TCP Fast Open recap

Client

sendmsg( 
MSG_FASTOPEN)

Stores cookie

Server

cookie: AES_enc(cli_ip, 
svr_secret)

accept()

SYN

SYNACK(cookie)

SYN(cookie)/DATA

SYNACK/DATA
sendmsg(MSG_FASTOPEN) implementation

- checked into Linux 3.5-rc5+

- sendmsg(MSG_FASTOPEN)
  - replace connect() and first write()
  - has cookie?
    - no: SYN + cookie request option
    - yes: SYN + cookie option + data

- blocking
  - blocks until handshake completes and all data buffered
    e.g., sendmsg(1MB, MSG_FASTOPEN)

- non-blocking
  - returns data bytes in SYN

- on errors
  - returns errnos as in connect() or write() depending on state
Detecting middleboxes dropping Fast Open SYN

- SYN retransmits do not include data

- If SYN-ACK after SYN timeout does not ack data or provide cookie
  - it's acking the SYN retransmit
  - original SYN-data or SYN-ACK is lost

- Automatically disable Fast Open on the path for 2**(recurring_drops) minutes up to 1.5 days.