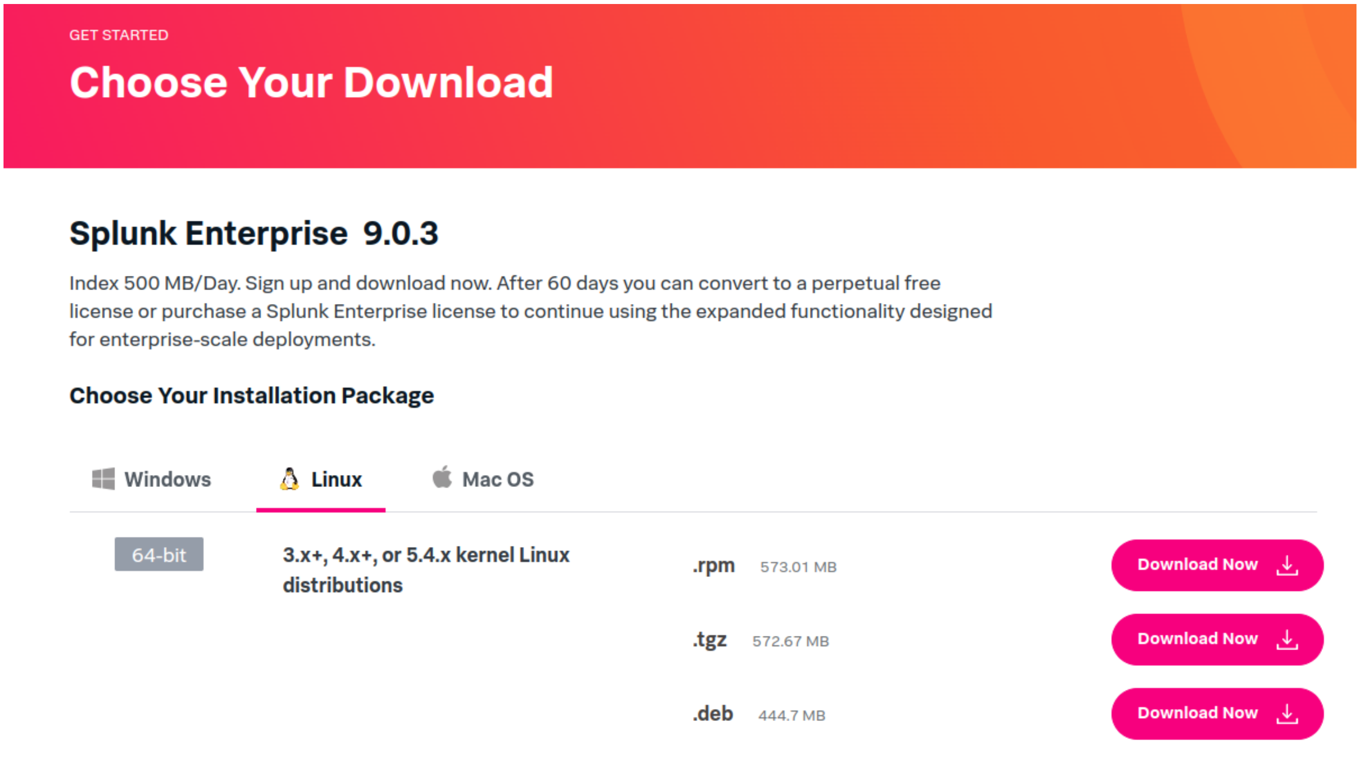
Hi, my name is Rafael José. Welcome to my miniSOC documentation!

1. Installation

I decided to choose Splunk for my miniSOC environment. In my case I will be installing Splunk in Linux.

We go to the official page of Splunk, log in and download the version that fits our OS.



GET STARTED

Choose Your Download

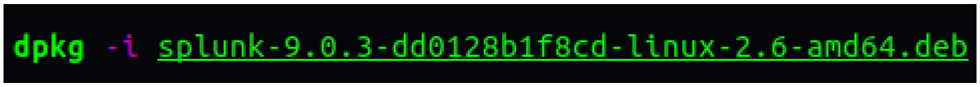
Splunk Enterprise 9.0.3

Index 500 MB/Day. Sign up and download now. After 60 days you can convert to a perpetual free license or purchase a Splunk Enterprise license to continue using the expanded functionality designed for enterprise-scale deployments.

Choose Your Installation Package

64-bit	3.x+, 4.x+, or 5.4.x kernel Linux distributions	.rpm	573.01 MB	Download Now
		.tgz	572.67 MB	Download Now
		.deb	444.7 MB	Download Now

In my case I downloaded the .deb package. I used dpkg to install it.



```
dpkg -i splunk-9.0.3-dd0128b1f8cd-linux-2.6-amd64.deb
```

2. Setting Splunk

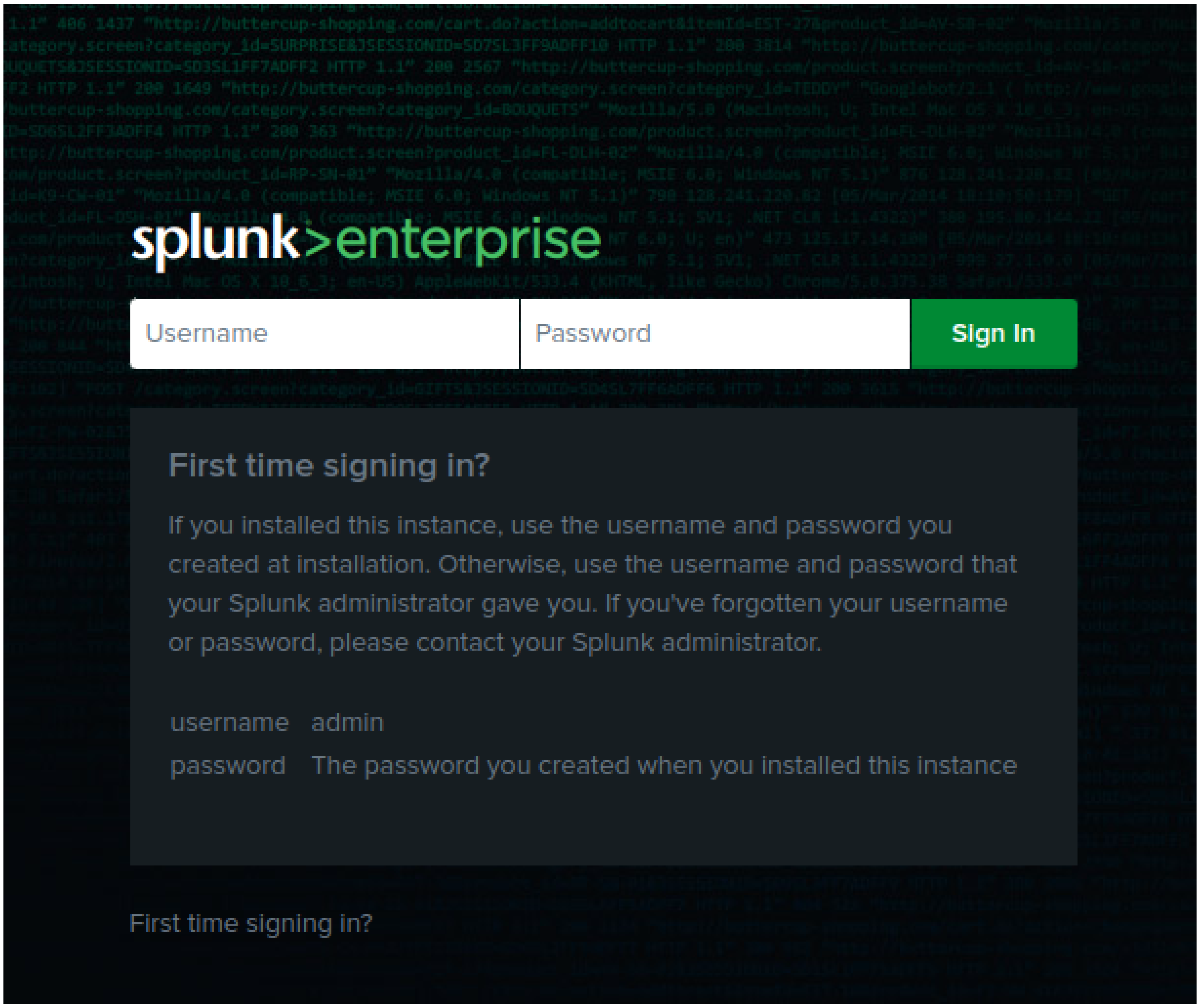
We can choose to start or to enable splunk every time the system starts. I will choose to start it manually every time the system starts.

After the installation, the files were placed into /opt/splunk.

```
sudo /opt/splunk/bin/splunk start
```

We will get some output and the port in which splunk is listening. So we can access it through visiting the localhost address in that port from the web browser.

So visting the http://localhost:port form our web browser, we can see the splunk panel.



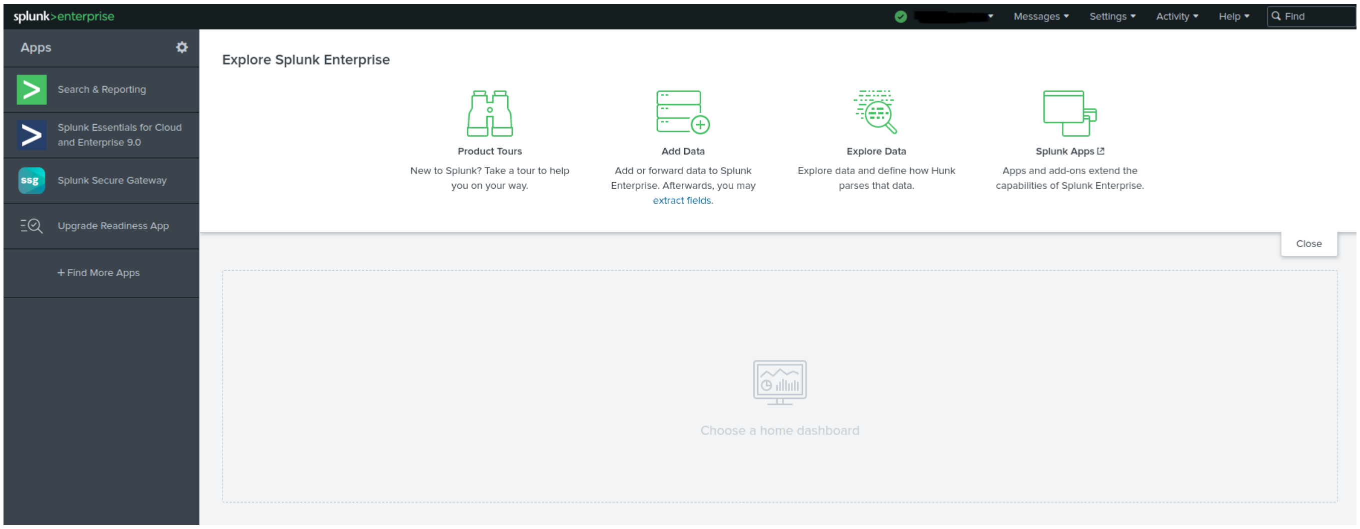
First time signing in?

If you installed this instance, use the username and password you created at installation. Otherwise, use the username and password that your Splunk administrator gave you. If you've forgotten your username or password, please contact your Splunk administrator.

username admin
password The password you created when you installed this instance

First time signing in?

Log in with your credentials.



Explore Splunk Enterprise

Product Tours
New to Splunk? Take a tour to help you on your way.

Add Data
Add or forward data to Splunk Enterprise. Afterwards, you may extract fields.

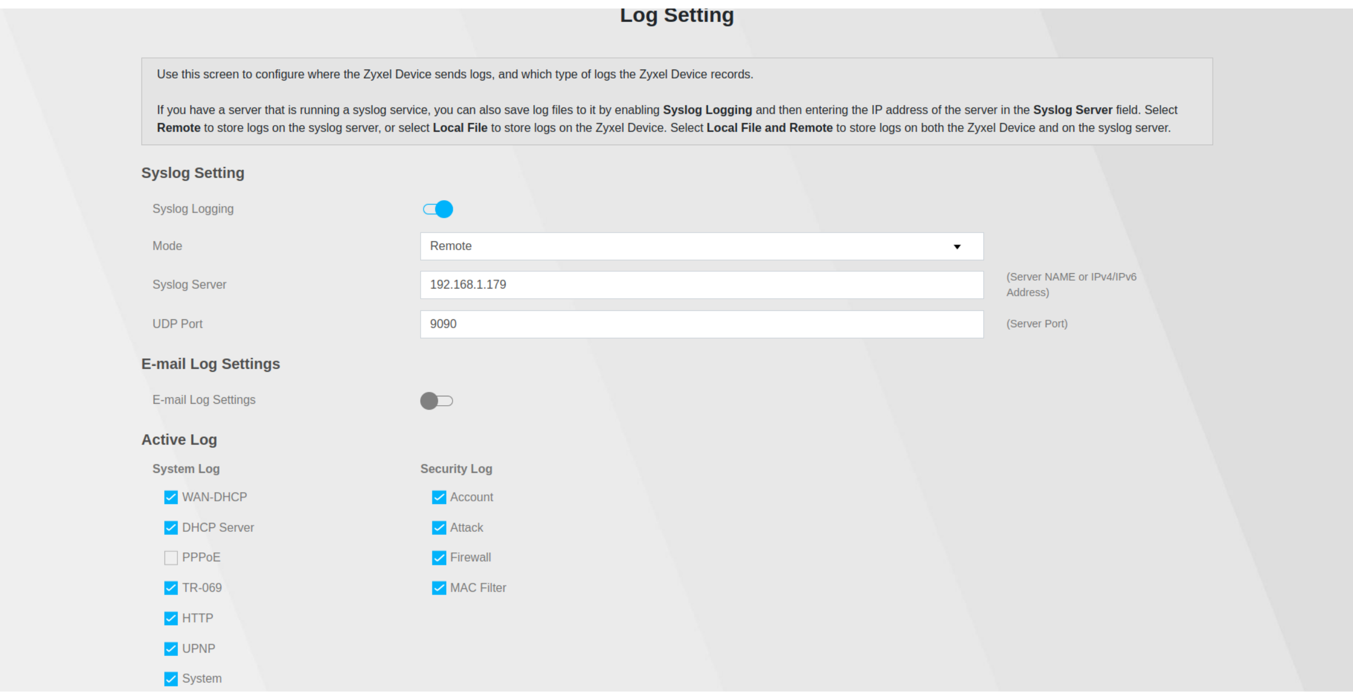
Explore Data
Explore data and define how Hunk parses that data.

Splunk Apps
Apps and add-ons extend the capabilities of Splunk Enterprise.

Choose a home dashboard

3. Forwarding the logs from my router to splunk

To forward the logs from the router to Splunk you need to enter into the admin panel of your router. It is important to note that some routers do not have that much logging functionalities, so maybe you are not able to forward the logs to Splunk.



Log Setting

Use this screen to configure where the Zyxel Device sends logs, and which type of logs the Zyxel Device records.

If you have a server that is running a syslog service, you can also save log files to it by enabling **Syslog Logging** and then entering the IP address of the server in the **Syslog Server** field. Select **Remote** to store logs on the syslog server, or select **Local File** to store logs on the Zyxel Device. Select **Local File and Remote** to store logs on both the Zyxel Device and on the syslog server.

Syslog Setting

Syslog Logging	● on	
Mode	Remote ▾	
Syslog Server	192.168.1.179	(Server NAME or IPv4/IPv6 Address)
UDP Port	9090	(Server Port)

E-mail Log Settings

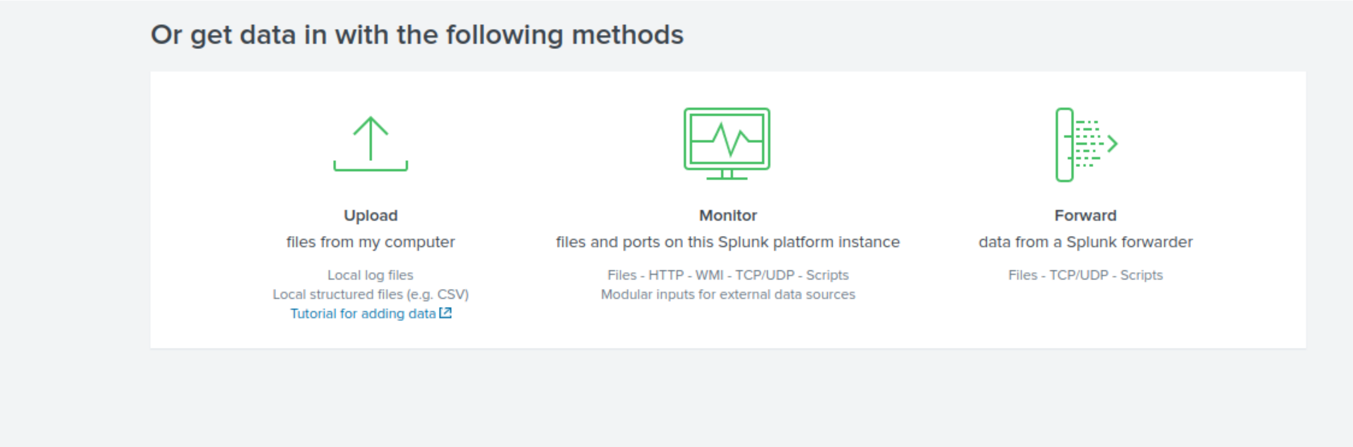
E-mail Log Settings ○ off

Active Log

System Log	Security Log
☑ WAN-DHCP	☑ Account
☑ DHCP Server	☑ Attack
☐ PPPoE	☑ Firewall
☑ TR-069	☑ MAC Filter
☑ HTTP	
☑ UPNP	
☑ System	

In my case, I was using a Zyxel router that had some logging functionalities. I set the syslog server address and the UDP port to send the logging. This address is were my Splunk software is installed. Now we need to configure Splunk to listen on that 9090 UDP port!

So in Splunk, we go to the **Add Data** option.



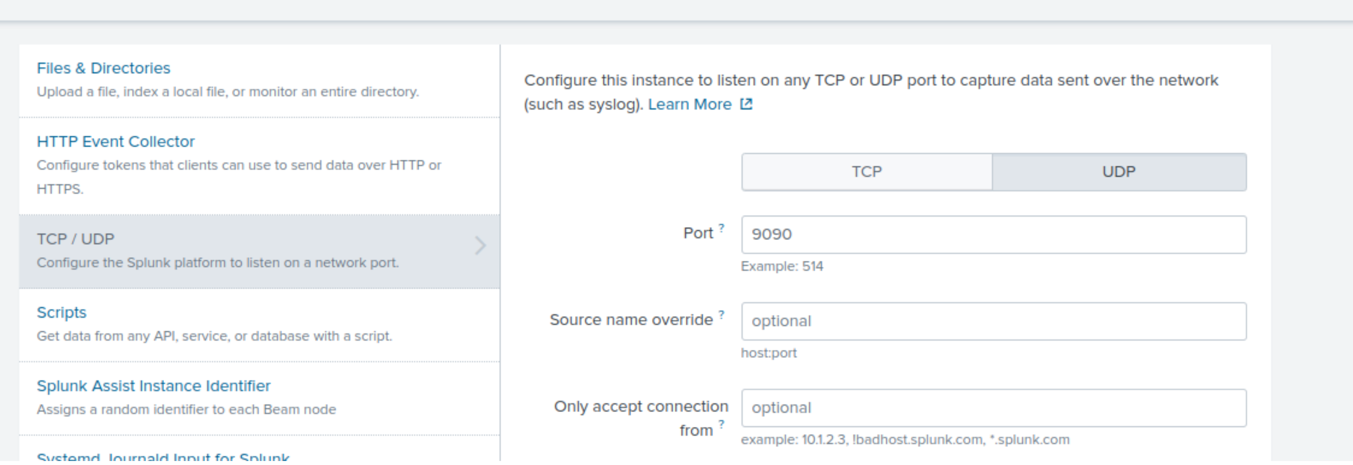
Or get data in with the following methods

Upload
files from my computer
Local log files
Local structured files (e.g. CSV)
Tutorial for adding data

Monitor
files and ports on this Splunk platform instance
Files - HTTP - WMI - TCP/UDP - Scripts
Modular inputs for external data sources

Forward
data from a Splunk forwarder
Files - TCP/UDP - Scripts

Then **Monitor**. And we choose **TCP/UDP**. Set the UDP port.



Files & Directories
Upload a file, index a local file, or monitor an entire directory.

HTTP Event Collector
Configure tokens that clients can use to send data over HTTP or HTTPS.

TCP / UDP
Configure the Splunk platform to listen on a network port.

Scripts
Get data from any API, service, or database with a script.

Splunk Assist Instance Identifier
Assigns a random identifier to each Beam node

Systemd Journald Input for Splunk

Configure this instance to listen on any TCP or UDP port to capture data sent over the network (such as syslog). Learn More

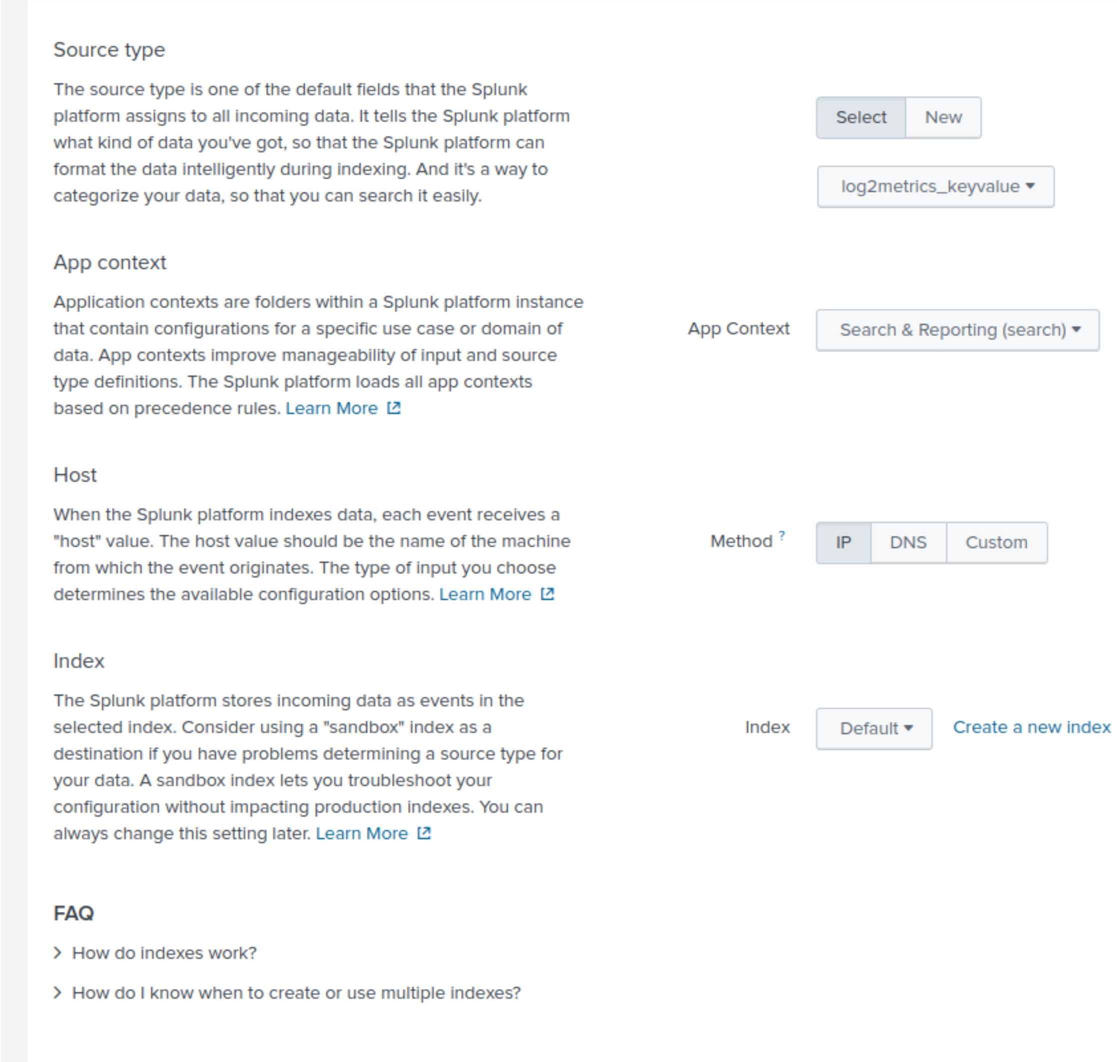
TCP | UDP

Port ? 9090
Example: 514

Source name override ? optional
host:port

Only accept connection from ? optional
example: 10.1.2.3, !badhost.splunk.com, *.splunk.com

Then I set some options like the source type, Host, and App context.



Source type

The source type is one of the default fields that the Splunk platform assigns to all incoming data. It tells the Splunk platform what kind of data you've got, so that the Splunk platform can format the data intelligently during indexing. And it's a way to categorize your data, so that you can search it easily.

Select | New

log2metrics_keyvalue ▾

App context

Application contexts are folders within a Splunk platform instance that contain configurations for a specific use case or domain of data. App contexts improve manageability of input and source type definitions. The Splunk platform loads all app contexts based on precedence rules. Learn More

App Context: Search & Reporting (search) ▾

Host

When the Splunk platform indexes data, each event receives a "host" value. The host value should be the name of the machine from which the event originates. The type of input you choose determines the available configuration options. Learn More

Method ?: IP | DNS | Custom

Index

The Splunk platform stores incoming data as events in the selected index. Consider using a "sandbox" index as a destination if you have problems determining a source type for your data. A sandbox index lets you troubleshoot your configuration without impacting production indexes. You can always change this setting later. Learn More

Index: Default ▾ Create a new index

FAQ

› How do indexes work?

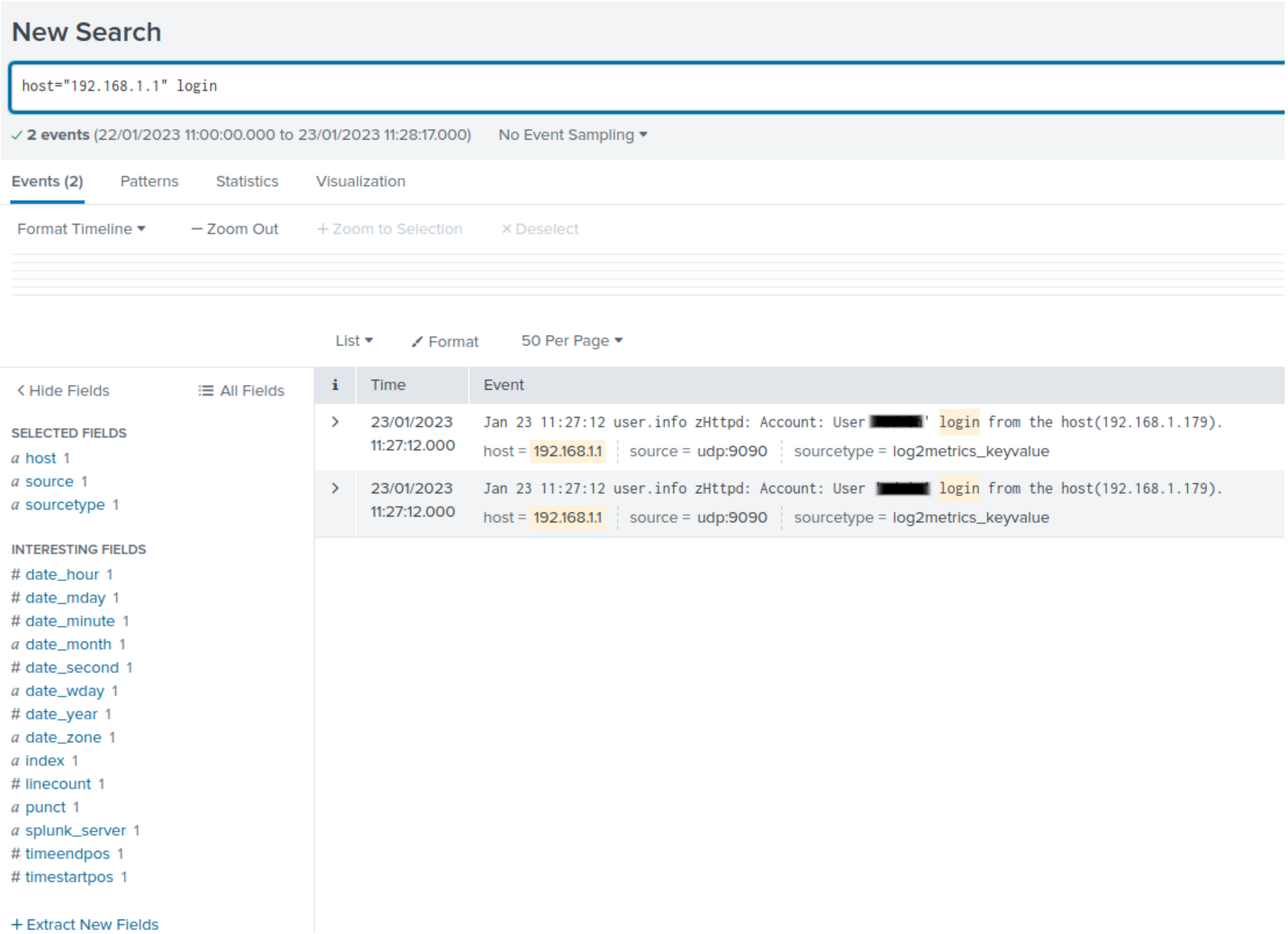
› How do I know when to create or use multiple indexes?

After that we click review, we check everything is ok and then we are done! Let's see the logs!

4. Searching

We click the option **Search & Reporting** at the home page, and we can start to perform some searches on the loggs that we have!

The first thing I did was to log in into the router once again to see how the events look like



```
host="192.168.1.1" login
```

✓ 2 events (22/01/2023 11:00:00.000 to 23/01/2023 11:28:17.000)

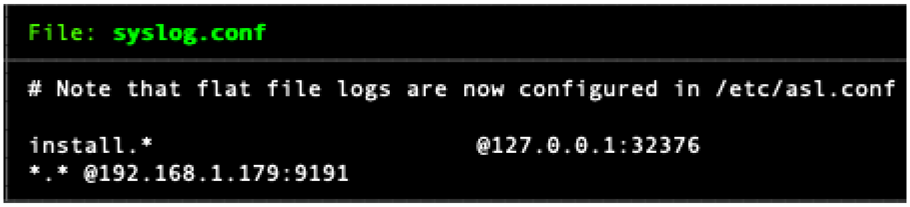
i	Time	Event
>	23/01/2023 11:27:12.000	Jan 23 11:27:12 user.info zHttpd: Account: User [redacted]' login from the host(192.168.1.179). host = 192.168.1.1 ¦ source = udp:9090 ¦ sourcetype = log2metrics_keyvalue
>	23/01/2023 11:27:12.000	Jan 23 11:27:12 user.info zHttpd: Account: User [redacted] login from the host(192.168.1.179). host = 192.168.1.1 ¦ source = udp:9090 ¦ sourcetype = log2metrics_keyvalue

Nice! So, we will receive many events form the router. Now we can make searches and start to gain some hands on experience with Splunk!
The next step is going to be to add more logs from other sources to Splunk.

5. Forwarding the logs from my computer to splunk

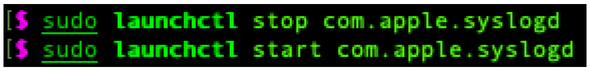
In this case I will send the syslogs from a macOS to Splunk. For this purpose we need to modify the **syslog.conf** file that lives in /etc.
We need to add the following line: ***.* @ip:port**

The IP address is the IP address of the computer where you have splunk installed. And the port is the port that you will listen on Splunk to receive the logs.



```
File: syslog.conf

# Note that flat file logs are now configured in /etc/asl.conf

install.*                          @127.0.0.1:32376
*.* @192.168.1.179:9191
```

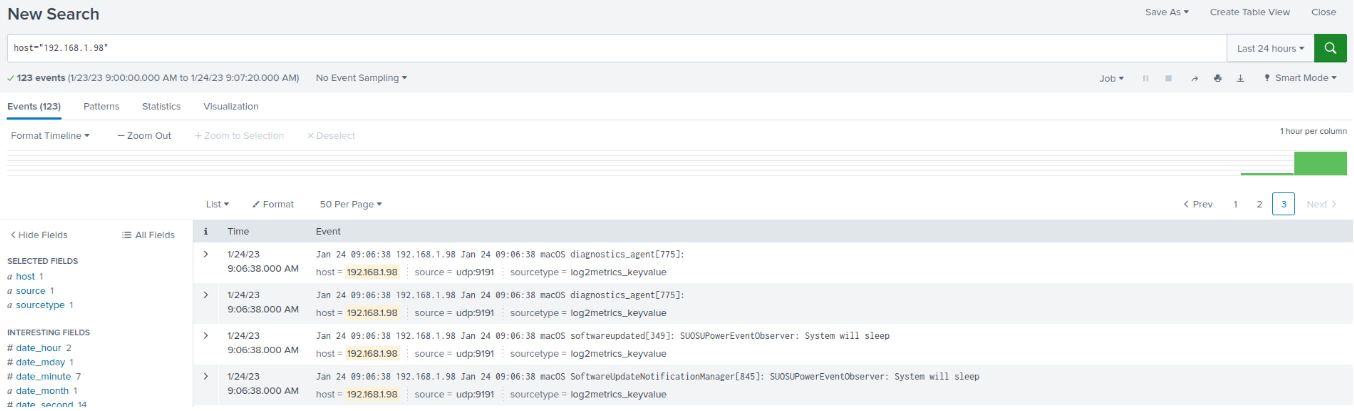
Then we need to execute these commands to restart the syslogd daemon



```
[$ sudo launchctl stop com.apple.syslogd
[$ sudo launchctl start com.apple.syslogd
```

Finally, we need to configure Splunk to listen on the port that we specified on the **syslog.conf** to listen. Like we did when forwarding the router logs.

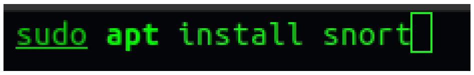
Now we can see the logs from our mac computer!



```
host="192.168.1.98"

✓ 123 events (1/23/23 9:00:00.000 AM to 1/24/23 9:07:20.000 AM)

>  1/24/23           Jan 24 09:06:38 192.168.1.98 Jan 24 09:06:38 macOS diagnostics_agent[775]:
   9:06:38.000 AM    host = 192.168.1.98   source = udp:9191   sourcetype = log2metrics_keyvalue
>  1/24/23           Jan 24 09:06:38 192.168.1.98 Jan 24 09:06:38 macOS diagnostics_agent[775]:
   9:06:38.000 AM    host = 192.168.1.98   source = udp:9191   sourcetype = log2metrics_keyvalue
>  1/24/23           Jan 24 09:06:38 192.168.1.98 Jan 24 09:06:38 macOS softwareupdated[349]: SUOSUPowerEventObserver: System will sleep
   9:06:38.000 AM    host = 192.168.1.98   source = udp:9191   sourcetype = log2metrics_keyvalue
>  1/24/23           Jan 24 09:06:38 192.168.1.98 Jan 24 09:06:38 macOS SoftwareUpdateNotificationManager[845]: SUOSUPowerEventObserver: System will sleep
   9:06:38.000 AM    host = 192.168.1.98   source = udp:9191   sourcetype = log2metrics_keyvalue
```

6. Installing snort and adding logs to Splunk

Snort is an IPS/IDS tool. So with snort we can monitor and drop/reject traffic based on rules.
Snort is very easy to install and configure on ubuntu.

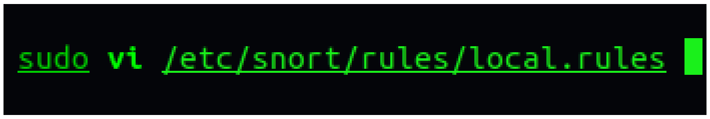


```
sudo apt install snort
```

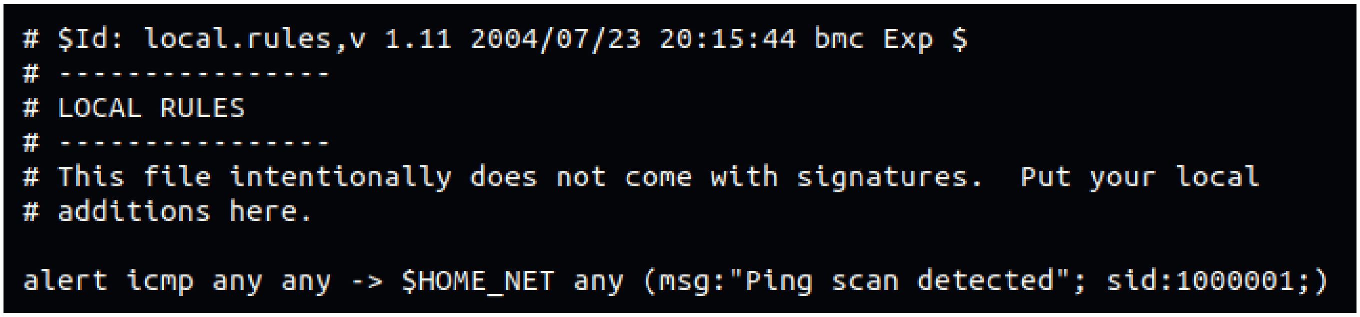
We will be asked to enter with CIDR notation the address of our local network.

After that we can start to use snort!

The snort logs are stored on **/var/log/snort** and the rules are stored on **/etc/snort/rules**. Let's create a rule to detect ping scans.



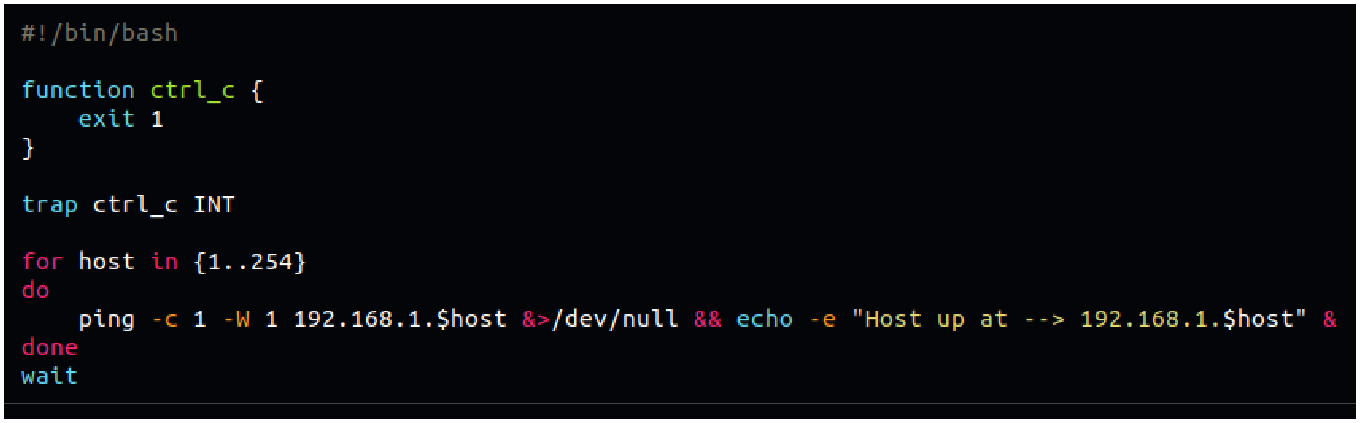
```
sudo vi /etc/snort/rules/local.rules
```



```
# $Id: local.rules,v 1.11 2004/07/23 20:15:44 bmc Exp $
# ----------------
# LOCAL RULES
# ----------------
# This file intentionally does not come with signatures.  Put your local
# additions here.

alert icmp any any -> $HOME_NET any (msg:"Ping scan detected"; sid:1000001;)
```

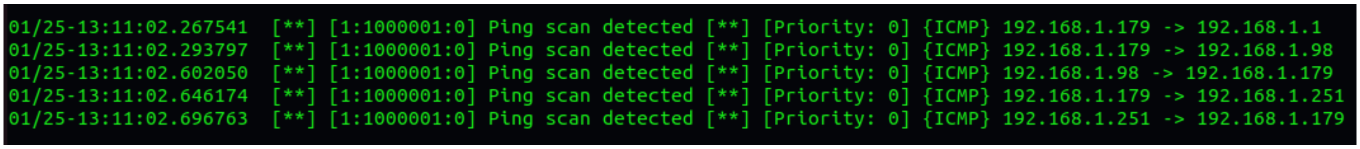
So the rule sets the action to alert, when using the ICMP protocol from any source to the LAN, and will display the message "Ping scan detected". The sid is a rule number identifier. We are using the number 1.000.001 because the numbers below 1.000.001 are reserved for installed rules from different vendors. So if we install some more rules we do not have an sid conflict between the rules. We need to restart the snort service for the changes to be applied.

Now we can use a tool like nmap to perform a ping scan to the whole network or we can create an easy script for this purpose



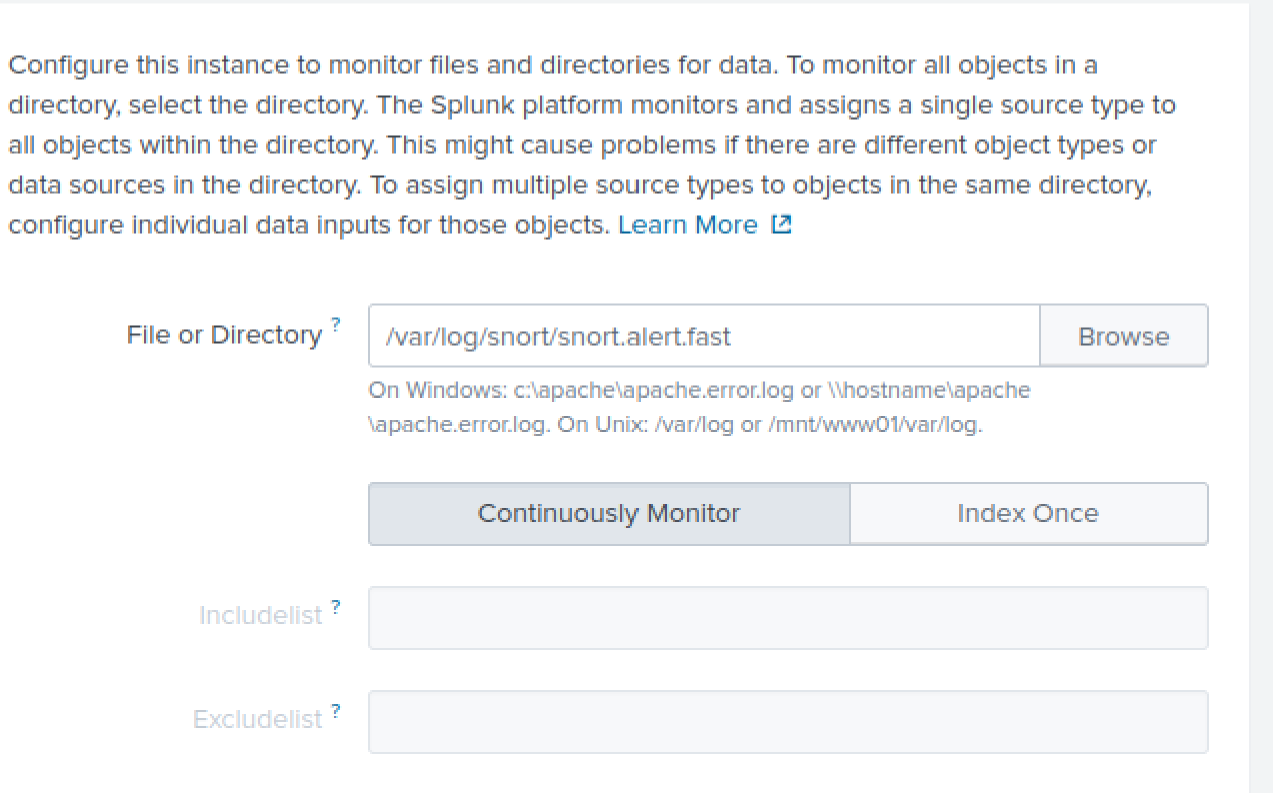
```
#!/bin/bash

function ctrl_c {
    exit 1
}

trap ctrl_c INT

for host in {1..254}
do
    ping -c 1 -W 1 192.168.1.$host &>/dev/null && echo -e "Host up at --> 192.168.1.$host" &
done
wait
```

Let's run it and see how the logs look like!



```
01/25-13:11:02.267541  [**] [1:1000001:0] Ping scan detected [**] [Priority: 0] {ICMP} 192.168.1.179 -> 192.168.1.1
01/25-13:11:02.293797  [**] [1:1000001:0] Ping scan detected [**] [Priority: 0] {ICMP} 192.168.1.179 -> 192.168.1.98
01/25-13:11:02.602050  [**] [1:1000001:0] Ping scan detected [**] [Priority: 0] {ICMP} 192.168.1.98 -> 192.168.1.179
01/25-13:11:02.646174  [**] [1:1000001:0] Ping scan detected [**] [Priority: 0] {ICMP} 192.168.1.179 -> 192.168.1.251
01/25-13:11:02.696763  [**] [1:1000001:0] Ping scan detected [**] [Priority: 0] {ICMP} 192.168.1.251 -> 192.168.1.179
```

Nice, now lets add this data to our Splunk SIEM!
In this case I will add the logs to splunk in a different way. I am going to monitor this file **snort.alert.fast** with splunk.



Configure this instance to monitor files and directories for data. To monitor all objects in a directory, select the directory. The Splunk platform monitors and assigns a single source type to all objects within the directory. This might cause problems if there are different object types or data sources in the directory. To assign multiple source types to objects in the same directory, configure individual data inputs for those objects. Learn More

File or Directory ? /var/log/snort/snort.alert.fast

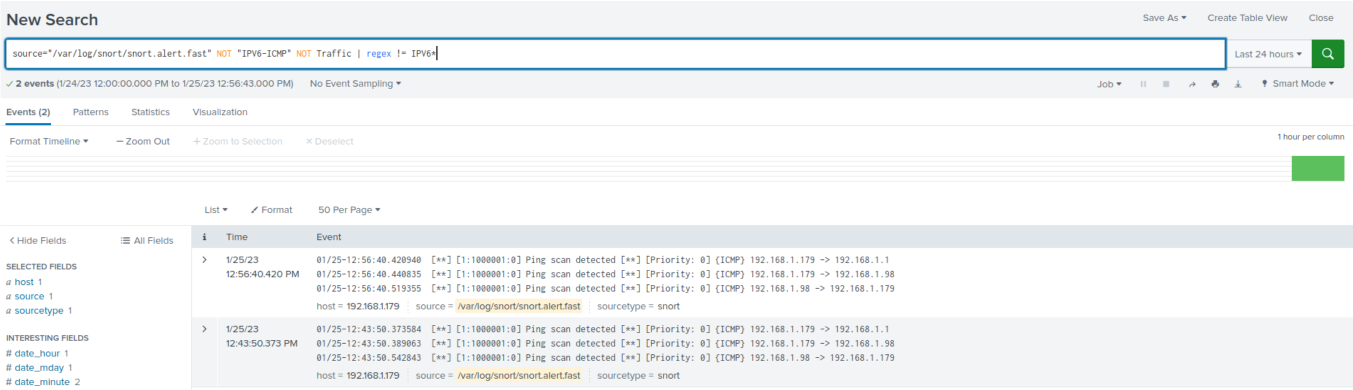
On Windows: c:\apache\apache.error.log or \\hostname\apache\apache.error.log. On Unix: /var/log or /mnt/www01/var/log.

Continuously Monitor

Includelist ?

Excludelist ?

Now we have the snort logs on Splunk!



New Search

```
source="/var/log/snort/snort.alert.fast" NOT "IPV6-ICMP" NOT Traffic | regex != IPV6*
```

Last 24 hours

✓ 2 events (1/24/23 12:00:00.000 PM to 1/25/23 12:56:43.000 PM)   No Event Sampling

Events (2)

1 hour per column

Time	Event
1/25/23 12:56:40.420 PM	01/25-12:56:40.420940 [**] [1:1000001:0] Ping scan detected [**] [Priority: 0] {ICMP} 192.168.1.179 -> 192.168.1.1 01/25-12:56:40.440835 [**] [1:1000001:0] Ping scan detected [**] [Priority: 0] {ICMP} 192.168.1.179 -> 192.168.1.98 01/25-12:56:40.519355 [**] [1:1000001:0] Ping scan detected [**] [Priority: 0] {ICMP} 192.168.1.98 -> 192.168.1.179 host = 192.168.1.179 source = /var/log/snort/snort.alert.fast sourcetype = snort
1/25/23 12:43:50.373 PM	01/25-12:43:50.373584 [**] [1:1000001:0] Ping scan detected [**] [Priority: 0] {ICMP} 192.168.1.179 -> 192.168.1.1 01/25-12:43:50.389063 [**] [1:1000001:0] Ping scan detected [**] [Priority: 0] {ICMP} 192.168.1.179 -> 192.168.1.98 01/25-12:43:50.542843 [**] [1:1000001:0] Ping scan detected [**] [Priority: 0] {ICMP} 192.168.1.98 -> 192.168.1.179 host = 192.168.1.179 source = /var/log/snort/snort.alert.fast sourcetype = snort

SELECTED FIELDS
a host 1
a source 1
a sourcetype 1

INTERESTING FIELDS
# date_hour 1
# date_mday 1
# date_minute 2