STAMUS NETWORKS

Suricata Language Server

Botconf 2023

About Me

Stamus Networks

- Co Founder
- CTO

Social Media

- @regiteric on Twitter (#jesors)
- https://www.linkedin.com/in/ericleblond/

Open Source and Security

- Suricata
  - Developer
  - Board member of OISF
- Netfilter
  - “Emeritus” core team member

Writing Suricata Signatures

Bringing you own intelligence to threat intelligence

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Writing Suricata Signatures

Some dare to say out loud what people are thinking quietly

Suricata Signature examples

Method Observed Malicious SSL Cert (Bazar Backdoor) / 1002032313

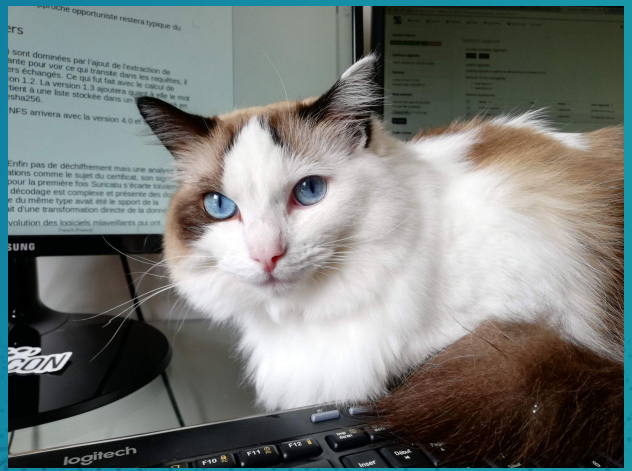
```
alert tls $EXTERNAL_NET any -> $HOME_NET any (msg:"Observed Malicious SSL Cert (Bazar Backdoor)"; flow:established,to_client; tls.cert_subject; content:"C=KZ, ST=Astana, L=Astana, O=NN Fern, OU=KZ System, CN=forenzik.kz"; bsize:66; fast_pattern; reference:url,twitter.com/z0ul_/status/1374121916143919106; reference:md5,4cf6fb8514073319e7759b4f66d13f08; classtype:domain-c2; sid:1002032313; gid:2; rev:1; metadata:attack_target Client_and_Server, created_at 2021_03_23, deployment Perimeter, former_category MALWARE, performance_impact Low, signature_severity Major, tag SSL_Malicious_Cert, updated_at 2021_03_23, mitre_tactic_id TA0042, mitre_tactic_name Resource_Development, mitre_technique_id T1587, mitre_technique_name Develop_Capabilities;)
```

Process of signatures writing

- Writing Suricata Signatures can be a nightmare:
  - Syntax inherited from Snort
  - With important evolution
- It is a repetitive process:
  - Write a signature
  - Check syntax
  - Check it is matching
  - Refine the signature
  - Check performance
  - Refine the signature

Suricata Language Server

By a lazy one, for the lazy ones



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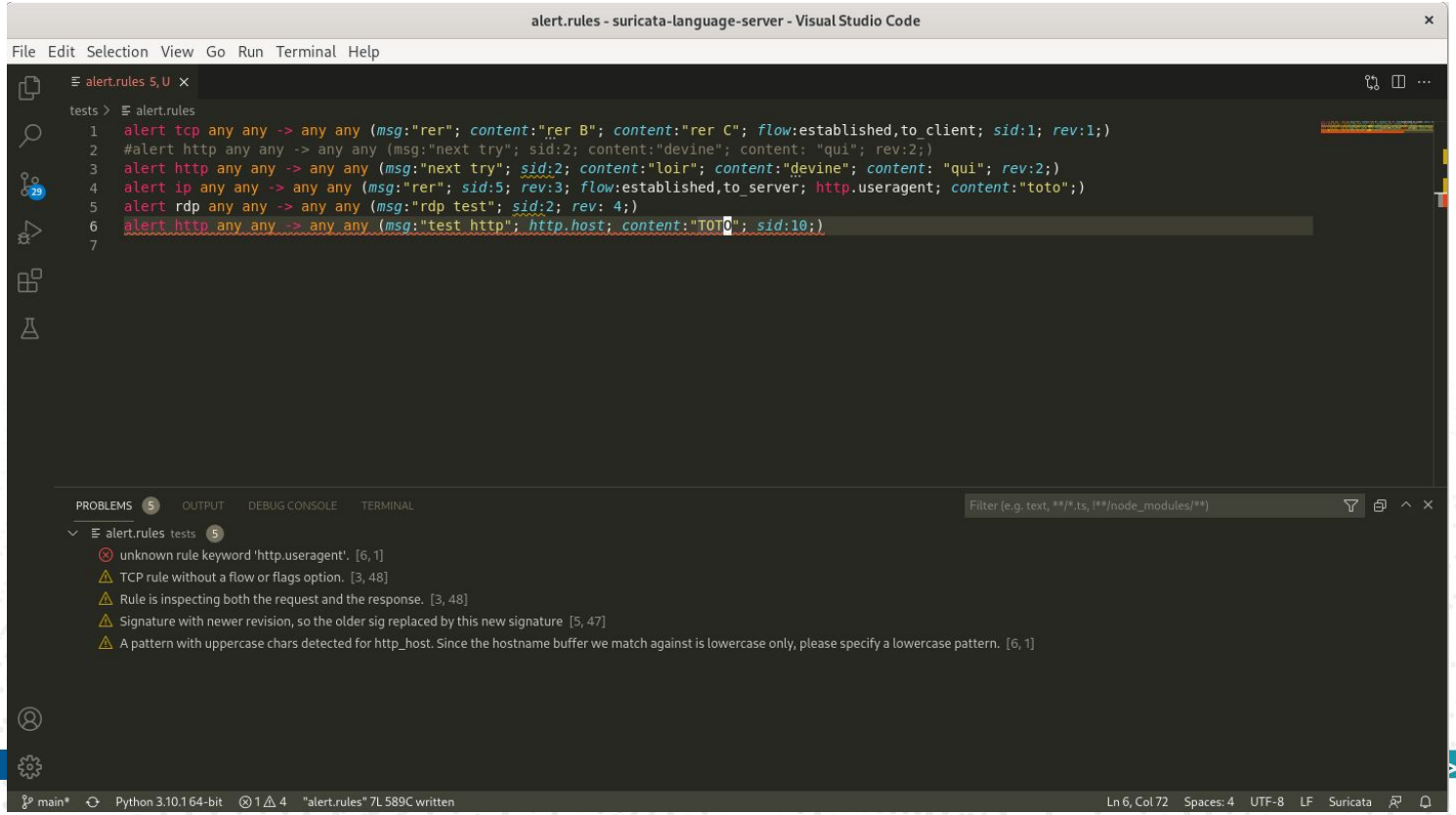
Excuse my French ? Language Server ?

- Language Server Protocol
  - Standardize communication between IDE/Text Editor and Language Server
  - Via JSON RPC
- Features
  - Auto complete
  - Go to definition
  - Find all references
  - Warnings
- More information:
  - https://microsoft.github.io/language-server-protocol/

Suricata Language Server

- A language server for Suricata signature
- Will get you
    - Syntax checking
    - Performance hints
        - Rule optimization
        - Detection engine optimization (fast pattern)
    - Auto completion
- In your preferred editors
- Tested with:
    - Visual Studio Code
    - Neovim
    - Kate
    - Sublime Text 3

VS Code


alert.rules - suricata-language-server - Visual Studio Code
File Edit Selection View Go Run Terminal Help
alert.rules 5, U
tests > alert.rules
1 alert tcp any any -> any any (msg:"rer"; content:"rer B"; content:"rer C"; flow:established,to_client; sid:1; rev:1;)
2 #alert http any any -> any any (msg:"next try"; sid:2; content:"devine"; content: "qui"; rev:2;)
3 alert http any any -> any any (msg:"next try"; sid:2; content:"loir"; content:"devine"; content: "qui"; rev:2;)
4 alert ip any any -> any any (msg:"rer"; sid:5; rev:3; flow:established,to_server; http.useragent; content:"toto";)
5 alert rdp any any -> any any (msg:"rdp test"; sid:2; rev: 4;)
6 alert http any any -> any any (msg:"test http"; http.host; content:"TOTO"; sid:10;)
7
PROBLEMS 5 OUTPUT DEBUG CONSOLE TERMINAL
Filter (e.g. text, **/*.ts, !**/node_modules/**)
alert.rules tests 5
unknown rule keyword 'http.useragent'. [6, 1]
TCP rule without a flow or flags option. [3, 48]
Rule is inspecting both the request and the response. [3, 48]
Signature with newer revision, so the older sig replaced by this new signature [5, 47]
A pattern with uppercase chars detected for http_host. Since the hostname buffer we match against is lowercase only, please specify a lowercase pattern. [6, 1]
main* Python 3.10.1 64-bit 1 4 "alert.rules" 7L 589C written
Ln 6, Col 72 Spaces: 4 UTF-8 LF Suricata

Neovim


1., alert.rules (6) ●
1 alert tcp any any → any any (msg:"rer"; content:"rer B"; content:"rer C"; flow:established,to_client; sid:1; rev:1;)
2 #alert http any any → any any (msg:"next try"; sid:2; content:"devine"; content: "qui"; rev:2;)
3 alert http any any → any any (msg:"next try"; sid:2; http.us content:"loir"; content:"devine"; content: "qui"; rev:2;)
Sticky Buffer
http.user_agent Keyword
er; http.user_agent; content:"TOTO";)
rev: 4;) ■ Signature with newer revision, so the older sig replace
sticky buffer to match specifically and only on the
HTTP User Agent buffer
[Documentation](https://suricata.readthedocs.io/en/
latest/rules/http-keywords.html#http-user-agent)

More info

- Suricata Language Server:
  - https://github.com/StamusNetworks/suricata-language-server
  - VS Code plugin: Suricata Intellisense
- Suricata Language Server webinar: https://www.stamus-networks.com/suricata-language-server
- Suricata for Analysts book: https://www.stamus-networks.com/suricata-4-analysts
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