Azure Provisioning Services

Azure Portal

- Convenient
- Display service specific pages
- Prompt & Validate resource settings

Azure CLI

- Set of commands to run from OS command promt OR Cloud shell
- Create/manage resources
- Automate with scripts
- Windows/MacOS/Linux

Azure Powershell

- Script & automate tasks
- Azure commandlet (Azure specific commands)
- Create/manage resources
- Online
- Windows/Mac OS/Linux

Azure Resource Manager

- Service(s) specific & deployed as JSON txt file
- Send template *az deployment group create* to AZ CLI
- Send template *New_AzResourceGroupDeployment* to AZ PSH

SQL Database

1. Go to portal
2. Select SQL DB
3. Add specifications (1/more subscriptions)
4. Allocate resource group
5. DB server (global unique name) provide username & password, geographic region
6. Configure Tier & performance, CPU, Core & Backup
7. Review & Create

MySQL

1. Search Azure databases
2. Create database
3. Add specifications for Resouce group, Server, Data Source, Location, Version, Compute & Storage, Tier Admin
4. Review & Create

- Tiers (IOPS Input/Output Operations per second (read/write capacity of the resource)
  - Basic = light workloads (develop, test small scale infrequenty used apps)
  - General purpose = business workloads (web, mobile, Enterprise apps)
  - Memory Oprimized = high in-memory performance (real time, high performance analytics/transactions)
- Administrative username
  - Not an azure_superuser, admin, administrator, root, guest, public
- Administrative password
  - 8 - 128 characters, uppercase, lowercase, special characters, numbers

PostgreSQL

- Single Server (similar to MySQL)

- HyperScale
  - Scale multiple machines
  - Add/remove services
  - Query parallization accross servers
    - Split queries into pieces on different servers & aggregate result.

FIREWALLS & CONNECTIVITY

- port 1433
- server-lever firewall rule 0.0.0.0 to connect all services to single/pooled database
- Allow only necessary connections/communications for service operation & block all other ports/protocols/connections

FIREWALLS & CONNECTIVITY

- port 3306
- Default SSL requied & enforced
- Configure server ('Server parameters' page)
- Read replicas ('Replication' page)
  - 5 geo-replicated data accross regions
  - distributed read-intensive work load overhead

FIREWALLS & CONNECTIVITY

- port 5432
  - default database name = *postgres*
  - connect via fulll server name/admin credentials (overview page of server)
- Configure in 'Server parameters' page
- Extensions => group related SQL objects in package

- Virtual local area networks (VLAN) & access central lists (ACL) to restrict network communication by source/destination network/protocol/port
  - ACL = list of resources/objects allowed access (such as router/load balancers to control traffic flow as defined by firewall rules)
- Connect to gateway public IP & port 1433
  - Redirects traffic to database cluster or proxy
  - DB cluster fowards traffic to specific DB
  - SQL DB cluster topology highly available with transparent replication
- Connect inside Azure service with default connect policy of Redirect
  - After connecting to DB through gateway, direct subsequent requests
  - Redirect failure redirects through DB copy on another server in cluster
- Connect outside of Azure
  - Default policy of proxy
  - Connect via gateway & request redirect via gateway (& serviced by 1/more DBs)
- DoS Guard
  - Denial of Service attack protection
  - Gateway services
  - Tracks failed logins from IP (number of failed attempts blocks IP)
- Gateway
  - Validates connecting clients
  - Encrypts Communication (client/DB)
  - Inpects network packet over client connection

  - asynchronous from master server (lag/latency)

  to load/remove with 1 command
  - built-in features
  - create extensions from psql tool to load into DB
  - Restricted extensions
- Read replicas ('Replication' page)
  - Read-only server
  - 5 asynchronously updated replicas with native technology
  - Increased performance/scale read-intenstive work loads
  - Read work loads isolated within replicas/write directed to master
  - BI/reporting analytics
  - Billed for vCore & GB storage/month

QUERY LANGUAGE

- Transact or T-SQL
- SQL version for Microsoft SQL Server & Azure SQL Database
- **Azure SQL DB Query Tool**
  1. Portal
  2. sqlcmd/Azure Cloud shell
  3. SQL Server Management Studio
  4. Azure Data Studio
  5. SQL Server Data Tools
- **Azure Portal**
  1. Query editor
  2. Create & run
- **SQL CMD**
  1. Install MS CLI utilities
  2. sqlcmd -S <server>.database.windows.net -d <database> -u <username> -p <password>
  3. sqlcmd success indicated by 1>

QUERY LANGUAGE

- MySQL CLI or Azure Cloud Shell
- GUI MySQL Workbench
- No extensions for Azure Data Studio
- **MySQL Workbench**
  1. Install
  2. Connect DB -> Parameters
  3. New query & execute (results grid with output)

QUERY LANGUAGE

- pgSQL => dialect of PostgreSQL
- pgAdmin GUI
- **psql CLI**
  1. In bash: psql --host=<server-name>.postgres.database.azure.com --username=<admin-user>@<server-name> --dbname=postgres
  2. Connect to database \c DB_name
  3. CREATE DATABASE DB_name;
  4. List databases \l
  5. List database tables \dt
- Azure Data Studio
  1. Install extension
  2. SERVERS -> New connection -> PostgreSQL
  3. New +Run query

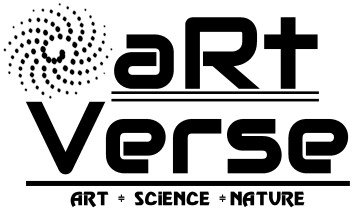
- **Azure Data Studio**
    1. Install GUI
    2. Create connection
    3. New query in SERVERS
    4. **T-SQL**
        1. CREATE/ALTER DATABASE [DB_name]
        2. -- for comments
        3. Use existing databases
        4. Cannot create single DB/elastic pool
        5. Create managed pool
    5. **SSMS**
        1. Connect server
        2. Expand Database
        3. New query & Execute
    - **SQL Data Visual Studio**
        1. Install development tools
        2. Tools -> SQL Server
        3. New Query
        4. Connect
        5. Execute

SQL QUERY LANGUAGE

- Data Manupulation Language (DML)
    - Manipulate rows in relational databases/table via query
    - SELECT, INSERT, UPDATE, DELETE, WHERE
    - INSERT one row at a time (INSERT INTO Table(Cols) VALUES (...)
    - UPDATE without WHERE clause updates all rows
    - DELETE doesn't prompt to prevent accidental data loss. Without WHERE clause deletes all rows

- Data Definition Language (DDL)
    - Create/modify/remove tables/stored procedures/views/objects
    - CREATE, ALTER, DROP, RENAME
    - DROP all table rows

- New databases:
    - Fields can be set to NOT NULL to specify manditory columns
    - PRIMARY KEY is not enforced
    - Specifly field data types, such as INT (integers) and VARCHAR (variable character length data)



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