2018

Covert Communication Application

FINAL PROJECT – DESIGN WORK

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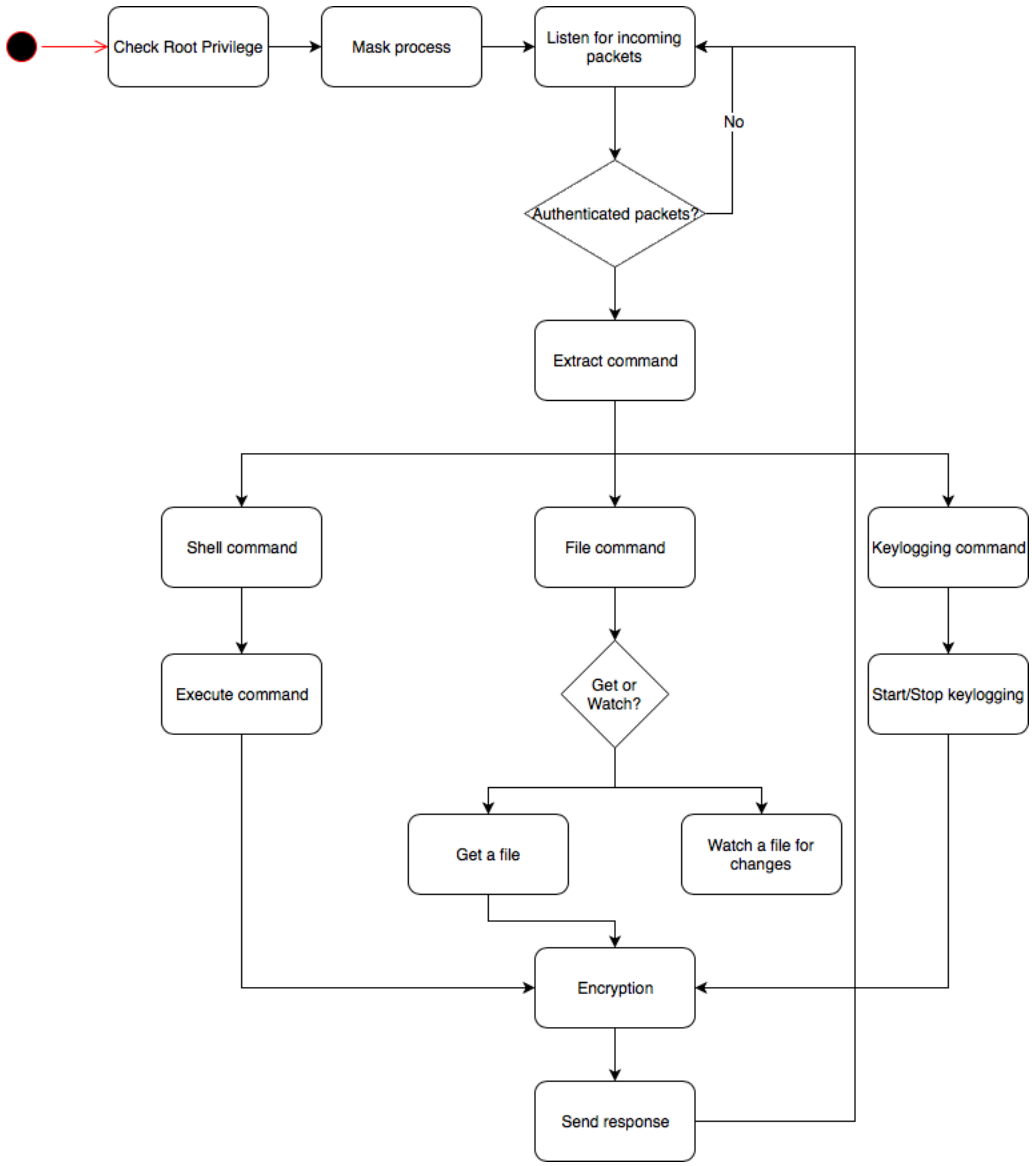
1. BACKDOOR

1.1. DIAGRAM



1.2. DESCRIPTION

- Check root privilege: the application requires root access in order to install necessary modules.
- Mask process: run the process as a disguised process that means it will not catch the victim's attention when he looks at the process table.
- Listen for incoming packets: sniff the traffic for incoming packets
- Authenticated packets: the backdoor will only process packets that are authenticated. Authenticated procedure can be embedded the password in the payload.
- Extract command: extract the command in the payload
- Shell command: check if the command is a shell command

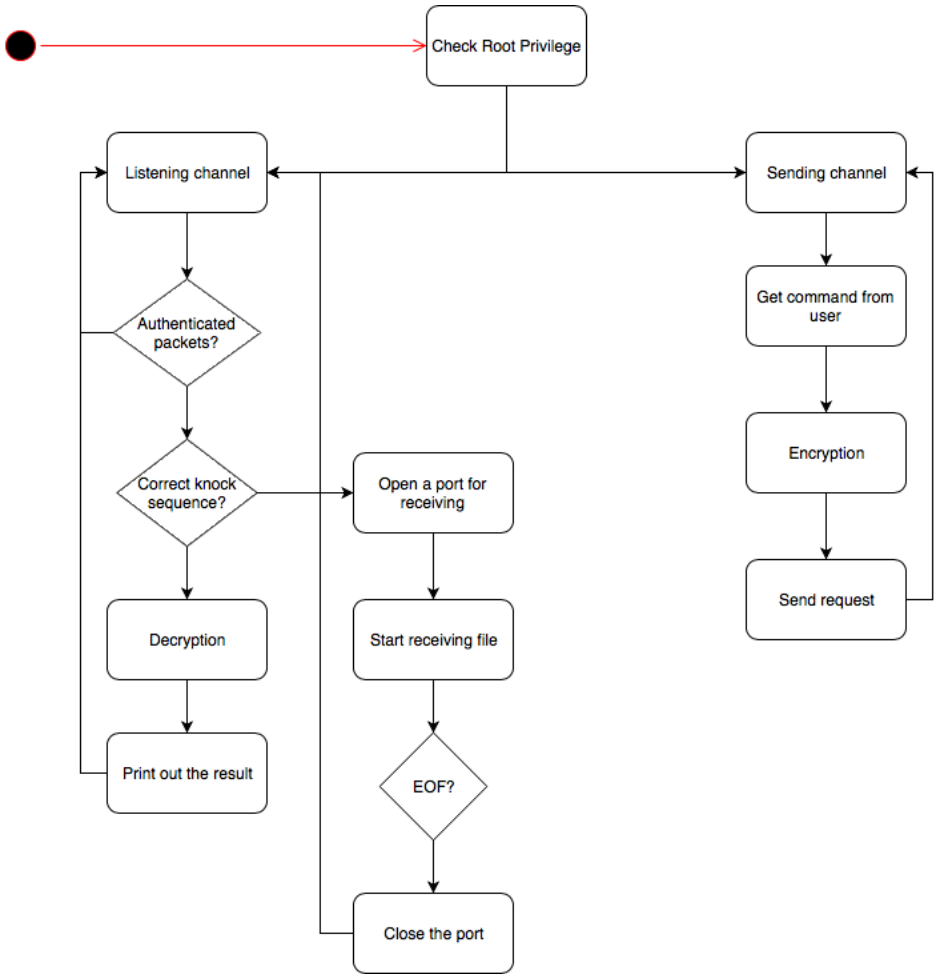
- Execute command: execute the command and return the result
- File command: check if the command is a file command
- Get or Watch: check if the user wants to watch a specific file/directory or to get a file
- Get a file: if the user wants to get a file, grasp the file and make it ready to send.
- Watch a file of changes: add a watch to look for any changes in the file/directory.
- Keylogging command: check if the command is a command for keylogging.
- Start/stop keylogging: start the keylogger if it is not started yet, stop the keylogger if it is started already.
- Encryption: encryption all data before sending them out
- Send response: send the packets to the attacker. If the command is a file command, send them on a different channel and run port knocker to create a connection.

1.3. PSEUDOCODE

```
Backdoor
Check if user is root user
Set the process tittle to be something else
While listening for incoming packets
     Receive a packet
     If packet is authenticated
          Extract command from packet payload
          If command is shell command
               Execute command
               Encrypt the result
               Send the result to attacker machine
          Elif command is file command
               If file command is watch
                    Add watch to a file
               Elif file command is get
                    If file exits
                         Get the file
                         Encrypt all data
                         Start port knocker
                         Send the file
                    Endif
               Endif
          Elif command is keylogging command
               If keylogger is active
                    Stop keylogger
               Elif keylogger is not active
                    Start keylogger
                    Encrypt keystroke data
                    Send keystroke data
               Endif
          Endif
Endwhile
```

2. ATTACKER

2.1. DIAGRAM



2.2. DESCRIPTION

- Check root privilege: the application requires root access in order to install necessary modules.
- Listening channel: sniff the traffic for incoming packets.
- Authenticated packets: check if the packets are intended for the attacker application.
- Correct knock sequence: if the knock sequence is correctly done, it means that the backdoor wants to send a file. If it is not, it means that the backdoor wants to send the result of executed commands.
- Decryption: decrypt the packet to get the result.
- Print out the result: print the result to standard output.
- Open a port for receiving: modify the iptables table to allow incoming traffic for a specific port.

- Start receiving file: after opening the port, the application will receive the file in chunk bytes.
- EOF: if the packet is EOF packet, stop receiving and write to a file.
- Close the port: remove the iptables rule to close the port.
- Sending channel: run the loop to get the user command.
- Get command from user: ask the user to get the command.
- Encryption: encrypt the command with password and put it in the payload.
- Send request: send the packet to the backdoor.

2.3. PSEUDOCODE

```
Attacker
Check if the user is root user
Start listening thread
     While listening for incoming packets
          If packet is authenticated
               If it does correct port knock sequence
                    Open a port to start receiving
                    While there is more data to receive
                         Write data to a file
                         If it reaches end-of-file
                              Break
                    Endwhile
                    Close the port
               Else
                    Decrypt the payload to get the result
                    Print out the result
               Endif
          Endif
     Endwhile
Start sending thread
     While the application is still alive
          Get the command from the user
          Encrypt the command
          Wrap encrypted command in packet's payload
          Send the packet
     Endwhile
```

3. TIMELINES

3.1. Milestone #1 (May 29 – June 05)

- Implementing keylogger on the backdoor application.
- The backdoor will send every keystroke that the victim presses.
- The attacker application will receive the keystroke data and print to the standard output.

3.2. Milestone #2 (June 05 – June 12)

- Implementing file monitor on the backdoor application.
- The attacker can specify to watch a file or a directory for changes such as modify, delete, create.

3.3. Milestone #3 (June 12 – June 19)

- Implementing file transfer on both application.
- The backdoor application will use port knocking technique to make the attacker application open a port
- The attacker application will open a port and start receiving and close the port after finished the task

3.4. Milestone #4 (June 19 – June 26)

- Testing and debugging
- Documentation