QUIC-enabled Service Differentiation for Traffic Engineering

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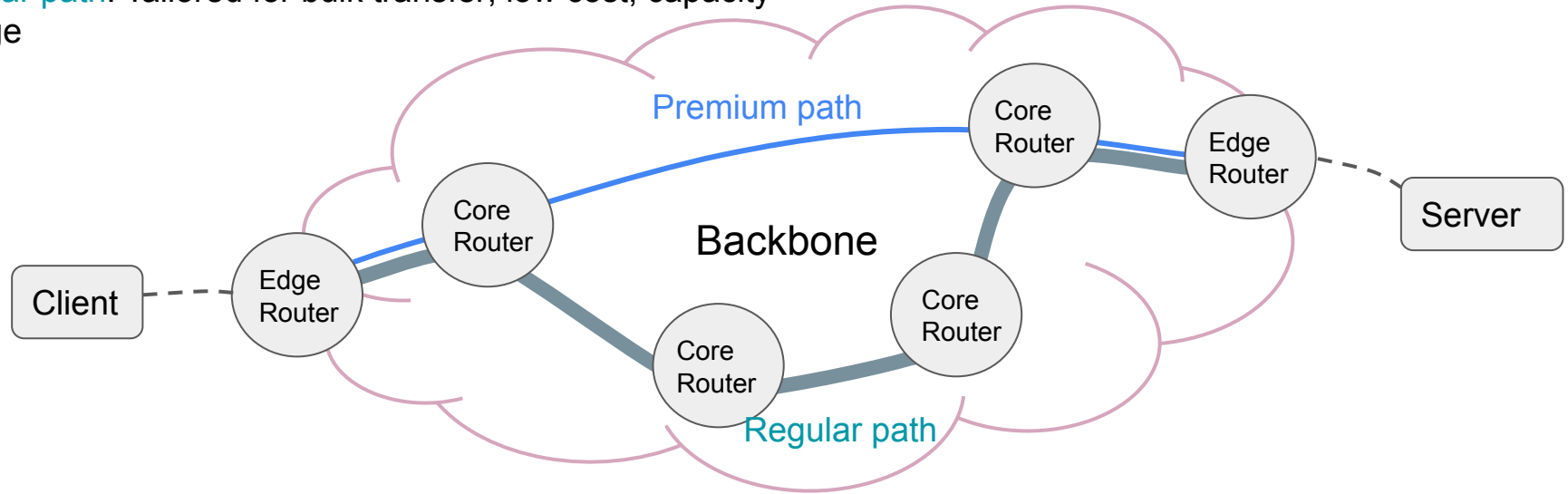
What problem to solve?

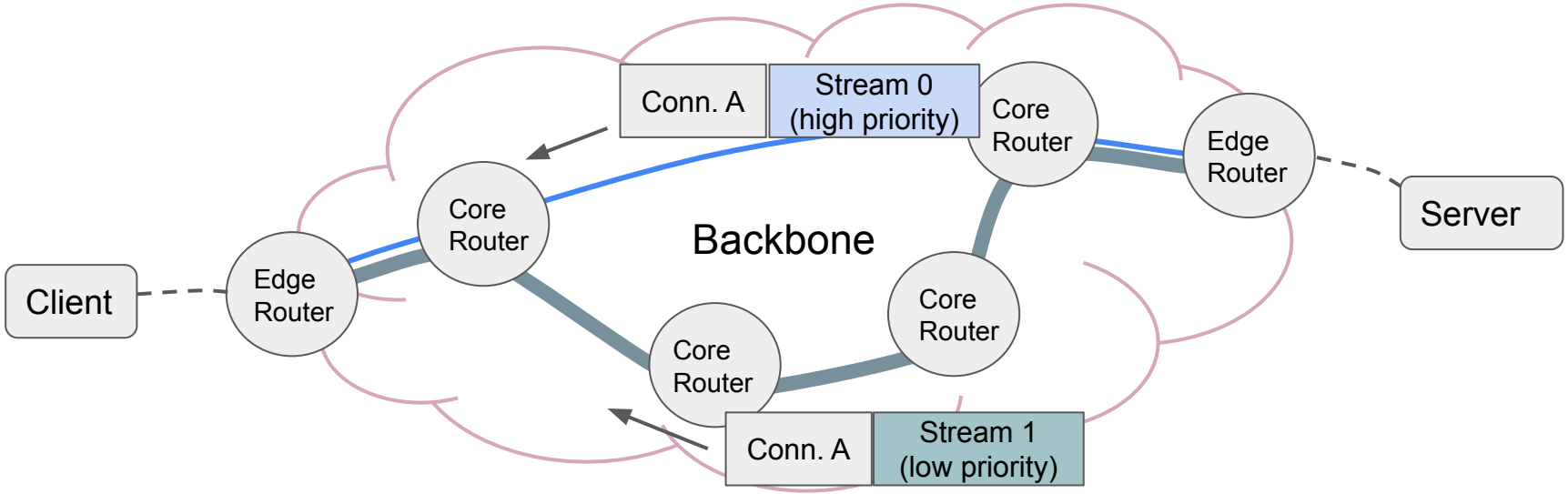
Premium path: Tailored for low-latency traffic; more expensive; resource may be limited

Regular path: Tailored for bulk transfer; low cost; capacity is large

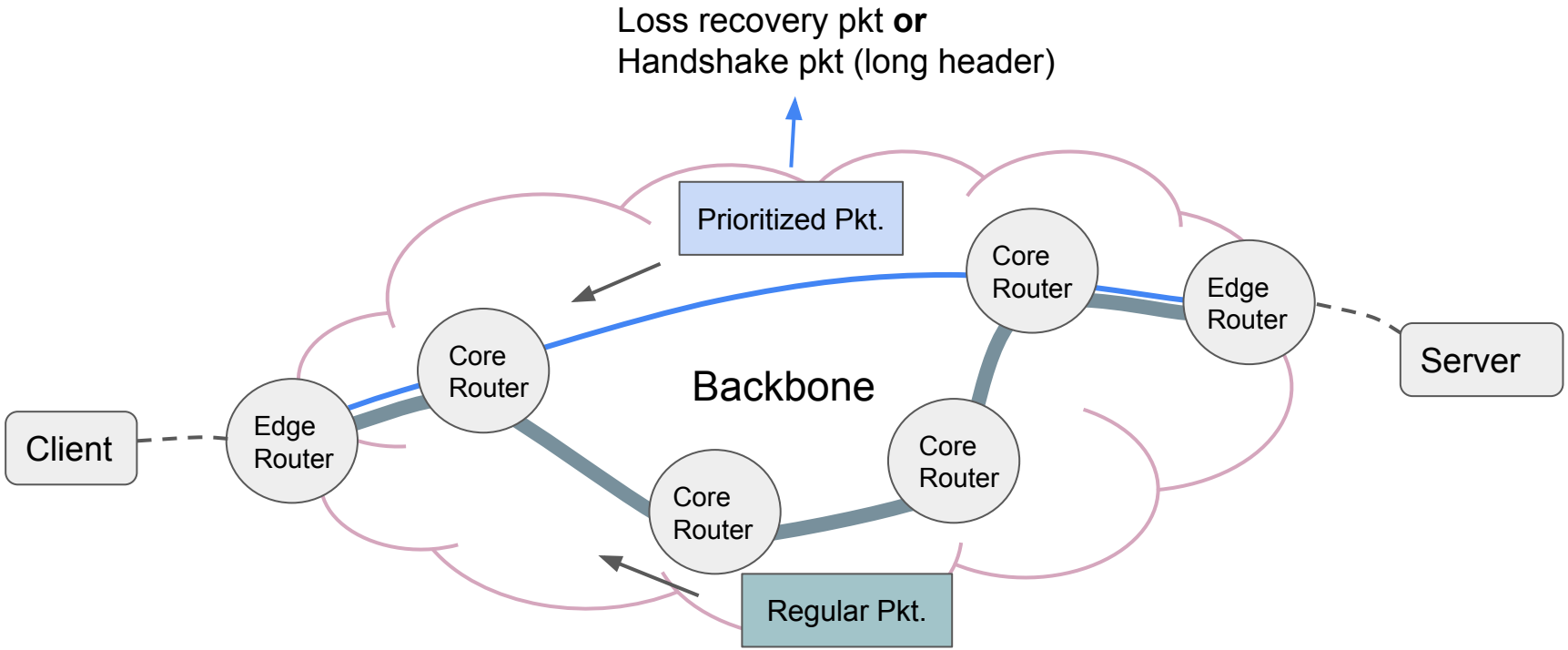


Goal: Balance cost and performance

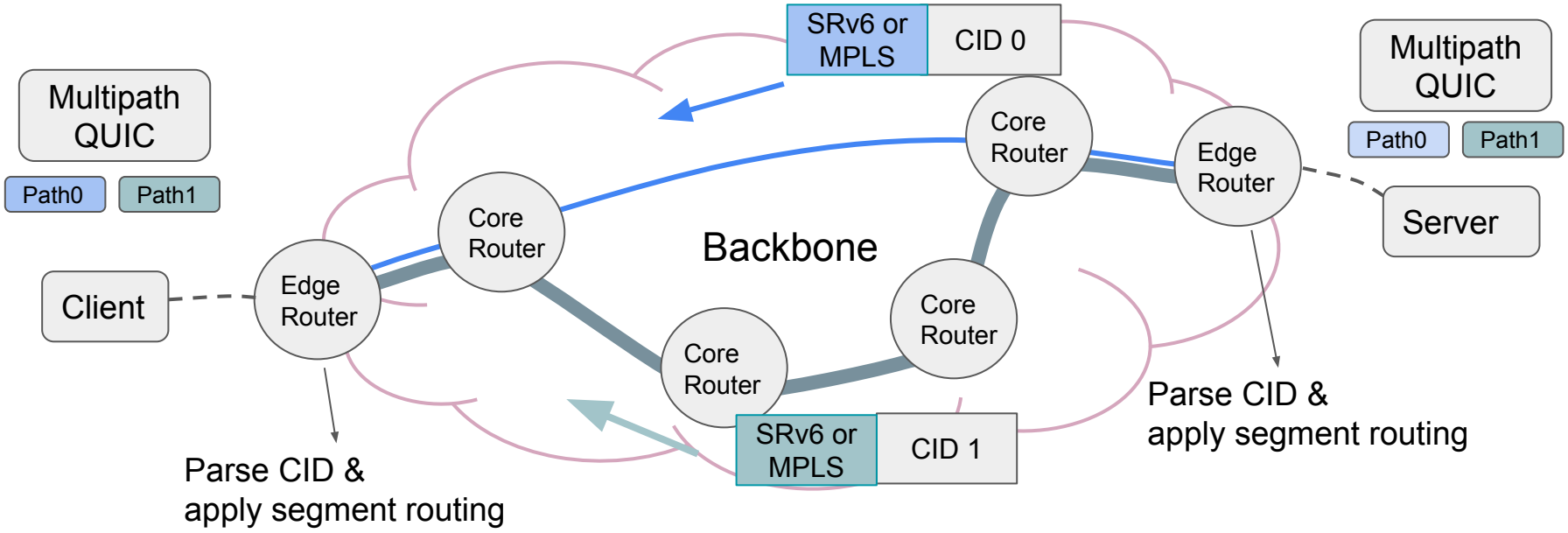
Differentiated service for prioritized streams



Differentiated service for prioritized packets



Proposal: multipath QUIC + embedding priority in path's CID



Benefits of QUIC-enabled Service Differentiation for TE

- Stream-level and packet level service differentiation granularity (vs. DSCP's 4-tuple level)
- User-space application has direct control (via packet scheduler)
- Packet reordering, RTT estimation, path congestion control automatically handled by multipath QUIC framework
- QoS marker cannot be interfered by middleboxes

What needs to be standardized?

- CID encoding rules & algorithm to express different priorities
  - Obfuscation for privacy
  - Coexist with Server ID encoding
- Client & Server need to negotiate this feature
  - Does infrastructure support this feature?
  - If so, how many priority levels in total that the infrastructure supports?
  - Further, how many priority levels the app wants to use?

CIDs issued by NEW_CONNECTION_ID frames must consider CID encoding rules and the number of priority levels negotiated.