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

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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?

- Red Hat RPM packages
- and/or
- Third party packages
- Post-installation configuration

Content in

- Backend builders
  - REST API
  - GUI
  - CLI

Content out

- DVD installers
  - Disk img
  - FileSystem img
  - Virtual img
  - Cloud img
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?
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

Lab 1 - 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](https://bastion-LAB-GUID.rhpds.opentlc.com:9090)
  - Username - lab-user
  - Password - <to-be-provided>

- **Become root**
  - **sudo -i**
Please start your lab now
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
THANK YOU

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