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TLS Attacke: ALPACA

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„Per Bande zum Ziel“

Wie ein Angriff auf das Web unschuldige Dienste nötigt.

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FireFox

Webseite

Angreifer.de

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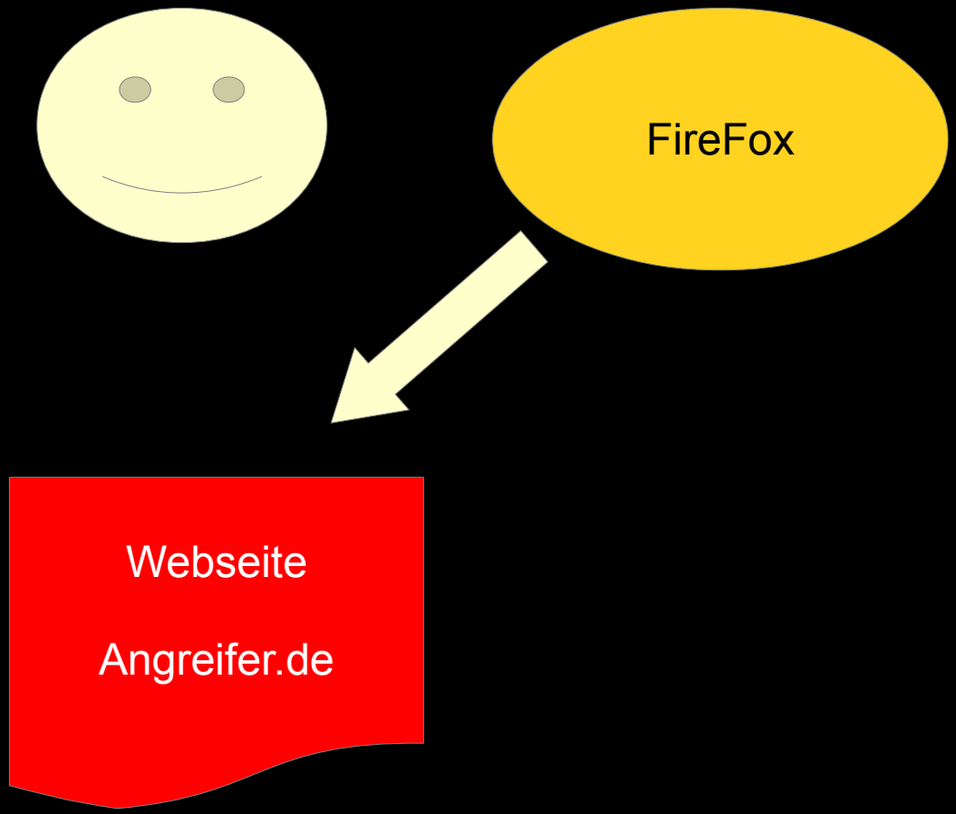

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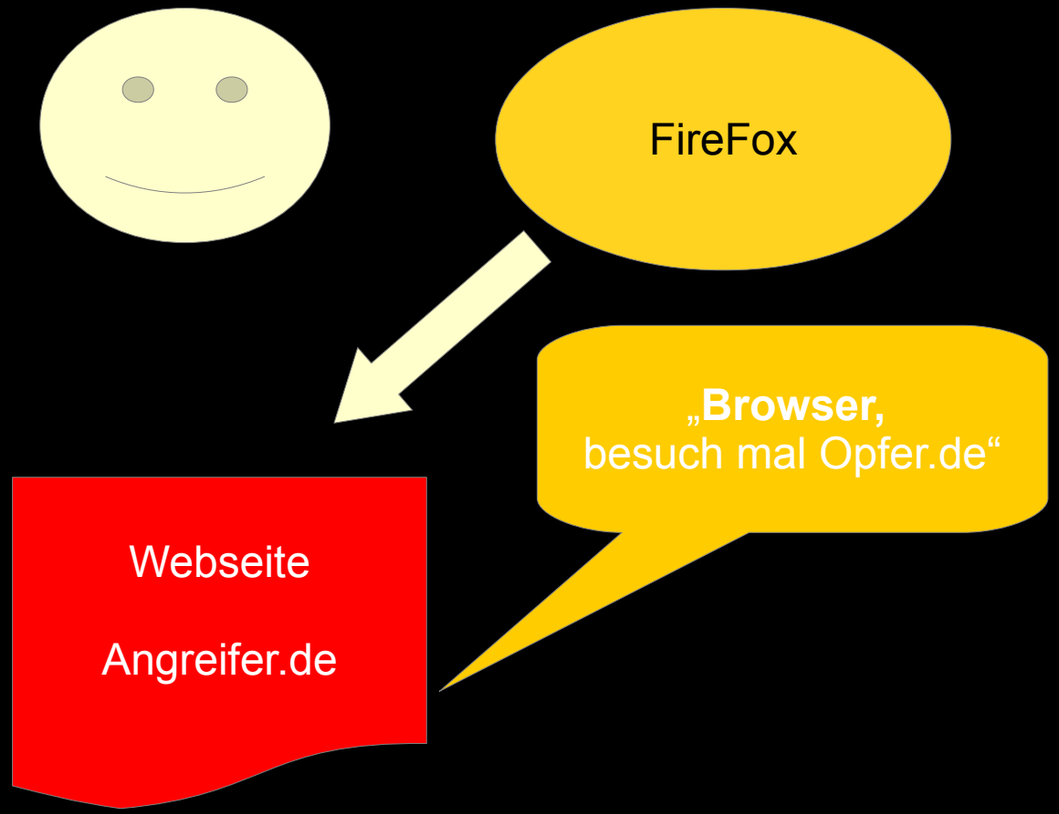

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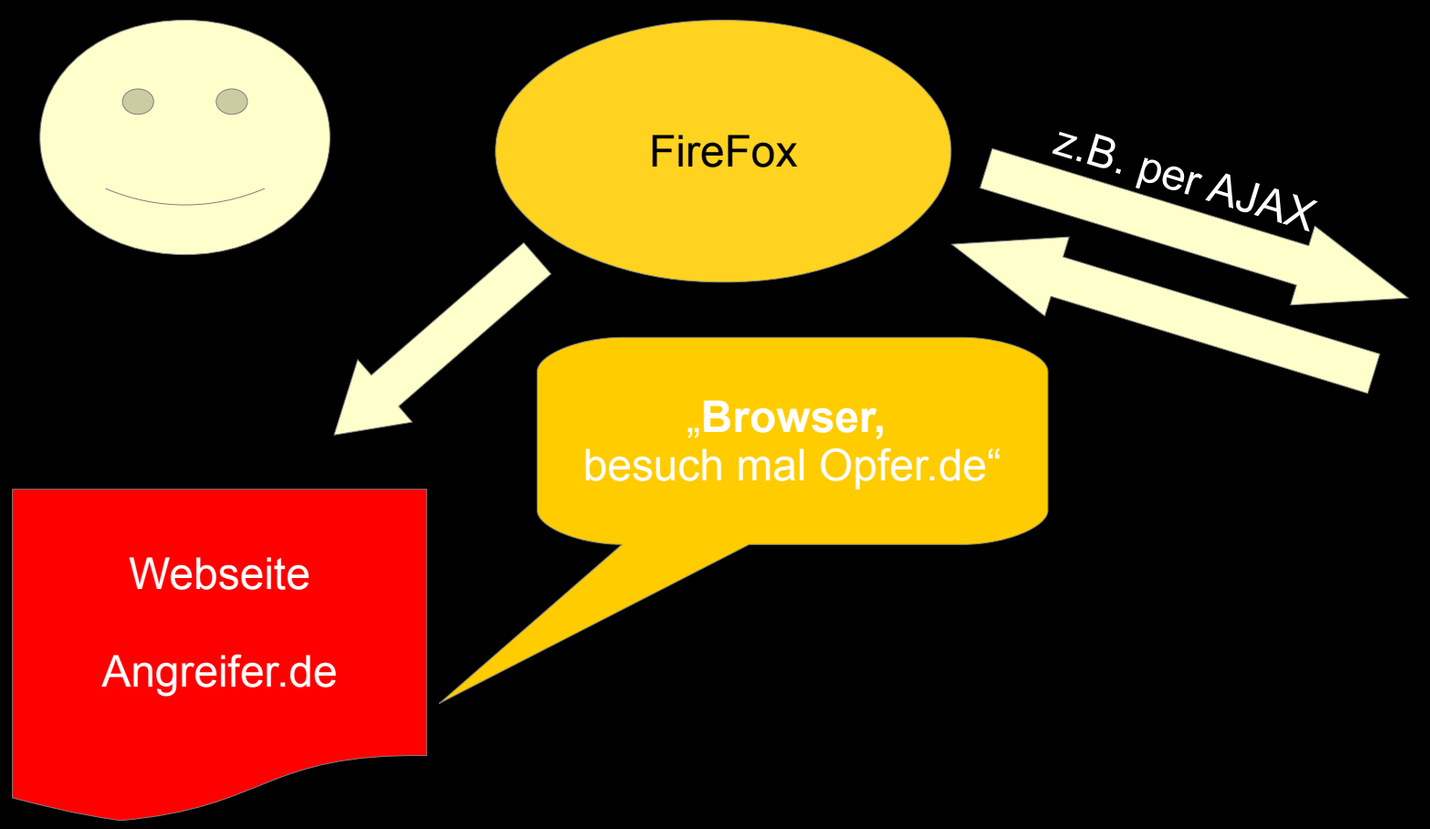

Domain: opfer.de

Webserver Port 443

FTP – Server Port 21
SMTP – Server Port 25
POP3 – Server Port 110
IMAP – Server Port 143

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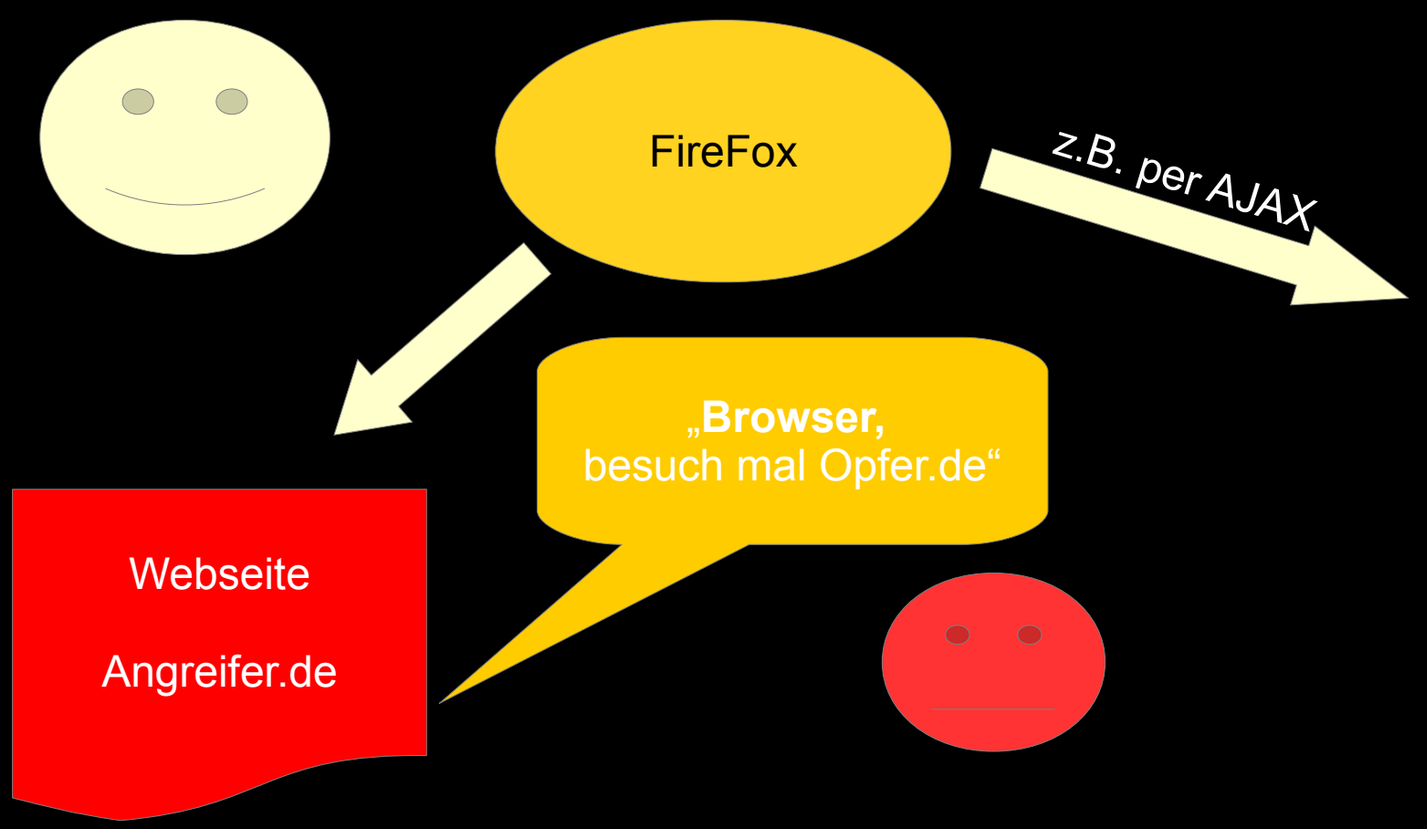

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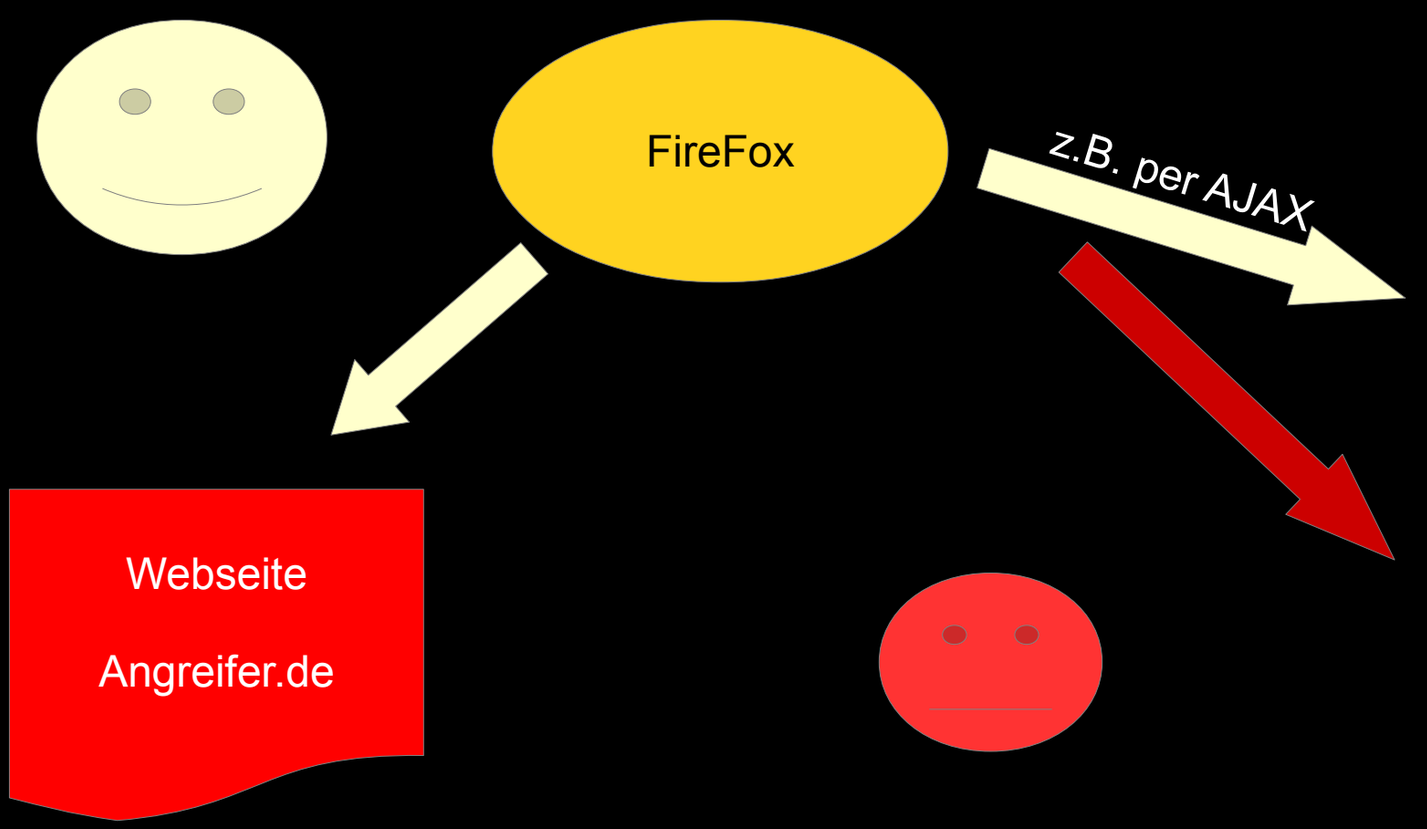

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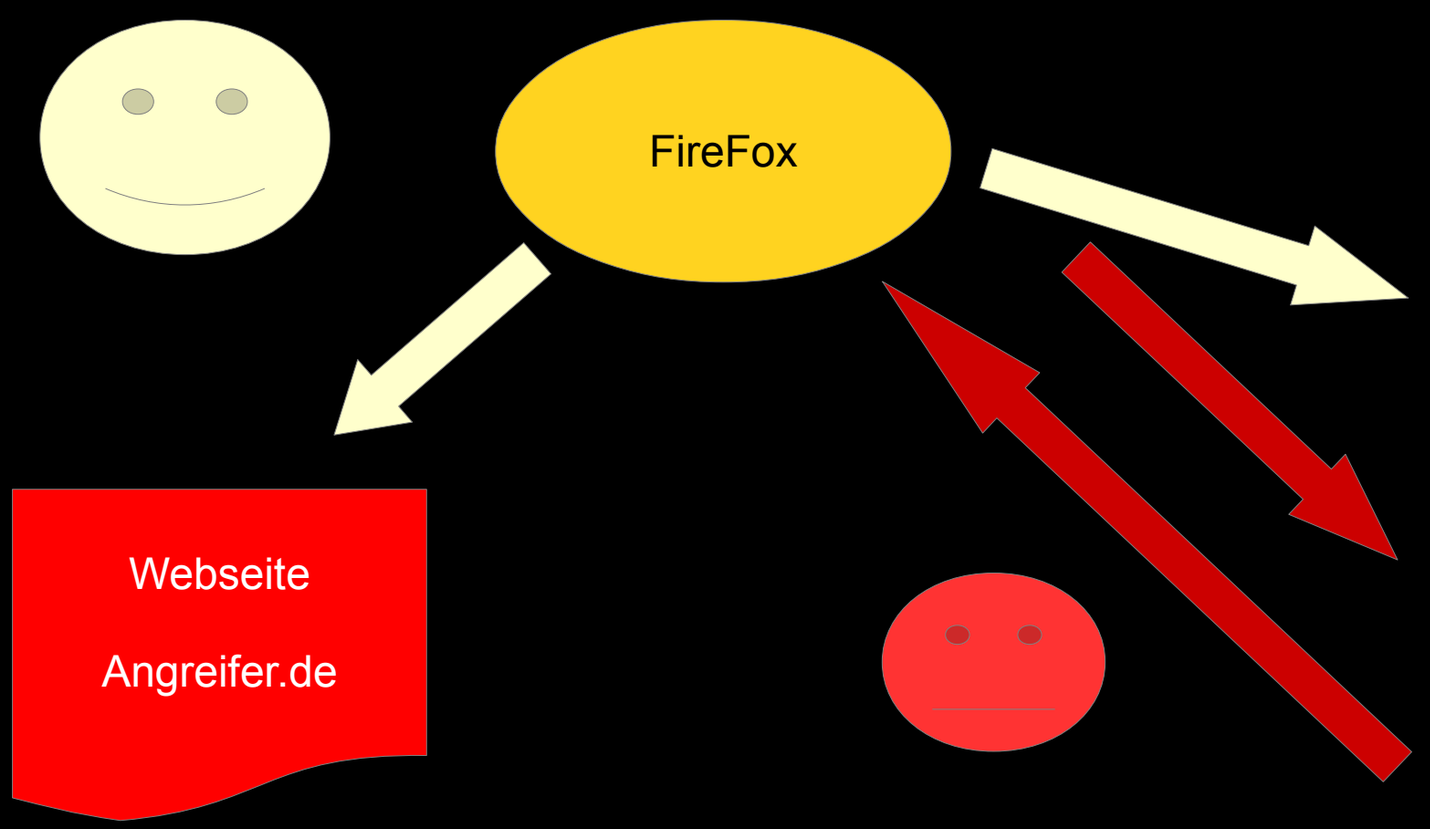

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Was ist jetzt so schlimm daran,

einen anderen Dienst zu belästigen?

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Beispiel: SMTP → Exim

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reales Beispiel:

```
# nc localhost 25
220 x.de ESMTP Exim 4.94 Tue, 15 Jun 2021 16:40:31 +0200
GET /index.html HTTP/1.1
500 unrecognized command
Host: opfer.de
500 unrecognized command
MAIL FROM: <script>alert(1);</script>
501 <script>alert(1);</script>: malformed address: alert(1);</script> may not follow <script>

500-unrecognized command
500 Too many syntax or protocol errors
```

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Dem Angreifer geht es dabei nicht darum den Mailserver zu kompromittieren,

sondern die Antwort an den Browser zu bekommen,

so daß dieser im Kontext der Webseite ausgeführt werden kann.

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```
$ nc c1 25
220 c1.x.de ESMTP Exim 4.94.2 Tue, 15 Jun 2021 16:22:10 +0200
MAIL FROM: <script>alert(1);</script>
501-<script>alert(1);</script>: malformed address:
alert(1);</script> may not follow <script>
501 Too many syntax or protocol errors
```

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Damit das klappt, müssen einige Voraussetzungen erfüllt sein:

Man-In-The-Middle-Attacke möglich
Pakete müssen punktgenau umgeleitet werden

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Ein Browser der das mit sich machen lässt

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Ein Server, der das Gewollte in der Antwort mitschickt
Ein Browser der das mit sich machen lässt
Es muß das gleiche TLS Zertifikat in Benutzung sein.

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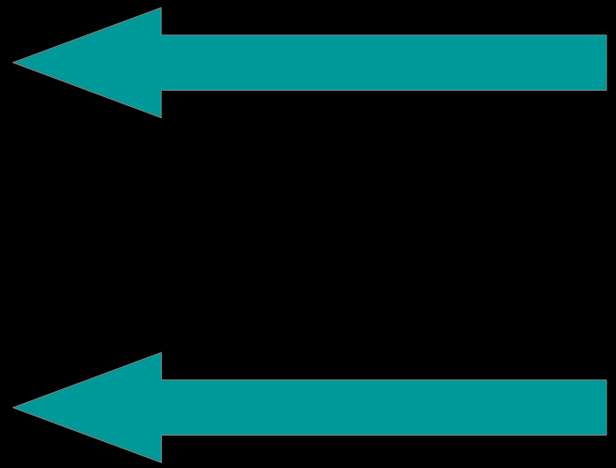

SSL-Zertifikat

Authority Information Access:
OCSP - URI:http://r3.o.lencr.org
CA Issuers - URI:http://r3.i.lencr.org/

X509v3 Subject Alternative Name:
DNS:opfer.de, DNS:www.opfer.de

X509v3 Certificate Policies:
Policy: 2.23.140.1.2.1
Policy: 1.3.6.1.4.1.44947.1.1.1
CPS: http://cps.letsencrypt.org

0 s:CN = opfer.de
i:C = US, O = Let's Encrypt, CN = R3
1 s:C = US, O = Let's Encrypt, CN = R3
i:C = US, O = Internet Security Research Group, CN = ISRG Root X1
2 s:C = US, O = Internet Security Research Group, CN = ISRG Root X1
i:C = US, O = Internet Security Research Group, CN = ISRG Root X1

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Warum ist das TLS-Zertifikat wichtig?

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Der Verbindungaufbau einer TLS gesicherten Verbindung

ist in einzelne Abschnitte aufgeteilt.

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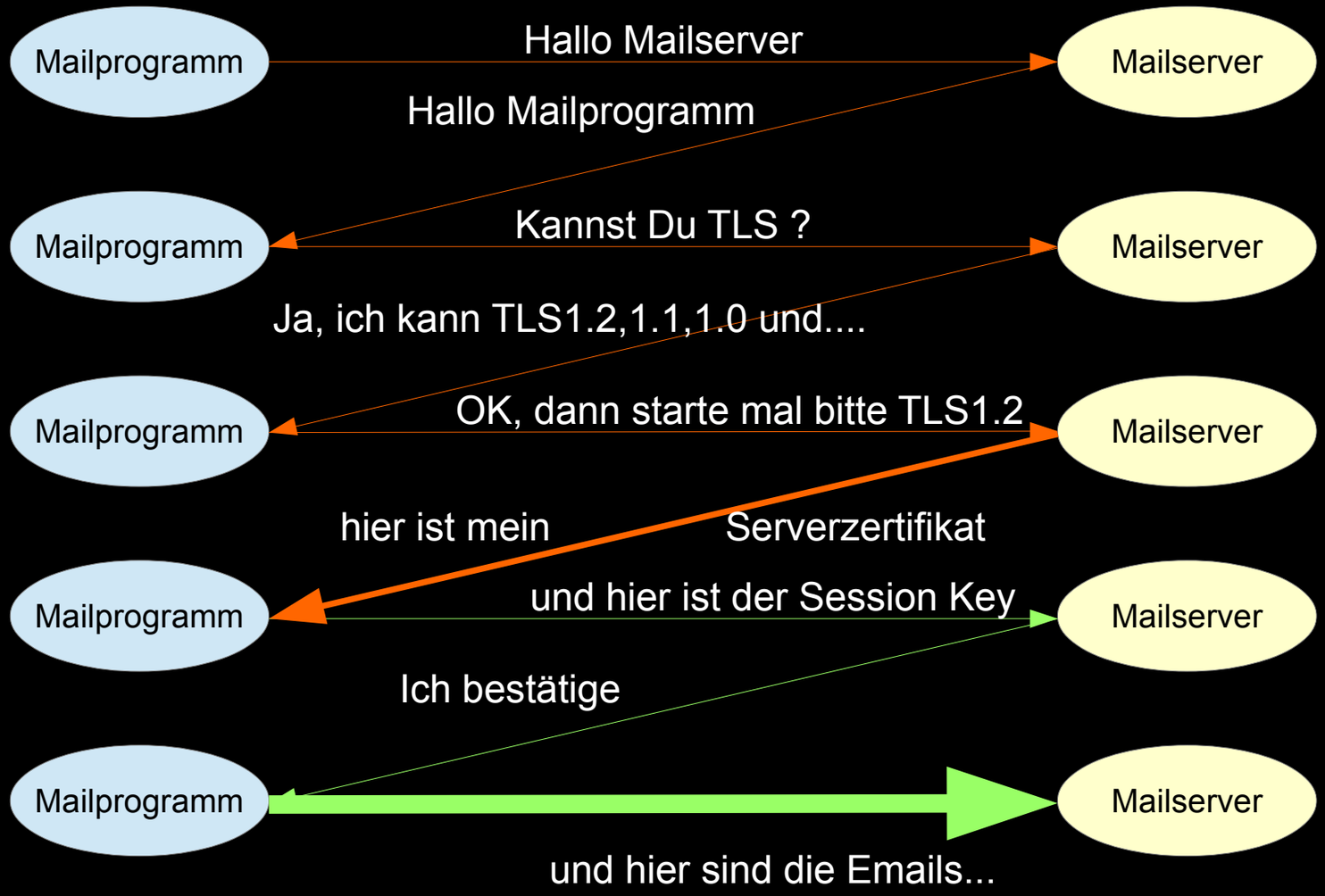

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Der Angreifer muß jetzt an der richtigen Stelle eingreifen,

damit er die Pakete vom Browser an den anderen Service umlenken kann ohne, daß es auf TLS-Ebene zu einem Fehler kommt.

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ATTACKE!

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2021-06-12 13:46:07 SMTP call from [193.37.255.114] dropped: too many syntax or protocol errors (last command was "\026\003\001\001\236\001?\001\232\003\003\233\340/Q^EV\320\205\177\302\271\375\036\373Z\367\\366u\363@\201\212-s\220Y\007V\265^
R\343J\357\301\262?\375\027\342\027\304\266\026\374\345#\375\336 \346x", NULL)
2021-06-12 13:46:08 SMTP call from [193.37.255.114] dropped: too many syntax or protocol errors (last command was "\026\003\001\001\265\001?\001\261\003\003s\022P\241K\301z\317\213\337\327\242g\027\353>\310?6\273\270\352k\fNi\274\355\316W\305\036 \
301W\347\025\355\352j\006\252\f\347\351c\257E]\346\277\035~\270\247\276\340\336cc\234-
H\3719?\214jj\300\022\300\023\300\007\300'\314\024\300/\023\001\300\024\023\002\300(\314\251\3000\300s\300`\300r\300a\300,\300v\300\257\300w\300\255\314\250\300$\023\005\300", NULL)
2021-06-12 13:46:08 SMTP call from [193.37.255.114] dropped: too many syntax or protocol errors (last command was "", C=EHLO,STARTTLS)
2021-06-12 13:46:39 SMTP call from [193.37.255.114] dropped: too many syntax or protocol errors (last command was "", C=EHLO,STARTTLS)
2021-06-12 13:46:40 SMTP call from [193.37.255.114] dropped: too many syntax or protocol errors (last command was "", C=EHLO,STARTTLS)
2021-06-12 13:46:40 SMTP call from [193.37.255.114] dropped: too many syntax or protocol errors (last command was "", C=EHLO,STARTTLS)
2021-06-12 13:46:40 SMTP call from [193.37.255.114] dropped: too many syntax or protocol errors (last command was "\026\003\001\001E\001?\001A\003\003\306\247\305\026l\376\365m\301\246\205\303\345$\232:(\261\177\305\222\375\214\025\344?\017\020\017\367i\254??\266\3000\300,\300(\300$\300\024\300", NULL)
2021-06-12 13:46:40 SMTP call from [193.37.255.114] dropped: too many syntax or protocol errors (last command was "", C=EHLO,STARTTLS)
2021-06-12 13:46:41 SMTP call from [193.37.255.114] dropped: too many syntax or protocol errors (last command was "\026\003\001?\214\001??\210\003\003 \027\206\364\254", NULL)
2021-06-12 21:01:58 SMTP call from [104.140.188.18] dropped: too many syntax or protocol errors (last command was "GET / HTTP/1.1", NULL)
2021-06-12 23:28:31 SMTP call from [89.248.165.106] dropped: too many syntax or protocol errors (last command was "\003??+&\340?????Cookie: mstshash=hello", NULL)
[root@c1 ~]# grep dropped /var/log/exim/main.log-20210613 |grep HTTP
2021-06-10 15:46:53 SMTP call from [83.135.88.244] dropped: too many syntax or protocol errors (last command was "GET /index.html HTTP/1.1", NULL)
2021-06-10 17:09:54 SMTP call from [134.122.7.20] dropped: too many syntax or protocol errors (last command was "HEAD / HTTP/1.0", NULL)
2021-06-10 17:09:55 SMTP call from [134.122.7.20] dropped: too many syntax or protocol errors (last command was "GET /system_api.php HTTP/1.1", NULL)
2021-06-10 17:09:56 SMTP call from [134.122.7.20] dropped: too many syntax or protocol errors (last command was "GET /c/version.js HTTP/1.1", NULL)
2021-06-10 17:09:58 SMTP call from [134.122.7.20] dropped: too many syntax or protocol errors (last command was "GET /streaming/clients_live.php HTTP/1.1", NULL)
2021-06-10 17:09:59 SMTP call from [134.122.7.20] dropped: too many syntax or protocol errors (last command was "GET /stalker_portal/c/version.js HTTP/1.1", NULL)
2021-06-10 17:10:01 SMTP call from [134.122.7.20] dropped: too many syntax or protocol errors (last command was "GET /stream/live.php HTTP/1.1", NULL)
2021-06-10 17:17:30 SMTP call from [138.197.154.233] dropped: too many syntax or protocol errors (last command was "HEAD / HTTP/1.0", NULL)
2021-06-10 17:17:31 SMTP call from [138.197.154.233] dropped: too many syntax or protocol errors (last command was "GET /system_api.php HTTP/1.1", NULL)
2021-06-10 17:17:32 SMTP call from [138.197.154.233] dropped: too many syntax or protocol errors (last command was "GET /system_api.php HTTP/1.1", NULL)
2021-06-10 17:17:34 SMTP call from [138.197.154.233] dropped: too many syntax or protocol errors (last command was "GET /c/version.js HTTP/1.1", NULL)
2021-06-10 17:17:35 SMTP call from [138.197.154.233] dropped: too many syntax or protocol errors (last command was "GET /streaming/clients_live.php HTTP/1.1", NULL)
2021-06-10 17:17:37 SMTP call from [138.197.154.233] dropped: too many syntax or protocol errors (last command was "GET /stalker_portal/c/version.js HTTP/1.1", NULL)
2021-06-10 17:17:39 SMTP call from [138.197.154.233] dropped: too many syntax or protocol errors (last command was "GET /client_area/ HTTP/1.1", NULL)
2021-06-10 17:17:40 SMTP call from [138.197.154.233] dropped: too many syntax or protocol errors (last command was "GET /stalker_portal/c/ HTTP/1.1", NULL)
2021-06-10 17:17:42 SMTP call from [138.197.154.233] dropped: too many syntax or protocol errors (last command was "GET /stream/live.php HTTP/1.1", NULL)
2021-06-10 19:08:50 SMTP call from [46.101.86.104] dropped: too many syntax or protocol errors (last command was "HEAD / HTTP/1.0", NULL)

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Das war noch gar kein ALPACA Angriff,

sondern nur das weiße Rauschen im Netz :D

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Fragen?

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