Qlog

IETF 116 – Yokohama – 2023-03

Robin Marx, Luca Niccolini, Marten Seemann,
Lucas Pardue

Since IETF 115

- Published 1 set of new drafts
  - Small amount of consistency changes, mainly to do with RawInfo type
- Finalized scope
  - Features and frames defined in RFC / IANA by end of 2022
  - See email of 20 december 2022
  - Future extensions can either do custom qlog drafts, or we'll have bulk (bi-)yearly update documents (if required)
- Requested early SECDIR review of main schema Security and Privacy considerations
- Continued working on many open issues and PRs

Versioning of qlog and additional schema #283

Current:

3 documents - main schema, QUIC schema, HTTP/3 and QPACK schema.
1 version field - `qlog_version`

Challenges:

1) Schema are not tightly coupled, expect them to progress independently.
2) We want, and expect, new additional schema documents in the future (e.g., extensions)
3) Just because an endpoint *could* log an event doesn't mean it *will.* Identifying schema is a hint about what might be in a qlog.

Versioning of qlog and additional schema #283

- **Proposal**:
  - PR 284
  - `additional_schema`
  - An array of schemas based on a unique label
  - Punt unique labelling to the datatracker/RFC editor/SDO
  - Don’t think we need to go full URL

```
{
  "qlog_version": "0.3",
  "qlog_format": "JSON",
  "additional_schema": [
    "draft-ietf-quic-qlog-quic-events-04",
    "draft-ietf-quic-qlog-quic-h3-events-04"
  ],
  "title": "Nice Name",
  "description": "Nice description",
  "summary": {...},
  "traces": [...]
}
```

Naming things #286

Qlog events belong to categories that have names e.g.,

- **`connectivity`**`:server_listening`
- **`transport`**`:packet_received`
- **`security`**`:key_updated`
- **`recovery`**`:congestion_state_updated`
- **`http`**`:frame_parsed`
- **`qpack`**`:headers_decoded`

Some of these category names are overly broad. Also spill into fields themselves

Future schema (e.g. TCP or HTTP/2) might be similar but are different and can’t reuse events we are currently defining

Naming things #286

Proposal:

Rename HTTP to H3 (PR 287)

http:frame_parsed → h3:frame_parsed

Rename `transport` to `quic`

transport:packet_sent → quic:packet_sent

Leave other names alone

Trivial to do in the spec but this would be a fairly large **breaking change** to implementations!

Multipath support #134

Current plan: add opaque “path_id” top-level field (can be logged for each event)

- Nice and flexible, but is it enough?
- Do we have a clearer view on this with the progressing multipath draft?

A proposal for QPACK events #199 (1/2)

Goal: investigate correctness or performance issues

Current events: Header block encoded/decoded, state updates, and raw instructions: *too low level*

Proposal:

- Events for Higher level conditions
  - Encoder
  - Decoder
  - Connection-level

A proposal for QPACK events #199 (2/2)

Encoder Events:

- Encoded a field section block
- Blocked Insertion
- Avoided Reference
- Blocked Reference
- Encoder Stream FC blocked

Decoder Events:

- Decoded a field section block
- Decoding blocked
- Insert count increment

Connection End Summary:

- Global stats/counters for both encoder and decoder

The problems with clocks #198

Events are time stamped. Values depend on format.

UNIX timestamps are implied but not mandatory. Not everyone wants to/can use UNIX e.g. Windows Epoch, CLOCK_MONOTONIC.

Proposal:

Explicit epoch date in ISO 8601 format

Possibly a special “opaque” tag to indicate scenarios like CLOCK_MONOTONIC.

ECN marking #263

How and where to log ECN marking info

Datagram or QUIC packet events?

Semantic ECN names or bit values (ECN = "Non-ECT" / "ECT(1)" / "ECT(0)" / "CE")

ECN probing is not covered yet. Should it? - tracked on #212