

RED HAT  
**SUMMIT**

# Create custom images suitable for deploying systems using Red Hat Enterprise Linux image

## builder

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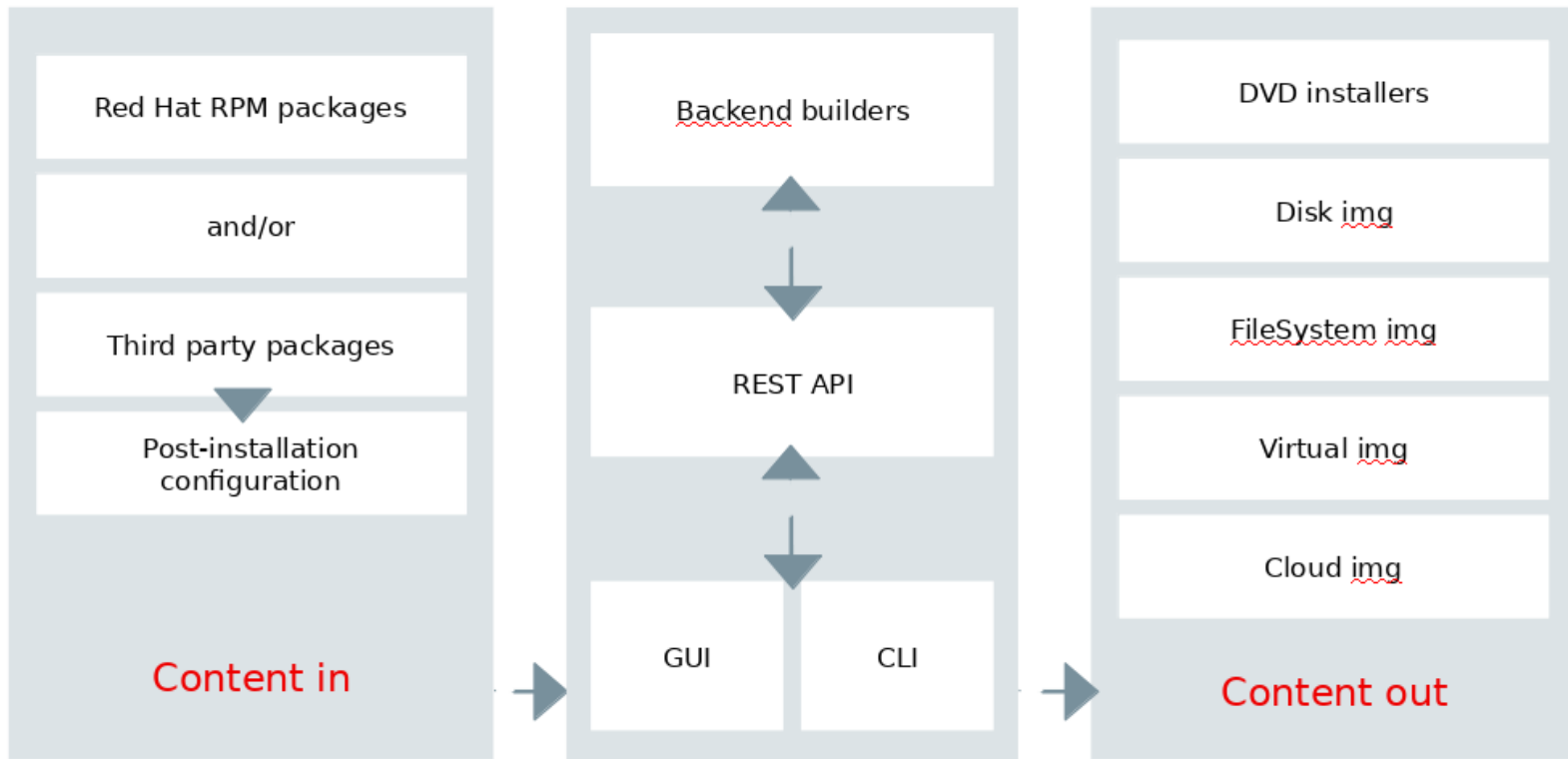
- Image builder
  - What?
  - Why?
  - How?
- Lab

# What is Image Builder?

# What is Image Builder?

- Image Builder is an image-building tool. Output image can be DVD installer, disk img, filesystem img, virtual img or cloud image.
- Introduced in RHEL 7.6 and RHEL 8
- Used to create custom deployable images (Customization via rpm packages selection, post-install configuration, etc.)
- Create images in a variety of formats for deployment to a variety of environments
- Customize images for third-party packages and updated RHEL Errata content

# What is Image Builder?



# Why Image Builder?

# Why Image Builder?

Before Image Builder:

- Creating customized RHEL images was unsupported
- Clients and partners often requested the ability to customize
- Customization grew in importance for cloud environments
- RHEL8 is very good guest :-)

# Why Image Builder?

- Provides an End-user with the ability to create supported custom RHEL images according to their needs
- Reduces configuration and deployment time on public cloud services
- Can be used to create images for deployment in a disconnected environment
- Output images can be configured for custom repositories (diverge from the Red Hat Content Delivery Network defaults)
- Provides package selection and configuration from a user-friendly web UI in the RHEL 8 web console
- Allows users to save and alter image configuration to create multiple replicas later



# Why Image Builder?

Supported output image formats:

- Live ISO (.iso)
- Raw disk (.img)
- File system (.img)
- Tarball (.tar.xz)
- QCOW2 for KVM, Red Hat Virtualization, Red Hat Satellite, and Red Hat CloudForms
- AMI (Amazon Web Services®)
- VHD (Microsoft® Azure®)
- VMDK (VMware® vSphere® Hypervisor)
- QCOW2 for OpenStack

# How to use Image Builder?

# How to use Image Builder?

Two known front-ends

- Command line tool
- GUI via Red Hat Web Console plugin

# How to use Image Builder?

## Command line tool

- Actual command : **composer-cli**
- Get help about it : `composer-cli -h`
- Currently it has some functions that are only available in the CLI (e.g. post-install configuration)

# How to use Image Builder?

GUI via Red Hat Web Console plugin

- Wait a minute... What is Red Hat Web Console?
- Red Hat Web Console
  - A user-friendly web-based interface for administering servers

# How to use Image Builder?

## Web Console plugin

- Actual plugin name : **cockpit-composer**
- Allows using Image Builder remotely from a web interface
- Does not require having the GUI packages installed on the RHEL system
- Currently the Image Builder functions available in the web console are more limited than in the CLI

# How to use Image Builder?

The screenshot shows the Red Hat Image Builder web interface. The browser address bar indicates the URL `https://bastion-cc2f.rhpdn.opentlc.com:9090/welder`. The page header displays "RED HAT ENTERPRISE LINUX" and the user is logged in as "lab-user". A sidebar on the left shows the "Image Builder" menu. The main content area lists several blueprints with their descriptions and actions:

Blueprint Name	Description	Actions
Atlas	Automatically Tuned Linear Algebra Software	Edit Blueprint, Create Image
Development	A general purpose development image	Edit Blueprint, Create Image
HTTP Server	An example http server with PHP and MySQL support.	Edit Blueprint, Create Image
Testing	testing	Edit Blueprint, Create Image

# How to use Image Builder?

## Blueprint

- A list of preselected components (RPM packages) that form a template for a custom image
- Create multiple images in multiple supported formats from the same blueprint
- A blueprint saves a record of the inputs and instructions for an image build



Talk is cheap.  
Show me the lab.

# Lab Index

## **Lab1 - Create qcow2 image with selected package**

- Lab 1.1 Image Builder installation
- Lab 1.2 Create a blueprint
- Lab 1.3 Add packages to blueprint
- Lab 1.4 Create image
- Lab 1.5 Test output image

# Lab Index

## Lab2 – Modify blueprint file and test it

- Lab 2.1 Customize blueprint configuration file
- Lab 2.2 Test new image with virt-install

# Lab Setup

- Red Hat Enterprise Linux 8 installed with Red Hat Web Console
- Web Console enabled using command
  - *# systemctl enable cockpit.socket*
- Installed **virt-install** and **virt-viewer** for testing the output image

# Lab Setup

- Access Web Console via
  - <https://bastion-LAB-GUID.rhpds.opentlc.com:9090>
  - Username - lab-user
  - Password - <to-be-provided>
- Become root
  - `sudo -i`

# Please start your lab now

# Lab1 Problem

Images created with Image Builder in the web console:

- Have their root account locked for security purposes
- By default, do not have any other users configured
- Currently can not have a user added using just the web console (requires the CLI)
- This results in images that have no way to log in
- This is not a problem where cloud-init available

# Lab1 Problem

- Currently can not have a user added using just the web console
- Solution : composer-cli comes to rescue
  - Get blueprint configuration file via composer-cli
  - Edit it. Append user details you want to be added
  - Push it back to Image Builder



# More user configuration options

```
[[customizations.sshkey]]  
user = "root"  
key = "<public SSH key>"
```

```
[[customizations.user]]  
shell = "/usr/bin/bash"  
uid = 1001  
gid = 1001
```

# Future Scope

- More image formats
  - Hyper-V
  - Google
  - IBM
  - Alibaba
- More deployment and configuration options

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