Technical Guide

# Getting Started with the Device GUI on VPN Routers

Feature Overview and Configuration Guide

## Introduction

Allied Telesis Virtual Private Network (VPN) Routers are the ideal secure gateway for modern businesses. Powerful firewall and VPN functionality is combined with routing and switching, to provide an innovative high performance solution.

### What information will you find in this document?

The Device GUI provides graphical management and monitoring for switches, UTM firewalls, and VPN routers running the AlliedWare Plus™ operating system.

This guide show how to configure a VPN Router using the Device GUI.

The Device GUI provides setup of the router, enabling the configuration of entities (zones, networks, and hosts) and then creating firewall, NAT and traffic-control rules for managing traffic between these entities. Features such as the Intrusion Prevention System (IPS) and URL Filtering help protect the network, and manage website access.

The GUI also supports a number of other features such as interface, VLAN, file, log, and wireless network management, as well as a CLI window and a Dashboard for network monitoring. The Dashboard shows interface and firewall traffic, system and environmental information, and the security monitoring widget lets you view and manage rules and security features.

You can configure the complete AlliedWare Plus feature-set using the GUI's built-in industry standard Command Line Interface (CLI) window.

# Contents

Introduction ........................................................ 1

What information will you find in this document? ........................ 1

Products and software version that apply to this guide ................. 3

Related documents ....................................................... 3

What is a Firewall? ..................................................... 4

What are Entities? ...................................................... 4

Zones, networks, and hosts .............................................. 5

Using Rules ............................................................. 6

Configuring the Router .................................................. 7

Part 1: Configure a standard 3-zone network ............................. 7

Part 2: Configure the router for Update Manager ......................... 21

Part 3: Configure security features ..................................... 24

The Dashboard ........................................................... 28

Other Features .......................................................... 30

File Management ......................................................... 30

Logging Management ...................................................... 33

Wireless management ..................................................... 35

## Products and software version that apply to this guide

This guide applies to all AR-Series VPN Routers running AlliedWare Plus™ software version 5.4.7-x.x or 5.4.8-x.x. Supported models include the AR2050V and AR2010V.

Feature support may change in later software versions. For the latest information, see the following documents:

- The product's Datasheet
- The AlliedWare Plus Datasheet
- The product's Command Reference

These documents are available from the above links on our website at alliedtelesis.com.

## Related documents

You also may find the following AlliedWare Plus Feature Overviews useful:

- URL Filtering
- Intrusion Prevention System

To configure an Allied Telesis UTM firewall or switch using the Device GUI, see the following guides:

- Getting Started with the Device GUI on UTM firewalls
- Getting Started with the Device GUI on Switches

To configure Autonomous Wave Control using the Device GUI, see AWC Wireless Control on AR-Series Devices.

# What is a Firewall?

The router’s firewall at its simplest level, controls traffic flow between a trusted network (such as a corporate LAN) and an untrusted or public network (such as the Internet). Firewalls determine whether traffic is allowed or disallowed based on characteristics of the packets, including their destination and source IP addresses and TCP/ UDP port numbers.

Applications can be created using a combination of protocol and port numbers, and then be used by firewall, NAT, and traffic control rules to manage traffic.

# What are Entities?

Before we begin to configure the router, let's take a look at the building blocks that allow this advanced control of online network activity.

When the router is deciding how it should treat a traffic stream, among the questions it needs to ask are “*where is the stream coming from?*” and “*where is it going to?*”

To help answer those questions, the firewall needs to have a logical map of the network environment, so that it can categorize the sources and destinations of the flows that it is managing.

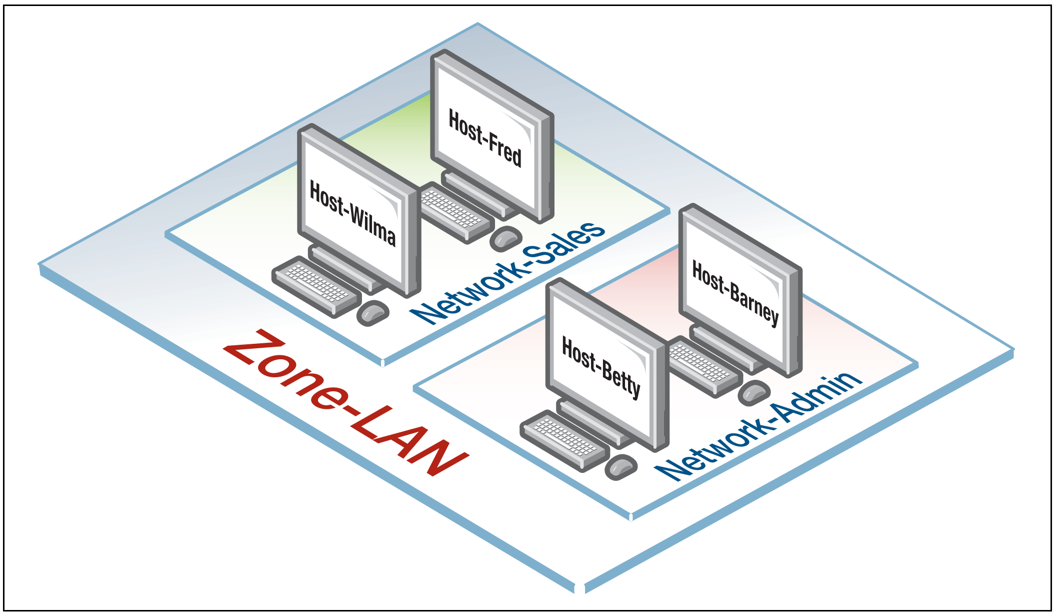
Allied Telesis firewalls and routers map out the network environment into regions, using three tiers of granularity. The divisions into which it cuts up its environment are referred to collectively as **Entities**. The three levels of granularity in the dividing up of the environment are zones, networks, and hosts. This hierarchy of entities empowers organizations to accurately apply security policies at company, department, or individual level.

## Zones, networks, and hosts

A **Zone** is the highest level of division within the network, and defines a boundary where traffic is subjected to policy restrictions as it crosses to another region of your network. A typical network environment might contain a public (WAN) zone representing the Internet, a private (LAN) zone behind the firewall, and a Demilitarized zone (DMZ) containing publicly accessible web servers. Zones are divided up into networks, which in turn contain hosts.

A **Network** is a logical grouping of hosts within a zone, for example, the sales network within the LAN zone. Networks consist of the IP subnets and interfaces over which they are reachable. The allocating of networks to zones is the core activity in dividing the network up into logical regions to which different security policies apply. A zone has no real meaning in itself until it has one or more networks allocated to it. Once networks have been allocated to a zone, the zone is then the entity that collectively represents that set of networks. Then rules can be applied to the zone as a whole, or to individual networks within the zone.

A **Host** is a single node in a network, for example, the PC of a specific employee. The diagram below shows PC Wilma is a host within the sales network within the LAN zone. Host entities are defined so that specific rules can be applied to those particular hosts - e.g. a server to which certain types of sessions may be initiated.



# Using Rules

Rules allow the advanced control of users, and the applications they use on the network.

**Firewall rules**: are used to filter traffic, allowing or denying, between any two entities. This allows for granular control, as rules can be based on traffic sources that might be zones, networks, or hosts, and traffic destinations that might be zones, networks, or hosts.

For example, an organization may choose to block Skype company-wide (i.e. from ANY zone to ANY zone), or allow it only for the marketing department (i.e. allow Skype from the Marketing network to ANY zone, but block it from any other network, zone, or host).

**Traffic control rules**: are used to control the bandwidth that applications use. For example, Spotify music streaming may be allowed, but limited in bandwidth due to an acceptable use policy ensuring company Internet connectivity is prioritized for business traffic.

**Network Address Translation (NAT) rules**: are used to hide private network addresses for traffic bound for the Internet. All company traffic leaving the corporate office can share a public network address for routing through the Internet to its destination.

The firewall supports:

- NAT with IP Masquerade, where private source addresses are mapped to a public source address with source port translation to identify the association. The single public IP address masquerades as the source IP on traffic from the private addresses as it goes out to the Internet.
- Port Forwarding, to provide public access to internal servers. Port forwarding redirects traffic to a specific host, e.g. forwarding HTTP traffic to a web server in the DMZ.

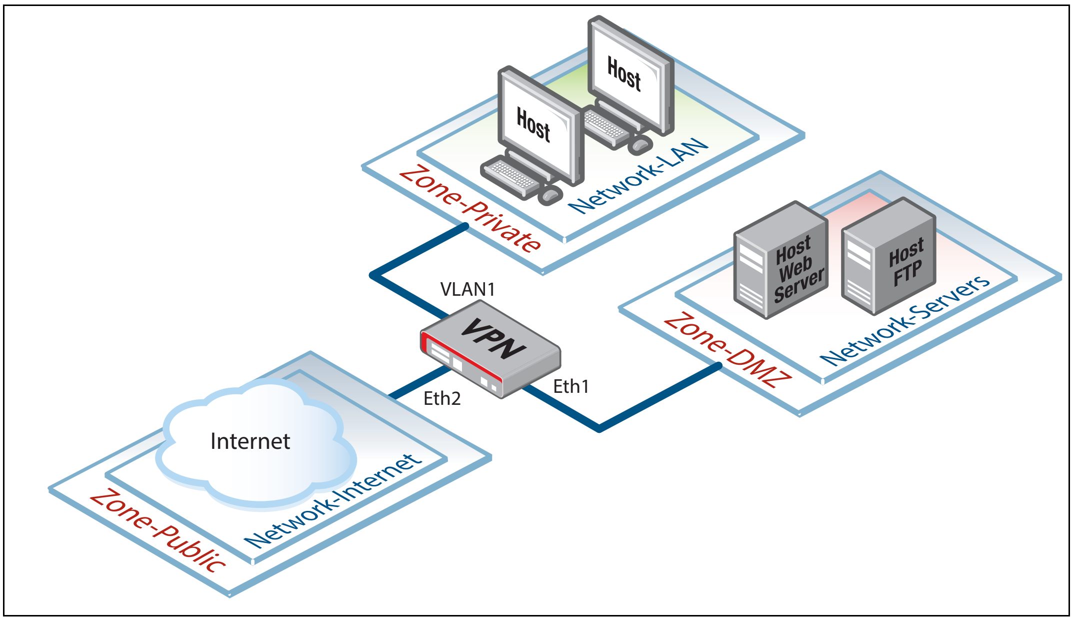
# Configuring the Router

This section comprises three parts, and describes how to configure:

1. A standard 3-zone network scenario as shown below.
2. Rules to allow Update Manager to update the GUI, see page 21
3. Security features - IPS, and Custom URL Filtering, see page 24

## Part 1: Configure a standard 3-zone network

The rest of this guide will use the AR2050V as the example device. The compact AR2010V offers the same functionality, but has only two Ethernet ports and no switch ports.



Step 1. **Configure router interfaces.**

Note: *If your router is new and unused, it will already have the Device GUI installed from the factory, with the IP address 192.168.1.1 on VLAN1 (AR2050V), or Eth1 (AR2010V), and the HTTP service enabled. Connect to any switch port (AR2050V) or Eth1 (AR2010V) and browse to 192.168.1.1 to begin.*

To use the Device GUI, we need to add an IP address to an interface over which we will connect with our browser, once the GUI resource file has been loaded onto the firewall.

We will also add IP addresses to the other interfaces that will be used in our network.

Alternatively, you can just add an IP address to the interface over which you will connect with your browser, and then add the other two IP addresses using the Device GUI Interface Management page.

From the CLI, add the following interface addresses:

IP address for eth2

```
awplus(config)#interface eth2
awplus(config-if)#ip address 128.0.0.1/24
awplus(config-if)#exit
```

IP address for eth1

```
awplus(config-if)#interface eth1
awplus(config-if)#ip address 172.16.0.1/24
awplus(config-if)#exit
```

IP address for VLAN 1

```
awplus(config)#interface vlan1
awplus(config-if)#ip address 192.168.1.1/24
awplus(config-if)#exit
```

### Step 2. **Enable the Web server.**

Enable HTTP so the router will serve the Device GUI pages:

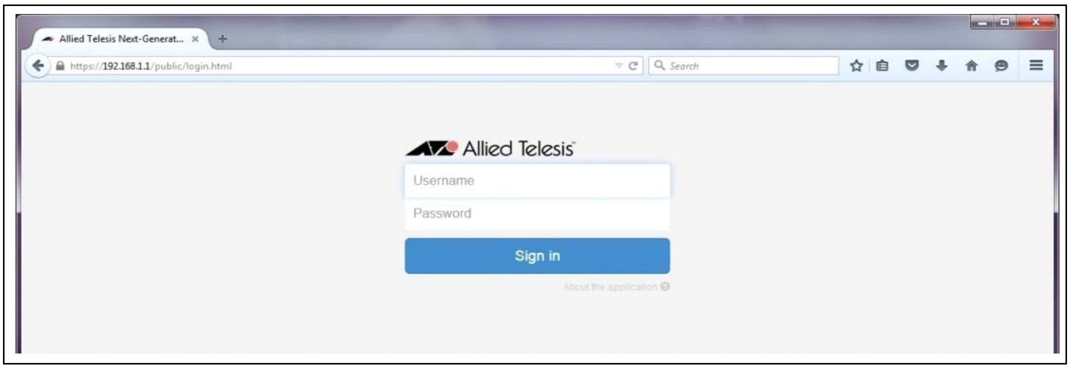
```
awplus(config)#service http
```

### Step 3. **Login to the Device GUI.**

Browse to the IP address of the router on the interface you are connecting to - e.g. 192.168.1.1 for VLAN1.

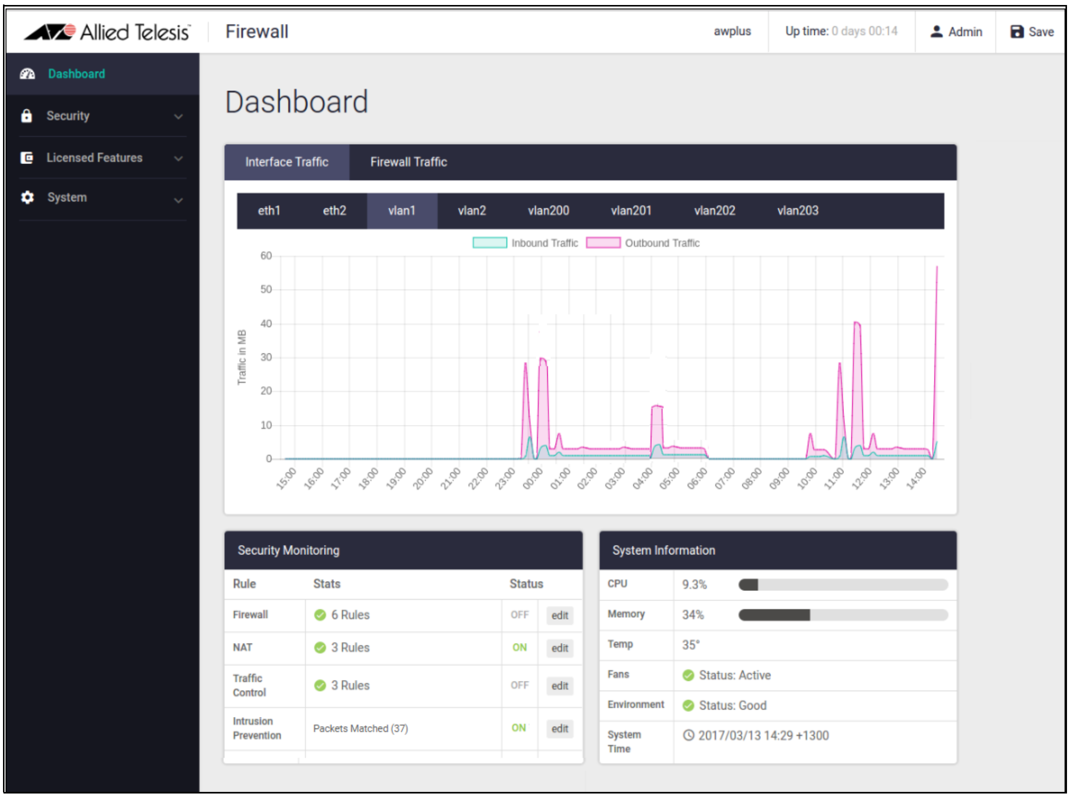
Note: The Device GUI currently supports the Firefox™, Microsoft Edge™ and Internet Explorer 11, Apple Safari™ and Chrome™ web browsers.

The following login page is displayed:


Allied Telesis Next-Generat...
https://192.168.1.1/public/login.html
Search
Allied Telesis
Username
Password
Sign in
About the application

You can log in using any valid username/password combination that has been configured on the unit, or use the default username/password (**manager**/**friend**), if that has not been deleted.

Once logged in you will be on the Dashboard of the Device GUI.



Security Monitoring

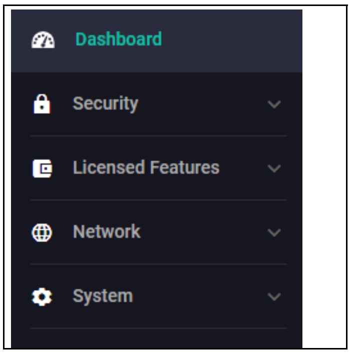
| Rule | Stats | Status | |
|---|---|---|---|
| Firewall | ✓ 6 Rules | OFF | edit |
| NAT | ✓ 3 Rules | ON | edit |
| Traffic Control | ✓ 3 Rules | OFF | edit |
| Intrusion Prevention | Packets Matched (37) | ON | edit |

System Information

| | |
|---|---|
| CPU | 9.3% |
| Memory | 34% |
| Temp | 35° |
| Fans | ✓ Status: Active |
| Environment | ✓ Status: Good |
| System Time | 2017/03/13 14:29 +1300 |

The Dashboard shows a number of useful widgets for monitoring the state of your router. We'll look closer at the various Dashboard widgets later, after we've configured the firewall.

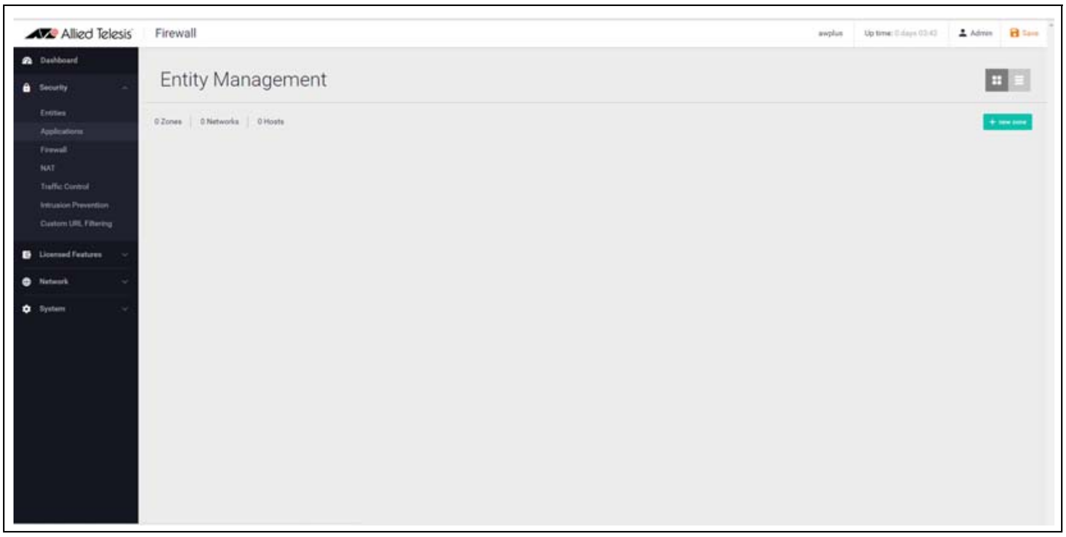
On the left-hand side of the Dashboard page is the navigation bar, with options to view the **Dashboard** or the **Security**, **Network**, **System**, and **Wireless Management** menus for configuration.



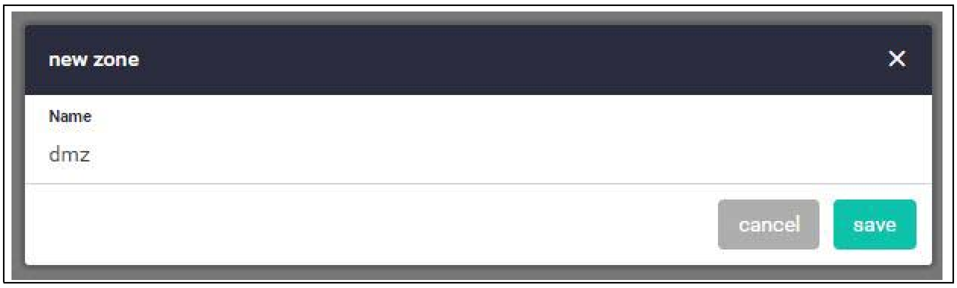
## Step 4. Configure Entities.

To configure the router, we'll first create entities to which rules can be applied.

- Select **Entities** under the **Security** menu.



- As no entities have yet been created, click the green **+ new zone** button to add a zone. The first zone we will add is the **DMZ** zone to be used for company servers that we want to be accessible from the Internet.

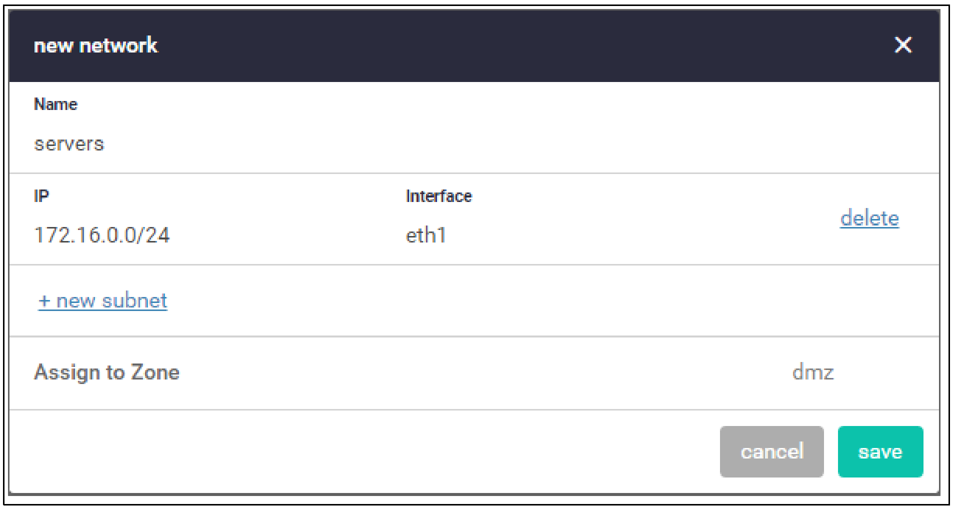


Name

dmz

- Next click the green **+ new network** button in the DMZ zone to add our **servers** network.

- Name the new network servers. Add the subnet 172.16.0.0/24 and eth1 as the interface over which this network will be reachable.


new network

Name
servers

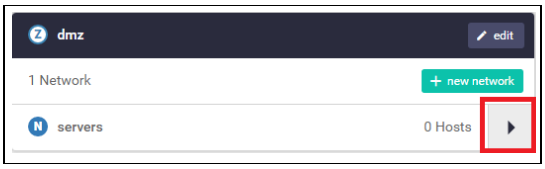
IP
172.16.0.0/24

Interface
eth1

Assign to Zone
dmz

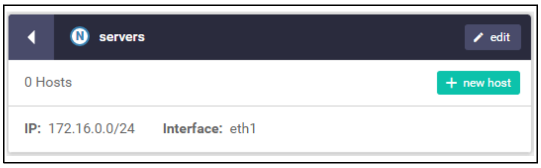
- We can now add specific hosts (servers in this case).

- Click on the slide arrow to open details of the servers network.


dmz

1 Network

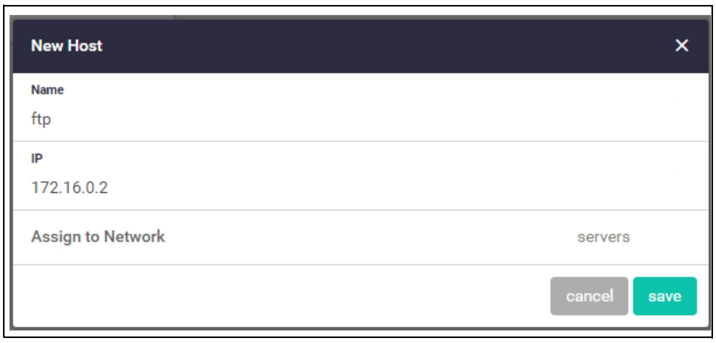
servers 0 Hosts


servers

0 Hosts

IP: 172.16.0.0/24 Interface: eth1

- Click the green **+new host** button to add the **ftp** server with an IP address of 172.16.0.2


New Host

Name
ftp

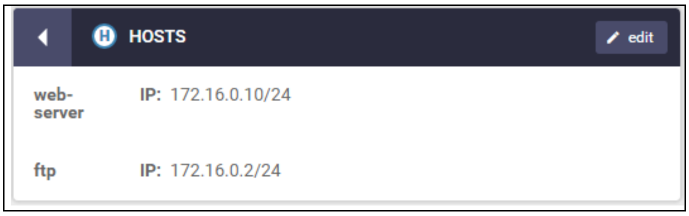
IP
172.16.0.2

Assign to Network
servers

- Add a second host named **web-server** with an IP address of 172.16.0.10

  Our DMZ zone now contains a network named **servers** with two hosts:

  - web-server
  - ftp



web-server IP: 172.16.0.10/24

ftp IP: 172.16.0.2/24

Use the same steps to create private and public zones/networks with the following details:

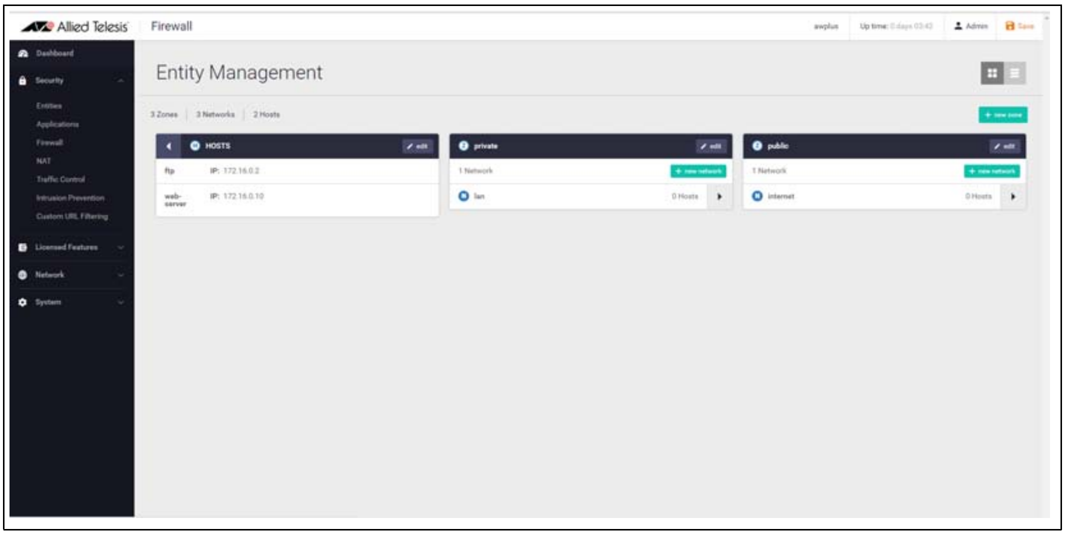
**Private zone:**

- Zone name = private
- Network name = lan
- Network subnet and interface = 192.168.1.0/24, VLAN1

**Public zone:**

- Zone name = public
- Network name = internet
- Network subnet and interface = 0.0.0.0/0, eth2

The Entities Management page now contains our 3-zone network.



3 Zones | 3 Networks | 2 Hosts

ftp IP: 172.16.0.2

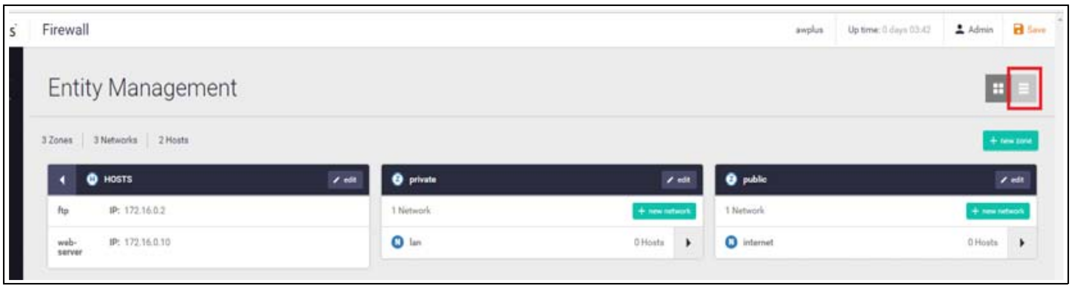
web-server IP: 172.16.0.10

private: 1 Network — lan 0 Hosts

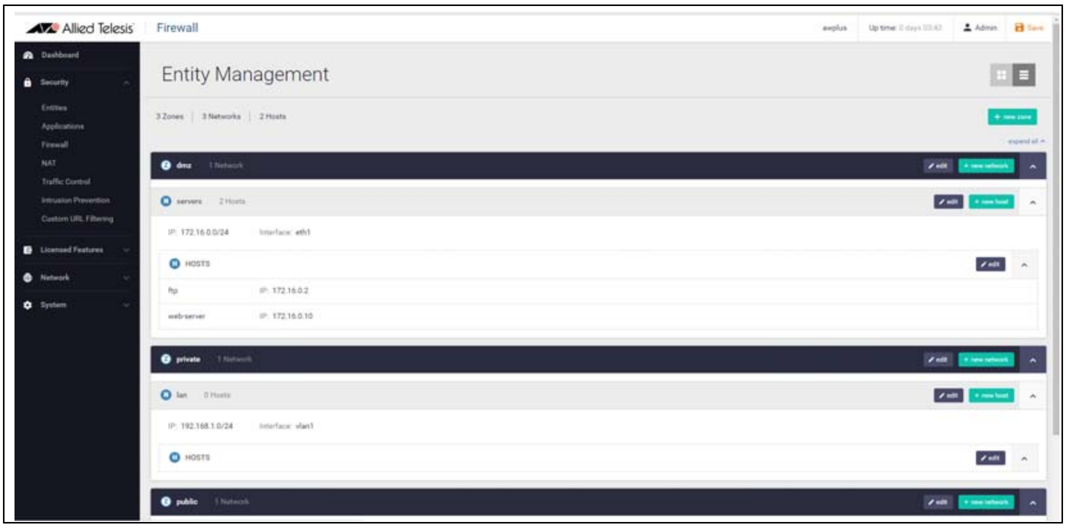
public: 1 Network — internet 0 Hosts

## Entity list view

An alternative view from the tiled view shown above, is the list view. To view and manage entities in a list view, click on the list icon on the right side of the page.

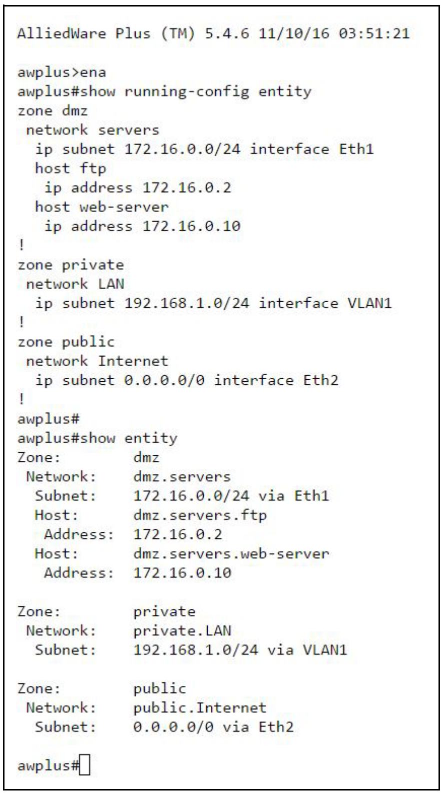


Clicking **expand all** (on the right side of the page) will display all entities and their interfaces, IP addresses, and so on. The list view is a good option for an overall entity view.



If you'd like to view these changes as added to the router configuration file:

- select **CLI** under the **System** menu, this opens a CLI tab.
- type **ena** to access Privileged Exec mode, then use the CLI commands: **show running-config entity** and **show entity**.



```
AlliedWare Plus (TM) 5.4.6 11/10/16 03:51:21

awplus>ena
awplus#show running-config entity
zone dmz
 network servers
  ip subnet 172.16.0.0/24 interface Eth1
  host ftp
   ip address 172.16.0.2
  host web-server
   ip address 172.16.0.10
!
zone private
 network LAN
  ip subnet 192.168.1.0/24 interface VLAN1
!
zone public
 network Internet
  ip subnet 0.0.0.0/0 interface Eth2
!
awplus#
awplus#show entity
Zone:         dmz
 Network:     dmz.servers
  Subnet:     172.16.0.0/24 via Eth1
  Host:       dmz.servers.ftp
   Address:   172.16.0.2
  Host:       dmz.servers.web-server
   Address:   172.16.0.10

Zone:         private
 Network:     private.LAN
  Subnet:     192.168.1.0/24 via VLAN1

Zone:         public
 Network:     public.Internet
  Subnet:     0.0.0.0/0 via Eth2

awplus#
```

Note the syntax that is used for identifying a network or host entity.

The syntax for naming a **network** entity is:

`<Parent Zone Name>.<network name>`

- For example, `private.LAN`

The syntax for identifying a **host** entity is:

`<Parent Zone name>.<Parent Network Name>.<Host Name>`

- For example, `dmz.servers.ftp`

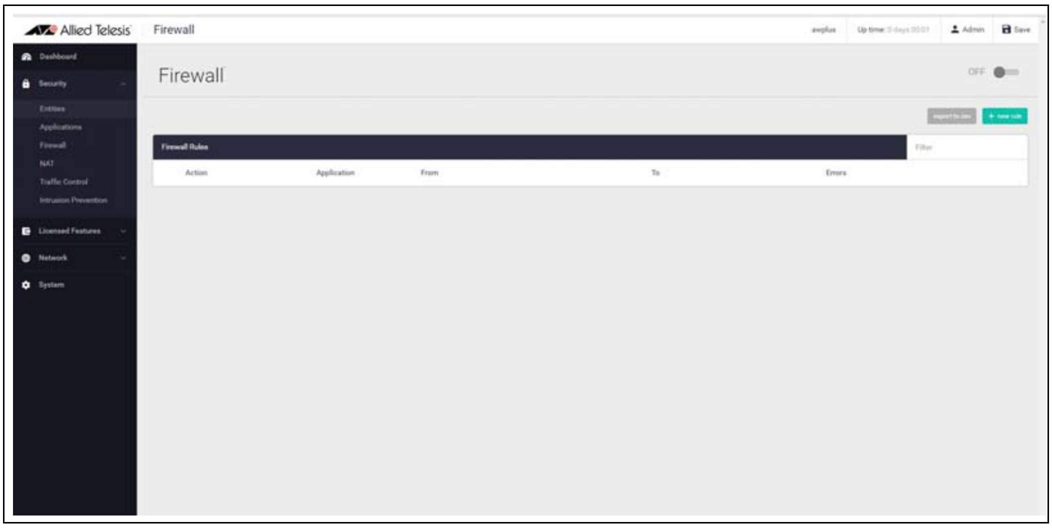
So, the hierarchy is included in the identifier of a second-tier or bottom-tier entity.

- For example, **dmz.servers.web-server** indicates that this host named **web-server** is part of the **servers** network within the **dmz** domain.

## Step 5. **Configure firewall rules.**

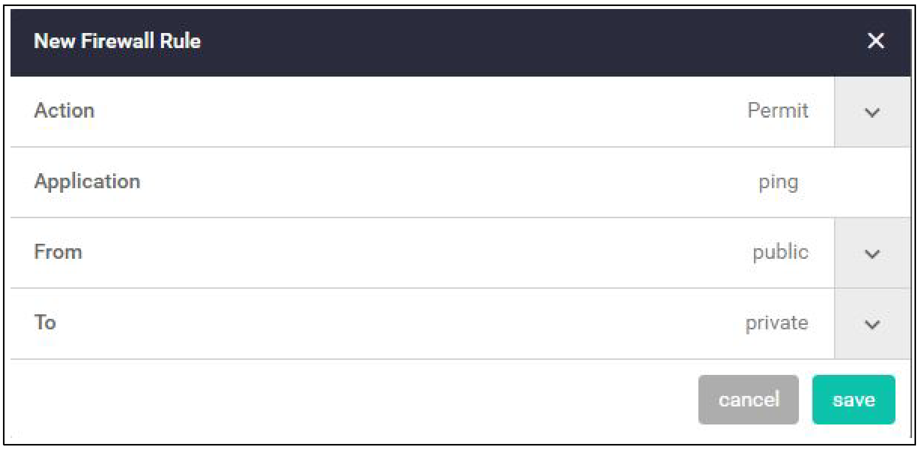
We now have a 3-zone network (Public, Private, and DMZ), so we can now configure the firewall rules to manage the traffic between these entities.

- Navigate to **Firewall** under the **Security** menu.



WARNING: Enabling the firewall with the **ON/OFF** switch will block all applications between all entities by default - No traffic will flow. It is therefore important to create firewall rules to allow application usage as desired prior to enabling the firewall.

- Click **+ new rule** and create a rule to allow **Ping** traffic from the Public zone to the Private zone. This will allow us to test connectivity through the firewall.



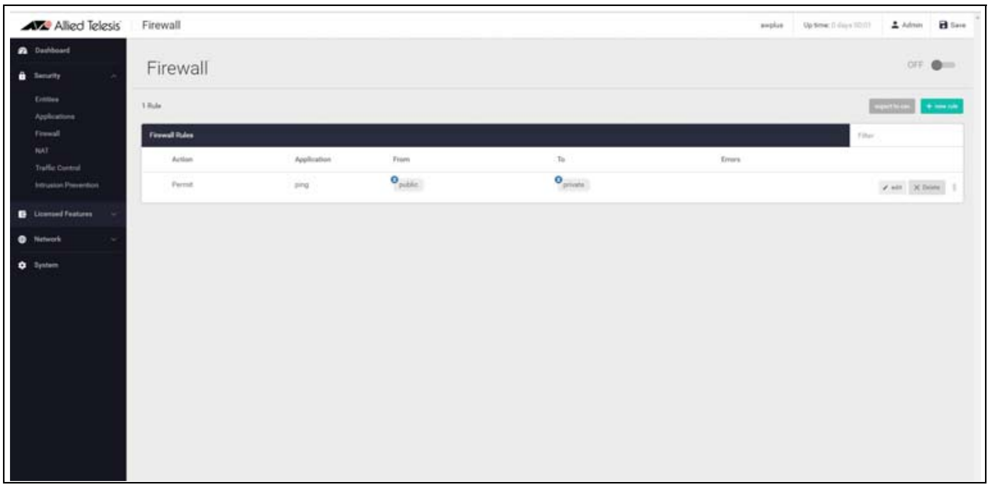
New Firewall Rule

| | |
|---|---|
| Action | Permit |
| Application | ping |
| From | public |
| To | private |

Note: To select an application, simply start typing in the application field. Available options will be filtered down until you select the desired one.

As well as using the built-in list of applications, you can also create your own custom applications on the **Applications** page, under the **Security** menu.

- You can see the new rule added to the firewall.



Firewall

1 Rule

Firewall Rules

| Action | Application | From | To | Errors |
|---|---|---|---|---|
| Permit | ping | public | private | |

**Create further new firewall rules with these details:**

Further Ping rules to allow connectivity checking:

- Permit Ping from Public to DMZ
- Permit Ping from Private to DMZ
- Permit Ping from DMZ to Private

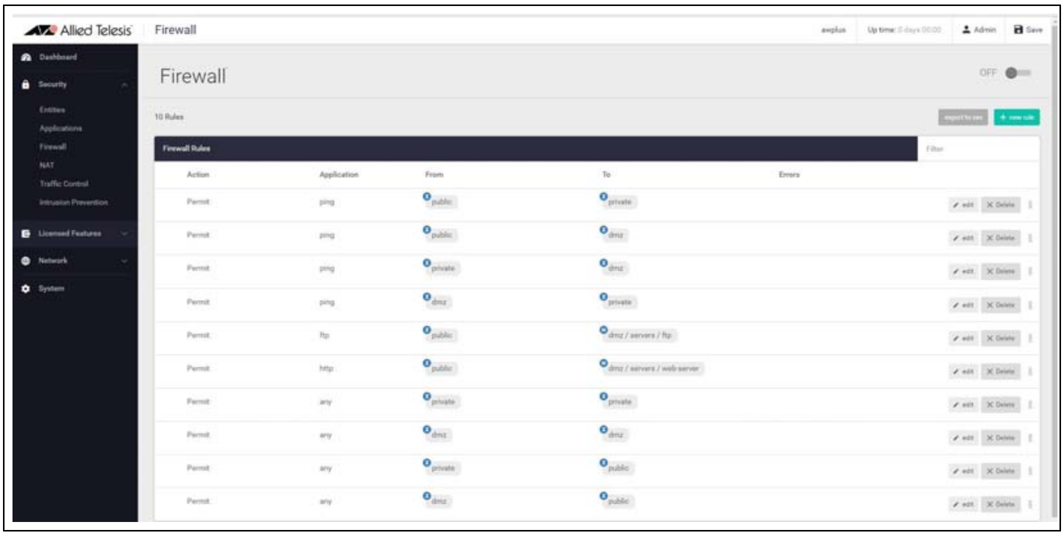
Allow Public traffic from the Internet to our DMZ servers:

- Permit ftp from Public to dmz.servers.ftp
- Permit http from Public to dmz.servers.web-server

Allow private side firewall zones to initiate traffic flows with each other and out to the Internet:

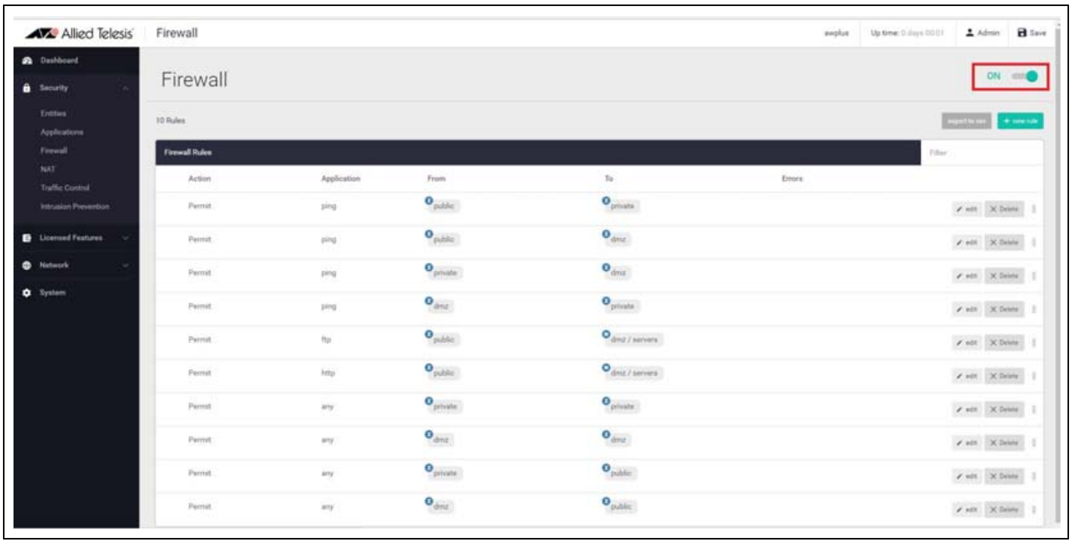
- Permit Any from Private to Private
- Permit Any from DMZ to DMZ
- Permit Any from Private to Public
- Permit Any from DMZ to Public

We can now see these firewall rules displayed:



| Action | Application | From | To | Errors |
|---|---|---|---|---|
| Permit | ping | public | private | |
| Permit | ping | public | dmz | |
| Permit | ping | private | dmz | |
| Permit | ping | dmz | private | |
| Permit | ftp | public | dmz / servers / ftp | |
| Permit | http | public | dmz / servers / web-server | |
| Permit | any | private | private | |
| Permit | any | dmz | dmz | |
| Permit | any | private | public | |
| Permit | any | dmz | public | |

- Now that the firewall rules are created, we can turn the firewall on using the **ON/OFF** button at the top right of the Dashboard page.



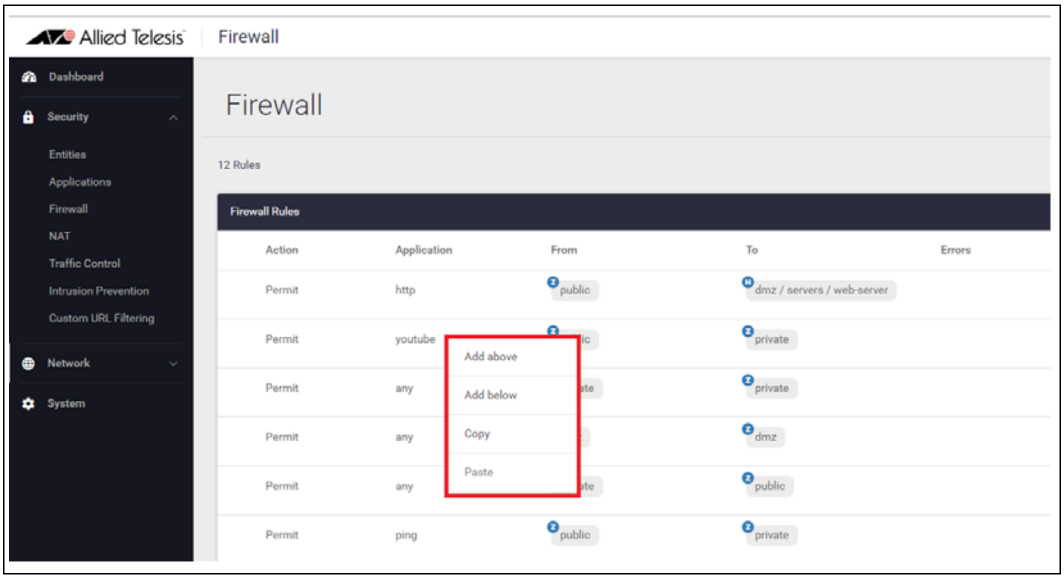
| Action | Application | From | To | Errors |
|---|---|---|---|---|
| Permit | ping | public | private | |
| Permit | ping | public | dmz | |
| Permit | ping | private | dmz | |
| Permit | ping | dmz | private | |
| Permit | ftp | public | dmz / servers | |
| Permit | http | public | dmz / servers | |
| Permit | any | private | private | |
| Permit | any | dmz | dmz | |
| Permit | any | private | public | |
| Permit | any | dmz | public | |

## Firewall rule placement

The firewall rules are displayed in the order they were created, which is also the order in which they will be **actioned** by the firewall. If you need to change the order of any specific rule, it can be dragged to a different location in the list.

By default a new rule is added to the bottom of the list, and can then be dragged to a new location. There are two other options for placing new rules:

- **Right-click** on any firewall rule and the menu gives you the option to create a new rule above or below that rule. This allows new rules to be immediately placed in the desired location, and order of processing.
- The **right-click** menu also has a copy-and-paste function, so you can copy an existing rule that is similar to the new rule you wish to create, and paste it into a different location. It can then be edited to suit.



Firewall

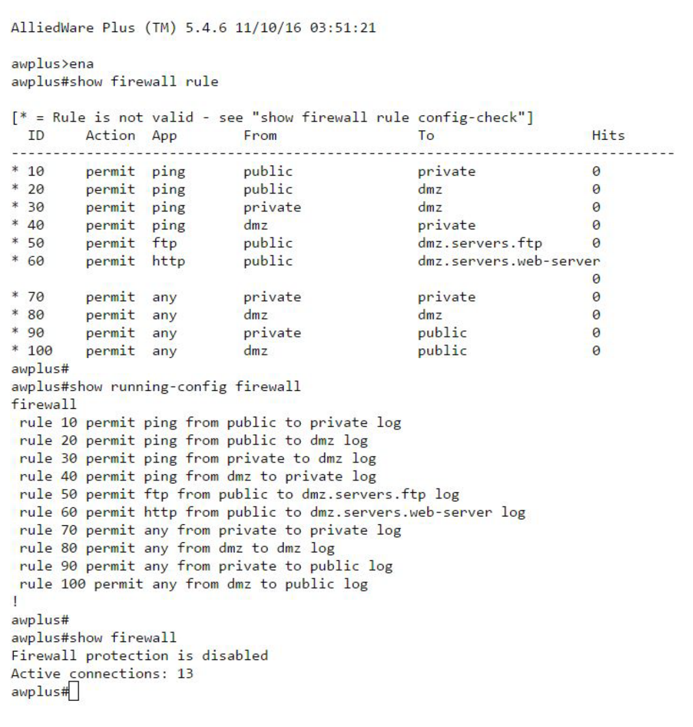
12 Rules

Firewall Rules

| Action | Application | From | To | Errors |
|---|---|---|---|---|
| Permit | http | public | dmz / servers / web-server | |
| Permit | youtube | ic | private | |
| Permit | any | ate | private | |
| Permit | any | | dmz | |
| Permit | any | ate | public | |
| Permit | ping | public | private | |

These right-click options are very useful when you have a large number of firewall rules. The same right-click options are also available when creating new NAT and Traffic Control rules.

If you'd like to use the CLI to view the updated firewall configuration, use the CLI window and the commands: **show firewall rule**, **show running-config firewall** and **show firewall**.



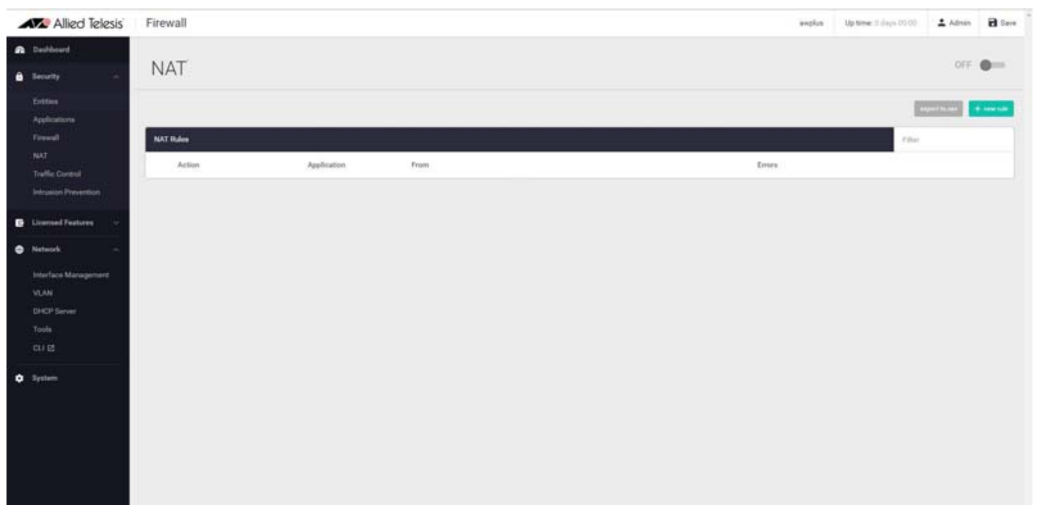
```
AlliedWare Plus (TM) 5.4.6 11/10/16 03:51:21

awplus>ena
awplus#show firewall rule

[* = Rule is not valid - see "show firewall rule config-check"]
  ID     Action  App        From                To                    Hits
--------------------------------------------------------------------------------
* 10     permit  ping       public              private               0
* 20     permit  ping       public              dmz                   0
* 30     permit  ping       private             dmz                   0
* 40     permit  ping       dmz                 private               0
* 50     permit  ftp        public              dmz.servers.ftp       0
* 60     permit  http       public              dmz.servers.web-server
                                                                      0
* 70     permit  any        private             private               0
* 80     permit  any        dmz                 dmz                   0
* 90     permit  any        private             public                0
* 100    permit  any        dmz                 public                0
awplus#
awplus#show running-config firewall
firewall
 rule 10 permit ping from public to private log
 rule 20 permit ping from public to dmz log
 rule 30 permit ping from private to dmz log
 rule 40 permit ping from dmz to private log
 rule 50 permit ftp from public to dmz.servers.ftp log
 rule 60 permit http from public to dmz.servers.web-server log
 rule 70 permit any from private to private log
 rule 80 permit any from dmz to dmz log
 rule 90 permit any from private to public log
 rule 100 permit any from dmz to public log
!
awplus#
awplus#show firewall
Firewall protection is disabled
Active connections: 13
awplus#
```

Note that the firewall rules are numbered in the order in which they will be actioned (e.g. 10, 20, 30 and so on). If a rule is dragged to a different location in the list displayed by the GUI, the rules will be renumbered to reflect the change in order of operation.

## Step 6. **Configure NAT rules.**

Now let's configure NAT rules to manage IP address translation between the Internet and our internal networks.

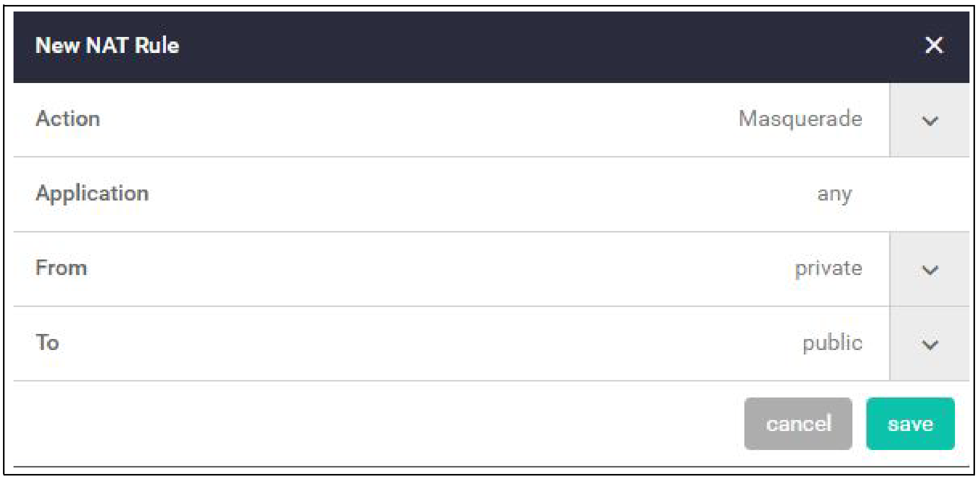
Navigate to **NAT** under the **Security** menu.



We need two NAT masquerade rules for private to public address translation, which are:

- Any traffic going from the Private zone out to the Public zone will have NAT applied, so that it appears to have come from the IP address of the eth2 interface
- Any traffic going from the DMZ zone out to the Public zone will have NAT applied, so that it appears to have come from the IP address of the eth2 interface.

Click **+ new rule** to create the first rule for Private to Public traffic:



New NAT Rule

| | |
|---|---|
| Action | Masquerade |
| Application | any |
| From | private |
| To | public |

Click **+ new rule** again and create the second NAT masquerade rule in the same way for DMZ to Public traffic with these details:

- Action = Masquerade, Application = any, From = DMZ, To = public

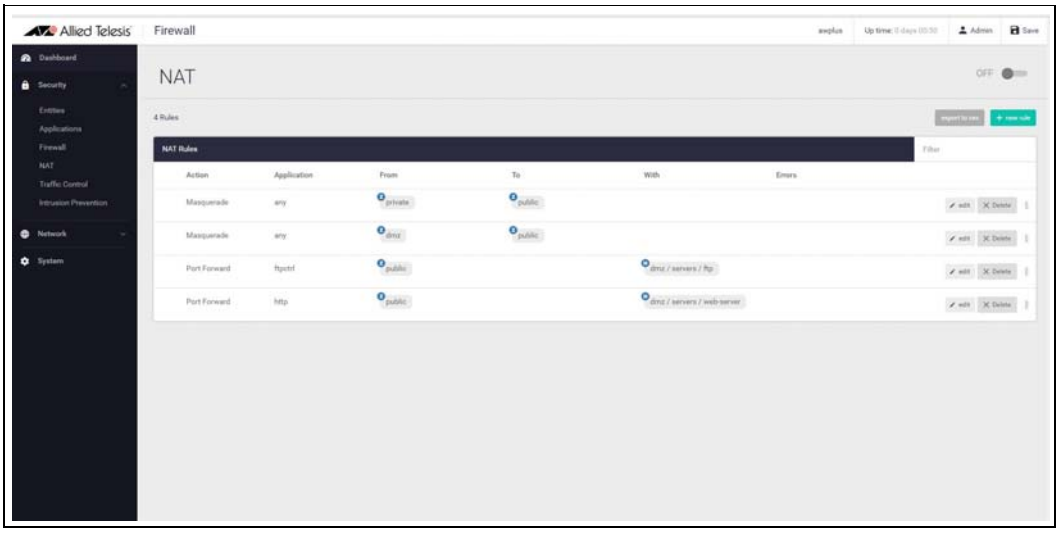
We now need to create two NAT port-forwarding rules to enable access to the FTP and Web servers to be delivered to the right destinations. To users in the Public zone, both servers will appear to have the IP address that is on the eth2 interface, so sessions towards those servers will be initiated to that address. The firewall must then forward those sessions to the actual addresses of the servers.

Click **+ new rule** and create the two NAT port-forward rules with the following details:

- Action = Port Forward, Application = ftp, From = public, With = dmz.servers.ftp
- Action = Port Forward, Application = http, From = public, With = dmz.servers.web-server

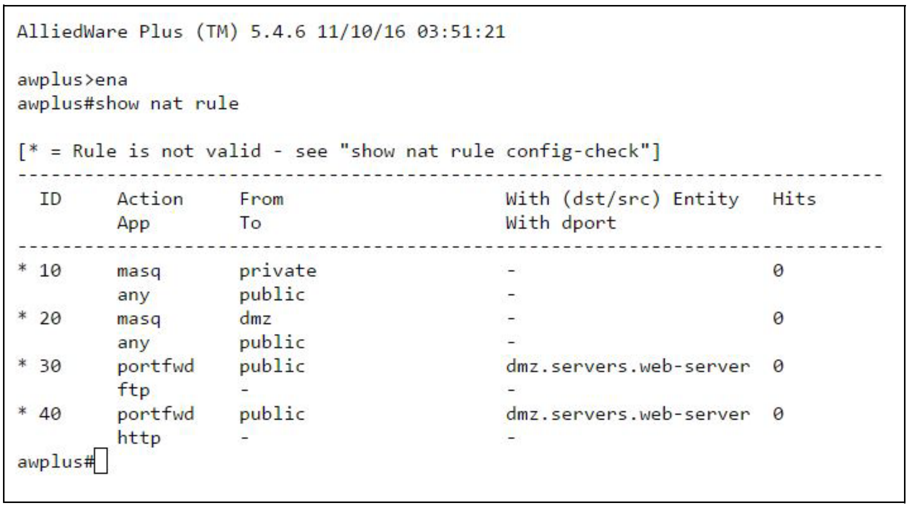
Now click the **ON/OFF** button at the top right of the Dashboard page to activate NAT.

You can see the four new NAT rules:



| Action | Application | From | To | With | Errors |
|---|---|---|---|---|---|
| Masquerade | any | private | public | | |
| Masquerade | any | dmz | public | | |
| Port Forward | ftpctrl | public | | dmz / servers / ftp | |
| Port Forward | http | public | | dmz / servers / web-server | |

To use the CLI window to see these new NAT rules, use the command **show nat rule**.



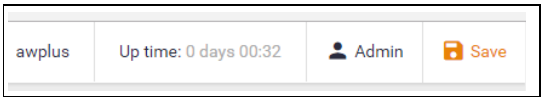
```
AlliedWare Plus (TM) 5.4.6 11/10/16 03:51:21

awplus>ena
awplus#show nat rule

[* = Rule is not valid - see "show nat rule config-check"]
--------------------------------------------------------------------------------
  ID      Action      From                     With (dst/src) Entity   Hits
          App         To                       With dport
--------------------------------------------------------------------------------
* 10      masq        private                  -                       0
          any         public                   -
* 20      masq        dmz                      -                       0
          any         public                   -
* 30      portfwd     public                   dmz.servers.web-server  0
          ftp         -                        -
* 40      portfwd     public                   dmz.servers.web-server  0
          http        -                        -
awplus#
```

## Step 7. **Save configuration changes.**

The configuration we have made so far is part of the running-configuration on the firewall.

Save these configuration changes to make them part of the boot configuration, so they can be backed up and will survive a reboot of the firewall.

- Click the **Save** button at the top right of the GUI screen. The **Save** button will be orange anytime there is unsaved configuration.



# Part 2: Configure the router for Update Manager

## Updating the GUI

As new versions of the Device GUI become available with additional functionality, they will be made available on the update server to be downloaded and installed on the firewall.

To check if there is a new version of the Device GUI, and install it on your router, firstly ensure that the firewall can contact the update server using the steps below, and then simply enter the following command from the CLI window:

```
update webgui now
```

Configuration of entities and rules is required to allow connectivity between Update Manager and the Update Server.

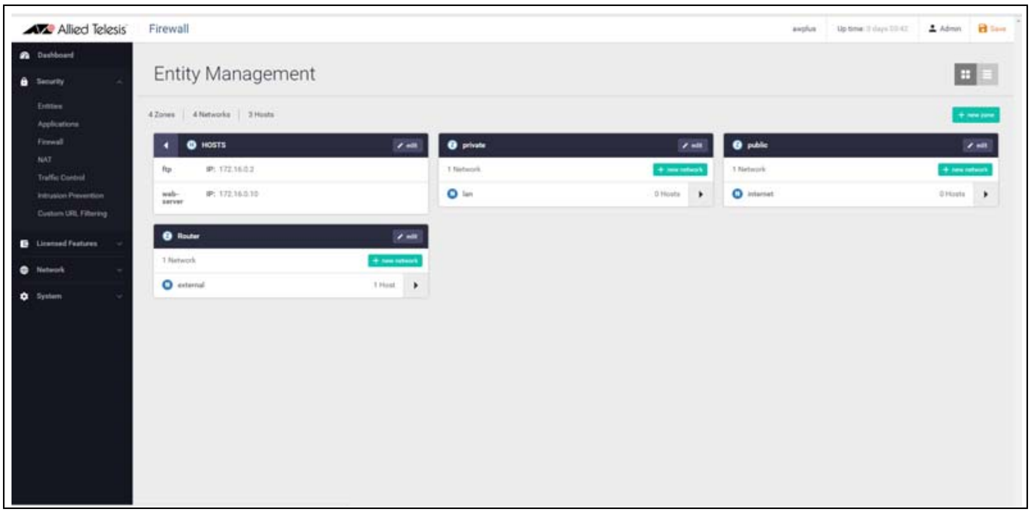
### Step 1. **Create appropriate entities.**

The retrieval of a new Device GUI file using Update Manager involves sessions that are initiated from the firewall unit itself. This means that firewall rules are required that permit these sessions. So, a zone needs to be created that represents the firewall itself, and the public interface of the firewall has to exist as a host within this zone.

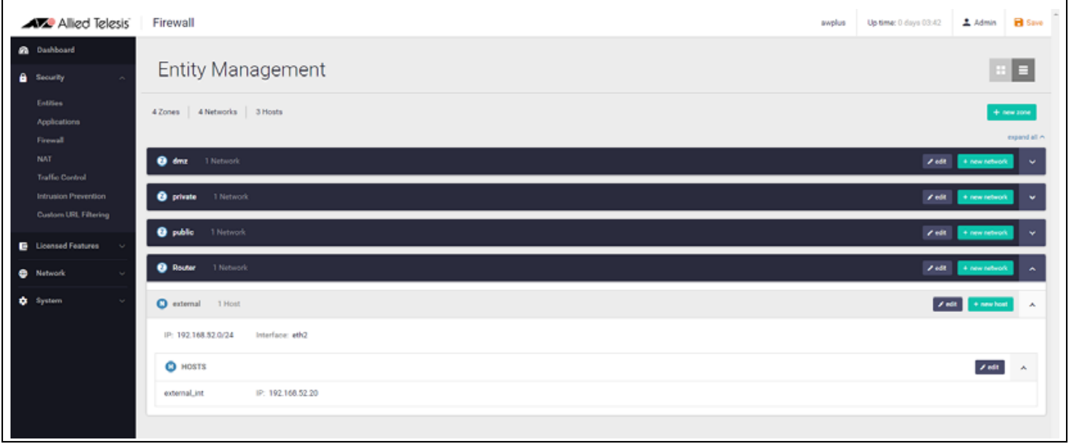
Create zone/network/host entities for the Update Manager source traffic with the following details:

- Zone name = Router
- Network name = External
- Network subnet and interface = 192.168.52.0/24, Eth2
- Host name = External_Int
- Host IP address = 192.168.52.20

The updated **Entity Management** page will look like this:

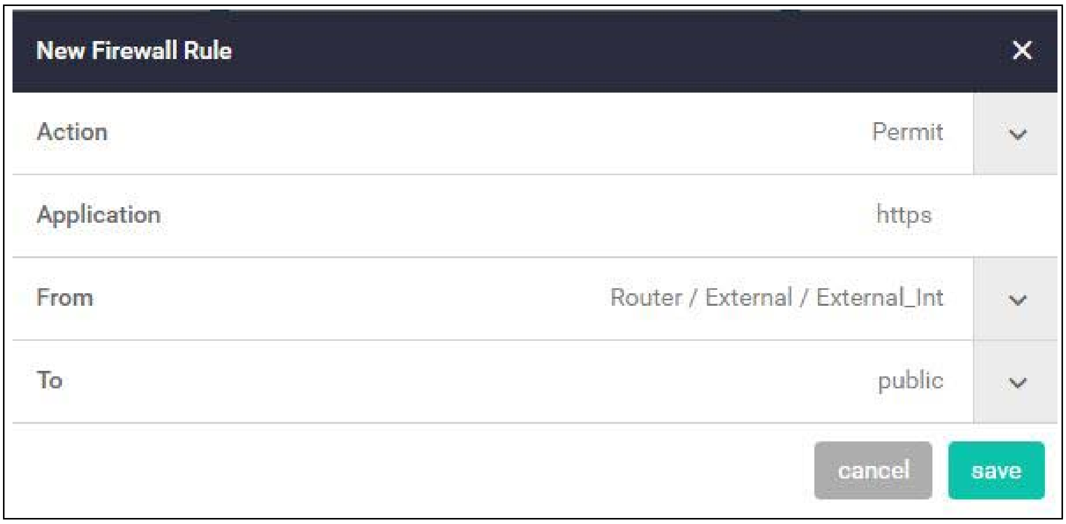


Or in list view (with just the new zone expanded) like this:



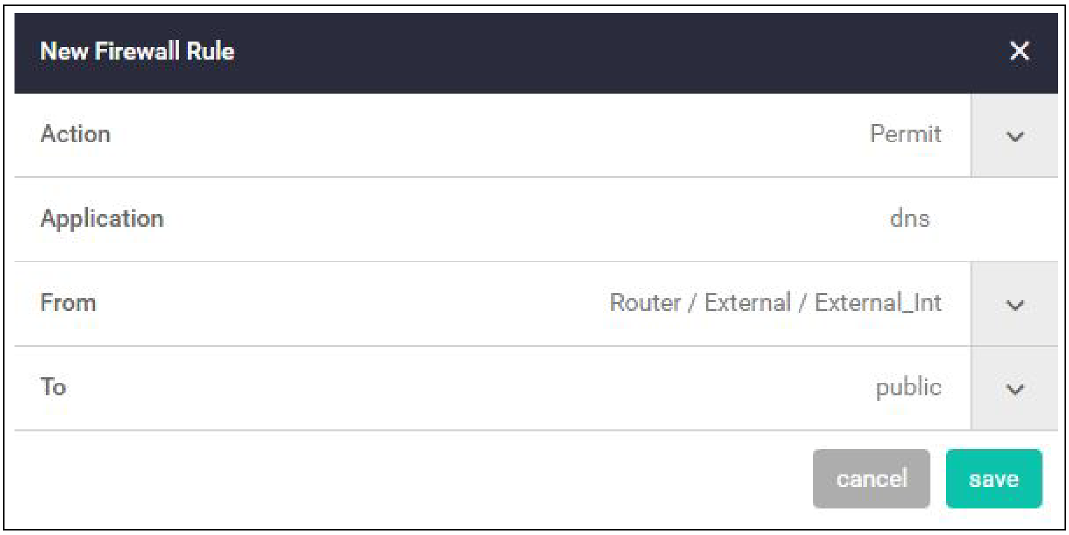
**Step 2. Create firewall rules for the Update Manager traffic.**

The Update Manager uses HTTPS for secure connectivity, so we'll create a firewall rule with the following details to allow HTTPS traffic out to the update server.



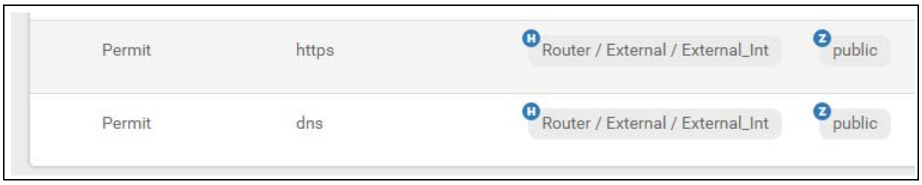
| | |
|---|---|
| Action | Permit |
| Application | https |
| From | Router / External / External_Int |
| To | public |

Also create a rule to allow DNS resolution of the update server's URL.



| | |
|---|---|
| Action | Permit |
| Application | dns |
| From | Router / External / External_Int |
| To | public |

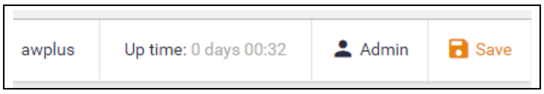
These new rules can be seen added to the firewall rule set.



| | | | |
|---|---|---|---|
| Permit | https | Router / External / External_Int | public |
| Permit | dns | Router / External / External_Int | public |

### Step 3. **Save configuration changes.**

Once again, click the **Save** button on the GUI top bar to save the Update Manager configuration to the boot configuration file.



## Part 3: Configure security features

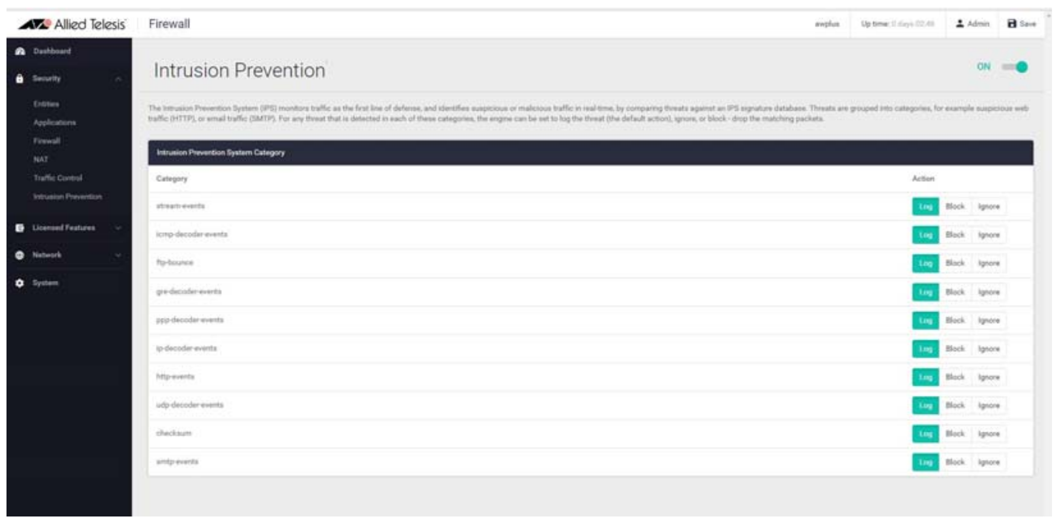
The VPN routers allow you to configure the Intrusion Prevention System (IPS) for network protection, and URL filtering to manage website access.

### Intrusion Prevention System

IPS monitors inbound and outbound traffic as the first line of defense, and identifies suspicious or malicious traffic in real-time by comparing threats against an IPS known signature database.

### Step 1. **Enable IPS.**

Navigate to the **Intrusion Prevention** configuration page under **Security**.
Click the **ON/OFF** switch on the top right of the page to enable IPS.



Intrusion Prevention

The Intrusion Prevention System (IPS) monitors traffic as the first line of defense, and identifies suspicious or malicious traffic in real-time, by comparing threats against an IPS signature database. Threats are grouped into categories, for example suspicious web traffic (HTTP), or email traffic (SMTP). For any threat that is detected in each of these categories, the engine can be set to log the threat (the default action), ignore, or block - drop the matching packets.

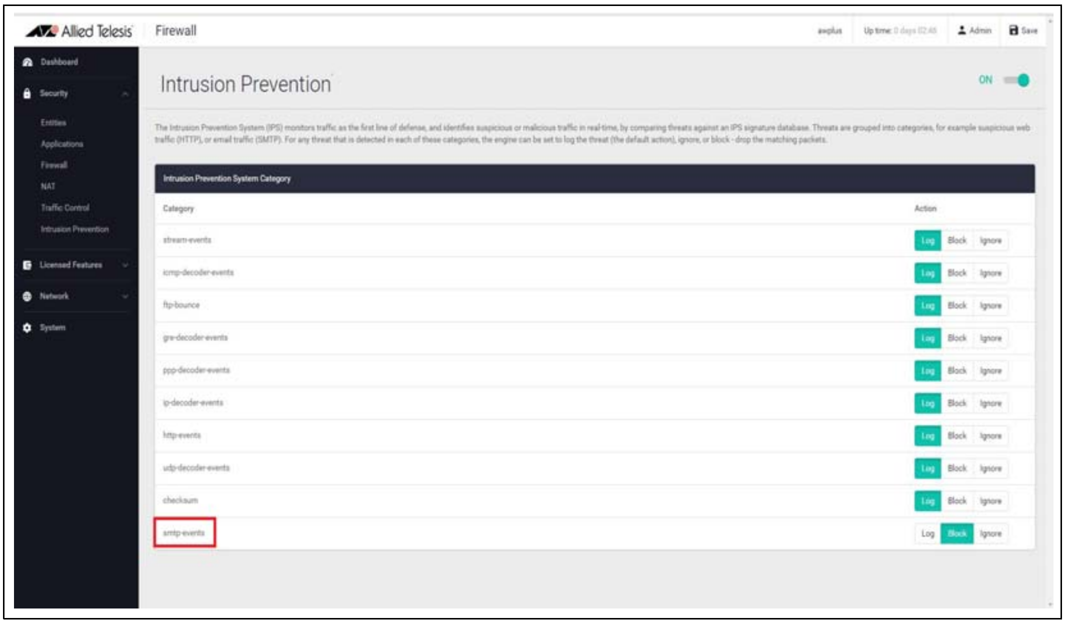
Intrusion Prevention System Category

| Category | Action |
|---|---|
| stream-events | Log Block Ignore |
| icmp-decoder-events | Log Block Ignore |
| ftp-bounce | Log Block Ignore |
| gre-decoder-events | Log Block Ignore |
| ppp-decoder-events | Log Block Ignore |
| ip-decoder-events | Log Block Ignore |
| http-events | Log Block Ignore |
| udp-decoder-events | Log Block Ignore |
| checksum | Log Block Ignore |
| smtp-events | Log Block Ignore |

### Step 2. **Configure IPS actions.**

Threats are grouped into categories, for example suspicious web traffic (HTTP), or email traffic (SMTP). For any threat that is detected in each of these categories, the engine can be set to log the threat (which is the default action), ignore, or block - drop the matching packets.

To drop suspicious SMTP traffic, set the action to **block**.



Intrusion Prevention

The Intrusion Prevention System (IPS) monitors traffic as the first line of defense, and identifies suspicious or malicious traffic in real-time, by comparing threats against an IPS signature database. Threats are grouped into categories, for example suspicious web traffic (HTTP), or email traffic (SMTP). For any threat that is detected in each of these categories, the engine can be set to log the threat (the default action), ignore, or block - drop the matching packets.

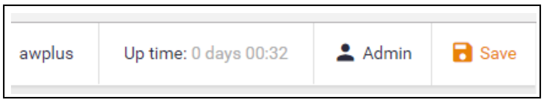
Intrusion Prevention System Category

| Category | Action |
|---|---|
| stream-events | [✓ Log] Block Ignore |
| icmp-decoder-events | [✓ Log] Block Ignore |
| ftp-bounce | [✓ Log] Block Ignore |
| gre-decoder-events | [✓ Log] Block Ignore |
| ppp-decoder-events | [✓ Log] Block Ignore |
| ip-decoder-events | [✓ Log] Block Ignore |
| http-events | [✓ Log] Block Ignore |
| udp-decoder-events | [✓ Log] Block Ignore |
| checksum | [✓ Log] Block Ignore |
| smtp-events | Log [✓ Block] Ignore |

You can monitor IPS matches on the Dashboard security monitoring widget.

## Step 3. Save configuration changes.

Save the IPS configuration changes to make them part of the boot configuration file.



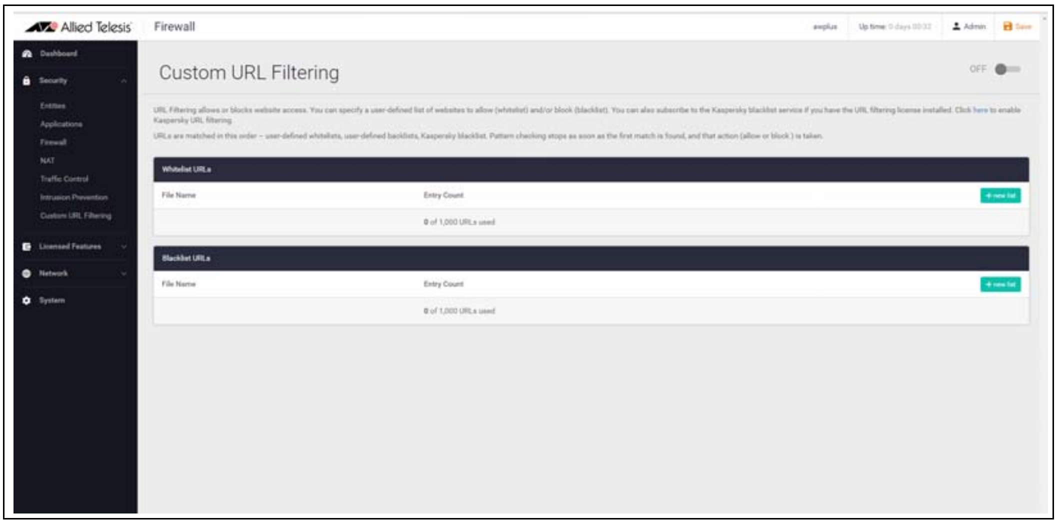
## Custom URL Filtering

URL Filtering is a fast efficient (stream-based) method to allow or block employee’s website access. You can specify a user-defined list of websites to allow (whitelist) and/or block (blacklist).

URLs are matched in this order: user-defined whitelists and then user-defined backlists. Pattern checking stops as soon as the first match is found, and that action (allow or block) is taken. If no match is found, website access will be allowed.

## Step 1. **Configure custom URL filtering**

- Navigate to the **Custom URL Filtering** page under **Security**.



Custom URL Filtering

URL Filtering allows or blocks website access. You can specify a user-defined list of websites to allow (whitelist) and/or block (blacklist). You can also subscribe to the Kaspersky blacklist service if you have the URL filtering license installed. Click here to enable Kaspersky URL filtering.

URLs are matched in this order – user-defined whitelists, user-defined backlists, Kaspersky blacklist. Pattern checking stops as soon as the first match is found, and that action (allow or block ) is taken.

Whitelist URLs

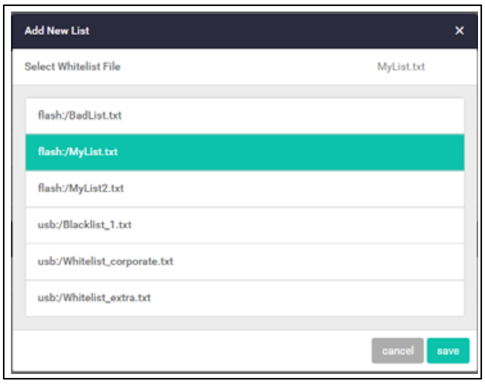
| File Name | Entry Count |
|---|---|
| | 0 of 1,000 URLs used |

Blacklist URLs

| File Name | Entry Count |
|---|---|
| | 0 of 1,000 URLs used |

You can now add user-defined whitelists of URLs to allow, and/or blacklists of URLs to block. You can add multiple lists, and these can have a total maximum of 1000 whitelist URLs and 1000 blacklist URLs. The GUI page lets you know how many URLs are in each list and the total URLs used.

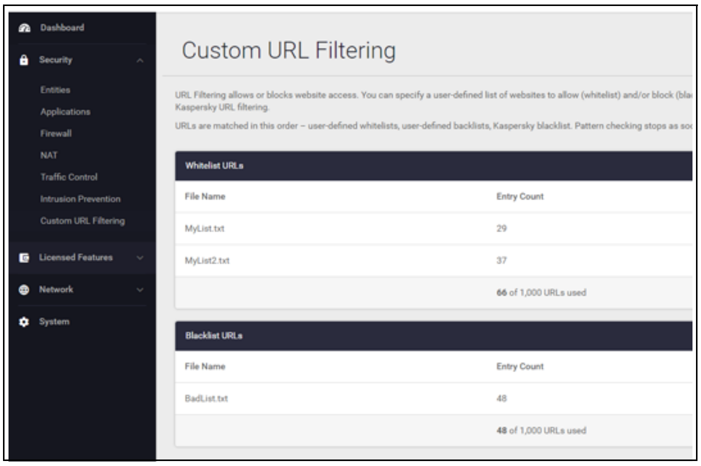
Click on the green **+New list** button to add a new whitelist or blacklist. The custom URL list must be a text file (.txt). Any .txt files in Flash, USB, or SD card are shown and able to be selected and saved for use by the custom URL Filtering feature. See the URL Filtering Feature Overview Guide for more information about creating user-defined URL Filtering lists.



Select Whitelist File: MyList.txt

- flash:/BadList.txt
- flash:/MyList.txt
- flash:/MyList2.txt
- usb:/Blacklist_1.txt
- usb:/Whitelist_corporate.txt
- usb:/Whitelist_extra.txt

Any whitelists and blacklists that have been selected are now shown on the page, with the entry count showing the number of URLs used:



Custom URL Filtering

URL Filtering allows or blocks website access. You can specify a user-defined list of websites to allow (whitelist) and/or block (bla
Kaspersky URL filtering.

URLs are matched in this order – user-defined whitelists, user-defined backlists, Kaspersky blacklist. Pattern checking stops as soo

Whitelist URLs

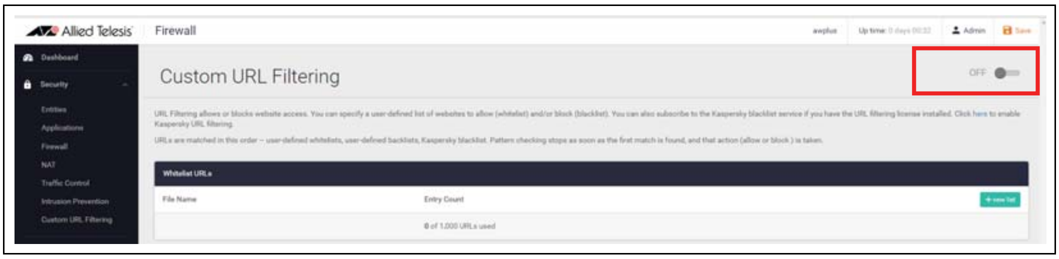
| File Name | Entry Count |
|---|---|
| MyList.txt | 29 |
| MyList2.txt | 37 |
| | **66** of 1,000 URLs used |

Blacklist URLs

| File Name | Entry Count |
|---|---|
| BadList.txt | 48 |
| | **48** of 1,000 URLs used |

## Step 2. **Enable URL Filtering**

Enable URL Filtering with the **ON/OFF** switch at the top of the page:



Custom URL Filtering

URL Filtering allows or blocks website access. You can specify a user-defined list of websites to allow (whitelist) and/or block (blacklist). You can also subscribe to the Kaspersky blacklist service if you have the URL filtering license installed. Click here to enable Kaspersky URL filtering.

URLs are matched in this order – user-defined whitelists, user-defined backlists, Kaspersky blacklist. Pattern checking stops as soon as the first match is found, and that action (allow or block ) is taken.

Whitelist URLs

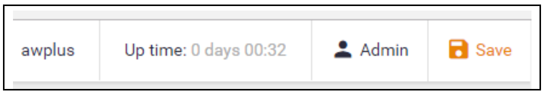
| File Name | Entry Count |
|---|---|
| | **0** of 1,000 URLs used |

The router will now match any website URLs that users try to browse to against the whitelist/s, then the blacklist/s. Pattern checking stops as soon as the first match is found, and that action (allow or block) is taken. If no match is found, website access will be allowed.

You can monitor URL Filtering hits on the Dashboard security monitoring widget.

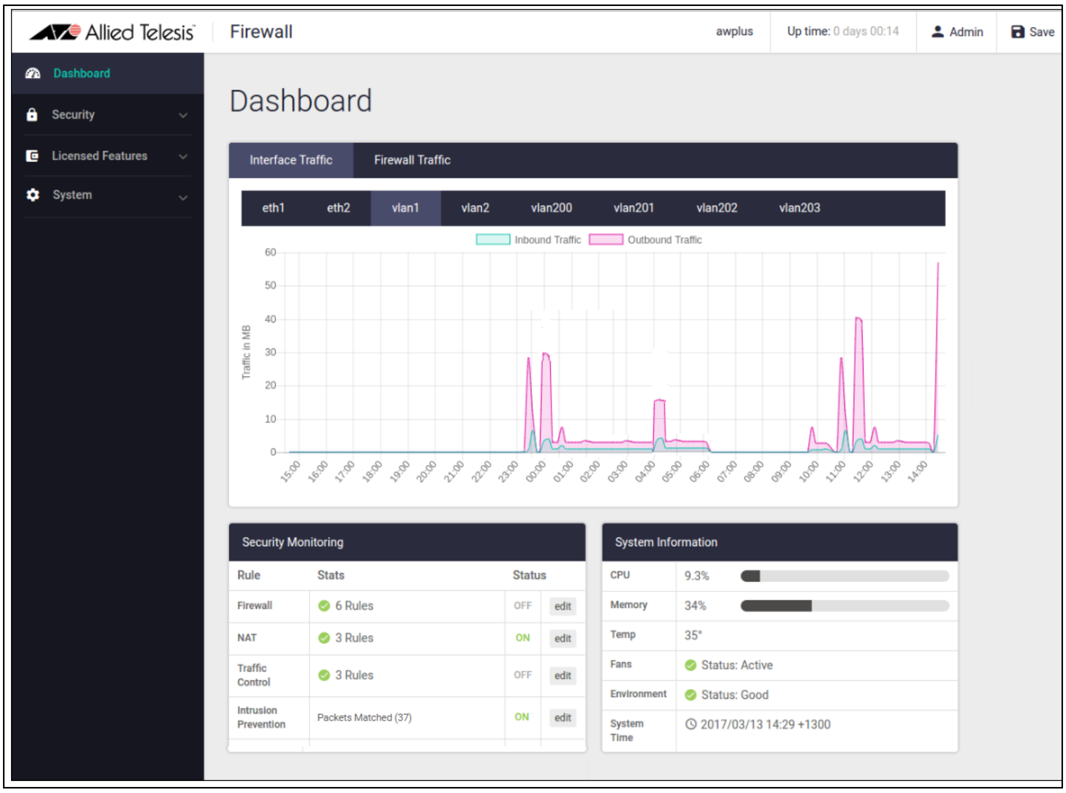
## Step 3. **Save configuration changes**

Save your Custom URL Filtering changes to make them part of the boot configuration.



# The Dashboard

Now that we have configured the router, let's take a look at the Dashboard of the GUI, and what information is provided in the various widgets.



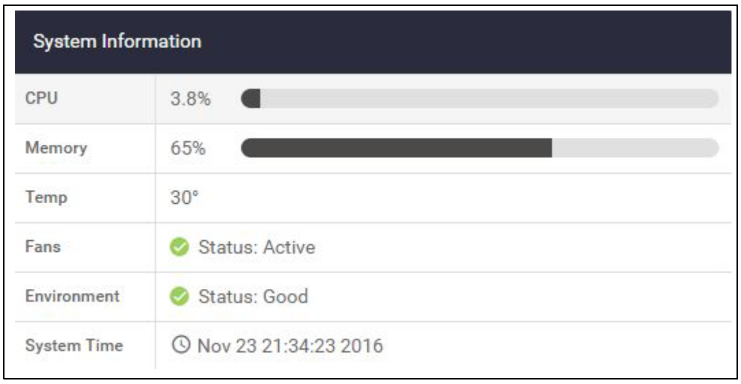
| Rule | Stats | Status | |
|---|---|---|---|
| Firewall | ✓ 6 Rules | OFF | edit |
| NAT | ✓ 3 Rules | ON | edit |
| Traffic Control | ✓ 3 Rules | OFF | edit |
| Intrusion Prevention | Packets Matched (37) | ON | edit |

| | |
|---|---|
| CPU | 9.3% |
| Memory | 34% |
| Temp | 35° |
| Fans | ✓ Status: Active |
| Environment | ✓ Status: Good |
| System Time | 2017/03/13 14:29 +1300 |

Currently there is a **System Information** widget that displays details about the firewalls status. The **Traffic** widget show traffic through the firewall, or per interface. The **Security Monitoring** widget shows the various traffic rules and security features.

**System Information**

Shows CPU and memory use, as well as device health.

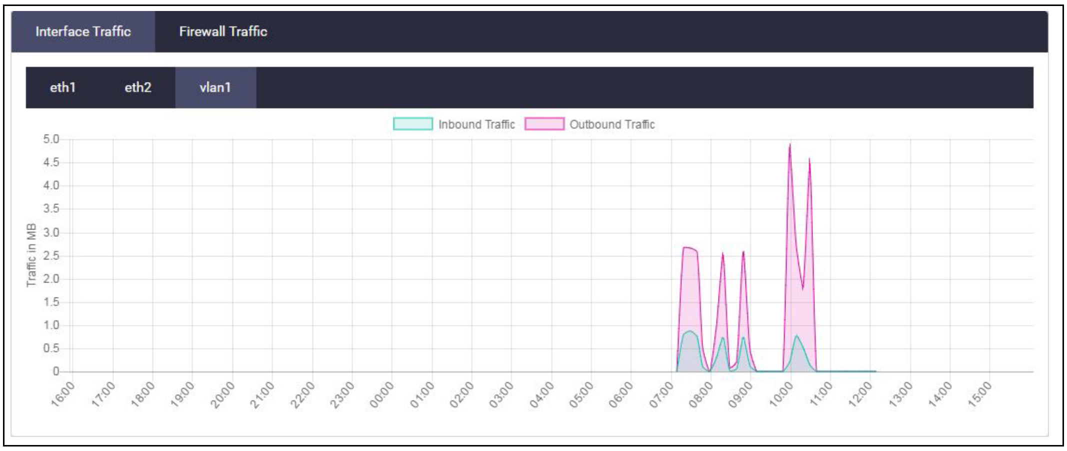


System Information

| | |
|---|---|
| CPU | 3.8% |
| Memory | 65% |
| Temp | 30° |
| Fans | ✓ Status: Active |
| Environment | ✓ Status: Good |
| System Time | Nov 23 21:34:23 2016 |

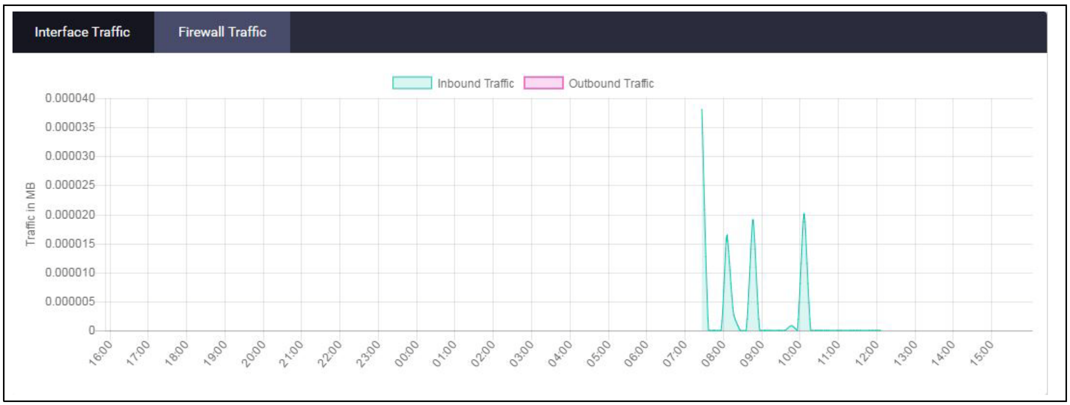
### Interface Traffic

**Interface Traffic** shows traffic passing through a chosen interface in both directions over a 24 hour period.



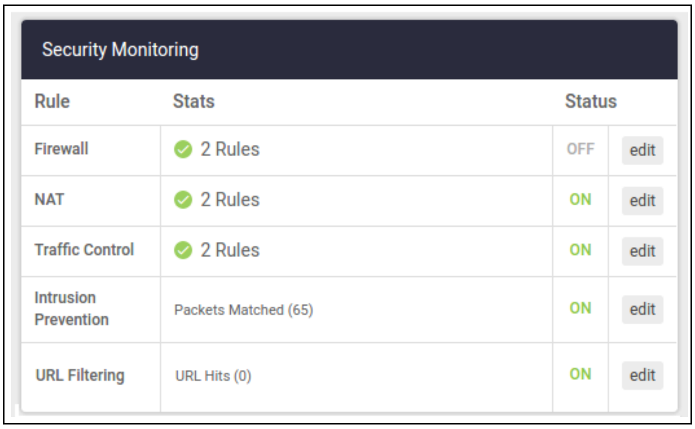
### Firewall Traffic

**Firewall Traffic** shows traffic passing through the firewall over a 24 hour period.



### Security Monitoring

The **Security Monitoring** widget shows the traffic rules and security features in one handy location. You can see which are currently enabled and which are not. You can select **edit** to go to that features dedicated page to configure it further.



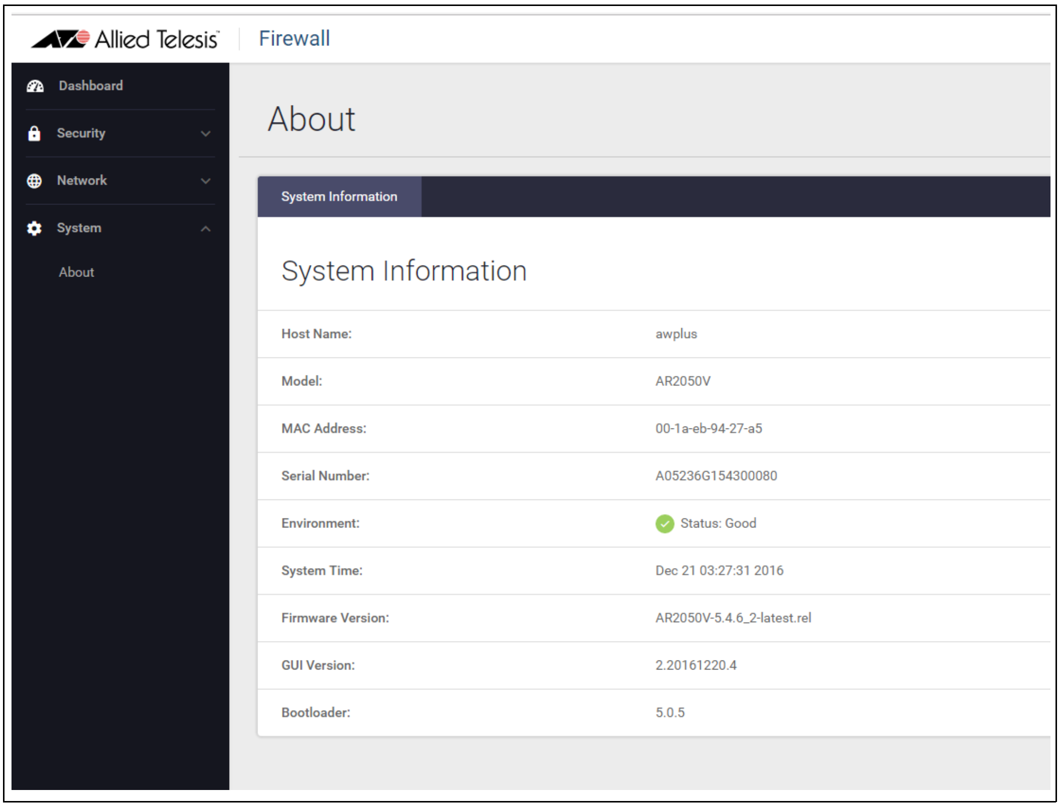
Security Monitoring

| Rule | Stats | Status | |
|---|---|---|---|
| Firewall | ✓ 2 Rules | OFF | edit |
| NAT | ✓ 2 Rules | ON | edit |
| Traffic Control | ✓ 2 Rules | ON | edit |
| Intrusion Prevention | Packets Matched (65) | ON | edit |
| URL Filtering | URL Hits (0) | ON | edit |

You can also see how many rules are configured for the various features, as well as IPS matches, and URL Filtering rule hit statistics.

**System Page**

Further system information is available on the **About** page, under the **System** menu, such as model, serial number, firmware and GUI versions, and so on.



System Information

| | |
|---|---|
| Host Name: | awplus |
| Model: | AR2050V |
| MAC Address: | 00-1a-eb-94-27-a5 |
| Serial Number: | A05236G154300080 |
| Environment: | ✓ Status: Good |
| System Time: | Dec 21 03:27:31 2016 |
| Firmware Version: | AR2050V-5.4.6_2-latest.rel |
| GUI Version: | 2.20161220.4 |
| Bootloader: | 5.0.5 |

# Other Features

The Device GUI has a number of other great features. The Network menu includes interface management, VLAN management, tools, and the ability to configure the firewall as a DHCP server for the network. These will not be detailed here, but are easy and intuitive to use.

Let's look at File Management and Logging from the System menu, and the Wireless Management menu.

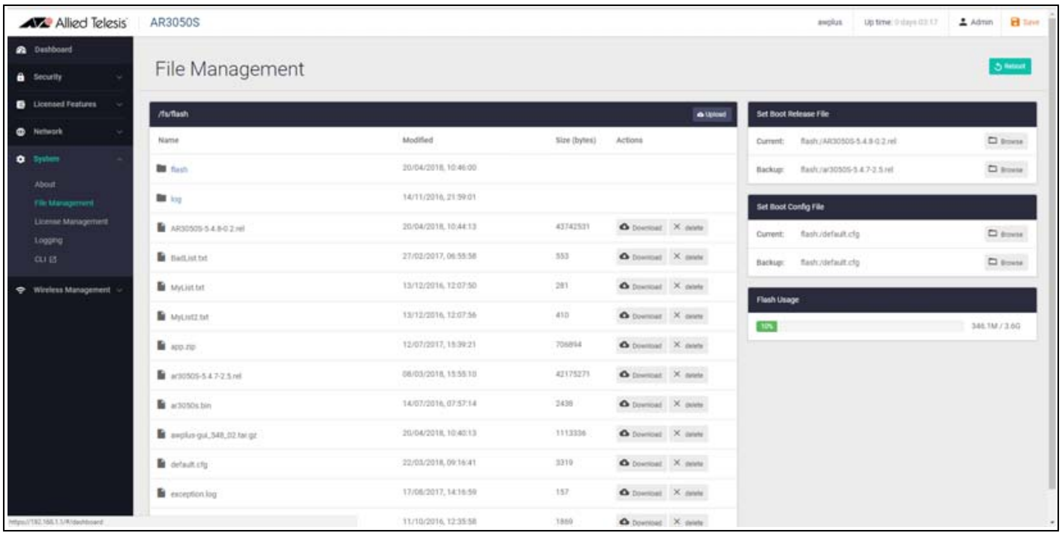
## File Management

The **File Management** page on the GUI allows users to view all files stored on the device, as well as any USB device or SD card that is plugged in.

The upload and download functions provide an easy way to add new files such as firmware, configurations, scripts, or URL lists to the device, as well as save configurations for backup.

The page also lets you set the software release and configuration files to be used, and reboot the device, providing easy firmware upgrade.

The **File Management** page can be found under the **System** menu:



File Management

/fs/flash

| Name | Modified | Size (bytes) | Actions |
|---|---|---|---|
| flash | 20/04/2018, 10:46:00 | | |
| log | 14/11/2016, 21:59:01 | | |
| AR3050S-5.4.8-0.2.rel | 20/04/2018, 10:44:13 | 43742531 | Download ✕ delete |
| BadList.txt | 27/02/2017, 06:55:58 | 553 | Download ✕ delete |
| MyList.txt | 13/12/2016, 12:07:50 | 281 | Download ✕ delete |
| MyList2.txt | 13/12/2016, 12:07:56 | 410 | Download ✕ delete |
| app.zip | 12/07/2017, 15:39:21 | 706894 | Download ✕ delete |
| ar3050S-5.4.7-2.5.rel | 08/03/2018, 15:55:10 | 42175271 | Download ✕ delete |
| ar3050s.bin | 14/07/2016, 07:57:14 | 2438 | Download ✕ delete |
| awplus-gui_548_02.tar.gz | 20/04/2018, 10:40:13 | 1113336 | Download ✕ delete |
| default.cfg | 22/03/2018, 09:16:41 | 3319 | Download ✕ delete |
| exception.log | 17/08/2017, 14:16:59 | 157 | Download ✕ delete |
| | 11/10/2016, 12:35:58 | 1869 | Download ✕ delete |

Set Boot Release File

Current: flash:/AR3050S-5.4.8-0.2.rel

Backup: flash:/ar3050S-5.4.7-2.5.rel

Set Boot Config File

Current: flash:/default.cfg

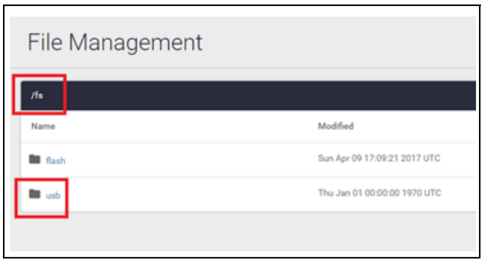
Backup: flash:/default.cfg

Flash Usage

10% 346.1M / 3.6G

By default, the Flash system files are shown as above.

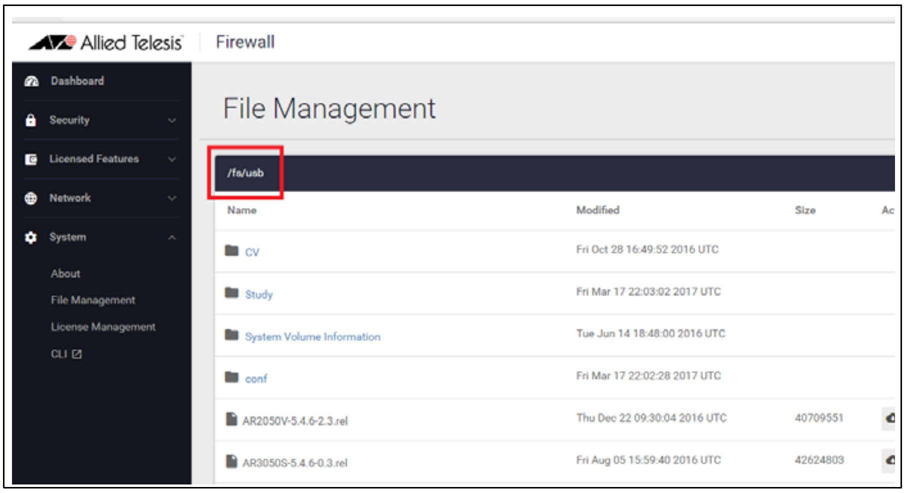
To view files on a USB device, navigate back to the main file system (fs), and choose **USB**:



File Management

/fs

| Name | Modified |
|---|---|
| flash | Sun Apr 09 17:09:21 2017 UTC |
| usb | Thu Jan 01 00:00:00 1970 UTC |



File Management

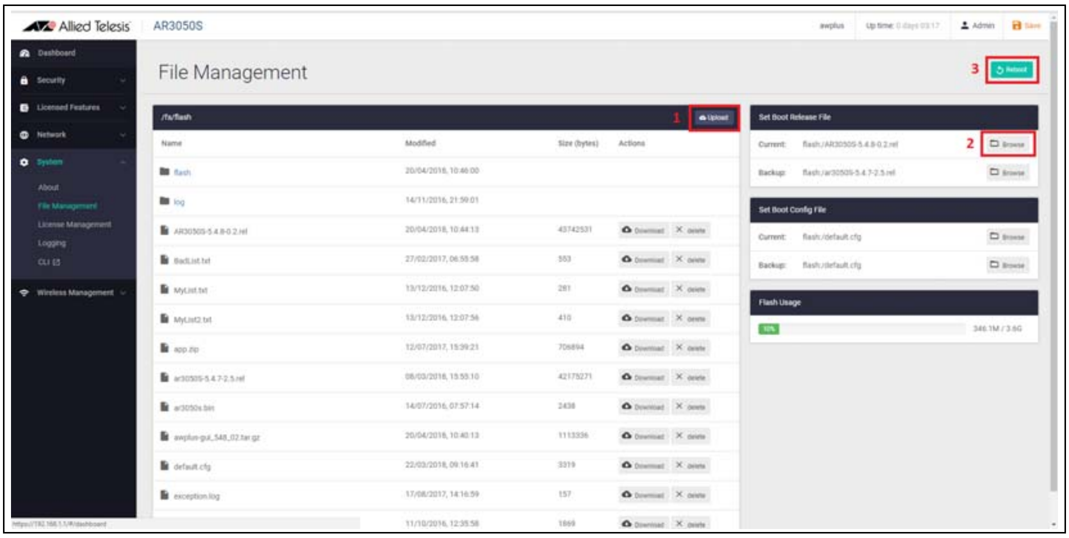
/fs/usb

| Name | Modified | Size | Ac |
|---|---|---|---|
| CV | Fri Oct 28 16:49:52 2016 UTC | | |
| Study | Fri Mar 17 22:03:02 2017 UTC | | |
| System Volume Information | Tue Jun 14 18:48:00 2016 UTC | | |
| conf | Fri Mar 17 22:02:28 2017 UTC | | |
| AR2050V-5.4.6-2.3.rel | Thu Dec 22 09:30:04 2016 UTC | 40709551 | |
| AR3050S-5.4.6-0.3.rel | Fri Aug 05 15:59:40 2016 UTC | 42624803 | |

The **upload** option allows you to browse and locate the file you wish to add to the firewall. From here it is easy to add more files and change the release and configuration files to be used.

For example, for an easy 3-click firmware upgrade, simply:

1. Browse to the new firmware file using the **upload** option
2. Set the new firmware file to be the boot release
3. Re-boot the device



File Management

/fs/flash

| Name | Modified | Size (bytes) | Actions |
|---|---|---|---|
| flash | 20/04/2018, 10:46:00 | | |
| log | 14/11/2016, 21:59:01 | | |
| AR3050S-5.4.8-0.2.rel | 20/04/2018, 10:44:13 | 43742531 | Download × delete |
| BadList.txt | 27/02/2017, 06:55:58 | 553 | Download × delete |
| MyList.txt | 13/12/2016, 12:07:50 | 281 | Download × delete |
| MyList2.txt | 13/12/2016, 12:07:56 | 410 | Download × delete |
| app.zip | 12/07/2017, 15:39:21 | 706894 | Download × delete |
| ar3050S-5.4.7-2.5.rel | 08/03/2018, 15:55:10 | 42175271 | Download × delete |
| ar3050s.bin | 14/07/2016, 07:57:14 | 2438 | Download × delete |
| awplus-gui_548_02.tar.gz | 20/04/2018, 10:40:13 | 1113336 | Download × delete |
| default.cfg | 22/03/2018, 09:16:41 | 3319 | Download × delete |
| exception.log | 17/08/2017, 14:16:59 | 157 | Download × delete |
| | 11/10/2016, 12:35:58 | 1869 | Download × delete |

Set Boot Release File

Current: flash:/AR3050S-5.4.8-0.2.rel Browse

Backup: flash:/ar3050S-5.4.7-2.5.rel Browse

Set Boot Config File

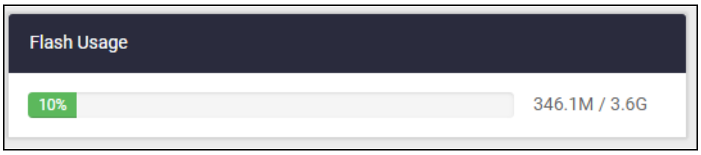
Current: flash:/default.cfg Browse

Backup: flash:/default.cfg Browse

Flash Usage

10% 346.1M / 3.6G

**Tip** Currently used and total **Flash Usage** information is available.



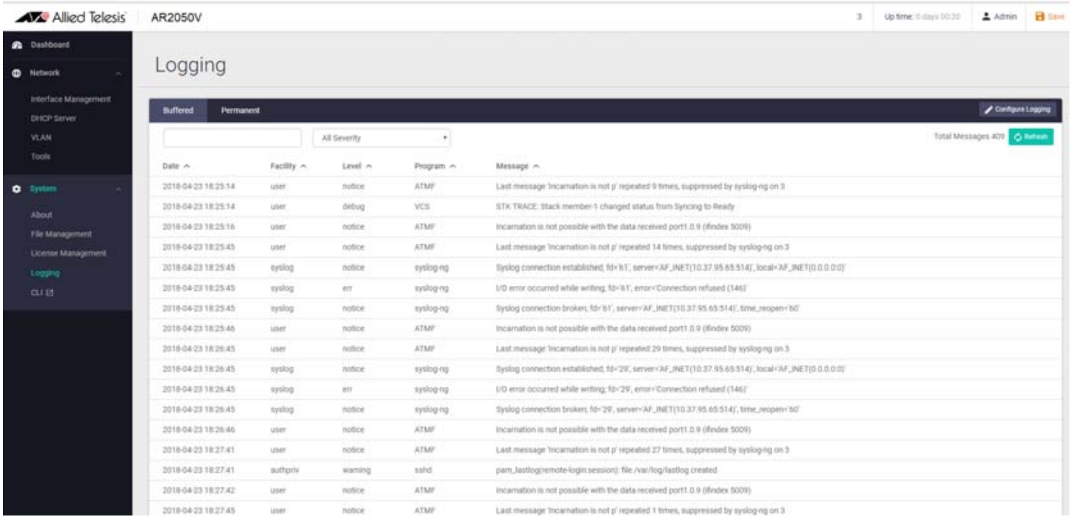
Flash Usage

10% 346.1M / 3.6G

## Logging Management

The **Logging** page shows buffered and permanent log messages stored on the device.

- By default the buffered logs tab is displayed.

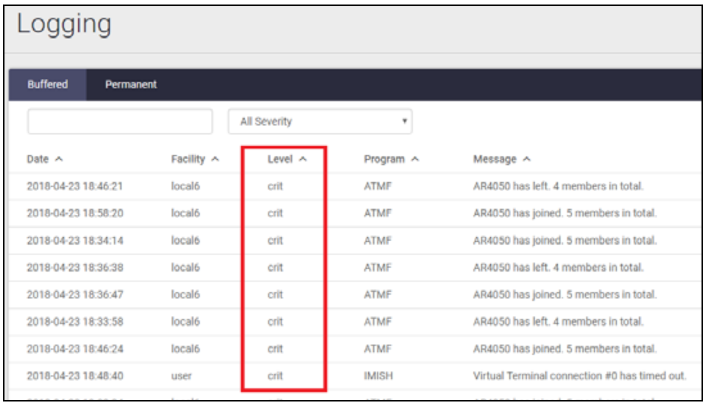


| Date | Facility | Level | Program | Message |
|---|---|---|---|---|
| 2018-04-23 18:25:14 | user | notice | ATMF | Last message 'Incarnation is not p' repeated 9 times, suppressed by syslog-ng on 3 |
| 2018-04-23 18:25:14 | user | debug | VCS | STK TRACE: Stack member-1 changed status from Syncing to Ready |
| 2018-04-23 18:25:16 | user | notice | ATMF | Incarnation is not possible with the data received port1.0.9 (ifindex 5009) |
| 2018-04-23 18:25:45 | user | notice | ATMF | Last message 'Incarnation is not p' repeated 14 times, suppressed by syslog-ng on 3 |
| 2018-04-23 18:25:45 | syslog | notice | syslog-ng | Syslog connection established; fd='61', server='AF_INET(10.37.95.65:514)', local='AF_INET(0.0.0.0:0)' |
| 2018-04-23 18:25:45 | syslog | err | syslog-ng | I/O error occurred while writing; fd='61', error='Connection refused (146)' |
| 2018-04-23 18:25:45 | syslog | notice | syslog-ng | Syslog connection broken; fd='61', server='AF_INET(10.37.95.65:514)', time_reopen='60' |
| 2018-04-23 18:25:46 | user | notice | ATMF | Incarnation is not possible with the data received port1.0.9 (ifindex 5009) |
| 2018-04-23 18:26:45 | user | notice | ATMF | Last message 'Incarnation is not p' repeated 29 times, suppressed by syslog-ng on 3 |
| 2018-04-23 18:26:45 | syslog | notice | syslog-ng | Syslog connection established; fd='29', server='AF_INET(10.37.95.65:514)', local='AF_INET(0.0.0.0:0)' |
| 2018-04-23 18:26:45 | syslog | err | syslog-ng | I/O error occurred while writing; fd='29', error='Connection refused (146)' |
| 2018-04-23 18:26:45 | syslog | notice | syslog-ng | Syslog connection broken; fd='29', server='AF_INET(10.37.95.65:514)', time_reopen='60' |
| 2018-04-23 18:26:46 | user | notice | ATMF | Incarnation is not possible with the data received port1.0.9 (ifindex 5009) |
| 2018-04-23 18:27:41 | user | notice | ATMF | Last message 'Incarnation is not p' repeated 27 times, suppressed by syslog-ng on 3 |
| 2018-04-23 18:27:41 | authpriv | warning | sshd | pam_lastlog(remote-login:session): file /var/log/lastlog created |
| 2018-04-23 18:27:42 | user | notice | ATMF | Incarnation is not possible with the data received port1.0.9 (ifindex 5009) |
| 2018-04-23 18:27:45 | user | notice | ATMF | Last message 'Incarnation is not p' repeated 1 times, suppressed by syslog-ng on 3 |

You can filter the logs in three ways to focus your view and support easy analysis:

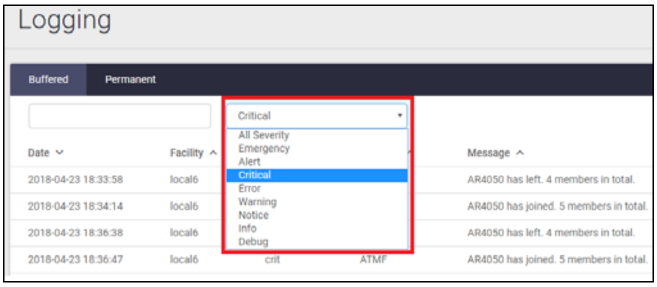
Filter logs by:

1. any information column in ascending or descending order



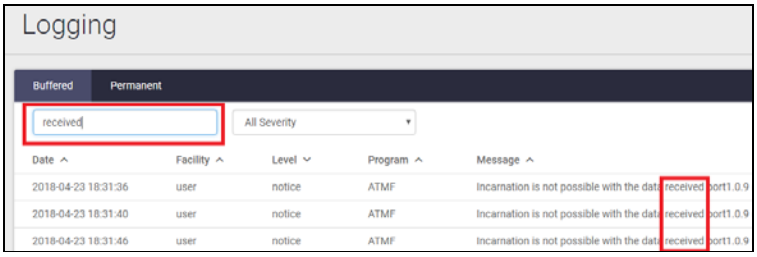
| Date | Facility | Level | Program | Message |
|---|---|---|---|---|
| 2018-04-23 18:46:21 | local6 | crit | ATMF | AR4050 has left. 4 members in total. |
| 2018-04-23 18:58:20 | local6 | crit | ATMF | AR4050 has joined. 5 members in total. |
| 2018-04-23 18:34:14 | local6 | crit | ATMF | AR4050 has joined. 5 members in total. |
| 2018-04-23 18:36:38 | local6 | crit | ATMF | AR4050 has left. 4 members in total. |
| 2018-04-23 18:36:47 | local6 | crit | ATMF | AR4050 has joined. 5 members in total. |
| 2018-04-23 18:33:58 | local6 | crit | ATMF | AR4050 has left. 4 members in total. |
| 2018-04-23 18:46:24 | local6 | crit | ATMF | AR4050 has joined. 5 members in total. |
| 2018-04-23 18:48:40 | user | crit | IMISH | Virtual Terminal connection #0 has timed out. |

2. selecting the level of logs to display, e.g Critical, Warning, Error etc.



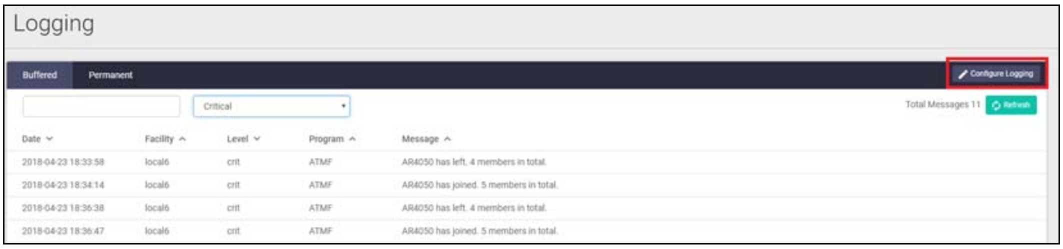
| Date | Facility | | | Message |
|---|---|---|---|---|
| 2018-04-23 18:33:58 | local6 | | | AR4050 has left. 4 members in total. |
| 2018-04-23 18:34:14 | local6 | | | AR4050 has joined. 5 members in total. |
| 2018-04-23 18:36:38 | local6 | | | AR4050 has left. 4 members in total. |
| 2018-04-23 18:36:47 | local6 | crit | ATMF | AR4050 has joined. 5 members in total. |

3. searching for any text string found in the logs.



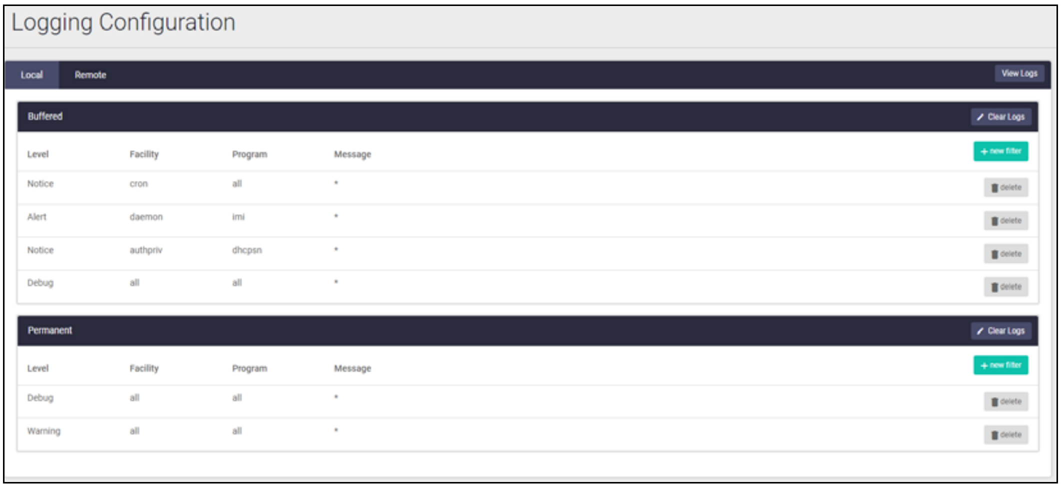
| Date | Facility | Level | Program | Message |
|---|---|---|---|---|
| 2018-04-23 18:31:36 | user | notice | ATMF | Incarnation is not possible with the data received port1.0.9 |
| 2018-04-23 18:31:40 | user | notice | ATMF | Incarnation is not possible with the data received port1.0.9 |
| 2018-04-23 18:31:46 | user | notice | ATMF | Incarnation is not possible with the data received port1.0.9 |

Click the **Configure Logging** button to access the Logging Configuration page. This page allows you to create filters to manage which logs are stored on the switch and also set up a Syslog server(s) for remote log storage.



| Date | Facility | Level | Program | Message |
|---|---|---|---|---|
| 2018-04-23 18:33:58 | local6 | crit | ATMF | AR4050 has left. 4 members in total. |
| 2018-04-23 18:34:14 | local6 | crit | ATMF | AR4050 has joined. 5 members in total. |
| 2018-04-23 18:36:38 | local6 | crit | ATMF | AR4050 has left. 4 members in total. |
| 2018-04-23 18:36:47 | local6 | crit | ATMF | AR4050 has joined. 5 members in total. |

The **Logging Configuration** page has tabs for local and remote (syslog server) settings.



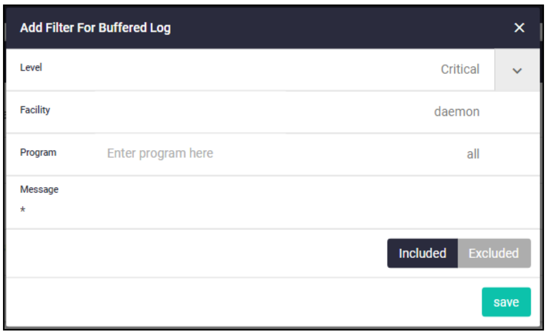
| Level | Facility | Program | Message | |
|---|---|---|---|---|
| Notice | cron | all | * | delete |
| Alert | daemon | imi | * | delete |
| Notice | authpriv | dhcpsn | * | delete |
| Debug | all | all | * | delete |

| Level | Facility | Program | Message | |
|---|---|---|---|---|
| Debug | all | all | * | delete |
| Warning | all | all | * | delete |

Use the **Local** tab (default) to create filters to manage the level of logs that are stored in the buffered and permanent logs on the switch. You can also delete the buffered or permanent logs using the **Clear Logs** button.

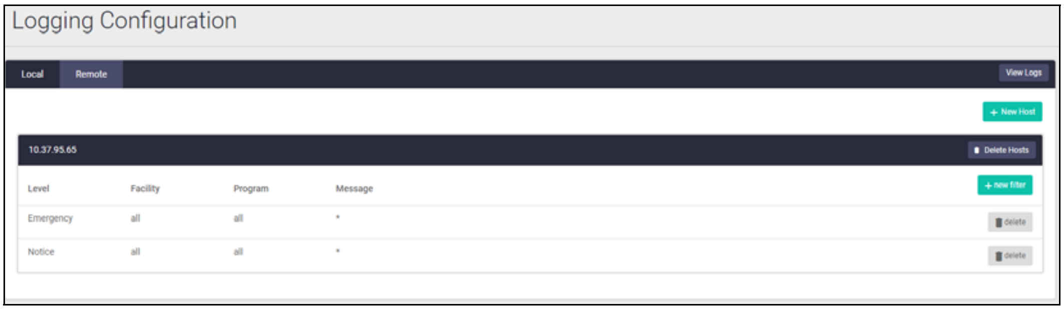
Use the **View Logs** button to return to the Logging page.

When creating a new logging filter you can specify any/all of level, facility, program, and message to be included or excluded in the log storage. This enables log storage on the device to be configured exactly as desired.


Add Filter For Buffered Log

|  |  |
|---|---|
| Level | Critical |
| Facility | daemon |
| Program | all |
| Message | * |

Use the **Remote** tab and the **+New Host** button to set up a syslog server to send log messages to for storage and analysis. Use the **+New Filter** button to configure filters that specify the type of logs (include or exclude) to be sent to the syslog server.


Logging Configuration

10.37.95.65

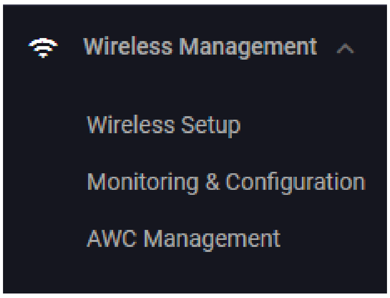
| Level | Facility | Program | Message |
|---|---|---|---|
| Emergency | all | all | * |
| Notice | all | all | * |

## Wireless management

Allied Telesis VPN Routers incorporate Autonomous Wave Control (AWC) wireless management, allowing your wireless access points (APs) to be setup and managed from the Device GUI on your security appliance.

AWC uses wireless intelligence to constantly model AP location and signal strength information. It then automatically optimizes wireless output and channel selection for optimum performance.

The device GUI includes a Wireless Management menu, which enables you to set up your wireless network, monitor and configure the network, and manage AWC:



Form more information about AWC and how to configure it, see AWC Wireless Control on AR-Series Devices Feature Overview and Configuration Guide.

Allied Telesis™ NETWORK SMARTER

**North America Headquarters** | 19800 North Creek Parkway | Suite 100 | Bothell | WA 98011 | USA | T: +1 800 424 4284 | F: +1 425 481 3895
**Asia-Pacific Headquarters** | 11 Tai Seng Link | Singapore | 534182 | T: +65 6383 3832 | F: +65 6383 3830
**EMEA & CSA Operations** | Incheonweg 7 | 1437 EK Rozenburg | The Netherlands | T: +31 20 7950020 | F: +31 20 7950021

**alliedtelesis**.com