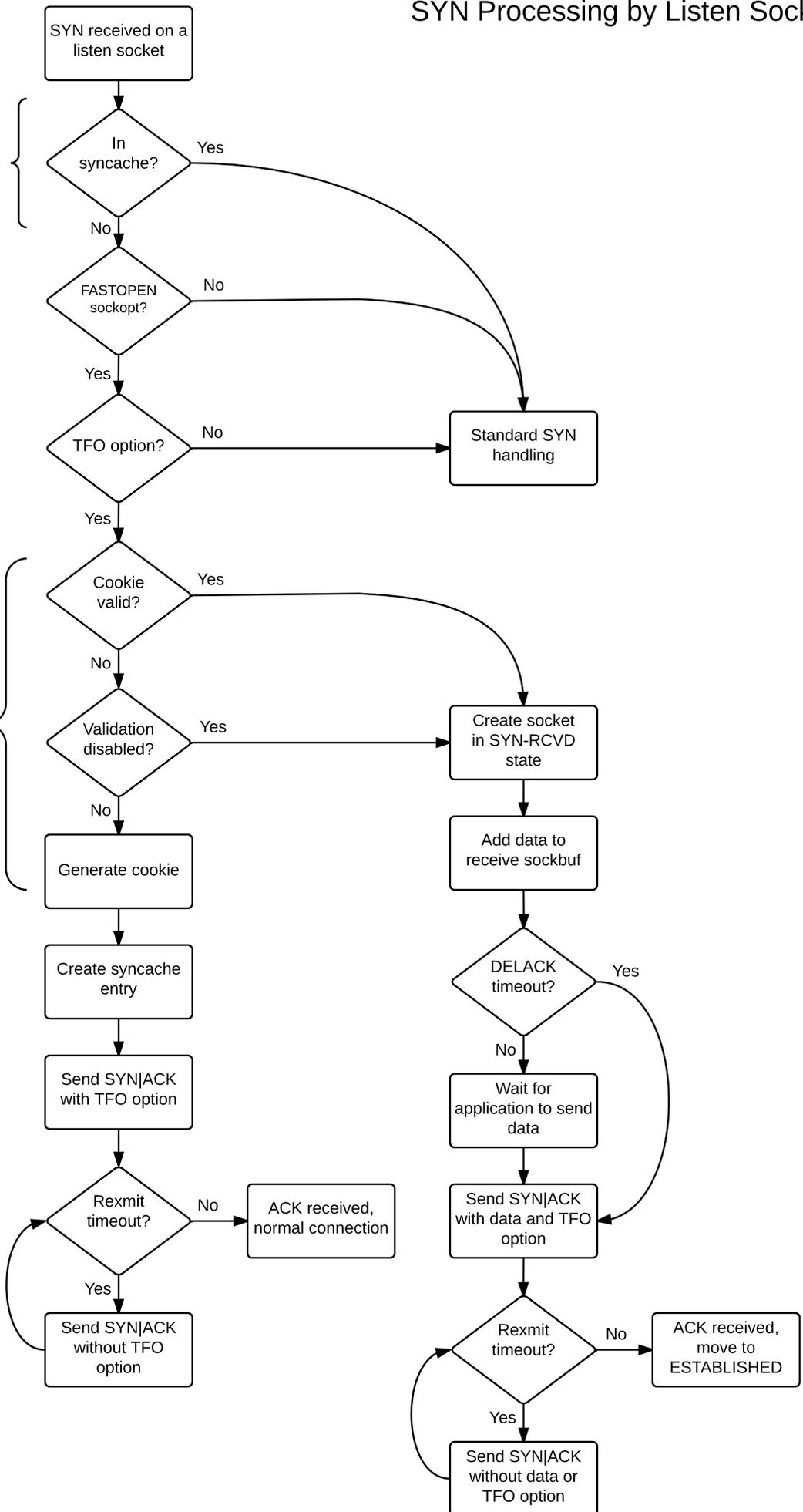


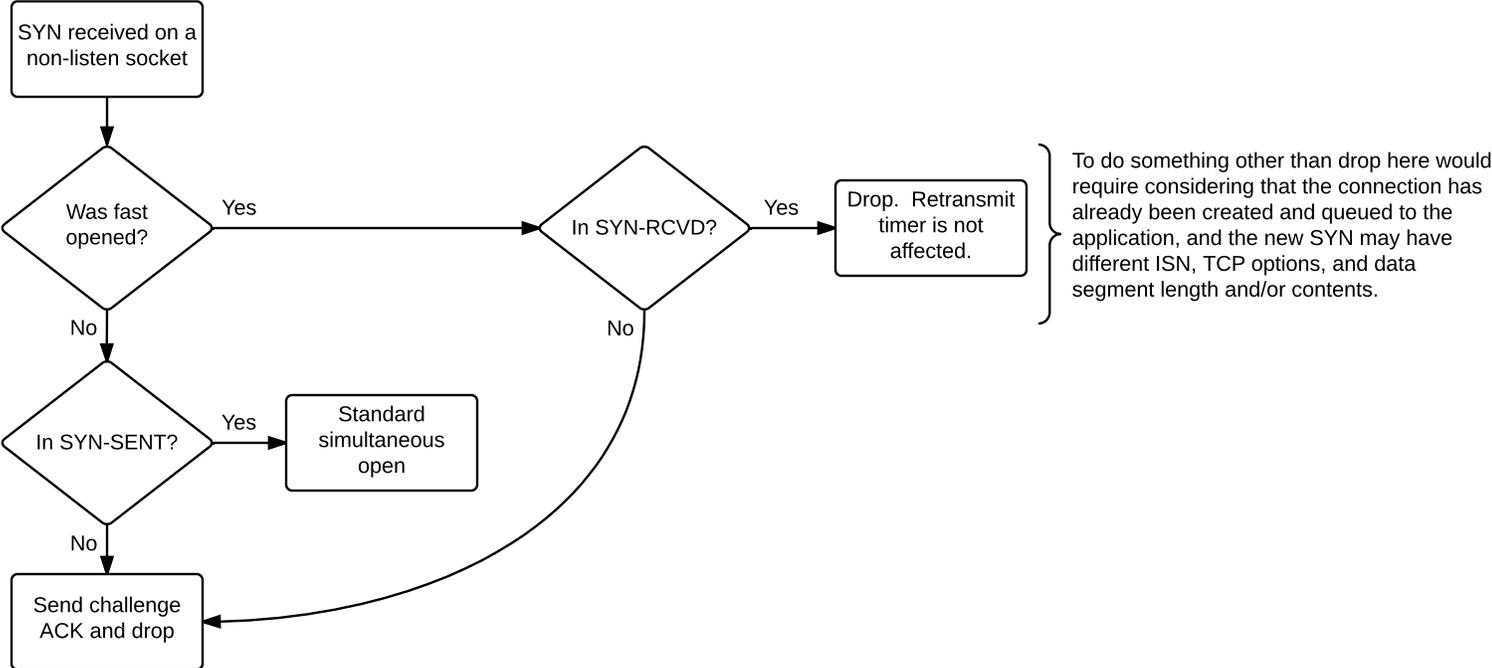
# SYN Processing by Listen Socket

The syncache is always checked first because a TFO SYN and a retransmitted fallback non-TFO SYN could be reordered in the network. Also, because middleboxes and bad people.

Cookie generation and validation is performed by computing the 64-bit value SipHash-2-4(key, remote\_ip). Cookies returned via SYN|ACK are computed using the most recently installed key. Cookies in SYN packets are validated by trying each active key in reverse order of installation.



# SYN Processing by non-Listen Socket



## Build options:

TCP\_RFC7413  
TCP\_RFC7413\_MAX\_KEYS

## Socket options:

**TCP\_FASTOPEN**  
Allows servicing of TFO connection requests when set on a listen socket. Can be set / cleared at any time during the listen socket's lifetime. If the sysctl `net.inet.tcp.fastopen.enabled` is zero, attempts to set `TCP_FASTOPEN` will fail.

**TCP\_FASTOPENED**  
This option is read-only and indicates whether fast open was successfully employed in creating the connection.

## Per-VNET sysctls:

`net.inet.tcp.fastopen.acceptany` (RW)  
Disables cookie validation. Any cookie value, including an empty one, will result in a TFO connection.

`net.inet.tcp.fastopen.autokey` (RW)  
Interval in seconds at which to auto-generate keys. An interval of 0 disables auto key generation. Transition from zero to non-zero will generate one random key if enabled is non-zero and there are no keys.

`net.inet.tcp.fastopen.enabled` (RW)  
Allow / disallow `TCP_FASTOPEN` socket option and new TFO connections. Transition from non-zero to zero clears keys. Transition from zero to non-zero generates one random key if `autokey` is non-zero and there are no keys.

`net.inet.tcp.fastopen.keylen` (RO)  
Key length in bytes

`net.inet.tcp.fastopen.maxkeys` (RO)  
Maximum number of keys supported

`net.inet.tcp.fastopen.numkeys` (RO)  
Current number of keys installed

`net.inet.tcp.fastopen.setkey` (WO)  
Install a new key by writing `keylen` bytes