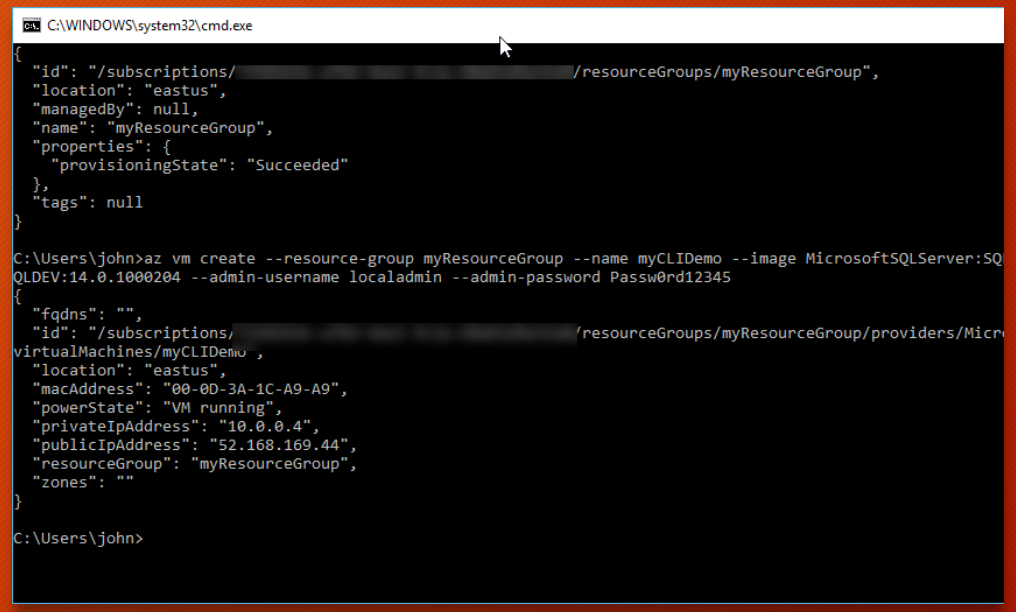
Managed Instances (MI)

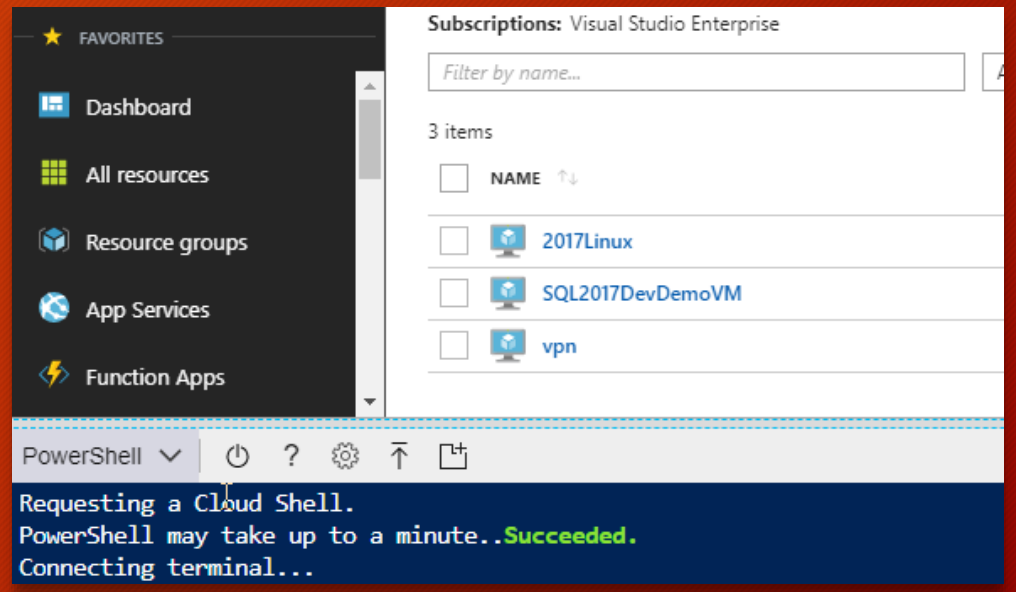


It really looks like…

Command Line

- Powershell
  - Locally
  - Azure Powershell (Cloud Shell)
- Azure Command Line Interface (CLI)





Demo

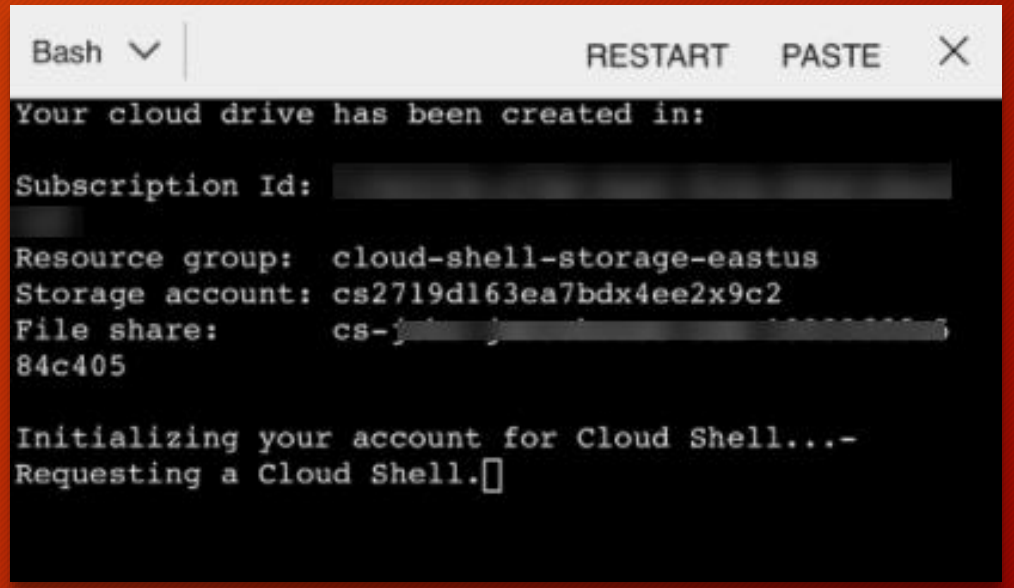
- Configuring a virtual machine (VM)
- Configuring SQL DB
- Powershell/Azure CLI

Gotchas

- VMs
  - Auto shut off
  - Storage – Spinning vs SSD
    - $$$$
- SQL DB
  - Where are the backups?
    - Ronco – Set it, Forget it

Mobile Capabilities

- Start/Stop VMs
- BASH Scripts
- PoSH



Getting Started

- Free trial
  - //azure.com/free
- 12 months of
  - Compute
  - Storage
  - Network
  - Database
- Always free access to 25+ services including app service and functions
- $200 US credit to try it out within 30 days

Resources

- Azure CLI
  - https://docs.microsoft.com/en-us/cli/azure/?view=azure-cli-latest
- Azure PowerShell
  - https://docs.microsoft.com/en-us/powershell/azure/overview?view=azurermps-5.6.0
- Storage Replication
  - https://docs.microsoft.com/en-us/azure/storage/common/storage-redundancy
- Windows VM Sizes
  - https://docs.microsoft.com/en-us/azure/virtual-machines/windows/sizes
- PaaS vs IaaS
  - https://docs.microsoft.com/en-us/azure/sql-database/sql-database-paas-vs-sql-server-iaas
- Azure SQL DB DTU Resource Limits
  - https://docs.microsoft.com/en-us/azure/sql-database/sql-database-dtu-resource-limits
- Azure SQL DB Service Tiers
  - https://docs.microsoft.com/en-us/azure/sql-database/sql-database-service-tiers

Questions

THANK YOU!!!!

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