



Red Hat Enterprise Linux 8

What's new in the Intelligent OS -Technical Overview

November 5, 2019

LINUX IS THE FOUNDATION

Red Hat Enterprise Linux 8 is the intelligent operating system that is the consistent foundation for the enterprise hybrid cloud.



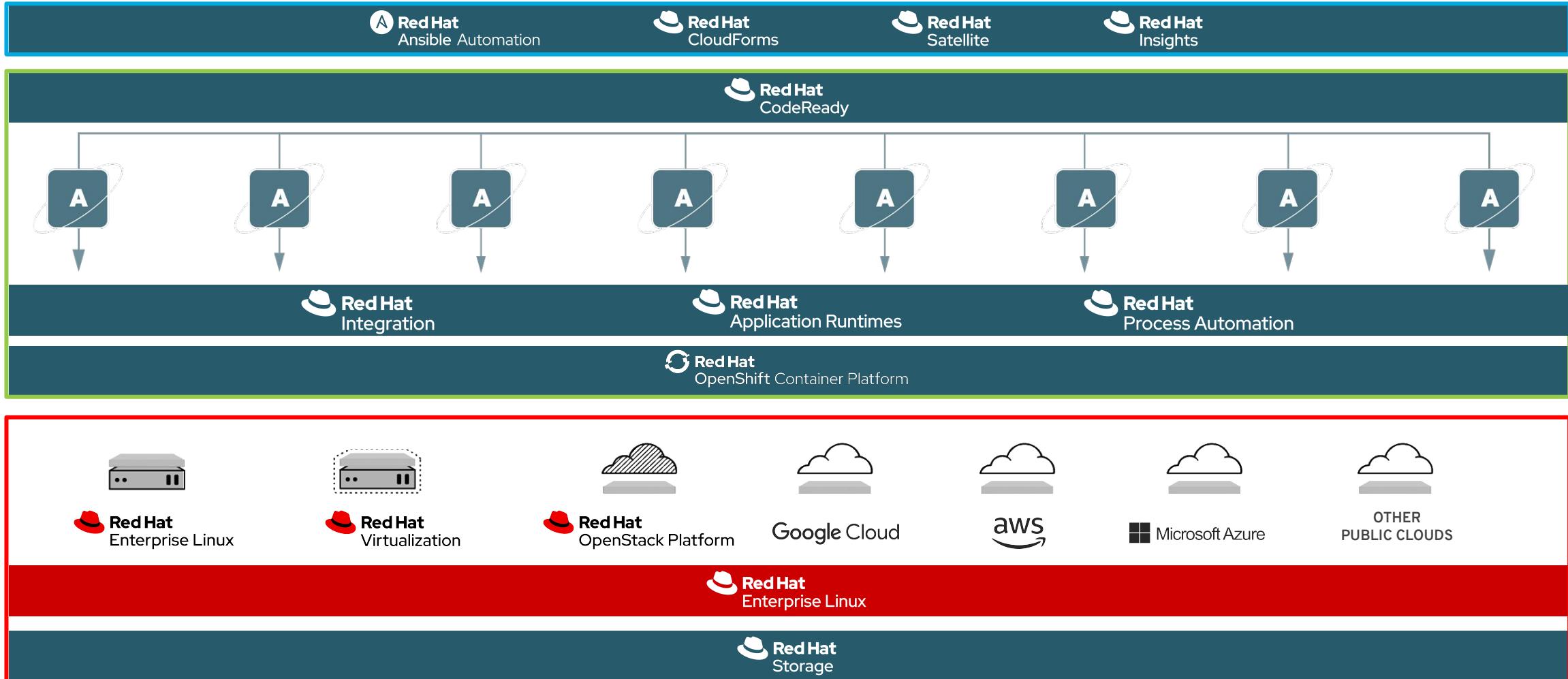
Red Hat
Enterprise Linux 8

Digital transformation can ONLY be done with Linux.

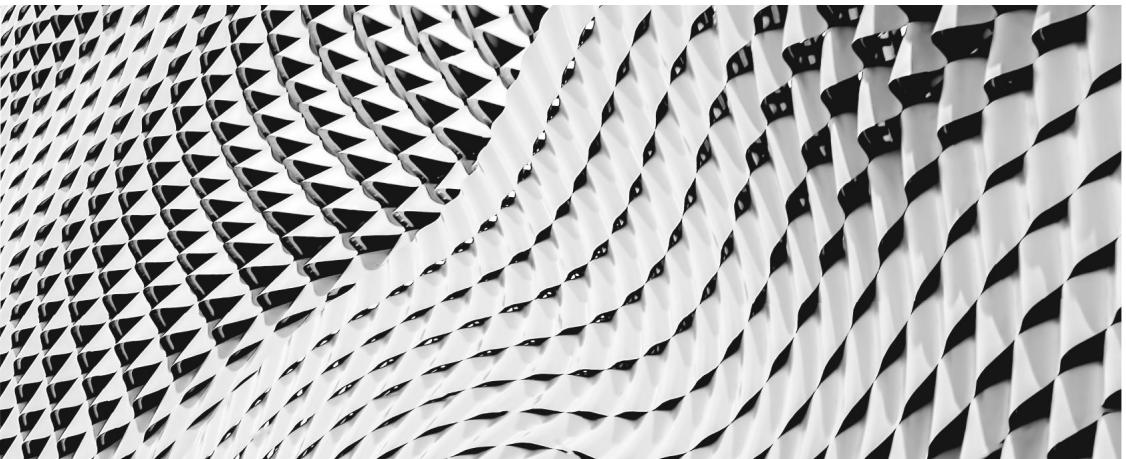
ONLY Red Hat Enterprise Linux provides an intelligent OS that is the consistent foundation for the enterprise hybrid cloud.

Delivering any application on **any footprint** at any time giving you **Control. Confidence. Freedom.**

Powering the hybrid cloud

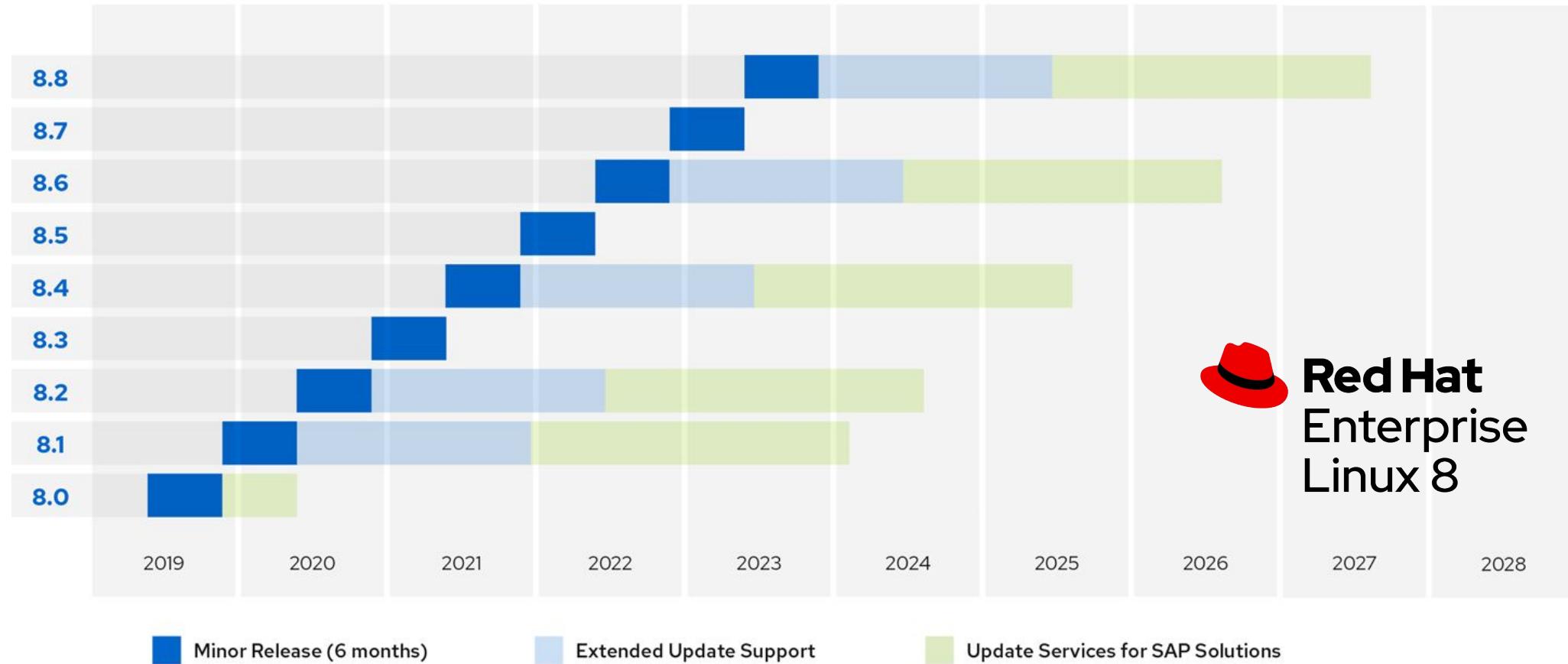


New release cadence



At Summit 2019 Red Hat announced that in future RHEL would be delivered in a new, more flexible way

Planned Red Hat Enterprise Linux 8 life cycle



Red Hat
Enterprise
Linux 8

RHEL_22_0919

Predictable updates

3 years

Major releases

6 months

Minor updates

2 phases

Support life cycle



On ramp non-Linux users more quickly without the fear of the command line.



RHEL 8 lowers the barrier of entry to Linux for Windows and Linux beginners with enhanced usability and familiar, intuitive deployment and management interfaces.

Remote single-system views in the web console

The screenshot shows the Red Hat Enterprise Linux Web Console interface. The left sidebar includes links for System, Logs, Storage, Networking, Virtual Machines, Accounts, Services, Session Recording, Applications, Diagnostic Reports, Kernel Dump, SELinux, Software Updates, Subscriptions, and Terminal. The main content area displays several cards:

- Reading/Writing:** Two line charts showing disk activity over time (13:25 to 13:29). The top chart is for Reading (KiB/s) and the bottom for Writing (KiB/s), both ranging from 0 to 96.
- Filesystems:** A table showing mounted file systems. One entry for /dev/vda1 has a progress bar indicating usage at 1.63 / 9.99 GiB.
- NFS Mounts:** A card stating "No NFS mounts set up".
- Storage Logs:** A log entry for April 2, 2019, showing system boot and module loading logs for udisksd.
- RAID Devices:** A card stating "No storage set up as RAID".
- Volume Groups:** A card stating "No volume groups created".
- VDO Devices:** A card with a "Install VDO support" button and a note that "VDO support not installed".
- iSCSI Targets:** A card stating "No iSCSI targets set up".
- Drives:** A card listing drives: "VirtIO Disk 10 GiB Hard Disk R: 0 B/s W: 0 B/s" and "QEMU DVD-ROM (QM00001) Optical Drive R: 0 B/s W: 0 B/s".

Browser-based interface

Offers remotely accessible user interface using host security mechanisms

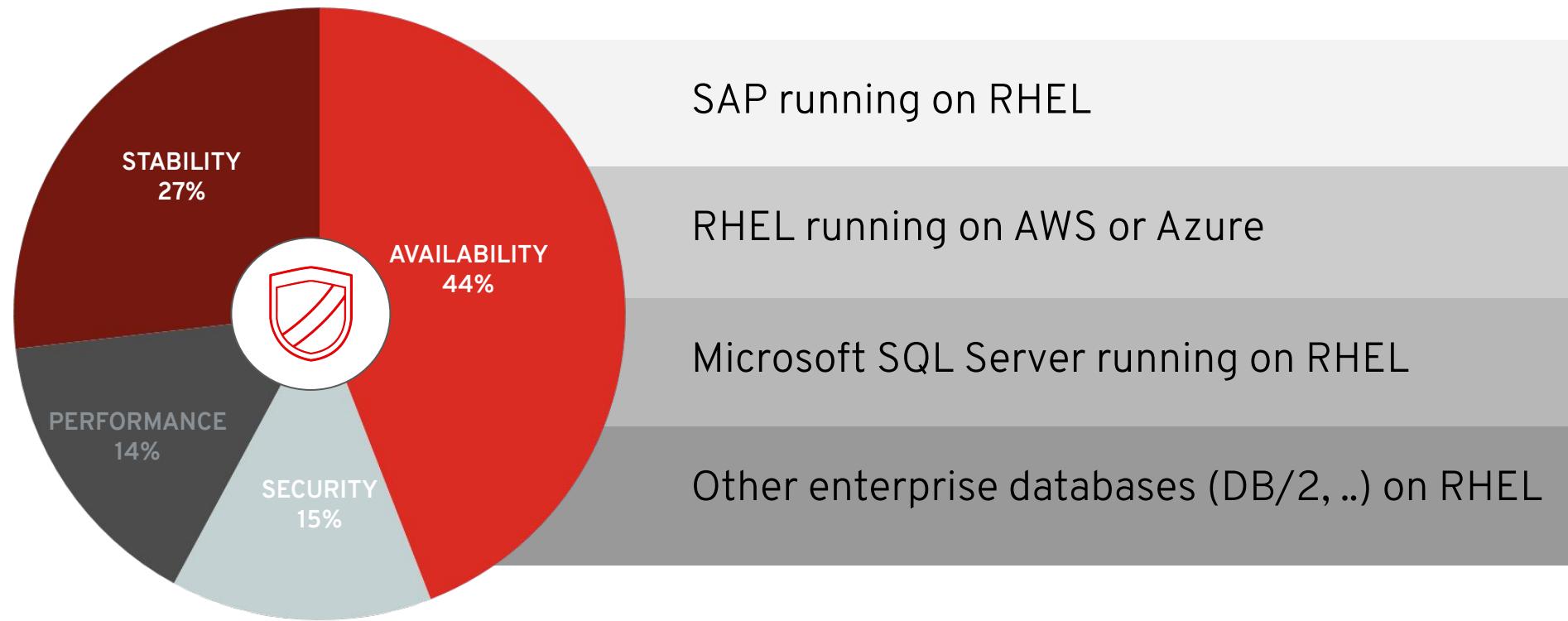
Consolidated view

Provides single view of tasks to speed understanding and completion

Standard management tools

Uses system tools to change state, not a separate workflow

Red Hat Insights has more than 1,000+ rules across several categories and workloads



Rules continue to grow, up from 600+ at Summit (May, 2019),
an approximate 60% increase

New tools in web console



Container management

From the Podman Containers application, installed by the cockpit-podman package, customers can get new images, manage images, and launch containers.

Firewall zone configuration

Under the Networking application, users can enable/disable firewalld, manage zones, and manage allowed services

Improved Virtual Machine Management

In the Virtual Machines application, provided by the cockpit-machines package, customers can import qcow formatted machine images, install guests using PXE, pause and resume guests, and more...

Image builder: New cloud provider image formats

Image builder now offers these additional machine image output formats:

- Google Cloud Platform
- Alibaba



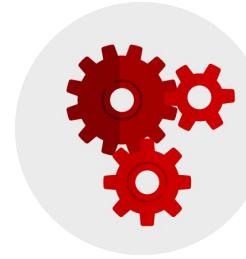
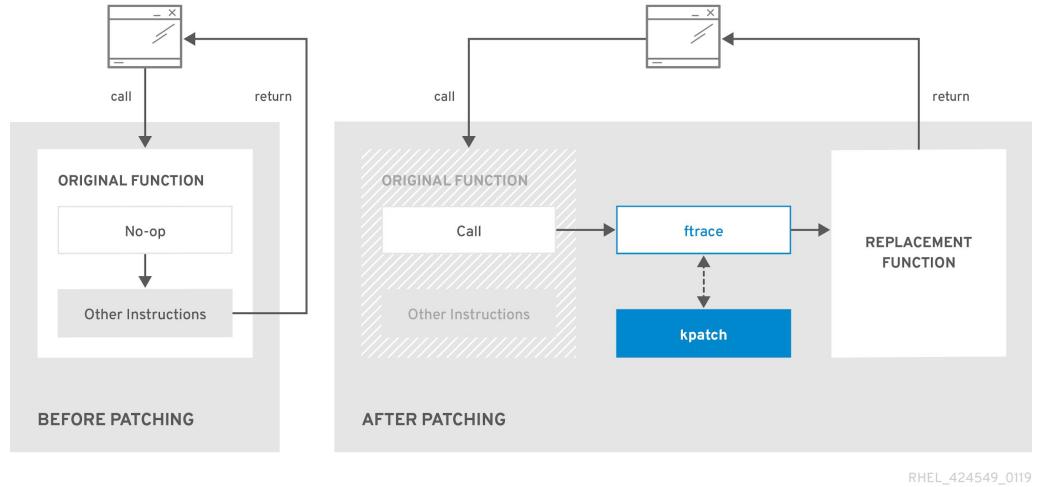
Faster and more consistent delivery in any deployment footprint...



...with full coverage native automation. RHEL 8 provides a path to an API-driven control plane with enhanced system design and automation capabilities and integrations.

kpatch service

Introducing the live kernel patching service for Red Hat Enterprise Linux 8



Replaces portions of the live kernel in memory

The kpatch module is loaded into the running kernel and patched functions are registered to the `ftrace` mechanism with a pointer to the location in memory of the replacement code. Future calls are redirected, through `ftrace`, to the new code.



Maintenance on your schedule

Important or Critical kernel CVE? No problem. Instead of scheduling an emergency maintenance for the affected systems, you can apply a kpatch to your running kernel and reconcile the system during a normally scheduled service window.



Support for up to one year

kpatches will be created for a dot release kernel for up to one year. Meaning the kernel released with RHEL 8.1 will continue to get kpatches through the service until November 2020.

RHEL system role: Storage

RHEL system roles now includes the ability to control storage across your server population with the Storage system role. Whether you are adding partitions or managing Logical Volume configuration, changes can be made using the Storage system role regardless of the makeup of supported RHEL versions among your population*.

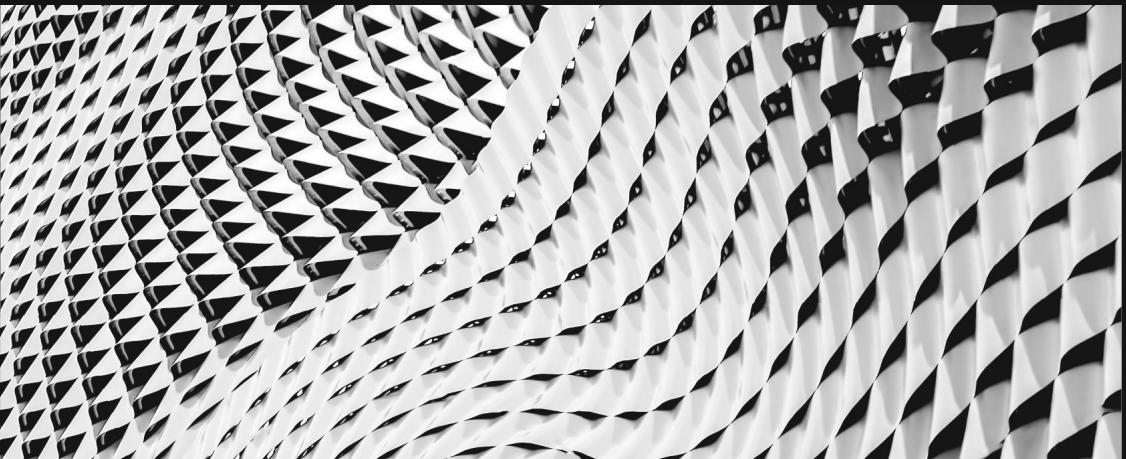


*For releases after Red Hat Enterprise Linux 7.7 and Red Hat Enterprise Linux 8

More Details:

[Managing local storage using RHEL System Roles](#)

Delivers a highly secure platform in cloud infrastructures and for emerging workloads like machine learning.



RHEL 8 lowers the barrier of adoption to new technologies like GPUs while minimizing the attack surface by only deploying the packages you need to support your workload.

Architected for security

It all starts with Linux, build on a solid foundation.



Container Specific SELinux Policies

Red Hat Enterprise Linux 8.1 includes the `udica` package. Using this technology, developers and administrators can create custom SELinux policies that target specific containers.



FIPS & Common Criteria [Update]

Red Hat Enterprise Linux 8.1 is the first Red Hat Enterprise Linux 8 version planned for FIPS and Common Criteria certifications.



Application Whitelisting

With the inclusion of the `fapolicyd` service, customers can now configure Red Hat Enterprise Linux 8 to permit a specific list of executable binaries or binaries stored specific directories to be executable on their systems.

New CVE management policy

Updated CVE policy providing benefit to later lifecycle phases

Red Hat Enterprise Linux now **provides coverage for all Critical and Important Security CVEs** throughout the standard 10 year lifecycle.

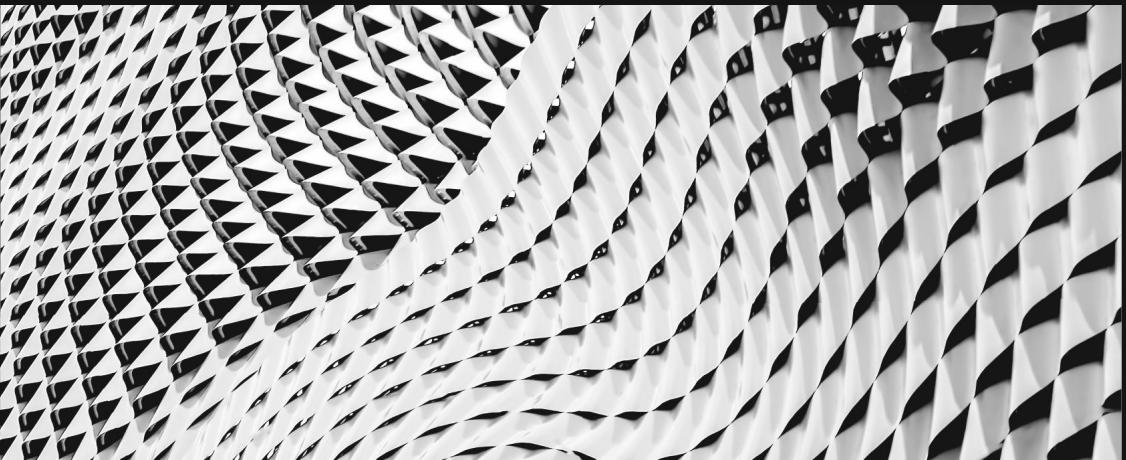


Rootless Containers

First Red Hat did away with needing a daemon to run containers, and now in 8.1 non-privileged users (those without root access) can run containers. With rootless containers, system administrators can defer instantiating containers to non-root users as well as avoid providing root credentials or privileges to those users.



A seamless, non-disruptive migration process for existing RHEL deployments.



RHEL 8 enhances the application migration process from earlier RHEL 7 versions to RHEL 8 so you can take advantages of the latest innovations.

In-place upgrades

Improvements to RHEL7 to RHEL8 in-place upgrades

In-Place Upgrade Report for: localhost.localdomain

Title	Risk Factor	Description	Tags
Repositories map file is invalid (/etc/leapp/files/repopmap.csv)	High	✗ Inhibitor 🔗 Links	upgrade process
OpenSSH configured to use removed ciphers	High	✗ Inhibitor 🕒 Remediation	authentication security network services
OpenSSH configured to use removed mac	High	✗ Inhibitor 🕒 Remediation	authentication security network services
Packages not signed by Red Hat found in the system	High	🕒 Remediation	sanity
LUKS encrypted partition detected	High	✗ Inhibitor	boot encryption
Possible problems with remote login using root account	High	✗ Inhibitor 🕒 Remediation	authentication security network services
chrony using default configuration	Medium		services time management
Postfix has incompatible changes in the next major version	Low		services email
The subscription-manager release is going to be set to 8.0	Low		upgrade process
Schedule SELinux relabeling	Low		selinux security



Additional supported architectures

Now Supported:

64-bit ARM

pSeries

zSeries



Upgrade process improvements

Red Hat continues to enhance and improve the in-place upgrade tooling and process. In this release, customers can now upgrade systems that have more complex filesystem mountpoint configurations.



Reporting integration into web console

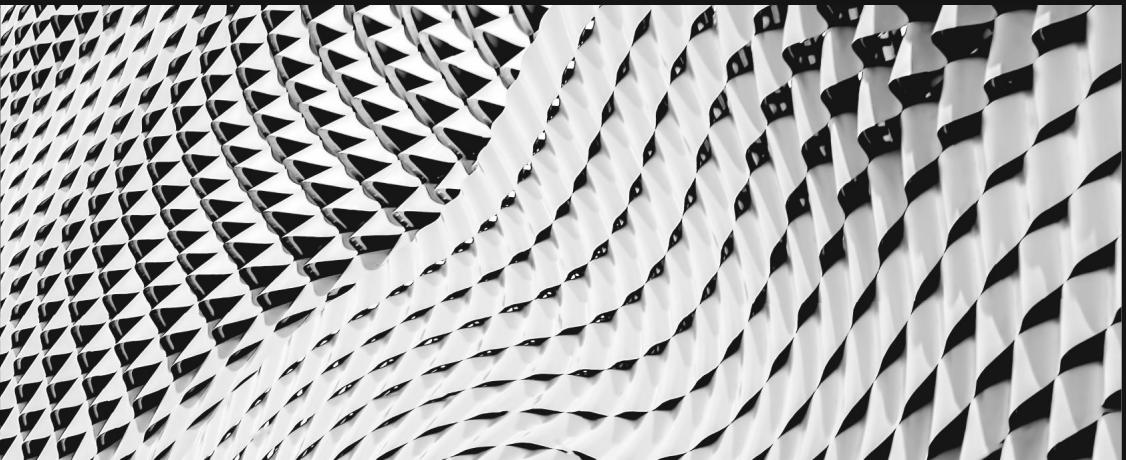
Pre-upgrade assistant reporting is now integrated into the web console for Red Hat Enterprise Linux 7. Customers interested in upgrading may now review the results of the pre-upgrade assistant

Red Hat Enterprise Linux 6 guests

Red Hat Enterprise Linux 6 has roughly one year left on the standard 10 year product lifecycle. To assist customers in transitioning from older hardware and ultimately to a newer version of RHEL, Red Hat Enterprise Linux 8.1 now supports RHEL6-based virtual machine guests.



Fastest time to “Hello World”...



...with streamlined access
to high quality open
source development tools.

RHEL 8 delivers more
versions and more updates
of supported, popular open
source language
frameworks and
databases.

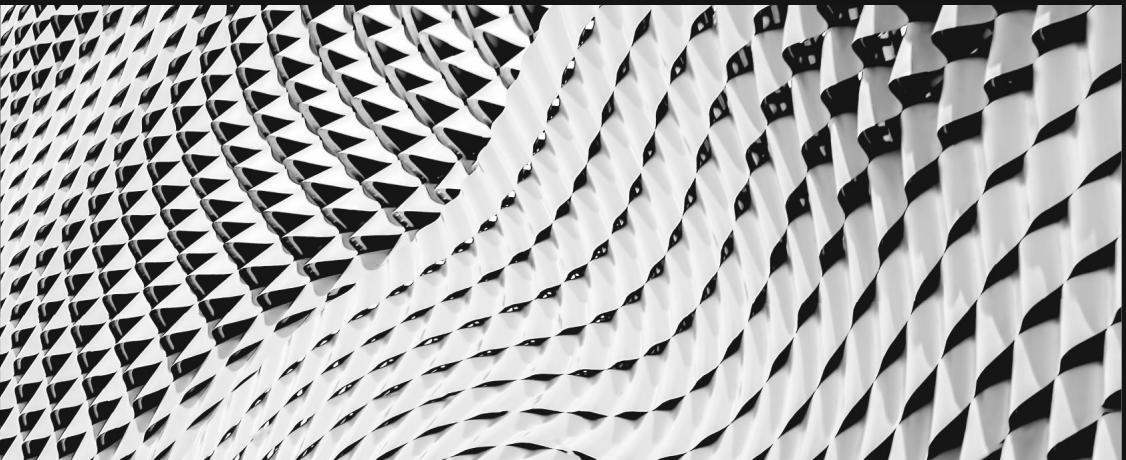
New application streams



**Delivering new language and software choices
with application streams**

- Ruby 2.6
- Nodejs 12
- PHP 7.3
- NGINX 1.16

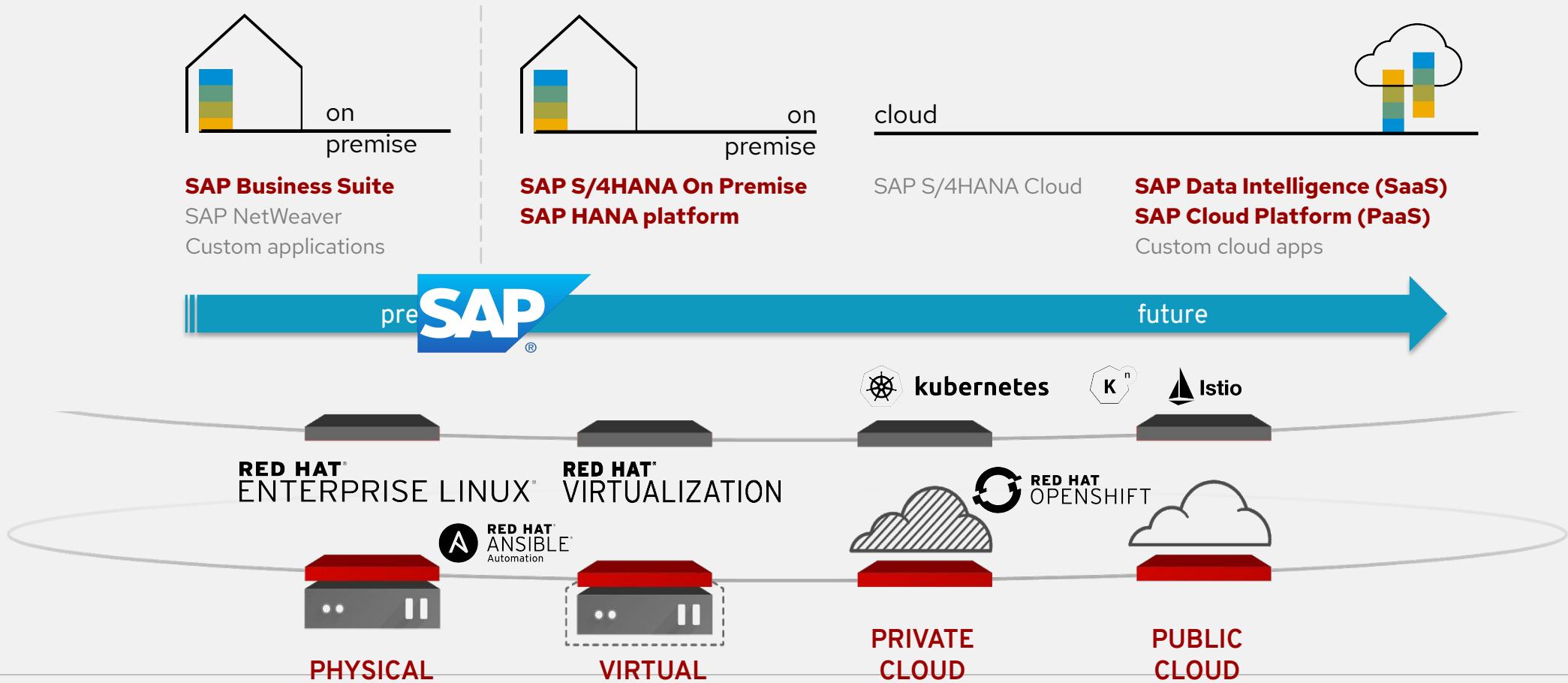
A trusted partner for Oracle, SAP HANA, Microsoft SQL Server, Postgres, and machine learning workloads.



RHEL 8 is optimized to support your critical database workloads as well as support for leading ISV applications and workloads.

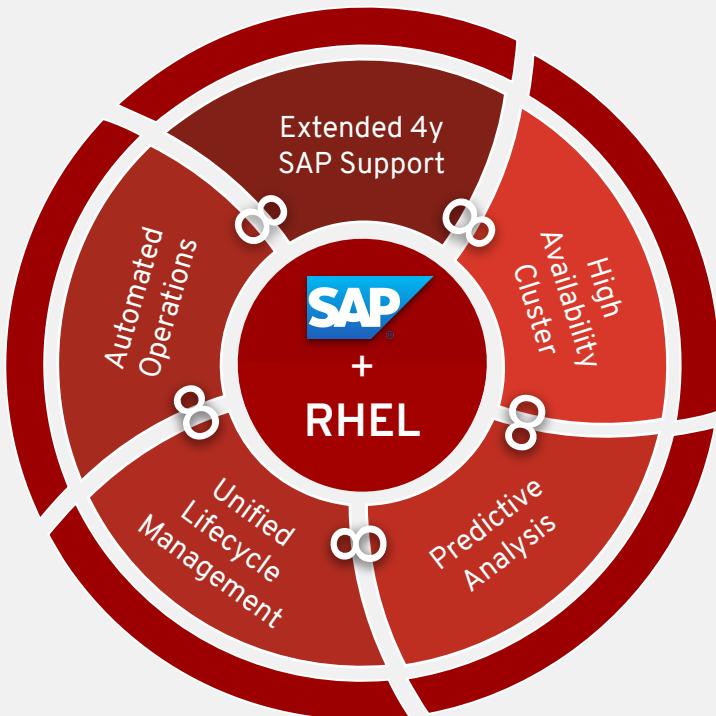
Red Hat Solutions for SAP

Where SAP and Red Hat intersect present and future architecture



RHEL 8 for SAP Solutions

tailored for the needs of business critical applications



- Enabled for **continuous availability** of SAP applications, through High Availability solutions for SAP HANA, NetWeaver and S/4 HANA, as well as SAP HANA tested in-place upgrade and Live Patching capabilities for Critical and Important CVEs (**RHEL HA add-on and Red Hat SAP HA solution incl.**)
- Focus on **SAP application lifecycle**, providing a stable foundation with support for certain minor releases of RHEL for up to 4 years from GA (**RHEL Extended Update Support for SAP incl.**)
- **Proactive monitoring and remote management** of SAP landscapes, with real-time assessment for risks related to performance, availability, stability, and security (**Red Hat Insights and Smart Management add-on incl.**)
- **Ready to run**, delivering high-performance profiles, runtime libraries and file system add-ons, turning SAP into a first class citizen on RHEL (**RHEL for SAP solutions specific software components incl.**)

Plan for stability with documented interfaces

Red Hat Enterprise Linux provides application stability for the duration of all major releases



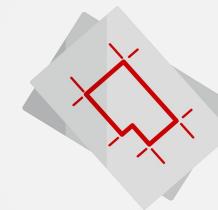
Compatibility levels

Compatibility details for components and packages



Exceptions

Exceptions to compatibility in Red Hat Enterprise Linux



Guidelines

Principles for preserving binary compatibility

Read the Red Hat Enterprise Linux 8 application compatibility guide at access.redhat.com/articles/rhel8-abi-compatibility.

RHEL system role: SAP

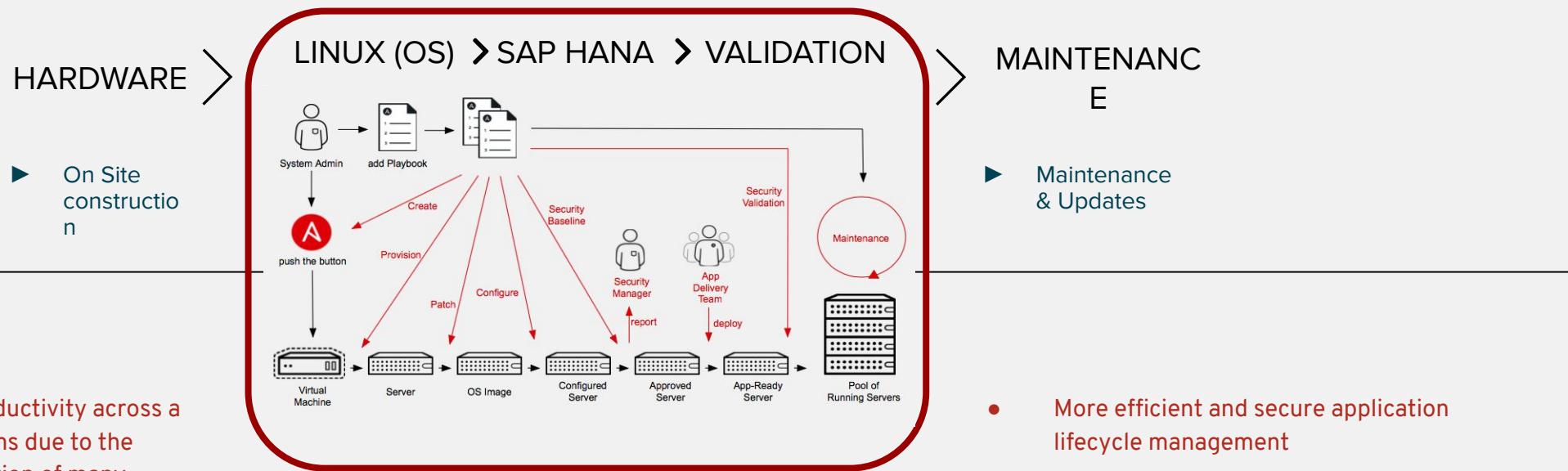
Available with the RHEL for SAP software repository, Red Hat Enterprise Linux now offers, as a Technology Preview, RHEL system roles to aid administrators with configuring SAP software across their SAP certified RHEL 7 and RHEL 8 servers:

- sap-preconfigure
- sap-netweaver-preconfigure
- sap-hana-preconfigure



SAP Optimized Installation with Ansible

Automation for the whole environment



- Increased IT operational productivity across a variety of infrastructure teams due to the standardization and automation of many configuration tasks and IT operations processes
- Faster deployment of new computer, networking, and storage infrastructure resources

- Basic system roles are available as Tech Preview: <https://access.redhat.com/articles/4488731>
- More are available upstream <https://github.com/redhat-sap>

- More efficient and secure application lifecycle management
- Increased scale and speed of application development and deployment using fully automated CI/CD tool chains to accelerate time to market » Improved application performance and availability due to reductions in unplanned downtime,

Generic Ansible advantages also true for SAP

Red Hat Enterprise Linux for SAP Solutions

SAP Certification Status & Roadmap

Today

SAP Net Weaver / RHEL 7

on Intel 64, zSystem and IBM Power
as of SAP Note [2369910](#)

SAP HANA / RHEL 8.0

on Intel 64 and IBM Power LE, as of SAP Note [2235581](#)

SAP ASE and Max DB / RHEL 8

as of SAP Note [2489781](#) and [1444241](#)

SAP NetWeaver / RHV 4.3

on Intel 64, zSystem and IBM Power
as of SAP Note [1400911](#)

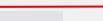
SAP HANA 3TB VM support (single/multiVM)

with RHV 4.2/4.3 on Intel 64 as of SAP Note [2852117](#)

RHEL HA solution for S/4 HANA and NetWeaver

SAP certified on Intel 64 / RHEL7

Next (2020)



SAP NetWeaver / RHEL 8.x

on Intel 64, zSystem and IBM Power

SAP BI / RHEL 8.x

on Intel 64

SAP HANA / RHEL 8.1 + 8.2 (skip 8.3)

on Intel 64 and IBM Power LE

SAP NetWeaver / RHV 4.4

on Intel 64, zSystem and IBM Power

SAP HANA 6TB VM support

with RHV 4.4 on Intel 64

RHEL HA for S/4 HANA and NetWeaver

SAP certified on Intel 64 and IBM Power / RHEL 8

Red Hat Enterprise Linux for SAP Solutions

Recent Product Enhancements & Outlook

Today

RHEL HA for SAP Solutions

for Highly Available deployments of SAP HANA,
S/4 HANA and NetWeaver deployments

Intel Optane DC Memory FS-DAX

production support for deployments of SAP HANA
2.0 SPS 04 (or later)

Live kernel patching

for critical and important CVEs

Automated day-0 system setup

using RHEL system roles for SAP

Next (2020)

RHEL HA for SAP solutions support

for SAP HANA multi-target replication

RHEL in-place upgrade

for smooth transition from RHEL 7 to 8

Performance optimizations

such as GCC, NUMA etc.

for SAP workloads such as SAP HANA

Proactive SAP system monitoring

leveraging RHEL Insights rules for SAP

The world's leading Enterprise Linux platform

SAP runs best on top of RHEL

SAP on Red Hat
Enterprise Linux
is real
- today!



All current RHEL releases are SAP HANA supported !



RHEL HA certified / supported for SAP NetWeaver & SAP HANA (incl. scale-out) !



SAP HANA tested In-place upgrade & live kernel patching capabilities



Automated configuration of SAP environments, by means of RHEL system roles



Intel Optane DC Persistent Memory support, incl. File System DAX for SAP HANA



Proactive monitoring and remote management via Insights & Smart Management



SAP HANA production support, on Intel 64 and IBM Power 9



Supporting today's application and tomorrow's emerging platforms



Consistent foundation



OPENSIFT

Technology platform for emerging solutions

Red Hat Enterprise Linux



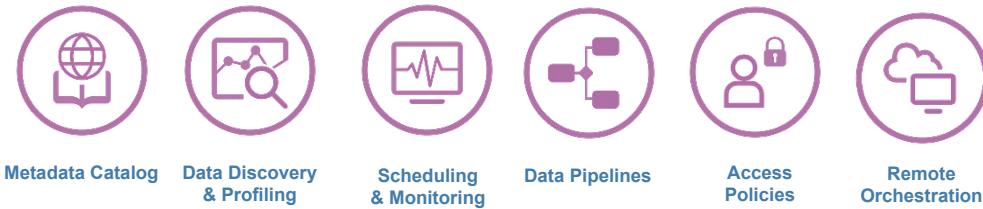
SAP Data Hub Architecture View

SAP Data Hub

Application
SAP HANA, XS Advanced Model

Platform Services

UAA Jobs Git ...



Distributed Runtime
Kubernetes Cluster

SAP Vora
Containerized

Relational
Graph
Time-Series
Document
DB Engines

SAP Data Hub Pipelines
Serverless infrastructure

Scripting (JS, Python)
Templates
Flow-based applications
Built-in Connectors
Custom Operators

Distributed Runtime
Hadoop Cluster

SAP Data Hub Adapter

VORA Spark Extensions

Connected Systems
SAP Integration & Open Connectivity

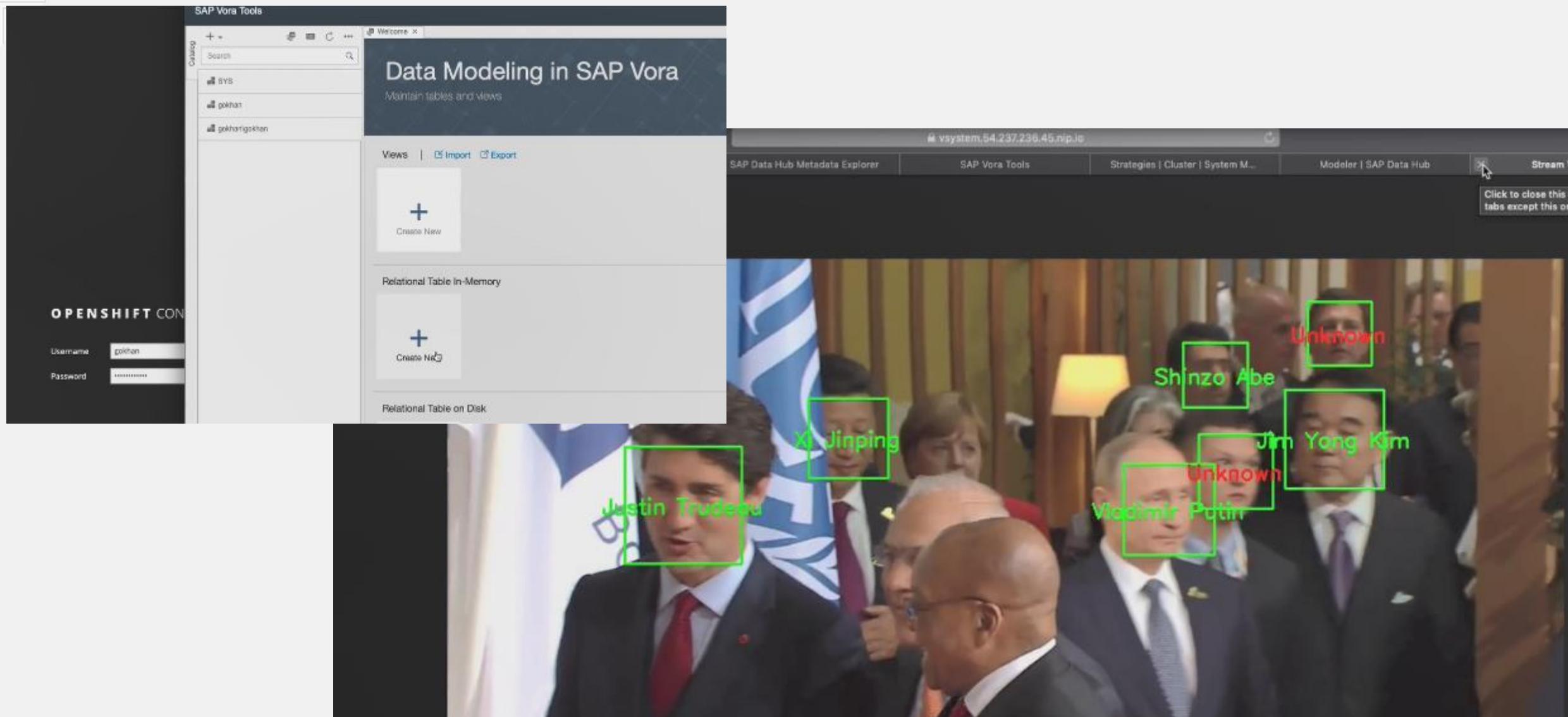
SAP BW
Process Chains
Data Warehousing Processes

SAP HANA
SDI Flowgraphs
Data Integration into SAP HANA

SAP Data Services
Data Services Job
Heterogeneous Landscapes

3rd party and Open Source
Direct Connectivity
Storage, Messaging, APIs

Face Recognition



Hardware requirements

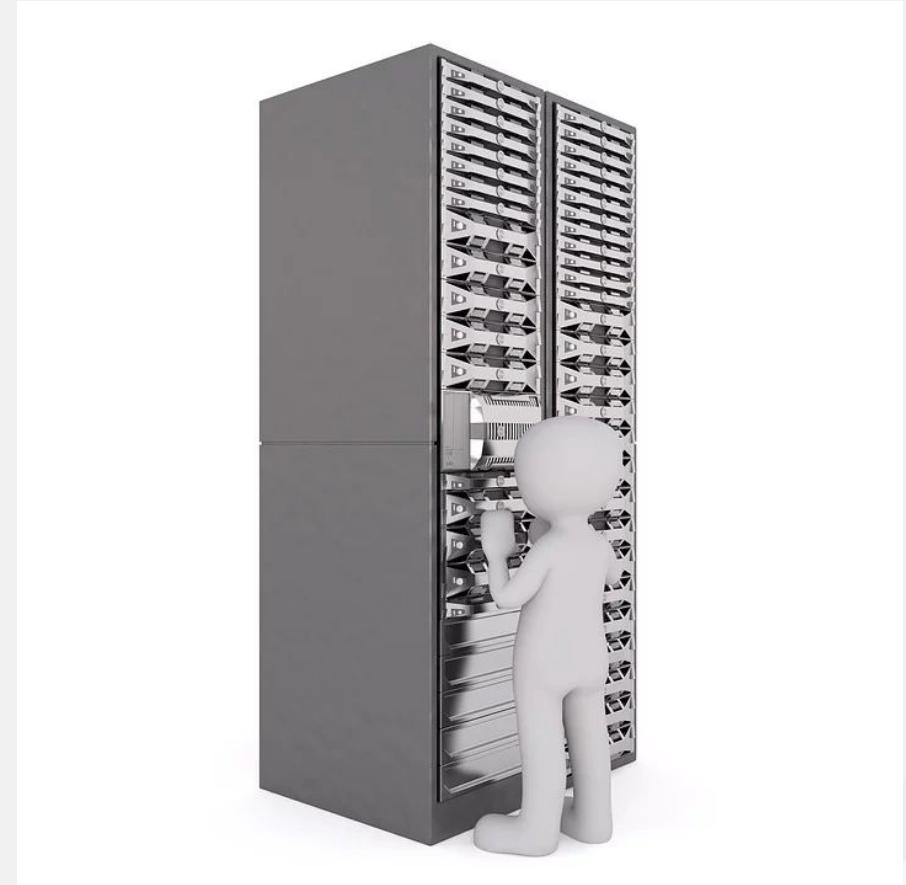
SAP Data Hub 2.7 and OpenShift 3.11

Minimum production Cluster consists of:

- 3+ Master Nodes
 - 4 cores, 16GB Mem, 120 GB storage
- 4+ Compute/Worker Nodes
 - 16 cores, 64GB Mem, 120 GB storage
- 6+ Ceph Storage Nodes for persistent volumes and object storage for checkpoint store
 - 2TB for persistent volumes
 - 5,5TB for object storage (checkpoint store)

In addition to the cluster an admin server or jumphost to run the installation from is required.

2 core/ 4GB mem / 120 GB storage



Hardware requirements

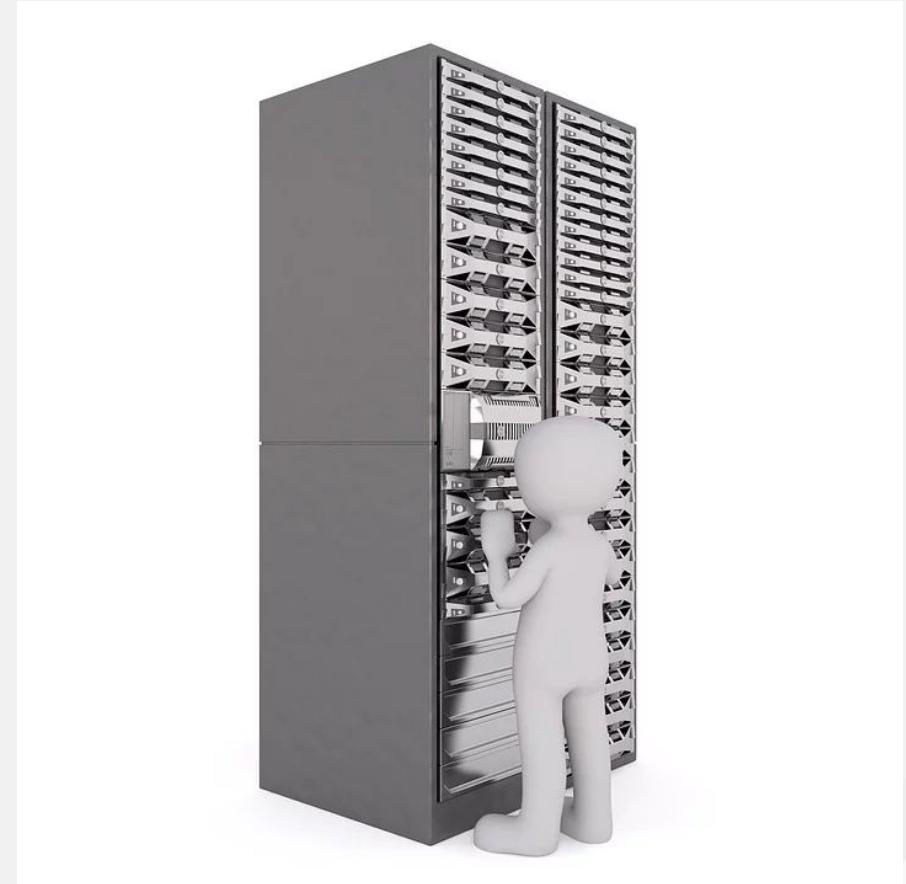
SAP Data Hub 2.7 on OpenShift 4.2 in vSphere

Minimum production Cluster consists of:

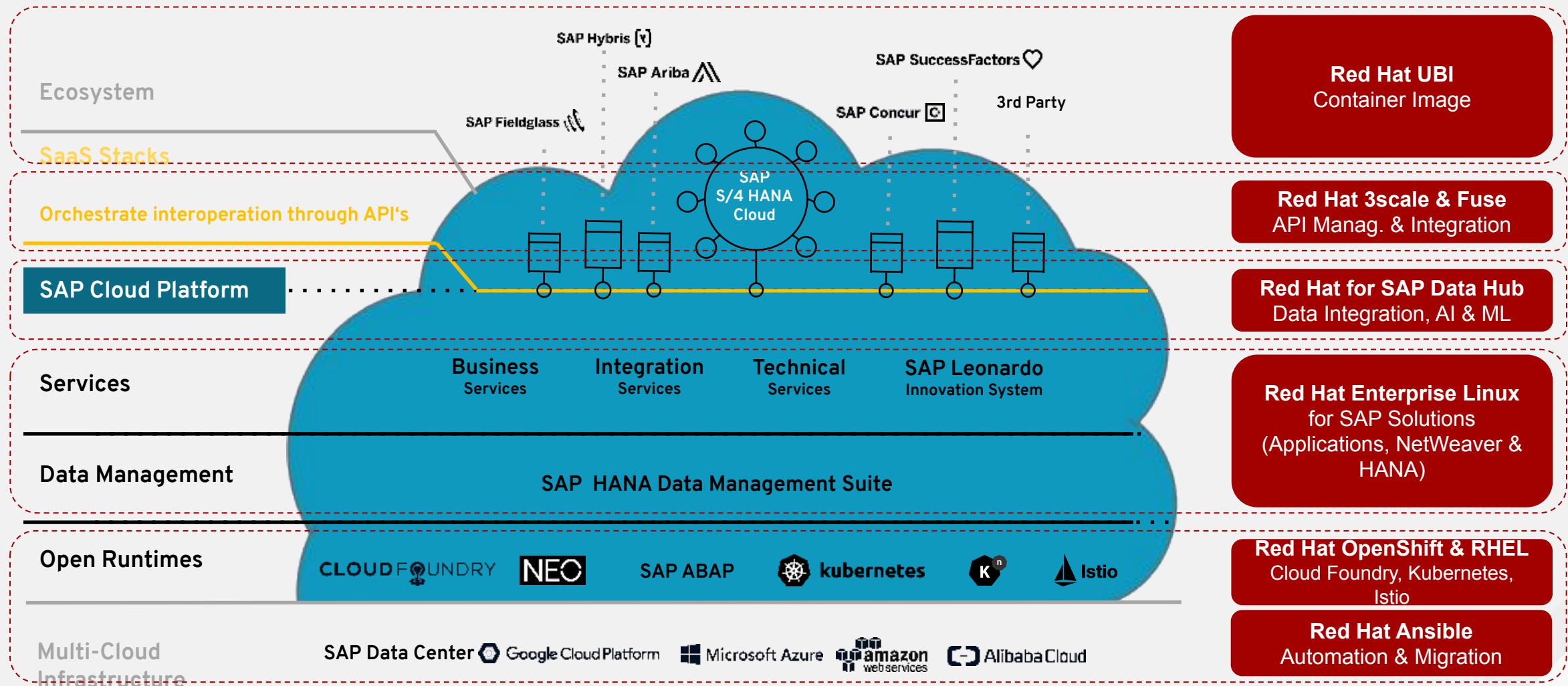
- 3+ Master Nodes
 - 4 cores, 16GB Mem, 120 GB storage
- 4+ Compute/Worker Nodes
 - 16 cores, 64GB Mem, 120 GB storage
- 4+ OCS Nodes
 - 16 cores, 64GB Mem
 - 120 GB root storage
 - 6TB OSD storage
 - 2TB for PVs (replicated 3 times)
 - 5.5TB for object storage (replicated 3 times)

In addition to the cluster an admin server or jumphost to run the installation from is required.

2 core/ 4GB mem / 120 GB storage



SAP's Architecture* – Why **RED HAT** beyond HANA!



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](https://www.linkedin.com/company/red-hat)



[youtube.com/user/RedHatVideos](https://www.youtube.com/user/RedHatVideos)

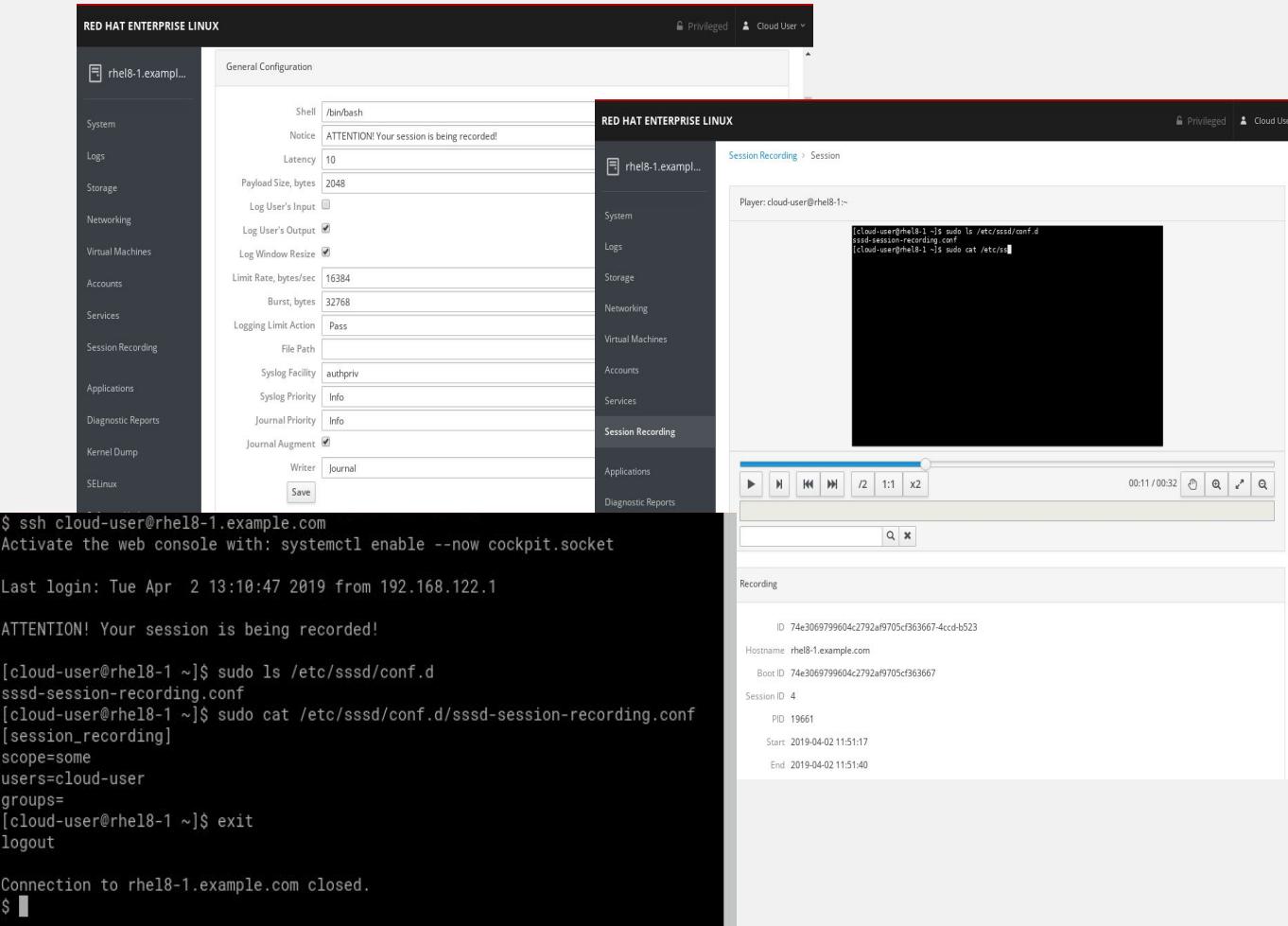


[facebook.com/redhatinc](https://www.facebook.com/redhatinc)



twitter.com/RedHat

Recording user terminal sessions



Audit activities

Create a record of actions taken for review against security policies

Create visual guides

Build run books and training materials with demonstrations

Record and play back

Logged via standard channels with multiple playback options