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# Installing And Using OpenVZ On Debian Lenny (AMD64)

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In this HowTo I will describe how to prepare a Debian Lenny server for OpenVZ. With OpenVZ you can create multiple Virtual Private Servers (VPS) on the same hardware, similar to Xen and the Linux Vserver project. OpenVZ is the open-source branch of Virtuozzo, a commercial virtualization solution used by many providers that offer virtual servers. The OpenVZ kernel patch is licensed under the GPL license, and the user-level tools are under the QPL license.

This howto is meant as a practical guide; it does not cover the theoretical backgrounds. They are treated in a lot of other documents in the web.

This document comes without warranty of any kind! I want to say that this is not the only way of setting up such a system. There are many ways of achieving this goal but this is the way I take. I do not issue any guarantee that this will work for you!

## 1 Preliminary Note

I'm using an x86_64 (amd64) system here. If you are on an i386 system, a few commands will be slightly different - I have added annotations to that parts.

## 2 Installing OpenVZ

An OpenVZ kernel and the *vzctl* and *vzquota* packages are available in the Debian Lenny repositories, so we can install them as follows:

```
apt-get install linux-image-openvz-amd64 vzctl vzquota
```

(If you are on a i386 system, the kernel package is named *linux-image-openvz-686*.)

Create a symlink from */var/lib/vz* to */vz* to provide backward compatibility:

```
ln -s /var/lib/vz /vz
```

Open */etc/sysctl.conf* and make sure that you have the following settings in it:

```
vi /etc/sysctl.conf
```

```
[...]
net.ipv4.conf.all.rp_filter=1
net.ipv4.icmp_echo_ignore_broadcasts=1
net.ipv4.conf.default.forwarding=1
net.ipv4.conf.default.proxy_arp = 0
net.ipv4.ip_forward=1
kernel.sysrq = 1
net.ipv4.conf.default.send_redirects = 1
net.ipv4.conf.all.send_redirects = 0
net.ipv4.conf.eth0.proxy_arp=1
[...]
```

If you need to modify */etc/sysctl.conf*, run

```
sysctl -p
```

afterwards.

The following step is important if the IP addresses of your virtual machines are from a **different subnet** than the host system's IP address. If you don't do this, networking will not work in the virtual machines!

Open */etc/vz/vz.conf* and set *NEIGHBOUR_DEVS* to *all*:

```
vi /etc/vz/vz.conf
```

```
[...]
# Controls which interfaces to send ARP requests and modify APR tables on.
NEIGHBOUR_DEVS=all
[...]
```

I also want to install the package *vzdump* which is not available in the Debian Lenny repositories - fortunately there's a *.deb* package available on **http://www.proxmox.com/cms_proxmox/en/virtualization/openvz/vzdump/**. First we install the package *cstream* on which *vzdump* is depending:

```
apt-get install cstream
```

Then we install *vzdump* as follows:

```
wget http://www.proxmox.com/cms_proxmox/cms/upload/vzdump/vzdump_1.1-1_all.deb

dpkg -i vzdump_1.1-1_all.deb
```

Finally, reboot the system:

```
reboot
```

If your system reboots without problems, then everything is fine!

Run

```
uname -r
```

and your new OpenVZ kernel should show up:

```
server1:~# uname -r
  2.6.26-1-openvz-amd64
server1:~#
```

# 3 Using OpenVZ

Before we can create virtual machines with OpenVZ, we need to have a template for the distribution that we want to use in the virtual machines in the */var/lib/vz/template/cache* directory. The virtual machines will be created from that template.

A few templates are available in the *http://download.openvz.org/debian-systs* Lenny repository. Let's add that repository to */etc/apt/sources.list*:

```
vi /etc/apt/sources.list
```

```
[...]
deb http://download.openvz.org/debian-systs lenny openvz
[...]
```

Of course (in order not to mess up our system), we want to install packages from that repository only if there's no appropriate package from the official Lenny repositories - if there are packages from the official Lenny repositories and the OpenVZ repository, we want to install the one from the official Lenny repositories. To do this, we give packages from the official Lenny repositories a higher priority in */etc/apt/preferences*:

```
vi /etc/apt/preferences
```

```
Package: *
Pin: release o=Debian
Pin-Priority: 700

Package: *
Pin: release o=debian.systs.org lenny archive
Pin-Priority: 650
```

Run

```
wget -q http://download.openvz.org/debian-systs/dso_archiv_signing_key.asc -O- | apt-key add - && apt-get update
```

afterwards to download the key of that repository and update the package database.

Run

```
apt-cache search openvz
```

In the output you should see some Debian templates, e.g.:

```
vzctl-ostmpl-debian-4.0-amd64-minimal - OpenVZ - OS Template debian-4.0-amd64-minimal
  vzctl-ostmpl-debian-4.0-i386-minimal - OpenVZ - OS Template debian-4.0-i386-minimal
  vzctl-ostmpl-debian-5.0-amd64-minimal - OpenVZ - OS Template debian-5.0-amd64-minimal
vzctl-ostmpl-debian-5.0-i386-minimal - OpenVZ - OS Template debian-5.0-i386-minimal
```

Pick the templates that you need and install them as follows (the *amd64* templates are not available on an i386 host):

```
apt-get install vzctl-ostmpl-debian-5.0-amd64-minimal vzctl-ostmpl-debian-4.0-amd64-minimal
```

You can use one of these templates, but you can also find a list of precreated templates on **http://wiki.openvz.org/Download/template/precreated**. For example, instead of installing the *vzctl-ostmpl-debian-5.0-amd64-minimal* template with apt, we could as well download it as follows:

```
cd /var/lib/vz/template/cache

wget http://download.openvz.org/template/precreated/contrib/debian-5.0-amd64-minimal.tar.gz
```

(If your host is an i386 system, you cannot use an amd64 template - you must use i386 templates then!)

I will now show you the basic commands for using OpenVZ.

To set up a VPS from the *vzctl-ostmpl-debian-5.0-amd64-minimal* template (you can find it in */var/lib/vz/template/cache*), run:

```
vzctl create 101 --ostemplate debian-5.0-amd64-minimal --config vps.basic
```

The *101* must be a uniqe ID - each virtual machine must have its own unique ID. You can use the last part of the virtual machine's IP address for it. For example, if the virtual machine's IP address is *192.168.0.101*, you use *101* as the ID.

If you want to have the vm started at boot, run

```
vzctl set 101 --onboot yes --save
```

To set a hostname and IP address for the vm, run:

```
vzctl set 101 --hostname test.example.com --save

vzctl set 101 --ipadd 192.168.0.101 --save
```

Next we set the number of sockets to 120 and assign a few nameservers to the vm:

```
vzctl set 101 --numothersock 120 --save

vzctl set 101 --nameserver 145.253.2.75 --nameserver 213.191.92.86 --save
```

(Instead of using the `vzctl set` commands, you can as well directly edit the vm's configuration file which is stored in the `/etc/vz/conf` directory. If the ID of the vm is `101`, then the configuration file is `/etc/vz/conf/101.conf`.)

To start the vm, run

```
vzctl start 101
```

To set a root password for the vm, execute

```
vzctl exec 101 passwd
```

You can now either connect to the vm via SSH (e.g. with **PuTTY**), or you enter it as follows:

```
vzctl enter 101
```

To leave the vm's console, type

```
exit
```

To stop a vm, run

```
vzctl stop 101
```

To restart a vm, run

```
vzctl restart 101
```

To delete a vm from the hard drive (it must be stopped before you can do this), run

```
vzctl destroy 101
```

To get a list of your vms and their statuses, run

```
vzlist -a
```

```
server1:~# vzlist -a
      VEID      NPROC STATUS  IP_ADDR         HOSTNAME
       101          8 running 192.168.0.101   test.example.com
server1:~#
```

To find out about the resources allocated to a vm, run

```
vzctl exec 101 cat /proc/user_beancounters
```

```
server1:~# vzctl exec 101 cat /proc/user_beancounters
Version: 2.5
       uid  resource           held    maxheld    barrier      limit    failcnt
      101:  kmemsize         500737     517142   11055923   11377049          0
            lockedpages           0          0        256        256          0
            privvmpages        2315       2337      65536      69632          0
            shmpages            640        640      21504      21504          0
            dummy                 0          0          0          0          0
```

```
            numproc              7         7       240       240         0
            physpages         1258      1289         0 2147483647         0
            vmguarpages          0         0     33792 2147483647         0
            oomguarpages      1258      1289     26112 2147483647         0
            numtcpsock           2         2       360       360         0
            numflock             1         1       188       206         0
            numpty               1         1        16        16         0
            numsiginfo           0         1       256       256         0
            tcpsndbuf        17856     17856   1720320   2703360         0
            tcprcvbuf        32768     32768   1720320   2703360         0
            othersockbuf      2232      2928   1126080   2097152         0
            dgramrcvbuf          0         0    262144    262144         0
            numothersock         1         3       120       120         0
            dcachesize           0         0   3409920   3624960         0
            numfile            189       189      9312      9312         0
            dummy                0         0         0         0         0
            dummy                0         0         0         0         0
            dummy                0         0         0         0         0
            numiptent           10        10       128       128         0
server1:~#
```

The `failcnt` column is very important, it should contain only zeros; if it doesn't, this means that the vm needs more resources than are currently allocated to the vm. Open the vm's configuration file in `/etc/vz/conf` and raise the appropriate resource, then restart the vm.

To find out more about the vzctl command, run

```
man vzctl
```

## 4 Links

- OpenVZ: **http://openvz.org**
- Debian: **http://www.debian.org**