The Marketing Story

- A single protocol
  - Exploration = confirmation of reachability = quick check
  - Works the same way for the current or other pairs
- Efficient
  - No packets sent if payload traffic is idle
  - No packets sent if bidirectional payload traffic
  - Packets sent **only** if (a) there's a failure or (b) there's unidirectional traffic
    - Minimization of overhead for case b is unimportant
- Simple, no unnecessary negotiation or messages
- Handles unidirectional failures
- Built to be extensible for handling NATs

The Design

- Same messages have four complementary functions:
  - Show direct reachability, i.e., that the message can get to the receiver
  - Show indirect reachability, i.e., that earlier messages or payload packets from the receiver have gotten to the sender
  - Request the receiver to send responses over different return paths
  - Perform a return routability test in anticipation of moving a traffic stream to an address
- Timeout is a protocol constant
  - 10s ; extensible later to other values for real-time re-homing

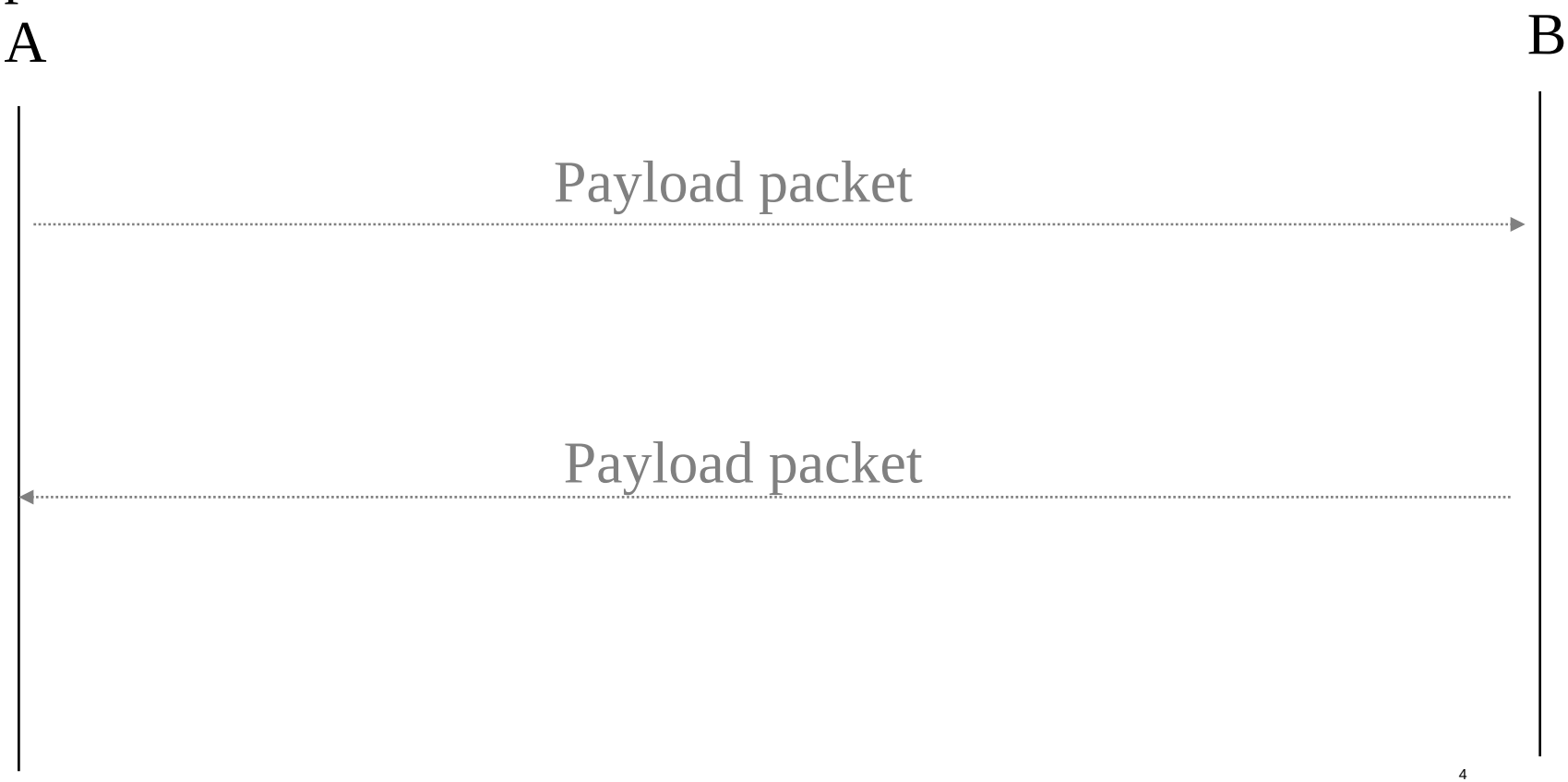
REAP (1/4) - Idle

If you are not sending or receiving payload packets, assume path is OK

A B

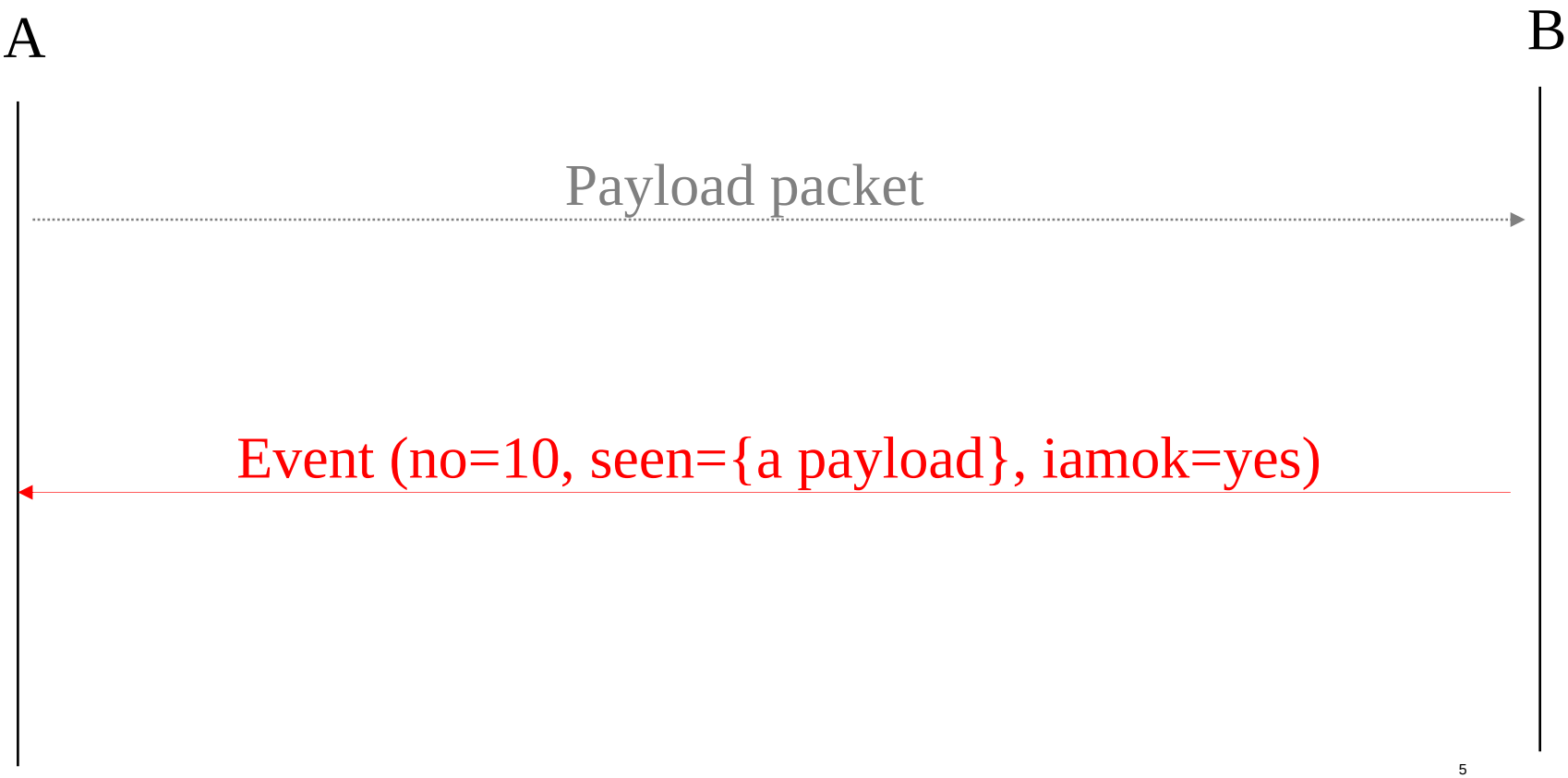
REAP (2/4) - Bidirectional Traffic

If you send and receive payload packets, assume path is OK



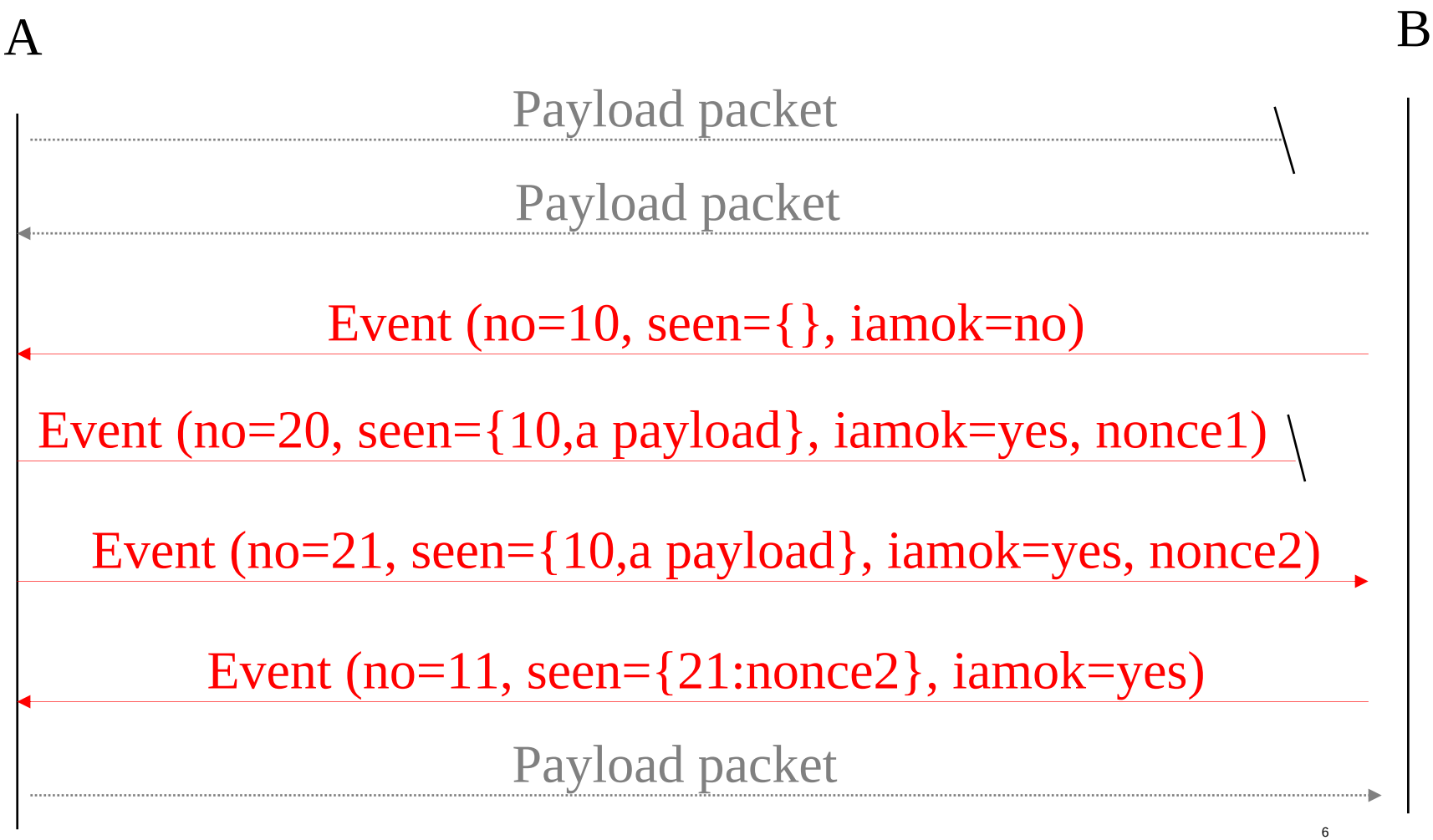
REAP (3/4) - Unidirectional Traffic

If you are receiving payload packets but not sending within t, assume path is OK but send an event message



REAP (4/4) - Failure

If you are sending payload packets but not receiving anything, request peer to explore other return paths. Return path failure:



State Machine

- State OK
  - I am receiving something
- State Not OK
  - I am not receiving anything, hence something needs to change