MASQUE CONNECT-UDP Bind

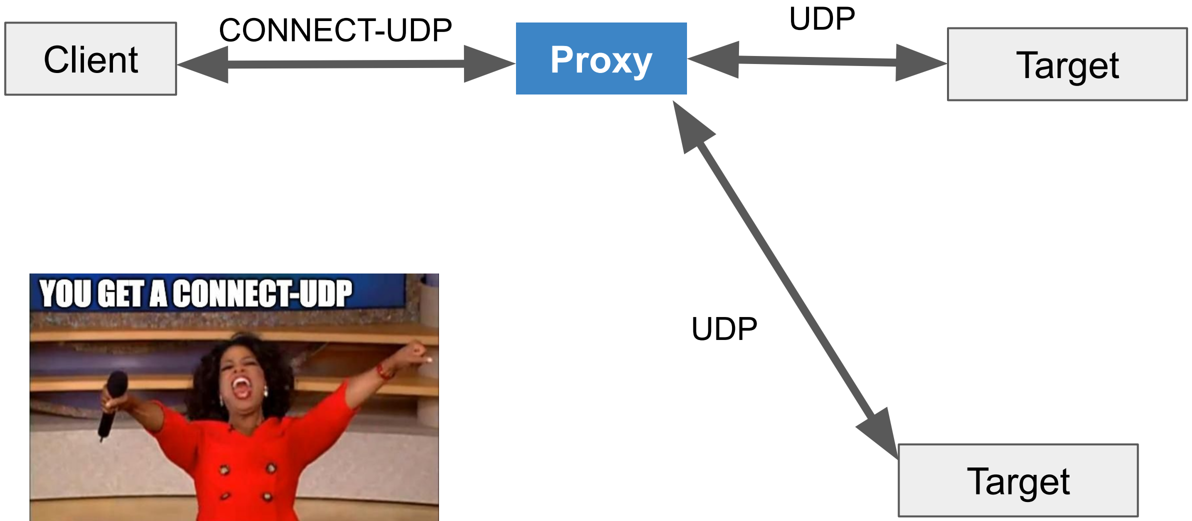
draft-ietf-masque-connect-udp-listen

IETF 120 – Vancouver– 2024-07-23

David Schinazi – dschinazi.ietf@gmail.com
Abhi Singh - abhisinghietf@gmail.com

CONNECT-UDP - with Binding support

The client can open UDP port(s) on the proxy to receive traffic from multiple targets



Enabled by setting the target to * and providing the connect-udp-bind header in the Request Headers.

```
HEADERS
  :method = CONNECT
  :protocol = connect-udp
  :scheme = https
  :path = /masque/udp/*/*/
  :authority = proxy.org
  capsule-protocol = ?1
  connect-udp-bind = ?1
```

What’s New? Target Compression

- Define two new capsules
  - COMPRESSION_ASSIGN: Allocate Context IDs to targets
  - COMPRESSION_CLOSE: Release Context IDs

```
CAPSULE COMPRESSION_ASSIGN {
  Context ID (i),
  IP Version (8),
  IP Address (32..128),
  UDP Port (16),
}
```

```
CAPSULE COMPRESSION_CLOSE {
  Context ID (i),
}
```

COMPRESSION_ASSIGN Capsule

```
CAPSULE COMPRESSION_ASSIGN {
  Context ID (i),
  IP Version (8),
  IP Address (32..128),
  UDP Port (16),
}
```

- Client or proxy can request compression of a target via this capsule
- Other party confirms allocation by echoing back the capsule
- When IP Version is set to 0, an Uncompressed Context is requested

Uncompressed Contexts

```
CAPSULE COMPRESSION_ASSIGN {
  Context ID (i) = 2,
  IP Version = 0
}
```

```
DATAGRAM QUIC Frame {
  Type (i) = 0x30..0x31,
  [Length (i)],
  Quarter Stream ID (i),
  Context ID (i) = 2,
  IP Version (8),
  IP Address (32..128),
  UDP Port (16),
  UDP Payload (..),
}
```

When IP Version is set to zero in COMPRESSION_ASSIGN, this context to allow connections from/to any target IP/Port

Target IP and Port MUST be provided on each frame

Only the client can allocate these.

Compressed Contexts

```
CAPSULE COMPRESSION_ASSIGN {
  Context ID (i) = 2,
  IP Version (8),
  IP Address (32..128),
  UDP Port (16),
}
```

```
DATAGRAM QUIC Frame {
  Type (i) = 0x30..0x31,
  [Length (i)],
  Quarter Stream ID (i),
  Context ID (i) = 2,
  UDP Payload (..),
}
```

Once the COMPRESSION capsule is exchanged, all frames exchanged between the proxy and client can omit the Target IP:Port, and use Context ID instead while it is valid.

Releasing a Context

```
CAPSULE COMPRESSION_CLOSE {
  Context ID (i) = 2,
}
```

Can be sent by either client or proxy, to clean up or close connections.
Resource management for both parties

This is also sent to reject a COMPRESSION_ASSIGN request. If for example, the proxy is unable to deal with more connections.

Achieves 2 goals at once

1) COMPRESSION: Save bytes from sending IP:Port per datagram using context IDs
2) IP RESTRICTION: Remove context IDs to reject traffic from a given target or all uncompressed targets. Create them to poke holes in the “firewall”

What’s new? The Proxy Public address header

The proxy is now required to return IP:Port tuples to the client in Response Headers. Multiple ones can be provided

```
HEADERS
  :status = 200
  capsule-protocol = ?1
  connect-udp-bind = ?1
  proxy-public-address = 192.188.0.2:8211,\
                     [2001:db8::1234]:54321
```

Allow more than one address per family?

We decided to allow more than one. ICE/WebRTC are designed to function with multiple candidate IP addresses.

Identifying the proxy local address used

We allow the proxy to pick its own proxy local address for relaying payloads.

Is knowledge of control of which specific proxy local address the client picked useful to the client?

Should the client be able to select the address it wants per packet/context?

MASQUE CONNECT-UDP Bind

draft-ietf-masque-connect-udp-listen

IETF 120 – Vancouver– 2024-07-23

David Schinazi – dschinazi.ietf@gmail.com
Abhi Singh - abhisinghietf@gmail.com