

Lab#2
NetGate pfSense

NACT-261 Network Security
2024-2025 Spring Semester

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Due by February 16
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OBJECTIVE

To be able to understand how does the pfSense Router SG-3100 works and learn how to install pfBlockerNG. So, with that, I can learn how to block the website as whatever I want on this router and understand what the features appear on this.

PROCEDURE

- Walked to the ICS Equipment room
- Got the SG-3100 model Router, MAC.
- Got WAN and LAN cable to connect with the router and Internet
- Learned how to reset the Router
- Opened the GUI on the website
- Learned how to install pfBlockerNG on it
- Block the website
- Take the items what I took from ICS Equipment to give it back

NETWORK DIAGRAM

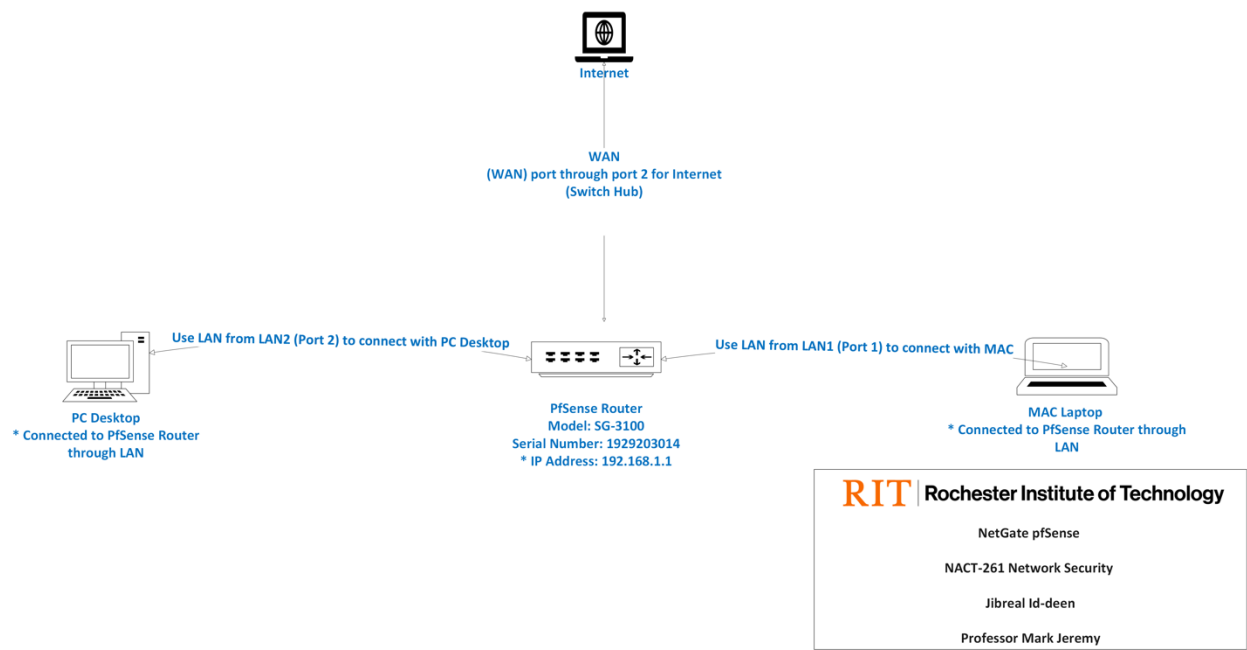


FIGURE 1 - NETWORK DIAGRAM

```
C:\Users\Student04>ipconfig 1

Windows IP Configuration

Ethernet adapter Ethernet:

    Connection-specific DNS Suffix  . : home.arpa
    Link-local IPv6 Address . . . . . : fe80::99e3:267:8025:5dbb%12
    IPv4 Address. . . . . : 192.168.1.134
    Subnet Mask . . . . . : 255.255.255.0
    Default Gateway . . . . . : fe80::208:a2ff:fe11:8c12%12
                                192.168.1.1 2
```

FIGURE 2 - CHECK THE ROUTER'S IP ADDRESS FROM CMD



FIGURE 3 - USE THAT IP ADDRESS ON THE WEBSITE TO LOOK



FIGURE 4 - SEEING THE ACCOUNT ON THE WEBSITE

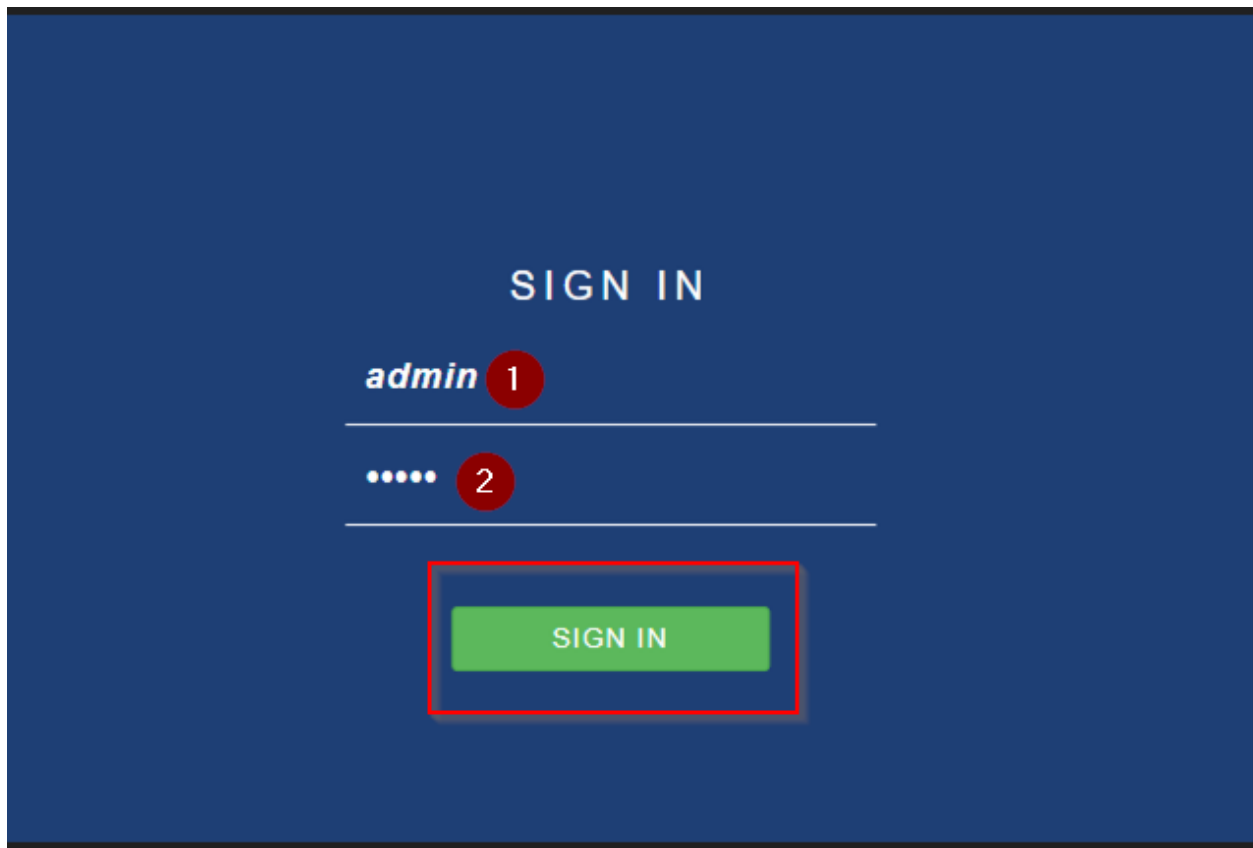


FIGURE 5 - LOGGING THE ACCOUNT ON THE WEBSITE

System
Interfaces
Firewall
Services
VPN
Status
Diagnostics
Help

1

Status / Dashboard

+

?

System Information

Name

pfSense.home.arpa

User

admin@192.168.1.134 (Local Database)

System

Netgate 3100
Serial: 1929203014
Netgate Device ID: 524ec036772cb963e3d6

Version

23.05.1-RELEASE (arm)
built on Wed Jun 28 03:58:46 UTC 2023
FreeBSD 14.0-CURRENT

Version 23.09.1 is available.

Version information updated at Wed Feb 5 20:34:02 UTC 2025

CPU Type

ARM Cortex-A9 r4p1 (ECO: 0x00000000)
2 CPUs
Crypto: Marvell Cryptographic Engine and Security Accelerator

Hardware crypto

AES-CBC,SHA1,SHA256

Uptime

01 Hour 13 Minutes 59 Seconds

Current date/time

Wed Feb 5 20:35:33 UTC 2025

DNS server(s)

127.0.0.1
10.1.40.1

Last config change

Tue Apr 30 20:05:34 UTC 2024

State table size

0% (47/202000) Show states

MBUF Usage

15% (1518/10035)

Temperature

57°C

Load average

0.41, 0.26, 0.22

CPU usage

12%

Memory usage

10% of 2027 MiB

Disks

Mount	Used	Size	Usage
/	1.8G	6.9G	28% of 6.9G (ufs)

Netgate Services And Support

Contract type

Community Support
Community Support Only

NETGATE AND pfSense COMMUNITY SUPPORT RESOURCES

If you purchased your pfSense gateway firewall appliance from Netgate and elected **Community Support** at the point of sale or installed pfSense on your own hardware, you have access to various community support resources. This includes the **NETGATE RESOURCE LIBRARY**.

You also may upgrade to a Netgate Global Technical Assistance Center (TAC) Support subscription. We're always on! Our team is staffed 24x7x365 and committed to delivering enterprise-class, worldwide support at a price point that is more than competitive when compared to others in our space.

- Upgrade Your Support
- Community Support Resources
- Netgate Global Support FAQ
- Official pfSense Training by Netgate
- Netgate Professional Services
- Visit Netgate.com

If you decide to purchase a Netgate Global TAC Support subscription, you **MUST** have your **Netgate Device ID (NDI)** from your firewall in order to validate support for this unit. Write down your NDI and store it in a safe place. You can purchase TAC supports [here](#).

Interfaces

WAN	1000baseT <full-duplex>	10.1.40.120
LAN	2500Base-KX <full-duplex>	192.168.1.1
ADMIN	Other <full-duplex>	192.168.10.1
SYSTEMADMINI	Other <full-duplex>	192.168.20.1
LAN 1	1000baseT <full-duplex> Switch Port	n/a
LAN 2	none Switch Port	n/a
LAN 3	none Switch Port	n/a
LAN 4	none Switch Port	n/a
LAN Uplink	Ethernet 2500Base-KX <full-duplex> Switch Uplink	n/a

FIGURE 6 - LOOKING AT THE GUI OF THE pfSENSE ROUTER

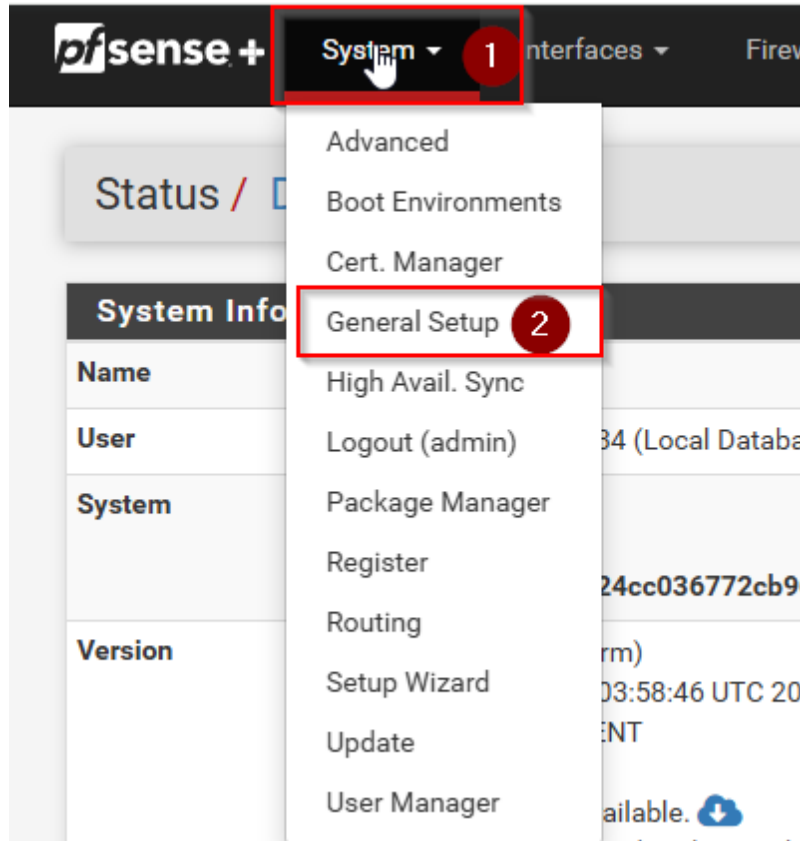


FIGURE 7 - OPEN THE SYSTEM THEN CLICK GENERAL SETUP

pfSense +

System ▾ Interfaces ▾ Firewall ▾ Services ▾ VPN ▾ Status ▾ Diagnostics ▾ Help ▾

System / General Setup

System

Hostname

pfSense

1

Domain

home.arpa

2

3

DNS Servers

DNS Server

DNS Hostname

Address

Enter IP addresses to be used by the system for DNS resolution. These are also used for the DHCP service, DNS Forwarder and DNS Resolver when it has DNS Query Forwarding enabled.

Hostname

Enter the DNS Server Hostname for TLS Verification in the DNS Resolver (optional).

4

Add DNS Server

+ Add DNS Server

5

DNS Server Override

☒ Allow DNS server list to be overridden by DHCP/PPP on WAN or remote OpenVPN server

If this option is set, Netgate pfSense Plus will use DNS servers assigned by a DHCP/PPP server on WAN or a remote OpenVPN server (if Pull DNS option is enabled) for its own purposes (including the DNS Forwarder/DNS Resolver). However, they will not be assigned to DHCP clients.

DNS Resolution Behavior

6

Use local DNS (127.0.0.1), fall back to remote DNS Servers (Default ▾)

By default the firewall will use local DNS service (127.0.0.1, DNS Resolver or Forwarder) as the first DNS server when possible, and it will fall back to remote DNS servers otherwise. Use this option to choose alternate behaviors.

FIGURE 8 - LOOKING AROUND THE GERNAL SETUP

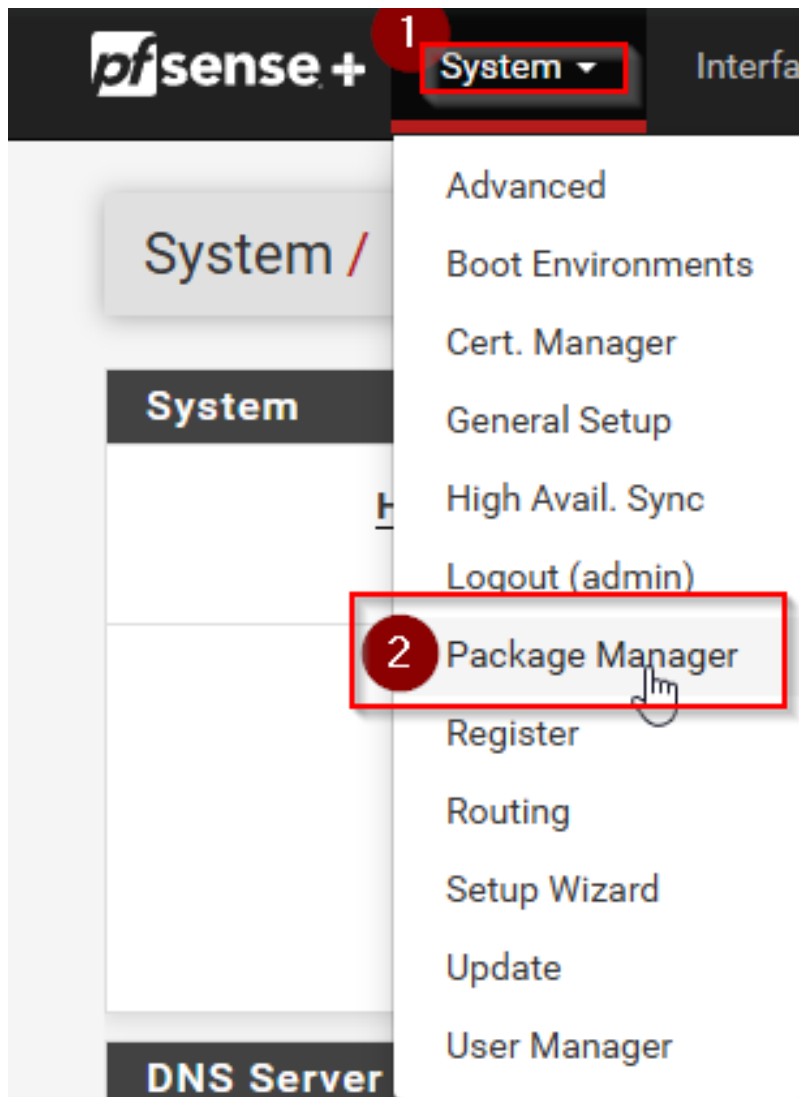


FIGURE 9 - OPEN THE SYSTEM AND CLICK PACKAGE MANAGER

pfSense+ System Interfaces Firewall Services VPN Status Diagnostics Help

System / Package Manager / Installed Packages

Installed Packages Available Packages

Installed Packages					
Name	Category	Version	Description	Actions	
✓ aws-wizard	net	0.10	pfSense AWS VPC VPN Connection Wizard Package Dependencies: php82-8.2.11 aws-sdk-php-3.273.3		
ipsec-profile-wizard	net	1.1_1	pfSense Mobile IPsec Client Profile Generator for Apple and Windows devices Package Dependencies: zip-3.0_1		

= Update ✓ = Current
 = Remove = Information = Reinstall
Newer version available
Package is configured but not (fully) installed or deprecated

FIGURE 10 - LOOKING AROUND THE PACKAGE MANAGER

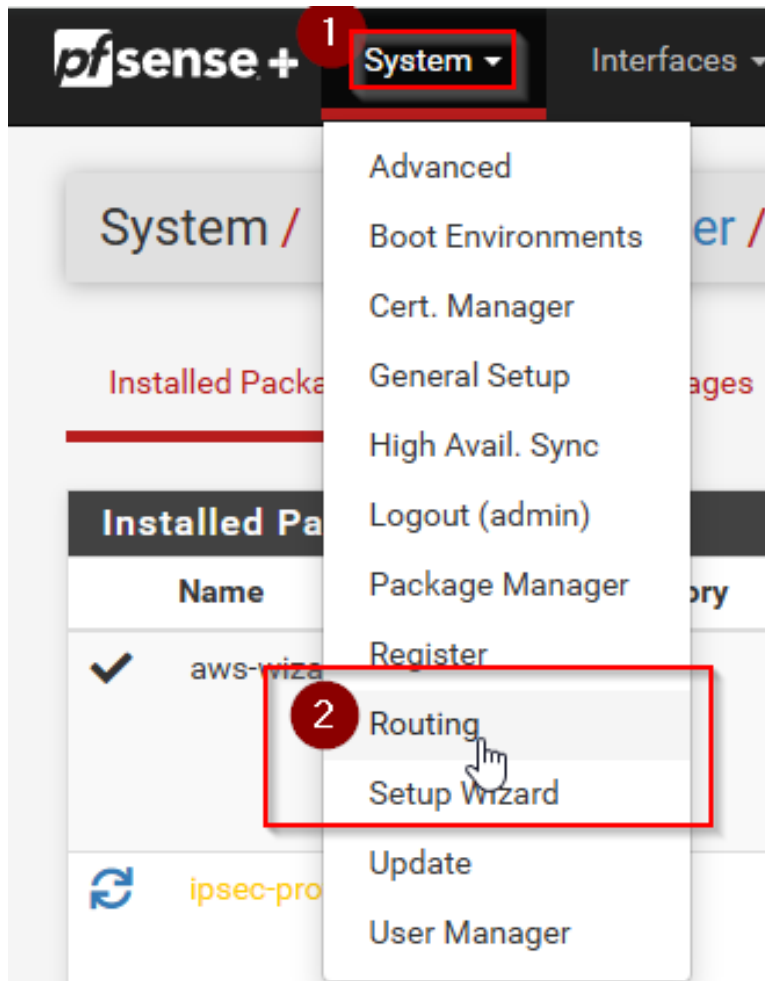


FIGURE 11 - OPEN THE SYSTEM AGAIN AND CLICK ROUTING

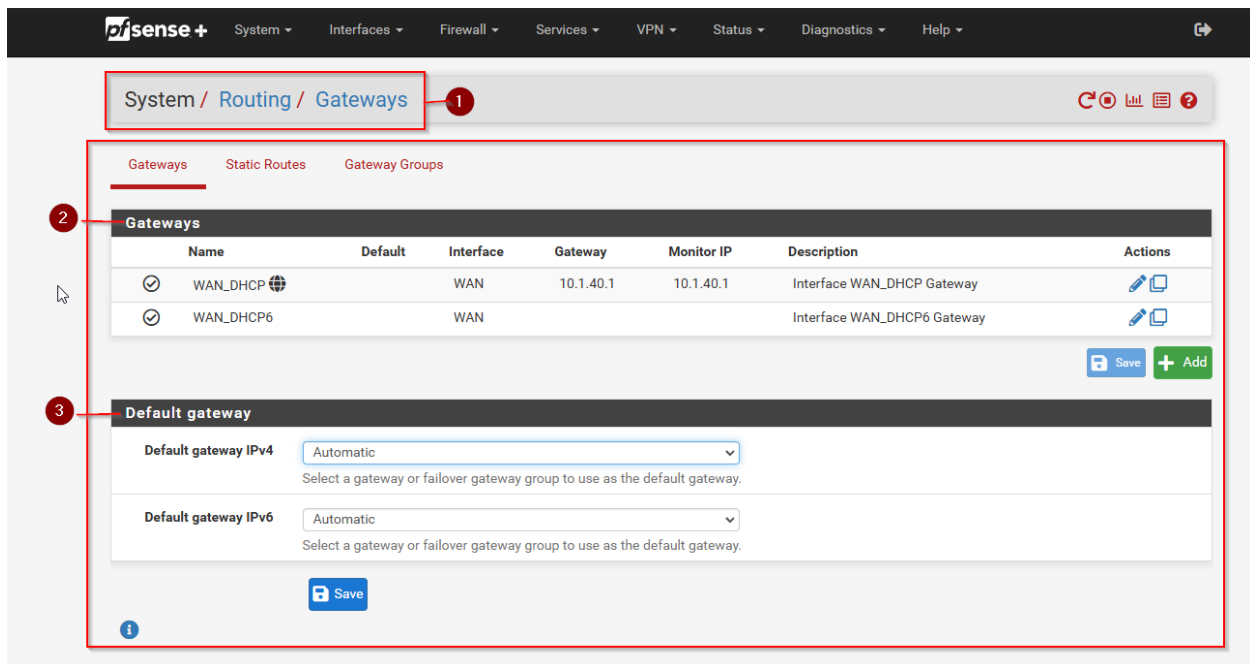


FIGURE 12 - LOOKING AROUND ROUTING

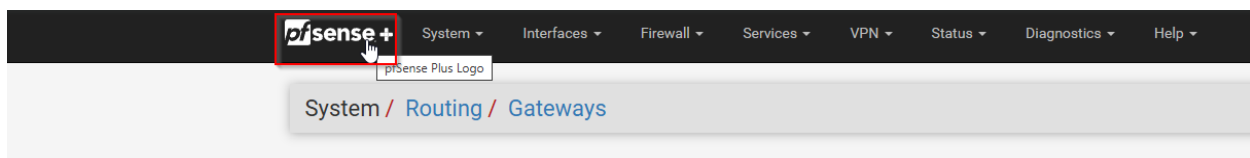


FIGURE 13 CLICK THE PFSense TO GO BACK

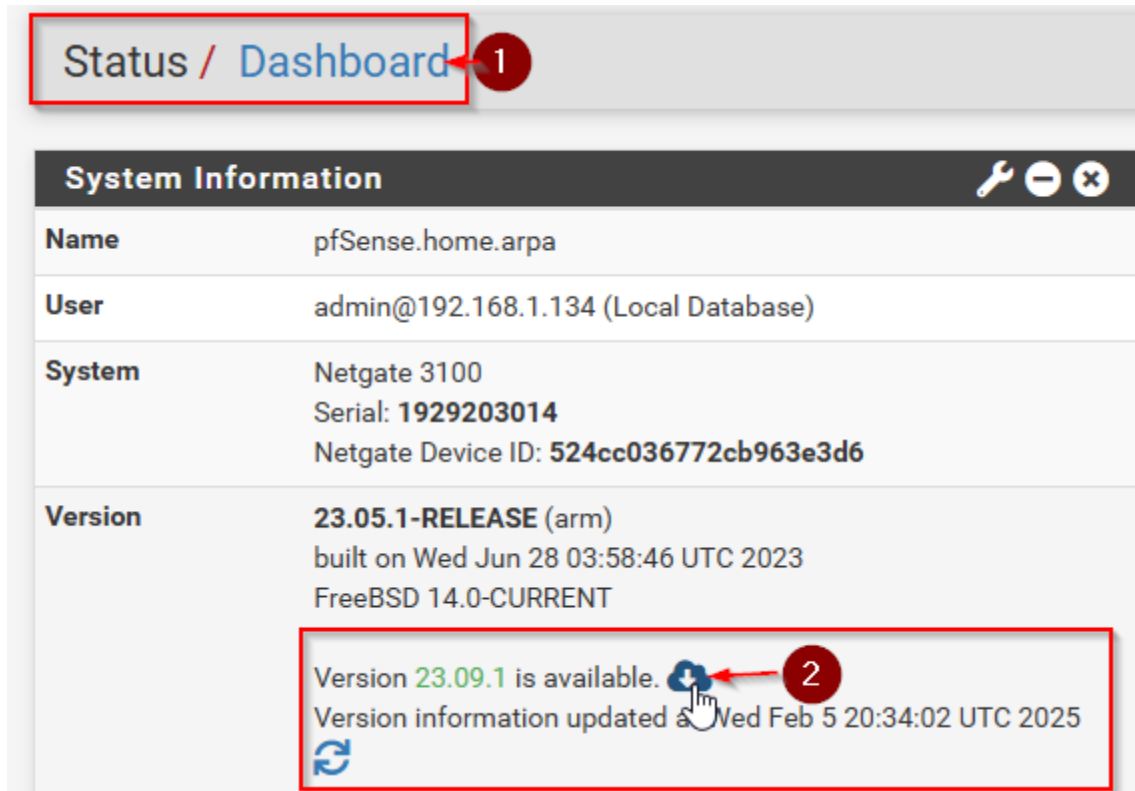


FIGURE 14 - UPDATE THE VERSION OF PFSense ROUTER

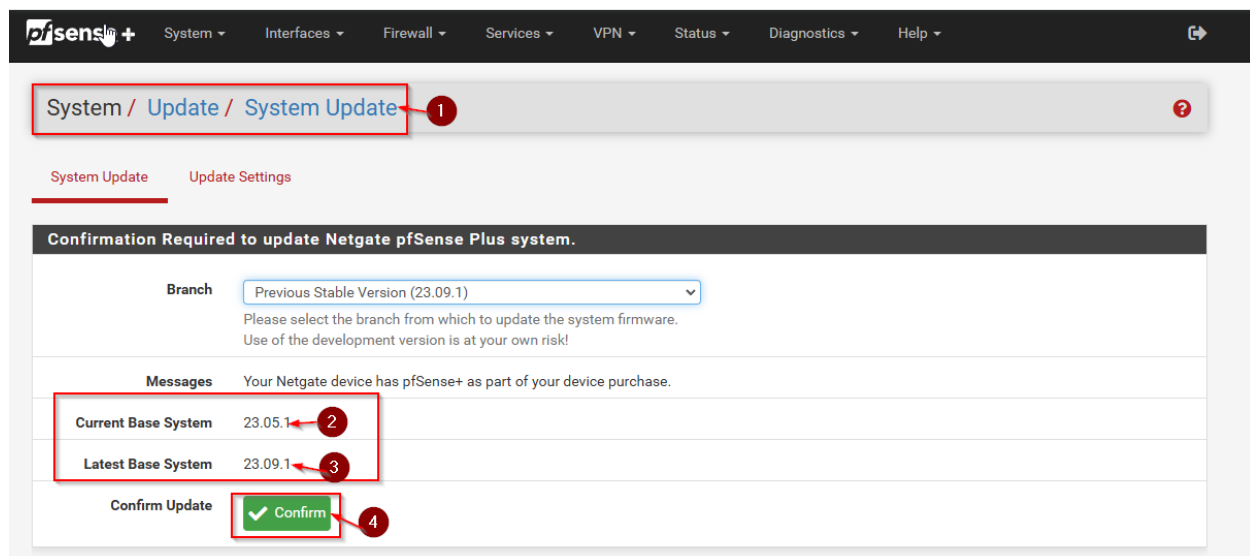


FIGURE 15 - CONFIRM THE UPDATE

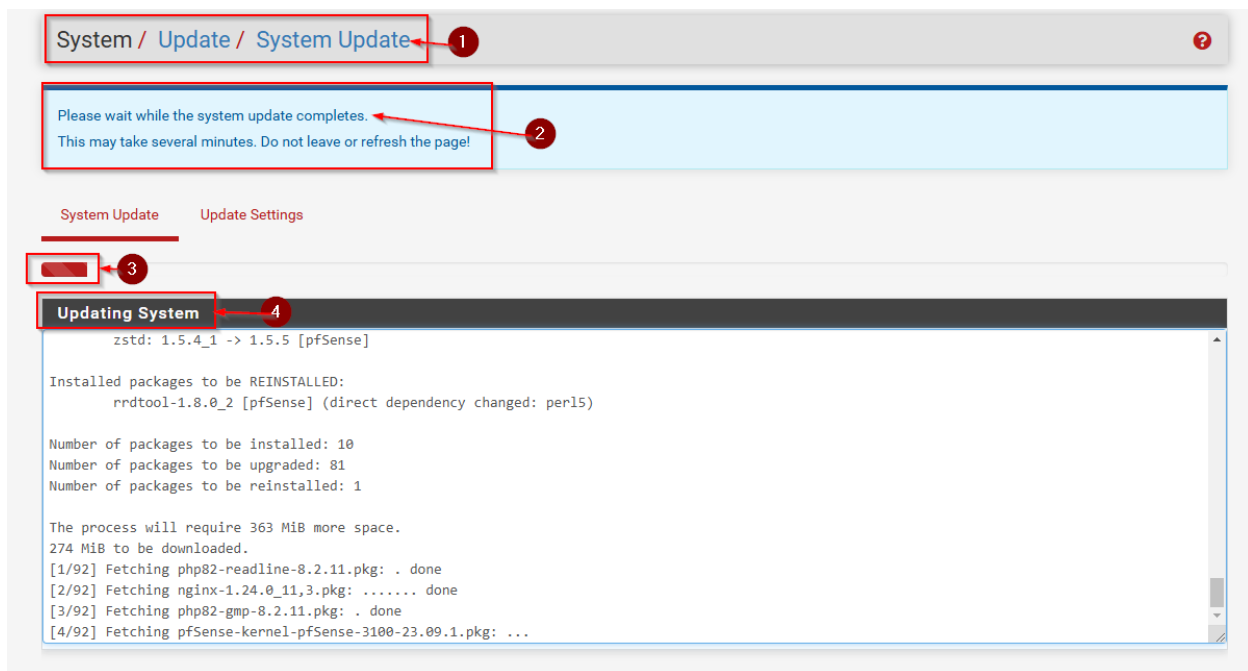


FIGURE 16 - UPDATING...

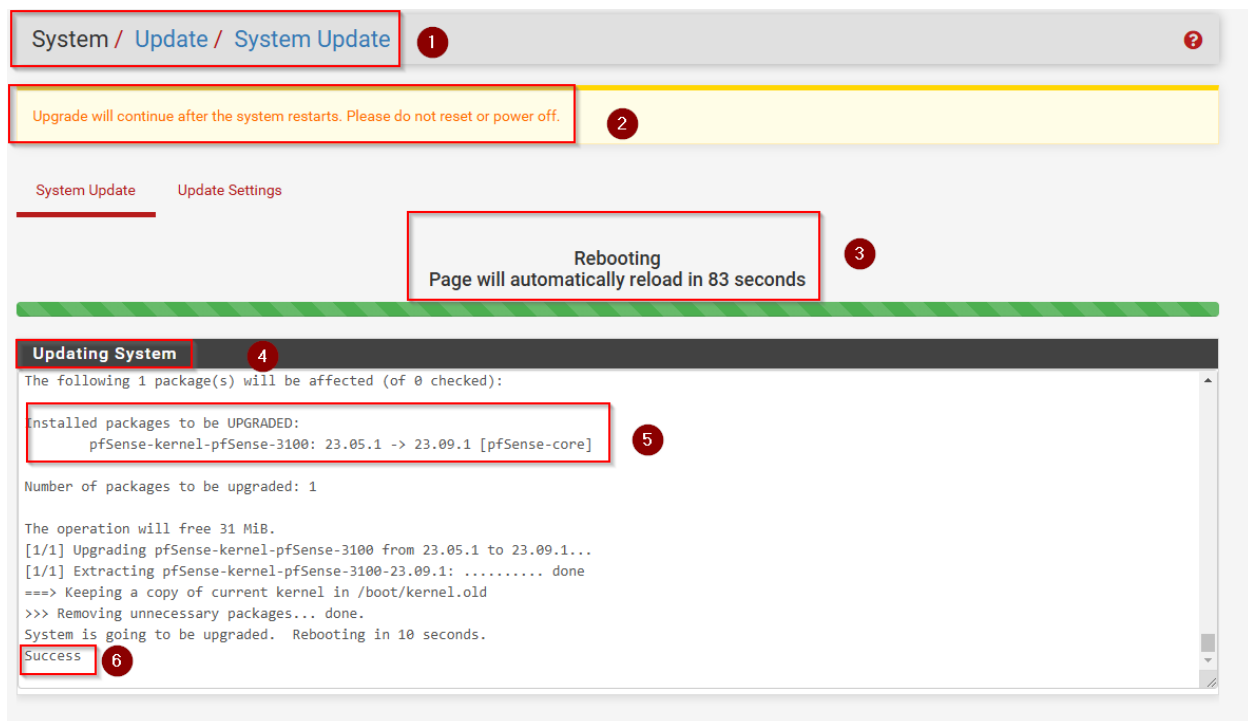


FIGURE 17 - REBOOTING....



FIGURE 18 - LOGGING THE ACCOUNT AGAIN

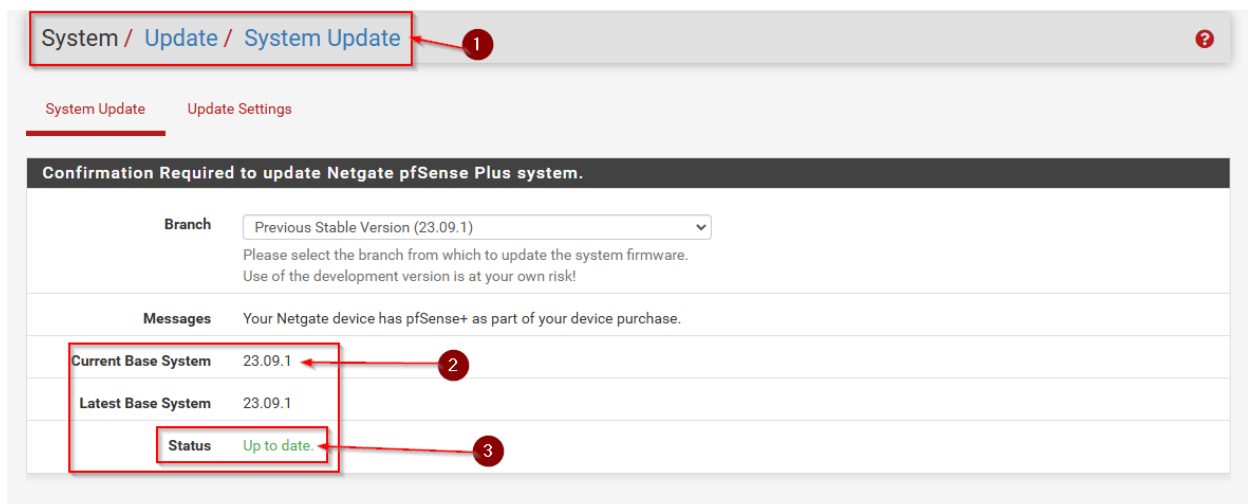


FIGURE 19 - UPDATE COMPLETED

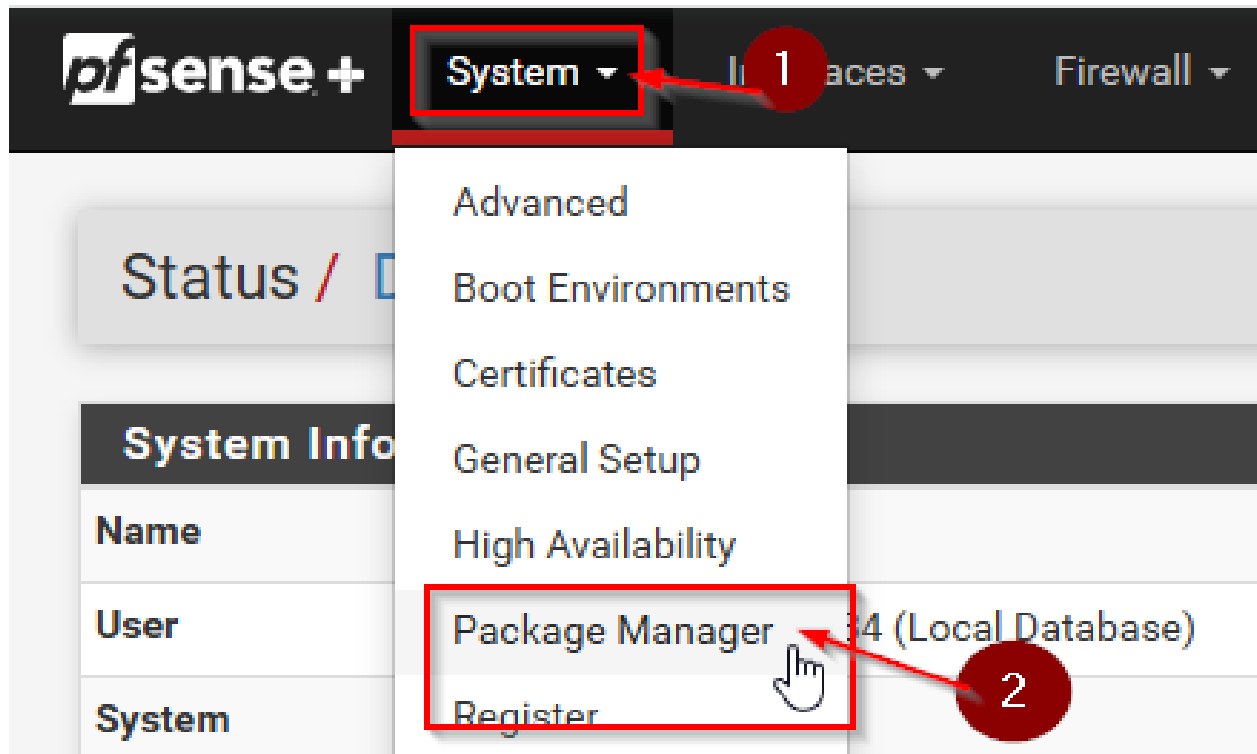


FIGURE 20 - OPEN THE SYSTEM AND CLICK PACKAGE MANAGER

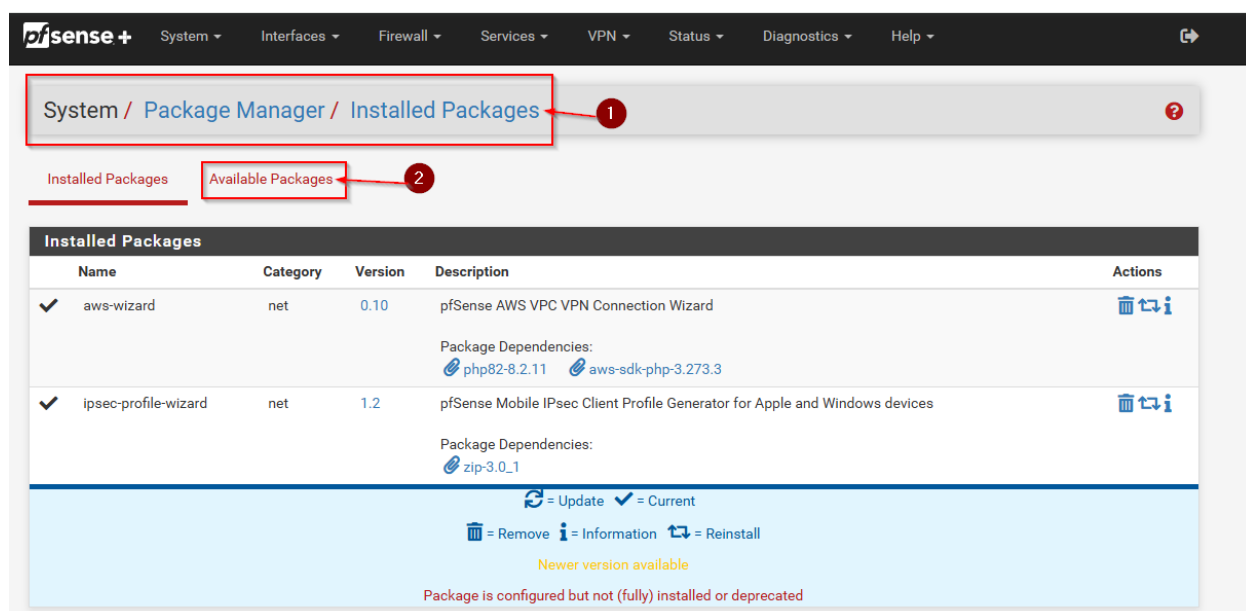


FIGURE 21 - CLICK THE AVAILABLE PACKAGES

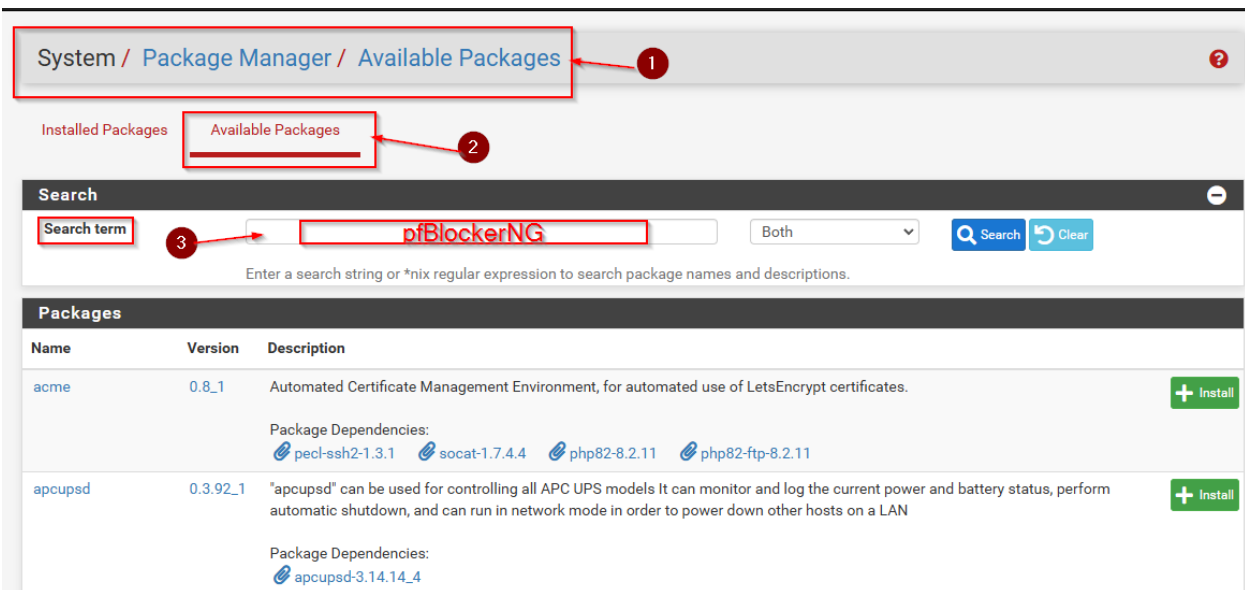


FIGURE 22 - TYPE "PFBLOCKERNG" ON AVAILABLE PACKAGE

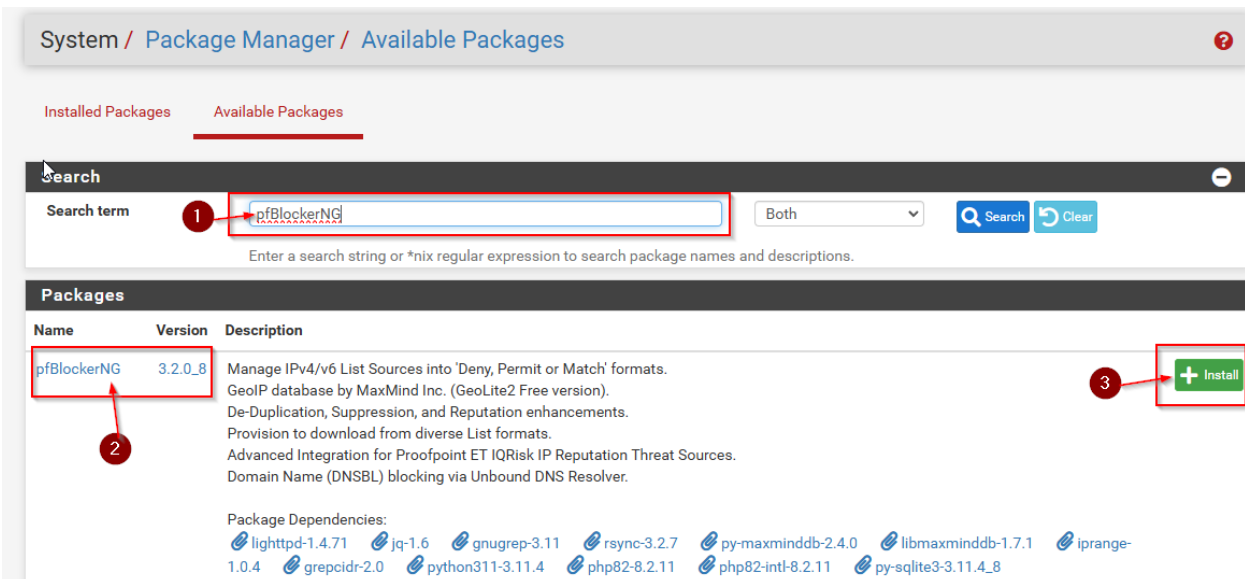


FIGURE 23 - INSTALL THE PFBLOCKERNG

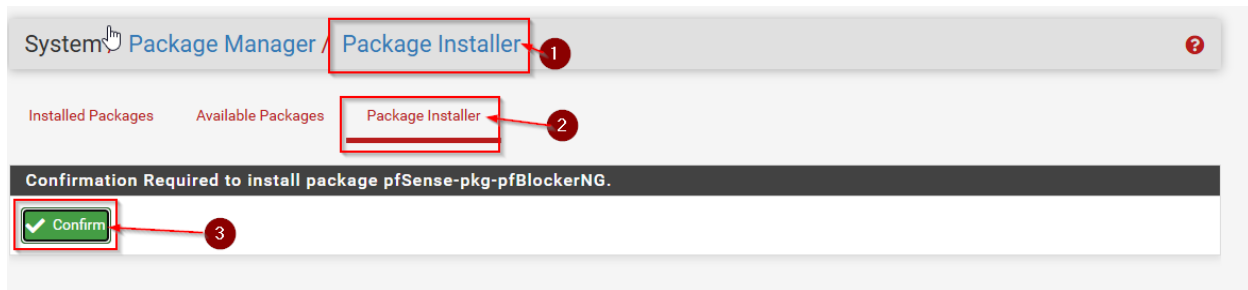


FIGURE 24 - CONFIRM THE PFBLOCKERNG

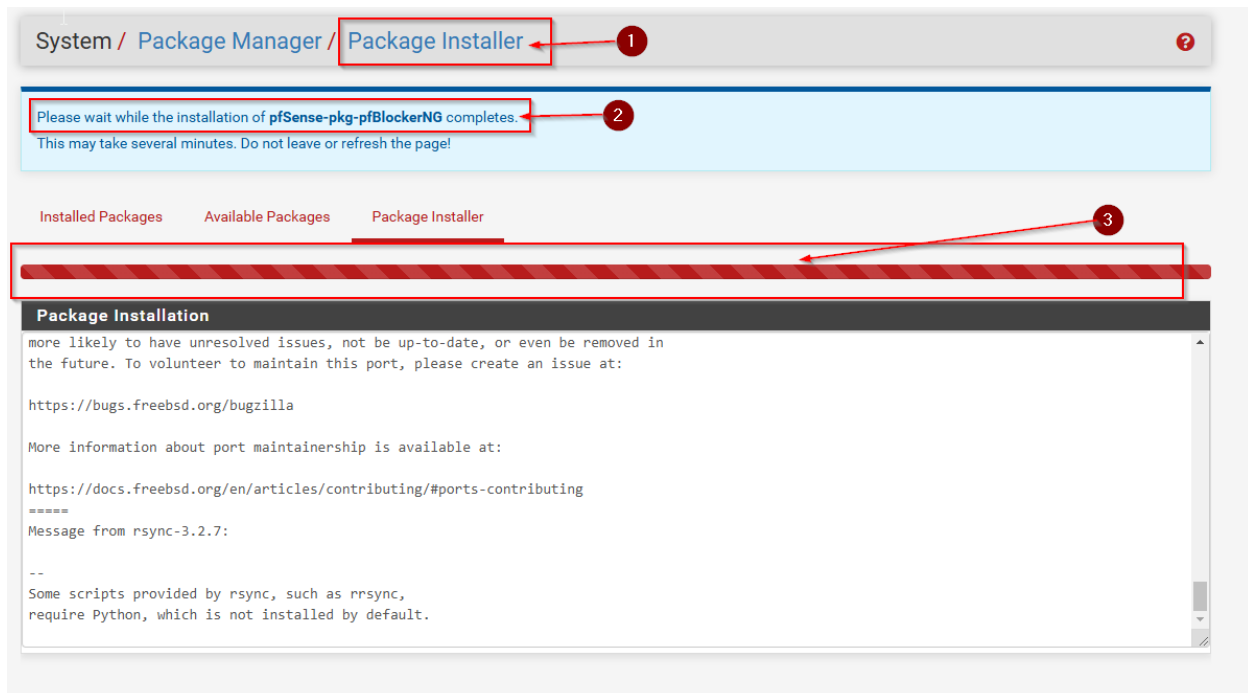


FIGURE 25 - INSTALLING....

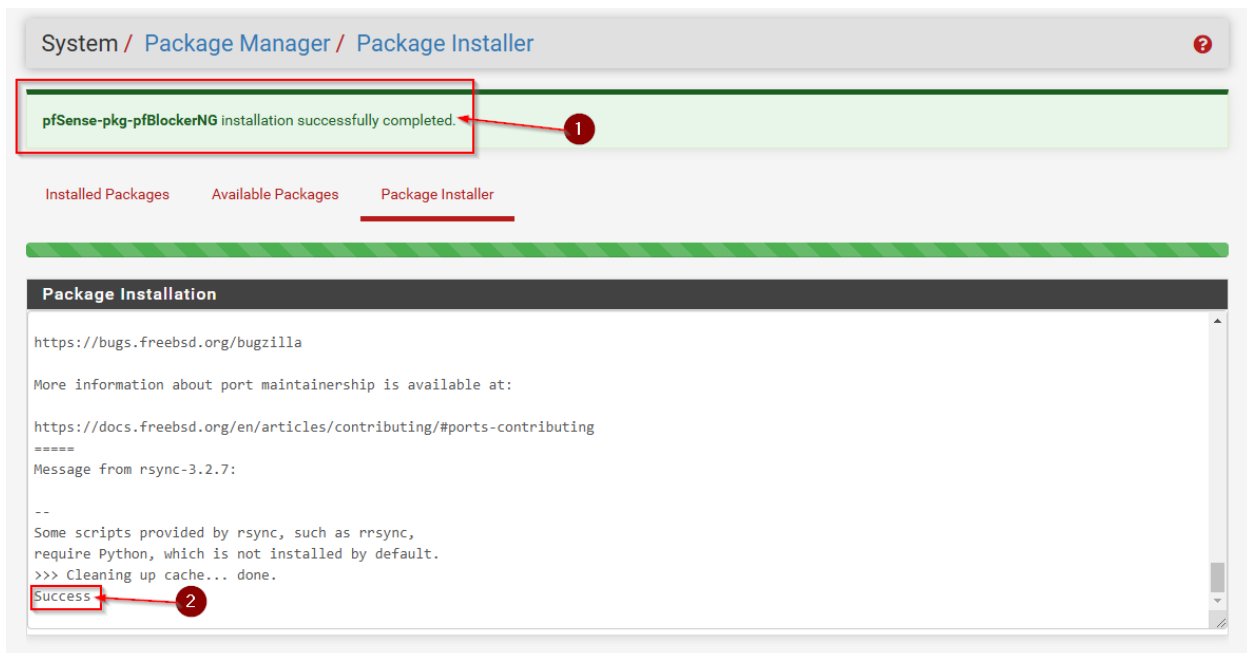


FIGURE 26 - INSTALLATION SUCCESSFULLY

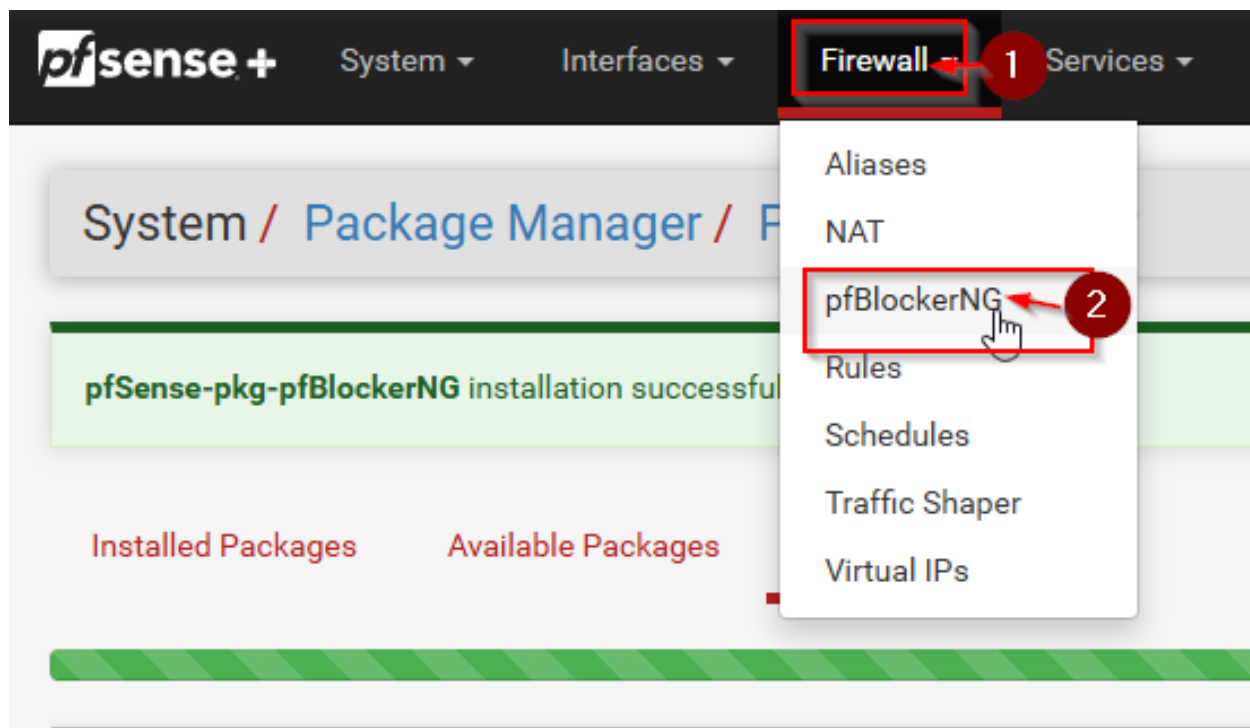


FIGURE 27 - OPEN FIREWALL THEN CLICK PFBLOCKERNG

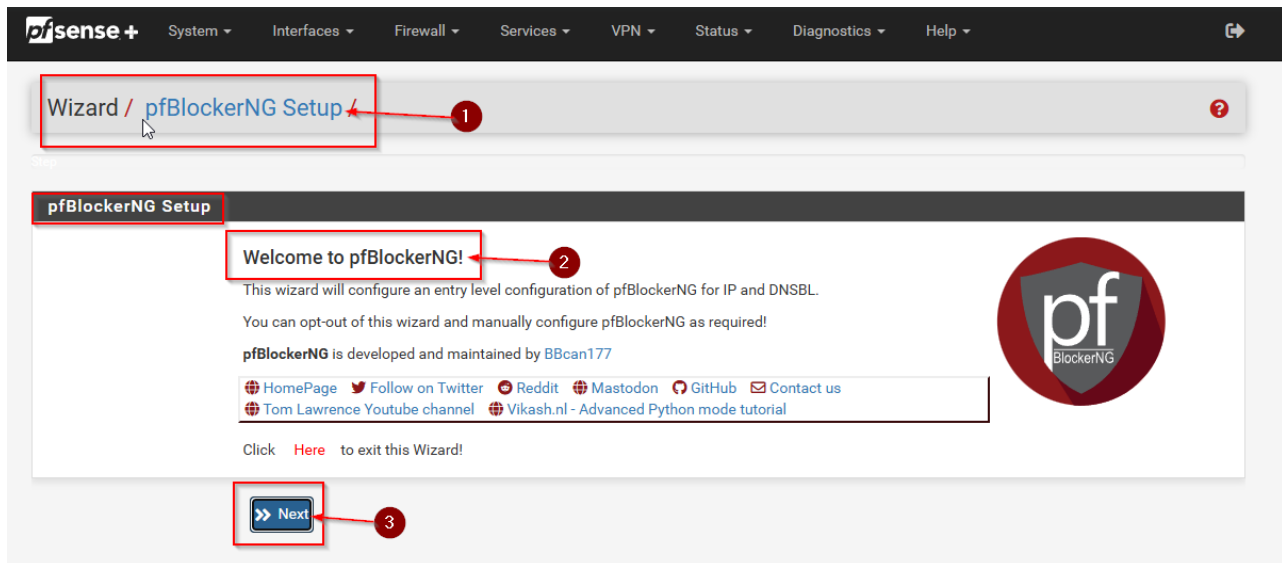


FIGURE 28 - SET THE PFBLOCKERNG UP

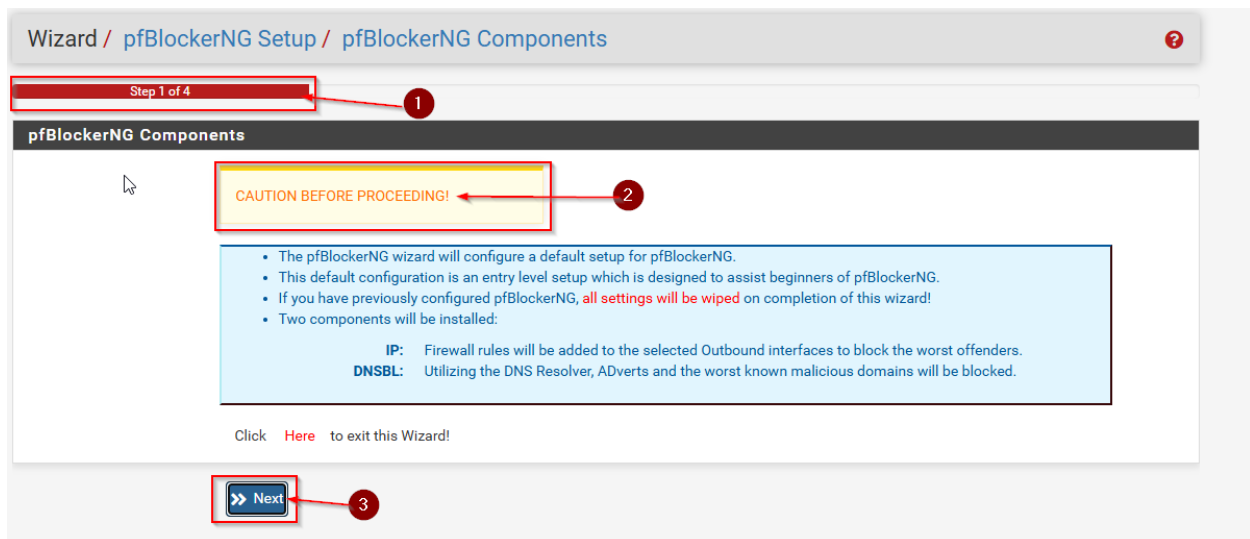


FIGURE 29 - PROCEEDING...

Wizard / pfBlockerNG Setup / **pfBlockerNG IP Component Configuration** 1

Step 2 of 4 2

pfBlockerNG IP Component Configuration

On this screen the pfBlockerNG IP Category parameters will be set.

Select Inbound Firewall Interface: WAN, LAN, ADMIN, SYSTEMADMINI 3

Select the Inbound interface(s) you want to apply auto rules to:

Select Outbound Firewall Interface: WAN, LAN, ADMIN, SYSTEMADMINI 4

Select the Outbound interface(s) you want to apply auto rules to:

[Back](#) [Next](#) 5

FIGURE 30 - PROCESSING....

Wizard / pfBlockerNG Setup / **pfBlockerNG DNSBL Component Configuration** 1

Step 3 of 4 2

pfBlockerNG DNSBL Component Configuration

On this screen the pfBlockerNG DNSBL Category parameters will be set. 3

DNSBL Webservice Configuration 4

VIP Address: 10.10.10.1

Port: 8081
Local port upon which DNSBL Webservice will listen for connections. The default port is 8081. This can be left at its default unless a different port needs to be used.

SSL Port: 8443
Local port upon which DNSBL Webservice will listen for connections. The default port is 8443. This can be left at its default unless a different port needs to be used.

IPv6 DNSBL: ☐
Enable DNSBL for IPv6 DNS Resolution filtering.

DNSBL Whitelist: ☒
Enable a default DNSBL Domain Whitelist. This list can be removed and/or modified following wizard installation.

[Back](#) [Next](#) 5

FIGURE 31 - LOOKING AROUND THE STEP 3 OF 4

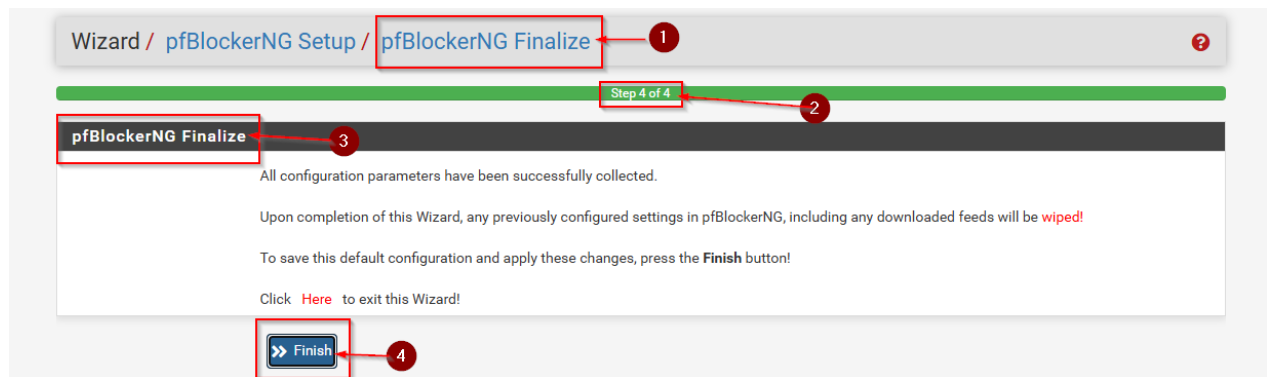


FIGURE 32 - FINISH THE PFBLOCKERNG FINALIZE

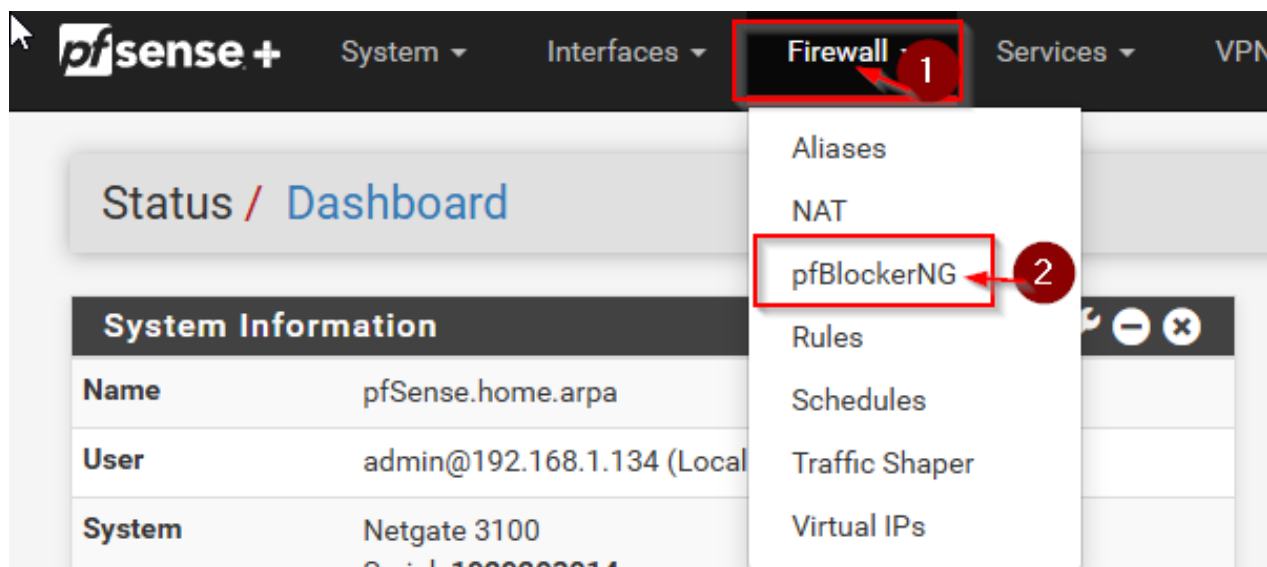


FIGURE 33 - OPEN FIREWALL THEN PFBLOCKERNG

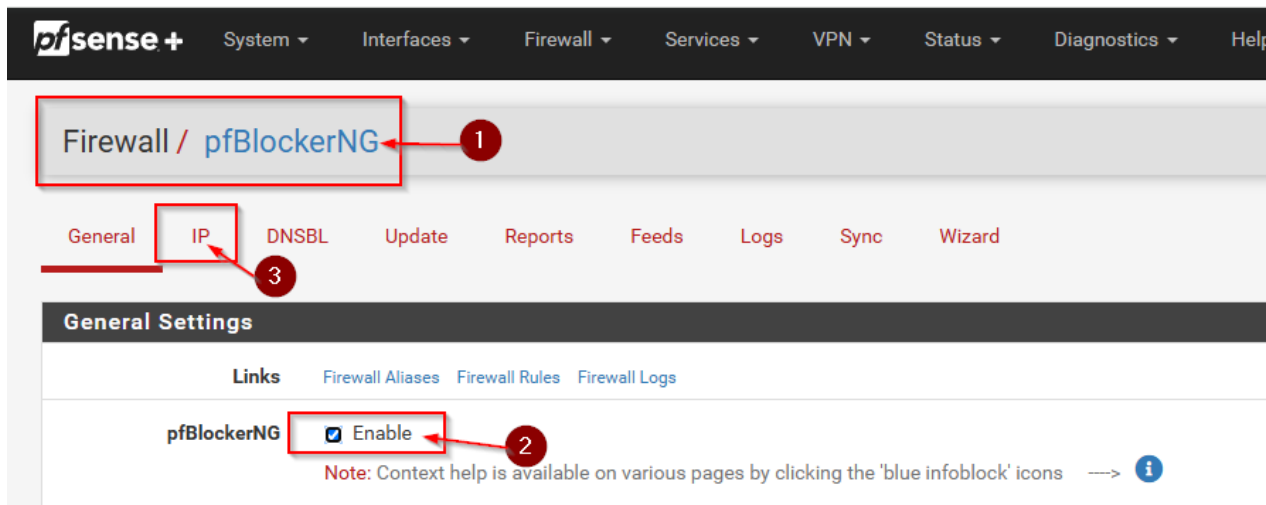


FIGURE 34 - ENABLE pfBLOCKERNG THEN CLICK IP

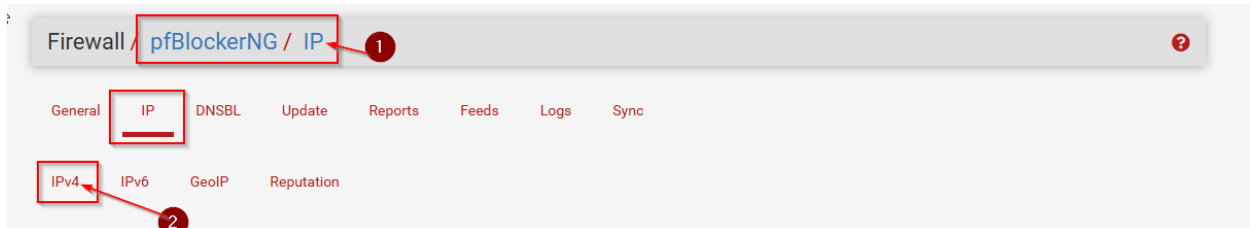


FIGURE 35 - CLICK IPv4

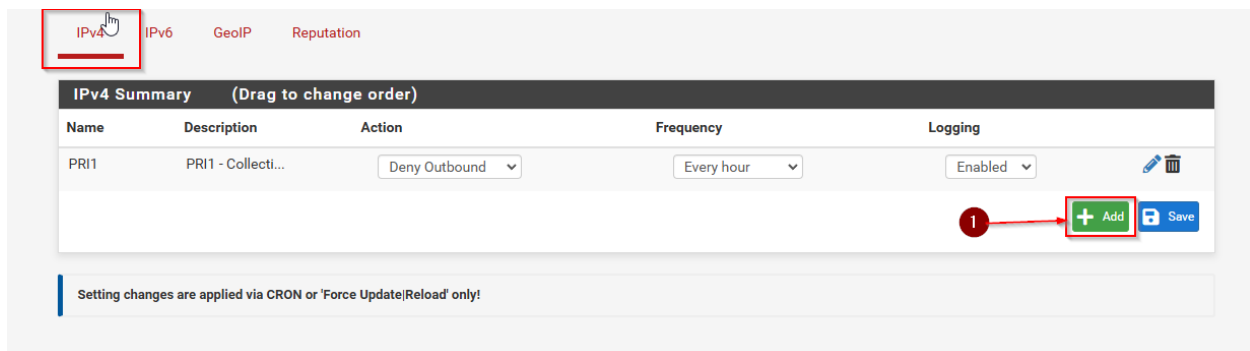


FIGURE 36 - CLICK "ADD"

IPv4 IPv6 GeoIP Reputation

Info

Links Firewall Aliases Firewall Rules Firewall Logs

Name / Description Name Description

BlockWebsite Block any website

1 2 3

Enter Name (Max 24 characters) and Description. ⓘ

FIGURE 37 - TYPE THE BLOCKWEBSITE AND DESCRIBE WHAT IT IS FOR

Info

Links Firewall Aliases Firewall Rules Firewall Logs

Name / Description BlockWebsite Block any website

Enter Name (Max 24 characters) and Description. ⓘ

FIGURE 38 - TYPING...

Info

Links Firewall Aliases Firewall Rules Firewall Logs

Name / Description BlockWebsite Block any website

Enter Name (Max 24 characters) and Description. ⓘ

Scroll down

FIGURE 39 - SCROLLING DOWN...

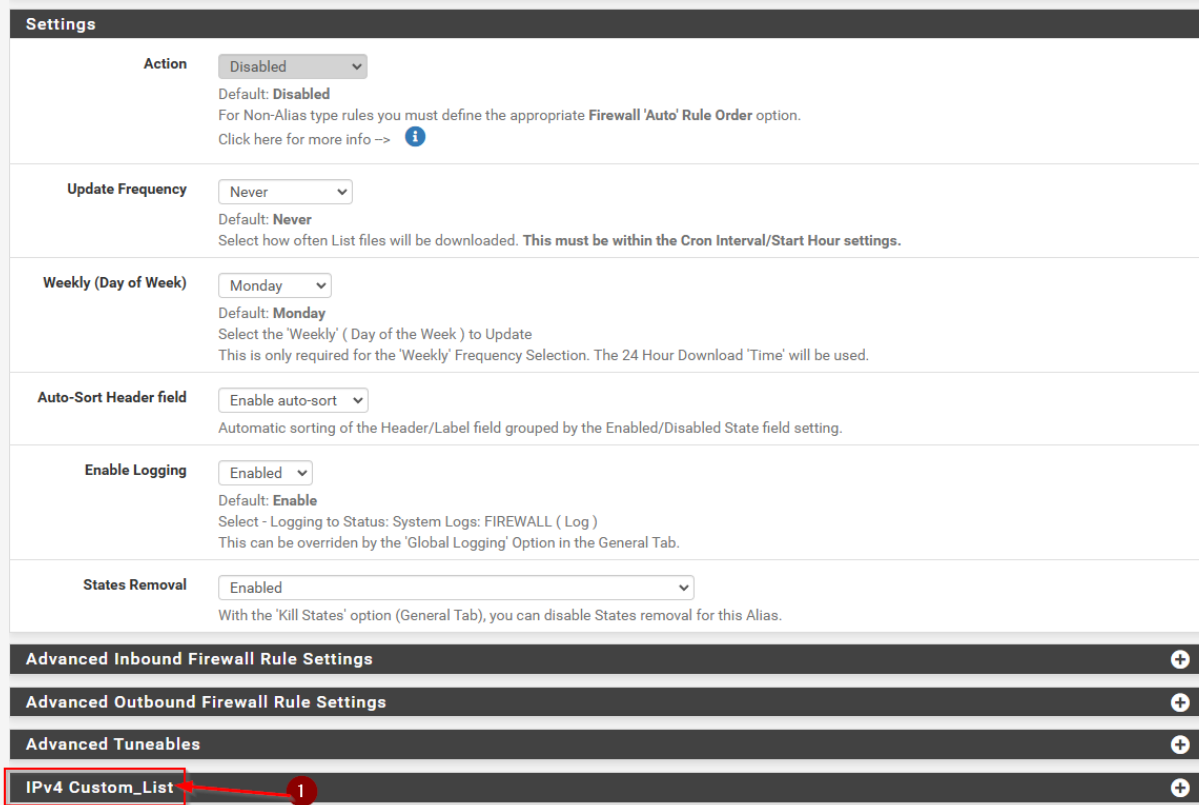


FIGURE 40 - CLICK IPV4 CUSTOM_LIST

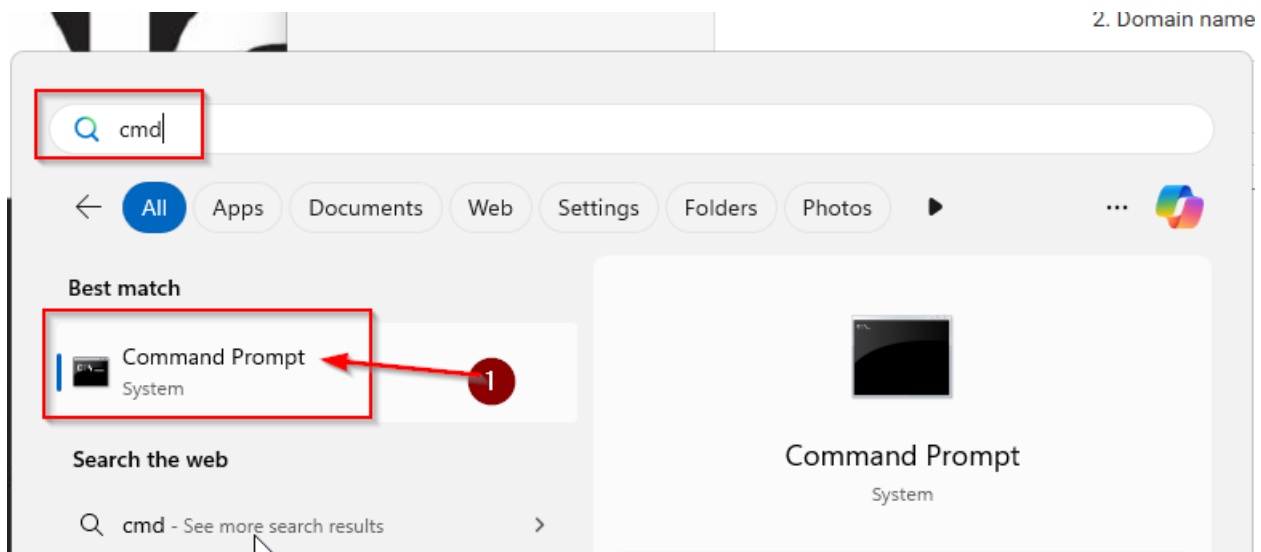


FIGURE 41 - BEFORE THAT, OPEN THE CMD

```
Command Prompt - nslookup  X  +  v

Microsoft Windows [Version 10.0.22631.4751]
(c) Microsoft Corporation. All rights reserved.

C:\Users\Student04>nslookup
Default Server:  pfSense.home.arpa
Address:  192.168.1.1

> |
```

FIGURE 42 - USING NSLOOKUP TO ASK THE ROUTER TO GET IP FROM IT

```
C:\Users\Student04>nslookup
Default Server:  pfSense.home.arpa
Address:  192.168.1.1

> lollypop.org
Server:  pfSense.home.arpa
Address:  192.168.1.1

Name:  lollypop.org
Address:  10.10.10.1

> |
```

FIGURE 43 - ASKING THE ROUTER TO SEND ME IP ADDRESS FROM THE LOLLUPOP.ORG WEBSITE

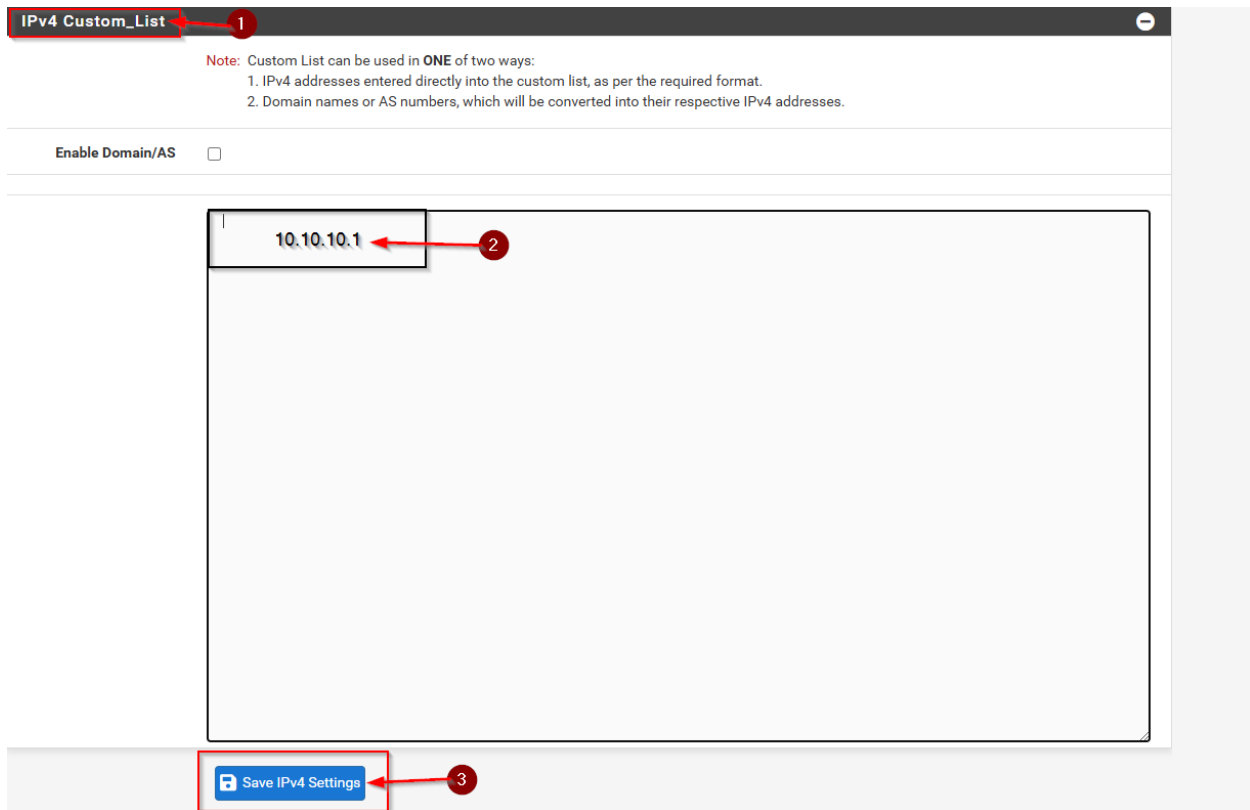


FIGURE 44 - PUTTING THE IP ADDRESS ON THE CUSTOM LIST

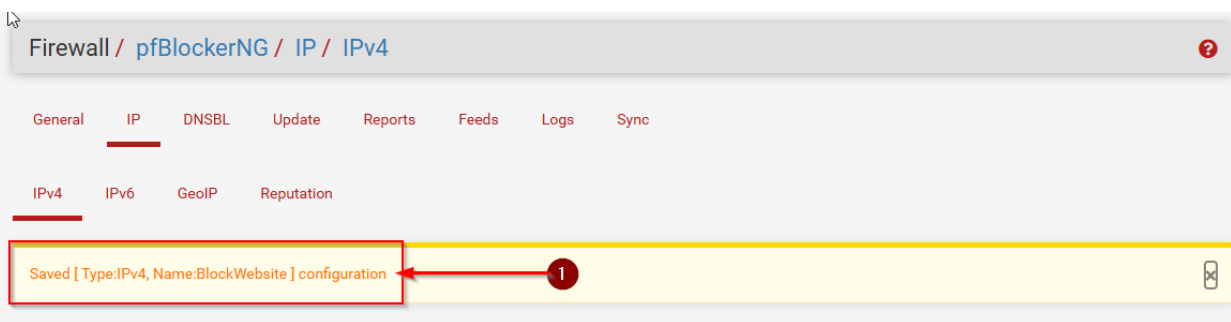


FIGURE 45 - SAVED IPv4 SETTING TO CONFIRM

```
C:\Users\Student06>nslookup
Default Server:  pfSense.home.arpa
Address:  10.15.15.8

> callofduty.com
Server:  pfSense.home.arpa
Address:  10.15.15.8

Non-authoritative answer:
Name:    callofduty.com
Address: 23.45.193.225

>
```

FIGURE 46 - USING NSLOOKUP TO ASK THE ROUTER TO GET IP ADDRESS FROM CALL OF DUTY WEBSITE

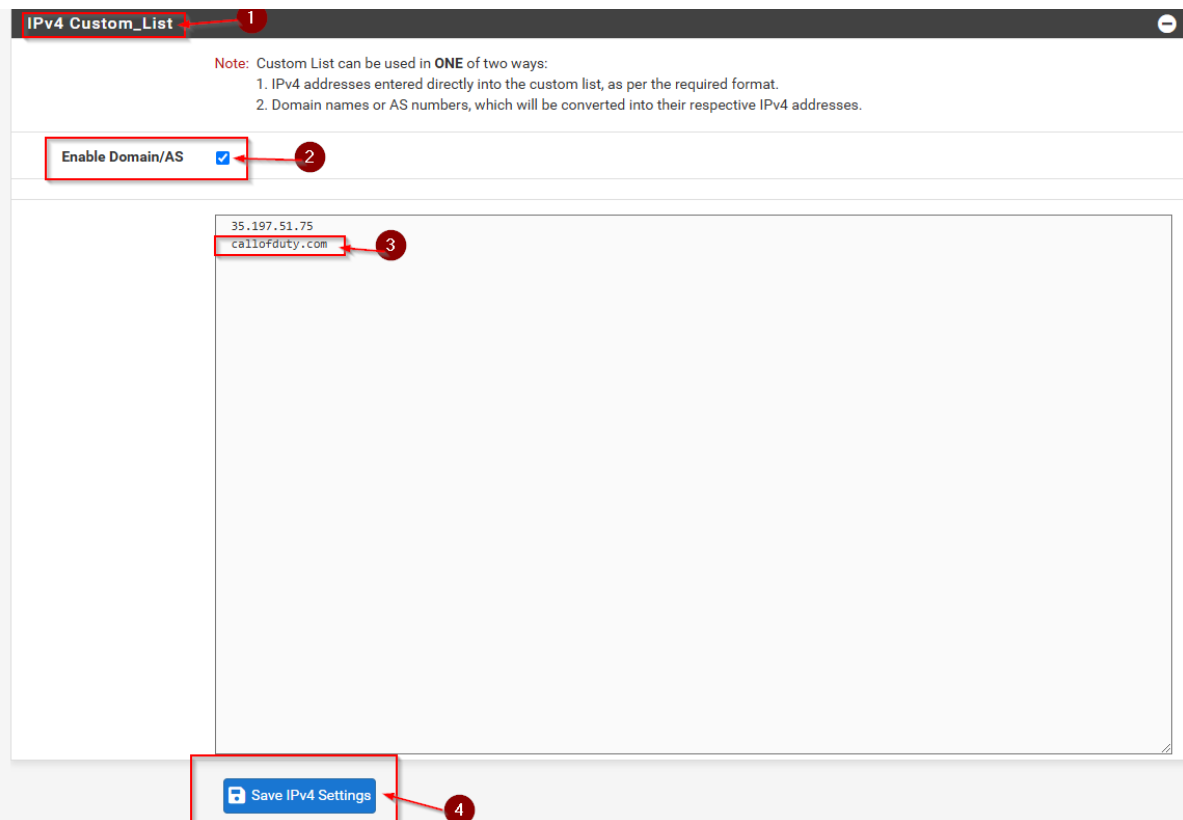


FIGURE 47 - ENABLE DOMAIN/AS AND PUT THE NAME OF WEBSITE ON IT

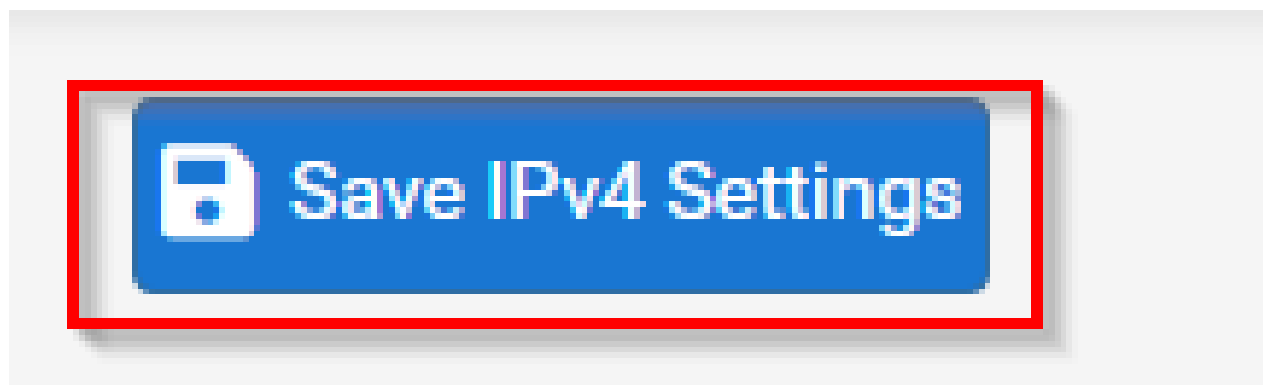


FIGURE 48 - CONFIRM THE IPV4 SETTING

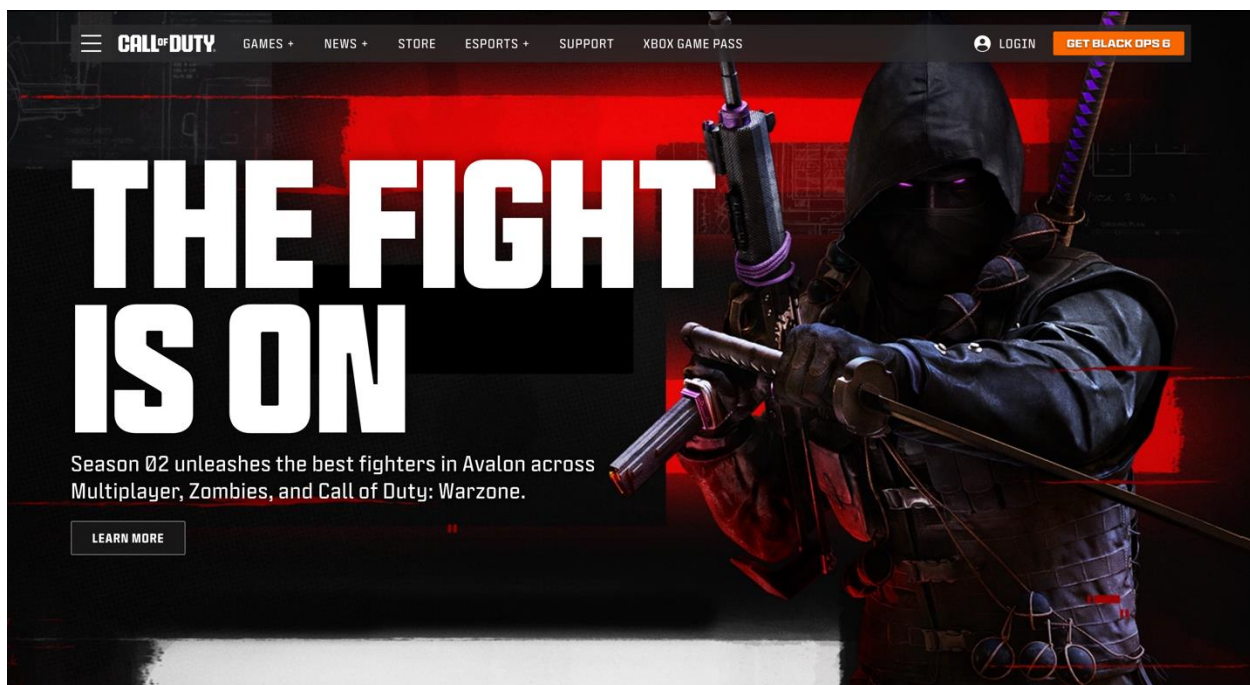
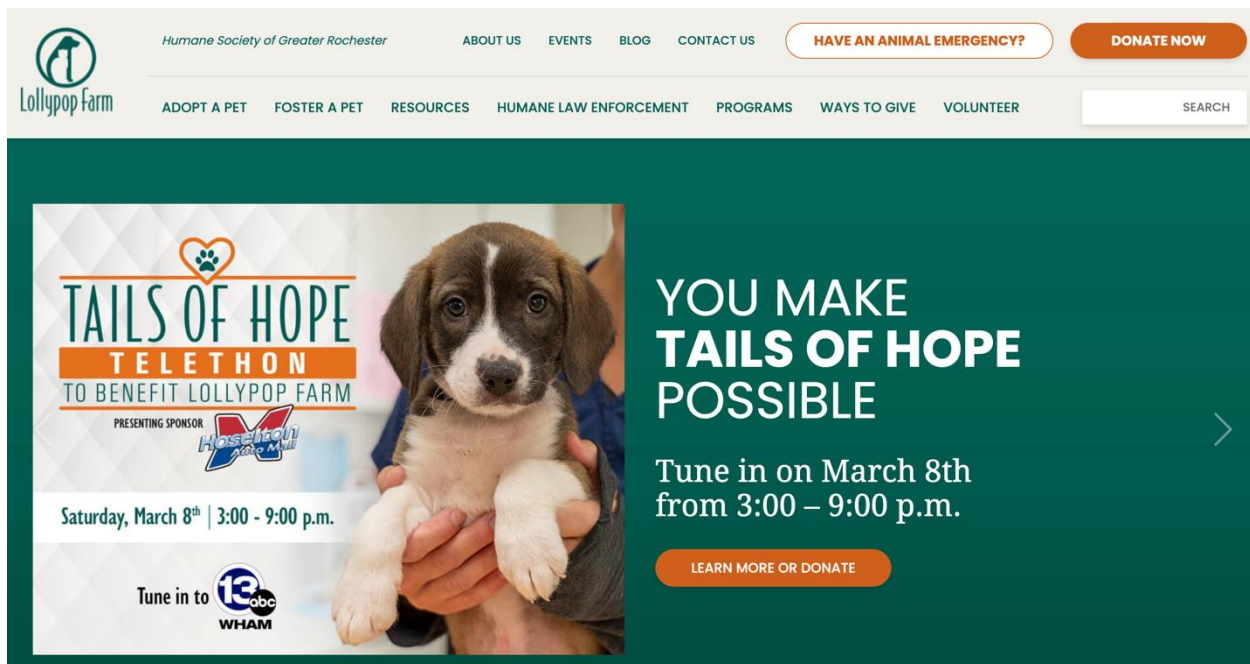


FIGURE 49 - CHECKING THE WEBSITES BEFORE IT GET BLOCKED

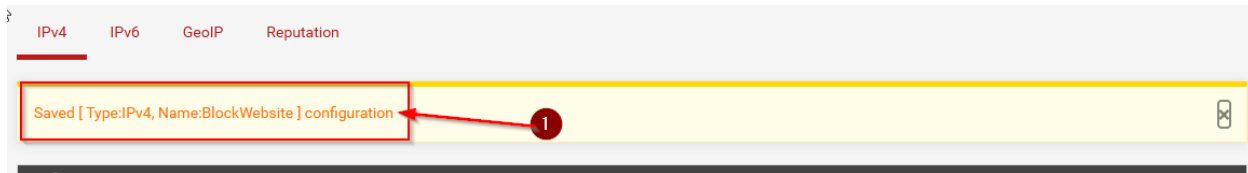


FIGURE 50 - SAVED THE IPV4 CONFIGURATION

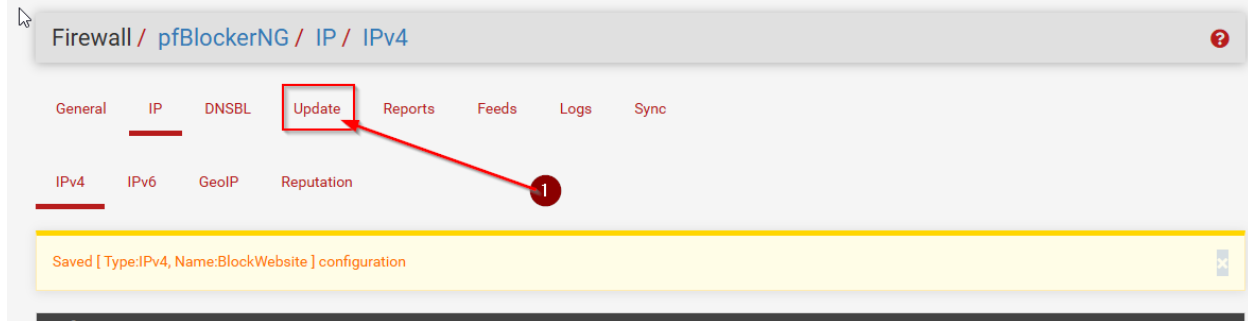


FIGURE 51 - CLICK UPDATE

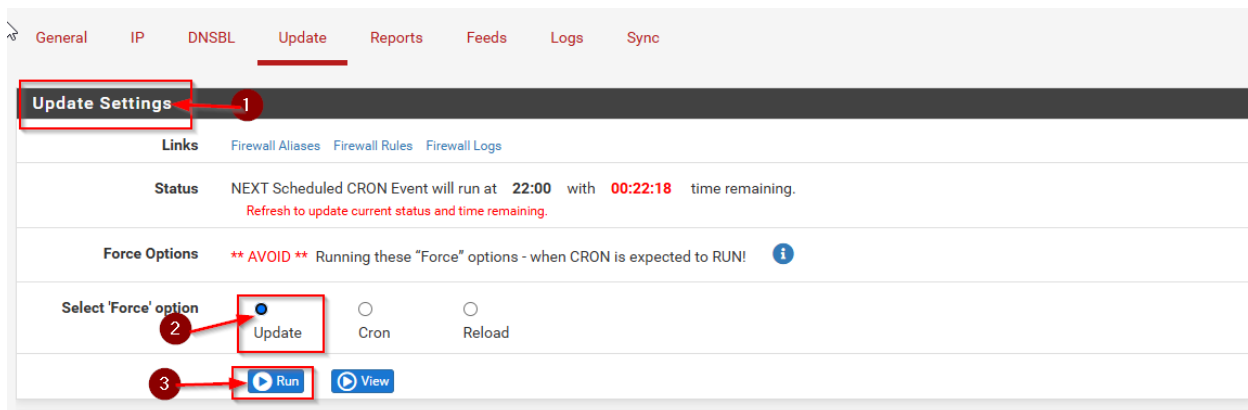


FIGURE 52 - RUN THE UPDATE STATUS

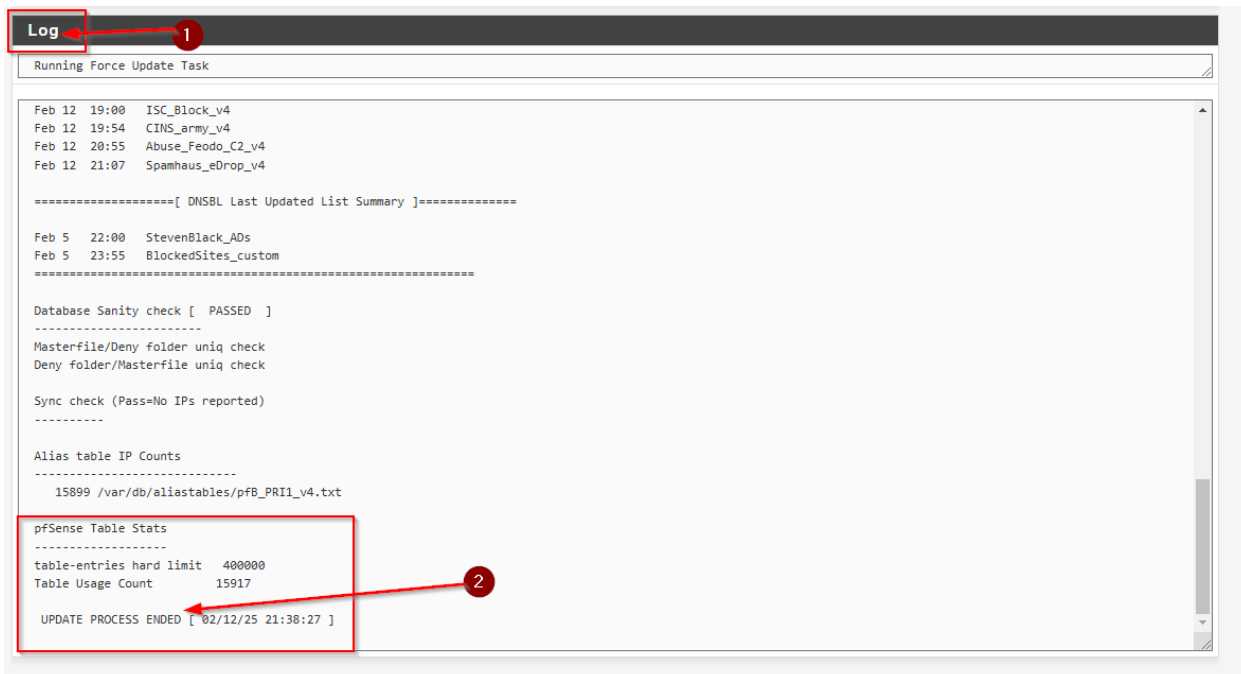


FIGURE 53 - COMPLETE THE UPDATE LOG

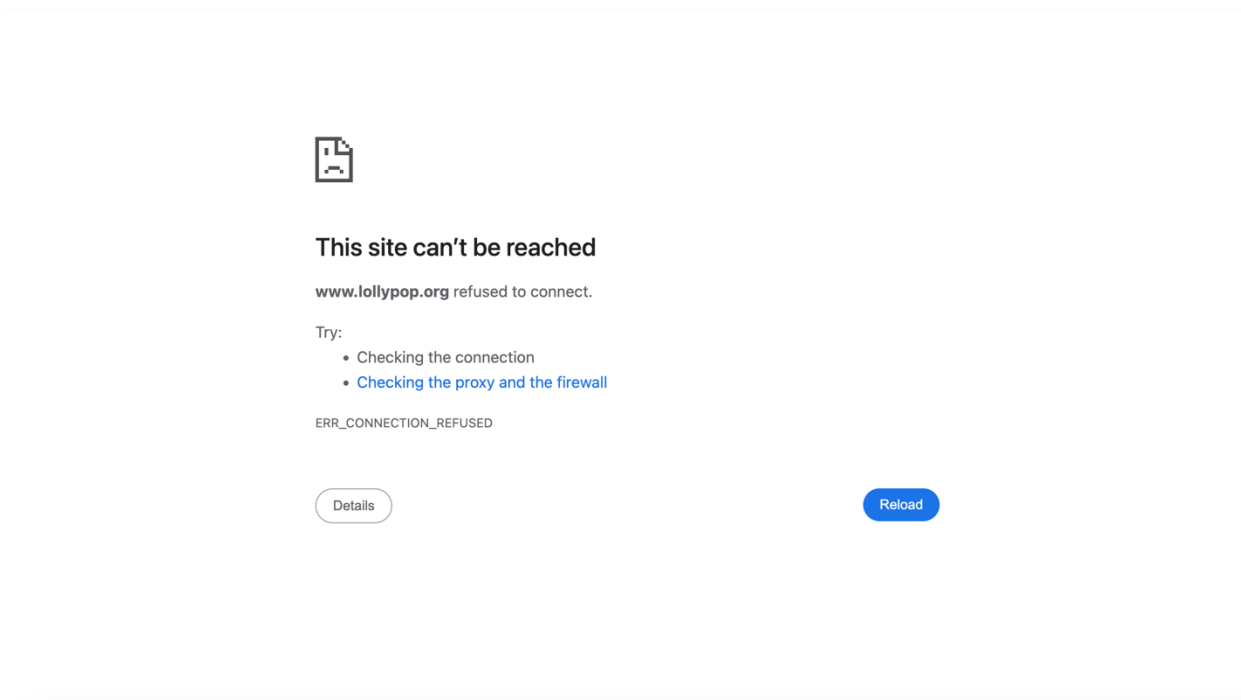


FIGURE 54 - LOLLYPOP IS BLOCKED NOW

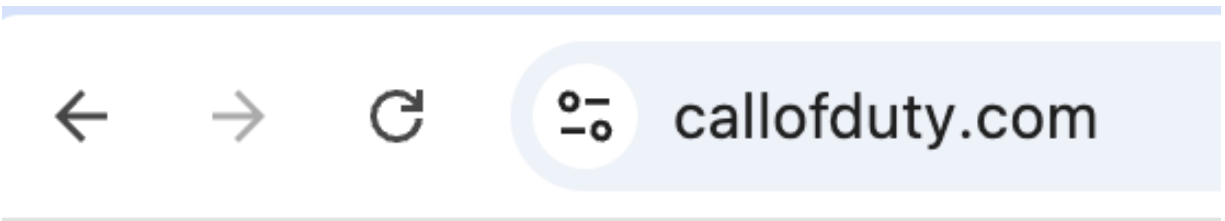


FIGURE 55 - TYPE THE CALL OF DUTY URL ON GOOGLE

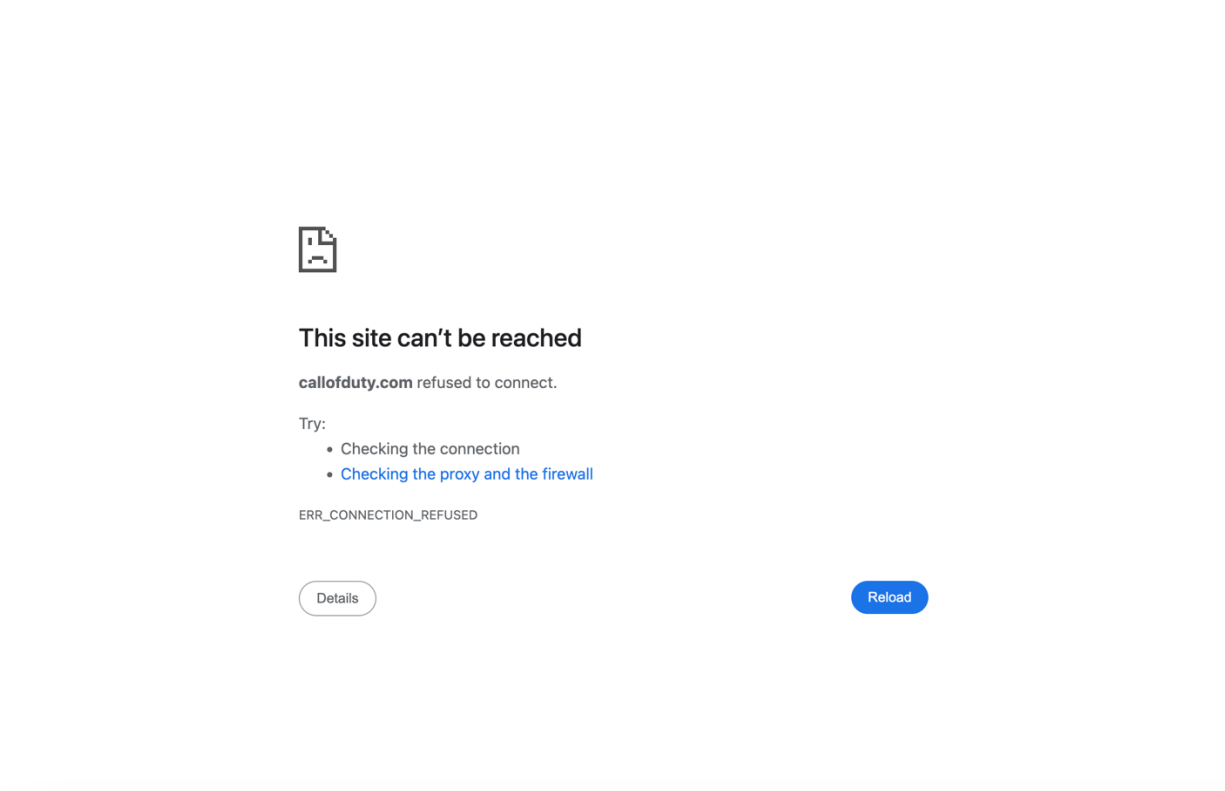


FIGURE 56 - CALL OF DUTY WEBSITE IS NOW BLOCKED

QUESTIONS AND ANSWERS

PART 2 –

1. Pick three different features that I like and describe each three features.
 - Please have look at #6 to #12 for the three features.
 - General Setup
 - This feature is for configuring it as firewall and router for securing and managing network traffic.
 - Package Manager
 - It allows you to easily install and manage additional software packages to extend its functionality.
 - Routing
 - It involves setting up rules to determine how data packets are directed between different networks or subnets, ensuring proper communication across your network infrastructure.
2. Does the NetGate device have the firmware version? If not, what version do you have and what is the most recent version? Also, how do you upgrade?
 - Please have look at #13 to #18 for the upgrade.
 - For the old version before it became new, it was 23.05.1 old version. Now is the 23.09.1 new recent version of pfSense Router.
 - Yes, it has the firmware version.

PART 4 –

Please have look at #19 to #26 for installing pfBlockerNG.

PART 5 –

- In terms of product support, what do "End of Sales" (EOS) and "End-of-Life" (EOL) mean?

- End of Sales" (EOS) means the product is no longer available for purchase from the manufacturer, while "End-of-Life" (EOL) means the product will no longer receive updates, support, or maintenance from the manufacturer.
- Is there any EOS and/or EOL scheduled for your NetGate model?
- The Netgate SG-3100 has reached its End of Sale (EOS) and is approaching its End of Life (EOL). While the exact dates for these milestones are not publicly specified, but here is the reference link;

[The Netgate SG-3100](#)

OBSERVATIONS

At first of all, it was difficult to understand the concept of using WAN and LAN through the pfSense Router. But as time passed, I started to understand how it works. The Network diagram really helped me out.