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

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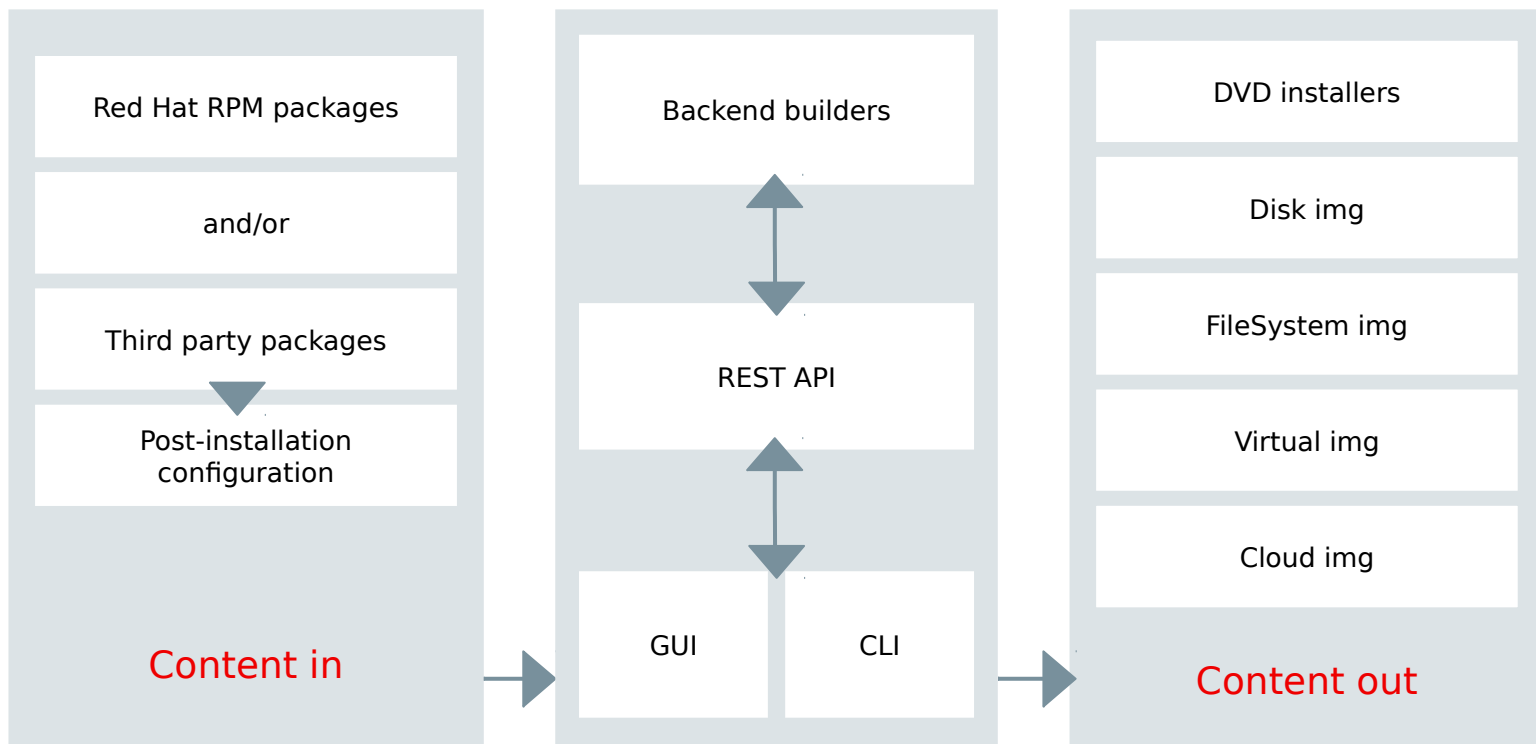# Index

- 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 (Customizatoin 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?

Red Hat RPM packages		Backend builders		DVD installers
and/or				Disk img
Third party packages		REST API		FileSystem img
Post-installation configuration				Virtual img
		GUI / CLI		Cloud img
Content in				**Content out**

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

Why Image Builder?

- Provides an End-user with the ability to create supported custom RHEL images according to their needs

- Reduces deployment and configuration 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 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)

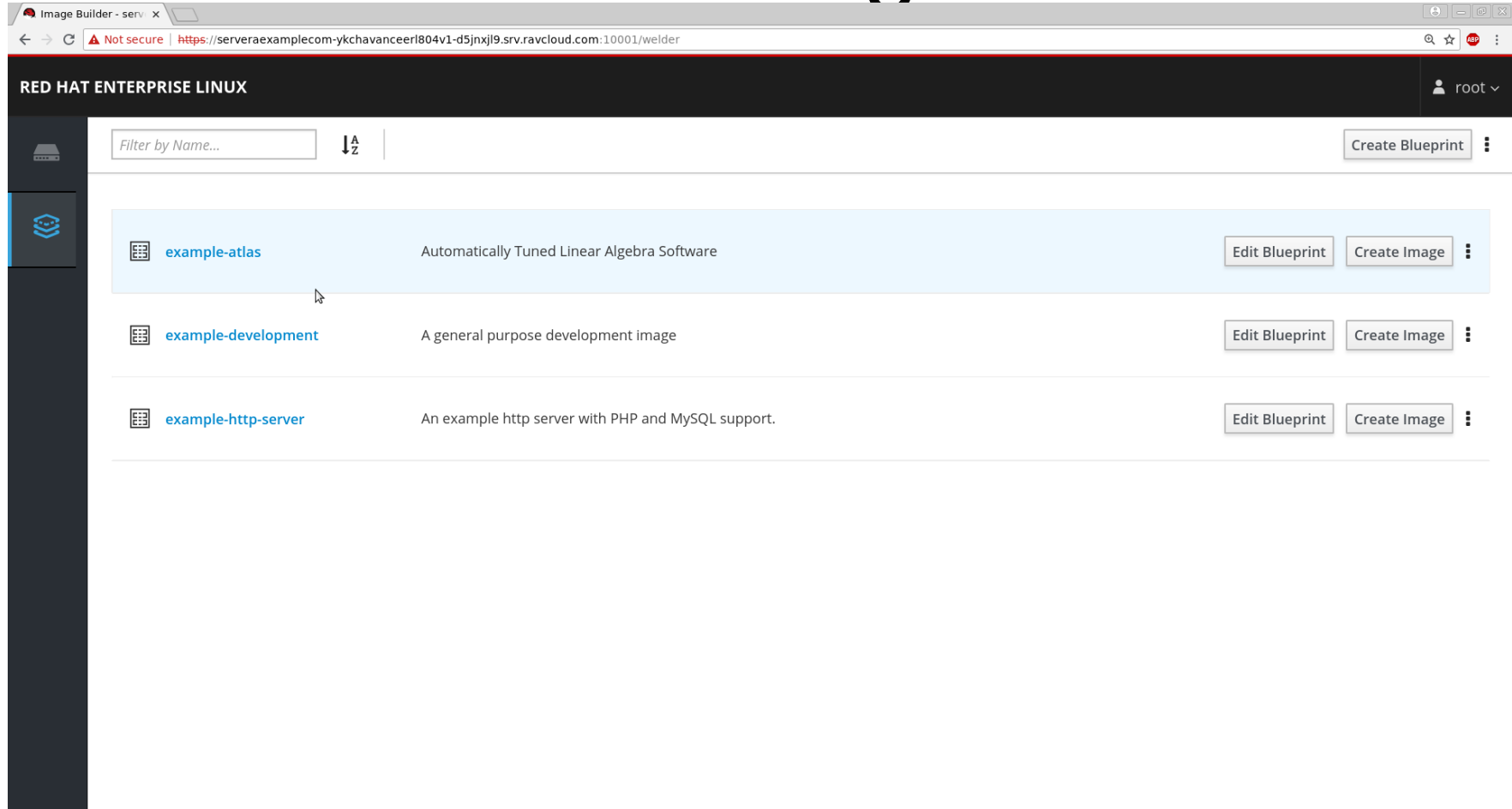# How to use Image Builder?

GUI via Web Console plugin

- Wait a minute… What is Web Console?

- Web Console
  - Web based system management tool. Available on all installations except - minimal installation

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?

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 Web Console

- Web Console enabled using command

  - *systemctl enable cockpit.socket*

- Installed **virt-install** and **virt-viewer** for testing 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