MS-SQL SERVER On RHEL

Red Hat

AGENDA

- Overview - Red Hat & Microsoft Partnership
- MS SQL Server on RHEL
- Q & A

Microsoft
&
Red Hat
Partnership

Red Hat

Strategic Partnership between Red Hat & Microsoft

Integrated support services for hybrid clouds, including Red Hat® products in on-premise customer environments and on Microsoft Azure

Microsoft .NET integration and availability with Red Hat Enterprise Linux®, including OpenShift Container Platform by Red Hat

Red Hat products offered and supported on Microsoft Azure.

Microsoft Windows supported on Red Hat OpenStack® Platform and Red Hat Enterprise Virtualization.

Management tooling integration for open hybrid cloud implementations with Red Hat CloudForms

Microsoft joins the Red Hat Certified Cloud and Service Provider program (CCSP)

RHEL is Microsoft's Reference Linux Platform for SQL Server

Microsoft offers SQL Server versions 2017 and 2019 on Red Hat Enterprise Linux, both on premises and on Microsoft Azure

Both SQL Server 2017 & 2019 on RHEL are also available in the Azure gallery
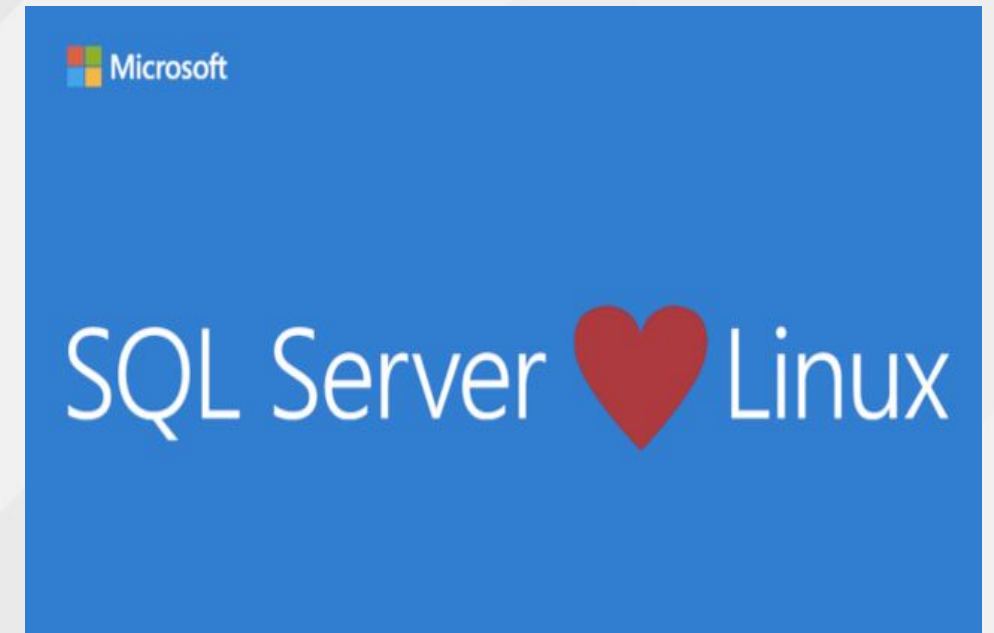
# MS SQL Server on RHEL

Red Hat

Announcing SQL Server on Linux

"This will enable SQL Server to deliver a consistent data platform across Windows Server and Linux, as well as on-premises and cloud," said Scott Guthrie, Executive Vice President Cloud and Enterprise Group, Microsoft

"SQL Server's proven enterprise experience and capabilities offer a valuable asset to enterprise Linux customers around the world," said Paul Cormier, President, Products and Technologies, Red Hat."
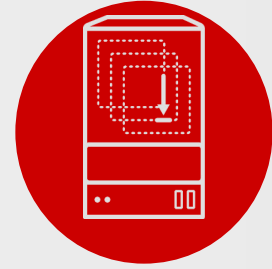

Microsoft and Windows are U.S. registered trademarks of Microsoft Corporation.

Delivering Choice: Microsoft SQL Server on Red Hat Enterprise Linux
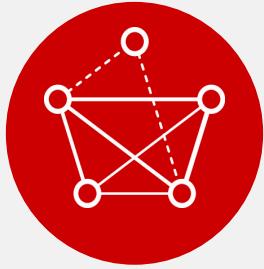
Consistent experience across your hybrid-cloud

Fast deployment, portability and trust via containers

Benchmark-breaking performance

Lower TCO for price/performance

Quick issue resolution via co-located support

Enhanced security features and coordinated response

Red Hat Enterprise Linux for Microsoft SQL Server 2019
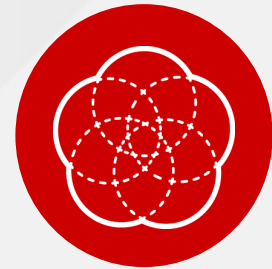
Consistent experience across your hybrid cloud

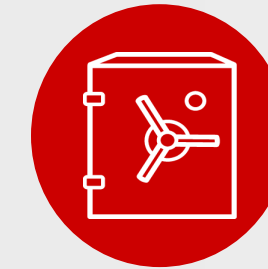Fast deployment, portability and trust via containers

Benchmark-breaking performance

Lower TCO for price/performance

Quick issue resolution via co-located support

Enhanced security features and coordinated response

Microsoft's reference Linux platform for Microsoft SQL Server across hybrid cloud

- Red Hat Enterprise Linux brings security, stability, reliability and manageability for Microsoft SQL Server wherever you choose to deploy.

Red Hat Enterprise Linux for Microsoft SQL Server 2019

Consistent experience across your hybrid cloud

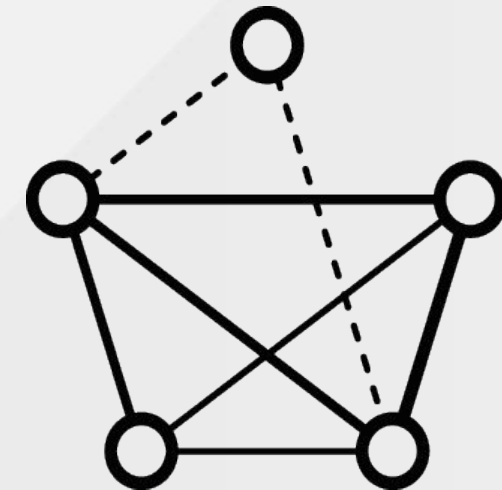Fast deployment, portability and trust via containers

Benchmark-breaking performance

Lower TCO for price/performance

Quick issue resolution via co-located support

Enhanced security features and coordinated response

Flexibility and portability of an image-based deployment method across environments

- Developers can quickly generate pre-configured deployments of SQL Server 2017 in containers, Including all dependencies at the push of a button

Red Hat Enterprise Linux for Microsoft SQL Server 2019

Consistent experience across your hybrid cloud

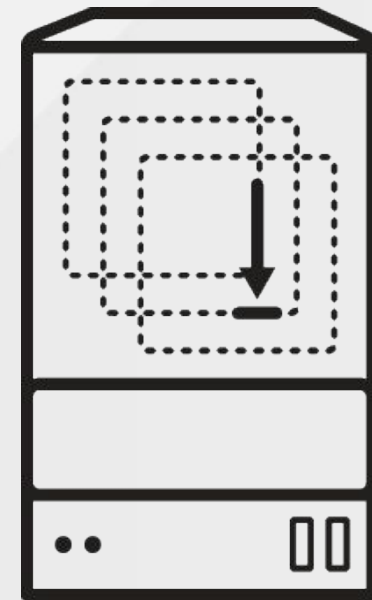Fast deployment, portability and trust via containers

Benchmark-breaking performance

Lower TCO for price/performance

Quick issue resolution via co-located support

Enhanced security features and coordinated response

#1 in 1TB TPC-H non-clustered results

#1

SQL Server 2017 on Red Hat Enterprise Linux surpasses the previous #1 TPC-H@1000GB result achieved with SQL Server 2016

- 6% higher performance

(As of 4-19-2017. http://www.tpc.org/3327 http://www.tpc.org/3320)

Red Hat Enterprise Linux for Microsoft SQL Server 2019

Consistent experience across your hybrid cloud

Fast deployment, portability and trust via containers

Benchmark-breaking performance

Lower TCO for price/performance

Quick issue resolution via co-located support

Enhanced security features and coordinated response

#1 in 1TB TPC-H non-clustered results

SQL Server 2017 on Red Hat Enterprise Linux surpasses the previous #1 TPC-H@1000GB result achieved with SQL Server 2016

- 5% better price/performance

(As of 4-192017. http://www.tpc.org/3327 http://www.tpc.org/3320".)

Red Hat Enterprise Linux for Microsoft SQL Server 2019

Consistent experience across your hybrid cloud

Fast deployment, portability and trust via containers

Benchmark-breaking performance

Lower TCO for price/performance

Quick issue resolution via co-located support

Enhanced security features and coordinated response

Red Hat and Microsoft co-located support model

- Available for Red Hat offerings on Azure and on premise integrated solutions
- Available globally

Red Hat Enterprise Linux for Microsoft SQL Server 2019

Consistent experience across your hybrid cloud

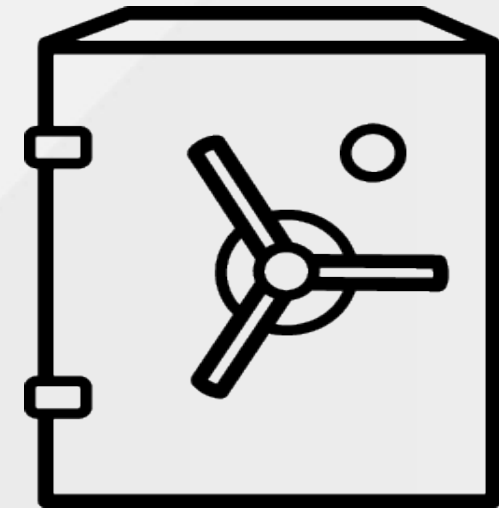Fast deployment, portability and trust via containers

Benchmark-breaking performance

Lower TCO for price/performance

Quick issue resolution via co-located support

Enhanced security features and coordinated response

Enterprise Security

- Built in enterprise class security from network firewall control to application isolation to combat intrusion
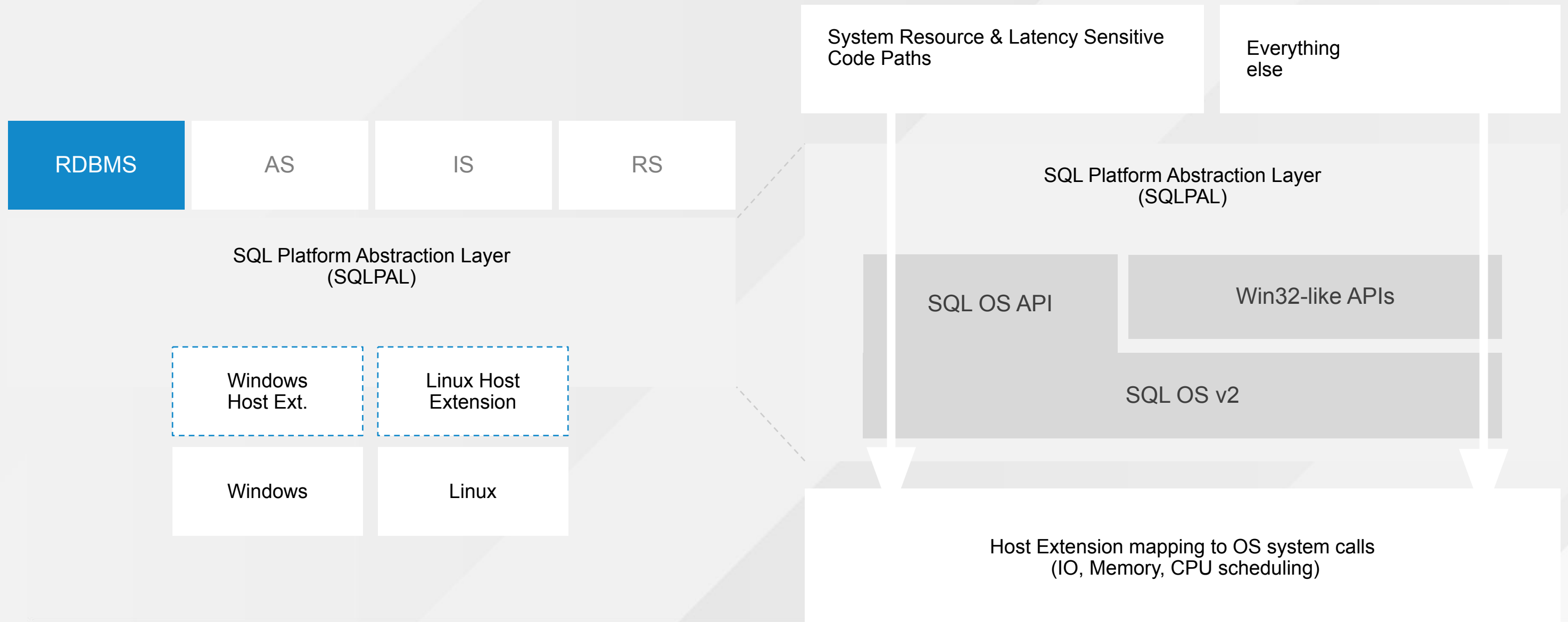- Backed by industry-leading Red Hat and Microsoft security response teams

Native Linux Integration

Factors that contributed to this outstanding result include **Red Hat Enterprise Linux 7 & 8** support for **performance** features such as:

- **DirectIO** – allows database applications to manage high I/O throughput more effectively

- **Non-Uniform Memory Access (NUMA)** – enables optimal placement of processes and threads in the server

- **x86_64 Hugepages** – offers better memory utilization for databases
- Yum package for **native installation**

- Pacemaker is the first **HA solution optimized for RHEL** and is integrated to work together

Cross-System Architecture
SQL Platform abstraction layer

Left diagram:

| RDBMS | AS | IS | RS |

SQL Platform Abstraction Layer
(SQLPAL)

| Windows Host Ext. | Linux Host Extension |
| Windows | Linux |

Right diagram:

| System Resource & Latency Sensitive Code Paths | Everything else |

SQL Platform Abstraction Layer
(SQLPAL)

| SQL OS API | Win32-like APIs |

SQL OS v2

Host Extension mapping to OS system calls
(IO, Memory, CPU scheduling)

HA and Clustering for Microsoft SQL Server on Red Hat Enterprise Linux

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-Sin-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

Integration with Active Directory for Microsoft SQL Server on Red Hat Enterprise Linux
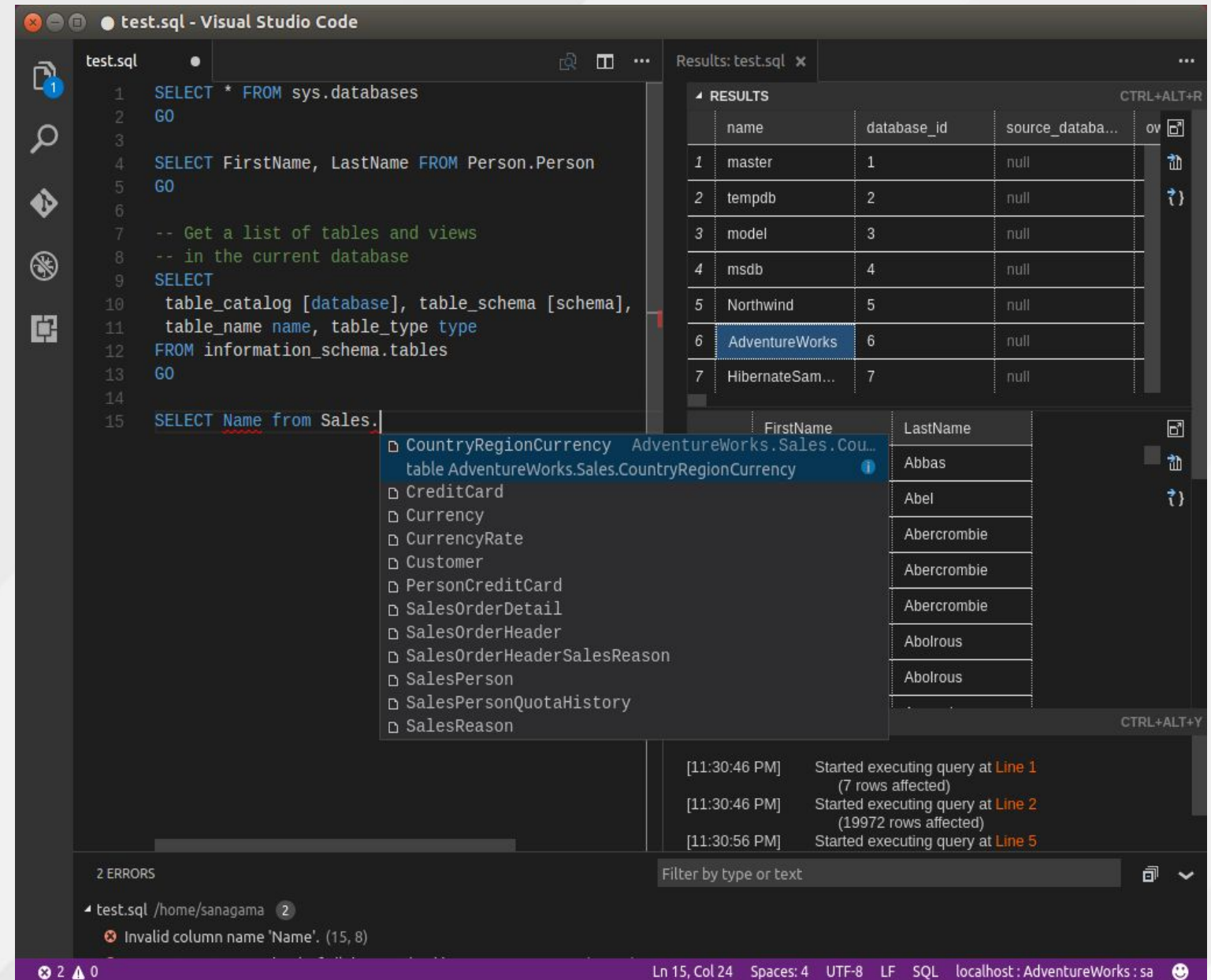
Integration Options
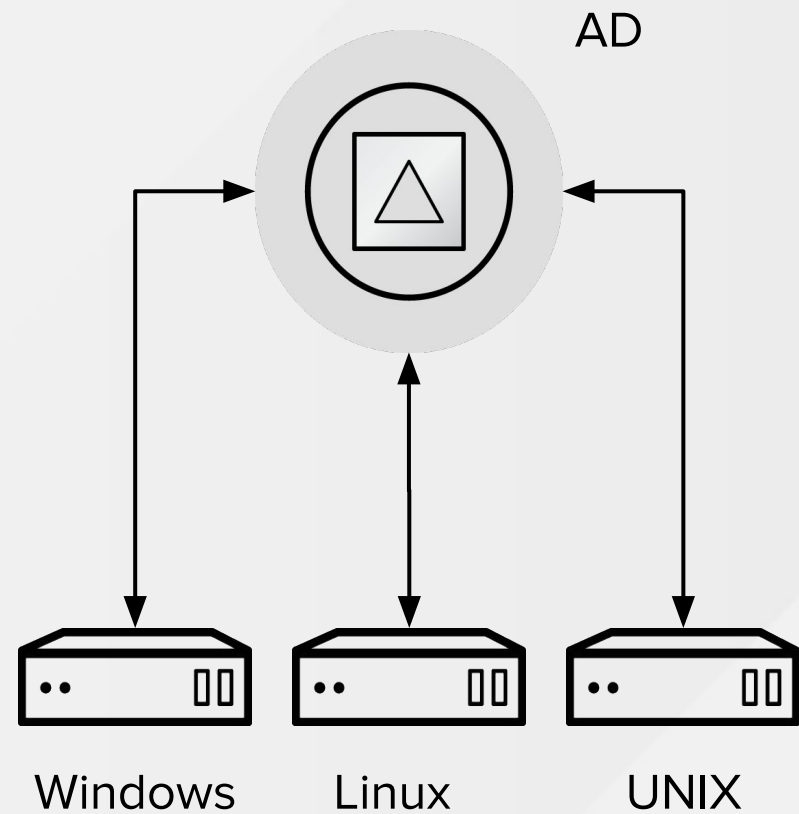
Direct Integration
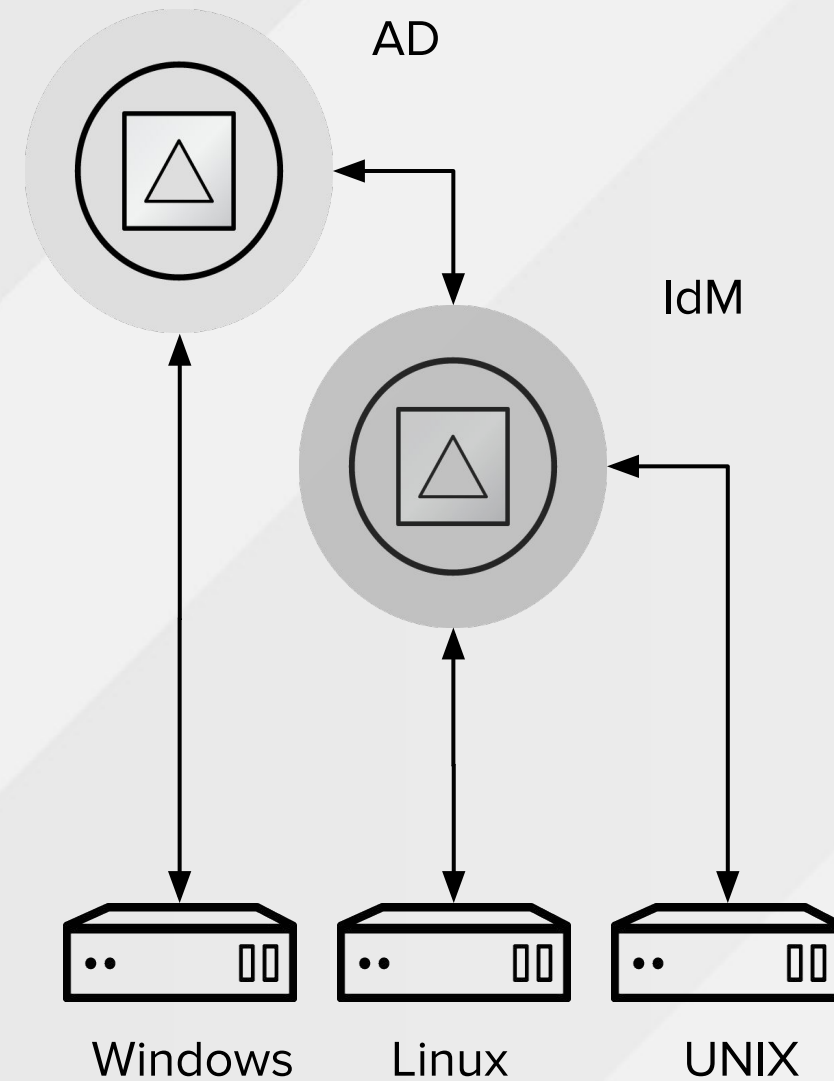
Indirect Integration

What tools and programmability for SQL Server is available for use on Linux?

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

MICROSOFT AND RED HAT INTEGRATED SUPPORT

Red Hat and Microsoft have created an integrated support model for customers using Red Hat solutions in Microsoft Azure.

- **Red Hat participation in Azure forums**

- **Red Hat & Microsoft security response team collaboration**

- **Support staff from Red Hat & Microsoft co-located @Redmond**

- **Integrated ticketing systems**

- **Red Hat Technical Account Management & Microsoft Premier Services**

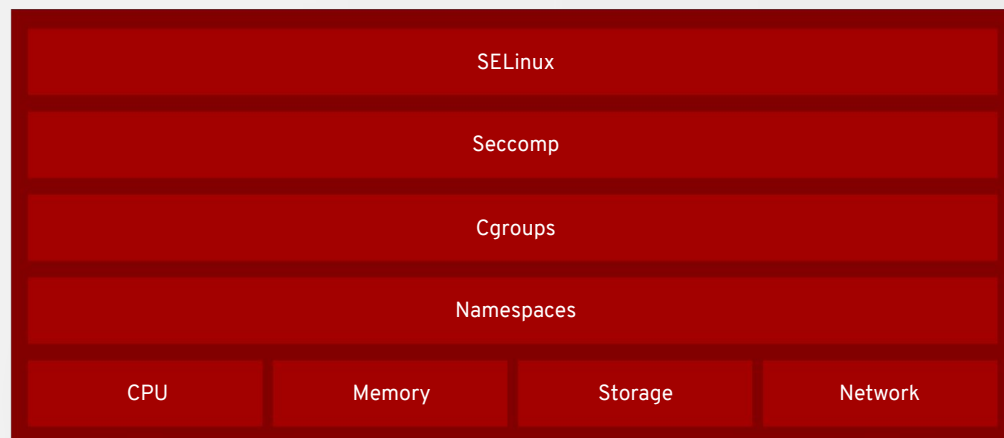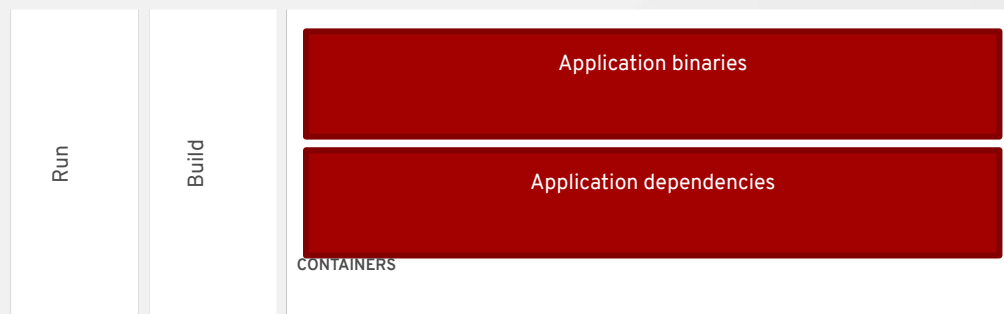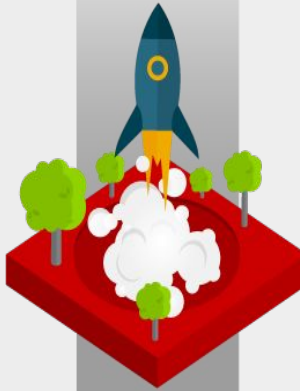- **Register to the Red Hat Customer Portal and knowledge base, directly in Azure**

Resources:

- **Get the FREE e-book for Microsoft SQL Server 2019:**
  https://info.microsoft.com/ww-landing-introducing-sql-server-2019-content.html

- **Red Hat Developer Portal:**
  https://developers.redhat.com

- **MS SQL Server 2019 Product Page:**
  https://www.microsoft.com/en-us/sql-server/default.aspx

- **Quick Start And Reference Documentation:**
  https://docs.microsoft.com/en-us/sql/linux/quickstart-install-connect-red-hat?view=sql-server-linux-ver15

CONTAINERS ARE LINUX

Linux is Red Hat® Enterprise Linux.®

Run

Build

CONTAINERS

Application binaries

Application dependencies

SELinux

Seccomp

Cgroups

Namespaces

CPU	Memory	Storage	Network

▶ **Consistency** across bare-metal, virtual and cloud architectures

▶ **Secure** container isolation called on by the container runtime

▶ **Reliable service** for container start, manage and stop

▶ **Container userspace**, including the libraries, apps, and services developers need

Q & A

Red Hat

Thank you

Red Hat is the world's leading provider of enterprise open source software solutions. Award-winning support, training, and consulting services make Red Hat a trusted adviser to the Fortune 500.

linkedin.com/company/red-hat

facebook.com/redhatinc

youtube.com/user/RedHatVideos

twitter.com/RedHat

Red Hat