Feature Requests for Advanced UDP Proxying

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Inconspicuous Proxying
Features

1. **Secure proxied traffic**
   - The integrity, confidentiality, and authenticity of the proxied traffic is guaranteed

2. **Proxied traffic blends in**
   - The proxied traffic ideally looks like web browsing traffic

3. **Similar performance characteristics**
   - The performance characteristics of the original traffic should be retained as much as possible

4. **Proxy authentication**
   - The proxy can only be used by authorized clients

5. **Active probing resistance**
   - The proxy cannot be identified as a proxy and ideally looks like a normal web server
TCP Proxying

1. Secure proxied traffic

TCP+TLS handshake
CONNECT [Covert Dest] HTTP/1.1
Proxy-Authorization: [correct]
HTTP/1.1 200 OK
[data]
TCP Proxying, cont’d.

2. Proxied traffic blends in

3. Similar performance characteristics
TCP Proxying, cont’d.

4. Proxy authentication
5. Active Probing Resistance
Advanced UDP Proxying

1. Secure proxied traffic
2. Proxied traffic blends in
3. Similar performance characteristics
4. Proxy authentication
5. Active probing resistance

Client

UDP
IP

Proxy

UDP
IP

Covert Destination

Client

UDP
IP

Proxy (443)

Covert Destination

Web Server

2. Proxied traffic blends in
Some Existing UDP Proxying Solutions

- **TURN**
  - TURN traffic may not have sufficiently high collateral damage
  - Operating a TURN server that does not belong to a known service could be suspicious

- **SOCKS**
  - SOCKS6 UDP traffic (over DTLS) wouldn’t blend in with QUIC traffic
  - Operating a web server on the same port would be difficult

- **Various existing VPN protocols**
  - UDP traffic is secured in ways that wouldn’t blend in with QUIC traffic
  - Operating a web server on the same port would be difficult
Thank you
Backup Slides
Additional Considerations

- **DNS resolution**
  - Providing a way for the client to control which resolver/protocol the proxy uses to resolve DNS queries could be a worthwhile feature

- **UDP Association**
  - Control over the duration of the UDP association between the client and proxy is desirable

- **Congestion control**
  - The client-to-proxy and proxy-to-server links may have significantly different properties
  - Nesting transports with multiple congestion control mechanisms may require extra care

- **IP proxying**
  - It may be easy and worthwhile enough to include support for IP proxying

- **Configuration and discovery of the proxy**