Template-Driven HTTP CONNECT Proxying for TCP

Ben Schwartz, Meta Platforms Inc.
HTTPBIS @ IETF 126

Template-driven TCP Transport Proxy (i.e. MASQUE for TCP)

Proxy is identified by a template:

```
https://proxy.example/tcp
{?target_host,target_port}
```

In HTTP/1.1:

```
GET /tcp?
    target_host=192.0.2.1&
    tcp_port=443 HTTP/1.1
Host: proxy.example:443
Connection: Upgrade
Upgrade: connect-tcp
capsule-protocol = ?1
```

In HTTP/2 & HTTP/3:

```
:method = CONNECT
:protocol = connect-tcp
:scheme = https
:authority = proxy.example:443
:path = /tcp?
        target_host=192.0.2.1&
        target_port=443
capsule-protocol = ?1
...
```

Changes since IETF 125 (draft-10)

- Draft-11
  - ~~MAY~~**MUST NOT** send a Proxy-Status trailer (issue #3389)
- 19 WGLC issues filed by Yaroslav Rosomakho and Eric Kinnear
  - Also thanks to Willy Tarreau for additional review
- WGLC concluded “Revised I-D Needed”
- Draft-12 (hopefully) addresses all WGLC issues
  - Many small text changes
    - Some normative, some clarifying, some advisory
  - No compatibility-breaking changes

WGLC Issues Resulting in Changes

- #3411 Nit: Update or remove draft references
- #3412 Clarify "in-stream metadata" and extensibility via capsules
- #3413 How do 100 Continue and optimistic data interact?
- #3416 Mention Happy Eyeballs?
- #3417 Nit: Normative and informative reference for CONNECT-UDP
- #3418 Editorial: Explain Proxy Authentication reasoning
- #3422 Edge cases for FINAL_DATA
  - Still open, awaiting confirmation of consensus. See PR #3480, PR #3481
- #3424 Server applicability
- #3425 mTLS authentication
- #3426 Capsules format
- #3427 What's the point of splitting capsules?
- #3428 Remove HPKP
- #3429 Streaming considerations

WGLC Issues Closed Without Changes

- #3414 Are proxies expected to allow the default template URI?
- #3415 When is it okay to use Proxy-Status?
- #3419 Graceful vs. abrupt closure for HTTP/1.1
- #3420 Capsule forwarding and intermediaries
- #3421 Nit: DATA and FINAL_DATA names
- #3423 TLS considerations

Next step:
Exit or repeat WGLC