

A close-up photograph of a bee on a pink flower. The bee is positioned on the left side of the frame, facing right towards the center of the flower. Its body is covered in fine hairs, and its wings are partially spread. The flower is a vibrant pink color with several stamens visible, each with a reddish-brown anther. The background is a dark, solid color, which makes the bee and the flower stand out. Overlaid on the image is the text "HTTP/QUIC Cross-Pollination" in a white, outlined font. The text is arranged in two lines: "HTTP/QUIC" on the top line and "Cross-Pollination" on the bottom line. The text is centered horizontally and partially overlaps the bee and the flower.

HTTP/QUIC
Cross-Pollination

HTTP/QUIC Charter

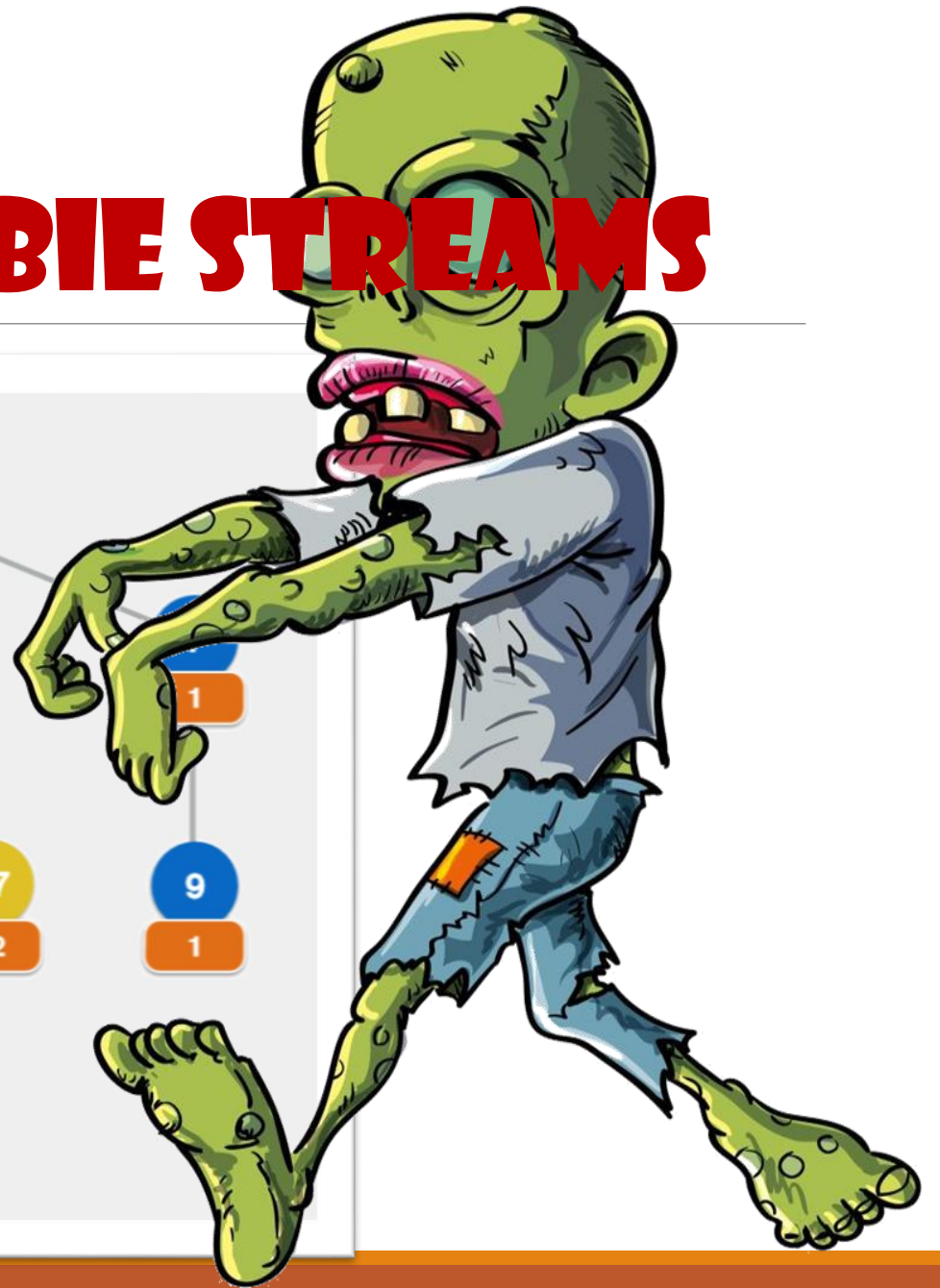
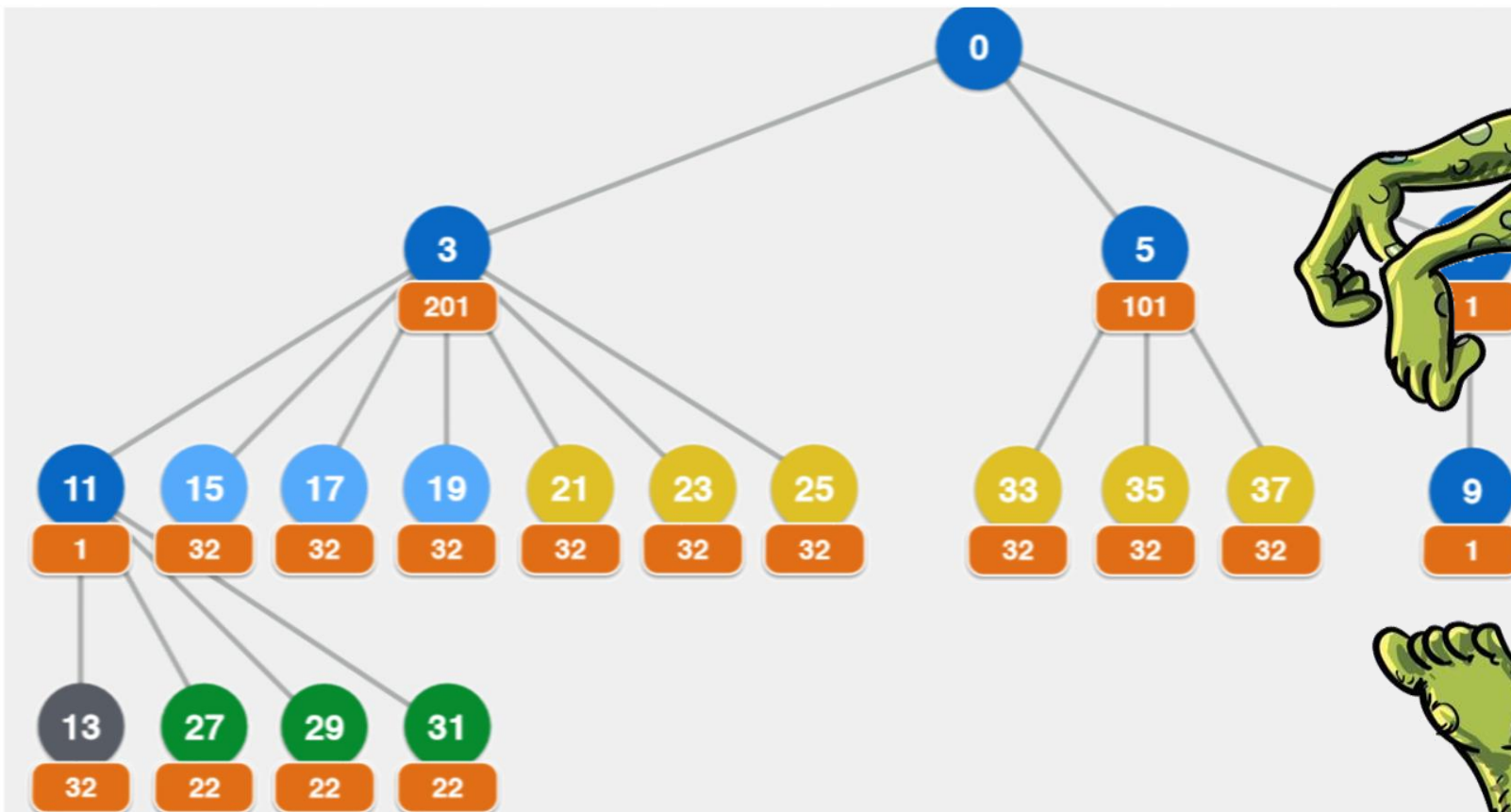
QUIC WG is chartered to

...describe mappings between... HTTP/2 semantics using QUIC, specifically with the goal of minimizing web latency using QUIC. This mapping will accommodate the extension mechanisms defined in the HTTP/2 specification.

Along the way, HTTP/QUIC has:

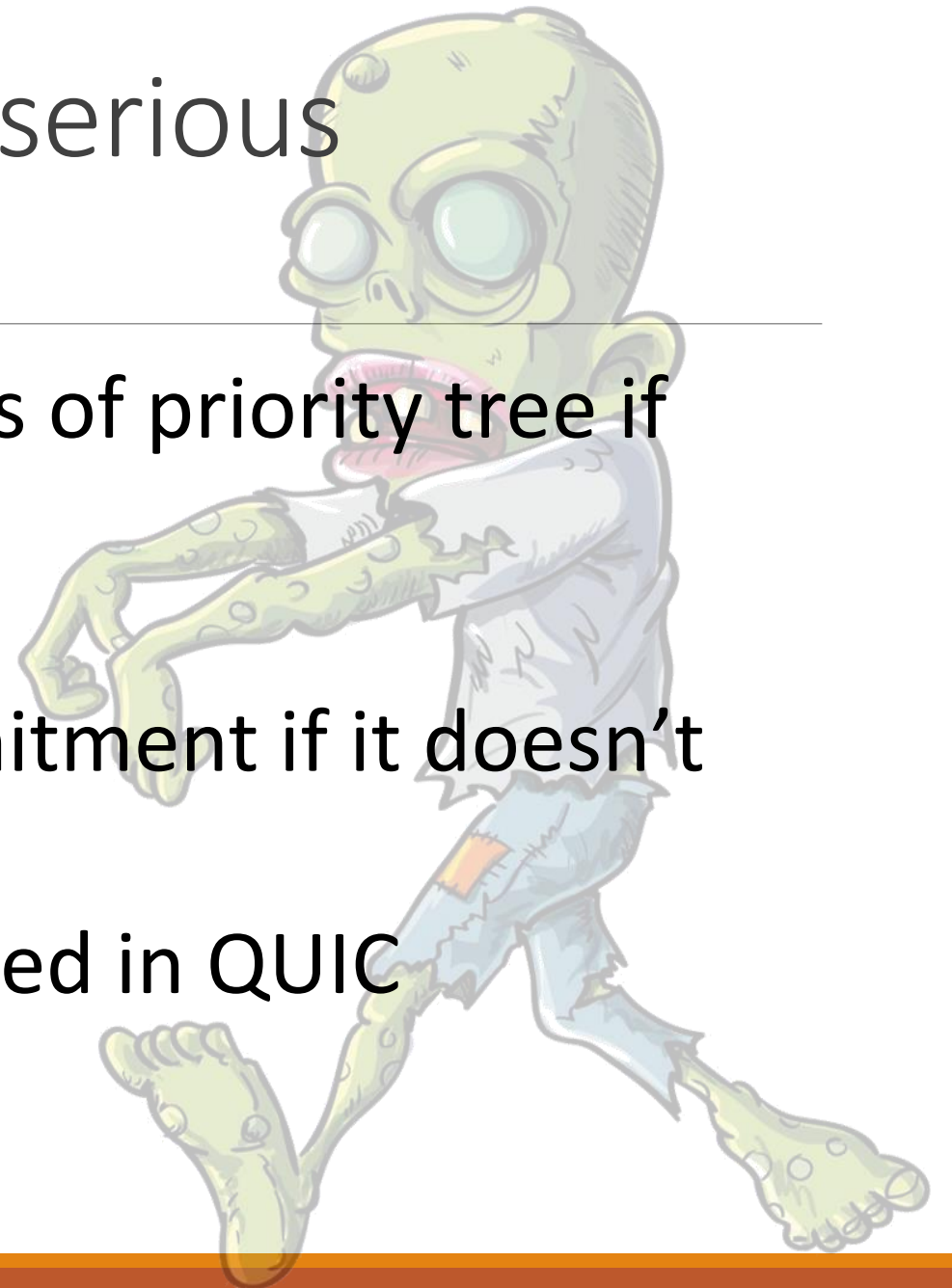
- adopted changes which might be beneficial to HTTP/2
- rejected some work as belonging to HTTPbis instead of QUIC

ATTACK OF THE ZOMBIE STREAMS



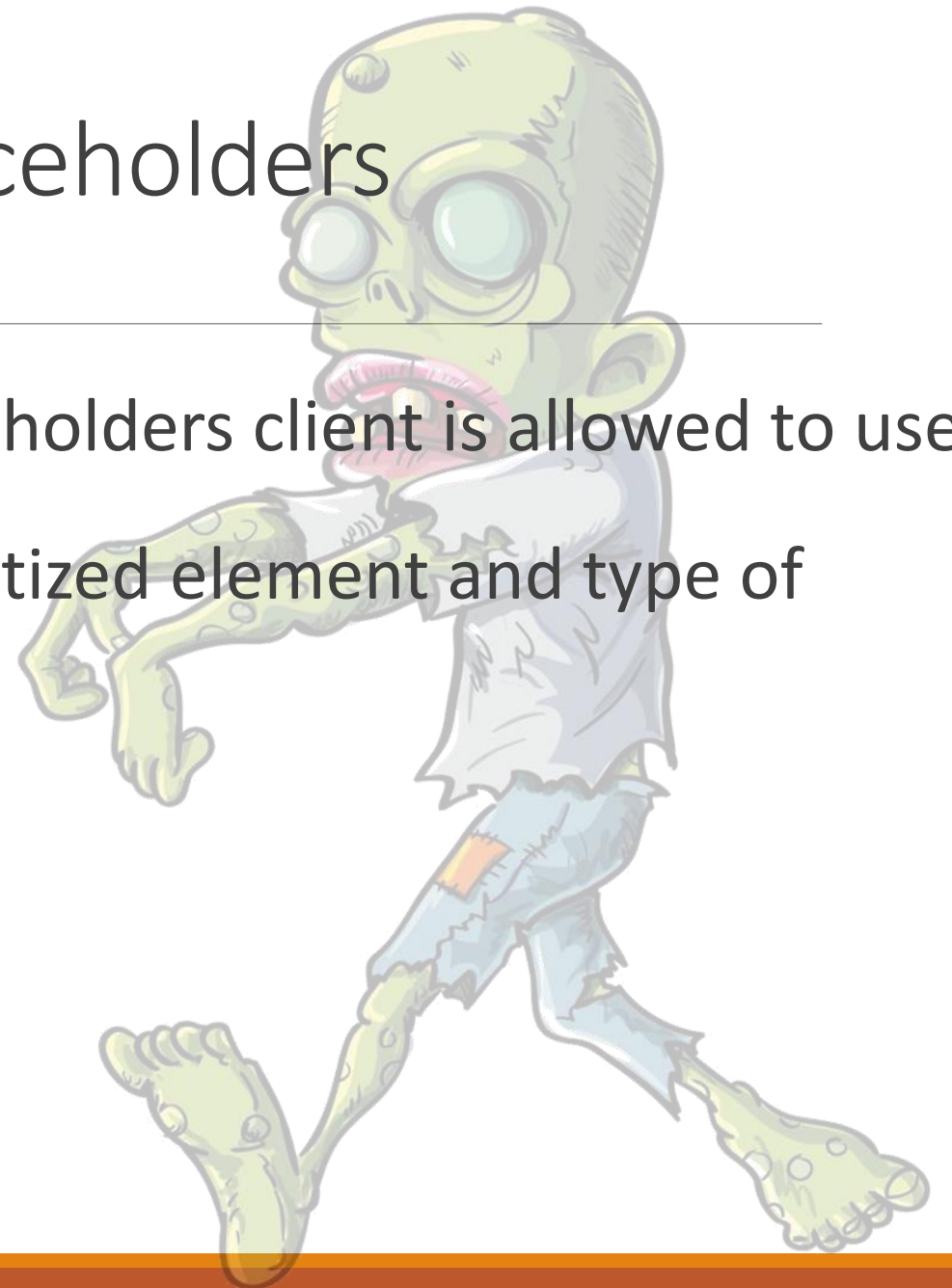
The HTTP/2 method has serious drawbacks...

- Inconsistent client/server views of priority tree if server prunes dead streams
- Unbounded server state commitment if it doesn't
- Streams can't be implicitly closed in QUIC

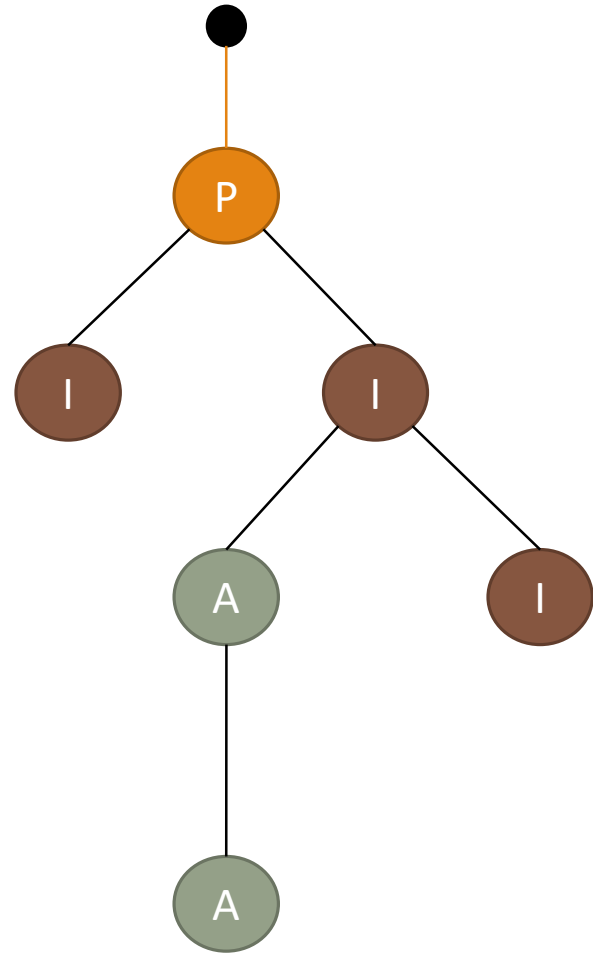


HTTP/QUIC has introduced Placeholders

- Server setting decides how many placeholders client is allowed to use
- PRIORITY frame indicates type of prioritized element and type of dependency
 - Request
 - Push
 - Placeholder
 - Root of tree
 - (0 is a valid request stream in QUIC)
- Permits more aggressive pruning



Aggressive Pruning

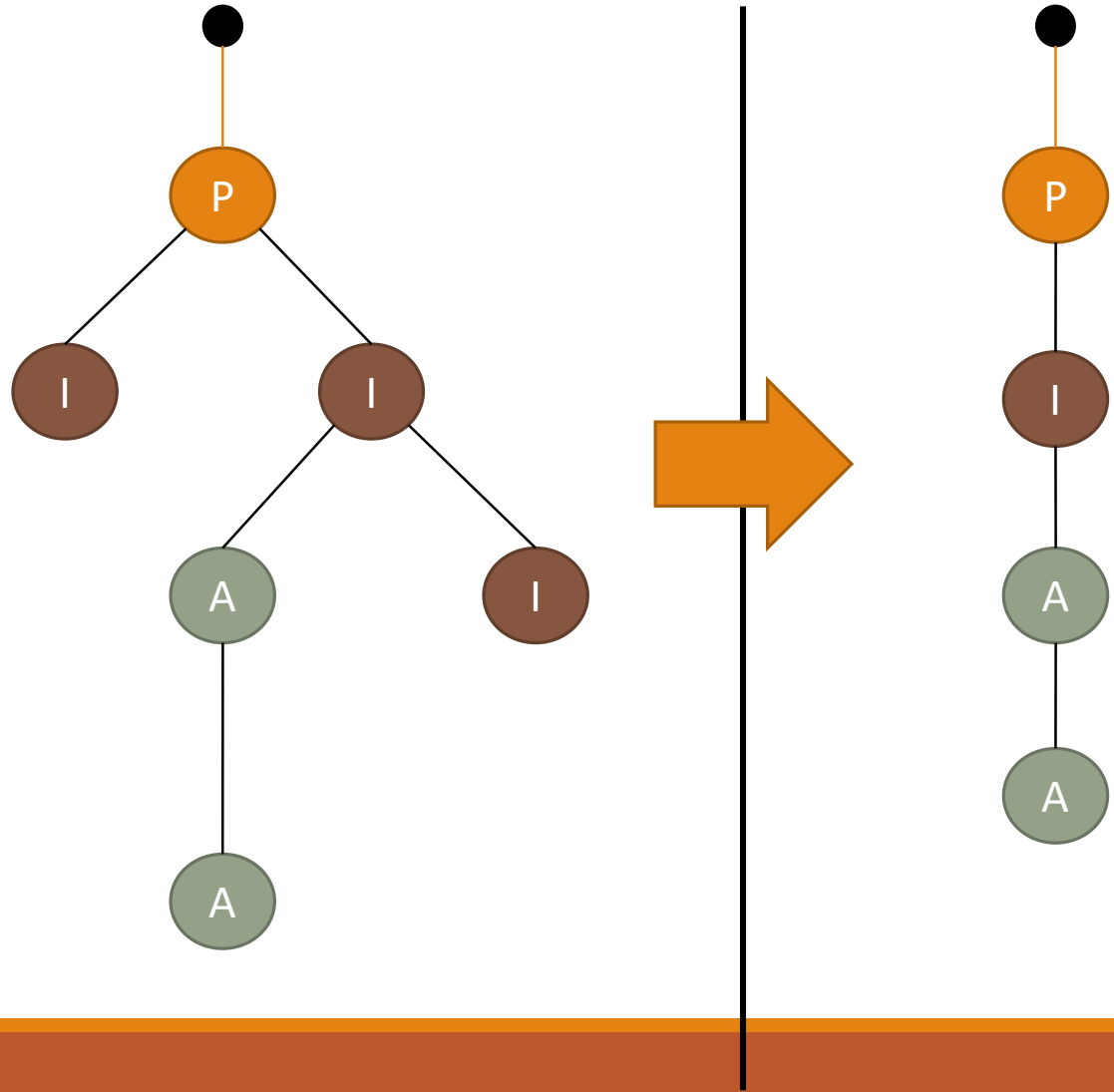


Active = open or recently closed
Inactive = closed >1 RTT ago



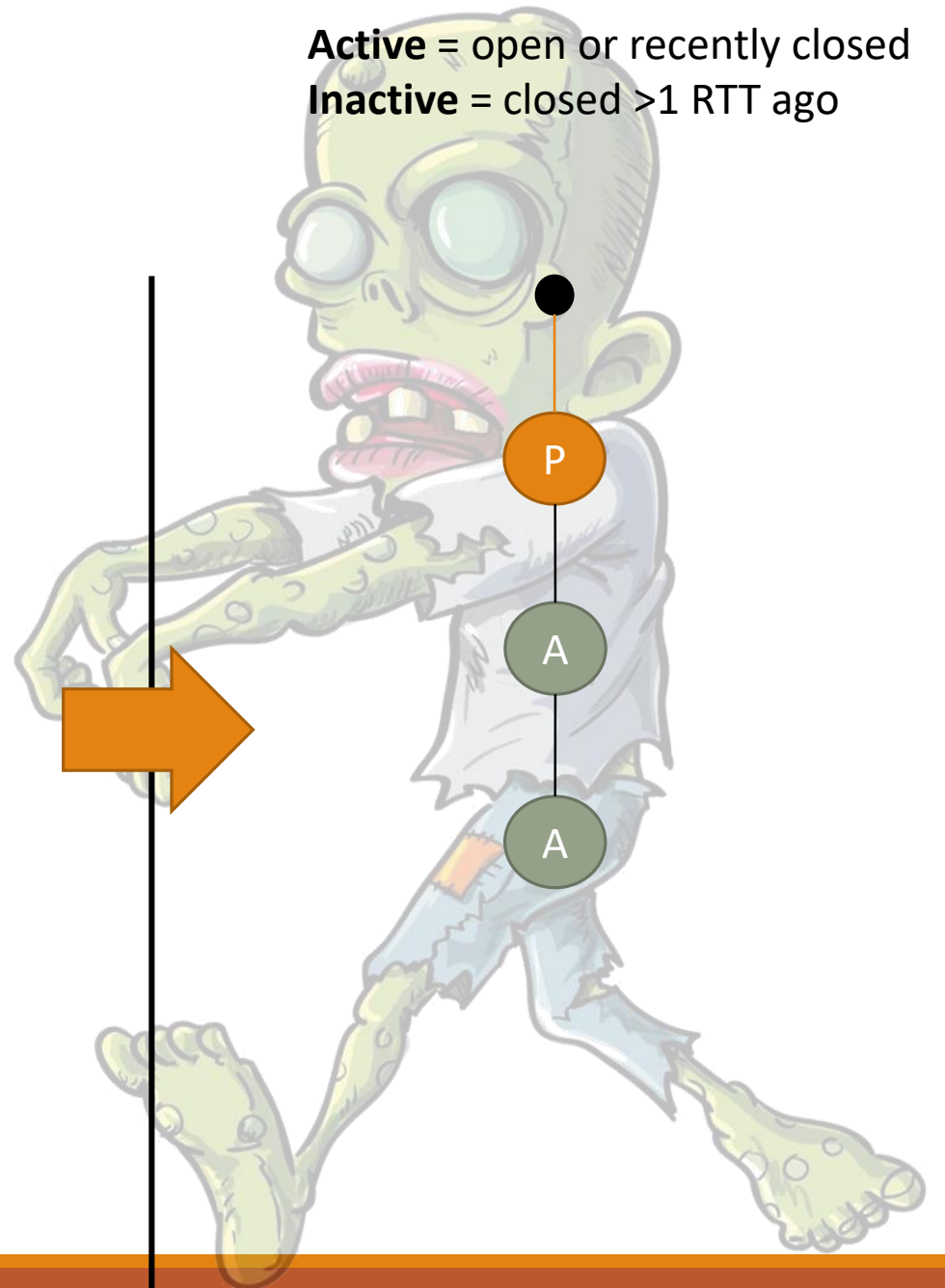
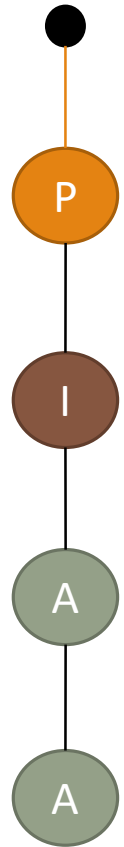
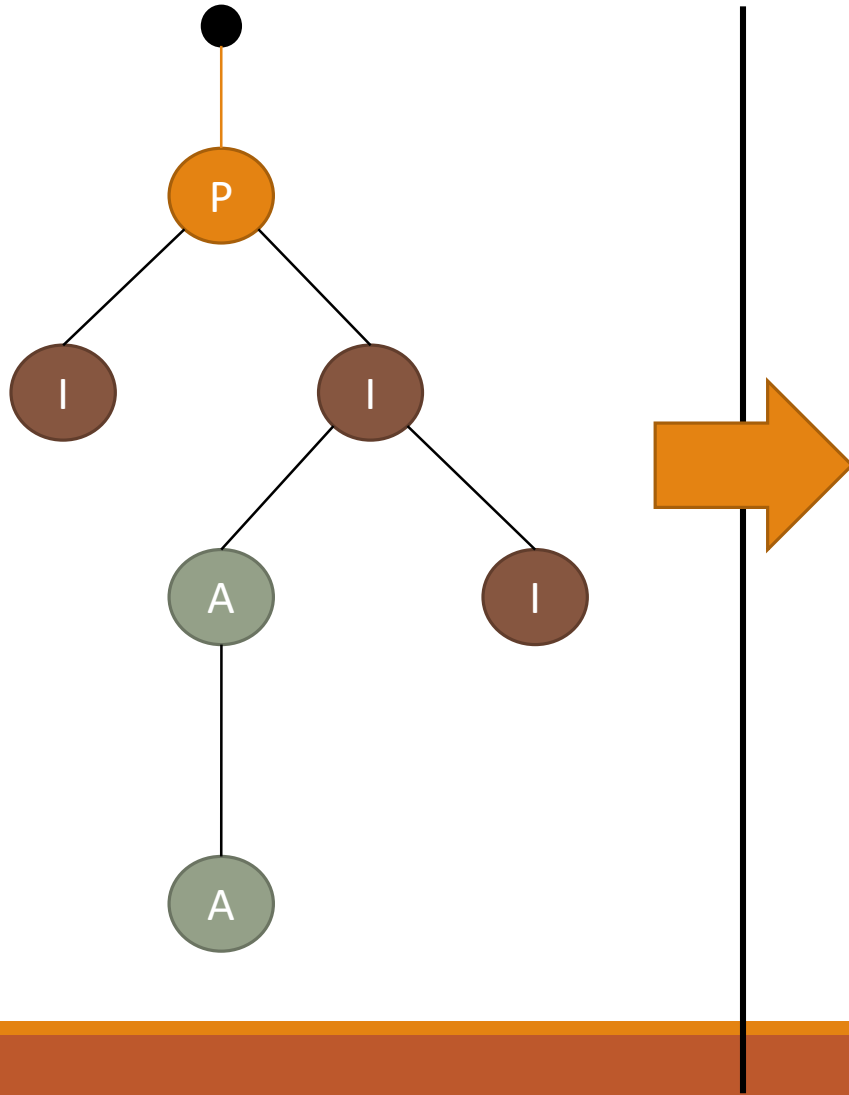
Aggressive Pruning

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Aggressive Pruning

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What do we want in HTTP/2?

Leave priorities alone – let HTTP/QUIC be different

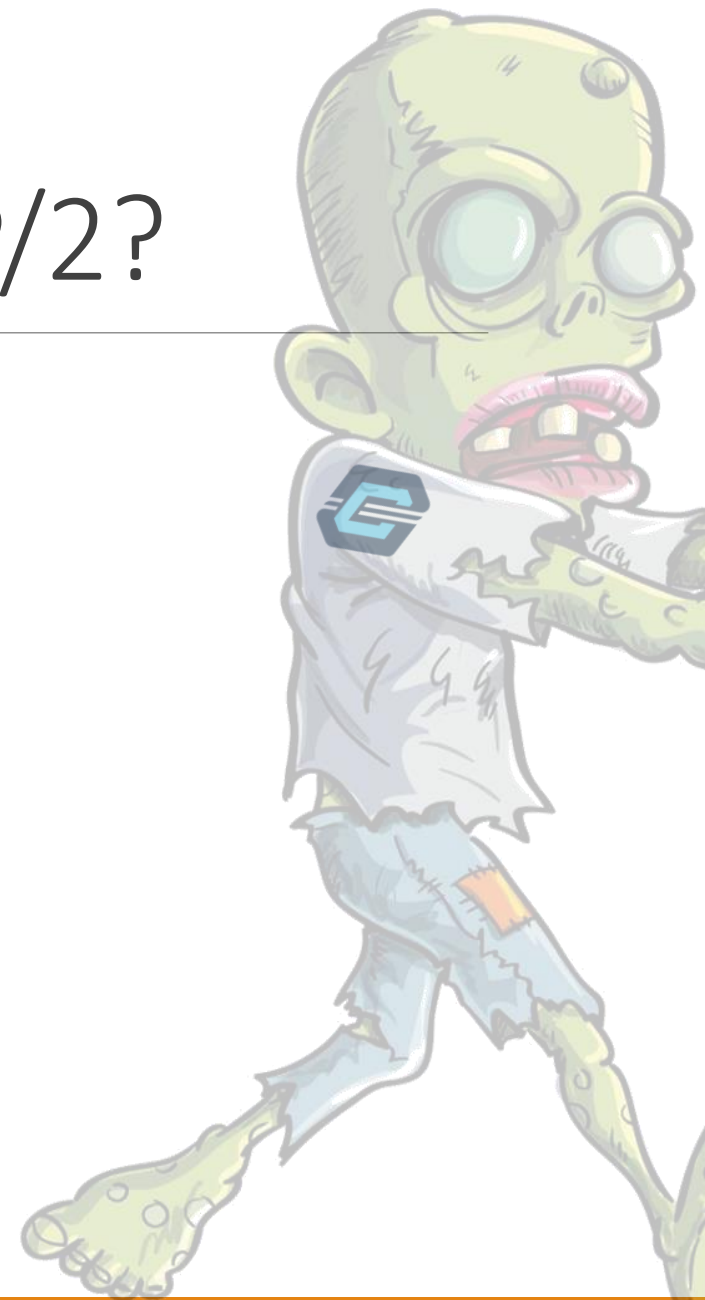
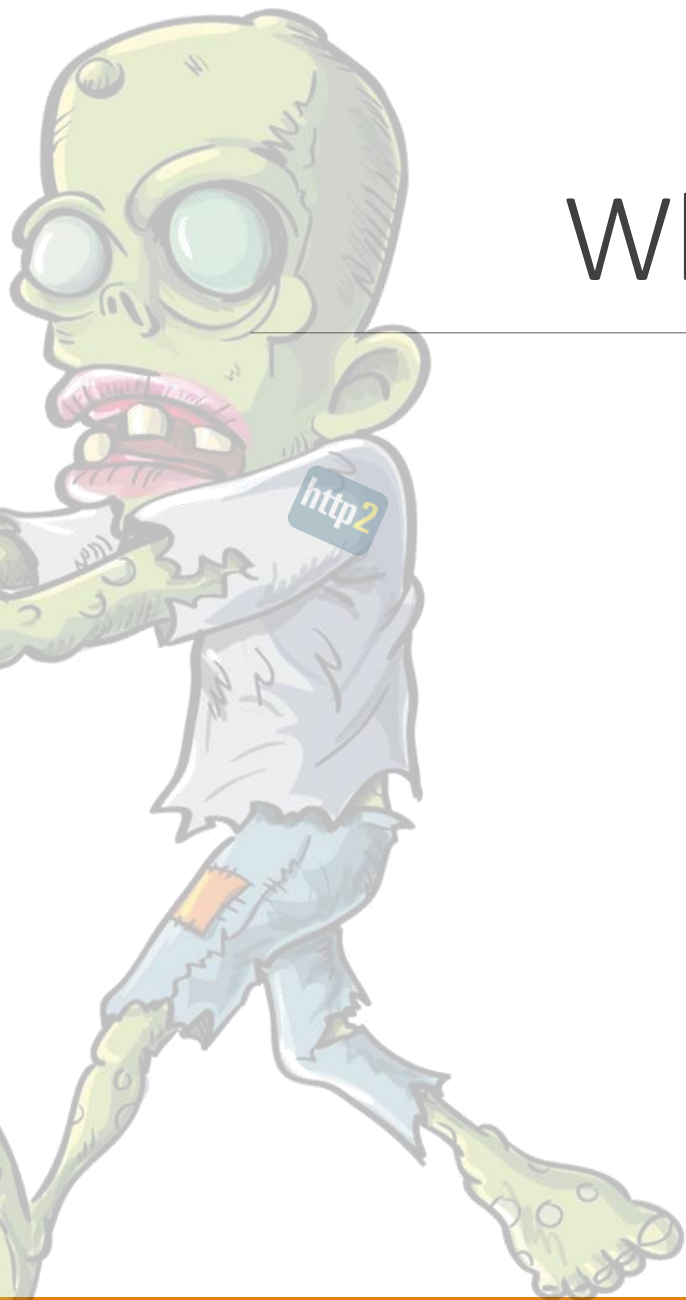
Adopt HTTP/QUIC scheme as an extension to HTTP/2

Define something better in a hurry and ask HTTP/QUIC to adopt it

- We do know some of these folks....

Diverge further by defining something better more slowly

- Recommend an extension to HTTP/QUIC later



ALTSVC and ORIGIN

RFC 7838 defines Alternative Services

- Header for any HTTP version
- Frame for HTTP/2

RFC 8336 defines ORIGIN frame

HTTP/QUIC is not porting all existing HTTP/2 extensions

- Ensuring that equivalent extension mechanisms exist
- Recommending that code points be assigned so as not to conflict with HTTP/2 uses

There is a draft (albeit expired) for ALTSVC

Nothing yet for ORIGIN, but it would be super simple.

GREASE in HTTP/2

Inspired by TLS 1.3, QUIC has followed the idea of greasing where possible

- Enforce “Ignore what you don’t understand and keep going” by occasionally sending nonsense
- Avoid catastrophe by reserving some values specifically for use as nonsense

HTTP/QUIC greases:

- Frame types: all types $0xb + (0x1f * N)$ are reserved
- Settings: all settings $0x?a?a$ are reserved

Recommends use of GREASE frame types for padding

Should HTTP/2 reserve these code points as well?

