CID Flow Indicator (CIDFI, “sid fye”)

draft-wing-cidfi-02

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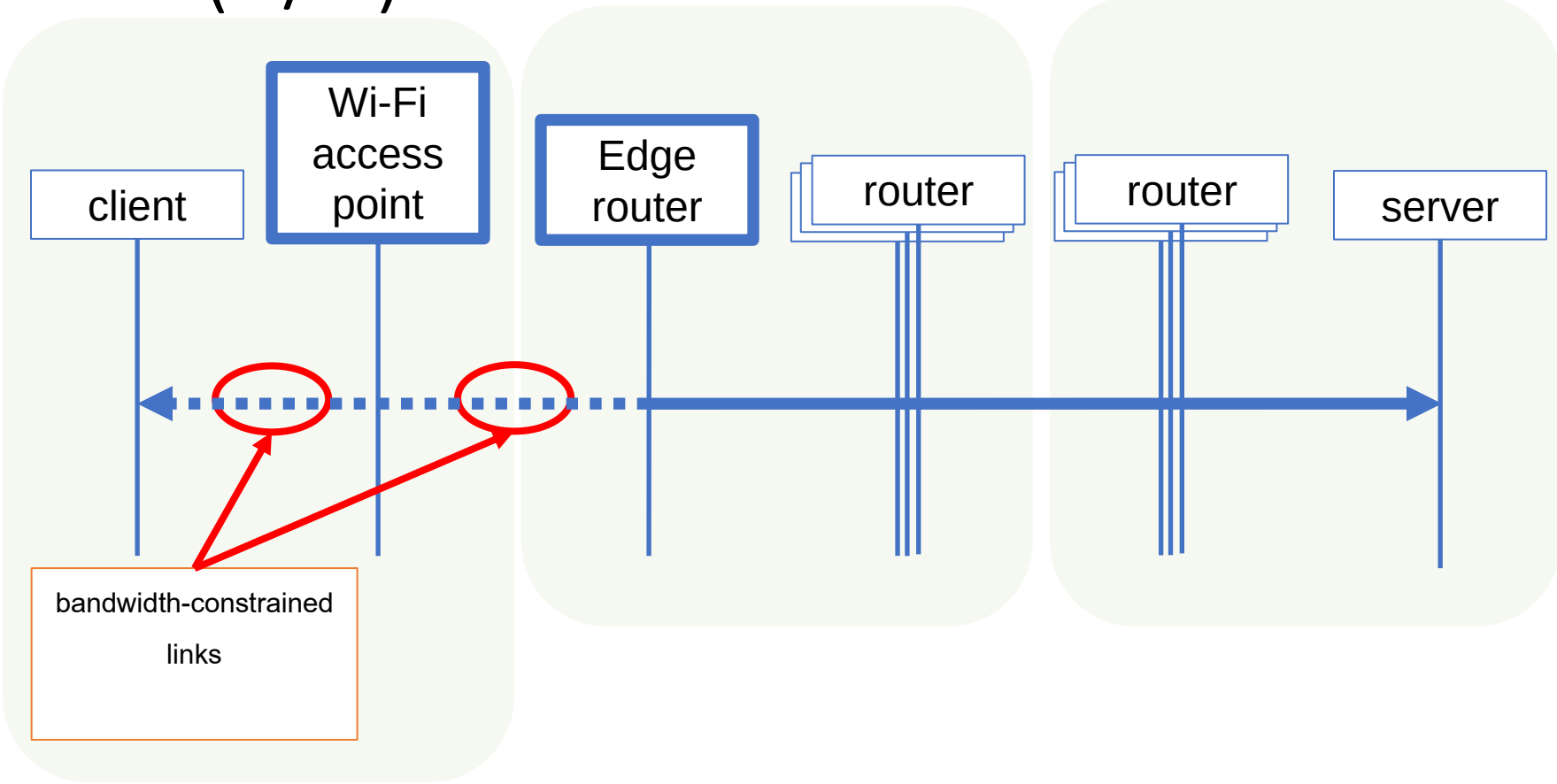
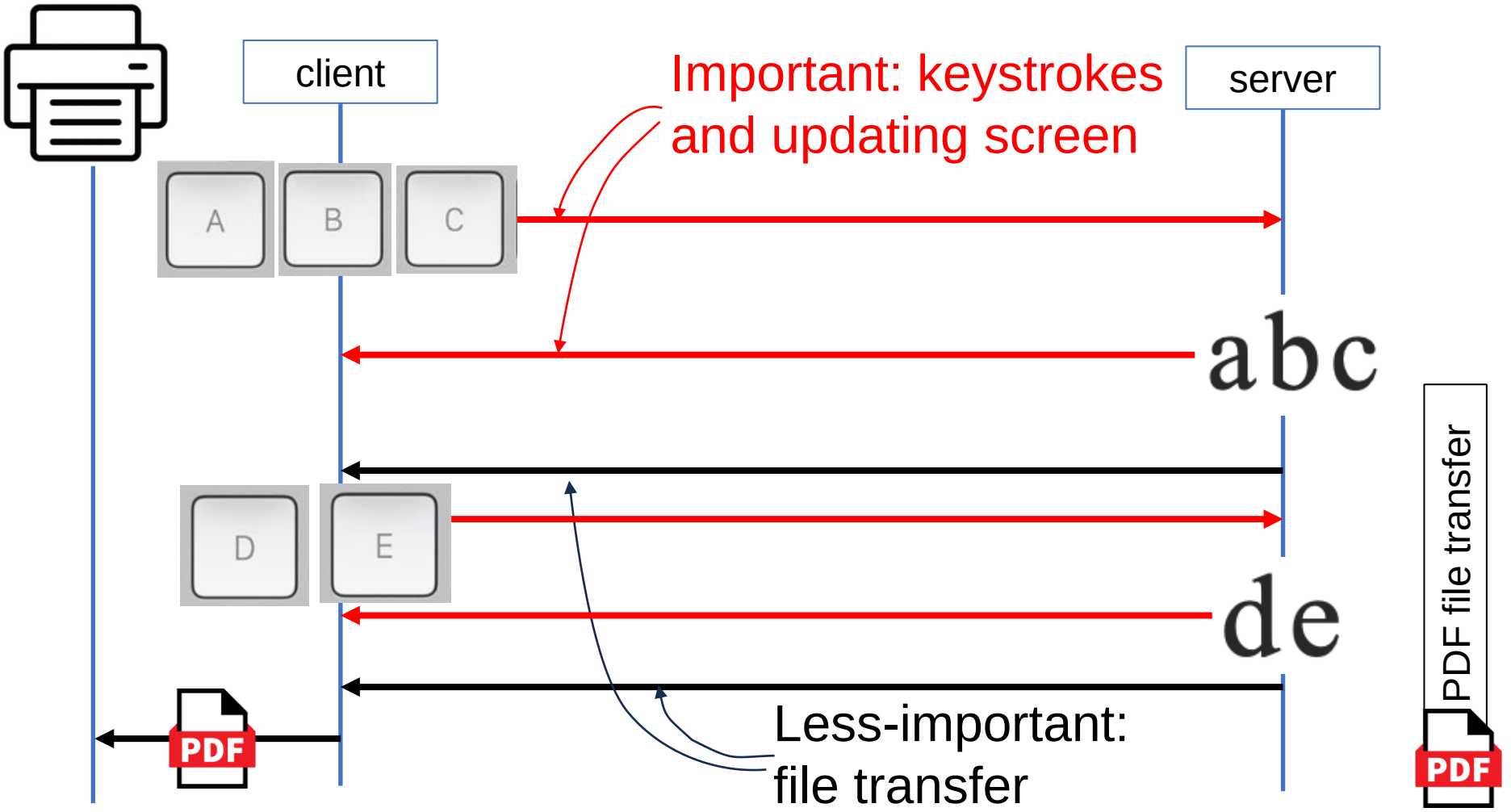
Problem

Problem: bandwidth-constrained links (1/2)



Problem: different importance (2/2)



Desired Solution

- Communicate packet importance *within a 5-tuple* to client-side bandwidth-constrained network elements
- Communicate network performance information to help streams *within a 5-tuple to* adapt.

CIDFI Overview

CIDFI Overview

- QUIC (or DTLS) CID mapped to ‘importance’ by server
- Mapping shared with CIDFI Network Elements
- Important packets sent with that CID

Solution Steps

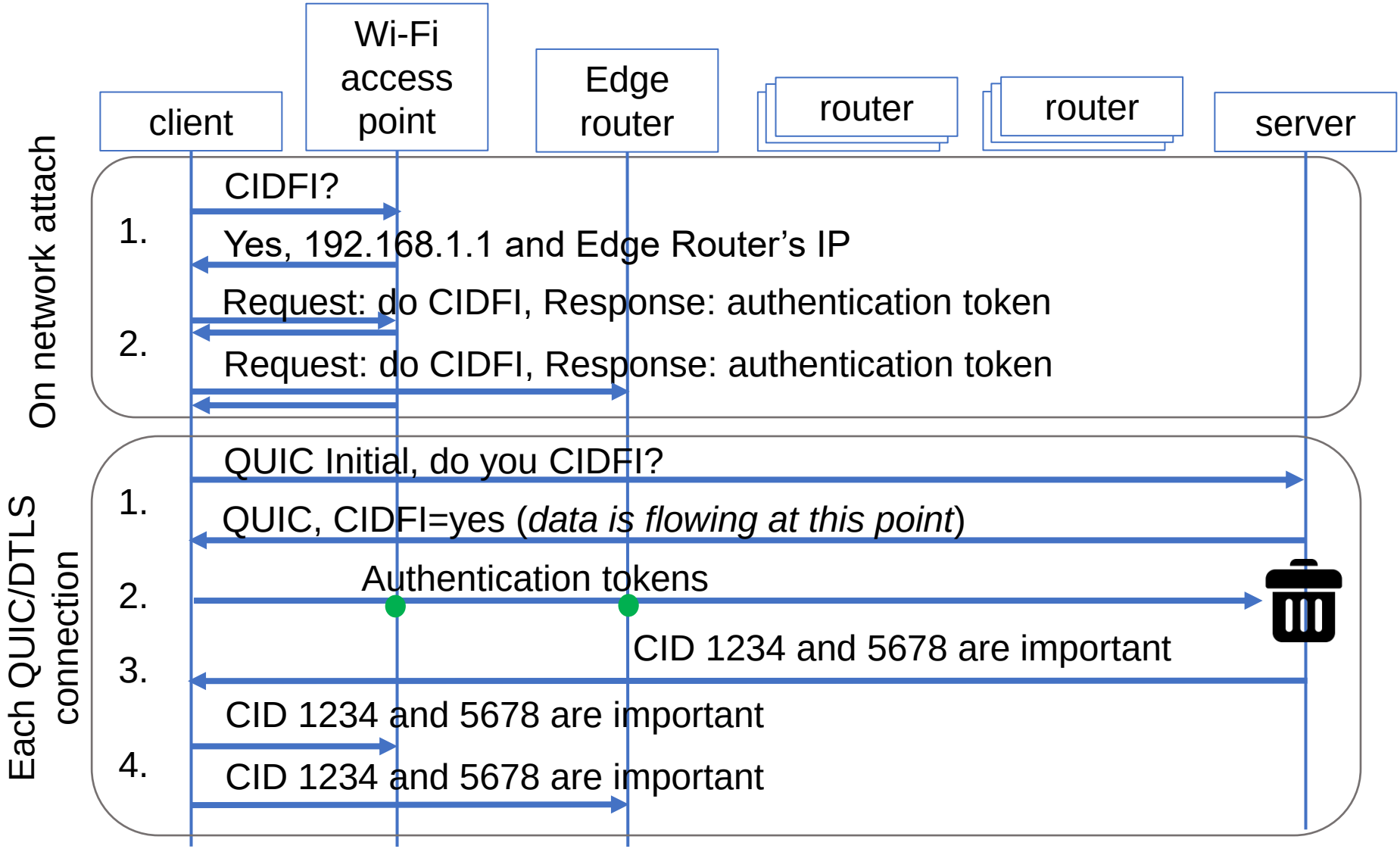
On network attach

1. Client learns CIDFI network elements
2. Client requests network element participation
   - Client authorizes each network element
   - Each network element sends authentication token

Each QUIC/DTLS connection

1. Client connects to CIDFI-aware server
2. Client sends authentication token over 5-tuple
3. Server sends CID->metadata mapping to client
4. Client relays mapping to network elements

CIDFI on one slide



CIDFI Advantages

- Supports IPv4, IPv6, and IPv6/IPv4 translation
- Uses QUIC v1 or DTLS Connection Id (RFC9146)
  - Immutable
- Internet deployable
  - Only CIDFI routers, client, and server need CIDFI support
  - Non-participating routers are unaffected
- Metadata is extensible and does not impact QUIC packet size and MTU

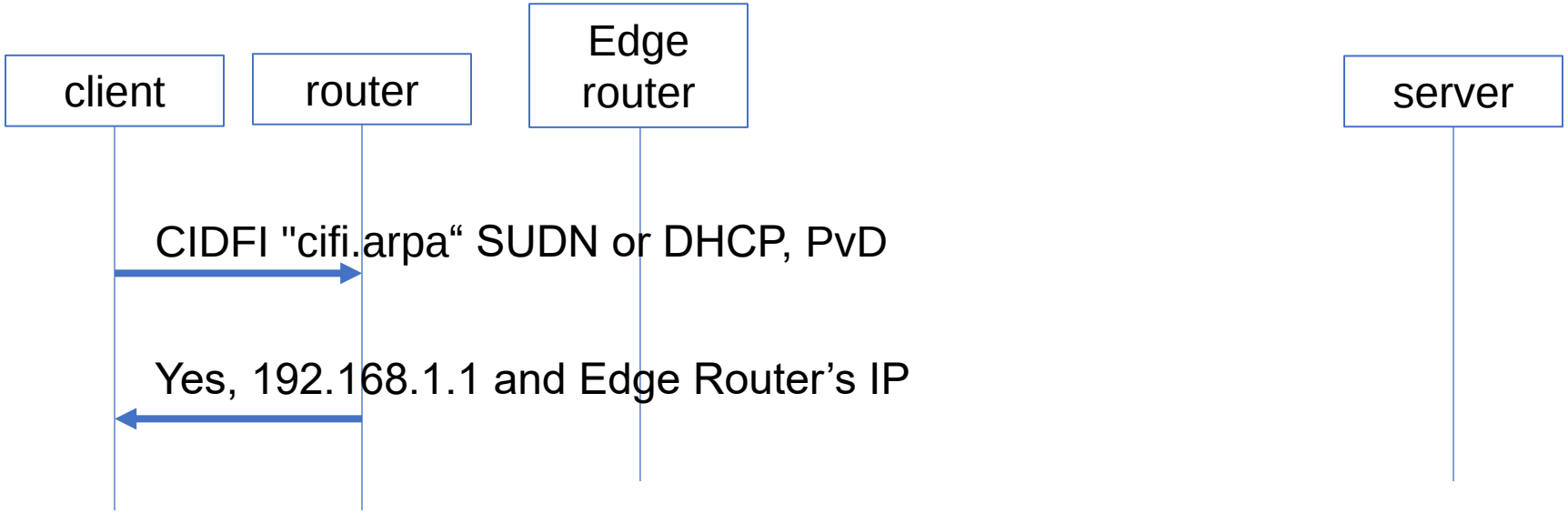
CIDFI Summary

- Use QUIC CID or DTLS CID mapped to ‘importance’
- Client authorizes and coordinates signaling
  - Client’s on-premise Wi-Fi and client’s ISP
- Server sends important packets using mapped CID

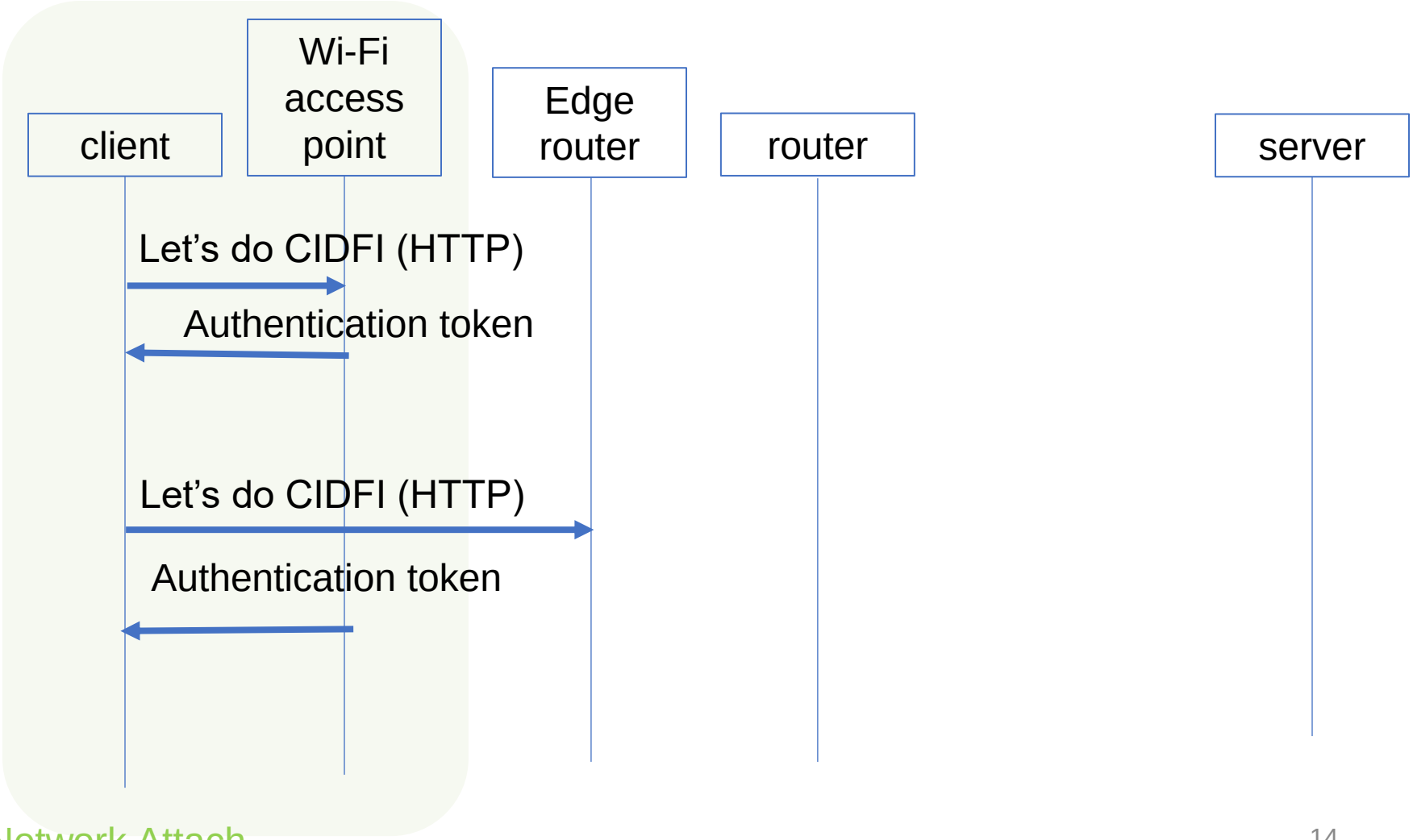
Backup

1. Client Finds Network Elements

- DNS query



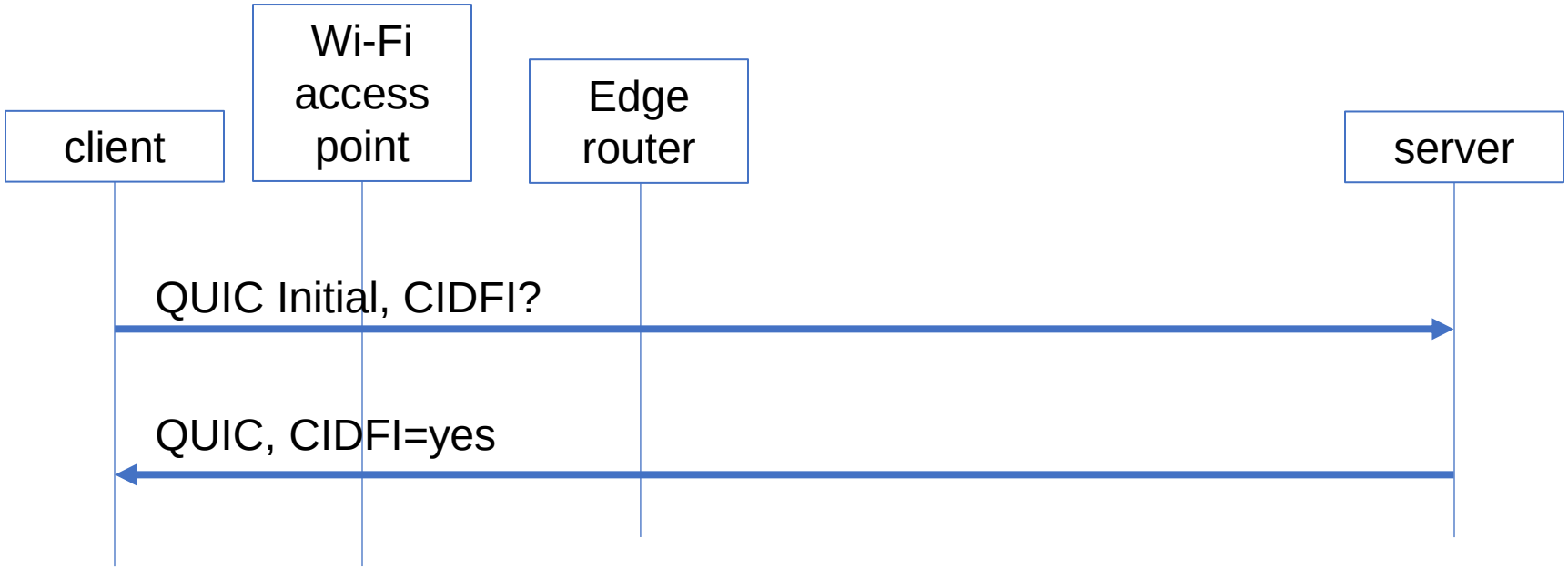
2. Client Requests Participation



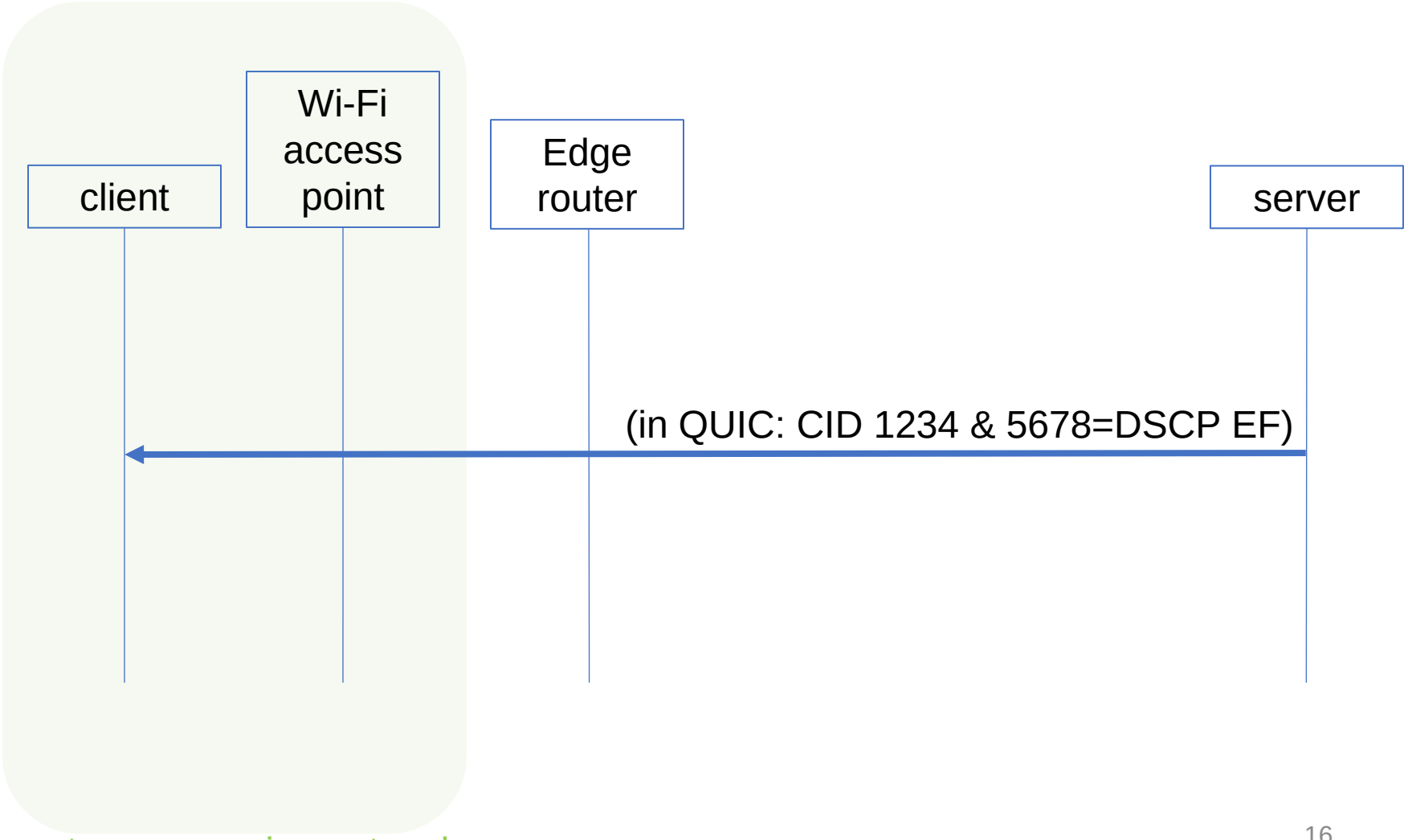
Network Attach

3. Client determines server supports CIDFI

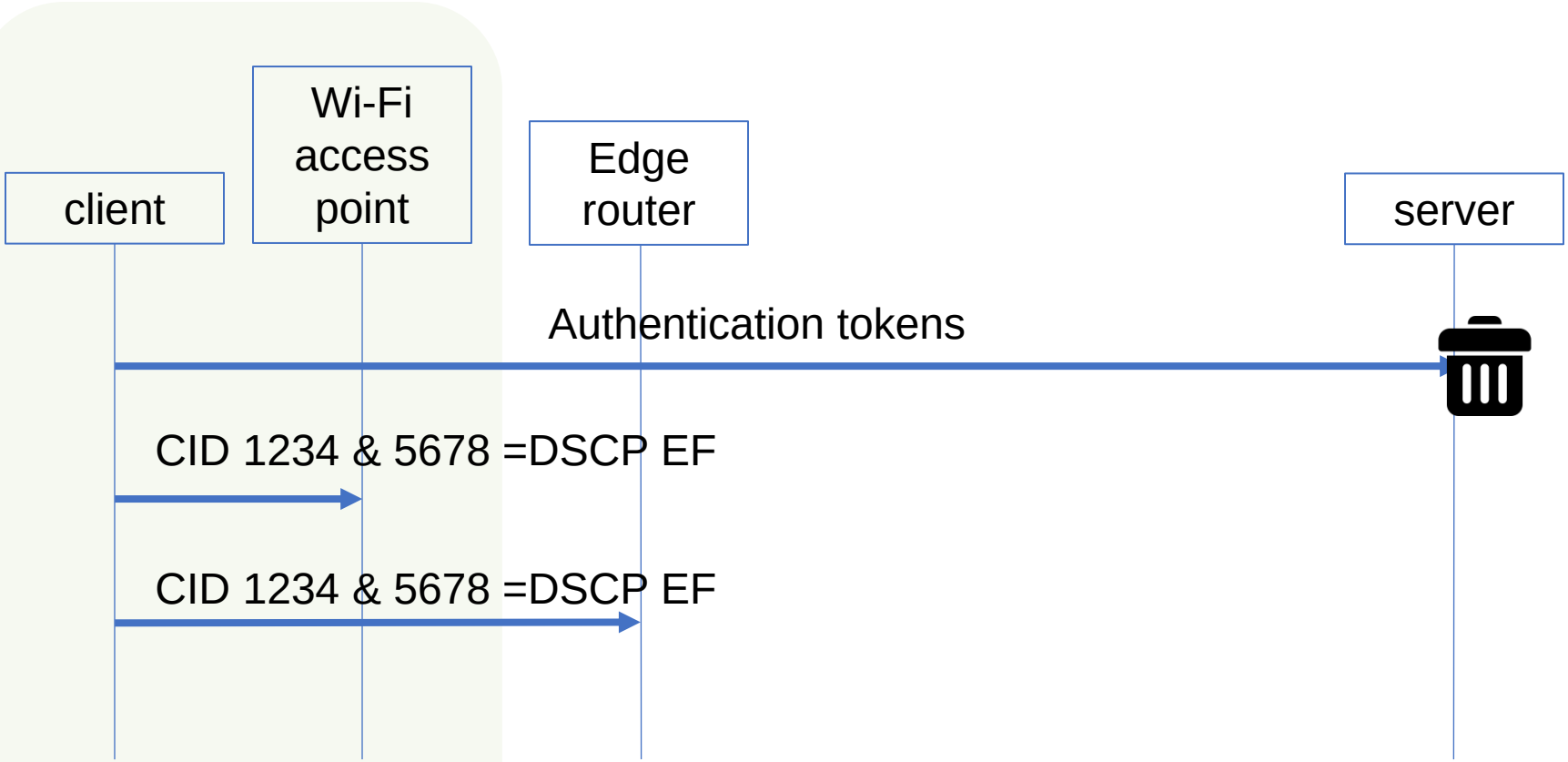
- New QUIC transport parameter
  - remembered for 0-RTT



4. Server Sends CID->metadata mapping



5. Client relays mapping to network elements



Leaking Packet Importance

- Concern: Recurring different CID leaks packet importance to attacker
- Possible mitigations:

  Obfuscation: server maps many CIDs and retires CIDs aggressively

End

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