
PAN-OS-PHP Install Guide for WSL V2

Version 1.0.1

Document History

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Document Distribution

Name	Division

Glossary of Terms

Term	Description
WSL	Windows Subsystem for Linux
PANOS	Palo Alto Network Operating System

References

Ref Id	Title / Link	Issue
1	https://github.com/PaloAltoNetworks/pan-os-php	
2	https://docs.microsoft.com/en-us/windows/wsl/about	
3	https://docs.microsoft.com/en-us/windows/wsl/install-win10	

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1 About PAN-OS-PHP

PAN-OS-PHP is a PHP library aimed at making PANOS config changes easy (and XML free ;), maintainable and allowing complex scenarios like rule merging, unused object tracking, conversion of checkpoint exclusion groups, massive rule editing, AppID conversion. It will work seamlessly on local config file or API.

Further information can be found in the link below:

<https://github.com/PaloAltoNetworks/pan-os-php>

This guide focuses on installing PAN-OS-PHP on WSL V2 for users that need to run PAN-OS-PHP without running a separate Linux Machine.

2 About Windows Subsystem for Linux

The Windows Subsystem for Linux lets developers run a GNU/Linux environment -- including most command-line tools, utilities, and applications -- directly on Windows, unmodified, without the overhead of a traditional virtual machine or dualboot setup.

You can:

- Choose your Favorite GNU/Linux distributions [from the Microsoft Store](#).
- Run common command-line tools such as grep, sed, awk, or other ELF-64 binaries.
- Run Bash shell scripts and GNU/Linux command-line applications including:
 - Tools: vim, emacs, tmux
 - Languages: [NodeJS](#), Javascript, [Python](#), Ruby, C/C++, C# & F#, Rust, Go, etc.
 - Services: SSHD, [MySQL](#), Apache, lighttpd, [MongoDB](#), [PostgreSQL](#).
- Install additional software using your own GNU/Linux distribution package manager.
- Invoke Windows applications using a Unix-like command-line shell.
- Invoke GNU/Linux applications on Windows.

Further information can be found in the link below:

<https://docs.microsoft.com/en-us/windows/wsl/about>

3 Installing the Windows Subsystem for Linux

Use the install guide in the link below to install WSL V2.

***** Please note this guide was written for Ubuntu 20.04.2 LTS. *****

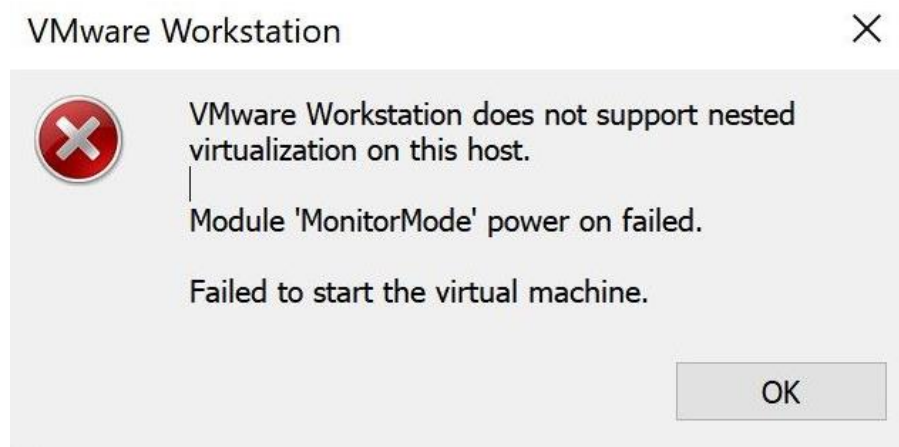
<https://docs.microsoft.com/en-us/windows/wsl/install-win10>

3.1 Effects of WSL V2 with VMware Workstation

At the time of writing this guide there was a known issue with not being able to run Nested Virtualization on VMware hosts running in VMware Workstation. This is due to incompatibility with Windows HyperV (required for WSL V2) and VMware Workstation. This was apparently resolved with VMware Workstation version > 15.5.5.

After installing WSL V2 and attempting to boot a VM with Virtualization extension enabled, you may receive the following the message:

*'VMware Workstation does not support nested virtualization on this host.
Module 'MonitorMode' power on failed.
Failed to start the virtual machine'*



You can either temporarily disable HyperV from a windows cmd shell

Disable Hyper-V:

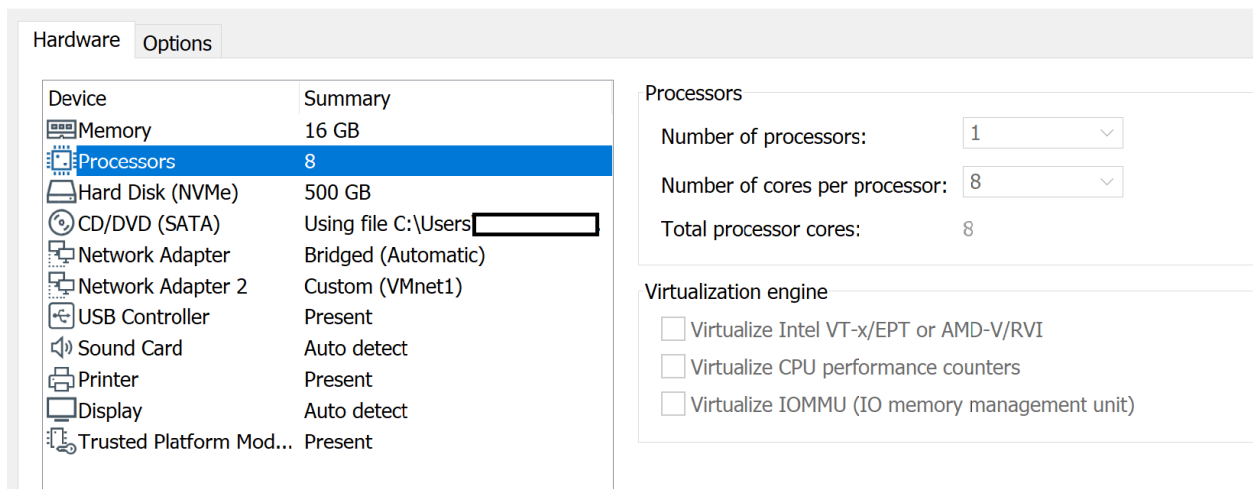
```
bcdedit /set hypervisorlaunchtype off
```

Enable Hyper-V:

```
bcdedit /set hypervisorlaunchtype auto
```

Alternatively, you can also disable nested virtualisation on the VM as below:

Virtual Machine Settings



The screenshot shows the 'Options' tab of the 'Virtual Machine Settings' dialog. On the left, a list of hardware components is shown with 'Processors' selected. On the right, the 'Processors' section shows 'Number of processors' set to 1, 'Number of cores per processor' set to 8, and 'Total processor cores' set to 8. Below this, the 'Virtualization engine' section has three unchecked checkboxes: 'Virtualize Intel VT-x/EPT or AMD-V/RVI', 'Virtualize CPU performance counters', and 'Virtualize IOMMU (IO memory management unit)'.

Device	Summary
Memory	16 GB
Processors	8
Hard Disk (NVMe)	500 GB
CD/DVD (SATA)	Using file C:\Users\ [redacted]
Network Adapter	Bridged (Automatic)
Network Adapter 2	Custom (VMnet1)
USB Controller	Present
Sound Card	Auto detect
Printer	Present
Display	Auto detect
Trusted Platform Mod...	Present

Processors

Number of processors: 1

Number of cores per processor: 8

Total processor cores: 8

Virtualization engine

- ☐ Virtualize Intel VT-x/EPT or AMD-V/RVI
- ☐ Virtualize CPU performance counters
- ☐ Virtualize IOMMU (IO memory management unit)

The problem with disabling nested virtualization is that you'll not be able to use a Windows VM running in VMware Workstation to test features such as WSL!

Some additional details on this issue:

<https://communities.vmware.com/t5/VMware-Workstation-Pro/VMware-Workstation-15-5-6-does-not-support-nested-virtualization/td-p/2301311>

4 Installing PAN-OS-PHP

Prior to cloning the GitHub Repository, first update and install packages. Please note the Linux distro used at the time of writing this guide was Ubuntu 20.04.2 LTS. Depending on which Linux Distro was installed the below may not be valid:

4.1 Updating and installing package dependencies

```
sudo apt-get update
sudo apt-get install php
sudo apt-get install php-curl
sudo apt-get install php-dom
sudo apt-get install php-mbstring
```

4.2 Clone the pan-os-php repository

```
git clone https://github.com/PaloAltoNetworks/pan-os-php.git
```

5 Example usage of PAN-OS-PHP

The below syntax add's a new tag named #DENY to security rules with the action set to deny:

```
/pan-os-php/utils$ php rules-edit.php in=api://10.94.90.253 actions=tag-add:#DENY 'filter=(action is.deny)' shadow-apikeynohidden
```

Do you want to enable log at start for rule going to DMZ zone and that has only object group 'Webfarms' as a destination?

```
/pan-os-php/utils$ php rules-edit.php in=api://fw1.mycompany.com actions=logStart-Enable 'filter=(to has dmz) and (dst has.only Webfarms)'
```

You are not sure about your filter and want to see rules before making changes? Use action 'display' :

```
/pan-os-php/utils$ php rules-edit.php in=api://fw1.mycompany.com actions=display 'filter=(to has dmz) and (dst has.only Webfarms)'
```

Change all rules using Application + Any service to application default?

```
/pan-os-php/utils$ php rules-edit.php in=api://fw1.mycompany.com actions=service-Set-AppDefault 'filter=! (app is.any) and (service is.any)'
```

Move post-SecurityRules with source zone 'dmz' or source object 'Admin-networks' to pre-Security rule?

```
/pan-os-php/utils$ php rules-edit.php in=api://panorama.mycompany.com actions=invertPreAndPost 'filter=((from has dmz) or (source has Admin-networks) and (rule is.postrule))'
```

Want to know what actions are supported?

```
/pan-os-php/utils$ php rules-edit.php listActionsphp rules-edit.php listFilters
```

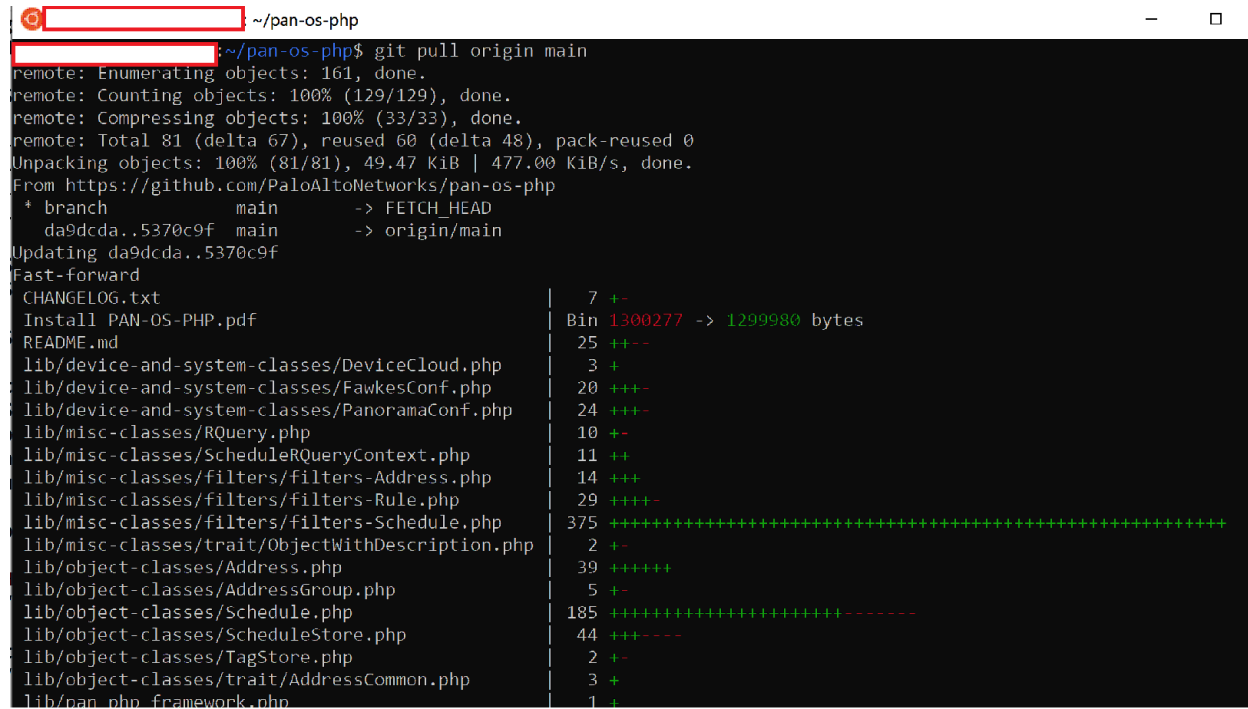
Many examples and further information can be found on the pan-os-php repositoryL

<https://github.com/paloaltonetworks/pan-os-php>

6 Updating PAN-OS-PHP

To update PAN-OS-PHP for new features and bug fixes run the below:

```
#pan-os-php$ git pull origin main
```



```
~/pan-os-php$ git pull origin main
remote: Enumerating objects: 161, done.
remote: Counting objects: 100% (129/129), done.
remote: Compressing objects: 100% (33/33), done.
remote: Total 81 (delta 67), reused 60 (delta 48), pack-reused 0
Unpacking objects: 100% (81/81), 49.47 KiB | 477.00 KiB/s, done.
From https://github.com/PaloAltoNetworks/pan-os-php
 * branch          main          -> FETCH_HEAD
    da9dcda..5370c9f  main        -> origin/main
Updating da9dcda..5370c9f
Fast-forward
 CHANGELOG.txt                | 7 +-
 Install PAN-OS-PHP.pdf       | Bin 1300277 -> 1299980 bytes
 README.md                   | 25 +---
 lib/device-and-system-classes/DeviceCloud.php | 3 +
 lib/device-and-system-classes/FawkesConf.php   | 20 +++-
 lib/device-and-system-classes/PanoramaConf.php | 24 +++-
 lib/misc-classes/RQuery.php | 10 +-
 lib/misc-classes/ScheduleRQueryContext.php     | 11 ++
 lib/misc-classes/filters/filters-Address.php   | 14 +++
 lib/misc-classes/filters/filters-Rule.php       | 29 +++-
 lib/misc-classes/filters/filters-Schedule.php  | 375 +++++
 lib/misc-classes/trait/ObjectWithDescription.php | 2 +-
 lib/object-classes/Address.php                  | 39 +++++
 lib/object-classes/AddressGroup.php             | 5 +-
 lib/object-classes/Schedule.php                 | 185 +++++
 lib/object-classes/ScheduleStore.php            | 44 +++---
 lib/object-classes/TagStore.php                 | 2 +-
 lib/object-classes/trait/AddressCommon.php      | 3 +
 lib/pan_php_framework.php                       | 1 +
```