Buildah Build OCI images

START HERE

buildah from *<image>*
Create a working container

buildah run *<ctr>* **--** *<cmd>*
Run a command in it

buildah copy *<ctr>* *<src>* *<dest>*
Copy files in

buildah config --entrypoint ...
Set image metadata

buildah commit *<ctr>* *<image>*
Save it as an image

buildah build -t *<image>* **.**
Build from a Containerfile

buildah images
List local images

buildah push *<image>* *<dest>*
Publish an image

Image base or scratch → **buildah from** → **Working container** run, copy, config → **buildah commit** → **New image** local storage → **buildah push** → **Registry / archive** docker://, oci:, dir:

CONCEPTS

No daemon: buildah works on local storage directly and runs fine rootless. Working containers are build scratchpads, not services.

Containerfile and Dockerfile are the same format; buildah build reads either. Scripting from/run/commit gives you control that a file cannot.

Unprivileged mount and filesystem edits only work inside buildah unshare, which gives you a user namespace with root mapped to you.

BUILD FROM A FILE

buildah build -t *<image>* **.**
Build an image from a Containerfile

buildah build -f *<file>* **-t** *<image>* *<dir>*
Use a specific Containerfile and context

buildah build --build-arg *<k>*=*<v>* **.**
Set a build argument

buildah build --layers .
Cache intermediate layers (off by default)
Without --layers only the final layer is created, so repeat builds redo every step. BUILDAH_LAYERS=true sets it permanently.

buildah build --no-cache .
Ignore cached layers

buildah build --target *<stage>* **.**
Stop at a named stage

buildah build --platform *<os/arch>* **.**
Build for another platform

buildah build --format docker .
Docker manifest instead of OCI
The default is oci; docker format is needed for HEALTHCHECK and SHELL to be kept.

buildah build --pull=always .
Always refresh base images

buildah build --secret id=*<id>***,src=***<file>* **.**
Pass a secret to RUN mounts

buildah build --platform *<list>* **--manifest** *<list>* **.**
Multi-arch build into a manifest list

WORKING CONTAINERS

buildah from *<image>*
Create a working container, print its name

buildah from scratch
Start from an empty root filesystem

buildah containers
List working containers

buildah rm *<ctr>*
Remove a working container

buildah run *<ctr>* **--** *<cmd>*
Run a command inside the container

buildah run -t *<ctr>* **-- sh**
Interactive shell with a terminal

ADD CONTENT

buildah copy *<ctr>* *<src>* *<dest>*
Copy files into the container

buildah copy --chown *<user>*:*<group>* *<ctr>* *<src>* *<dest>*
Set owner while copying

buildah copy --from *<image>* *<ctr>* *<src>* *<dest>*
Copy from another image or container

buildah add *<ctr>* *<url|archive>* *<dest>*
Copy, fetching URLs and unpacking archives

buildah mount *<ctr>*
Print the container root filesystem path

buildah unshare
Shell in a rootless user namespace

buildah unshare --mount *<var>*=*<ctr>* **--** *<cmd>*
Mount a container and export its path

CONFIGURE AND COMMIT

buildah config --entrypoint '*<json-array>***'** *<ctr>*
Set the entrypoint

buildah config --cmd '*<cmd>***'** *<ctr>*
Set the default command

buildah config --env *<k>*=*<v>* *<ctr>*
Set an environment variable

CONFIGURE AND COMMIT (cont.)

buildah config --port *<port>***/tcp** *<ctr>*
Declare an exposed port

buildah commit *<ctr>* *<image>*
Create an image from the container

buildah commit --rm *<ctr>* *<image>*
Commit, then delete the container

buildah commit --format docker *<ctr>* *<image>*
Docker format instead of OCI

IMAGES AND REGISTRIES

buildah images
List local images

buildah inspect *<name>*
Show config of a container or image

buildah pull *<image>*
Fetch an image into local storage

buildah push *<image>* *<dest>*
Push to a registry or other transport

buildah push *<image>* **docker://***<registry>***/***<repo>***:***<tag>*
Push to a registry explicitly

buildah push *<image>* **oci-archive:***<file>***.tar:***<tag>*
Export as an OCI archive

buildah tag *<image>* *<new-name>*
Add another name to an image

buildah rmi *<image>*
Remove an image

buildah login *<registry>*
Log in to a registry

buildah push --tls-verify=false *<image>* *<dest>*
Skip TLS verification (testing only)

MANIFEST LISTS

buildah manifest create *<list>*
Create a manifest list

buildah manifest add *<list>* *<image>*
Add an image to the list

MANIFEST LISTS (cont.)

buildah manifest push --all *<list>* **docker://***<registry>***/***<repo>***:***<tag>*
Push the list and its images

SYSTEM

buildah info
Show storage and host details

buildah version
Show version info

buildah --root *<dir>* **--runroot** *<dir>* *<cmd>*
Use a separate storage location

Image names without a registry get localhost/ prepended on build; use a full name such as <registry>/<repo>:<tag> before pushing.

Reset rootless storage with buildah unshare rm -rf ~/.local/share/containers/ storage when ownership gets confused.

RECIPES

Scripted image from scratch

```
ctr=$(buildah from alpine)
buildah run $ctr -- apk add --no-cache curl
buildah copy $ctr ./app /usr/local/bin/app
buildah config --entrypoint '["/usr/local/bin/app"]' $ctr
buildah commit --rm $ctr localhost/myapp:1.0
```

Minimal rootfs with host package manager

```
buildah unshare bash -c '
  ctr=$(buildah from scratch)
  mnt=$(buildah mount $ctr)
  dnf -y install --installroot=$mnt --releasever=<n> bash
  buildah commit --rm $ctr localhost/mini
'
```

Multi-arch image

```
buildah build --platform linux/amd64,linux/arm64 \
  --manifest myapp .
buildah manifest push --all myapp \
  docker://<registry>/<repo>:<tag>
```

Build, hand off to another tool

```
buildah build -t myapp .
buildah push myapp oci-archive:myapp.tar
skopeo copy oci-archive:myapp.tar docker://<registry>/<repo>:<tag>
```