

Proof of Concept Technical Solution

for the *Marconi Law Firm, LLC*.

(WordPress Website)

Project Background: Assume that you are an entrepreneur and that you own your own Information Technology (IT) consulting firm. You have recently acquired a new client called “Marconi Law Firm”. As part of your client’s contract agreement, you are to deliver full documentation for their upcoming WordPress Website Hosting project implementation. This documentation includes a Proof-of-Concept Technical Solution which documents all software, hardware, and network configuration details. Assume that the finished document will be used in-house by the Marconi Law Firm and will be referenced by their in-house IT department---after the project has been successfully completed.

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Preface

This document will serve as proof of concept to Mr. Marconi for creating his WordPress website for his law firm and as audit documentation.

The purpose of audit documentation is to provide a comprehensive record of the organization's information technology infrastructure and security controls and processes. It plays a crucial role in providing transparency, accountability, and QA/QC regarding an organization's cybersecurity controls and practices. It enables organizations to demonstrate compliance, identify areas for improvement, and make informed decisions to strengthen their overall organizational cybersecurity.

Audit documentation serves several important purposes:

- **Compliance:** Evidence that an organization has undergone a thorough examination of its systems. It helps validate that the organization has implemented appropriate controls to protect its information systems and sensitive data.

- **Validation:** Verification of the effectiveness and adequacy of cybersecurity controls. It provides detailed information about the design, implementation, and operation of these controls, enabling reviewers to assess their reliability and identify any gaps or weaknesses.
- **Records Maintenance:** Historical record of cybersecurity audits conducted over time. It enables organizations to track their progress, identify trends, and evaluate the effectiveness actions taken. It also serves as reference for future audits and allows auditors to understand the current cybersecurity implemented and facilitates a more targeted approach to future cybersecurity updates and audits.
- **Decision-making Support:** Valuable insights and information that can support decision-making processes. It allows management to make informed decisions about allocating resources, prioritizing cybersecurity investments, and addressing identified risks and vulnerabilities.

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Inventory

EQUIPMENT	OPERATING SYSTEM	ADDITIONAL INFO	IP ADDRESS
Router/Custom Network	-	-	10.10.229.1
Docker	CentOS 7	Ghost Container	10.10.229.11
NginX Reverse Proxy	Rocky 8	Reverse Proxy	10.10.229.10
WordPress	Ubuntu	LAMP Stack running WordPress	10.10.229.12

Custom Network

NETWORK NAME	SUBNET IP	SUBNET MASK	DNS	GATEWAY
ITE229	10.10.229.0	255.255.255.0	10.10.229.1	10.10.229.1

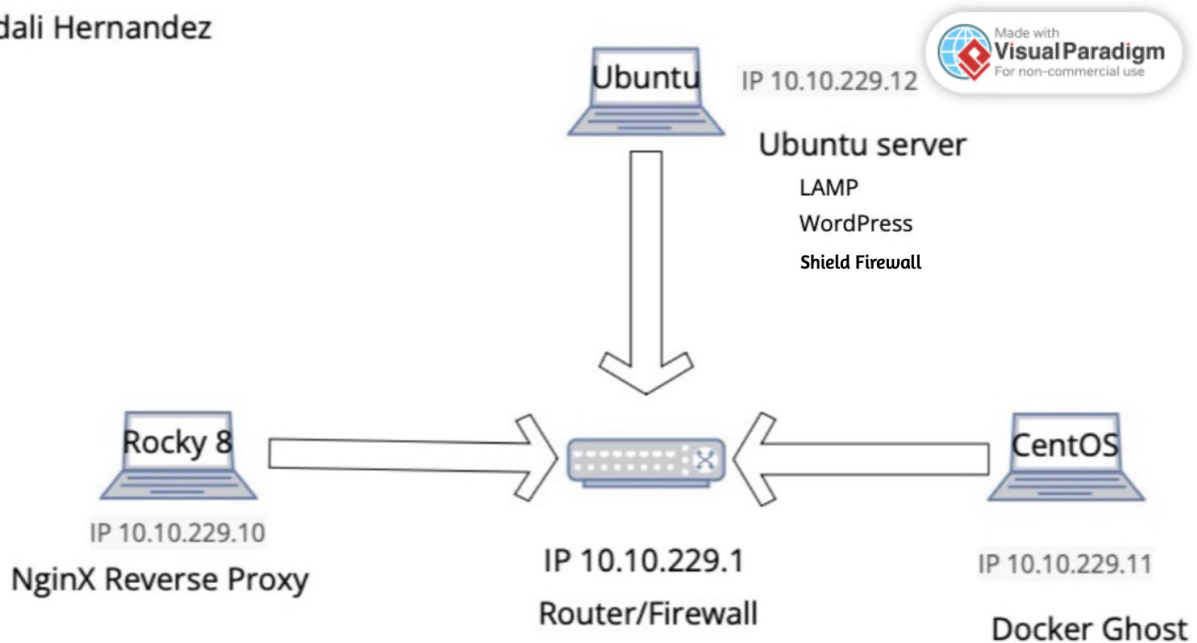
IDs and Passwords

ACCOUNT	USER ID	PASSWORD
CentOS 7 Root User	root	Fullsail1!
Rocky 8 Root User	root	Fullsail1!
MySQL Root User	root@localhost	VWqJReU17ak
MySQL WordPress User	WordPressUser	bLlvG8cddFyLgTv70oSp
WordPress Admin	admin	iHp1COMGwgD%4hhUU1

IMPORTANT: To earn full credit, ALL screenshots must include a “full view”, including your ProxMox title bar with your username showing.

Network Topology Diagram

Ydali Hernandez



The Virtual machines communicate with each other through proper network configuration, which is internal networking. Each VM's firewall must be configured to allow incoming and outgoing traffic between VMs. Each VM should have a unique IP address within the same network segment. You can configure static IP addresses or use DHCP to assign IP addresses to VMs dynamically.

Node.js Application (Ghost) on Docker

Show screenshot of your CentOS 7 Console in VE

The screenshot shows the Proxmox Virtual Environment (VE) interface. The top bar indicates the user is logged in as 'yhermandez1@LabAccount'. The left sidebar shows a list of virtual machines, with '1028 (yhermandez1-CentOS7-2310)' selected. The main panel displays the console output for this VM, showing the login process. The console output includes the following text:

```
CentOS Linux 7 (Core)
Kernel 3.10.0-1160.el7.x86_64 on an x86_64

localhost login: root
Password:
Login incorrect

localhost login: root
Password:
Last failed login: Wed Sep 27 21:55:14 EDT 2023 on tty1
There was 1 failed login attempt since the last successful login.
Last login: Wed May 31 13:55:11 on tty1
[root@localhost ~]#
```

Below the console output, there is a 'Tasks' section with a table showing the history of actions performed on the VM:

Start Time	End Time	Node	User name	Description	Status
Sep 27 18:54:29		IT125	yhermandez1@Lab...	VMCT 1028 - Console	
Sep 27 18:54:27	Sep 27 18:54:28	IT125	yhermandez1@Lab...	VM 1028 - Start	OK
Sep 27 18:53:34	Sep 27 18:53:36	IT125	yhermandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 18:53:23	Sep 27 18:53:27	IT125	yhermandez1@Lab...	VM 1028 - Delete Snapshot	OK
Sep 27 18:41:02	Sep 27 18:53:19	IT125	yhermandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 18:39:09	Sep 27 18:39:14	IT125	yhermandez1@Lab...	VM 1028 - Snapshot	OK
Sep 27 18:29:45	Sep 27 18:40:59	IT125	yhermandez1@Lab...	VMCT 1028 - Console	OK

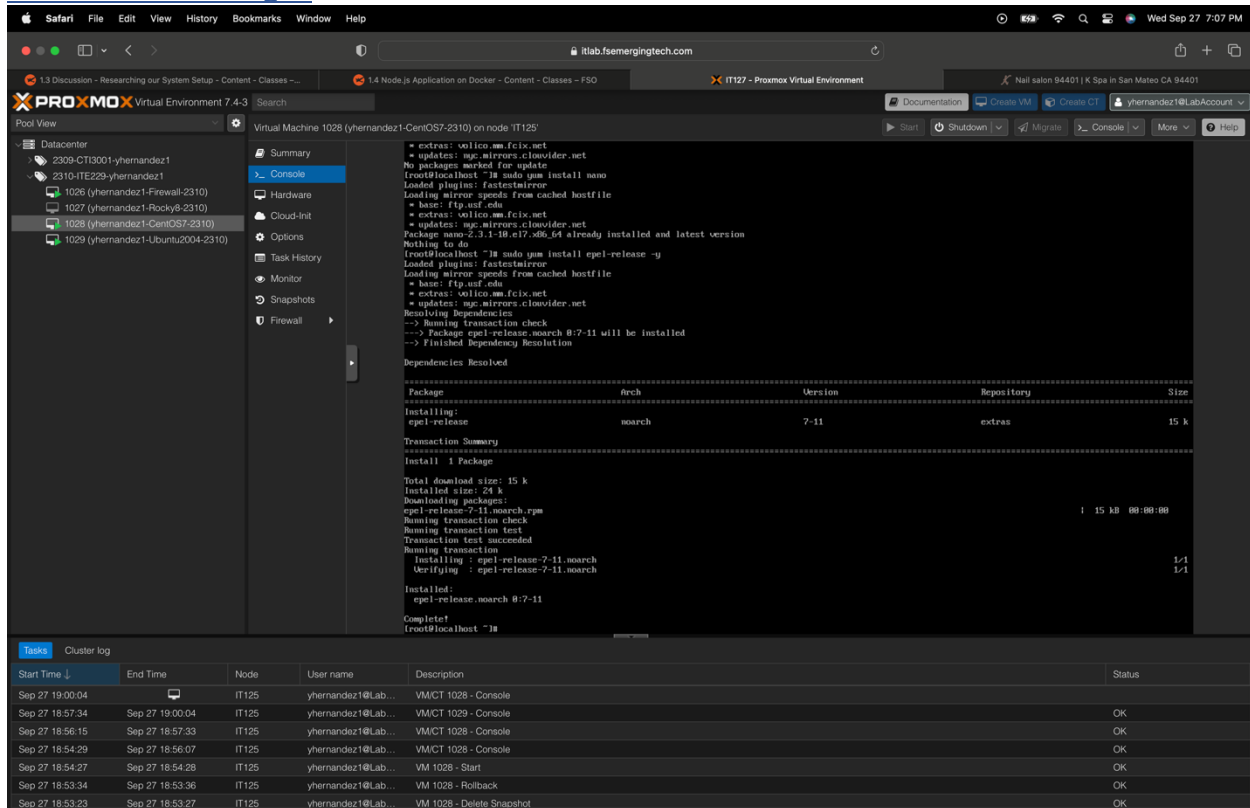
Update CentOS

The screenshot shows the Proxmox Virtual Environment (VE) interface. On the left, a sidebar lists several virtual machines (VMs) under the 'Datacenter' tab, including '2309-CT13001-yhernandez1', '2310-ITE229-yhernandez1', '1026 (yhernandez1-Firewall-2310)', '1027 (yhernandez1-Rocky8-2310)', '1028 (yhernandez1-CentOS7-2310)', and '1029 (yhernandez1-Ubuntu2004-2310)'. The '1028 (yhernandez1-CentOS7-2310)' VM is selected, and its console is displayed in the main area. The console shows the output of the 'yum update' command, which is updating various packages including kernel, microcode, openssh-server, openssh-clients, python-perf, python-libs, and python. The output indicates that the packages are being updated to their latest versions. Below the console output, a 'Tasks' tab is visible, showing a list of tasks performed on the VM, including 'VMCT 1028 - Console', 'VMCT 1029 - Console', 'VMCT 1028 - Console', 'VMCT 1028 - Console', 'VM 1028 - Start', 'VM 1028 - Rollback', and 'VM 1028 - Delete Snapshot'.

Start Time	End Time	Node	User name	Description	Status
Sep 27 19:00:04		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 18:57:34	Sep 27 19:00:04	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Sep 27 18:56:15	Sep 27 18:57:33	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 18:54:29	Sep 27 18:56:07	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 18:54:27	Sep 27 18:54:28	IT125	yhernandez1@Lab...	VM 1028 - Start	OK
Sep 27 18:53:34	Sep 27 18:53:36	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 18:53:23	Sep 27 18:53:27	IT125	yhernandez1@Lab...	VM 1028 - Delete Snapshot	OK

Type in **sudo yum update -y**, and the VM will automatically update CentOS.

Install EPEL Packages



The screenshot displays the Proxmox Virtual Environment (VE) interface. The left sidebar shows the Datacenter tree with several VMs listed. The main panel shows the console of VM 1028 (yhernandez1-CentOS7-2310) on node IT125. The console output shows the execution of the command `sudo yum install epel-release -y` and the successful installation of the `epel-release` package from the `extras` repository. Below the console, a table lists recent tasks.

Start Time	End Time	Node	User name	Description	Status
Sep 27 19:00:04		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 18:57:34	Sep 27 19:00:04	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Sep 27 18:56:15	Sep 27 18:57:33	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 18:54:29	Sep 27 18:56:07	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 18:54:27	Sep 27 18:54:28	IT125	yhernandez1@Lab...	VM 1028 - Start	OK
Sep 27 18:53:34	Sep 27 18:53:36	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 18:53:23	Sep 27 18:53:27	IT125	yhernandez1@Lab...	VM 1028 - Delete Snapshot	OK

Type in **sudo yum install epel-release -y**, and it will install automatically EPEL packages.

Install Nano Editor

The screenshot displays the Proxmox Virtual Environment (VE) interface. The left sidebar shows a list of virtual machines, with '1028 (yhernandez1-CentOS7-2310)' selected. The main panel shows the console output for this VM. The output indicates that the nano editor has been successfully installed. The terminal shows the following commands and their outputs:

```
[root@localhost ~]# sudo yum update -y
Loaded plugin: fastestmirror
Loading mirror speeds from cached hostfile
* base: ftp.usf.edu
* extras: volico.sm.fcix.net
* updates: mc.mirrors.clowider.net
No packages marked for update
[root@localhost ~]# sudo yum install nano
Loaded plugin: fastestmirror
Loading mirror speeds from cached hostfile
* base: ftp.usf.edu
* extras: volico.sm.fcix.net
* updates: mc.mirrors.clowider.net
Package nano-2.3.1-18.el7.x86_64 already installed and latest version
Nothing to do
[root@localhost ~]#
```

The bottom section of the interface shows a table of tasks, including the installation of nano on VM 1028.

Start Time	End Time	Node	User name	Description	Status
Sep 27 19:00:04		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 18:57:34	Sep 27 19:00:04	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Sep 27 18:56:15	Sep 27 18:57:33	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 18:54:29	Sep 27 18:56:07	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 18:54:27	Sep 27 18:54:28	IT125	yhernandez1@Lab...	VM 1028 - Start	OK
Sep 27 18:53:34	Sep 27 18:53:36	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 18:53:23	Sep 27 18:53:27	IT125	yhernandez1@Lab...	VM 1028 - Delete Snapshot	OK

Type in **sudo yum install nano**, and it will install nano.

Docker CE

Install required packages

The screenshot shows the Proxmox Virtual Environment (VE) interface. The left sidebar displays a tree view of the virtual machines, with '1028 (yher)' selected. The main panel shows the 'Console' view for this VM. The terminal output displays the installation of Docker CE packages using yum.

```
Package arch Version Repository Size
Installing:
yum-utils noarch 1.1.31-54.el7_8 base 122 k
Installing for dependencies:
libb2-python noarch 2.9.1-6.el7_9.6 updates 247 k
python-chardet noarch 2.2.1-3.el7 base 227 k
python-kitchen noarch 1.1.1-5.el7 base 267 k

Transaction Summary
Install 1 Package (+3 Dependent packages)
Total download size: 863 k
Installed size: 4.3 M
Downloading packages:
(1/4): libb2-python-2.9.1-6.el7_9.6.x86_64.rpm 1.247 MB 00:00:00
(2/4): python-chardet-2.2.1-3.el7.noarch.rpm 1.222 kB 00:00:00
(3/4): python-kitchen-1.1.1-5.el7.noarch.rpm 1.267 kB 00:00:00
(4/4): yum-utils-1.1.31-54.el7_8.noarch.rpm 1.122 MB 00:00:00
Total 1.7 MB/s | 863 kB 00:00:00
Running transaction check
Running transaction test
Transaction test succeeded
Running transaction
Installing : python-chardet-2.2.1-3.el7.noarch 1/4
Installing : python-kitchen-1.1.1-5.el7.noarch 2/4
Installing : libb2-python-2.9.1-6.el7_9.6.x86_64 3/4
Installing : yum-utils-1.1.31-54.el7_8.noarch 4/4
Verifying : python-kitchen-1.1.1-5.el7.noarch 1/4
Verifying : yum-utils-1.1.31-54.el7_8.noarch 2/4
Verifying : libb2-python-2.9.1-6.el7_9.6.x86_64 3/4
Verifying : python-chardet-2.2.1-3.el7.noarch 4/4
Installed:
yum-utils.noarch 0:1.1.31-54.el7_8
Dependency Installed:
libb2-python.x86_64 0:2.9.1-6.el7_9.6 python-chardet.noarch 0:2.2.1-3.el7 python-kitchen.noarch 0:1.1.1-5.el7
Complete!
[root@localhost ~]# sudo yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo
Loaded plugins: fastestmirror
Adding repo from: https://download.docker.com/linux/centos/docker-ce.repo
grabbing file https://download.docker.com/linux/centos/docker-ce.repo to /etc/yum/repos.d/docker-ce.repo
repo saved to /etc/yum/repos.d/docker-ce.repo
[root@localhost ~]#
```

The bottom section of the interface shows a 'Tasks' table with the following data:

Start Time	End Time	Node	User name	Description	Status
Sep 27 19:16:08		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:14:43	Sep 27 19:14:49	IT125	yhernandez1@Lab...	VM 1028 - Snapshot	OK
Sep 27 19:00:04	Sep 27 19:14:03	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK

Type in **sudo yum install -y yum-utils**, and it will automatically install Docker packages.

Set up stable repository

The screenshot shows the Proxmox VE interface with a terminal window displaying the output of a yum installation command. The output shows the installation of yum-utils, libxml2-python, python-chardet, and python-kitchen. Below the terminal output, there is a table showing the tasks performed.

Start Time	End Time	Node	User name	Description	Status
Sep 27 19:16:08		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:14:43	Sep 27 19:14:49	IT125	yhernandez1@Lab...	VM 1028 - Snapshot	OK
Sep 27 19:00:04	Sep 27 19:14:03	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK

type in `sudo yum-config-manager --add-repo https://download.docker.com/linux/centos/docker-ce.repo`
it will set up stable repository.

Install Docker CE

The screenshot shows the Proxmox VE interface with a virtual machine console open. The console output displays the successful installation of Docker CE on a CentOS 7 system. The installation process includes downloading and installing various packages like libseccomp, libbpf, fuse-overlayfs, and docker-ce. The output also shows the verification of the installed packages and the completion of the installation.

```
Transaction test succeeded
Running transaction
Installing : libseccomp-0.41-21.el7.x86_64 1/17
Installing : docker-buildx-plugin-0.11.2-1.el7.x86_64 2/17
Installing : audit-libs-python-2.8.5-4.el7.x86_64 3/17
Installing : slirp4netns-0.4.3-4.el7_8.x86_64 4/17
Installing : actool-1.18-3.3.0-4.el7.x86_64 5/17
Installing : libsemanage-python-2.5-14.el7.x86_64 6/17
Installing : docker-compose-plugin-2.21.0-1.el7.x86_64 7/17
Installing : 1:docker-ce-cli-24.0.6-1.el7.x86_64 8/17
Installing : python-IPy-0.75-6.el7.noarch 9/17
Installing : fuse3-libs-0.6.1-4.el7.x86_64 10/17
Installing : fuse-overlayfs-0.7.2-6.el7_8.x86_64 11/17
Installing : checkpolicy-2.5-8.el7.x86_64 12/17
Installing : policycoreutils-python-2.5-34.el7.x86_64 13/17
Installing : 2:container-selinux-2.119.2-1.911c722.el7_8.noarch 14/17
Installing : containerd.io-1.6.24-3.1.el7.x86_64 15/17
Installing : docker-ce-rootless-extras-24.0.6-1.el7.x86_64 16/17
Installing : 3:docker-ce-24.0.6-1.el7.x86_64 17/17
Verifying : checkpolicy-2.5-8.el7.x86_64 1/17
Verifying : fuse3-libs-0.6.1-4.el7.x86_64 2/17
Verifying : containerd.io-1.6.24-3.1.el7.x86_64 3/17
Verifying : python-IPy-0.75-6.el7.noarch 4/17
Verifying : docker-compose-plugin-2.21.0-1.el7.x86_64 5/17
Verifying : libsemanage-python-2.5-14.el7.x86_64 6/17
Verifying : actool-1.18-3.3.0-4.el7.x86_64 7/17
Verifying : slirp4netns-0.4.3-4.el7_8.x86_64 8/17
Verifying : 2:container-selinux-2.119.2-1.911c722.el7_8.noarch 9/17
Verifying : docker-ce-rootless-extras-24.0.6-1.el7.x86_64 10/17
Verifying : 3:docker-ce-24.0.6-1.el7.x86_64 11/17
Verifying : audit-libs-python-2.8.5-4.el7.x86_64 12/17
Verifying : 1:docker-ce-cli-24.0.6-1.el7.x86_64 13/17
Verifying : docker-buildx-plugin-0.11.2-1.el7.x86_64 14/17
Verifying : fuse-overlayfs-0.7.2-6.el7_8.x86_64 15/17
Verifying : libseccomp-0.41-21.el7.x86_64 16/17
Verifying : 1:docker-ce-24.0.6-1.el7.x86_64 17/17

Installed:
docker-ce.x86_64 3:24.0.6-1.el7

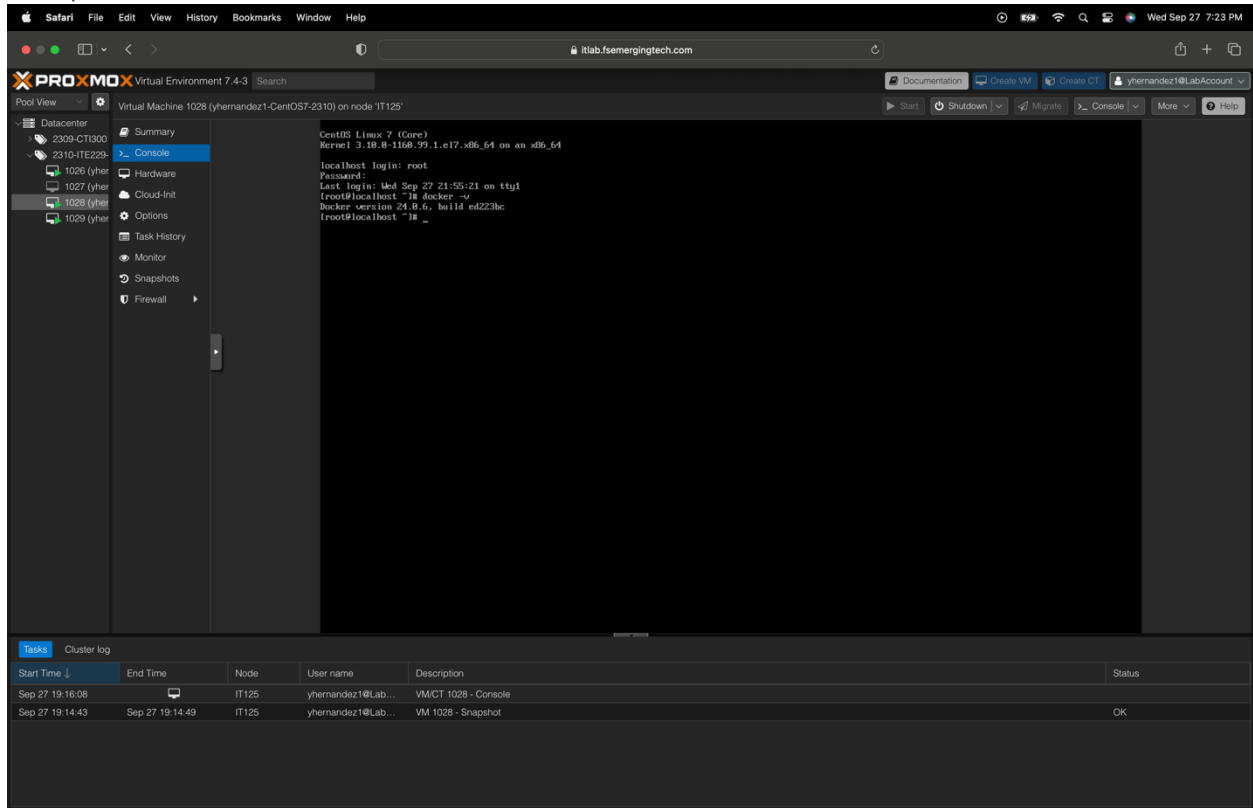
Dependency Installed:
audit-libs-python.x86_64 0:2.8.5-4.el7          checkpolicy.x86_64 0:2.5-8.el7          container-selinux.noarch 2:2.119.2-1.911c722.el7_8
containerd.io.x86_64 0:1.6.24-3.1.el7          docker-buildx-plugin.x86_64 0:0.11.2-1.el7          docker-compose-plugin.x86_64 0:2.21.0-1.el7
fuse3-libs.x86_64 0:0.6.1-4.el7                docker-ce-rootless-extras.x86_64 0:24.0.6-1.el7          fuse-overlayfs.x86_64 0:0.7.2-6.el7_8
policycoreutils-python.x86_64 0:2.5-34.el7          libseccomp.x86_64 0:0.41-21.el7          libsemanage-python.x86_64 0:2.5-14.el7
slirp4netns.x86_64 0:0.4.3-4.el7_8              python-IPy.noarch 0:0.75-6.el7          actool-1.18.x86_64 0:3.3.0-4.el7
```

Complete!
[root@localhost ~]#

Start Time	End Time	Node	User name	Description	Status
Sep 27 19:28:12		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:27:59	Sep 27 19:28:07	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 19:16:08	Sep 27 19:27:54	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 19:14:43	Sep 27 19:14:49	IT125	yhernandez1@Lab...	VM 1028 - Snapshot	OK

Type in **sudo yum install docker-ce**, and it will install Docker CE.

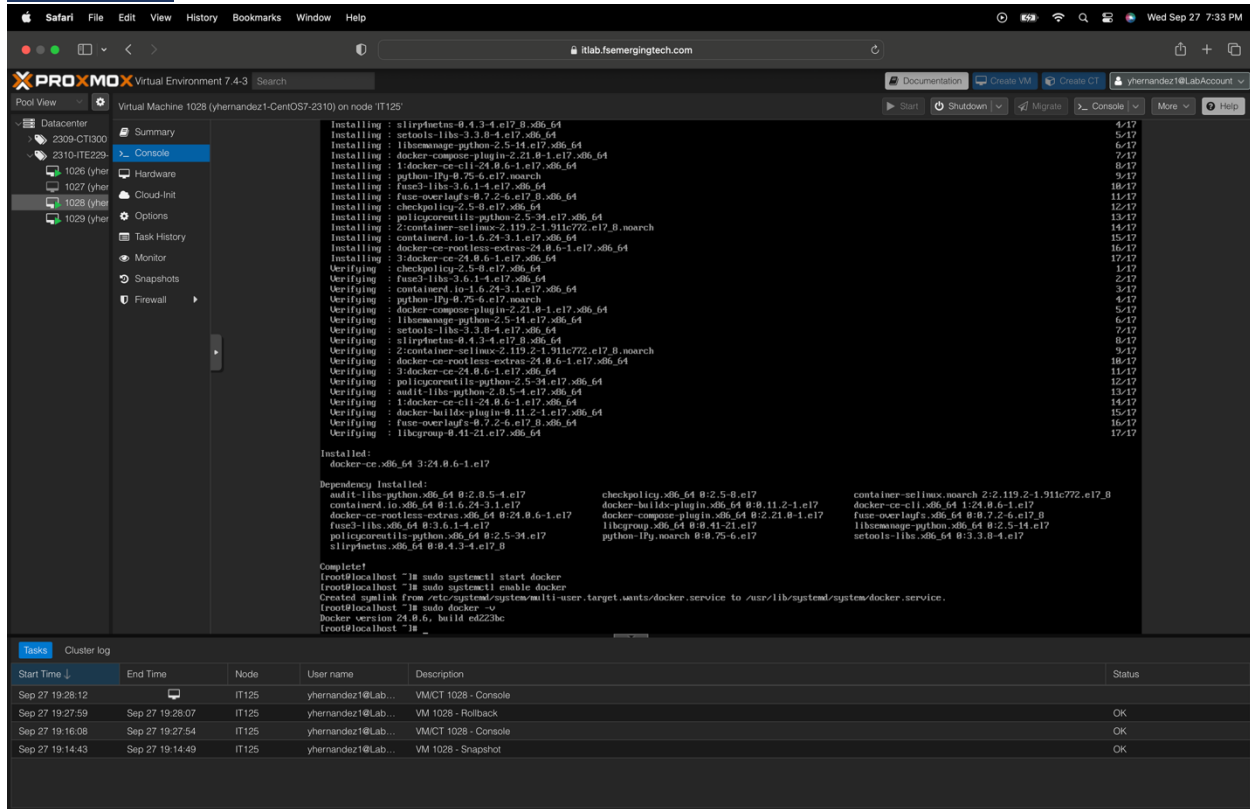
Verify docker version



Type in **sudo docker -v** to verify the docker version.

Initialize Docker

Start Docker



The screenshot displays the Proxmox Virtual Environment (VE) interface. The main window shows the installation progress of Docker on a virtual machine named '1028 (yher)'. The installation is in progress, with a progress bar at the top indicating the status. The left sidebar shows the 'Datacenter' view with a tree of virtual machines. The main panel displays the 'Console' view, showing the output of the installation process. The output includes the installation of various Docker components and the successful completion of the setup. The bottom of the interface shows a 'Tasks' table with a list of recent tasks.

Start Time ↓	End Time	Node	User name	Description	Status
Sep 27 19:28:12		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:27:59	Sep 27 19:28:07	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 19:16:08	Sep 27 19:27:54	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 19:14:43	Sep 27 19:14:49	IT125	yhernandez1@Lab...	VM 1028 - Snapshot	OK

Type in **sudo systemctl start docker**, and it will initialize docker.

Enable Docker

The screenshot shows the Proxmox Virtual Environment (VE) interface. The main window displays the installation progress for Docker on VM 1028 (yhernandez1@Lab...). The progress bar is at 100%, indicating the installation is complete. The console output shows the following steps:

```
Installing : slirpnetns-0.4.3-4.el7_8.x86_64
Installing : setools-libs-3.3.8-4.el7.x86_64
Installing : libsmmanage-python-2.5-14.el7.x86_64
Installing : docker-compose-plugin-2.21.8-1.el7.x86_64
Installing : 1:docker-ce-cli-24.8.6-1.el7.x86_64
Installing : python-IPy-0.75-6.el7.noarch
Installing : fuse3-libs-3.6.1-4.el7.x86_64
Installing : fuse-overlayfs-0.7.2-6.el7_8.x86_64
Installing : checkpolicy-2.5-8.el7.x86_64
Installing : policycoreutils-python-2.5-34.el7.x86_64
Installing : 2:container-selinux-2.119.2-1.911c772.el7_8.noarch
Installing : containerd.io-1.6.24-3.1.el7.x86_64
Installing : docker-ce-rootless-extras-24.8.6-1.el7.x86_64
Installing : 3:docker-ce-24.8.6-1.el7.x86_64
Verifying : checkpolicy-2.5-8.el7.x86_64
Verifying : fuse3-libs-3.6.1-4.el7.x86_64
Verifying : python-IPy-0.75-6.el7.noarch
Verifying : docker-compose-plugin-2.21.8-1.el7.x86_64
Verifying : libsmmanage-python-2.5-14.el7.x86_64
Verifying : setools-libs-3.3.8-4.el7.x86_64
Verifying : slirpnetns-0.4.3-4.el7_8.x86_64
Verifying : 2:container-selinux-2.119.2-1.911c772.el7_8.noarch
Verifying : docker-ce-rootless-extras-24.8.6-1.el7.x86_64
Verifying : 3:docker-ce-24.8.6-1.el7.x86_64
Verifying : policycoreutils-python-2.5-34.el7.x86_64
Verifying : audit-libs-python-2.8.5-4.el7.x86_64
Verifying : 1:docker-ce-cli-24.8.6-1.el7.x86_64
Verifying : docker-buildx-plugin-0.11.2-1.el7.x86_64
Verifying : fuse-overlayfs-0.7.2-6.el7_8.x86_64
Verifying : libcgrouper-0.41-21.el7.x86_64

Installed:
docker-ce.x86_64 3:24.8.6-1.el7

Dependency Installed:
audit-libs-python.x86_64 0:2.8.5-4.el7
containerd.io.x86_64 0:1.6.24-3.1.el7
docker-ce-rootless-extras.x86_64 0:24.8.6-1.el7
fuse3-libs.x86_64 0:3.6.1-4.el7
policycoreutils-python.x86_64 0:2.5-34.el7
slirpnetns.x86_64 0:0.4.3-4.el7_8
checkpolicy.x86_64 0:2.5-8.el7
docker-buildx-plugin.x86_64 0:0.11.2-1.el7
docker-compose-plugin.x86_64 0:2.21.8-1.el7
python-IPy.noarch 0:0.75-6.el7
container-selinux.noarch 2:2.119.2-1.911c772.el7_8
docker-ce-cli.x86_64 1:24.8.6-1.el7
fuse-overlayfs.x86_64 0:0.7.2-6.el7_8
libsmmanage-python.x86_64 0:2.5-14.el7
setools-libs.x86_64 0:3.3.8-4.el7

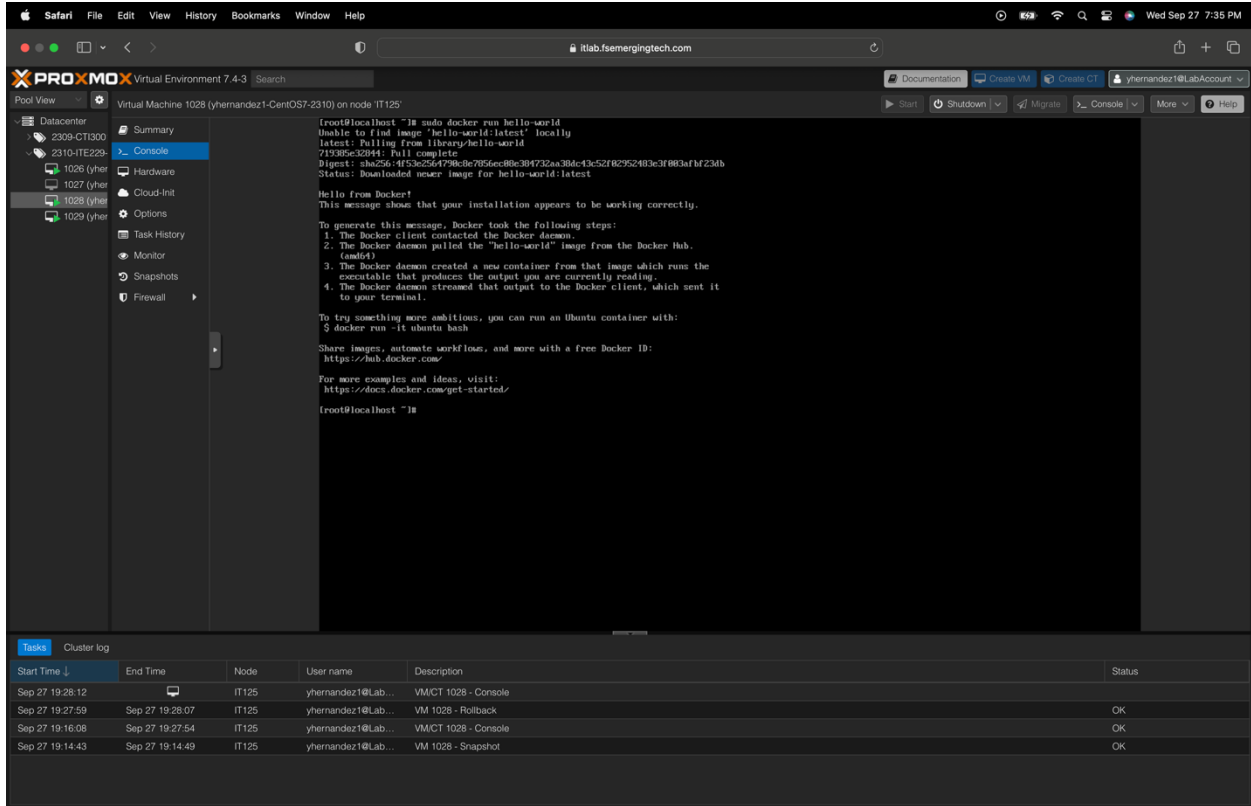
Complete!
[root@localhost ~]# sudo systemctl start docker
[root@localhost ~]# sudo systemctl enable docker
Created symlink from /etc/systemd/system/multi-user.target.wants/docker.service to /usr/lib/systemd/system/docker.service.
[root@localhost ~]# sudo docker --v
Docker version 24.8.6, build 41c223c
[root@localhost ~]# _
```

The bottom section of the interface shows a table of tasks:

Start Time	End Time	Node	User name	Description	Status
Sep 27 19:28:12		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:27:59	Sep 27 19:28:07	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 19:16:08	Sep 27 19:27:54	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 19:14:43	Sep 27 19:14:49	IT125	yhernandez1@Lab...	VM 1028 - Snapshot	OK

Type in `sudo systemctl enable docker`, and it will allow docker to use it.

Test Docker (hello-world)



The screenshot shows the Proxmox Virtual Environment (VE) interface. The main console window displays the output of the command `sudo docker run hello-world`. The output indicates that the Docker client contacted the Docker daemon, which pulled the `hello-world:latest` image from the Docker Hub. The image was successfully downloaded and a new container was created from it. The container then executed the `echo Hello from Docker!` command, which produced the output `Hello from Docker!`. Below this, the console shows the steps to generate this message and provides links for more information.

```
[root@localhost ~]# sudo docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
7f5386c2944f: pull complete
Digest: sha256:4f53e256479b8c7956cc88c384732aa38dc43c52f82952483c3f883af1f234b
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
   (amd64)
3. The Docker daemon created a new container from that image which runs the
   executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it
   to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

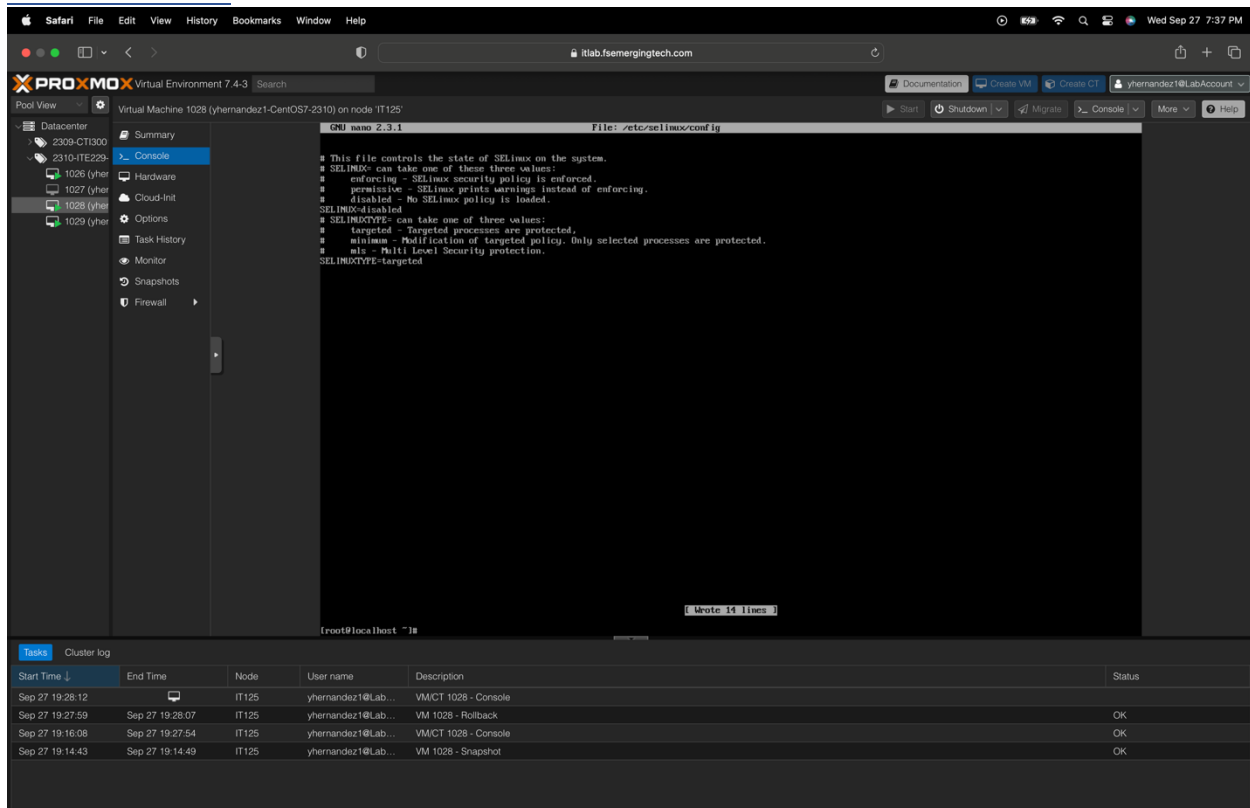
[root@localhost ~]#
```

Below the console window, the 'Tasks' tab is selected, showing a table of recent tasks:

Start Time ↓	End Time	Node	User name	Description	Status
Sep 27 19:28:12		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:27:59	Sep 27 19:28:07	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 19:16:08	Sep 27 19:27:54	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 19:14:43	Sep 27 19:14:49	IT125	yhernandez1@Lab...	VM 1028 - Snapshot	OK

Type in **sudo docker run hello-world**, which will run the command and display a hello-world message.

Disable SELinux

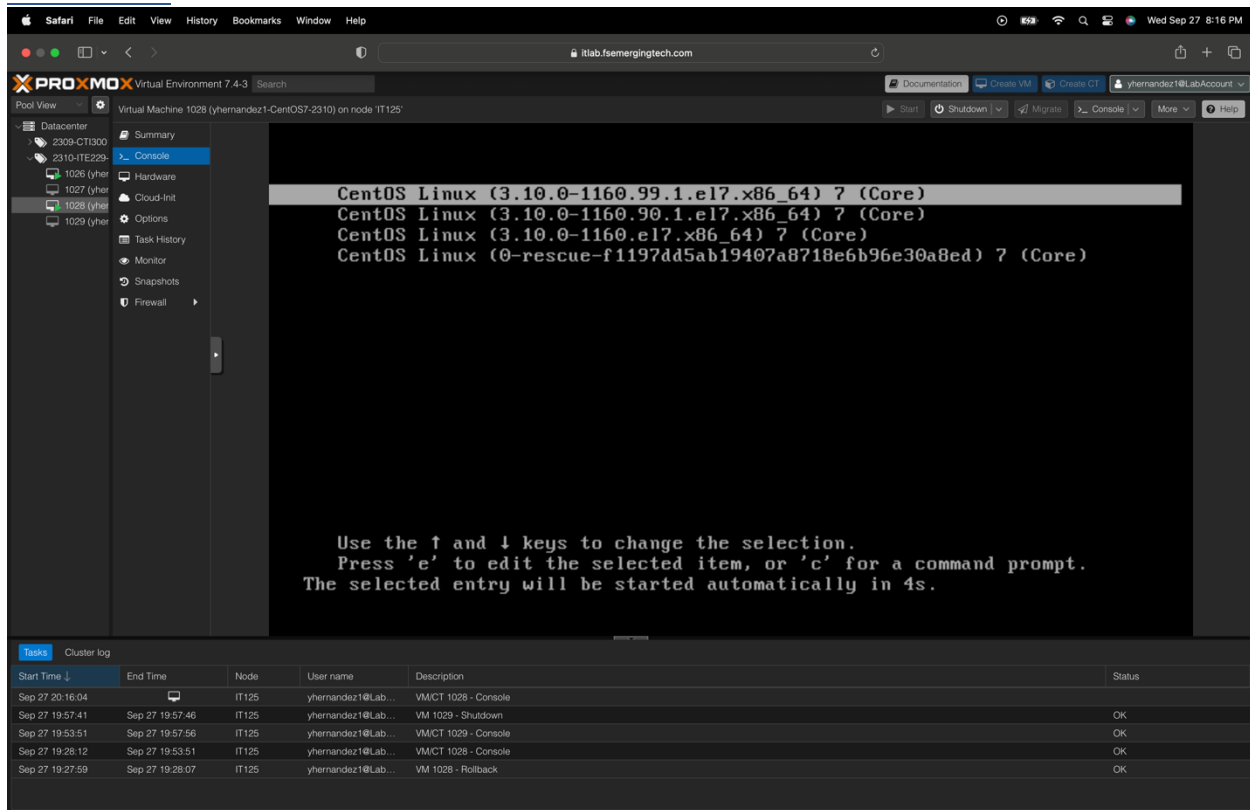


The screenshot shows the Proxmox Virtual Environment (VE) interface. On the left, a sidebar lists various components like Datacenter, Virtual Machine 1028, and its hardware. The main area displays the console of VM 1028, which is running CentOS 7. The user is in the `/etc/selinux/config` file, editing it with nano. The file content shows the current SELinux state and options. The bottom of the interface shows a 'Tasks' tab with a cluster log table.

Start Time	End Time	Node	User name	Description	Status
Sep 27 19:28:12		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:27:59	Sep 27 19:28:07	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 19:16:06	Sep 27 19:27:54	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 19:14:43	Sep 27 19:14:49	IT125	yhernandez1@Lab...	VM 1028 - Snapshot	OK

type in **`sudo nano /etc/selinux/config`**. Once in the configurations, go down to SELinux and delete enforcing to disabled, then press control x to save, press y when commanded, and enter to exit.

Reboot VM



The screenshot shows the Proxmox VE web interface. The left sidebar displays the 'Datacenter' tree with a list of VMs: 2309-CTI300, 2310-ITE220, 1026 (yher), 1027 (yher), 1028 (yher), and 1029 (yher). The 'Console' tab is selected for VM 1028. The main console window shows the boot menu for CentOS Linux. The menu options are:

- CentOS Linux (3.10.0-1160.99.1.el7.x86_64) ? (Core)
- CentOS Linux (3.10.0-1160.90.1.el7.x86_64) ? (Core)
- CentOS Linux (3.10.0-1160.el7.x86_64) ? (Core)
- CentOS Linux (0-rescue-f1197dd5ab19407a8718e6b96e30a8ed) ? (Core)

Below the menu, instructions are displayed:

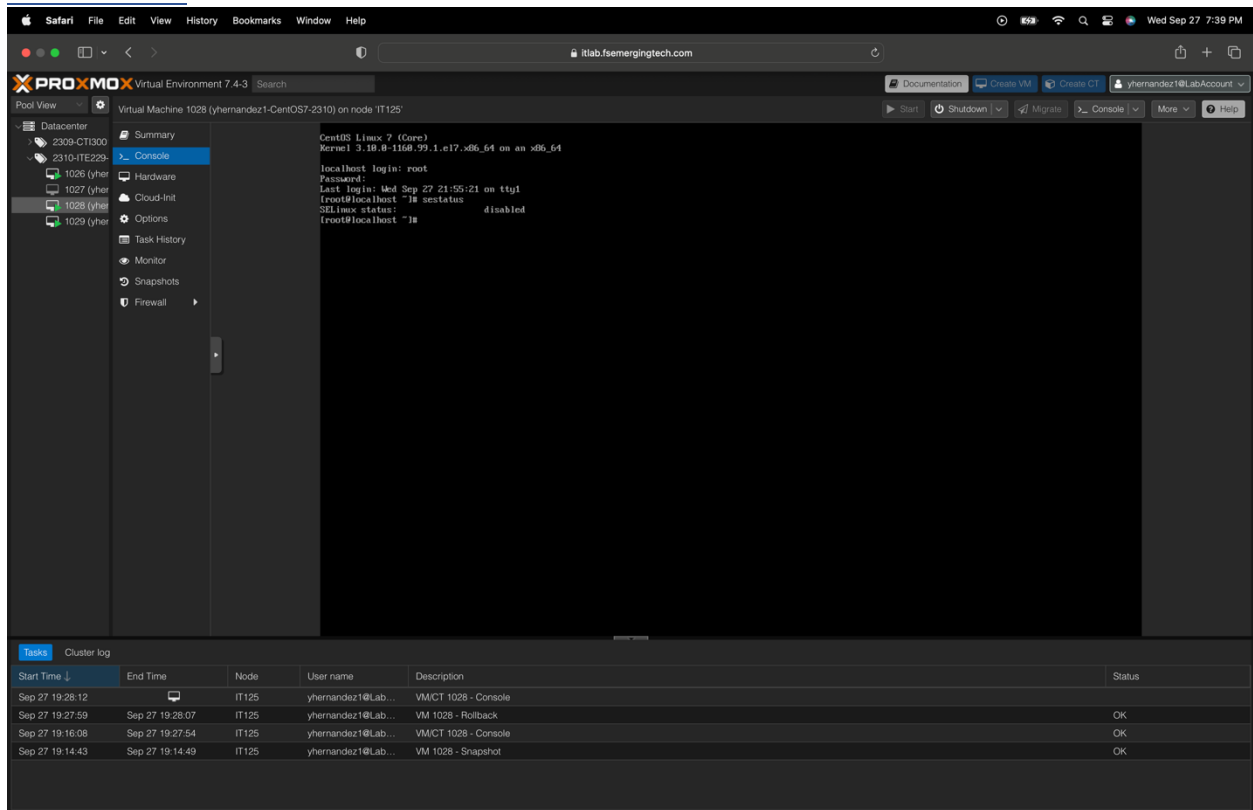
Use the ↑ and ↓ keys to change the selection.
Press 'e' to edit the selected item, or 'c' for a command prompt.
The selected entry will be started automatically in 4s.

At the bottom of the interface, the 'Tasks' tab is active, showing a table of recent operations:

Start Time ↓	End Time	Node	User name	Description	Status
Sep 27 20:16:04		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:57:41	Sep 27 19:57:46	IT125	yhernandez1@Lab...	VM 1029 - Shutdown	OK
Sep 27 19:53:51	Sep 27 19:57:56	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Sep 27 19:28:12	Sep 27 19:53:51	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 19:27:59	Sep 27 19:28:07	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK

Type in **reboot**, and it will automatically reboot the system.

Test SELinux



The screenshot displays the Proxmox Virtual Environment (VE) interface. The main window shows the console of Virtual Machine 1028 (yhernandez1-CentOS7-2310) on node IT125. The terminal output is as follows:

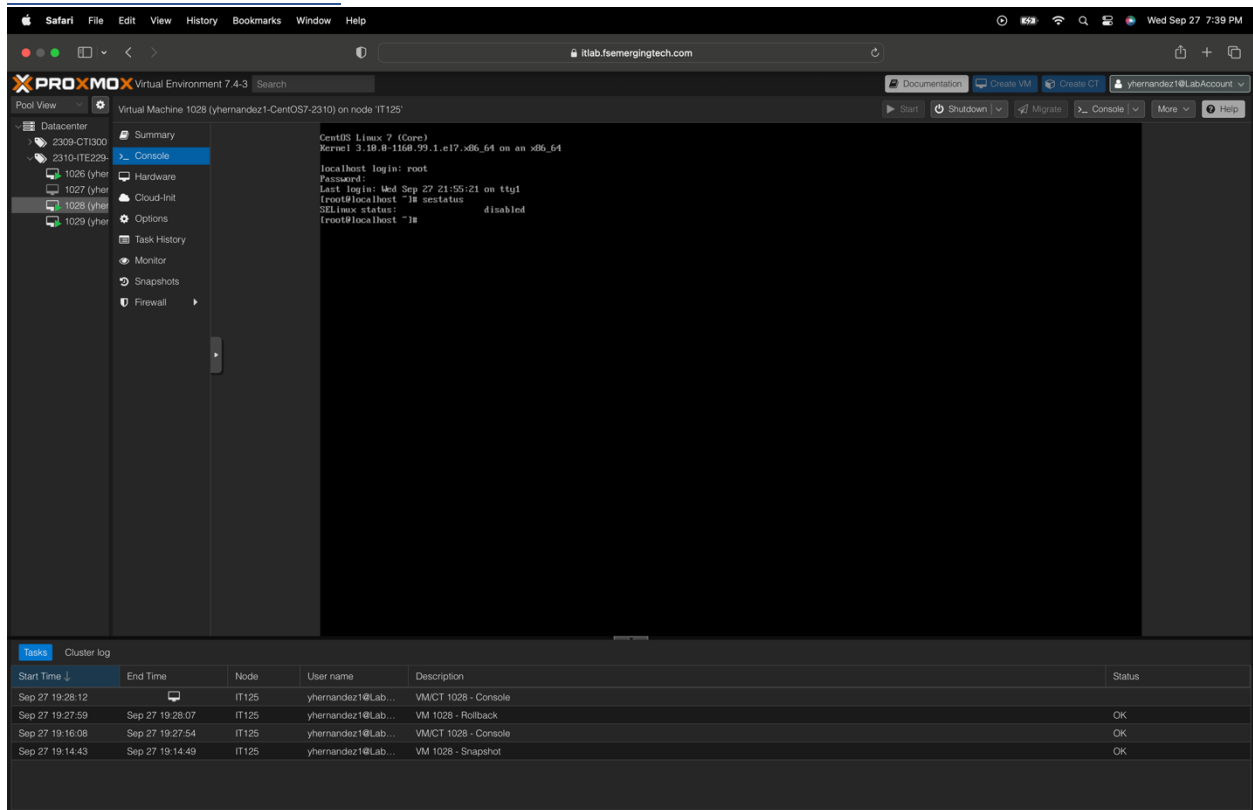
```
CentOS Linux 7 (Core)  
Kernel 3.10.0-1160.99.1.el7.x86_64 on an x86_64  
  
localhost login: root  
Password:  
Last login: Wed Sep 27 21:55:21 on tty1  
[root@localhost ~]# sestatus  
SELinux status: disabled  
[root@localhost ~]#
```

Below the terminal, the 'Tasks' tab is active, showing a table of recent operations:

Start Time	End Time	Node	User name	Description	Status
Sep 27 19:28:12		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:27:59	Sep 27 19:28:07	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 19:16:08	Sep 27 19:27:54	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 19:14:43	Sep 27 19:14:49	IT125	yhernandez1@Lab...	VM 1028 - Snapshot	OK

Type in **sestatus**, and this will test SELinux.

Confirm SELinux Status



The screenshot shows the Proxmox VE interface with the console of Virtual Machine 1028 (yhernandez1-CentOS7-2310) on node IT125. The console output shows the user logging in as root and running the `sestatus` command, which reports that SELinux is disabled.

```
CentOS Linux 7 (Core)  
Kernel 3.10.0-1160.99.1.el7.x86_64 on an x86_64  
  
localhost login: root  
Password:  
Last login: Wed Sep 27 21:55:21 on tty1  
[root@localhost ~]# sestatus  
SELinux status: disabled  
[root@localhost ~]#
```

Below the console, the 'Tasks' tab is active, displaying a table of recent tasks.

Start Time ↓	End Time	Node	User name	Description	Status
Sep 27 19:28:12		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:27:59	Sep 27 19:28:07	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 19:16:08	Sep 27 19:27:54	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 19:14:43	Sep 27 19:14:49	IT125	yhernandez1@Lab...	VM 1028 - Snapshot	OK

Type in **sestatus** to confirm SELinux Status.

Install Ghost Docker Container

The screenshot shows the Proxmox Virtual Environment (VE) interface. The main window displays the console of a virtual machine named '1028' (yhernandez1-CentOS7-2310) on node 'IT125'. The terminal output shows the following commands and results:

```
CentOS Linux 7 (Core)
Kernel 3.10.0-1160.99.1.el7.x86_64 on an x86_64

localhost login: root
Password:
Last login: Wed Sep 27 21:55:21 on tty1
[root@localhost ~]# systemctl status
SELinux status: disabled
[root@localhost ~]# docker run -d --name ghost -p 3001:2368 -e url=http://10.10.229.11:3001 ghost
Unable to find image 'ghost:latest' locally
latest: Pulling from library/ghost
74b1d4f28ac: Pull complete
74b1d4f28ac: Pull complete
24b8e0b613: Pull complete
4231a3fc793: Pull complete
4398be7493c: Pull complete
6d89b14676d: Pull complete
28324b9caaf: Pull complete
f363b70af42: Pull complete
ca147934cd9: Pull complete
Digest: sha256:745ed4f614943b794771ebf4785a26bb39643cb3f94a73ba8b59a1223066822
Status: Downloaded newer image for ghost:latest
c30afe19332e167eebe79ac780132a130e5c28fca0c4a218ebb2044e5def6a
[root@localhost ~]#
```

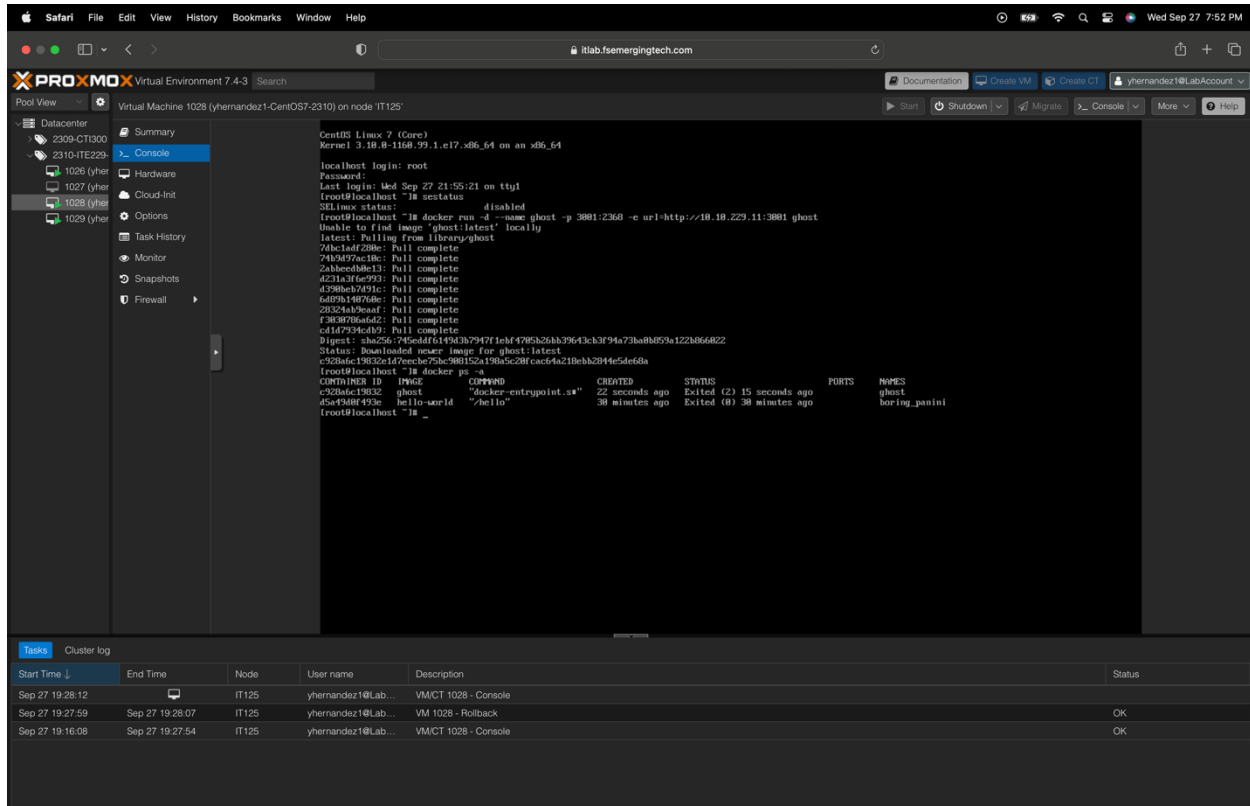
Below the console, the 'Tasks' tab is selected, showing a list of tasks performed on the cluster:

Start Time	End Time	Node	User name	Description	Status
Sep 27 19:28:12		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:27:59	Sep 27 19:28:07	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 19:16:08	Sep 27 19:27:54	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 27 19:14:43	Sep 27 19:14:49	IT125	yhernandez1@Lab...	VM 1028 - Snapshot	OK

To install Ghost, type **docker run -d --name ghost -p 3001:2368 -e url=http://10.10.229.11:3001 ghost**. This will establish a ghost docker container.

Test Ghost

Ghost Container ID



The screenshot shows a Proxmox VE interface with a terminal window open. The terminal displays the following commands and output:

```
CentOS Linux 7 (Core)
Kernel 3.10.0-1160.99.1.el7.x86_64 on an x86_64

localhost login: root
Password:
Last login: Wed Sep 27 21:55:21 on ttty1
[root@localhost ~]# sestatus
SELinux status: disabled
[root@localhost ~]# docker run -d --name ghost -p 3801:2360 -e url=http://10.10.229.11:3801 ghost
Unable to find image 'ghost:latest' locally
latest: Pulling from library/ghost
7d8c1adf288e: Pull complete
7d93d7ac18c: Pull complete
2abbce0b8e13: Pull complete
4231a3f5c993: Pull complete
4789eb2d91c: Pull complete
6d89b14876de: Pull complete
2832a4b3caaf: Pull complete
f363070e6fd2: Pull complete
c41d793dc4b9: Pull complete
Digest: sha256:746ddff61943b7947f1e4f4795326bb79643cb3f94a73ba8d59a123066822
Status: Downloaded newer image for ghost:latest
c90baf6c19032e147eeb675bc980152a19ba5c28fcac64a21bebb2944e5def6a
[root@localhost ~]# docker ps -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
c90baf6c19032	ghost	"docker-entrypoint.sh"	22 seconds ago	Exited (2) 15 seconds ago		ghost
45c6488e453e	hello-world	"hello"	30 minutes ago	Exited (0) 30 minutes ago		boring_panini
[root@localhost ~]#						

Below the terminal, the 'Tasks' tab is visible, showing a list of recent tasks:

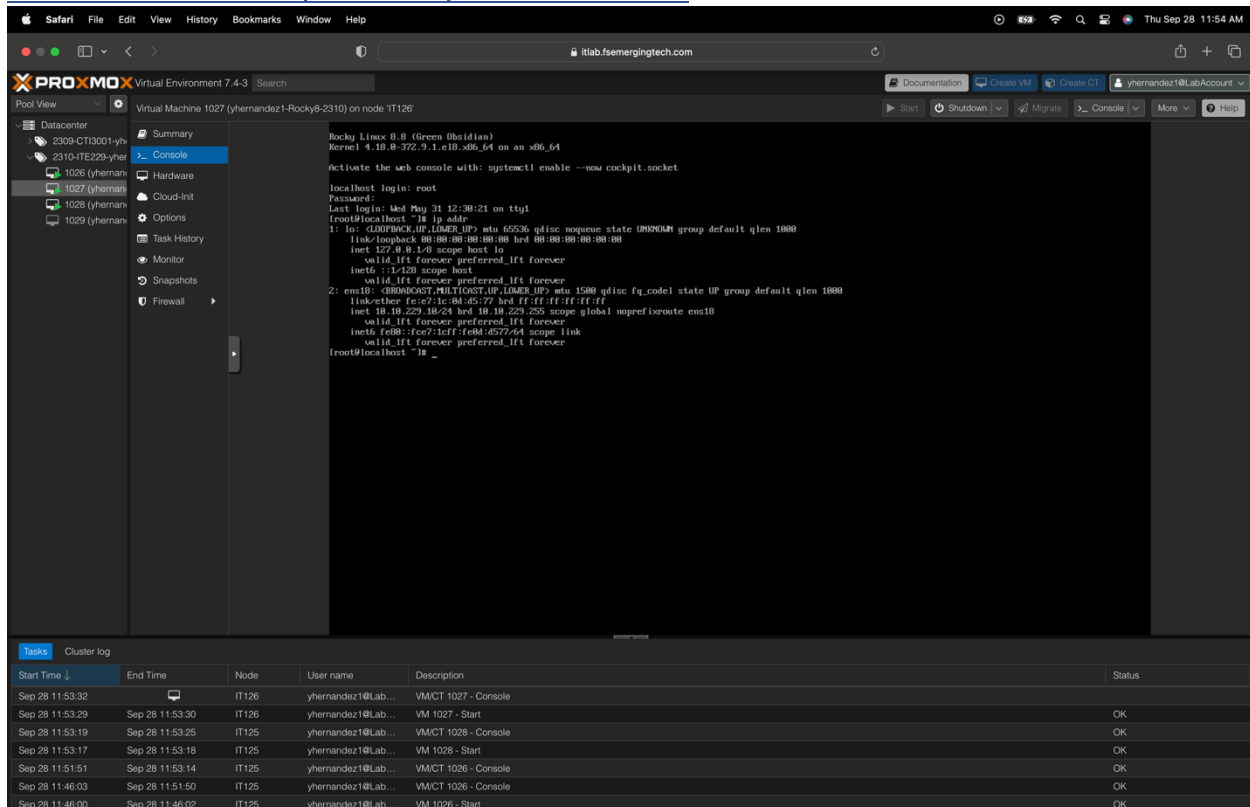
Start Time	End Time	Node	User name	Description	Status
Sep 27 19:28:12		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 27 19:27:59	Sep 27 19:28:07	IT125	yhernandez1@Lab...	VM 1028 - Rollback	OK
Sep 27 19:16:08	Sep 27 19:27:54	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK

To test ghost container type in **docker ps -a**, this will display the containers created and give you the container ID.

IMPORTANT: To earn full credit, ALL screenshots must include a “full view”, including your ProxMox title bar with your username showing.

NginX Reverse Proxy

Show screenshot of your Rocky 8 Console in VE



The screenshot displays the Proxmox Virtual Environment (VE) interface. The left sidebar shows the 'Datacenter' view with a list of virtual machines (VMs) including '2309-CT13001-yh...', '2310-ITE229-yh...', '1026 (yherman)', '1027 (yherman)', '1028 (yherman)', and '1029 (yherman)'. The 'Console' tab is selected for VM 1027. The main window shows the Rocky Linux 8.8 (Green Obsidian) console output, which includes the following text:

```
Rocky Linux 8.8 (Green Obsidian)
Kernel 4.18.0-372.3.1.el8.x86_64 on an x86_64

Activate the web console with: systemctl enable --now cockpit.socket

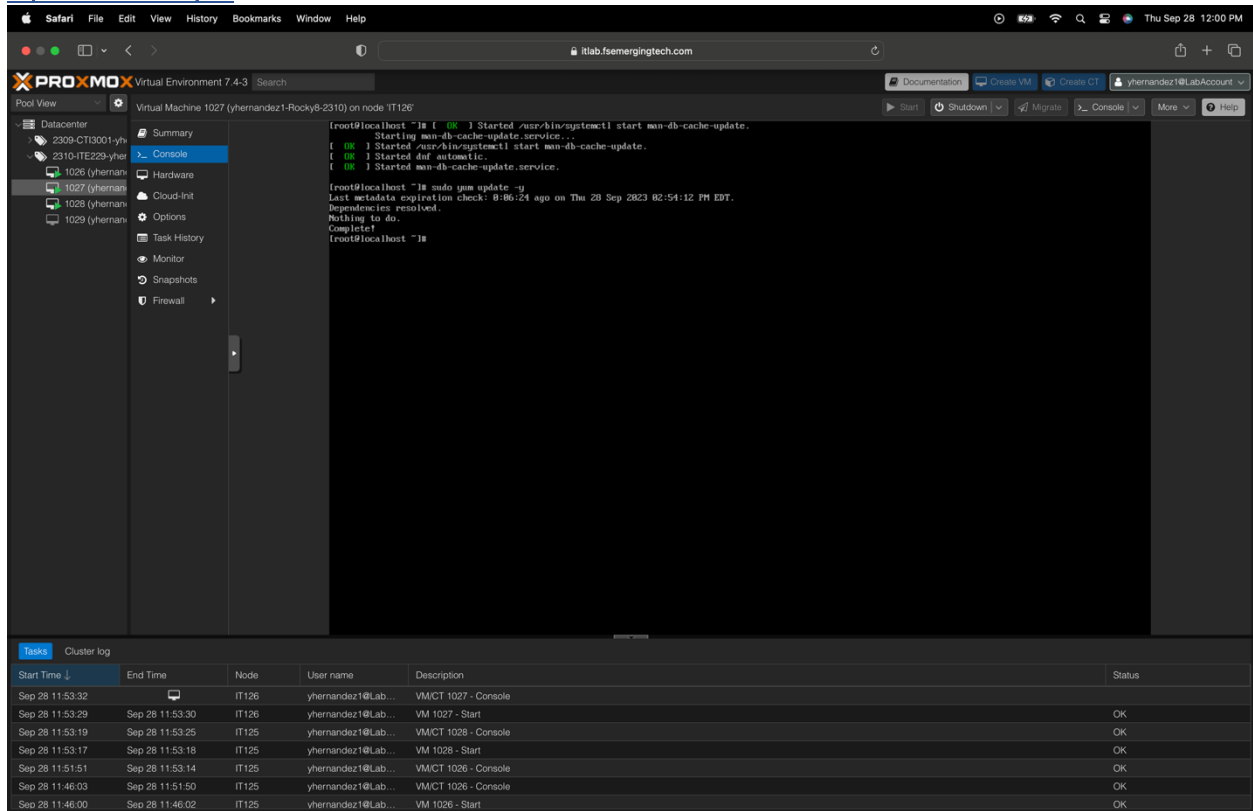
localhost login: root
Password:
Last login: Wed May 31 12:38:21 on ttpt1
[root@localhost ~]# ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default qlen 1000
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP group default qlen 1000
    link/ether fe:c7:1c:84:d5:77 brd ff:ff:ff:ff:ff:ff
    inet 10.18.229.18/24 brd 10.18.229.255 scope global noprefixroute ens18
        valid_lft forever preferred_lft forever
    inet6 fe80::fc7:1c:ff:fe84:d577:64 scope link
        valid_lft forever preferred_lft forever
[root@localhost ~]#
```

Below the console output, the 'Tasks' tab is visible, showing a table of cluster log entries:

Start Time	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yhermandez1@Lab...	VMCT-1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yhermandez1@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yhermandez1@Lab...	VMCT-1028 - Console	OK
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yhermandez1@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yhermandez1@Lab...	VMCT-1026 - Console	OK
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yhermandez1@Lab...	VMCT-1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yhermandez1@Lab...	VM 1026 - Start	OK

To access Rocky 8 Console, go to your proxmox environment, and on the left side of the screen, click on the firewall machine and start it up. Once completely loaded, click the Rocky 8 and start it up. Then, log in with credentials and verify the IP address on the command line—type in the **IP addr**.

Update Rocky 8



The screenshot shows the Proxmox VE interface. The main window displays a terminal for VM 1027 (yhernandez1-Rocky8-2310) on node IT126. The terminal output shows the execution of the command `sudo yum update -y`, which updates the system. The output includes the following lines:

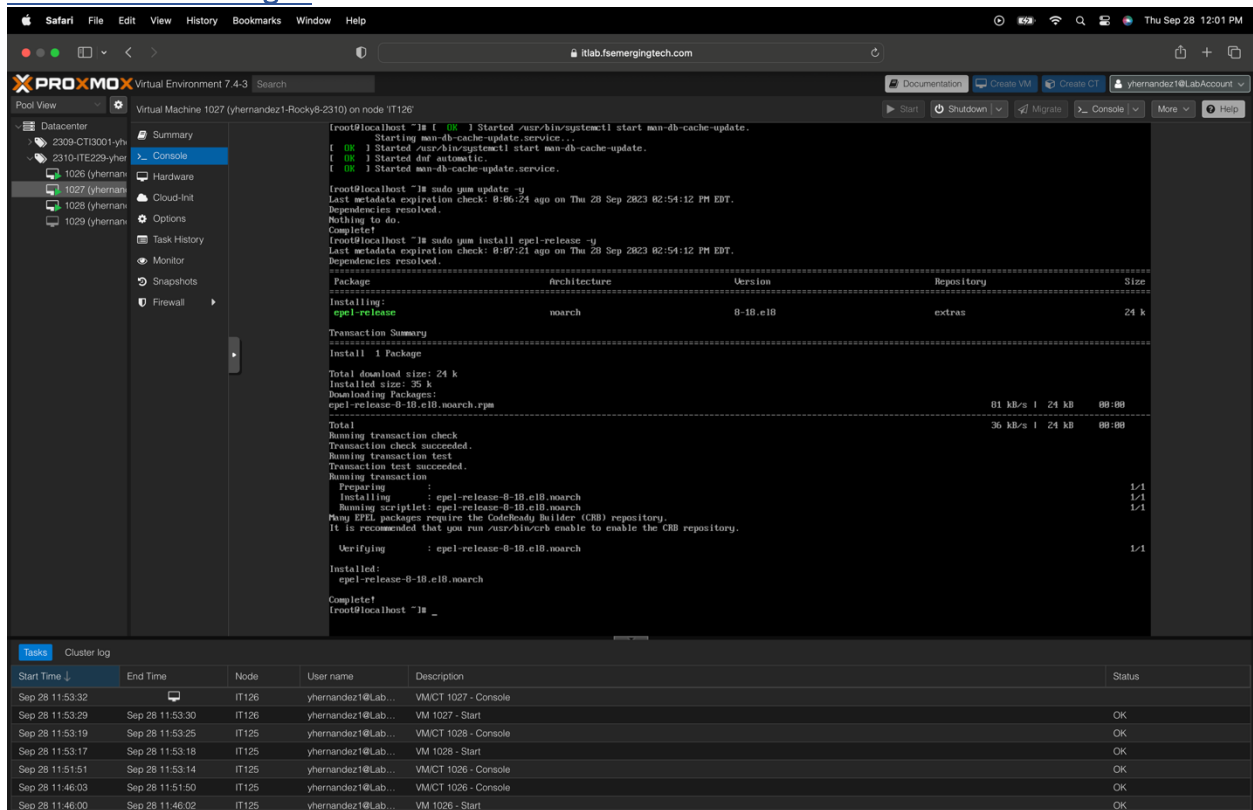
```
(root@localhost ~)# [ OK ] Started /usr/bin/systemctl start man-db-cache-update.  
Starting man-db-cache-update.service...  
[ OK ] Started /usr/bin/systemctl start man-db-cache-update.  
[ OK ] Started dnf-automatic.  
[ OK ] Started man-db-cache-update.service.  
  
(root@localhost ~)# sudo yum update -y  
Last metadata expiration check: 8:06:24 ago on Thu 28 Sep 2023 02:54:12 PM EDT.  
Dependencies resolved.  
Nothing to do.  
Complete!  
(root@localhost ~)#
```

The bottom section of the interface shows a 'Tasks' table with the following data:

Start Time ↓	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yhernandez1@Lab...	VMCT-1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yhernandez1@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yhernandez1@Lab...	VMCT-1028 - Console	OK
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yhernandez1@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yhernandez1@Lab...	VMCT-1026 - Console	OK
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yhernandez1@Lab...	VMCT-1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yhernandez1@Lab...	VM 1026 - Start	OK

To update Rocky 8, type on the command line **sudo yum update -y**, which will update the machine to the latest updates.

Install EPEL Packages



The screenshot shows a Proxmox Virtual Environment (VE) interface. The main window displays the console output of a virtual machine (VM) named '1027 (yherman...)'. The output shows the following commands and their results:

```
(root@localhost ~) # systemctl start man-db-cache-update.
Starting man-db-cache-update.service:
[ OK ] Started /usr/bin/systemctl start man-db-cache-update.
[ OK ] Started dnf-automatic.
[ OK ] Started man-db-cache-update.service.

(root@localhost ~) # sudo yum update -y
Last metadata expiration check: 8:06:24 ago on Thu 28 Sep 2023 02:54:12 PM EDT.
Dependencies resolved.
Nothing to do.
Complete!

(root@localhost ~) # sudo yum install epel-release -y
Last metadata expiration check: 8:07:21 ago on Thu 28 Sep 2023 02:54:12 PM EDT.
Dependencies resolved.

Package Architecture Version Repository Size
-----
Installing: epel-release noarch 8-18.el8 extras 24 k

Transaction Summary
-----
Install 1 Package

Total download size: 24 k
Installed size: 35 k
Downloading Packages:
epel-release-8-18.el8.noarch.rpm 01 kB/s | 24 kB 00:00
-----
Total 36 kB/s | 24 kB 00:00

Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
Preparing : epel-release-8-18.el8.noarch 1/1
Installing : epel-release-8-18.el8.noarch 1/1
Running scriptlet: epel-release-8-18.el8.noarch 1/1
Many EPEL packages require the CodeReady Builder (CRB) repository.
It is recommended that you run /usr/bin/crb enable to enable the CRB repository.
Verifying : epel-release-8-18.el8.noarch 1/1

Installed:
epel-release-8-18.el8.noarch

Complete!
(root@localhost ~) # _
```

Below the console output, there is a 'Tasks' section with a table showing the cluster log:

Start Time ↓	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yherman21@Lab...	VMCT 1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yherman21@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yherman21@Lab...	VMCT 1028 - Console	OK
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yherman21@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yherman21@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yherman21@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yherman21@Lab...	VM 1026 - Start	OK

To install EPEL packages, type on the command line **sudo yum install epel-release -y**. This will install the packages for EPEL.

Install Nano Editor

The screenshot shows a Proxmox VE virtual machine console for VM 1027. The terminal output shows the execution of `sudo yum update -y` and `sudo yum install epel-release -y`. The `epel-release` package is being installed from the `extras` repository. The output also shows the installation of `nano` and a warning about the CodeReady Builder (CRB) repository.

```
[root@localhost ~]# sudo yum update -y
Last metadata expiration check: 8:06:24 ago on Thu 28 Sep 2023 02:54:12 PM EDT.
Dependencies resolved.
Nothing to do.
Complete!

[root@localhost ~]# sudo yum install epel-release -y
Last metadata expiration check: 8:07:21 ago on Thu 28 Sep 2023 02:54:12 PM EDT.
Dependencies resolved.

Package                Architecture      Version           Repository        Size
Installing:
epel-release            noarch            8-18.el8          extras            24 k

Transaction Summary
-----
Install 1 Package

Total download size: 24 k
Installed size: 25 k
Downloading Packages:
epel-release-8-18.el8.noarch.rpm                                01 MB/s | 24 kB | 00:00
-----
Total
Running transaction check
Transaction check succeeded.
Running transaction test
Transaction test succeeded.
Running transaction
  Preparing                : epel-release-8-18.el8.noarch                                1/1
  Installing               : epel-release-8-18.el8.noarch                                1/1
  Running scriptlet        : epel-release-8-18.el8.noarch                                1/1
Many EPEL packages require the CodeReady Builder (CRB) repository.
It is recommended that you run /usr/bin/crb enable to enable the CRB repository.
  Verifying                : epel-release-8-18.el8.noarch                                1/1

Installed:
epel-release-8-18.el8.noarch

Complete!

[root@localhost ~]# sudo yum install nano
Extra Packages for Enterprise Linux 8 - x86_64
Last metadata expiration check: 8:08:06 ago on Thu 28 Sep 2023 03:01:52 PM EDT.
Package nano-2.9.0-1.el8.x86_64 is already installed.
Dependencies resolved.
Nothing to do.
Complete!

[root@localhost ~]#
```

Start Time	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yhernandez1@Lab...	VMCT 1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yhernandez1@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yhernandez1@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yhernandez1@Lab...	VMCT 1026 - Console	
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yhernandez1@Lab...	VM 1026 - Start	OK

To install nano, type on the command line **sudo yum install nano**; this will install nano to the machine.

Disable SELinux

The screenshot shows the Proxmox Virtual Environment (VE) interface. The top panel displays the 'Virtual Machine 1027 (yhermandez1-Rocky8-2310) on node IT126'. The left sidebar shows the 'Datacenter' view with a tree of VMs. The main console area shows the output of the 'cat /etc/selinux/config' command, which displays the current SELinux configuration. The configuration shows 'SELINUX=enforcing' and 'SELINUXTYPE=targeted'. The bottom panel shows a 'Tasks' table with a cluster log.

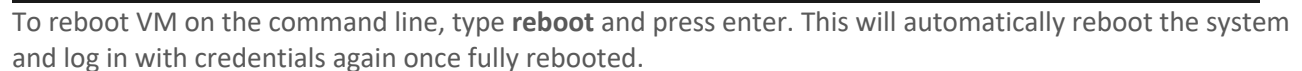
SELinux Configuration Output:

```
# This file controls the state of SELinux on the system.
# SELINUX can take one of these three values:
# enforcing - SELinux security policy is enforced.
# permissive - SELinux prints warnings instead of enforcing.
# disabled - No SELinux policy is loaded.
SELINUX=enforcing
# SELINUXTYPE can take one of these three values:
# targeted - Targeted processes are protected.
# minimum - Modification of targeted policy. Only selected processes are protected.
# mls - Multi Level Security protection.
SELINUXTYPE=targeted
```

Tasks Table:

Start Time	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yhermandez1@Lab...	VMCT 1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yhermandez1@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yhermandez1@Lab...	VMCT 1028 - Console	OK
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yhermandez1@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yhermandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yhermandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yhermandez1@Lab...	VM 1026 - Start	OK

Reboot VM



Test SELinux

Rocky Linux 8.8 (Green Obsidian)
Kernel 4.18.0-477.18.1.el8_8.x86_64 on an x86_64

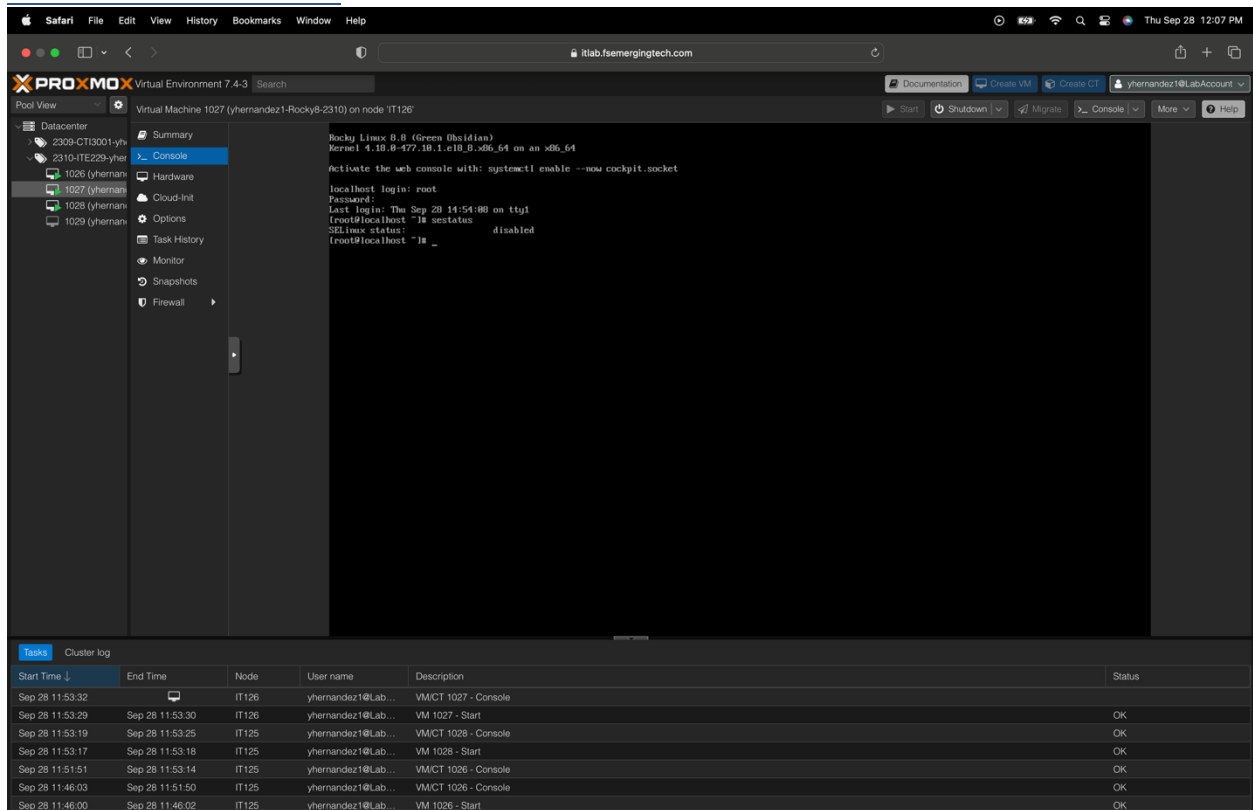
Activate the web console with: `systemctl enable --now cockpit.socket`

localhost login: root
Password:
Last login: Thu Sep 28 14:54:08 on ttty1
root@localhost ~# sestatus
SELinux status: disabled
root@localhost ~#

Start Time ↓	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yhernandez1@Lab...	VMCT 1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yhernandez1@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yhernandez1@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yhernandez1@Lab...	VM 1026 - Start	OK

To test SELinux type on the command line **sestatus**.

Confirm SELinux Status



The screenshot shows the Proxmox VE web interface. The left sidebar displays a tree view of the datacenter with nodes 1026, 1027, 1028, and 1029. The main panel shows the console of Virtual Machine 1027 (yhermandez1-Rocky8-2310) on node IT126. The console output shows the Rocky Linux 8.8 (Green Obsidian) boot process, including the login prompt and the command `sestatus` being executed, which returns `disabled`.

```
Rocky Linux 8.8 (Green Obsidian)
Kernel 4.18.0-477.18.1.el8_8.x86_64 on an x86_64

Activate the web console with: systemctl enable --now cockpit.socket

localhost login: root
Password:
Last login: Thu Sep 28 14:54:08 on ttty1
root@localhost ~# sestatus
SELinux status: disabled
root@localhost ~# _
```

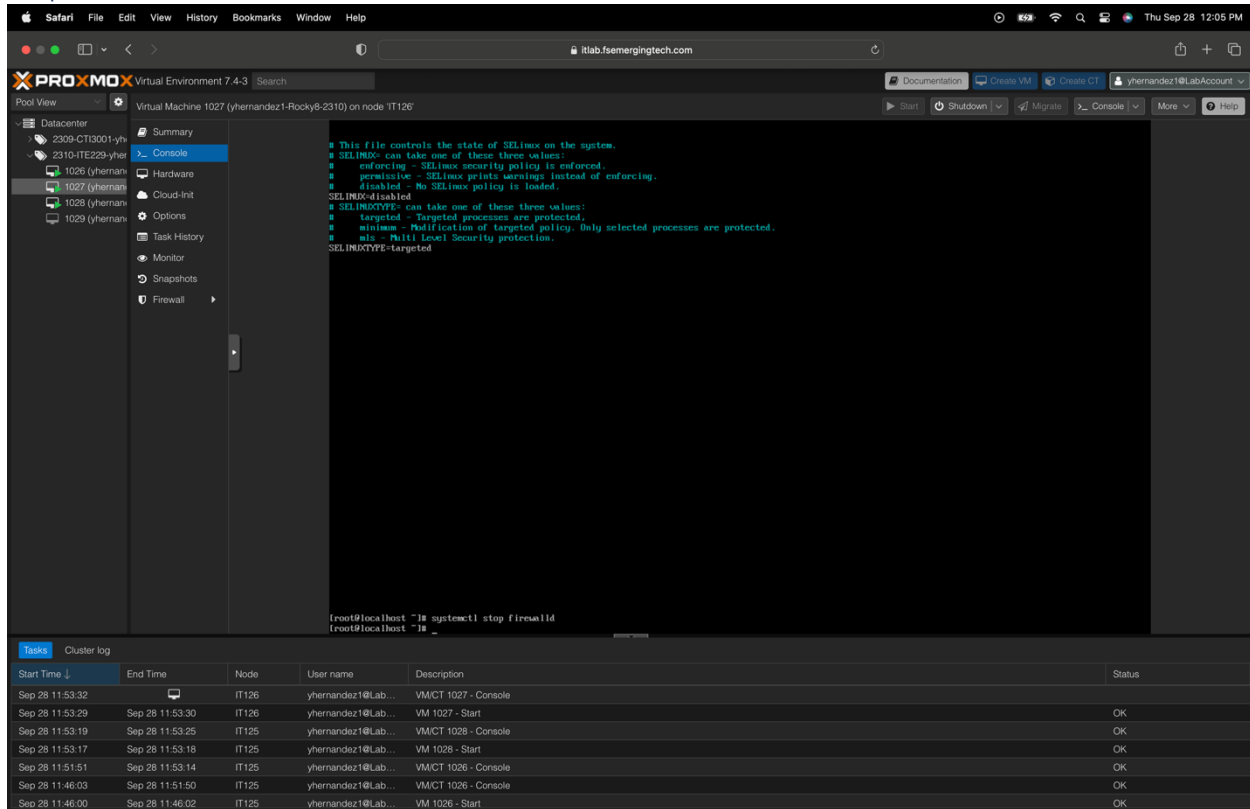
Below the console output, the 'Tasks' tab is selected, showing a table of cluster log entries.

Start Time ↓	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yhermandez1@Lab...	VMCT 1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yhermandez1@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yhermandez1@Lab...	VMCT 1028 - Console	OK
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yhermandez1@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yhermandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yhermandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yhermandez1@Lab...	VM 1026 - Start	OK

To confirm SELinux status on the command line, type **sestatus**.

Rocky Firewall

Stop Firewall



The screenshot shows the Proxmox VE interface with the console of Virtual Machine 1027 (yhernandez1-Rocky6-2310) on node IT126. The console output shows SELinux status information and the command `systemctl stop firewalld` has been executed.

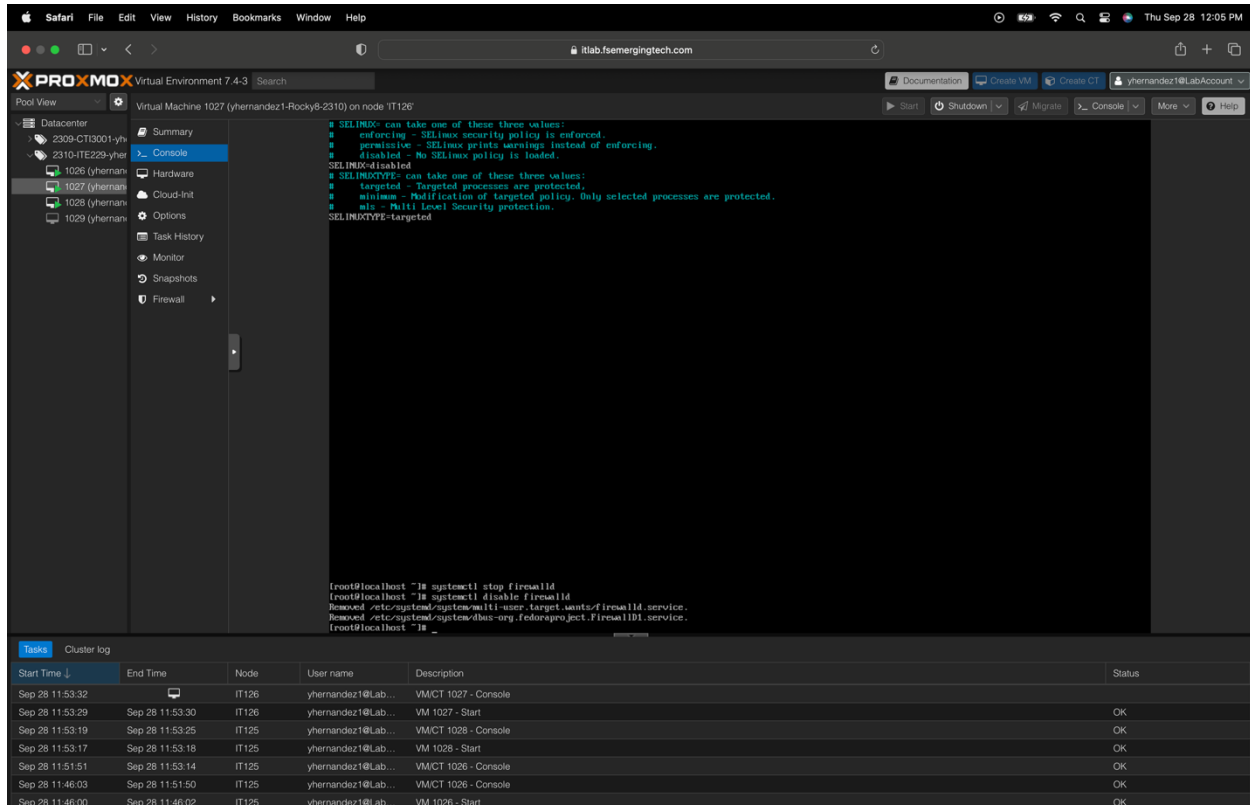
```
root@localhost ~# systemctl stop firewalld
root@localhost ~#
```

The console output also includes the following SELinux status information:

```
SELinux: Disabled
SELinux can take one of these three values:
# enforcing - SELinux security policy is enforced.
# permissive - SELinux prints warnings instead of enforcing.
# disabled - No SELinux policy is loaded.
SELinux is disabled
SELinux can take one of these three values:
# targeted - Targeted processes are protected.
# minimum - Modification of targeted policy. Only selected processes are protected.
# mls - Multi Level Security protection.
SELinux is disabled
```

To stop the Firewall on Rocky on the command line, type **systemctl stop firewalld**, then press enter.

Disable Firewall



The screenshot shows the Proxmox VE interface with a terminal window open for VM 1027. The terminal displays the SELinux status and the commands used to disable the firewall.

```
SELinux can take one of these three values:  
# enforcing - SELinux security policy is enforced.  
# permissive - SELinux prints warnings instead of enforcing.  
# disabled - No SELinux policy is loaded.  
SELinux:disabled  
SELinux can take one of these three values:  
# targeted - Targeted processes are protected.  
# minimum - Modification of targeted policy. Only selected processes are protected.  
# mls - Multi Level Security protection.  
SELinux:targeted  
  
root@localhost ~# systemctl stop firewalld  
root@localhost ~# systemctl disable firewalld  
Removed /etc/systemd/system/multi-user.target.wants/firewalld.service.  
Removed /etc/systemd/system/dbus-org.fedoraproject.FirewallD1.service.  
root@localhost ~# _
```

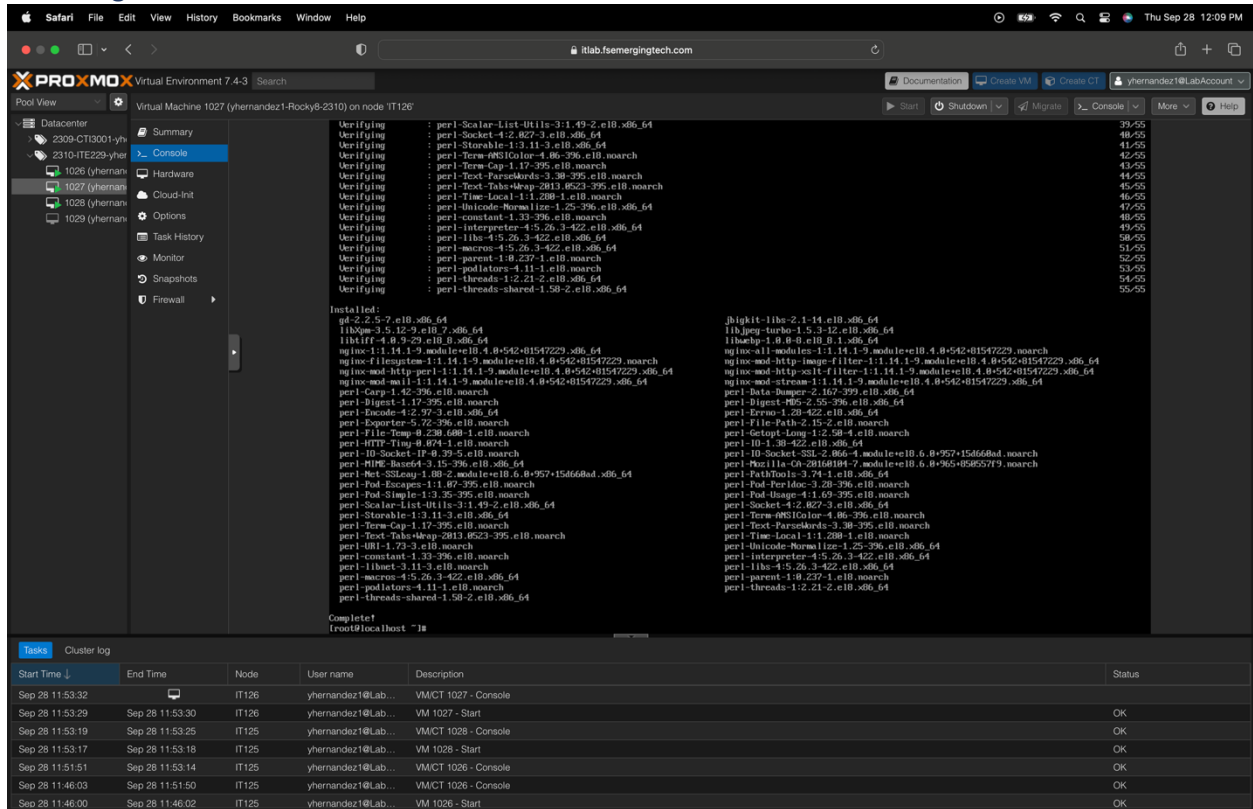
Below the terminal window, a table shows the cluster log entries:

Start Time ↓	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yhernandez1@Lab...	VMCT 1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yhernandez1@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yhernandez1@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yhernandez1@Lab...	VM 1026 - Start	OK

To disable the Firewall on the command line, type **systemctl disable firewalld**.

NginX

Install NginX



The screenshot shows the Proxmox VE interface with a virtual machine named '1027 (yherman)' selected. The console output displays the installation of NginX and its dependencies. The output is as follows:

```
Verifying : perl-Scalar-List-Utils-3.1.49-2.el8.x86_64
Verifying : perl-Socket-4.12.027-3.el8.x86_64
Verifying : perl-Storable-1.1.11-3.el8.x86_64
Verifying : perl-Term-ANSIColor-4.06-396.el8.noarch
Verifying : perl-Term-Cap-1.17-395.el8.noarch
Verifying : perl-Text-ParseWords-3.30-395.el8.noarch
Verifying : perl-Text-Tabs4Heap-2013.0523-395.el8.noarch
Verifying : perl-Time-Local-1.1.200-1.el8.noarch
Verifying : perl-Unicode-Normalize-1.25-396.el8.x86_64
Verifying : perl-constant-1.33-396.el8.noarch
Verifying : perl-Interpreter-4.15.26-3-422.el8.x86_64
Verifying : perl-libs-4.15.26-3-422.el8.x86_64
Verifying : perl-macros-4.15.26-3-422.el8.x86_64
Verifying : perl-parent-1.0.237-1.el8.noarch
Verifying : perl-podlators-4.11-1.el8.noarch
Verifying : perl-threads-1.2.21-2.el8.x86_64
Verifying : perl-threads-shared-1.50-2.el8.x86_64

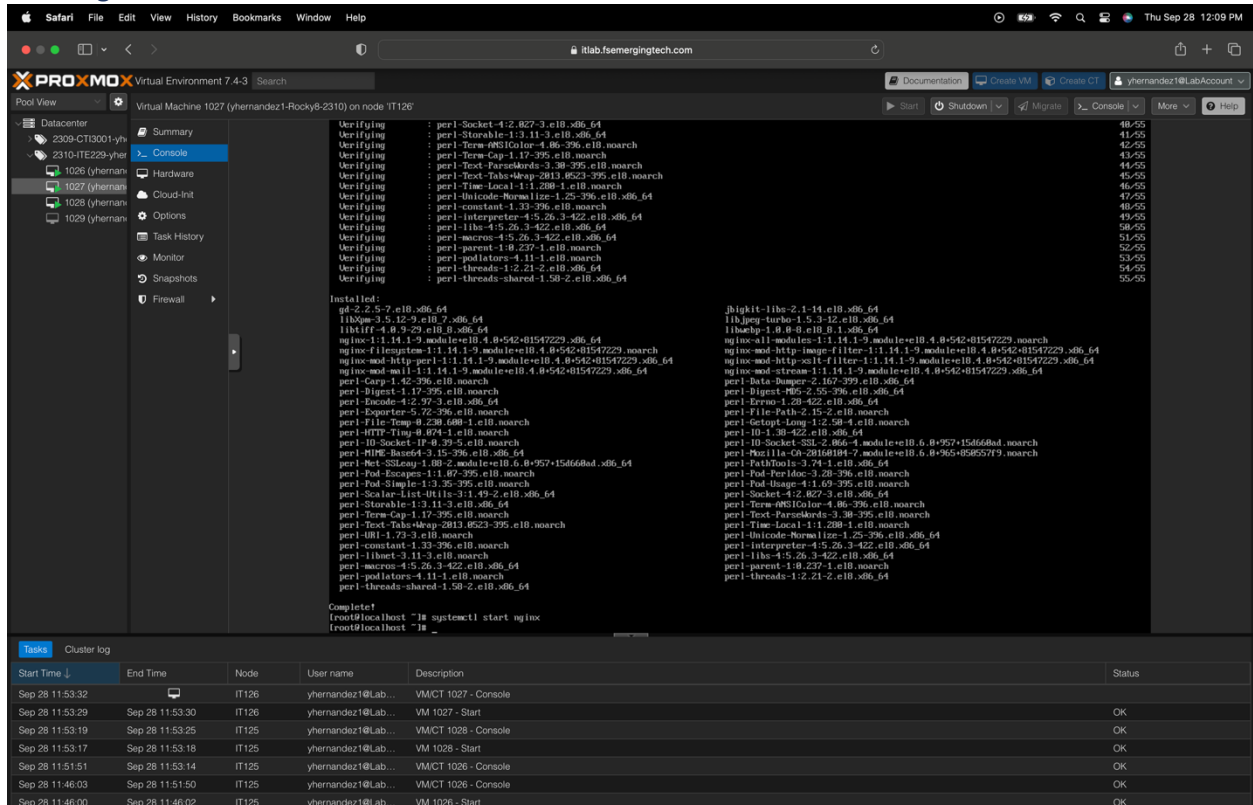
Installing :
at-2.2.5-7.el8.x86_64
libbpm-3.5.12-9.el8.7.x86_64
libbpf-1.4.0-9-29.el8.0.x86_64
nginx-1.1.14.1-9.module@el8.4.0-542-01547229.x86_64
nginx-filesystem-1.1.14.1-9.module@el8.4.0-542-01547229.noarch
nginx-mod-http-perl-1.1.14.1-9.module@el8.4.0-542-01547229.x86_64
nginx-mod-mail-1.1.14.1-9.module@el8.4.0-542-01547229.x86_64
perl-Carp-1.42-396.el8.noarch
perl-Digest-1.17-395.el8.noarch
perl-Exporter-5.72-396.el8.noarch
perl-File-Temp-0.238.600-1.el8.noarch
perl-HTTP-Tiny-0.074-1.el8.noarch
perl-IO-Socket-IP-0.39-5.el8.noarch
perl-IO-String-3.15-396.el8.x86_64
perl-Met-SSLay-1.00-2.module@el8.6.0-957-154660ad.x86_64
perl-Pod-Excerpt-1.11-07-395.el8.noarch
perl-Pod-Simple-1.13.35-395.el8.noarch
perl-Scalar-List-Utils-3.1.49-2.el8.x86_64
perl-Storable-1.1.11-3.el8.x86_64
perl-Term-Cap-1.17-395.el8.noarch
perl-Text-Tabs4Heap-2013.0523-395.el8.noarch
perl-URI-1.72-3.el8.noarch
perl-libnet-3.11-3.el8.noarch
perl-macros-4.15.26-3-422.el8.x86_64
perl-podlators-4.11-1.el8.noarch
perl-threads-1.2.21-2.el8.x86_64
perl-threads-shared-1.50-2.el8.x86_64
perl-IO-Socket-SSL-2.066-1.module@el8.6.0-957-154660ad.noarch
perl-Mail-OS-0.0100044-7.module@el8.6.0-952-09855719.noarch
perl-PathTools-3.74-1.el8.x86_64
perl-Pod-Perldoc-3.20-396.el8.noarch
perl-Pod-Usage-4.11.69-395.el8.noarch
perl-Socket-4.12.027-3.el8.x86_64
perl-Term-ANSIColor-4.06-396.el8.noarch
perl-Text-ParseWords-3.30-395.el8.noarch
perl-Time-Local-1.1.200-1.el8.noarch
perl-Unicode-Normalize-1.25-396.el8.x86_64
perl-libs-4.15.26-3-422.el8.x86_64
perl-parent-1.0.237-1.el8.noarch
perl-threads-1.2.21-2.el8.x86_64

Complete!
[root@localhost ~]#
```

Start Time	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yherman21@Lab...	VMCT 1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yherman21@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yherman21@Lab...	VMCT 1028 - Console	OK
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yherman21@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yherman21@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yherman21@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yherman21@Lab...	VM 1026 - Start	OK

To install NginX, type **sudo yum install nginx -y** on the command line, which will automatically install NginX on your machine.

Start NginX



The screenshot displays the Proxmox VE interface for a virtual machine named '1027 (yherman)'. The console output shows the following installed modules:

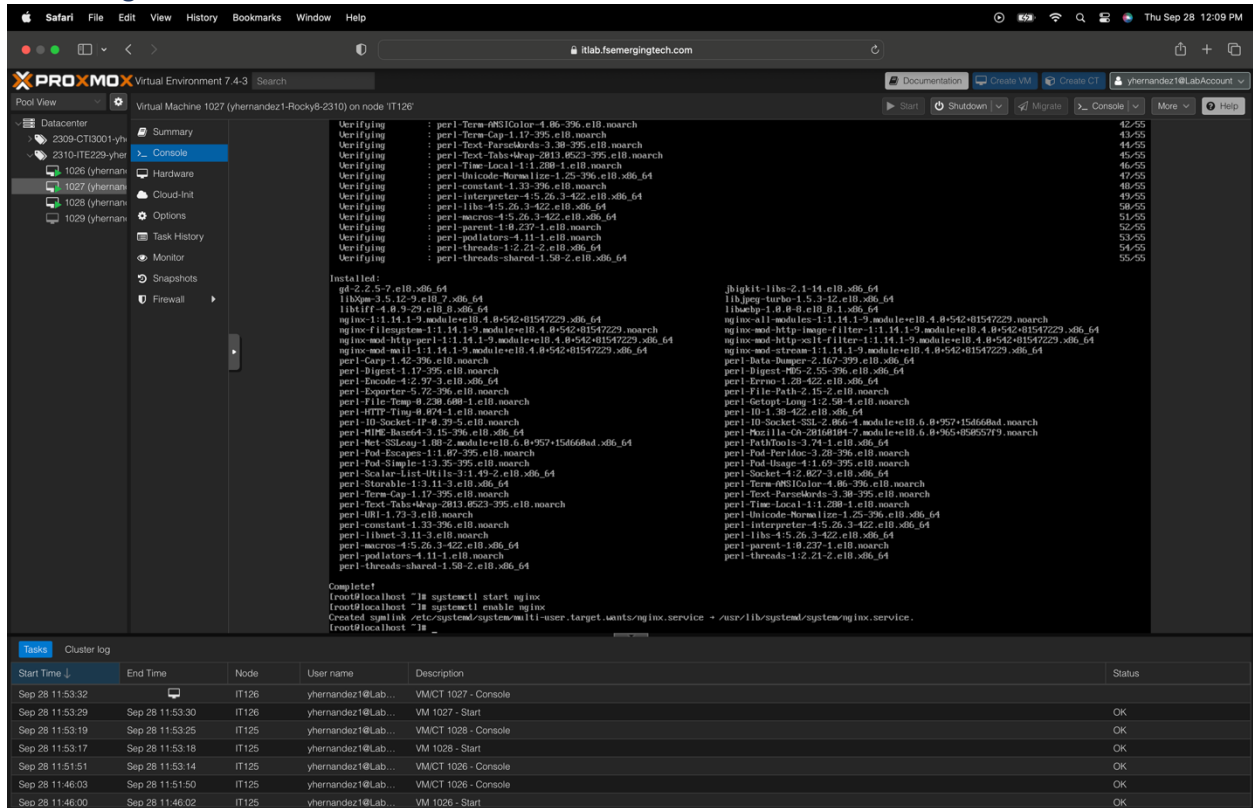
```
Installed:
perl-2.2.5-7.el8.x86_64
libjpeg-turbo-1.5.3-12.el8.x86_64
libltdl-4.0.3-29.el8.x86_64
nginx-1:1.14.1-9.module.el8.4.0-542-01547229.x86_64
nginx-mod-http-image-filter-1:1.14.1-9.module.el8.4.0-542-01547229.x86_64
nginx-mod-http-xslt-filter-1:1.14.1-9.module.el8.4.0-542-01547229.x86_64
nginx-mod-stream-1:1.14.1-9.module.el8.4.0-542-01547229.x86_64
perl-Carp-1.42-396.el8.noarch
perl-Digest-1.27-395.el8.noarch
perl-Encode-4:2.37-3.el8.x86_64
perl-Exporter-5.72-396.el8.noarch
perl-File-Temp-0.230.600-1.el8.noarch
perl-HTTP-Tiny-0.074-1.el8.noarch
perl-IO-Socket-1.0-0.39-5.el8.noarch
perl-MIME-Based64-3.15-396.el8.x86_64
perl-Net-SSLeay-1.00-2.module.el8.6.0-957-154668d.x86_64
perl-Pod-Encaps-1:1.07-395.el8.noarch
perl-Pod-Simple-1:3.35-395.el8.noarch
perl-Scalar-List-Utils-3.1.4-2.el8.x86_64
perl-Storable-1:3.11-3.el8.x86_64
perl-Term-Cap-1.17-395.el8.noarch
perl-Text-Tabs-0.813-352-395.el8.noarch
perl-URI-1.73-3.el8.noarch
perl-constant-1.33-396.el8.noarch
perl-libnet-3.11-3.el8.noarch
perl-macros-4:5.26-3-422.el8.x86_64
perl-podlators-4.11-1.el8.noarch
perl-threads-shared-1.50-2.el8.x86_64
```

The terminal window at the bottom shows the command `systemctl start nginx` being executed successfully, with the output `nginx.service: started`.

Start Time	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yherman21@Lab...	VMCT 1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yherman21@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yherman21@Lab...	VMCT 1028 - Console	OK
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yherman21@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yherman21@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yherman21@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yherman21@Lab...	VM 1026 - Start	OK

To start NginX on the command line, type `systemctl start nginx`.

Enable NginX



The screenshot shows the Proxmox VE interface with the console of VM 1027 (yhermandez1-Rocky8-2310) open. The console output shows the installation of various Perl modules and the successful completion of the Nginx setup. The bottom section shows a table of tasks with columns for Start Time, End Time, Node, User name, Description, and Status.

Start Time ↓	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yhermandez1@Lab...	VMCT 1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yhermandez1@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yhermandez1@Lab...	VMCT 1028 - Console	OK
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yhermandez1@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yhermandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yhermandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yhermandez1@Lab...	VM 1026 - Start	OK

To enable NginX on the command line, type **systemctl enable nginx**.

Test NginX

The screenshot shows a Proxmox VE interface with a terminal window for a virtual machine named '1027 (yherman)'. The terminal output displays the installation of NginX modules and the service status.

```
libpcre-3.5.12-9.el8.x86_64
libtirpc-4.0.9-29.el8.x86_64
nginx-1.14.1-9.module.el8.4.0-542-01547229.x86_64
nginx-filter-lua-1.14.1-9.module.el8.4.0-542-01547229.noarch
nginx-mod-http-perl-1.14.1-9.module.el8.4.0-542-01547229.x86_64
nginx-mod-wsgi-1.14.1-9.module.el8.4.0-542-01547229.x86_64
perl-Carp-1.42-396.el8.noarch
perl-Digest-1.17-395.el8.noarch
perl-Encode-4.12.39-3.el8.x86_64
perl-Exporter-5.72-396.el8.noarch
perl-File-Temp-0.230.600-1.el8.noarch
perl-HTTP-Tiny-0.074-1.el8.noarch
perl-IO-Socket-IP-0.39-5.el8.noarch
perl-MIME-Base64-3.15-396.el8.x86_64
perl-Net-SSLeay-1.80-2.module.el8.6.0-957-15d668d.x86_64
perl-Pod-Escapes-1.11-395.el8.noarch
perl-Pod-Simple-1.13-395.el8.noarch
perl-Scalar-List-Utils-3.11-492.el8.x86_64
perl-Storable-1.13.11-3.el8.x86_64
perl-Term-Cap-1.17-395.el8.noarch
perl-Text-Fake-News-2013.0523-395.el8.noarch
perl-URI-1.73-3.el8.noarch
perl-constant-1.33-396.el8.noarch
perl-libs-3.11-3.el8.noarch
perl-macros-4.15.26.3-422.el8.x86_64
perl-podlators-4.11-1.el8.noarch
perl-threads-shared-1.58-2.el8.x86_64

libjpeg-turbo-1.5.3-12.el8.x86_64
libwebp-1.0.0-8.el8.8.1.x86_64
nginx-all-modules-1.14.1-9.module.el8.4.0-542-01547229.noarch
nginx-mod-http-image-filter-1.14.1-9.module.el8.4.0-542-01547229.x86_64
nginx-mod-http-xslt-filter-1.14.1-9.module.el8.4.0-542-01547229.x86_64
nginx-mod-stream-1.14.1-9.module.el8.4.0-542-01547229.x86_64
perl-Brotli-1.0.7-399.el8.x86_64
perl-Digest-MD5-2.55-396.el8.x86_64
perl-Evms-1.20-422.el8.x86_64
perl-File-Path-2.15-2.el8.noarch
perl-Getopt-Long-1.12.50-4.el8.noarch
perl-IO-1.30-422.el8.x86_64
perl-IO-Socket-SSL-2.066-4.module.el8.6.0-957-15d668d.noarch
perl-Mozilla-Cv-20160104-7.module.el8.6.0-965-058557f9.noarch
perl-PathTools-3.74-1.el8.x86_64
perl-Pod-Perldoc-3.20-396.el8.noarch
perl-Pod-Usage-4.1.69-395.el8.noarch
perl-Socket-4.12.027-3.el8.x86_64
perl-Term-ANSIColor-4.06-396.el8.noarch
perl-Text-Farseconds-3.30-395.el8.noarch
perl-Time-Local-1.11200-1.el8.noarch
perl-Unicode-Normalize-1.25-396.el8.x86_64
perl-Interpreter-4.15.26.3-422.el8.x86_64
perl-libs-4.15.26.3-422.el8.x86_64
perl-parent-1.0.237-1.el8.noarch
perl-threads-1.12.21-2.el8.x86_64

Complete!
[root@localhost ~]# systemctl start nginx
[root@localhost ~]# systemctl enable nginx
Created symlink /etc/systemd/system/nginx.service → /usr/lib/systemd/system/nginx.service.
[root@localhost ~]# service nginx status
Redirecting to /bin/systemctl status nginx.service
● nginx.service - The nginx HTTP and reverse proxy server
   Loaded: loaded (/usr/lib/systemd/system/nginx.service; enabled; vendor preset: disabled)
   Active: active (running) since Thu 2023-09-20 15:09:30 EDT; 47s ago
     Main PID: 7933 (nginx)
       Tasks: 3 (limit: 11140)
      Memory: 0.1M
      CGroup: /system.slice/nginx.service
              └─7933 nginx: master process /usr/sbin/nginx
                  └─7934 nginx: worker process
                    └─7935 nginx: worker process

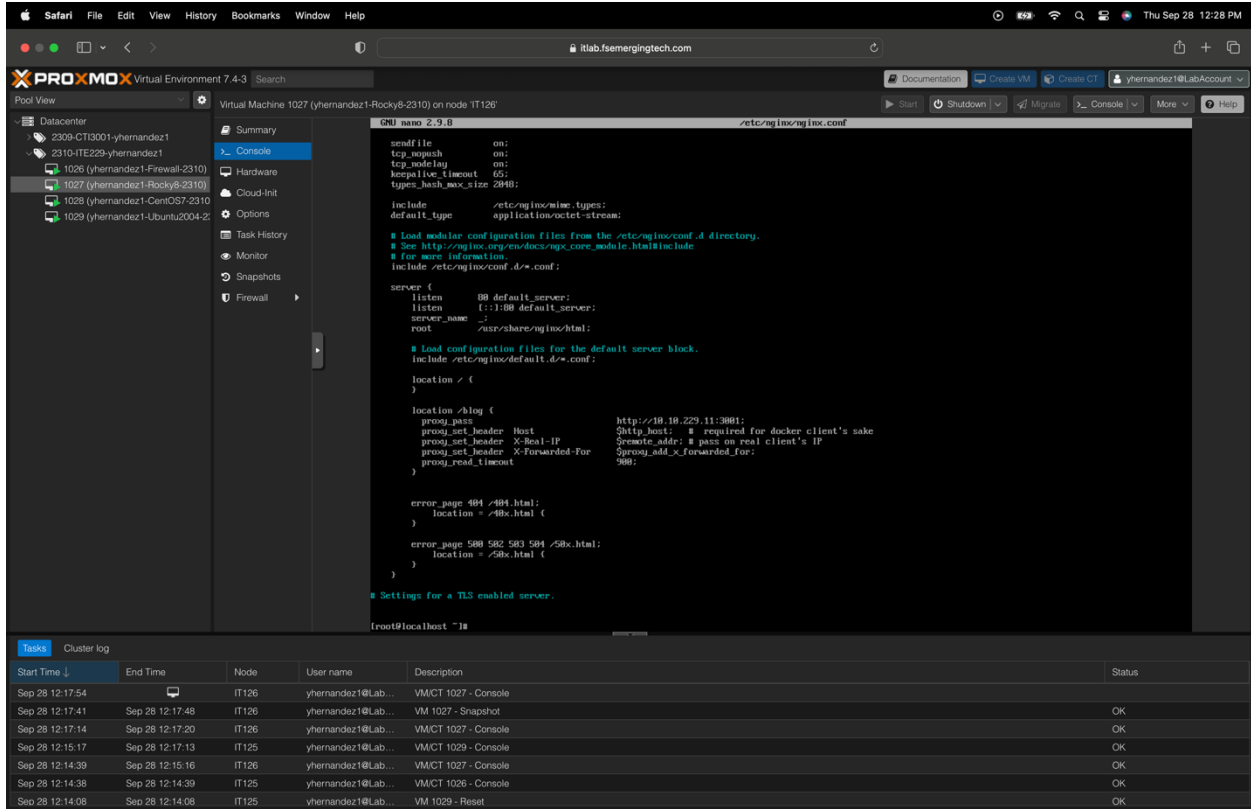
Sep 20 15:09:30 localhost.localdomain systemd[1]: Starting The nginx HTTP and reverse proxy server...
Sep 20 15:09:30 localhost.localdomain nginx[7930]: nginx: the configuration file /etc/nginx/nginx.conf syntax is ok
Sep 20 15:09:30 localhost.localdomain nginx[7930]: nginx: configuration file /etc/nginx/nginx.conf test is successful
Sep 20 15:09:30 localhost.localdomain systemd[1]: Started The nginx HTTP and reverse proxy server.
[root@localhost ~]#
```

Start Time ↓	End Time	Node	User name	Description	Status
Sep 28 11:53:32		IT126	yherman21@Lab...	VMCT 1027 - Console	
Sep 28 11:53:29	Sep 28 11:53:30	IT126	yherman21@Lab...	VM 1027 - Start	OK
Sep 28 11:53:19	Sep 28 11:53:25	IT125	yherman21@Lab...	VMCT 1028 - Console	OK
Sep 28 11:53:17	Sep 28 11:53:18	IT125	yherman21@Lab...	VM 1028 - Start	OK
Sep 28 11:51:51	Sep 28 11:53:14	IT125	yherman21@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:03	Sep 28 11:51:50	IT125	yherman21@Lab...	VMCT 1026 - Console	OK
Sep 28 11:46:00	Sep 28 11:46:02	IT125	yherman21@Lab...	VM 1026 - Start	OK

To test NginX on the command line, type `service nginx status`.

Reverse Proxy for Ghost Site

Edit NginX configuration file



To edit the NginX configuration file on the command line, type **sudo nano /etc/nginx/nginx.conf**. This will take you to the GPU page, where you will scroll down until you find Location, and you will enter the needed reverse proxy code. Make sure everything is credited correctly.

Reload NginX service

The screenshot shows the Proxmox Virtual Environment (VE) interface. On the left, the 'Datacenter' tree lists several VMs, including '1029 (yhermandez1-Ubuntu2004-2)'. The main panel shows the 'Summary' tab for this VM, with a 'Console' button. The console output shows the Nginx welcome page for Rocky Linux, indicating that the web server is installed and working properly. The page includes instructions for the 'Website Administrator' and links to the Nginx and Rocky Linux websites.

Start Time	End Time	Node	User name	Description	Status
Sep 28 12:15:17		IT125	yhermandez1@Lab...	VMCT-1029 - Console	
Sep 28 12:14:39	Sep 28 12:15:16	IT126	yhermandez1@Lab...	VMCT-1027 - Console	OK
Sep 28 12:14:38	Sep 28 12:14:39	IT125	yhermandez1@Lab...	VMCT-1026 - Console	OK
Sep 28 12:14:08	Sep 28 12:14:08	IT125	yhermandez1@Lab...	VM 1029 - Reset	OK
Sep 28 12:13:53	Sep 28 12:13:55	IT125	yhermandez1@Lab...	VM 1029 - Reboot	OK
Sep 28 12:12:30	Sep 28 12:13:47	IT126	yhermandez1@Lab...	VMCT-1027 - Console	OK
Sep 28 12:12:27	Sep 28 12:12:29	IT125	yhermandez1@Lab...	VMCT-1028 - Console	OK

To reload the NginX service, go to the Ubuntu machine, open Firefox, and type in the address bar **10.10.229.10**; this will load the page.

Terminate Docker

The screenshot shows the Proxmox VE interface. On the left, a sidebar lists several virtual machines (VMs) under the 'Datacenter' section. The main panel displays the 'Console' view for VM 1028 (yhermandez1-CentOS7-2310) on node IT125. The terminal window shows the following commands and output:

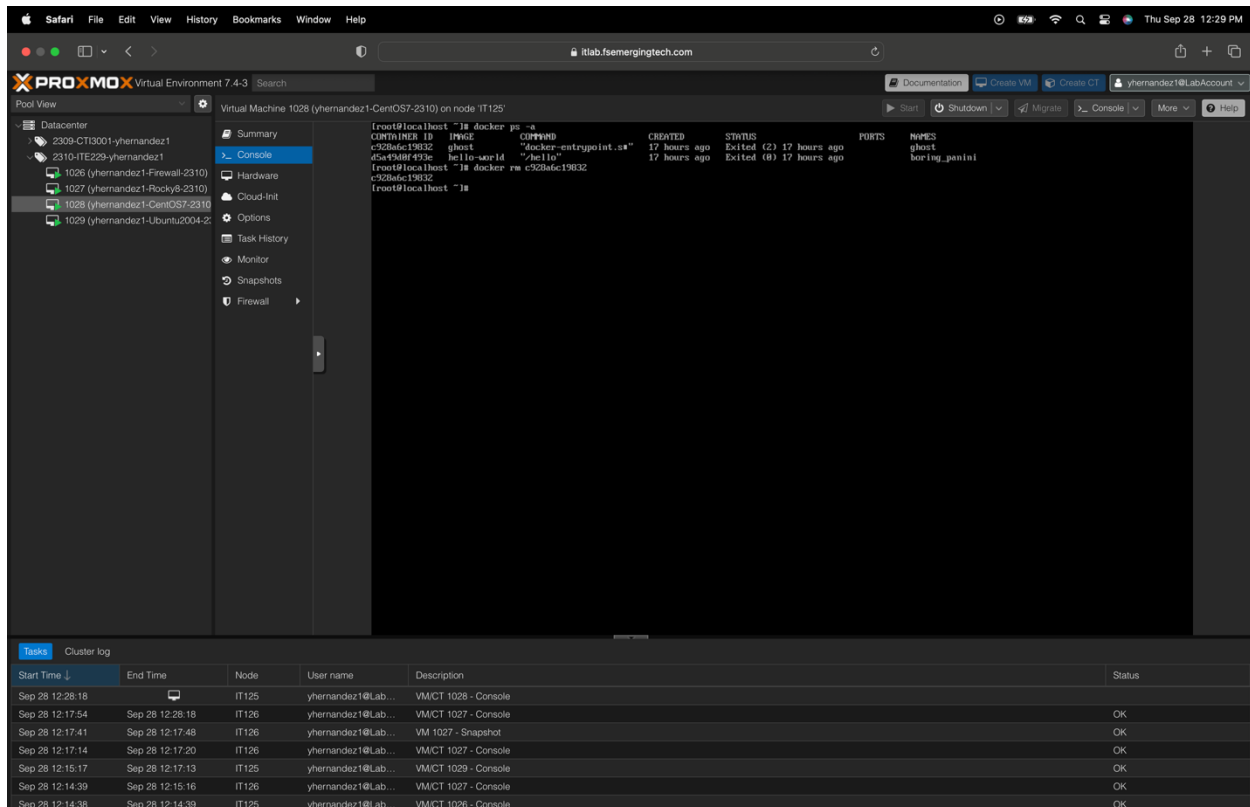
```
[root@localhost ~]# docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED    STATUS      PORTS      NAMES
c528a6c19b32   ghost     "docker-entrypoint.s"    17 hours ago    Exited (2) 17 hours ago           ghost
6a59d8f493c   hello-sea "hello"                  17 hours ago    Exited (8) 17 hours ago           boring_painal
[root@localhost ~]# docker rm c528a6c19b32
[root@localhost ~]#
```

Below the terminal window, a 'Tasks' table is visible, showing a list of operations performed on the VMs:

Start Time ↓	End Time	Node	User name	Description	Status
Sep 28 12:28:18		IT125	yhermandez1@Lab...	VMCT 1028 - Console	
Sep 28 12:17:54	Sep 28 12:28:18	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:17:41	Sep 28 12:17:48	IT126	yhermandez1@Lab...	VM 1027 - Snapshot	OK
Sep 28 12:17:14	Sep 28 12:17:20	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:15:17	Sep 28 12:17:13	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK
Sep 28 12:14:39	Sep 28 12:15:16	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:14:38	Sep 28 12:14:39	IT125	yhermandez1@Lab...	VMCT 1026 - Console	OK

To terminate docker type in **docker rm**.

Delete Ghost Container

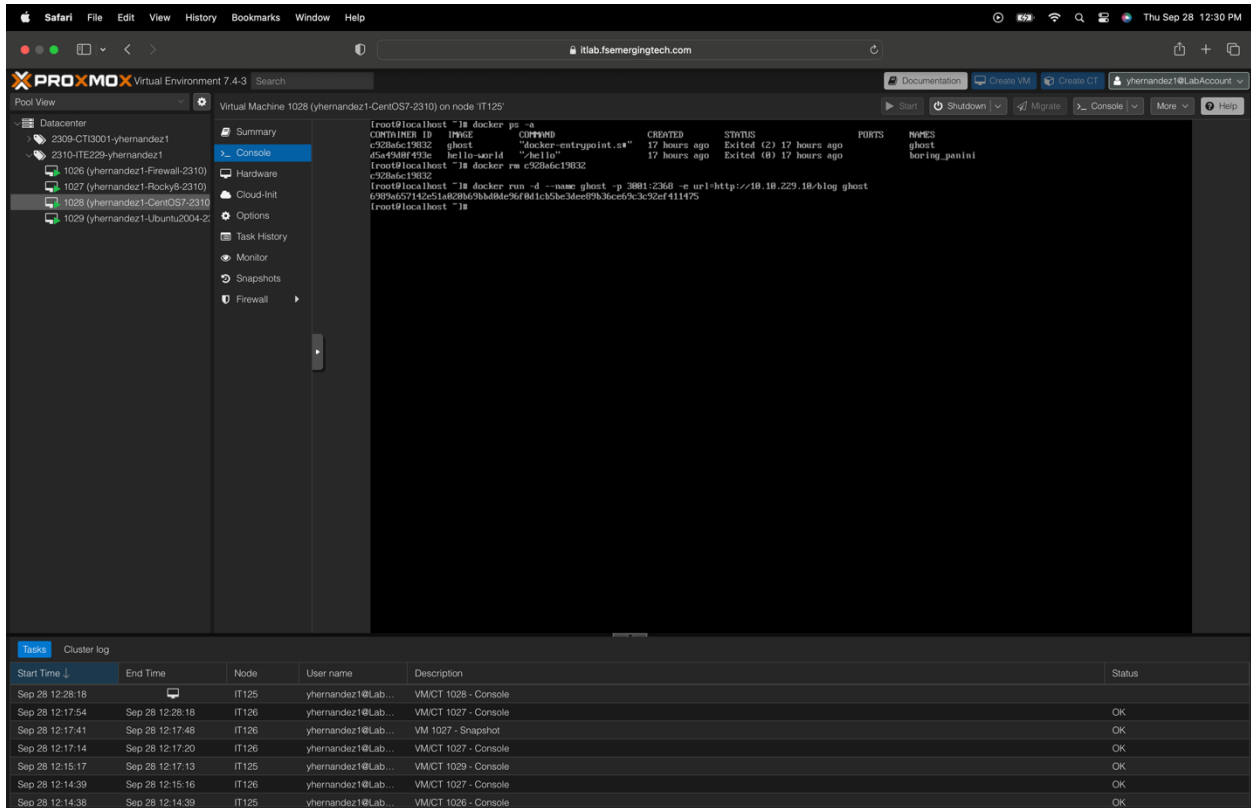


The screenshot displays the Proxmox Virtual Environment (VE) interface. The main window shows the console of Virtual Machine 1028 (yhermandez1-CentOS7-2310) on node IT125. The console output shows the command `docker ps -a` and its output, which includes a container named `ghost` with ID `c528a6c19b32`. The `ghost` container is in an `Exited` state. The interface also shows a list of tasks at the bottom.

Start Time	End Time	Node	User name	Description	Status
Sep 28 12:28:18		IT125	yhermandez1@Lab...	VMCT 1028 - Console	
Sep 28 12:17:54	Sep 28 12:28:18	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:17:41	Sep 28 12:17:48	IT126	yhermandez1@Lab...	VM 1027 - Snapshot	OK
Sep 28 12:17:14	Sep 28 12:17:20	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:15:17	Sep 28 12:17:13	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK
Sep 28 12:14:39	Sep 28 12:15:16	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:14:38	Sep 28 12:14:39	IT125	yhermandez1@Lab...	VMCT 1026 - Console	OK

To delete the Ghost container on the command line, type **docker rm (container ID)**.

Create New Ghost Container



The screenshot shows the Proxmox VE interface. On the left, a sidebar lists several virtual machines: 2309-CT3001-yhernandez1, 2310-ITE229-yhernandez1, 1026 (yhernandez1-Firewall-2310), 1027 (yhernandez1-Rocky8-2310), 1028 (yhernandez1-CentOS7-2310), and 1029 (yhernandez1-Ubuntu2004-2). The main panel displays the console of VM 1028. The console output shows the following commands and their results:

```
[root@localhost ~]# docker ps -a
CONTAINER ID   IMAGE      COMMAND                  CREATED    STATUS    PORTS    NAMES
c528a6c19b32   ghost     "docker-entrypoint.sh"   17 hours ago    Exited (2) 17 hours ago    ghost
6a598af93c     hello-sse1d "hello"                  17 hours ago    Exited (8) 17 hours ago    boring_painal
[root@localhost ~]# docker rm c528a6c19b32
c528a6c19b32
[root@localhost ~]# docker run -d --name ghost -p 3001:2368 -e url=http://10.10.229.10/blog ghost
6909a657142e51a028469b4b84e96f8d1c35b3dced9b36c6f9c3c92ef411475
[root@localhost ~]#
```

Below the console output, a table lists recent tasks:

Start Time ↓	End Time	Node	User name	Description	Status
Sep 28 12:28:18		IT125	yhernandez1@Lab...	VMCT 1028 - Console	
Sep 28 12:17:54	Sep 28 12:28:18	IT126	yhernandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:17:41	Sep 28 12:17:48	IT126	yhernandez1@Lab...	VM 1027 - Snapshot	OK
Sep 28 12:17:14	Sep 28 12:17:20	IT126	yhernandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:15:17	Sep 28 12:17:13	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Sep 28 12:14:39	Sep 28 12:15:16	IT126	yhernandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:14:38	Sep 28 12:14:39	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK

To create a new Ghost container on the command line, type **docker run -d --name ghost 3001:2368 -e url=http://10.10.229.10/blog ghost**.

Browse to Ghost

The image consists of two screenshots of a Proxmox Virtual Environment (VE) interface, showing the process of browsing to a Ghost blog on an Ubuntu VM.

Top Screenshot: The interface shows the 'Virtual Machine 1029 (yhermandez1-Ubuntu2004-2310) on node IT125'. The 'Console' tab is active, displaying a Firefox Web Browser window. The browser's address bar shows '10.10.229.10'. The page content is a 'Welcome to nginx on Rocky Linux!' message, indicating that the default nginx page is being served.

Bottom Screenshot: The interface shows the same VM. The 'Console' tab is active, displaying a Firefox Web Browser window. The browser's address bar shows '10.10.229.10/blog'. The page content is an 'nginx error!' message, indicating that the requested page is temporarily unavailable.

Cluster log table:

Start Time	End Time	Node	User name	Description	Status
Sep 28 12:31:16		IT125	yhermandez1@Lab...	VMCT 1029 - Console	
Sep 28 12:28:18	Sep 28 12:31:15	IT125	yhermandez1@Lab...	VMCT 1028 - Console	OK
Sep 28 12:17:54	Sep 28 12:28:18	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:17:41	Sep 28 12:17:48	IT126	yhermandez1@Lab...	VM 1027 - Snapshot	OK
Sep 28 12:17:14	Sep 28 12:17:20	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:15:17	Sep 28 12:17:13	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK
Sep 28 12:14:39	Sep 28 12:15:16	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK

Cluster log table (continued):

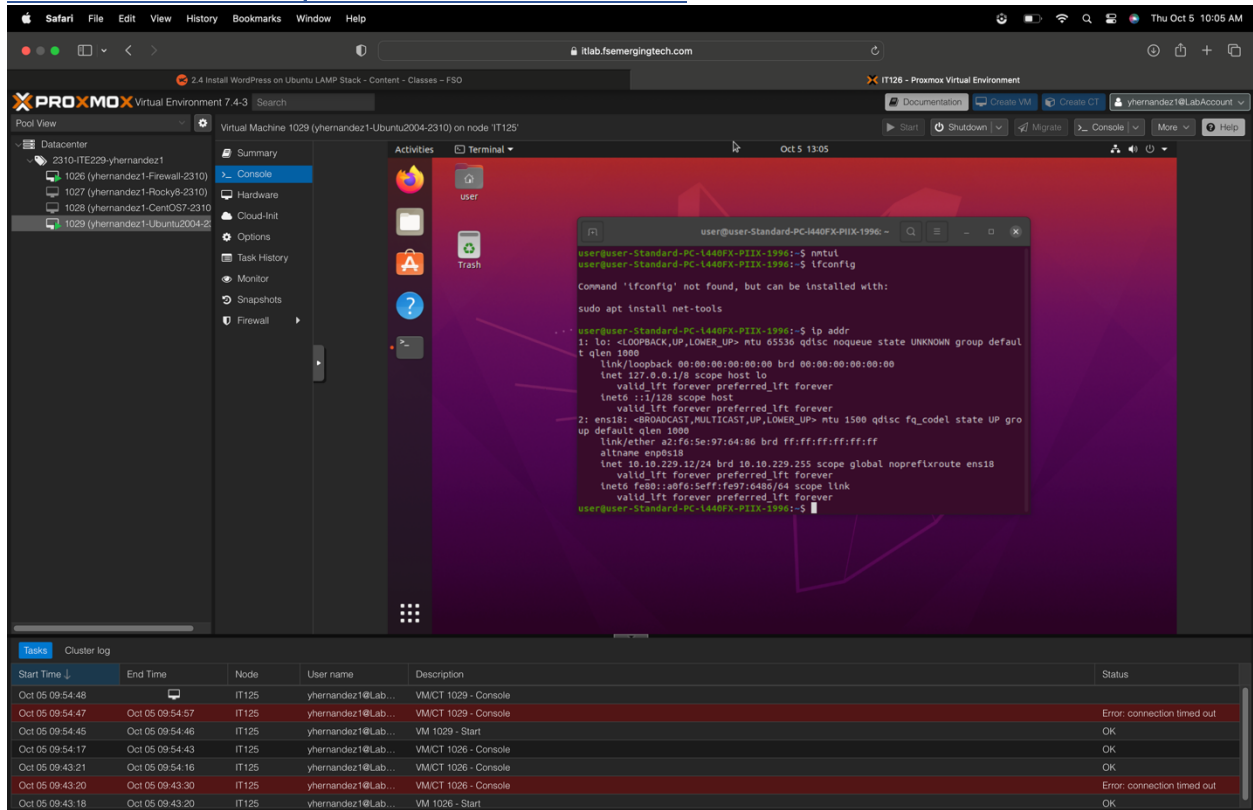
Start Time	End Time	Node	User name	Description	Status
Sep 28 12:57:55		IT125	yhermandez1@Lab...	VMCT 1029 - Console	
Sep 28 12:57:07	Sep 28 12:57:55	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:57:04	Sep 28 12:57:07	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK
Sep 28 12:56:47	Sep 28 12:57:03	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:49:15	Sep 28 12:56:56	IT125	yhermandez1@Lab...	VMCT 1028 - Console	OK
Sep 28 12:48:05	Sep 28 12:49:14	IT126	yhermandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:43:30	Sep 28 12:48:05	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK

To browse to ghost log in to the Ubuntu machine, open up Firefox and type on the address bar <http://10.10.229.10>, then press enter, and once it loads, type on the address bar <http://10.10.229.10/blog>.

IMPORTANT: To earn full credit, ALL screenshots must include a “full view”, including your ProxMox title bar with your username showing.

WordPress on Ubuntu - LAMP Stack

Show screenshot of your Ubuntu Console in VE



The screenshot displays a Proxmox Virtual Environment (VE) interface. The main window shows a terminal session for a user on a VM named 'Standard-PC-1440FX-P11X-1996'. The terminal output shows the user running 'nmtui' and 'ifconfig', followed by a message indicating that 'ifconfig' is not found but can be installed with 'sudo apt install net-tools'. The user then runs 'ip addr' and 'ip netns exec' to view network details for the 'lo' and 'ens18' interfaces. The 'lo' interface is a loopback address (127.0.0.1) and the 'ens18' interface is a physical address (10.10.229.12/24). The terminal output is as follows:

```
user@Standard-PC-1440FX-P11X-1996:~$ nmtui
user@Standard-PC-1440FX-P11X-1996:~$ ifconfig
Command 'ifconfig' not found, but can be installed with:
sudo apt install net-tools
user@Standard-PC-1440FX-P11X-1996:~$ ip addr
1: lo: <LOOPBACK,UP,LOWER_UP> mtu 65536 qdisc noqueue state UNKNOWN group default
    link/loopback 00:00:00:00:00:00 brd 00:00:00:00:00:00
    inet 127.0.0.1/8 scope host lo
        valid_lft forever preferred_lft forever
    inet6 ::1/128 scope host
        valid_lft forever preferred_lft forever
2: ens18: <BROADCAST,MULTICAST,UP,LOWER_UP> mtu 1500 qdisc fq_codel state UP gro
    up default qlen 1000
    link/ether a2:fe:5e:97:64:86 brd ff:ff:ff:ff:ff:ff
    altname enp0s18
    inet 10.10.229.12/24 brd 10.10.229.255 scope global noprefroute ens18
        valid_lft forever preferred_lft forever
    inet6 fe80:a0f6:5eff:fe97:6480/64 scope link
        valid_lft forever preferred_lft forever
user@Standard-PC-1440FX-P11X-1996:~$
```

Below the terminal window, there is a table showing the cluster log for the tasks performed:

Start Time	End Time	Node	User name	Description	Status
Oct 05 09:54:48		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 09:54:47	Oct 05 09:54:57	IT125	yhernandez1@Lab...	VMCT 1029 - Console	Error: connection timed out
Oct 05 09:54:45	Oct 05 09:54:46	IT125	yhernandez1@Lab...	VM 1029 - Start	OK
Oct 05 09:54:17	Oct 05 09:54:43	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:21	Oct 05 09:54:16	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:20	Oct 05 09:43:30	IT125	yhernandez1@Lab...	VMCT 1026 - Console	Error: connection timed out
Oct 05 09:43:18	Oct 05 09:43:20	IT125	yhernandez1@Lab...	VM 1026 - Start	OK

Update Ubuntu

Safari File Edit View History Bookmarks Window Help

itlab.fsmergingtech.com

2.4 Install WordPress on Ubuntu LAMP Stack - Content - Classes - FSO

IT126 - Proxmox Virtual Environment

Pool View Virtual Machine 1029 (yhernandez1-Ubuntu2004-2310) on node IT125

2310-ITE229-yhernandez1

1026 (yhernandez1-Firewall-2310)

1027 (yhernandez1-Rocky8-2310)

1028 (yhernandez1-CentOS7-2310)

1029 (yhernandez1-Ubuntu2004-2310)

Summary Console Hardware Cloud-Init Options Task History Monitor Snapshots Firewall

Activities Terminal

user

Trash

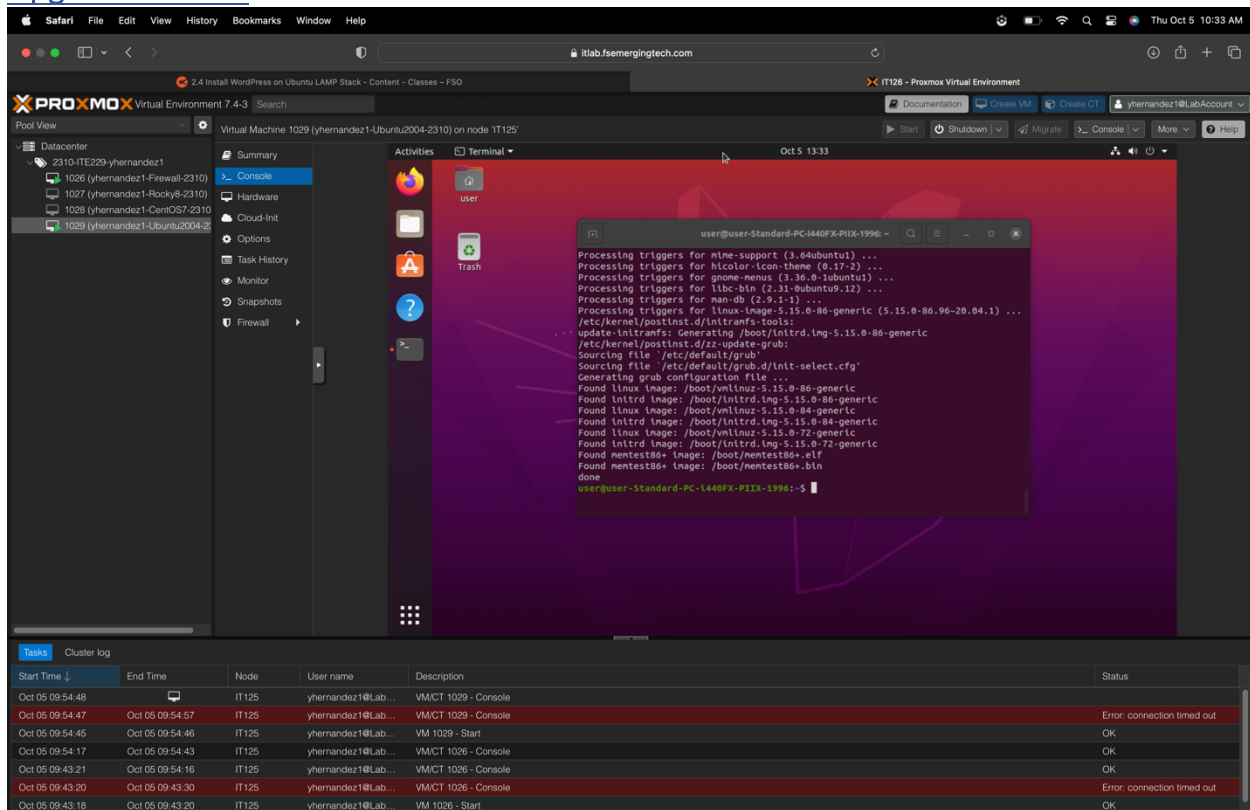
```
[898 kB]
Get:23 http://security.ubuntu.com/ubuntu focal-security/universe Translation-en [186 kB]
Get:24 http://security.ubuntu.com/ubuntu focal-security/universe amd64 DEP-11 Metadata [96.3 kB]
Get:25 http://security.ubuntu.com/ubuntu focal-security/universe amd64 c-n-f Metadata [19.1 kB]
Get:26 http://security.ubuntu.com/ubuntu focal-security/multiverse amd64 DEP-11 Metadata [940 B]
Get:27 http://us.archive.ubuntu.com/ubuntu focal-updates/universe Translation-en [268 kB]
Get:28 http://us.archive.ubuntu.com/ubuntu focal-updates/universe amd64 DEP-11 Metadata [414 kB]
Get:29 http://us.archive.ubuntu.com/ubuntu focal-updates/universe amd64 c-n-f Metadata [25.6 kB]
Get:30 http://us.archive.ubuntu.com/ubuntu focal-updates/multiverse amd64 DEP-11 Metadata [944 B]
Get:31 http://us.archive.ubuntu.com/ubuntu focal-backports/main amd64 DEP-11 Metadata [30.5 kB]
Fetched 16.2 MB in 4s (4,361 kB/s)
Reading package lists... Done
user@user-Standard-PC-i440FX-PiIX-1996:~$ sudo apt
```

Tasks Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Oct 05 09:54:48		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 09:54:47	Oct 05 09:54:57	IT125	yhernandez1@Lab...	VMCT 1029 - Console	Error: connection timed out
Oct 05 09:54:45	Oct 05 09:54:46	IT125	yhernandez1@Lab...	VM 1029 - Start	OK
Oct 05 09:54:17	Oct 05 09:54:43	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:21	Oct 05 09:54:16	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:20	Oct 05 09:43:30	IT125	yhernandez1@Lab...	VMCT 1026 - Console	Error: connection timed out
Oct 05 09:43:16	Oct 05 09:43:20	IT125	yhernandez1@Lab...	VM 1026 - Start	OK

To update Ubuntu, you type on the terminal **sudo apt-get update**, and then it will update.

Upgrade Ubuntu



The screenshot shows the Proxmox Virtual Environment (VE) interface. The main window displays a terminal for a virtual machine named '1029 (yhernandez1-Ubuntu2004-2310)' on node 'IT125'. The terminal output shows the process of upgrading Ubuntu, including processing triggers for various packages and generating the grub configuration file. The output ends with 'done' and a prompt 'user@user-Standard-PC-1440FX-PIIX-1996:~\$'.

Below the terminal window, there is a table showing the cluster log. The table has columns for Start Time, End Time, Node, User name, Description, and Status.

Start Time	End Time	Node	User name	Description	Status
Oct 05 09:54:48		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 09:54:47	Oct 05 09:54:57	IT125	yhernandez1@Lab...	VMCT 1029 - Console	Error: connection timed out
Oct 05 09:54:45	Oct 05 09:54:46	IT125	yhernandez1@Lab...	VM 1029 - Start	OK
Oct 05 09:54:17	Oct 05 09:54:43	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:21	Oct 05 09:54:16	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:20	Oct 05 09:43:30	IT125	yhernandez1@Lab...	VMCT 1026 - Console	Error: connection timed out
Oct 05 09:43:18	Oct 05 09:43:20	IT125	yhernandez1@Lab...	VM 1026 - Start	OK

To upgrade Ubuntu on the terminal, you type **sudo apt upgrade**, then press enter, and it will upgrade.

Install Nano Editor

Nano was installed already.

Install Git

The screenshot shows a Proxmox Virtual Environment interface. The main window displays a terminal session for a user named 'yhernandez1' on a VM named 'yhernandez1@Ubuntu:2004-2310'. The terminal output shows the following commands and their results:

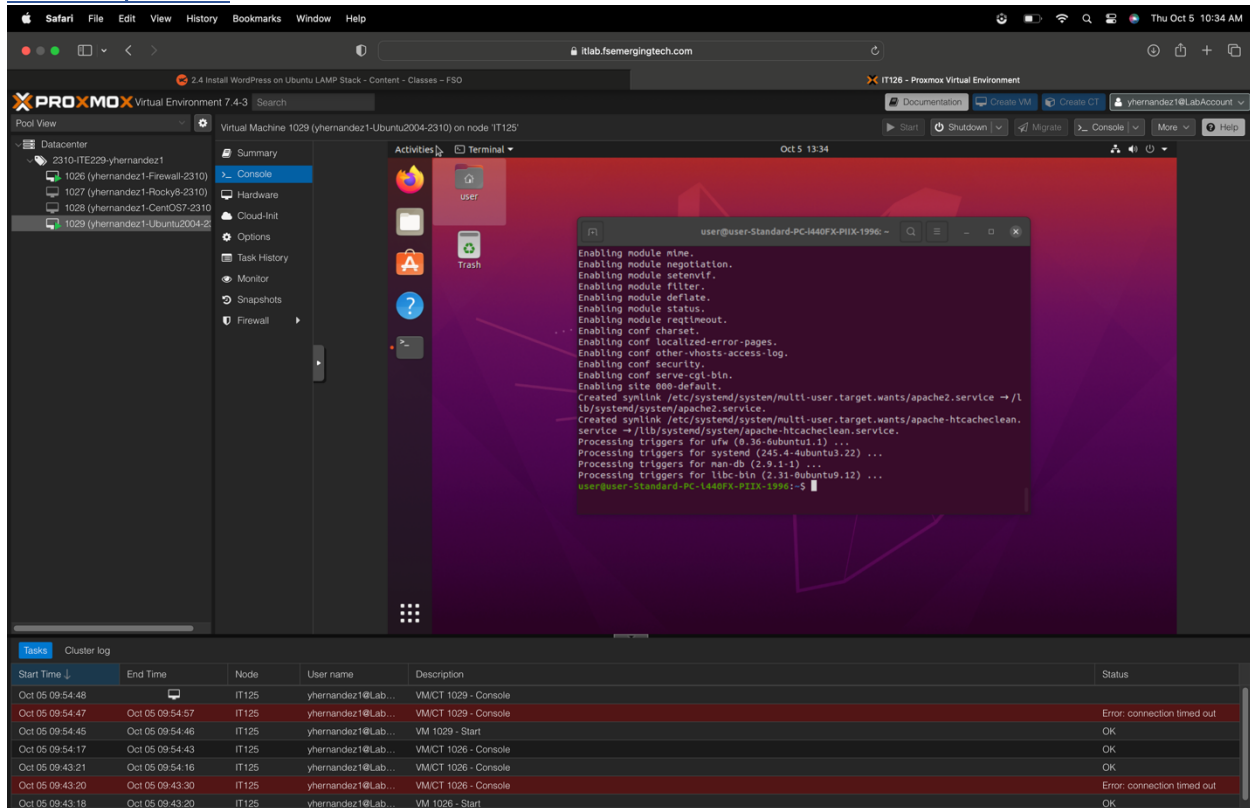
```
[sudo] password for user:
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo rm /var/www/html/*
user@user-Standard-PC-1440FX-PIIX-1996:~$ is /var/www/html
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo apt install git -y
Building dependency tree
Reading package lists... Done
Building dependency tree
Reading state information... Done
The following packages were automatically installed and are no longer required:
  git-2-goa-1.0 libfupdpkglib1 libtomb1 linux-headers-5.15.0-72-generic linux-hwe-5.15-headers-5.15.0-72
  linux-image-5.15.0-72-generic linux-modules-5.15.0-72-generic linux-modules-extra-5.15.0-72-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
  git-man liberror-perl
Suggested packages:
  git-daemon-run | git-daemon-symlinks git-doc git-el git-email git-gui gitk gitweb git-cvs git-mediawiki git-svn
The following NEW packages will be installed:
  git git-man liberror-perl
0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 5,518 kB of archives.
After this operation, 38.7 MB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu focal/main amd64 liberror-perl all 0.17029-1 [26.5 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 git-man all 1:2.25.1-1ubuntu3.11 [687 kB]
Get:3 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 git amd64 1:2.25.1-1ubuntu3.11 [4,605 kB]
Fetched 5,518 kB in 1s (4,013 kB/s)
Selecting previously unselected package liberror-perl.
(Reading database ... 196855 files and directories currently installed.)
Preparing to unpack .../liberror-perl_0.17029-1_all.deb ...
Unpacking liberror-perl (0.17029-1) ...
Selecting previously unselected package git-man.
Preparing to unpack .../git-man_1:2.25.1-1ubuntu3.11_all.deb ...
Unpacking git-man (1:2.25.1-1ubuntu3.11) ...
Selecting previously unselected package git.
Preparing to unpack .../git_1:2.25.1-1ubuntu3.11_amd64.deb ...
Unpacking git (1:2.25.1-1ubuntu3.11) ...
Setting up liberror-perl (0.17029-1) ...
Setting up git-man (1:2.25.1-1ubuntu3.11) ...
Setting up git (1:2.25.1-1ubuntu3.11) ...
Processing triggers for man-db (2.9.1-1) ...
```

Below the terminal window, there is a table showing the cluster log:

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To install Git, you type **sudo apt install git -y**; this will automatically install Git.

Install Apache2



The screenshot shows a Proxmox Virtual Environment (VE) interface. The main window displays a terminal window for a virtual machine named '1029 (yhernandez1-Ubuntu2004-2310)' on node 'IT125'. The terminal output shows the installation of Apache2, including enabling modules and creating symlinks. The background shows the Proxmox interface with a list of virtual machines and a task log at the bottom.

Terminal Output:

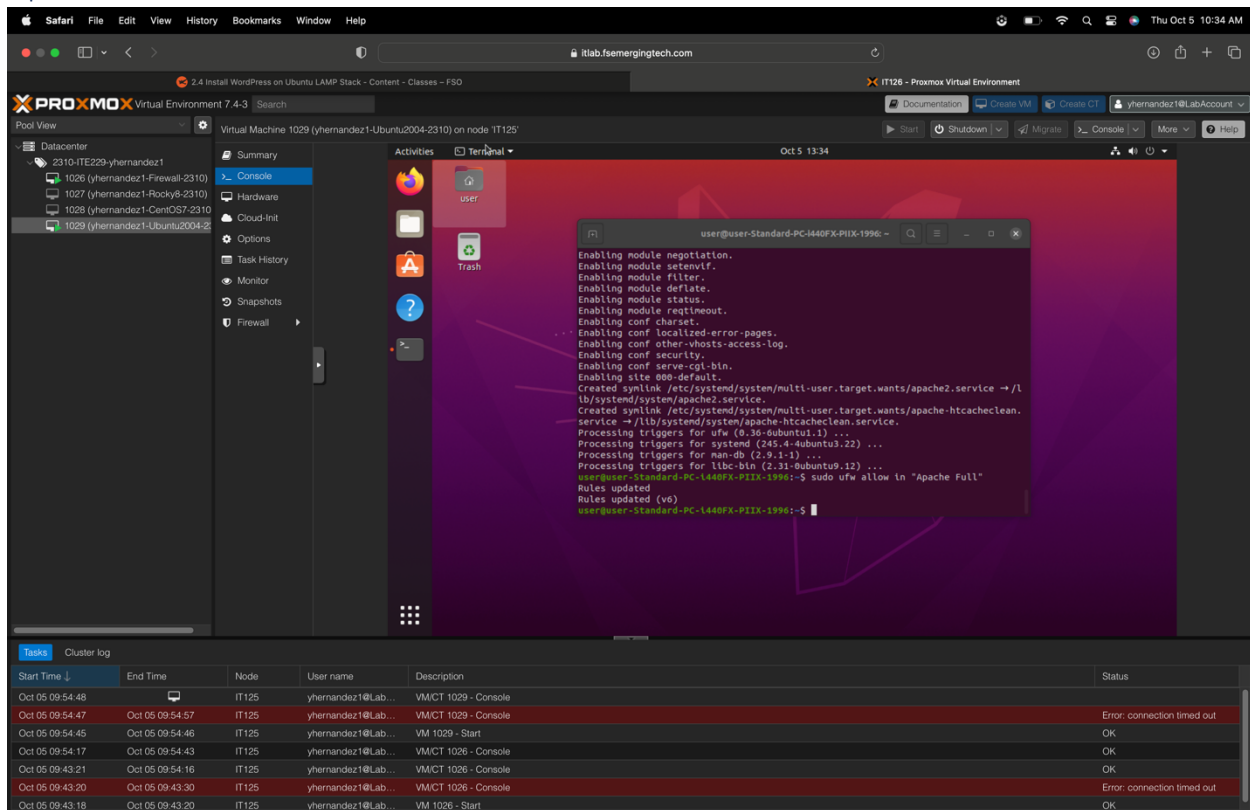
```
user@user-Standard-PC-1440FX-P11X-1996:~$ sudo apt install apache2
Enabling module mpm.
Enabling module negotiation.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (4.3.6-6ubuntu1.1) ...
Processing triggers for systemd (245.4-4ubuntu3.22) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-6ubuntu9.12) ...
user@user-Standard-PC-1440FX-P11X-1996:~$
```

Task Log:

Start Time	End Time	Node	User name	Description	Status
Oct 05 09:54:48		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 09:54:47	Oct 05 09:54:57	IT125	yhernandez1@Lab...	VMCT 1029 - Console	Error: connection timed out
Oct 05 09:54:45	Oct 05 09:54:46	IT125	yhernandez1@Lab...	VM 1029 - Start	OK
Oct 05 09:54:17	Oct 05 09:54:43	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:21	Oct 05 09:54:16	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:20	Oct 05 09:43:30	IT125	yhernandez1@Lab...	VMCT 1026 - Console	Error: connection timed out
Oct 05 09:43:18	Oct 05 09:43:20	IT125	yhernandez1@Lab...	VM 1026 - Start	OK

To install Apache2 on the terminal, type **sudo apt install apache2**, then press enter.

Open Firewall Ports 80 and 443



The screenshot displays the Proxmox Virtual Environment (VE) interface. The main window shows a terminal session for a user on a virtual machine. The terminal output includes the following commands and their results:

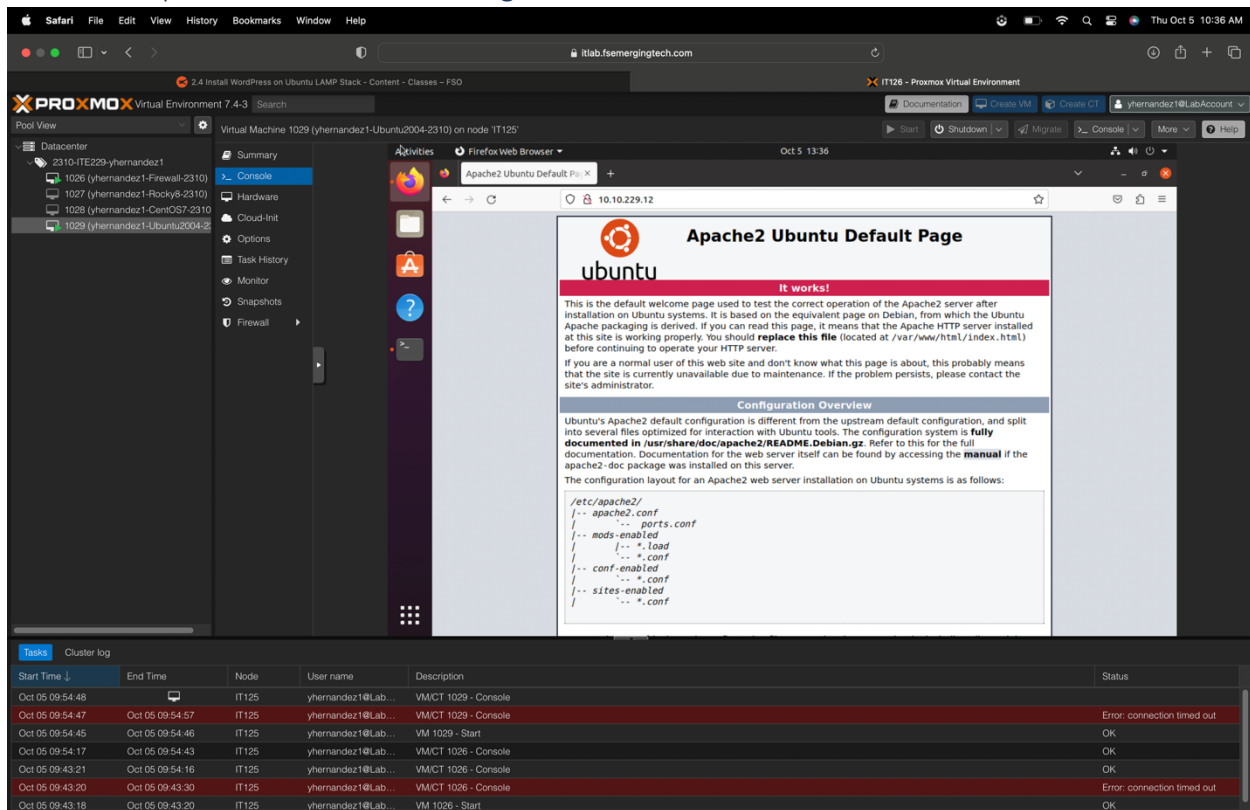
```
Enabling module negotiation.
Enabling module setenvif.
Enabling module filter.
Enabling module deflate.
Enabling module status.
Enabling module reqtimeout.
Enabling conf charset.
Enabling conf localized-error-pages.
Enabling conf other-vmhosts-access-log.
Enabling conf security.
Enabling conf serve-cgi-bin.
Enabling site 000-default.
Created symlink /etc/systemd/system/multi-user.target.wants/apache2.service → /lib/systemd/system/apache2.service.
Created symlink /etc/systemd/system/multi-user.target.wants/apache-htcacheclean.service → /lib/systemd/system/apache-htcacheclean.service.
Processing triggers for ufw (0.36-0ubuntu1.1) ...
Processing triggers for systemd (245.4-4ubuntu3.22) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.12) ...
user@user-Standard-PC-1440FX-P11X-1996:~$ sudo ufw allow in "Apache Full"
Rules updated
Rules updated (v6)
user@user-Standard-PC-1440FX-P11X-1996:~$
```

Below the terminal window, the 'Tasks' tab is selected, showing a list of tasks with columns for Start Time, End Time, Node, User name, Description, and Status.

Start Time	End Time	Node	User name	Description	Status
Oct 05 09:54:48		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 09:54:47	Oct 05 09:54:57	IT125	yhernandez1@Lab...	VMCT 1029 - Console	Error: connection timed out
Oct 05 09:54:45	Oct 05 09:54:46	IT125	yhernandez1@Lab...	VM 1029 - Start	OK
Oct 05 09:54:17	Oct 05 09:54:43	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:21	Oct 05 09:54:16	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:20	Oct 05 09:43:30	IT125	yhernandez1@Lab...	VMCT 1026 - Console	Error: connection timed out
Oct 05 09:43:18	Oct 05 09:43:20	IT125	yhernandez1@Lab...	VM 1026 - Start	OK

To open Firewall Ports 80 and 443 on the terminal, type `sudo ufw allow in "Apache Full"` then press enter to ensure it's correctly spelled with quotations and uppercase included.

Browse to Apache2 Ubuntu Default Page



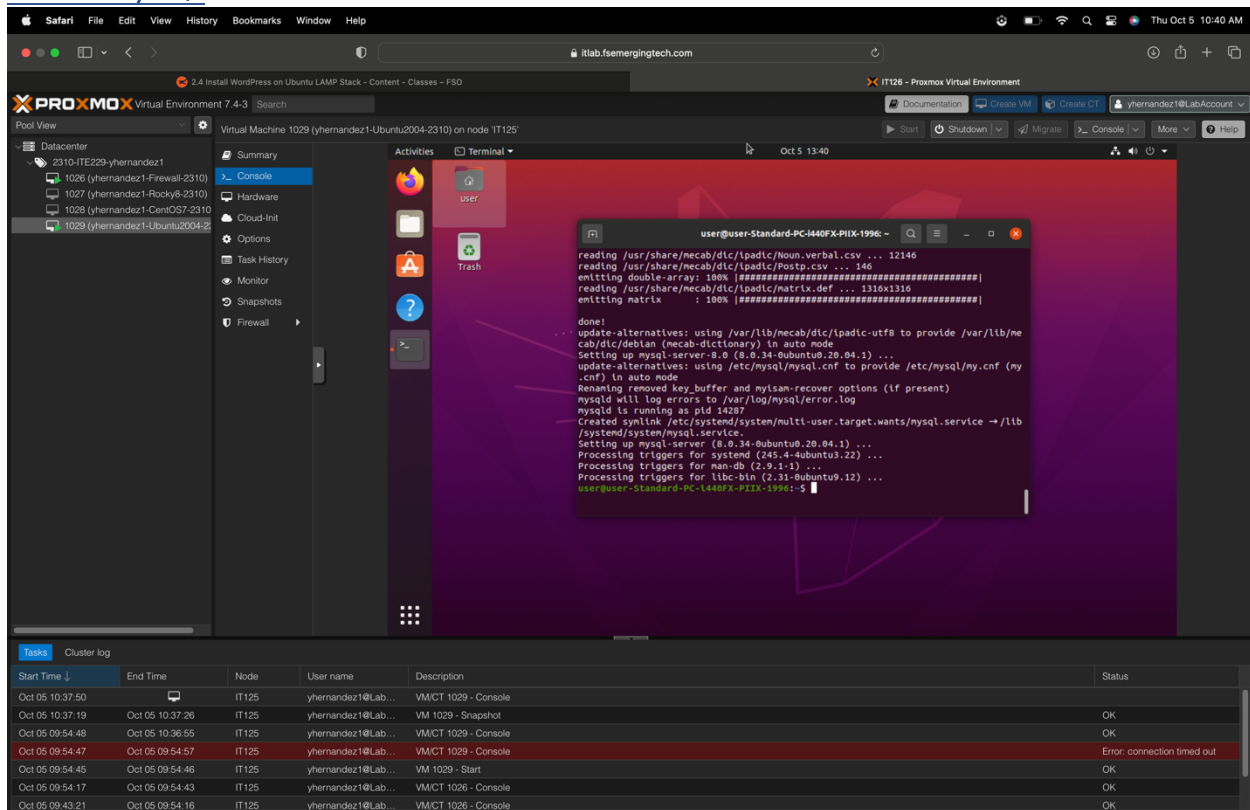
The screenshot shows a Proxmox Virtual Environment interface. In the background, a Firefox browser window is open, displaying the Apache2 Ubuntu Default Page. The browser's address bar shows the URL <http://10.10.229.12>. The page content includes the Ubuntu logo, a red banner saying "It works!", and a section titled "Configuration Overview" which explains the default configuration and provides a list of files in the `/etc/apache2/` directory.

The Proxmox interface shows a list of virtual machines on the left, including VMCT 1029, VMCT 1026, and VMCT 1027. The main panel displays the Apache2 Ubuntu Default Page. The bottom of the interface shows a "Tasks" tab with a table of recent tasks.

Start Time	End Time	Node	User name	Description	Status
Oct 05 09:54:48		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 09:54:47	Oct 05 09:54:57	IT125	yhernandez1@Lab...	VMCT 1029 - Console	Error: connection timed out
Oct 05 09:54:46	Oct 05 09:54:46	IT125	yhernandez1@Lab...	VM 1029 - Start	OK
Oct 05 09:54:17	Oct 05 09:54:43	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:21	Oct 05 09:54:16	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:20	Oct 05 09:43:30	IT125	yhernandez1@Lab...	VMCT 1026 - Console	Error: connection timed out
Oct 05 09:43:18	Oct 05 09:43:20	IT125	yhernandez1@Lab...	VM 1026 - Start	OK

To browse the Apache2 Ubuntu Default Page, click on Firefox browser, and on the address bar, type <http://10.10.229.12>. Press enter, and it will take you to the default page.

Install MySQL

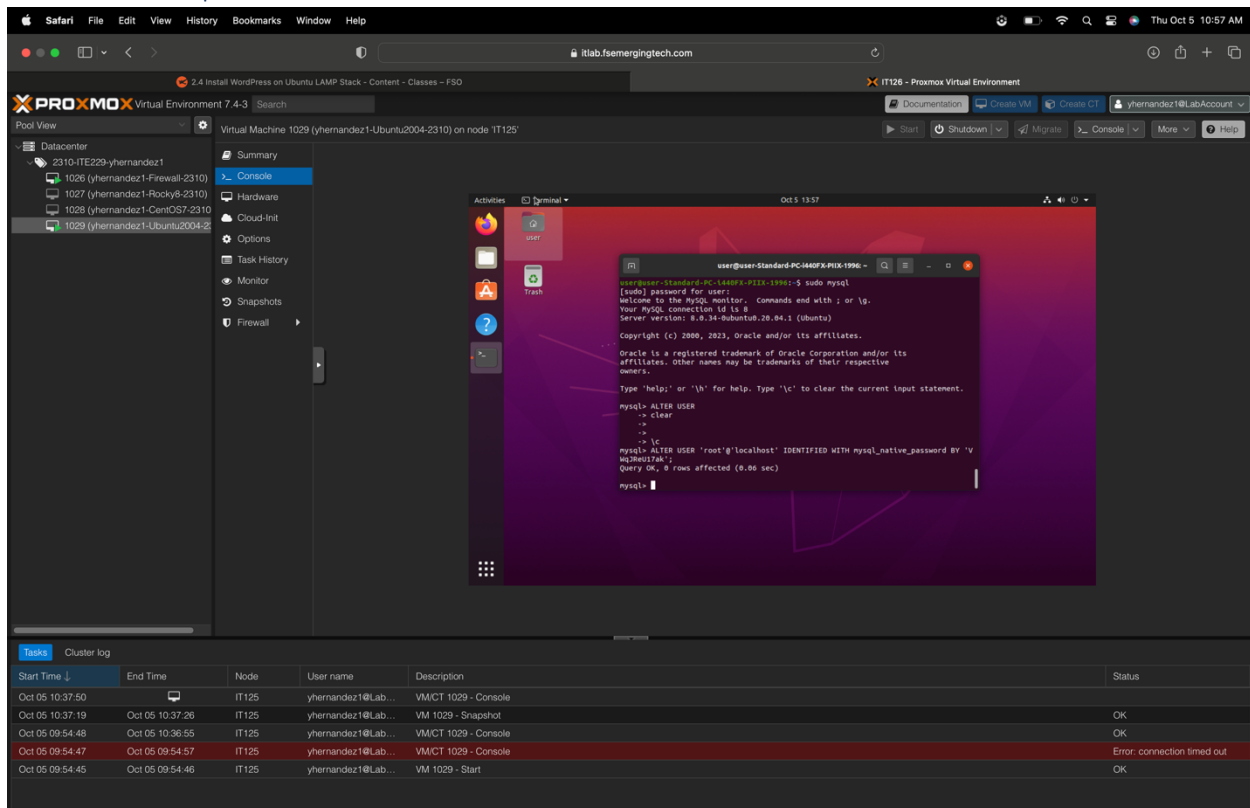


The screenshot shows a Proxmox Virtual Environment (VE) interface. The main window displays a terminal session for a virtual machine named '1029 (yhernandez1-Ubuntu2004-2310)' on node 'IT125'. The terminal output shows the installation of MySQL server 8.0 (8.0.34-0ubuntu0.20.04.1) and the configuration of the MySQL service. The tasks table at the bottom provides a detailed log of the operations performed.

Start Time	End Time	Node	User name	Description	Status
Oct 05 10:37:50		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 10:37:19	Oct 05 10:37:26	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK
Oct 05 09:54:48	Oct 05 10:36:55	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 09:54:47	Oct 05 09:54:57	IT125	yhernandez1@Lab...	VMCT 1029 - Console	Error: connection timed out
Oct 05 09:54:45	Oct 05 09:54:46	IT125	yhernandez1@Lab...	VM 1029 - Start	OK
Oct 05 09:54:17	Oct 05 09:54:43	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 05 09:43:21	Oct 05 09:54:16	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK

To install MySQL, we type **sudo apt install mysql-server** on the terminal and type enter.

Alter root user password



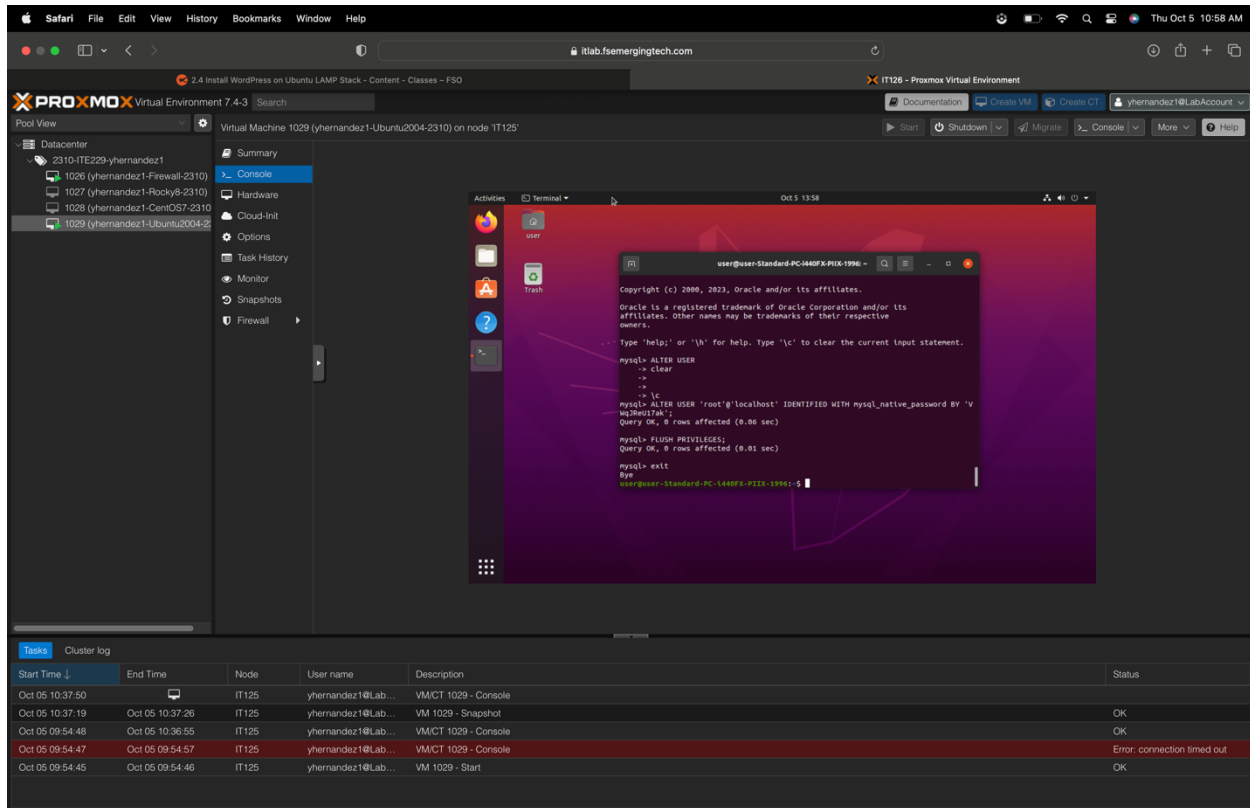
The screenshot shows the Proxmox Virtual Environment (VE) interface. On the left, a sidebar lists virtual machines, including '1029 (yhernandez1-Ubuntu2004-2310)'. The main panel displays a terminal window for this VM. The terminal shows the user 'user' at the prompt, typing 'sudo mysql'. The MySQL CLI prompt 'mysql>' appears, followed by the command 'ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'VqBz0u1ak';'. The terminal output shows 'Query OK, 0 rows affected (0.00 sec)'.

Start Time	End Time	Node	User name	Description	Status
Oct 05 10:37:50		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 10:37:19	Oct 05 10:37:26	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK
Oct 05 09:54:48	Oct 05 10:36:55	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 09:54:47	Oct 05 09:54:57	IT125	yhernandez1@Lab...	VMCT 1029 - Console	Error: connection timed out
Oct 05 09:54:45	Oct 05 09:54:46	IT125	yhernandez1@Lab...	VM 1029 - Start	OK

To alter the root user password, you must load the MySQL CLI; therefore, you type **sudo mysql**, then press enter MySQL will show up. By this time, we had created a password through a website or on our own. Then we will type **ALTER USER** (in uppercase) **'root'@'localhost'** **IDENTIFIED WITH** (in uppercase) **mysql_native_password BY** '[add password]'; then press enter.

NOTE: Document root user password in table at top of document.

Flush Privileges



The screenshot shows the Proxmox Virtual Environment (VE) interface. On the left, a sidebar lists various virtual machines (VMs) under the 'Datacenter' tab. The main panel displays the 'Console' view for VM 1029 (yhernandez1-Ubuntu2004-2310) on node IT125. The terminal window shows the following commands and output:

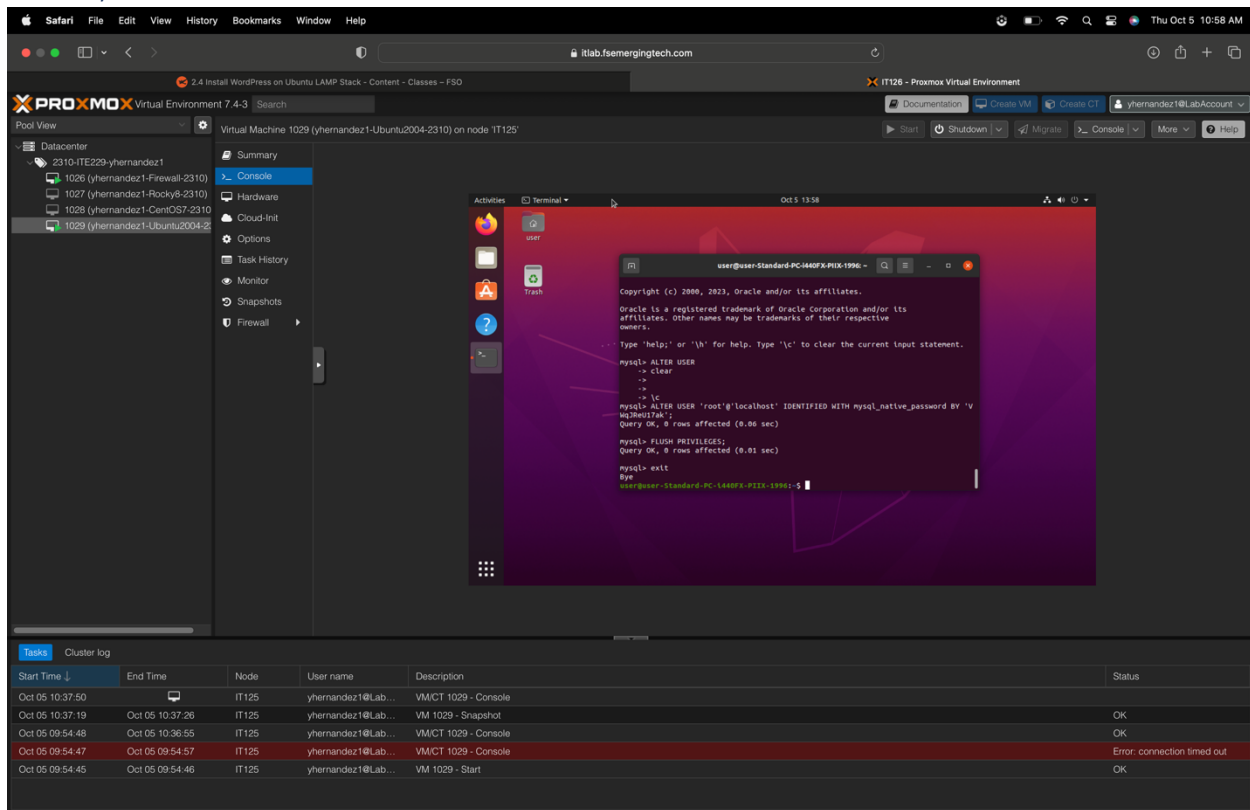
```
Copyright (c) 2000, 2023, Oracle and/or its affiliates.  
Oracle is a registered trademark of Oracle Corporation and/or its  
affiliates. Other names may be trademarks of their respective  
owners.  
-- Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
mysql> ALTER USER  
-> clear  
->  
-> \c  
mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'V  
yhernandez1@;  
Query OK, 0 rows affected (0.00 sec)  
mysql> FLUSH PRIVILEGES;  
Query OK, 0 rows affected (0.01 sec)  
mysql> exit  
Bye  
user@user-Standard-PC-1440FX-PIIX-1996:~$
```

Below the terminal window, a 'Tasks' tab is visible, showing a list of tasks performed on the cluster. The tasks are as follows:

Start Time	End Time	Node	User name	Description	Status
Oct 05 10:37:50		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 10:37:19	Oct 05 10:37:26	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK
Oct 05 09:54:48	Oct 05 10:36:55	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 09:54:47	Oct 05 09:54:57	IT125	yhernandez1@Lab...	VMCT 1029 - Console	Error: connection timed out
Oct 05 09:54:45	Oct 05 09:54:46	IT125	yhernandez1@Lab...	VM 1029 - Start	OK

To flush privileges, type **FLUSH PRIVILEGES** on the command line, then enter.

Quit MySQL



The screenshot shows a Proxmox Virtual Environment interface. On the left, a sidebar lists several virtual machines (VMs) including '2310-ITE229-yhernandez1', '1026 (yhernandez1-Firewall-2310)', '1027 (yhernandez1-Rocky8-2310)', '1028 (yhernandez1-CentOS7-2310)', and '1029 (yhernandez1-Ubuntu2004-2)'. The main area displays the 'Summary' tab for VM 1029. A terminal window is open, showing a MySQL session. The terminal output is as follows:

```
Copyright (c) 2000, 2023, Oracle and/or its affiliates.  
Oracle is a registered trademark of Oracle Corporation and/or its  
affiliates. Other names may be trademarks of their respective  
owners.  
-- Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.  
mysql> ALTER USER  
-> clear  
->  
-> \c  
mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'V';  
Query OK, 0 rows affected (0.00 sec)  
mysql> FLUSH PRIVILEGES;  
Query OK, 0 rows affected (0.01 sec)  
mysql> exit  
Bye  
user@user-Standard-PC-1460FX-P11X-1996:~$
```

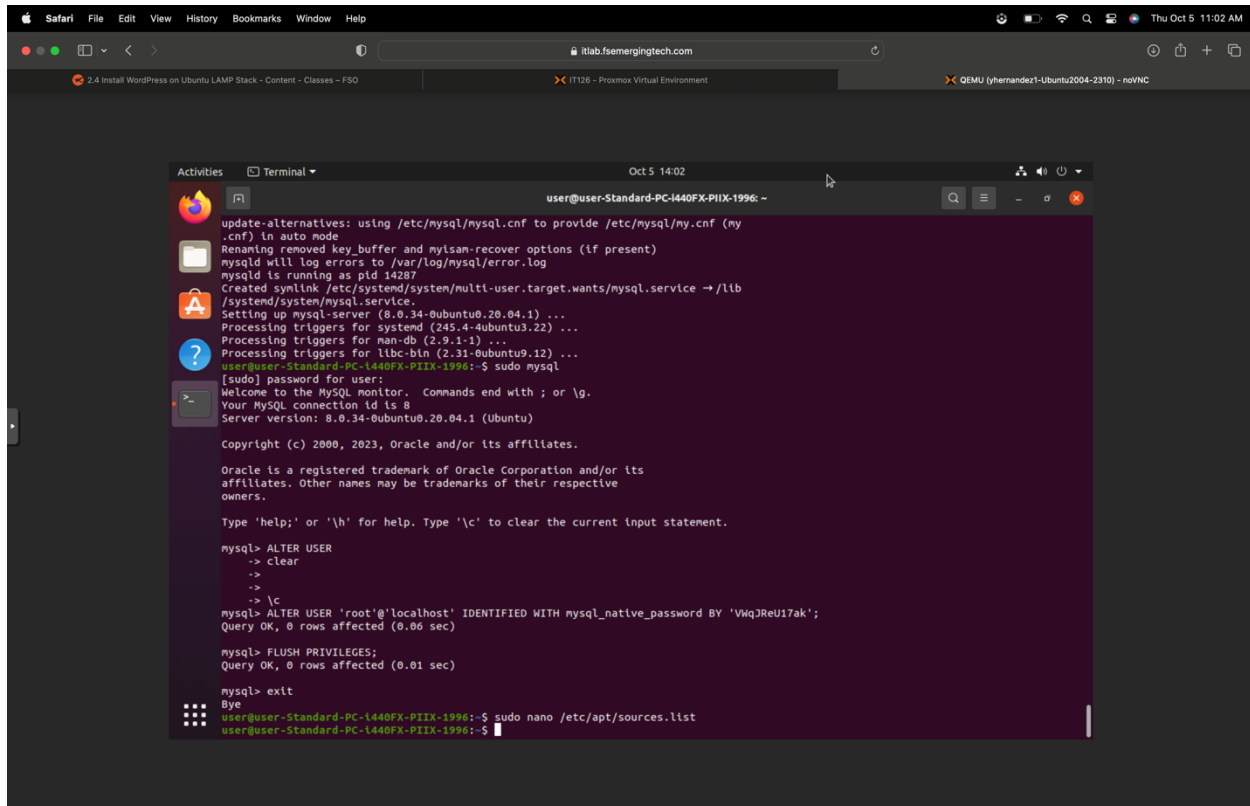
Below the terminal window, a 'Tasks' table is visible, showing a list of operations performed on the VM. The table has columns for 'Start Time', 'End Time', 'Node', 'User name', 'Description', and 'Status'.

Start Time	End Time	Node	User name	Description	Status
Oct 05 10:37:50		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 10:37:19	Oct 05 10:37:26	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK
Oct 05 09:54:48	Oct 05 10:36:55	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 09:54:47	Oct 05 09:54:57	IT125	yhernandez1@Lab...	VMCT 1029 - Console	Error: connection timed out
Oct 05 09:54:45	Oct 05 09:54:46	IT125	yhernandez1@Lab...	VM 1029 - Start	OK

To quit MySQL, you type **exit** and then enter. This will exit you out of MySQL.

Install PHP

Edit Sources.list File



```
user@user-Standard-PC-I440FX-PIIX-1996: ~$ sudo update-alternatives --install /etc/mysql/mysql.conf.d/mysqld.cnf /etc/mysql/mysql.conf.d/mysqld.cnf /etc/mysql/my.cnf (my.cnf) in auto mode
update-alternatives: using /etc/mysql/mysql.conf to provide /etc/mysql/my.cnf (my.cnf) in auto mode
Renaming removed key buffer and myisam-recover options (if present)
mysqld will log errors to /var/log/mysql/error.log
mysqld is running as pid 14287
Created symlink /etc/systemd/system/multi-user.target.wants/mysql.service → /lib/systemd/system/mysql.service.
Setting up mysql-server (8.0.34-0ubuntu0.20.04.1) ...
Processing triggers for systemd (245.4-4ubuntu3.22) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.12) ...
user@user-Standard-PC-I440FX-PIIX-1996:~$ sudo mysql
[sudo] password for user:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.34-0ubuntu0.20.04.1 (Ubuntu)

Copyright (c) 2000, 2023, Oracle and/or its affiliates.

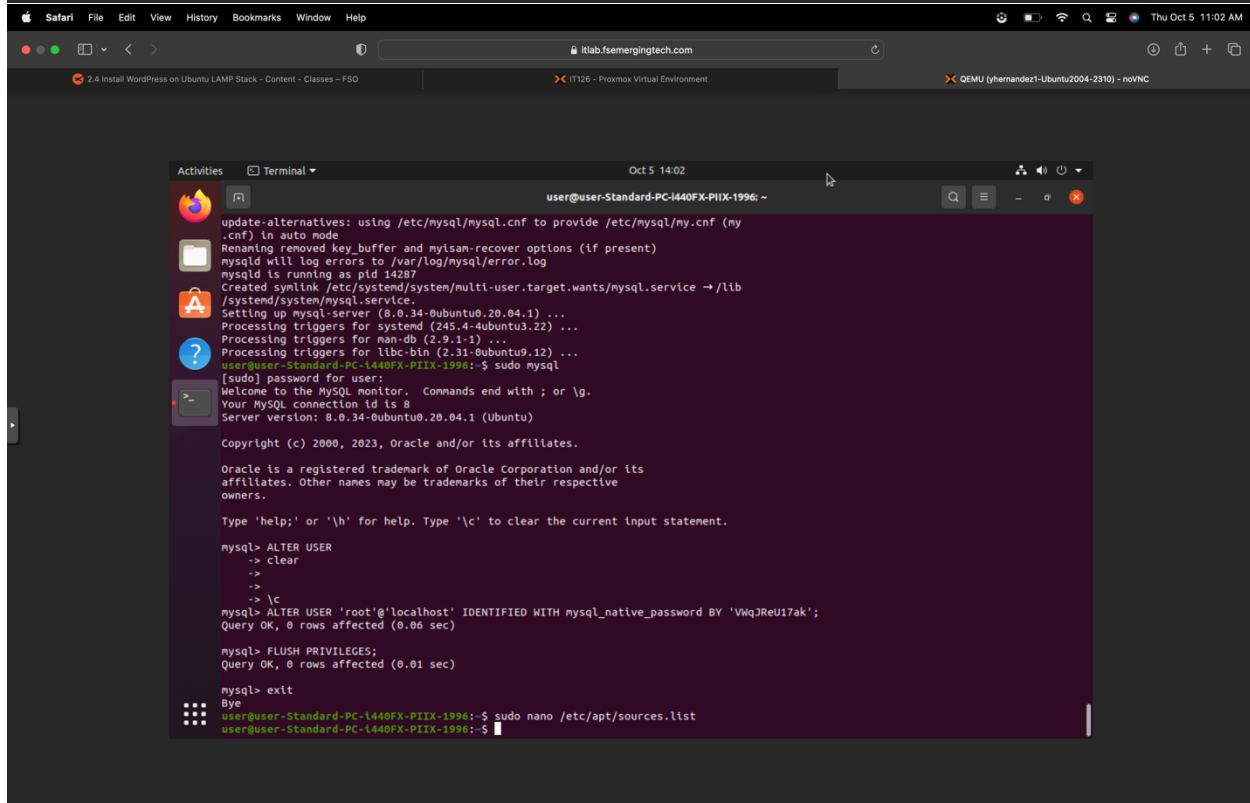
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> ALTER USER
-> clear
->
-> \c
mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'Vwq2ReU17ak';
Query OK, 0 rows affected (0.06 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.01 sec)

mysql> exit
Bye
user@user-Standard-PC-I440FX-PIIX-1996:~$ sudo nano /etc/apt/sources.list
user@user-Standard-PC-I440FX-PIIX-1996:~$
```



```
user@user-Standard-PC-I440FX-PIIX-1996: ~$ sudo update-alternatives --install /etc/mysql/mysql.conf.d/mysqld.cnf /etc/mysql/mysql.conf.d/mysqld.cnf /etc/mysql/my.cnf (my.cnf) in auto mode
update-alternatives: using /etc/mysql/mysql.conf to provide /etc/mysql/my.cnf (my.cnf) in auto mode
Renaming removed key buffer and myisam-recover options (if present)
mysqld will log errors to /var/log/mysql/error.log
mysqld is running as pid 14287
Created symlink /etc/systemd/system/multi-user.target.wants/mysql.service → /lib/systemd/system/mysql.service.
Setting up mysql-server (8.0.34-0ubuntu0.20.04.1) ...
Processing triggers for systemd (245.4-4ubuntu3.22) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for libc-bin (2.31-0ubuntu9.12) ...
user@user-Standard-PC-I440FX-PIIX-1996:~$ sudo mysql
[sudo] password for user:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 8
Server version: 8.0.34-0ubuntu0.20.04.1 (Ubuntu)

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affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

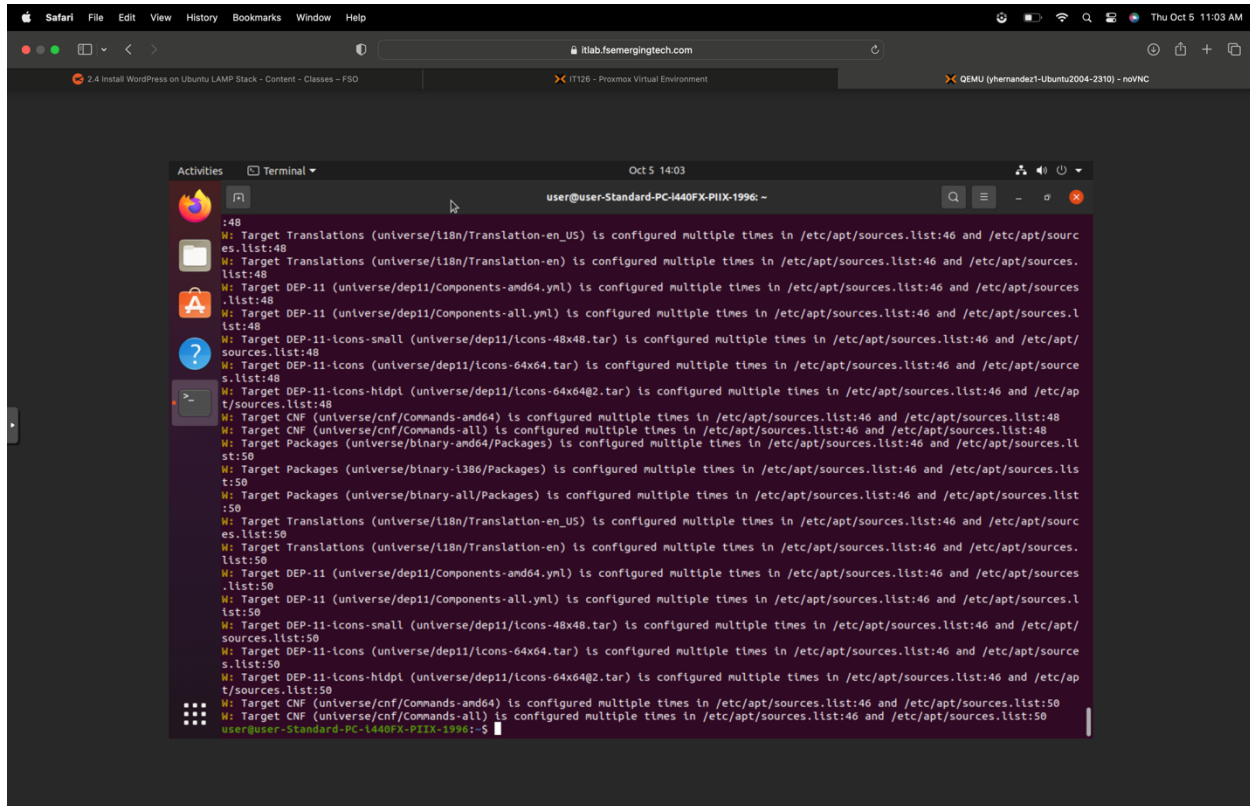
mysql> ALTER USER
-> clear
->
-> \c
mysql> ALTER USER 'root'@'localhost' IDENTIFIED WITH mysql_native_password BY 'Vwq2ReU17ak';
Query OK, 0 rows affected (0.06 sec)

mysql> FLUSH PRIVILEGES;
Query OK, 0 rows affected (0.01 sec)

mysql> exit
Bye
user@user-Standard-PC-I440FX-PIIX-1996:~$ sudo nano /etc/apt/sources.list
user@user-Standard-PC-I440FX-PIIX-1996:~$
```

Add “universe” to all URLs

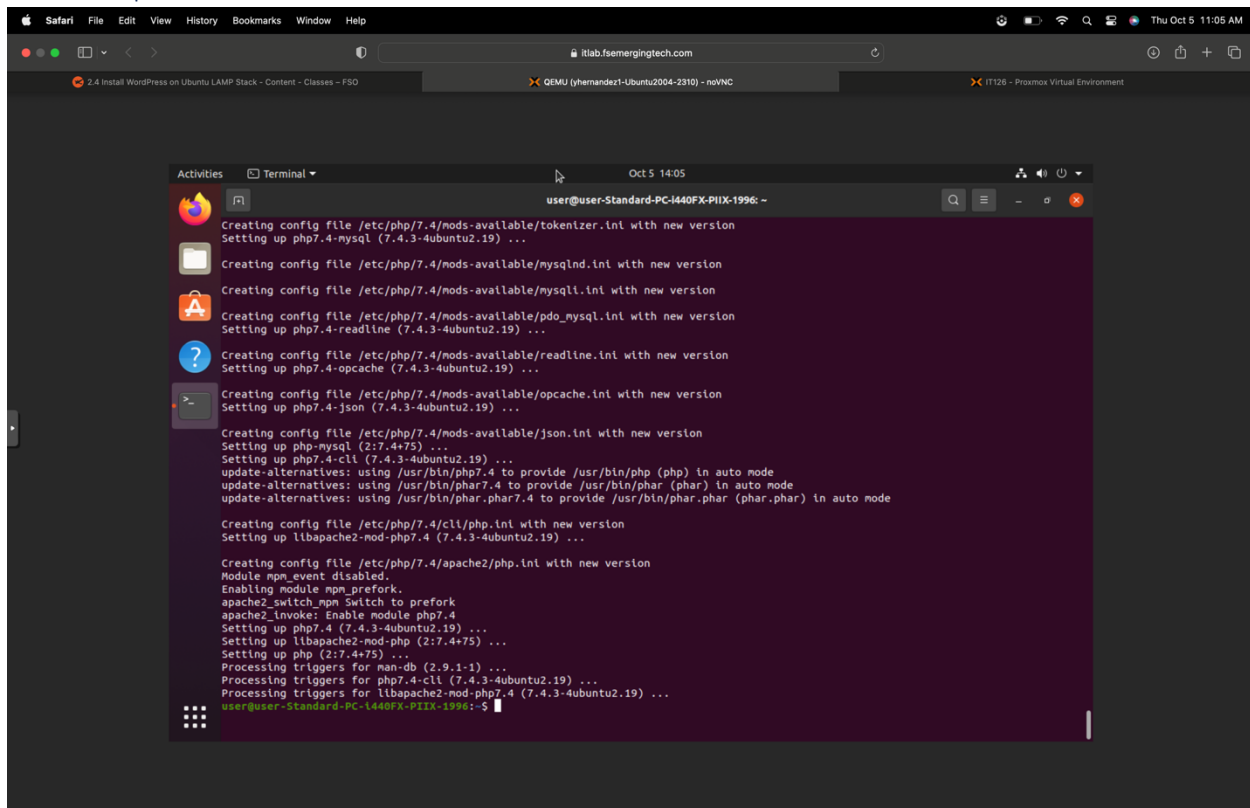
Update Ubuntu (refreshes the repolist)



```
user@user-Standard-PC-i440FX-PIIX-1996:~$ sudo apt update
W: Target Translations (universe/l18n/Translation-en_US) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:48
W: Target Translations (universe/l18n/Translation-en) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:48
W: Target DEP-11 (universe/dep11/Components-and64.yml) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:48
W: Target DEP-11 (universe/dep11/Components-all.yml) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:48
W: Target DEP-11-icons-small (universe/dep11/icons-48x48.tar) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:48
W: Target DEP-11-icons (universe/dep11/icons-64x64.tar) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:48
W: Target DEP-11-icons-hidpi (universe/dep11/icons-64x64@2.tar) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:48
W: Target CNF (universe/cnf/Commands-and64) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:48
W: Target CNF (universe/cnf/Commands-all) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:48
W: Target Packages (universe/binary-and64/Packages) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
W: Target Packages (universe/binary-l386/Packages) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
W: Target Packages (universe/binary-all/Packages) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
W: Target Translations (universe/l18n/Translation-en_US) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
W: Target Translations (universe/l18n/Translation-en) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
W: Target DEP-11 (universe/dep11/Components-and64.yml) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
W: Target DEP-11 (universe/dep11/Components-all.yml) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
W: Target DEP-11-icons-small (universe/dep11/icons-48x48.tar) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
W: Target DEP-11-icons (universe/dep11/icons-64x64.tar) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
W: Target DEP-11-icons-hidpi (universe/dep11/icons-64x64@2.tar) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
W: Target CNF (universe/cnf/Commands-and64) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
W: Target CNF (universe/cnf/Commands-all) is configured multiple times in /etc/apt/sources.list:46 and /etc/apt/sources.list:50
user@user-Standard-PC-i440FX-PIIX-1996:~$
```

To update Ubuntu, you type **sudo apt update**, then press enter.

Install Required PHP Libraries



The screenshot shows a terminal window titled "user@user-Standard-PC-I440FX-PIIX-1996: ~" with a timestamp of "Oct 5 14:05". The terminal displays the output of the command `sudo apt install php libapache2-mod-php php-mysql`. The output shows the creation and setting up of various PHP modules and libraries, including `tokenizer`, `mysql`, `mysqli`, `pdo_mysql`, `readline`, `opcache`, `json`, `cli`, and `apache2`. The terminal also shows the installation of `libapache2-mod-php7.4` and the configuration of the `php` module for `apache2`. The terminal output is as follows:

```
Creating config file /etc/php/7.4/mods-available/tokenizer.ini with new version
Setting up php7.4-mysql (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/mods-available/mysqlnd.ini with new version
Creating config file /etc/php/7.4/mods-available/mysqli.ini with new version
Creating config file /etc/php/7.4/mods-available/pdo_mysql.ini with new version
Setting up php7.4-readline (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/mods-available/readline.ini with new version
Setting up php7.4-opcache (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/mods-available/opcache.ini with new version
Setting up php7.4-json (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/mods-available/json.ini with new version
Setting up php-mysql (2:7.4+75) ...
Setting up php7.4-cli (7.4.3-4ubuntu2.19) ...
update-alternatives: using /usr/bin/php7.4 to provide /usr/bin/php (php) in auto mode
update-alternatives: using /usr/bin/phar7.4 to provide /usr/bin/phar (phar) in auto mode
update-alternatives: using /usr/bin/phar.phar7.4 to provide /usr/bin/phar.phar (phar.phar) in auto mode
Creating config file /etc/php/7.4/cli/php.ini with new version
Setting up libapache2-mod-php7.4 (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/apache2/php.ini with new version
Module mpm_event disabled.
Enabling module mpm_prefork.
apache2_switch_mpm Switch to prefork
apache2_invoke: Enable module php7.4
Setting up php7.4 (7.4.3-4ubuntu2.19) ...
Setting up libapache2-mod-php (2:7.4+75) ...
Processing triggers for man-db (2.9.1-1) ...
Processing triggers for php7.4-cli (7.4.3-4ubuntu2.19) ...
Processing triggers for libapache2-mod-php7.4 (7.4.3-4ubuntu2.19) ...
user@user-Standard-PC-I440FX-PIIX-1996:~$
```

To install required PHP libraries, you type `sudo apt install php libapache2-mod-php php-mysql`, then press enter.

The screenshot shows a terminal window titled "user@user-Standard-PC-1440FX-PIIX-1996: -" with a timestamp of "Oct 5 14:09". The terminal output shows the installation of various PHP 7.4 modules on a Proxmox Virtual Environment (PVE) using the command `dpkg --get-selections | grep -E 'php7.4-.*'`. The output lists the following modules and their versions:

- `php7.4-curl (7.4.3-4ubuntu2.19) ...`
- `php7.4-intl (7.4.3-4ubuntu2.19) ...`
- `php7.4-zip (7.4.3-4ubuntu2.19) ...`
- `php7.4-gd (7.4.3-4ubuntu2.19) ...`
- `php7.4-xmlrpc (7.4.3-4ubuntu2.19) ...`
- `php7.4-mbstring (7.4.3-4ubuntu2.19) ...`
- `php7.4-soap (7.4.3-4ubuntu2.19) ...`

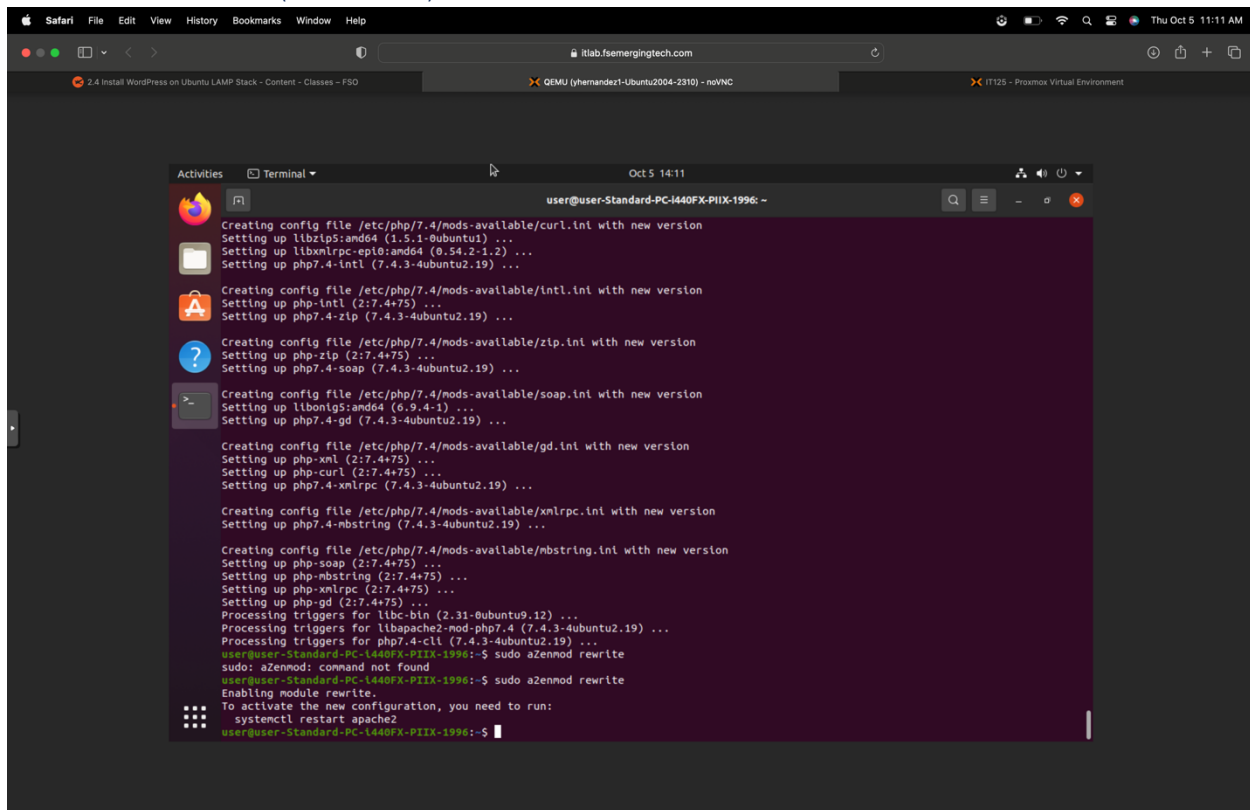
The terminal also shows the installation of the `php7.4-cli` package, which is the command-line interface for PHP 7.4. The output for `php7.4-cli` is:

```

Creating config file /etc/php/7.4/mods-available/xsl.ini with new version
Setting up php7.4-curl (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/mods-available/curl.ini with new version
Setting up libzip5:amd64 (1.5.1-0ubuntu1) ...
Setting up libxmlrpc-epi6:amd64 (0.54.2-1.2) ...
Setting up php7.4-intl (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/mods-available/intl.ini with new version
Setting up php-intl (2:7.4+75) ...
Setting up php7.4-zip (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/mods-available/zip.ini with new version
Setting up php-zip (2:7.4+75) ...
Setting up php7.4-soap (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/mods-available/soap.ini with new version
Setting up libonig5:amd64 (6.9.4-1) ...
Setting up php7.4-gd (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/mods-available/gd.ini with new version
Setting up php-xml (2:7.4+75) ...
Setting up php-curl (2:7.4+75) ...
Setting up php7.4-xmlrpc (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/mods-available/xmlrpc.ini with new version
Setting up php7.4-mbstring (7.4.3-4ubuntu2.19) ...
Creating config file /etc/php/7.4/mods-available/mbstring.ini with new version
Setting up php-soap (2:7.4+75) ...
Setting up php-mbstring (2:7.4+75) ...
Setting up php-xmlrpc (2:7.4+75) ...
Setting up php-gd (2:7.4+75) ...
Processing triggers for libc-bin (2.31-0ubuntu9.12) ...
Processing triggers for libapache2-mod-php7.4 (7.4.3-4ubuntu2.19) ...
Processing triggers for php7.4-cgi (7.4.3-4ubuntu2.19) ...
user@user-Standard-PC-1440FX-PIIX-1996:~$

```

Enable URL Rewrites (clean URLs)



The screenshot shows a terminal window with the following output:

```
Creating config file /etc/php/7.4/mods-available/curl.ini with new version
Setting up libzip5:amd64 (1.5.1-0ubuntu1) ...
Setting up libxmlrpc-epi0:amd64 (0.54.2-1.2) ...
Setting up php7.4-intl (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/intl.ini with new version
Setting up php-intl (2:7.4+75) ...
Setting up php7.4-zip (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/zip.ini with new version
Setting up php-zip (2:7.4+75) ...
Setting up php7.4-soap (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/soap.ini with new version
Setting up libonig5:amd64 (6.9.4-1) ...
Setting up php7.4-gd (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/gd.ini with new version
Setting up php-xml (2:7.4+75) ...
Setting up php-curl (2:7.4+75) ...
Setting up php7.4-xmlrpc (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/xmlrpc.ini with new version
Setting up php7.4-mbstring (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/mbedtls.ini with new version
Setting up php-soap (2:7.4+75) ...
Setting up php-mbedtls (2:7.4+75) ...
Setting up php-xmlrpc (2:7.4+75) ...
Setting up php-gd (2:7.4+75) ...
Processing triggers for libc-bin (2.31-0ubuntu9.12) ...
Processing triggers for libapache2-mod-php7.4 (7.4.3-4ubuntu2.19) ...
Processing triggers for php7.4-cgi (7.4.3-4ubuntu2.19) ...
user@user-Standard-PC-l440FX-PIIX-1996:~$ sudo a2enmod rewrite
sudo: a2enmod: command not found
user@user-Standard-PC-l440FX-PIIX-1996:~$ sudo a2enmod rewrite
Enabling module rewrite.
To activate the new configuration, you need to run:
systemctl restart apache2
user@user-Standard-PC-l440FX-PIIX-1996:~$
```

To enable URL Rewrites, type **sudo a2enmod rewrite**, then press enter.

Restart Apache Service

The screenshot shows a terminal window with the following output:

```

Setting up libzip5:amd64 (1.5.1-0ubuntu1) ...
Setting up libxmlrpc-epi0:amd64 (0.54.2-1.2) ...
Setting up php7.4-intl (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/intl.ini with new version
Setting up php-intl (2:7.4+75) ...
Setting up php7.4-zip (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/zip.ini with new version
Setting up php-zip (2:7.4+75) ...
Setting up php7.4-soap (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/soap.ini with new version
Setting up libonig5:amd64 (6.9.4-1) ...
Setting up php7.4-gd (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/gd.ini with new version
Setting up php-xsl (2:7.4+75) ...
Setting up php-curl (2:7.4+75) ...
Setting up php7.4-xmlrpc (7.4.3-4ubuntu2.19) ...

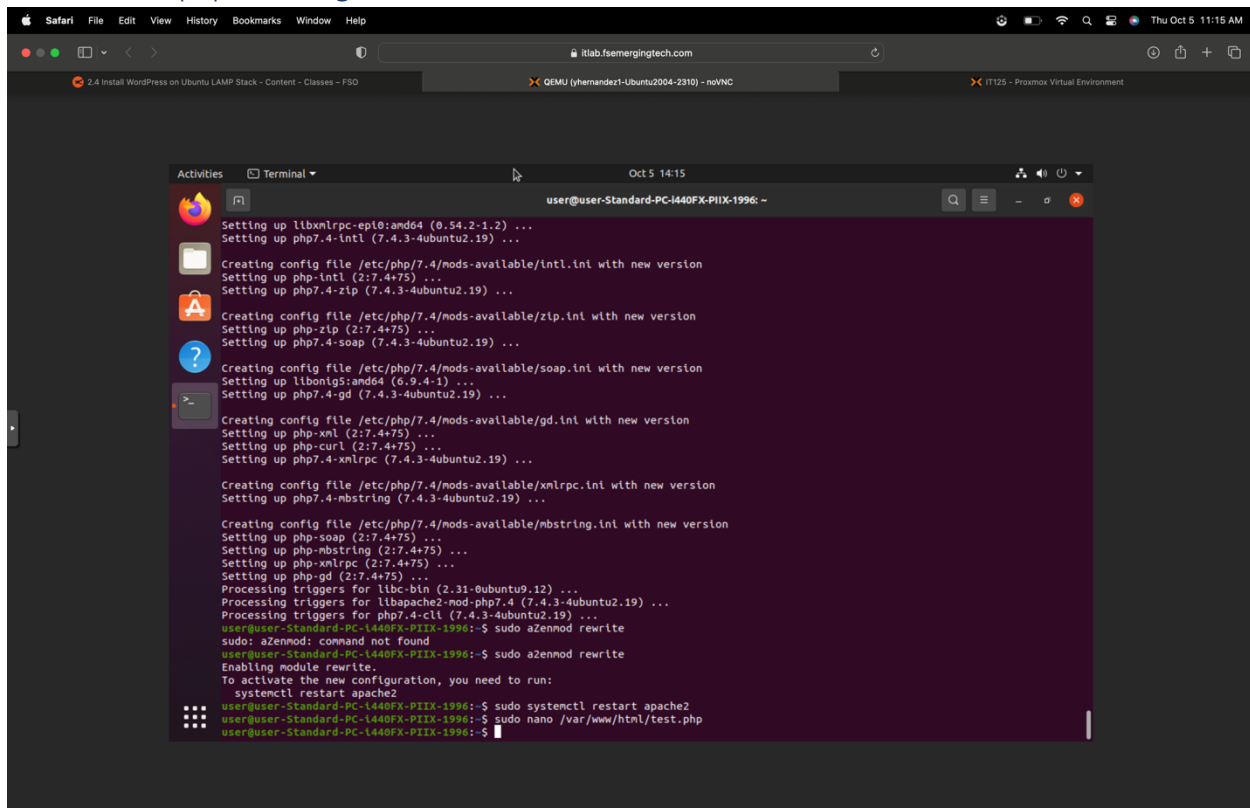
Creating config file /etc/php/7.4/mods-available/xmlrpc.ini with new version
Setting up php7.4-mbstring (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/mbstring.ini with new version
Setting up php-soap (2:7.4+75) ...
Setting up php-mbstring (2:7.4+75) ...
Setting up php-xmlrpc (2:7.4+75) ...
Setting up php-gd (2:7.4+75) ...
Processing triggers for libc-bin (2.31-0ubuntu9.12) ...
Processing triggers for libapache2-mod-php7.4 (7.4.3-4ubuntu2.19) ...
Processing triggers for php7.4-cgi (7.4.3-4ubuntu2.19) ...
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo azenmod rewrite
sudo: azenmod: command not found
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo azenmod rewrite
Enabling module rewrite.
To activate the new configuration, you need to run:
    systemctl restart apache2
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo systemctl restart apache2
user@user-Standard-PC-1440FX-PIIX-1996:~$

```

To restart Apache, you type **sudo systemctl restart apache2**

Create a test.php Web Page



The screenshot shows a terminal window titled "user@user-Standard-PC-l440FX-PIIX-1996: ~" with a timestamp of "Oct 5 14:15". The terminal displays the following commands and output:

```
Setting up libxmlrpc-epi0:amd64 (0.54.2-1.2) ...
Setting up php7.4-intl (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/intl.ini with new version
Setting up php-intl (2:7.4+75) ...
Setting up php7.4-zip (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/zip.ini with new version
Setting up php-zip (2:7.4+75) ...
Setting up php7.4-soap (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/soap.ini with new version
Setting up libonigjs:amd64 (6.9.4-1) ...
Setting up php7.4-gd (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/gd.ini with new version
Setting up php-xml (2:7.4+75) ...
Setting up php-curl (2:7.4+75) ...
Setting up php7.4-xmlrpc (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/xmlrpc.ini with new version
Setting up php7.4-mbstring (7.4.3-4ubuntu2.19) ...

Creating config file /etc/php/7.4/mods-available/mbedtls.ini with new version
Setting up php-soap (2:7.4+75) ...
Setting up php-mbstring (2:7.4+75) ...
Setting up php-xmlrpc (2:7.4+75) ...
Setting up php-gd (2:7.4+75) ...
Processing triggers for libc-bin (2.31-0ubuntu9.12) ...
Processing triggers for libapache2-mod-php7.4 (7.4.3-4ubuntu2.19) ...
Processing triggers for php7.4-cgi (7.4.3-4ubuntu2.19) ...
user@user-Standard-PC-l440FX-PIIX-1996:~$ sudo a2enmod rewrite
sudo: a2enmod: command not found
user@user-Standard-PC-l440FX-PIIX-1996:~$ sudo a2enmod rewrite
Enabling module rewrite.
To activate the new configuration, you need to run:
  systemctl restart apache2
user@user-Standard-PC-l440FX-PIIX-1996:~$ sudo systemctl restart apache2
user@user-Standard-PC-l440FX-PIIX-1996:~$ sudo nano /var/www/html/test.php
user@user-Standard-PC-l440FX-PIIX-1996:~$
```

To create a test.php web page, type **sudo nano /var/www/html/test.php**, then enter. When the nano page comes up, you will order **<?php phpinfo(); ?>**, then you will save it by pressing (Control ^ and X) and exit by pressing enter.

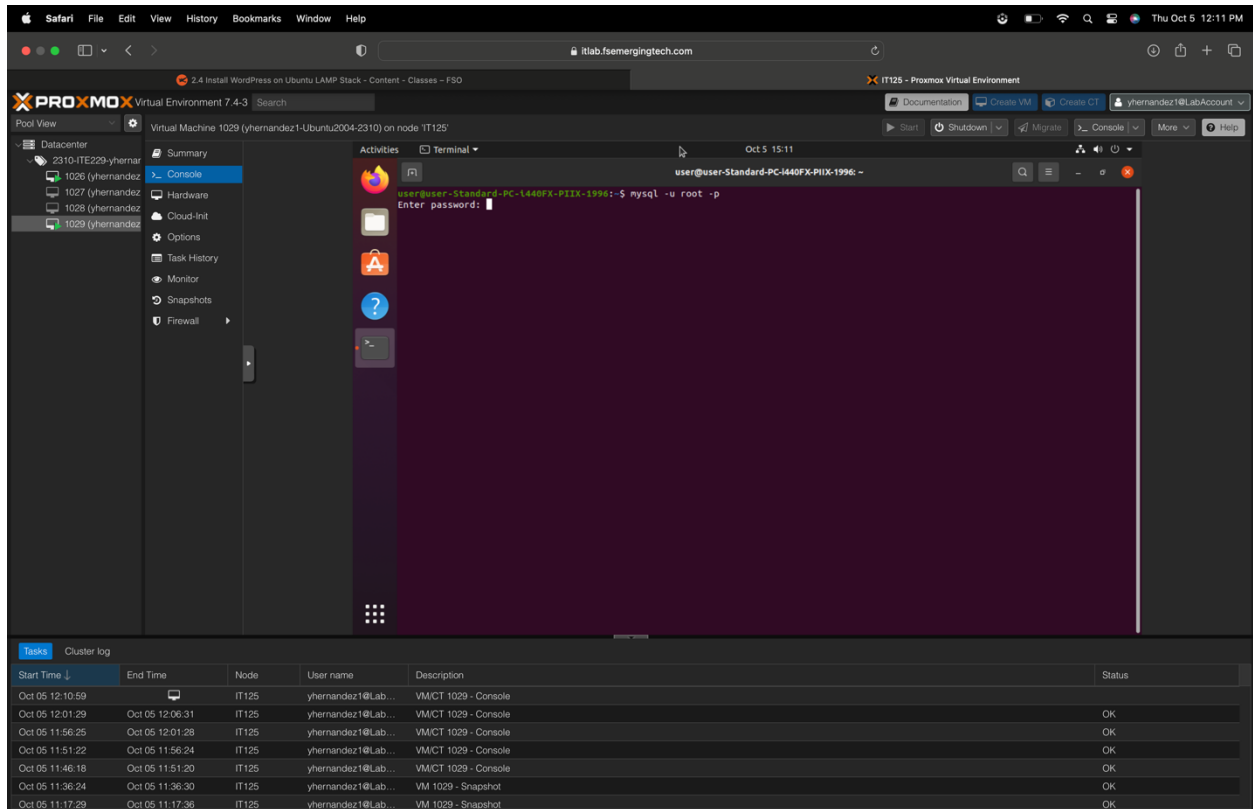
Test the test.php Web Page

The screenshot shows a Proxmox Virtual Environment (VE) interface. In the center, a virtual machine (VM) named '1029 (yhernandez)' is running. A Firefox web browser is open within the VM, displaying the PHP Version 7.4.3-4ubuntu2.19 page. The browser address bar shows '10.10.229.12/test.php'. The Proxmox interface includes a sidebar with 'Datacenter' and 'Virtual Machine 1029' options, and a 'Tasks' table at the bottom.

Start Time	End Time	Node	User name	Description	Status
Oct 05 11:10:11		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 11:10:03		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 11:07:31	Oct 05 11:09:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:01:05	Oct 05 11:10:02	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:00:16	Oct 05 11:10:17	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 10:59:36	Oct 05 10:59:43	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK
Oct 05 10:37:50	Oct 05 10:59:25	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To test the test.php web page, go to a Firefox web browser, and on the address bar, type **10.10.229.12/test.php**. Then you press enter, and you will get the PHP Version page.

Database Configuration in MySQL

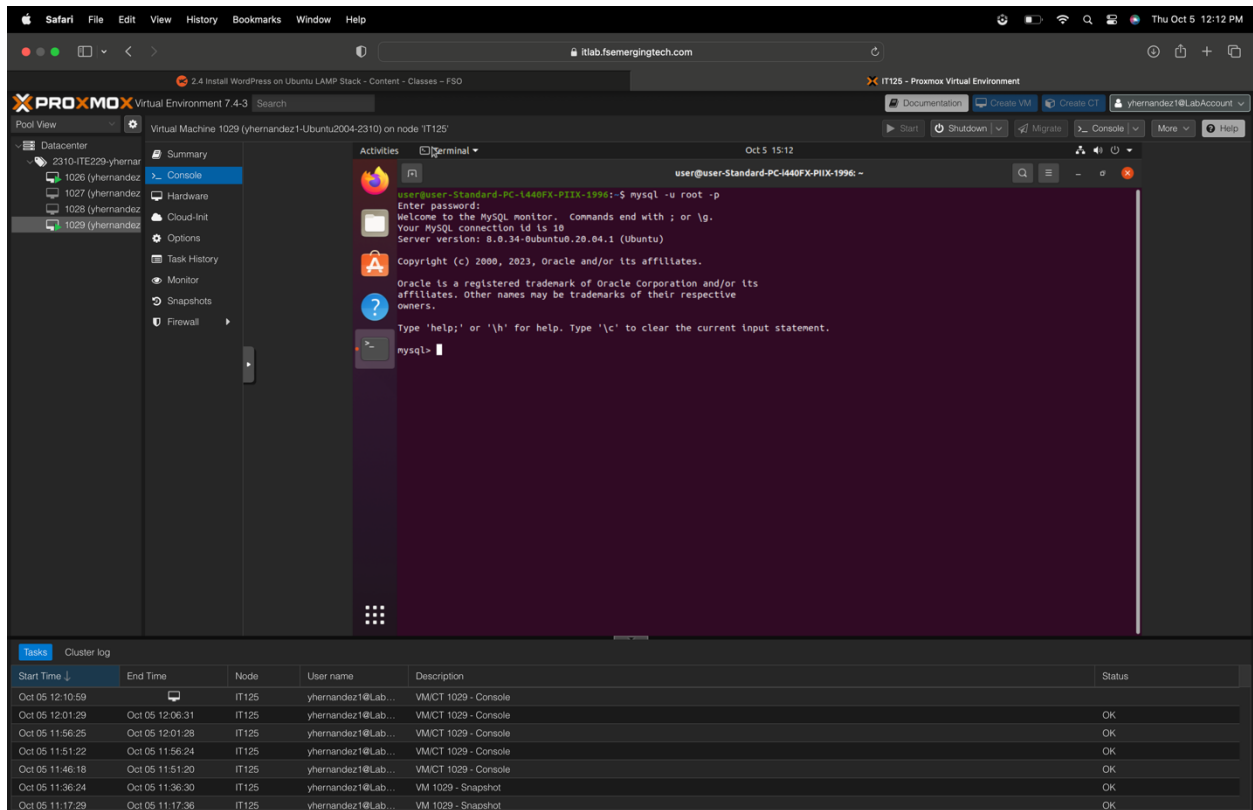


The screenshot shows the Proxmox Virtual Environment (VE) interface. The main window displays a terminal for a virtual machine named 'yhernandez1-Ubuntu2004-2310' on node 'IT125'. The terminal prompt is 'user@user-Standard-PC-1440FX-PIIX-1996:~\$'. The user has entered the command 'mysql -u root -p' and is prompted to enter a password. The left sidebar shows the 'Datacenter' view with a list of virtual machines. The bottom panel shows a 'Tasks' table with a cluster log.

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:10:59		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:46:18	Oct 05 11:51:20	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:36:24	Oct 05 11:36:30	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK
Oct 05 11:17:29	Oct 05 11:17:36	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK

To log in to the Database Configuration in MySQL on the command line, type **mysql -u root -p**, then press enter.

Log into MySQL Database

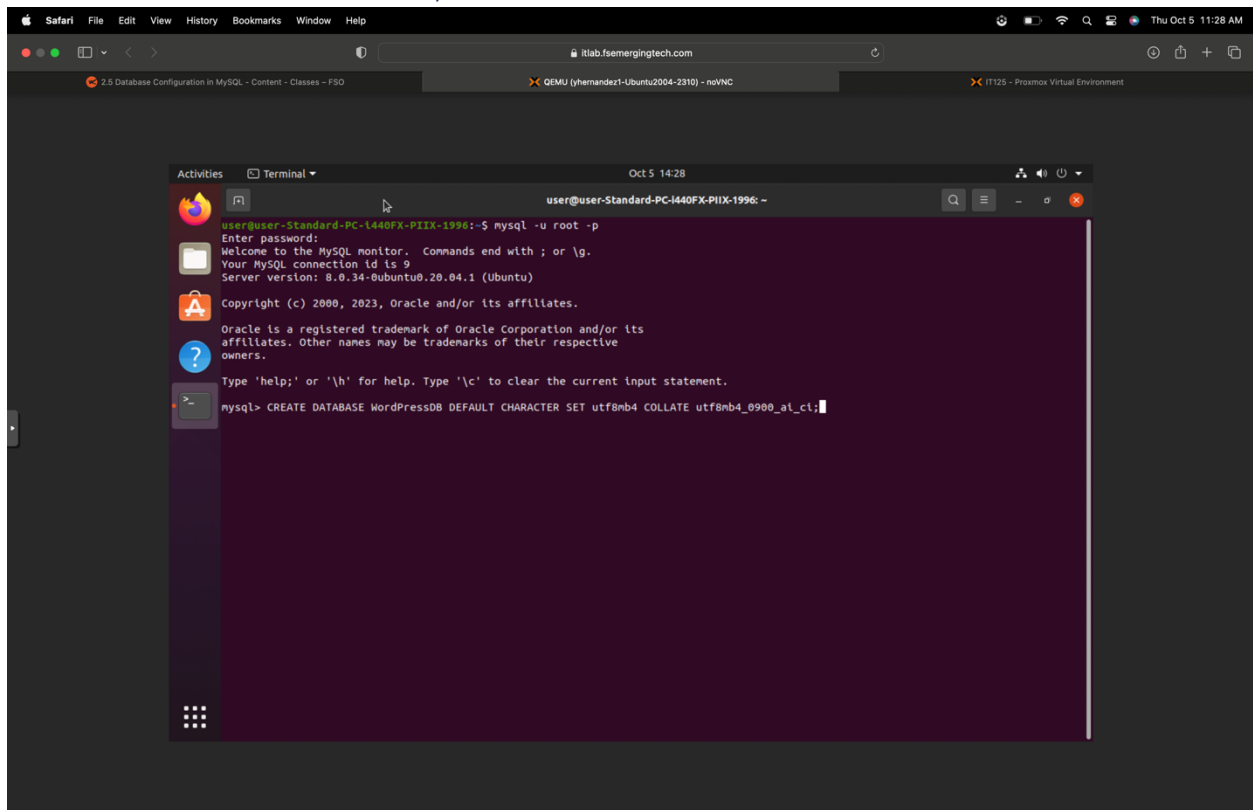


The screenshot shows a Proxmox Virtual Environment interface. On the left, a sidebar lists virtual machines: 2310-ITE229-yhernandez, 1026 (yhernandez), 1027 (yhernandez), 1028 (yhernandez), and 1029 (yhernandez). The main panel displays the terminal for VM 1029. The terminal output shows the user running the command `mysql -u root -p`, entering a password, and being prompted for the MySQL connection ID. The terminal also displays the MySQL version (8.0.34-0ubuntu0.20.04.1) and copyright information. The user is now at the `mysql>` prompt.

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:10:59		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:46:18	Oct 05 11:51:20	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:36:24	Oct 05 11:36:30	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK
Oct 05 11:17:29	Oct 05 11:17:36	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK

To log in to MySQL, you have to type in your password.

Create WordPress Database in MySQL

A screenshot of a web browser window displaying a terminal session. The browser's address bar shows 'itlab.fsemergingtech.com'. The terminal window is titled 'Terminal' and shows a user logging into a MySQL shell. The user enters 'mysql -u root -p', followed by a password prompt. After entering the password, the MySQL monitor displays a welcome message and the server version '8.0.34-0ubuntu0.20.04.1 (Ubuntu)'. The user then enters the command 'CREATE DATABASE WordPressDB DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_0900_ai_ci;' and the prompt returns to 'mysql>'.

```
user@user-Standard-PC-L440FX-PIIX-1996:~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 8.0.34-0ubuntu0.20.04.1 (Ubuntu)

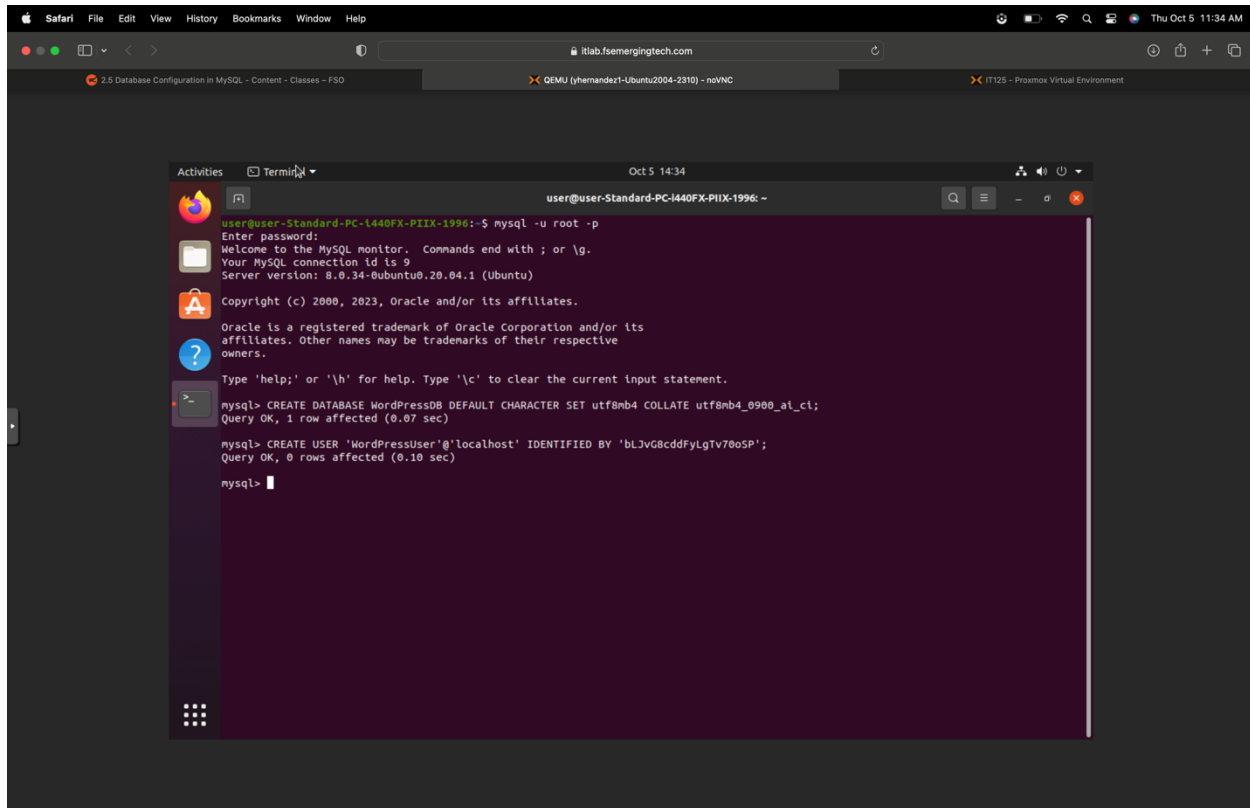
Copyright (c) 2000, 2023, Oracle and/or its affiliates.
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE DATABASE WordPressDB DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_0900_ai_ci;
```

To create y Database on the command line, type **CREATE DATABASE WordPressDB DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_0900_ai_ci;** then enter.

Create WordPress User for MySQL Database



The screenshot shows a terminal window titled "user@user-Standard-PC-l440FX-PIIX-1996: ~" with a timestamp of "Oct 5 14:34". The terminal displays the following commands and output:

```
user@user-Standard-PC-l440FX-PIIX-1996:~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 8.0.34-0ubuntu0.20.04.1 (Ubuntu)

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Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

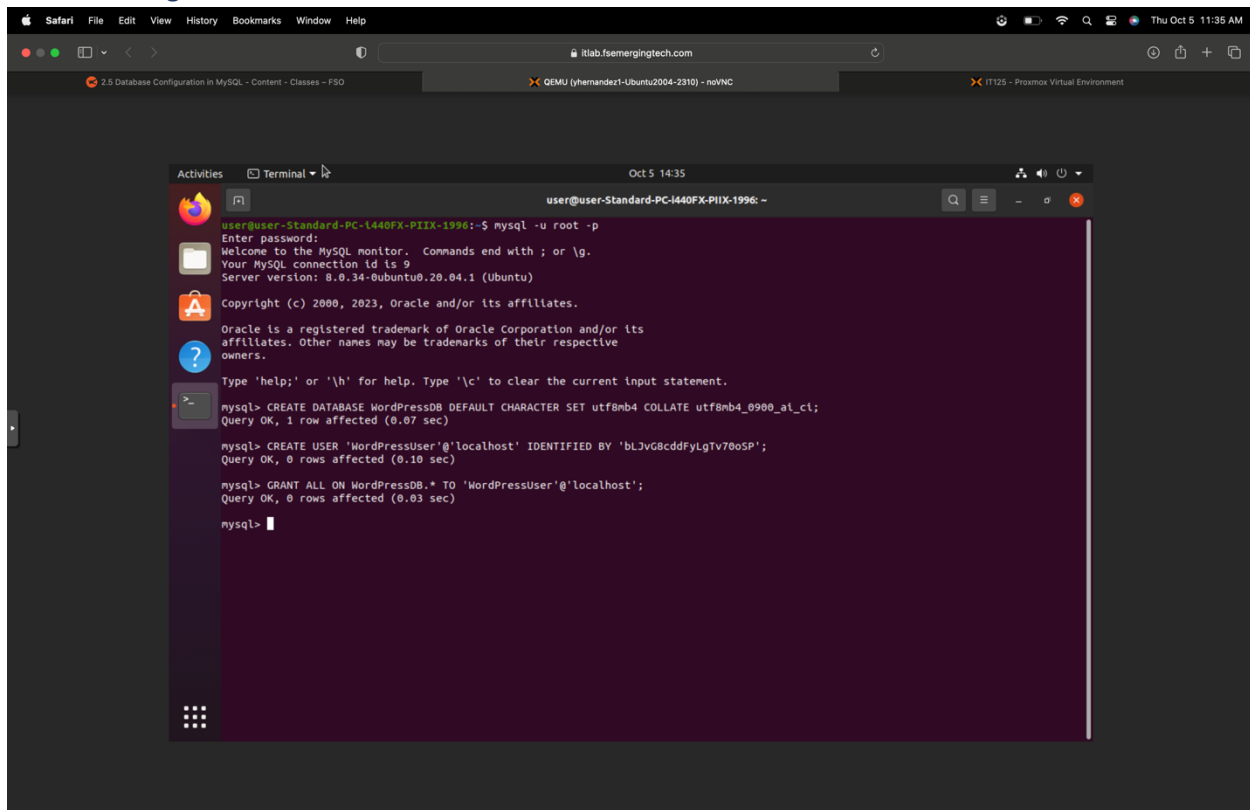
mysql> CREATE DATABASE WordPressDB DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_0900_ai_ci;
Query OK, 1 row affected (0.07 sec)

mysql> CREATE USER 'WordPressUser'@'localhost' IDENTIFIED BY 'bLJvG8cddfYlgTv70oSP';
Query OK, 0 rows affected (0.10 sec)

mysql>
```

To create a WordPress User on the command line, type **CREATE USER 'WordPressUser'@'localhost' IDENTIFIED BY '[add password]'**; then press enter.

Grant Privileges to this New WordPress User



The screenshot shows a terminal window titled "user@user-Standard-PC-l440FX-PIIX-1996: ~" with a timestamp of "Oct 5 14:35". The terminal displays the following commands and output:

```
user@user-Standard-PC-l440FX-PIIX-1996:~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 8.0.34-0ubuntu0.20.04.1 (Ubuntu)

Copyright (c) 2000, 2023, Oracle and/or its affiliates.
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE DATABASE WordPressDB DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_0900_ai_ci;
Query OK, 1 row affected (0.07 sec)

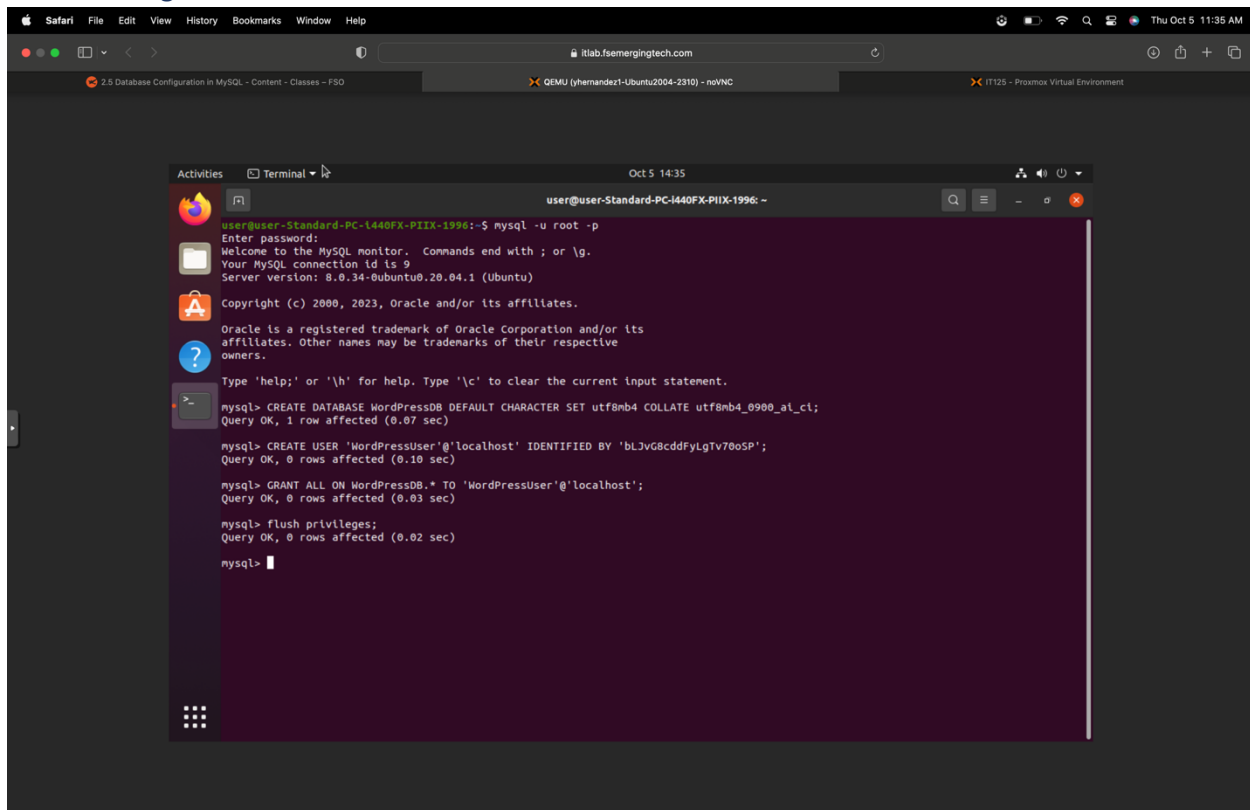
mysql> CREATE USER 'WordPressUser'@'localhost' IDENTIFIED BY 'bLJvG8cddfYlgTv70oSP';
Query OK, 0 rows affected (0.10 sec)

mysql> GRANT ALL ON WordPressDB.* TO 'WordPressUser'@'localhost';
Query OK, 0 rows affected (0.03 sec)

mysql>
```

To grant privileges on the command line, type **GRANT ALL ON WordPressDB.* TO 'WordPressUser'@'localhost';** then press enter.

Flush Privileges



The screenshot shows a terminal window titled "user@user-Standard-PC-l440FX-PIIX-1996: ~" with a timestamp of "Oct 5 14:35". The terminal displays the following commands and output:

```
user@user-Standard-PC-l440FX-PIIX-1996:~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 8.0.34-0ubuntu0.20.04.1 (Ubuntu)

Copyright (c) 2000, 2023, Oracle and/or its affiliates.

Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE DATABASE WordPressDB DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_0900_ai_ci;
Query OK, 1 row affected (0.07 sec)

mysql> CREATE USER 'WordPressUser'@'localhost' IDENTIFIED BY 'bLjvG8cddfYlgTv70oSP';
Query OK, 0 rows affected (0.10 sec)

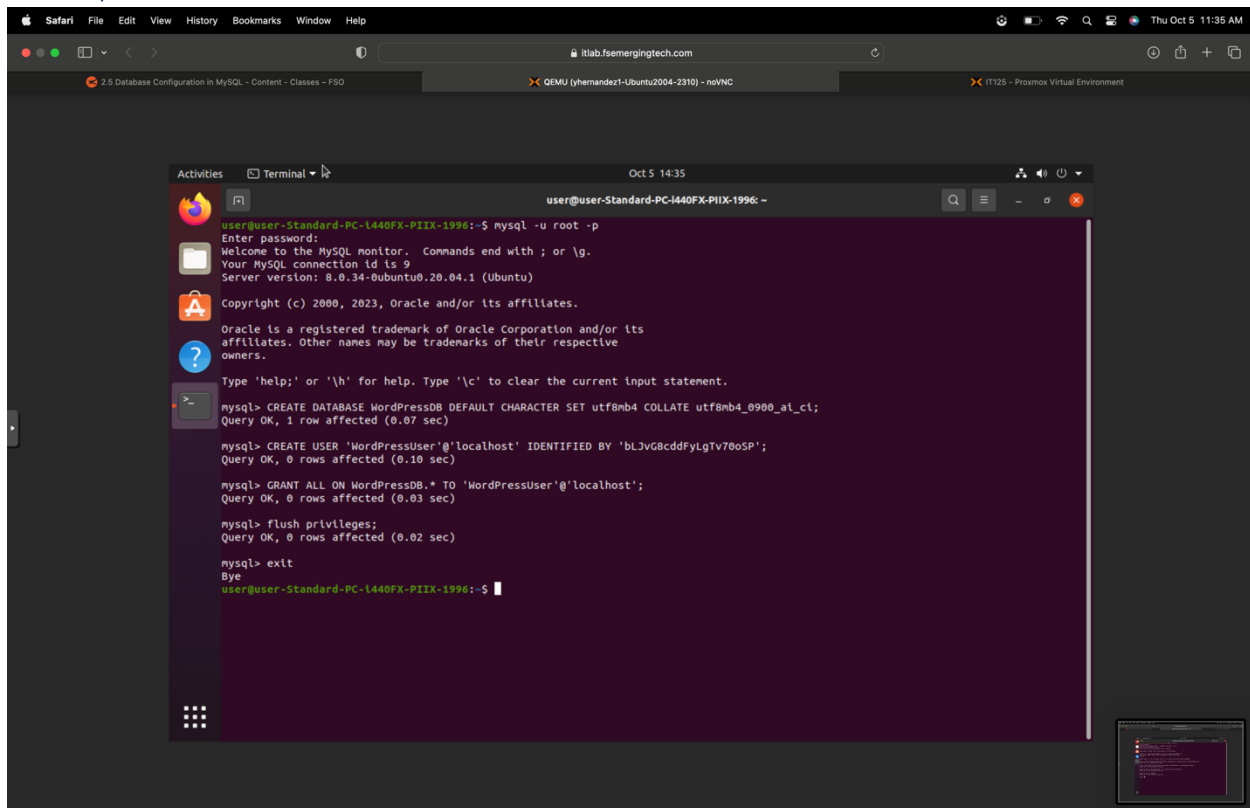
mysql> GRANT ALL ON WordPressDB.* TO 'WordPressUser'@'localhost';
Query OK, 0 rows affected (0.03 sec)

mysql> flush privileges;
Query OK, 0 rows affected (0.02 sec)

mysql>
```

To flush privileges, you type **flush privileges** on the command line, then press enter.

Quit MySQL



The screenshot shows a terminal window titled "Terminal" with a dark background. The prompt is "user@user-Standard-PC-l440FX-PIIX-1996: ~". The user has entered the command "mysql -u root -p". The MySQL monitor displays a welcome message, the connection ID (9), and the server version (8.0.34-0ubuntu0.20.04.1 (Ubuntu)). It also shows the copyright notice for Oracle. The user then enters several SQL commands: "CREATE DATABASE WordPressDB", "CREATE USER 'WordPressUser'@'localhost'", "GRANT ALL ON WordPressDB.* TO 'WordPressUser'@'localhost'", and "flush privileges;". Each command is followed by a confirmation message. Finally, the user enters "exit", and the terminal displays "Bye" and returns to the shell prompt.

```
user@user-Standard-PC-l440FX-PIIX-1996:~$ mysql -u root -p
Enter password:
Welcome to the MySQL monitor.  Commands end with ; or \g.
Your MySQL connection id is 9
Server version: 8.0.34-0ubuntu0.20.04.1 (Ubuntu)

Copyright (c) 2000, 2023, Oracle and/or its affiliates.
Oracle is a registered trademark of Oracle Corporation and/or its
affiliates. Other names may be trademarks of their respective
owners.

Type 'help;' or '\h' for help. Type '\c' to clear the current input statement.

mysql> CREATE DATABASE WordPressDB DEFAULT CHARACTER SET utf8mb4 COLLATE utf8mb4_0900_ai_ci;
Query OK, 1 row affected (0.07 sec)

mysql> CREATE USER 'WordPressUser'@'localhost' IDENTIFIED BY 'bLJvG8cddfYlgTv70oSP';
Query OK, 0 rows affected (0.10 sec)

mysql> GRANT ALL ON WordPressDB.* TO 'WordPressUser'@'localhost';
Query OK, 0 rows affected (0.03 sec)

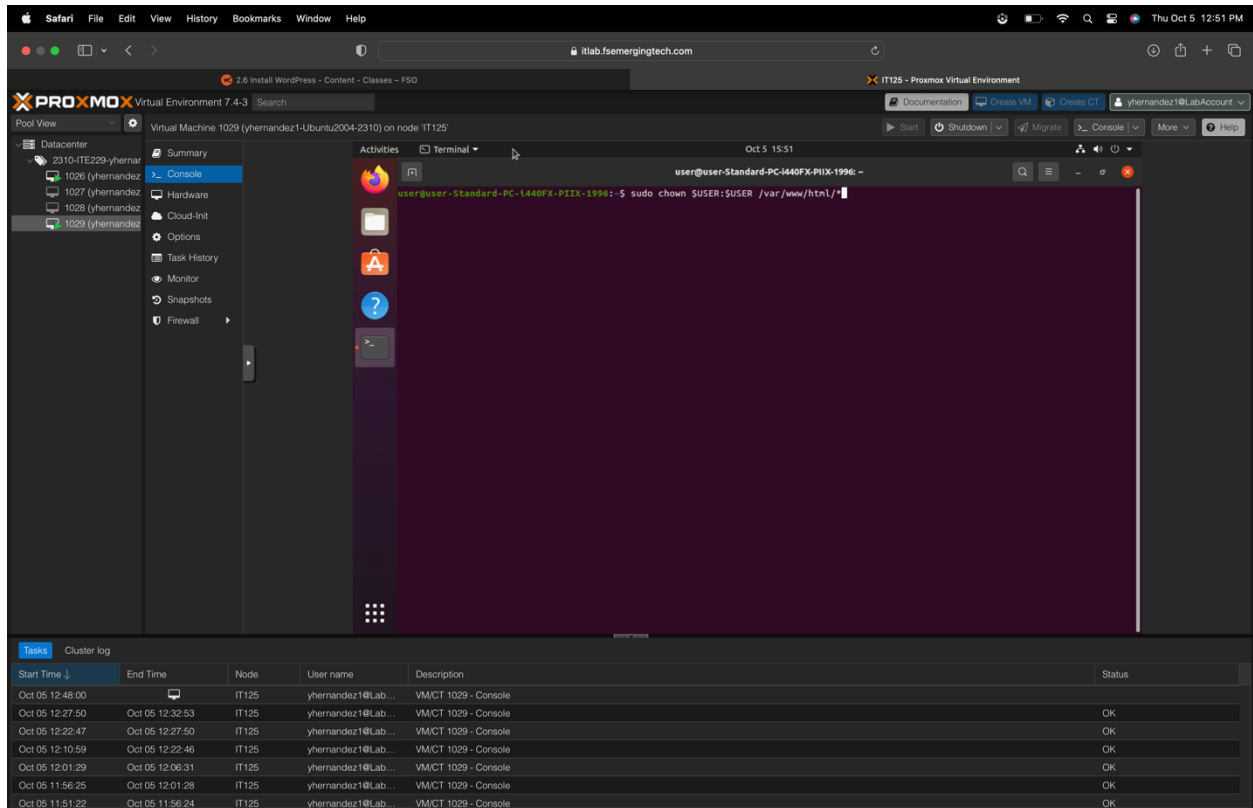
mysql> flush privileges;
Query OK, 0 rows affected (0.02 sec)

mysql> exit
Bye
user@user-Standard-PC-l440FX-PIIX-1996:~$
```

To quit MySQL, you type **exit** on the command line and press enter.

Install WordPress

Grant Permission to html Directory to WordPress User



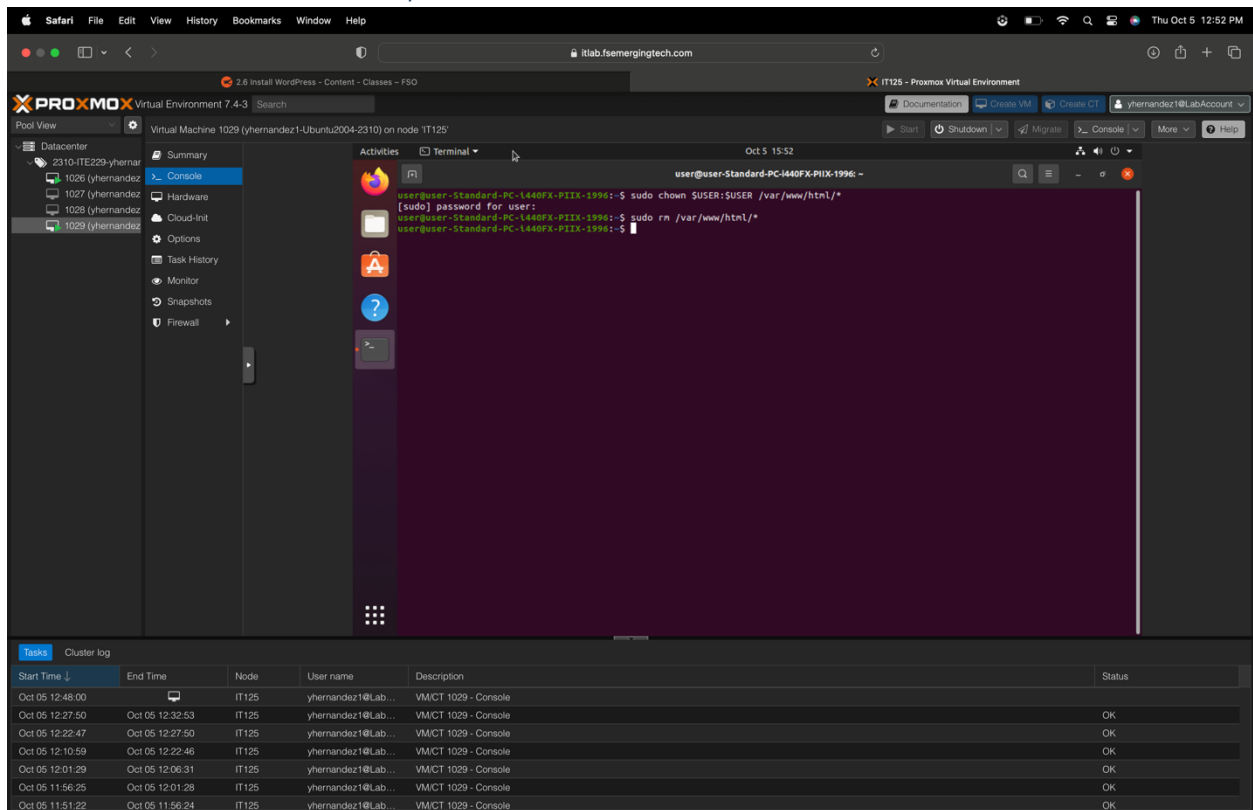
The screenshot shows the Proxmox Virtual Environment (VE) interface. The main window displays a terminal for a virtual machine named 'user@user-Standard-PC-1440FX-PIIX-1996'. The terminal prompt is '\$', and the command being executed is 'sudo chown \$USER:\$USER /var/www/html/*'. The command has been executed successfully, as indicated by the prompt returning to '\$'.

Below the terminal window, there is a 'Tasks' section with a 'Cluster log' table. The table has columns for 'Start Time', 'End Time', 'Node', 'User name', 'Description', and 'Status'. The log shows several successful tasks performed by 'yhermandez1@Lab...' on node 'IT125'.

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhermandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK

To grant permissions to the html directory on the command line, type **sudo chown \$User:\$User /var/www/html/***, then press enter.

Delete Files from html Directory



The screenshot displays the Proxmox Virtual Environment (VE) interface. On the left, the 'Datacenter' view shows a list of virtual machines (VMs) with IDs 2310, 1026, 1027, 1028, and 1029. The 'Summary' tab for VM 1029 is selected. The main area shows the 'Terminal' window for VM 1029, which is running Ubuntu 20.04-2310 on node IT125. The terminal session shows the following commands and output:

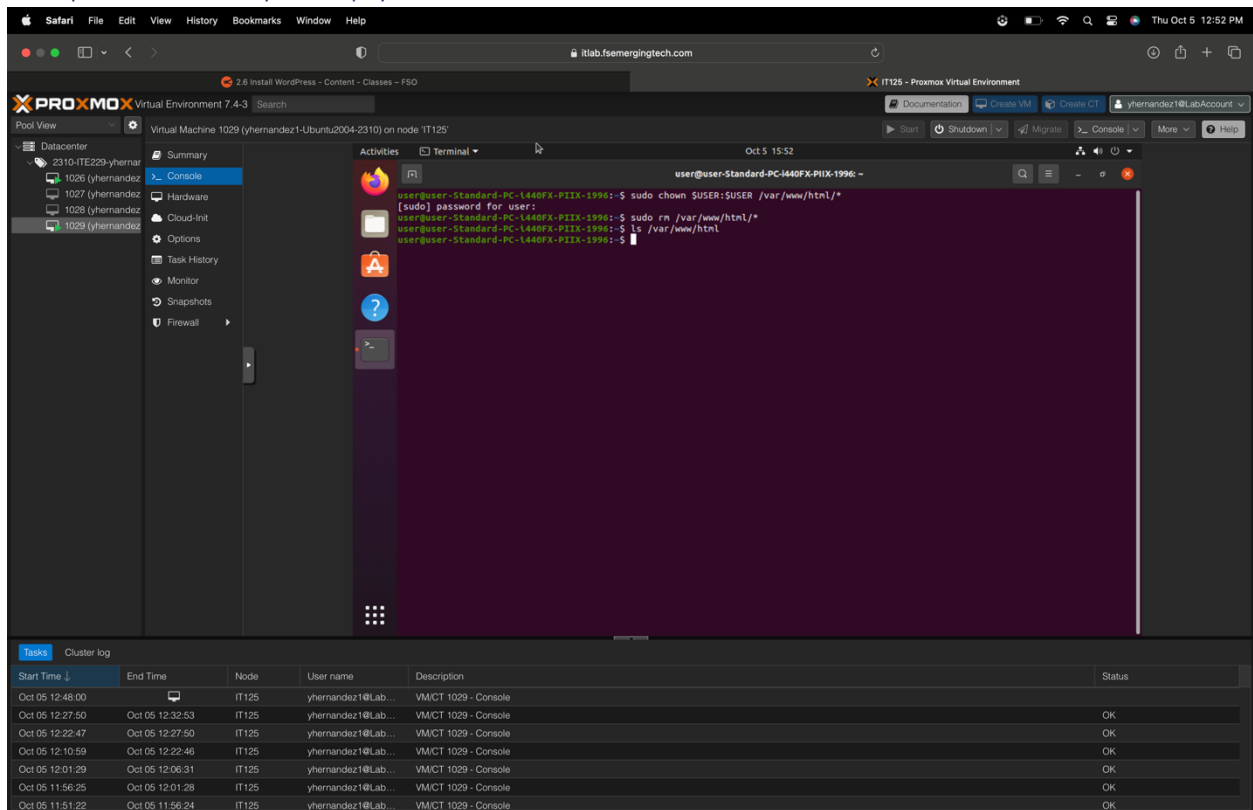
```
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo chown $USER:$USER /var/www/html/*
[sudo] password for users:
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo rm /var/www/html/*
user@user-Standard-PC-1440FX-PIIX-1996:~$
```

At the bottom of the interface, the 'Tasks' tab is active, showing a list of tasks performed on the cluster. The tasks are listed in a table with columns for Start Time, End Time, Node, User name, Description, and Status.

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To delete files from the html directory on the command line, type **sudo rm /var/www/html/***, then press enter.

Verify html Directory is Empty



The screenshot displays the Proxmox Virtual Environment (VE) interface. The left sidebar shows the 'Datacenter' view with a list of virtual machines (1026, 1027, 1028, 1029). The main panel shows the 'Summary' tab for VM 1029, which is a Ubuntu 20.04-2310 on node IT125. The 'Terminal' tab is active, showing a shell session for user 'user' on a Standard-PC. The commands executed are:

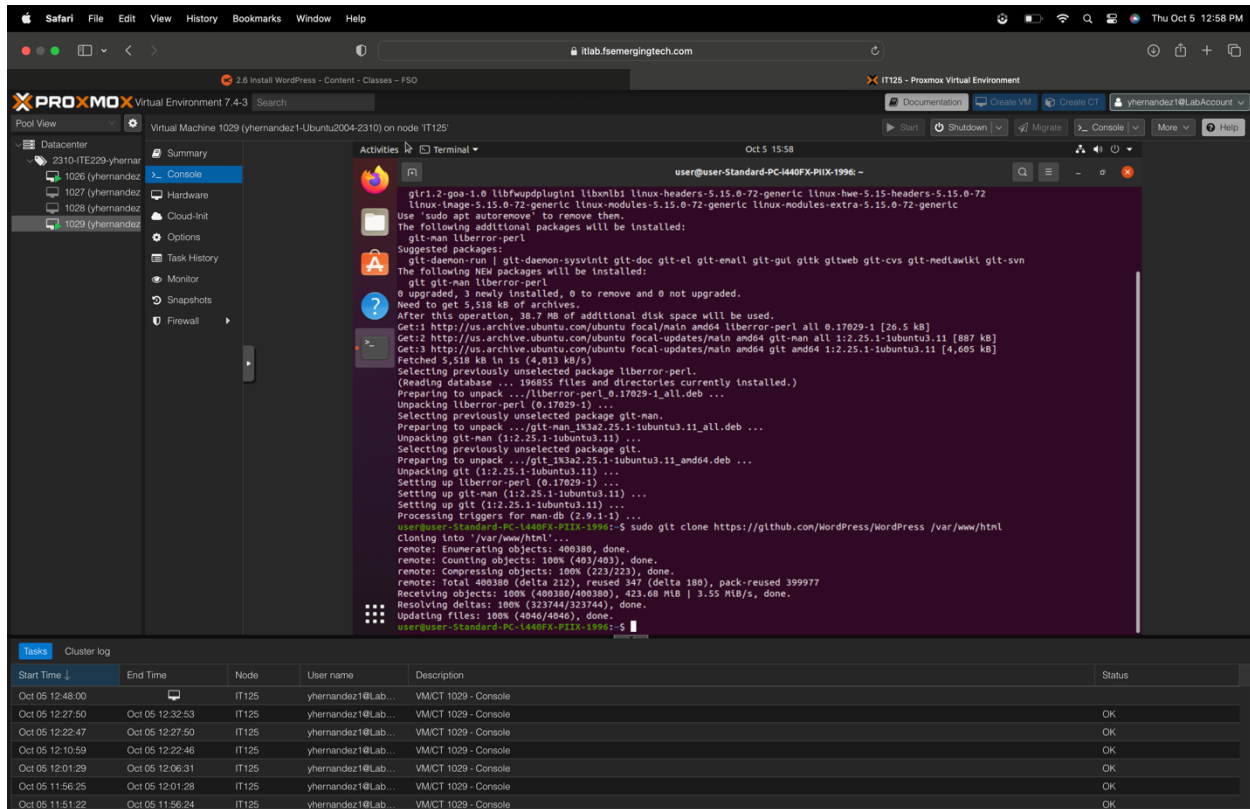
```
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo chown $USER:$USER /var/www/html/*
[sudo] password for user:
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo rm /var/www/html/*
user@user-Standard-PC-1440FX-PIIX-1996:~$ ls /var/www/html
user@user-Standard-PC-1440FX-PIIX-1996:~$
```

At the bottom of the interface, a 'Tasks' table shows the execution history of these commands:

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To verify the empty html directory, type `ls /var/www/html` on the command line, then press enter.

Clone WordPress to html Directory



The screenshot shows a Proxmox VE terminal window with the following output:

```
git1.2-goa-1.0 libfupdpugin1 libxml1 linux-headers-5.15.0-72-generic linux-hwe-5.15.0-headers-5.15.0-72-generic
linux-image-5.15.0-72-generic linux-modules-5.15.0-72-generic linux-modules-extra-5.15.0-72-generic
Use 'sudo apt autoremove' to remove them.
The following additional packages will be installed:
git-man liberror-perl
Suggested packages:
git-daemon-run | git-daemon-sysvinit git-doc git-el git-email git-gui gitk gitweb git-cvs git-mediawiki git-svn
The following NEW packages will be installed:
git git-man liberror-perl
0 upgraded, 3 newly installed, 0 to remove and 0 not upgraded.
Need to get 5,518 kB of archives.
After this operation, 38.7 MB of additional disk space will be used.
Get:1 http://us.archive.ubuntu.com/ubuntu focal/main amd64 liberror-perl all 0.17029-1 [26.5 kB]
Get:2 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 git-man all 1:2.25.1-1ubuntu3.11 [887 kB]
Get:3 http://us.archive.ubuntu.com/ubuntu focal-updates/main amd64 git amd64 1:2.25.1-1ubuntu3.11 [4,605 kB]
Fetched 5,518 kB in 1s (4,013 kB/s)
Selecting previously unselected package liberror-perl.
(Reading database ... 196855 files and directories currently installed.)
Preparing to unpack .../liberror-perl_0.17029-1_all.deb ...
Unpacking liberror-perl (0.17029-1) ...
Selecting previously unselected package git-man.
Preparing to unpack .../git-man_1k3a2.25.1-1ubuntu3.11_all.deb ...
Unpacking git-man (1:2.25.1-1ubuntu3.11) ...
Selecting previously unselected package git.
Preparing to unpack .../git_1k3a2.25.1-1ubuntu3.11_amd64.deb ...
Unpacking git (1:2.25.1-1ubuntu3.11) ...
Setting up liberror-perl (0.17029-1) ...
Setting up git-man (1:2.25.1-1ubuntu3.11) ...
Setting up git (1:2.25.1-1ubuntu3.11) ...
Processing triggers for man-db (2.9.1-1) ...
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo git clone https://github.com/WordPress/WordPress /var/www/html
Cloning into '/var/www/html' ...
remote: Enumerating objects: 400380, done.
remote: Counting objects: 100% (403/403), done.
remote: Compressing objects: 100% (223/223), done.
remote: Total 400380 (delta 212), reused 347 (delta 180), pack-reused 399977
Receiving objects: 100% (400380/400380), 423.68 MiB | 3.55 MiB/s, done.
Resolving deltas: 100% (323744/323744), done.
Updating files: 100% (4046/4046), done.
user@user-Standard-PC-1440FX-PIIX-1996:~$
```

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To clone WordPress, type `sudo git clone https://github.com/WordPress/WordPress /var/www/html/` on the command line, then press enter.

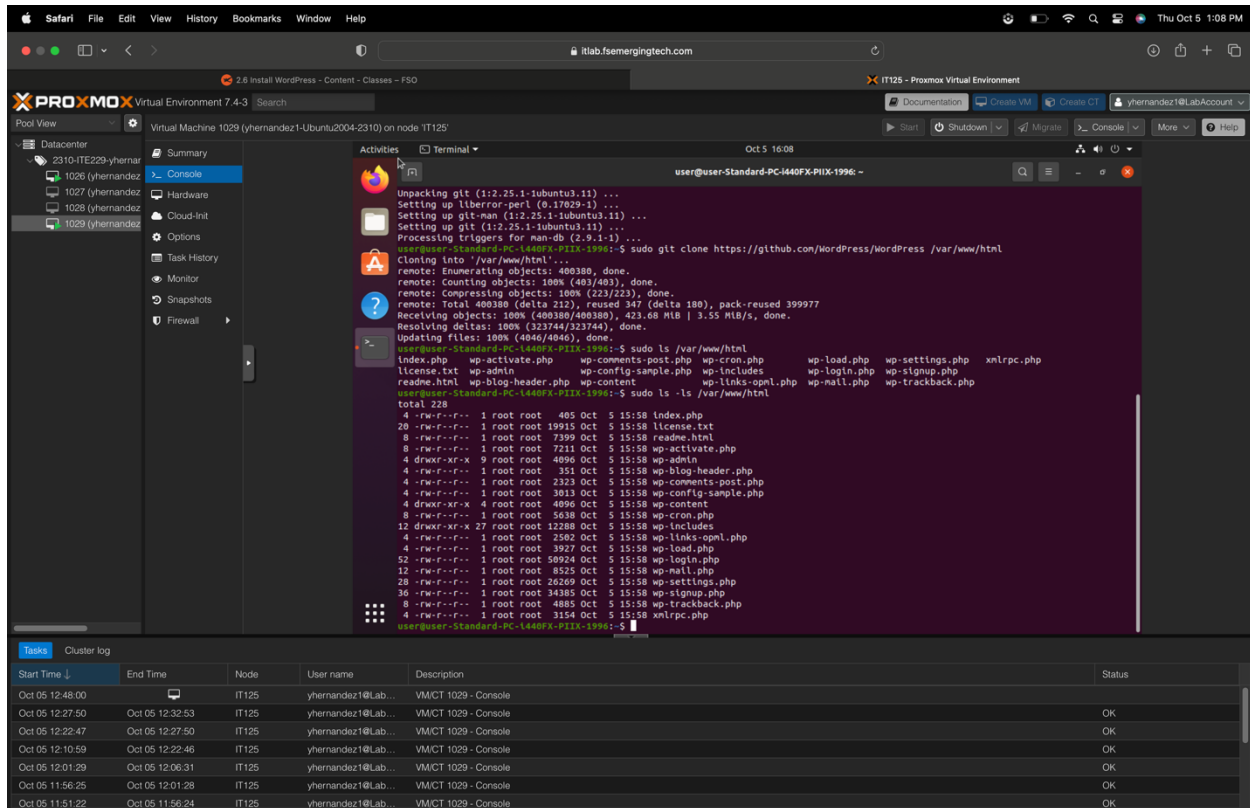
Verify html Directory Contains WordPress Files

The screenshot shows a Proxmox Virtual Environment terminal window. The terminal output displays the installation of several packages: `liberror-perl`, `git-man`, and `git`. It then shows the cloning of the WordPress repository from GitHub to `/var/www/html`. Below the terminal, a table lists tasks performed, including VMCT 1029 - Console operations.

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To verify that the HTML directory contains WordPress Files, type `sudo ls /var/www/html`, then press enter.

Verify Permissions on html Directory



The screenshot shows a Proxmox Virtual Environment (VE) interface. The main window displays a terminal session for a user named 'user' on a machine named 'Standard-PC-1440FX-PIIX-1996'. The terminal output shows the command 'sudo ls -ls /var/www/html' being executed, which lists the permissions for various files in the directory. The output is as follows:

```
total 228
4 -rw-r--r-- 1 root root 485 Oct 5 15:58 index.php
20 -rw-r--r-- 1 root root 19915 Oct 5 15:58 license.txt
8 -rw-r--r-- 1 root root 7399 Oct 5 15:58 readme.html
8 -rw-r--r-- 1 root root 7211 Oct 5 15:58 wp-activate.php
4 drwx-r-x 9 root root 4096 Oct 5 15:58 wp-admin
4 -rw-r--r-- 1 root root 351 Oct 5 15:58 wp-blog-header.php
4 -rw-r--r-- 1 root root 2323 Oct 5 15:58 wp-comments-post.php
4 -rw-r--r-- 1 root root 3013 Oct 5 15:58 wp-config-sample.php
4 drwx-r-x 4 root root 4096 Oct 5 15:58 wp-content
8 -rw-r--r-- 1 root root 5638 Oct 5 15:58 wp-cron.php
12 drwx-r-x 27 root root 12288 Oct 5 15:58 wp-includes
4 -rw-r--r-- 1 root root 2502 Oct 5 15:58 wp-links-opml.php
4 -rw-r--r-- 1 root root 3927 Oct 5 15:58 wp-load.php
52 -rw-r--r-- 1 root root 58924 Oct 5 15:58 wp-login.php
12 -rw-r--r-- 1 root root 8525 Oct 5 15:58 wp-mail.php
28 -rw-r--r-- 1 root root 26269 Oct 5 15:58 wp-settings.php
36 -rw-r--r-- 1 root root 34385 Oct 5 15:58 wp-signup.php
8 -rw-r--r-- 1 root root 4885 Oct 5 15:58 wp-trackback.php
4 -rw-r--r-- 1 root root 3154 Oct 5 15:58 xmlrpc.php
```

Below the terminal window, there is a 'Tasks' section showing a list of tasks. The tasks are as follows:

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To verify permissions on the HTML file, type `sudo ls -ls /var/www/html`, then press enter.

Edit Ownership

Edit Ownership of Contents of html Directory

```
Setting up liberror-perl (0.17029-1) ...
Setting up git-man (1:2.25.1-1ubuntu3.11) ...
Setting up git (1:2.25.1-1ubuntu3.11) ...
Processing triggers for man-db (2.9.1-1) ...
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo git clone https://github.com/WordPress/WordPress /var/www/html
Cloning into '/var/www/html'...
remote: Enumerating objects: 400380, done.
remote: Counting objects: 100% (403/403), done.
remote: Compressing objects: 100% (223/223), done.
remote: Total 400380 (delta 312), reused 347 (delta 180), pack-reused 399977
Receiving objects: 100% (400380/400380), 423.08 MiB | 3.55 MiB/s, done.
Resolving deltas: 100% (123744/123744), done.
Updating files: 100% (4046/4046), done.
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo ls -ls /var/www/html
total 228
4 -rw-r--r-- 1 root root 405 Oct 5 15:58 index.php
20 -rw-r--r-- 1 root root 19915 Oct 5 15:58 license.txt
8 -rw-r--r-- 1 root root 7399 Oct 5 15:58 readme.html
8 -rw-r--r-- 1 root root 7211 Oct 5 15:58 wp-activate.php
4 drwxr-xr-x 9 root root 4096 Oct 5 15:58 wp-admin
4 -rw-r--r-- 1 root root 351 Oct 5 15:58 wp-blog-header.php
4 -rw-r--r-- 1 root root 2323 Oct 5 15:58 wp-comments-post.php
4 -rw-r--r-- 1 root root 3013 Oct 5 15:58 wp-config-sample.php
4 drwxr-xr-x 4 root root 4096 Oct 5 15:58 wp-content
8 -rw-r--r-- 1 root root 5638 Oct 5 15:58 wp-cron.php
12 drwxr-xr-x 27 root root 12288 Oct 5 15:58 wp-includes
4 -rw-r--r-- 1 root root 2502 Oct 5 15:58 wp-links-opml.php
4 -rw-r--r-- 1 root root 3927 Oct 5 15:58 wp-load.php
52 -rw-r--r-- 1 root root 50924 Oct 5 15:58 wp-login.php
12 -rw-r--r-- 1 root root 8525 Oct 5 15:58 wp-mail.php
28 -rw-r--r-- 1 root root 26269 Oct 5 15:58 wp-settings.php
36 -rw-r--r-- 1 root root 34385 Oct 5 15:58 wp-signup.php
8 -rw-r--r-- 1 root root 4885 Oct 5 15:58 wp-trackback.php
4 -rw-r--r-- 1 root root 3154 Oct 5 15:58 xmlrpc.php
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo chown -R www-data:www-data /var/www/html/*
user@user-Standard-PC-1440FX-PIIX-1996:~$
```

Start Time ↓	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

```
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo chown -R www-data:www-data /var/www/html/*
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo ls -ls /var/www/html
total 228
4 -rw-r--r-- 1 www-data www-data 405 Oct 5 15:58 index.php
20 -rw-r--r-- 1 www-data www-data 19915 Oct 5 15:58 license.txt
8 -rw-r--r-- 1 www-data www-data 7399 Oct 5 15:58 readme.html
8 -rw-r--r-- 1 www-data www-data 7211 Oct 5 15:58 wp-activate.php
4 drwxr-xr-x 9 www-data www-data 4096 Oct 5 15:58 wp-admin
4 -rw-r--r-- 1 www-data www-data 351 Oct 5 15:58 wp-blog-header.php
4 -rw-r--r-- 1 www-data www-data 2323 Oct 5 15:58 wp-comments-post.php
4 -rw-r--r-- 1 www-data www-data 3013 Oct 5 15:58 wp-config-sample.php
4 drwxr-xr-x 4 www-data www-data 4096 Oct 5 15:58 wp-content
8 -rw-r--r-- 1 www-data www-data 5638 Oct 5 15:58 wp-cron.php
12 drwxr-xr-x 27 www-data www-data 12288 Oct 5 15:58 wp-includes
4 -rw-r--r-- 1 www-data www-data 2502 Oct 5 15:58 wp-links-opml.php
4 -rw-r--r-- 1 www-data www-data 3927 Oct 5 15:58 wp-load.php
52 -rw-r--r-- 1 www-data www-data 50924 Oct 5 15:58 wp-login.php
12 -rw-r--r-- 1 www-data www-data 8525 Oct 5 15:58 wp-mail.php
28 -rw-r--r-- 1 www-data www-data 26269 Oct 5 15:58 wp-settings.php
36 -rw-r--r-- 1 www-data www-data 34385 Oct 5 15:58 wp-signup.php
8 -rw-r--r-- 1 www-data www-data 4885 Oct 5 15:58 wp-trackback.php
4 -rw-r--r-- 1 www-data www-data 3154 Oct 5 15:58 xmlrpc.php
user@user-Standard-PC-1440FX-PIIX-1996:~$
```

Start Time ↓	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To Edit Ownership of Contents of HTML Directory, you type **sudo chown -R www-data:www-data /var/www/html/*** then press enter and to check that they have changed ownership, type **sudo ls -ls /var/www/html** then press enter.

Edit Ownership of the html Directory Itself

The screenshot shows the Proxmox VE interface. On the left, the 'Datacenter' sidebar lists several virtual machines. The main area displays the 'Terminal' window for a virtual machine named '1029 (yhernandez)'. The terminal shows the following commands and output:

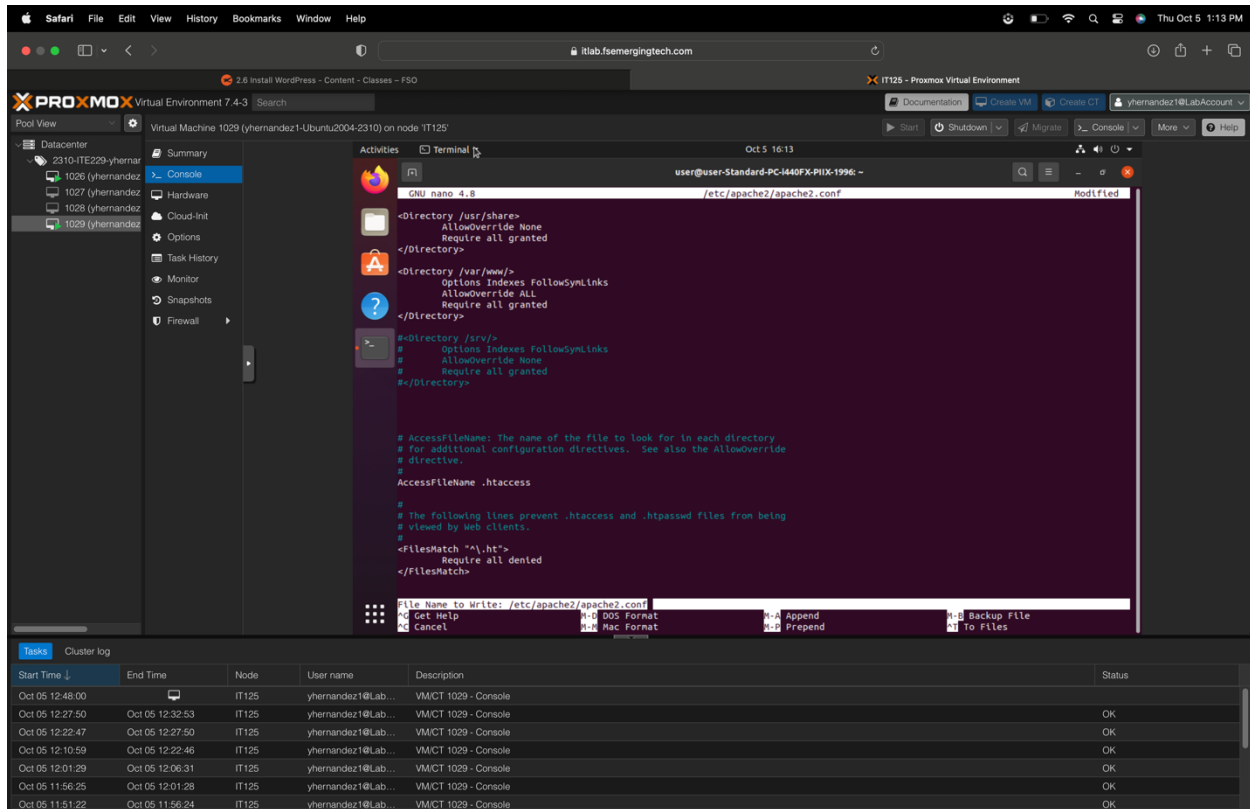
```
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo chown -R www-data:www-data /var/www/html/*
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo ls -ls /var/www/html/
total 228
4 -rw-r--r-- 1 www-data www-data 405 Oct 5 15:58 index.php
20 -rw-r--r-- 1 www-data www-data 19915 Oct 5 15:58 license.txt
8 -rw-r--r-- 1 www-data www-data 7399 Oct 5 15:58 readme.html
8 -rw-r--r-- 1 www-data www-data 7211 Oct 5 15:58 wp-activate.php
4 drwxr-xr-x 9 www-data www-data 4096 Oct 5 15:58 wp-admin
4 -rw-r--r-- 1 www-data www-data 351 Oct 5 15:58 wp-blog-header.php
4 -rw-r--r-- 1 www-data www-data 3013 Oct 5 15:58 wp-config-sample.php
4 drwxr-xr-x 4 www-data www-data 4096 Oct 5 15:58 wp-content
8 -rw-r--r-- 1 www-data www-data 5638 Oct 5 15:58 wp-cron.php
12 drwxr-xr-x 27 www-data www-data 12288 Oct 5 15:58 wp-includes
4 -rw-r--r-- 1 www-data www-data 2502 Oct 5 15:58 wp-links-opml.php
4 -rw-r--r-- 1 www-data www-data 3927 Oct 5 15:58 wp-load.php
52 -rw-r--r-- 1 www-data www-data 50924 Oct 5 15:58 wp-login.php
12 -rw-r--r-- 1 www-data www-data 8525 Oct 5 15:58 wp-mail.php
28 -rw-r--r-- 1 www-data www-data 26269 Oct 5 15:58 wp-settings.php
36 -rw-r--r-- 1 www-data www-data 34385 Oct 5 15:58 wp-signup.php
8 -rw-r--r-- 1 www-data www-data 4885 Oct 5 15:58 wp-trackback.php
4 -rw-r--r-- 1 www-data www-data 3154 Oct 5 15:58 xmlrpc.php
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo chown www-data:www-data /var/www/html
user@user-Standard-PC-1440FX-PIIX-1996:~$
```

Below the terminal window, there is a 'Tasks' tab showing a cluster log with the following entries:

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To edit ownership of the HTML directory, type **sudo chown www-data:www-data /var/www/html**, then press enter.

Edit the apache2.conf File

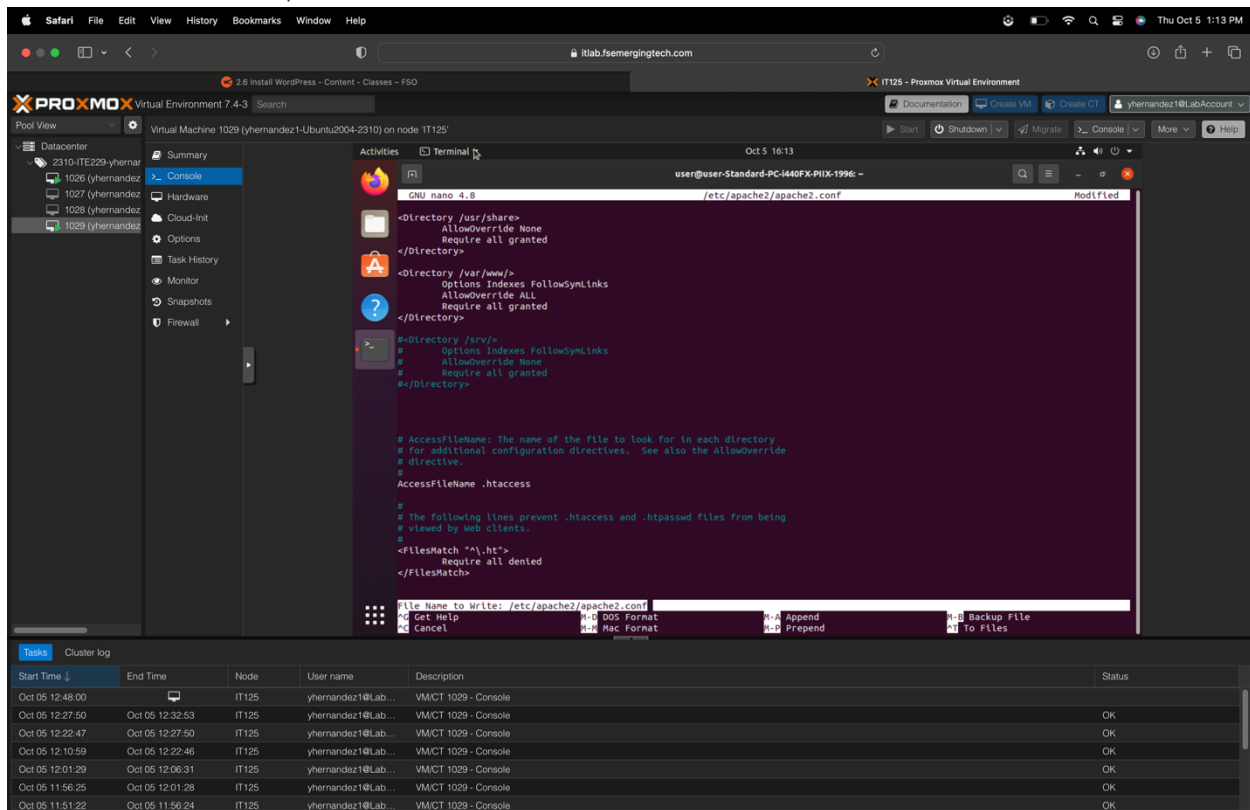


The screenshot shows the Proxmox Virtual Environment (VE) interface. On the left, the 'Datacenter' view shows several virtual machines (VMs) with names like '2310-ITE229-yhernar', '1026 (yhernandez)', '1027 (yhernandez)', '1028 (yhernandez)', and '1029 (yhernandez)'. The 'Summary' tab is selected for VM 1029. The main panel displays the 'Terminal' window for VM 1029, showing the GNU nano 4.8 editor editing the file `/etc/apache2/apache2.conf`. The file content includes configuration directives for `<Directory /usr/share>`, `<Directory /var/www/>`, and `<Directory /srv/>`, along with `AccessFileName .htaccess` and `<FilesMatch "^\.ht">` blocks. The bottom of the terminal window shows a file manager interface with options like 'File Name to Write: /etc/apache2/apache2.conf', 'Get help', 'DOS Format', 'Mac Format', 'Append', 'Prepend', 'Backup File', and 'To Files'. Below the terminal, the 'Tasks' tab is active, showing a table of recent tasks.

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To edit the `apache2.conf` file type on the terminal `sudo nano /etc/apache2/apache2.conf`, then press enter.

Override All Default Apache Directives



The screenshot shows the Proxmox VE interface with a terminal window open. The terminal is editing the file `/etc/apache2/apache2.conf` using the `nano` editor. The file content is as follows:

```
<Directory /usr/share>
    AllowOverride None
    Require all granted
</Directory>

<Directory /var/www/>
    Options Indexes FollowSymLinks
    AllowOverride ALL
    Require all granted
</Directory>

#<Directory /srv/>
#
# Options Indexes FollowSymLinks
#
# AllowOverride None
#
# Require all granted
#</Directory>

#
# AccessFileName: The name of the file to look for in each directory
# for additional configuration directives. See also the AllowOverride
# directive.
#
AccessFileName .htaccess

#
# The following lines prevent .htaccess and .htpasswd files from being
# viewed by Web clients.
#
<FilesMatch "\.ht">
    Require all denied
</FilesMatch>
```

The terminal shows the user is at the prompt `user@user-Standard-PC-i440FX-PIIX-1996: ~`. The file name to write is `/etc/apache2/apache2.conf`. The user is prompted to change the `AllowOverride` directive from `none` to `ALL`.

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To override all default Apache directives, scroll down until you see **AllowOverride none**, then delete **none** and change it to **ALL**.

Create a .htaccess File in the /var/www/html/.git/ Directory

The screenshot shows a Proxmox VE interface with a terminal window open. The terminal displays the following commands and output:

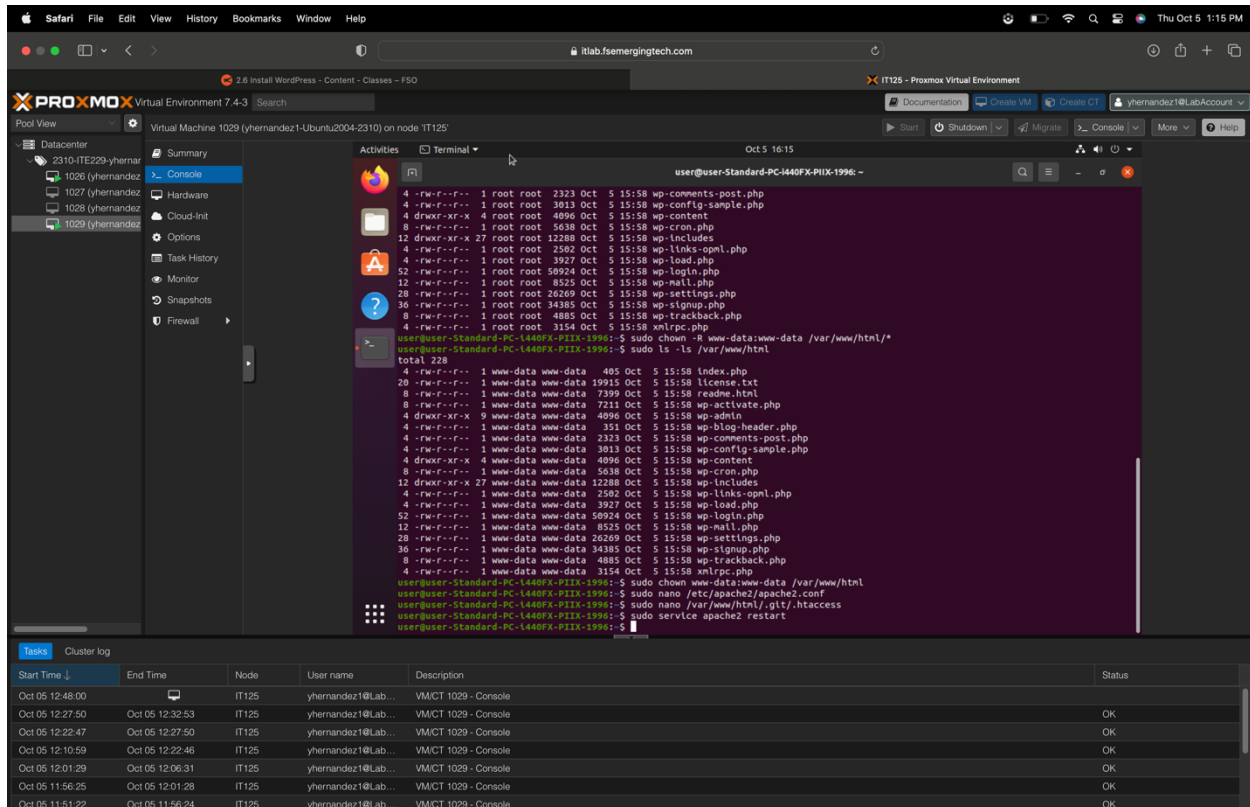
```
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo chown -R www-data:www-data /var/www/html/*
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo ls -ls /var/www/html/
total 228
4 -rw-r--r-- 1 www-data www-data 405 Oct 5 15:58 index.php
20 -rw-r--r-- 1 www-data www-data 19915 Oct 5 15:58 license.txt
8 -rw-r--r-- 1 www-data www-data 7390 Oct 5 15:58 readme.html
8 -rw-r--r-- 1 www-data www-data 7211 Oct 5 15:58 wp-activate.php
4 drwxr-xr-x 9 www-data www-data 4096 Oct 5 15:58 wp-admin
4 -rw-r--r-- 1 www-data www-data 351 Oct 5 15:58 wp-blog-header.php
4 -rw-r--r-- 1 www-data www-data 2323 Oct 5 15:58 wp-comments-post.php
4 drwxr-xr-x 4 www-data www-data 4096 Oct 5 15:58 wp-config-sample.php
8 -rw-r--r-- 1 www-data www-data 5638 Oct 5 15:58 wp-cron.php
12 drwxr-xr-x 27 www-data www-data 12288 Oct 5 15:58 wp-includes
4 -rw-r--r-- 1 www-data www-data 2582 Oct 5 15:58 wp-links-opml.php
4 -rw-r--r-- 1 www-data www-data 3927 Oct 5 15:58 wp-load.php
52 -rw-r--r-- 1 www-data www-data 50924 Oct 5 15:58 wp-login.php
12 -rw-r--r-- 1 www-data www-data 8525 Oct 5 15:58 wp-mail.php
28 -rw-r--r-- 1 www-data www-data 26269 Oct 5 15:58 wp-settings.php
36 -rw-r--r-- 1 www-data www-data 34385 Oct 5 15:58 wp-signup.php
8 -rw-r--r-- 1 www-data www-data 4885 Oct 5 15:58 wp-trackback.php
4 -rw-r--r-- 1 www-data www-data 3154 Oct 5 15:58 xmlrpc.php
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo chown www-data:www-data /var/www/html
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo nano /etc/apache2/apache2.conf
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo nano /var/www/html/.git/.htaccess
```

The bottom of the screenshot shows a table of tasks:

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To create a .htaccess file, type on the terminal **sudo nano /var/www/html/.git/.htaccess**, then press enter. It will take you to the nano page, and you will add on the first line **order deny, allow** then press enter, and on the second line, you will add **deny from all**, then press control (^X) and X, then Y to save.

Restart the Apache Service



The screenshot shows the Proxmox VE interface. On the left, the 'Datacenter' tree lists several VMs, with '1029 (yhernandez)' selected. The main panel shows the 'Terminal' view for this VM. The terminal output displays the file permissions for the WordPress installation directory and the files within it. The user then runs the command `sudo service apache2 restart` to restart the Apache service. The bottom of the interface shows a 'Tasks' table with a log of recent operations.

```
user@user-Standard-PC-1440FX-PIIX-1996:~$ ls -ls /var/www/html/*
total 228
4 -rw-r--r-- 1 root root 2323 Oct 5 15:58 wp-comments-post.php
4 -rw-r--r-- 1 root root 3013 Oct 5 15:58 wp-config-sample.php
4 drwxr-xr-x 4 root root 4096 Oct 5 15:58 wp-content
8 -rw-r--r-- 1 root root 5638 Oct 5 15:58 wp-cron.php
12 drwxr-xr-x 27 root root 12288 Oct 5 15:58 wp-includes
4 -rw-r--r-- 1 root root 2592 Oct 5 15:58 wp-links-opml.php
4 -rw-r--r-- 1 root root 3927 Oct 5 15:58 wp-load.php
52 -rw-r--r-- 1 root root 58924 Oct 5 15:58 wp-login.php
12 -rw-r--r-- 1 root root 8525 Oct 5 15:58 wp-mail.php
28 -rw-r--r-- 1 root root 26269 Oct 5 15:58 wp-settings.php
36 -rw-r--r-- 1 root root 34385 Oct 5 15:58 wp-signup.php
8 -rw-r--r-- 1 root root 4885 Oct 5 15:58 wp-trackback.php
4 -rw-r--r-- 1 root root 3154 Oct 5 15:58 xmlrpc.php

user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo chown -R www-data:www-data /var/www/html/*
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo ls -ls /var/www/html/*
total 228
4 -rw-r--r-- 1 www-data www-data 405 Oct 5 15:58 index.php
20 -rw-r--r-- 1 www-data www-data 19915 Oct 5 15:58 license.txt
8 -rw-r--r-- 1 www-data www-data 7399 Oct 5 15:58 readme.html
8 -rw-r--r-- 1 www-data www-data 7211 Oct 5 15:58 wp-activate.php
4 drwxr-xr-x 9 www-data www-data 4096 Oct 5 15:58 wp-admin
4 -rw-r--r-- 1 www-data www-data 351 Oct 5 15:58 wp-blog-header.php
4 -rw-r--r-- 1 www-data www-data 2323 Oct 5 15:58 wp-comments-post.php
4 drwxr-xr-x 4 www-data www-data 4096 Oct 5 15:58 wp-content
9 -rw-r--r-- 1 www-data www-data 5638 Oct 5 15:58 wp-cron.php
12 drwxr-xr-x 27 www-data www-data 12288 Oct 5 15:58 wp-includes
4 -rw-r--r-- 1 www-data www-data 2592 Oct 5 15:58 wp-links-opml.php
4 -rw-r--r-- 1 www-data www-data 3927 Oct 5 15:58 wp-load.php
52 -rw-r--r-- 1 www-data www-data 58924 Oct 5 15:58 wp-login.php
12 -rw-r--r-- 1 www-data www-data 8525 Oct 5 15:58 wp-mail.php
28 -rw-r--r-- 1 www-data www-data 26269 Oct 5 15:58 wp-settings.php
36 -rw-r--r-- 1 www-data www-data 34385 Oct 5 15:58 wp-signup.php
8 -rw-r--r-- 1 www-data www-data 4885 Oct 5 15:58 wp-trackback.php
4 -rw-r--r-- 1 www-data www-data 3154 Oct 5 15:58 xmlrpc.php

user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo chown www-data:www-data /var/www/html/*
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo nano /etc/apache2/apache2.conf
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo nano /var/www/html/.git/.htaccess
user@user-Standard-PC-1440FX-PIIX-1996:~$ sudo service apache2 restart
user@user-Standard-PC-1440FX-PIIX-1996:~$
```

Start Time	End Time	Node	User name	Description	Status
Oct 05 12:48:00		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:22:47	Oct 05 12:27:50	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:10:59	Oct 05 12:22:46	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:01:29	Oct 05 12:06:31	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:56:25	Oct 05 12:01:28	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 11:51:22	Oct 05 11:56:24	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

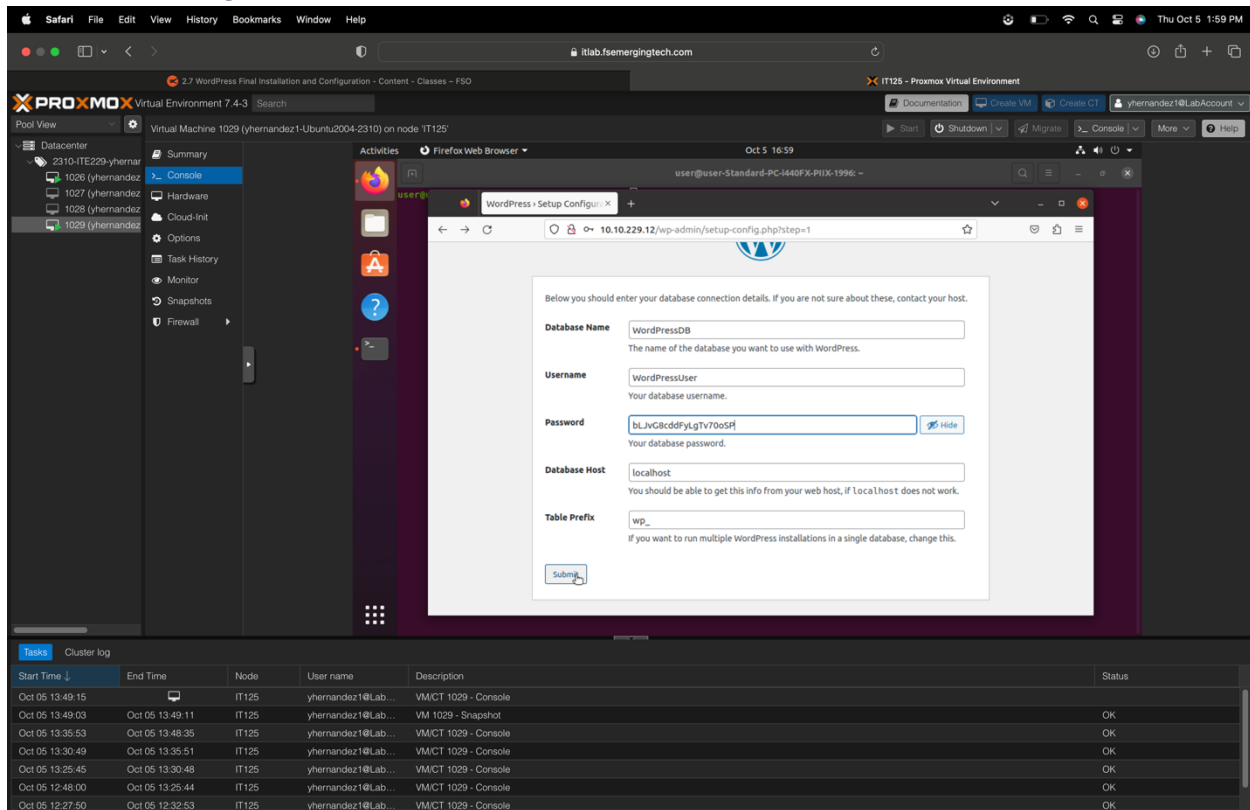
To restart the Apache service, you type on the terminal **sudo service apache2 restart**, then press enter.

IMPORTANT: To earn full credit, ALL screenshots must include a “full view”, including your Proxmox title bar with your username showing.

WordPress Configuration

Configure WordPress

WordPress Configuration Selections



To configure WordPress, go to Firefox web browser, type in the address bar **10.10.229.12**, then press enter. Once there, click through the settings until you reach the page where you enter your database connection details. You fill in the information as directed, then press submit.

- **Database Name:** WordPressDB
- **Username:** WordPressUser
- **Password:** *this is your WordPressUser password*
- **Database Host:** localhost
- **Table Prefix:** wp_

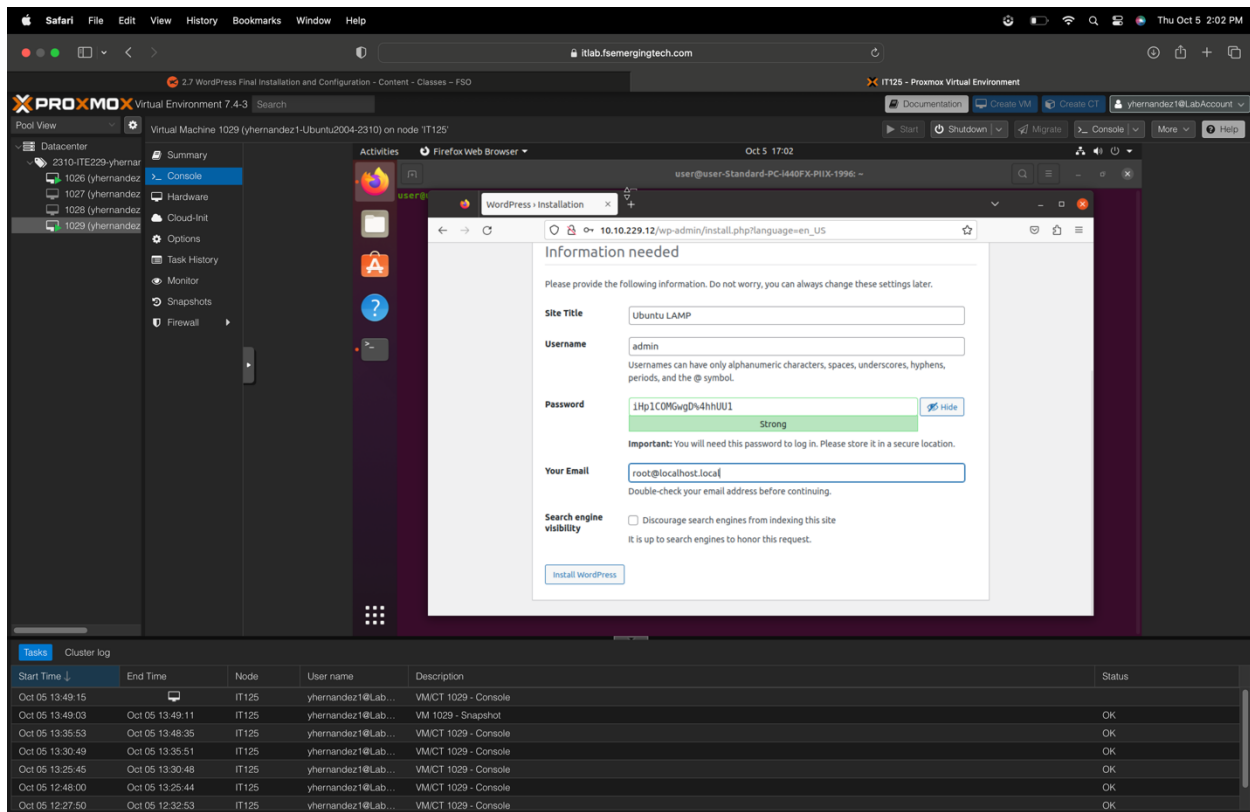
Run Installation

The screenshot shows the Proxmox Virtual Environment (VE) interface. On the left, the 'Datacenter' view shows a list of virtual machines (VMs) with their respective IP addresses and user names. The 'Activities' tab is selected, showing a list of recent activities. In the center, a Firefox Web Browser window is open, displaying the WordPress installation form. The form is titled 'Information needed' and contains fields for Site Title, Username, Password, and Your Email. The 'Install WordPress' button is visible at the bottom of the form. The bottom of the screenshot shows a 'Tasks' table with columns for Start Time, End Time, Node, User name, Description, and Status.

Start Time	End Time	Node	User name	Description	Status
Oct 05 13:49:15		IT125	yhernandez1@Lab...	VMCT: 1029 - Console	
Oct 05 13:49:03	Oct 05 13:49:11	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK
Oct 05 13:35:53	Oct 05 13:48:35	IT125	yhernandez1@Lab...	VMCT: 1029 - Console	OK
Oct 05 13:30:49	Oct 05 13:35:51	IT125	yhernandez1@Lab...	VMCT: 1029 - Console	OK
Oct 05 13:25:45	Oct 05 13:30:48	IT125	yhernandez1@Lab...	VMCT: 1029 - Console	OK
Oct 05 12:48:00	Oct 05 13:25:44	IT125	yhernandez1@Lab...	VMCT: 1029 - Console	OK
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT: 1029 - Console	OK

Once you have all the correct information, you click submit. Then, you will click on the **run installation**.

Create an Admin WordPress User



The screenshot shows the Proxmox VE interface with a virtual machine named '1029 (yhermandez)' selected. The 'Console' tab is active, displaying the WordPress installation configuration page. The page is titled 'Information needed' and contains the following fields:

- Site Title:** Ubuntu LAMP
- Username:** admin
- Password:** 1Hp1C0M6w9D44hhUU1 (Strong)
- Your Email:** root@localhost.local
- Search engine visibility:** ☐ Discourage search engines from indexing this site

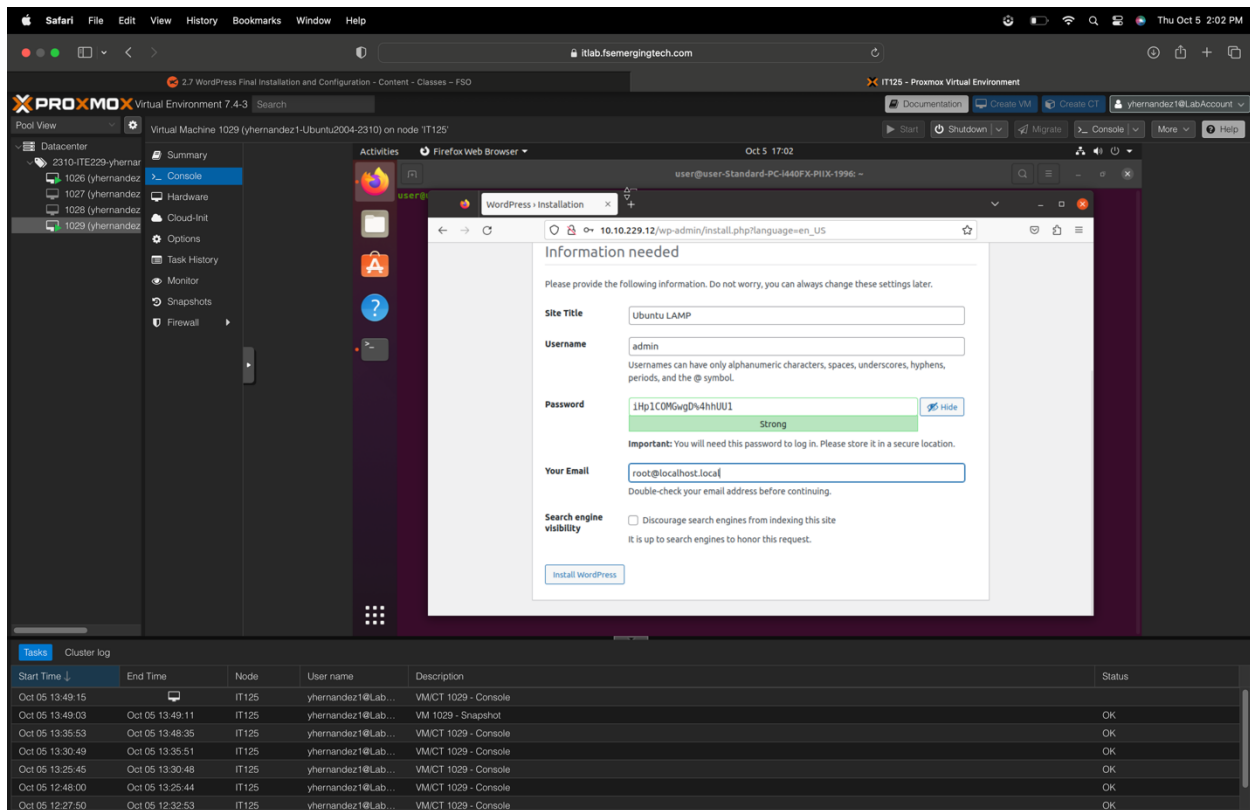
The 'Install WordPress' button is visible at the bottom of the form.

Start Time	End Time	Node	User name	Description	Status
Oct 05 13:49:15		IT125	yhermandez1@Lab...	VMCT-1029 - Console	
Oct 05 13:49:03	Oct 05 13:49:11	IT125	yhermandez1@Lab...	VM 1029 - Snapshot	OK
Oct 05 13:35:53	Oct 05 13:48:35	IT125	yhermandez1@Lab...	VMCT-1029 - Console	OK
Oct 05 13:30:49	Oct 05 13:35:51	IT125	yhermandez1@Lab...	VMCT-1029 - Console	OK
Oct 05 13:25:45	Oct 05 13:30:48	IT125	yhermandez1@Lab...	VMCT-1029 - Console	OK
Oct 05 12:48:00	Oct 05 13:25:44	IT125	yhermandez1@Lab...	VMCT-1029 - Console	OK
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhermandez1@Lab...	VMCT-1029 - Console	OK

You will create an admin WordPress user, adding the necessary information that should be added to the similar page above.

NOTE: Document WordPress admin user password in table at top of document.

WordPress Site Selections



After adding the information, you will click **Install WordPress**.

Site Title: Ubuntu LAMP

Username: admin

Password: *You will create this*

Your email: root@localhost.local

Search Engine Visibility: leave unchecked

SafariFileEditViewHistoryBookmarksWindowHelp

itlab.fsmergingtech.com

Thu Oct 5 2:02 PM

PROXMOXVirtual Environment 7.4-3

WordPress Final Installation and Configuration - Content - Classes - F50

IT125 - Proxmox Virtual Environment

Pool View

Virtual Machine 1029 (yhernandez1-Ubuntu2004-2310) on node IT125

DocumentationCreate VMCreate CTyhernandez1@LabAccount

StartShutdownMigrateConsoleMoreHelp

Datacenter

2310-ITE229-yhernar

1026 (yhernandez)

1027 (yhernandez)

1028 (yhernandez)

1029 (yhernandez)

Summary

Console

Hardware

Cloud-Init

Options

Task History

Monitor

Snapshots

Firewall

Activities

Firefox Web Browser

Oct 5 17:02

user@user-Standard-PC-i440FX-PiIX-1996 ~

WordPress - Installation

10.10.229.12/wp-admin/install.php?step=2

WordPress

Success!

WordPress has been installed. Thank you, and enjoy!

Usernameadmin

PasswordYour chosen password.

Log In

Tasks

Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Oct 05 13:49:15		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 13:49:03	Oct 05 13:49:11	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK
Oct 05 13:35:53	Oct 05 13:48:35	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 13:30:49	Oct 05 13:35:51	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 13:25:45	Oct 05 13:30:48	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:48:00	Oct 05 13:25:44	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

Test WordPress

The screenshot displays the Proxmox Virtual Environment (VE) interface. The top bar shows the Proxmox logo and version 7.4-3. The left sidebar contains navigation options: Summary, Console, Hardware, Cloud-Init, Options, Task History, Monitor, Snapshots, and Firewall. The main window shows the 'Hello world!' post page of a WordPress installation. The post title is 'Hello world!' and it has 2 thoughts. The post content includes a comment from 'A WordPress Commenter' and a reply from 'admin'. The post is categorized as 'Uncategorized'.

Below the main window, a 'Tasks' table shows a list of operations performed on the VM. The table has columns for Start Time, End Time, Node, User name, Description, and Status.

Start Time	End Time	Node	User name	Description	Status
Oct 08 17:43:41		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 08 17:43:18	Oct 08 17:43:36	IT125	yhernandez1@Lab...	VM 1029 - Rollback	OK
Oct 08 17:41:32	Oct 08 17:43:17	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 08 17:41:22	Oct 08 17:41:31	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 08 17:37:19	Oct 08 17:41:22	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 08 17:36:31	Oct 08 17:36:45	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 08 17:36:23	Oct 08 17:36:31	IT122	yhernandez1@Lab...	VMCT 1027 - Console	OK

To test WordPress, click on login on the page that says **Success!** Then, enter the username and password. On the left side of the page, click **Appearance**, then **Theme**, pick a theme, and click on Activate. Then, once that's active, click on **Posts**, then on **All Posts**, then **New Post**. Add information, then publish. Click the **W** on the top left side, which will take you to the dashboard.

IMPORTANT: To earn full credit, ALL screenshots must include a “full view”, including your ProxMox title bar with your username showing.

WordPress Security Settings and Configurations

WordPress Security Summary

I protected files and directories in my blog site, fortified the “wp-config.php” file, and set up a firewall security system. Before altering permissions, we verified our ability to access the files and directories. After confirming our access, we modified the permissions to ensure no unauthorized access. We checked again once the modifications were completed to ensure the changes were effective.

Then, to enhance the security of the “wp-config.php” file, we relocated it to a different folder. We also incorporated a robust code into the “.htaccess” file to prevent unauthorized configuration changes.

Lastly, we installed a firewall plugin for security scanning and surveillance. This will help secure the site from any malware or other vulnerable assets.

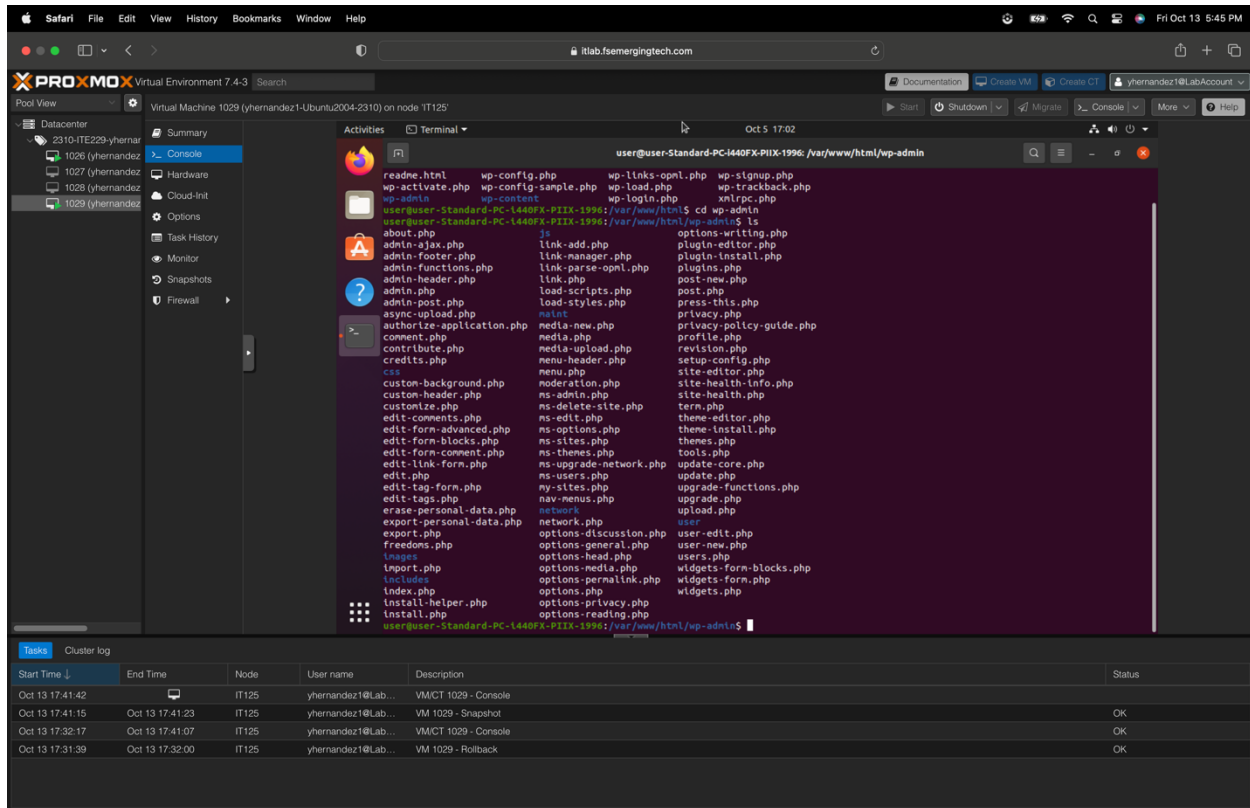
Defense-in-depth

My strategy embodies the defense in depth principle because I've implemented diverse security measures at various levels of the WordPress environment. Each step contributes to the overall security, ensuring that even if one control fails, others are in place to prevent or mitigate a security incident. After setting up our LAMP server with WordPress, we examined the file permissions. We adjusted these permissions to ensure that only the essential level of access was given, providing WordPress and its plugins operated correctly. This minimized any undue access to specific files and directories. Also, we enhanced the security of the wp-config.php file by relocating it to a folder above the one it was before.

Additionally, we updated its permissions and tweaked the .htaccess file to block unwarranted access. This action not only moved the config file from its conventional location but also safeguarded it from unauthorized edits. Finally, we integrated the Shield Security plugin, which offers security scanning, activity monitoring, and IP filtering features. This tool helps in the early detection of vulnerabilities, tracks site activities, and controls site access based on IP addresses, providing a comprehensive security layer.

File Permissions

Vulnerability

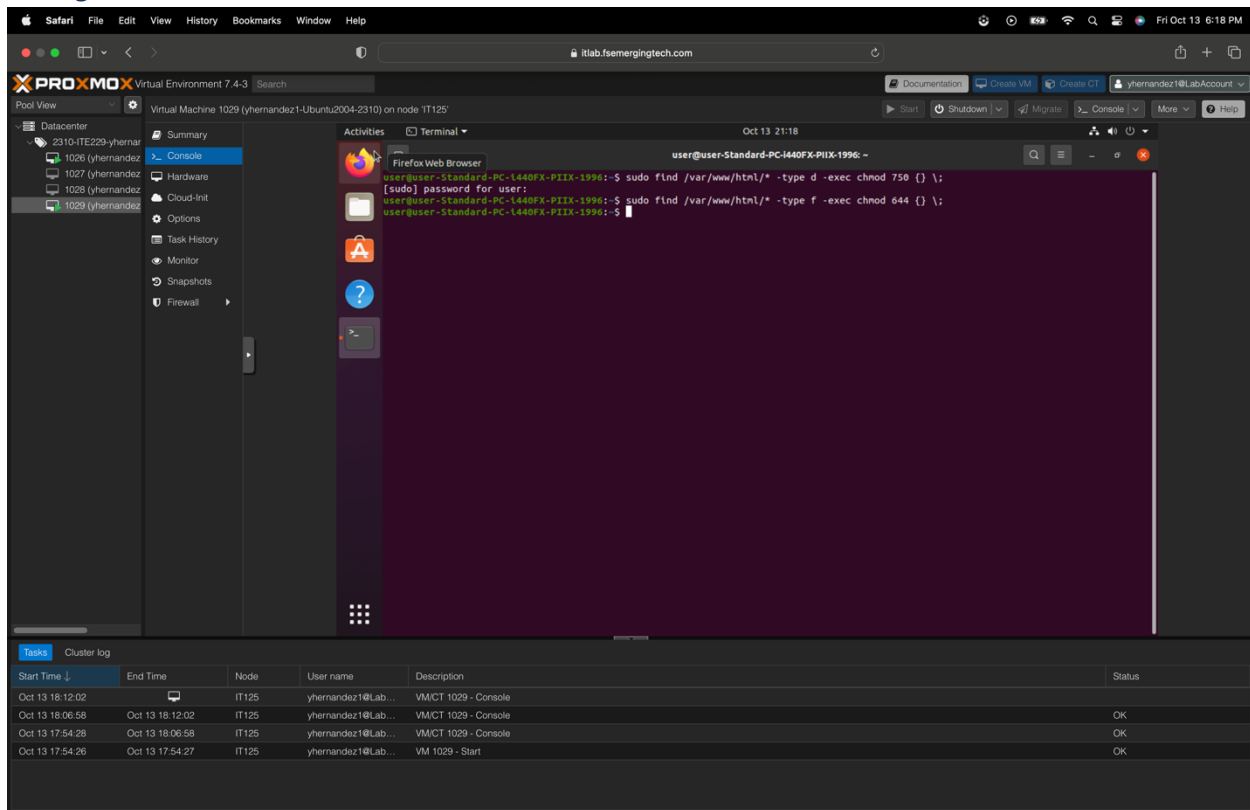


The screenshot shows a Proxmox Virtual Environment (VE) interface. On the left, there's a sidebar with a tree view showing the datacenter, virtual machines (1026, 1027, 1028, 1029), and various management options like Summary, Hardware, Cloud-init, Task History, Monitor, Snapshots, and Firewall. The main area displays a terminal window for a virtual machine named 'yhermandez1@Ubuntu:2004-2310' on node 'IT125'. The terminal shows the user 'user' at the prompt 'user@user-Standard-PC-l440FX-PIIX-1996: /var/www/html/wp-admin'. A file listing is displayed, showing various PHP files and directories. The files listed include: readme.html, wp-activate.php, wp-admin, wp-config.php, wp-config-sample.php, wp-login.php, wp-links-opml.php, wp-signup.php, wp-trackback.php, xlrpc.php, about.php, admin-ajax.php, admin-footer.php, admin-functions.php, admin-header.php, admin.php, admin-post.php, async-upload.php, authorize-application.php, comment.php, contribute.php, credits.php, custom-background.php, custom-header.php, customize.php, edit-comments.php, edit-form-advanced.php, edit-form-blocks.php, edit-form-comment.php, edit-link-form.php, edit.php, edit-tag-form.php, edit-tags.php, erase-personal-data.php, export-personal-data.php, export.php, freedoms.php, images, import.php, includes, index.php, install-helper.php, install.php, link-add.php, link-manager.php, link-parse-opml.php, link.php, load-scripts.php, load-styles.php, media-new.php, media-upload.php, menu-header.php, menu.php, moderation.php, ms-admin.php, ms-delete-site.php, ms-edit.php, ms-options.php, ms-sites.php, ms-themes.php, ms-upgrade-network.php, ms-users.php, my-sites.php, nav-menus.php, network, options-discussion.php, options-general.php, options-head.php, options-media.php, options-permalink.php, options.php, options-privacy.php, options-reading.php, options-writing.php, plugin-editor.php, plugin-install.php, plugins.php, post-new.php, post.php, press-this.php, privacy.php, privacy-policy-gulde.php, profile.php, revision.php, setup-config.php, site-editor.php, site-health-info.php, site-health.php, term.php, theme-editor.php, theme-install.php, themes.php, tools.php, update-core.php, update.php, upgrade-functions.php, upgrade.php, upload.php, user, user-edit.php, user-new.php, users.php, widgets-form-blocks.php, widgets-form.php, and widgets.php. The terminal prompt is 'user@user-Standard-PC-l440FX-PIIX-1996: /var/www/html/wp-admin\$'. Below the terminal window, there's a 'Tasks' section with a table showing the cluster log.

Start Time ↓	End Time	Node	User name	Description	Status
Oct 13 17:41:42		IT125	yhermandez1@Lab...	VMCT 1029 - Console	
Oct 13 17:41:15	Oct 13 17:41:23	IT125	yhermandez1@Lab...	VM 1029 - Snapshot	OK
Oct 13 17:32:17	Oct 13 17:41:07	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK
Oct 13 17:31:39	Oct 13 17:32:00	IT125	yhermandez1@Lab...	VM 1029 - Rollback	OK

To check for permissions for files and directories, go to the terminal and, on the command line, type `cd /var/www/html/wp-admin`. Permissions must be changed if it allows you to go into the file.

Configuration



To configure files and directories, go to the terminal and on the command line, type **sudo find /var/www/html/* -type d -exec chmod 750 {} \;** this will change the permissions for the directories. Then type **sudo find /var/www/html/* -type f -exec chmod 644 {} \;** this will change permissions for the files.

Validation

Before making any modifications, I ensured I had complete access to the files and directories by entering the command "cd wp-admin." Successfully accessing it confirmed my full access rights. After making the necessary changes, I tested directory access once more by trying to create a new directory. A "permission denied" message indicated that the modifications were effective, restricting access and enforcing a principle of least privilege.

The screenshot shows the Proxmox VE interface. On the left, a sidebar lists virtual machines: 2310-ITE229-yhernandez, 1026 (yhernandez), 1027 (yhernandez), 1028 (yhernandez), and 1029 (yhernandez). The main panel displays the terminal for VM 1029. The terminal output is as follows:

```
user@user-Standard-PC-l440FX-PIIX-1996: /var/www/html
[user@user-Standard-PC-l440FX-PIIX-1996:~]$ sudo find /var/www/html/* -type d -exec chmod 750 {} \;
[sudo] password for user:
user@user-Standard-PC-l440FX-PIIX-1996:~$ sudo find /var/www/html/* -type f -exec chmod 644 {} \;
user@user-Standard-PC-l440FX-PIIX-1996:~$ cd wp-admin
bash: cd: wp-admin: No such file or directory
user@user-Standard-PC-l440FX-PIIX-1996:~$ cd /var/www/html
user@user-Standard-PC-l440FX-PIIX-1996: /var/www/html$ cd wp-admin
bash: cd: wp-admin: Permission denied
user@user-Standard-PC-l440FX-PIIX-1996: /var/www/html$ cd wp-content
bash: cd: wp-content: Permission denied
user@user-Standard-PC-l440FX-PIIX-1996: /var/www/html$ cd wp-includes
bash: cd: wp-includes: Permission denied
user@user-Standard-PC-l440FX-PIIX-1996: /var/www/html$
```

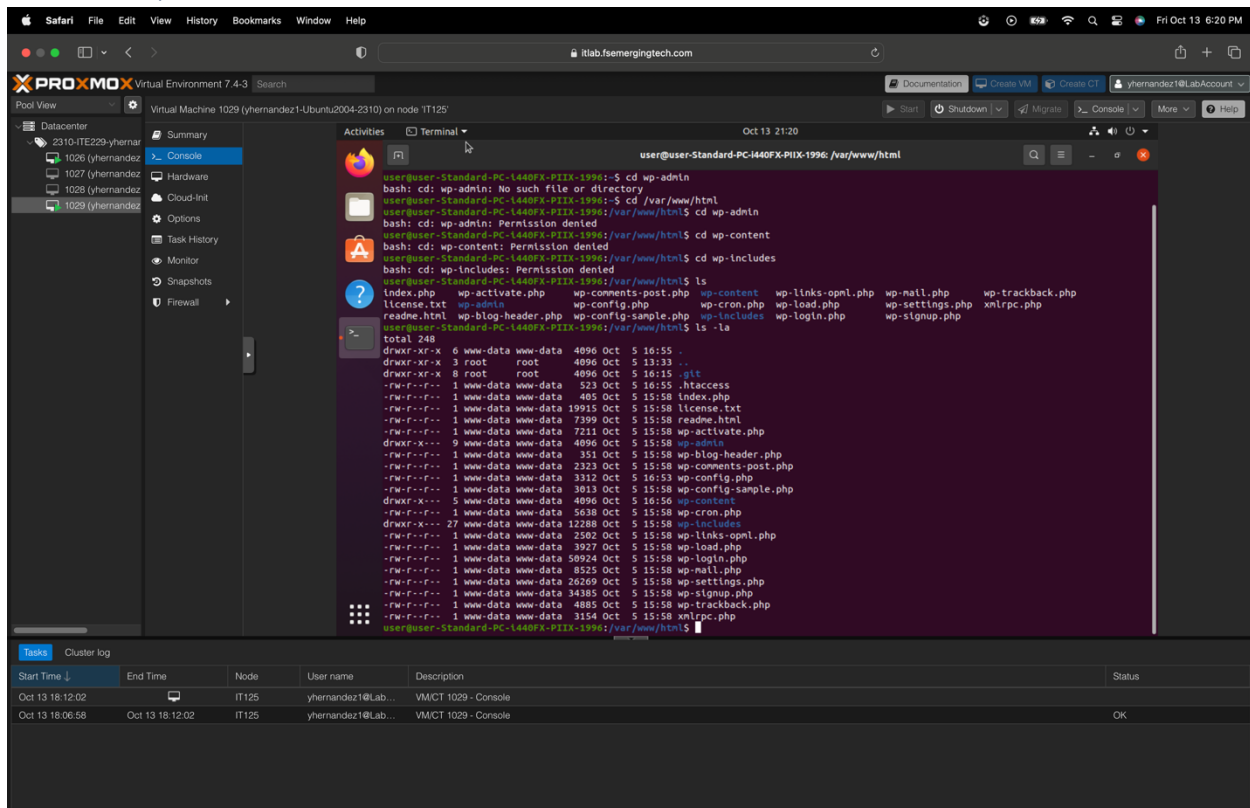
At the bottom of the interface, a 'Tasks' table shows the cluster log:

Start Time ↓	End Time	Node	User name	Description	Status
Oct 13 18:12:02		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 13 18:06:58	Oct 13 18:12:02	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 13 17:54:28	Oct 13 18:06:58	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 13 17:54:26	Oct 13 17:54:27	IT125	yhernandez1@Lab...	VM 1029 - Start	OK

To verify that permissions were changed, go to the terminal and type `cd wp-admin`, `cd wp-content`, and `cd wp-includes` on the command line. If they all say permission denied, then the configuration worked.

Securing wp-config.php

Vulnerability



The screenshot shows a Proxmox Virtual Environment (VE) interface. On the left, a sidebar lists various management tools like Datacenter, Summary, Console, Hardware, Cloud-init, Options, Task History, Monitor, Snapshots, and Firewall. The main area displays a terminal window for a virtual machine named 'yhermandez1-Ubuntu2004-2310' on node 'IT125'. The terminal shows the user 'user' at the prompt 'user@user-Standard-PC-l440FX-PIIX-1996: /var/www/html'. The user attempts to navigate to the WordPress configuration file with the following commands and receives permission denied errors:

```
user@user-Standard-PC-l440FX-PIIX-1996:~$ cd wp-admin
bash: cd: wp-admin: No such file or directory
user@user-Standard-PC-l440FX-PIIX-1996:~$ cd /var/www/html
user@user-Standard-PC-l440FX-PIIX-1996:/var/www/html$ cd wp-admin
bash: cd: wp-admin: Permission denied
user@user-Standard-PC-l440FX-PIIX-1996:/var/www/html$ cd wp-content
bash: cd: wp-content: Permission denied
user@user-Standard-PC-l440FX-PIIX-1996:/var/www/html$ cd wp-includes
bash: cd: wp-includes: Permission denied
```

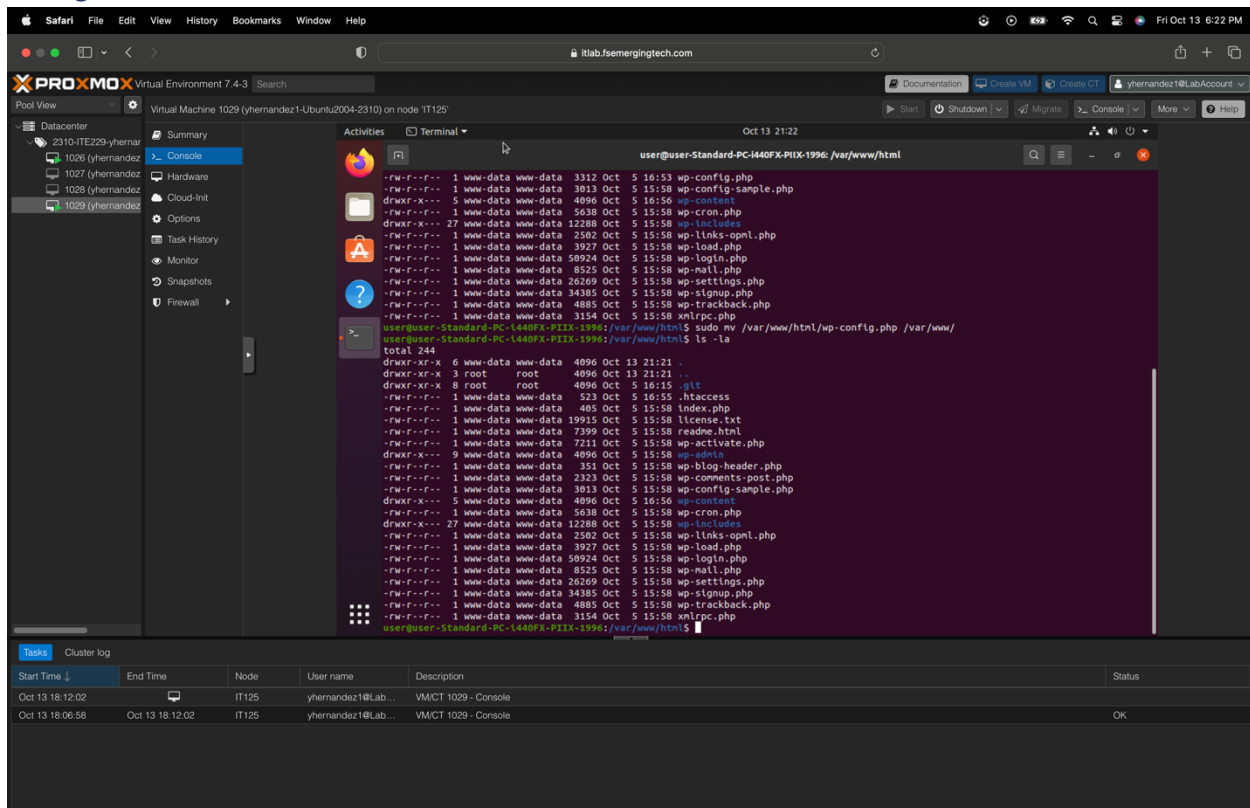
After these failures, the user runs 'ls' to list the contents of the directory, showing a list of files including 'index.php', 'license.txt', 'readme.html', 'wp-activate.php', 'wp-blog-header.php', 'wp-comments-post.php', 'wp-config.php', 'wp-cron.php', 'wp-links-opml.php', 'wp-load.php', 'wp-login.php', 'wp-mail.php', 'wp-nl.php', 'wp-settings.php', 'wp-trackback.php', 'xmlrpc.php', and 'wp-signup.php'. The terminal output also shows file permissions and ownership details for these files.

At the bottom of the interface, a 'Tasks' table is visible, showing a log of recent operations:

Start Time	End Time	Node	User name	Description	Status
Oct 13 18:12:02		IT125	yhermandez1@Lab...	VMCT 1029 - Console	
Oct 13 18:06:58	Oct 13 18:12:02	IT125	yhermandez1@Lab...	VMCT 1029 - Console	OK

To check if the wp-config.php file is vulnerable, go to the terminal and type `cd /var/www/html/wp-config.php`. If able to access it, then configurations need to be changed.

Configuration



To configure the wp-config.php file, go to the terminal, and on the command line, type **sudo mv /var/www/html/wp-config.php var/www/** this will move the file to another directory. Then type **sudo nano /var/www/html/.git/.htaccess** This will take you to .htaccess, and you will add the following code

```
<files wp-config.php>
order allow,deny
deny from all
</files>
```

Validation

Before initiating any adjustments to the file, it was essential to ensure that I had the necessary permissions to access and modify it. To confirm this, I attempted to open the file. Once my access was ascertained, I proceeded with the following steps to enhance its security. Using the 'nano' editor, a popular text editor for many UNIX-based systems, I appended specific instructions to deny unauthorized file access. This is crucial in safeguarding sensitive files, especially if they contain configurations or data that shouldn't be publicly accessible. A practical approach was to try and access the file from a web browser to test the effectiveness of my modifications. So, I navigated to <http://10.10.229.12/wp-config.php> to see if my held changes. The result was a blank page. In web security, this often signifies that access to a particular resource has been restricted or blocked, making it unavailable for viewing. Seeing this confirmed that my protective measures were effectively implemented, preventing unauthorized access and enhancing the file's security.

SafariFileEditViewHistoryBookmarksWindowHelp

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PROXMOXVirtual Environment 7.4-3

DocumentationCreate VMCreate CTyhermandez1@LabAccount

Pool ViewVirtual Machine 1029 (yhermandez1-Ubuntu2004-2310) on node IT125

Datacenter

2310-ITE229-yhermandez1026 (yhermandez1027 (yhermandez1028 (yhermandez1029 (yhermandez1

Summary

ConsoleHardwareCloud-initOptionsTask HistoryMonitorSnapshotsFirewall

ActivitiesTerminal

GNU nano 4.8 /var/www/html/.git/.htaccess

files wp-config.php
order allow,deny
deny from all
</files>

order deny, allow
deny from all

Get HelpExitWrite OutRead FileWhere IsReplaceCut TextPaste TextJustifyTo SpellCur PosGo To LineUndoRedoMark TextCopy Text

TasksCluster log

Start Time ↓	End Time	Node	User name	Description	Status
Oct 13 15:08:19		IT125	yhermandez1@Lab...	VMCT-1029 - Console	
Oct 13 14:49:28	Oct 13 15:08:19	IT125	yhermandez1@Lab...	VMCT-1029 - Console	OK
Oct 13 14:44:24	Oct 13 14:49:28	IT125	yhermandez1@Lab...	VMCT-1029 - Console	OK

Safari File Edit View History Bookmarks Window Help

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PROXMOX Virtual Environment 7.4-3

Virtual Machine 1029 (yhernandez1-Ubuntu2004-2310) on node IT125

Activities Terminal

```
user@user-Standard-PC-1440FX-PIIX-1996: /var/www
user@user-Standard-PC-1440FX-PIIX-1996:/$ sudo nano /var/www/html/.git/.htaccess
user@user-Standard-PC-1440FX-PIIX-1996:/$ cd /var/www/html/wp-config.php
bash: cd: /var/www/html/wp-config.php: No such file or directory
user@user-Standard-PC-1440FX-PIIX-1996:/$ cd /var/www
user@user-Standard-PC-1440FX-PIIX-1996:/$ cd /var/www$ ls
html  wp-config.php
user@user-Standard-PC-1440FX-PIIX-1996: /var/www$
```

Tasks Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Oct 13 18:53:09		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 13 18:48:05	Oct 13 18:53:08	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

Safari File Edit View History Bookmarks Window Help

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PROXMOX Virtual Environment 7.4-3

Virtual Machine 1029 (yhernandez1-Ubuntu2004-2310) on node IT125

Activities Firefox Web Browser

Page not found | Ubuntu LAMP

10.10.229.12/wp-config.php

Sample Page

Not Found

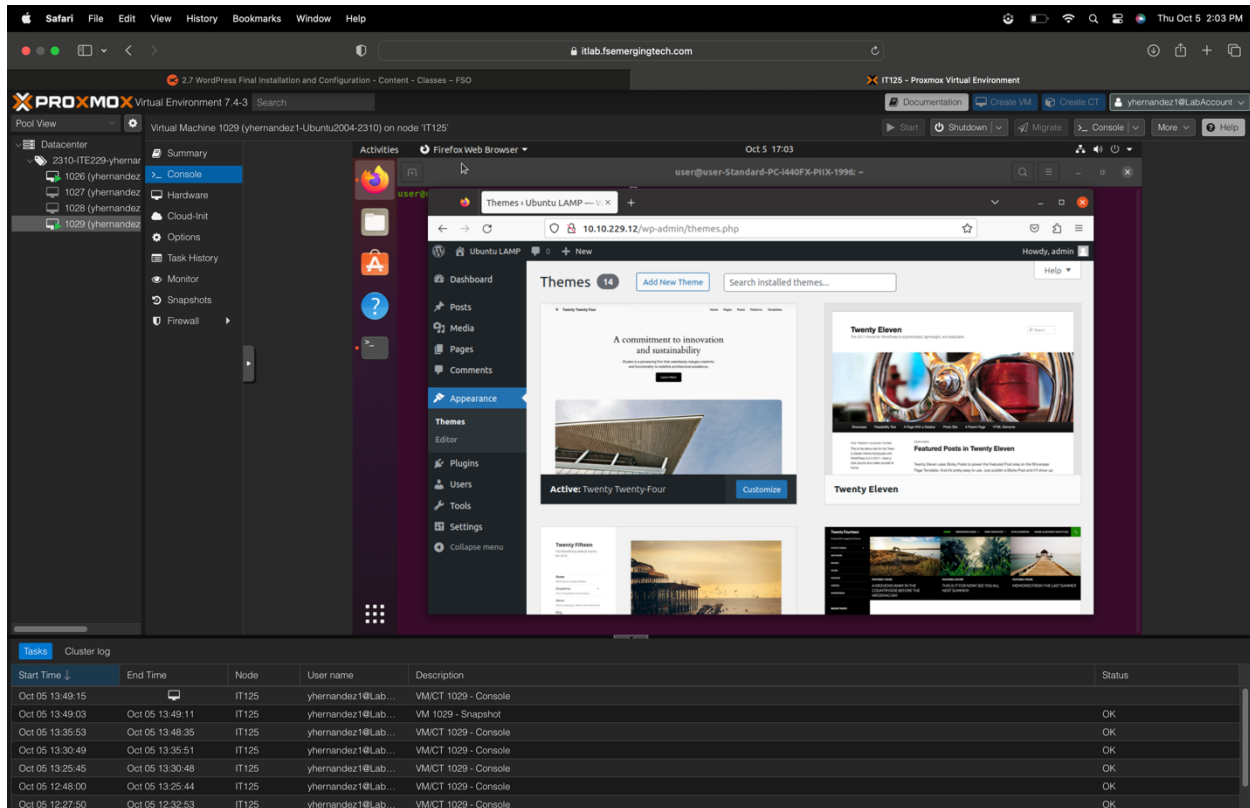
Tasks Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Oct 13 18:53:09		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 13 18:48:05	Oct 13 18:53:08	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

To validate, you will go to Firefox web browser, then on the address bar, type **10.10229.12/wp-config.php**. This will redirect you to the config page, and if everything was moved and configured correctly, a page not found should load up.

Firewall (Shield)

Vulnerability

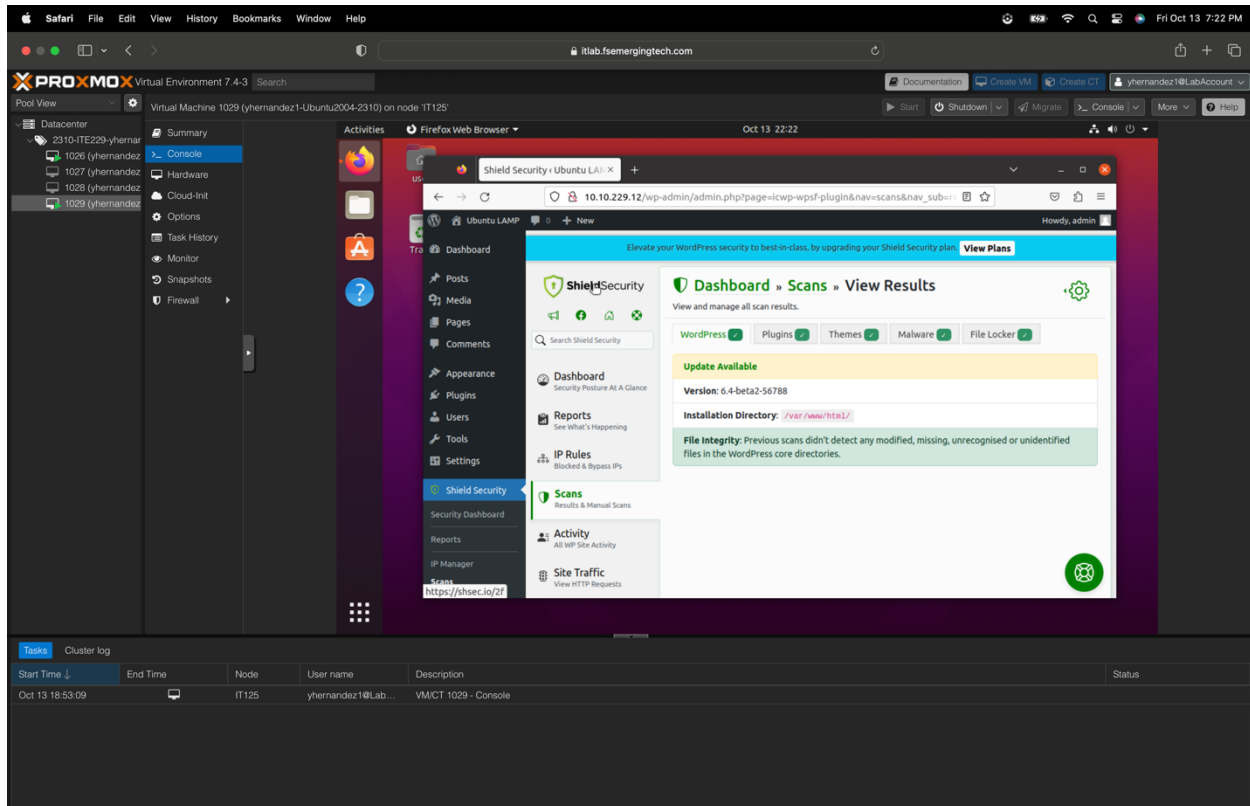


The screenshot shows a Proxmox Virtual Environment (VE) interface. On the left, the 'Datacenter' tree lists several virtual machines, including '1029 (yhernandez)'. The main panel displays the 'Console' of VM 1029, which is running Ubuntu 20.04-2310 on node IT125. A Firefox web browser is open within the console, showing the WordPress 'Themes' page at the URL `10.10.229.12/wp-admin/themes.php`. The browser's address bar shows the IP address `10.10.229.12`. Below the console, a 'Tasks' table is visible, listing various operations performed on the VM.

Start Time	End Time	Node	User name	Description	Status
Oct 05 13:49:15		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 05 13:49:03	Oct 05 13:49:11	IT125	yhernandez1@Lab...	VM 1029 - Snapshot	OK
Oct 05 13:35:53	Oct 05 13:48:35	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 13:30:49	Oct 05 13:35:51	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 13:25:45	Oct 05 13:30:48	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:48:00	Oct 05 13:25:44	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Oct 05 12:27:50	Oct 05 12:32:53	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

On the Firefox web browser, click on the address bar, type **10.10.229.12**, then click enter. If no firewall is running as a plugin, there is a vulnerability.

Configuration



To configure the firewall in WordPress, login to Ubuntu, then on Firefox, go to **10.10.229.12**, then click on plugins. Search for **Shield Security**, install the plugin, and follow the instructions. Once fully established, make sure that it's active and running.

Validation

Before implementing any modifications, I first assessed the status of the firewall. It was found to be inactive, which needed a change. To address this, I integrated a plugin named 'Security Shield.' I opted for the free version, which allows scanning and overseeing the firewall in WordPress. After installing the plugin, I reloaded the page and showed that the firewall was working correctly. This will scan, monitor activity, and filter IP.

Safari File Edit View History Bookmarks Window Help

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PROXMOX Virtual Environment 7.4-3

Virtual Machine 1029 (yhernandez1-Ubuntu2004-2310) on node IT125

Activities Firefox Web Browser

Shield Security - Ubuntu LAMP

10.10.229.12/wp-admin/admin.php?page=icwp-wp-f-plugin&nav=dashboard&nav_sub=overview

ShieldSecurity Dashboard Security Overview

Your entire WordPress site security at a glance.

Dashboard Security Posture At A Glance

Reports See What's Happening

IP Rules Blocked & Bypass IPs

Scans Results & Manual Scans

Activity All WP Site Activity

Site Traffic View HTTP Requests

Config Setup Your Security

High-Level System Security Summary

How good WordPress site & system security is looking

Analysis

WordPress Files 2415 Scan Results →

Malware - Scan Results →

Vulnerable Assets

Abandoned Plugin

Tasks Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Oct 15 09:48:02		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Oct 15 09:48:00	Oct 15 09:48:01	IT125	yhernandez1@Lab...	VM 1029 - Start	OK
Oct 15 09:48:00	Oct 15 09:48:01	IT125	yhernandez1@Lab...	VM 1029 - Start	Error: VM 1029 already runni...
Oct 15 09:48:17	Oct 15 09:47:57	IT126	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 15 09:36:18	Oct 15 09:46:17	IT126	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 15 09:31:14	Oct 15 09:36:17	IT126	yhernandez1@Lab...	VMCT 1026 - Console	OK
Oct 15 09:25:23	Oct 15 09:31:14	IT126	yhernandez1@Lab...	VMCT 1026 - Console	OK

Safari File Edit View History Bookmarks Window Help

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PROXMOX Virtual Environment 7.4-3

Virtual Machine 1029 (yhernandez1-Ubuntu2004-2310) on node IT125

Activities Firefox Web Browser

Wordfence Dashboard - Ubuntu LAMP

10.10.229.12/xmlrpc.php

XML-RPC server accepts POST requests only.

Tasks Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Oct 13 15:08:19		IT125	yhernandez1@Lab...	VMCT 1029 - Console	

To validate the proper functionality of the security shield, go to **10.10.229.12/xmlrpc.php**. A POST requests-only page should load up if it is properly working.

Conclusion

To implement a security methodology, my initial step involved conducting extensive research. Once I had completed my research, I assessed the necessary changes required in files and directories. I verified my access to these files and directories before adjusting their permissions. After completing the permission changes, I revisited the files to ensure I could no longer access them. Once I received "permission denied" for all three files, I moved on to the next task.

The second vulnerability I addressed involved the wp-config.php file. This was resolved by relocating the directory and modifying the code within the .htaccess file. After completing these tasks, I confirmed that the file was no longer accessible.

To address the last vulnerability, I implemented a firewall plugin, specifically Shield Security, which operates in the background to conduct security scans for malware, monitor activity, and filter IP addresses.

Appendix A

Pool View

Virtual Machine 1027 (yhernandez1-Rocky8-2310) on node IT126

2309-CT3001-yhernandez1

2310-ITE229-yhernandez1

1026 (yhernandez1-Firewall-2310)

1027 (yhernandez1-Rocky8-2310)

1028 (yhernandez1-CentOS7-2310)

1029 (yhernandez1-Ubuntu2004-2)

Summary

Console

Hardware

Cloud-Init

Options

Task History

Monitor

Snapshots

Firewall

GNU nano 2.9.6

etc/nginx/nginx.conf

```
sendfile        on;
tcp_nopush     on;
tcp_nodelay    on;
keepalive_timeout 65;
types_hash_max_size 2048;

include /etc/nginx/mime.types;
default_type application/octet-stream;

# Load modular configuration files from the /etc/nginx/conf.d directory.
# See http://nginx.org/en/docs/nginx_core_module.html#include
# for more information.
include /etc/nginx/conf.d/*.conf;

server {
    listen      80 default_server;
    listen      [::]:80 default_server;
    server_name _;
    root        /usr/share/nginx/html;

    # Load configuration files for the default server block.
    include /etc/nginx/default.conf;

    location / {
    }

    location /blog {
        proxy_pass http://10.10.229.11:3001;
        proxy_set_header Host $http.host; # required for docker client's sake
        proxy_set_header X-Real-IP $remote_addr; # pass on real client's IP
        proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
        proxy_read_timeout 900;
    }

    error_page 404 /404.html;
        location = /404.html {
        }

    error_page 500 502 503 504 /50x.html;
        location = /50x.html {
        }

    # Settings for a TLS enabled server.
}

root@localhost ~#
```

Tasks

Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Sep 28 12:17:54		IT126	yhernandez1@Lab...	VMCT 1027 - Console	
Sep 28 12:17:41	Sep 28 12:17:48	IT126	yhernandez1@Lab...	VM 1027 - Snapshot	OK
Sep 28 12:17:14	Sep 28 12:17:20	IT126	yhernandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:15:17	Sep 28 12:17:13	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Sep 28 12:14:39	Sep 28 12:15:16	IT126	yhernandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:14:38	Sep 28 12:14:39	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Sep 28 12:14:08	Sep 28 12:14:08	IT125	yhernandez1@Lab...	VM 1029 - Reset	OK

Appendix B

The screenshot shows the Proxmox Virtual Environment (VE) interface. On the left, a sidebar lists various virtual machines (VMs) under the 'Datacenter' tab. The main window displays the 'Summary' tab for a specific VM. A Firefox web browser is open within the VM, showing the 'Welcome to nginx on Rocky Linux!' page. The page includes instructions for testing the nginx HTTP server and provides links to the nginx website and Rocky Linux documentation. The browser's address bar shows the URL '10.10.229.10'.

Start Time	End Time	Node	User name	Description	Status
Sep 28 12:31:16		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Sep 28 12:28:18	Sep 28 12:31:15	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 28 12:17:54	Sep 28 12:28:18	IT126	yhernandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:17:41	Sep 28 12:17:48	IT126	yhernandez1@Lab...	VM 1027 - Snapshot	OK
Sep 28 12:17:14	Sep 28 12:17:20	IT126	yhernandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:15:17	Sep 28 12:17:13	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Sep 28 12:14:39	Sep 28 12:15:16	IT126	yhernandez1@Lab...	VMCT 1027 - Console	OK

The screenshot shows the Proxmox Virtual Environment (VE) interface. On the left, a sidebar lists various virtual machines (VMs) under the 'Datacenter' tab. The main window displays the 'Summary' tab for a specific VM. A Firefox web browser is open within the VM, showing an 'nginx error!' page. The page includes instructions for troubleshooting the error and provides links to the nginx website and Rocky Linux documentation. The browser's address bar shows the URL '10.10.229.10/blog'.

Start Time	End Time	Node	User name	Description	Status
Sep 28 12:57:55		IT125	yhernandez1@Lab...	VMCT 1029 - Console	
Sep 28 12:57:07	Sep 28 12:57:55	IT126	yhernandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:57:04	Sep 28 12:57:07	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK
Sep 28 12:56:47	Sep 28 12:57:03	IT126	yhernandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:49:15	Sep 28 12:56:56	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 28 12:48:05	Sep 28 12:49:14	IT126	yhernandez1@Lab...	VMCT 1027 - Console	OK
Sep 28 12:43:30	Sep 28 12:48:05	IT125	yhernandez1@Lab...	VMCT 1029 - Console	OK

Safari File Edit View History Bookmarks Window Help

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PROXMOX Virtual Environment 7.4-3 Search

Pool View Virtual Machine 1027 (yhernandez1-Rocky8-2310) on node IT126

Summary Console Hardware Cloud-Init Options Task History Monitor Snapshots Firewall

Rocky Linux 8.8 (Green Obsidian)
Kernel 4.18.8-477.18.1.el8_8.x86_64 on an x86_64

Activate the web console with: `systemctl enable --now cockpit.socket`

localhost login: root

Password:

Last login: Thu Sep 28 15:57:52 on tty1

[root@localhost ~]# service nginx status

Redirecting to `/bin/systemctl status nginx.service`

● nginx.service - The nginx HTTP and reverse proxy server

Loaded: loaded (`/usr/lib/systemd/system/nginx.service`; enabled; vendor preset: disabled)

Active: active (running) since Sat 2023-09-30 17:16:43 EDT; 46s ago

Process: 888 ExecStartPre=/usr/sbin/nginx (code=exited, status=0/SUCCESS)

Process: 769 ExecStartPre=/usr/sbin/nginx -t (code=exited, status=0/SUCCESS)

Process: 766 ExecStartPre=/usr/bin/rm -f /run/nginx.pid (code=exited, status=0/SUCCESS)

Main PID: 813 (nginx)

Tasks: 3 (limit: 11148)

Memory: 13.6M

Group: /system.slice/nginx.service

└─813 nginx: master process /usr/sbin/nginx

└─814 nginx: worker process

└─815 nginx: worker process

Sep 30 17:16:42 localhost.localdomain systemd[1]: Starting The nginx HTTP and reverse proxy server...

Sep 30 17:16:43 localhost.localdomain nginx[769]: nginx: the configuration file `/etc/nginx/nginx.conf` syntax is ok

Sep 30 17:16:43 localhost.localdomain nginx[769]: nginx: configuration file `/etc/nginx/nginx.conf` test is successful

Sep 30 17:16:43 localhost.localdomain systemd[1]: Started The nginx HTTP and reverse proxy server.

[root@localhost ~]#

Tasks Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Sep 30 14:16:19		IT126	yhernandez1@Lab...	VMCT 1027 - Console	
Sep 30 14:16:17	Sep 30 14:16:18	IT126	yhernandez1@Lab...	VM 1027 - Start	OK
Sep 30 14:16:13	Sep 30 14:16:15	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Sep 30 14:10:19	Sep 30 14:16:12	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 30 14:10:13	Sep 30 14:10:16	IT125	yhernandez1@Lab...	VM 1028 - Reboot	OK
Sep 30 14:05:20	Sep 30 14:10:16	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 30 14:05:18	Sep 30 14:05:19	IT125	yhernandez1@Lab...	VM 1028 - Start	OK

Safari File Edit View History Bookmarks Window Help

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PROXMOX Virtual Environment 7.4-3 Search

Pool View Virtual Machine 1027 (yhernandez1-Rocky8-2310) on node IT126

Summary Console Hardware Cloud-Init Options Task History Monitor Snapshots Firewall

Rocky Linux 8.8 (Green Obsidian)
Kernel 4.18.8-477.18.1.el8_8.x86_64 on an x86_64

Activate the web console with: `systemctl enable --now cockpit.socket`

localhost login: root

Password:

Last login: Thu Sep 28 15:57:52 on tty1

[root@localhost ~]# service nginx status

Redirecting to `/bin/systemctl status nginx.service`

● nginx.service - The nginx HTTP and reverse proxy server

Loaded: loaded (`/usr/lib/systemd/system/nginx.service`; enabled; vendor preset: disabled)

Active: active (running) since Sat 2023-09-30 17:16:43 EDT; 46s ago

Process: 888 ExecStartPre=/usr/sbin/nginx (code=exited, status=0/SUCCESS)

Process: 769 ExecStartPre=/usr/sbin/nginx -t (code=exited, status=0/SUCCESS)

Process: 766 ExecStartPre=/usr/bin/rm -f /run/nginx.pid (code=exited, status=0/SUCCESS)

Main PID: 813 (nginx)

Tasks: 3 (limit: 11148)

Memory: 13.6M

Group: /system.slice/nginx.service

└─813 nginx: master process /usr/sbin/nginx

└─814 nginx: worker process

└─815 nginx: worker process

Sep 30 17:16:42 localhost.localdomain systemd[1]: Starting The nginx HTTP and reverse proxy server...

Sep 30 17:16:43 localhost.localdomain nginx[769]: nginx: the configuration file `/etc/nginx/nginx.conf` syntax is ok

Sep 30 17:16:43 localhost.localdomain nginx[769]: nginx: configuration file `/etc/nginx/nginx.conf` test is successful

Sep 30 17:16:43 localhost.localdomain systemd[1]: Started The nginx HTTP and reverse proxy server.

[root@localhost ~]# cd /var/log/nginx

[root@localhost nginx]# tail access.log

18.18.229.12 - - [28/Sep/2023:15:16:01 -0400] "GET / HTTP/1.1" 200 3429 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100818 Firefox/113.0" "-"

18.18.229.12 - - [28/Sep/2023:15:16:01 -0400] "GET /nginx-logo.png HTTP/1.1" 200 360 "http://18.18.229.18/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100818 Firefox/113.0" "-"

18.18.229.12 - - [28/Sep/2023:15:16:01 -0400] "GET /poweredby.png HTTP/1.1" 200 1080 "http://18.18.229.18/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100818 Firefox/113.0" "-"

18.18.229.12 - - [28/Sep/2023:15:16:01 -0400] "GET /favicon.ico HTTP/1.1" 404 3332 "http://18.18.229.18/" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100818 Firefox/113.0" "-"

18.18.229.12 - - [28/Sep/2023:15:32:26 -0400] "GET /blog HTTP/1.1" 404 3332 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100818 Firefox/113.0" "-"

18.18.229.12 - - [28/Sep/2023:15:36:09 -0400] "GET /blog HTTP/1.1" 404 3332 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100818 Firefox/113.0" "-"

18.18.229.12 - - [28/Sep/2023:15:37:35 -0400] "GET /blog HTTP/1.1" 404 3332 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100818 Firefox/113.0" "-"

18.18.229.12 - - [28/Sep/2023:15:44:13 -0400] "GET /blog HTTP/1.1" 404 3332 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100818 Firefox/113.0" "-"

18.18.229.12 - - [28/Sep/2023:15:58:37 -0400] "GET /blog HTTP/1.1" 502 3484 "-" "Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:109.0) Gecko/20100818 Firefox/113.0" "-"

[root@localhost nginx]#

Tasks Cluster log

Start Time ↓	End Time	Node	User name	Description	Status
Sep 30 14:16:19		IT126	yhernandez1@Lab...	VMCT 1027 - Console	
Sep 30 14:16:17	Sep 30 14:16:18	IT126	yhernandez1@Lab...	VM 1027 - Start	OK
Sep 30 14:16:13	Sep 30 14:16:15	IT125	yhernandez1@Lab...	VMCT 1026 - Console	OK
Sep 30 14:10:19	Sep 30 14:16:12	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 30 14:10:13	Sep 30 14:10:16	IT125	yhernandez1@Lab...	VM 1028 - Reboot	OK
Sep 30 14:05:20	Sep 30 14:10:16	IT125	yhernandez1@Lab...	VMCT 1028 - Console	OK
Sep 30 14:05:18	Sep 30 14:05:19	IT125	yhernandez1@Lab...	VM 1028 - Start	OK