Using HTTP/2 as a Transport for Arbitrary Bytestreams

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Use Cases

Generic transport for secure, arbitrary bytestreams

Multiplexed streams

  Low setup cost for new streams

  Single congestion and recovery context

Can be peer-to-peer

Ability to tunnel traffic as necessary

Example: Remote IPC
Document Motivation

HTTP/2 provides framing layer with many of the desired transport features

- Configuration exchange
- Multiplexed streams
- Flow control
- Stream relationships

Separate this from HTTP semantics, provide as a generic transport
Potential Strategies

1. New ALPN token
   • Conceptually a new protocol
2. Allow empty HEADERS frames
3. Introduce STREAM frame
   • Negotiated protocol extension
Potential Strategies

New ALPN Token

Something like “h2t”

Allows negotiation alongside h2

Potential to fall back between implementations depending on server support

Conceptually a new protocol

Public information during negotiation
Potential Strategies
Allow empty HEADERS frames

No change to wire format, minimal text changes
Easy for implementations to adopt
Can introduce a SETTING for graceful negotiation

Conflates ideas in an unclean way
Potential Strategies

Negotiated extension

Use the extension mechanism to negotiate the use of a new fame type: STREAM

Negotiate with SETTINGS

Conceptually a STREAM frame is the same as an empty HEADERS frame

Described today in the document
STREAM Frame Details

A STREAM frame is conceptually an empty HEADERS frame:

• It modifies the stream state in the same manner
• It is allowed at the same times, causes the same errors
• Streams opened with STREAM frames behave in the same manner as before
• Stream limits from SETTINGS apply in the same way as to streams opened with the headers frame
Stream States

- send PP
  - idle
  - recv PP

- send H / recv H
  - send H
    - recv ES
      - open
        - send ES
          - recv H
        - send R / recv R
          - send ES / send R / recv R
            - send R / recv R
              - recv R
                - closed
  - recv H

- reserved (local)
- reserved (remote)
Feedback

Additional use cases?

Other options beyond the three discussed?

Any preference towards an option other than the third (STREAM frame)?