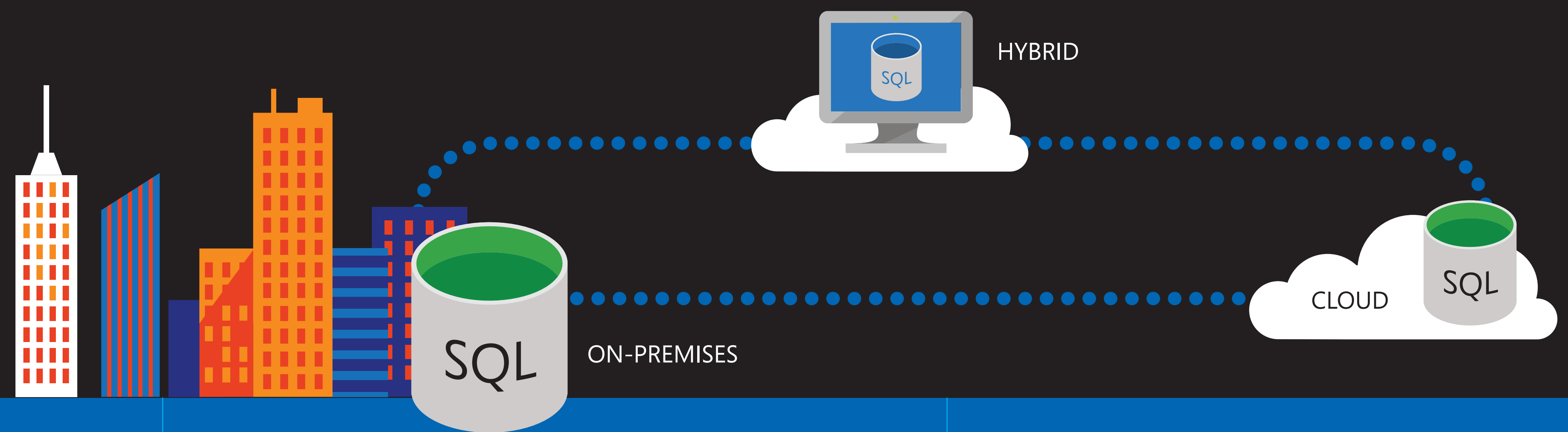


# SQL Server 2016

Use your skills now to work with SQL Server's new features: on-premises, in the cloud, and in between



## Ready to leap ahead

SQL Server 2016 has preminent, enterprise-ready features. You are ready to advance with SQL Server on Microsoft Azure, and with Azure SQL Database. Start benefiting today from the new world of SQL Server.

## Leader

Gartner has named Microsoft a leader in vision and ability to execute for their 2015 Magic Quadrant for Operational Database Management Systems.



## Cloud first

- Speed** Many new features go to the cloud first
- Agility** Spin up a test environment and move it to production when ready
- Feedback** Faster turnaround—we learn from you and make it better
- Proven** Many SQL Server 2016 features are first tested and proven in the cloud
- Go faster** Take advantage of the cloud and realize your ideas sooner

## SQL Server on Azure virtual machines

- Scalability** Largest VM sizes in the market (32 cores, 448 GB RAM, 64 TB disk, 2 GBs I/O)
- Business continuity** Multiple local and remote storage copies, Availability Groups across regions
- Flexibility** Largest number of gallery images in the market
- Ease of use** Automated configuration of high availability, patching, and backup

## Azure SQL Database

- Scalability** Create databases when you need them
- Elastic databases** Scale both size and performance characteristics
- Elastic pools** Add and subtract databases for easy management
- Elastic queries** Use T-SQL with sets of databases
- Troubleshoot** Use reports from the Workload Insights dashboard

## Hybrid + hyperscale

SQL Server 2016 and Microsoft Azure work together to provide new ways to store and scale data.

### Stretch DB

- Stretches on-premises tables to cloud
- Moves cold data to Azure cloud storage
- Keeps hot data on server
- Transparently stretch warm and cold OLTP data to Azure SQL Database

### Scale to the cloud

- Back up to Azure blob storage
- Schedule backups for system databases
- Support for Simple recovery model
- Hybrid backups for high availability and disaster recovery

### Snapshot

- Uses Azure blob storage for snapshots
- Recovery occurs in seconds

## High availability + disaster recovery

Recover from hardware failures or unexpected interruptions by redirecting traffic to secondary locations. Restore backups from a previous time to recover from user error.

### AlwaysOn Availability Groups

Primary and secondary replicas with automatic failover can exist on-premises or on Azure virtual machines.

### Point-in-time restore

Go back to a previous version of the database.

### Geo-replication + restore

Azure SQL Database automatically replicates to other Azure regions. Use active replication to access secondaries, or restore to any Azure region.

## Real-time + historical analytics

Analyze OLTP and historical data in real time. Perform operational analytics with minimal effect on performance of the OLTP operations. Query data from any point in time.

### Operational analytics

The ability to create updateable columnstore indexes over rowstores with little effort is an innovation that enables cutting-edge application developers to respond quickly to dynamic business conditions.

### Historical analytics

When data changes, previous values are recorded in the historical table. Querying constructs hide this complexity from users.

## Security

### 1 Who are you—authentication

- Active Directory—central access management
- Contained database authentication—makes your database portable

### 2 What you can see—access control

**Dynamic Data Masking**

- Non-privileged users can't see sensitive data
- Presets for credit cards, Social Security and email

**Row-level security**

- Access to rows based on group membership
- Uses policy to govern access
- Policy filters rows that can be viewed
- Multitenant apps logically partitioned

### 3 Securing secrets—encryption options

**Always Encrypted**

Sensitive data remains encrypted at all times: at rest, and in motion, with the ability to query. Only trusted apps can read the data.

- Master key unlocks column for queries
- Apps use exported certificates

## Advanced analytics

SQL Server 2016 integrates the R Language and scalable parallel algorithms directly into the database. R users and SQL Server users can build models using data in the database without moving it, and then use those models to store data in the database and add predictive analytics to their applications.

+

R =

COMMUNITY

PREDICTIONS

STATIC REPORTS

SQL Server 2016

- Build apps with R's rich set of packages
- Run R scripts and algorithms from T-SQL
- Data stays in SQL Server during modeling

R, the open source predictive analytics language most used by data scientists

- Proactive analytics allows you to be ready
- Predictive analytics helps you anticipate events
- Make better-informed decisions across your organization
- Run R scripts in SQL Server 2016, Hadoop, Linux, and Windows without change

## Beyond relational

In the real world, data comes in all forms. Simplify big data using PolyBase + native JSON.

### PolyBase

Query external Hadoop clusters or Azure blob storage as external tables using your T-SQL skills. Import external data into SQL Server 2016 for persistent storage. Export cold data from SQL Server to Hadoop or Azure blob storage while keeping it queryable.

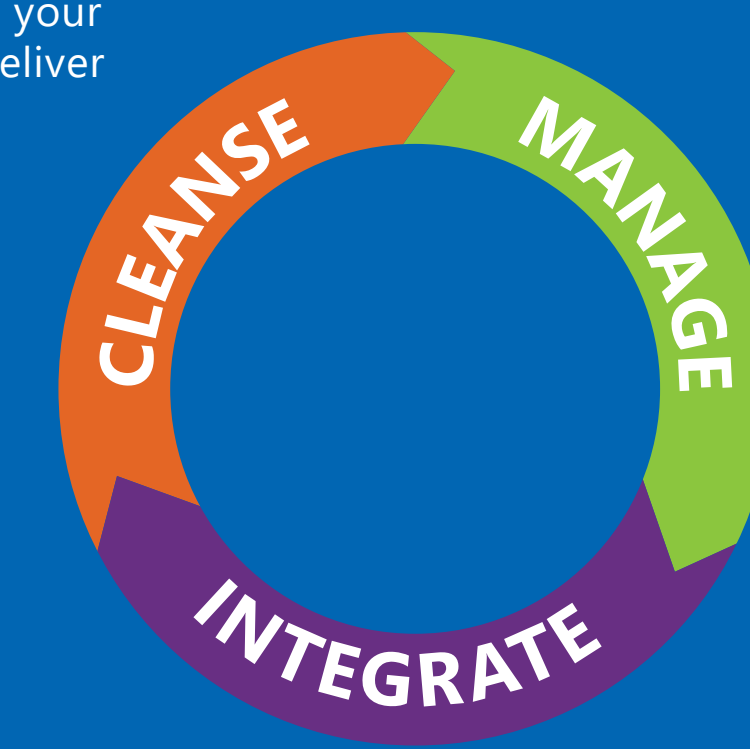
### Native JSON

Import and export data that is in JSON format. For NoSQL applications, allows interop with relational databases. Format query results as JSON using the syntax: FOR JSON.

## Enterprise information management

SQL Server 2016 offers a full suite of tools for curating your data. These produce accurate, trustworthy data and deliver credible, consistent results to the right users with end-to-end integration, cleansing, and management.

- Data Quality Services**
  - Knowledge-based data cleansing and matching
  - Standalone and integrated with SQL Server Integration Services 2016
- Integration Services**
  - Integrated development and management
  - Improved user experience
- Master Data Services**
  - Excel UI for managing data and dimensions
  - Rapid data loading



## Business intelligence

SQL Server 2016 helps gain business insights faster and more easily through improved performance and new modeling capabilities. Deliver insights through mobile BI reports and modernized paginated reports, or by using a hybrid approach with Power BI in the cloud.

### Data sources

- SQL Server
- Analytics Platform System
- Azure SQL Data Warehouse
- 3rd party data sources

### SQL Server Analysis Services 2016

- Tabular
  - DirectQuery
  - In-memory
- Multidimensional
  - ROLAP
  - MOLAP

### BI tools

- SQL Server Reporting Services 2016
  - Paginated reports
  - Mobile reports
- Power BI
- Excel

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