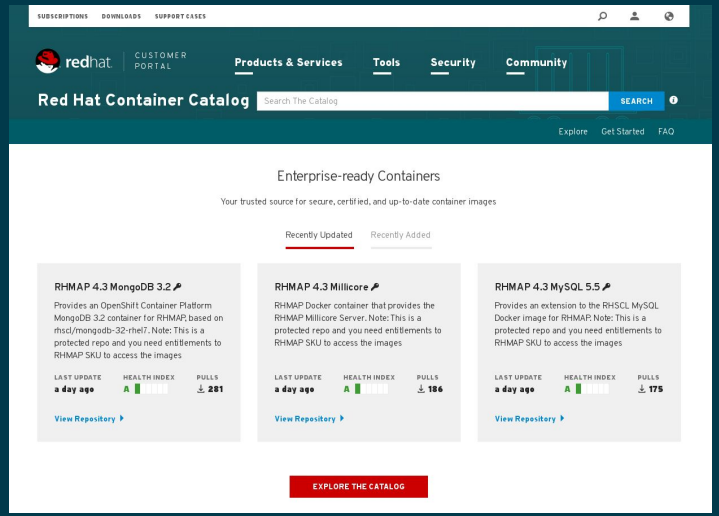
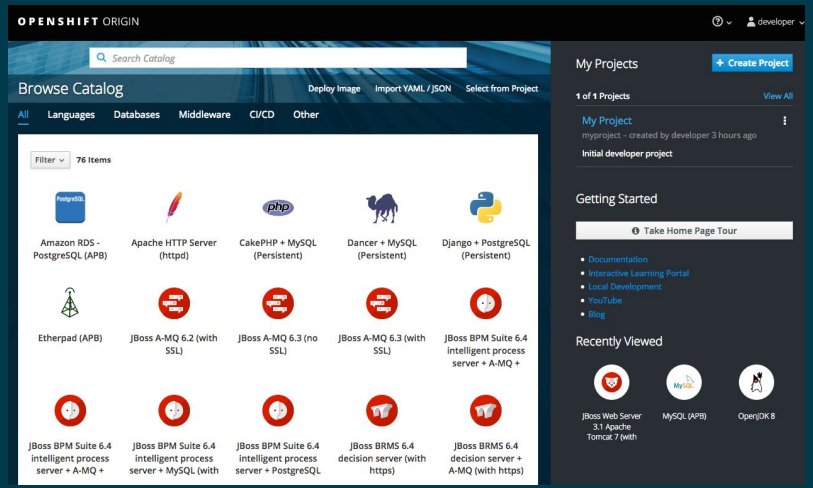
RED HAT CONTAINER CATALOG

How we built it - what's in there - what's next

Dirk Herrmann
(Former Product Owner RHCC)
Product Manager OpenShift
Bonn, April 24th 2018

RHCC is NOT OpenShift Service Catalog (yet?)





https://access.redhat.com/containers/

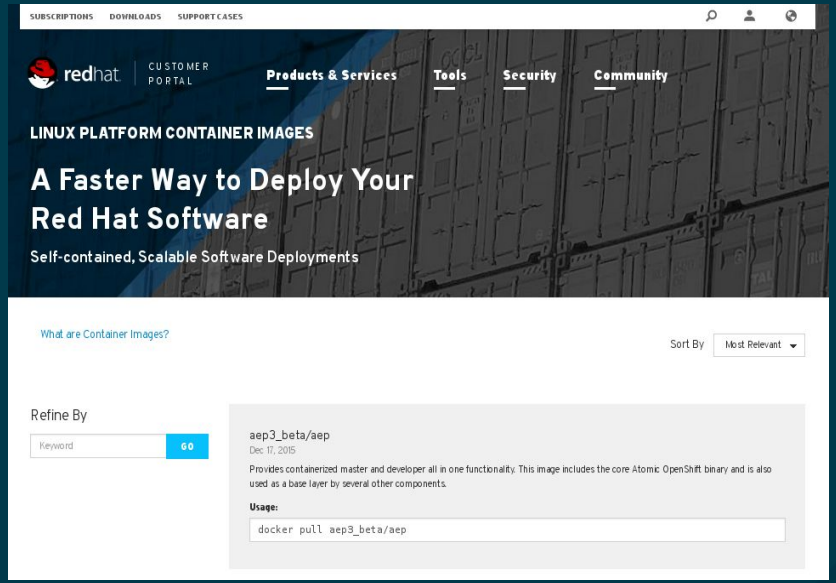
Part of OpenShift Container Platform

The Customer Challenge

When we compared the customer challenge with where we were

It’s quick and easy to pull a Linux container image from a public registry and get started.

In fact, too easy. There can be an explosion of different distributions, architectures, performance and security characteristics in different images.



Questions we asked ourselves

- Do we provide sufficient guidance to search for a particular image?
- Do we provide sufficient data to evaluate an image based on different criteria?
- Do we provide sufficient information how to consume an image depending on the container runtime or container management platform?
- Do we bring together existing, valuable assets and show them side-by-side with their corresponding container images?
- Assuming that container images are static content bundles, how we can make clear which image versions is affected by critical security vulnerabilities?

Red Hat Registry Stats

- 544 repositories
- 5,609 images
- 1+ TB storage

Red Hat Security Statistics 2016

- 97 critical RHSA
- 286 important RHSA
- 100% fixed in <1d *

Red Hat Customer Portal Stats 2016

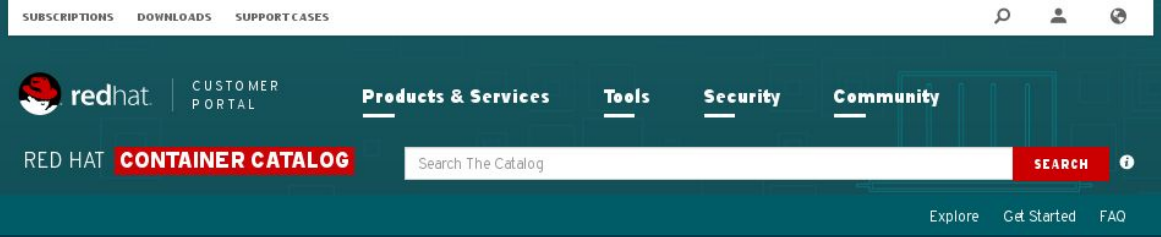
- 13,100,00 visitors
- 2,400,000 searches
- 108,300,000 views

- Cross-team effort of 10 teams across 4 organizations
- Design driven approach focusing on end customer user experience

RED HAT®
CONTAINER
CATALOG

- Container Health Index
- Extensive Image Metadata
- Image Documentation
- Image Advisories

* 100% of critical security flaws in RHEL have been fixed in less than one day: https://access.redhat.com/blogs/766093/posts/2957221



Vision

Our vision is to help developers, architects, and IT operations realize the full potential of containers by transforming the way container-based applications are built, delivered, and consumed

1 Explore & Search

2 Evaluate & Select

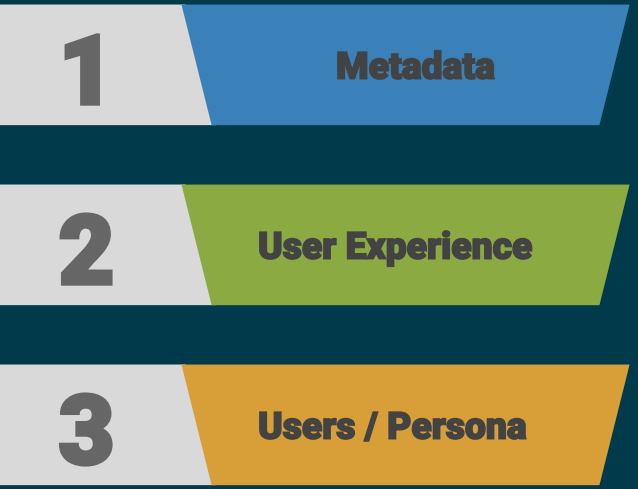
3 Consume & Distribute

4 Use & Maintain

Mission

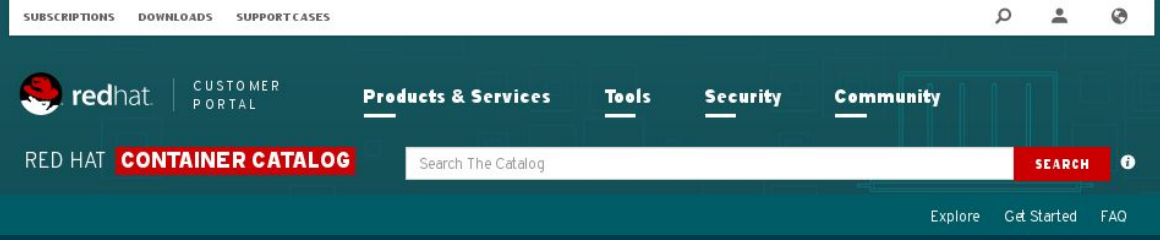
Our mission is to provide customers and partners with the best experience when delivering and consuming container-based applications. This includes the right information and guidance to make intelligent decisions about which container images to consume

RHCC Mission Statement - 3 Focus Areas



- Provide as much as possible **relevant** metadata
- Focus on human readable and actionable metadata

- Provide an intuitive UI supporting target use cases
- Focus on relevant user journeys (UX) and UI design
- Support different target persona
- Focus on high value and existing USPs (differentiate)



Joe

Architect

I want to explore what's inside the Red Hat Container Catalog

I want to search for a product and see all images belonging to it

1 Explore & Search

2 Evaluate & Select

3 Consume & Distribute

4 Use & Maintain

I'm searching for a database container image

I'm searching for Red Hat Enterprise Linux base image

Jane

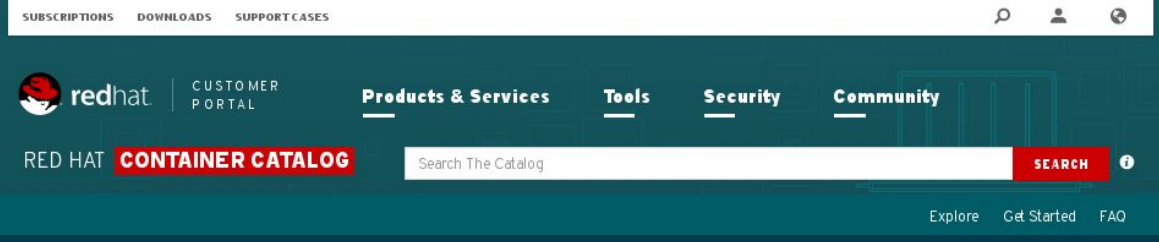
Developer

use our explore page to browse most relevant products and image categories

popular Red Hat and Ecosystem products

app categories such as database, programming language, logging

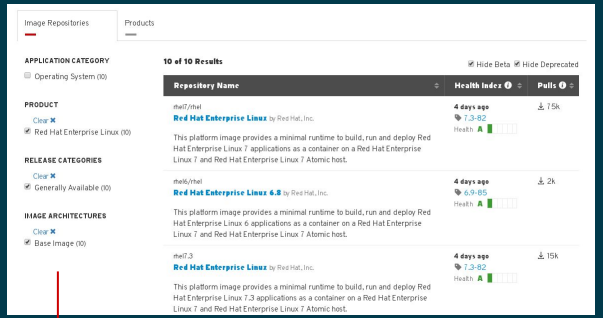
Base, Builder and Application Images



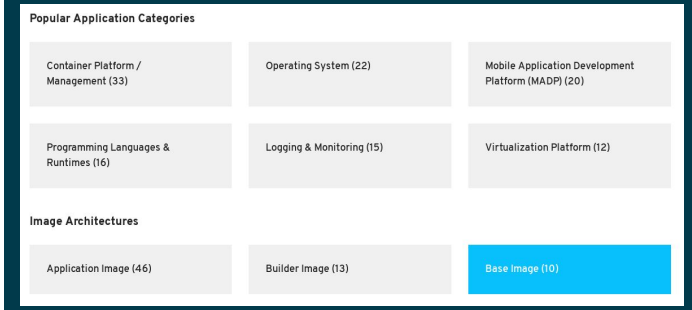
Jane

Developer

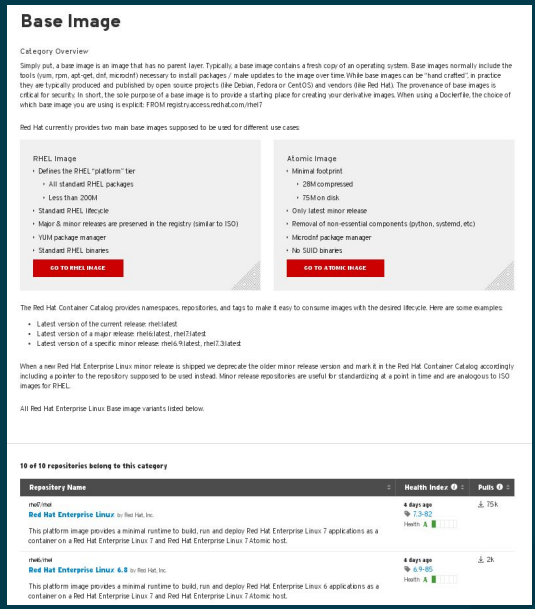
I'm looking for a base image, what are my options?



use the Base Images filter on search page



or use Base Images tile on explore page

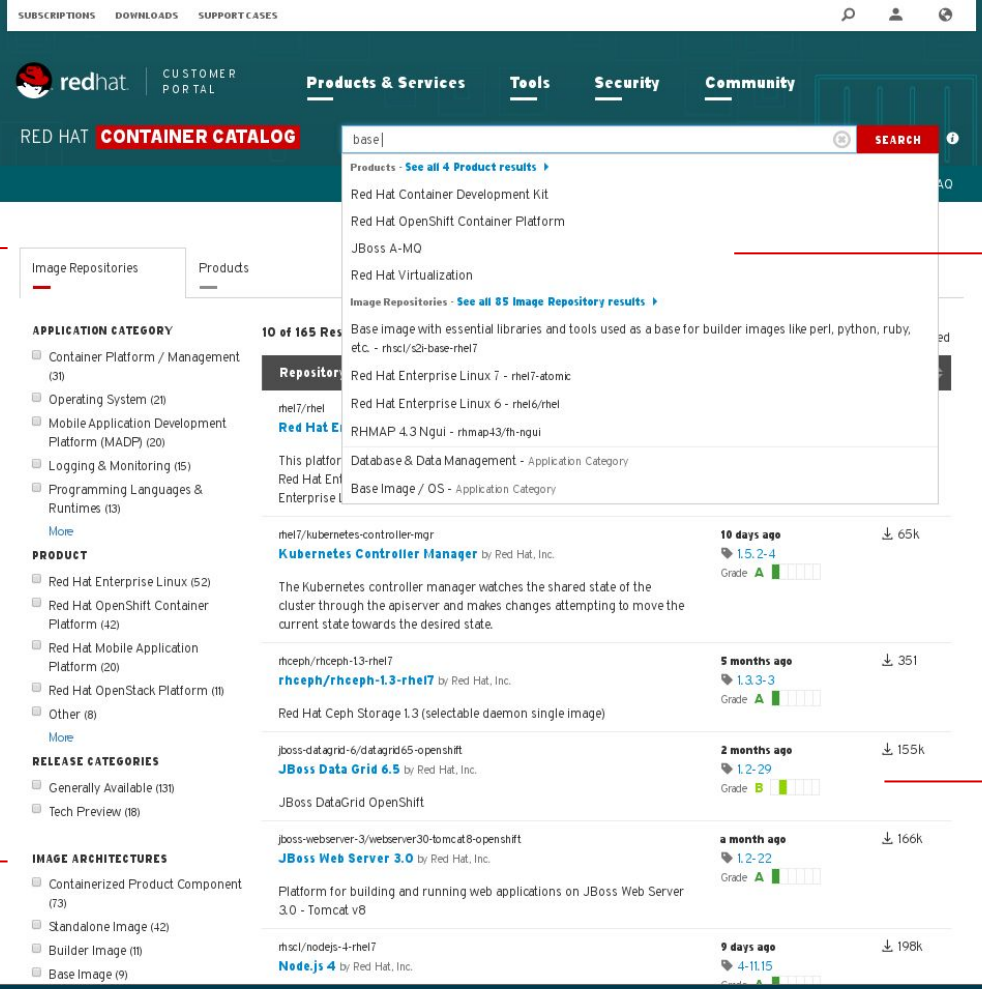


to find our Red Hat base images

You can search for:

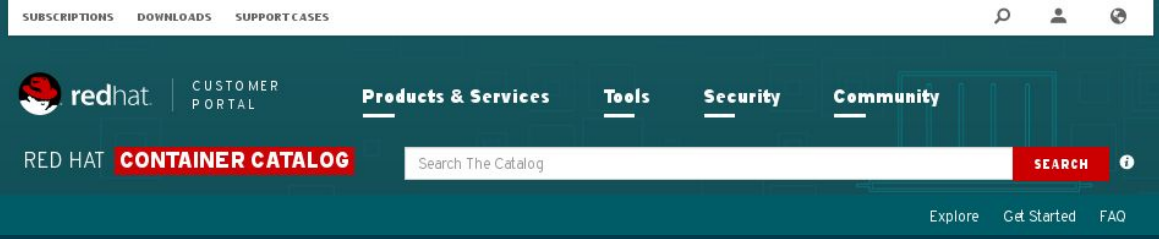
- Images / Repos
- Products
- Image ID
- Advisory ID
- Categories
- Keywords
- etc.

Filter facets for multiple characteristics



Type-ahead contains products, repositories and app categories

Search results with key data



Joe

Architect

I want to see the key characteristics of an image.

Is there documentation available around an image?

1 Explore & Search

2 Evaluate & Select

3 Consume & Distribute

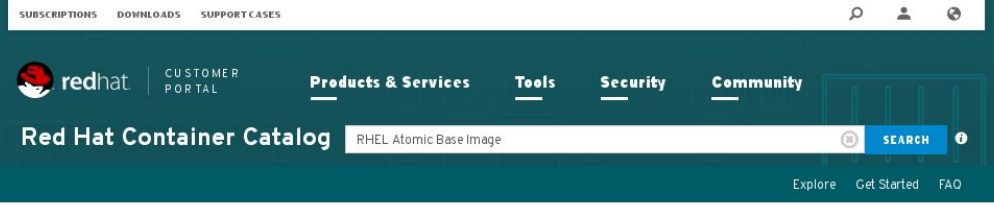
4 Use & Maintain

What are the environment variables defined inside the image?

I would like to learn how this images has been built.

Jane

Developer



RHEL Atomic Base Image

by Red Hat, Inc. | in Product Red Hat Enterprise Linux

`registry.access.redhat.com/rhel-atomic` Updated 5 days ago 7.3-19 : Health Index A

Overview | Get this image | Tech Details | Documentation | Tags

Description

The Red Hat Enterprise Linux 7 Atomic Base Image is designed to be a fully supported foundation for your custom developed applications which are built and updated rapidly, and don't require the extensive libraries or services in the operating system.This image is maintained by Red Hat and updated regularly, following the latest minor release cadence of Red Hat Enterprise Linux. It is designed for containerized applications that don't rely on a full, traditional Linux userspace, but wish to maintain complete runtime compatibility with RHEL. When used as the source for your containers, only one copy will ever be downloaded and cached in your production environment.Use this image just like you would a regular Red Hat Enterprise Linux distribution. Only a minimal set of tools are provided - components such as python, systemd, and yum are not included by default. Extra packages can be installed and updated with a simplified package manager called microdnf.

Application Categories Operating System

Keywords base rhel7 atomic

Hide Repository Specifications

Registry	registry.access.redhat.com
Namespace/Repository	rhel-atomic
Release Category	Generally Available
Repository Size	112.5 MB
Image Versions	4
Subscription Required	No

Most recent tag

View All Tags

Updated 5 days ago

7.3-19

Health Index

A

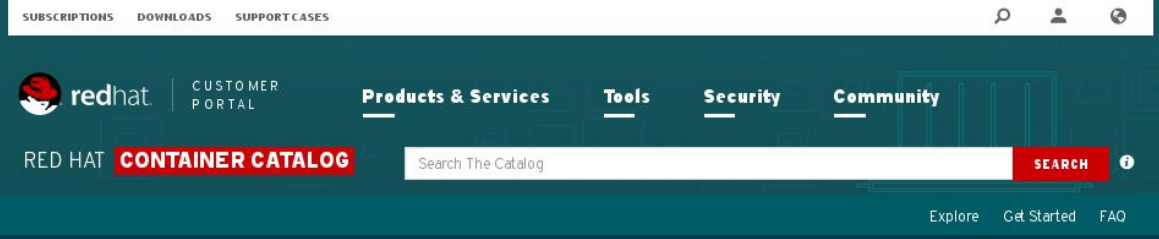
ImageAdvisory

RHBA-2017:1123

Show Image Specifications

overview page shows most relevant repository and latest image version data

additional tabs for consumption guidance, further technical details, surrounding documentation and tag index



Joe

Architect

I want to learn more how to consume and use this image.

Do I need a subscription or license to pull it?

1 Explore & Search

2 Evaluate & Select

3 Consume & Distribute

4 Use & Maintain

I want to pull this image, what do I need to do?

I'm using Red Hat Satellite 6, how can I sync the repository?

Jane

Developer

RHEL Atomic Base Image

by Red Hat, Inc. | in Product Red Hat Enterprise Linux

`registry.access.redhat.com/rhel-atomic` Updated 11 days ago 7.3-15 : Freshness

Overview | Get this image | Tech Details | Documentation | Tags

Choose your platform:

Red Hat Satellite

See Acquiring Red Hat Container Images for general information on acquiring images listed in the Red Hat Container Catalog. Select "Choose your platform" for specific acquire paths.

Satellite 6 supports two different ways to distribute container images to its managed hosts:

A. **External Registries:** You can configure external registries by navigating to **Containers > Registries** in the Web UI of Satellite 6. Note that in this scenario Satellite 6 only triggers commands executed on the corresponding container host. This is a **pass-by** scenario because the image is neither pulled through Satellite 6 nor cached or stored inside Satellite 6. This also applies for the predefined external registry Docker Hub while creating a new container.
B. **Local Content:** Red Hat Satellite allows you to import / synchronize images from local and external registries. Satellite itself can act as an image registry for hosts. However, hosts cannot push changes back to the registry.

In this document we describe how to use Satellite 6 to synchronize external image repositories (**local content, scenario B**).

1 Prerequisites

Before container images can be synchronized into Satellite 6 the following prerequisites have to be met:

- Red Hat Satellite 6 has been installed following the Satellite 6 Install Guide
- Subscription Manifest created and uploaded to Satellite 6 to access content
- For CLI Users only: hammer CLI installed and configured

2 Creating a Custom Product

consumption guidance for different container runtime env's and registries

consumption details including copyable command lines

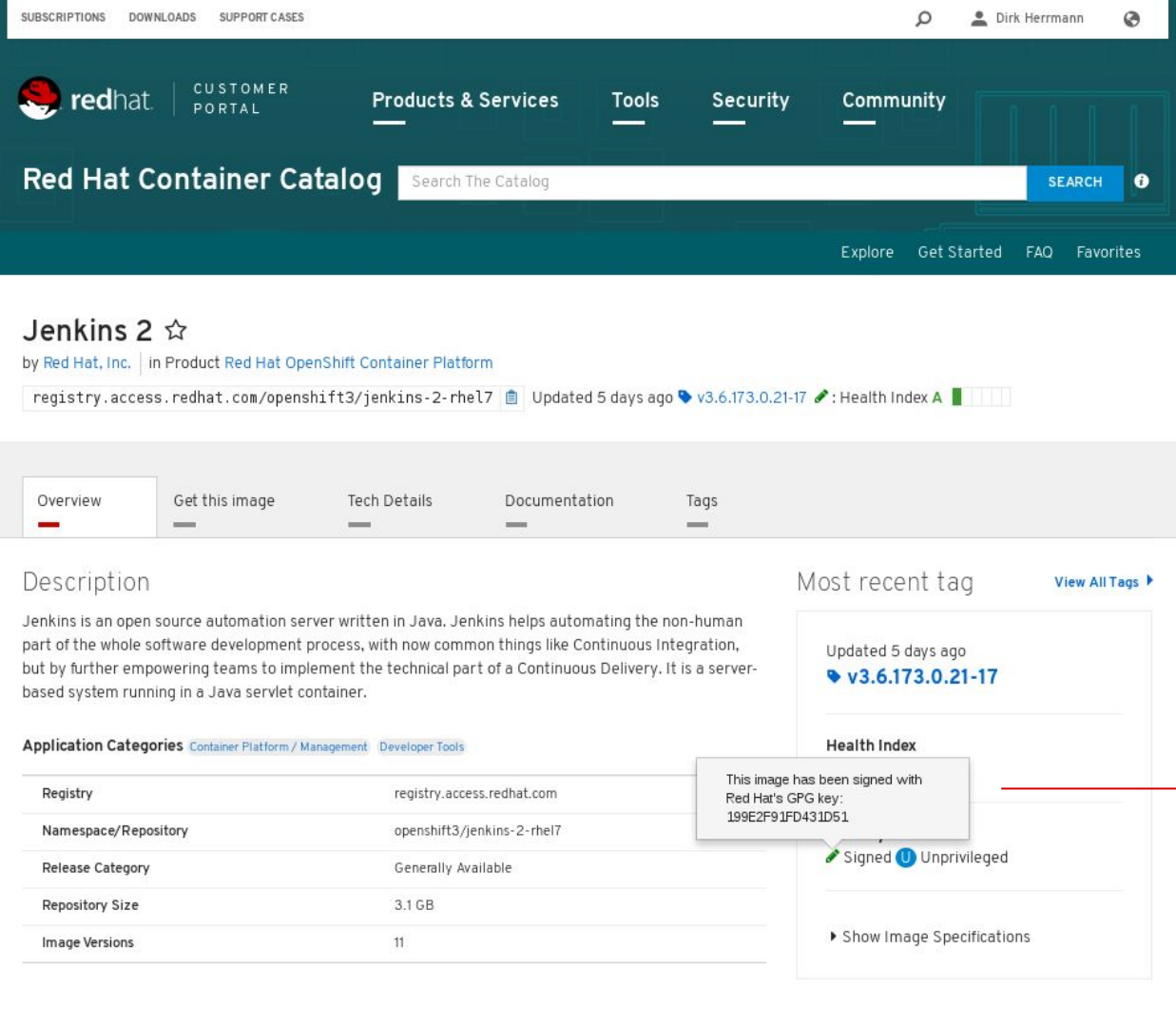
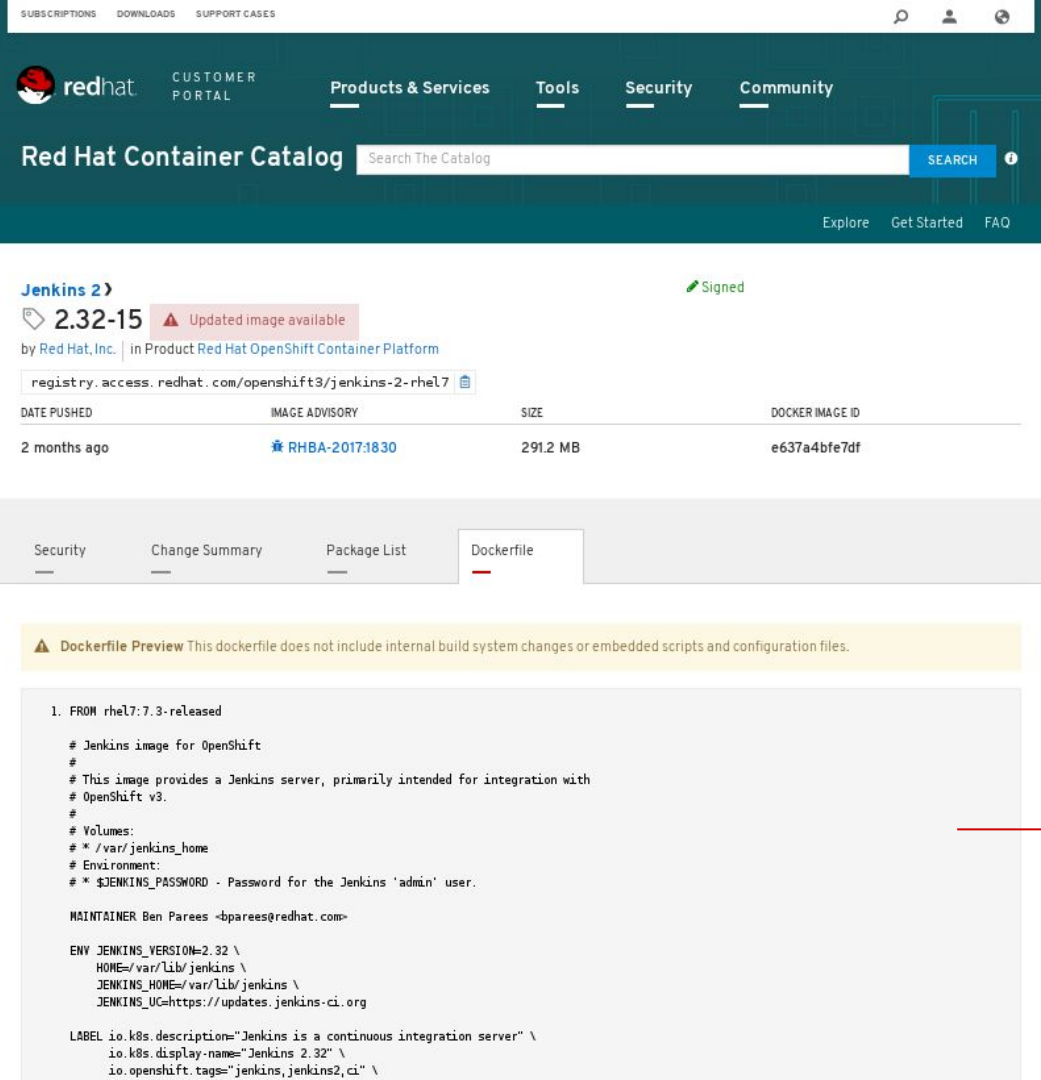


Image Sign
information
verify GPG
signatures



Dockerfile content to understand how we built the image

RED HAT CONTAINER HEALTH INDEX

Questions we asked ourselves

- How customers know which images are outdated?
- How can complex security information simplified in a way that even non-security experts can easily understand if the image health is good or bad?
- How do customers know which updates are available (both content (pet container use case) and image level)?
- How customers can verify that we are updating our images on a regular basis and in case of relevant (security) events?
- How can provide all relevant information around an update including the Red Hat advisory, content diff, timestamps and other relevant data?

Red Hat Registry Stats

- 544 repositories
- 5,609 images
- 1.594,682 RPMs

images are static content bundles

but

security issues emerge frequently

Red Hat Security Statistics

- 3672 advisories
- 5075 unique CVEs
- 2016: 97 crit RHSA

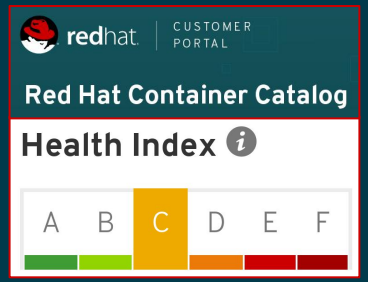
health index indicators

age of the image

unapplied updates

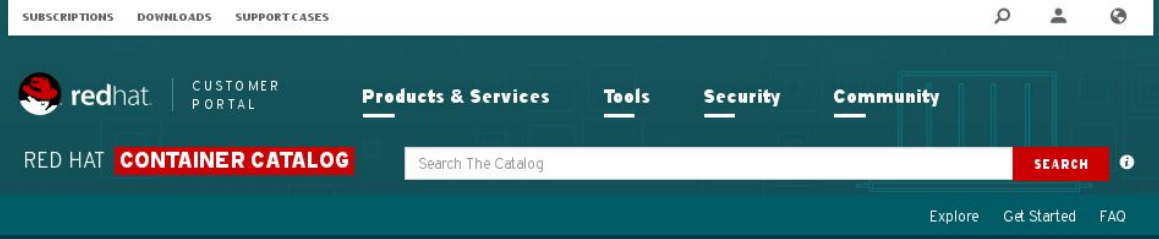
Developed as a **cross-team effort** leveraging Red Hat's Security expertise

Single item status (grade A-F) as an aggregated indicator of container health



Leveraging **Red Hat security data** (advisories) for RPMs and images

Actionable scan results (RPM, Image)



Carl

Security

I want to see which updates are applicable to an image used by us

I want to see an actionable result for applicable security updates

1 Explore & Search

2 Evaluate & Select

3 Consume & Distribute

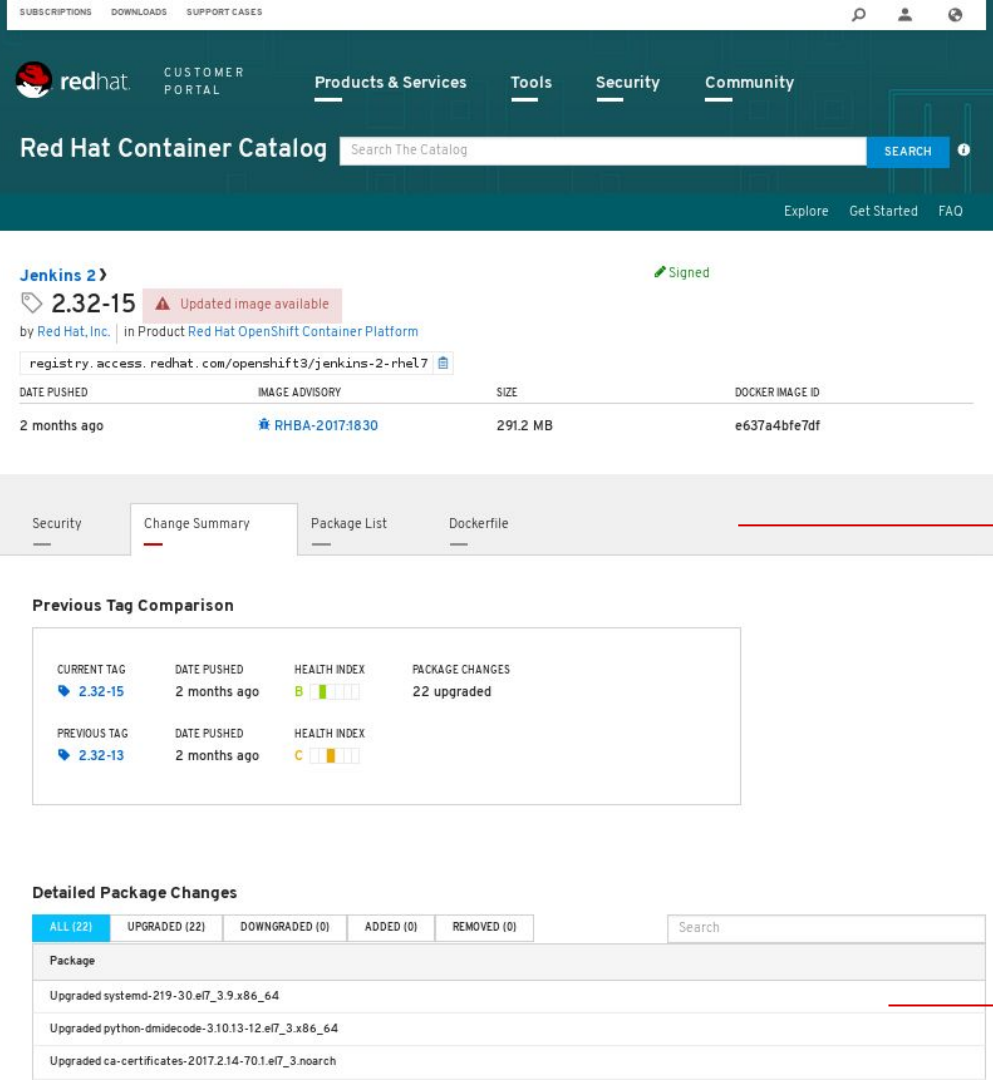
4 Use & Maintain

I want to get a list of all images associated with an advisory ID

I want to see an aggregated and simple freshness description

Jane

Developer



Change Summary includes Container Health Index before / after

Detailed List of Package Changes

What we've done

- Defined high level goals based on Google's OKR model
- Reviewing the existing RH security metadata model (advisories, OVAL, etc.)
- Defined and verified customer journeys and priorities
- Investigated existing tooling (scanners) compared with our needs
- Developed to Container Health Index backend (CVE Engine) and algorithm
- Put initial measurement / reporting in place for all our content
- Initiated several improvements inside our own image factory (auto rebuilds)
- Finally released the Container Health Index at Red Hat Summit '17 (PR)

Red Hat Sets New Standard for Trusted, Enterprise-Grade Containers with Industry's First Container Health Index

MAY 02, 2017

Red Hat extends container inspection and tooling to ISV partner ecosystem; provides customers with enhanced security, reliability and support for deploying Linux containers at scale

BOSTON--(BUSINESS WIRE)-- Red Hat, Inc. (NYSE:RHT), the world's leading provider of open source solutions, today introduced the industry's first Container Health Index, setting a new standard for enterprise-grade Linux containers. Based upon Red Hat's track record of delivering enterprise-grade open source technologies, including the world's leading enterprise Linux platform, the Container Health Index provides the most comprehensive image detail of any enterprise container service. The index grades all of Red Hat's containerized products as well as the Red Hat base layer of containers from certified independent software vendor (ISV) partners, with Red Hat planning to certify containerized products from 20 ISVs within the next 90 days.

While container-based applications have begun moving into production, not all containers are created or maintained equally. Every container starts with a Linux base layer, which means that every ISV building container images is distributing Linux content. For these containers to be used in production environments, this content needs to be free from known

SUBSCRIPTIONS DOWNLOADS SUPPORT CASES

redhat CUSTOMER PORTAL

Products & Services Tools Security Community

Red Hat Container Catalog bf9f9320b3d2 SEARCH

Explore Get Started FAQ

Platform for building and running Node.js 4 applications

by Red Hat, Inc. | in Product Red Hat Enterprise Linux

registry.access.redhat.com/rhscl/nodejs-4-rhel7 Updated 4 days ago 4-11.16 : Health Index A

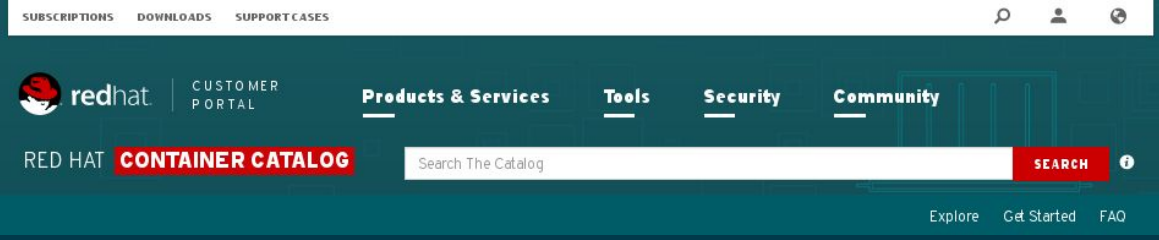
Overview Get this image Tech Details Documentation Tags

Tag Name	Date Pushed	Image Advisory	Health Index	Docker Image ID
4-11.16 4 latest	4 days ago	RHBA-2017:1127	A	9e8704e70637
4-11.15	16 days ago	RHBA-2017:0975	C	79b2e96829e0
4-11.14	2 months ago	RHBA-2017:0404	C	bf9f9320b3d2
4-11.13	3 months ago	RHBA-2017:0174	C	6a532adbfabf

list of all image versions inside this repository

Container Health Index history

key version attributes

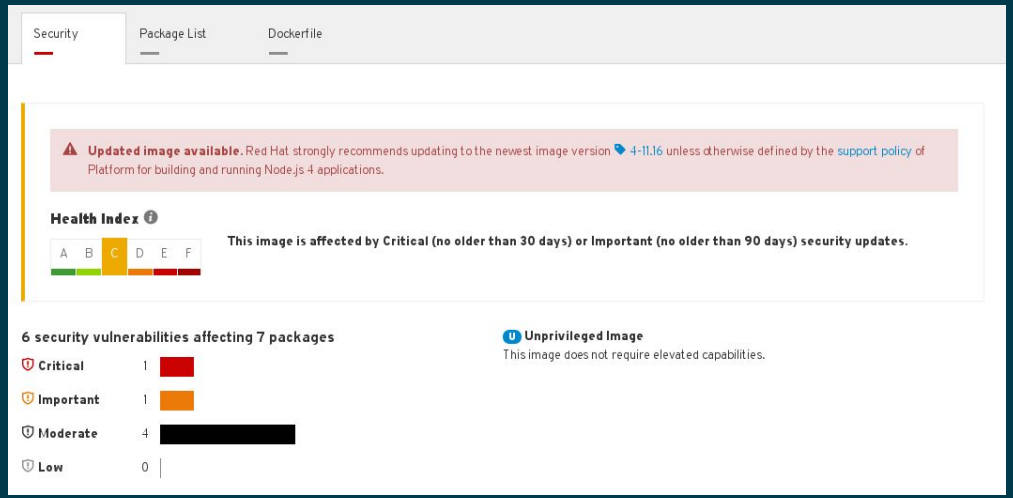


Carl

Security

What is the associated risk with the content inside the image?

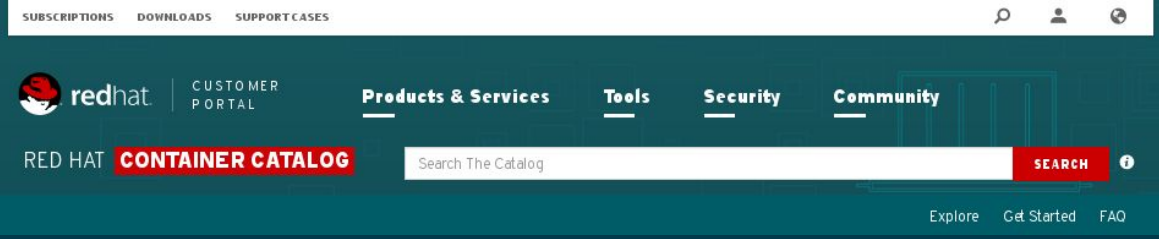
warning if non-current image version



Container Health Index based on applicable security updates and its age

vulnerabilities by advisory severity

privilege requirements



Carl

Security

How can I get rid of those vulnerabilities ?

Affected Packages

7 of 528 packages have security-related updates

Search affected packages

Impact		Affected Package	RPM Advisory	Fixed in Image
Critical	CVE-2017-5461	nss-util-3.21.3-1.1.el7_3.x86_64	RHSA-2017:1100	4-11.16
Critical	CVE-2017-5461	nss-sysinit-3.21.3-2.el7_3.x86_64 nss-tools-3.21.3-2.el7_3.x86_64 nss-3.21.3-2.el7_3.x86_64	RHSA-2017:1100	4-11.16
Important	CVE-2017-2636	kernel-headers-3.10.0-514.10.2.el7.x86_64	RHSA-2017:0933	4-11.16

Red Hat advisory severity

CVE ID

content advisory which contains fix

newer image version which contains fix

Ideas of Adding RHCC Features to OpenShift

- Search & explore experience part of OpenShift service catalog
- Container Health Index integration (scanning)
- Multi-content type and dependency information
- Detailed update information (RHCC Errata++ feature)
- Documentation assets incl. custom doc's
- Update notifications and event triggers (rebuild automation)
- RHCC and OpenShift used simultaneously (play store analogy)
- Metadata exposure and sync (Grafeas)
- Interaction with RH web applications (kbase, support cases, etc.)

How you can help / contribute

- File customer support tickets asking for getting RHCC UX into OpenShift
- Soon: **customer survey** asking for use cases and their importance
  - If you're interested please fill out the pre-survey at (link to real survey)

    http://people.redhat.com/dherrman/rhcc.html
- Later today: workshop and survey around content governance & security

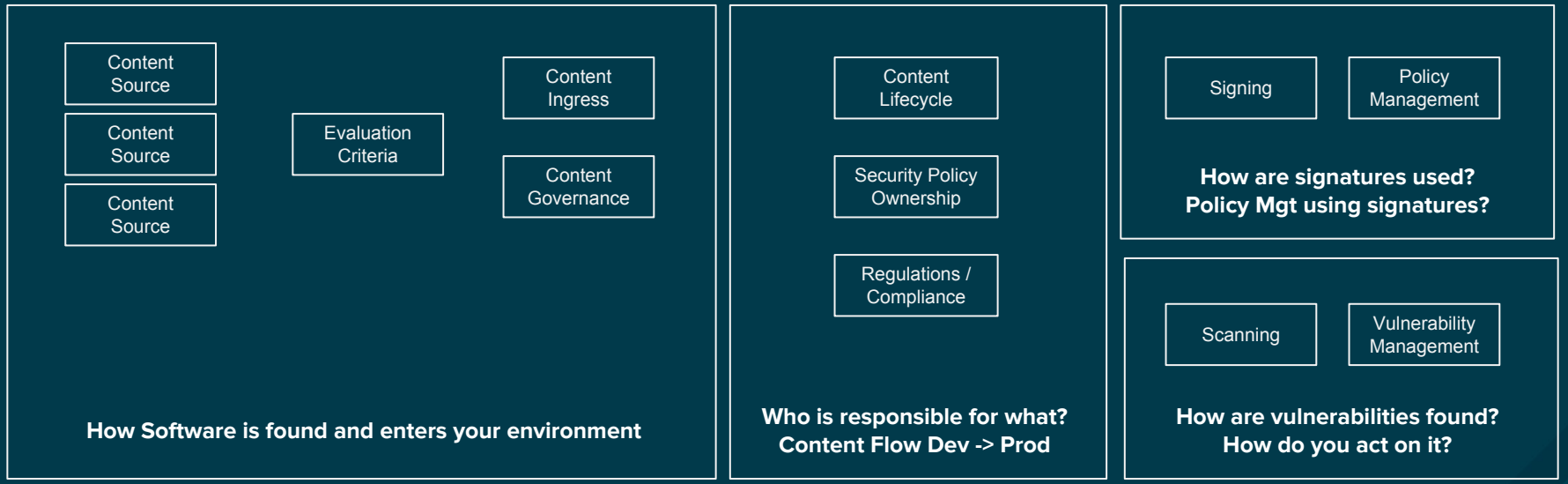
  (includes content mgt, metadata, signing, scanning and other topics)

Why we're doing a survey?

- It's all about **you** - your use cases, requirements and priorities
- Security is a broad and complex topics with nearly unlimited options
  - We would like to focus on what really matters to you
- Many customers are asking us for guidance
  - In order to provide guidance it's important to understand the use case
- The "why - what - how" paradigm
  - Survey helps us to understand the "why" and the "what" to focus on "how"
  - it ensures that our "how" addresses your "why" and "what"
- We've done plenty of surveys and feedback sessions around RHCC
- Survey is the first step, further follow-up sessions planned (workshops)

Security Survey Structure

Survey Focus on Content Mgt, Signing and Scanning



http://people.redhat.com/dherrman/sec.html

redhat.

THANK YOU

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linkedin.com/company/red-hat

twitter.com/RedHat

youtube.com/user/RedHatVideos