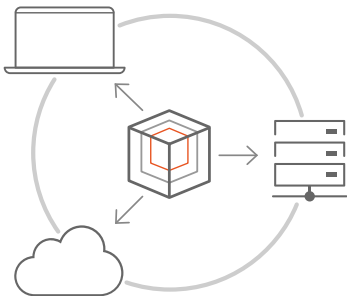


LXD

Your own low-touch
cloud at any scale

September 2022



What is LXD?

LXD is a modern system container and virtual machine manager with everything you need to run your virtualised workloads. It's image-based, supporting a wide range of Linux distributions.

Easily manage your instances from the command-line or remotely through the REST API. Choose between different storage backends and network types. Integrate LXD with third-party orchestration and management tools. Scale from one instance on your laptop to a full rack in a data center.

LXD is suitable for any scale



Developers can easily use LXD on any device they have at hand - a Raspberry Pi, their laptop, their workstation or home server(s). With the high system container density that LXD offers, even a device with limited memory can accommodate quite a few containers, allowing for the repurposing of machines, and easy experimentation.

Enterprises can rely on LXD and scale it from a single server to a full data centre rack. LXD can run on top of bare-metal, virtualised platforms and public or multi-clouds. Moreover, it can run on a hybrid configuration, with some LXD cluster nodes running on bare-metal, and some on virtualised platforms. LXD provides a reliable and resource-efficient way to run infrastructure.



System Containers

LXD system containers are similar to virtual or physical machines. The environment is as close as possible to a standard Linux installation, but without the need for a separate kernel. They run a full operating system inside them, and you manage them exactly as you would a virtual or a physical machine.

This allows you to run any workload, or containerise your traditional systems without modifying apps or your operations. LXD runs unprivileged containers by default for increased security.



Virtual Machines

For workloads that need a different OS or kernel than that of the host, LXD provides virtual machines. They are QEMU based, with a modern hardware layout with UEFI and SecureBoot by default. LXD can also run Windows virtual machines.

All devices are virtio-based - LXD doesn't do any complex device emulation at the host level. Thanks to a built-in agent, running commands and working with files ('lxc exec' and 'lxc file') is exactly the same as with containers.



Clustering Mode

For complex workloads, LXD runs in a clustering mode. You can have up to 50 servers in a unified cluster. These servers share a distributed database and can be managed uniformly using the lxc client or the REST API.

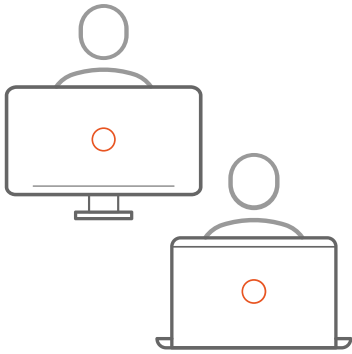
Run system containers, virtual machines or a combination of the two, all managed in the same way through the same interface. Users can operate instances from any node in the cluster, or designate a specific target node for the instance.



Secure and dependable

LXD runs unprivileged containers by default and uses Namespaces, AppArmor and Seccomp for multi-layered security.

Advanced resource control allows for additional restrictions. For multi-tenant environments, LXD offers remote authentication, role-based access control, projects and multi-user setup.



Safe to use in a shared environment

With the multi-user feature, administrators have complete LXD access, whereas other users can easily be segmented into groups with restricted access.

Non-administrators get automatically generated LXD projects, where they can run their own system containers and virtual machines isolated from anyone else's instances and sufficiently restricted to prevent privilege escalation.

Choose your network setup

The easiest method is to have LXD create a network bridge during initialisation and use this bridge for all instances, but LXD supports many different and advanced setups for networking.



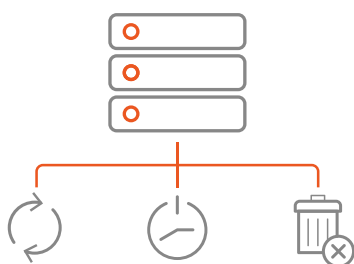
Fully controlled networks

The **default network bridge** creates a virtual L2 ethernet switch that instance NICs can connect to, making it possible for them to communicate with each other and the host. The bridge can also provide local DHCP and DNS.

You can create an **OVN-based logical network** to build your own private cloud. Unlike other network types, non-admin users can manage their own OVN network even in a restricted project.

External Networks

Use external networks to provide an uplink network through a parent interface. There are several options when using network interfaces that already exist: **Macvlan network**, **SR-IOV network** or a **physical network**.



Supported storage drivers

LXD stores its data in storage pools, divided into storage volumes of different content types. It supports a variety of storage drivers, that cover a wide range of potential use-cases:

- **Directory** - basic backend
- **Btrfs** - a local file system based on the COW principle
- **LVM** - storage management used to manage physical storage devices
- **ZFS** - combines both physical volume management and a file system
- **Ceph** - highly scalable open-source storage platform
- **CephFS** - Ceph's file system component

Additional Features

- Flexible resource limits (CPU, memory, network I/O, disk space and some kernel resources)
- Advanced snapshot support, including scheduling and automatic expiry
- Hardware passthrough (GPU, USB, NIC, disks and more)
- Support for live-migration and stateful snapshotting
- Identity Management through TLS client certificates, Candid-based authentication or RBAC
- Built-in image store, with the remote image server supported directly at instance creation time
- Various backup and recovery options
- LTS releases every two years - supported for five years

Enterprise-grade support & services

Canonical, the company behind Ubuntu, provides professional commercial support for the entire Ubuntu cloud suite. Choose your service level: <https://ubuntu.com/support>

Canonical also offers professional consulting services to get you up and running in any type of deployment, as well as training to ensure your staff are ready for go-live.

Got a question?

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