HTTP/QUIC

Interim 1806 - Kista

PRINCIPLE:

HTTP/QUIC is conceptually like HTTP/2, but structurally divergent when it makes sense.

HTTP/2 defines ten frame types

Six HTTP/2 frames use the Flags field

…so it's defined as part of the base frame layout.

HTTP/QUIC eliminates three frame types…

...and changes which frames use Flags

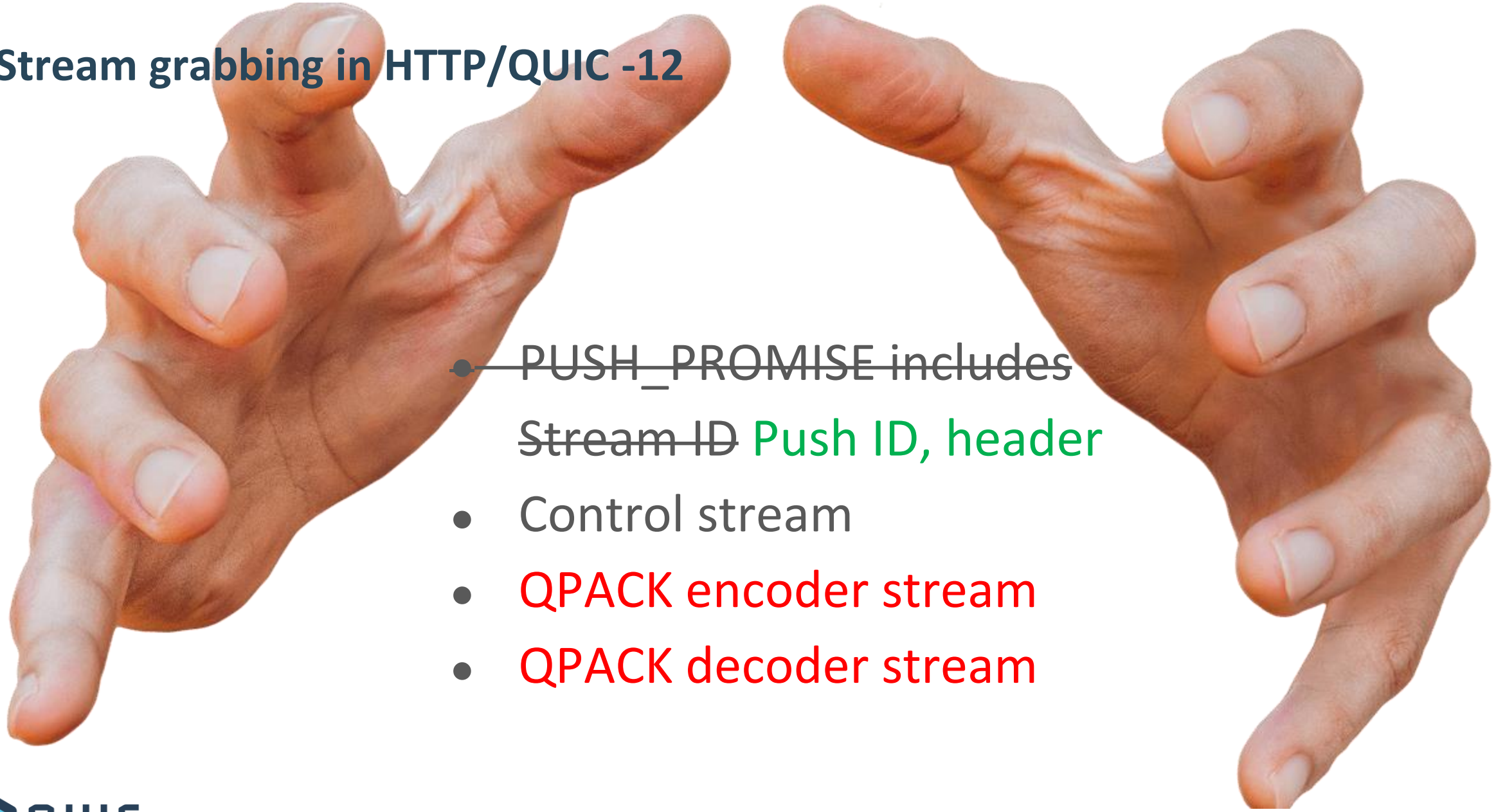

PROPOSAL:
Define Flags inside PRIORITY,
not in every frame type.

PRINCIPLE:
Application layer shouldn’t need to “grab” a particular stream by ID

Stream grabbing in prior versions of HTTP/QUIC

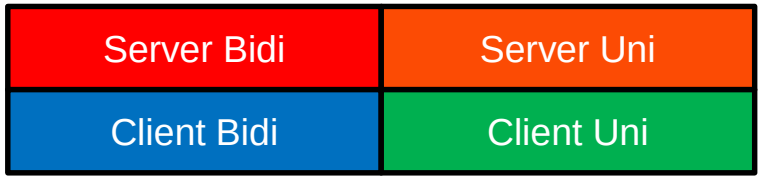
- PUSH_PROMISE includes Stream ID
- Control stream

Stream grabbing in HTTP/QUIC -12



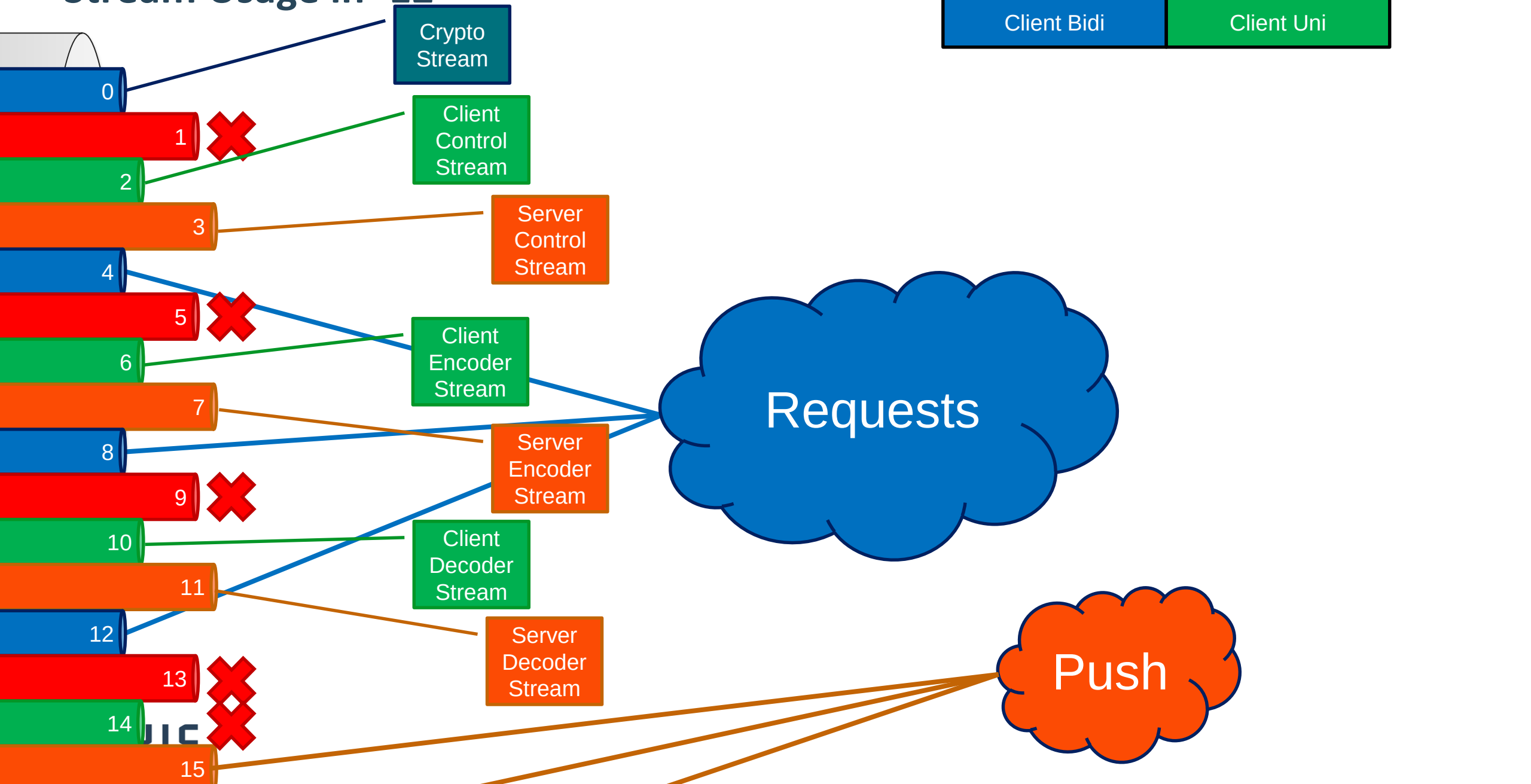
- ~~PUSH_PROMISE includes Stream ID~~ Push ID, header
- Control stream
- QPACK encoder stream
- QPACK decoder stream

Stream Usage in -12



- Bidirectional streams
  - Client-initiated: Request/response (modulo crypto)
  - Server-initiated: Not used
- Unidirectional streams
  - First stream: Control stream
  - Second stream: QPACK encoder
  - Third stream: QPACK decoder
  - All subsequent: Push

Stream Usage in -12

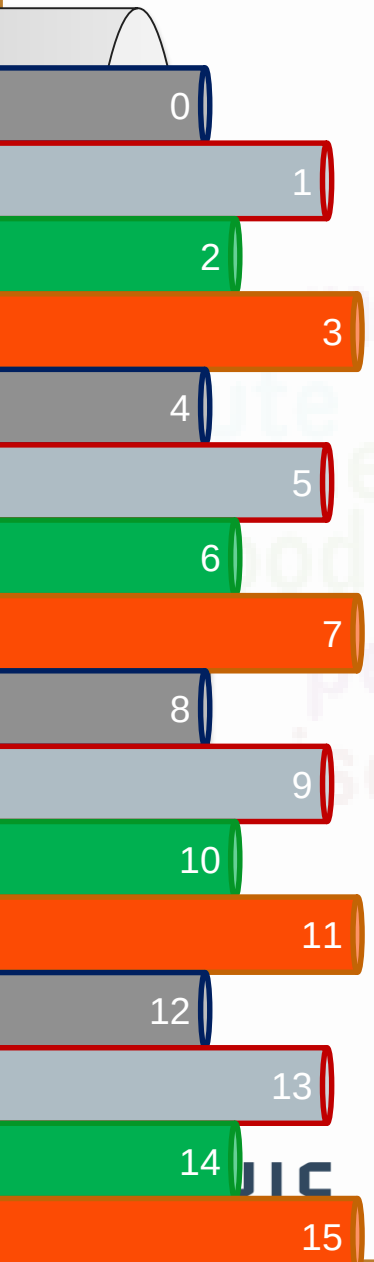


PROPOSAL:
Self-describing unidirectional streams

QUIC

Self-Describing?

Server Bidi	Server Uni
Client Bidi	Client Uni

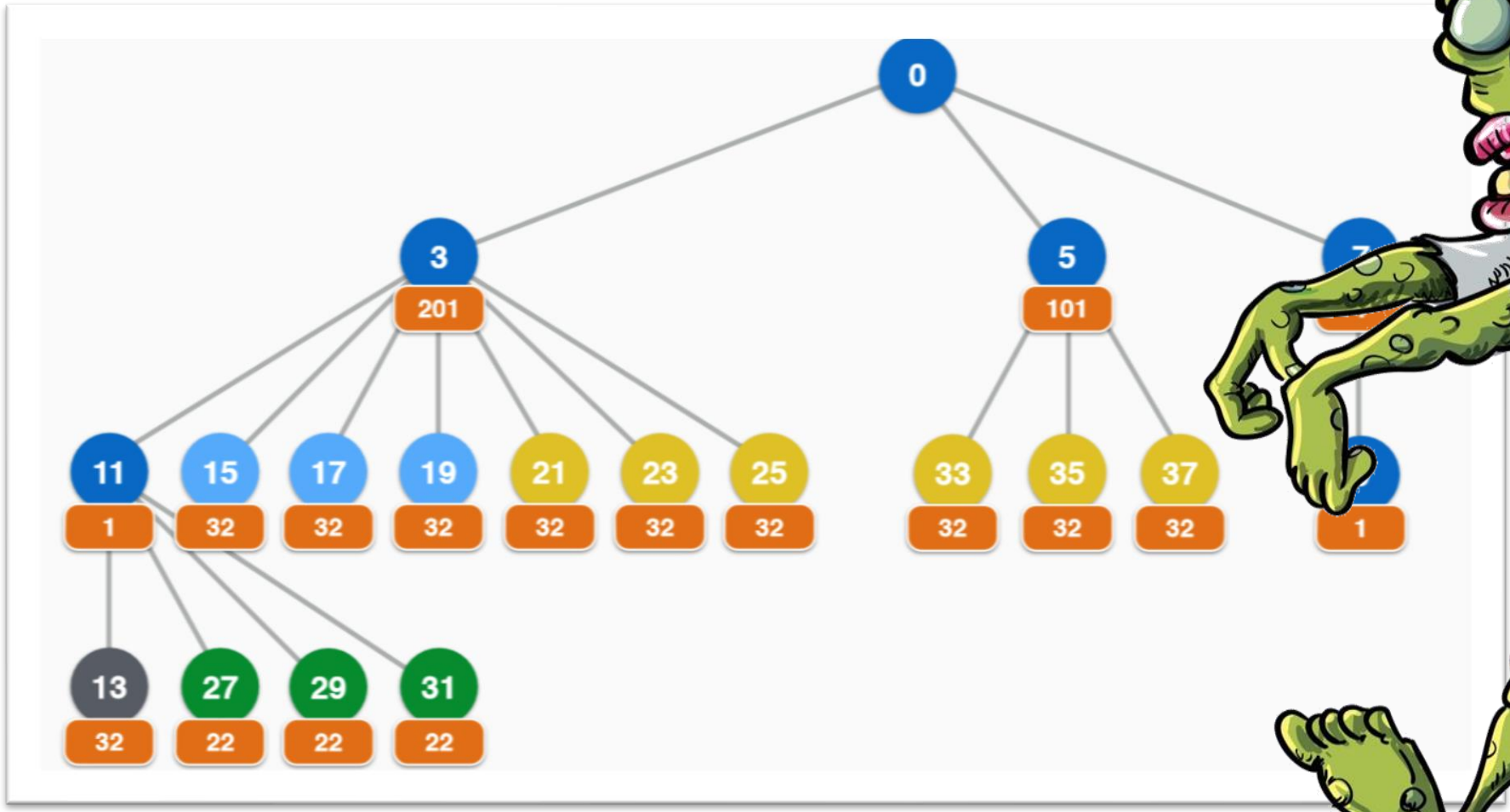


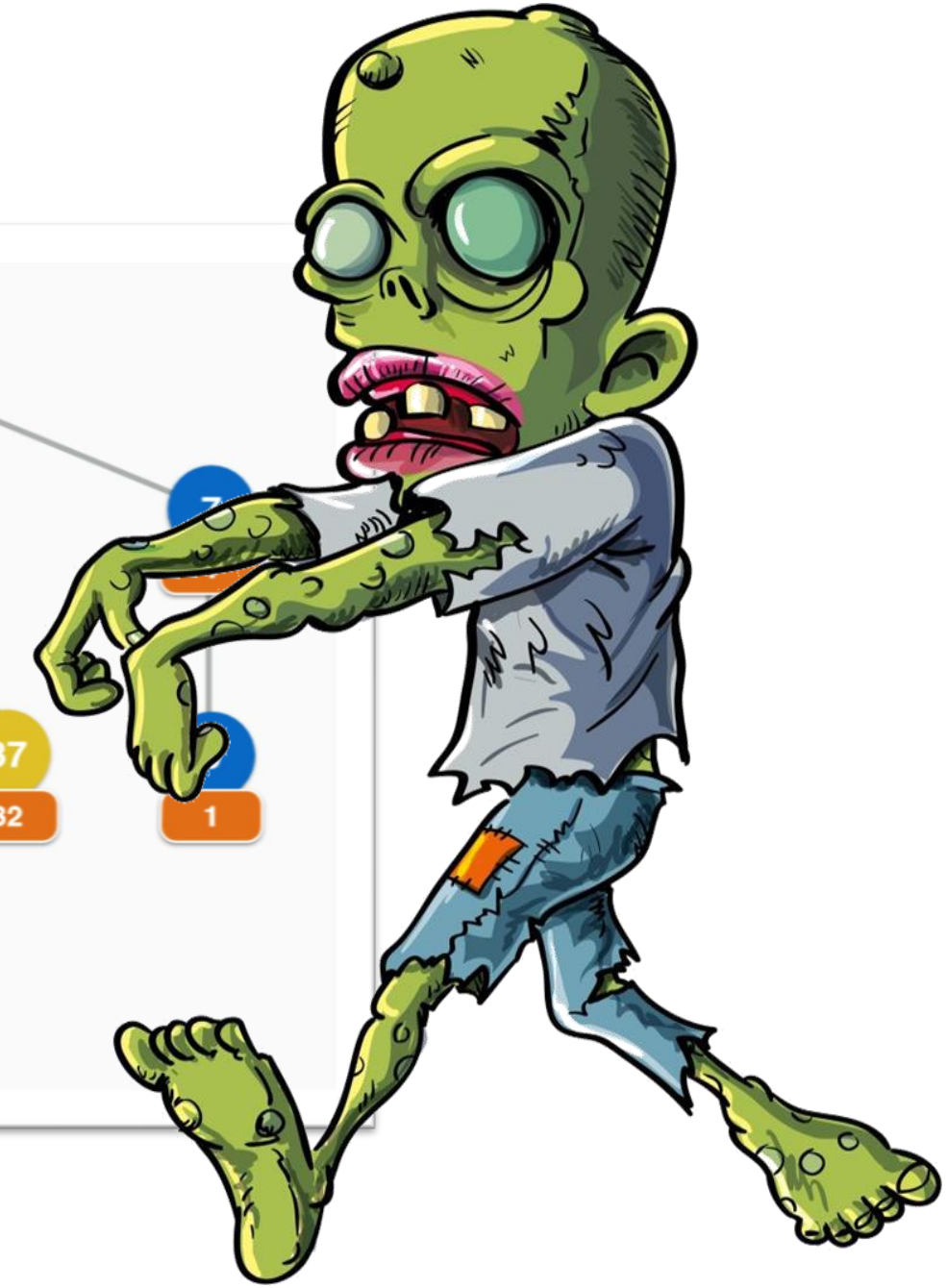
- Begin with a type byte
  - If you understand it, keep reading. Four types defined now:
    - Control
    - QPACK Encoder
    - QPACK Decoder
    - Push
  - If not, kill the stream (STOP_SENDING)
- Extensible, similar to frame types
  - Define frame if data is always a single unit
  - Define stream type if data can develop over time

PRINCIPLE:

HTTP/QUIC is conceptually like HTTP/2, but structurally divergent when it makes sense.

ATTACK OF THE ZOMBIE STREAMS

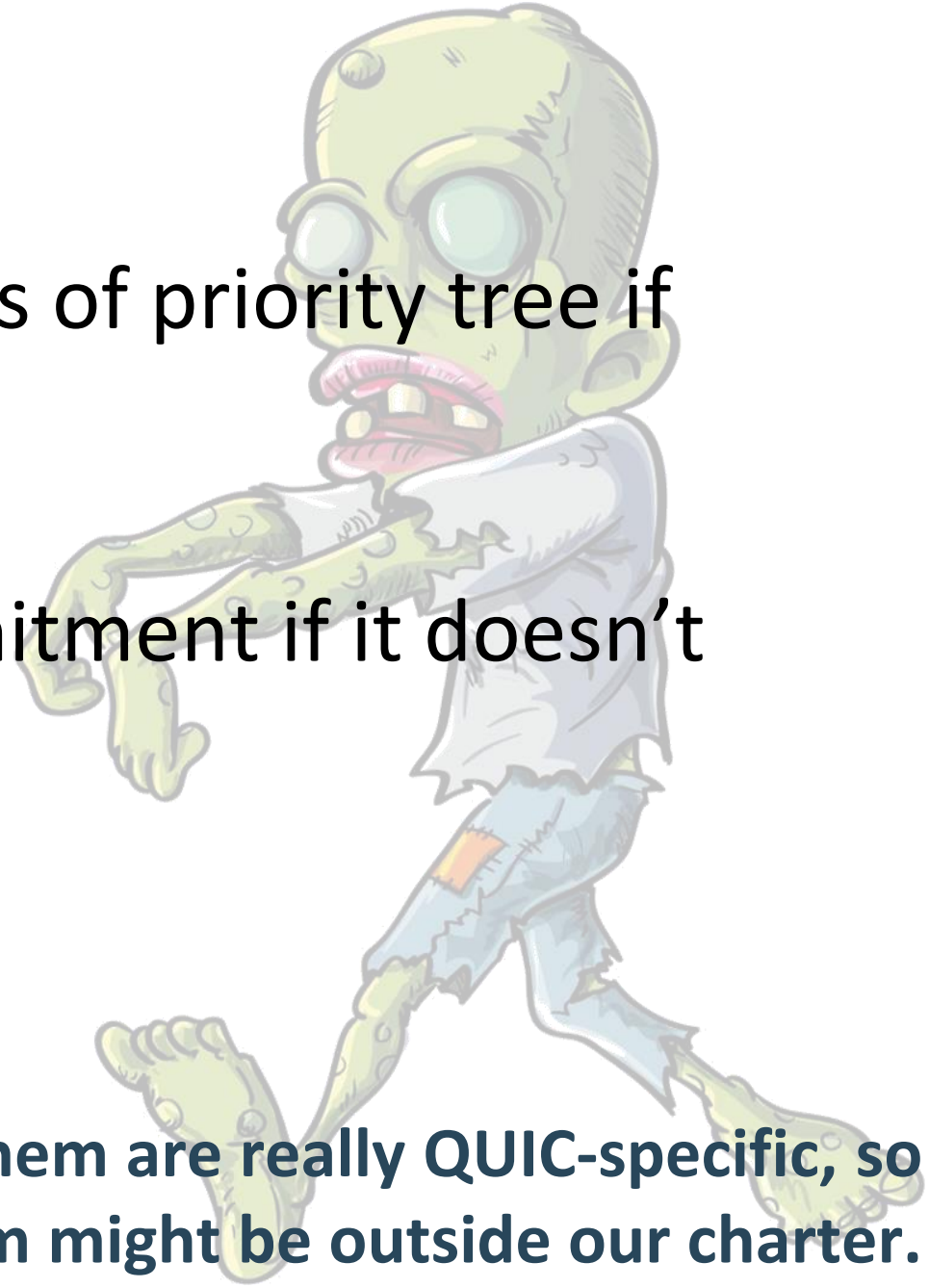




QUIC

The HTTP/2 method has serious drawbacks…

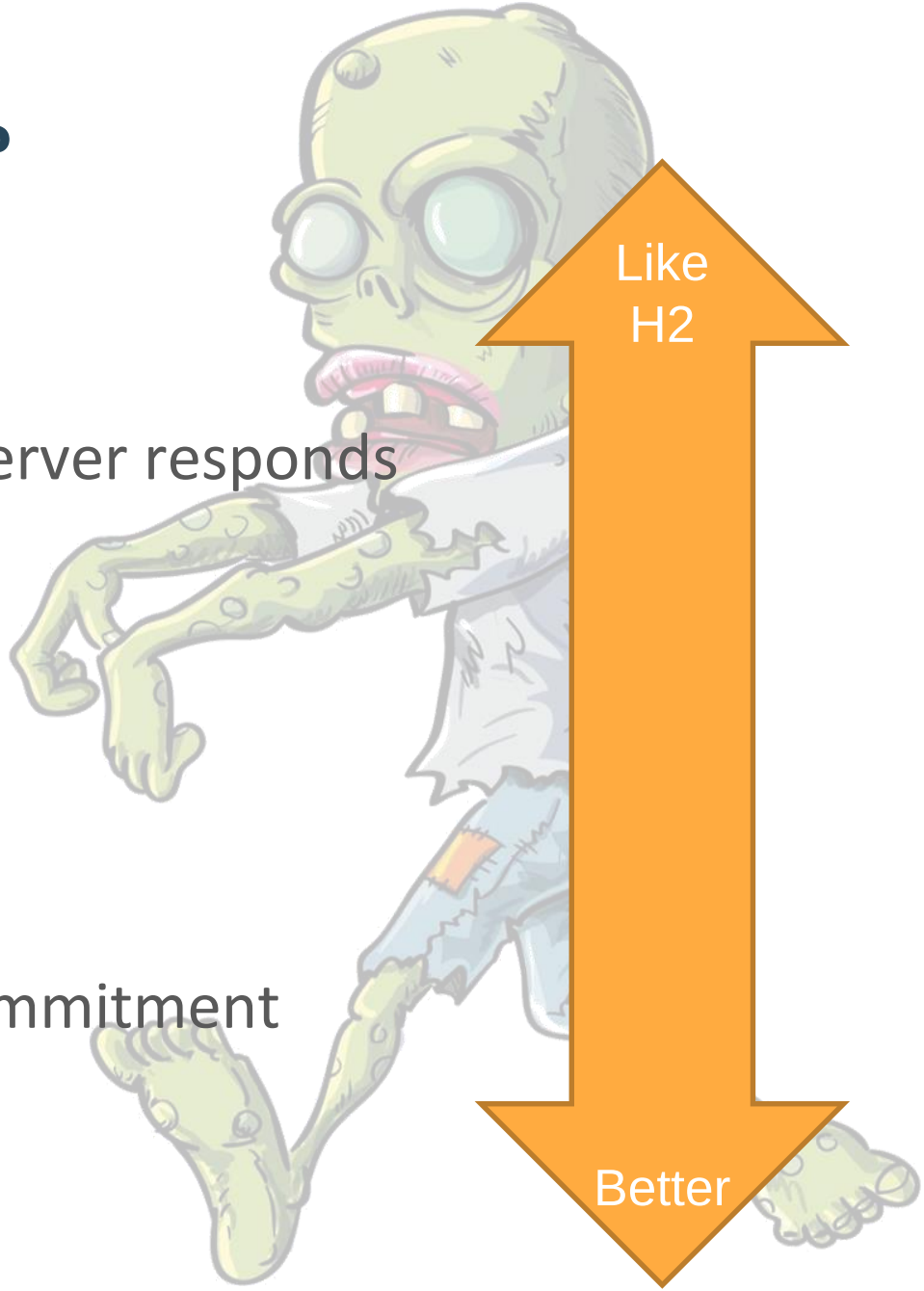
- Inconsistent client/server views of priority tree if server prunes dead streams
- Unbounded server state commitment if it doesn't



…but none of them are really QUIC-specific, so fixing them might be outside our charter.

How should we represent this in HTTP/QUIC?

- Explicitly close request streams
  - Send QUIC STREAM w/ FIN, Offset=0; server responds
- Don’t support priority in HTTP/QUIC
- Introduce placeholders
  - Would permit server to bound state commitment



PROPOSAL: Placeholders

QUIC