Large scale container management with LXD and OpenStack

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LXD: the container lighter-visor

What it IS

→ Simple
   *Clean command line interface, simple REST API and clear terminology.*

→ Fast
   *No virtualization overhead so as fast as bare metal.*

→ Secure
   *Safe by default. Combines all available kernel security features.*

→ Scalable
   *From a single container on a developer’s laptop to thousands of containers per host in a datacenter.*
LXD: the container lighter-visor

What it IS

nova-compute-lxd

lxc (command line tool)

your own client/script?

LXD REST API

LXD

LXC

Linux kernel

Host A

LXD

LXC

Linux kernel

Host B

LXD

LXC

Linux kernel

Host C

LXD

LXC

Linux kernel

Host D

LXD

LXC

Linux kernel

Host ...

LXD: the container lighter-visor

What it **ISN’T**

➡️ Another virtualization technology

*LXD tries to offer as similar a user experience as that of a virtual machine but it doesn’t itself virtualize anything, you always get access to the real hardware and the real native performance.*

➡️ A fork of LXC

*LXD uses LXC’s API to manage the containers behind the scene.*

➡️ Another application container manager

*LXD only cares about full system containers and doesn’t care about what runs inside the container.*
LXD: the container lighter-visor

Who it’s for

➔ Users and developers

*LXD can be used as an alternative user experience to LXC.*

➔ DevOps

*LXD makes it easy to prepare a container locally or in staging and then move it to production.*

➔ Clouds

*LXD lets you manage containers in very much the same way you would virtual machines. It also integrates with OpenStack.*
Secure containers

- **User namespaces**
  - **LXD** defaults to running containers in a separate user namespace.

- **Mandatory Access Control**
  - **LXD** integrates with AppArmor, SELinux, and Seccomp to prevent containers from interacting with each other and the host.

- **Resource restrictions**
  - **LXD** makes it easy to restrict the use of physical resources like CPU, memory, and storage devices through the use of Control Cgroups.

- **Secure network operations**
  - Using only modern TLS with safe ciphers.
LXD: the container lighter-visor

REST API

- containers
- images
- profiles
- certificates
- events
- operations
- networks
- volumes
- snapshots
- aliases
- utility/internal collections
- read-only collections
Demo time
LXD standalone
Demo time
LXD through OpenStack
LXD: the container hypervisor

What’s coming up next

➔ Support of all LXD features with OpenStack
➔ Safe live migration
  *Don’t miss Tycho Andersen’s talk on Wednesday!*
➔ Improved network & storage handling
  *Ensure LXD works with SDNs like Contrail and more storage backends*
➔ Snappy LXD on Ubuntu Core
➔ LXD in Ubuntu 16.04 LTS
  *LXD and nova-computed-lxd commercially supported for 5 years*
Questions?

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