Moving into your new RHEL 8 Home

Essentials for a comfortable transition.

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Predictable updates

3 years
Major releases

6 months
Minor updates

2 phases
Support life cycle

Red Hat

Support Lifecycle

May 2019
General Availability

10 Years
Regular Support

+3 ELS
Extended Life Support

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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

Understanding Content in RHEL 8

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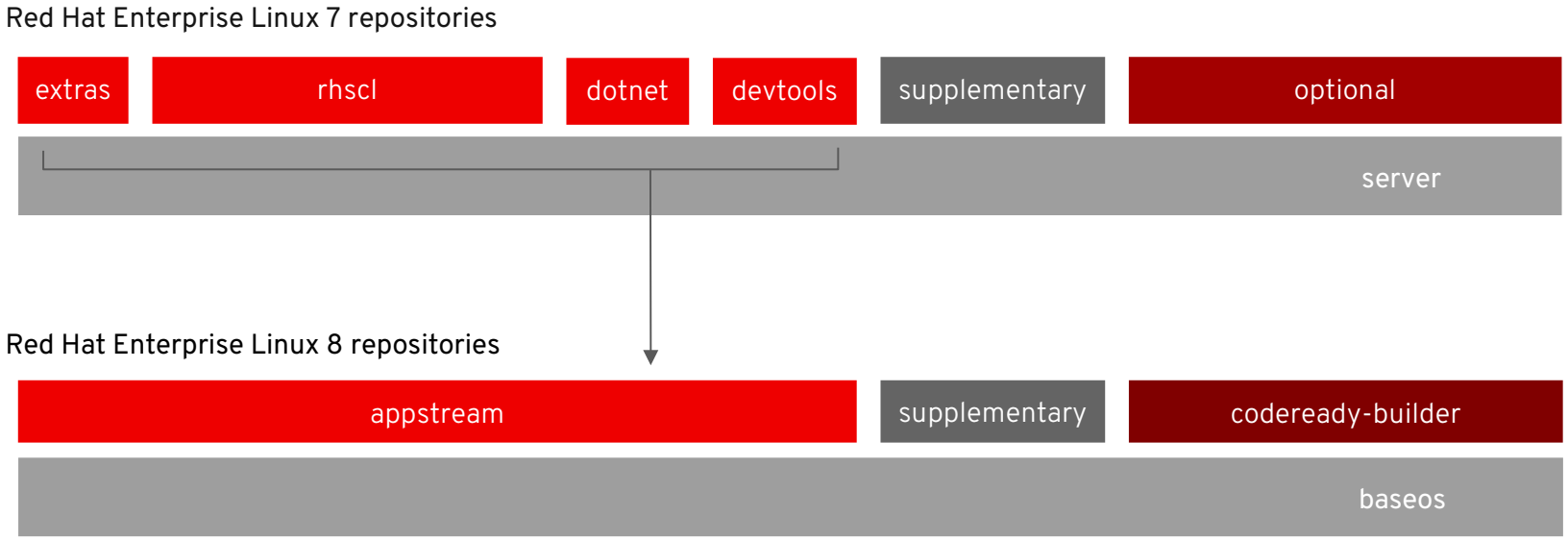
RHEL 8 Content

- RHEL 8 content split between **BaseOS** and **AppStream**
  - The Application Stream contains modules
  - Some content in the Application Stream has a less than ten-year life cycle
- Add-Ons like HA and RS will not be part of the default installation media
- All RHEL SKUs/variants have a shared content set
  - No more separate builds/repos for Server, Workstation, HPC, etc
  - “**System Purpose**” is used in place of the old build variants.

    #syspurpose [show, --role=, --sla=, --usage=]
- Internal RHEL (8 and beyond) releases & naming have changed to incorporate the Application Stream build information.

Simplified access to software



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RHEL 8 BaseOS

- **BaseOS** content
  - Core operating system functionality
  - Traditional RPM packages only
  - Not the same thing as “minimal” - contains more than that
- Releases
  - 6-month RHEL minor-release cadence
  - 6-week batch updates - “z stream”
- Supported life of content
  - Follows full RHEL lifecycle - 10 years, in phases

RHEL 8 Application Stream

- aka “**AppStream**”
- AppStream Content
  - No AppStream packages required to run BaseOS
  - Application Stream is RHEL
    - Not an add-on product or something you purchase separately
  - Desktop, apps, libraries, etc.
  - AppStream replaces RHSCL, Extras, DotNet, and other repos
  - Software Collections content is in, or transitioning to, AppStream

RHEL 8 Application Stream

Releases

- 3-month updates - RHEL minor + an interim-release
  - Minor releases align BaseOS and AppStream updates
  - AppStream/Quarterly releases enable rapid change for non-BaseOS content
- 6-week batch updates - “z stream”

Supported life of content - variable

- Most will follow full RHEL lifecycle - 10 years, in phases

RHEL 8 Media

- Boot ISO
  - Boot up, point to an external repo for content
  - Use RHEL 8 BaseOS [and AppStream] repos

- Install DVD ISO
  - Includes all of BaseOS and AppStream

- Custom media spins
  - Use Image Builder to include your desired content and/or cloud images (VMware, AWS, Azure, Openstack/KVM)
  - More on Image Builder

Package Management

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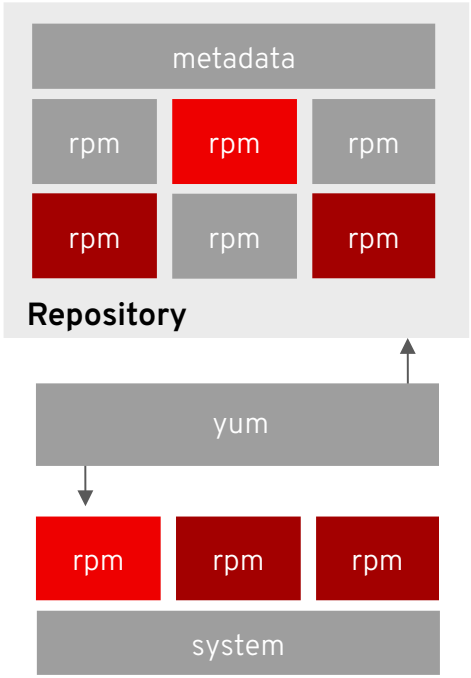
The newest yum package manager: version 4



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

yum

- Based on upstream DNF technology
- Performance improvements
  - Verify
  - Clean
- Stable API for plugins
- Module functionality

```
# yum module [list, enable, info, reset] PACKAGE_NAME
```

rpm-4.14

- Performance improvements
- Packaging files larger than 4Gb
- Allows parallel debuginfo package installs
  - Great improvement for support delivery!!

Your New RHEL 8 Home

Proactive Remediation with RHEL 8

Red Hat

Red Hat Insights

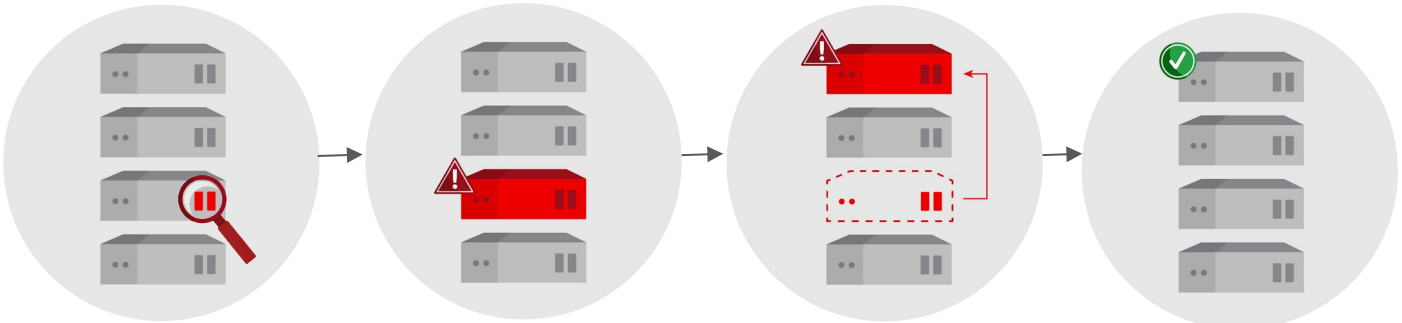
Now included with all Red Hat Enterprise Linux subscriptions

Buy

Get

Red Hat

Gain operating intelligence



More than just security

Red Hat Insights has more than 1000 rules—here is how they stack up across categories

- **Availability** 44%
- **Security** 15%
- **Stability** 27%
- **Performance** 14%

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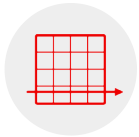
Key risks discovered

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.

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Data collection

No sensitive data collected—only data needed for rule analysis

Example files

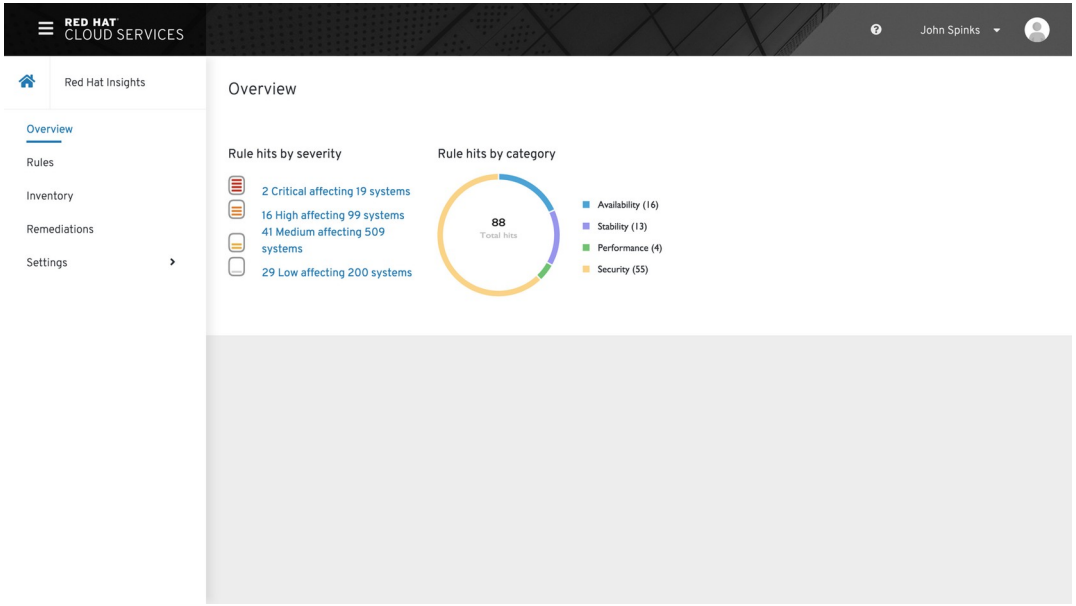
```
/etc/redhat-release
/proc/meminfo
/var/log/messages
/boot/grub/grub.conf
/boot/grub2/grub.cfg
/etc/modprobe.conf
```

Commands

```
/bin/rpm -qa
/bin/uname -a
/usr/sbin/dmidecode
/bin/netstat -i
/bin/ps auxcww
```

We do not collect log files, but we collect the lines that match a potential rule (e.g., page allocation failure.)

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

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Updated Operating System Components

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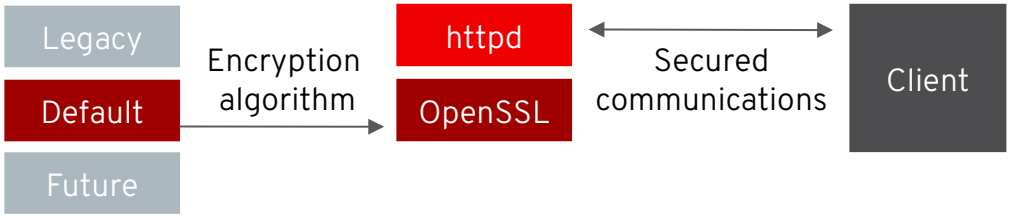
Configuring system wide cryptographic policies

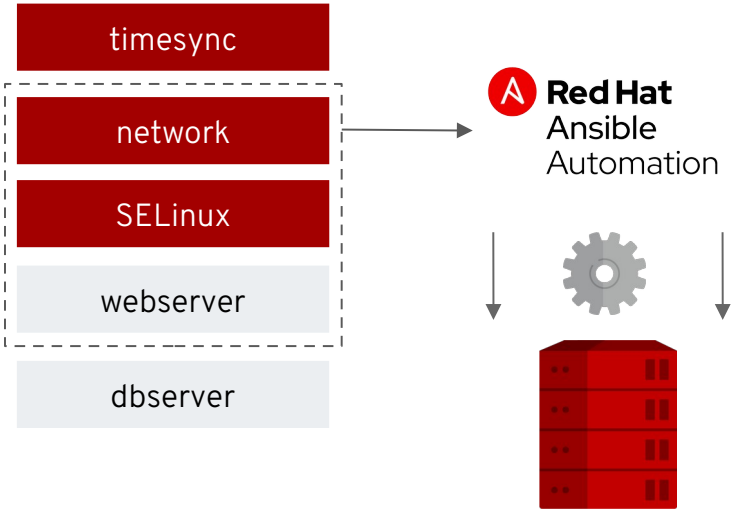


Central configuration
Set acceptable algorithms from a single tool

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

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

kernel-4.18+

- NFTables
- New TCP features, performance, scale
  - New congestion algorithms
    - BBR: Bottleneck Bandwidth and RTT from Google
    - NV: New Vegas from Facebook
- 5-level paging (128 PiB Virtual Memory)
- NVDIMM storage
  - Intel Optane DC
- New hardware support
  - AMD EPYC

New Features :: 8.1

- Security
  - FIPS-140
  - Common Criteria
  - TPM 2.0 userspace tools
  - rngd can run as non-root
- Cockpit updates
  - Firewall zones
  - Log filtering based on services
  - Enable/Disable SMT
- Kernel Live patching only
  - No special request required any longer
  - Regular content stream
- 400 additional Insights rules
  - SAP focused
  - Microsoft SQL
  - Satellite 6.6

New Features :: 8.2 Beta

- Performance Co-Pilot
  - New Microsoft SQL Server 2019 support
  - Grafana PCP integration

- Streamline Installation Process
  - Addition of subscription registration
  - Optionally enable RH Insights
  - Use Boot ISO to install from CDN (latest)

New Features :: 8.2 Beta

- Samba update
  - Rebased to 4.11.2
  - SMB1 protocol disabled

- Cockpit
  - UI updated to PatternFly v4
  - Session timeout configurable
  - TLS client certificate support
  - Smart Card or YubiKey

New Features :: 8.2 Beta

- Image Builder
  - cloud-init support for Azure images
- Tuned profile updates and rebased to 2.13.0
  - SAP-Hana
  - Latency-performance
  - realtime
- BIND rebased to 9.11.3
  - DDoS attack: stale-answer
  - New GeoIP2 library for logs

New Features :: 8.2 Beta

- Crypto-policies can be customized
- SCAP Security Guide
  - Added ACSC (Australian Cyber Security Center)
- New SELINUX tools
  - setools-gui
  - setools-console-analyses

New Features :: 8.2 Beta

- audit rebased to 3.0-0.14
- Clevis update
  - List Policies
  - Key Status
  - Rebind Keys
  - Extract Passphrase
- rsyslog rebased to 8.1911.0

New Features :: 8.2 Beta

- whois package added
- Rebased Developer Tooling
  - GCC Toolset 9.1
  - Python 3.8
  - Maven 3.6
- firewalld rebased to 0.8
  - JSON libnftables support

New Features :: 8.2 Beta

- HA new PCS options
  - pcs resource disable --simulate: show effects of disabling specified resource(s) while not changing the cluster configuration
  - pcs resource disable --safe: disable specified resource(s) only if no other resources would be affected in any way, such as being migrated from one node to another
  - pcs resource disable --safe --no-strict: disable specified resource(s) only if no other resources would be stopped or demoted
  - pcs resource relations : command allows you to display the relations between cluster resources in a tree structure
  - pcs dr : display status of both primary and recovery sites

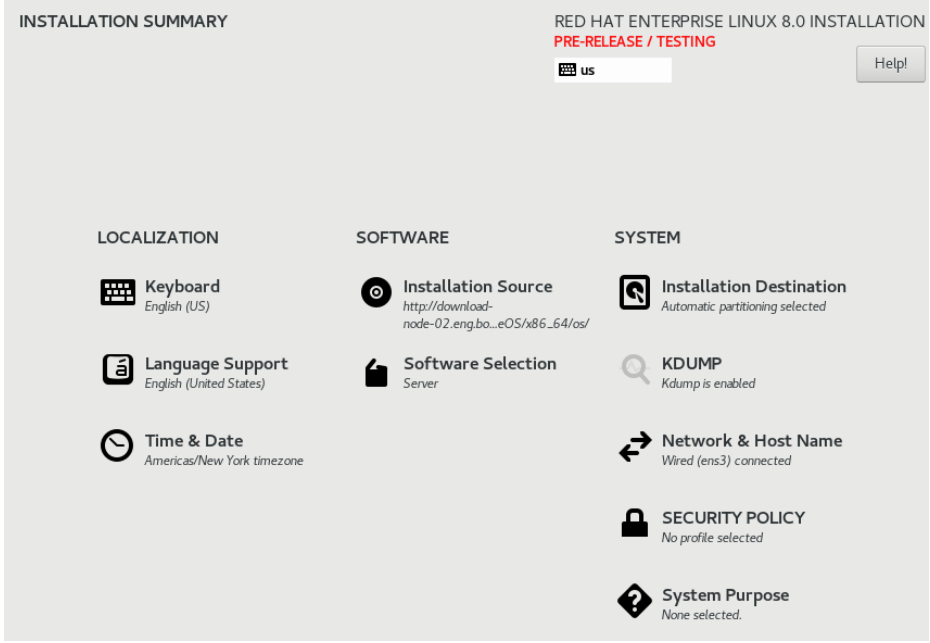
Your New RHEL 8 Home

Installer, Web Console, Image Builder

Red Hat

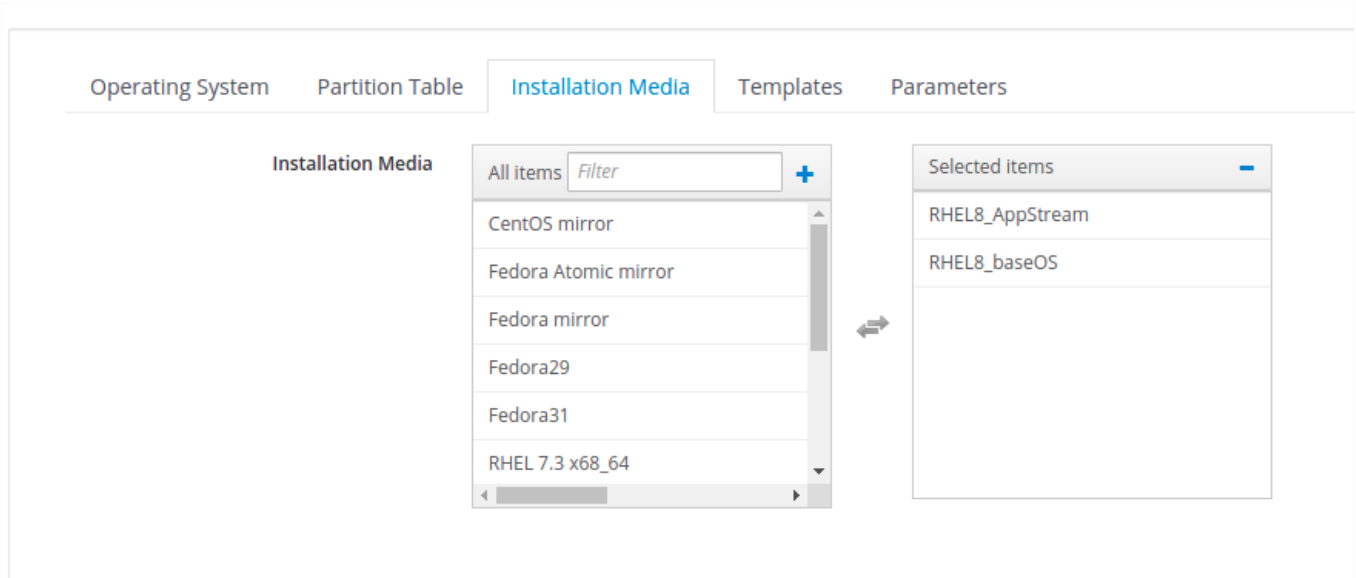
Installer

- The look of the RHEL 8 installer will look similar to what you are familiar with in Fedora and RHEL 7.



Installing from Satellite

- Satellite 6.4+ supports the ability to manage multiple installation repositories specified for a particular OS.



Installing via Kickstart

Use Red Hat Labs Kickstart Converter to convert from RHEL7 to RHEL8 kickstart file:

https://access.redhat.com/labs/kickstartconvert

Use Red Hat Labs Kickstart Config to create from scratch:

https://access.redhat.com/labs/kickstartconfig

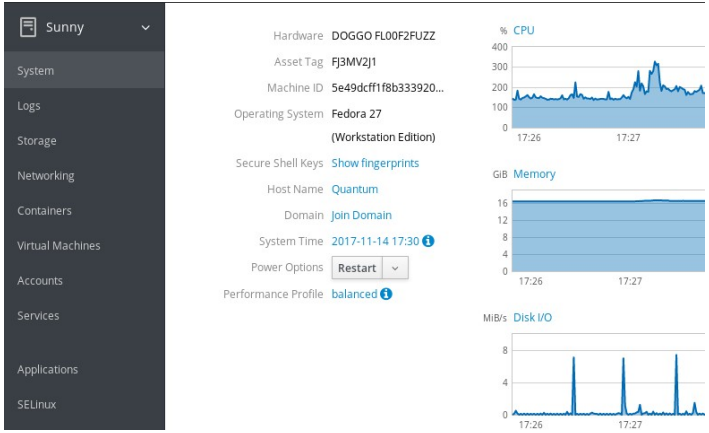
Kickstart Changes (very long URL - Appendix B - Advanced Install)

https://red.ht/2QXsnjC

https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/8/html-single/performing_an_advanced_rhel_installation/index/

RHEL Web Console

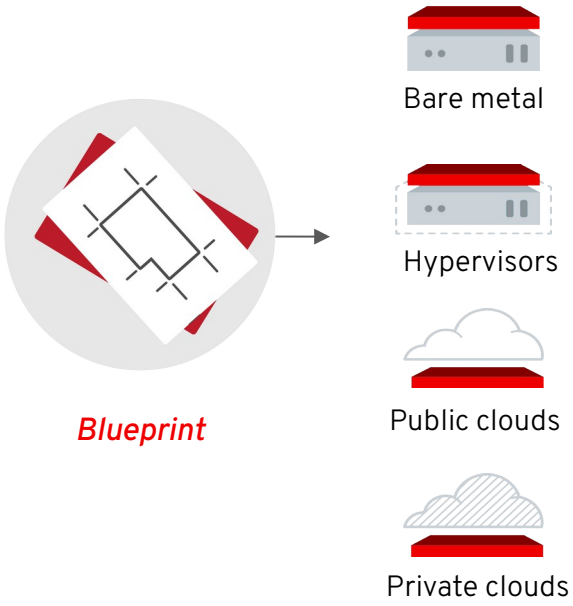
- Cockpit is a user-friendly, web-based interface for administering RHEL servers. It allows monitoring of system resources and adjusting of configurations with ease. It’s the modern Linux admin interface.
- Bits are installed by default, disabled by default.
- Runs on socket.
- systemctl enable --now cockpit.socket



Web Console Features

- What’s new in Web Console for RHEL 8
  - IdM
  - Firewall services
  - Storaged
  - SELinux
  - authselect
  - Performance Co-Pilot
  - Network Based Disk Encryption
  - Virtualization

Create images for all your environments with image builder



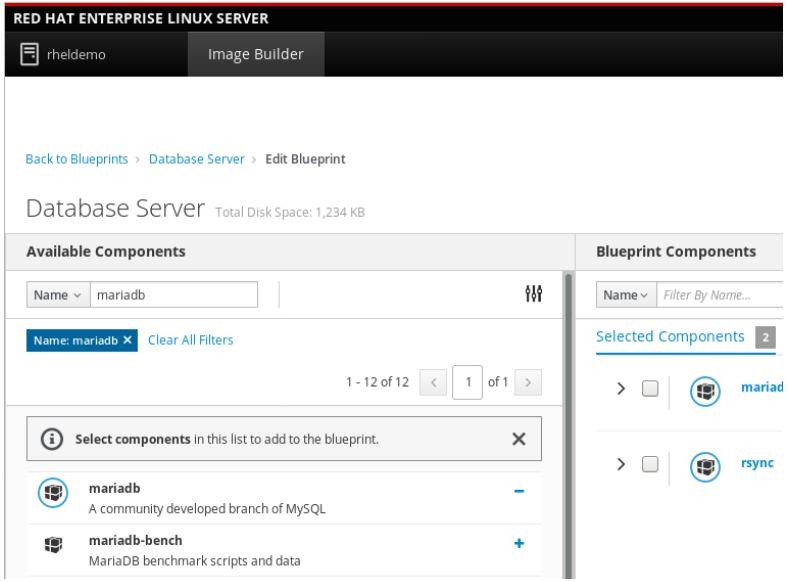
Single source
Lets you create gold images for any environment from the same blueprint increasing stability and consistency

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

Image Builder

A tool to let architects build their own OS without teaching them how to get good at it.

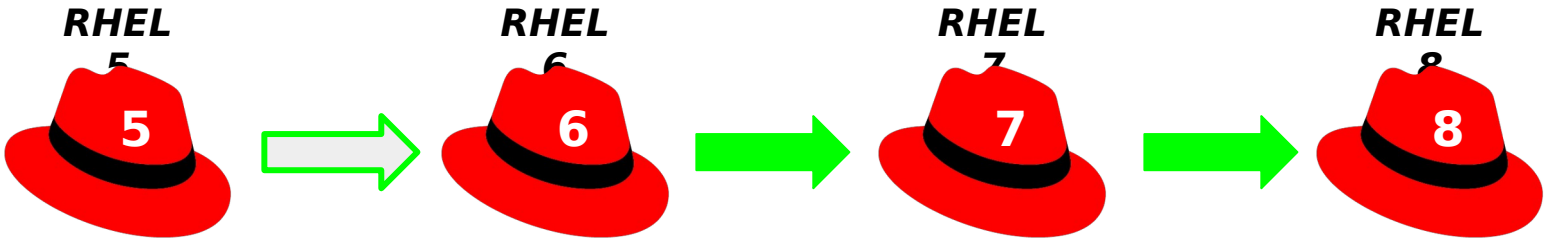


Your New RHEL 8 Home

Upgrading from RHEL 7 to RHEL 8 with Leapp and BOOM

Red Hat

Upgrade Paths

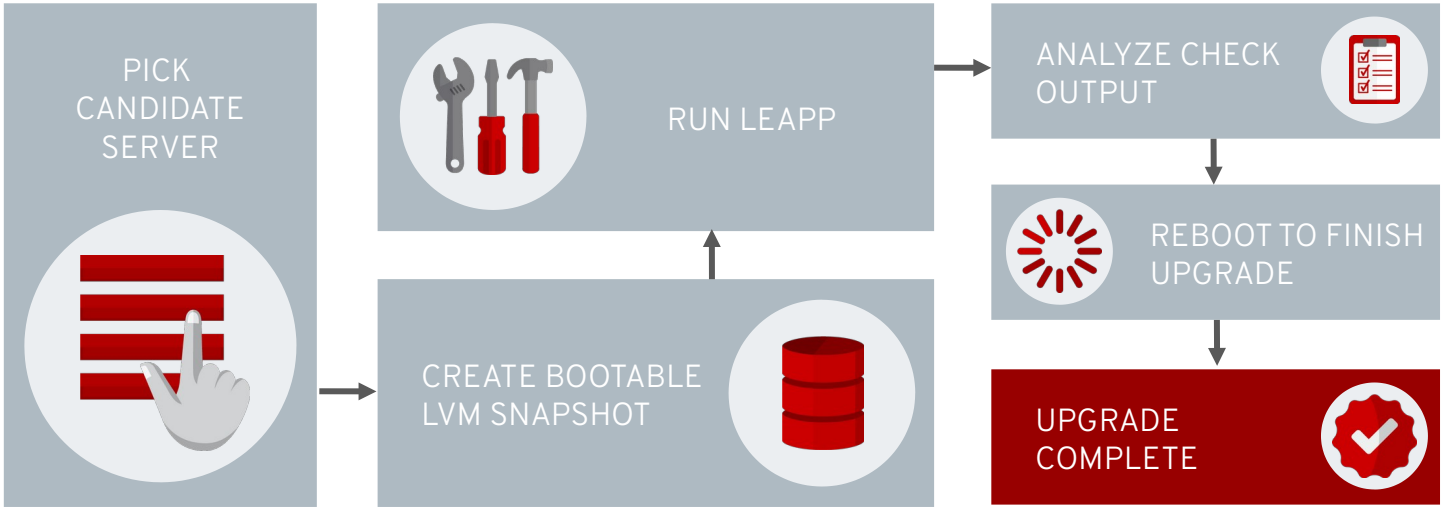


Overlay
or
Rolling
(no automation
from Red Hat)

In-Place
Upgrade
(via IPU)

In-Place
Upgrade
(via LEAPP)

Can I upgrade this host?



Leapp & BOOM

- Leapp is a CLI tool that helps users with the installation process and makes the in-place upgrade easier
  - What Leapp does under the hood:
    - Preparation of the upgrade process before the first reboot.
    - Execution of the upgrade process in RAM disk.
    - Execution of minor post-upgrade tasks after the upgrade from RAM disk.

- BOOM is a utility available starting with RHEL 7.5
  - This tool allows users to manage additional boot loader entries on the system

https://www.redhat.com/en/blog/upgrading-rhel-7-rhel-8-leapp-and-boom

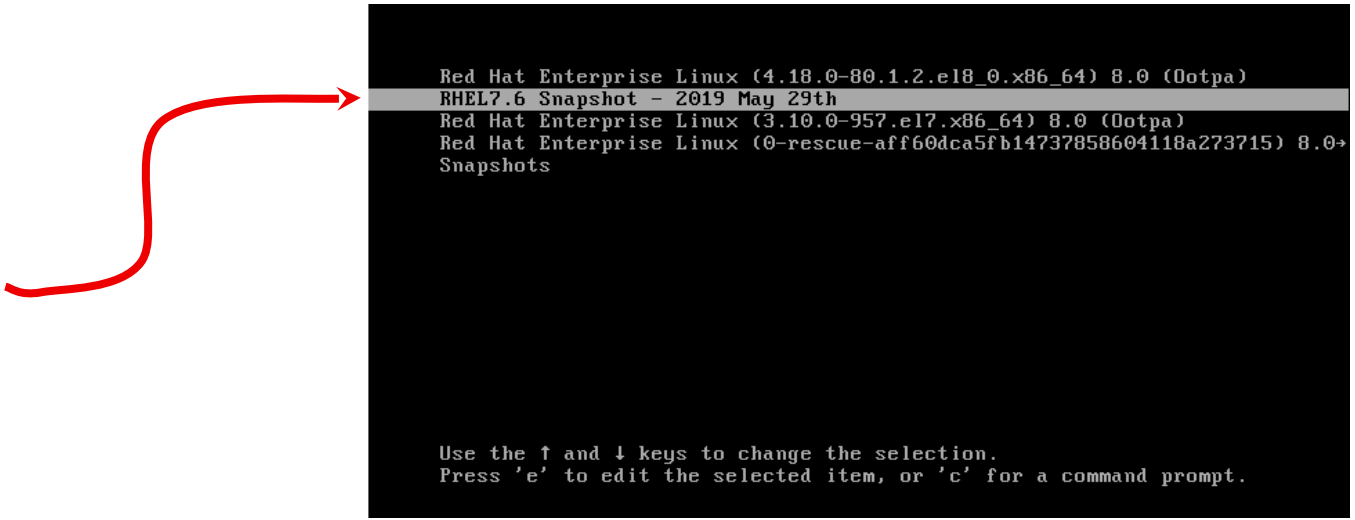
At a High Level

- Are you Ready?
- Install http Service (Optional test)
- Creating snapshots and BOOM entry
- Execute the Upgrade Process
- Check the New Upgraded System
  - RHEL and kernel version, and IP address
  - HTTPD service
  - Yum and packages changes after the upgrade
- Set SELINUX to Enforcing

https://www.redhat.com/en/blog/upgrading-rhel-7-rhel-8-leapp-and-boom

But……..Rollback process

To boot your recently upgraded RHEL 8 box from your previous RHEL 7 operating system, just restart the server and select the appropriate GRUB entry from the GRUB menu.



Upgrade Paths

- Red Hat currently supports in-place upgrade from RHEL 7.6 Extended Update Support (EUS) to RHEL 8.1.
- Red Hat plans to support an in-place upgrade from RHEL 7.8 to RHEL 8.2
- When the last RHEL 7.x minor version that Red Hat releases is available, Red Hat plans to support an in-place upgrade from the last RHEL 7.x minor version to the latest version of RHEL 8.

https://access.redhat.com/articles/4263361
https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/8/pdf/upgrading_to_rhel_8/Red_Hat_Enterprise_Linux-8-Upgrading_to_RHEL_8-en-US.pdf

Known Limitations

- A rollback to the last known good state has not been implemented in the Leapp utility. **A complete system backup prior to the upgrade is recommended.**
- Packages that are not a part of the Minimal or Base package groups can cause the upgrade to fail.
- Encryption of the whole disk or a partition, or file-system encryption currently cannot be used on a system targeted for an in-place upgrade.
- No Multipath or any kind of network storage mount can be used as a system partition (for example, iSCSI, FCoE, or NFS).
- During the upgrade process, the Leapp utility sets **SELinux mode to permissive**.
- The in-place upgrade is currently unsupported for on-demand instances on Public Clouds (Amazon EC2, Azure, Huawei Cloud, Alibaba Cloud, Google Cloud).

https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/8/html-single/upgrading_to_rhel_8/index#known-limitations-upgrading-to-rhel-8

Special Notes

- Read and heed all notes and documents carefully
  - Especially if you get ERRORS
  - See /var/log/leapp/leapp-report.txt
- You will need some space on your partition
- It’s faster if you remove deprecated packages (like **btfs**) first
- Disable unused repos (To save time)
- You need to fix ERRORS (See Below) before it will complete

```
==========================================================
                        ERRORS
==========================================================

2020-04-20 17:08:13.234014 [ERROR] Actor: verify_check_results Message: Possible problems with remote login using root account

==========================================================
                    END OF ERRORS
==========================================================
```

More Information

https://access.redhat.com/documentation/en-us/red_hat_enterprise_linux/8/pdf/upgrading_to_rhel_8/Red_Hat_Enterprise_Linux-8-Upgrading_to_RHEL_8-en-US.pdf

Top Features and Demo

Red Hat

Thank you

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