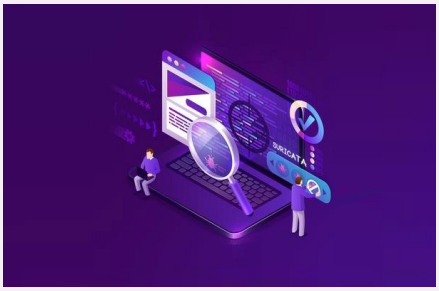
Suricata NSM: More than an IDS Cheat Sheet

by mN3m0N1c (g33k247) via cheatography.com/163410/cs/34239/

Network Security Monitoring with Suricata



Getting Started

- Easy to deploy in just a few steps
- Purpose built to do 1 thing well
- Installs easily on your favorite platform
- Configurable to your network architecture
- Write/Tune/Update/Delete your rules
- Export/forward data to a SIEM (e.g., Splunk)

Building Suricata from Source

```
$ tar xzvf suricata-6.0.0.tar.gz
$ cd suricata-6.0.0
$ ./configure
$ make && sudo make install
```

Installing Suricata from a Repository

```
$ sudo add-apt-repository ppa:oisf/suricata-stable
$ sudo apt update
$ sudo apt install suricata jq
$ sudo suricata --build-info
$ sudo systemctl status suricata
$ sudo vim /etc/suricata/suricata.yaml
$ sudo systemctl restart suricata
```

Checking the Suricata Configuration

```
$ suricata --build-info|grep -A 3 '\-\-prefix'
$ suricata --dump-config
$ suricata --list-app-layer-protos
```

Running Suricata in IDS or IPS Mode

```
$ sudo vim /etc/suricata/suricata.yaml
#LISTENMODE=af-packet #IDS[1]
#LISTENMODE=nfqueue #IPS[1]
```

[1] Remove # to activate mode (default: IDS).

Suricata File Locations

```
/etc/suricata/classification.config #class-types
/etc/suricata/rules #files end in .rules
/etc/suricata/rules/custom.rules #local rules
/etc/suricata/suricata.yaml #config file
/etc/suricata/threshold.config #limit firing
/etc/suricata/variables.config #local defined
```

Suricata Monitoring (/var/log/suricata)

```
$ tail -f /var/log/suricata/fast.log (alerts)
$ tail -f /var/log/suricata/http.log (http requests)
$ tail -f /var/log/suricata/suricata.log (changes)
$ tail -f /var/log/suricata/stats.log (counters)
```

Suricata Monitoring (JSON Log)

```
$ jq 'select(.event_type=="alert")' /var/log/-suricata/eve.json #watch all alerts fire
$ jq 'select(.alert .signature_id==2100498)' /var/log/suricata/eve.json #specific alert fire
$ jq 'select(.event_type=="stats")' /var/log/-suricata/eve.json #monitor statistics
$ jq 'select(.event_type=="stats")|.stats.c-apture.kernel_packets' /var/log/suricata/-eve.json #kernel stats
```

Troubleshooting Suricata

```
$ sudo suricata -c /etc/suricata/suricat-a.yaml -T -vvv #check config/look for <Notice> - Configuration provided was successfully loaded. Exiting. in the output
$ sudo systemctl restart suricata #restart
```

Troubleshooting Suricata (cont)

```
$ sudo systemctl status -l suricata #status
$ grep -Ril <SID#> #get flagged SID in rules
```

[ERRCODE: SC_ERR_CONF_YAML_ER-ROR(242)] - App-Layer protocol sip enable status not set (Enable in suricata.yaml app-layer stanza)

Writing Suricata Rules

- Target the vulnerability, not the exploit
- Target activity outside normal hours
- Target to eliminate traffic of no interest
- Target IP ranges based on your network
- Target unusual conns, ports/protocols
- Test, tune, and validate!

Rules Protocols (Basic)

icmp	ip[1]
tcp	udp

[1] ip stands for 'all' or 'any'

Rules Protocols (Application Layer)

dcerpc	dhcp	dnp3[1]	dns
enip[1]	ftp	http	http2
ikev2	imap	krb5	modbus*
nfs	ntp	rfb	rdp
sip	smb	smtp	snmp
ssh	tftp	tls (incl ssl)	

[1] disabled by default

Suricata Rules: The 3 Elements of a Rule

- **action** (what happens on a rule match)
- **header** (protocol, address, port, direction)
- **options** (specifics of the rule)

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Element #1: Rule Actions

- **Alert** generates an alert for later analysis
- **Pass** stops scanning, allows packet to pass, no alert
- **Drop** (IPS) stops processing/creates alert
- **Reject** (IPS) rst sent, matching packet dropped
- **Rejectsrc** same as just reject
- **Rejectdst** send RST/ICMP error packet to receiver of the matching packet
- **Rejectboth** send RST/ICMP error packets to both sides of the conversation

Element #2: Rule Headers

<proto><src_ip><port> -> <dst_ip><port>

- ip any any -> any any
- tcp $EXTERNAL_NET any -> 10.200.0.0/24 80
- ssh any any -> 203.0.113.0/24 !2
- tcp $EXTERNAL_NET any -> $HOME_NET 80
- source -> destination
- source <> destination (both directions)

Element #3: Rule Options

- arguments contain options/keyword modifiers
- match in packet, classify rule, log custom messages
- separated by ";" (may use *key: value* format)

Rule Classtypes

- categorizes traffic: **config classification:-shortname,short description,priority**
- 3 fields (machine readable name, description, priority): **config classification: bad-unknown,Potentially Bad Traffic, 2**

Rule Priority

- implicit priority assigned by **classtype** in /etc/suricata/classification.config
- to override classtype default priority add the **priority:n** option to a signature (where n is 1 to 255)

Rule Reference Keyword

- find more info/links (Do NOT put http:// into reference string, assumed with url)
- use to tag CVE **reference:cve,2014-0160;** or MITRE T-Codes **reference:tcode,1194;**

Rule Numbering (SID Allocation)

- 1000000-1999999 Custom
- 2000000-2099999 Emerging Threats (ET)
- 2100000-2103999 Forked Snort GPL
- 2200000-2200999 Decoder events
- 2210000-2210999 Stream events
- 2220000-2299999 Reserved
- 2800000-2899999 ET Pro (subscrip. only)
- 2400000-2528999 Dynamically updated

Note: Signature ID (SID) provided as last keyword (or second-to-last if a rev # included) in the rule

Example Rule for ICMP Ping

alert icmp any any -> any any (msg:"PING detected"; sid:2; rev:1;)

Example Rule for HTTP GET Request

alert http $HOME_NET any -> $EXTERNAL_NET any (msg:"HTTP GET Request Containing Rule in URI"; flow:established,to_server; http.method; content:"GET"; http.uri; content:"rule"; fast_pattern; classtype:bad-unknown; sid:123; rev:1;)

Reloading Rules

$ sudo systemctl restart suricata

$ sudo kill -USR1 $(pidof suricata)[1]

$ sudo suricatasc -c reload-rules[2]

[1] When enabled in suricata.yaml (preferred)
[2] When using the Unix socket feature

Triggering Rules (Testing)

$ curl http://testmynids.org/uid/index.html
$ grep 2100498 /var/log/suricata/fast.log

Thresholding Rules (Criteria)

- Limit to 1 alert every 60 seconds for sid #2404000: **threshold gen_id 1, sig_id 2404000, type threshold, track by_dst, count 1, seconds 60**
- Limit to 10 alerts every 60 seconds for each *source* host: **threshold gen_id 0, sig_id 0, type threshold, track by_src, count 10, seconds 60**

Suppressing Rules (Traffic)

- suppress to ensure no alerts are generated (suppression only considered post-matching): **suppress gen_id 0, sig_id 0, track by_src, ip 1.2.3.4**

Offline Processing

- Read pcap files just like network traffic

$ sudo suricata -c /etc/suricata/suricata.yaml -r <pcap_location> -l <where to log results>^1

$ tail -f /var/log/suricata/fast.log

[1] *Same directory as pcap file if -l not used*

Learn More

ET Rulesets	Suricata Docs
ET Rule Changes	Suricata User Guide
ET Rule SID Lookup	User Agent Strings
Oinkmaster	Talos VRT Rules
Snorpy Generator	YouTube Playlist
Suricata Config File	

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