

# Encrypted Transport Protocol Path Explicit Signals

draft-reddy-tsvwg-explcit-signal-01

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# Problem

- Cellular needs to manage radio resources
  - Network congestion/noise/distance
  - Mobile device changes towers: drop or transmit?
- IAB discussions explicit signals
  - *Transport Protocol Path Signals*, RFC8558
  - *Considerations on Application - Network Collaboration Using Path Signals*, RFC9419
- Improving radio management can improve user experience

# Network-Layer verses Transport-Layer signal

- IPv6 hop-by-hop headers limitations:
  - IPv4
  - Routers drop hop-by-hop options (to avoid slow path)
  - 90% loss rate in transit ASs for packets with HBH options
  - Years until network adoption of draft-ietf-6man-hbh-processing

# Solution overview

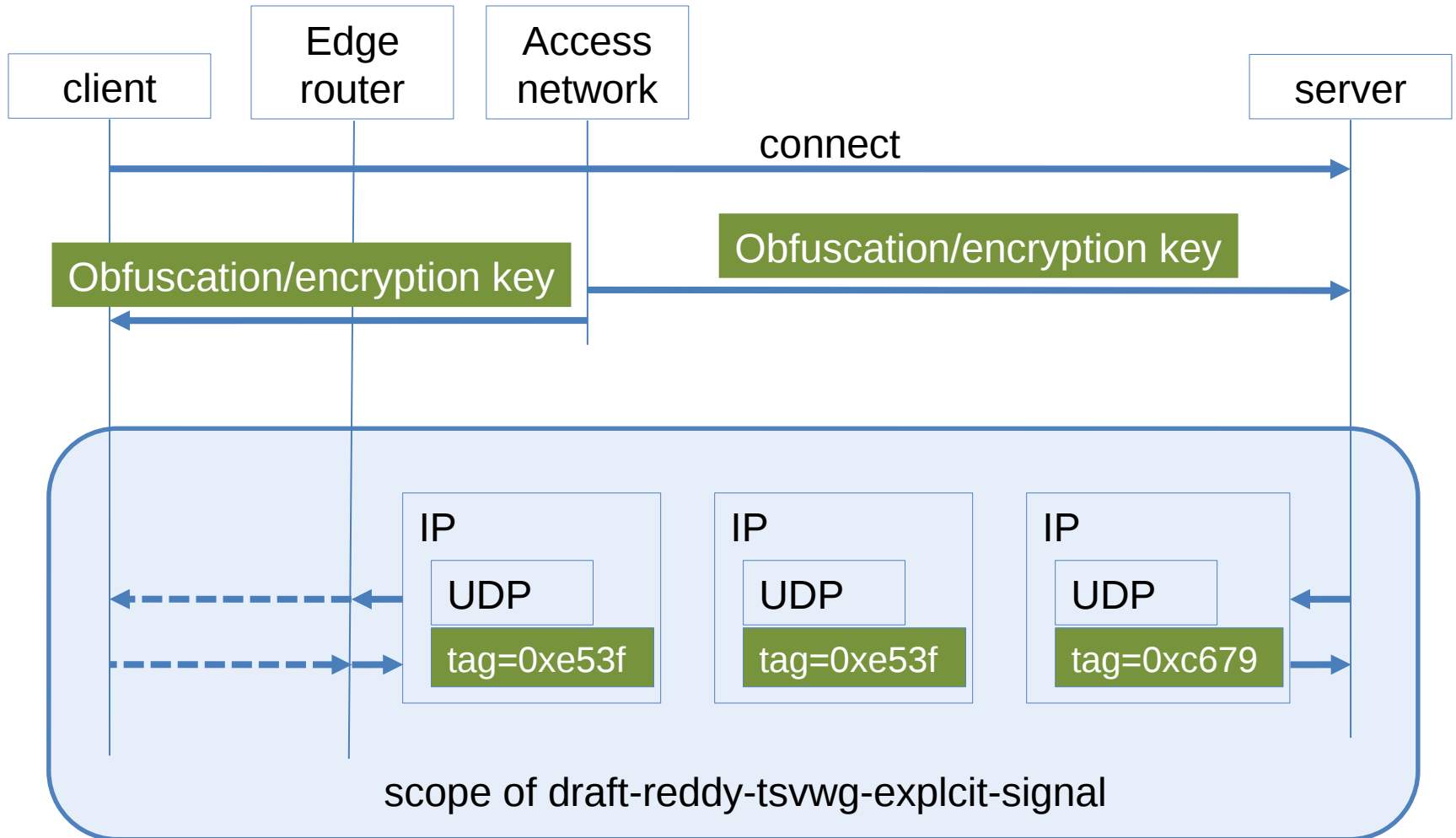
- *Sender* obtains keys
- *Sender* signals “tag” in the packet
  - As new UDP option (“trailer”)
- Necessary network elements understand the signal
  - ~Always near the subscriber (“last hop”)
- IPv6 and IPv4



# Design Principles

- Explicit signal is **encrypted or obfuscated**
- Explicit signals are shared intentionally, not accidentally
  - Authentication and trust between the endpoint and network path elements
- Endpoint constrains data shared with network
- Explicit signal is **integrity-protected**
- Explicit signals decoupled from endpoint protocol state
  - Reduces network interference opportunities

# System Diagram



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- Comments and suggestions are welcome