# Cloud Computing for Beginners

## Database Technologies

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# How to use a specific database type?

- **Option #1 – DYI (on-premises)**
  - Most popular
  - On-premises installation
  - Software Installation + Configure + Monitor + Manage
- **Option #2 – DYI (Cloud-based)**
  - Cloud installation
  - IaaS Model – rent IT environment
  - Software Installation + Configure + Monitor + Manage
- **Option #3 – DBaaS…**

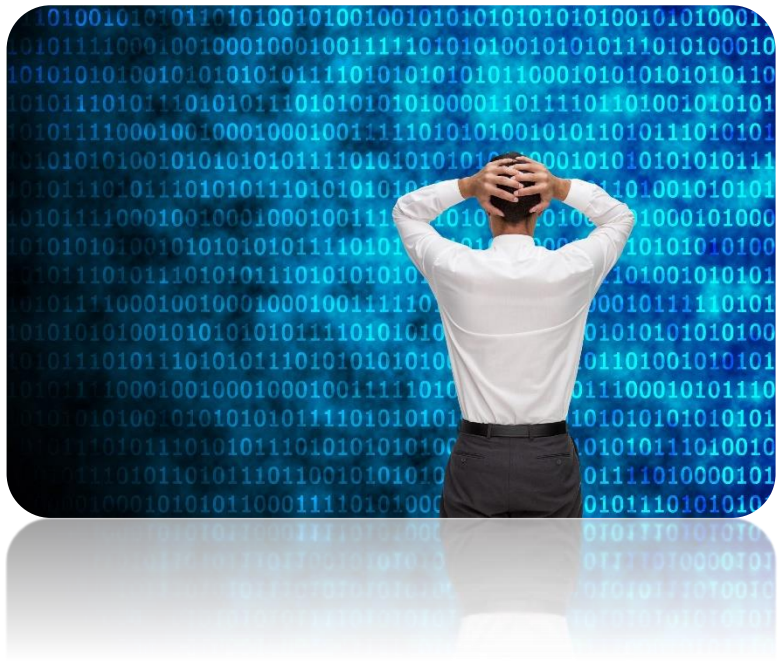
# Database as a Service(DBaaS)

## Concept, Advantages, Azure/AWS/GCP

# The Challenges of Database Management

The Era of Data Explosion

- **Large Organizations**
  - Handling a massive amount of data, generated from a variety of data sources
  - To be used for different use cases
  - **Operational challenges**
    - How to store and handle the data **using databases**?
    - Cost-effective
    - Provides the business benefits



# The Challenges of Database Management

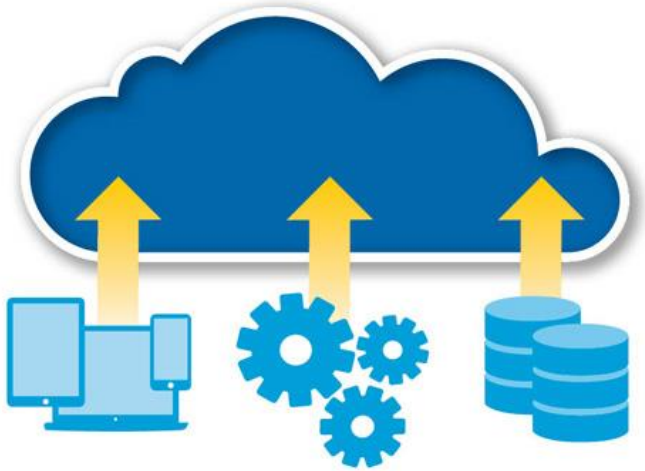
The **Traditional Approach** for Database Management

- **A New Database**
  - Someone is asking to create a new database instance
  - Typically a long internal process in most enterprise organizations
    - Change Request → Trouble Ticket to IT → Trouble Ticket to DBA
  - A labor-intensive and time-consuming process
- **Database Management**
  - Manual process by DB Admin
  - Tune and optimize the database according to the application workload
  - Large Organizations - hundreds of database instances
  - Under-utilized IT resources across the organization

# The Challenges of Database Management

The **Traditional Approach** for Database Management

- **Cloud Migration**
  - Many enterprise applications used to run in on-premises data centers moved to public clouds
  - Started with "lift and shift" strategy of existing applications
  - Using IaaS Model
  - The customer is **still handling the day-by-day database management tasks!**
- **Fully Managed Cloud Database Services**



# The Concept of DBaaS

What and Why?

- **Database as Service (DBaaS)**
  - A cloud computing service model
  - A flexible, scalable, and on-demand platform to **create and use** database systems
  - **Outsource** some of our responsibilities of handling and managing databases
  - A cloud service for **renting databases**
  - One of fastest-growing cloud-services in cloud computing


# The Concept of DBaaS

What and Why?

- **Self-Service Platform**
  - On-demand
  - Simple UI to create databases by end-users (step by step)
  - Fully automated process
  - UI or via APIs
- **Ongoing Database Management**
  - The cloud provider takes care of **almost everything!**
    - Backups
    - Security patches
    - Software upgrades
    - System health monitoring
    - Scaling actions

# The Concept of DBaaS

- **Private DBaaS** (vs. Public DBaaS)
  - Large companies that implemented this concept in their **private cloud**
  - Centralized the database allocation and management tasks
  - More flexible when end-users would like to get new databases
  - Support specific database software releases
  - Restrict the configurations that specific user can provision
- **We will focus on Public DBaaS**


# The Advantages of DBaaS

- #1 – Rapid Provisioning
  - On-demand provisioning of new databases
  - Automating the end-to-end process
  - Set up a database can be reduced to minutes
- #2 – Reduced Operational Overheard
  - Admin tasks - configuration, performance tuning, monitoring, upgrading, creating backups
  - A big portion of that overheard is moved to someone else
- #3 - Developer Agility
  - Developers are going to be one of main end-users for DBaaS
  - Directly impact the productivity of those developers
- #4 – Consolidated Unified Framework
  - Manage databases through automation and standardization

# The Advantages of DBaaS

- #5 – **Cost Saving**
  - **Public DBaaS** or **Private DBaaS**
  - No licenses for software
  - No hardware/IT resources
  - Less man-power for DB admin tasks
- #6 – **Granular Metering**
  - Everything is measured down to hours/seconds
  - Database service consumption time
  - Check and optimize costs

# The Advantages of DBaaS

- **#7 – Scalability**
  - The biggest advantages of DBaaS
  - On-demand scalability (up/down, out/in)
    - Using simple interface
    - Can be fully automated
  - Leverage the Pubic Cloud “endless” capacity
- **#8 - High Availability**
  - A public cloud - **many data centers** located in different locations worldwide
  - **Data will be replicated** to different data centers
  - Computing resources will be deployed in different places to increase redundancy
  - Reduce network latency