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Microsoft SQL Server

- Overview
- Installation
- Configuration

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Microsoft SQL Server: History

Version	Year	Release
1.0 (OS/2)	1989	SQL Server 1.0 (16-bit)
1.1 (OS/2)	1990	SQL Server 1.1 (16-bit)
4.2A (OS/2)	1992	SQL Server 4.2A
4.2B (OS/2)	1993	SQL Server 4.2B (16-bit)
4.21a (WinNT)	1993	SQL Server 4.21a
6.0	1995	SQL Server 6.0
6.5	1996	SQL Server 6.5
7.0	1998	SQL Server 7.0
-	1999	SQL Server 7.0 OLAP Tools
8.0	2000	SQL Server 2000
8.0	2003	SQL Server 2000 64-bit Edition
9.0	2005	SQL Server 2005
10.0	2008	SQL Server 2008
10.25	2010	Azure SQL database (initial release)
10.50	2010	SQL Server 2008 R2
11.0	2012	SQL Server 2012
12.0	2014	Azure SQL database
12.0	2014	SQL Server 2014
13.0	2016	SQL Server 2016
14.0	2017	SQL Server 2017
15.0	2019	SQL Server 2019 RC

Old version | Older version, still maintained | **Latest version**

SQL and NoSQL: core differences

Relational (SQL) databases

- Predefined schemas to determine the structure of data
- Structured language to make requests (SQL or TSQL in case of MS)
- Most vertically scalable (performance depends on CPU, RAM and disks speed). Practically, not possible to scale horizontally
- SQL databases are table-based (one type of data per column)

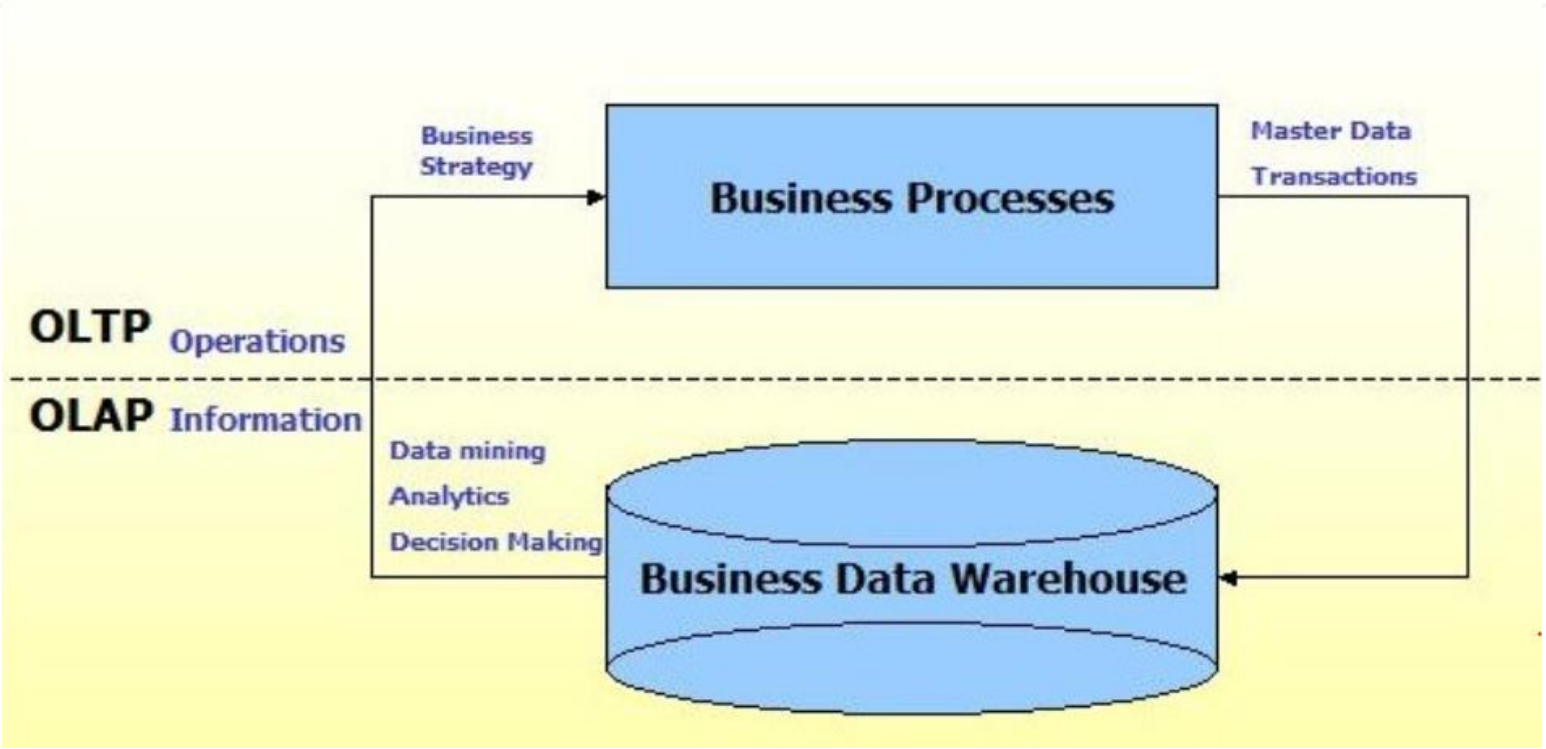
Examples: MySQL, Oracle, PostgreSQL, Microsoft SQL Server

Non-relational (NoSQL) databases

- Dynamic schema for unstructured data
- Not SQL languages (java, python, any custom)
- Horizontally scalable. (Traffic sharding, adding more instances)
- NoSQL databases are document-based, key-value pairs, graph databases or wide-column stores (any type of data in the same column)

Examples: MongoDB, gcp BigTable, Redis, RavenDB, Cassandra, HBase

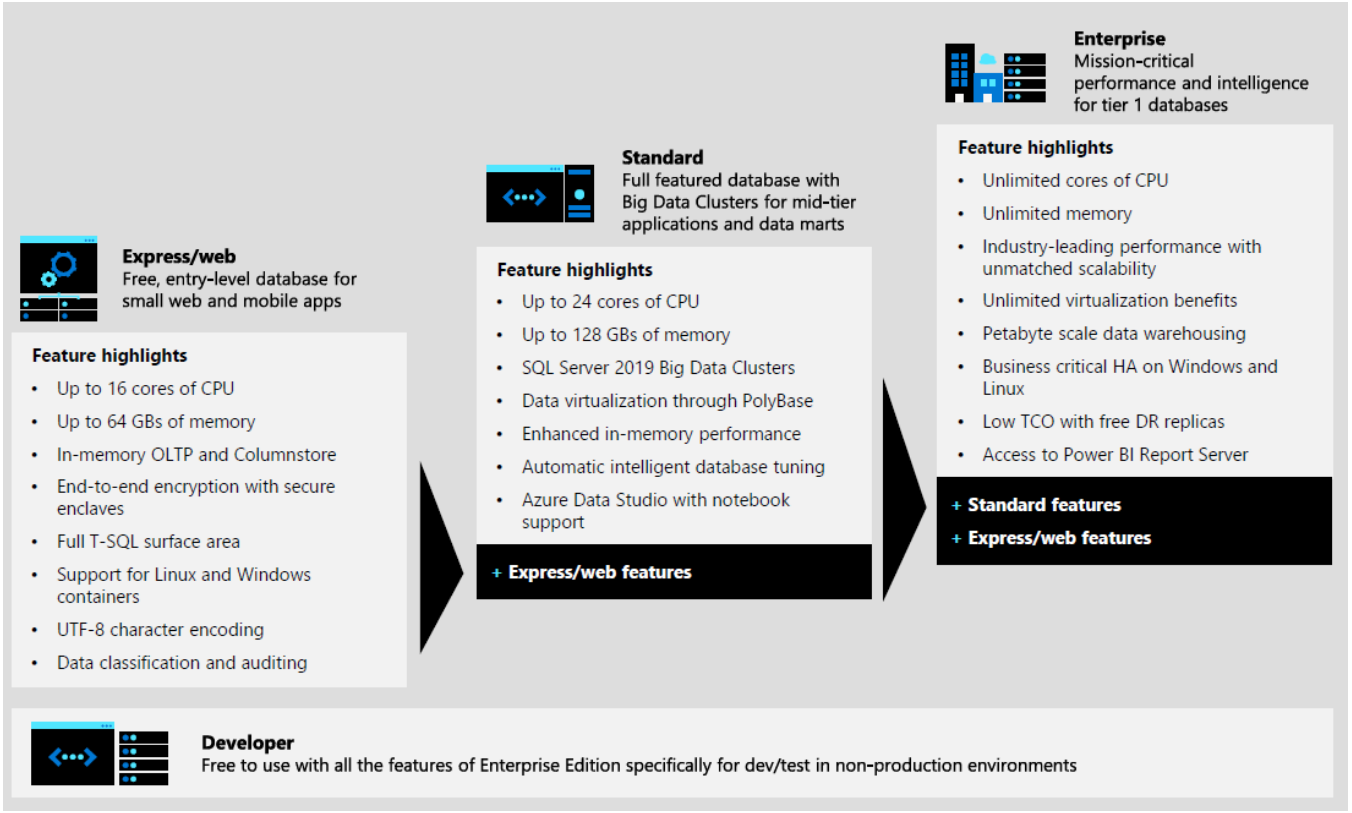
Data Processing types. OLTP and OLAP



Microsoft SQL server. Components

- SQL Server Database Services
- Analysis Services
- Reporting Services
- Integration Services
- Master Data Services
- Machine Learning Services
- Connectivity Components
- SQL Server Management Studio
- SQL Server Configuration Manager
- SQL Server Profiler
- Database Engine Tuning Advisor
- Data Quality Client
- SQL Server Data Tools

Microsoft SQL server 2019. Editions



Microsoft SQL server 2019. Licensing

- Core-based licensing (4 cores starts from, 1-core step)
- Server and Client Access License (CAL) licensing (1 license for each connection, could be used for multiple instances + 1 license for each server installation)

SQL Server 2019 Edition	Licensing Options	
	Server + CAL	Per Core
Enterprise		•
Standard	•	•
Developer	Free edition	
Express	Free edition	

Microsoft SQL server. Planning and installation

Two types of instances:

- Default instance (1 per VM)
- Named instance (up to 50 on 1 VM)

To plan installation of SQL server following factors should be considered:

- Required components and features (Install only features you need to work)
- Minimal hardware resource requirements (1 core CPU 1.4 GHz and 1 GB RAM)
- Service account identities (Custom AD accounts or default system service accounts)
- Default data file locations (including recommends to use different disks for DB, Logs, backups and so on)
- Server collation (specified collation to control how character data is sorted and stored.)
- Windows 10 or Windows Server 2016+

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Demo

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Microsoft SQL server. Best Practices

Key Points	Description
Security Identities	Active Directory domain accounts is the only recommended setup for SQL Server services working over the network.
Firewall	1433 TCP port is default for connecting to Database Engine Services 1434 UDP is required to connect to named instances
SQL Server Browser Service	Is responsible for connection to named instances
SQL Server Configuration Manager	TCP/IP protocol must be enabled for remote connections to the instance
SQL Server Management Studio	Integrated environment for managing any SQL infrastructure. Is installed separately.