

Fahoo forays, dahoo dorays
Welcome Christmas, bring your light
Fahoo forays, dahoo dorays
Welcome in the cold of night

Welcome Christmas, fahoo ramus Welcome Christmas, dahoo damus Welcome Christmas, while we stand Heart to heart and hand in hand

Every Who down in Whoville liked Christmas a lot But the Grinch who lived just North of Whoville did not!

The Grinch hated Christmas!
The whole Christmas season!
Now, please don't ask why.
No one quite knows the reason.

To make a long story short about the mean Grinch, He finds the true meaning of Christmas in a clinch.

The Whos down in Whoville come to love him a lot, In the end the Grinch's tale becomes a joyful plot.

Sadly this tale a takes different direction,
As Jessica and Josh find in their inspection.
Santa's gone missing they exclaim, as they stared,
At the hint left behind, Santa's business card bared.

Santa's been kidnapped right before its Christmas Day.

Hopefully not to some galaxy far-far away?

So, get your eggnog ready there's no time for rest,

As we start unraveling this hack holiday quest!

The challenge starts with a business card on the floor, Referencing twitter and a site like imgur (image-er).

Starting with 300 tweets,
so many the same,
No need for complex scripts,
in Notepad there's no shame.
Search strip out the junk content
and survey the rest,
Behold the big picture,
we pass the 'bugbounty' test.

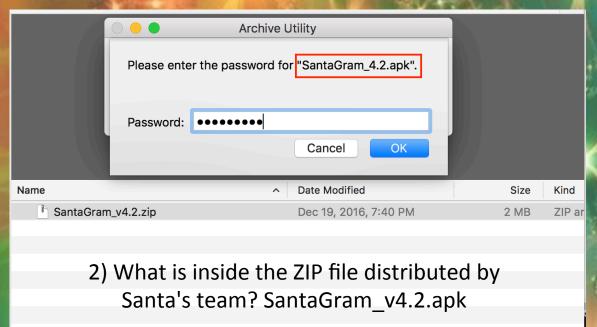




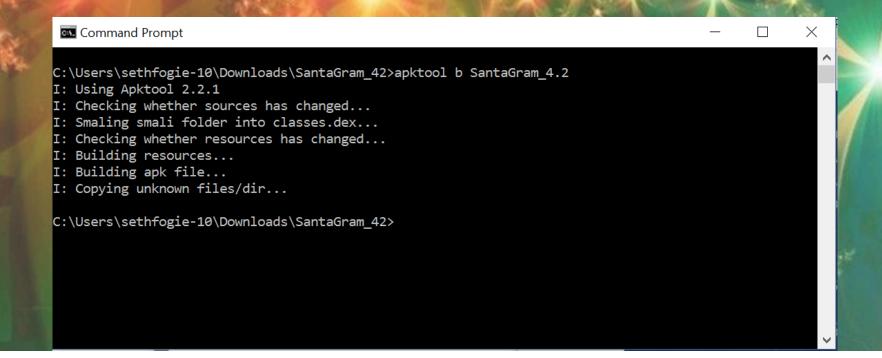
1) What is the secret message in Santa's tweets? BUGBOUNTY

On to puzzle number two, we search for a zip, Where could this file be, perhaps a hidden tip?
Using a skill set referred to as O-S-INT,
The secret becomes clear with a little squint.

Yes, buried right there in Santa's Instagram page, Is not one, but two hints that were cleverly staged. By combining the Northpolewonderland domain With the SantaGram version 4-dot-2 zip file name, Then viewing the contents with our bugbounty code, We find object three that needs an Android to load.



APK files are zipped gifts of JAVA based joy,
That can be unpacked with the apktool toy,
Using the d flag will create code decompiled,
And waallaaa, you now have small code
reconciled.



Peering inside the folders of decoded text,

It doesn't take long to find the audio hex -

A Discombobulated1 dot M-P-3,

And the target user and pass in b.smali!

Putting creds in an app is like hiding in smoke,

But this finding makes us feel we have A New Hope.

```
:try_start_0
const-string v1, "username"

const-string v2, "guest"

invoke-virtual {v0, v1, v2}, Lorg/json/JSONObject

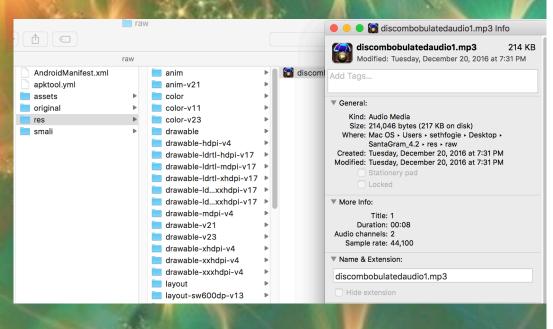
const-string v1, "password"

const-string v2, "busyreindeer78"

invoke-virtual {v0, v1, v2}, Lorg/json/JSONObject

const-string v1, "type"

const-string v2, "usage"
```



What other secrets could this decompiled spread hold? Having to look through it all seems like we've been trolled.

However, right near our file of audio sound, Another hint to the game we thankfully found.

The res values folder has an xml file, Without which this puzzle would be terribly vile.

Dev, app, exception and dungeon paths all displayed, But first some other hack game challenges need played.

```
<string name="TAG">SantaGram</string>
  <string name="analytics_launch_url">https://analytics.northpolewonderland.com/report.php?type=launch</string>
  <string name="analytics_usage_url">https://analytics.northpolewonderland.com/report.php?type=usage</string>
  <string name="appVersion">4.2</string>
  <string name="appDarase">SantaGram</string>
  <string name="appDarase">SantaGram</string>
  <string name="appbar_cscrolling_view_behavior">android.support.design.widget.AppBarLayout$ScrollingViewBehavior</string>
  <string name="banner_ad_url">http://ads.northpolewonderland.com/affiliate/C9E380C8-2244-41E3-93A3-D6C6700156A5</string>
  <string name="bottom_sheet_behavior">android.support.design.widget.BottomSheetBehavior</string>
  <string name="bottom_sheet_behavior">android.support.design.widget.BottomSheetBehavior</string>
  <string name="bottom_sheet_behavior">android.support.design.widget.BottomSheetBehavior</string>
  <string name="debug_data_collection_url">http://dev.northpolewonderland.com/index.php</string>
  <string name="debug_data_enabled">aname="debug_data_collection_url">http://dev.northpolewonderland.com/</string>
  <string name="dungeon_url">http://dungeon.northpolewonderland.com/</string>
  <string name="exhandler_url">http://dungeon.northpolewonderland.com/exception.php</string>
  <string name="title_activity_comments">comments</string>
  </string>
  </string>
  </string>
  <string name="title_activity_comments">comments</string>
  <string name="chandler_url">comments</string></string></string>
  <string name="title_activity_comments">comments</string></string>
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```



But soon enough we find the widgets we're seeking.

The pi pieces were all gathered by 12/19,
And subsequently returned to Holly Evergreen,
Who provided us with the foundational brick The firmware for the cranpi challenge 5 and 6.

Detailed pointers to help unpack the file system.

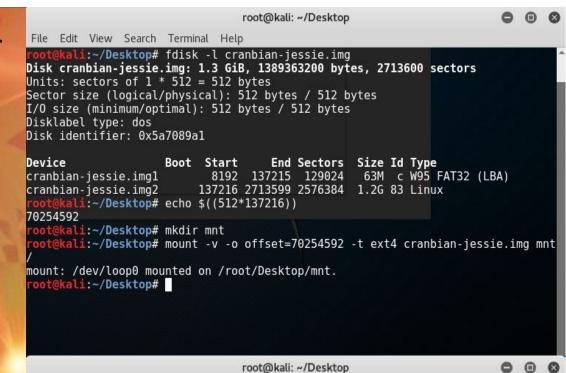
With /etc/shadow file access now fully gained.

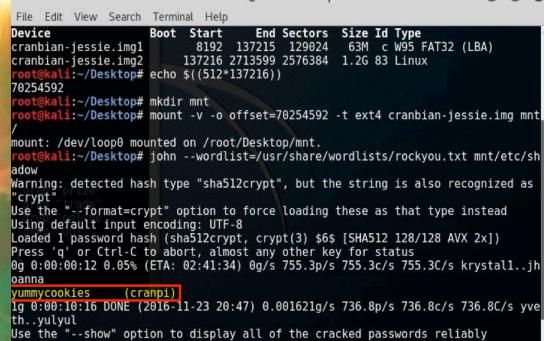
The cranpi account password could be obtained,

John made cracking easy, even for newb wookies,

With the rockyou wordlist we found yummycookies!

5) What is the password for the "cranpi" account on the Cranberry Pi system? yummycookies



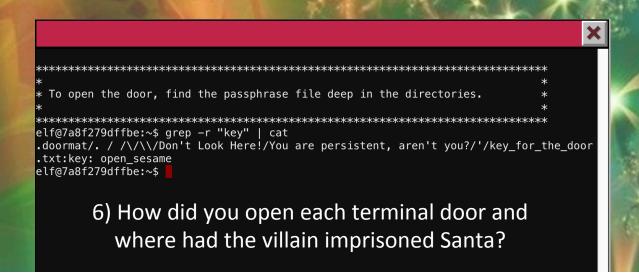


Session completed

Part 6 proved to be a bit more complicated, As terminal challenge answers were located.

Wumpus was solved, while playing the game as it should. We learned the phrase was 'WUMPUS IS MISUNDERSTOOD'. Behind the locked door, an empty stall was there found, Fear not, for this location will not long confound.

The key was hidden in a dot directory,
But find -r "key" | cat showed 'open_sesame'.

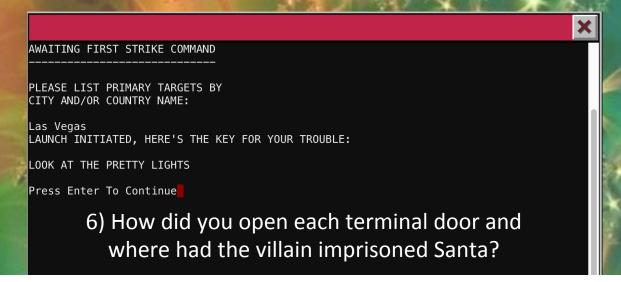


Behind this door was a second door number two,
Where I grew Nostalgic over WarGames text fu.
The text was quite detailed, and had to be just right,
But I was soon told to look at the pretty lights.

Now in the short hall, we're stumped again with no clues.

But even the Grinch who really hated the Whos,

Learned it is sometimes good to have alternate views.



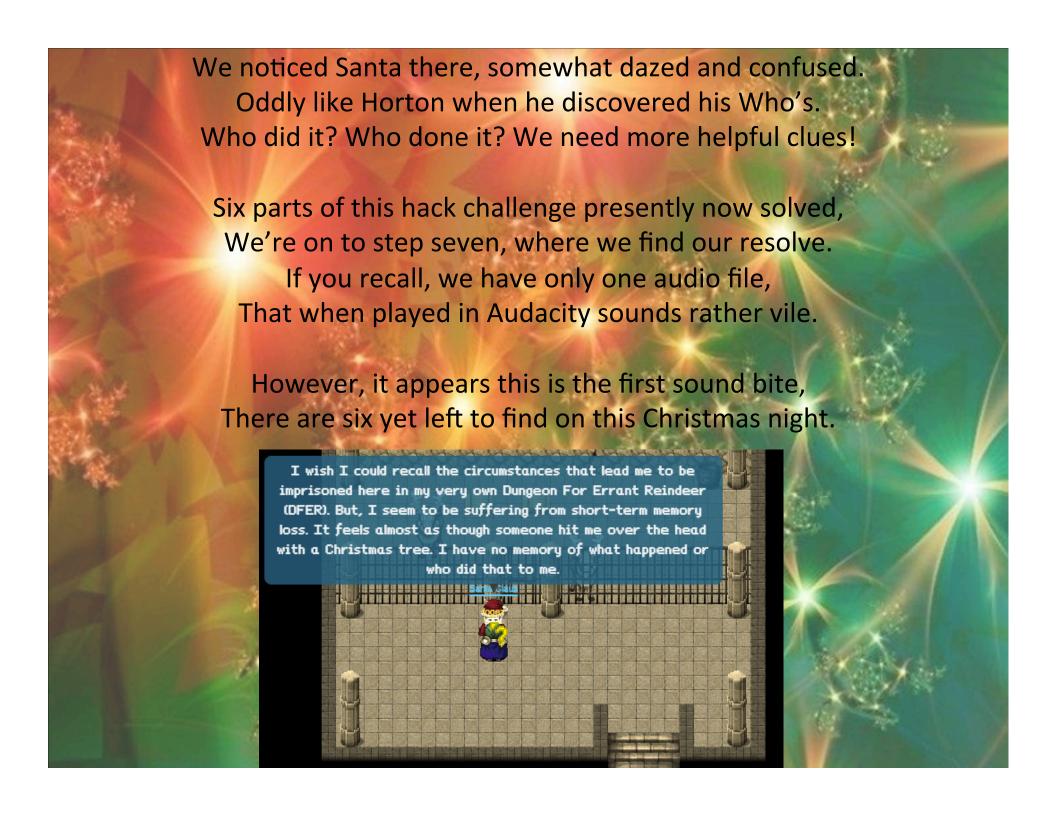
The pcap.out quest was solved with some string theory,
But only when combined with some su-du-ery.
Once the right encoding options were selected,
The phrase santaslittlehelpers was collected.

Finally we hacked the back in time train console, Which took a HELP- bang (!) to find the shell access hole. Once the ActivateTrain switch was virtually flicked, We arrived in '78 and found Saint Nick.

scratchy@6bcba1916586:/\$ sudo -u itchy strings -e S /out.pcap | grep "hidden" sudo: unable to resolve host 6bcba1916586
<input type="hidden" name="part1" value="santasli" />
scratchy@6bcba1916586:/\$ sudo -u itchy strings -e l /out.pcap | grep "part2" sudo: unable to resolve host 6bcba1916586
part2:
ttlehelper
scratchy@6bcba1916586:/\$

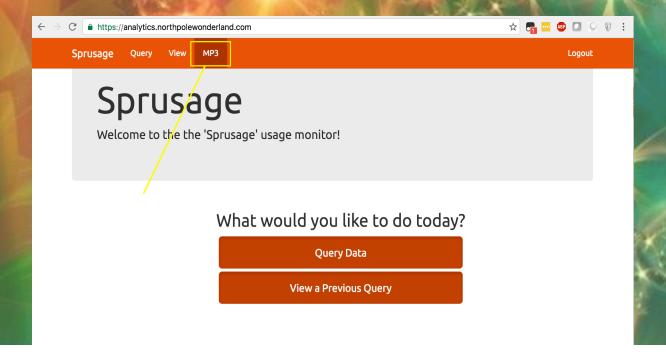
6) How did you open each terminal door and where had the villain imprisoned Santa?

Train Management Console: AUTHORIZED USERS ONLY ==== MAIN MENU ==== STATUS: Train Status BRAKEON: Set Brakes BRAKEOFF: Release Brakes START: Start Train HELP: Open the help document QUIT: Exit console menu:main> HELP sh-4.3\$ ls ActivateTrain TrainHelper.txt Train_Console sh-4.3\$./ActivateTrain



Server two, was a mere test of observation,
The credentials part of our prior conversation.
The user guest and pass busyreindeer78,
We found ourselves staring at the file without wait.

The dungeon game proved to be excruciating,
Because bad assumptions lead to some mistaking,
While the complexity of the puzzle did lack,
The dungeon game felt like the **Empire just Struck Back**.



After beating the game a time or two or ten,
We went back to read the bloody manual again.
Buried in the text was an obvious huge hint,
That led us to think about this puzzles intent.

Haven learned a few cheats to help our dungeon lore,
The GDT hack was known, and a couple more.
Had we paid notice to what DT provided,
Tip 1024 would have been sooner sighted.

```
-MacBook-Pro:SantaGram_4.2 $ nc dungeon.northpolewonderland.com 1111

Welcome to Dungeon. This version created 11-MAR-78.

You are in an open field west of a big white house with a boarded front door.

There is a small wrapped mailbox here.

>gdt

GDT>dt

Entry: 1024

The elf, satisified with the trade says - send email to "peppermint@northpolewonderland.com" for that which you seek.

GDT>
```

Next is the debug challenge for us to get through,
Strings.xml debug variable set true,
Repack the APK, use JAVA to usurp,
Code signing requirements - there's now data in Burp.

The POST request holds noteworthy JSON data,
We wonder aloud, Is SantaGram a beta?
One variable is missing that makes all the difference,
"verbose":true brings a complete new app experience!

```
POST /index.php HTTP/1.1
Content-Type: application/json
User-Agent: Dalvik/1.6.0 (Linux; U; Android 4.4.2; Venue
7 3730 Build/KOT49H)
Host: dev.northpolewonderland.com
Connection: close
Accept-Encoding: gzip
Content-Length: 159

{"date":"20161226111728-0500", "freemem":29830496, "debug":"
com.northpolewonderland.santagram.EditProfile,
EditProfile", "udid":"23a0880e38257dd1", "verbose":true}
```

```
HTTP/1.1 200 OK
Server: nginx/1.6.2
Date: Mon, 26 Dec 2016 16:18:52 GMT
Content-Type: application/json
Connection: close
Content-Length: 436

{"date":"20161226161852","date.len":14,"status":"OK","status.len":"2","filename":"debug-20161226161852-0.txt","filename.len":26,"request":{"date":"20161226111728-0500","freemem":29830496,"debug":"com.northpolewonderland.santagram.EditProfile,
EditProfile","udid":"23a0880e38257dd1","verbose":true},"files":["debug-20161224235959-0.mp3","debug-20161226161726-0.txt","debug-20161226161852-0.txt","index.php"]}
```

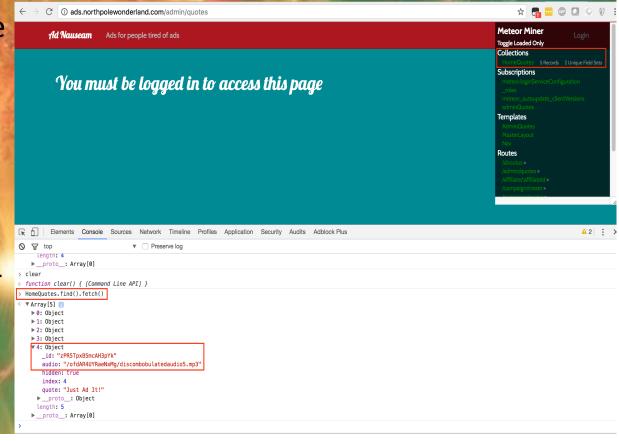
With SantaGram modded and its use underway, The ad servers next this Christmas Eve holiday.

The website loaded with complex JavaScript ads,
More hackable than the DNC was for Vlad!
Thanks to Eds write up we were not greatly confused,
Soon Meteors framework was quite abused.

Meteor Miner, and some JavaScript kung fu,
Gave us the path to file number fives hidden view.

What a gift, there's the file name under admin – quotes.

Hack One, two three, four and now five, we're getting close



We are still looking to solve this games main premise,
That there is some particular Phantom Menace.

On to puzzle sixes misleading subreption,
One assured to grant an audio exception.

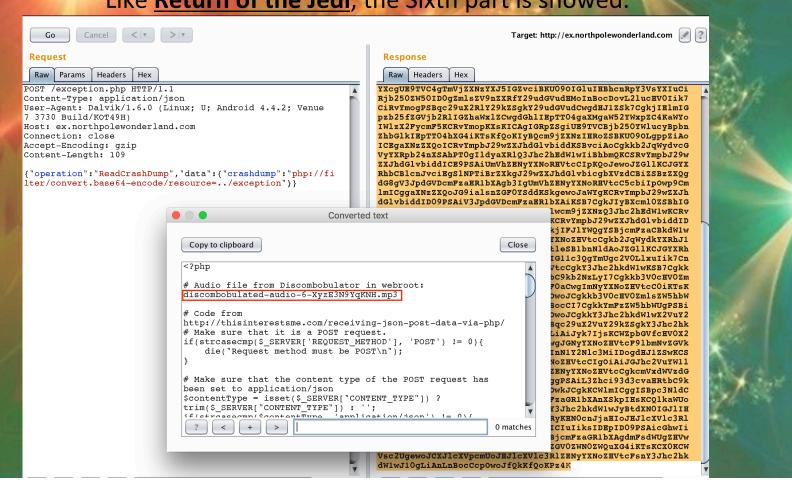
Fahoo forays, dahoo dorays
Welcome Christmas! Come this way
Fahoo forays, dahoo dorays
Welcome Christmas, Christmas Day

Welcome, welcome, fahoo ramus Welcome, welcome, dahoo damus Christmas Day is in our grasp So long as we have hands to clasp

Pouring over error datas rarely straight forward, Tweaking POST JSON content is its own reward.

For with a flip of the variable WriteCrashDump, We had more data real estate access than Trump.

Add to this the filter-base-64 decode, Like <u>Return of the Jedi</u>, the Sixth part is showed.



While we're hoping to keep our solving momentum, We'll be honest - this hack took some intervention.

SQL injection, didn't appear to do much,
At least not without an administrator touch.

Starting from scratch, we nikto'd the Sprusage server, And found a git unseen by the causal observer.

```
kali:/tmp# nikto -port 443/-host analytics.northpolewonderland.com
                      104.198.252.157
  Target IP:
  Target Hostname:
                     analytics.northpolewonderland.com
 Target Port:
                  Subject: /CN=analytics.northpolewonderland.com
 SSL Info:
                  Ciphers: ECDHE-RSA-AES128-GCM-SHA256
                            /C=US/O=Let's Encrypt/CN=Let's Encrypt Authority X3
 Start Time:
                      2016-12-26 07:03:53 (GMT-5)
 Server: nginx/1.6.2
 Root page / redirects to: login.php
 No CGI Directories found (use '-C all' to force check all possible dirs)
 OSVDB-3093: /db.php: This might be interesting... has been seen in web logs from an unknown scanner.

    /login.php: Admin login page/section found.

 Server leaks inodes via ETags, header found with file /.git/index, fields: 0x5841cee6 0xd2c
+ OSVDB-3092: /.git/index: Git Index file may contain directory listing information.
+ /.git/HEAD: Git HEAD file found. Full repo details may be present.
+ /.git/config: Git config file found. Infos about repo details may be present.
+ 7499 requests: 0 error(s) and 6 item(s) reported on remote host
                     2016-12-26 07:48:58 (GMT-5) (2705 seconds)
```

A recursive get supplied a local depot, Of the content to create a git based repo.

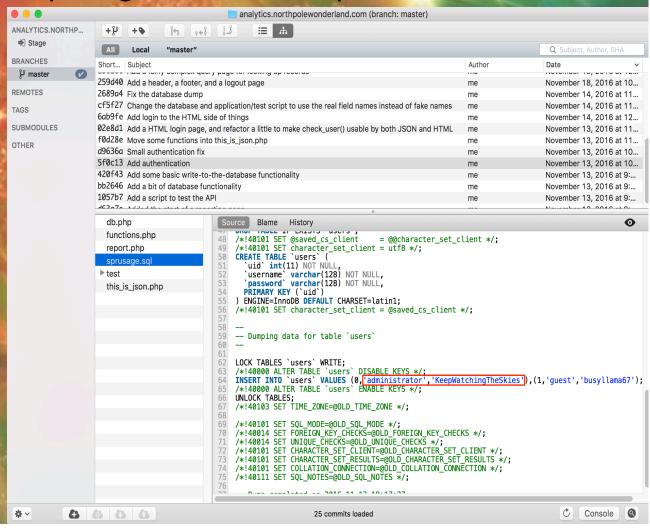
Given that you need to have some knowledge of git,
I found myself yelling at the screen quite a bit...

"All I need is the admin creds. We said to null,

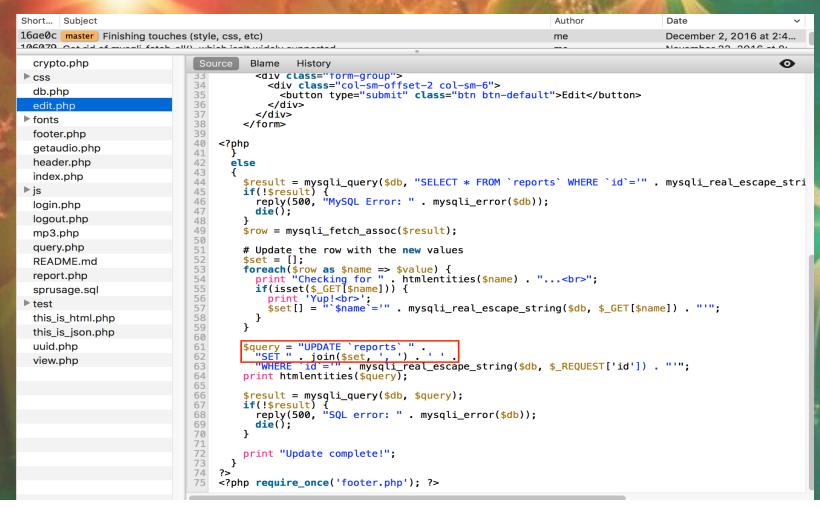
But passwords are scarce except on Defcons shame wall.

Dedication rewarded us as we persist,

Now Keep Watching The Skies is on my 'to watch list'.



The next part was a duzy, I'll gladly admit,
Lots of source code review, to find one little bit.
Slipped in a file, that only the admin could view
The file edit.php gave us lots to do.



In the Sprusage schema, a column was betrayed,
Adding the field 'query' proved a risky upgrade.
Injecting some carefully crafted SELECT SQL,
The appsec failed worse than the first Star Wars prequel.

```
DROP TABLE IF EXISTS `reports`;
/*!40101 SET @saved_cs_client = @@character_set_client */;
/*!40101 SET character_set_client = utf8 */;
CREATE TABLE `reports` (
  id` varchar(36) NOT NULL,
  `name` varchar(64) NOT NULL,
  description` text.
 `query` text NOT NULL
 ENGINE=InnoDB DEFAULT CHARSET=latin1;
/*!40101 SET character s
                       CREATE TABLE `audio` (
                           id` varchar(36) NOT NULL,
                           username` varchar(32) NOT NULL,
                           filename` varchar(32) NOT NULL,
                          `mp3` MEDIUMBLOB NOT NULL
                          ENGINE=InnoDB DEFAULT CHARSET=latin1;
                        /*!40101 SET character_set_client = @saved_cs_client */;
```

By SELECTing this and that we eventually saw, The details to get this challenges final haul.

One more trick was required in order to extract, To_base64 tweak finalized the attack.

Sprusage Query View Edit Logout

Sprusage

Welcome to the the 'Sprusage' usage monitor!

Checking for id...

Yup!

Checking for name...

Yup!

Checking for description...

Yup!

Checking for query...

Yup!

UPDATE `reports` SET `id`='3bd6c517-4eb7-43f6-a5e9-9048a77c4142', `name`='`\$name`',
`description`='`\$name`', `query`='select to_base64(mp3) from audio where username=\'administrator\'' WHERE
`id`='3bd6c517-4eb7-43f6-a5e9-9048a77c4142'Update complete!

From raw ASCII characters in a huge text pile,

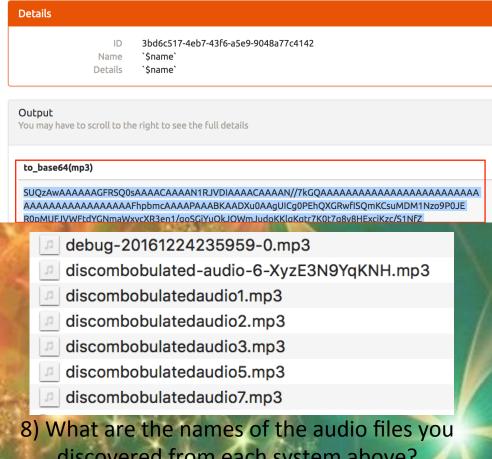
We use a converter to create a bin file.

We've all the audio files to complete the game.

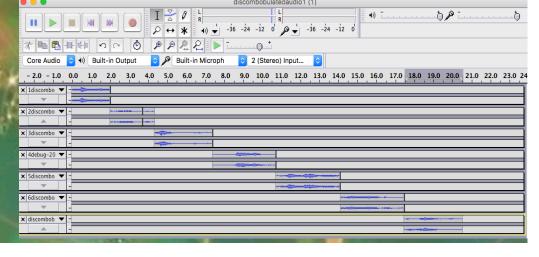
Audacity will help us see if they're the same.

Arrange front to back, then tweak the pitch and tempo,

> And so we have discovered the final passcode.



discovered from each system above?



Thanks to a little Tardis hint left on the desk,

The search for the details didn't leave us perplexed

Dr. Who as it appears, might have been involved,

In this dastardly puzzle that we finally solved.

You're a vile one, Dr. Who. Your a nasty ol chef.
Cooking up more nasty tricks than the Revenge of the Sith.
Dr. Who! You were caught said,
Father Christmas, Santa Claus or, as I've always known him, Jeff.

But I have to wonder about one little thing,
Could Dr. Seuss be Dr. Who in lyrical bling?
The Grinch lives in Whoville, and Dr. Whos a Grinch?
Naaa, that would be too much a coincidence.

So I did what I had to do. I knew that Santa's powerful North
Pole Wonderland Magick could prevent the Star Wars Special
from being released, if I could leverage that magick with my
own abilities back in 1978. But Jeff refused to come with me,
insisting on the mad idea that it is better to maintain the
integrity of the universe's timeline. So I had no choice — I had
to kidnap him.



(Dr. Who) - Next question: Why would anyone in his right mind kidnap Santa Claus?

<Dr. Who> - The answer: Do I look like I'm in my right mind? I'm a madman with a box.

<Dr. Who> - I have looked into the time vortex and I have seen a universe in which the Star Wars Holiday Special was NEVER released. In that universe, 1978 came and went as normal. No one had to endure the misery of watching that abominable blight. People were happy there. It's a better life, I tell you, a better world than the scarred one we endure here.

(Dr. Who) - Give me a world like that, Just once.

<Dr. Who> - So I did what I had to do. I knew that Santa's powerful North Pole Wonderland Magick could prevent the Star Wars Special from being released, if I could leverage that magick with my own abilities back in 1978. But Jeff refused to come with me, insisting on the mad idea that it is better to maintain the integrity of the universe's timeline. So I had no choice — I had to kidnap him.

9) Who is the villain behind the nefarious plot.

Dr. Who

10) Why had the villain abducted Santa?

See above

O

With a smile to his soul, we descended Mount Crumpet Cheerily blowing "Who! Who!" on our trumpet.

We road into Whoville. We brought back their toys. We brought back their floof to the Who girls and boys.

We brought back their snoof and their tringlers and fuzzles, Brought back their pantookas, their dafflers and wuzzles.

We brought everything back, all the food for the feast! And he, he himself, the Grinch carved the roast beast!

Welcome Christmas. Bring your cheer, Cheer to all Whos, far and near.

Christmas Day is in our grasp So long as we have hands to grasp.

Christmas Day will always be Just as long as we have we.

Welcome Christmas as we stand, Heart in heart and hand in hand.

