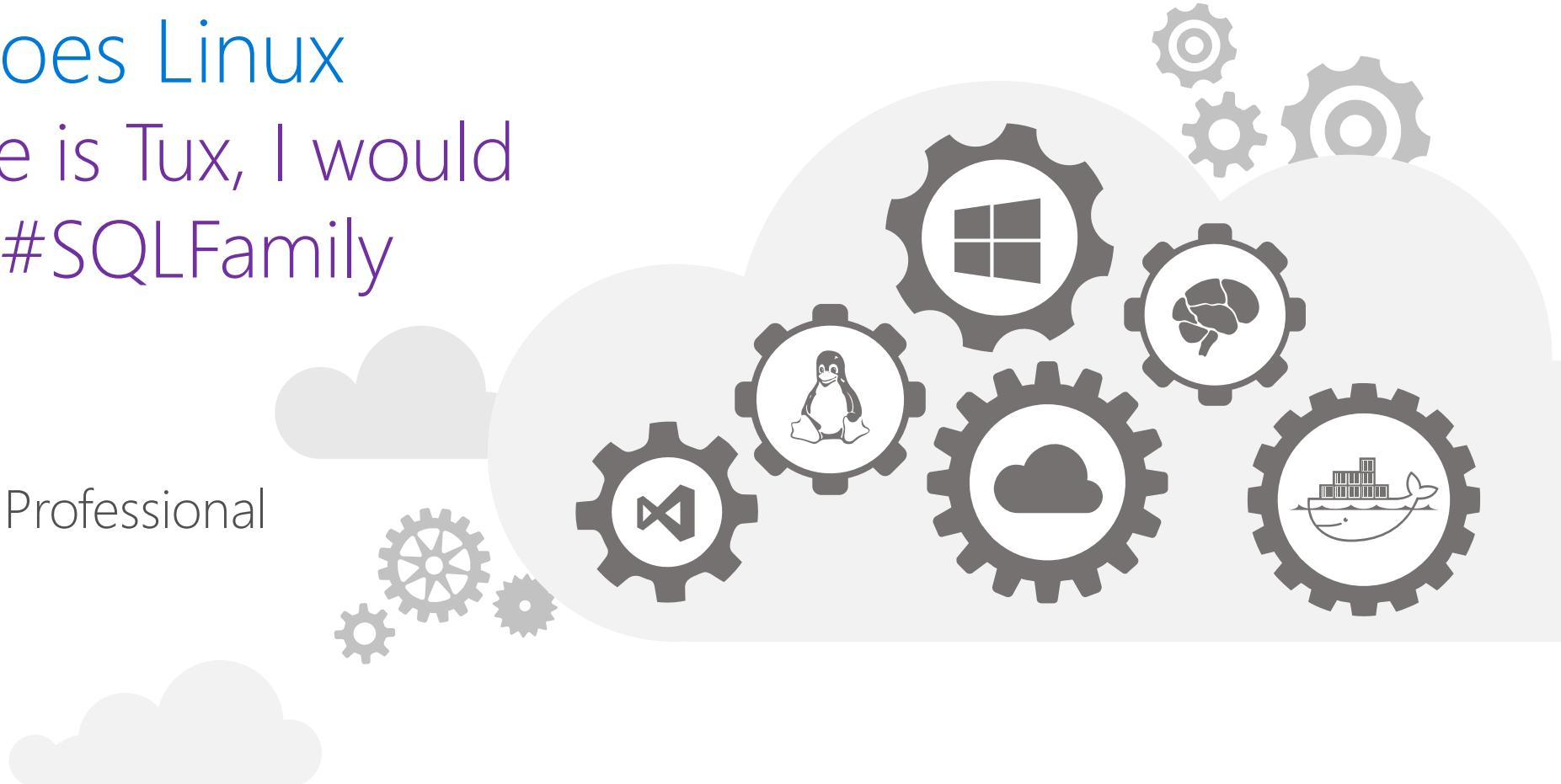


SQL Server goes Linux

Hello, my name is Tux, I would
like to join the #SQLFamily

Andre Essing
Technology Solutions Professional
Data Platform

26.09.2017





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Andre advises, in his role as Technology Solutions Professional, customers in topics all around the Microsoft Data Platform. He is specialized in mission critical systems, high-availability, security, operating and of course the cloud.

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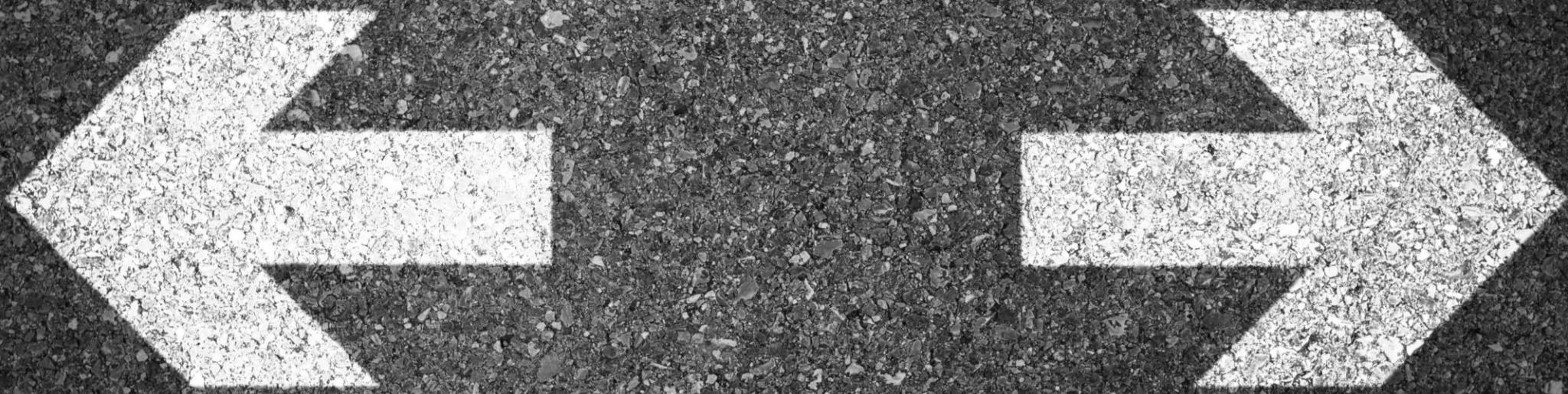
✖ [/Andre_Essing](https://www.linkedin.com/in/Andre_Essing)

in [/aessing](https://www.linkedin.com/in/aessing)

twitter [@aessing](https://twitter.com/@aessing)

github [aessing](https://github.com/aessing)

The platform of your choice



Database engine enhancements

SQL Server on the platform of your choice

Linux



redhat.



ubuntu

Linux/Windows container



Windows



Windows Server

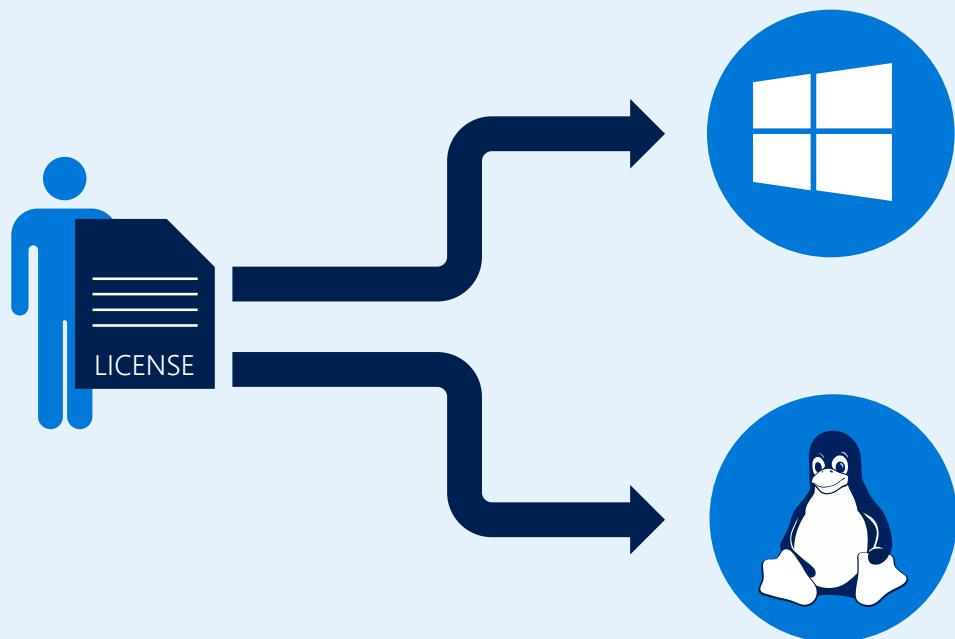


Windows 10

- **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

Licensing

Same license, new choice



- Buying a SQL Server license per-server or per-core grants the option to use it **on Windows Server or Linux**
- **Same set of editions on Linux**
Developer, Express, Standard, Web, Enterprise

What's coming in SQL Server on Linux

		Windows	Linux GA
Editions	Developer, Express, Web, Standard, Enterprise	●	●
Services	Database Engine	●	●
	R Services, Integration Services, Analysis Services, Reporting Services, MDS, DQS	●	
Mission critical performance	Maximum number of cores Maximum memory utilized per instance Maximum database size Basic OLTP (Basic In-Memory OLTP, Basic operational analytics) Advanced OLTP (Advanced In-Memory OLTP, Advanced operational analytics) Basic high availability (2-node single database failover, non-readable secondary) Advanced HA (Always On - multi-node, multi-db failover, readable secondaries)	Unlimited 12 TB 524 PB ● ● ● ●	TBD TBD TBD ● ● ●
Security	Basic security (Basic auditing, Row-level security, Data masking, Always Encrypted) Advanced security (Transparent Data Encryption)	● ●	● ●
Data warehousing	PolyBase ² Basic data warehousing/data marts (Basic In-Memory ColumnStore, Partitioning, Compression) Advanced data warehousing (Advanced In-Memory ColumnStore) Advanced data integration (Fuzzy grouping and look ups)	● ● ● ●	● ● ● ●
Tools	Windows ecosystem: Full-fidelity Management & Dev Tool (SSMS & SSDT), command line tools Linux/OSX/Windows ecosystem: Dev tools (VS Code), DB Admin GUI tool, command line tools	● ●	● ●
Developer	Programmability (T-SQL, CLR, Data Types, JSON) Windows Filesystem Integration - FileTable	● ●	● ●
BI & Advanced Analytics	Basic Corporate Business Intelligence (Multi-dimensional models, Basic tabular model) Basic "R" integration (Connectivity to R Open, Limited parallelism for ScaleR) Advanced "R" integration (Full parallelism for ScaleR)	● ● ●	
Hybrid cloud	Stretch Database	●	

What's working already?

Operations Features

- Support for RHEL, SUSE, Ubuntu, Docker
- Package based installs, Docker image
- Support for Open Shift, Kubernetes, Docker Swarm, DC/OS
- Failover Clustering & Availability Groups through Pacemaker
- Backup/Restore
- SSMS on Windows connected to Linux
- Command line tools: sqlcmd, bcp, sqlpackage
- SQL Server Agent
- Replication
- Log Shipping
- Transparent Data Encryption
- SCOM Management Pack
- DMVs
- Full Text Search

Programming Features

- All major language driver compatibility
- In memory OLTP and ColumnStore
- Compression
- Always Encrypted, Row Level Security, and Data Masking
- Service Broker
- Change Data Capture
- Partitioning
- Auditing
- CLR
- JSON, XML
- Third party tools

...and more!



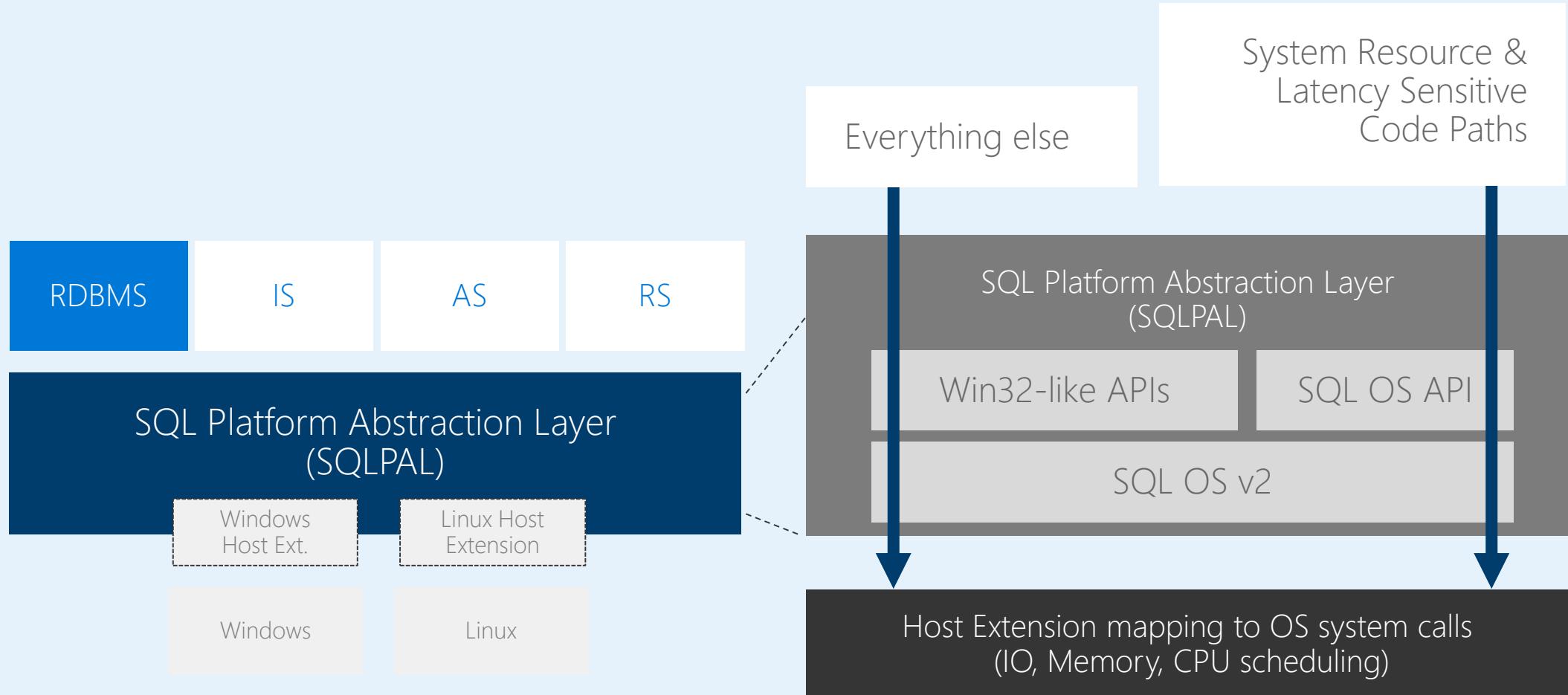
Demo

How to get started

Project „Drawbridge“



System Architecture



High Availability & Disaster Recovery



What's coming in SQL Server 2017 for Linux

High availability and disaster recovery

Simple HADR

VM Failure

- Resilience against guest & OS level failures
- Planned & unplanned events
- Minimum downtime for patching and upgrades
- Minutes RTO

Backup/Restore

- Protection against accidental or malicious data corruption
- DR protection
- Minutes to hours RTO

Standard HADR

Failover Cluster

- Instance level protection
- Automatic failure detection & failover
- Seconds to minutes RTO
- Resilience against OS and SQL Server failures

Basic Availability Groups

- AG with 2 replicas

Log Shipping

- Warm standbys for DR

Mission-Critical HADR

Availability Groups

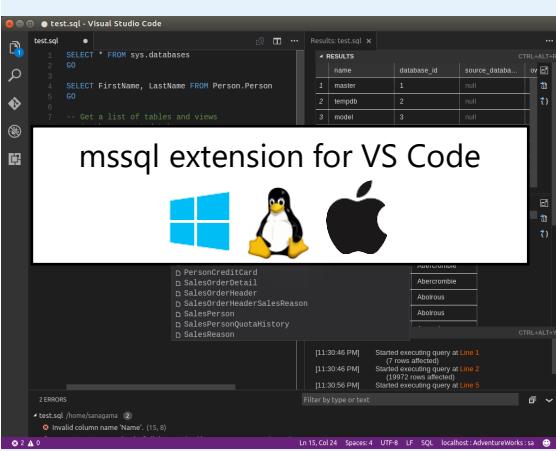
- Database level protection
- Seconds RTO
- No data loss
- Recover from unplanned outage
- No downtime for planned maintenance
- Offload read/backup workload to active secondaries
- Failover to geographically distributed secondary site

SQL Server Tooling

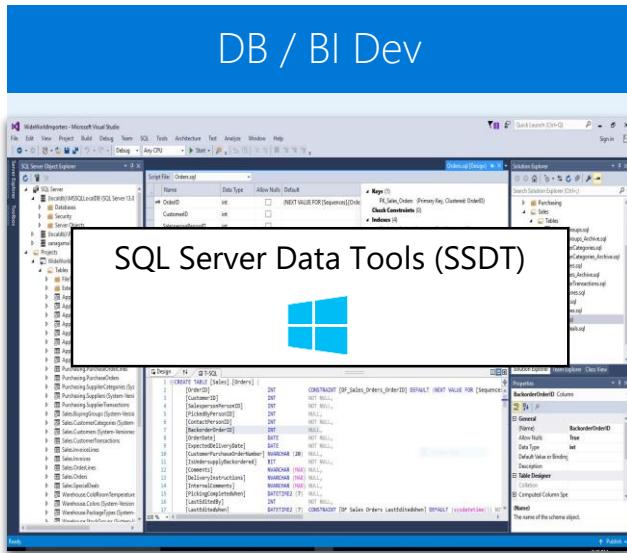


SQL Tools Available Today

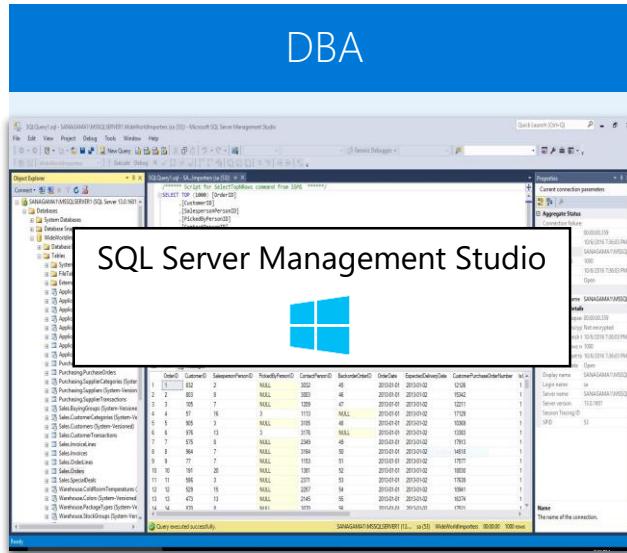
AppDev



DB / BI Dev



DBA



Sysadmin



- Connect to SQL anywhere
- Editor + IntelliSense
- Run ad-hoc T-SQL
- View results
- Export results as CSV, JSON

- Online/Offline project-based dev
- Visual DB/table design
- Source Code Control
- CI/CD
- Schema Compare
- Data Compare
- DB Unit Testing

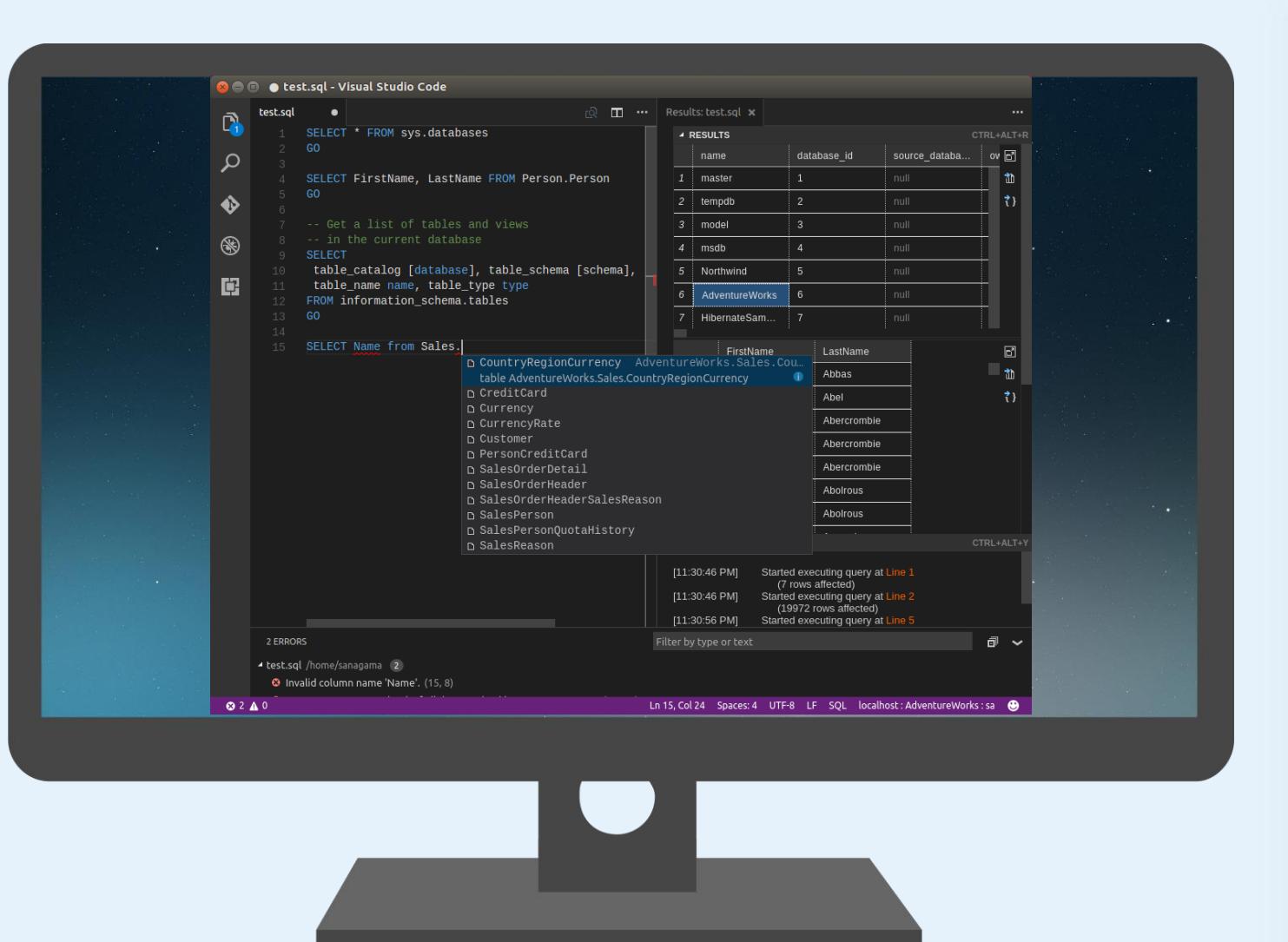
- HA + DR
- Backup / Restore
- DB config, maintenance
- Data security & compliance
- Generate T-SQL scripts
- Monitor
- Troubleshoot Performance

CLI Tools
SQL PowerShell cmdlets

sqlcmd: run ad-hoc T-SQL
bcp: bulk load/save data
mssql-conf: configure SQL

What's coming in SQL Server 2017 for Linux

Tools and programmability



A screenshot of the Visual Studio Code interface. On the left, a code editor window titled "test.sql" displays several SQL queries. One query is highlighted, showing a dropdown menu with options like "CountryRegionCurrency", "Adventureworks.Sales.Cou...", and "Adventureworks.Sales.CountryRegionCurrency". The right side of the screen shows the "Results" panel for the "test.sql" query, displaying a table with columns "name", "database_id", and "source_database_name". The table lists seven databases: master, tempdb, model, msdb, Northwind, AdventureWorks, and HibernateSam... The "AdventureWorks" row is selected. Below the results table, there is a preview pane showing a list of names from the Sales table. At the bottom of the interface, a status bar shows the file path "/home/sanagama/test.sql", line 15, column 24, and other details like "Ln 15, Col 24 Spaces: 4 UTF-8 LF SQL localhost:AdventureWorks:sa".

- Windows-based SQL Server tools like SSMS, SSDT, Profiler work when connected to SQL Server on Linux
- 3rd party tools continue to work
- Native command line tools: sqlcmd, bcp, sqlpackage
- Visual Studio Code extension
- New cross-platform DB admin GUI tool (planned)
- All existing drivers and frameworks supported



Demo Visual Studio Code



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