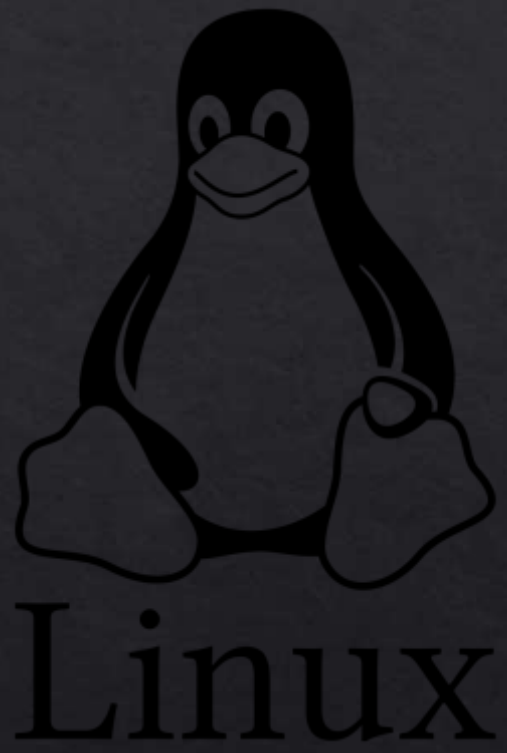
HUNTER PENGUIN

NO REST FOR BAD GUYS

01/12/2021

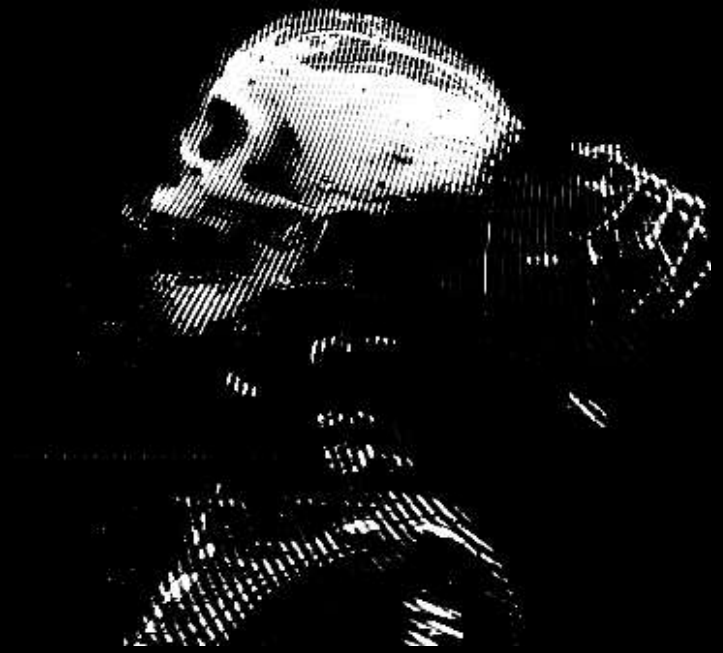
Hacker Club - Beco do Exploit



BECO DO EXPLOIT

FIAP

BECO DO EXPLOIT



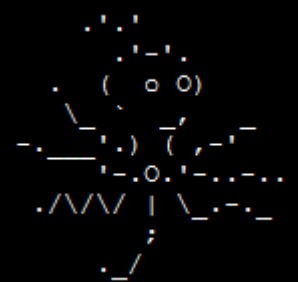
PROJECT OCT0PS

Fundador: C41Tx90 - Victor de Queiroz

Inicio do projeto: 03/09/2021

Proposta de Assuntos para a Seleção:

- [-] Binary Exploitation
- [-] Windows Internals
- [-] Kernel Linux
- [-] Reverse Engineering
- [-] Mobile Security
- [-] WEB Security
- [-] Wireless
- [-] IoT
- [-] ICS
- [-] Malware
- [-] Network/telecom
- [-] Cloud
- [-] Análise de Memória
- [-] Anti-Forense
- [-] OSINT
- [-] Exfiltração de Dados
- [-] Obfuscação
- [-] Criptografia
- [-] Esteganografia
- [-] Anonimato

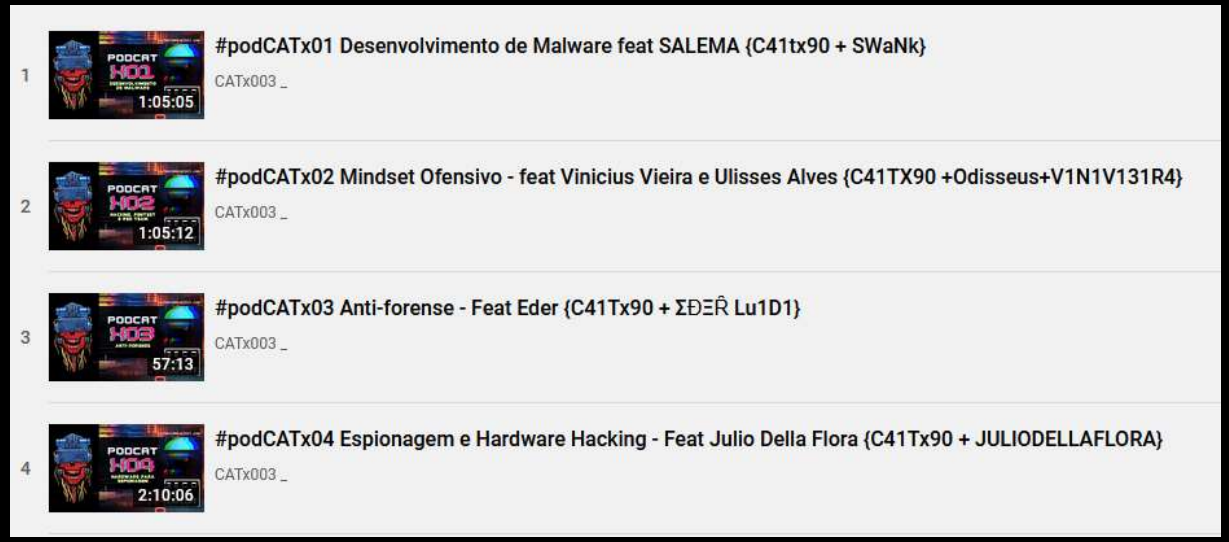


https://becodoexploit.com/ProjectOct0PS.html

DESAFIO – 30 MÁQUINAS EM 30 DIAS

- 0x02 Edições

PODCAT



https://www.youtube.com/c/CATx003/

BECO DO EXPLOIT

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EMAIL

contato@becodoexploit.com

TELEGRAM

t.me/becodoxpl

HTTPS://T.ME/BECODOXPL

SEXTA HACK NO BECO

/*TODA SEXTA*\

BECO DO EXPLOIT

TODA SEXTA AS 24H OU SABADO AS OOH , VOCÊ QUEM MANDA.

TRAGA SUA BEBIDA

VENHA JOGAR UM CTF OU BATER UM PAPO OU QUALQUER COISA QUE ESTIVER ROLANDO...

COMEÇA AS OOH

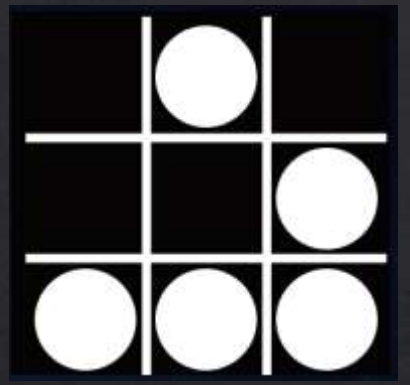
$ CAT .AGENDA

- Disclaimer && whoami && objetivo
- Contexto
- Filesystem Hierarchy Standard
- Gerenciamento e Processamento de logs;
- A linguagem dos daemons (Serviços);
- Buscando Anomalias;
  - Anomalias no FileSystem, how detect and evade
  - Anomalias em arquivos de log: Detectando ataques
  - Padrão em arquivos
- Automação do processo (IDS, IPS)
- The next level
- Time to play

./DISCLAIMER

- I don’t speak on behalf of my employer.
- All the ideas and information presented here are from myself.
- All the external documents, images and papers referenced here will be linked on “References”, a big thanks for the security professionals and they researches.
- I do not take any responsibility for the usage of this documentation for improper ends.

MORE ~/.PROFILE



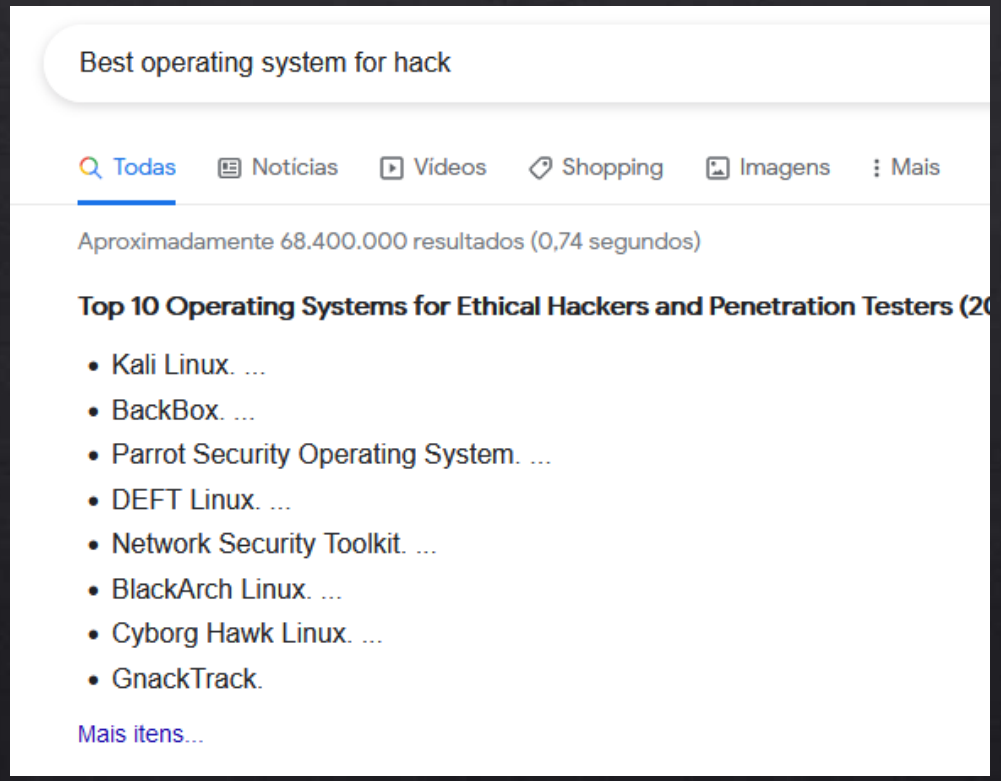
- Real Name: Felippe Foppa
- Area de atuação: Redteamer, Pentester and Security Researcher
- Current Role: Especialista de Segurança Ofensiva na GlobalHitss
- Certifications: LPI1, LPI2, OSCP, CRTP, eWPTXv2, ISO27k, ITILv4
- CVE's: 2021-39375, 2021-39376
- Blog: https://diesec.home.blog/
- Linkedin: https://www.linkedin.com/in/felippe-foppa-6b1434108/
- Github: https://github.com/d34dfr4m3
- Material da Palestra vai ser compartilhado em:
  - https://github.com/d34dfr4m3/Contributions/

echo $OBJETIVO

- Essa talk não tem como objetivo aprofundar em temas de auditoria de ambientes Linux, resposta à incidente, forense ou threat hunting.
- A expectativa, é que no pouco tempo de duração de agenda, os participantes obtenham os insumos necessários para entender alguns aspectos de serviços, o papel dos logs, buscar por anomalias que podem revelar potenciais ameaças e melhores práticas de escalabilidade do processo de monitoramento/auditoria.
- Vendor Free!
- Distro Free!

Contexto

Porque Linux é relevante?



Nota Importante: Linux não é vírus free....

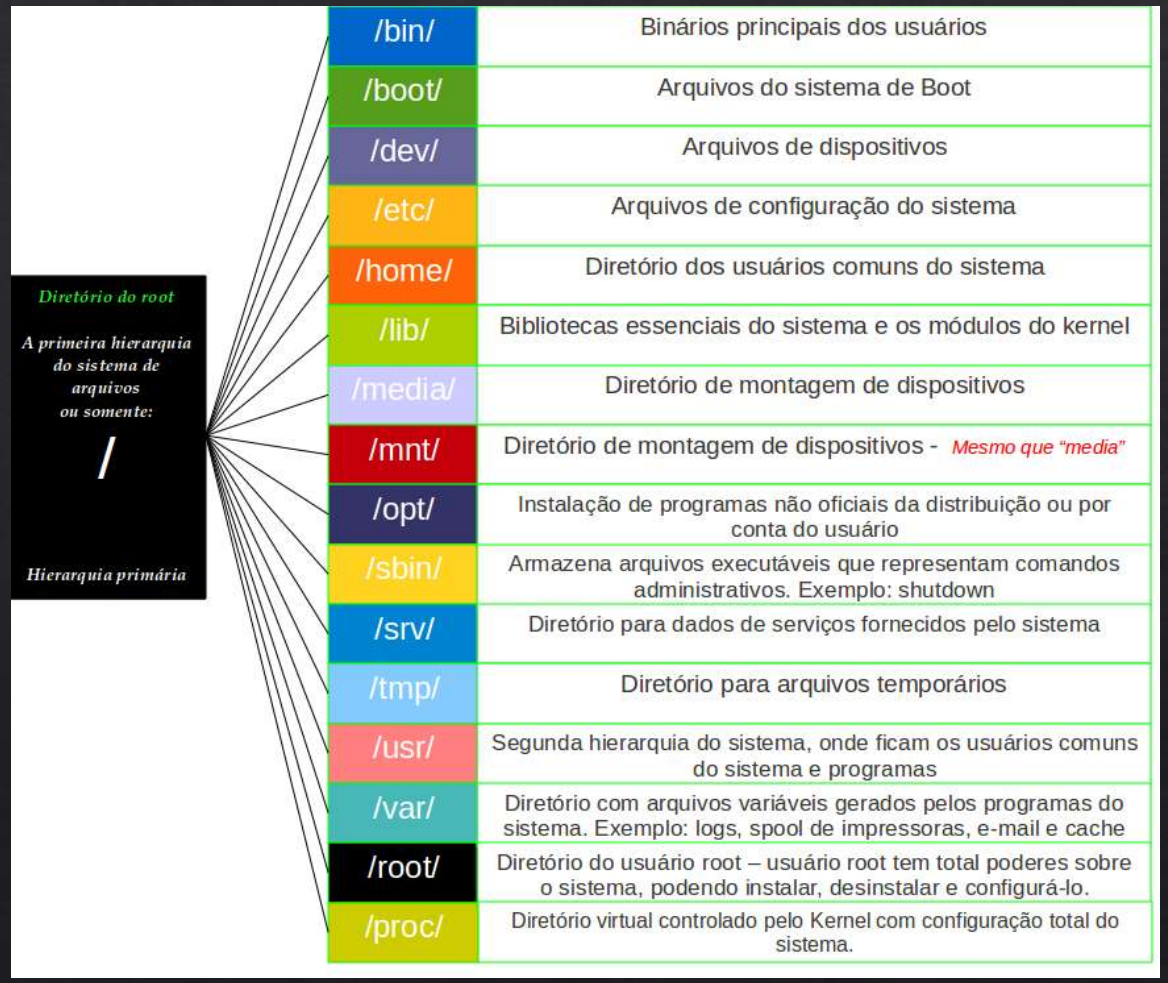
https://www.quickstart.com/blog/why-linux-runs-90-percent-of-the-public-cloud-workload/

FILESYSTEM HIERARCHY STANDARD

Visão Geral

Filesystem Hierarchy Standard

- O Filesystem Hierarchy Standard (padrão para sistema de arquivos hierárquico), ou FHS**, define os principais diretórios, e o seu conteúdo, em um sistema operacional** Linux ou do tipo Unix. A versão atual é a 3.0, anunciada em 3 de junho de 2015
- O FHS é mantido pela **Linux Foundation,** uma organização sem fins lucrativos formada por importantes empresas de hardware e software, como HP, Red Hat, IBM e Dell.
- Ainda hoje, algumas maioria das distribuições Linux, incluindo membros da Linux Foundation, não adotam o padrão proposto. Em particular, diretórios (paths) criados pelo FHS, como o /srv/, não foram adotados em grande escala. Alguns sistemas Unix e Linux rompem com o padrão FH.
- https://pt.wikipedia.org/wiki/Filesystem_Hierarchy_Standard



https://samthngs.files.wordpress.com/2017/11/hierarquia_linux.png

Gerenciamento de log

Visão Geral

Logs everwhere

- Os logs do Linux fornecem uma linha de tempo dos eventos para o kernel Linux, aplicativos e sistema e são uma valiosa ferramenta de solução de problemas quando você encontra problemas. Essencialmente, a análise de arquivos de log é a primeira coisa que um administrador precisa fazer quando um problema é descoberto.
- Para problemas específicos do aplicativo da área de trabalho, os arquivos de log são escritos em locais diferentes. Por exemplo, o Chrome grava relatórios de falhas em '~/.chrome/Crash Reports'.
- Os arquivos são armazenados em texto simples e podem ser encontrados no diretório /var/log e subdiretório. Existem logs do Linux para tudo (que tenha minimo de boas práticas): sistema, kernel, gerenciadores de pacotes, processos de inicialização, Xorg, Apache, MySQL.

Linux log Files and Usage

- /var/log/messages : General message and system related stuff
- /var/log/auth.log : Authenication logs
- /var/log/kern.log : Kernel logs
- /var/log/cron.log : Crond logs (cron job)
- /var/log/maillog : Mail server logs
- /var/log/qmail/ : Qmail log directory (more files inside this directory)
- /var/log/httpd/ : Apache access and error logs directory
- /var/log/lighttpd/ : Lighttpd access and error logs directory
- /var/log/nginx/ : Nginx access and error logs directory
- /var/log/apt/ : Apt/apt-get command history and logs directory
- /var/log/boot.log : System boot log
- /var/log/mysqld.log : MySQL database server log file
- /var/log/secure or /var/log/auth.log : Authentication log
- /var/log/utmp or /var/log/wtmp : Login records file
- /var/log/yum.log or /var/log/dnf.log: Yum/Dnf command log file.

https://www.cyberciti.biz/faq/linux-log-files-location-and-how-do-i-view-logs-files/

Utilitários de Console

- less command
- more command
- cat command
- grep command
- tail command
- zcat command
  - Arquivos comprimimdos em gzip
- zgrep command
  - Procura padrões (regex) em arquivos comprimidos
- zmore command
- dmesg command
- journalctl command

Exemplos

- # less /var/log/messages
- # more -f /var/log/messages
- # cat /var/log/messages
- # tail -f /var/log/messages
- # grep -i error /var/log/messages
- # head –n 10 /var/log/messages
- # tac /var/log/messages | head –n 10

Printing the Linux kernel ring buffer messages

- sudo dmesg
- sudo dmesg | grep 'error'
- sudo dmesg | grep -i -E 'error|warn|failed'
- sudo dmesg | more

How it works, exactly?

- Os **daemons de log do sistema registram as mensagens de saída do kernel (klogd) e sistema (syslogd) nos arquivos em /var/log .**
- Syslogd : Este daemon **controla o registro de logs do sistema**.
- Klogd: **Este daemon controla o registro de mensagens do kernel**. Ele monitora as mensagens do kernel e as envia para o daemon de monitoramento syslogd, por padrão.
- Journalctl: é um core do systemd, portanto, é instalado automaticamente em qualquer sistema operacional usando o systemd. O **Journal fornece registro estruturado e indexado, enquanto fornece um certo grau de compatibilidade** com implementações clássicas de syslog.
- A principal diferença é que o journal, além de outras ferramentas baseadas em syslog é que ele **armazena logs ou mensagens em formato binário**, que não pode ser lido por humanos. Os logs do journal são gerealmente processados pela aplicação journalctl

Log Levels

- Um nível de log ou gravidade de log é uma informação que indica a importância de uma determinada mensagem de log. É uma maneira simples, mas muito poderosa, de distinguir eventos de log entre si. Se os níveis de log forem usados corretamente em seu aplicativo, tudo o que você precisa é examinar primeiro a gravidade. Ele dirá se você pode continuar dormindo durante a noite de plantão ou se precisa pular da cama imediatamente e bater outro recorde pessoal ao correr entre o quarto e o laptop.
- O Syslog surgiu com a ideia dos níveis de criticidade, que agora são definidos no padrão syslog. O Syslog vem com os seguintes níveis de criticidade:
  - Emergency – Sistema inutilizável
  - Alert – Ações devem ser tomadas imediatamente
  - Critical – Condições de operação em níveis críticos
  - Error – Erros não críticos
  - Warning – Condições de alertas que devem ser tratadas.
  - Notice - Nível normal de log, eventos significantes
  - Informational – Informativo, não requer ações
  - Debug – Exibido pelo kernel se for habilitado.

Meet Logger

- Este comando permite enviar uma mensagem nos log do sistema. A mensagem é enviada aos logs via daemon syslogd ou via soquete do sistema, é possível especificar a prioridade, nível, um nome identificando o processo, etc. Seu uso é muito útil em shell scripts ou em outros eventos do sistema.

```
logger -p kern.emerg KERNEL PANIC, DONT LET ME DIE. just kiding bro
```

```
Jan 7 23:06:19 masterslave-dns centos: KERNEL PANIC, DONT LET ME DIE. just kiding bro
```

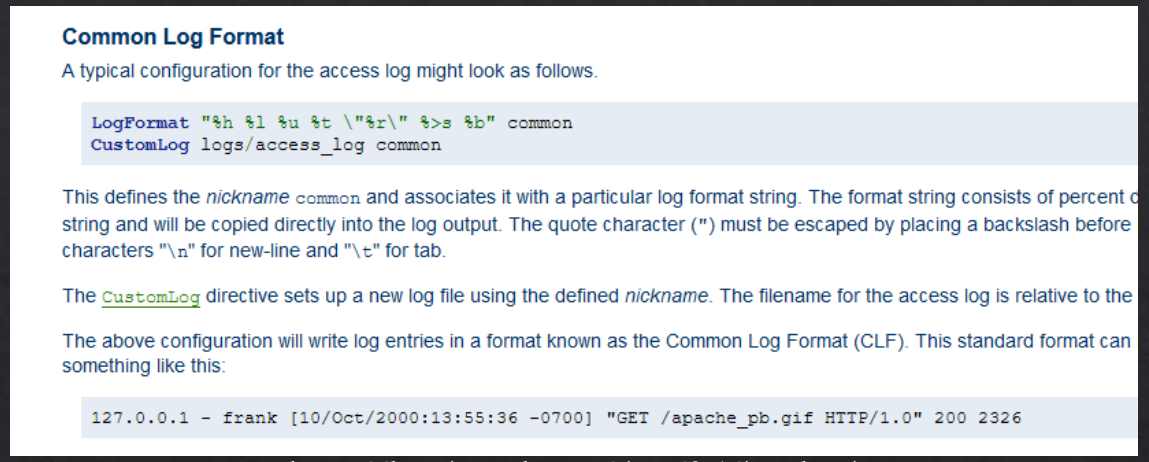
Collateral Effect: Disk usage - Logrotate

- Usado para fazer backups dos logs atuais do sistema (programado via cron, ou outro daemon com a mesma função) e criando novos arquivos de logs que serão usados pelo sistema. Opcionalmente os arquivos de logs antigos serão compactados para diminuir a utilização de espaço em disco ou enviados por e-mail ao administrador. A rotação dos arquivos de logs proporciona maior agilidade quando precisamos encontrar algum detalhe útil (que seria mais difícil de se achar em um arquivo de log de 10MB ou maior).
- /etc/logrotate.conf

Entendendo os Daemons

Apache2 Logs

Apache2 Case



Common Log Format

A typical configuration for the access log might look as follows.

```
LogFormat "%h %l %u %t \"%r\" %>s %b" common
CustomLog logs/access_log common
```

This defines the *nickname* `common` and associates it with a particular log format string. The format string consists of percent d
string and will be copied directly into the log output. The quote character (") must be escaped by placing a backslash before
characters "\n" for new-line and "\t" for tab.

The `CustomLog` directive sets up a new log file using the defined *nickname*. The filename for the access log is relative to the

The above configuration will write log entries in a format known as the Common Log Format (CLF). This standard format can
something like this:

```
127.0.0.1 - frank [10/Oct/2000:13:55:36 -0700] "GET /apache_pb.gif HTTP/1.0" 200 2326
```

https://httpd.apache.org/docs/2.4/logs.html

- 127.0.0.1 (%h) - This is the IP address of the client (remote host)
- (%l) - Identity of the client determined by identd on the clients machine; (Highly unreliable)
- frank (%u) - This is the userid of the person requesting the document as determined by HTTP authentication
- (\"%r\“) – The requesqt
- 200 (%>s) - This is the status code that the server sends back to the client
- 2326 (%b) - The last part indicates the size of the object returned to the client

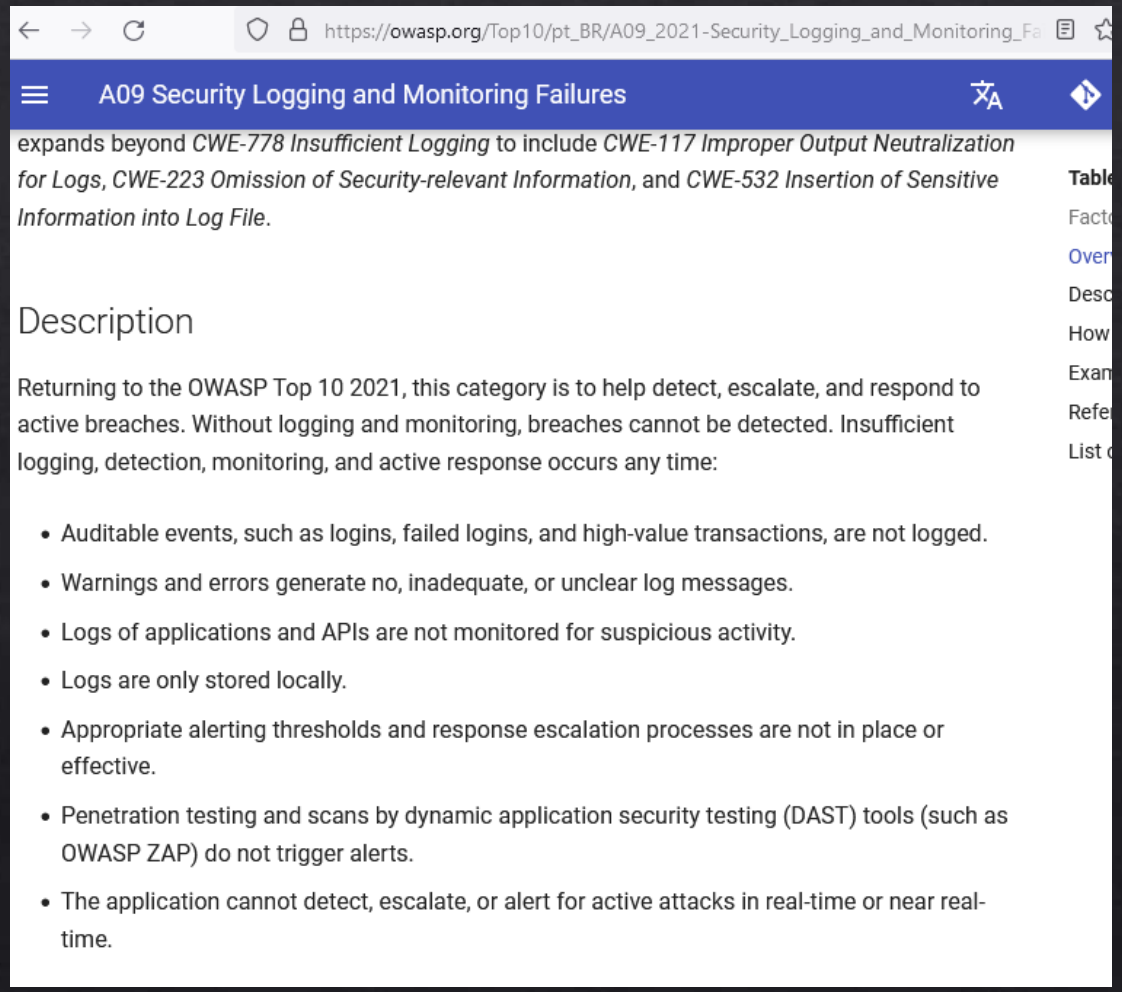
Buscando Anomalias

Daemons e FileSystem

The Pattern Finder

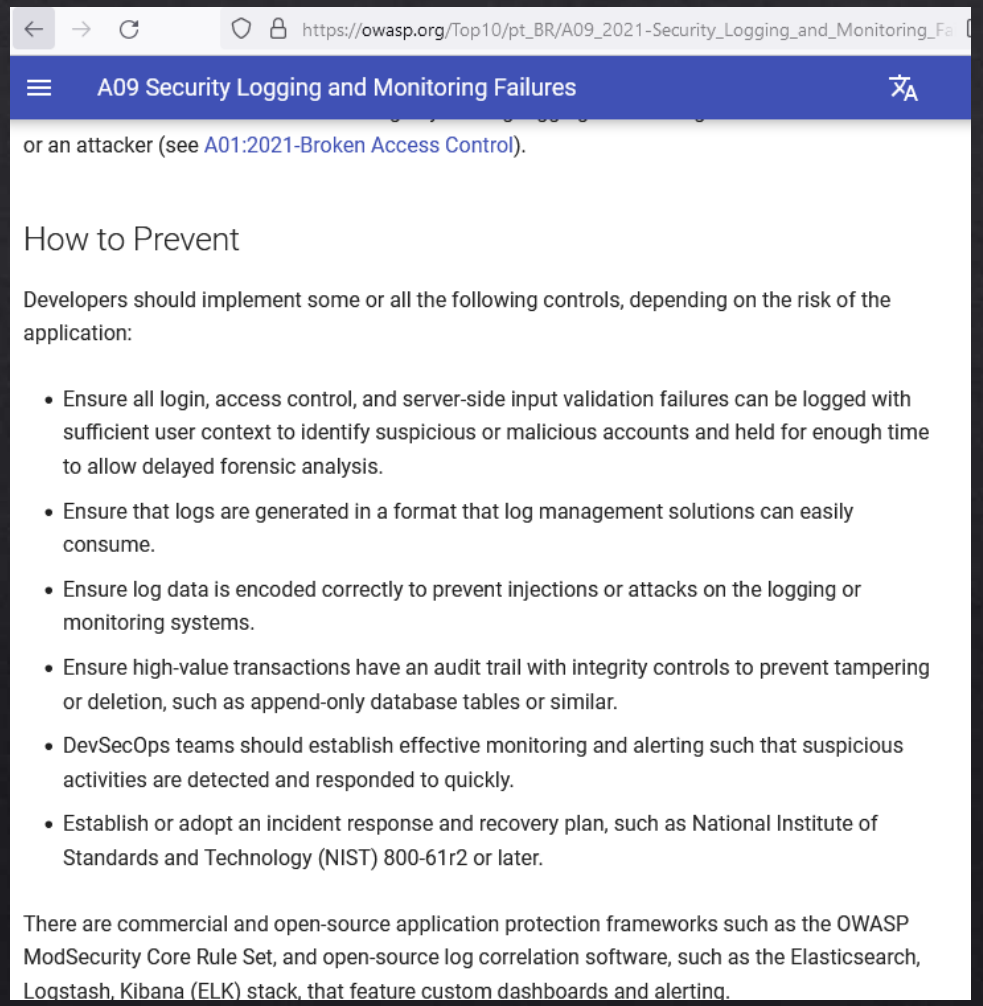
- **A09:2021 – Security Logging and Monitoring Failures**
- Manipulação de arquivos
  - Buscando anomalias em logs, ataques de força bruta de diretórios, tentativas de autenticação etc.
  - Buscando divergência de padrão
  - Utilitários (wc, find,sort, uniq, cut, sed etc)
- Filesystem
  - Caçando alterações no disco, cenário de pós exploração.
  - Utilitários (Stat, touch, find)

A09:2021 – Security Logging and Monitoring Failures



https://owasp.org/Top10/pt_BR/A09_2021-Security_Logging_and_Monitoring_Failures/

A09:2021 – Security Logging and Monitoring Failures



https://owasp.org/Top10/pt_BR/A09_2021-Security_Logging_and_Monitoring_Failures/

HTTP Status Code

https://developer.mozilla.org/pt-BR/docs/Web/HTTP/Status

Apache2 (Web Server) Case – Attack Types

- Negação de Serviço baseado em consumo de recursos;
  - Problema de Frequência de iteração ou CWE-799 (https://cwe.mitre.org/data/definitions/799.html)
- Ataques de força bruta em autenticação de usuários;
  - Frequência de Iteração? Sim, além disso, HTTP STATUS CODE? PICK ONE! 40X? 401? 403?
- Enumeração de Diretórios (Força Bruta);
  - Frequência de Iteração? Sim, além disso? HTTP STATUS CODEE? PICK ONE! GO 3.2.1
- Injeção de SQL (A1:2017) (A3:2021)
  - Frequência de Iteração? Sim, mas não, além disso?
- Cross Site Script (A7:2017) (A3:2021)
  - Answer this question really quick

Apache2 (Web Server) Case - BadRobots?

- Metadados de Ferramentas
- User Agents?!
- Quais anomalias podemos ver?

```
operador@remember:~$ sudo nmap -sS -sV  --script=http-enum.nse 192.168.1.8

Starting Nmap 7.60 ( https://nmap.org ) at 2021-11-30 22:10 -03
Nmap scan report for 192.168.1.8
Host is up (0.0088s latency).
Not shown: 998 closed ports
PORT   STATE SERVICE VERSION
22/tcp open  ssh     OpenSSH 7.6p1 Ubuntu 4ubuntu0.5 (Ubuntu Linux; protocol 2.0)
80/tcp open  http    Apache httpd 2.4.29 ((Ubuntu))
|_http-server-header: Apache/2.4.29 (Ubuntu)
MAC Address: 00:15:5D:42:E1:08 (Microsoft)
Service Info: OS: Linux; CPE: cpe:/o:linux:linux_kernel
```

```
p.org/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /xGB/ HTTP
/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /xml/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nmap.org
/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /XSL/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nmap.org
/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /xtemp/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nmap.o
rg/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /xymon/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nmap.o
rg/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /zb41/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nmap.or
g/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /zipfiles/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nma
p.org/book/nse.html)"
```

Apache2 (Web Server) Case - BadRobots?

- Pelo menos 3?!

```
p.org/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /xGB/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nmap.org
/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /xml/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nmap.org
/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /XSL/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nmap.org
/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /xtemp/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nmap.o
rg/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /xymon/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nmap.o
rg/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /zb41/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nmap.or
g/book/nse.html)"
192.168.1.70 - - [01/Dec/2021:01:11:08 +0000] "GET /zipfiles/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (compatible; Nmap Scripting Engine; https://nma
p.org/book/nse.html)"
```

Apache2 (Web Server) Case - BadRobots?

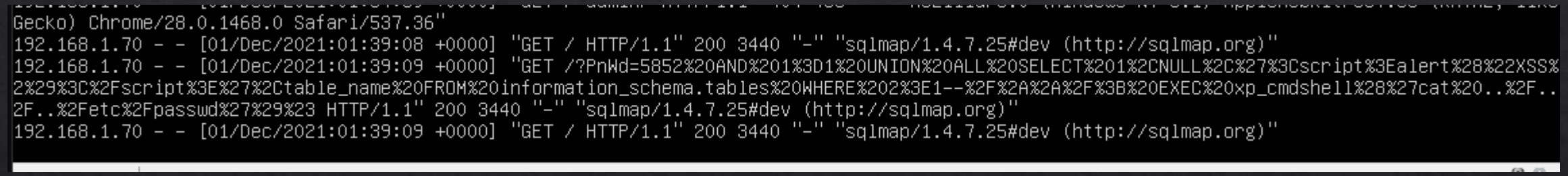
- DirSearch?

```
operador@remember:~$ dirsearch -u http://192.168.1.8 -e

 _|. _ _  _  _  _ _|_    v0.3.8
(_||| _) (/_(_|| (_| )

Extensions: [ | HTTP method: get | Threads: 10 |

Error Log: /opt/dirsearch/logs/errors-21-11-30_22

Target: http://192.168.1.8

[22:34:13] Starting:
[22:34:14] 403 -  276B  - /.hta
[22:34:14] 403 -  276B  - /.ht_wsr.txt
[22:34:14] 403 -  276B  - /.htaccess-dev
[22:34:14] 403 -  276B  - /.htaccess-marco
[22:34:14] 403 -  276B  - /.htaccess-local
[22:34:14] 403 -  276B  - /.htaccess.BAK
[22:34:14] 403 -  276B  - /.htaccess.old
[22:34:14] 403 -  276B  - /.htaccess.bak1
[22:34:14] 403 -  276B  - /.htaccess.orig
[22:34:14] 403 -  276B  - /.htaccess.sample
[22:34:14] 403 -  276B  - /.htaccess.save
[22:34:14] 403 -  276B  - /.htaccess.txt
[22:34:14] 403 -  276B  - /.htaccess_extra
[22:34:14] 403 -  276B  - /.htaccess_orig
[22:34:14] 403 -  276B  - /.htaccess_sc
[22:34:14] 403 -  276B  - /.htaccessBAK
[22:34:14] 403 -  276B  - /.htaccessOLD
[22:34:14] 403 -  276B  - /.htaccessOLD2
[22:34:14] 403 -  276B  - /.htgroup
[22:34:14] 403 -  276B  - /.htpasswd-old
[22:34:14] 403 -  276B  - /.htpasswd_test
[22:34:14] 403 -  276B  - /.htpasswds
[22:34:14] 403 -  276B  - /.htusers
[22:34:28] 200 -   11KB - /index.html
```

```
, like Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /xmlrpc.php HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML, li
ke Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /xmlrpc_server.php HTTP/1.1" 404 488 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KH
TML, like Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /xphpMyAdmin/ HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML,
like Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /xsl/ HTTP/1.1" 404 453 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML, like Gec
ko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /xsl/_common.xsl HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTM
L, like Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /XSQLConfig.xml HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML
, like Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /yaml.log HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML, like
 Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /xsl/common.xsl HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML
, like Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /yaml_cron.log HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML,
 like Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /yonetici HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML, like
 Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /xsql/lib/XSQLConfig.xml HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.
36 (KHTML, like Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /yonetici.html HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML,
 like Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /yonetici.php HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML,
like Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /yonetim HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML, like
Gecko) Chrome/28.0.1468.0 Safari/537.36"
192.168.1.70 - - [01/Dec/2021:01:34:39 +0000] "GET /yonetim.html HTTP/1.1" 404 489 "-" "Mozilla/5.0 (Windows NT 6.1) AppleWebKit/537.36 (KHTML,
like Gecko) Chrome/28.0.1468.0 Safari/537.36"
```

Apache2 (Web Server) Case – SQL Injection?

- Sqlmap?



Apache2 (Web Server) Case – SQL Injection?

- SQL Injection Signatures?

Apache2 (Web Server) Case – SQL Injection?

- GET Parameters Example
- Estou sendo atacado?
  - grep –iE “select|table|union” /var/log/apache2/access.log –color
- Quantas tentativas?
  - wc –l
- E de onde vem?
  - cut –d ‘ ‘ –f 1 | uniq -c

```
root@fiap-linux-websrv:~# grep -iE "select|table|union" /var/log/apache2/access.log  --color | wc -l
102
root@fiap-linux-websrv:~#
```

```
root@fiap-linux-websrv:~# grep -iE "select|table|union" /var/log/apache2/access.log  --color | cut -d ' ' -f 1 | uniq -c
    102 192.168.1.70
```

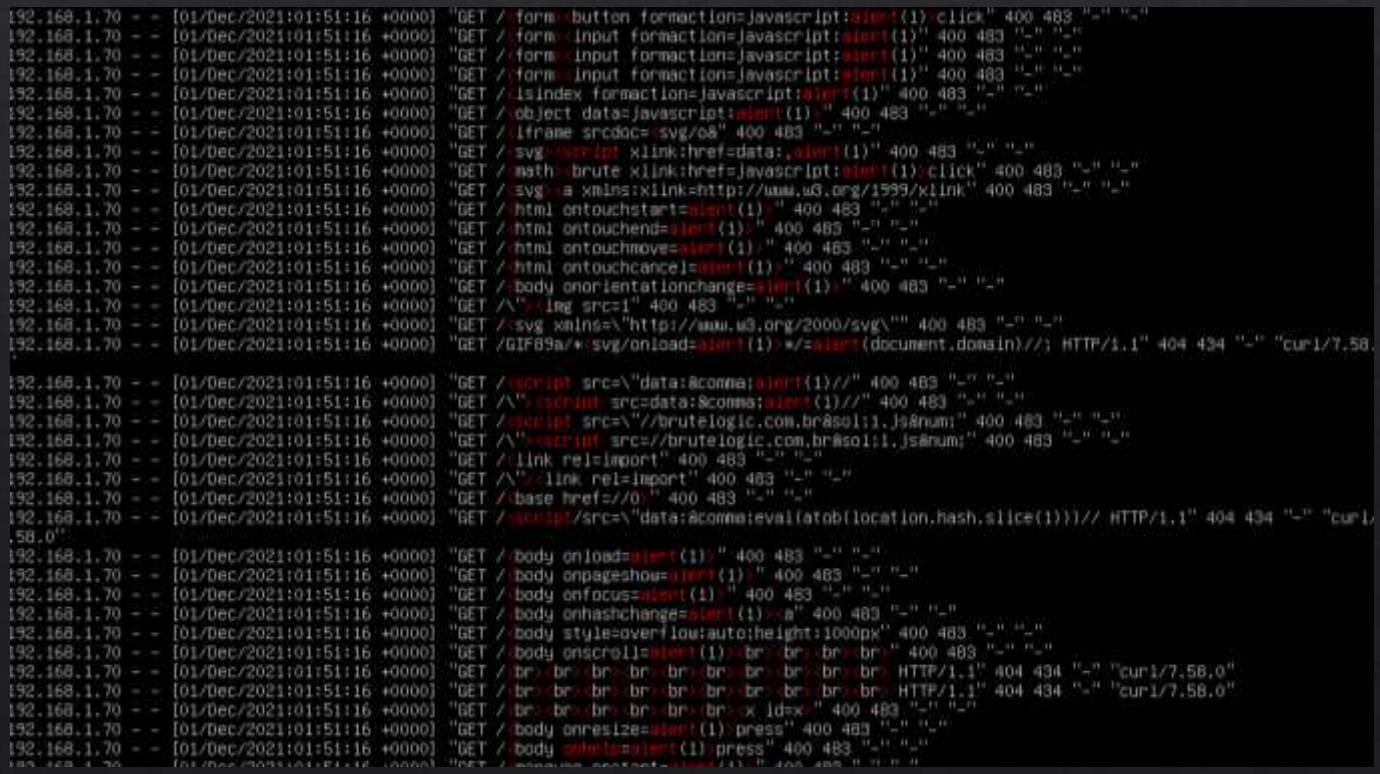
Apache2 (Web Server) Case – XSS?

- GET Parameters Example
- Signature?

```
root@fiap-linux-websrv:~# tail -n 30  /var/log/apache2/access.log
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<svg xmlns=\"http://www.w3.org/2000/svg\"" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /GIF89a/*<svg/onload=alert(1)>*/=alert(document.domain)//; HTTP/1.1" 404 434 "-" "curl/7.58
"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<script src=\"data:&comma;alert(1)//" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /\"><script src=data:&comma;alert(1)//" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<script src=\"//brutelogic.com.br&sol;1.js&num;" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /\"><script src=//brutelogic.com.br&sol;1.js&num;" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<link rel=import" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /\"><link rel=import" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<base href=//0>" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<script/src=\"data:&comma;eval(atob(location.hash.slice(1)))// HTTP/1.1" 404 434 "-" "curl
.58.0"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<body onload=alert(1)>" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<body onpageshow=alert(1)>" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<body onfocus=alert(1)>" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<body onhashchange=alert(1)><a" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<body style=overflow:auto;height:1000px" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<body onscroll=alert(1)><br><br><br><br>" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<br><br><br><br><br><br><br><br><br><br> HTTP/1.1" 404 434 "-" "curl/7.58.0"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<br><br><br><br><br><br><br><br><br><br> HTTP/1.1" 404 434 "-" "curl/7.58.0"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<br><br><br><br><br><br><x id=x>" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<body onresize=alert(1)>press" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<body onhelp=alert(1)>press" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<marquee onstart=alert(1)>" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<marquee loop=1" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:16 +0000] "GET /<audio src" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:17 +0000] "GET /<video onloadstart=alert(1)><source>" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:17 +0000] "GET /<input autofocus" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:17 +0000] "GET /<keygen autofocus" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:17 +0000] "GET /<form onsubmit=alert(1)><input" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:17 +0000] "GET /<select onchange=alert(1)><option>1<option>2" 400 483 "-" "-"
192.168.1.70 - - [01/Dec/2021:01:51:17 +0000] "GET /<menu id=x" 400 483 "-" "-"
```

Apache2 (Web Server) Case – XSS?

- GET Parameters Example
- Grep –iE “onhelp|alert|<script|<|>” /var/log/apache2/access.log



Apache2 (Web Server) Case – Sentindo Falta de Algo?!

- E como fica o POST?
- Não é logado por default no Apache2…..
- Wait what?
  - a2enmod dump_io
- Melhor solução? Nah.

SSH Case

- Caçando ataques de força bruta.
- grep "Failed password" /var/log/auth.log
- egrep "Failed|Failure" /var/log/auth.log

```
Dec  1 01:59:37 fiap-linux-websrv sshd[3003]: pam_unix(sshd:auth): authentication failure; logname= uid=0 euid=0 tty=ssh ruser= rhost=192.168.1
70  user=operador
Dec  1 01:59:39 fiap-linux-websrv sshd[3003]: Failed password for operador from 192.168.1.70 port 37394 ssh2
Dec  1 01:59:45 fiap-linux-websrv sshd[3003]: message repeated 2 times: [ Failed password for operador from 192.168.1.70 port 37394 ssh2]
Dec  1 01:59:45 fiap-linux-websrv sshd[3003]: Connection closed by authenticating user operador 192.168.1.70 port 37394 [preauth]
Dec  1 01:59:45 fiap-linux-websrv sshd[3003]: PAM 2 more authentication failures; logname= uid=0 euid=0 tty=ssh ruser= rhost=192.168.1.70  user
operador
Dec  1 01:59:48 fiap-linux-websrv sshd[3006]: pam_unix(sshd:auth): authentication failure; logname= uid=0 euid=0 tty=ssh ruser= rhost=192.168.1
70  user=operador
Dec  1 01:59:50 fiap-linux-websrv sshd[3006]: Failed password for operador from 192.168.1.70 port 37396 ssh2
Dec  1 01:59:56 fiap-linux-websrv sshd[3006]: message repeated 2 times: [ Failed password for operador from 192.168.1.70 port 37396 ssh2]
Dec  1 01:59:56 fiap-linux-websrv sshd[3006]: Connection closed by authenticating user operador 192.168.1.70 port 37396 [preauth]
Dec  1 01:59:56 fiap-linux-websrv sshd[3006]: PAM 2 more authentication failures; logname= uid=0 euid=0 tty=ssh ruser= rhost=192.168.1.70  user
operador
root@fiap-linux-websrv:~#
```

https://security.stackexchange.com/questions/110706/am-i-experiencing-a-brute-force-attack
https://linoxide.com/enable-sshd-logging/

Tools

- wc
- sort
- uniq
- sed
- cut
- Regex (egrep) (grep –E) (https://regex101.com/)

FileSystem - Hunting

- Find, algumas dicas, mas o caminho é sempre rtfm

```
# Identificando arquivos com 777
find . -type f -perm 0777 –print
# Sticky Bit Files (551)
 find / -perm 1551
# SUID Files
find / -perm /u=s
# Read-Only Files
find / -perm /u=r
# Executable Files
 find / -perm /a=x
```

```
# Seek and destroy
find . -type f -name "*.txt" -exec rm -f {} \;
# Files from user
find / –user fiapstudent
# Files from group
find /home -group developer
```

FileSystem - Hunting

- Mas o ponto é, no linux tudo é um arquivo e todo arquivo tem um timestamp.
- O que é Unix TimeStamp ou Unix Time ou POSIX TIME ou UNIX Epoch?
- Primeiramente, é a mesma coisa.
- Segundamente, é o número de segundos que se passaram desde 01/01/1970, literamente o Unix Time 0 é meia noite de 01/01/1970.

1 Hora	3600 segundos
1 Dia	86400 segundos
1 Semana	604800 Segundos
1 mês	2629743 Segundos
1 Ano	31556926 Segundos

```
date +%s -d"Jan 1, 1980 00:00:01
date -d @1520000000
```

FileSystem – Hunting

- Identificar arquivos modificados em –50 dias
  - find / -mtime 50
- Identificar arquivos acessados em -50 dias
  - find / -atime 50
- Identificar arquivos modificados entre 50 e 100 dias
  - find / -mtime +50 –mtime -100
- Identificar Alterações em arquivos em menos de 1h
  - find / -cmin -60
- Identificar arquivos modificados em 1h
  - find / -mmin -60
- Identificar arquivos acessados em 1 hr
  - find / -amin -60

```
root@fiap-linux-websrv:~# stat /var/www/html/LEAVE-ME_HERE
  File: /var/www/html/LEAVE-ME_HERE
  Size: 13              Blocks: 8          IO Block: 4096   regular file
Device: fd00h/64768d    Inode: 1441985     Links: 1
Access: (0644/-rw-r--r--)  Uid: (   33/www-data)   Gid: (   33/www-data)
Access: 2021-12-01 00:11:38.142282260 +0000
Modify: 2021-12-01 00:11:38.142282260 +0000
Change: 2021-12-01 00:11:44.648694889 +0000
 Birth: -
```

```
root@fiap-linux-websrv:~# find /var/www -mmin -10
/var/www/html
/var/www/html/LEAVE-ME_HERE
```

```
root@fiap-linux-websrv:~# find /var/www -mmin -10 -exec cat {} +;
cat: /var/www/html: Is a directory
lalala_haxor
```

```
root@fiap-linux-websrv:~# stat /var/www/html/LEAVE-ME_HERE
  File: /var/www/html/LEAVE-ME_HERE
  Size: 13              Blocks: 8          IO Block: 4096   regular file
Device: fd00h/64768d    Inode: 1441985     Links: 1
Access: (0644/-rw-r--r--)  Uid: (   33/www-data)   Gid: (   33/www-data)
Access: 2021-12-01 00:21:17.131236469 +0000
Modify: 2021-12-01 00:11:38.142282260 +0000
Change: 2021-12-01 00:11:44.648694889 +0000
 Birth: -
```

stat /path/to/file

FileSystem – Hunting: Limpando Rastros

- Cenário: Exploração Web, log poisoning, WebShell, upload de arquivo malicioso usando wget, execução de arquivo, reverse shell, shell spawn em /var/www/public/
- No logs No Crimes?
- Log do HTTPd/apache2;
- Arquivo anômalo em diretório conhecido;
- Conexão de rede anômala;
- Processos filhos anômalos.
- Onde mais?

https://unix.stackexchange.com/questions/669234/backup-and-restore-timestamps-of-files-directories?rq=1

FileSystem – Hunting: Limpando Rastros

- Vai apagar o log inteiro do apache2? rm –rf /var/log/apache2/? Não? Vai fazer o que?
  - Supondo que você tenha acesso): sed '/192.168.1.2/d' access.log
- E sobre o arquivo novo no diretório? Vai deletar sua reverse shell? Não? Medo de ficar sem acesso?Vai Fazer o que?
  - Fileless payloads
  - TimeStamp?
    1. Get the timestamp pattern from other files using stat
    2. Change the timestamp using toutch
  - Pray (ou adote backdoors mais elaborados – weevely?)
- E a conexão reversa de rede? Vai matar a conexão? Não? Vai fazer o que?
  - The Problem
- E aquele processo com o nome revshell.py com seu IP no 'ps aux'? Vai matar o Processo? Ta com Pena? Não?
- Onde mais?

https://unix.stackexchange.com/questions/669234/backup-and-restore-timestamps-of-files-directories?rq=1

FileSystem – Hunting: Curiosidade

- Usado IRL?
- Sim, o blackhat PHINEAS FISHER publicou um vídeo de uma intrusão não autorizada em um órgão do governo vinculado à policiamento.
- Na gravação, durante a pós exploração, ele realiza a alteração do timestamp dos arquivos como técnica anti-forense.

Não Localizei a URL do vídeo no youtube :x

Automação do processo (IDS, IPS)

The wayy you go

Local Stuff

- IDS/IPS
- ModSecurity – WAF de baixo custo? Não, é de graça! funciona? Depende de você.
- Mod Evasive – Mitigação de DDoS/DoS
- Fail2Ban – IPS Local, atua em conjunto com o firewall para bloquear endereços de origem;
- Tripware – Mapeia modificações no filesystem com base em hashs de arquivos e monitora periodicamente.
- Snort? NIDS de baixo custo
- Suricata? IPS

Apache WAF

- ModSecurity, IDS, IPS. Signature based
- What are signatures? Regex?
- Wait what? Brace yourselfs

https://owasp.org/www-project-modsecurity-core-rule-set/

Apache WAF – Big reveal

Step 5: Analyzing the alert messages

So we are looking at 13,000 alerts. And even if the format of the entries in the error log may be clear, without a tool they are very hard to read, let alone analyze. A simple remedy is to use a few *shell aliases*, which extract individual pieces of information from the entries. They are stored in the alias file we discussed in the log format in Tutorial 5.

```
$> cat ~/.apache-modsec.alias
...
alias meldata='grep -o "\[data [^]]*" | cut -d\" -f2'
alias melfile='grep -o "\[file [^]]*" | cut -d\" -f2'
alias melhostname='grep -o "\[hostname [^]]*" | cut -d\" -f2'
alias melid='grep -o "\[id [^]]*" | cut -d\" -f2'
alias melip='grep -o "\[client [^]]*" | cut -b9-'
alias melidmsg='sed -e "s/.*\[id \"//" -e "s/\([0-9]*\).*\[msg \"/\1 /" -e "s/\"\].*//" -e "s/(Total .*/(Total ...) .../"
-e "s/Incoming and Outgoing Score: [0-9]* [0-9]*/Incoming and Outgoing Score: .../"
alias melline='grep -o "\[line [^]]*" | cut -d\" -f2'
alias melmatch='grep -o " at [^\ ]*\. \[file" | sed -e "s/\. \[file//" | cut -b5-'
alias melmsg='grep -o "\[msg [^]]*" | cut -d\" -f2'
alias meltimestamp='cut -b2-25'
alias melunique_id='grep -o "\[unique_id [^]]*" | cut -d\" -f2'
alias meluri='grep -o "\[uri [^]]*" | cut -d\" -f2'
...
```

https://owasp.org/www-project-modsecurity-core-rule-set/

Apache WAF – REMOTE COMMAND EXEC?

```
362  # [ Unix direct remote command execution ]
363  #
364  # Detects Unix commands at the start of a parameter (direct RCE).
365  # Example: foo=wget%20www.example.com
366  #
367  # This case is different from command injection (rule 932100), where
368  # command string is appended (injected) to a regular parameter, and
369  # passed to a shell unescaped.
370  #
371  # Due to a higher risk of false positives, the following changes hav
372  # made relative to rule 932100:
373  # 1) the set of commands is smaller
374  # 2) we require a trailing space (denoting command parameters) or co
375  #    separator character after the command
376  #
377  # To rebuild the word list regexp:
378  #   cd util/regexp-assemble
379  #   cat regexp-932150.txt | ./regexp-cmdline.py unix | ./regexp-asse
380  #
381  # Then insert the assembled regexp into this template:
382  #
```

```
387  SecRule REQUEST_COOKIES|!REQUEST_COOKIES:/__utm/|REQUEST_COOKIES_NAMES|ARGS_NAMES|ARGS|XML:/* "@rx (?:^|=)\s*(?:{|\s*\
388          "msg:'Remote Command Execution: Direct Unix Command Execution',\
389          phase:request,\
390          rev:'1',\
391          ver:'OWASP_CRS/3.0.0',\
392          maturity:'1',\
393          accuracy:'7',\
394          capture,\
395          t:none,\
396          ctl:auditLogParts=+E,\
397          block,\
398          id:932150,\
399          tag:'application-multi',\
400          tag:'language-shell',\
401          tag:'platform-unix',\
402          tag:'attack-rce',\
403          tag:'OWASP_CRS/WEB_ATTACK/COMMAND_INJECTION',\
404          tag:'WASCTC/WASC-31',\
405          tag:'OWASP_TOP_10/A1',\
406          tag:'PCI/6.5.2',\
407          logdata:'Matched Data: %{TX.0} found within %{MATCHED_VAR_NAME}: %{MATCHED_VAR}',\
408          severity:'CRITICAL',\
409          setvar:'tx.msg=%{rule.msg}',\
410          setvar:tx.rce_score=+%{tx.critical_anomaly_score},\
411          setvar:tx.anomaly_score=+%{tx.critical_anomaly_score},\
412          setvar:tx.%{rule.id}-OWASP_CRS/WEB_ATTACK/RCE-%{matched_var_name}=%{tx.0}"
413
```

https://github.com/SpiderLabs/owasp-modsecurity-crs/blob/v3.0/master/rules/REQUEST-932-APPLICATION-ATTACK-RCE.conf#L294

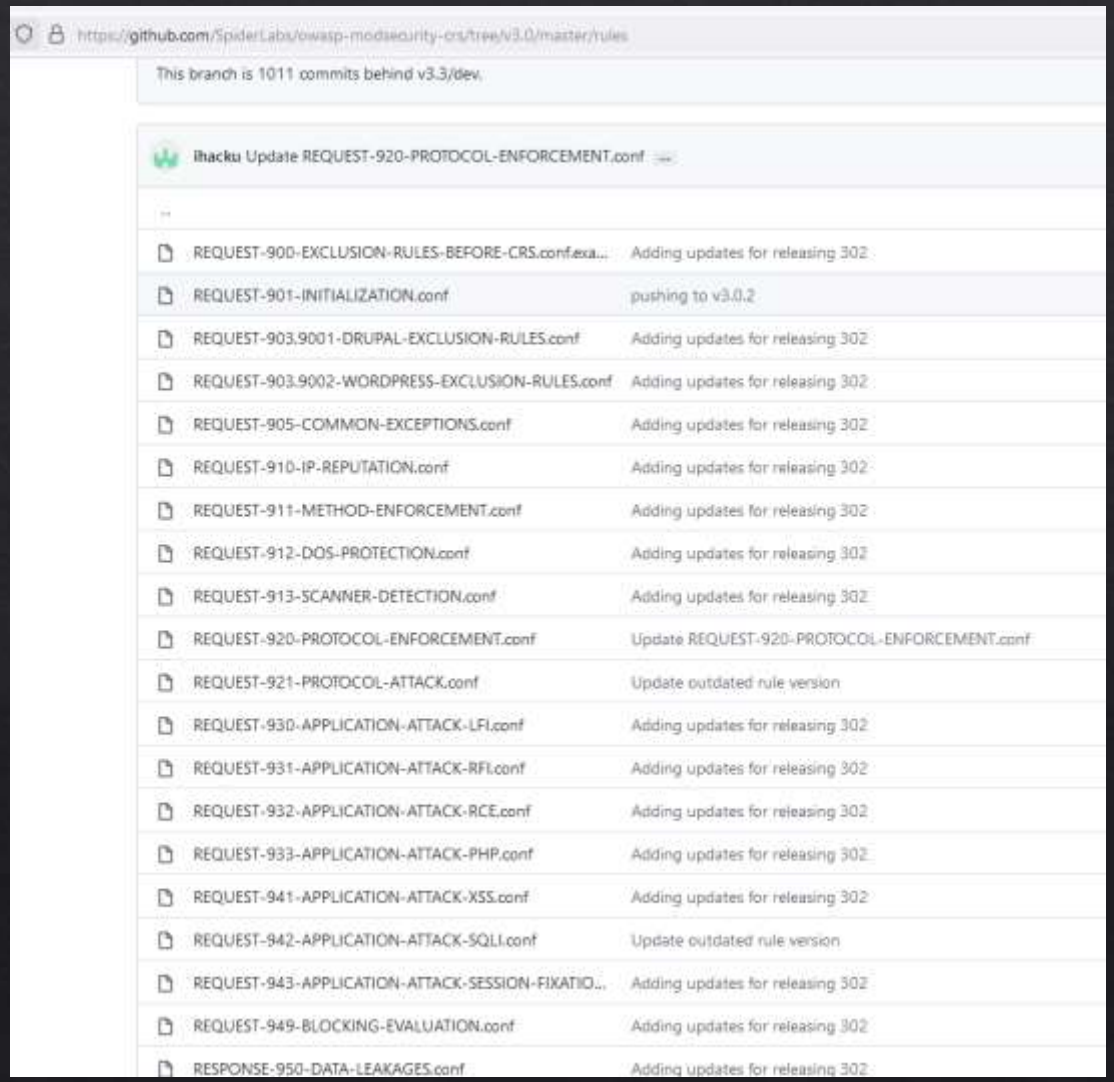
Here we go


RULES ARE JUST REGEX
SO ITS EASY RIGHT, JUST THAT?
SO ITS EASY, RIGHT?
imgflip.com

Remember rce rule?

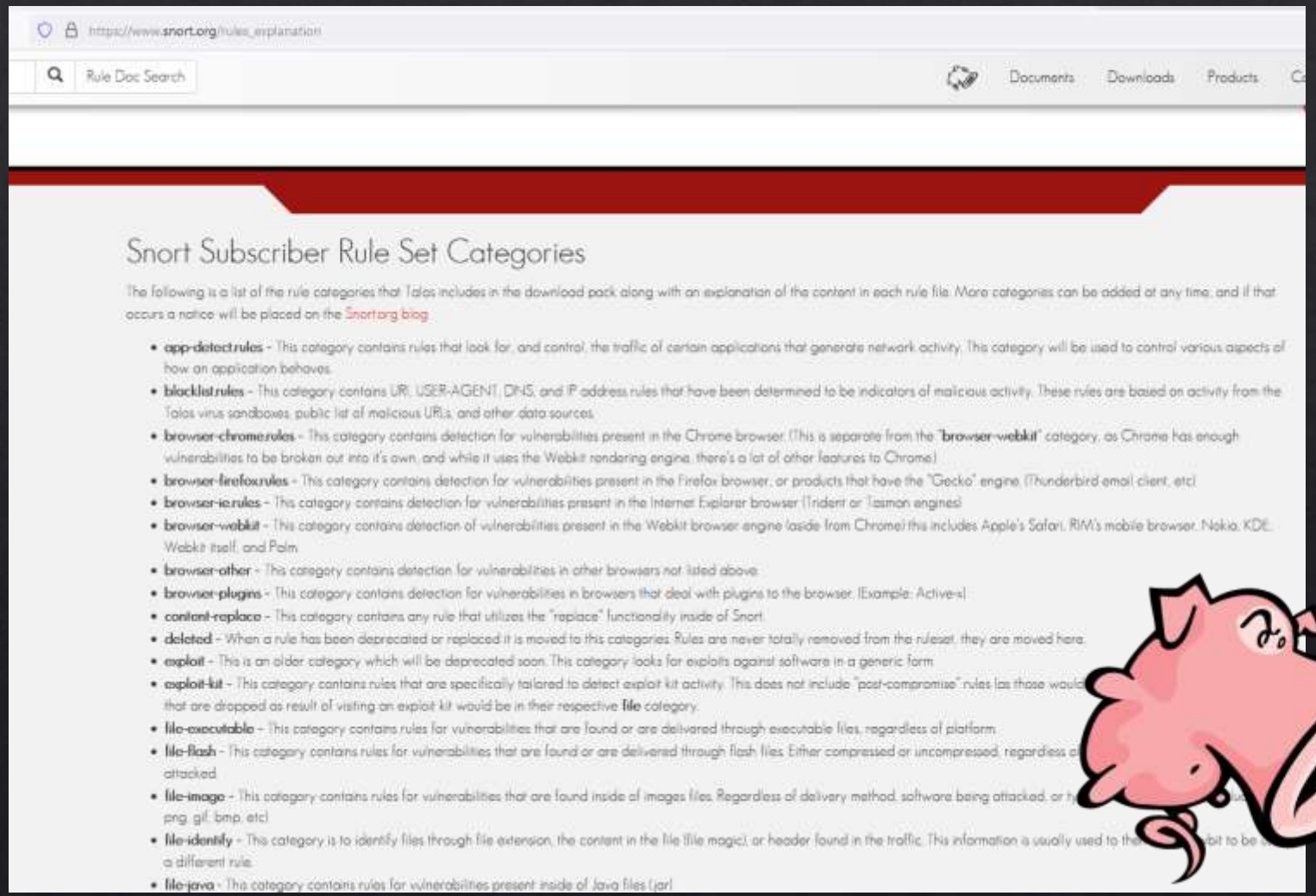

```
"@rx (?:^|=)\s*(?:{|\s*\(\s*|\w+=(?:[^\s]*|\$.*|\$.*|<.*|>.*|\'.*\'|\".*\")\s+|!\s*|\$)*\s*(?:'|\")*(?:[\?\*\[\]\(\)\-
\|+\w'\"\./\\\]+/)?[\\\'\"]*(?:l[\\\'\"]*(?:s(?:[\\\'\"]*(?:b[\\\'\"]*_[\\\'\"]*r[\\\'\"]*e[\\\'\"]*l[\\\'\"]*e[\\\'\"]*a[\\\'\"]*s[\\\'\"]*e|c[\\\'\"]*p[\\\'\"]*u|m[\\\'\"]*o[\\\'\"]*d|p[
\\\'\"]*c[\\\'\"]*i|u[\\\'\"]*s[\\\'\"]*b|-
[\\\'\"]*F|o[\\\'\"]*f))?|z[\\\'\"]*(?:(?:[ef][\\\'\"]*)?g[\\\'\"]*r[\\\'\"]*e[\\\'\"]*p|c[\\\'\"]*(?:a[\\\'\"]*t|m[\\\'\"]*p)|m[\\\'\"]*(?:o[\\\'\"]*r[\\\'\"]*e|a)|d[\\\'\"]*i[\\\'\"]*f[\\\'
\"]*f|l[\\\'\"]*e[\\\'\"]*s[\\\'\"]*s)|e[\\\'\"]*s[\\\'\"]*s[\\\'\"]*(?:(?:f[\\\'\"]*i[\\\'\"]*l|p[\\\'\"]*i[\\\'\"]*p)[\\\'\"]*e|e[\\\'\"]*c[\\\'\"]*h[\\\'\"]*o)|a[\\\'\"]*s[\\\'\"]*t[\\\'\\
\"]*(?:l[\\\'\"]*o[\\\'\"]*g(?:[\\\'\"]*i[\\\'\"]*n)?|c[\\\'\"]*o[\\\'\"]*m[\\\'\"]*m)|w[\\\'\"]*p(?:[\\\'\"]*-
[\\\'\"]*d[\\\'\"]*o[\\\'\"]*w[\\\'\"]*n[\\\'\"]*l[\\\'\"]*o[\\\'\"]*a[\\\'\"]*d)?|f[\\\'\"]*t[\\\'\"]*p(?:[\\\'\"]*g[\\\'\"]*e[\\\'\"]*t)?|y[\\\'\"]*n[\\\'\"]*x)|s[\\\'\"]*(?:e[\\\'\"]*(?:
t[\\\'\"]*(?:e[\\\'\"]*n[\\\'\"]*v|s[\\\'\"]*i[\\\'\"]*d)|n[\\\'\"]*d[\\\'\"]*m[\\\'\"]*a[\\\'\"]*i[\\\'\"]*l|d)|h(?:[\\\'\"]*\.[\\\'\"]*d[\\\'\"]*i[\\\'\"]*s[\\\'\"]*t[\\\'\"]*r[\\\'\"]*i[
\\\'\"]*b)?|o[\\\'\"]*(?:u[\\\'\"]*r[\\\'\"]*c[\\\'\"]*e|c[\\\'\"]*a[\\\'\"]*t)|t[\\\'\"]*r[\\\'\"]*i[\\\'\"]*n[\\\'\"]*g[\\\'\"]*s|y[\\\'\"]*s[\\\'\"]*c[\\\'\"]*t[\\\'\"]*l|c[\\\'\"]*(?:h[
\\\'\"]*e[\\\'\"]*d|p)|d[\\\'\"]*i[\\\'\"]*f[\\\'\"]*f|f[\\\'\"]*t[\\\'\"]*p|u[\\\'\"]*d[\\\'\"]*o|s[\\\'\"]*h|v[\\\'\"]*n)|p[\\\'\"]*(?:t[\\\'\"]*a[\\\'\"]*r(?:[\\\'\"]*(?:d[\\\'\"]*i[\\\'
\"]*f[\\\'\"]*f|g[\\\'\"]*r[\\\'\"]*e[\\\'\"]*p))?|y[\\\'\"]*t[\\\'\"]*h[\\\'\"]*o[\\\'\"]*n(?:[\\\'\"]*(?:3(?:[\\\'\"]*m)?|2))?|k[\\\'\"]*(?:e[\\\'\"]*x[\\\'\"]*e[\\\'\"]*c|i[\\\'\"]*l[\\\'\\
\"]*l)|r[\\\'\"]*i[\\\'\"]*n[\\\'\"]*t[\\\'\"]*e[\\\'\"]*n[\\\'\"]*v|(?:g[\\\'\"]*r[\\\'\"]*e|f[\\\'\"]*t)[\\\'\"]*p|e[\\\'\"]*r[\\\'\"]*l(?:[\\\'\"]*5)?|h[\\\'\"]*p(?:[\\\'\"]*[57])?|i[\\\'\"]*
n[\\\'\"]*g)|n[\\\'\"]*(?:c(?:[\\\'\"]*(?:\.[\\\'\"]*(?:t[\\\'\"]*r[\\\'\"]*a[\\\'\"]*d[\\\'\"]*i[\\\'\"]*t[\\\'\"]*i[\\\'\"]*o[\\\'\"]*n[\\\'\"]*a[\\\'\"]*l|o[\\\'\"]*p[\\\'\"]*e[\\\'\"]*n[
\\\'\"]*b[\\\'\"]*s[\\\'\"]*d)|a[\\\'\"]*t))?|e[\\\'\"]*t[\\\'\"]*(?:k[\\\'\"]*i[\\\'\"]*t[\\\'\"]*-
[\\\'\"]*f[\\\'\"]*t[\\\'\"]*p|(?:s[\\\'\"]*t|c)[\\\'\"]*a[\\\'\"]*t)|o[\\\'\"]*h[\\\'\"]*u[\\\'\"]*p|p[\\\'\"]*i[\\\'\"]*n[\\\'\"]*g|s[\\\'\"]*t[\\\'\"]*a[\\\'\"]*t)|t[\\\'\"]*(?:c[\\\'\"]
*(?:p[\\\'\"]*(?:t[\\\'\"]*r[\\\'\"]*a[\\\'\"]*c[\\\'\"]*e[\\\'\"]*r[\\\'\"]*o[\\\'\"]*u[\\\'\"]*t[\\\'\"]*e|i[\\\'\"]*n[\\\'\"]*g)|s[\\\'\"]*h)|r[\\\'\"]*a[\\\'\"]*c[\\\'\"]*e[\\\'\"]*r[\\
\\'\"]*o[\\\'\"]*u[\\\'\"]*t[\\\'\"]*e(?:[\\\'\"]*6)?|i[\\\'\"]*m[\\\'\"]*e(?:[\\\'\"]*o[\\\'\"]*u[\\\'\"]*t)?|a[\\\'\"]*(?:i[\\\'\"]*l(?:[\\\'\"]*f)?|r)|e[\\\'\"]*l[\\\'\"]*n[\\\'\"]*e[\\\'\"]
*t)|r[\\\'\"]*(?:e[\\\'\"]*(?:p[\\\'\"]*(?:l[\\\'\"]*a[\\\'\"]*c[\\\'\"]*e|e[\\\'\"]*a[\\\'\"]*t)|a[\\\'\"]*l[\\\'\"]*p[\\\'\"]*a[\\\'\"]*t[\\\'\"]*h|n[\\\'\"]*a[\\\'\"]*m[\\\'\"]*e)|u[\\\'
\"]*b[\\\'\"]*y(?:[\\\'\"]*(?:1(?:[\\\'\"]*[89])?|2[\\\'\"]*[012]))?|m[\\\'\"]*(?:u[\\\'\"]*s[\\\'\"]*e|d[\\\'\"]*i)[\\\'\"]*r|n[\\\'\"]*a[\\\'\"]*n[\\\'\"]*o|s[\\\'\"]*y[\\\'\"]*n[\\\'\"]*c|c
[\\\'\"]*p)|b[\\\'\"]*(?:z[\\\'\"]*(?:(?:[ef][\\\'\"]*)?g[\\\'\"]*r[\\\'\"]*e[\\\'\"]*p|d[\\\'\"]*i[\\\'\"]*f[\\\'\"]*f|l[\\\'\"]*e[\\\'\"]*s[\\\'\"]*s|m[\\\'\"]*o[\\\'\"]*r[\\\'\"]*e|c[\\\'
\"]*a[\\\'\"]*t)|s[\\\'\"]*d[\\\'\"]*(?:c[\\\'\"]*a[\\\'\"]*t|i[\\\'\"]*f[\\\'\"]*f|t[\\\'\"]*a[\\\'\"]*r)|u[\\\'\"]*i[\\\'\"]*l[\\\'\"]*t[\\\'\"]*i[\\\'\"]*n|a[\\\'\"]*s[\\\'\"]*h)|m[\\\'\\
\"]*(?:y[\\\'\"]*s[\\\'\"]*q[\\\'\"]*l[\\\'\"]*(?:d[\\\'\"]*u[\\\'\"]*m[\\\'\"]*p(?:[\\\'\"]*s[\\\'\"]*l[\\\'\"]*o[\\\'\"]*w)?|h[\\\'\"]*o[\\\'\"]*t[\\\'\"]*c[\\\'\"]*o[\\\'\"]*p[\\\'\"]*y|
a[\\\'\"]*d[\\\'\"]*m[\\\'\"]*i[\\\'\"]*n|s[\\\'\"]*h[\\\'\"]*o[\\\'\"]*w)|l[\\\'\"]*o[\\\'\"]*c[\\\'\"]*a[\\\'\"]*t[\\\'\"]*e|a[\\\'\"]*i[\\\'\"]*l[\\\'\"]*q)|u[\\\'\"]*(?:n[\\\'\"]*(?:c
[\\\'\"]*o[\\\'\"]*m[\\\'\"]*p[\\\'\"]*r[\\\'\"]*e[\\\'\"]*s[\\\'\"]*s|l[\\\'\"]*z[\\\'\"]*m[\\\'\"]*a|a[\\\'\"]*m[\\\'\"]*e|r[\\\'\"]*a[\\\'\"]*r|s[\\\'\"]*e[\\\'\"]*t|z[\\\'\"]*i[\\\'\\
\"]*p|x[\\\'\"]*z)|s[\\\'\"]*e[\\\'\"]*r[\\\'\"]*(?:(?:a[\\\'\"]*d|m[\\\'\"]*o)[\\\'\"]*d|d[\\\'\"]*e[\\\'\"]*l))|x[\\\'\"]*(?:z(?:[\\\'\"]*(?:(?:[ef][\\\'\"]*)?g[\\\'\"]*r[\\\'\"]*e[\\\'\"]*p|
d[\\\'\"]*(?:i[\\\'\"]*f[\\\'\"]*f|e[\\\'\"]*c)|c[\\\'\"]*(?:a[\\\'\"]*t|m[\\\'\"]*p)|l[\\\'\"]*e[\\\'\"]*s[\\\'\"]*s|m[\\\'\"]*o[\\\'\"]*r[\\\'\"]*e))?|a[\\\'\"]*r[\\\'\"]*g[\\\'\"]*s)|z[\\
\\'\"]*(?:(?:(?:[ef][\\\'\"]*)?g[\\\'\"]*r[\\\'\"]*e|i)[\\\'\"]*p|c[\\\'\"]*(?:a[\\\'\"]*t|m[\\\'\"]*p)|d[\\\'\"]*i[\\\'\"]*f[\\\'\"]*f|l[\\\'\"]*e[\\\'\"]*s[\\\'\"]*s|m[\\\'\"]*o[\\\'\"]*r[\\
\'\"]*e|r[\\\'\"]*u[\\\'\"]*n|s[\\\'\"]*h)|f[\\\'\"]*(?:t[\\\'\"]*p[\\\'\"]*(?:s[\\\'\"]*t[\\\'\"]*a[\\\'\"]*t[\\\'\"]*s|w[\\\'\"]*h[\\\'\"]*o)|i[\\\'\"]*l[\\\'\"]*e[\\\'\"]*t[\\\'\"]*e[\\\'\\
\"]*s[\\\'\"]*t|e[\\\'\"]*t[\\\'\"]*c[\\\'\"]*h|g[\\\'\"]*r[\\\'\"]*e[\\\'\"]*p)|c[\\\'\"]*(?:o[\\\'\"]*(?:m[\\\'\"]*m[\\\'\"]*a[\\\'\"]*n[\\\'\"]*d|p[\\\'\"]*r[\\\'\"]*o[\\\'\"]*c)|u[\\
\\'\"]*r[\\\'\"]*l|s[\\\'\"]*h|c)|e[\\\'\"]*(?:g[\\\'\"]*r[\\\'\"]*e[\\\'\"]*p|c[\\\'\"]*h[\\\'\"]*o|v[\\\'\"]*a[\\\'\"]*l|x[\\\'\"]*e[\\\'\"]*c|n[\\\'\"]*v)|d[\\\'\"]*(?:m[\\\'\"]*e[\\\'\"]*s[\\\'\"]*g|a[\\\'\"]*s[\\\'\"]*h|i[\\\'\"]*f[\\\'\"]*f|o[\\\'\"]*a[\\\'\"]*s)|g[\\\'\"]*(?:z[\\\'\"]*(?:c[\\\'\"]*a[\\\'\"]*t|i[\\\'\"]*p)|r[\\\'\"]*e[\\\'\"]*p|c[\\\'\"]*c)|w[\\\'\"]*(?
:h[\\\'\"]*o[\\\'\"]*a[\\\'\"]*m[\\\'\"]*i|g[\\\'\"]*e[\\\'\"]*t|3[\\\'\"]*m)|j[\\\'\"]*(?:o[\\\'\"]*b[\\\'\"]*s[\\\'\"]*\s[\\\'\"]*-
[\\\'\"]*x|a[\\\'\"]*v[\\\'\"]*a)|i[\\\'\"]*r[\\\'\"]*b(?:[\\\'\"]*(?:1(?:[\\\'\"]*[89])?|2[\\\'\"]*[012]))?|o[\\\'\"]*n[\\\'\"]*i[\\\'\"]*n[\\\'\"]*t[\\\'\"]*r|h[\\\'\"]*(?:e[\\\'\"]*a[\\\'\"]*
]*d|u[\\\'\"]*p)|v[\\\'\"]*i[\\\'\"]*(?:g[\\\'\"]*r|p[\\\'\"]*w)|G[\\\'\"]*E[\\\'\"]*T)[\\\'\"]*(?:\s|;|\||&|<|>)" \
```

Want more?



https://github.com/SpiderLabs/owasp-modsecurity-crs/tree/v3.0/master/rules

E a nível de camada 3 e 4?



E a nível de camada rede?

```
# alert tcp $HOME_NET any -> $EXTERNAL_NET $HTTP_PORTS (msg:"MALWARE-CNC Win.Trojan.FileEncoder IP geolocation checkin attempt";
flow:to_server,established; isdataat:213; isdataat:!214; urilen:1; content:"GET / HTTP/1.1|0D 0A|User-Agent: Mozilla/4.0 (compatible|3B| MSIE
6.0|3B| Windows NT 5.1|3B| SV1|3B| .NET4.0C|3B| .NET4.0E|3B| .NET CLR 2.0.50727|3B| .NET CLR 3.0.4506.2152|3B| .NET CLR 3.5.30729)|0D 0A|Host:
ip-addr.es|0D 0A|Cache-Control: no-cache|0D 0A 0D 0A|"; fast_pattern:only; metadata:impact_flag red, ruleset community, service http;
reference:url,www.virustotal.com/en/file/17edf82c40df6c7268191def7cbff6e60e78d7388018408800d42581567f78cf/analysis/; classtype:trojan-activity;
sid:33449; rev:3;)
# alert tcp $HOME_NET any -> $EXTERNAL_NET $HTTP_PORTS (msg:"MALWARE-CNC Win.Trojan.FileEncoder variant outbound connection";
flow:to_server,established; content:"POST"; http_method; content:"="; depth:2; http_client_body; content:"Content-Length: 128|0D 0A|";
fast_pattern:only; http_header; content:"Content-Type: application/x-www-form-urlencoded|0D 0A|"; http_header; content:"|3B 20|MSIE|20|";
http_header; content:!"Accept-Language:"; http_header; pcre:"/[a-z]\x3d[a-f\d]{126}/P"; metadata:impact_flag red, ruleset community, service
http; reference:url,www.virustotal.com/en/file/17edf82c40df6c7268191def7cbff6e60e78d7388018408800d42581567f78cf/analysis/; classtype:trojan-
```

```
# alert udp any 53 -> $HOME_NET any (msg:"PROTOCOL-DNS glibc getaddrinfo A record stack buffer overflow attempt"; flow:to_client; dsize:>2000;
byte_test:1,&,2,2; byte_test:1,&,0x80,2; byte_test:1,!&,0x78,2; content:"|00 01|"; depth:2; offset:4; content:"|00 00 01 00 01|";
fast_pattern:only; metadata:policy max-detect-ips drop, policy security-ips drop, ruleset community, service dns; reference:cve,2015-7547;
reference:url,googleonlinesecurity.blogspot.com/2016/02/cve-2015-7547-glibc-getaddrinfo-stack.html; classtype:attempted-user; sid:37730; rev:5;)
# alert udp any 53 -> $HOME_NET any (msg:"PROTOCOL-DNS glibc getaddrinfo AAAA record stack buffer overflow attempt"; flow:to_client; dsize:>2000;
byte_test:1,&,2,2; byte_test:1,&,0x80,2; byte_test:1,!&,0x78,2; content:"|00 01|"; depth:2; offset:4; content
fast_pattern:only; metadata:policy max-detect-ips drop, policy security-ips drop, ruleset community, service
reference:url,googleonlinesecurity.blogspot.com/2016/02/cve-2015-7547-glibc-getaddrinfo-stack.html; classty
# alert tcp $HOME_NET any -> $EXTERNAL_NET $HTTP_PORTS (msg:"MALWARE-CNC Win.Trojan.Dridex dropper varian
flow:to_server,established; content:"/gt.jpg?"; fast_pattern; http_uri; content:"="; within:1; distance:1
http_header; metadata:impact_flag red, ruleset community, service http;
reference:url,www.virustotal.com/en/file/8a80760f60f42ce5574a8020c08123a6a8fc2a12d28e8802f3d5101f72c2ad0
sid:37733; rev:2;)
```

Next Level

Centralização dos logs, monitoramento e orquestração (SIEM and SOAR)

Centralização de logs

- Centralização ou descentralização nativa
  - É recomendado que os logs sejam armazenados em mais de um lugar (A10:2017?).
  - O processos pode ser feito utilizando integrações nativas dos gerenciadores de logs do próprio Linux através do RSYSLOG por exemplo.
  - Escalável? TLDR? Nope
  - Gestão centralizada? TLDR? Nope
  - Fácil auditoria? TLDR? Nope
  - Funciona? TLRD? Sim

Monitoramento

- Eventos são quaisquer ações.
- Dado um determinado conjuntos de eventos (rules? Remember that?), alertas são criados e endereçados para equipes responsáveis. (Na teoria)

SIEM?

- **SIEM** é a combinação de gerenciamento de eventos de segurança **(SEM – security event management)** e gerenciamento de informações de segurança (**SIM – security information management**).
- Com eventos de segurança, alertas e etc, o SIEM é capaz de detectar ameaças de segurança já existentes...
  - Dado a configuração correta das rules e correlações, sim.
- E eventos Desconhecidos?
- Hmm IA? Machine Learning? Patterns everwhere?

Orquestração?

- Então você coleta eventos e garante que todos (relevantes) estão sendo coletados,
- E determinados eventos geram alertas?
- Então uma equipe irá atuar no alerta? Sim
- Todo um processo de investigação é feito, documentado e arquivado (playbooks) e podem ser usados em próximos cenários semelhantes ou idênticos.
- E se uma vez documentados, as respostas/tratativas fossem automatizadas?

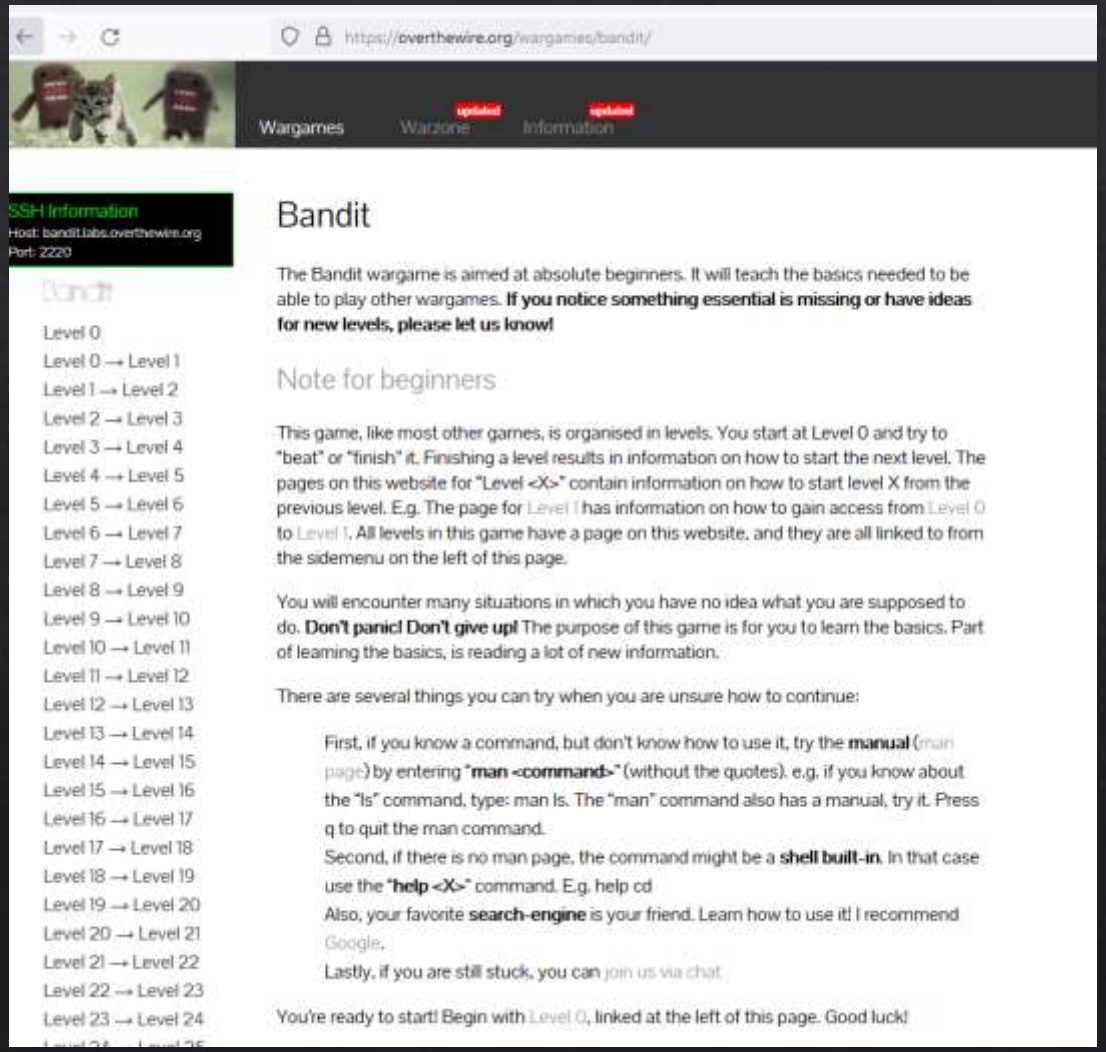
Like it or not, meet SOAR

- Security Orchestration, Automation and Response (SOAR)

Time to Play Around

Meet Bandit

BACK TO TUX



https://overthewire.org/wargames/bandit/

Referências

- https://sempreupdate.com.br/como-funciona-os-logs-no-linux/
- https://diesec.home.blog/2018/01/07/centralizando-logs-com-rsyslog/
- https://www.ppgia.pucpr.br/pt/arquivos/techdocs/linux/foca-avancado/ch-log.html
- https://www.digitalocean.com/community/tutorials/how-to-use-journalctl-to-view-and-manipulate-systemd-logs-pt
- https://httpd.apache.org/docs/2.4/logs.html
- https://www.geeksforgeeks.org/find-command-in-linux-with-examples/

Thank you security community!

Dúvidas?

Muito Obrigado!

XOR “Vale mais 7 horas de debug do que 15 minutos de man pages”