



Red Hat Enterprise Linux 8

Technical overview

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Red Hat Enterprise Linux 8

To deliver business advantages today, organizations are shifting IT from traditional infrastructure operations and are focusing on service delivery.

At a glance

KERNEL VERSION	4.18+
SYSTEM COMPILER	GCC 8.2, LLVM 6.0
HARDWARE ARCHITECTURES	Intel/AMD 64-bit, IBM Power LE, IBM z Systems, ARM 64-bit
DEFAULT FILE SYSTEM	XFS
PACKAGE MANAGEMENT	Yum v4
TIME SYNCHRONIZATION	Chrony
NETWORKING	NetworkManager

Developers need access
to the latest tools.

Operations needs to know
those are stable and supported.



Faster time to “Hello World”

Ability to plan with confidence

Remove uncertainty from your platforms

Simpler deployment options

Use standardized platforms for any environments

Latest stable tools

Combine open source innovation with enterprise reliability

Predictable updates

3 years
Major releases

6 months
Minor updates

2 phases
Support life cycle



RHEL 5/6/7 Life Cycle

Life Cycle^{viii}:



ELSI 10/2019

In Red Hat Enterprise Linux 7, EUS is available for the following releases:

- 7.1 (ended March 31, 2017)
- 7.2 (ended November 30, 2017)
- 7.3 (ended November 30, 2018)
- 7.4 (ends August 31, 2019)
- 7.5 (ends April 30, 2020)
- 7.6 (ends October 31, 2020)
- 7.7 (GA 2H/2019; Final RHEL 7 EUS Release)

Approximate (~) Product Phases

Not predictable from a customer or partner perspective

Minor Release Cadence Not Proactively Communicated

Doesn't allow for customers or partners to plan

Simplified 10 Year Life Cycle



RHEL_22_0419



10 Year support + 2 year ELS

Full Support for 5 years

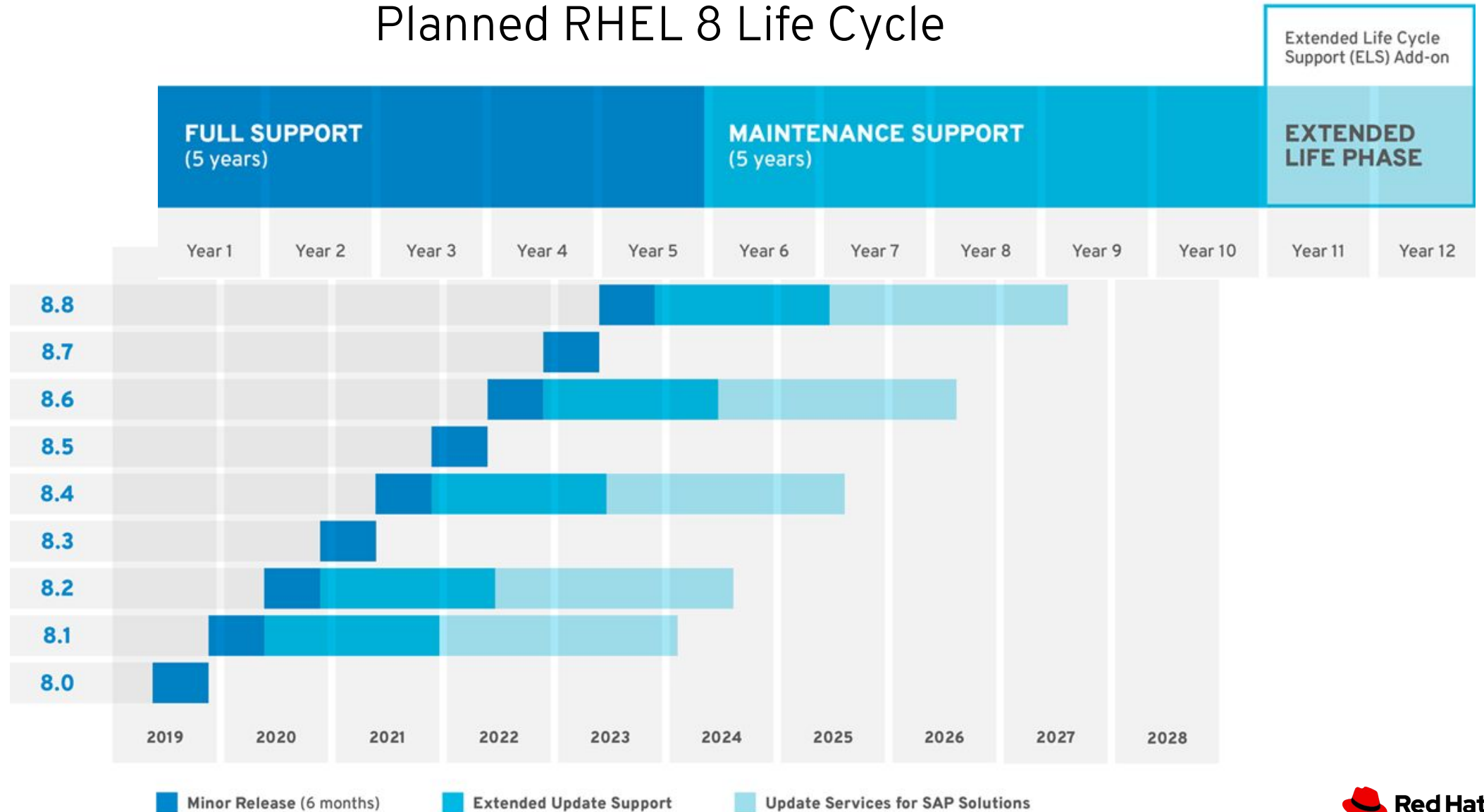
Same as current policy; new features, new hardware enablement

Maintenance Support for 5 years

No new features or hardware enablement
Security and bug fixes only

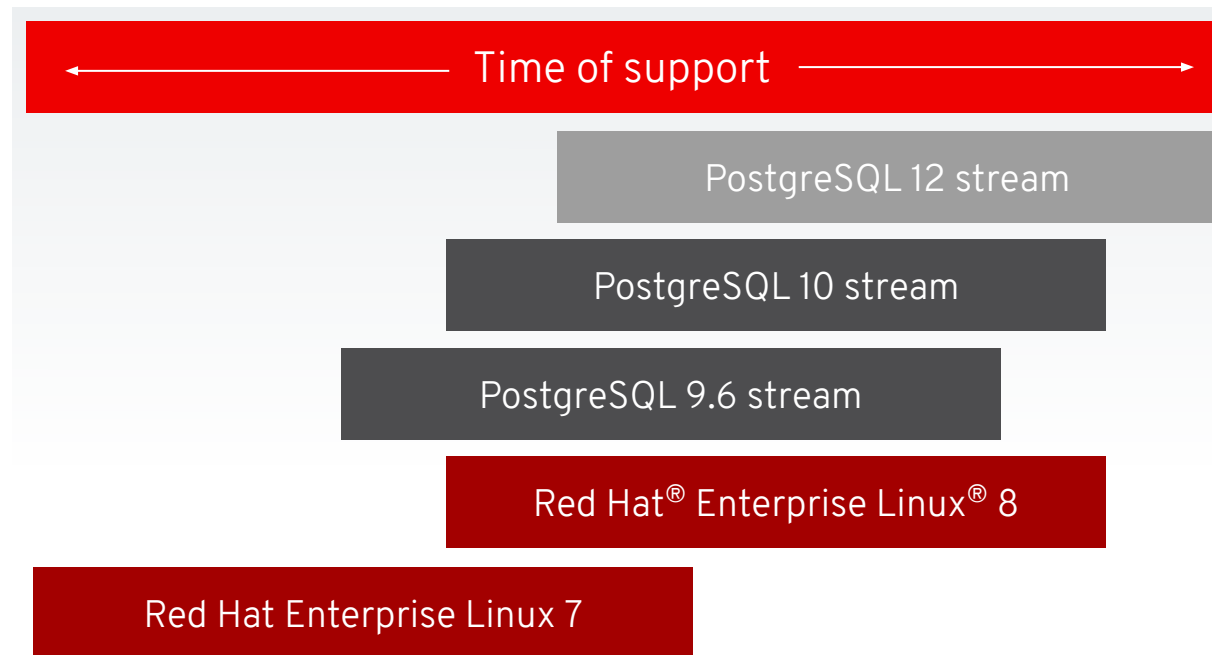
All predicated on a 3 year major release cycle

Planned RHEL 8 Life Cycle



■ Minor Release (6 months)
 ■ Extended Update Support
 ■ Update Services for SAP Solutions

Application streams



More choice

Offers versions of the open source tools and frameworks developers need

Newer versions

Provides access to newer versions as they stabilize

Simpler access

Maintains standard locations for tools and libraries

Simplified access to software

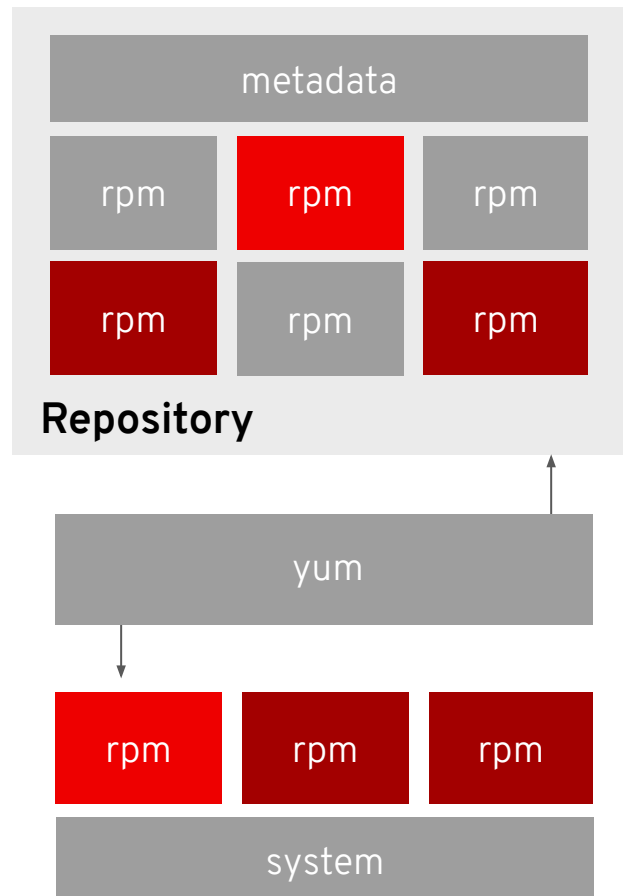
Red Hat Enterprise Linux 7 repositories



Red Hat Enterprise Linux 8 repositories



The newest yum package manager: version 4



New technology

Maintains the same experience while adding new tools

Better dependency management

Offers faster resolution and easier minimization of what's installed

Stable API

Provides new application programming interface (API) for extending yum that will progress into the future

The future of
infrastructure is hybrid,
multicloud



Faster and more consistent delivery in any deployment

Improve automation

Automation expertise from the engineers who wrote the platform

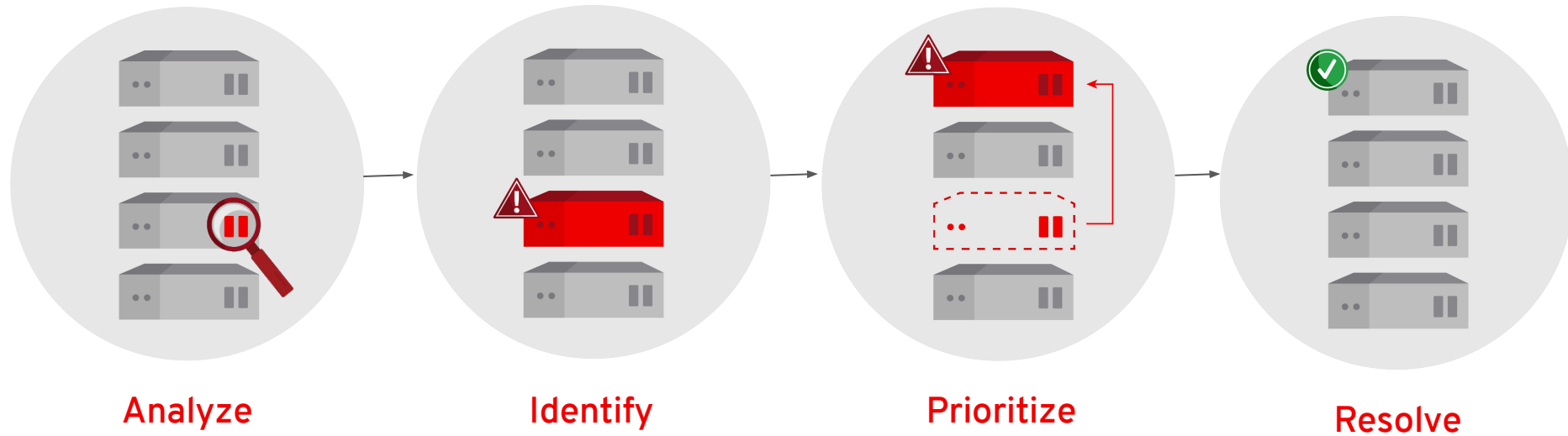
Maintain standards

Simple common machine images for any environment

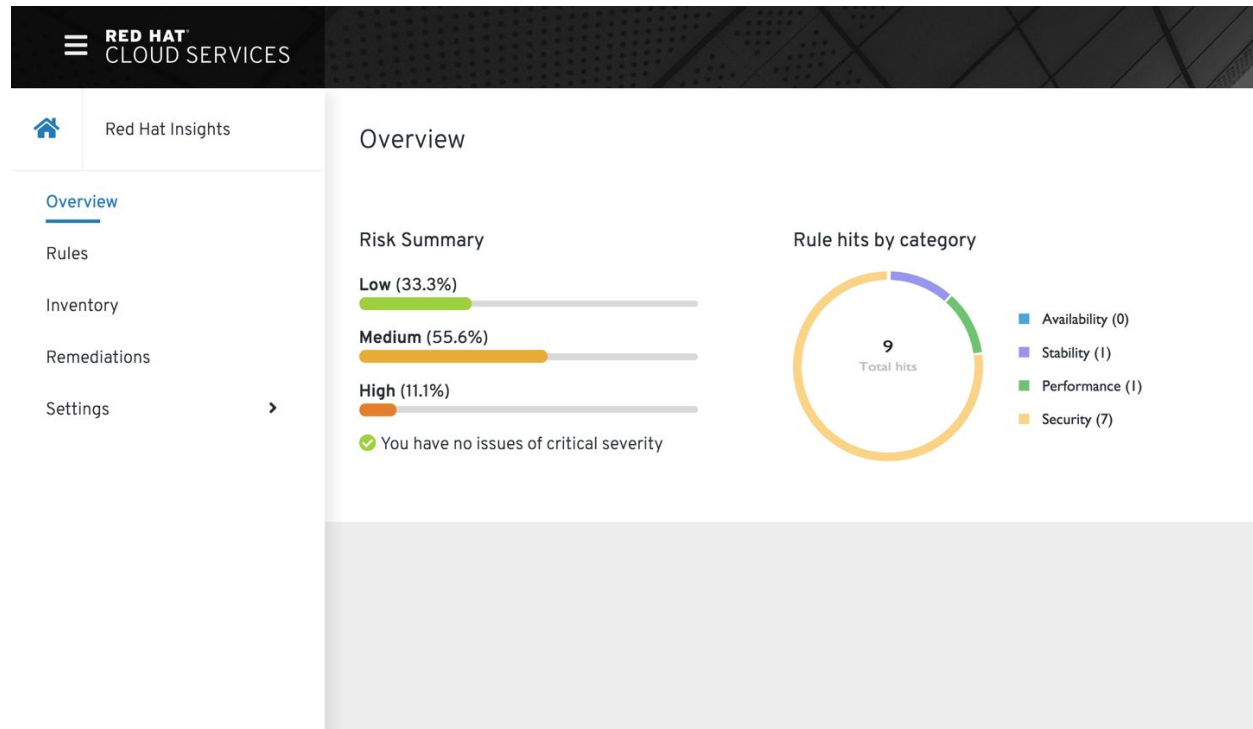
Gain rapid intelligence

Information that helps you focus on business initiatives, not fighting fires

Gain operating intelligence



Detect and fix issues with Red Hat Insights



Proactive advice

Identification of issues before they become problems

Continuous assessment

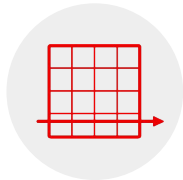
Real-world results to help find new risks

Simpler remediations

Tailored results at the host level

Key risks discovered

Tailored resolution steps included for resolution



Performance issue

Network interface is not performing at maximum speed



Recommended action

Check cable, connections, and remote switch settings



Security risk detected

Privilege escalation



Recommended action

Apply mitigation and update the kernel



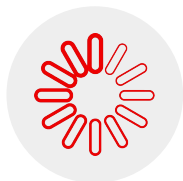
Availability

OpenShift operations fail if insufficient CPU or memory



Recommended action

Increase CPU and/or memory reservation



Stability

Filesystem has exceeded 95% capacity

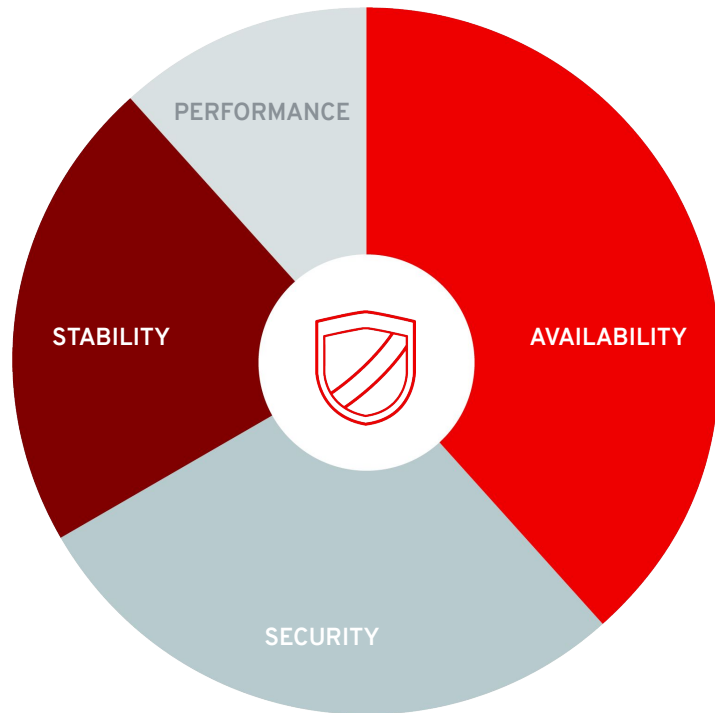


Recommended action

Increase free space on the host.

More than just security

Red Hat Insights has more than 600 rules—here is how they stack up across categories



- **Availability** 38.6%
- **Security** 28.1%
- **Stability** 21.7%
- **Performance** 11.6%

Get ahead of key security risks

Don't wait for your security team to tap you on the shoulder

> Security > NetworkManager DHCP vulnerable to remote code execution (CVE-2018-1111)

☰ Impact ☰ Likelihood ☰ Total Risk ☒ Risk of change: **Very Low**

> Stability > New Ansible Engine packages are inaccessible when dedicated Ansible repo is not enabled

☰ Impact ☰ Likelihood ☰ Total Risk ☒ Risk of change: **Very Low**

> **Ⓢ**Stability > Kdump crashkernel reservation failed due to improper configuration of crashkernel parameter

☰ Impact ☰ Likelihood ☰ Total Risk ☒ Risk of change: **Moderate**

- Prioritizes security response by analyzing runtime configuration and usage

- Automates security analysis, beyond just CVEs

“...when a vulnerability is released, it's likely to be exploited within **40-60** days. However, it takes security teams between **100-120** days on average to remediate...”

– KENNA SECURITY GROUP

Critical Risk Actions

Find a rule...



Filters

Show Rules With Hits

2 rules

Rule	Added	Total Risk	Systems	Ansible	
> Dnsmasq with listening processes vulnerable to remote code execution via crafted DNS requests (CVE-2017-14491)	2 years ago		18		
> Apache httpd with externally listening processes vulnerable to man-in-the-middle via CGI (CVE-2016-5387/HTTPoxy)	3 years ago		1		

Insights plans with Ansible playbooks

Solve common issues through Ansible Automation

Red Hat Insights

Now included with all Red Hat Enterprise Linux subscriptions

Buy



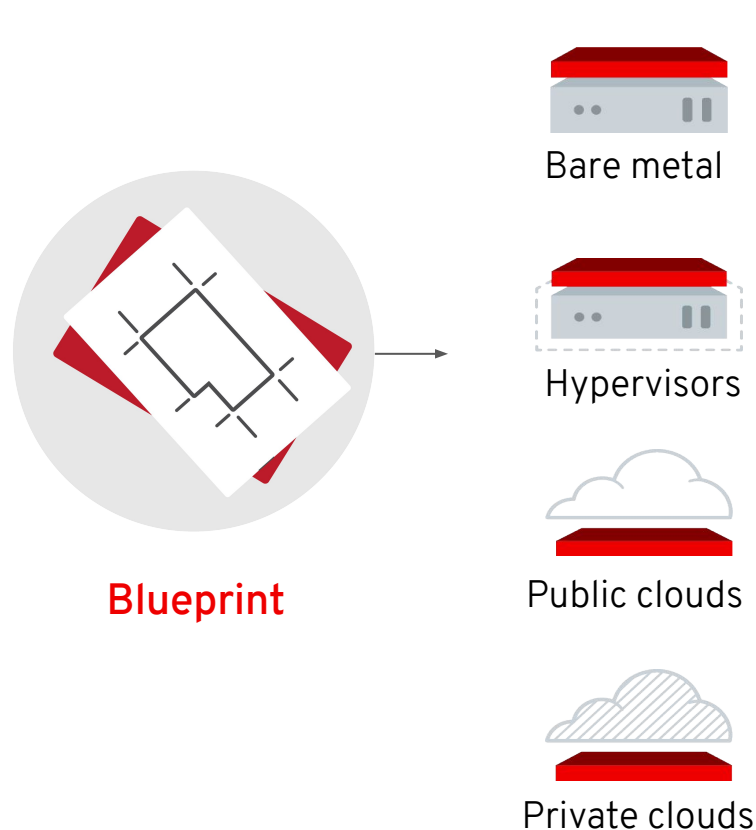
Red Hat
Enterprise Linux

Get



Red Hat
Insights

Create images for all your environments with image builder



Single source

Lets you create gold images for any environment from the same blueprint increasing stability and consistency

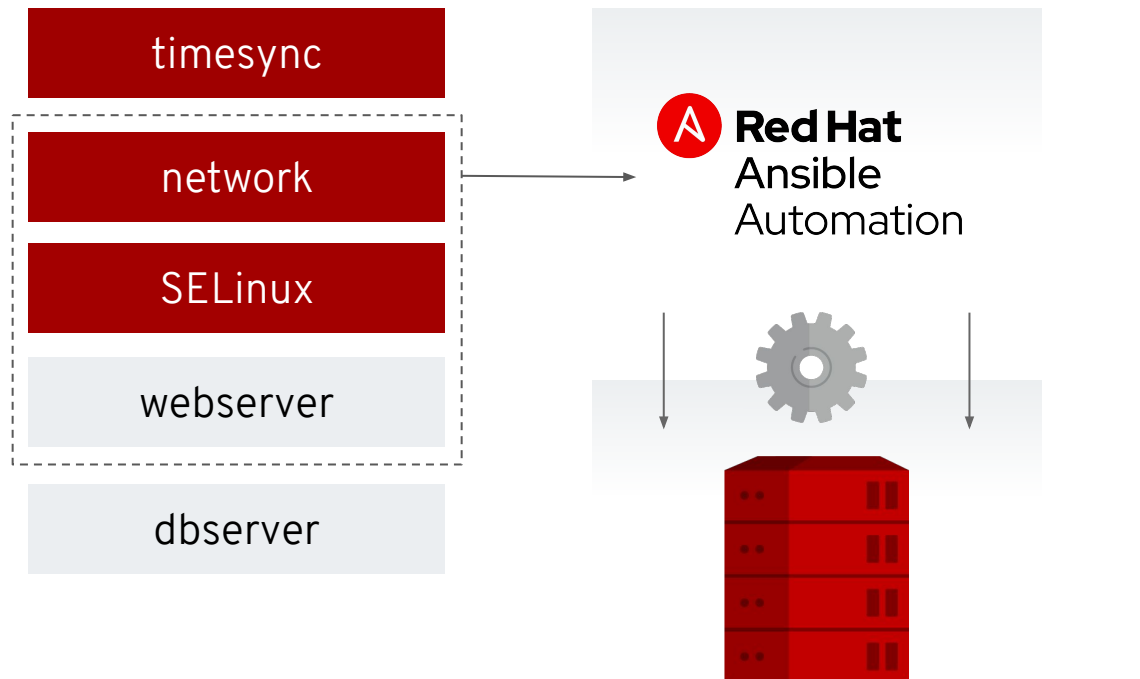
Any footprint

Supports public cloud, private cloud, enterprise hypervisors, and bare metal

Simple interface

Provides web-based view within the web console for selecting packages and creating blueprints

Speed automation creation with system roles



Common automation

Manage multiple versions of Red Hat Enterprise Linux from a single role

Reduced rework

Import provided roles to eliminate task creation in playbooks

Easy switching of providers

Change between default and optional tools quickly and safely

Enterprise workloads
require a trusted set of
partners



Trusted partner

Speed integration with common platforms

Ease management and integration of your business applications

Focus on your business

We focus on support and engineering so you don't have to

Innovate faster

Get to your next big thing without building ours

Optimized experiences for mission-critical databases

Microsoft SQL Server

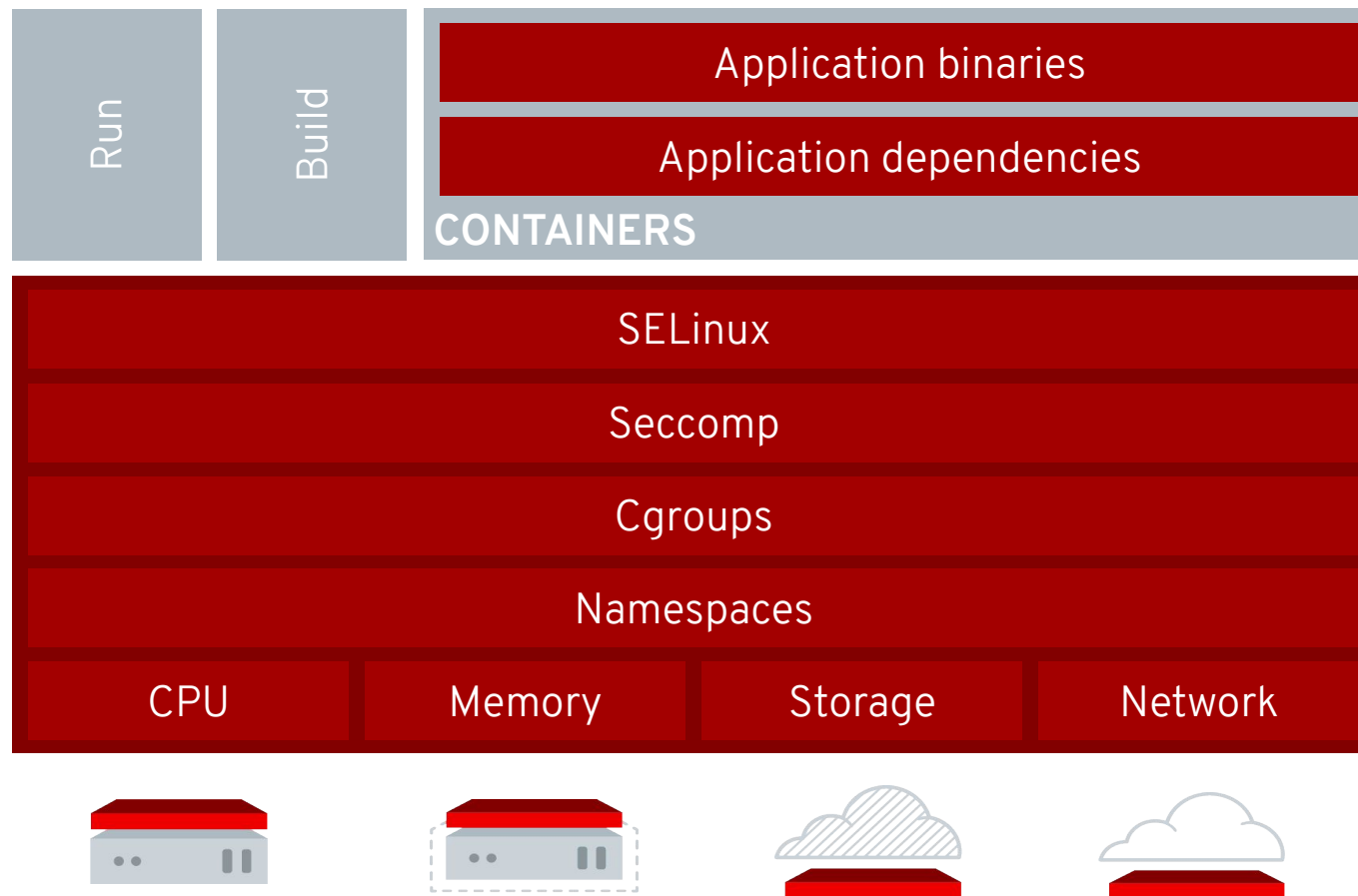
- Red Hat Enterprise Linux is the reference platform for SQL Server on Linux
- Benchmark-breaking performance
- Fast deployment and portability via containers



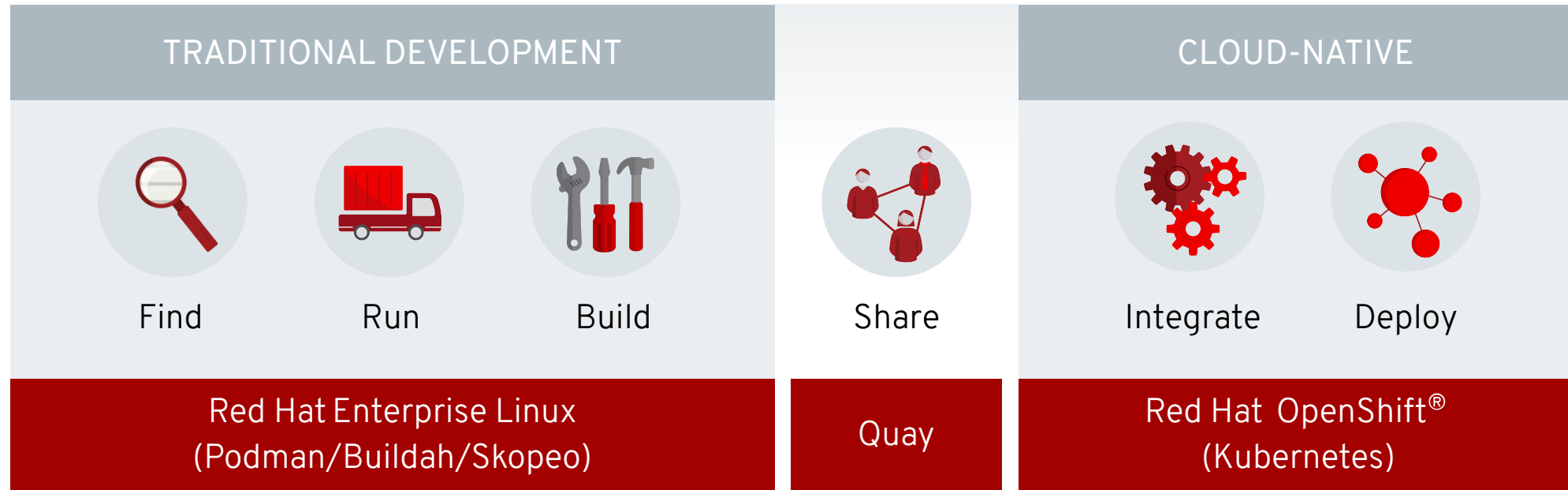
- Red Hat Enterprise Linux is 1 of only 2 certified Linux distributions
- More than 20 years of Red Hat and SAP joint engineering collaboration
- Exceptional performance and scalability –the largest SAP install in the world runs on Red Hat Enterprise Linux

Power the adoption of containers

Containers are Linux



Powering the adoption of containerized workloads



Come to our RHUG

4:00 PM

To learn more details about:

New OCI Compliant **Container tooling**, and

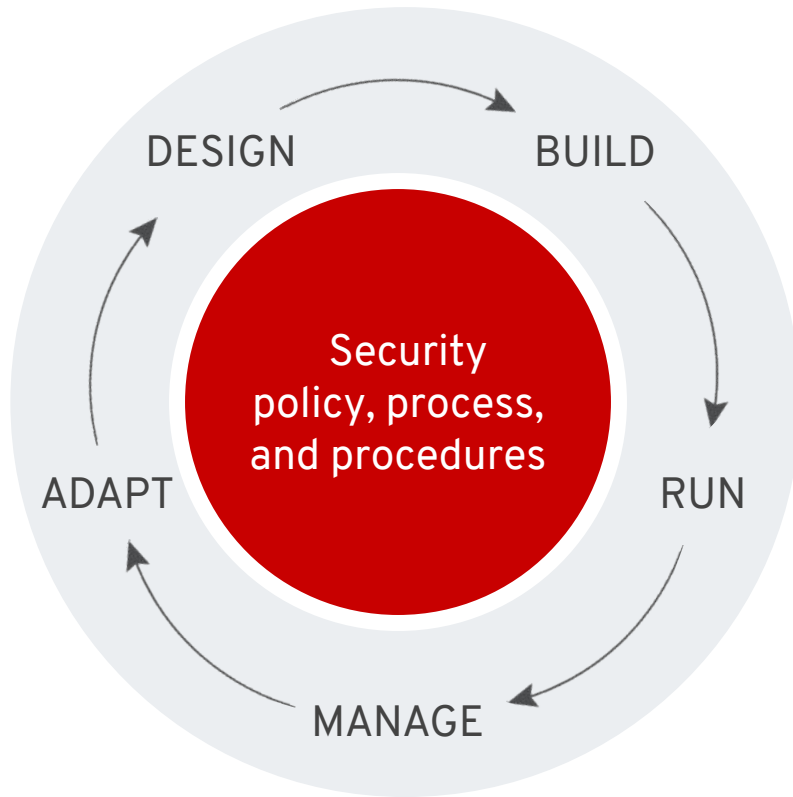
A Demo of **Elastic Infrastructure** on our Container Orchestration Platform: OpenShift.

Join the Pittsburgh RHUG:

<https://www.meetup.com/Pittsburgh-Red-Hat-User-Group/>

New capabilities can't
come at the expense
of security

A highly secure platform



Latest protocol support

Including TLS 1.3 via OpenSSL 1.1.1

Hardened code

Including PIE and RELRO binaries and code analysis in our pipelines

Integrated identity management

As a stand-alone provider or trusted member of an Active Directory, with expanded integrations to tools like the web console

Updated tools

Including the LUKS v2 on-disk format for encryption

Configuring systemwide cryptographic policies



Central configuration

Set acceptable algorithms from a single tool

Improved consistency

Covers multiple cryptographic providers and consumers like TLS, kerberos, and Java

Built-in policies

Including legacy systems requiring 64-bit security and FIPS allowed or approved algorithms

Recording user terminal sessions

The image shows two screenshots from the Red Hat Enterprise Linux 8 graphical user interface. The left screenshot displays the 'General Configuration' window for a system named 'rhel8-1.exempl...'. The 'Session Recording' section is expanded, showing various settings such as 'Log User's Input', 'Log User's Output', 'Log Window Resize', 'Limit Rate', 'Burst', 'Logging Limit Action', 'File Path', 'Syslog Facility', 'Syslog Priority', 'Journal Priority', 'Journal Augment', and 'Writer'. A 'Save' button is visible at the bottom of this section.

The right screenshot shows the 'Session Recording' application interface. It displays a terminal window titled 'Player: cloud-user@rhel8-1-~' with a black background and white text. The terminal output shows the user running the following commands:


```
[cloud-user@rhel8-1 ~]$ sudo ls /etc/sss/conf.d
sssd-session-recording.conf
[cloud-user@rhel8-1 ~]$ sudo cat /etc/sss/conf.d/sssd-session-recording.conf
[session_recording]
scope=some
users=cloud-user
groups=
[cloud-user@rhel8-1 ~]$ exit
logout
```

 Below the terminal window is a playback control bar with buttons for play, stop, previous, next, and zoom, along with a progress indicator showing '00:11 / 00:32'. At the bottom, a 'Recording' table lists session details:

ID	Hostname	Boot ID	Session ID	PID	Start	End
74e3060799604c2792a9f705cf3636674ccd4523	rhel8-1.example.com	74e3060799604c2792a9f705cf363667	4	19661	2019-04-02 11:51:17	2019-04-02 11:51:40

Below the screenshots is a terminal window showing the command sequence used to activate session recording:


```
$ ssh cloud-user@rhel8-1.example.com
Activate the web console with: systemctl enable --now cockpit.socket

Last login: Tue Apr  2 13:10:47 2019 from 192.168.122.1

ATTENTION! Your session is being recorded!

[cloud-user@rhel8-1 ~]$ sudo ls /etc/sss/conf.d
sssd-session-recording.conf
[cloud-user@rhel8-1 ~]$ sudo cat /etc/sss/conf.d/sssd-session-recording.conf
[session_recording]
scope=some
users=cloud-user
groups=
[cloud-user@rhel8-1 ~]$ exit
logout

Connection to rhel8-1.example.com closed.
$
```

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

Improved firewall management with nftables



Consolidated filtering

Supports IPv4, IPv6, ARP, and Bridge filtering in a single tool

Simpler rule creation

Multiple matches and actions reduce the number of rules required

Improved tracing

Provides easier debugging and verification of actions taken on any packet

Improved service
delivery brings Linux
to more new users

Remote single-system views in the web console

The screenshot displays the Red Hat Enterprise Linux web console interface for a remote system named 'rhel8-1.exempl...'. The interface is divided into several sections:

- Navigation Sidebar:** Lists system components such as System, Logs, Storage, Networking, Virtual Machines, Accounts, Services, Session Recording, Applications, Diagnostic Reports, Kernel Dump, SELinux, Software Updates, Subscriptions, and Terminal.
- Performance Graphs:** Two line graphs showing 'Reading' and 'Writing' speeds in KIB/s over time (13:25 to 13:29).
- Filesystems Table:**

Name	Mount Point	Size
/dev/vda1	/	1.63 / 9.99 GiB
cidata	-	366 KiB
- NFS Mounts:** A section indicating 'No NFS mounts set up' with a '+ Add' button.
- Storage Logs:** A log viewer for 'Storage Logs' dated 'April 2, 2019', showing messages from the 'udisksd' daemon, such as 'Loading module libudisks2_...'.


```

13:16 g_object_notify: object class 'UDisksObjectS... udisksd
13:16 g_object_notify: object class 'UDisksObjectS... udisksd
13:16 Loading module libudisks2_... udisksd
13:16 Loading module libudisks2_iscsi.so... udisksd
13:16 Acquired the name org.freedesktop.UDisks2 on... udisksd
13:16 udisks daemon version 2.8.0 starting udisksd
            
```
- RAID Devices:** A section showing 'No storage set up as RAID' with a '+ Add' button.
- Volume Groups:** A section showing 'No volume groups created' with a '+ Add' button.
- VDO Devices:** A section showing 'VDO support not installed' with an 'Install VDO support' button.
- iSCSI Targets:** A section showing 'No iSCSI targets set up' with a '+ Add' button.
- Drives:** A list of system drives:
 - VirtIO Disk: 10 GiB Hard Disk (R: 0 B/s, W: 0 B/s)
 - 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

New in the web console

The screenshot shows the Red Hat Enterprise Linux web console interface. The top navigation bar includes the system name 'rhel8-1.exempl...' and user information 'Privileged' and 'Cloud User'. The left sidebar contains a menu with categories like 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 is divided into several sections:

- Performance:** Two line graphs showing 'Reading' and 'Writing' speeds in KIB/s over time.
- Filesystems:** A table listing mounted filesystems:

Name	Mount Point	Size
/dev/vda1	/	1.63 / 9.99 GiB
cidata	-	366 KiB
- NFS Mounts:** A section indicating 'No NFS mounts set up' with a plus icon for configuration.
- Storage Logs:** A log viewer for 'Storage Logs' dated 'April 2, 2019', showing messages from the 'udisksd' daemon such as 'g_object_notify', 'Loading module libudisks2_...', and 'udisks daemon version 2.8.0 starting'.
- RAID Devices:** A section showing 'No storage set up as RAID' with a plus icon.
- Volume Groups:** A section showing 'No volume groups created' with a plus icon.
- VDO Devices:** A section showing 'VDO support not installed' with an 'Install VDO support' button.
- iSCSI Targets:** A section showing 'No iSCSI targets set up' with edit and plus icons.
- Drives:** A list of hardware drives:
 - VirtIO Disk: 10 GiB Hard Disk (R: 0 B/s, W: 0 B/s)
 - QEMU DVD-ROM (QM00001): Optical Drive (R: 0 B/s, W: 0 B/s)

Virtual machines

Create and manage virtual machines

Network-bound disk encryption

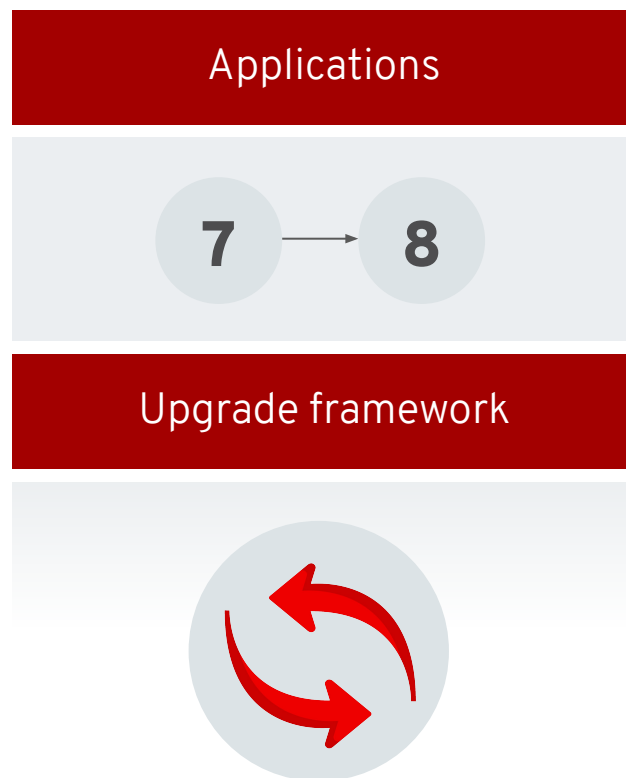
Enroll disks with Tang server and manage LUKS keys

Single sign-on configuration

Automatically configure when joining a domain

Gain new capabilities
while giving up nothing

In-place upgrades for your systems



Reduced migrations

Analyze systems to determine if upgrading in place can avoid a costly migration

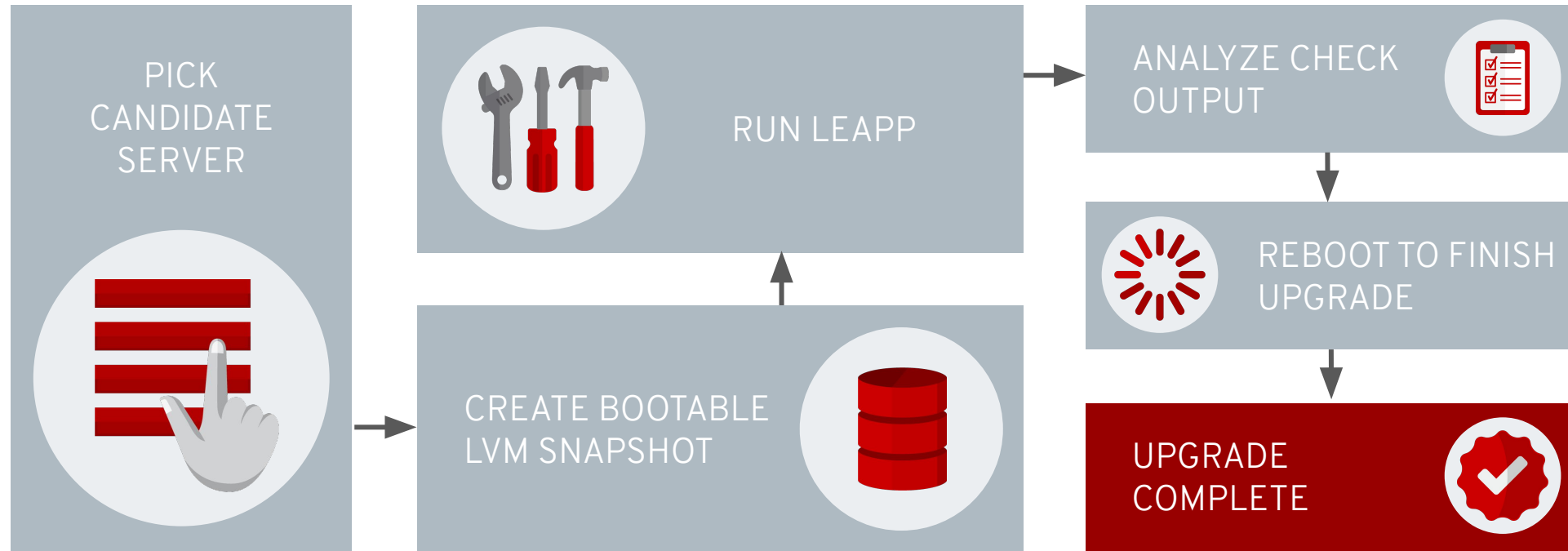
Easy rollback options

Combine with bootable LVM snapshots for safety

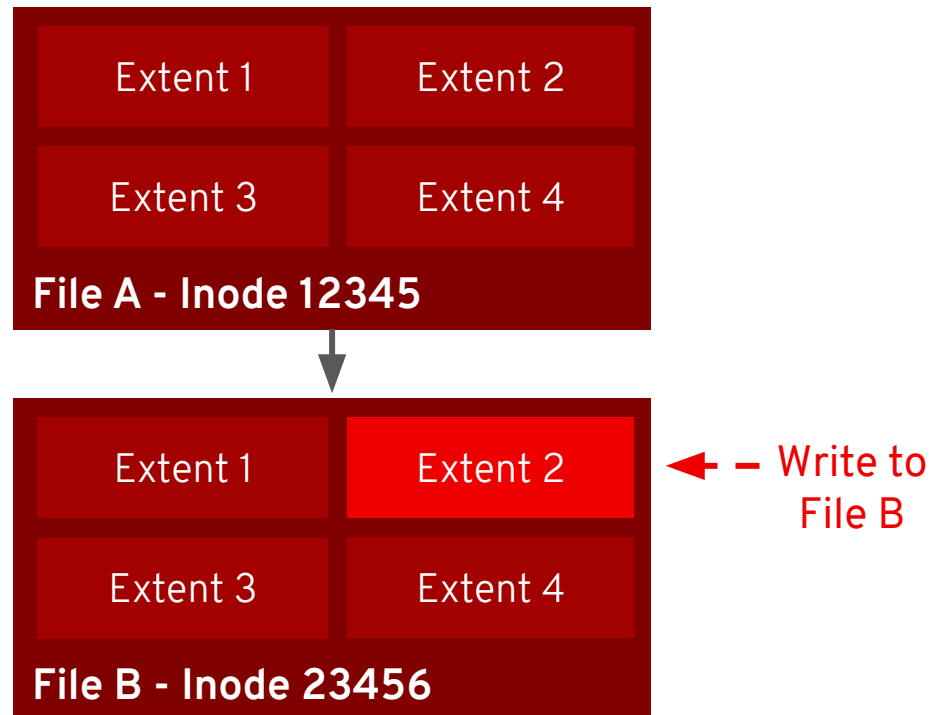
Improved framework

Get better analysis and a simplified process with a more extensible framework

Can I upgrade this host?



Fast file copy with XFS shared data extents



Filesystem level copy-on-write

XFS creates new extents when data is changed in a copy without additional application integrations

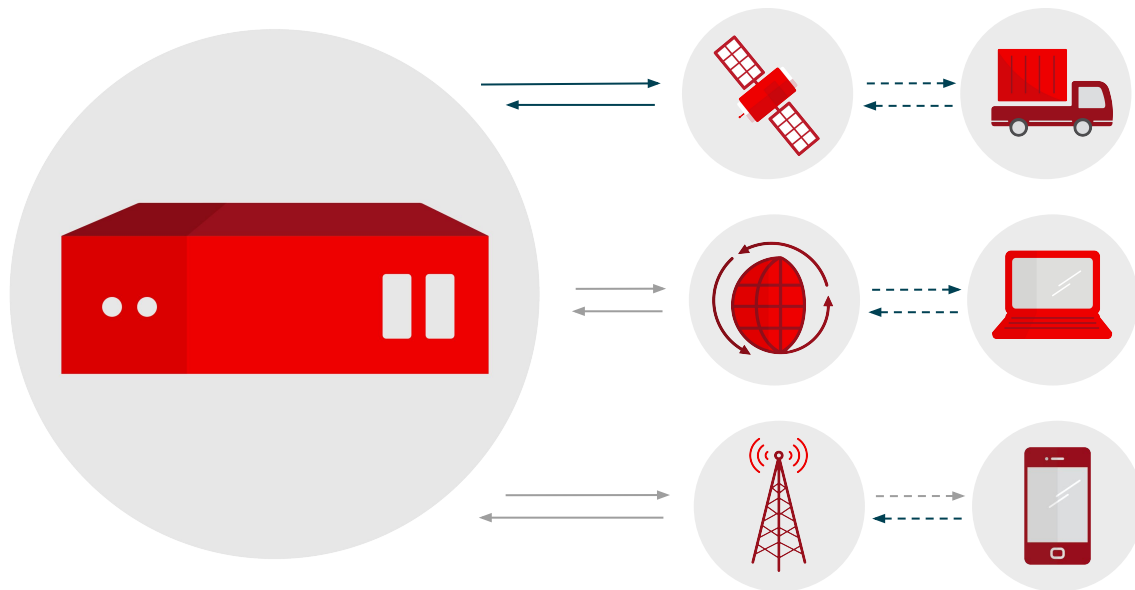
Separate metadata

Copies have unique file system metadata allowing for owner, group, and permission changes

Fast operations

XFS creates new inode and metadata instead of full data copy

Improve network performance with bandwidth and round-trip propagation time congestion algorithm



End-to-end performance

Link capacity calculation and management at server do not require client end modifications

High-latency links

Improved performance over other algorithms on networks with high latency and congestion

More choices

An improved network stack combined with BBR and other algorithms lets you select the highest performance combinations

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.



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