



# CLONING A VPS

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# DISCLAIMER

This method is particular to OVH, where we are hosting linux-ottawa. It probably will work for any similar type of provider, but your success may be dependent on factors outside of your control. This is also not the only way.

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# APOLOGY

I have not used this in a while, so I'll apologize now for the default centering. I need to edit some CSS to fix it and I considered that as too much work while putting this together. It is now a task before my next talk.

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# THE PROBLEM

You want to make changes, but you only have one hosted system.

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# MORE PROBLEMS

In addition, you kind of built it in a hurry without a development environment or a well documented plan. It is based on the evolved iterations of previous systems, all built on the bones of others and multiple hardware changes.

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# THE LATEST PROBLEM

You need to upgrade it.

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# WHAT DO YOU DO NOW?

A great question.

My quick answer: clone it!

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# HOW DO WE DO THAT?

Another great question.

The real problem is that none of these services (at the low cost level we use), have any available functionality for doing this without incurring cost. That is something we don't really have the resources for.

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# HOWEVER...

We can always do it on the cheap and that is what this talk is about.

A little CLI-fu is necessary and some understanding of what we are doing helps.

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# REQUIREMENTS

Assuming you have the necessary disk space, a reasonably fast internet connection, a few useful utilities, and the desire to do this, you can make an image of your running environment - while it is not running of course.

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# THE PROCESS

We start with the idea that we can boot a rescue image  
Then we do things with the rescue image to make it all  
work.

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# AND THEN...?

You can bring it into your own vm service and work on it.

- Document what you have
- Decide where you want to go with it
- Snapshot it
- etc.

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# PREPARATION

Like anything, the prep work makes it easy.

For this to work, we need to take down our VPS, boot a rescue image, add some software to the rescue image, add a maintenance web page and log in remotely. Easy stuff...

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# OUR VPS INFO

### Your VPS

**Status**  
Active

**Name**  
vps-0866e26d.vps.ovh.ca

**Boot**  
LOCAL

**OS/Distribution**  
Debian 11 - deprecated - 2022-01-1  
3

**Zone**  
Region OpenStack: os-bhs2

**Location**  
🇨🇦 Beauharnois (BHS) - Canada

### Your configuration

**Model**  
VPS vps2020-value-1-2-40

**vCores**  
1  
Add vCores by upgrading to the higher range

**Memory**  
2 GB 4 GB  
Double the memory for an additional price of \$3.79 CAD/month, i.e. a total of \$11.14 CAD/month

**Storage**  
40 GB 80 GB  
Double the storage space for an additional price of \$3.79 CAD/month, i.e. a total of \$11.14 CAD/month

### IP

**IPv4**  
142.44.247.35

**IPv6**  
2607:5300:201:3100::9032

**Gateway**  
2607:5300:201:3100::1


**Secondary DNS**  
No domains configured

# BOOT INTO RESCUE MODE

**Boot**  
LOCAL

---

**OS/Distribution**  
Debian 11 - de  
3



[Reboot my VPS](#)

[Reboot in rescue mode](#)

# WAITING FOR REBOOT

×

### Reboot in rescue mode

If you confirm your request, your server will reboot immediately in rescue mode. Downtime due to reboot: approximately 2 minutes.

**Warning:** You will receive temporary login details, but you will need to reset your password yourself. Follow the [guide](#).






# AFTER WAITING

We need to get into the console to get info...

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# LAUNCHING THE CONSOLE

<b>Name</b> vps-0866e26d.vps.ovh.ca	
<b>Boot</b> LOCAL	<b>Change the name</b>
<b>OS/Distribution</b>	<b>KVM</b>
	<b>Delete VPS</b>

# CONSOLE BOOTING

KVM

```
Connected to QEMU (instance-003d2d01) Send CtrlAltDel
SeaBIOS (version 2:1.10.2-58953eb7)
Machine UUID d786e389-e18c-4a3a-b470-cb26b5fb8a66

iPXE (http://ipxe.org) 00:03.0 C980 PCI2.10 PnP PMM+7CF8D1E0+7CECD
...

Booting from Hard Disk...
GRUB loading.
Welcome to GRUB!
```

# CONSOLE LOGIN

**KVM**

Connected to QEMU (instance-003d2d01) Send Ctrl/Alt/Del

```
GNU/Linux, to the rescue!  
Server:  vps-0866e26d  
Login:   root  
Password: m8973NCcbUmW  
vps-0866e26d login: _
```

# WE CAN REMOTE IN NOW

Since this is a rescue image and cut/paste is a problem with these virtual consoles, we should ssh in. We have the creds from the console (and there is an email). This lets us get started with the cloning.

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# WORKING WITH THE RESCUE BOOT

We need to copy over a maintenance website, to explain the outage.

```
scp -q linux-ottawa_maint.tar root@linux-ottawa.org:
```

We will use this in a moment.

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# LOG IN REMOTELY

So now we need to set up a reverse proxy for the first tool, `sshfs` to be used.

```
ssh -q root@linux-ottawa.org -R  
10000:127.0.0.1:22
```

As a side effect, we are now logged in and ready to get started

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# THE PROCESS

Install the utilities you need. `ddrescue` is called `gddrescue` in Debian. After install, the `nginx` service starts automatically. At least on Debian.

- `apt install sshfs`
- `apt install gddrescue`
- `apt install nginx`



# THE PROCESS

Extract the maintenance info page

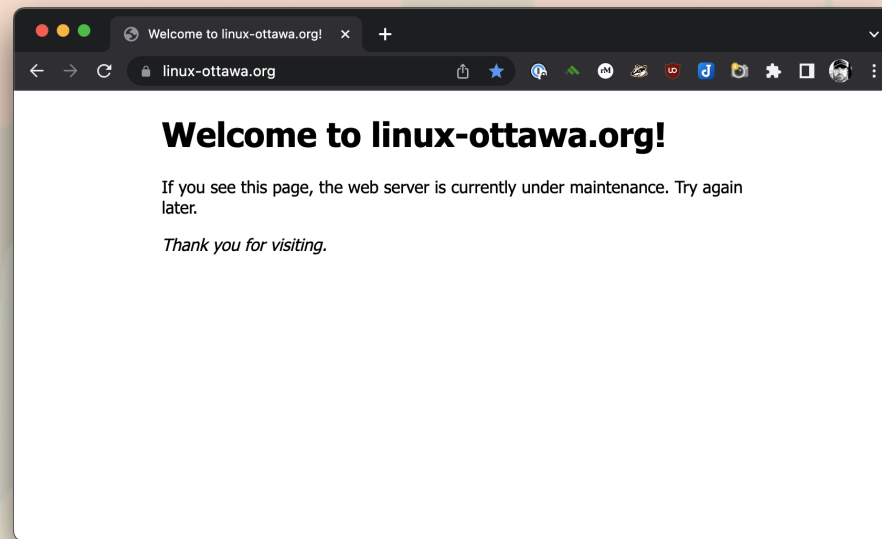
- `cd /`
- `tar xf /root/linux-ottawa_maint.tar`

Restart the web server

- `systemctl restart nginx`

# WEB SITE MAINTENANCE

If you visited the site at this point, this is what you would have seen.



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# THE PROCESS

Technical details time...

Get the disk info

- `lsblk`

Make the mount point for sshfs

- `mkdir /dump`

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# THE PROCESS

Launch sshfs and tunnel the target directory to the mount point

- `sshfs -p 10000 user@127.0.0.1:/home/user/current/linux_ottawa_backup/c /dump`

Show it is there

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# THE PROCESS

Start the process. There is a time summary at the end, but this way I have a bracketed time stamp.

- date
- ddrescue -d /dev/sdb /dump/linuxott\_20230924.img /dump/linuxott\_20230924.logfile
- date

# THE PROCESS

Show we have the info

- `ls -als /dump`
- `df`

Remove the sshfs mount point

- `fusermount -u /dump`
- `df`



# THE PROCESS

Remove the directory & logout

- `rmdir /dump`
- `exit`

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## THE RESULT

We now have a dumped image of the drive that can be restored in a similar fashion. It is stored on your local system in the directory you provided for the sshfs mount.

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# SCREEN RECORDING

I'll show an asciicast of the process next , with chunks taken out of the long running ddrescue process. I kept 1 out of 60 frames so a minute passes in a second. It is a little tedious to watch in real time. It is about 70s.

# LIVE(ISH) SESSION

This is greatly accelerated to show the actual process.

```
996968 0% /sys/fs/cgroup
user@127.0.0.1:/home/user/current/linux_ottawa_backup/dump 51290592 24 48
652744 1% /dump
[RESCUE] root@vps-0866e26d:/ $ lsblk
NAME        MAJ:MIN RM  SIZE RO TYPE MOUNTPOINT
sda          8:0    0  2.5G  0 disk
└─sda1       8:1    0  2.5G  0 part /
sdb          8:16   0  40G   0 disk
├─sdb1       8:17   0 39.9G  0 part
├─sdb14      8:30   0    3M   0 part
└─sdb15      8:31   0  124M  0 part
[RESCUE] root@vps-0866e26d:/ $ date
Sun 24 Sep 2023 07:44:16 PM UTC
[RESCUE] root@vps-0866e26d:/ $ ddrescue -d /dev/sdb /dump/linuxott_20230924.img
/dump/linuxott_20230924.logfile
GNU ddrescue 1.23
Press Ctrl-C to interrupt
      ipos:  31373 MB, non-trimmed:      0 B,  current rate:  29949 kB/s
      opos:  31373 MB, non-scraped:     0 B,  average rate:  28625 kB/s
non-tried: 11576 MB, bad-sector:      0 B,  error rate:    0 B/s
      rescued: 31373 MB, bad areas:     0,    run time:    18m 16s
pct rescued: 73.04%, read errors:     0,  remaining time:  6m
                                           time since last successful read:  0s
Copying non-tried blocks... Pass 1 (forwards)
```



This is not live on the pdf!

# VPS STATUS

[Home](#)

[Secondary DNS](#)

[Automated backup](#)

## Your VPS

### Status

In rescue

### Name

vps-0866e26d.vps.ovh.ca



### Boot

RESCUE



### OS/Distribution

Debian 11 - deprecated - 2022-01-13




### Zone

Region OpenStack: os-bhs2

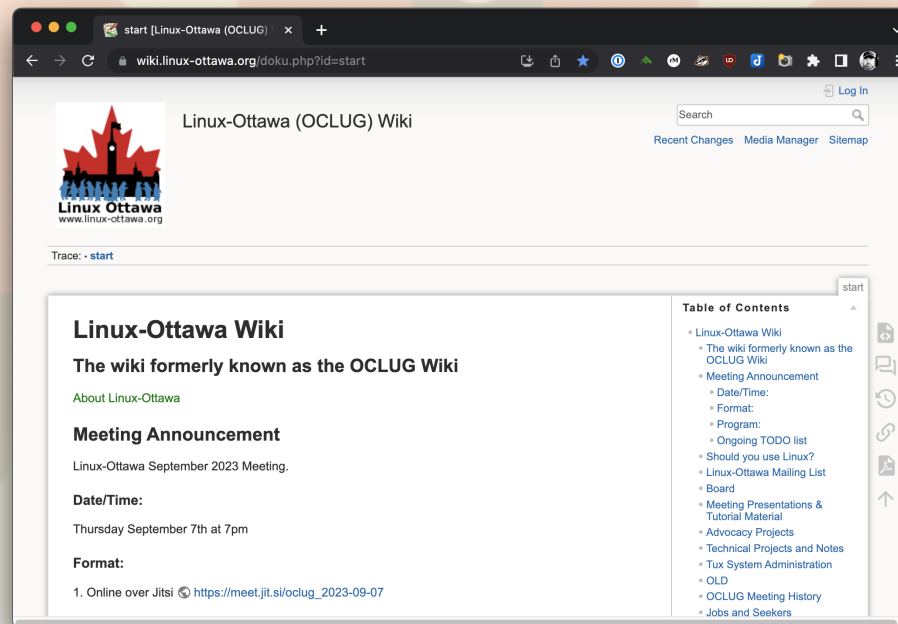
### Location

 Beauharnois (BHS) - Canada

# REBOOT INTO NORMAL MODE

<b>Boot</b> RESCUE	
<b>OS/Distribution</b> Debian 11 - deprecated - 2022-0	<a href="#">Reboot my VPS</a>
	<a href="#">Reboot in rescue mode</a>

# BACK ONLINE



The screenshot shows a web browser window displaying the Linux-Ottawa Wiki page. The browser's address bar shows the URL `wiki.linux-ottawa.org/doku.php?id=start`. The page header includes the Linux-Ottawa logo, the title "Linux-Ottawa (OCLUG) Wiki", and navigation links for "Recent Changes", "Media Manager", and "Sitemap". A search bar is also present. The main content area features a "Trace" section with a link to "start". The primary heading is "Linux-Ottawa Wiki", followed by the sub-heading "The wiki formerly known as the OCLUG Wiki". Below this is a "Meeting Announcement" section with the following details:

- About Linux-Ottawa**
- Meeting Announcement**
- Linux-Ottawa September 2023 Meeting.
- Date/Time:** Thursday September 7th at 7pm
- Format:**
  1. Online over Jitsi [https://meet.jit.si/oclug\\_2023-09-07](https://meet.jit.si/oclug_2023-09-07)

A "Table of Contents" sidebar is visible on the right, listing various wiki pages such as "Linux-Ottawa Wiki", "The wiki formerly known as the OCLUG Wiki", "Meeting Announcement", "Date/Time:", "Format:", "Program:", "Ongoing TODO list", "Should you use Linux?", "Linux-Ottawa Mailing List", "Board", "Meeting Presentations & Tutorial Material", "Advocacy Projects", "Technical Projects and Notes", "Tux System Administration", "OLD", "OCLUG Meeting History", and "Jobs and Seekers".

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## CREATE A LOCAL VM

This part is up to you. For my own use, I'll be using ProxMox and a blank VM that matches the characteristics of the VPS we cloned.

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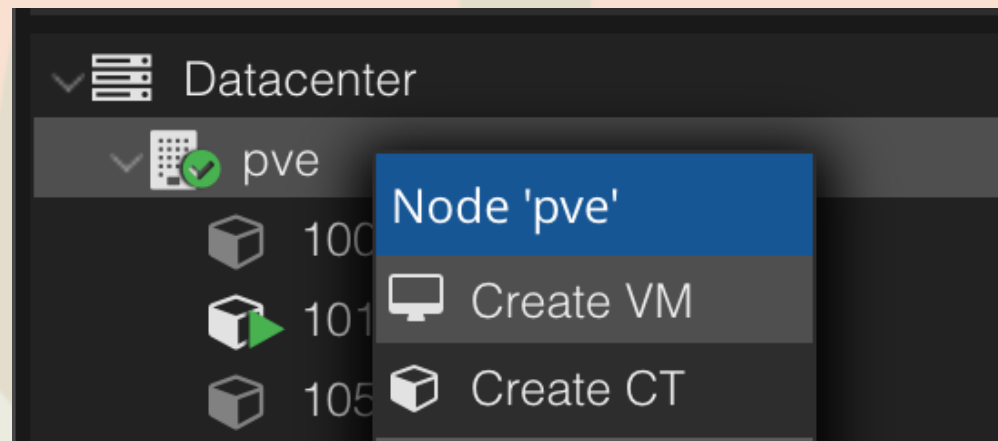
# LOGIN PROXMOX

Proxmox VE Login

User name:	root
Password:	••••••
Realm:	Linux PAM standard authentication
Language:	English - English

Save User name:

# CREATING THE VM





# BUILDING THE VM

Create: Virtual Machine ⓧ

**General** OS System Disks CPU Memory Network Confirm

Node: pve Resource Pool: ⌵

VM ID: 118 ⌵

Name:

---

Start at boot:

Start/Shutdown order: any

Startup delay: default

Shutdown timeout: default

? Help Advanced  Back Next

# BUILDING THE VM

Create: Virtual Machine ⓧ

**General** OS System Disks CPU Memory Network Confirm

Node: pve Resource Pool: ⌵

VM ID: 118

Name: linux-ottawa-testing

---

Start at boot:

Start/Shutdown order: any

Startup delay: default

Shutdown timeout: default

? Help Advanced  Back Next

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# BUILDING THE VM

Create: Virtual Machine

General OS System Disks CPU Memory Network Confirm

Use CD/DVD disc image file (iso)

Storage: local

ISO image: debian-live-12.1.0-amd64-xfce.iso

Guest OS:

Type: Linux

Version: 6.x - 2.6 Kernel

Use physical CD/DVD Drive

Do not use any media

Advanced  Back Next

# BUILDING THE VM

Create: Virtual Machine ⊗

General OS **System** Disks CPU Memory Network Confirm

Graphic card: Default ⌵ SCSI Controller: VirtIO SCSI single ⌵

Machine: Default (i440fx) ⌵ Qemu Agent:

Firmware

BIOS: Default (SeaBIOS) ⌵ Add TPM:

? Help Advanced  Back Next

# BUILDING THE VM

Create: Virtual Machine

General OS System **Disks** CPU Memory Network Confirm

scsi0 🗑️ **Disk** Bandwidth

Bus/Device: SCSI 0 Cache: Default (No cache)

SCSI Controller: VirtIO SCSI single Discard:

Storage: NFS1 IO thread:

Disk size (GiB): 42

Format: QEMU image format

---

SSD emulation:  Backup:

Read-only:  Skip replication:

Async IO: Default (io\_uring)

➕ Add

🔍 Help Advanced  Back Next

# BUILDING THE VM

Create: Virtual Machine

General OS System Disks **CPU** Memory Network Confirm

Sockets: 1 Type: Default (kvm64)

Cores: 1 Total cores: 1

VCPUs: 1 CPU units: 100

CPU limit: unlimited Enable NUMA:

CPU Affinity: All Cores

Extra CPU Flags:

Default	- <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> +	md-clear	Required to let the guest OS know if MDS is mitigated correctly
Default	- <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> +	pcid	Meltdown fix cost reduction on Westmere, Sandy-, and IvyBridge Intel CPUs
Default	- <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> +	spec-ctrl	Allows improved Spectre mitigation with Intel CPUs
Default	- <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> +	ssbd	Protection for "Speculative Store Bypass" for Intel models
Default	- <input type="radio"/> <input checked="" type="radio"/> <input type="radio"/> +	ibpb	Allows improved Spectre mitigation with AMD CPUs

[? Help](#)  Advanced [Back](#) [Next](#)

# BUILDING THE VM

Create: Virtual Machine ⊗

General OS System Disks CPU **Memory** Network Confirm

Memory (MiB): 2048

---

Minimum memory (MiB): 2048

Shares: Default (1000)

Ballooning Device:

? Help Advanced  Back Next

# BUILDING THE VM

Create: Virtual Machine

General OS System Disks CPU Memory **Network** Confirm

No network device

Bridge: vubr0 Model: VirtIO (paravirtualized)

VLAN Tag: no VLAN MAC address: auto

Firewall:

---

Disconnect:  Rate limit (MB/s): unlimited

MTU: 1500 (1 = bridge MTU) Multiqueue:

? Help Advanced  Back Next



# BUILDING THE VM

Create: Virtual Machine ⊗

General OS System Disks CPU Memory Network **Confirm**

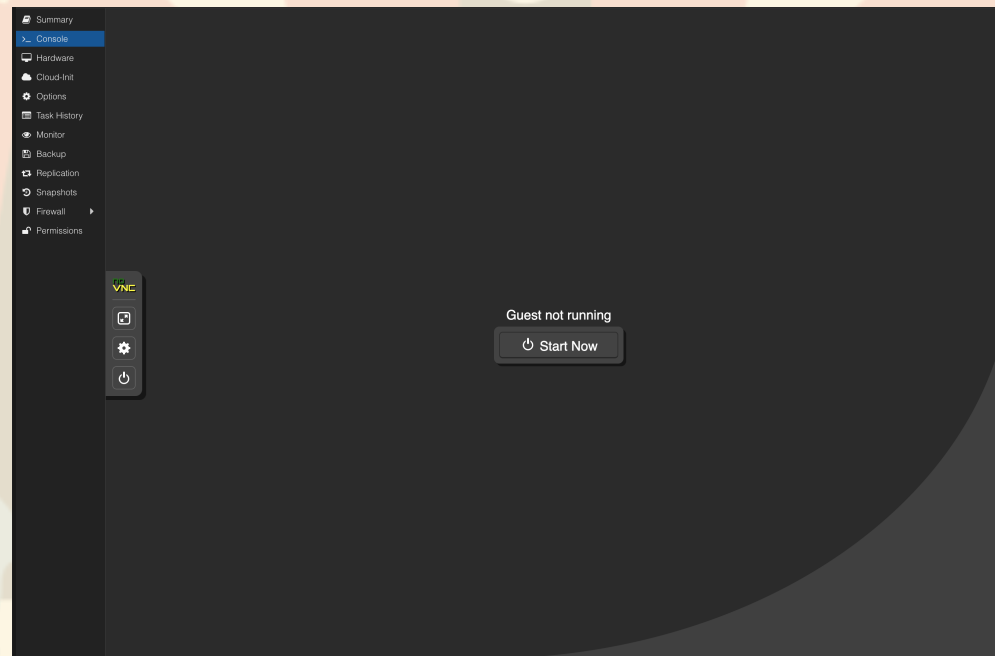
Key ↑	Value
cores	1
ide2	local:iso/debian-live-12.1.0-amd64-xfce.iso,media=cdrom
memory	2048
name	linux-ottawa-testing
net0	virtio,bridge=vibr0,firewall=1
nodename	pve
numa	0
ostype	l26
scsi0	NFS1:42,format=qcow2,iotread=on
scsihw	virtio-scsi-single
sockets	1
vmid	118

Start after created

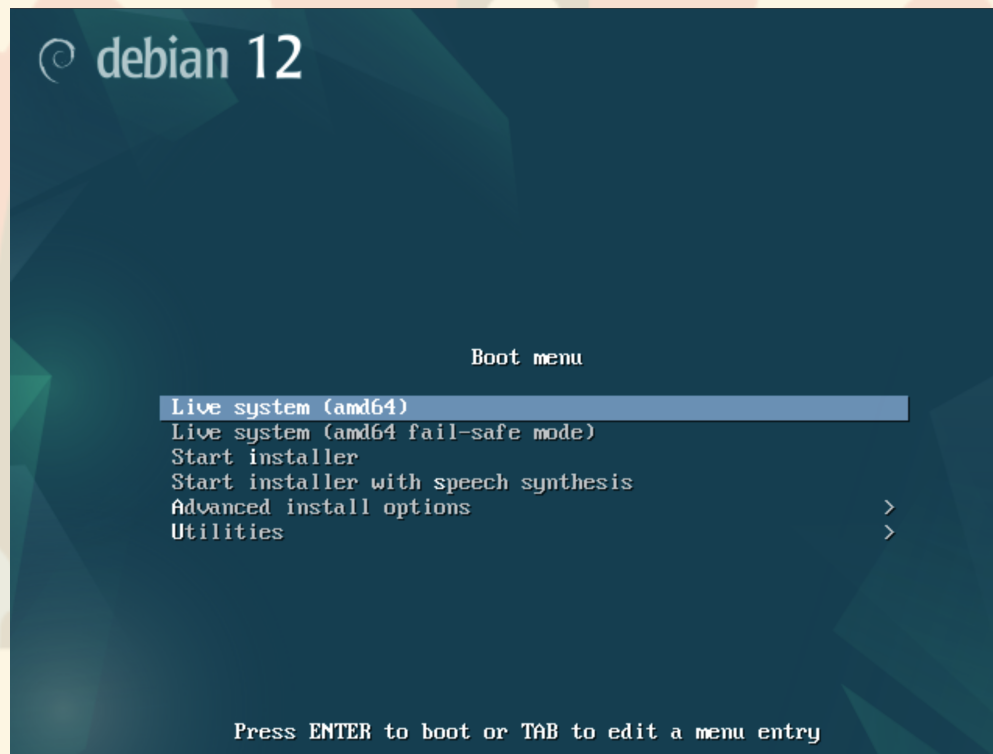
Advanced  **Back** **Finish**

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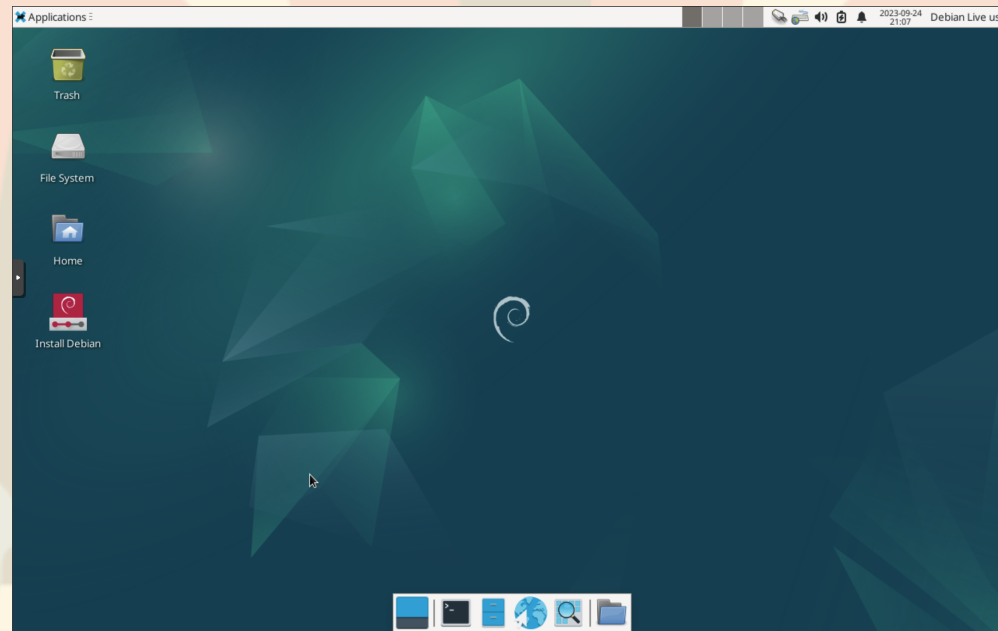
# START THE CLONE



# READY FOR START



# LIVE IMAGE RUNNING



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# Q&D RESTORE

Well, really quick. We are doing the same process as the dump, but in reverse.

In this case:

- From the console edit the ssh config to allow root logins
- Set a root password
- Install gddrescue
- Install sshfs

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# Q&D RESTORE

- From the system holding the image, ssh in with the port forwarding just like before.
- Create the directory to mount the remote directory
- Start sshfs with the parameters from before

# Q&D RESTORE

Now we restore with ddrescue, just a little different this time

```
ddrescue -f /dump/linuxott_20230924.img /dev/sda  
/dump/restore.log
```

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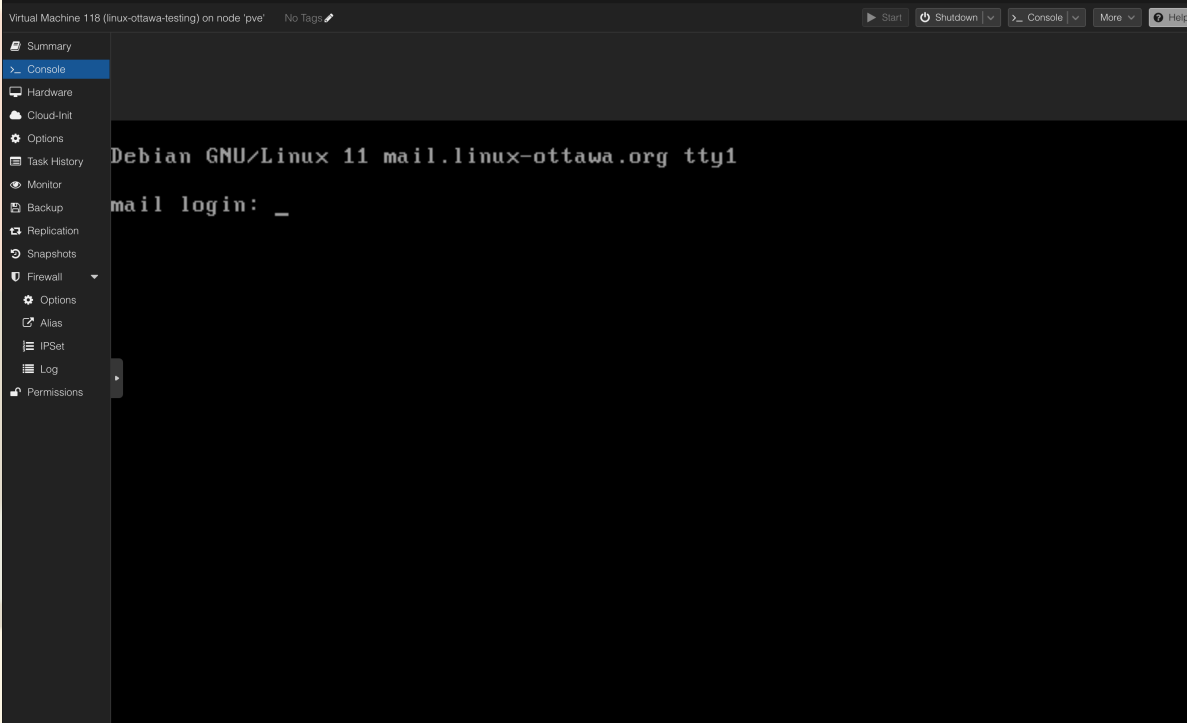
# Q&D RESTORE

When completed:

- Unmount the sshfs file system
- Shutdown the VM
- Remove the livecd image
- Start the VM



# POST CLONE BOOT



Virtual Machine 118 (linux-ottawa-testing) on node 'pve' No Tags

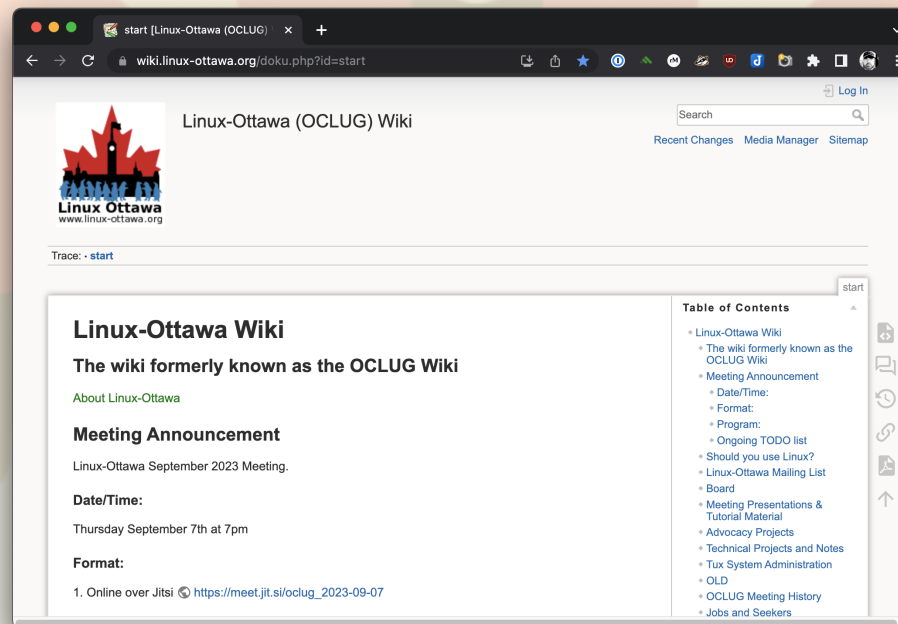
Start Shutdown Console More Help

- Summary
- Console
- Hardware
- Cloud-Init
- Options
- Task History
- Monitor
- Backup
- Replication
- Snapshots
- Firewall
  - Options
  - Alias
  - IPSet
  - Log
- Permissions

```
Debian GNU/Linux 11 mail.linux-ottawa.org tty1
mail login: _
```

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# THE HOMEPAGE



The screenshot shows a web browser window displaying the Linux-Ottawa (OCLUG) Wiki homepage. The browser's address bar shows the URL `wiki.linux-ottawa.org/doku.php?id=start`. The page features the Linux-Ottawa logo, a search bar, and navigation links for "Recent Changes", "Media Manager", and "Sitemap". The main content area is titled "Linux-Ottawa Wiki" and includes a "Table of Contents" sidebar. The sidebar lists various topics such as "Linux-Ottawa Wiki", "The wiki formerly known as the OCLUG Wiki", "Meeting Announcement", "Date/Time:", "Format:", "Program:", "Ongoing TODO list", "Should you use Linux?", "Linux-Ottawa Mailing List", "Board", "Meeting Presentations & Tutorial Material", "Advocacy Projects", "Technical Projects and Notes", "Tux System Administration", "OLD", "OCLUG Meeting History", and "Jobs and Seekers".

Linux-Ottawa (OCLUG) Wiki

Search

Recent Changes Media Manager Sitemap

Trace: - start

**Linux-Ottawa Wiki**

The wiki formerly known as the OCLUG Wiki

About Linux-Ottawa

**Meeting Announcement**

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# UTILITIES USED

- sshfs
- ddrescue
- proxmox
- debian 12 live image

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# QUICK DEMO

I added the local vm ip address to my `/etc/hosts` file so that I can connect by name and it works the same.

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