SQL Server 2016

Everything built-in

Alexandru Petculescu
MCSE Data Platform
alexandru.petculescu@24software.ro
SQL Server 2016: Everything built-in

Industry leader in Mission Critical OLTP

Most secure database

Highest performing data warehouse

End-to-end mobile BI on any device

In-database Advanced Analytics

Leader 2 years in a row

6 years in a row least vulnerable

#1 performance

A fraction of the cost

R + in-memory

Consistent experience from on-premises to cloud

In-memory across all workloads

The above graphics were published by Gartner, Inc. as part of a larger research document and should be evaluated in the context of the entire document. The Gartner document is available upon request from Microsoft. Gartner does not endorse any vendor, product or service depicted in its research publications, and does not advise technology users to select only those vendors with the highest ratings or other designation. Gartner research publications consist of the opinions of Gartner’s research organization and should not be construed as statements of fact. Gartner disclaims all warranties, expressed or implied, with respect to this research, including any warranties of merchantability or fitness for a particular purpose.

National Institute of Standards and Technology Comprehensive Vulnerability Database update 10/2015

Industry leading TCO

**Built-in with SQL Server vs. expensive add-ons with Oracle**

- **In-memory** built-in
- **End-to-end security** built-in
- **Advanced Analytics** built-in
- **Complete mobile BI** built-in

Note: For OLTP and DW scenario, the price comparison is based on a server with 2 proc, 8 cores each.
Real-time operational analytics

In-memory built-in

- Up to 30x faster transactions with in-memory OLTP
- Queries from minutes to seconds
- Real-time operational analytics

Mission critical OLTP
Dramatically simplify HA & DR

+35% operational efficiencies with hybrid cloud

**Enhanced AlwaysOn**

- Easy Setup of on-premises and hybrid cloud HA & DR
- Load balancing of readable secondaries
- Fast failover on-premises or to cloud

**Lufthansa Systems 35%**
Most secure database

Layers of protection

- **Monitor activity**
  - Advanced Threat Analytics
  - SQL Server auditing

- **Control access**
  - Windows Authentication
  - Row-level security
  - Dynamic data masking

- **Protect data**
  - Always Encrypted
  - Transparent data encryption

Least vulnerable 6 years in a row & most utilized

*National Institute of Standards and Technology Comprehensive Vulnerability Database update 10/2015*
Protect your data at rest and in motion without impacting database performance

Always Encrypted

Apps

Trusted

SELECT Name FROM Patients WHERE SSN=@SSN

@SSN='198-33-0987'

Result Set

Linked Network

Enhanced ADO.NET Library

SQL Server

SELECT Name FROM Patients WHERE SSN=@SSN

@SSN=0x7ff654ae6d

Column Encryption Key

Protected Data

198-33-0987

NEW*

Column Master Key

Result Set

<table>
<thead>
<tr>
<th>Name</th>
<th>SSN</th>
<th>Country</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denny Usher</td>
<td>0x7ff654ae6d</td>
<td>USA</td>
</tr>
<tr>
<td>Philip Wegner</td>
<td>1x7fg655se2e</td>
<td>USA</td>
</tr>
<tr>
<td>Alicia Hodge</td>
<td>0y8fj754ea2c</td>
<td>USA</td>
</tr>
</tbody>
</table>

dbo.Patients
#1 Price/performance with massive scale

**#1 TPC-H**
10 TB TPC-H world record*
@ ½ hardware costs

**24X TPS boost**
In throughput on the same hardware

**#1 SAP performance**
2-tier 16-processor SAP benchmark on Superdome X + SQL Server

* As of 4/6/2015 [http://www.tpc.org/3312]

**Unparalleled scalability**
with Windows Server 2016

12TB of memory
WS 2016 max cores
Highest performing data warehouse

*In-memory built-in*

**On-premises, cloud, or hybrid**

- **SMP**
  - Data marts
  - SQL Server

- **MPP**
  - Petabyte-scale
  - SQL Server + Analytics Platform System

- **SMP**
  - Data marts
  - SQL Server in Azure VM

- **MPP**
  - Petabyte-scale
  - Azure SQL Data Warehouse

- **Scale to MPP**
  - on-premises & in the cloud

- **Simple T-SQL**
  - to manage structured and unstructured data

- **½ the cost**
  - of Oracle Exadata

**Consistent experience** from on-premises to cloud
End-to-end mobile BI on any device

**Lightning fast** queries & reports

- **In-memory** built-in
- **Reduce time to insight** with direct query
- **Powerful modeling** support for 50+ new DAX functions

Reports in **minutes** not days

**PB scale DW** in SQL Server

---

On all mobile devices

- **Mobile BI** built-in
- **Online & offline** access
- **Rich visualizations** using Power BI or enhanced Reporting Services

---

NEW 

Windows  Apple  iOS  Android  HTML5
Remove the complexity of big data

T-SQL over Hadoop

Manage structured & unstructured data

- **Simple T-SQL**
  to query Hadoop data (HDFS)

- **JSON support**

<table>
<thead>
<tr>
<th>Name</th>
<th>DOB</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>Denny Usher</td>
<td>11/13/58</td>
<td>WA</td>
</tr>
<tr>
<td>Gina Burch</td>
<td>04/29/76</td>
<td>WA</td>
</tr>
</tbody>
</table>
In-database Advanced Analytics
Build intelligent applications with SQL Server R Services

- R built-in to your T-SQL
- Real-time operational analytics without moving the data
- Open Source R with in-memory & massive scale - multi-threading and massive parallel processing

R built-in to SQL Server
Continuous Innovation

Cloud-First Approach

- Speed
- Agility
- Proven
- Feedback

SQL Server 2016

- Advanced Analytics
- End-to-end mobile BI
- Enterprise-grade DW
- Mission critical OLTP

The best SQL Server release in history
Cut storage costs with Stretch Database

Stretch Database with Always Encrypted

Data is encrypted & queryable

Save money & improve customer experience

No application changes

<table>
<thead>
<tr>
<th>Name</th>
<th>SSN</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Philip Wenger</td>
<td>cm61ba906fd</td>
<td>2/28/2005</td>
</tr>
<tr>
<td>Denny Usher</td>
<td>ox7ff654ae6d</td>
<td>3/18/2005</td>
</tr>
<tr>
<td>Alicia Hodge</td>
<td>i2y36cg776rg</td>
<td>4/10/2005</td>
</tr>
<tr>
<td>Alta Levy</td>
<td>nx290pldo90l</td>
<td>4/27/2005</td>
</tr>
<tr>
<td>Dionne Hardin</td>
<td>ypo85ba616rj</td>
<td>5/12/2005</td>
</tr>
<tr>
<td>Kristy Flowers</td>
<td>bae51e806fd</td>
<td>5/22/2005</td>
</tr>
</tbody>
</table>
Only Microsoft delivers
On-premises & cloud

Consistent experience is everything

- SQL Server
- SQL Server in Azure VM
- Azure SQL Database
- Analytics Platform System
- Azure SQL Data Warehouse

- **Common tools** for development and management
- **Common T-SQL** surface area
- **Simple** cloud migration

<table>
<thead>
<tr>
<th>Common tools</th>
<th></th>
<th>Identity</th>
<th>Virtualization</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dev ops tools</td>
<td>Management tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Single-vendor support</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Upgrade easily
Without breaking changes

New tools built-in to ease upgrades

SQL Server 2005 ➔ Clone environment ➔ SQL Server 2014 ➔ Upgrade & compatibility testing ➔ ✓

New upgrade advisors

- **Accelerate upgrade cycle** with new tools built-in
- Upgrade and optimize existing query plans with new **Query Data Store**

NEW
Migrate from other top databases

With free tools from Microsoft

SQL Server migration assistant

- **Simplify migration** to SQL Server
- **Saves you** time and money
For all your applications
Innovations across all editions

- Up to 30x faster transactions, 100x faster queries with InMemory
- Real-time operational analytics without impacting performance
- Only data solution to encrypt your data at rest and in motion
- Connect your relational data to big data with PolyBase
- Unparalleled choice for developer tools and languages

T-SQL, PHP, Java, Node.js, C/C++, Python, C#/VB.NET, Ruby

SQL Server 2016 SP1
Available now
On the platform of your choice

SQL Server v.Next

*SQL Server v.Next Public Preview available now on Linux, Windows, and Docker.

Targeting CY2017
Database engine enhancements

SQL Server on the platform of your choice

- **Linux distributions** including Red Hat Enterprise Linux (RHEL), Ubuntu, and SUSE Linux Enterprise (SLES)
- **Linux containers for Docker engine on MacOS, Windows and Linux**: Windows and Hyper-V container for SQL Server on Windows
- **Package-based installation**, yum install, apt-get, zypper and more options
Bringing SQL Server to Linux is another way we are making our products and new innovations more accessible to a broader set of users and meeting them where they are.

Scott Guthrie
Microsoft
Migrate to SQL Server v.Next
Get free SQL Server licenses today when you migrate!*

Identify apps for migration
Use migration tools and partners
Deploy to production
Run SQL Server v.Next

Oracle
Sybase
DB2

SQL Server Migration Assistant
Global partner ecosystem
SQL Server 2016 on Windows
OR
SQL Server v.Next CTP

Deploy today and easily migrate to v.Next
Test your app today and go live close to GA with the Early Adoption Program
Easily upgrade to SQL Server v.Next GA
Use simple backup and restore from Windows to Linux
Easily upgrade to SQL Server v.Next GA
Go-live

Software Assurance subscription required. Some restrictions may apply. Limited time offer—free training and subsidized deployment services available until December 31, 2016.
Thousands of ISVs build on SQL Server

Healthcare
- Cerner
- Siemens medical
- McKesson
- GE Healthcare
- Epic

Manufacturing
- Honeywell
- Autodesk
- Rockwell Automation
- PTC
- Dassault Systèmes

Power & utilities
- Halliburton
- Esri
- Pros
- Schlumberger
- Temenos

Banking & capital markets
- OpenText
- Bloomberg
- Thomson Reuters
- Sungard
- Lufthansa

Hospitality & travel
- Boeing
- SITA
- Panasonic
- Par
Customers using SQL Server for Tier 1