



from Echobot to TRIfA, a journey

Zoff at ToxCon 2018 12.-14.10.2018

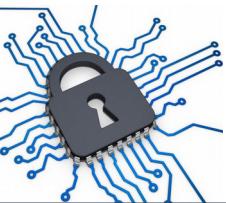


About

- Programmer
- IT Worker
- System Administrator (Linux, Solaris)
- Projectmanager



ordering stuff on the internet



3

a long time ago in a garden far away



the reality of package delivery



Ohne Abstellgenehmigung nicht erlaubt: Vor der Haustür abgelegtes Paket.



watch it ...

Get a camera and watch your garden and garden door.
Have proof if the packet is damaged or is gone.

some technical solutions:

- NetCam with WiFi
- Raspberry Pi with Camera
- look on <https://hackaday.io>
- some proprietary solution



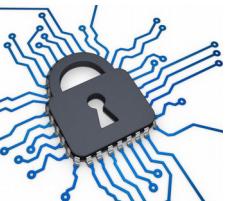
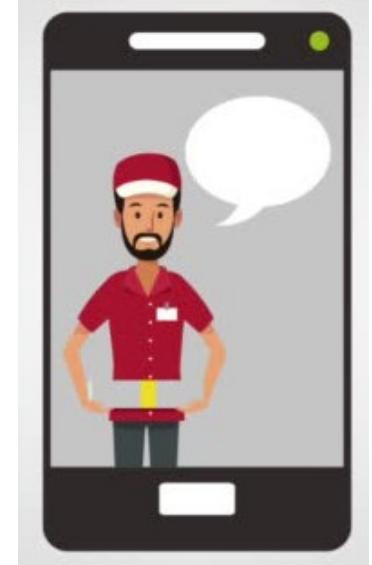
Why not use one of those?

- proprietary
- expensive
- security unknown
- don't want a Server on the Internet
- don't want to open up the Homenet



solution with Tox ...

- open source
- secure
- no Server needed
- no need to modify your firewall or homenet
- works for mobile devices
- live 2 way communication possible



where to start?

Echobot, just 100 lines of C code
(https://wiki.tox.chat/developers/client_examples/echo_bot)



ToxDoorspy

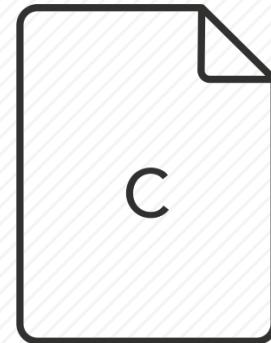
<https://github.com/zoff99/ToxDoorspy>



save
captured
image
to
folder



Tox node



poll folder
for
new images



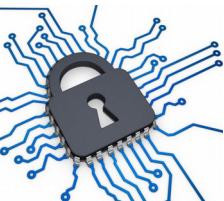
Antox

it only makes sense to get notice on a mobile device



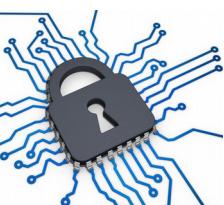
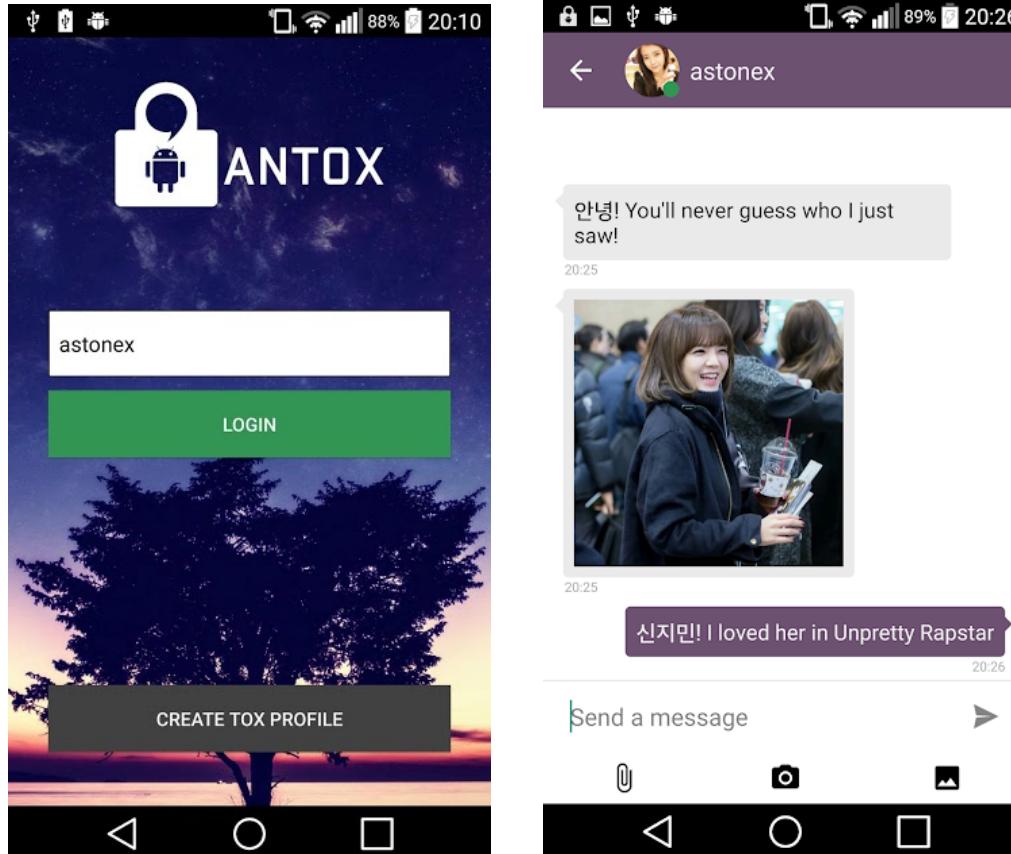
Antox

it only makes sense to get notice on a mobile device



Antox

it only makes sense to get notice on a mobile device



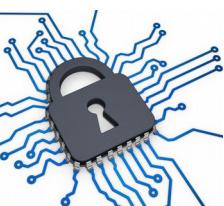
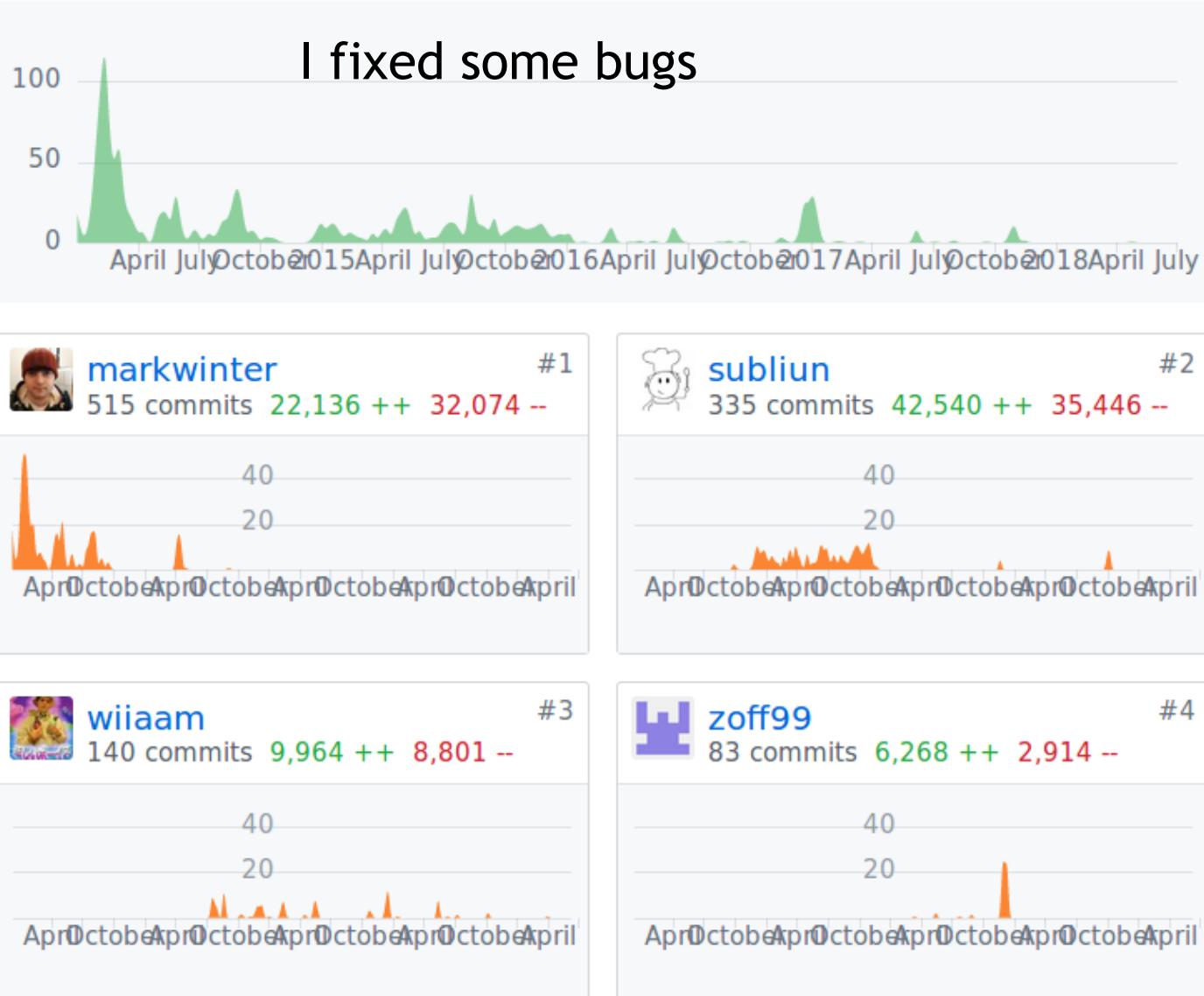
Antox

issues on everyday use:

- hangs/freezes often
- crashes often
- crashed immediately on 64bit Android devices
- A/V not working
- Groupchat not implemented
- don't know Scala



Antox



compiling Antox from Source

dependencies needed to compile Antox fully from source:

- scala
- sbt
- Android SDK
- Android NDK
- yasm
- libsodium
- libkalium-jni
- libvpx
- opus
- c-toxcore
- jvm-toxcore-c
- jvm-toxcore-api
- jvm-svt-plugins
- protobuf
- Java, Scala, C, C++, gcc, clang, some 32bit stuff

compile time on CircleCI:

 **FIXED**

Finished:

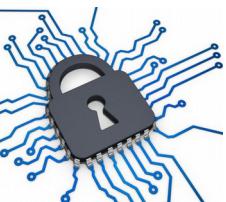
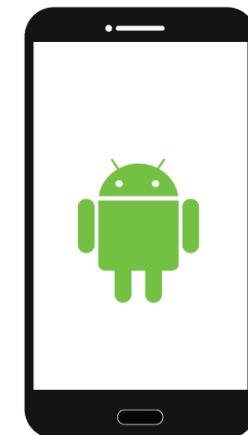
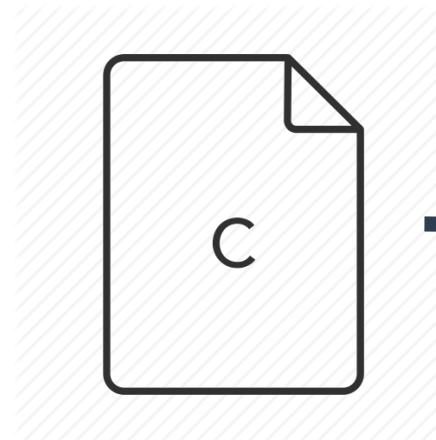
1 year ago (1:32:46)



ToxCam

<https://github.com/zoff99/ToxCam>

- compiled as totally static binary



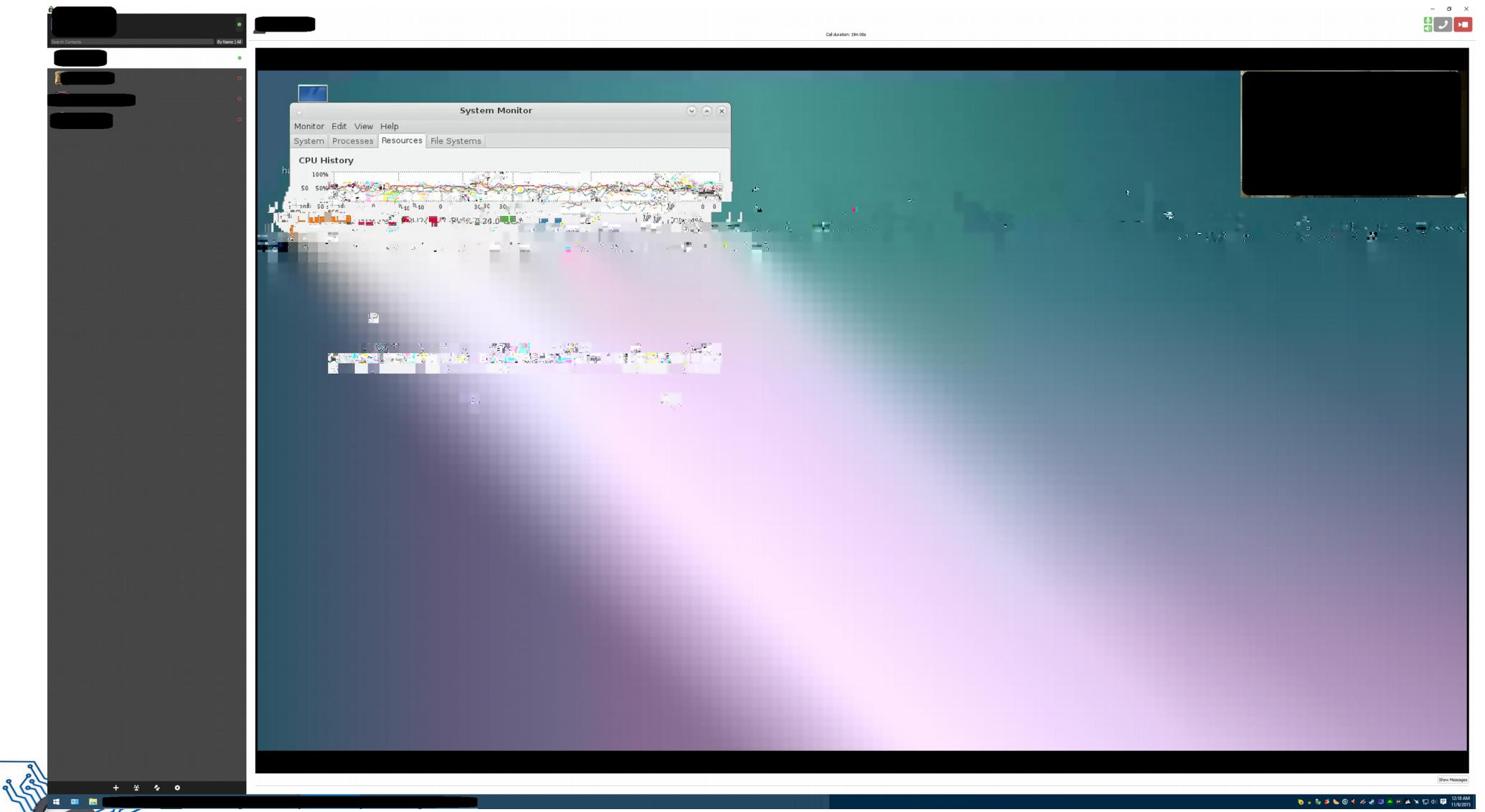
the elusive video bug, #620

symptoms may include:

- no video arriving on receiver ever
- first video frame arriving on receiver minutes after call started
- top of the video is ok, rest is just noise



the elusive video bug, #620



the elusive video bug, #620

<https://github.com/TokTok/c-toxcore/blob/v0.1.10/toxav/rtp.c>

a small thing has a huge impact:
length modulo `UINT16_MAX` is used.
so if length is 65537 then actually 1 is used.
so if length is 65536 then actually 0 is used.

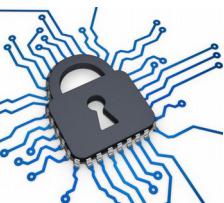
```
112 int rtp_send_data(RTPSession *session, const uint8_t *data, uint16_t length, Logger *log)
113 {
114     if (!session) {
115         LOGGER_ERROR(log, "No session!");
116         return -1;
117     }
118 }
```



Oops i wrote a new client

(this actually happened before we found and solved the video bug)
I wanted to get to the root of the video issues with Antox

- write a simple echobot in java using only jvm-* dependencies
→ jvm-* need scala to work
- write a super simple JNI library for c-toxcore just giving API functions to java 1:1
→ this worked faster than i expected
- write a simple Android app using the new JNI library without a GUI
→ just output stuff to system log
- add just enough GUI to receive video in the Android App
→ in 1 weekend TRIfA was born (by accident)



TRIfA

Tox Reference Implementation for Android [TRIfA]

~~This is not a Reference Client, it's c-toxcore for Android.~~

This is now also a Tox Client for Android.



TRIfA - feature list

- the only client that encrypts everything (well 99,9%)
- stores incoming messages and files in encrypted storage
- stores outgoing messages in encrypted storage
- 1-on-1 messages
- 1-on-1 filetransfers
- group chats (messages only)
- persistent group history (stored fully encrypted)
- 1-on-1 Video chat
- 1-on-1 Audio chat
- add friends via QR-Code
- connect via Tor (using Orbot) via 1 click setting
- bootstrap hosts DNS lookup via Tor (if using Tor)
- option to update the bootstrap hosts list from <https://nodes.tox.chat>

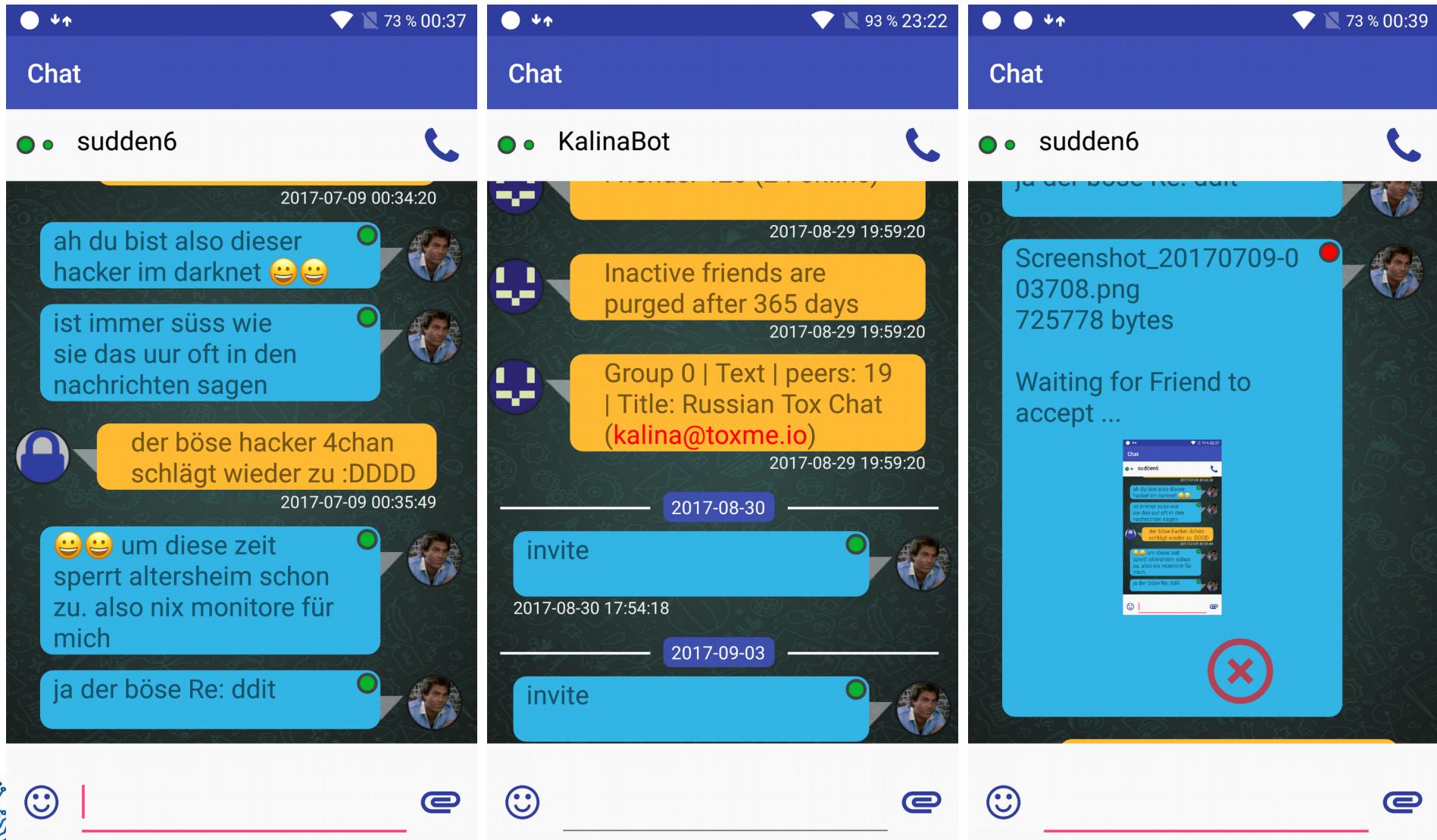


TRIfA - some components

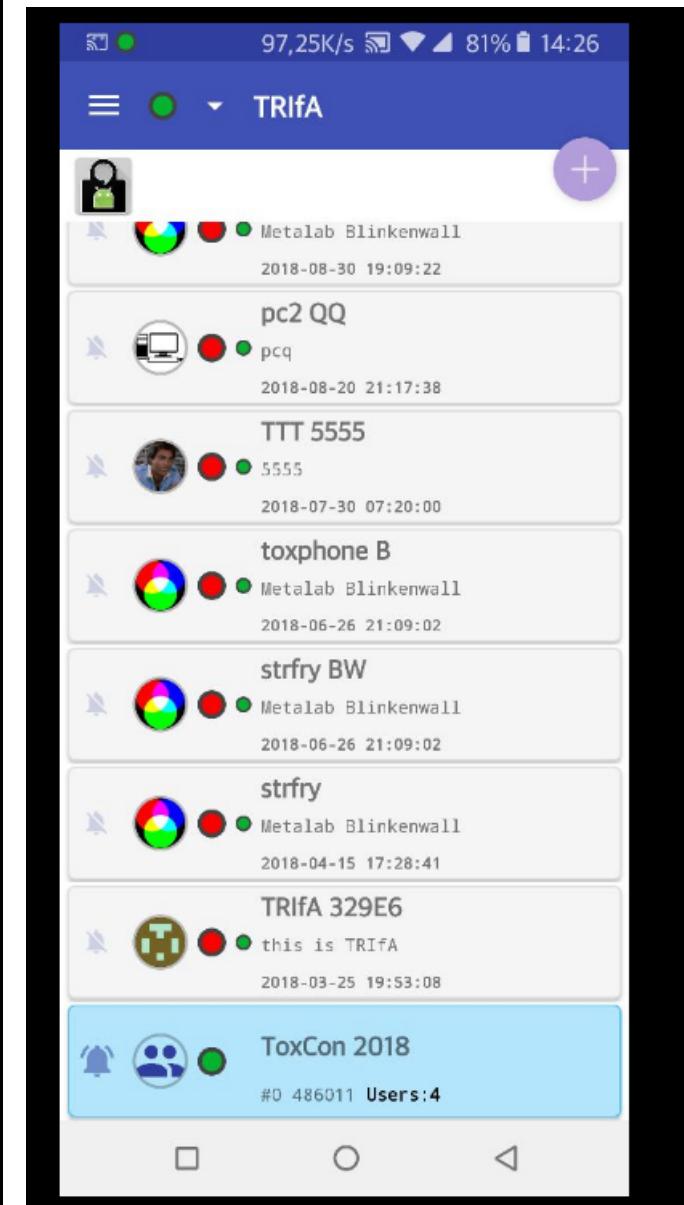
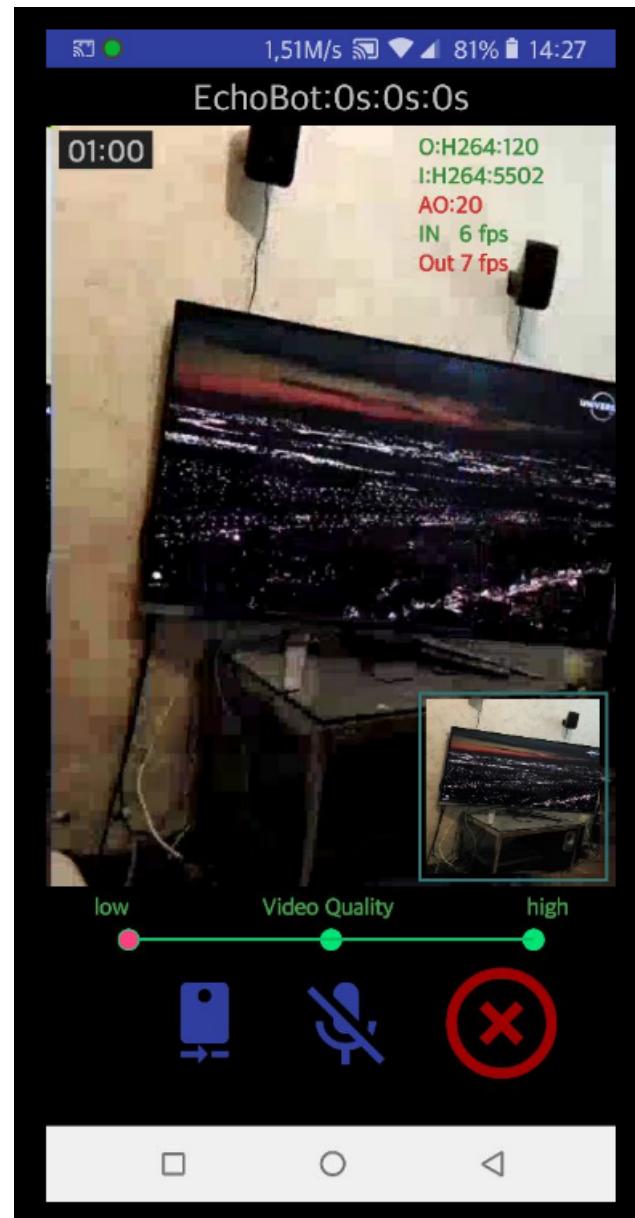
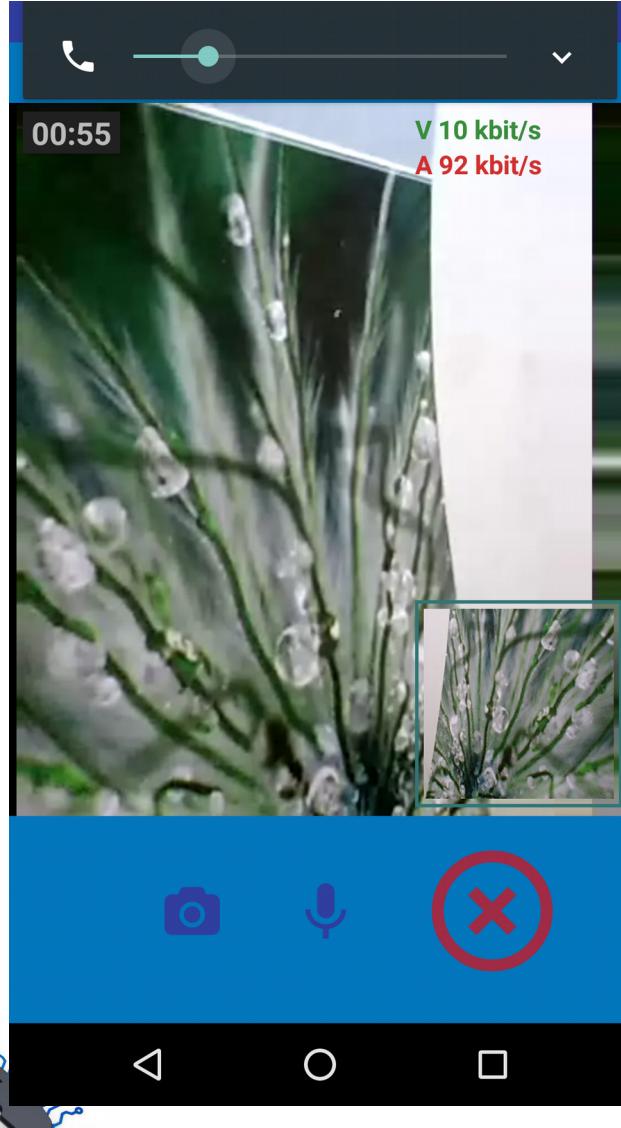
- SQLCipher for Android (via Android-Orma)
<https://github.com/maskarade/Android-Orma>
- IOCipher for Android
<https://github.com/guardianproject/IOCipher>
- Gradle Witness
<https://github.com/signalapp/gradle-witness>
- RenderScript for Android
<https://en.wikipedia.org/wiki/RenderScript>
- iOS Emojis for Android
<https://github.com/vanniktech/Emoji>



TRIfA - screenshots



TRIfA - screenshots



TRIfA - on the „north pole“

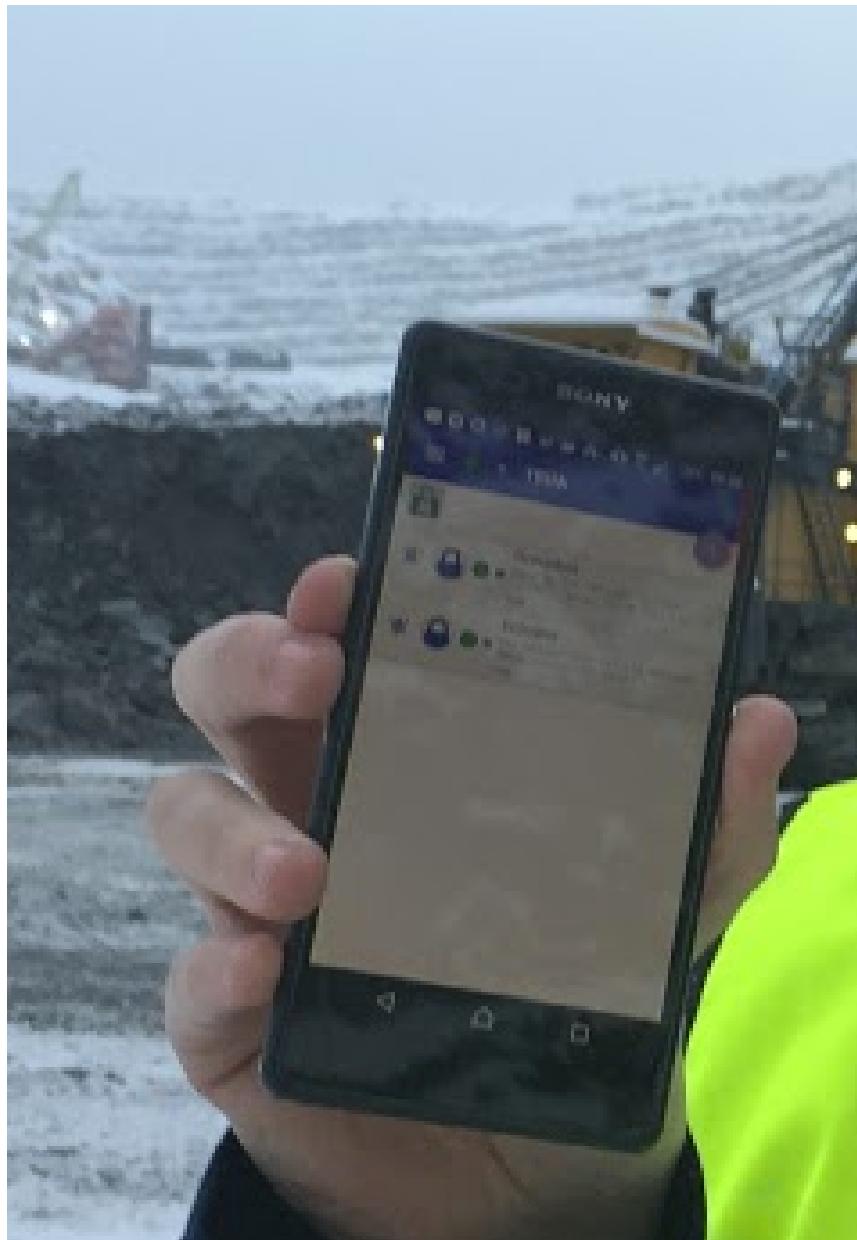


Photo credit: Amazonaws.com



getting in touch ...

- Github

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- Email

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