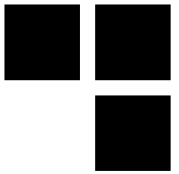
SYNACKTIV
DIGITAL SECURITY



TCP Fast Open

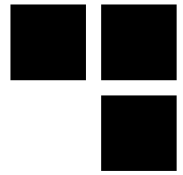
Bypassing pigs/suricats like a synack~~psh~~tiv ninja

Presented in the 05/06/2014

During the SSTIC 2014

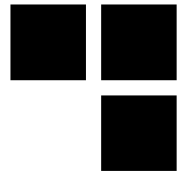
By Nicolas Collignon and Renaud Dubourguais

Fixing TCP to help HTTP



- **HTTP/1.0**
  - 1 HTTP request = 1 TCP handshake
- **HTTP/1.1**
  - "Keep-Alive" HTTP header
  - Multiple HTTP requests = 1 TCP handshake
- **YouTube**
  - Still too slow!
  - We need something else...

TCP Fast Open

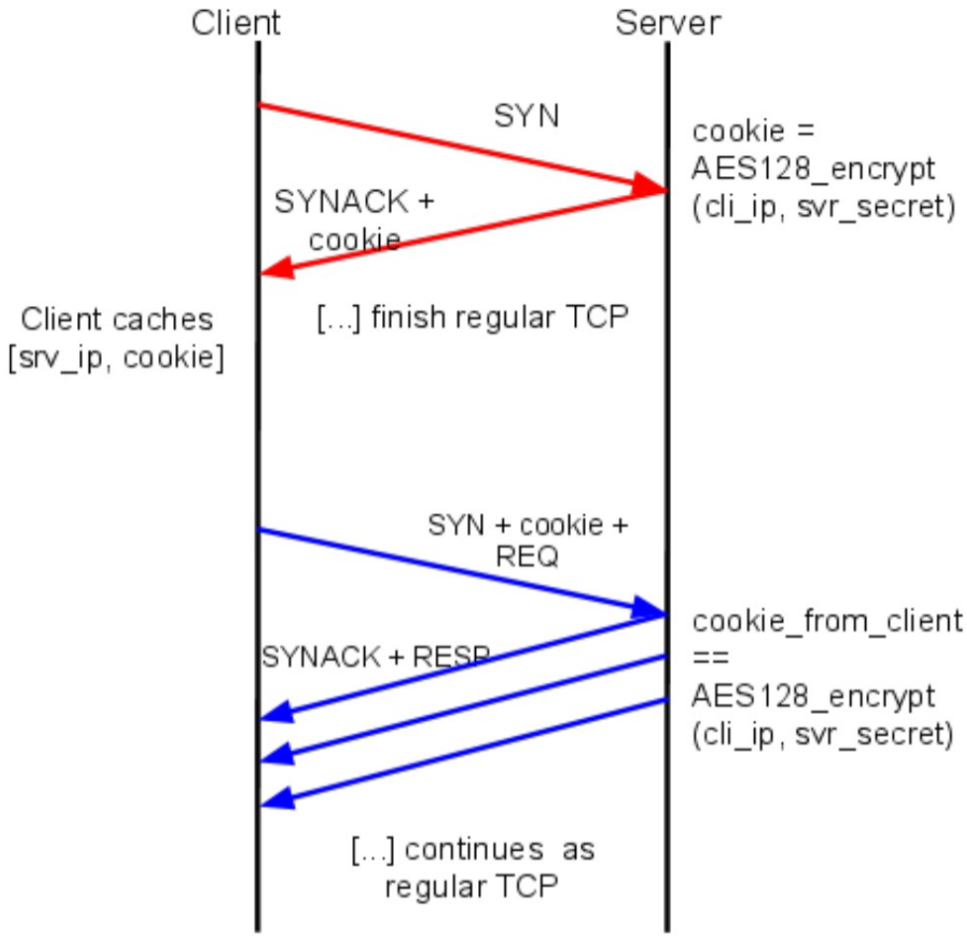


- **IETF draft**
  - The aim is to speed up connections establishment
  - Allows data transmission in the TCP handshake
  - Supported since Linux 3.6
  - Client-side TFO is enabled by default since Linux 3.13

- **Impacts on the socket API**
  - Client-side: connect() → sendto(MSG_FASTOPEN)
  - Server-side : setsockopt(TCP_FASTOPEN)

TFO handshake

- The first HTTP connection requires a regular 3WHS with the TFO TCP option enabled
- The server generates a TFO cookie and send it to the client in the SYN-ACK
- Next, the client can send data during the following 3WHS



TFO vs IDS

- **Data is in the SYN packet**
- **Intermediate devices don't care about TFO**
- **IDS don't analyse data in SYN packets**

Demo!

- **TFO vs SNORT = TFO wins**
- **TFO vs Suricata = TFO wins**