



Security Gateway Manual

SG-2100

© Copyright 2020 Rubicon Communications LLC

Oct 06, 2020

OUT OF THE BOX

1	Getting Started	2
2	Initial Configuration	4
3	pfSense Overview	9
4	Input and Output Ports	13
5	Safety and Legal	16
6	Netgate SG-2100 Wall Mount	24
7	Connecting to the Console Port	27
8	Reinstalling pfSense Software	33
9	Optional M.2 SATA Installation	37
10	Configuring the Switch Ports	41
11	Additional Resources	47
12	Warranty and Support	48



This Quick Start Guide covers the first time connection procedures for the Netgate® SG-2100 Firewall Appliance with pfSense® software. It will provide the information needed to keep the appliance up and running.

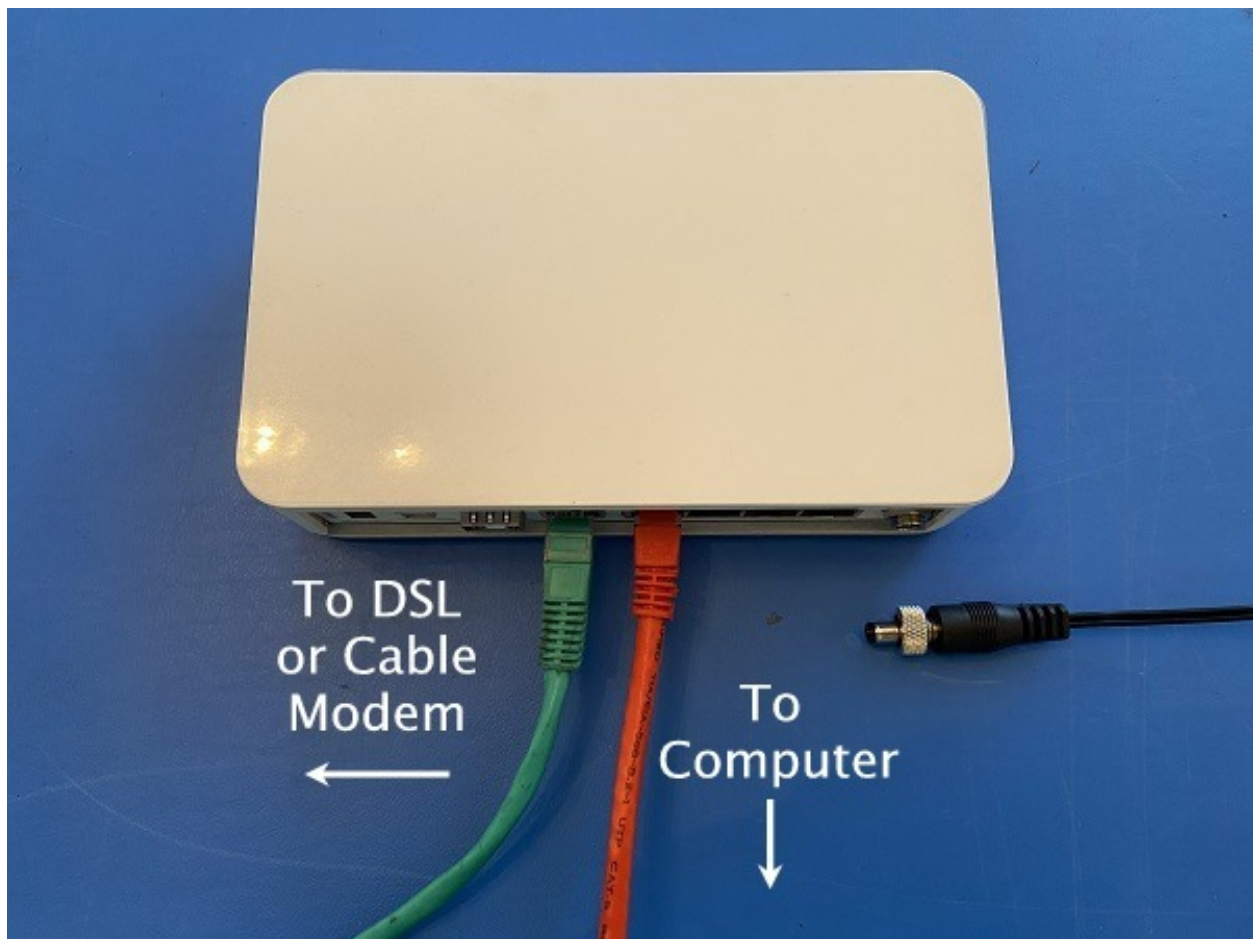
Tip: Before getting started, we recommend downloading the [PDF version of the Product Manual](#) and the [PDF version of the pfSense Documentation](#) in case you lose Internet access.

GETTING STARTED

The basic firewall configuration begins with connecting the Netgate® appliance to the Internet. The Netgate appliance should be unplugged at this time.

Connect one end of an Ethernet cable to the WAN port (shown in the *Input and Output Ports* section) of the Netgate appliance. The other end of the same cable should be inserted into a port of the Cable or DSL modem. The modem provided by the ISP should have multiple LAN ports. Any port should work.

Next, connect one end of a second Ethernet cable to the LAN port (shown in the *Input and Output Ports* section) of the pfSense appliance. Connect the other end to the computer.



Warning: The default IP Address on the LAN subnet on the Netgate firewall is 192.168.1.1/24. The same subnet **cannot** be used on both WAN and LAN, so if the default IP address on the ISP-supplied modem is also 192.168.1.1/24, **disconnect the WAN** interface until the LAN interface on the firewall has been renumbered to a different subnet (like **192.168.2.1/24**).

INITIAL CONFIGURATION

Plug the power cable into the power port (shown in the *Input and Output Ports* section) to turn on the Netgate® Firewall. Allow 4 or 5 minutes to boot up completely.

Warning: If your DSL or Cable Modem has a default IP Address of 192.168.1.1, please disconnect the Ethernet cable from the WAN port on your SG-2100 Netgate Security Gateway before proceeding. You will need to change the default IP Address of the device during a later step in the configuration.

1. From the computer, log into the Web Interface

Open a web browser (Google Chrome in this example) and type in 192.168.1.1 on the address bar. Press Enter.

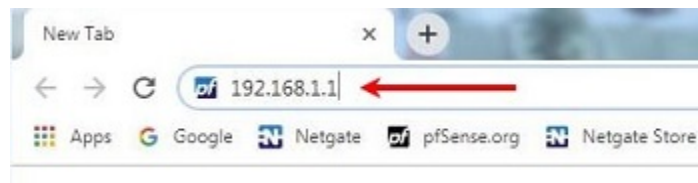


Fig. 1: Enter the Default LAN IP Address

2. A warning message may appear. If this message or similar message is encountered, it is safe to proceed. Click the **Advanced Button** and then click **Proceed to 192.168.1.1 (unsafe) to continue**.
3. At the **Sign In** page, enter the default pfSense username and password and click **Next**.
 - Default Username: **admin**
 - Default Password: **pfsense**

2.1 The Setup Wizard

The following steps will step through the Setup Wizard for the initial configuration of the firewall.

Note: Ignore the warning to reset the 'admin' account password. One of the steps in the Setup Wizard is to change the default password.

1. Click **Next** to start the Setup Wizard.
2. Click **Next** after you have read the information on Netgate Global Support.

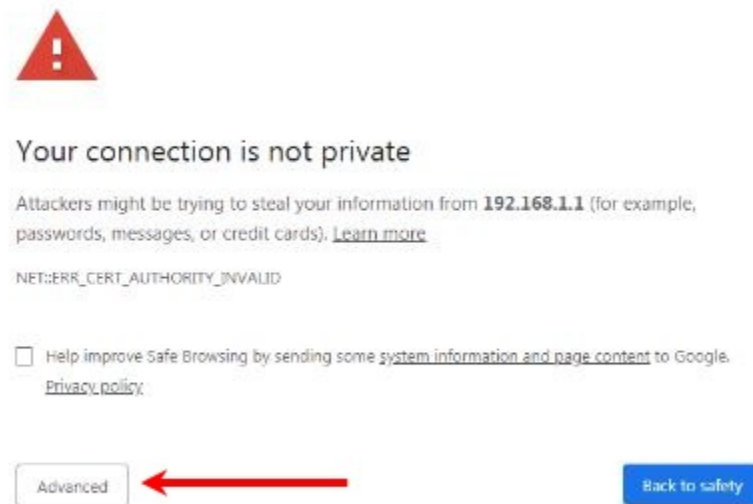


Fig. 2: Click **Advanced** and then **Proceed to 192.168.1.1 (unsafe)**

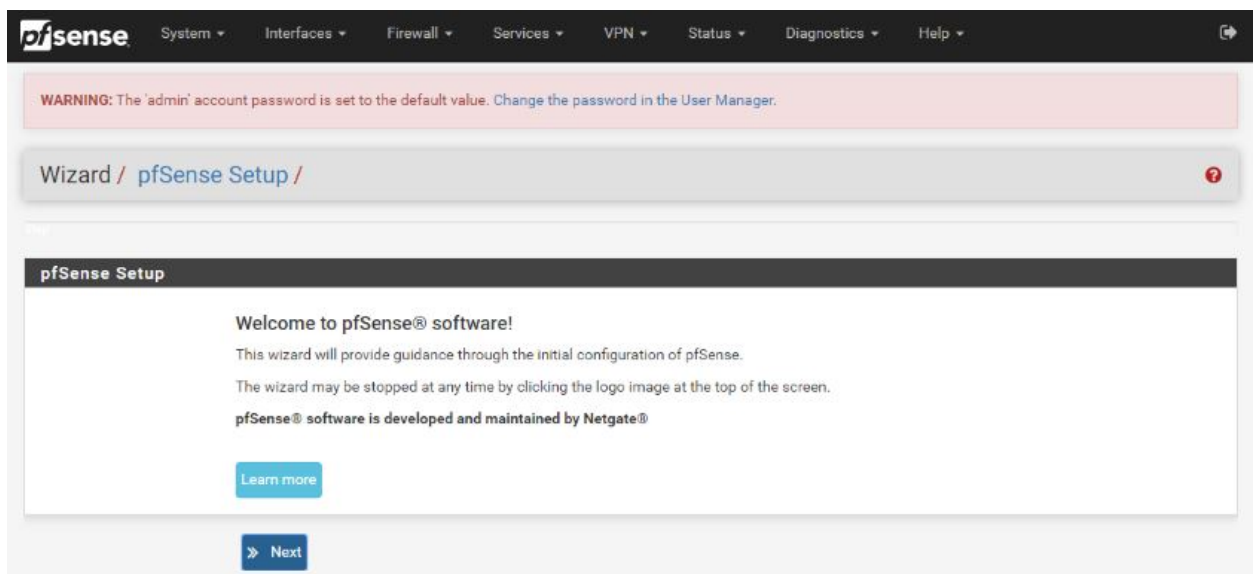


Fig. 3: Click **Next**

3. On the General Information page, use the following as a guide to configure the firewall.

Hostname: Any desired name can be entered. For the purposes of this guide, the default hostname `pfSense` is used.

Domain: The default `localdomain` is used for the purposes of this tutorial.

DNS Servers: For purposes of this setup guide, use the Google public DNS servers (8.8.8.8 and 8.8.4.4).

The screenshot shows the pfSense Setup Wizard at the 'General Information' step. The breadcrumb trail is 'Wizard / pfSense Setup / General Information'. A progress bar indicates 'Step 2 of 9'. The 'General Information' section has a sub-header 'On this screen the general pfSense parameters will be set.' Below this are four input fields: 'Hostname' with 'pfSense' entered (EXAMPLE: myserver), 'Domain' with 'localdomain' entered (EXAMPLE: mydomain.com), 'Primary DNS Server' with '8.8.8.8' entered, and 'Secondary DNS Server' with '8.8.4.4' entered. A note explains that the default DNS Resolver behavior is to ignore manually configured DNS servers for client queries and query root DNS servers directly. Below the fields is an 'Override DNS' checkbox which is checked, with a note 'Allow DNS servers to be overridden by DHCP/PPP on WAN'. A blue 'Next' button is at the bottom.

Fig. 4: Type in the DNS Server information and Click **Next**

4. Use the following information for the Time Server Information page.

Time Server Hostname: Use the default pfSense time server address.

Timezone: Select the time zone for the location of the firewall. For this guide, the Timezone will be set to `America/Chicago` for US Central time.

5. The WAN interface is the Public IP address the network will use to communicate with the Internet. Use the following information for the WAN configuration page.

DHCP is the default and is the most common type of interface for home cable modems.

Default settings for the other items on this page should be acceptable for normal home users.

6. Configuring LAN IP Address & Subnet Mask. The default LAN IP address of 192.168.1.1 and subnet mask of 24 is usually sufficient.

Tip: If your DSL or Cable Modem has a default IP Address of 192.168.1.1, change the IP Address of your SG-2100 Netgate Security Gateway to a different subnet, such as 192.168.2.1 with a subnet mask of 24 to avoid an IP Address conflict.

7. Change the **Admin Password**. Enter the same password in both fields.
8. Click **Reload** to save the configuration.

The screenshot shows the pfSense web interface. At the top is a navigation bar with the pfSense logo and menu items: System, Interfaces, Firewall, Services, VPN, and Status. Below the navigation bar is a red warning box that reads: "WARNING: The 'admin' account password is set to the default value. Change the password in the User Manager." Below the warning is a breadcrumb trail: "Wizard / pfSense Setup / Time Server Information". A progress bar indicates "Step 3 of 9". The main heading is "Time Server Information". Below the heading is a text prompt: "Please enter the time, date and time zone." There are two input fields: "Time server hostname" with the value "0.pfsense.pool.ntp.org" and a sub-prompt "Enter the hostname (FQDN) of the time server.", and "Timezone" with a dropdown menu showing "America/Chicago". At the bottom is a blue button labeled "Next".

Fig. 5: Change the Timezone and Click Next

The screenshot shows the pfSense web interface. At the top is a navigation bar with the pfSense logo and menu items: System, Interfaces, Firewall, Services, VPN, Status, Diagnostics, and Help. Below the navigation bar is a red warning box that reads: "WARNING: The 'admin' account password is set to the default value. Change the password in the User Manager." Below the warning is a breadcrumb trail: "Wizard / pfSense Setup / Configure WAN Interface". A progress bar indicates "Step 4 of 9". The main heading is "Configure WAN Interface". Below the heading is a text prompt: "On this screen the Wide Area Network information will be configured." There is a dropdown menu for "SelectedType" with the value "DHCP". Below this is a section titled "General configuration" with three input fields: "MAC Address" with a sub-prompt "This field can be used to modify ('spoof') the MAC address of the WAN interface (may be required with some cable connections). Enter a MAC address in the following format: xxxxxxxxxx or leave blank.", "MTU" with a sub-prompt "Set the MTU of the WAN interface. If this field is left blank, an MTU of 1492 bytes for PPPoE and 1500 bytes for all other connection types will be assumed.", and "MSS" with a sub-prompt "If a value is entered in this field, then MSS clamping for TCP connections to the value entered above minus 40 (TCP/IP header size) will be in effect. If this field is left blank, an MSS of 1492 bytes for PPPoE and 1500 bytes for all other connection types will be assumed. This should match the above".

Fig. 6: Default Settings Should be Acceptable. Click Next

9. After a few seconds, a message will indicate the Setup Wizard has completed. To proceed to the pfSense dashboard, click **Finish**.
10. A final notification screen will appear stating that **NO COMMERCIAL DISTRIBUTION...** Click **Accept** to continue to the pfSense dashboard.



Fig. 7: Read and Click **Accept**

If you unplugged the Ethernet cable at the beginning of this configuration, reconnect it to the WAN port now. This completes the basic configuration for the Netgate appliance.

PFSense OVERVIEW

This page provides an overview of the pfSense® dashboard and navigation. It also provides information on how to perform frequent tasks such as backing up the pfSense software and connecting to the Netgate firewall console.

3.1 The Dashboard

pfSense software is highly configurable, all of which can be done through the dashboard. This orientation will help to navigate and further configure the firewall.

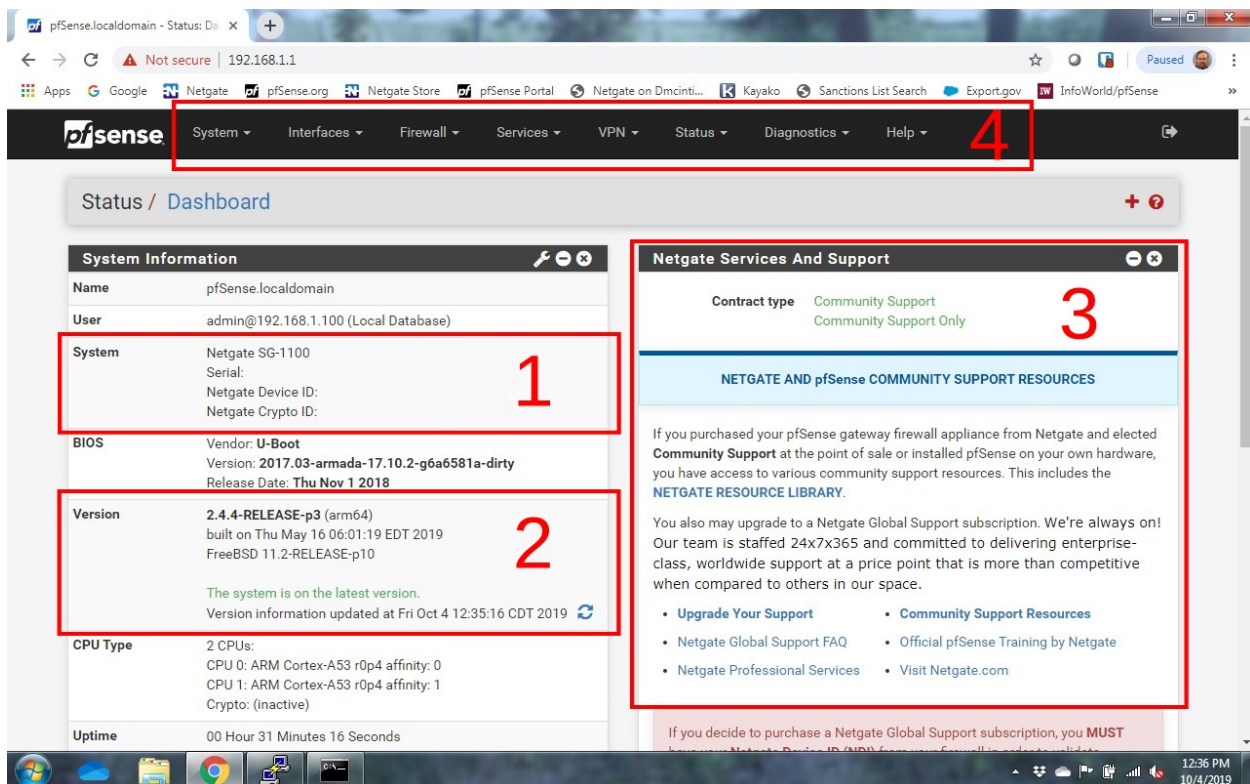


Fig. 1: The pfSense Dashboard

Section 1 shows important system information such as the model, Serial Number, and Netgate Device ID for this Netgate firewall.

Section 2 identifies what version of pfSense software is installed, and if an update is available.

Section 3 describes Netgate Service and Support.

Section 4 shows the various menu headings. Each menu heading has drop-down options for a wide range of configuration choices.

3.2 Re-running the Setup Wizard

To re-run the Setup Wizard, navigate to **System -> Setup Wizard**.

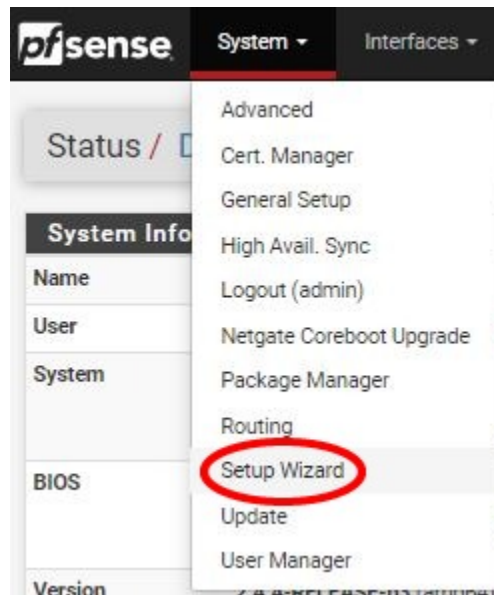


Fig. 2: Re-run the Setup Wizard

3.3 Backup and Restore

It is important to backup the firewall configuration prior to updating or making any configuration changes. From the menu at the top of the page, browse to **Diagnostics > Backup/Restore**.

Click **Download configuration as XML** and save a copy of the firewall configuration to the computer connected to the Netgate firewall.

This backup (or any backup) can be restored from the same screen by choosing the backed up file under **Restore Configuration**.

Note: Auto Config Backup is a built-in service located at **Services -> Auto Config Backup**. This service will save up to 100 encrypted backup files automatically, any time a change to the configuration has been made. Visit the [Auto Config Backup](#) page for more information.

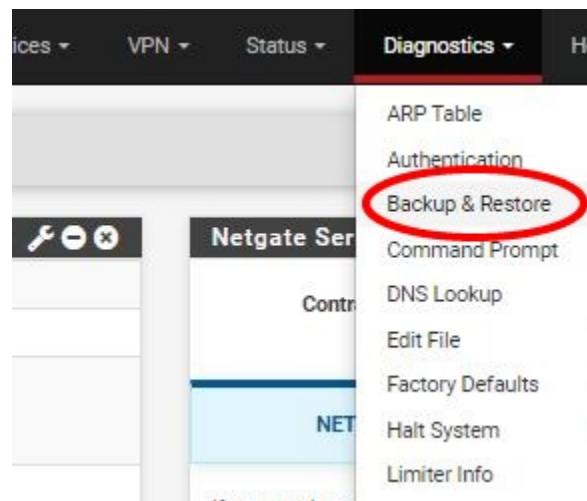


Fig. 3: Backup & Restore

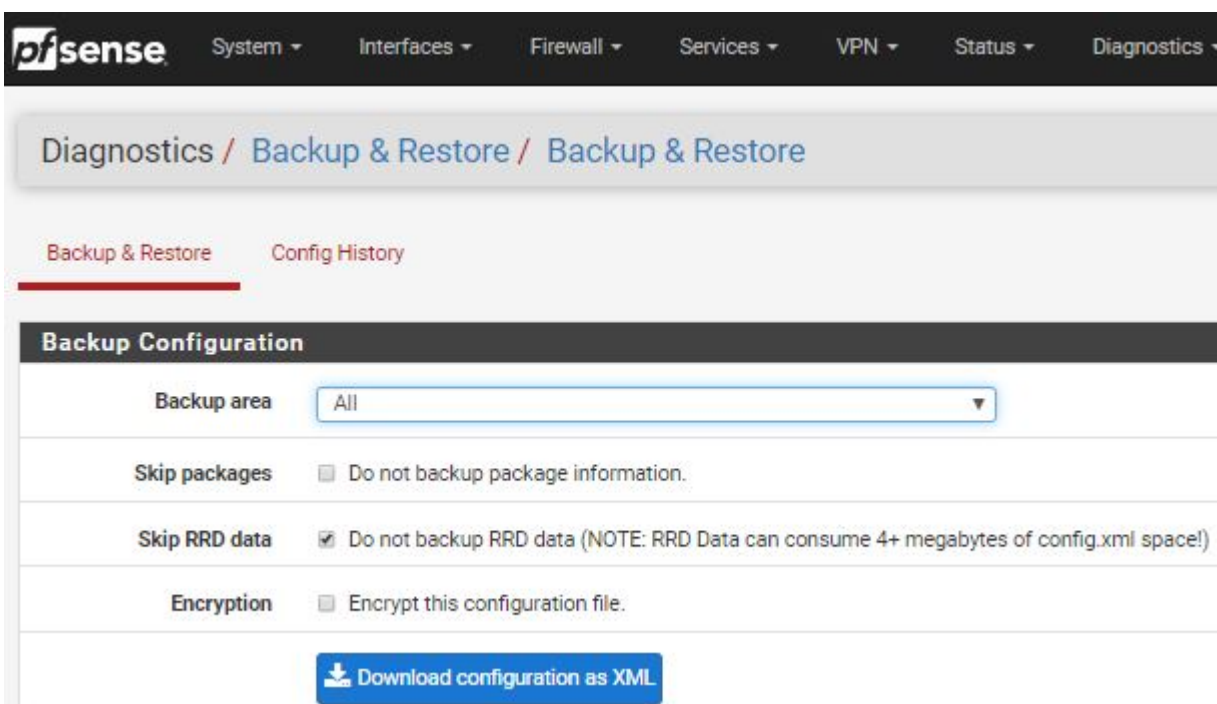


Fig. 4: Click Download configuration as XML

3.3.1 Connecting to the Console

There are times when accessing the console is required. Perhaps GUI console access has been locked out, or the password has been lost or forgotten.

See also:

Connecting to the Console Port Connect to the console. Cable is required.

Tip: To learn more about getting the most out of your Netgate appliance, sign up for a [pfSense Training](#) course or browse our extensive [Resource Library](#).

INPUT AND OUTPUT PORTS

4.1 Rear Side



4.1.1 Routed Ethernet

The WAN Combo-Port is shared between an RJ-45 port and an SFP port. Only one port can be used.

Interface Name	Port Name
WAN	mvneta0

LED Pattern	Description
Left LED only green	Flashes with 1Gb traffic, solid with link.
Both LEDs green	Both flash with 100Mb traffic, solid with link.
Right LED only green	Flashes with 10Mb traffic, solid with link.

4.1.2 Switched Ethernet

Interface Name	Port Name
LAN1	mvnet1
LAN2	mvnet1
LAN3	mvnet1
LAN4	mvnet1

LED Pattern	Description
Both LEDs green	Left Flashes with 1Gb traffic, solid with link.
Left LED only green	Left flashes with 100Mb traffic, solid with link.
Right LED only green	Left Flashes with 10Mb traffic, solid with link.

Warning: The LAN ports do not support the Spanning Tree Protocol (STP). Two or more ports connected to another Layer 2 switch, or connected to 2 or more different interconnected switches, could create a flooding loop between the switches. This can cause the router to stop functioning until the loop is resolved.

4.1.3 Other Ports

- Power (12 VDC with threaded locking connector)
- Recessed Reset Button (performs a [reset to factory default](#))
- USB 2.0
- Micro SIM
- Console (Mini-USB)
- 3x SMA-sized antenna holes (covered by rubber caps)

Note: The reset button is only used to reset the system back to factory defaults. It does not respond when pushed while the system is running. See our [Youtube video](#) for instructions.

4.2 Front Side



LED Pattern	Description
Boot Process	The sequence, circle -> square -> diamond, quickly flashes blue.
Boot Completed	The diamond slowly flashes blue.
Update is Available	The square slowly flashes orange.

SAFETY AND LEGAL

5.1 Safety Notices

1. Read, follow, and keep these instructions.
2. Heed all warnings.
3. Only use attachments/accessories specified by the manufacturer.

Warning: Do not use this product in location that can be submerged by water.

Warning: Do not use this product during an electrical storm to avoid electrical shock.

5.2 Electrical Safety Information

1. Compliance is required with respect to voltage, frequency, and current requirements indicated on the manufacturer's label. Connection to a different power source than those specified may result in improper operation, damage to the equipment or pose a fire hazard if the limitations are not followed.
2. There are no operator serviceable parts inside this equipment. Service should be provided only by a qualified service technician.
3. This equipment is provided with a detachable power cord which has an integral safety ground wire intended for connection to a grounded safety outlet.
 - a) Do not substitute the power cord with one that is not the provided approved type. If a 3 prong plug is provided, never use an adapter plug to connect to a 2-wire outlet as this will defeat the continuity of the grounding wire.
 - b) The equipment requires the use of the ground wire as a part of the safety certification, modification or misuse can provide a shock hazard that can result in serious injury or death.
 - c) Contact a qualified electrician or the manufacturer if there are questions about the installation prior to connecting the equipment.
 - d) Protective grounding/earthing is provided by Listed AC adapter. Building installation shall provide appropriate short-circuit backup protection.
 - e) Protective bonding must be installed in accordance with local national wiring rules and regulations.

5.3 FCC Compliance

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment. This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

1. This device may not cause harmful interference, and
2. This device must accept any interference received, including interference that may cause undesired operation.

Note: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a residential environment.

5.4 Industry Canada

This Class B digital apparatus complies with Canadian ICES-3(B). Cet appareil numérique de la classe B est conforme à la norme NMB-3(B) Canada.

5.5 Australia and New Zealand

This is a AMC Compliance level 2 product. This product is suitable for domestic environments.

5.6 CE Marking

CE marking on this product represents the product is in compliance with all directives that are applicable to it.

5.7 RoHS/WEEE Compliance Statement

5.7.1 English

European Directive 2002/96/EC requires that the equipment bearing this symbol on the product and/or its packaging must not be disposed of with unsorted municipal waste. The symbol indicates that this product should be disposed of separately from regular household waste streams. It is your responsibility to dispose of this and other electric and electronic equipment via designated collection facilities appointed by the government or local authorities. Correct disposal and recycling will help prevent potential negative consequences to the environment and human health. For more detailed information about the disposal of your old equipment, please contact your local authorities, waste disposal service, or the shop where you purchased the product.

5.7.2 Deutsch

Die Europäische Richtlinie 2002/96/EC verlangt, dass technische Ausrüstung, die direkt am Gerät und/oder an der Verpackung mit diesem Symbol versehen ist, nicht zusammen mit unsortiertem Gemeindeabfall entsorgt werden darf. Das Symbol weist darauf hin, dass das Produkt von regulärem Haushaltsmüll getrennt entsorgt werden sollte. Es liegt in Ihrer Verantwortung, dieses Gerät und andere elektrische und elektronische Geräte über die dafür zuständigen und von der Regierung oder örtlichen Behörden dazu bestimmten Sammelstellen zu entsorgen. Ordnungsgemäßes Entsorgen und Recyceln trägt dazu bei, potentielle negative Folgen für Umwelt und die menschliche Gesundheit zu vermeiden. Wenn Sie weitere Informationen zur Entsorgung Ihrer Altgeräte benötigen, wenden Sie sich bitte an die örtlichen Behörden oder städtischen Entsorgungsdienste oder an den Händler, bei dem Sie das Produkt erworben haben.

5.7.3 Español

La Directiva 2002/96/CE de la UE exige que los equipos que lleven este símbolo en el propio aparato y/o en su embalaje no deben eliminarse junto con otros residuos urbanos no seleccionados. El símbolo indica que el producto en cuestión debe separarse de los residuos domésticos convencionales con vistas a su eliminación. Es responsabilidad suya desechar este y cualesquiera otros aparatos eléctricos y electrónicos a través de los puntos de recogida que ponen a su disposición el gobierno y las autoridades locales. Al desechar y reciclar correctamente estos aparatos estará contribuyendo a evitar posibles consecuencias negativas para el medio ambiente y la salud de las personas. Si desea obtener información más detallada sobre la eliminación segura de su aparato usado, consulte a las autoridades locales, al servicio de recogida y eliminación de residuos de su zona o pregunte en la tienda donde adquirió el producto.

5.7.4 Français

La directive européenne 2002/96/CE exige que l'équipement sur lequel est apposé ce symbole sur le produit et/ou son emballage ne soit pas jeté avec les autres ordures ménagères. Ce symbole indique que le produit doit être éliminé dans un circuit distinct de celui pour les déchets des ménages. Il est de votre responsabilité de jeter ce matériel ainsi que tout autre matériel électrique ou électronique par les moyens de collecte indiqués par le gouvernement et les pouvoirs publics des collectivités territoriales. L'élimination et le recyclage en bonne et due forme ont pour but de lutter contre l'impact néfaste potentiel de ce type de produits sur l'environnement et la santé publique. Pour plus d'informations sur le mode d'élimination de votre ancien équipement, veuillez prendre contact avec les pouvoirs publics locaux, le service de traitement des déchets, ou l'endroit où vous avez acheté le produit.

5.7.5 Italiano

La direttiva europea 2002/96/EC richiede che le apparecchiature contrassegnate con questo simbolo sul prodotto e/o sull'imballaggio non siano smaltite insieme ai rifiuti urbani non differenziati. Il simbolo indica che questo prodotto non deve essere smaltito insieme ai normali rifiuti domestici. È responsabilità del proprietario smaltire sia questi prodotti sia le altre apparecchiature elettriche ed elettroniche mediante le specifiche strutture di raccolta indicate dal governo o dagli enti pubblici locali. Il corretto smaltimento ed il riciclaggio aiuteranno a prevenire conseguenze potenzialmente negative per l'ambiente e per la salute dell'essere umano. Per ricevere informazioni più dettagliate circa lo smaltimento delle vecchie apparecchiature in Vostro possesso, Vi invitiamo a contattare gli enti pubblici di competenza, il servizio di smaltimento rifiuti o il negozio nel quale avete acquistato il prodotto.

5.8 Declaration of Conformity

5.8.1 Český[Czech]

NETGATE tímto prohlašuje, že tento NETGATE device, je ve shodě se základními požadavky a dalšími příslušnými ustanoveními směrnice 1999/5/ES.

5.8.2 Dansk [Danish]

Undertegnede NETGATE erklærer herved, at følgende udstyr NETGATE device, overholder de væsentlige krav og øvrige relevante krav i direktiv 1999/5/EF.

5.8.3 Nederlands [Dutch]

Hierbij verklaart NETGATE dat het toestel NETGATE device, in overeenstemming is met de essentiële eisen en de andere relevante bepalingen van richtlijn 1999/5/EG. Bij deze verklaart NETGATE dat deze NETGATE device, voldoet aan de essentiële eisen en aan de overige relevante bepalingen van Richtlijn 1999/5/EC.

5.8.4 English

Hereby, NETGATE, declares that this NETGATE device, is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

5.8.5 Eesti [Estonian]

Käesolevaga kinnitab NETGATE seadme NETGATE device, vastavust direktiivi 1999/5/EÜ põhinõuetele ja nimetatud direktiivist tulenevatele teistele asjakohastele sätetele.

5.8.6 Suomi [Finnish]

NETGATE vakuuttaa täten että NETGATE device, tyyppinen laite on direktiivin 1999/5/EY oleellisten vaatimusten ja sitä koskevien direktiivin muiden ehtojen mukainen. Français [French] Par la présente NETGATE déclare que l'appareil Netgate, device est conforme aux exigences essentielles et aux autres dispositions pertinentes de la directive 1999/5/CE.

5.8.7 Deutsch [German]

Hiermit erklärt Netgate, dass sich diese NETGATE device, in Übereinstimmung mit den grundlegenden Anforderungen und den anderen relevanten Vorschriften der Richtlinie 1999/5/EG befindet". (BMW)

5.8.8 Ελληνικά [Greek]

ΜΕ ΤΗΝ ΠΑΡΟΥΣΑ ΝΕΤΓΑΤΕ ΔΗΛΩΝΕΙ ΟΤΙ ΝΕΤΓΑΤΕ device, ΣΥΜΜΟΡΦΩΝΕΤΑΙ ΠΡΟΣ ΤΙΣ ΟΥΣΙΩΔΕΙΣ ΑΠΑΙΤΗΣΕΙΣ ΚΑΙ ΤΙΣ ΛΟΙΠΕΣ ΣΧΕΤΙΚΕΣ ΔΙΑΤΑΞΕΙΣ ΤΗΣ ΟΔΗΓΙΑΣ 1995/5/ΕΚ.

5.8.9 Magyar [Hungarian]

Alulírott, NETGATE nyilatkozom, hogy a NETGATE device, megfelel a vonatkozó alapvető követelményeknek és az 1999/5/EC irányelv egyéb előírásainak.

5.8.10 Íslenska [Icelandic]

Hér me l sír NETGATE yfir ví a NETGATE device, er í samræmi við grunnkröfur og a rar kröfur, sem ger ar eru í tilskipun 1999/5/EC.

5.8.11 Italiano [Italian]

Con la presente NETGATE dichiara che questo NETGATE device, è conforme ai requisiti essenziali ed alle altre disposizioni pertinenti stabilite dalla direttiva 1999/5/CE.

5.8.12 Latviski [Latvian]

Ar o NETGATE deklar , ka NETGATE device, atbilst Direkt vas 1999/5/EK b tiskaj m pras b m un citiem ar to saist tajiem noteikumiem.

5.8.13 Lietuviškai [Lithuanian]

NETGATE deklaruoja, kad šis NETGATE įrenginys atitinka esminius reikalavimus ir kitas 1999/5/EB Direktyvos nuostatas.

5.8.14 Malti [Maltese]

Hawnhekk, Netgate, jiddikjara li dan NETGATE device, jikkonforma mal- ti ijjiet essenzjali u ma provvedimenti o rajn rilevanti li hemm fid-Dirrettiva 1999/5/EC.

5.8.15 Norsk [Norwegian]

NETGATE erklærer herved at utstyret NETGATE device, er i samsvar med de grunnleggende krav og øvrige relevante krav i direktiv 1999/5/EF.

5.8.16 Slovensky [Slovak]

NETGATE týmto vyhlasuje, že NETGATE device, spĺňa základné požiadavky a všetky príslušné ustanovenia Smernice 1999/5/ES.

5.8.17 Svenska [Swedish]

Härmed intygar NETGATE att denna NETGATE device, står i överensstämmelse med de väsentliga egenskapskrav och övriga relevanta bestämmelser som framgår av direktiv 1999/5/EG.

5.8.18 Español [Spanish]

Por medio de la presente NETGATE declara que el NETGATE device, cumple con los requisitos esenciales y cualesquiera otras disposiciones aplicables o exigibles de la Directiva 1999/5/CE.

5.8.19 Polski [Polish]

Niniejszym, firma NETGATE oświadczają, że produkt serii NETGATE device, spełnia zasadnicze wymagania i inne istotne postanowienia Dyrektywy 1999/5/EC.

5.8.20 Português [Portuguese]

NETGATE declara que este NETGATE device, está conforme com os requisitos essenciais e outras disposições da Directiva 1999/5/CE.

5.8.21 Română [Romanian]

Prin prezenta, NETGATE declară că acest dispozitiv NETGATE este în conformitate cu cerințele esențiale și alte prevederi relevante ale Directivei 1999/5/CE.

5.9 Disputes

ANY DISPUTE OR CLAIM RELATING IN ANY WAY TO YOUR USE OF ANY PRODUCTS/SERVICES, OR TO ANY PRODUCTS OR SERVICES SOLD OR DISTRIBUTED BY RCL OR ESF WILL BE RESOLVED BY BINDING ARBITRATION IN AUSTIN, TEXAS, RATHER THAN IN COURT. The Federal Arbitration Act and federal arbitration law apply to this agreement.

THERE IS NO JUDGE OR JURY IN ARBITRATION, AND COURT REVIEW OF AN ARBITRATION AWARD IS LIMITED. HOWEVER, AN ARBITRATOR CAN AWARD ON AN INDIVIDUAL BASIS THE SAME DAMAGES AND RELIEF AS A COURT (INCLUDING INJUNCTIVE AND DECLARATORY RELIEF OR STATUTORY DAMAGES), AND MUST FOLLOW THE TERMS OF THESE TERMS AND CONDITIONS OF USE AS A COURT WOULD.

To begin an arbitration proceeding, you must send a letter requesting arbitration and describing your claim to the following:

Rubicon Communications LLC
Attn.: Legal Dept.

4616 West Howard Lane, Suite 900
Austin, Texas 78728
legal@netgate.com

The arbitration will be conducted by the American Arbitration Association (AAA) under its rules. The AAA's rules are available at www.adr.org. Payment of all filing, administration and arbitrator fees will be governed by the AAA's rules.

We each agree that any dispute resolution proceedings will be conducted only on an individual basis and not in a class, consolidated or representative action. We also both agree that you or we may bring suit in court to enjoin infringement or other misuse of intellectual property rights.

5.10 Applicable Law

By using any Products/Services, you agree that the Federal Arbitration Act, applicable federal law, and the laws of the state of Texas, without regard to principles of conflict of laws, will govern these terms and conditions of use and any dispute of any sort that might arise between you and RCL and/or ESF. Any claim or cause of action concerning these terms and conditions or use of the RCL and/or ESF website must be brought within one (1) year after the claim or cause of action arises. Exclusive jurisdiction and venue for any dispute or claim arising out of or relating to the parties' relationship, these terms and conditions, or the RCL and/or ESF website, shall be with the arbitrator and/or courts located in Austin, Texas. The judgment of the arbitrator may be enforced by the courts located in Austin, Texas, or any other court having jurisdiction over you.

5.11 Site Policies, Modification, and Severability

Please review our other policies, such as our pricing policy, posted on our websites. These policies also govern your use of Products/Services. We reserve the right to make changes to our site, policies, service terms, and these terms and conditions of use at any time.

5.12 Miscellaneous

If any provision of these terms and conditions of use, or our terms and conditions of sale, are held to be invalid, void or unenforceable, the invalid, void or unenforceable provision shall be modified to the minimum extent necessary in order to render it valid or enforceable and in keeping with the intent of these terms and conditions. If such modification is not possible, the invalid or unenforceable provision shall be severed, and the remaining terms and conditions shall be enforced as written. Headings are for reference purposes only and in no way define, limit, construe or describe the scope or extent of such section. Our failure to act with respect to a breach by you or others does not waive our right to act with respect to subsequent or similar breaches. These terms and conditions set forth the entire understanding and agreement between us with respect to the subject matter hereof, and supersede any prior oral or written agreement pertaining thereto, except as noted above with respect to any conflict between these terms and conditions and our reseller agreement, if the latter is applicable to you.

5.13 Limited Warranty

DISCLAIMER OF WARRANTIES AND LIMITATION OF LIABILITY

THE PRODUCTS/SERVICES AND ALL INFORMATION, CONTENT, MATERIALS, PRODUCTS (INCLUDING SOFTWARE) AND OTHER SERVICES INCLUDED ON OR OTHERWISE MADE AVAILABLE TO YOU THROUGH THE PRODUCTS/SERVICES ARE PROVIDED BY US ON AN “AS IS” AND “AS AVAILABLE” BASIS, UNLESS OTHERWISE SPECIFIED IN WRITING. WE MAKE NO REPRESENTATIONS OR WARRANTIES OF ANY KIND, EXPRESS OR IMPLIED, AS TO THE OPERATION OF THE PRODUCTS/SERVICES, OR THE INFORMATION, CONTENT, MATERIALS, PRODUCTS (INCLUDING SOFTWARE) OR OTHER SERVICES INCLUDED ON OR OTHERWISE MADE AVAILABLE TO YOU THROUGH THE PRODUCTS/SERVICES, UNLESS OTHERWISE SPECIFIED IN WRITING. YOU EXPRESSLY AGREE THAT YOUR USE OF THE PRODUCTS/SERVICES IS AT YOUR SOLE RISK.

TO THE FULL EXTENT PERMISSIBLE BY APPLICABLE LAW, RUBICON COMMUNICATIONS, LLC (RCL) AND ELECTRIC SHEEP FENCING (ESF) DISCLAIM ALL WARRANTIES, EXPRESS OR IMPLIED, INCLUDING, BUT NOT LIMITED TO, IMPLIED WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. RCL AND ESF DO NOT WARRANT THAT THE PRODUCTS/SERVICES, INFORMATION, CONTENT, MATERIALS, PRODUCTS (INCLUDING SOFTWARE) OR OTHER SERVICES INCLUDED ON OR OTHERWISE MADE AVAILABLE TO YOU THROUGH THE PRODUCTS/SERVICES, RCL’S OR ESF’S SERVERS OR ELECTRONIC COMMUNICATIONS SENT FROM RCL OR ESF ARE FREE OF VIRUSES OR OTHER HARMFUL COMPONENTS. RCL AND ESF WILL NOT BE LIABLE FOR ANY DAMAGES OF ANY KIND ARISING FROM THE USE OF ANY PRODUCTS/SERVICES, OR FROM ANY INFORMATION, CONTENT, MATERIALS, PRODUCTS (INCLUDING SOFTWARE) OR OTHER SERVICES INCLUDED ON OR OTHERWISE MADE AVAILABLE TO YOU THROUGH ANY PRODUCTS/SERVICES, INCLUDING, BUT NOT LIMITED TO DIRECT, INDIRECT, INCIDENTAL, PUNITIVE, AND CONSEQUENTIAL DAMAGES, UNLESS OTHERWISE SPECIFIED IN WRITING.

IN NO EVENT WILL RCL’S OR ESF’S LIABILITY TO YOU EXCEED THE PURCHASE PRICE PAID FOR THE PRODUCT OR SERVICE THAT IS THE BASIS OF THE CLAIM.

CERTAIN STATE LAWS DO NOT ALLOW LIMITATIONS ON IMPLIED WARRANTIES OR THE EXCLUSION OR LIMITATION OF CERTAIN DAMAGES. IF THESE LAWS APPLY TO YOU, SOME OR ALL OF THE ABOVE DISCLAIMERS, EXCLUSIONS, OR LIMITATIONS MAY NOT APPLY TO YOU, AND YOU MIGHT HAVE ADDITIONAL RIGHTS.

NETGATE SG-2100 WALL MOUNT

The Netgate SG-2100 has built in wall-mount keyholes on the bottom of the appliance. This page provides an overview and a PDF template for attaching the system to the wall.



The SG-2100 can be mounted vertically or horizontally. If mounted horizontally, the ports and cables should face up to reduce the pull from the weight of the cables on the ports. Click on the button below to download the Wall Mount Template.

Once the PDF template is downloaded, print it out at 100% Scale for it to be accurate.

The screenshot displays the Netgate SG-2100 Wall Mounting Instructions PDF viewer. The left pane shows the PDF content, including a title page with the Netgate logo and a diagram showing the mounting holes with a dimension of 5.5" / 140mm. The right pane shows the print settings. The 'Scale' option is selected and highlighted with a red box, set to 100%.

Printer: HP Color LaserJet

Presets: Print Color as Gray

Copies: 1 ☐ Two-Sided

Pages: ☒ All
☐ From: 1 to: 1

Paper Size: US Letter 8.50 by 11.00 inches

Orientation: ☒ Portrait ☐ Landscape

Preview

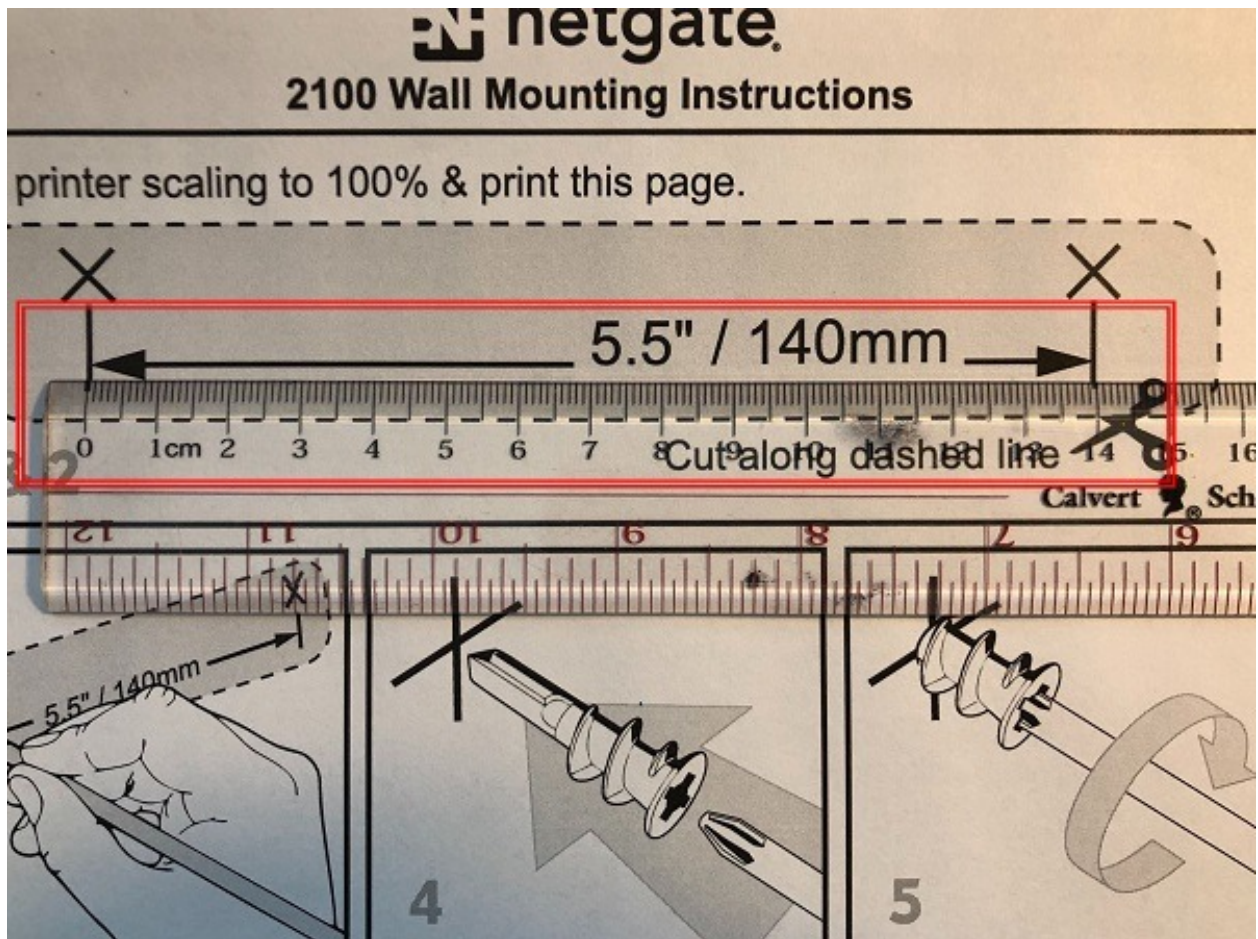
☒ Auto Rotate ☐ Show Notes

☒ Scale: 100%
☐ Scale to Fit: ☐ Print Entire Image
☐ Fill Entire Paper

Copies per page: 1

Note: The 100% Scale setting varies by printer manufacturer and model.

Verify the distance between holes is 5.5-inches or 140 mm (14 cm) before placing the anchors in the wall.



Follow the pictured instructions on the PDF to complete the wall mount installation.

CONNECTING TO THE CONSOLE PORT

There are times when directly accessing the console is required. Perhaps webGUI or SSH access has been locked out, or the password has been lost or forgotten. This guide shows how to regain access directly through the console.

7.1 Install the Driver

A Silicon Labs CP210x **USB-to-UART Bridge** driver is used to provide access to the console, which is exposed via the Mini-USB port on the appliance.

If needed, install an appropriate Silicon Labs CP210x **USB to UART Bridge** driver on the workstation used to connect with the system.

Windows

There are drivers available for Windows [available for download](#).

Mac OSX

There are drivers available for Mac OSX [available for download](#).

For Mac, choose the **Macintosh OSX** download.

Linux

There are drivers available for Linux [available for download](#).

FreeBSD

Recent versions of FreeBSD include this driver and will not require manual installation.

7.2 Connect a USB Cable

Next, locate an appropriate USB cable that has a Mini-USB connector on one end and a regular **USB Type A** plug on the other end. These cables are commonly used with smaller USB peripherals such as GPS units, cameras, and so on.

Gently push the Mini-USB plug end into the console port on the appliance and connect the **USB Type A** plug into an available USB port on the workstation.

Tip: Be certain to gently push in the Mini-USB connector on the system side completely. With most cables there will be a tangible “click”, “snap”, or similar indication when the cable is fully engaged.

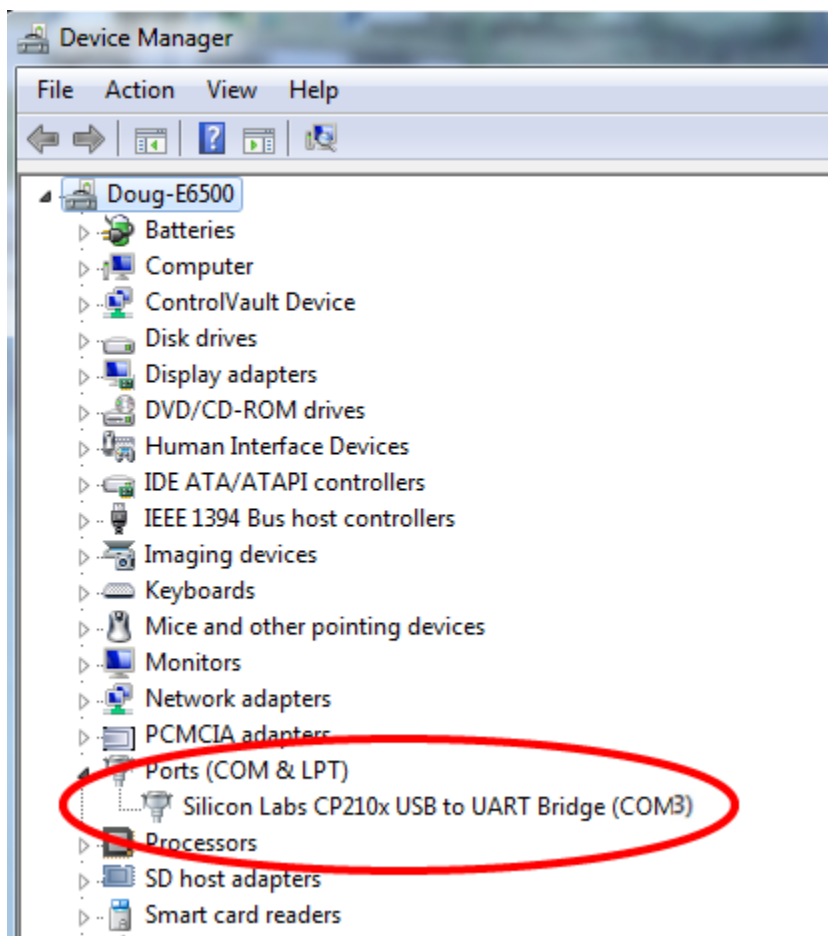
7.3 Locate the Console Port Device

The appropriate console port device that the workstation assigned as the serial port must be located before attempting to connect to the console.

Note: Even if the serial port was assigned in the BIOS, the workstation's OS may remap it to a different COM Port.

Windows

To locate the device name on Windows, open **Device Manager** and expand the section for **Ports (COM & LPT)**. Look for an entry with a title such as **Silicon Labs CP210x USB to UART Bridge**. If there is a label in the name that contains "COMX" where X is a decimal digit (e.g. COM3), that value is what would be used as the port in the terminal program.



Mac OSX

The device associated with the system console is likely to show up as `/dev/cu.SLAB_USBtoUART`.

Linux

The device associated with the system console is likely to show up as `/dev/ttyUSB0`. Look for messages about the device attaching in the system log files or by running `dmesg`.

Note: If the device does not appear in `/dev/`, see the note above in the driver section about manually loading the Linux

driver and then try again.

FreeBSD

The device associated with the system console is likely to show up as `/dev/cuaU0`. Look for messages about the device attaching in the system log files or by running `dmesg`.

7.4 Launch a Terminal Program

Use a terminal program to connect to the system console port. Some choices of terminal programs:

Windows

For Windows it is recommended to run *PuTTY in Windows* or *SecureCRT*. An example of how to configure Putty is below.

Warning: Do not use **Hyperterminal**.

Mac OSX

For Mac OSX it is recommended to run `screen`, or `cu`. An example of how to configure screen is below.

Linux

For Linux it is recommended to run `screen`, *PuTTY in Linux*, `minicom`, or `dterm`. An example of how to configure Putty and screen is below.

FreeBSD

For FreeBSD it is recommended to run `screen` or `cu`. An example of how to configure screen is below.

7.4.1 Client-Specific Examples

PuTTY in Windows

Open PuTTY and select **Session** under **Category** on the left hand side. Next, set the **Connection type** to **Serial**. Then, set **Serial line** to the console port that was located above, in *Locate the Console Port Device*, and the **Speed** to 115200 bits per second.

Click the **Open** button and the console screen will be displayed.

PuTTY in Linux

Open PuTTY from a terminal by typing `sudo putty`. Next, set the **Connection type** to **Serial**. Then, set **Serial line** to `/dev/ttyUSB0` and the **Speed** to 115200 bits per second.

Click the **Open** button and the console screen will be displayed.

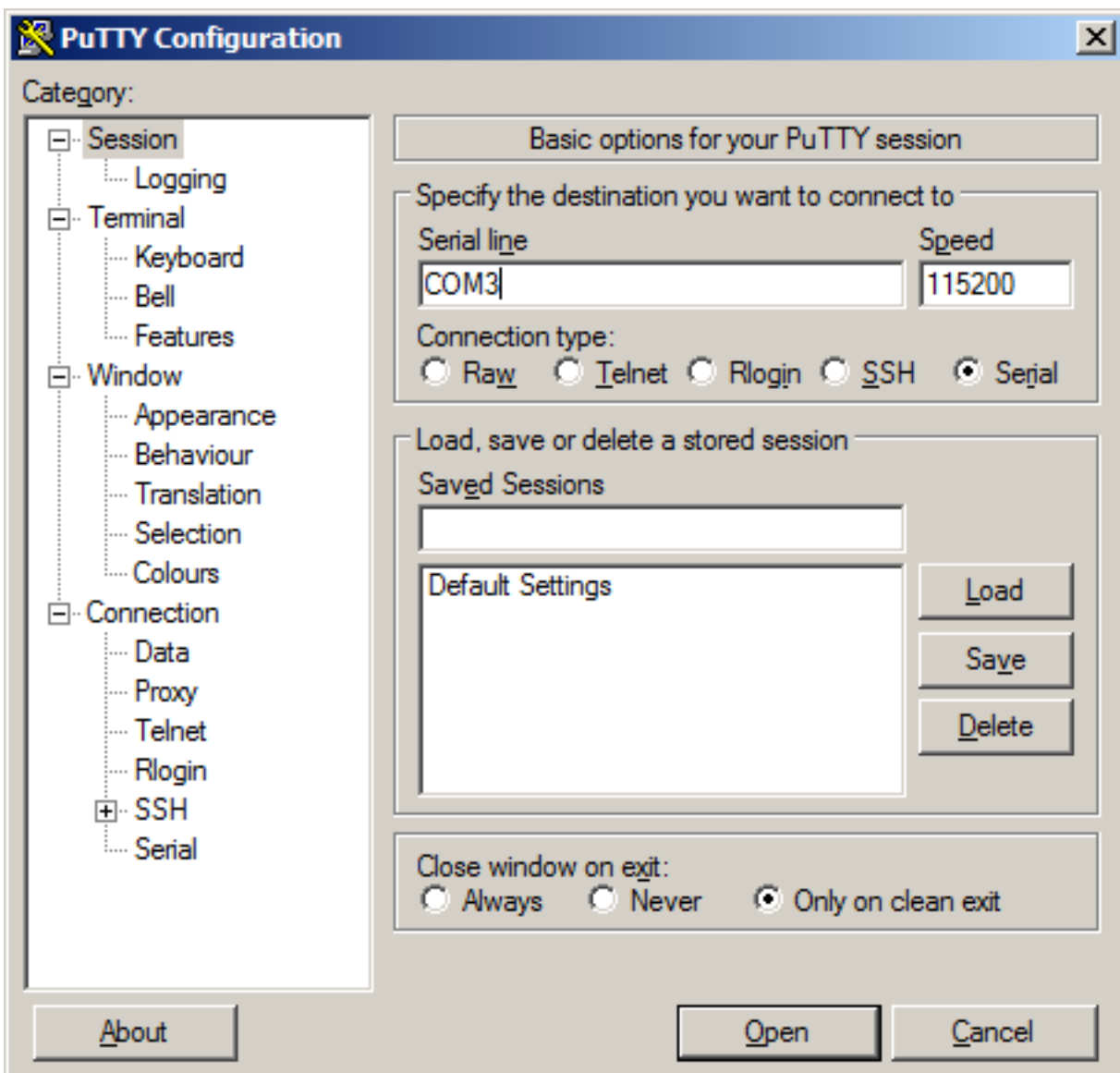


Fig. 1: An example of using PuTTY in Windows.

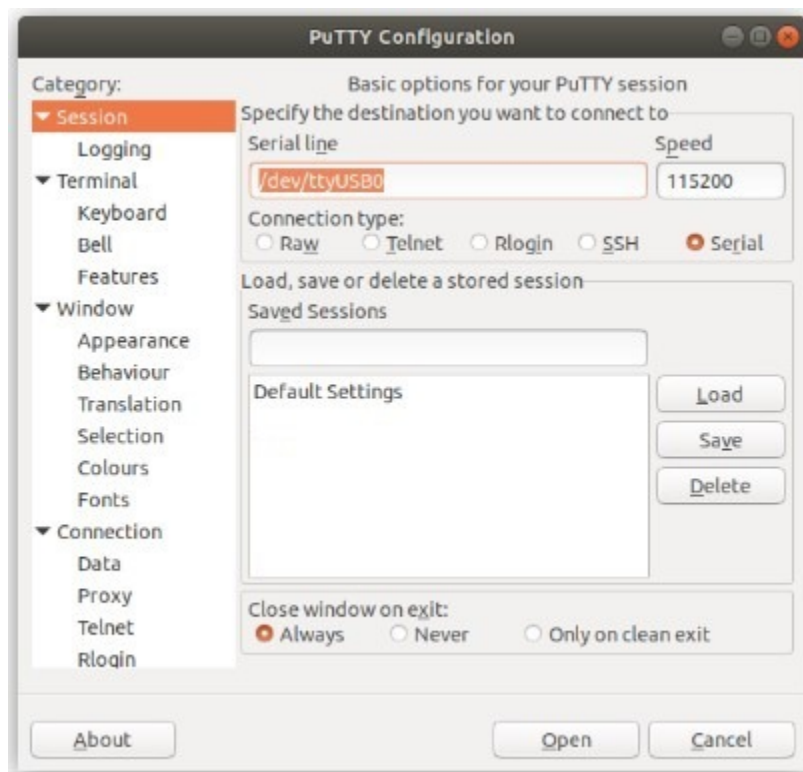


Fig. 2: An example of using PuTTY in Linux.

GNU screen

In many cases `screen` may be invoked simply by using the proper command line, where `<console-port>` is the console port that was located above.

```
sudo screen <console-port> 115200
```

If portions of the text are unreadable but appear to be properly formatted, the most likely culprit is a character encoding mismatch in the terminal. Adding the `-U` parameter to the `screen` command line arguments forces it to use UTF-8 for character encoding:

```
sudo screen -U <console-port> 115200
```

7.4.2 Terminal Settings

The settings to use within the terminal program are:

Speed 115200 baud, the speed of the BIOS

Data bits 8

Parity none

Stop bits 1

Flow Control Off or XON/OFF. Hardware flow control (RTS/CTS) must be **disabled**.

7.5 Troubleshooting

7.5.1 No Serial Output

If there is no output at all, check the following items:

- Ensure the cable is correctly attached and fully inserted
- Ensure the terminal program is using the correct port
- Ensure the terminal program is configured for the correct speed. The default BIOS speed is **115200**, and many other modern operating systems use that speed as well. Some older operating systems or custom configurations may use slower speeds such as **9600** or **38400**.
- Ensure the operating system is configured for the proper console (e.g. `ttys1` in Linux). Consult the various operating install guides on this site for further information.

7.5.2 PuTTY has issues with line drawing

PuTTY generally handles most cases OK but can have issues with line drawing characters on certain platforms.

These settings seem to work best (tested on Windows):

Window Columns x Rows = *80x24*

Window > Appearance Font = *Courier New 10pt* or *Consolas 10pt*

Window > Translation Remote Character Set = *Use font encoding* or *UTF-8*

Window > Translation Handling of line drawing characters = *Use font in both ANSI and OEM modes*
or *Use Unicode line drawing code points*

Window > Colours Indicate bolded text by changing = *The colour*

7.5.3 Garbled Serial Output

If the serial output appears to be garbled, binary, or random characters check the following items:

- Ensure the terminal program is configured for the correct speed. (See [No Serial Output](#))
- Ensure the terminal program is configured for the proper character encoding, such as **UTF-8** or **Latin-1**, depending on the operating system. (See [GNU Screen](#))

7.5.4 Serial Output Stops After the BIOS

If serial output is shown for the BIOS but stops afterward, check the following items:

- Ensure the terminal program is configured for the correct speed for the installed operating system. (See [No Serial Output](#))
- Ensure the installed operating system is configured to activate the serial console.
- Ensure the installed operating system is configured for the proper console (e.g. `ttys1` in Linux). Consult the various operating install guides on this site for further information.
- If booting from a USB flash drive, ensure that the drive was written correctly and contains a bootable operating system image.

REINSTALLING PFSENSE SOFTWARE

1. Please [open a support ticket](#) to request access to the factory firmware by selecting **Firmware Access** as the **General Problem** and then select **Netgate SG-2100** for the platform. Make sure to include the serial number in the ticket to expedite access.

Once the ticket is processed, the latest stable version of the firmware will be attached to the ticket, with a name such as:

```
pfSense-netgate-SG-2100-recovery-2.4.5-p1-RELEASE-aarch64.img.gz
```

Note: The pfSense® factory version is the version that is preinstalled on units purchased from Netgate. The factory image is optimally tuned for our hardware and contains some features that cannot be found elsewhere, such as the AWS VPN Wizard.

2. Write the image to a USB memstick. Locating the image and writing it to a USB memstick is covered in detail under [Writing Flash Drives](#).
3. [Connect to the console port](#) of the pfSense device.
4. Insert the memstick into the USB port and boot the system.

Tip: Best practice is to **turn off** the system, **insert** the USB memstick, ensure you have **console access**, and **reboot** the system. You will need to **interrupt the boot process** very soon after initial boot.

5. When prompted, press any key to stop the autoboot process.
6. Type `run usbrecovery` at the **Marvell>>** prompt and press `Enter`.
7. Select the destination device.

Note: The onboard eMMC flash memory is always **mmcsd0**. If a M.2 SATA drive is installed, it will be **ada0**.

8. Type `y` and `Enter` to confirm your choice.
9. The **Netgate SG-2100** will automatically reboot to complete the installation. Remove the USB key when the console menu appears.

Note: For information on restoring from a previously saved configuration, go to [Backup and Restore](#).

```
lease-1.3.0)
NOTICE: BL31: Built : 14

U-Boot 2018.03-devel-1.2.0ROGUE2-01.00.00.02+ (Feb 07 2020 - 14:33:22 -0500)

Model: Silicom Rogue-2
  CPU      1200 [MHz]
  L2       800 [MHz]
  TClock   200 [MHz]
  DDR      750 [MHz]
DRAM: 3.4 GiB
Comphy chip #0:
Comphy-0: SGMII1      3.125 Gbps
Comphy-1: PEX0       2.5 Gbps
Comphy-2: SATA0      6 Gbps
PCIE-0: Link down
MMC: sdhci@d8000: 0
Loading Environment from SPI Flash... mvebu_spi_ofdata_to_platdata: ofdata clock
200000000, frequency 200000000
SF: Detected w25q32bv with page size 256 Bytes, erase size 4 KiB, total 4 MiB
OK
Model: Silicom Rogue-2
Net: eth0: neta@30000 [PRIME], eth1: neta@40000
Hit any key to stop autoboot: 1 █
```

```
NOTICE: BL31: Built : 14

U-Boot 2018.03-devel-1.2.0ROGUE2-01.00.00.02+ (Feb 07 2020 - 14:33:22 -0500)

Model: Silicom Rogue-2
  CPU      1200 [MHz]
  L2       800 [MHz]
  TClock   200 [MHz]
  DDR      750 [MHz]
DRAM: 3.4 GiB
Comphy chip #0:
Comphy-0: SGMII1      3.125 Gbps
Comphy-1: PEX0       2.5 Gbps
Comphy-2: SATA0      6 Gbps
PCIE-0: Link down
MMC: sdhci@d8000: 0
Loading Environment from SPI Flash... mvebu_spi_ofdata_to_platdata: ofdata clock
200000000, frequency 200000000
SF: Detected w25q32bv with page size 256 Bytes, erase size 4 KiB, total 4 MiB
OK
Model: Silicom Rogue-2
Net: eth0: neta@30000 [PRIME], eth1: neta@40000
Hit any key to stop autoboot: 0
Marvell>> run usbrecovery █
```

PIXAR

```
Welcome to pfSense 2.4.5-RELEASE (Patch 1)...
```

Netgate SG-2100 firmware recovery

Serial:

Netgate Crypto ID:

This will install the standard firmware and will erase all the existing contents of the destination device permanently.

```
eMMC device: mmcblk0
```

```
AHCI device: ada0
```

```
Type the name of the destination device (mmcsd0,ada0) or type enter to install o
n mmcsd0: ada0
```

| . _ / | _ | _ _ ^ _ _ | _ | _ _ ^ _ _ |
 | _ |

```
Welcome to pfSense 2.4.5-RELEASE (Patch 1)...
```

Netgate SG-2100 firmware recovery

Serial:

Netgate Crypto ID:

This will install the standard firmware and will erase all the existing contents of the destination device permanently.

```
eMMC device: mmcblk0
```

```
AHCI device: ada0
```

```
Type the name of the destination device (mmc0,mmc1,mmc2,mmc3,mmc4,mmc5,mmc6,mmc7,mmc8,mmc9,mmc10,mmc11,mmc12,mmc13,mmc14,mmc15,mmc16,mmc17,mmc18,mmc19,mmc20,mmc21,mmc22,mmc23,mmc24,mmc25,mmc26,mmc27,mmc28,mmc29,mmc30,mmc31,mmc32,mmc33,mmc34,mmc35,mmc36,mmc37,mmc38,mmc39,mmc40,mmc41,mmc42,mmc43,mmc44,mmc45,mmc46,mmc47,mmc48,mmc49,mmc50,mmc51,mmc52,mmc53,mmc54,mmc55,mmc56,mmc57,mmc58,mmc59,mmc60,mmc61,mmc62,mmc63,mmc64,mmc65,mmc66,mmc67,mmc68,mmc69,mmc70,mmc71,mmc72,mmc73,mmc74,mmc75,mmc76,mmc77,mmc78,mmc79,mmc80,mmc81,mmc82,mmc83,mmc84,mmc85,mmc86,mmc87,mmc88,mmc89,mmc90,mmc91,mmc92,mmc93,mmc94,mmc95,mmc96,mmc97,mmc98,mmc99,mmc100,mmc101,mmc102,mmc103,mmc104,mmc105,mmc106,mmc107,mmc108,mmc109,mmc110,mmc111,mmc112,mmc113,mmc114,mmc115,mmc116,mmc117,mmc118,mmc119,mmc120,mmc121,mmc122,mmc123,mmc124,mmc125,mmc126,mmc127,mmc128,mmc129,mmc130,mmc131,mmc132,mmc133,mmc134,mmc135,mmc136,mmc137,mmc138,mmc139,mmc140,mmc141,mmc142,mmc143,mmc144,mmc145,mmc146,mmc147,mmc148,mmc149,mmc150,mmc151,mmc152,mmc153,mmc154,mmc155,mmc156,mmc157,mmc158,mmc159,mmc160,mmc161,mmc162,mmc163,mmc164,mmc165,mmc166,mmc167,mmc168,mmc169,mmc170,mmc171,mmc172,mmc173,mmc174,mmc175,mmc176,mmc177,mmc178,mmc179,mmc180,mmc181,mmc182,mmc183,mmc184,mmc185,mmc186,mmc187,mmc188,mmc189,mmc190,mmc191,mmc192,mmc193,mmc194,mmc195,mmc196,mmc197,mmc198,mmc199,mmc200,mmc201,mmc202,mmc203,mmc204,mmc205,mmc206,mmc207,mmc208,mmc209,mmc210,mmc211,mmc212,mmc213,mmc214,mmc215,mmc216,mmc217,mmc218,mmc219,mmc220,mmc221,mmc222,mmc223,mmc224,mmc225,mmc226,mmc227,mmc228,mmc229,mmc230,mmc231,mmc232,mmc233,mmc234,mmc235,mmc236,mmc237,mmc238,mmc239,mmc240,mmc241,mmc242,mmc243,mmc244,mmc245,mmc246,mmc247,mmc248,mmc249,mmc250,mmc251,mmc252,mmc253,mmc254,mmc255,mmc256,mmc257,mmc258,mmc259,mmc260,mmc261,mmc262,mmc263,mmc264,mmc265,mmc266,mmc267,mmc268,mmc269,mmc270,mmc271,mmc272,mmc273,mmc274,mmc275,mmc276,mmc277,mmc278,mmc279,mmc280,mmc281,mmc282,mmc283,mmc284,mmc285,mmc286,mmc287,mmc288,mmc289,mmc290,mmc291,mmc292,mmc293,mmc294,mmc295,mmc296,mmc297,mmc298,mmc299,mmc300,mmc301,mmc302,mmc303,mmc304,mmc305,mmc306,mmc307,mmc308,mmc309,mmc310,mmc311,mmc312,mmc313,mmc314,mmc315,mmc316,mmc317,mmc318,mmc319,mmc320,mmc321,mmc322,mmc323,mmc324,mmc325,mmc326,mmc327,mmc328,mmc329,mmc330,mmc331,mmc332,mmc333,mmc334,mmc335,mmc336,mmc337,mmc338,mmc339,mmc340,mmc341,mmc342,mmc343,mmc344,mmc345,mmc346,mmc347,mmc348,mmc349,mmc350,mmc351,mmc352,mmc353,mmc354,mmc355,mmc356,mmc357,mmc358,mmc359,mmc360,mmc361,mmc362,mmc363,mmc364,mmc365,mmc366,mmc367,mmc368,mmc369,mmc370,mmc371,mmc372,mmc373,mmc374,mmc375,mmc376,mmc377,mmc378,mmc379,mmc380,mmc381,mmc382,mmc383,mmc384,mmc385,mmc386,mmc387,mmc388,mmc389,mmc390,mmc391,mmc392,mmc393,mmc394,mmc395,mmc396,mmc397,mmc398,mmc399,mmc400,mmc401,mmc402,mmc403,mmc404,mmc405,mmc406,mmc407,mmc408,mmc409,mmc410,mmc411,mmc412,mmc413,mmc414,mmc415,mmc416,mmc417,mmc418,mmc419,mmc420,mmc421,mmc422,mmc423,mmc424,mmc425,mmc426,mmc427,mmc428,mmc429,mmc430,mmc431,mmc432,mmc433,mmc434,mmc435,mmc436,mmc437,mmc438,mmc439,mmc440,mmc441,mmc442,mmc443,mmc444,mmc445,mmc446,mmc447,mmc448,mmc449,mmc450,mmc451,mmc452,mmc453,mmc454,mmc455,mmc456,mmc457,mmc458,mmc459,mmc460,mmc461,mmc462,mmc463,mmc464,mmc465,mmc466,mmc467,mmc468,mmc469,mmc470,mmc471,mmc472,mmc473,mmc474,mmc475,mmc476,mmc477,mmc478,mmc479,mmc480,mmc481,mmc482,mmc483,mmc484,mmc485,mmc486,mmc487,mmc488,mmc489,mmc490,mmc491,mmc492,mmc493,mmc494,mmc495,mmc496,mmc497,mmc498,mmc499,mmc500,mmc501,mmc502,mmc503,mmc504,mmc505,mmc506,mmc507,mmc508,mmc509,mmc510,mmc511,mmc512,mmc513,mmc514,mmc515,mmc516,mmc517,mmc518,mmc519,mmc520,mmc521,mmc522,mmc523,mmc524,mmc525,mmc526,mmc527,mmc528,mmc529,mmc530,mmc531,mmc532,mmc533,mmc534,mmc535,mmc536,mmc537,mmc538,mmc539,mmc540,mmc541,mmc542,mmc543,mmc544,mmc545,mmc546,mmc547,mmc548,mmc549,mmc550,mmc551,mmc552,mmc553,mmc554,mmc555,mmc556,mmc557,mmc558,mmc559,mmc560,mmc561,mmc562,mmc563,mmc564,mmc565,mmc566,mmc567,mmc568,mmc569,mmc570,mmc571,mmc572,mmc573,mmc574,mmc575,mmc576,mmc577,mmc578,mmc579,mmc580,mmc581,mmc582,mmc583,mmc584,mmc585,mmc586,mmc587,mmc588,mmc589,mmc590,mmc591,mmc592,mmc593,mmc594,mmc595,mmc596,mmc597,mmc598,mmc599,mmc600,mmc601,mmc602,mmc603,mmc604,mmc605,mmc606,mmc607,mmc608,mmc609,mmc610,mmc611,mmc612,mmc613,mmc614,mmc615,mmc616,mmc617,mmc618,mmc619,mmc620,mmc621,mmc622,mmc623,mmc624,mmc625,mmc626,mmc627,mmc628,mmc629,mmc630,mmc631,mmc632,mmc633,mmc634,mmc635,mmc636,mmc637,mmc638,mmc639,mmc640,mmc641,mmc642,mmc643,mmc644,mmc645,mmc646,mmc647,mmc648,mmc649,mmc650,mmc651,mmc652,mmc653,mmc654,mmc655,mmc656,mmc657,mmc658,mmc659,mmc660,mmc661,mmc662,mmc663,mmc664,mmc665,mmc666,mmc667,mmc668,mmc669,mmc670,mmc671,mmc672,mmc673,mmc674,mmc675,mmc676,mmc677,mmc678,mmc679,mmc680,mmc681,mmc682,mmc683,mmc684,mmc685,mmc686,mmc687,mmc688,mmc689,mmc690,mmc691,mmc692,mmc693,mmc694,mmc695,mmc696,mmc697,mmc698,mmc699,mmc700,mmc701,mmc702,mmc703,mmc704,mmc705,mmc706,mmc707,mmc708,mmc709,mmc710,mmc711,mmc712,mmc713,mmc714,mmc715,mmc716,mmc717,mmc718,mmc719,mmc720,mmc721,mmc722,mmc723,mmc724,mmc725,mmc726,mmc727,mmc728,mmc729,mmc730,mmc731,mmc732,mmc733,mmc734,mmc735,mmc736,mmc737,mmc738,mmc739,mmc740,mmc741,mmc742,mmc743,mmc744,mmc745,mmc746,mmc747,mmc748,mmc749,mmc750,mmc751,mmc752,mmc753,mmc754,mmc755,mmc756,mmc757,mmc758,mmc759,mmc760,mmc761,mmc762,mmc763,mmc764,mmc765,mmc766,mmc767,mmc768,mmc769,mmc770,mmc771,mmc772,mmc773,mmc774,mmc775,mmc776,mmc777,mmc778,mmc779,mmc780,mmc781,mmc782,mmc783,mmc784,mmc785,mmc786,mmc787,mmc788,mmc789,mmc790,mmc791,mmc792,mmc793,mmc794,mmc795,mmc796,mmc797,mmc798,mmc799,mmc800,mmc801,mmc802,mmc803,mmc804,mmc805,mmc806,mmc807,mmc808,mmc809,mmc810,mmc811,mmc812,mmc813,mmc814,mmc815,mmc816,mmc817,mmc818,mmc819,mmc820,mmc821,mmc822,mmc823,mmc824,mmc825,mmc826,mmc827,mmc828,mmc829,mmc830,mmc831,mmc832,mmc833,mmc834,mmc835,mmc836,mmc837,mmc838,mmc8
```

```
Selected AHCI device: ada0
```

```
Are you sure you want to continue ? (y/N) y
```

```
pfSense 2.4.5-RELEASE (Patch 1) arm64 Tue Jun 02 17:44:41 EDT 2020
Bootup complete

FreeBSD/arm64 (pfSense.localdomain) (ttyu0)

Netgate SG-2100                      Netgate Device ID:
Serial:                             Netgate Crypto ID:

*** Welcome to pfSense 2.4.5-RELEASE-p1 (arm64) on pfSense ***

WAN (wan)      -> mvneta0      -> v4/DHCP4: 192.168.2.116/24
LAN (lan)      -> mvneta1      -> v4: 192.168.1.1/24

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: █
```

OPTIONAL M.2 SATA INSTALLATION

The Netgate® SG-2100 has built-in onboard eMMC storage. Optionally, a M.2 SATA drive could be installed as an upgrade or to bypass the onboard eMMC flash memory.



Note: The SG-2100 does not support NVMe drives.

Warning: Before proceeding:

1. Backup your configuration file, if possible.
2. Unplug the system for at least 60 seconds to ensure all phantom power has dissipated.
3. Anti-static protection must be used throughout this procedure.
4. Any hardware damage incurred during this procedure is **not covered** by the hardware warranty.

Note: pfSense® software must be reinstalled on the M.2 SATA drive. By default, the M.2 SATA drive will then be the first drive recognized by pfSense software.

The SG-2100 has one slot capable of installing an optional M.2 SATA drive.

The connector is for a 2242 (22mm x 42mm) M.2 SATA only.

Warning: The 42mm standoff cannot be moved without disconnecting the processor's thermal paste from the heat sink. **This is not supported and may void the warranty.**

1. Turn the system over carefully to avoid scratching the top of the system. Remove the four **T10 Torx** screws as indicated below.



Fig. 1: Removing the SG-2100 Case Screws

2. Turn system upright and carefully remove the cover. Set the cover off to the side and keep it upright so the top is not scratched. Identify where the M.2 SATA drive slot is located and remove the screw from the standoff.

Note: If the standoff turns as you try to remove the screw, hold the standoff with a fine pair of needle-nosed pliers.

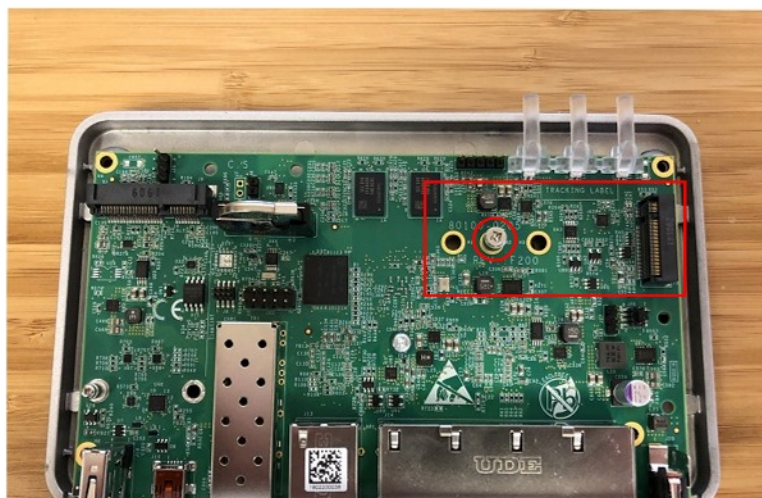


Fig. 2: M.2 SATA Location and Screw

3. After the screw has been removed, insert the M.2 SATA drive into the slot at about a 30° angle.

Warning: The M.2 SATA card is keyed. Do not force it into the slot.



Fig. 3: Insert the M.2 SATA Drive at about a 30° Angle

4. Gently push down the M.2 SATA card and replace the screw into the standoff.
5. Place the cover back on and turn the SG-2100 over. Replace the four **T10 Torx** case screws. Be careful not to crossthread the screws or overtighten them.
6. Reinstall the pfSense software on the new M.2 SATA drive.
7. Restore your configuration backup if you have one.



Fig. 4: The M.2 SATA Drive Installed

CONFIGURING THE SWITCH PORTS

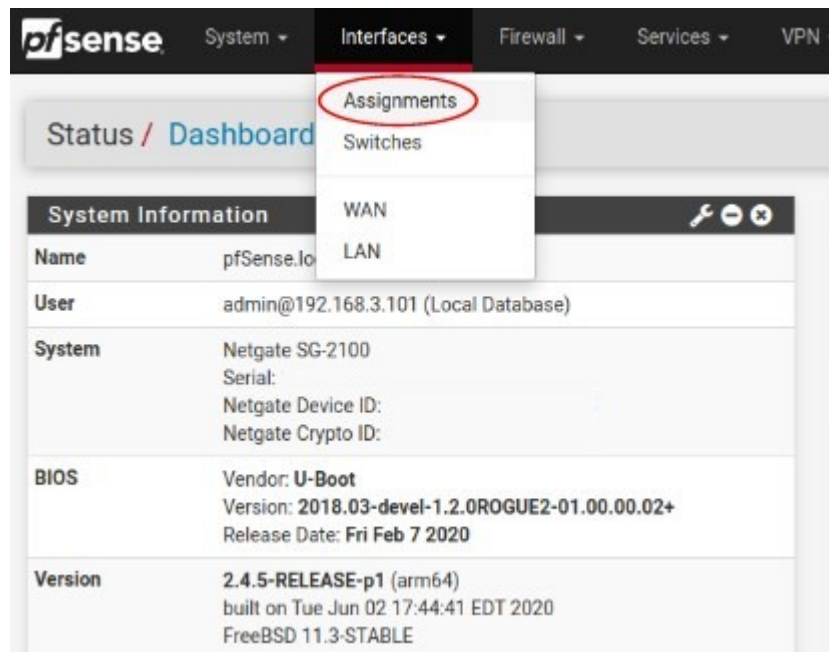
This optional guide shows the steps required to configure the 4 switched Ethernet ports as discrete ports.

The following attributes are used in this configuration guide but can be changed to suit your particular requirements:

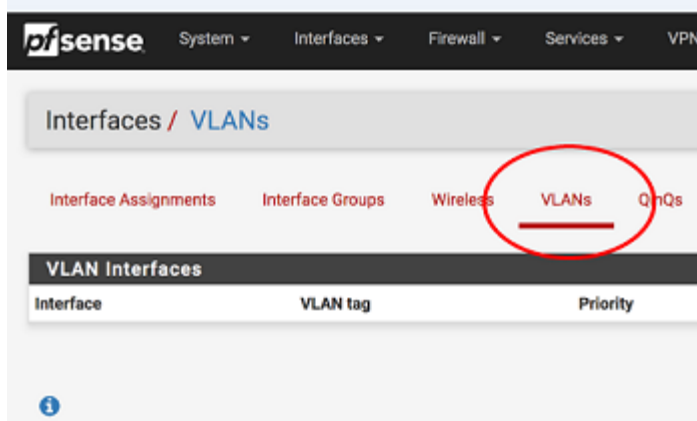
- SG-2100 Ethernet Port: **LAN4**
- IP Address Assignment: **192.168.100.1/24**
- VLAN Tag: **4084** (VLAN tags should be 4081-4084 for LAN Ports 1-4)

Note: When connecting to the webConfigurator, be sure you are NOT connected to the port you are going to configure or you will lose connectivity during this procedure.

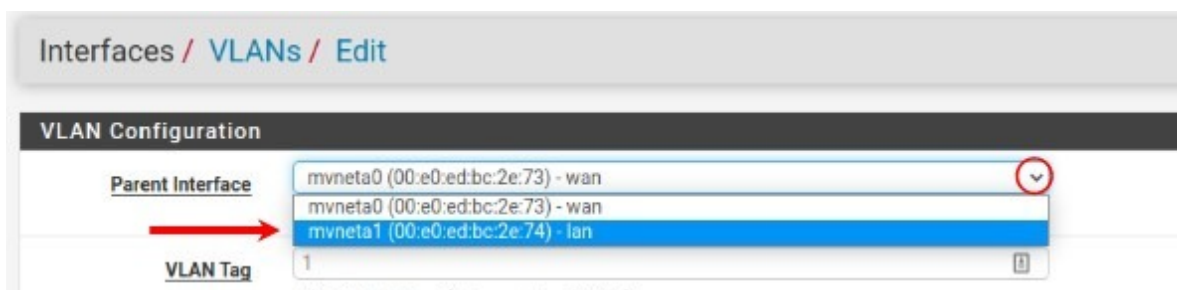
1. Open the pfSense® WebGUI and log in.
2. From the menu, navigate to **Interfaces > Assignments**.



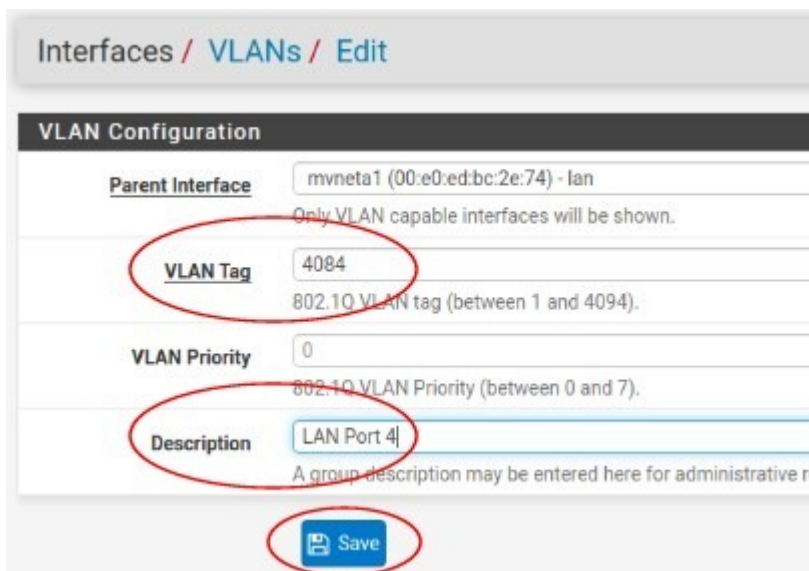
3. Go to the **VLANs** sub-menu.



4. In the lower right-hand corner of the screen, click **+ Add**.
5. Choose **mvneta1 (MAC Address) - lan** from the **Parent Interface** drop-down menu.



6. Set the **VLAN Tag** to **4084**. Type **Lan port 4** as the **Description**. Click **Save**.



Note: 4084 is used as an example in this guide. The value for the tags must be unique for each VLAN and must be between 1 and 4094. Avoid using values that are already in use. Best practice is not to use 1.

7. Go to the **Interface Assignments** sub-menu.
8. Ensure **Available network ports:** is correct. It is VLAN 4084 on mvneta1 - lan (Lan port 4) in this example.

Click on **+ Add**.

The screenshot shows the 'Interface Assignments' page with tabs for Interface Assignments, Interface Groups, Wireless, VLANs, QinQs, PPPs, GREs, GIFs, Bridges, and LAGGs. The 'Interface Assignments' tab is active. It displays a table with columns 'Interface' and 'Network port'. The 'WAN' interface is assigned to 'mvneta0 (00:e0:ed:bc:2e:73)' and the 'LAN' interface is assigned to 'mvneta1 (00:e0:ed:bc:2e:74)'. Below the table, the 'Available network ports' section shows 'VLAN 4084 on mvneta1 - lan (LAN Port 4)'. A red arrow points from the 'Available network ports' label to this entry. A green '+ Add' button is circled in red at the bottom right of the 'Available network ports' section. A 'Save' button is at the bottom left.

9. Click on **OPT1**. This is the Interface that matches the new VLAN being created.

This screenshot shows the 'Interface Assignments' page after adding a new interface. A green message box at the top states 'Interface has been added.' The table now includes a third row for 'OPT1' assigned to 'VLAN 4084 on mvneta1 - lan (LAN Port 4)'. A red circle highlights the 'OPT1' button, and a red arrow points from it to the corresponding network port entry. The 'Save' button remains at the bottom left.

10. Check the **Enable Interface** check-box.

11. Change the **IPv4 Configuration Type** from None to **Static IPv4**.

The screenshot shows the 'General Configuration' page for the 'OPT1' interface. The 'Enable' section has the 'Enable interface' checkbox checked, which is circled in red. The 'Description' field contains 'OPT1'. The 'IPv4 Configuration Type' dropdown is set to 'Static IPv4', indicated by a red arrow. The 'IPv6 Configuration Type' dropdown is set to 'None'.

12. Scroll down and make the IPv4 Address **192.168.100.1/24** (in this example).



Static IPv4 Configuration

IPv4 Address: 192.168.100.1 / 24

IPv4 Upstream gateway: None

+ Add a new gateway

13. Click **Save**.

14. Click **Apply Changes**.



Interfaces / OPT1 (mvneta1.4084)

The OPT1 configuration has been changed.
The changes must be applied to take effect.
Don't forget to adjust the DHCP Server range if needed after applying.

✓ Apply Changes

15. Go to **Interfaces -> Switches**.



pfSense System Interfaces Firewall

Interfaces / OPT1 (mvneta1.4084)

The changes have been applied

General Configuration

Assignments

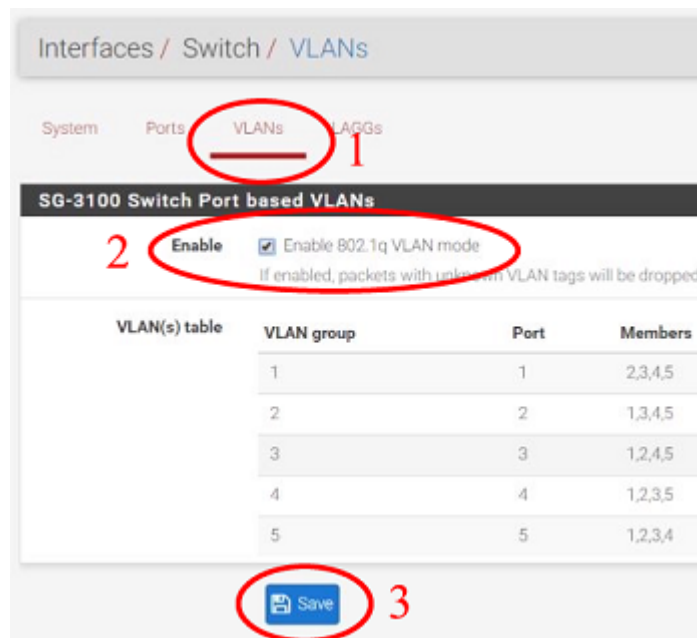
Switches

WAN

LAN

OPT1

16. Go to the **VLANs** sub-menu. Click in the **Enable 802.1q VLAN mode** check-box and click **Save**.



Interfaces / Switch / VLANs

System Ports VLANs LAGGs

SG-3100 Switch Port based VLANs

2 Enable ☒ Enable 802.1q VLAN mode
If enabled, packets with unknown VLAN tags will be dropped.

VLAN(s) table	VLAN group	Port	Members
	1	1	2,3,4,5
	2	2	1,3,4,5
	3	3	1,2,4,5
	4	4	1,2,3,5
	5	5	1,2,3,4

3 Save

17. You will notice that the table changes. Click + **Add Tag**.

Interfaces / Switch / VLANs

System Ports **VLANs**

SG-2100 Switch 802.1Q VLANs

Enable ☒ Enable 802.1q VLAN mode
If enabled, packets with unknown VLAN tags will be dropped.

VLAN(s) table	VLAN group	VLAN tag
	0	1

Save

18. Type 4084 for the **VLAN Tag** and 4 for **Member(s)**. This represents LAN4 (port 4) and tagged should be **unchecked**.

Vlan properties

VLAN tag
Enter a VLAN ID number (that is not already in use.)

Description
A description may be entered here for administrative reference (not parsed).

Member(s) ☐ tagged

Save

19. Click + **Add Member** to add the LAN Uplink, 5. This member should be **tagged** as shown.

Member(s) ☐ tagged

☒ tagged

Save

20. Click **Save**.

21. Click on beside VLAN group 0.

SG-2100 Switch 802.1Q VLANs

Enable ☒ Enable 802.1q VLAN mode
If enabled, packets with unknown VLAN tags will be dropped.

VLAN(s) table	VLAN group	VLAN tag	Members	Description	Action
	0	1	1,2,3,4,5	Default System VLAN	
	1	4084	4,5		

22. Click **Delete** beside Member(s) 4. This will remove LAN4 from this VLAN group.

Description: Default System VLAN
A description may be entered here for administrative reference (not parsed).

Member(s)		
1	tagged	Delete
2	tagged	Delete
3	tagged	Delete
4	tagged	Delete
5	tagged	Delete

23. Click **Save**.

24. Go to the **Ports** sub-menu.



25. Click on **Port VID 1** beside **LAN4**. Backspace through 1 and insert 4084, the new VLAN ID.

SG-2100 Switch Ports					
Port #	Port name	Port VID	LAGG	Flags	State
1	LAN 1	1	-		FOR
2	LAN 2	1	-		FOR
3	LAN 3	1	-		FOR
4	LAN 4	4084	-		FOR
5	LAN Uplink	1	-	HOST	FOR

26. Click **Save**.

This completes the configuration of a discrete port on the Netgate SG-2100.

You will need to create the appropriate [firewall rules](#) because by default, all traffic is blocked. Go to **Firewall > Rules** and then the **OPT1** sub-menu (in this example) to configure the firewall rules.

You should also enable DHCP if necessary, by going to **Services > DHCP Server > OPT1** (for the example above).

ADDITIONAL RESOURCES

11.1 Netgate Training

Netgate training offers training courses for increasing your knowledge of pfSense® products and services. Whether you need to maintain or improve the security skills of your staff or offer highly specialized support and improve your customer satisfaction; Netgate training has got you covered.

<https://www.netgate.com/training>

11.2 Resource Library

To learn more about how to use your Netgate appliance and for other helpful resources, make sure to browse our Resource Library.

<https://www.netgate.com/resources>

11.3 Professional Services

Support does not cover more complex tasks such as CARP configuration for redundancy on multiple firewalls or circuits, network design, and conversion from other firewalls to pfSense software. These items are offered as professional services and can be purchased and scheduled accordingly.

<https://www.netgate.com/our-services/professional-services.html>

11.4 Community Options

If you elected not to get a [paid support plan](#), you can find help from the active and knowledgeable pfSense community on our forums.

<https://forum.netgate.com/>

WARRANTY AND SUPPORT

- One year manufacturer's warranty.
- Please contact Netgate for warranty information or view our [Product Lifecycle](#) page.
- All Specifications subject to change without notice

For support information, view our [support plans](#).

See also:

For more information on how to use pfSense® software, see the [pfSense Documentation](#) and [Resource Library](#).