

BGP Flow Specification for QUIC

draft-lin-idr-flowspec-quic-01

Changwang Lin (New H3C)

Yujia Gao (Zhongguancun Laboratory)

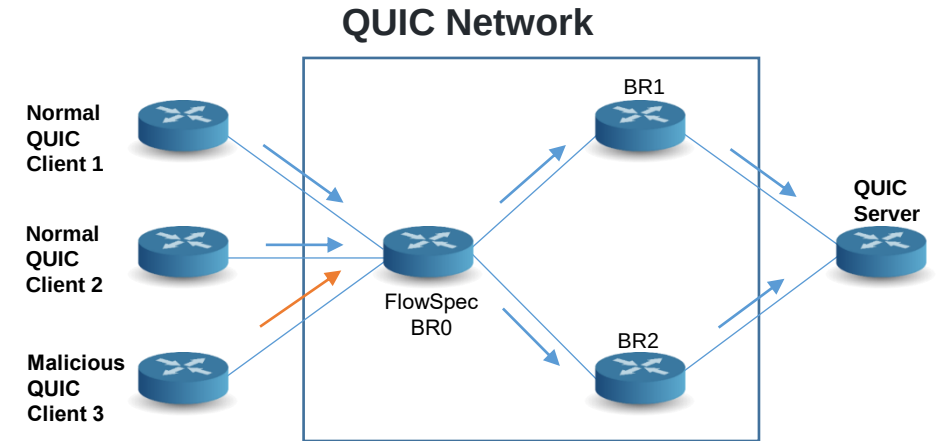
IETF IDR Interim Meeting

2026-10-26

Problem, Solution & Benefits

Problem:

- Traditional FlowSpec uses 5-tuple matching (Src/Dst IP, Ports, Protocol).
- QUIC runs over UDP, usually on a single well-known port (e.g., 443).
- This makes it **impossible** to distinguish different QUIC applications/connections using the 5-tuple alone.
- QUIC payloads are **encrypted** (TLS), so Deep Packet Inspection (DPI) cannot be used for classification.
- How can network operators perform fine-grained traffic steering, QoS, or mitigation for QUIC flows without DPI?



Solution:

- ◆ Due to that QUIC header fields like **Connection ID** and **Header Form (first byte)** remain **unencrypted**.
- ◆ Defines three **new components**:
 - **TBD1** – QUIC Destination Connection ID
 - **TBD2** – QUIC Source Connection ID
 - **TBD3** – QUIC Header Flag (Header Form)
- ◆ The new components apply to **BGP FlowSpec Version 2 (FSv2)**.
- ◆ They are used within the **IPv4 Basic** and **IPv6 Basic** filter families.

Benefits:

- **Enables:**
 - ✓ Fine-grained, application-aware traffic steering.
 - ✓ Rapid isolation of problematic or malicious connections.
 - ✓ Identity-aware micro-segmentation in zero-trust networks.
 - ✓ Targeted DDoS mitigation against QUIC services.

Updated Filter Component Layouts

The current assigned values in the “FSv2 IP Basic Filter Components” registry (draft-ietf-idr-fsv2-ip-basic):

Filter Family: IPv4 Basic(Type = 1000) or IPv6 Basic (type=1100)

Filter Components:

1. Type: QUIC Destination Connection ID = TBD1 (type = 3100)
 - **Purpose:** Match the Destination Connection ID in the QUIC header.
 - **Encoding:** <type (1 octet), length (1 octet), connectionID (variable)>
2. Type: QUIC Source Connection ID = TBD2 (type = 3110)
 - **Purpose:** Match the Source Connection ID in the QUIC header.
 - **Encoding:** <type (1 octet), length (1 octet), connectionID (variable)>
3. Type: QUIC Header Flag (Header Form) = TBD3 (type = 3120)
 - **Purpose:** Match the **first byte** of the QUIC header as defined in RFC 9000.
 - **Use:** Differentiates QUIC packet types (e.g., Initial, Handshake, 0-RTT).
 - **Encoding:** <type (1 octet), [bitmask_op, bitmask]+>, (1-octet bitmask)

Thanks!