

# Linux Containers (LXC)

## Introduction

Ubuntu introduced LXC containers as a fast lightweight virtualization technique to create multiple Linux systems on a single host. It provides virtualization at the operating system level and shares the same kernel, thus reducing the overhead of using hypervisor such as VirtualBox, KVM and Vmware.

This presentation will use a Raspberry Pi3 as the host which is not recommended for production implementations. We will use Ubuntu 16.04 on the Pi3 host and create a Debian 9 Stretch container.

## Setup

Need at least a 16 GB SD micro card but I would recommend a 32 GB or 64 GB if you plan to spin up several containers.

Download the Ubuntu image at this link: <http://www.finnie.org/software/raspberrypi/ubuntu-rpi3/ubuntu-16.04-preinstalled-server-armhf+raspi3.img.xz>

Extract and burn it to the sd card using unxz and dd command on linux

Boot up the Pi3 with the new image. Default user name and password is ubuntu and ubuntu.

Change ubuntu password with command `sudo passwd ubuntu` and enter your new password

Then update your system:

```
sudo -i (root)
apt update && apt upgrade -y
```

## LXC Containers

LXC is installed by default on Ubuntu 16.04 systems. You will install the templates so that you can select available Linux container images from a menu

(Assuming that we did `sudo -i` first to become root)

```
apt install lxct1 lxc-templates
```

```
lxc-checkconfig
```

```
modprobe configs
```

```
lxc-checkconfig
```

Before we create our first container we need to make a change to our network so that we can Host Bridge our containers to see the containers on our network. The default is Nat Bridge which is a private unique network accessible only by the host. Make the following change:

```
nano /etc/network/interfaces.d/50-cloud-init.cfg
```

```
auto lo
```

```
iface lo inet loopback
```

```
auto br0
```

```
iface br0 inet dhcp
```

```
bridge_ports eth0
```

```
auto eth0
iface eth0 inet manual
Save (Ctrl O) and reboot the Pi3
```

## Create a Container

Create a new CentOS container.

```
sudo -i
uname -a to determine kernel type (armv71 on Ubuntu 16.04 for Pi3)
lxc-create -t download -n Ubuntu18
Select the Distro, Name and kernel
Once installed start it with lxc-start -n Ubuntu18 -d
To see if it is running use: lxc-ls -fancy
To access it use lxc-attach -n Ubuntu18 (You will be attached to it as root with no password
which should be changed.)
```

Add Web Interface to LXC

```
sudo apt-get install python-setuptools
wget https://lxc-webpanel.github.io/tools/install.sh -O - | sudo bash
```

Access web interface with `http://<ip address>:5000/` with user name and password admin and admin.

## Networking

We need to set the container network to Host Bridge to make it accessible on our network.

Command line use `sudo nano /var/lib/lxc/<container name>/config` and change `lxd.network.link = lxcbr0` to `br0`

Web interface change the container network link to `br0`

## LXC Commands

```
lxc-create : Create a containers lxc-create -t download -n <Container Name>
lxc-start: Start a container, lxc-start -n <Container Name> -d
lxc-stop: Stop a container, lxc-stop -n <Container Name>
lxc-ls -fancy: Show all containers with status
lxc-destroy: Delete a container, lxc-destroy -n <Container name>
lxc-attach: Connect to container console, lxc-attach -n <Container Name>
lxc-info: View container information, lxc-info -n <Container Name>
lxc-clone: Copy a container, lxc-clone <Container Name> <New Container Name>
```

References: <https://www.blackmagicboxes.com/?p=349>

