MASQUE HTTP Datagrams Design Team Output

draft-ietf-masque-h3-datagram

draft-ietf-masque-connect-udp

Interim – Virtual – 2022-02-14

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HAPPY
Valentine's
DAY


GOOD BYE
E-MAIL ME
I ♡ YOU
MAD 4 U
I'M SURE
SOUL MATE
LIV ME
HELLO
FIRST KISS
FIRST KISS
TOO HOT
LOL
MY HERO
XOXO
I ♡ YOU
XOXO
KISS ME
GOOD BYE
FIRST KISS
LOL
MY CUTIE
XOXO
TOO COOL
GET REAL
KISS ME
YOU ROCK
E-MAIL ME
I ♡ YOU
UR MINE

Previously, on MASQUE...

We are building CONNECT-UDP, like CONNECT but for UDP!

There is interest in datagrams beyond CONNECT-UDP,
so we split the draft into HTTP Datagrams + CONNECT-UDP

We had an interim in 2021-04, focused on the design of HTTP Datagrams

We redesigned everything, and after discussion on the list, merged some PRs

We then re-redesigned everything

We didn't agree on a solution at IETF 112, so we formed a design team

Design Team Participants

Eric Rescorla, Mozilla

Martin Thomson, Mozilla

Mike Bishop, Akamai

Tommy Pauly, Apple

Alan Frindell, Facebook

Lucas Pardue, Cloudflare

Alex Chernyakhovsky, Google

Marcus Ihlar, Ericsson

Ben Schwartz, Jigsaw

Victor Vasiliev, Google

David Schinazi, Google (lead)

Goal of the Design Team

Reach (rough) consensus amongst design team members on an overall design for HTTP Datagrams (the means by which WebTransport, CONNECT-UDP, and CONNECT-IP exchange datagrams)

Output of this design team will be a recommendation written up as PR(s) which will be discussed at a MASQUE interim before IETF 113, then we will confirm MASQUE WG consensus on list

Output of the Design Team

https://github.com/ietf-wg-masque/draft-ietf-masque-h3-datagram/pull/135

https://github.com/ietf-wg-masque/draft-ietf-masque-connect-udp/pull/77

Capsule Protocol

Sequence of TLVs on data stream, carries end-to-end messages even with intermediaries

New methods / upgrade tokens can choose to use the Capsule Protocol

CONNECT-UDP uses it

```
Capsule Protocol {
  Capsule (..) ...,
}

Capsule {
  Capsule Type (i),
  Capsule Length (i),
  Capsule Value (..),
}
```

New `Capsule-Protocol` HTTP header that allows endpoints to inform intermediaries that the capsule protocol is in use

Intermediaries can translate between different versions of HTTP

HTTP Datagrams

HTTP Datagrams are associated with a currently open HTTP request stream

HTTP Datagrams can be sent either using the QUIC DATAGRAM frame, or inside a new DATAGRAM capsule

HTTP Datagrams are supported for all existing versions of HTTP

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

QUIC

HTTP/3

```
Datagram Capsule {
  Type (i) = DATAGRAM,
  Length (i),
  HTTP Datagram Payload (..),
}
```

Extensibility / Demultiplexing

Moved from HTTP Datagrams to CONNECT-UDP

CONNECT-UDP

`connect-udp` HTTP Upgrade Token

`:method = CONNECT`

`:protocol = connect-udp`

Context ID

- 0 means UDP Payload
- non-zero is dynamically allocated
- even IDs are client-allocated
- odd IDs are server-allocated

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

QUIC

HTTP/3

CONNECT-UDP

```
Datagram Capsule {
  Type (i) = DATAGRAM,
  Length (i),
  Context ID (i),
  Payload (..),
}
```

CONNECT-UDP Context ID Registration

CONNECT-UDP draft defines concept of registration:

- means informing the peer of the semantics/format of the payload

Registration can use HTTP headers and/or capsules

Specifics of how registration is done is currently not defined and left to extensions

- we will confirm whether this is the state we want with the WG
- separately from the outcome of this design team

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