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FKIE

Daniel Baier & Max Ufer

friTap: Decrypting TLS on the fly

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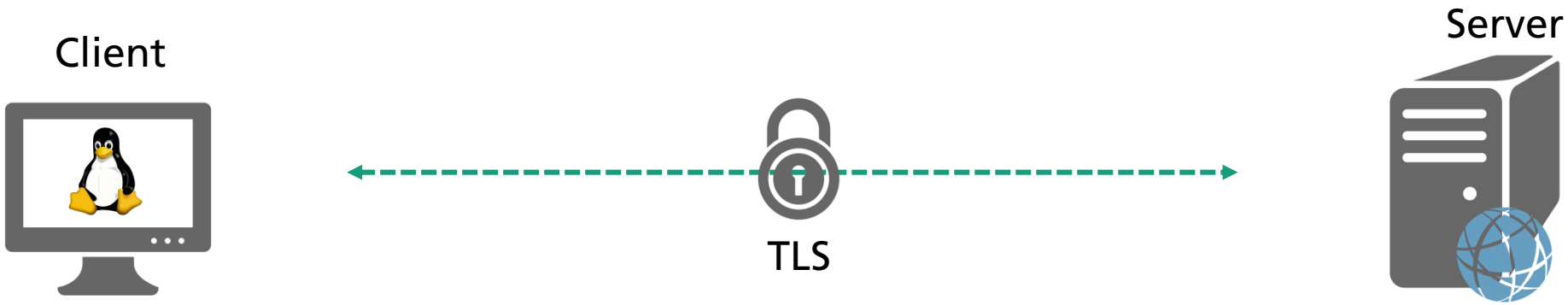
Is a MitM-Proxy enough?



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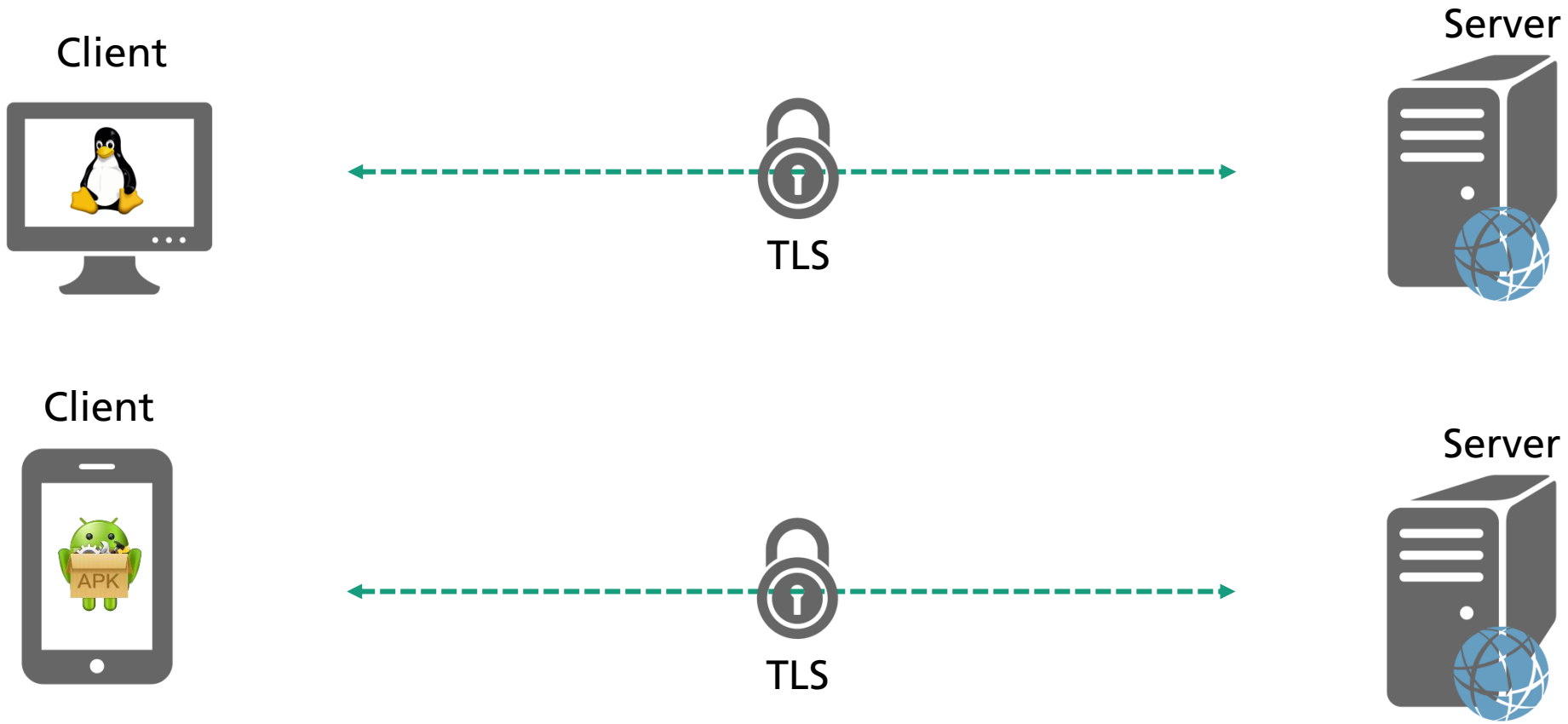
Is a MitM-Proxy enough?

TLS without any attack



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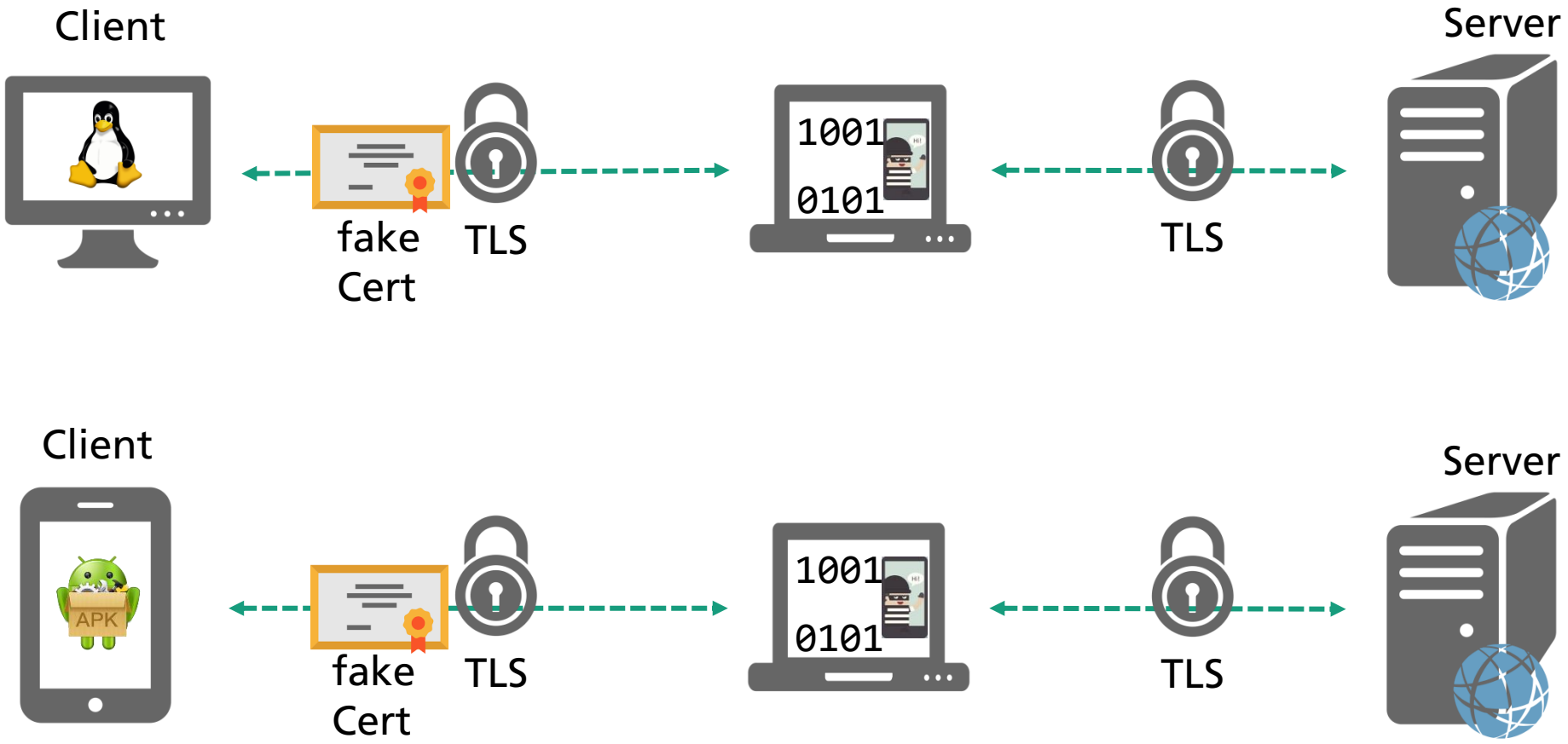
Is a MitM-Proxy enough?

DH-Attack with fake Cert



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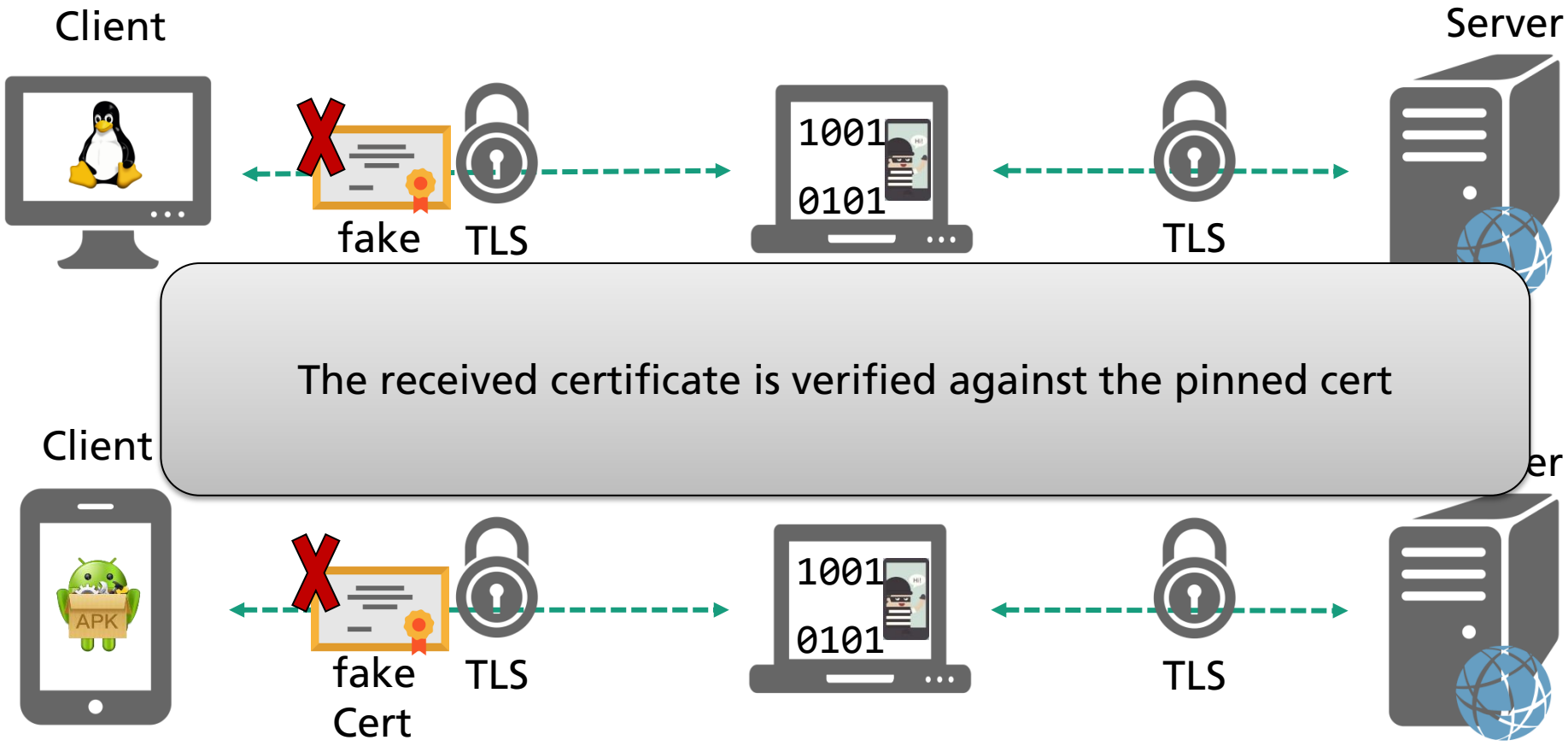
Is a MitM-Proxy enough?

Certificate Pinning



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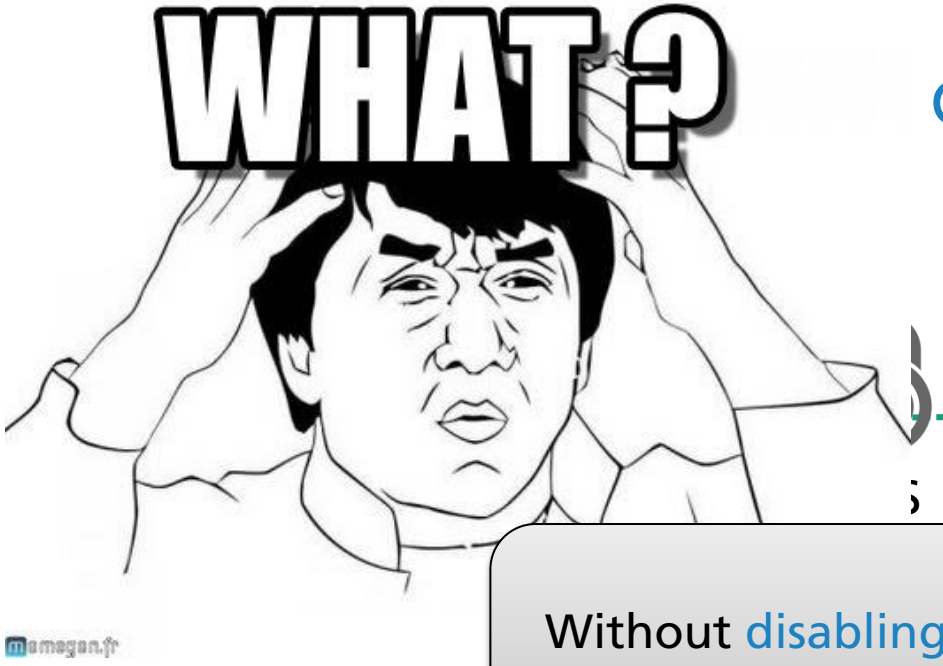
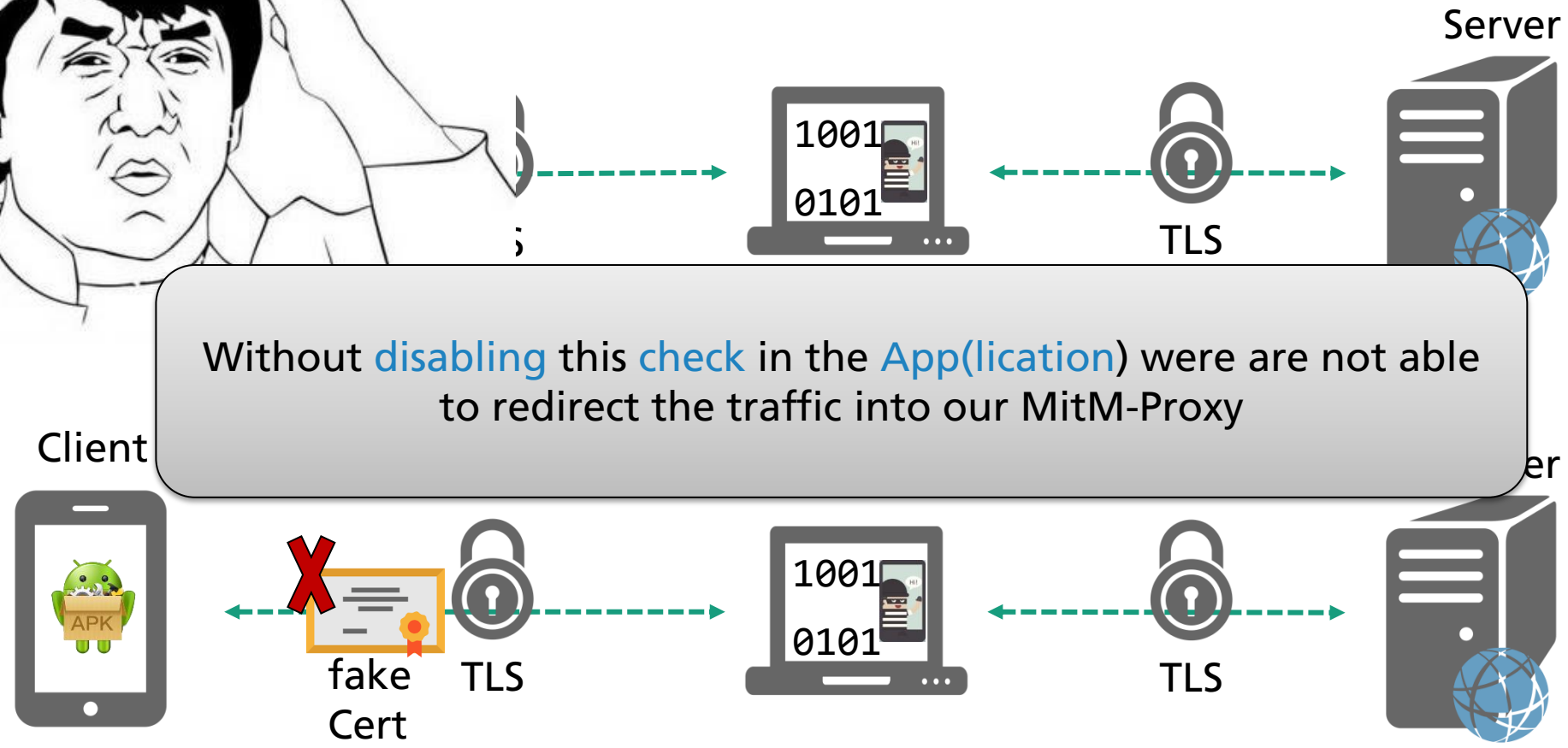
MitM-Proxy is not enough



Certificate Pinning



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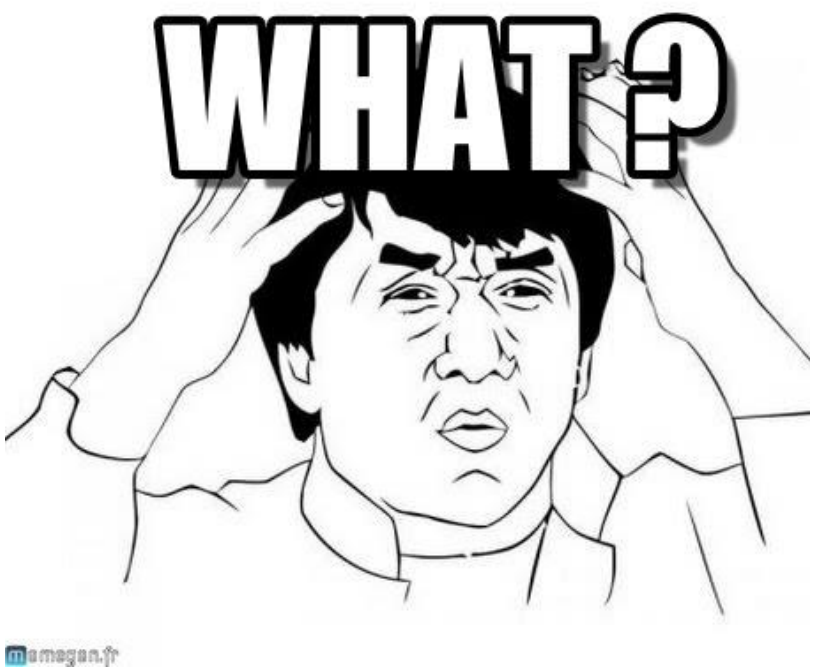
Solution: Disable the check



9.Hook SSLPINNING.js into target application:

- Finally, we will hook sslpinning.js into the native application with the following command:

frida -U -l sslpinning.js — no-paus -f com.twitter.android

```
C:\Users\Pranav.Achary\AppData\Local\Programs\Python\Python38\Scripts>frida -U -l sslpinning.js --no-paus -f com.twitter.android
     ____
    / _  |   Frida 12.9.7 - A world-class dynamic instrumentation toolkit
   | (_| |
    > _  |   Commands:
   /_/ |_|       help      -> Displays the help system
   . . . .       object?   -> Display information about 'object'
   . . . .       exit/quit -> Exit
   . . . .
   . . . .   More info at https://www.frida.re/docs/home/
Spawned `com.twitter.android`. Resuming main thread!
                                                                    T=PortSwigger, C=PortSwigger
[o] App invoked javax.net.ssl.SSLContext.init...
[+] SSLContext initialized with our custom TrustManager!
```

We have to apply some hooking of the certificate pinning check

fake Cert

When we have to „attack“ the App why not directly extract the payload of the TLS-stream?

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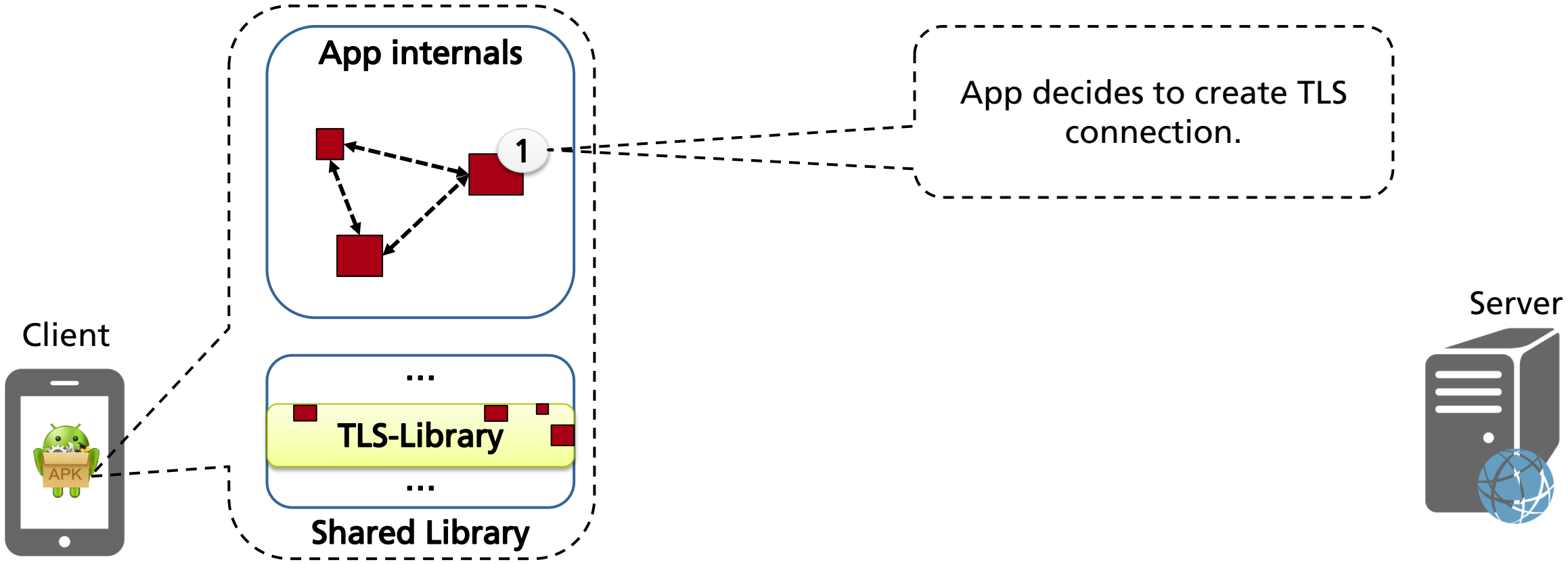
friTap: Approach

A TLS-stream offers the application to write its decrypted value to it ....



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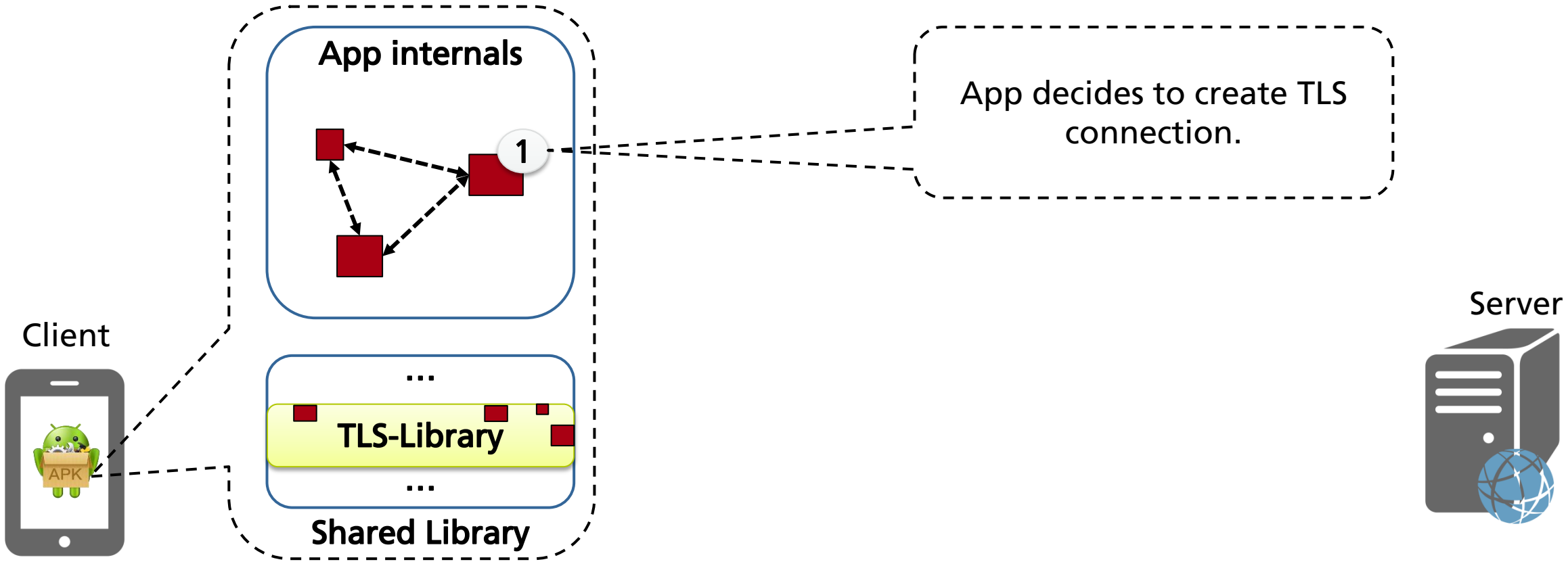
friTap: Approach

A TLS-stream offers the application to write its decrypted value to it ....



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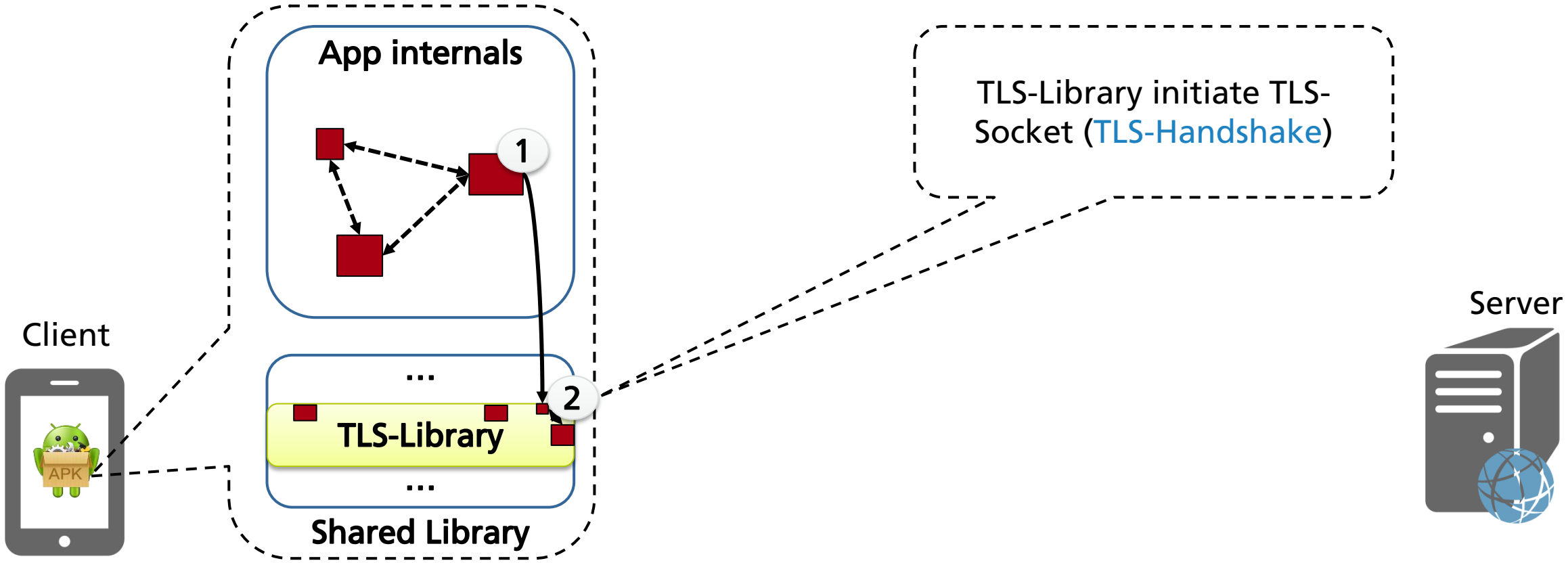
friTap: Approach

A TLS-stream offers the application to write its decrypted value to it ....



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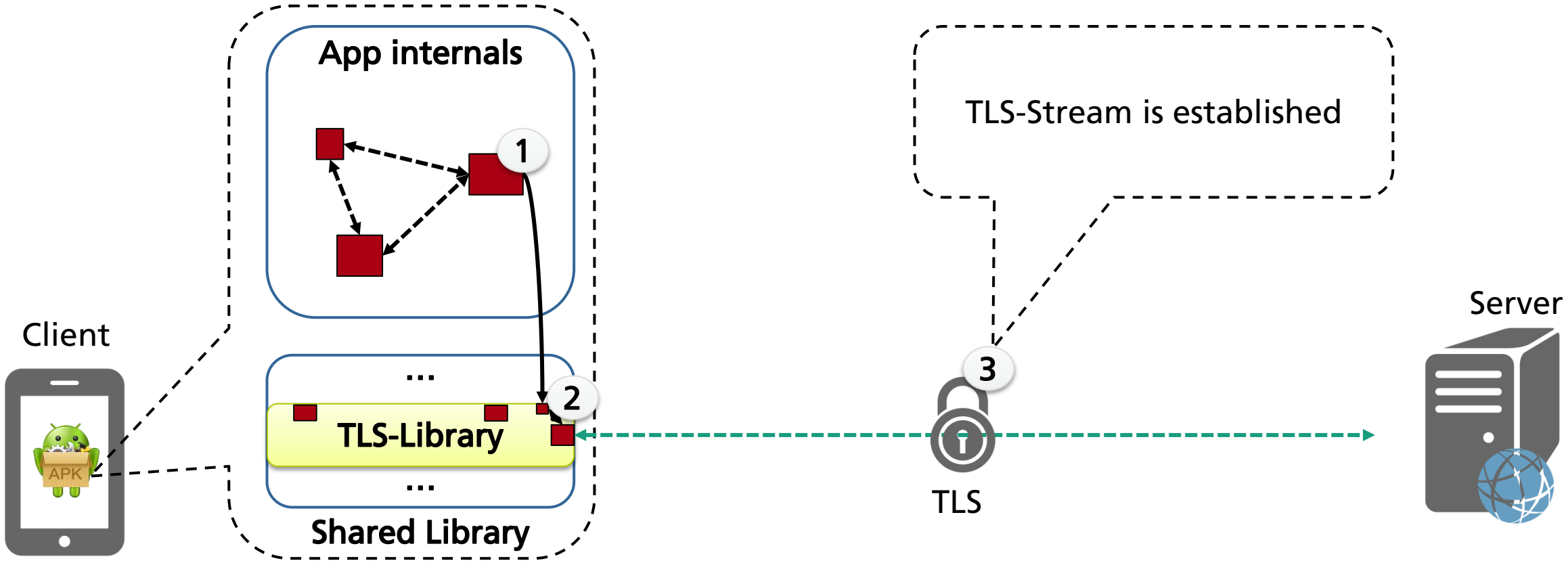
friTap: Approach

A TLS-stream offers the application to write its decrypted value to it ....



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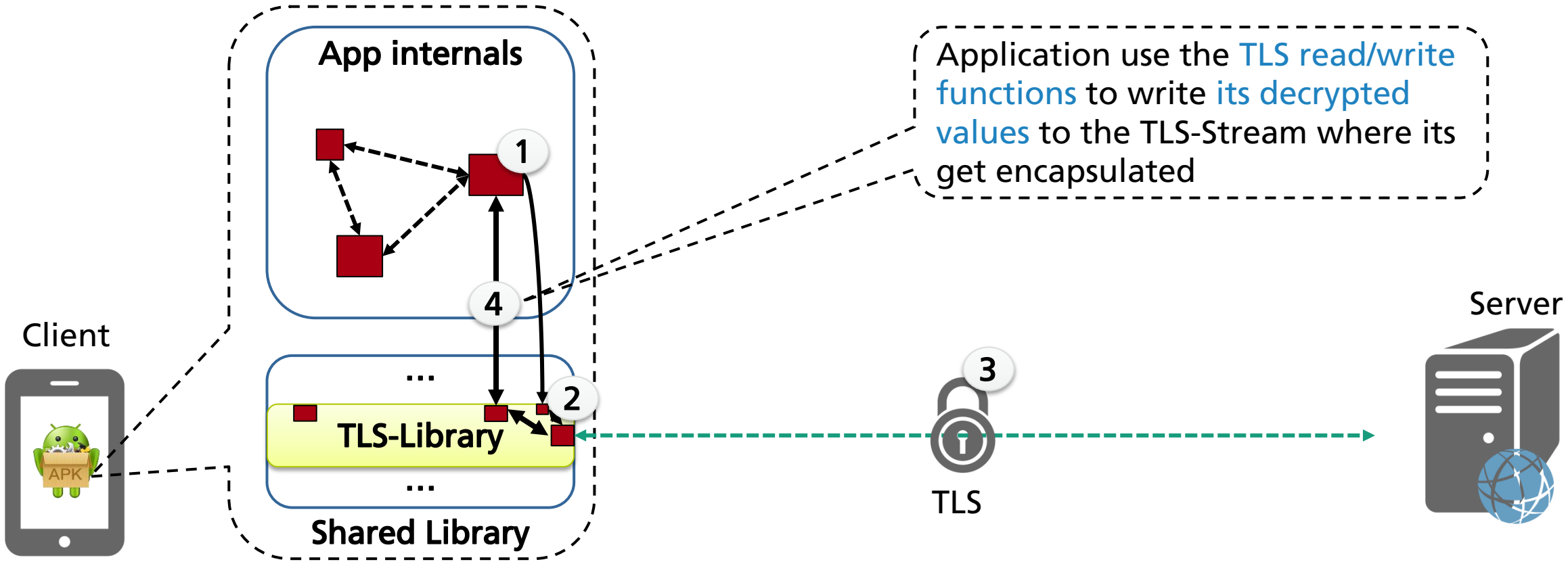
friTap: Approach

A TLS-stream offers the application to write its decrypted value to it ....



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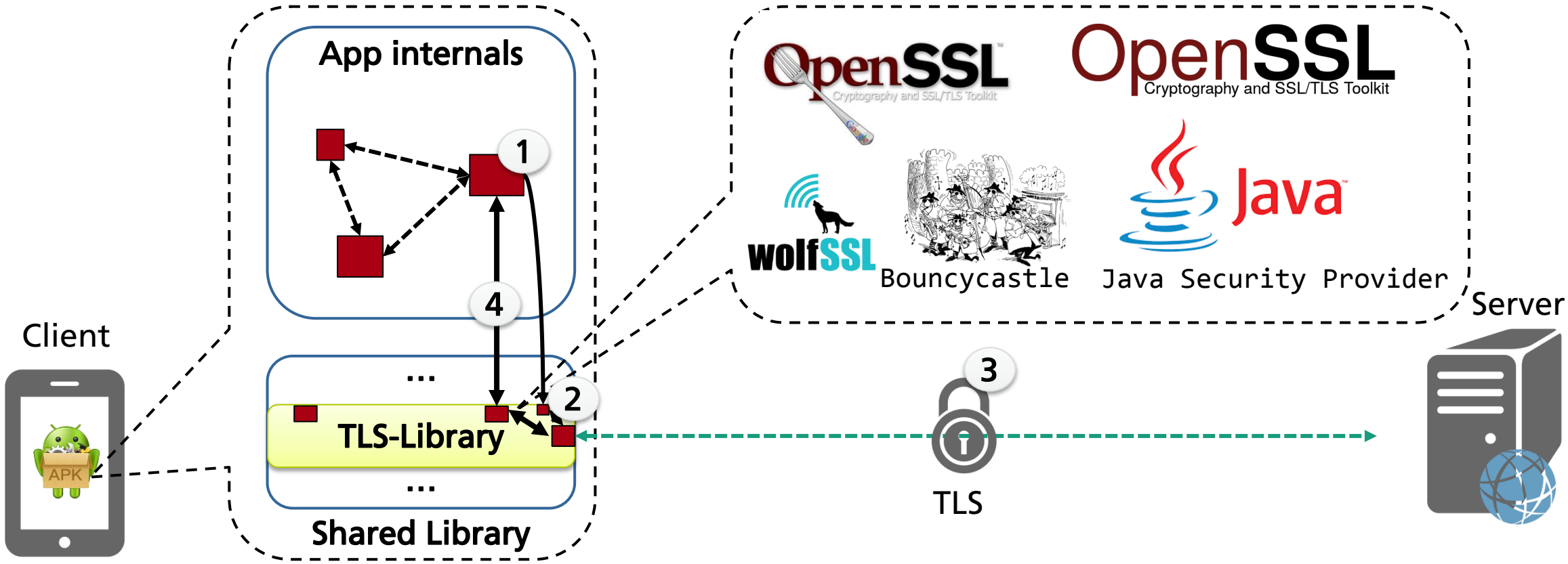
friTap: Approach

Hooking the TLS read/write functions of the TLS library



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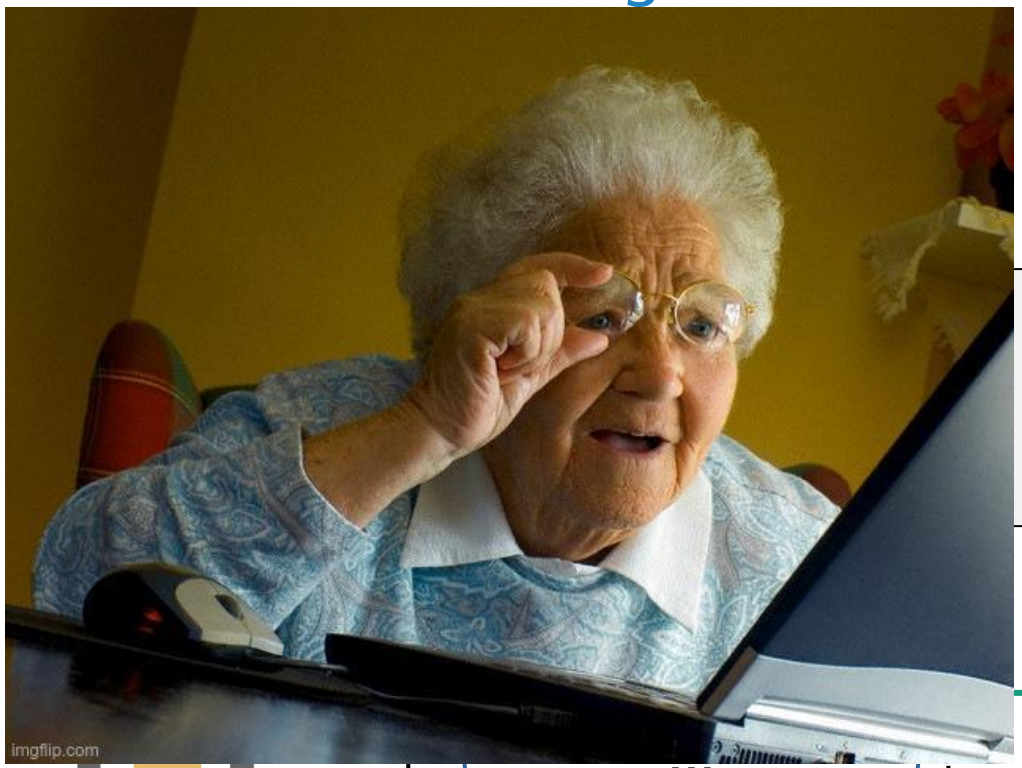
friTap: What else?

Hooking the TLS functions of the TLS-library to extract TLS-Keys



THE SSLKEYLOG-file can also be logged. SSL-Libraries offers ways to write the used keys into a file which can later on used by Wireshark to decrypt the captured traffic.

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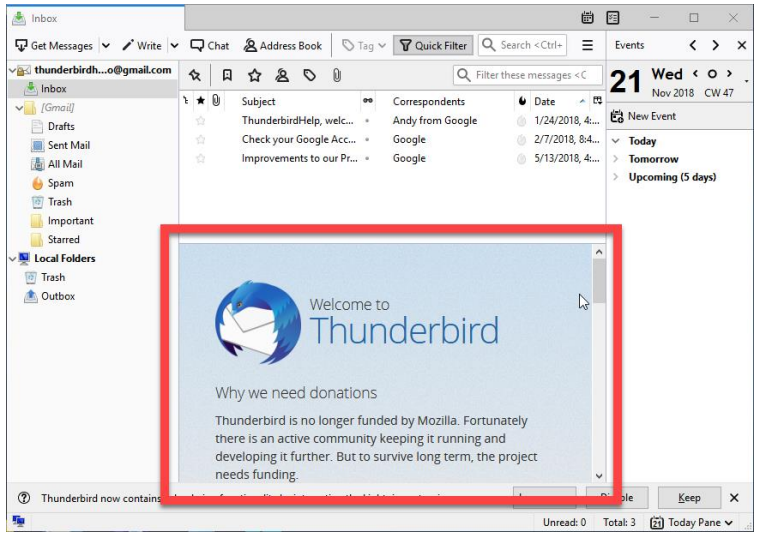
Demo

Thunderbird



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Demo

Different Android APKs from the Playstore

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Future Work

There is still a lot of work to do….

- Add fully Linux support
- Support for other Operating Systems
- Capturing all traffic of an Application directly with friTap