



PfSense Installation

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Choose Installation Type

- To install pfSense, first a few decisions are necessary to pick which type of installation will be performed.
- 64-bit vs 32-bit - pfSense supports both 64-bit (amd64) and 32-bit (i386) architectures.
- Full vs Embedded - The first major decision is whether to use a Full or Embedded installation type. Typically, a Full Install is performed to an SSD or HDD, while Embedded is used for CF/SD/USB media.

Choose Installation Type

- Installer ISO vs Memstick vs Memstick Serial - If a Full Install is to be performed, there are three types of install media that can be used to accomplish the task:
 - Optical disc image (ISO image, CD/DVD disc)
 - Memstick: Like the CD/DVD, but run from a USB thumb drive.
 - Serial Memstick: Like the Memstick image, but runs using the serial console rather than VGA, for newer embedded systems.

Choose Installation Type

- NanoBSD vs NanoBSD+VGA - NanoBSD uses the Serial Console by default, so there are two sets of NanoBSD images:
 - NanoBSD: Embedded install type using the serial console by default
 - NanoBSD+VGA: Like NanoBSD, but uses the VGA console instead.
- Virtual Machines - Virtual Machines, such as VMware/ESX, should be installed using the ISO image.

Prepare Installation Media

- The downloaded image must be written to target media before it can be used.
- For a Full Install, this media is used to boot and install and then will not be needed again.
- Write the installer ISO: If the .iso file was downloaded, it must be burned to a disc as an ISO image.
- Writing Memstick or NanoBSD images.

Performing a Full Install (ISO, Memstick)

- Power on the target system and connect the install media.
- If the BIOS is set to boot from CD/USB, pfSense will start.
- As the operating system boots and pfSense starts, a prompt is presented with some choices and a countdown timer. At this prompt, press i to invoke the installer now.

Performing a Full Install (ISO, Memstick)

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Performing a Full Install (ISO, Memstick)

```

  \ p \_ _ _ \ Sense
  \_ _ _ \_ _ _ \
  \_ _ _ \_ _ _ \

Welcome to pfSense 2.3-RELEASE on the 'cdrom' platform...

Mounting unionfs directories...done.
Creating symlinks.....ELF ldconfig path: /lib /usr/lib /usr/lib/compat /usr/local/lib /usr/local/lib/ipsec
32-bit compatibility ldconfig path: /usr/lib32
done.
>>> Under 512 megabytes of ram detected.  Not enabling opcache
Launching the init system..... done.
Initializing..... done.
Starting device manager (devd)...done.

[ Press R to enter recovery mode or ]
[  press I to launch the installer  ]

(R)ecovery mode can assist by rescuing config.xml
from a broken hard disk installation, etc.

(I)nstaller will be invoked

Timeout before auto boot continues (seconds): 9

```


Performing a Full Install (ISO, Memstick)

- Alternately, allow the system to boot the rest of the way, assign interfaces, and then choose option 99 to invoke the installer.
- The Quick/Easy Install option is, as the name implies, both Quick and Easy. That is the method which will be demonstrated here.
- First, the installer console can be changed to use a different font, screenmap, or keymap. Most people do not need to change these, but it may help with some international keyboards.

Performing a Full Install (ISO, Memstick)

F10=Refresh Display

Configure Console

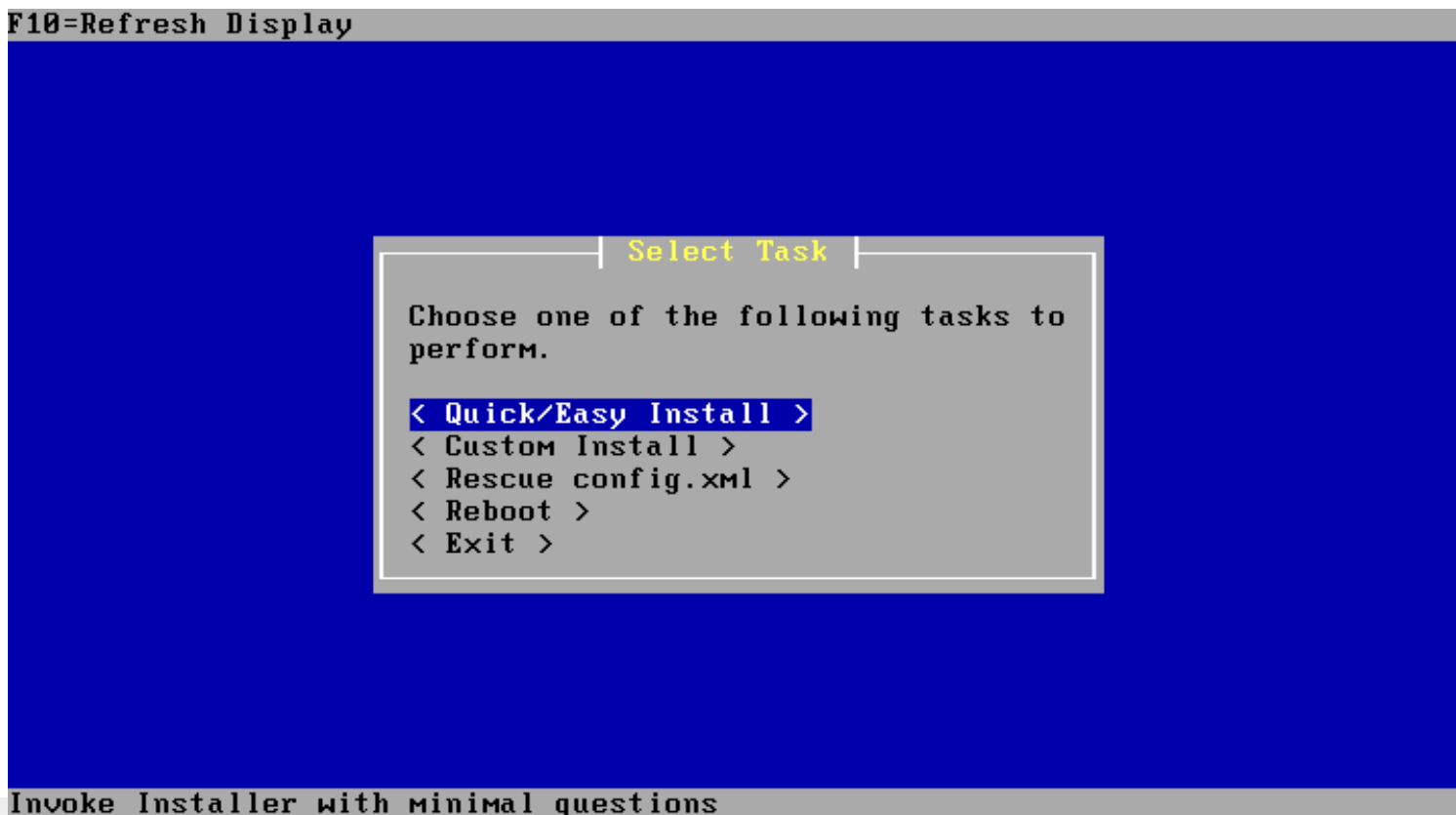
Your selected environment uses the following console settings, shown in parentheses. Select any that you wish to change.

- < Change Video Font (default) >
- < Change Screenmap (default) >
- < Change Keymap (default) >
- < Accept these Settings >

Performing a Full Install (ISO, Memstick)

- At the Select Task prompt, choose Quick/Easy Install.

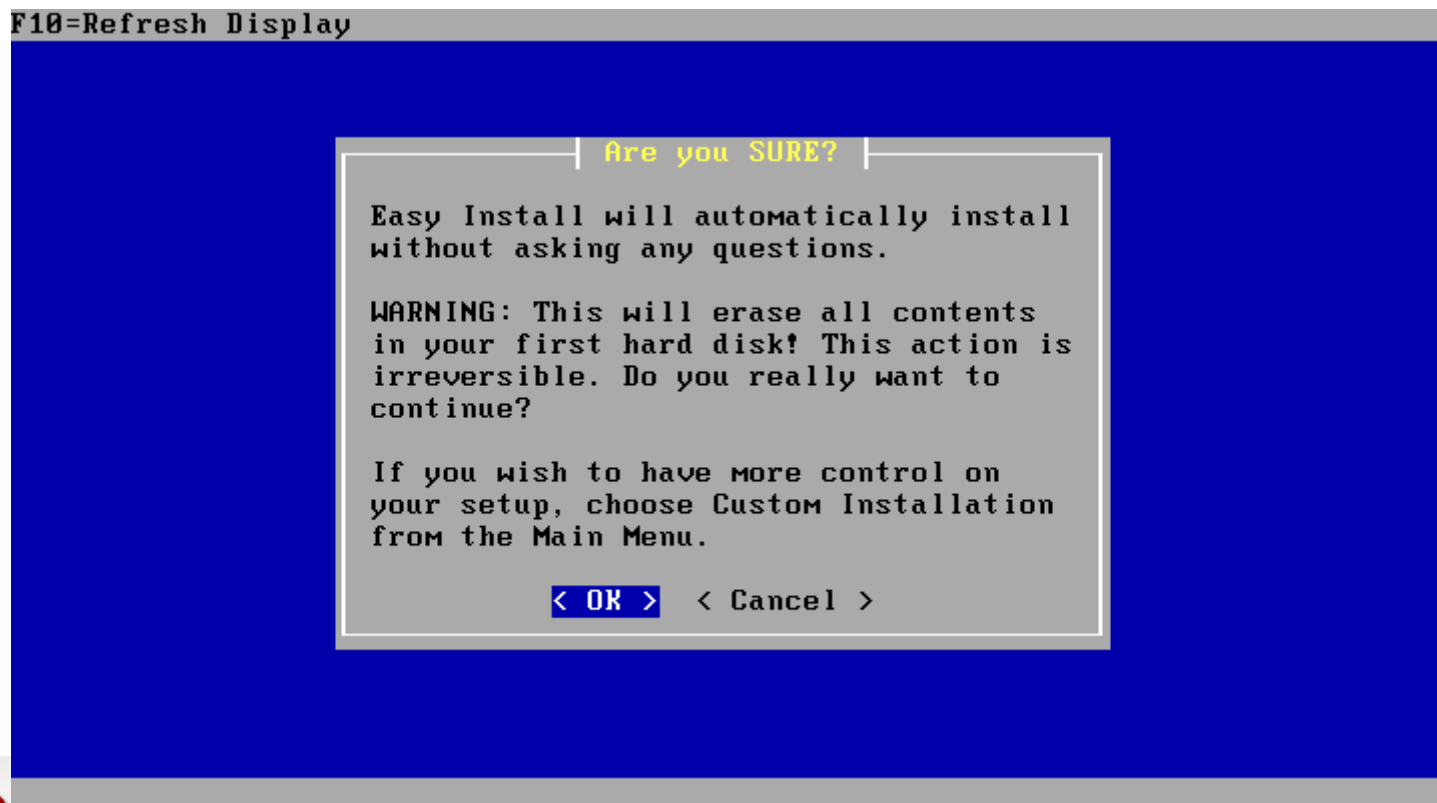
F10=Refresh Display



Invoke Installer with minimal questions

Performing a Full Install (ISO, Memstick)

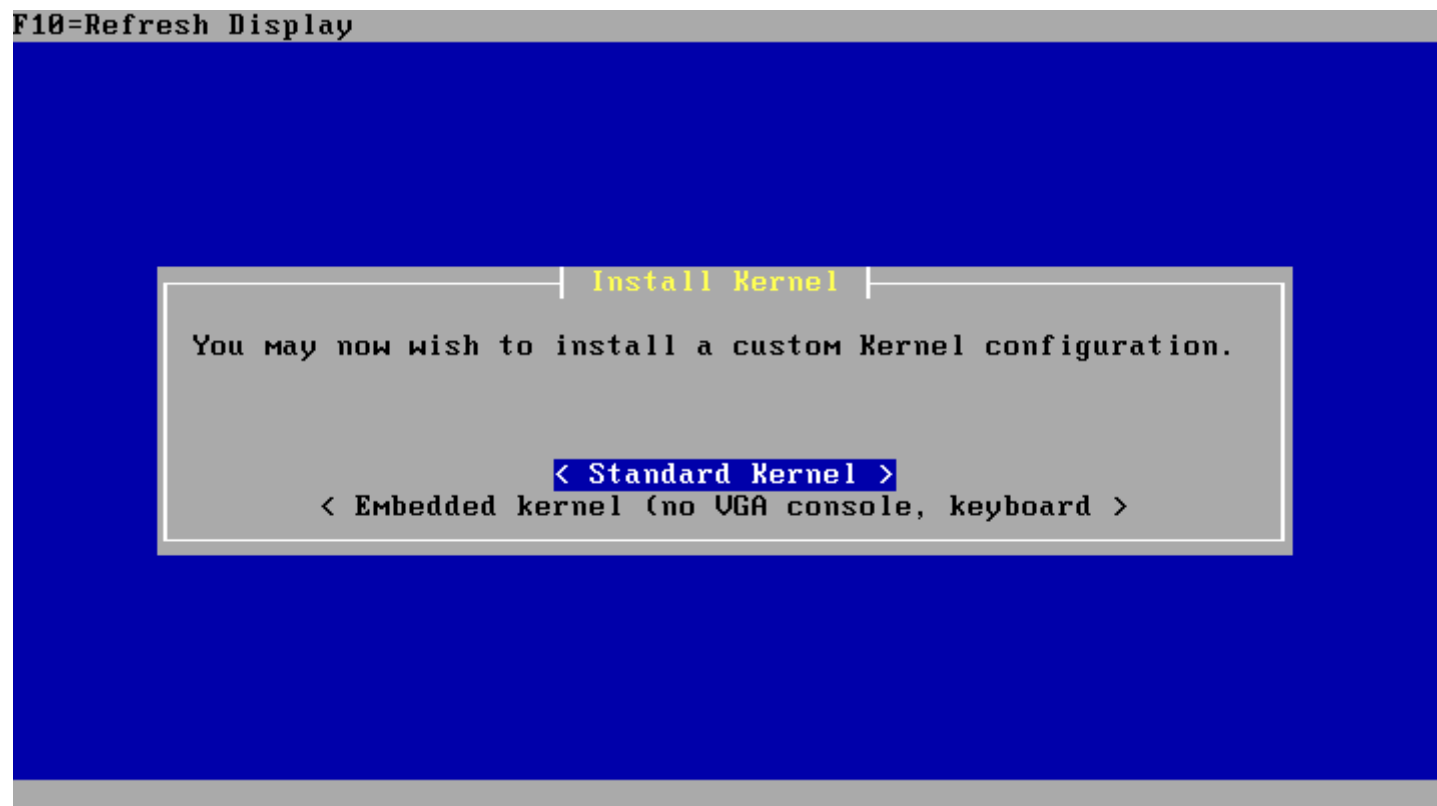
- The Quick/Easy Install option assumes the first located disk is the intended target, so be sure there is only one SSD/HDD is present in the system.



Performing a Full Install (ISO, Memstick)

- The install will proceed, wiping the target disk and installing pfSense. Copying files may take some time to finish.
- After the files have been copied to the target disk, a choice is presented to select the console type. Standard defaults to the VGA console. Embedded defaults to serial console.

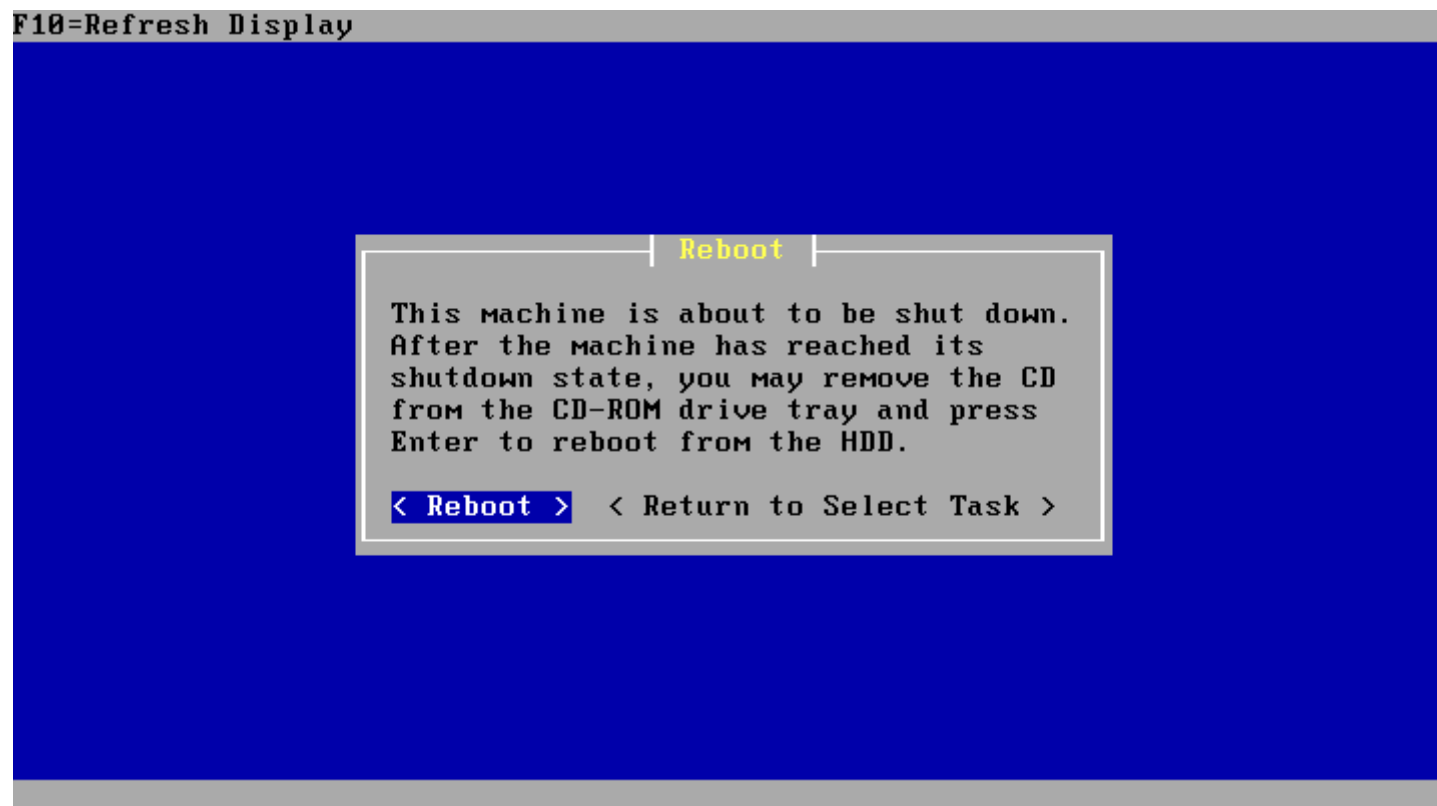
Performing a Full Install (ISO, Memstick)



Performing a Full Install (ISO, Memstick)

- Now the system must reboot so that pfSense may start from the target disk.
- Select Reboot and then press Enter.
- Be sure to remove the disc or USB memstick so that the system will not attempt to boot from there next time.

Performing a Full Install (ISO, Memstick)



Performing a Full Install (ISO, Memstick)

```
pfSense is now rebooting
```

```
After the reboot is complete, open a web browser and  
enter https://192.168.1.1 (or the LAN IP Address) in the  
location bar.
```

```
You might need to acknowledge the HTTPS certificate if  
your browser reports it as untrusted. This is normal  
as a self-signed certificate is used by default.
```

```
*DEFAULT Username*: admin  
*DEFAULT Password*: pfsense
```

```
Rebooting in 5 seconds. CTRL-C to abort.  
Rebooting in 4 seconds. CTRL-C to abort.  
Rebooting in 3 seconds. CTRL-C to abort.  
Rebooting in 2 seconds. CTRL-C to abort.  
Rebooting in 1 second.. CTRL-C to abort.
```

```
pfSense is now rebooting.
```

Performing a Full Install (ISO, Memstick)

- After the system reboots, pfSense will be running from the target disk. The next step is to Assign Interfaces on the Console below.

Performing a Full Install (ISO, Memstick)

```
Starting CRON... done.
pfSense (pfSense) 2.3-RELEASE amd64 Fri Apr 08 12:18:28 CDT 2016
Bootup complete

FreeBSD/amd64 (pfSense.localdomain) (ttyv0)

*** Welcome to pfSense 2.3-RELEASE-pfSense (amd64) on pfSense ***

WAN (wan)          -> em0          -> v4/DHCP4: 198.51.100.149/24
                   ->              v6/DHCP6: 2001:db8::20c:29ff:fe34:a560/64
LAN (lan)           -> em1          -> v4: 192.168.1.1/24
                   ->              v6/t6: 2001:db8:1:ee00:20c:29ff:fe34:a56a/60

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) pfSense Developer Shell
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: █
```

Assign Interfaces on the Console

- The default configuration file on pfSense 2.3 has em0 assigned as WAN, and em1 assigned as LAN.
- If the target hardware has em0 and em1, then the assignment prompt is skipped and the install will proceed as usual.
- Several other common platforms such as our SG systems, APU, and ALIX are also recognized and will have their interfaces assigned in the expected order.
- If the hardware platform cannot be identified, a list of network interfaces and their MAC addresses that were located on the system will appear, along with an indication of their link state if that is supported by the network card.
- The link state is denoted by "(up)" appearing after the MAC address if a link is detected on that interface.
- After that, a prompt will be shown for VLAN configuration.

VLANs

- The option to assign VLANs is presented first.
- If VLANs are not required, or they are not known, enter No here.
- VLANs are optional and are only needed for advanced networking.
- VLAN-capable equipment is also required if they are to be used.

LAN, WAN, OPT_x

- The first interface prompt is for the WAN interface.
- If the interface is known, enter its name, such as igb0 or em0 and press Enter.
- If the identity of the card is not known, see the next section for the Auto Assign Procedure.

LAN, WAN, OPT_x

- The second interface prompt is for the LAN interface.
- Enter the appropriate interface, such as igb1 or em1, and press Enter again.
- If only the WAN interface is to be used, and no LAN, press Enter without giving any other input.

LAN, WAN, OPT_x

- Only one interface (WAN) is required to setup pfSense.
- If more interfaces are available they may be assigned as LAN and OPT_x interfaces.
- The procedure is the same for additional interfaces: Enter the appropriate interface name, then press Enter.

LAN, WAN, OPT_x

- When there are no more interfaces to add, press Enter.
- The list of assigned interfaces is displayed.
- If the mappings are correct, enter y, otherwise enter n and repeat the assignment.

LAN, WAN, OPT_x

- If only one NIC is assigned (WAN), This is called Appliance Mode.
- In this mode, pfSense will move the GUI anti-lockout rule to the WAN interface so the firewall may be accessed from there.
- The usual routing functions would not be active since there is no "internal" interface.
- This type of configuration is useful for VPN appliances, DNS servers, etc.

Auto Assign Procedure

- For automatic interface assignment, first unplug all network cables from the system, then type a and press Enter.
- Now plug a network cable into the interface that should connect to the WAN, and press Enter.
- If all went well, pfSense should know now which interface to use for the WAN.
- The same process may be repeated for the LAN, and any optional interfaces that will be needed.
- If a message is displayed such as No link-up detected, see Installation Troubleshooting for more information on sorting out network card identities.

pfSense Default Configuration

- After installation and interface assignment, pfSense has the following default configuration:
- WAN is configured as an IPv4 DHCP client
- WAN is configured as an IPv6 DHCP client and will request a prefix delegation
- LAN is configured with a static IPv4 address of 192.168.1.1/24
- LAN is configured to use a delegated IPv6 address/prefix obtained by WAN (Track IPv6) if one is available
- All incoming connections to WAN are blocked
- All outgoing connections from LAN are allowed

pfSense Default Configuration

- NAT is performed on IPv4 traffic leaving WAN from the LAN subnet
- The firewall will act as an IPv4 DHCP Server
- The firewall will act as an IPv6 DHCPv6 Server if a prefix delegation was obtained on WAN, and also enables SLAAC
- The DNS Resolver is enabled so the firewall can accept and respond to DNS queries
- SSH is disabled.
- WebGUI is running on port 443 using HTTPS
- Default credentials are set to a username of admin with password pfsense

Post-Install Tasks

- After installation and assignment, a shell menu is presented on the console with a number of options.
- pfSense now is ready to be accessed via the network, either on the LAN interface (if one is assigned), or on the WAN interface in a single interface deployment.

Post-Install Tasks

```
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                v6/t6: 2001:db8:1:ee00:20c:29ff:fe34:a56a/60

0) Logout (SSH only)          9) pfTop
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Enter an option: █
```

Connect to the GUI

- The WebGUI is used to configure the vast majority of items in pfSense.
- It may be accessed by any modern browser, though Firefox and Chrome are preferred.
- Connect a client PC to the LAN of the firewall and ensure it obtained an IP address.
- If it did not, it may be plugged into the wrong port.
- Open a web browser and navigate to <https://192.168.1.1/>, using the default username admin and password pfsense to login.
- The first visit to the WebGUI will be redirected to the setup wizard, which is also accessible at System > Setup Wizard.
- Proceed through the wizard and configure things as desired.

Q&A.

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THANK YOU!