Packer Machine image builder

CONCEPTS

A template is HCL files: a source says what to boot, a build runs provisioners on it and saves an image.

Template *.pkr.hcl
↓ `packer init`
Plugins builders, provisioners
↓ `packer build`
Temp machine source + provisioners
↓ `post-processors`
Image AMI, box, template

Point commands at a directory (.) to load every *.pkr.hcl in it, not just one file.

Packer builds a throwaway machine, then deletes it; only the resulting image remains.

INIT & PLUGINS

`packer init <dir>`
Install plugins the template requires

`packer init -upgrade <dir>`
Upgrade plugins within constraints

`packer plugins installed`
List installed plugin binaries

`packer plugins required <dir>`
List plugins a template needs

CHECK & FORMAT

`packer validate <dir>`
Check syntax and configuration

`packer validate -syntax-only <dir>`
Check syntax only

`packer fmt <dir>`
Rewrite files in canonical style

`packer fmt -check <dir>`
Fail if unformatted (CI)

`packer fmt -diff <dir>`
Show formatting changes

`packer inspect <dir>`
List variables, sources, provisioners

BUILD

`packer build <dir>`
Build all sources

`packer build <file.pkr.hcl>`
Build from a single file

`packer build -only=<a>,<b> <dir>`
Run only the named builds

`packer build -except=<a>,<b> <dir>`
Skip the named builds

`packer build -force <dir>`
Overwrite earlier artifacts

`packer build -parallel-builds=<n> <dir>`
Limit concurrent builds

VARIABLES

`packer build -var <key>=<value> <dir>`
Set one variable

`packer build -var-file=<file> <dir>`
Load variables from a file

`PKR_VAR_<name>=<value>`
Set a variable via environment

`*.auto.pkrvars.hcl`
Variable file loaded automatically

`packer validate -var-file=<file> <dir>`
Validate with the same values

Later wins: environment, then auto files, then -var and -var-file in the order given.

Mark secrets with sensitive = true so Packer masks them in its output.

DEBUG & ERRORS

`packer build -on-error=ask <dir>`
Prompt to clean up, abort or retry

`packer build -on-error=abort <dir>`
Keep the failed machine

`packer build -debug <dir>`
Step by step, pauses between steps

DEBUG & ERRORS (cont.)

`PACKER_LOG=1`
Verbose logs on stderr

`PACKER_LOG_PATH=<file>`
Write the log to a file

`packer console <dir>`
Evaluate HCL expressions interactively

TEMPLATE SKELETON

Plugins and a variable

```
packer {
  required_plugins {
    docker = {
      version = "⩾ 1.0.0"
      source  = "github.com/
hashicorp/docker"
    }
  }
}

variable "tag" {
  type    = string
  default = "latest"
}
```

Source and build

```
source "docker" "app" {
  image  = "ubuntu:24.04"
  commit = true
}

build {
  sources = ["source.docker.app"]
  provisioner "shell" {
    inline = ["apt-get update"]
  }
}
```

`packer fix <file.json>`
Update an old JSON template

RECIPES

Pre-flight before CI build

```
packer init .
packer fmt -check -recursive .
packer validate -var-
file=prod.pkrvars.hcl .
packer build -var-
file=prod.pkrvars.hcl .
```

Debug a failing provisioner

```
# keeps the machine so you can SSH
in and retry
PACKER_LOG=1
PACKER_LOG_PATH=packer.log \
  packer build -on-error=ask .
```

Rebuild a single source

```
packer build -
only='app.docker.app' -force .
```