

The **OPPENHEIMER** Update  
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# Since IETF 117

- Published 2 new drafts
  - Added ECN events
  - Editorial updates (structure, remove IANA)
- Need some input on issues
  - Remove QPACK
  - Connection migration / Path ID



# Added ECN info/events [#263](#)

ECN = "Not-ECT" / "ECT(1)" / "ECT(0)" / "CE"

In QUIC:DatagramsSent / DatagramsReceived

```
ECNStateUpdated = {  
  ? old: ECNState  
  new: ECNState  
}
```

```
ECNState =  
  ; testing in progress  
  "testing" /  
  ; waiting for ack of testing packets  
  "unknown" /  
  ; testing failed  
  "failed" /  
  ; testing successful, now sending with ECT(0) marking  
  "capable"
```



# Remove QPACK?! [#335](#)

Current: Wire Image

- `SetDynamicTableCapacityInstruction`
- `LiteralHeaderFieldWithName`

Ideal: **High-Level usability**

- `HeadOfLineBlocked`
- `TableEntryAdded/Removed`

Problem 1: no experience/opinions

Problem 2: blocking progress

**Solution: move it to separate doc?**



# (Multi)path/Migration support [#336](#)

## Basic idea:

```
{time: 12456, path: "my_first_path", name: "quic:packet_sent", data: {...}}
```

## Path ID can be *any string*:

- path: "192.0.2.0:12345-203.0.113.0:443-0xFACADE"
- path: "2001:0db8:85a3::8a2e:0370:7334:12345-2001:0db8:85a3::8a2e:0370:7335-12346-0xDE1E7E"
- path: "0xABC123"
- path: "76dd12427552987b85a823f0d807de785f58271e"
- path: "the fellowship of the ring"
- ...



# (Multi)path/Migration support [#336](#)

**Associate metadata with PathID *(if wanted)*:**

```
PathAssigned = {  
    path_id: text  
  
    ? path_remote: PathEndpointInfo  
    ? path_local: PathEndpointInfo  
}  
  
PathEndpointInfo = {  
    ? ip_v4: IPAddress  
    ? ip_v6: IPAddress  
    ? port_v4: uint16  
    ? port_v6: uint16  
  
    ? connection_ids: [+ ConnectionID]  
}
```



**Can update metadata**  
later by logging again  
(e.g., after migration)

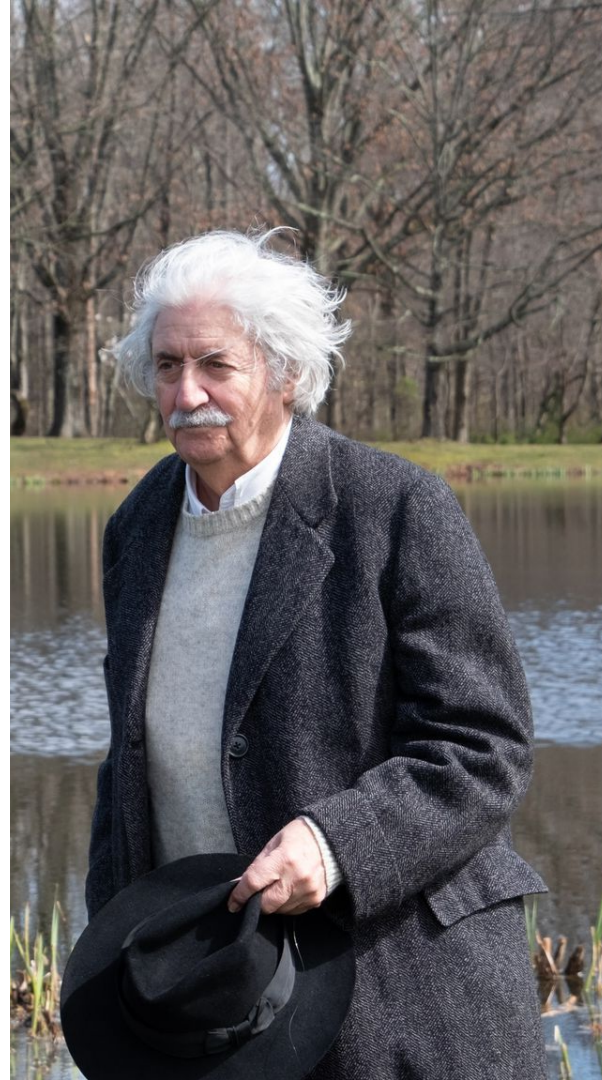
**Default path\_id is “”**  
(associate path info in  
non-migration traces)

# (Multi)path/Migration support [#336](#)

## Explicit Connection Migration states:

```
QUICMigrationStateUpdated = {  
    ? old: MigrationState  
    new: MigrationState  
  
    ? path_id: PathID  
    ? path_remote: PathEndpointInfo  
    ? path_local: PathEndpointInfo  
}
```

```
MigrationState =  
    "probing_started" /  
    "probing_abandoned" /  
    "probing_successful" /  
    "migration_started" /  
    "migration_abandoned" /  
    "migration_complete"
```





# (Multi)path/Migration support [#336](#)

## Summary:

- Path ID for each event  $\Rightarrow$  **each event can have associated IP/port/CID**
- Path ID is separate from metadata  $\Rightarrow$  **efficient, privacy-aware**
- Explicit Connection Migration states  $\Rightarrow$  **extra clarity *if needed***

*Should be enough to support tooling like qvis*

*Should be multipath “proof”*





# The end (for qpack?)

- Added ECN events
- Remove QPACK?
- “Path” proposal!

