



Cnuas Tools, Datasheet

Build, package, image, virtual machine, release and deployment tooling

Document DS-CNU-021 • **Revision** A • **Issued** 03 August 2026 • **Status** Published

Item	Value
Part	cnuas-tools
Type	Developer and operator tooling
Package	cnuas-tools, version 0.2.0
Version	9fbdddf-dirty
Repo	PacketFive/cnuas

1. Overview

cnuas-tools turns a checked out superproject into something runnable. It builds the Debian packages for every component, bakes the golden guest image, starts and stops the laboratory virtual machines, publishes releases with a manifest, installs components onto a host, and bridges a sled management controller to an emulated blade.

Where the control plane operates a running platform, cnuas-tools produces and installs one.

Key features

- Nine Debian package targets plus a bundle target, built from one command.
- Reproducible golden image build with a checksum and a manifest.
- Direct QEMU virtual machine lifecycle with cloud-init seeding and serial console capture, with no libvirt dependency.
- Release publication and verification against a manifest.
- Host installation with a component registry and a host tuning step.
- Sled management controller bridge driving an emulated blade over general purpose input and output through the emulator monitor.

2. Command reference

Group	Commands	Purpose
pkg	list, build, clean	Debian package production
image	build, inspect, verify	Golden guest image
vm	up, down, console, ssh, scp, list, lab, lab-down, destroy	Virtual machine lifecycle
release	publish, verify, manifest	Release artefacts
deploy	install, list, check, uninstall, paths, host-tune	Host installation
sledbmc	bridge, status	Sled management controller to blade bridge

Root flags: --verbose, --version.



3. Package targets

Package	Contents
cnuas-nic-modules	cnuas_net.ko, cnuas_ib.ko
cnuas-gpu-modules	cnuasgpu.ko and the accelerator tools
cnuas-vswitchd	Fabric switch daemon
cnuas-cli	Switch command line client
cnuas-link-cli	Accelerator fabric command line client
cnuas-libcnuas-provider	rdma-core verbs provider
cnuas-libcnuasrt	Accelerator runtime, device library and compute backends
cnuas-linux-image	Cnuas kernel fork image
cnuas-nccl-tests	Collective benchmarks
cnuas	Bundle that pulls in the set

4. Golden image

Item	Value
Output	cnuas-vm-vX.Y.Z.qcow2
Base	Ubuntu 24.04 cloud image, fetched by the recipe
Kernel	Resolved from the kernel fork build, falling back to the build host release
Build steps	Resize, customise, sparsify
Recipe controls	Base image location, disk size, packages, user, modules, services, udev rules, post install steps
Products	The image, a manifest, and a SHA-256 checksum

`image inspect` reports what a built image contains and `image verify` checks it against the recorded checksum.

5. Virtual machine lifecycle

Command	Behaviour
<code>vm up</code>	Create a copy on write overlay, build the cloud-init seed, start QEMU
<code>vm down</code>	Stop a running machine
<code>vm console</code>	Follow the captured serial log
<code>vm ssh</code> , <code>vm scp</code>	Reach the guest through the forwarded port
<code>vm list</code>	Report machine state
<code>vm lab</code> , <code>vm lab-down</code>	Bring the two machine laboratory up or down together
<code>vm destroy</code>	Force stop, with optional removal of the overlay

The engine is QEMU directly. There is no libvirt layer, which keeps the guest command line visible and reproducible.

6. Deployment registry



Component key	Repository
cnuas	PacketFive/cnuas
cnuasnic	PacketFive/CnuasNIC
cnuasgpu	PacketFive/CnuasGPU
cnuasswitch	PacketFive/CnuasSwitch
cnuaslink	PacketFive/CnuasLink

deploy check verifies an installation, deploy paths prints where each component landed, and deploy host-tune applies the host settings the emulated fabric expects.

7. Validation

Area	Test files	Cases
Root command line, process runner, configuration	tests/test_cli.py, tests/test_run.py, tests/test_config.py	18
Packaging	tests/pkg/	14
Image build, manifest, recipe	tests/image/	23
Virtual machines	tests/vm/	16
Sled bridge and emulator monitor protocol	tests/sledbmc/	33
Deployment	tests/deploy/	10

All 122 cases pass, and they run without a build host or an emulator because the external steps are exercised through recorded interfaces. See the Validation Matrix.

8. Integration information

Item	Value
Repo	PacketFive/cnuas
Source	tools/src/cnuas_tools/
Entry point	cnuas-tools
Python	3.11 or later
External tools	QEMU, virt-resize, virt-customize, virt-sparsify, dpkg-deb
Related	Deployment

9. Revision history

Revision	Notes
A	First publication. Command tree, package targets and registry read from the source.

PacketFive, Packet Five Networks Ltd., Dublin, Ireland.

Cnuas Virtual AI/HPC Infrastructure is published at <https://github.com/PacketFive/cnuas> under the Apache License 2.0; read it at <https://github.com/PacketFive/cnuas/blob/main/LICENSE>.

Cnuas Virtual AI/HPC Infrastructure is emulation software. It is not affiliated with, endorsed by, or derived from any hardware vendor, and every device it models is a software artefact. The work is published by its authors in a personal capacity and is not sponsored or endorsed by any employer.

Specifications describe the referenced revision of the software and may change without notice. Contact info@packetfive.com.