Dans le cadre de ma formation, nous avons mis en place un serveur pfSense sur une VM via VirtualBox. pfSense est une distribution FreeBSD spécialisée dans les fonctions de pare-feu et de routeur, offrant une grande flexibilité et de nombreuses fonctionnalités avancées. Ce serveur a été utilisé pour sécuriser et gérer le trafic réseau dans un environnement simulé.

Configuration de la VM :

- Système d'exploitation : pfSense
- Processeur : 1 cœur
- Mémoire vive (RAM) : 2048 Mo
- Espace disque : 20 Go

Étape 1 : Préparation de l'environnement

Nous avons commencé par télécharger l'ISO de pfSense depuis le site officiel et créé une nouvelle VM dans VirtualBox avec les paramètres suivants :

- Type de système d'exploitation : BSD
- Version : FreeBSD (64-bit)
- Nom de la VM : pfSense

Ensuite, nous avons monté l'ISO de pfSense sur la VM et démarré l'installation.

Étape 2 : Installation de pfSense

L'installation de pfSense **a été réalisée en suivant les étapes de l'assistant** d'installation :

- Choisir l'option d'installation par défaut (Install)
- Accepter les paramètres de partitionnement automatique
- Installer pfSense sur le disque dur
- Redémarrage du système



<mark>Auto (2FS)</mark> Auto (UFS) Manual Shell	<mark>Guided Root-on-ZFS</mark> Guided UFS Disk Setup Manual Disk Setup (experts Open a shell and partition	;) i by hand
	Cancel>	



ZFS Configuration Select Virtual Device type:
stripeStripeNoRedundancymirrorMirror - n-Way Mirroringraid10RAID 1+0 - n x 2-Way Mirrorsraid21RAID-21 - Single Redundant RAIDraid22RAID-22 - Double Redundant RAIDraid23RAID-23 - Triple Redundant RAID
<pre></pre>

pfSense Installer		
	ZFS Configuration	
	[*] adaØ VBOX HARDDISK	
	Cok > < Back >	
ntsonco installor		

ast Chance! Are you sure you want to destroy the current contents of the following disks: ada0 ▲ YES > < NO > [Press arrows, TAB or ENTER]
ada0
<pre></pre>



Étape 3 : Configuration initiale de pfSense

Après l'installation, nous avons effectué la configuration initiale de pfSense via l'interface console :

- Définir les interfaces réseau (WAN et LAN)
- Attribuer les interfaces réseau

done . Starting CRON... done. pfSense 2.7.2-RELEASE amd64 20231206-2010 Bootup complete FreeBSD/amd64 (pfSense.home.arpa) (ttyv0) VirtualBox Virtual Machine - Netgate Device ID: c8639ced1a798e925969 *** Welcome to pfSense 2.7.2-RELEASE (amd64) on pfSense *** WAN (wan) -> em0 -> LAN (lan) -> v4: 192.168.1.1/24 -> em1 0) Logout (SSH only) 9) pfTop 10) Filter Logs 1) Assign Interfaces 2) Set interface(s) IP address 11) Restart webConfigurator 3) Reset webConfigurator password
4) Reset to factory defaults
5) Reboot system 12) PHP shell + pfSense tools 13) Update from console 14) Enable Secure Shell (sshd) 15) Restore recent configuration 6) Halt system 7) Ping host 16) Restart PHP-FPM 8) Shell Enter an option: 1 0) Logout (SSH only) 1) Assign Interfaces 9) ptlop 10) Filter Logs 2) Set interface(s) IP address 11) Restart webConfigurator 3) Reset webConfigurator password
4) Reset to factory defaults
5) Reboot system 12) PHP shell + pfSense tools 13) Update from console 14) Enable Secure Shell (sshd) 6) Halt system 15) Restore recent configuration 7) Ping host 16) Restart PHP-FPM 8) Shell Inter an option: 1 lalid interfaces are: 08:00:27:ae:cd:30 (up) Intel(R) Legacy PRO/1000 MT 82540EM 08:00:27:1e:66:41 (up) Intel(R) Legacy PRO/1000 MT 82540EM 08:00:27:d8:8e:7b (down) Intel(R) Legacy PRO/1000 MT 82540EM emØ em 1 em2 08:00:27:53:7f:81 (down) Intel(R) Legacy PRO/1000 MT 82540EM em3 o 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 [uln]? n

16) Restart PHP-FPM

Enter an option: 1

7) Ping host 8) Shell

Valid interfaces are:

em0 08:00:27:ae:cd:30 (up) Intel(R) Legacy PRO/1000 MT 82540EM em1 08:00:27:1e:66:41 (up) Intel(R) Legacy PRO/1000 MT 82540EM em2 08:00:27:d8:8e:7b (down) Intel(R) Legacy PRO/1000 MT 82540EM em3 08:00:27:53:7f:81 (down) Intel(R) Legacy PRO/1000 MT 82540EM

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 [yln]? 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 (em0 em1 em2 em3 or a): em0

/alid interfaces are:

08:00:27:ae:cd:30 (up) Intel(R) Legacy PR0/1000 MT 82540EM
08:00:27:1e:66:41 (up) Intel(R) Legacy PR0/1000 MT 82540EM
08:00:27:d8:8e:7b (down) Intel(R) Legacy PR0/1000 MT 82540EM
08:00:27:53:7f:81 (down) Intel(R) Legacy PR0/1000 MT 82540EM
00 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 [yIn]? 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 (em0 em1 em2 em3 or a): em0
Enter the LAN interface name or 'a' for auto-detection 10TE: this enables full Firewalling/NAT mode.

(em1 em2 em3 a or nothing if finished): em1

1f 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 (em0 em1 em2 em3 or a): em0 Enter the LAN interface name or 'a' for auto-detection NOTE: this enables full Firewalling/NAT mode. (em1 em2 em3 a or nothing if finished): em1 Enter the Optional 1 interface name or 'a' for auto-detection (em2 em3 a or nothing if finished): em2 Enter the Optional 2 interface name or 'a' for auto-detection (em3 a or nothing if finished): em3 The interfaces will be assigned as follows: AAN -> em0 AN -> em1 DPT1 -> em2 DPT2 -> em3

)o you want to proceed [y|n]? y

Enter an option: reeBSD/amd64 (pfSense.home.arpa) (ttyv0) /irtualBox Virtual Machine - Netgate Device ID: c8639ced1a798e925969 *** Welcome to pfSense 2.7.2-RELEASE (amd64) on pfSense *** WAN (wan) -> em0 LAN (lan) -> em1 -> v4: 192.168.1.1/24 OPT1 (opt1) -> em2 -> OPT2 (opt2) -> -> em3 0) Logout (SSH only) 1) Assign Interfaces 9) pfTop 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 16) Restart PHP-FPM 7) Ping host 8) Shell Enter an option: 2

WHN (wan) LAN (lan) ·> em⊍ -> v4: 192.168.1.1/24 -> em1 OPT1 (opt1) OPT2 (opt2) -> em2 -> em3 0) Logout (SSH only) 1) Assign Interfaces 9) pfTop 10) Filter Logs Restart webConfigurator
 PHP shell + pfSense tools
 Update from console 2) Set interface(s) IP address 3) Reset webConfigurator password4) Reset to factory defaults 5) Reboot system 14) Enable Secure Shell (sshd) 15) Restore recent configuration 6) Halt system 7) Ping host 16) Restart PHP-FPM 8) Shell Enter an option: 2 Available interfaces: 1 – WAN (em0 – dhcp, dhcp6) 2 – LAN (em1 – static) 3 - OPT1 (em2) 4 - OPT2 (em3) Enter the number of the interface you wish to configure: 1 Available interfaces: 1 - WAN (em0 - dhcp, dhcp6) - LAN (em1 - static) 3 - OPT1 (em2) 4 - OPT2 (em3) Enter the number of the interface you wish to configure: 1 Configure IPv4 address WAN interface via DHCP? (y/n) n Enter the new WAN IPv4 address. Press <ENTER> for none: 192.168.23.254 Subnet masks are entered as bit counts (as in CIDR notation) in pfSense. e.g. 255.255.255.0 = 24 255.255.0.0 = 16 255.0.0 = 8 Enter the new WAN IPv4 subnet bit count (1 to 32): > 24 For a WAN, enter the new WAN IPv4 upstream gateway address. For a LAN, press <ENTER> for none: \ ■

or a LAN, press <ENTER> for none: 192.168.23.200 Should this gateway be set as the default gateway? (y/n) y Configure IPv6 address WAN interface via DHCP6? (y/n) n Enter the new WAN IPv6 address. Press <ENTER> for none: Do you want to enable the DHCP server on WAN? (y/n) n Disabling IPv4 DHCPD... Disabling IPv6 DHCPD... Do you want to revert to HTTP as the webConfigurator protocol? (y/n) y Please wait while the changes are saved to WAN... Reloading filter... Reloading routing configuration... DHCPD.. Restarting webConfigurator... The IPv4 WAN address has been set to 192.168.23.254/24 Press <ENTER> to continue.

Étape 4 : Accès à l'interface web de pfSense

Une fois les interfaces réseau configurées, nous avons accédé à l'interface web de pfSense en utilisant l'adresse IP de l'interface LAN :

• http://192.168.1.1

Les étapes suivantes ont été réalisées :

- Connexion avec les identifiants par défaut (admin/pfsense)
- Changement du mot de passe par défaut

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Full par	me Susta	n Administration											5	
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Étape 5 : Finalisation

Nous avons maintenant accès à l'interface du Routeur pfSENSE :

Configuration de l'interface VLAN (type de connexion, adresse IP, etc.)
Configuration de l'interface DMZ (adresse IP, masque de sous-réseau)

Enable	🖸 Enable interface
Description	dmz
	Enter a description (name) for the interface here.
IPv4 Configuration Type	Static IPv4
Pv6 Configuration Type	None 🗸
MAC Address	xx:xx:xx:xx:xx:xx This field can be used to modify ("spoof") the MAC address of this interface. Enter a MAC address in the following format: xx:xx:xx:xx:xx:xx or leave blank.
MTU	If this field is blank, the adapter's default MTU will be used. This is typically 1500 bytes but can vary in some circumstance
MSS	If a value is entered in this field, then MSS clamping for TCP connections to the value entered above minus 40 for IPv4 (TCP/IPv4 header size) and minus 60 for IPv6 (TCP/IPv6 header size) will be in effect.
	Default (no preference, typically autoselect)
Speed and Duplex	WARNING: MUST be set to autoselect (automatically negotiate speed) unless the port this interface connects to has its

Conclusion :

En conclusion, cette mission m'a permis de développer et de valider mes compétences en administration de systèmes et réseaux, conformément aux exigences du module [insérer le nom du module]. J'ai démontré ma capacité à installer, configurer et sécuriser un serveur de pare-feu et de routage avec pfSense. Ce projet m'a également sensibilisé aux enjeux de la sécurité réseau et de la gestion des pare-feu en entreprise.