

## Installation et intégration d'un routeur PfSense :

Tout d'abord il faut télécharger l'image ISO du routeur PfSense :

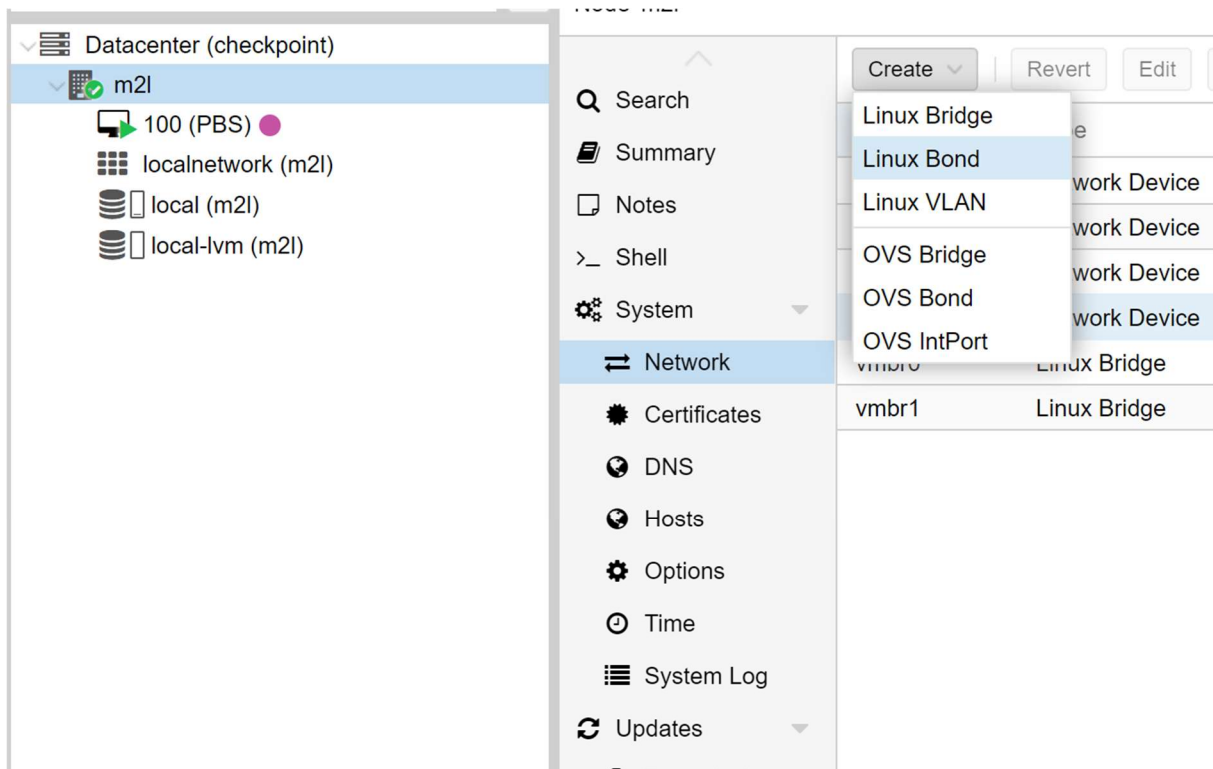
The screenshot shows the Netgate website's product page for the 'NETGATE INSTALLER'. The page has a dark blue header with the Netgate logo, a search bar, and a shopping cart icon. Below the header, there are navigation links for 'ALL PRODUCTS', 'PFSENSE+ PRODUCTS', 'TNSR PRODUCTS', 'ACCESSORIES', 'SUPPORT', and 'TRAINING'. The main content area features the 'NETGATE INSTALLER' product name, a price of '\$0.00', and a note that shipping is calculated at checkout. It also mentions a 4-installment payment option for orders over \$50.00. The 'Installation Image' section shows a dropdown menu set to 'AMD64 ISO IPMI/Virtual Mach'. A quantity selector is set to 1. At the bottom, there are buttons for 'ADD TO CART' and 'FIND A PARTNER'. The Netgate logo and 'PfSense+' logo are also visible.

Une fois téléchargée, il faut se rendre sur l'interface graphique de l'hyperviseur ProxMox afin de créer la VM dédiée au routeur PfSense. Pour ce faire, il faut importer l'image ISO du Routeur directement dans Proxmox :

The screenshot shows the Proxmox Virtual Environment (VE) interface. The left sidebar displays the 'Server View' with a tree structure including 'Datacenter (checkpoint)', 'm2l', '100 (PBS)', 'localnetwork (m2l)', 'local (m2l)', and 'local-lvm (m2l)'. The main panel shows the 'Storage 'local' on node 'm2l'' view. The 'ISO Images' tab is selected, displaying a table of ISO images. The table has columns for 'Name', 'Date', 'Format', and 'Size'. Two ISO images are listed: 'netgate-installer-v1.0-RC-amd64-20240919-1435.iso' and 'proxmox-backup-server\_3.2-1.iso'.

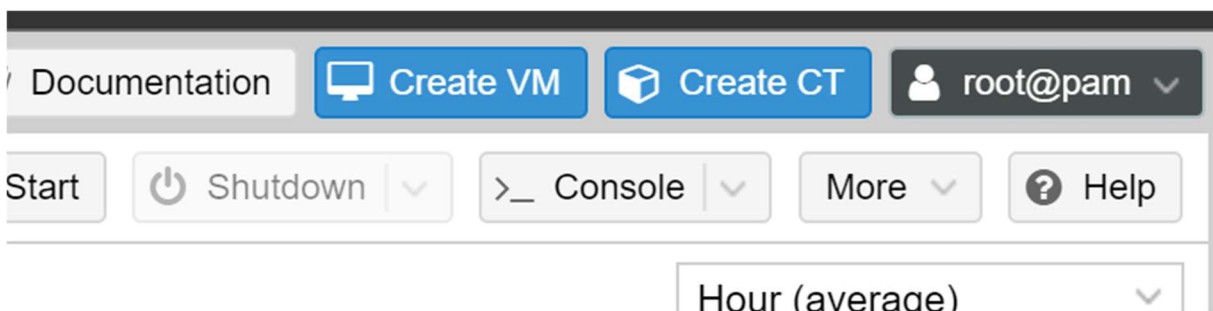
Name	Date	Format	Size
netgate-installer-v1.0-RC-amd64-20240919-1435.iso	2024-10-14 16:59:28	iso	989.73 MB
proxmox-backup-server_3.2-1.iso	2024-10-14 16:33:34	iso	1.15 GB

Il faut ensuite créer un vmbr auquel il faudra connecter notre routeur en tant que pont :

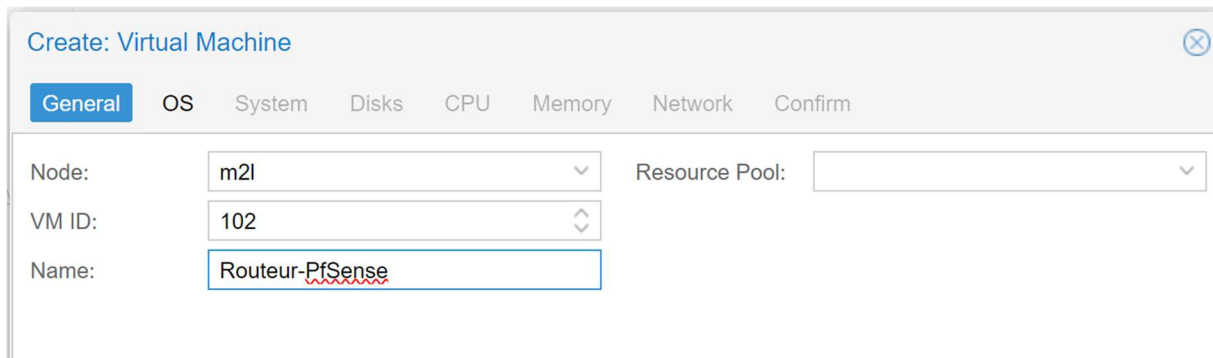


Par la suite il faudra impérativement redémarrer le Proxmox afin que les changements soient appliqués.

Arrive l'étape de la création d'une VM pour le routeur :



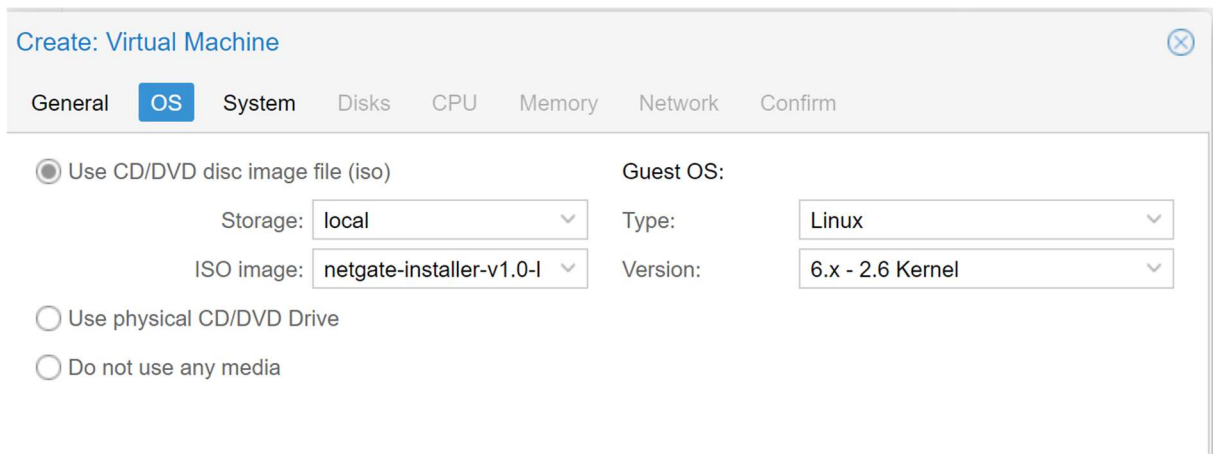
Nous mettons le nom de notre machine virtuelle ; « Routeur-PfSense » dans notre cas.



The screenshot shows the 'Create: Virtual Machine' dialog box with the 'General' tab selected. The 'Node' dropdown is set to 'm2l', 'VM ID' is '102', and 'Name' is 'Routeur-PfSense'. The 'Resource Pool' dropdown is empty.

Field	Value
Node:	m2l
VM ID:	102
Name:	Routeur-PfSense
Resource Pool:	

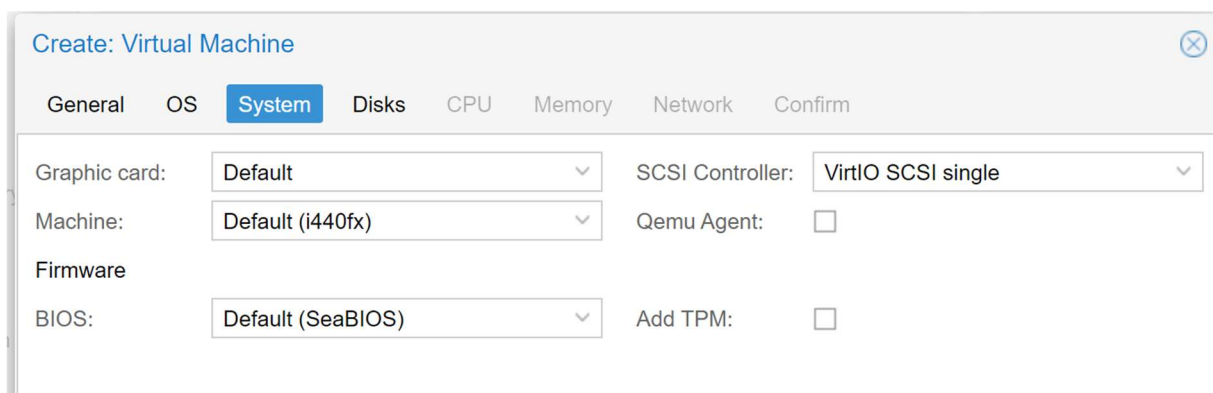
Nous choisissons l'image ISO que nous voulons utiliser pour cette VM.



The screenshot shows the 'Create: Virtual Machine' dialog box with the 'OS' tab selected. The 'Use CD/DVD disc image file (iso)' radio button is selected. The 'Storage' dropdown is 'local', 'ISO image' is 'netgate-installer-v1.0-l', 'Guest OS' is 'Linux', and 'Version' is '6.x - 2.6 Kernel'. The other two radio buttons are unselected.

Option	Value
Use CD/DVD disc image file (iso)	Selected
Storage:	local
ISO image:	netgate-installer-v1.0-l
Guest OS:	Linux
Version:	6.x - 2.6 Kernel
Use physical CD/DVD Drive	Unselected
Do not use any media	Unselected

Laisser par défaut.



The screenshot shows the 'Create: Virtual Machine' dialog box with the 'System' tab selected. The 'Graphic card' is 'Default', 'Machine' is 'Default (i440fx)', 'SCSI Controller' is 'VirtIO SCSI single', 'Firmware' is 'Default (SeaBIOS)', and 'Add TPM' is unselected. 'Qemu Agent' is also unselected.

Field	Value
Graphic card:	Default
Machine:	Default (i440fx)
SCSI Controller:	VirtIO SCSI single
Firmware	
BIOS:	Default (SeaBIOS)
Qemu Agent:	Unselected
Add TPM:	Unselected

Nous attribuons 20go de stockage pour cette VM.

Create: Virtual Machine

GeneralOSSystemDisksCPUMemoryNetworkConfirm

scsi0

DiskBandwidth

Bus/Device:SCSI0Cache:Default (No cache)

SCSI Controller:VirtIO SCSI singleDiscard:☐

Storage:local-lvmIO thread:☒

Disk size (GiB):20

Format:Raw disk image (raw)

Laisser par défaut.

Create: Virtual Machine

GeneralOSSystemDisksCPUMemoryNetworkConfirm

Sockets:1Type:x86-64-v2-AES

Cores:1Total cores:1

Pour la mémoire vive il est possible d'attribuer seulement 1024Mo cependant je lui attribut 2048mo car le serveur nous le permet. Nous pouvons néanmoins ajuster la taille de la mémoire vive par la suite.

Create: Virtual Machine

GeneralOSSystemDisksCPUMemoryNetworkConfirm

Memory (MiB):2048

Le pont réseau est celui qu'on laisse par défaut, c'est-à-dire le vmbr0.

Create: Virtual Machine

General

OS

System

Disks

CPU

Memory

Network

Confirm

☐ No network device

Bridge:

vmbr0

Model:

VirtIO (paravirtualized)

VLAN Tag:

no VLAN

MAC address:

auto

Firewall:

☒

La machine virtuelle relative au routeur est maintenant créée.

Une fois la VM créée, nous allons passer à la configuration du routeur :

Choisir « Boot Multi User ».

Create: Virtual Machine

General

OS

System

Disks

CPU

Memory

Network

Confirm

Key ↑	Value
cores	1
cpu	x86-64-v2-AES
ide2	local:iso/netgate-installer-v1.0-RC-amd64-20240919-1435.iso,media=cdrom
memory	2048
name	Routeur-PfSense
net0	virtio,bridge=vmbr0,firewall=1
nodename	m2l
numa	0
ostype	l26
scsi0	local-lvm:20,iothread=on
scsihw	virtio-scsi-single
sockets	1
vmid	102

☐ Start after created

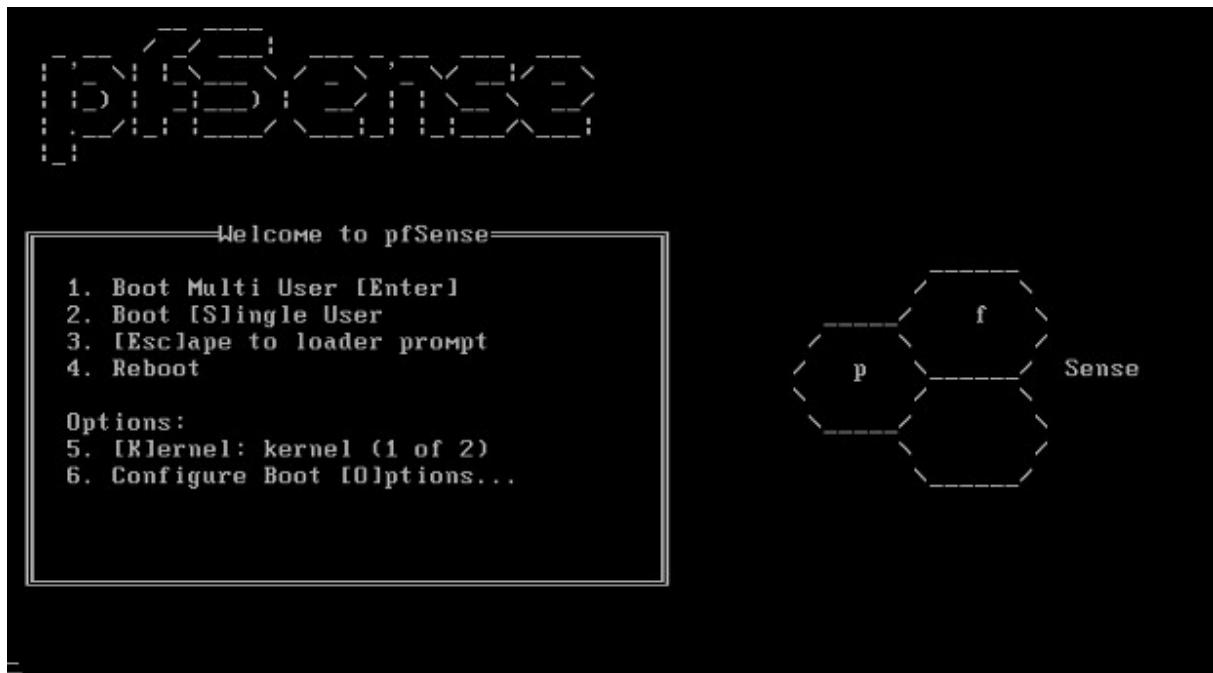
Advanced ☐

Back

Finish

Une fois la VM créée, nous allons passer à la configuration du routeur :

Choisir « Boot Multi User ».



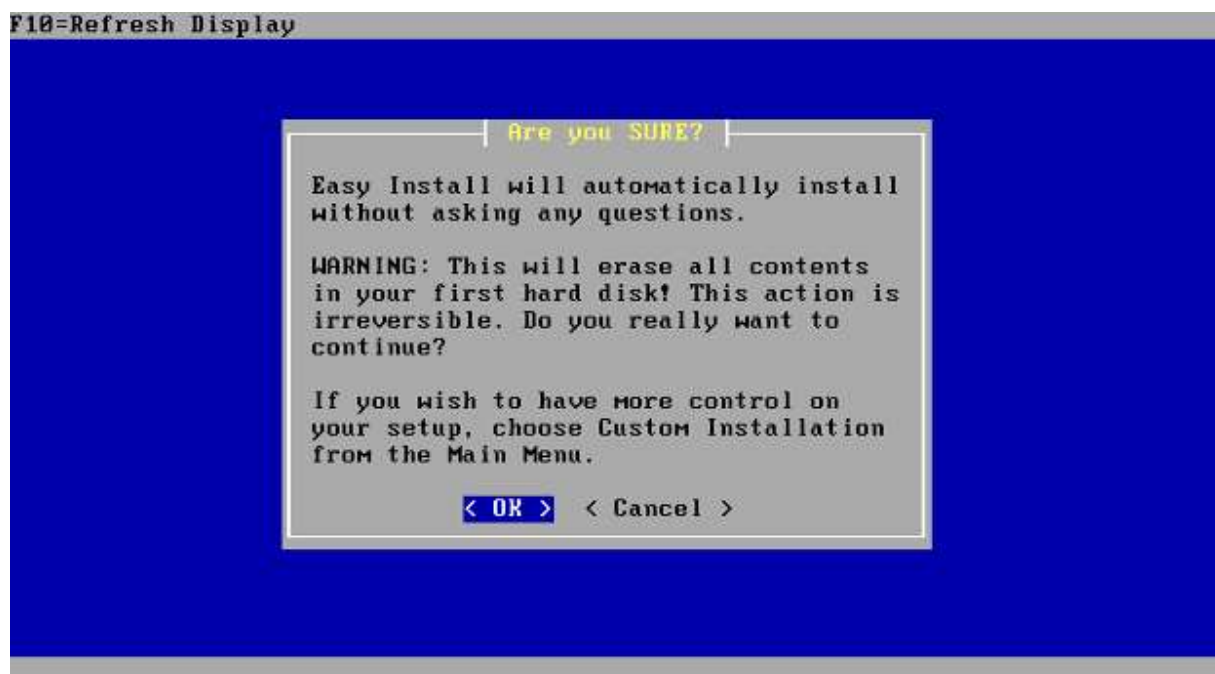
Sélectionner « Accept these Settings ».



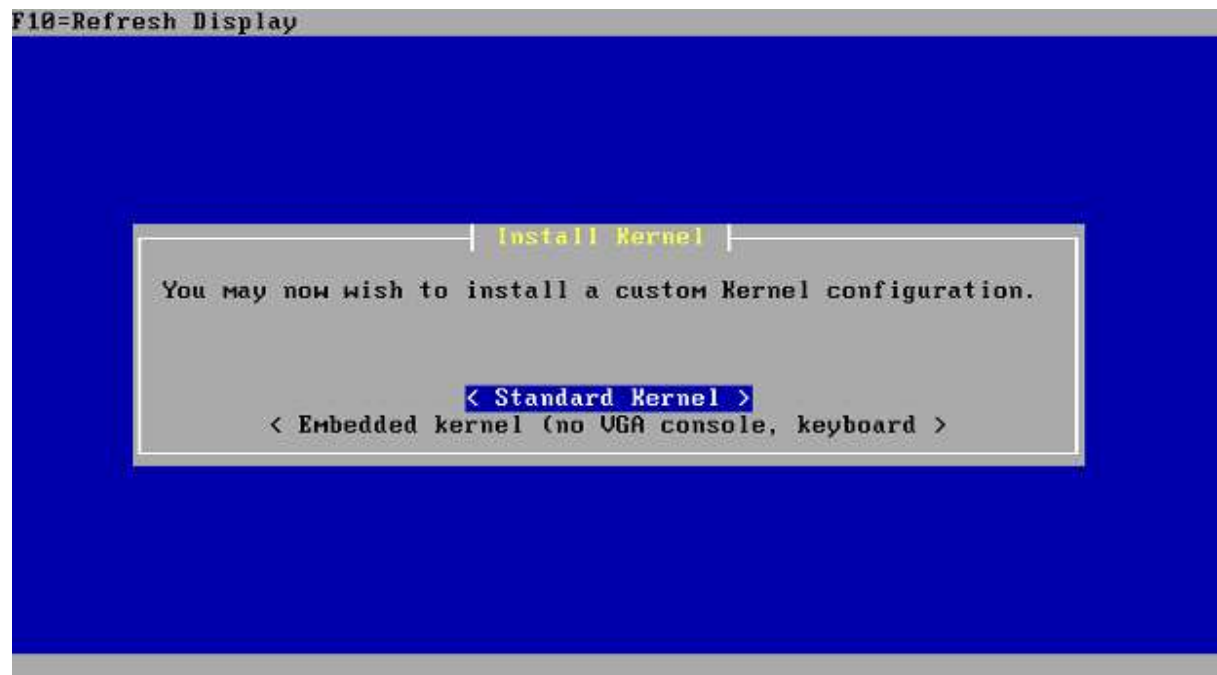
Sélectionner « Quick/Easy Install ».



Cliquer sur « OK » (Cette sélection installera le package PfSense sans demander aucune autre autorisation, ce qui facilite l'installation. Cependant nous n'aurons aucun contrôle sur le choix des packages en plus à installer).



Sélectionner « Standard Kernel » (le routeur aura le droit Kernel sur le serveur, c'est-à-dire qu'il aura les droits total sur la machine).



Il faut maintenant redémarrer la machine afin que tous les changements s'appliquent.





Nous n'allons pas ajouter de VLANs donc taper n.

```
No core dumps found.
Creating symlinks.....ELF ldconfig path: /lib /usr/lib /usr/lib/compat /usr/local/lib /usr/local/lib/ipsec /usr/local/lib/perl5/5.24/mach/CORE
32-bit compatibility ldconfig path: /usr/lib32
done.
External config loader 1.0 is now starting... da0s1 da0s1a da0s1b
Launching the init system..... done.
Initializing..... done.
Starting device manager (devd)...done.
Loading configuration.....done.

Default interfaces not found -- Running interface assignment option.
vmx0: link state changed to UP
vmx1: link state changed to UP

Valid interfaces are:

vmx0    00:0c:29:59:72:ae (down) VMware VMXNET3 Ethernet Adapter
vmx1    00:0c:29:59:72:b8 (down) VMware VMXNET3 Ethernet Adapter

Do VLANs need to be set up first?
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.
Should VLANs be set up now [y;n]? █
```

Notre interface connectée à internet est bien la « vmx0 », précédemment configurée sur notre serveur.

```
Initializing..... done.
Starting device manager (devd)...done.
Loading configuration.....done.

Default interfaces not found -- Running interface assignment option.
vmx0: link state changed to UP
vmx1: link state changed to UP

Valid interfaces are:

vmx0    00:0c:29:59:72:ae (down) VMware VMXNET3 Ethernet Adapter
vmx1    00:0c:29:59:72:b8 (down) VMware VMXNET3 Ethernet Adapter

Do VLANs need to be set up first?
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.
Should VLANs be set up now [y;n]? n

If the names of the interfaces are not known, auto-detection can
be used instead. To use auto-detection, please disconnect all
interfaces before pressing 'a' to begin the process.

Enter the WAN interface name or 'a' for auto-detection
(vmx0 vmx1 or a): vmx0 █
```

Notre interface connectée au réseau local est bien la « vmx1 », précédemment configurée sur notre serveur.

```
Default interfaces not found -- Running interface assignment option.
vmx0: link state changed to UP
vmx1: link state changed to UP

Valid interfaces are:

vmx0    00:0c:29:59:72:ae (down) VMware VMXNET3 Ethernet Adapter
vmx1    00:0c:29:59:72:b8 (down) VMware VMXNET3 Ethernet Adapter

Do VLANs need to be set up first?
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.

Should VLANs be set up now [y!n]? n

If the names of the interfaces are not known, auto-detection can
be used instead. To use auto-detection, please disconnect all
interfaces before pressing 'a' to begin the process.

Enter the WAN interface name or 'a' for auto-detection
(vmx0 vmx1 or a): vmx0

Enter the LAN interface name or 'a' for auto-detection
NOTE: this enables full Firewalling/NAT mode.
(vmx1 a or nothing if finished): vmx1
```

Nous n'avons pas d'autre interface, il faut donc appuyer sur Entrer

```
Valid interfaces are:

vmx0    00:0c:29:59:72:ae (down) VMware VMXNET3 Ethernet Adapter
vmx1    00:0c:29:59:72:b8 (down) VMware VMXNET3 Ethernet Adapter

Do VLANs need to be set up first?
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.

Should VLANs be set up now [y!n]? n

If the names of the interfaces are not known, auto-detection can
be used instead. To use auto-detection, please disconnect all
interfaces before pressing 'a' to begin the process.

Enter the WAN interface name or 'a' for auto-detection
(vmx0 vmx1 or a): vmx0

Enter the LAN interface name or 'a' for auto-detection
NOTE: this enables full Firewalling/NAT mode.
(vmx1 a or nothing if finished): vmx1

Enter the Optional 1 interface name or 'a' for auto-detection
( a or nothing if finished):
```

Nos interfaces sont bonnes, taper sur y.

```
If VLANs will not be used, or only for optional interfaces, it is typical to
say no here and use the webConfigurator to configure VLANs later, if required.

Should VLANs be set up now [y\N]? n

If the names of the interfaces are not known, auto-detection can
be used instead. To use auto-detection, please disconnect all
interfaces before pressing 'a' to begin the process.

Enter the WAN interface name or 'a' for auto-detection
(vmx0 vmx1 or a): vmx0

Enter the LAN interface name or 'a' for auto-detection
NOTE: this enables full Firewalling/NAT mode.
(vmx1 a or nothing if finished): vmx1

Enter the Optional 1 interface name or 'a' for auto-detection
( a or nothing if finished):

The interfaces will be assigned as follows:

WAN -> vmx0
LAN -> vmx1

Do you want to proceed [y\N]? █
```

Le routeur est maintenant correctement configuré, nous pouvons y accéder depuis l'interface graphique directement via l'adresse IP du routeur.

```
FreeBSD/amd64 (pfsense.smmet.fr) (ttyv0)

*** Welcome to pfSense 2.3.4-RELEASE-p1 (amd64 full-install) on pfsense ***

WAN (wan)      -> vmx0      ->
LAN (lan)      -> vmx1      -> v4: 172.16.7.254/21

0) Logout (SSH only)          9) pfTop
1) Assign Interfaces          10) Filter Logs
2) Set interface(s) IP address 11) Restart webConfigurator
3) Reset webConfigurator password 12) PHP shell + pfSense tools
4) Reset to factory defaults  13) Update from console
5) Reboot system              14) Enable Secure Shell (sshd)
6) Halt system                15) Restore recent configuration
7) Ping host                  16) Restart PHP-FPM
8) Shell

Enter an option: █
```

Cependant, nous allons lui attribuer une adresse IP statique cohérente avec notre réseau local :

Appuyer sur « 2 ».

```
0) Logout (SSH only)          9) pfTop
1) Assign Interfaces          10) Filter Logs
2) Set interface(s) IP address 11) Restart webConfigurator
3) Reset webConfigurator password 12) PHP shell + pfSense tools
4) Reset to factory defaults  13) Update from console
5) Reboot system              14) Enable Secure Shell (sshd)
6) Halt system                15) Restore recent configuration
7) Ping host                  16) Restart PHP-FPM
8) Shell

Enter an option: 2
```

Nous souhaitons ne pas activer le DHCP en WAN :

```
Enter an option: 2

Available interfaces:

1 - WAN (vtnet0 - dhcp, dhcp6)
2 - LAN (vtnet1 - static)

Enter the number of the interface you wish to configure: 1

Configure IPv4 address WAN interface via DHCP? (y/n) n
```

Nous allons maintenant lui affecter l'adresse IP ainsi que le masque de sous réseau mais également la passerelle par défaut :

```
Enter the new WAN IPv4 address. Press <ENTER> for none:
> [redacted]

Enter the new WAN IPv4 subnet bit count (1 to 32):
> [redacted]

For a WAN, enter the new WAN IPv4 upstream gateway address.
For a LAN, press <ENTER> for none:
> [redacted]
```

Sélectionner « n » pour la configuration DHCP6

```
Configure IPv6 address WAN interface via DHCP6? (y/n) n
```

Ne rien saisir et appuyer directement sur « Entrer »

```
Enter the new WAN IPv6 address. Press <ENTER> for none:  
>
```

Nous ne voulons pas d'adresse WAN en DHCP, sélectionner « n »

```
Do you want to enable the DHCP server on WAN? (y/n) n
```

Nous voulons un accès en HTTPS donc sélectionner « y »

```
Do you want to revert to HTTP as the webConfigurator protocol? (y/n)
```

Appuyer sur « Entrer »

```
The IPv4 WAN address has been set to 212.83.149.100/32  
You can now access the webConfigurator by opening the following URL in your web  
browser:  
https://212.83.149.100  
Press <ENTER> to continue.
```

Notre routeur est maintenant configuré.

Nous avons bien accès à l'interface graphique du routeur :

