

WEBTRANS WG

IETF 114

Hybrid Meeting

Tuesday, July 26, 2022

Session I, Freedom E/F

10:00 - 12:00 US/Eastern Time

Mailing list: webtransport@ietf.org

MeetEcho: <https://wvs.conf.meetecho.com/conference/?group=webtrans>

Notes: <https://notes.ietf.org/notes-ietf-114-webtrans>

IETF 114 Meeting Tips

In-person participants





- Make sure to sign into the session using the Meetecho (usually the “Meetecho lite” client) from the Datatracker agenda
- Use Meetecho to join the mic queue
- *Keep audio and video off if not using the onsite version*
- **Wear masks unless actively speaking at the microphone.**



Remote participants

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- Use of a headset is strongly recommended

IETF 114 Remote Meeting Tips

- Enter the queue with , leave with 
- When you are called on, you need to enable your audio to be heard.
- Audio is enabled by unmuting  and disabled by muting 
- Video can also be enabled, but it is separate from audio.
- Video is encouraged to help comprehension but not required.

Resources for IETF 114 Philadelphia

- Agenda
<https://datatracker.ietf.org/meeting/agenda>
- Meetecho and other information:
<https://www.ietf.org/how/meetings/114/preparation>
- If you need technical assistance, see the Reporting Issues page:
<http://www.ietf.org/how/meetings/issues/>

Note well



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Definitive information is in the documents listed below and other IETF BCPs. For advice, please talk to WG chairs or ADs:

- [BCP 9](#) (Internet Standards Process)
- [BCP 25](#) (Working Group processes)
- [BCP 25](#) (Anti-Harassment Procedures)
- [BCP 54](#) (Code of Conduct)
- [BCP 78](#) (Copyright)
- [BCP 79](#) (Patents, Participation)
- <https://www.ietf.org/privacy-policy/> (Privacy Policy)

Note really well

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<https://www.ietf.org/how/meetings/114/faq/#covidmeasures>

About this meeting



- Agenda: <https://datatracker.ietf.org/doc/agenda-114-webtrans/>
- Notes: <https://notes.ietf.org/notes-ietf-114-webtrans>
- Jabber Room: webtrans@jabber.ietf.org
- Secretariat: mtd@jabber.ietf.org
- WG Chairs: Bernard Aboba & David Schinazi
- Zulip Scribe: TBD
- Note Takers: TBD

Agenda



- Preliminaries, Chairs (15 minutes)
 - Note Well, Virtual Bluesheets
 - Jabber Scribe, Note Takers
 - Speaking Queue Manager (David Schinazi)
 - Agenda Bash
- W3C WebTransport Update, Jan-Ivar Bruaroey, (10 minutes)
- Output of WT Capsule Design Team, Eric Kinnear (40 minutes)
 - <https://tools.ietf.org/html/draft-ietf-webtrans-http2>
- WebTransport over HTTP/3, Victor Vasiliev (40 minutes)
 - <https://tools.ietf.org/html/draft-ietf-webtrans-http3>
- Hums, Wrap up and Summary, Chairs & ADs (15 minutes)

W3C WebTransport Update (1)



W3C WebTransport WG progress since March 24th

- **Status:** Published a [Working Draft](#) - latest version 23 June 2022
- **Charter extension** underway for additional year. Current charter expires Sept 22.
- **Realistic** timetable for year
 - Sept 30 : Candidate for Recommendation - requires stability in API
 - Dec 30 : Proposed Recommendation - requires two independent implementations per our charter.
 - Feb 2023: Call for Review of a Proposed Recommendation
 - April 2023 - Publication by W3C as a Recommendation after AC review.
- **Milestone** status
 - [minimum-viable-ship](#) has 3 remaining issues.
 - New milestone aligned with W3C release process - [Candidate Recommendation](#). (10 open issues, 6 ready-for-PR)

W3C WebTransport Update (2)



- **Decisions and updates since last IETF report:**
 - **Per-stream stats #372** - added per stream `getStats()`, providing `bytesWritten`, `bytesSent`, `bytesAcknowledged`.
 - **Datagram priority algorithm fails to account for chunk size of reliable streams #388** - reduced algo to normative guidance.
 - **Alternatively using stats for dropped datagrams #97** - put datagram stats in a sub-dict of `wt.getStats()`. We provide `droppedTooBig`, `droppedIncoming` & `lost`.
 - **Add WebTransport constructor for reliability #385** - constructor now supports `new WebTransport(url, {requireUnreliable:true})` (default false)
 - **Add read-only property for WebTransport #385** - `wt.reliability` now returns “reliable-only” (TCP) || “supports-unreliable” (UDP).
 - **Is connection pooling off the right default? #393** - yes. So `allowPooling` still defaults to false.

W3C WebTransport Update (3)

Current issues of debate (1/3):

- **Pluggable Congestion Control #365** - agreement to provide some constructor level configuration API surface for providing application preference for the type of CC to be used. Should get us to Candidate Recommendation and will mark as feature-at-risk if implementations do not materialize prior to Proposed-Recommendation. Discussions remain around shape.
 - A: `new WebTransport(url, {congestionControl: "low-latency"}); // default = "throughput"`
 - B: `const [congestionControl] = WebTransport.getCongestionControlAlgorithms();
new WebTransport(url, {congestionControl}); // e.g. {name: "CUBIC", aim: "throughput"}`

W3C WebTransport Update (4)

Current issues of debate (2/3):

- **Datagram vs stream & relative stream prioritization #62** - discussion seems to center on ordering instead of bandwidth-allocation. Ordering requires strict (non weighted) levels. Want to support use-cases around one-frame-per-stream, as well as control channel, real-time A/V streams and long term background downloads. Some schemes may need as many levels as we have objects in flight. Current proposals boil down to:
 - 8 resettable levels to match what browsers are doing. Allows JS to downprioritize ongoing streams with some granularity and effort
 - maxint32 fixed levels, requested by Twitch for WARP. Chrome to investigate if practical.

W3C WebTransport Update (5)

Current issues of debate (3/3):

Stats to enable JS to build RTP-like real-time protocols for client 2 server A/V #21 -

assumed to be datagrams only, or at least at the connection level only. Current datagram stats only detail loss: expiredOutgoing, droppedIncoming and lostOutgoing;

- RFC 8888 and draft-engelbart-rtp-quic suggest that **latest_rtt**, **packet_deparature**, **packet_arrival** times, **ecn** and **ACK** info would be sufficient.
- Reached out to David Baldassin for experimental data on implementing RTP over WebTransport with BBRv2 and BBRv2 + SReAM

JS API does not operate at the packet level. Are packets and datagrams sufficiently analogous for a RTP implementation? Further input welcomed from IETF webtrans as to how to progress on this issue.

Output of WebTransport Capsule Design Team (40 minutes)

Eric Kinnear

<https://datatracker.ietf.org/doc/html/draft-ietf-webtransport-http2>

Capsules?

Why or why not?

Existing HTTP/2 specification looked like capsules

Sharing between HTTP/3 and HTTP/2?

Capsules

HTTP/3

Datagram

Close WT Session

Capsules

HTTP/3

Datagram

Close WT Session

HTTP/2

Datagram

Padding

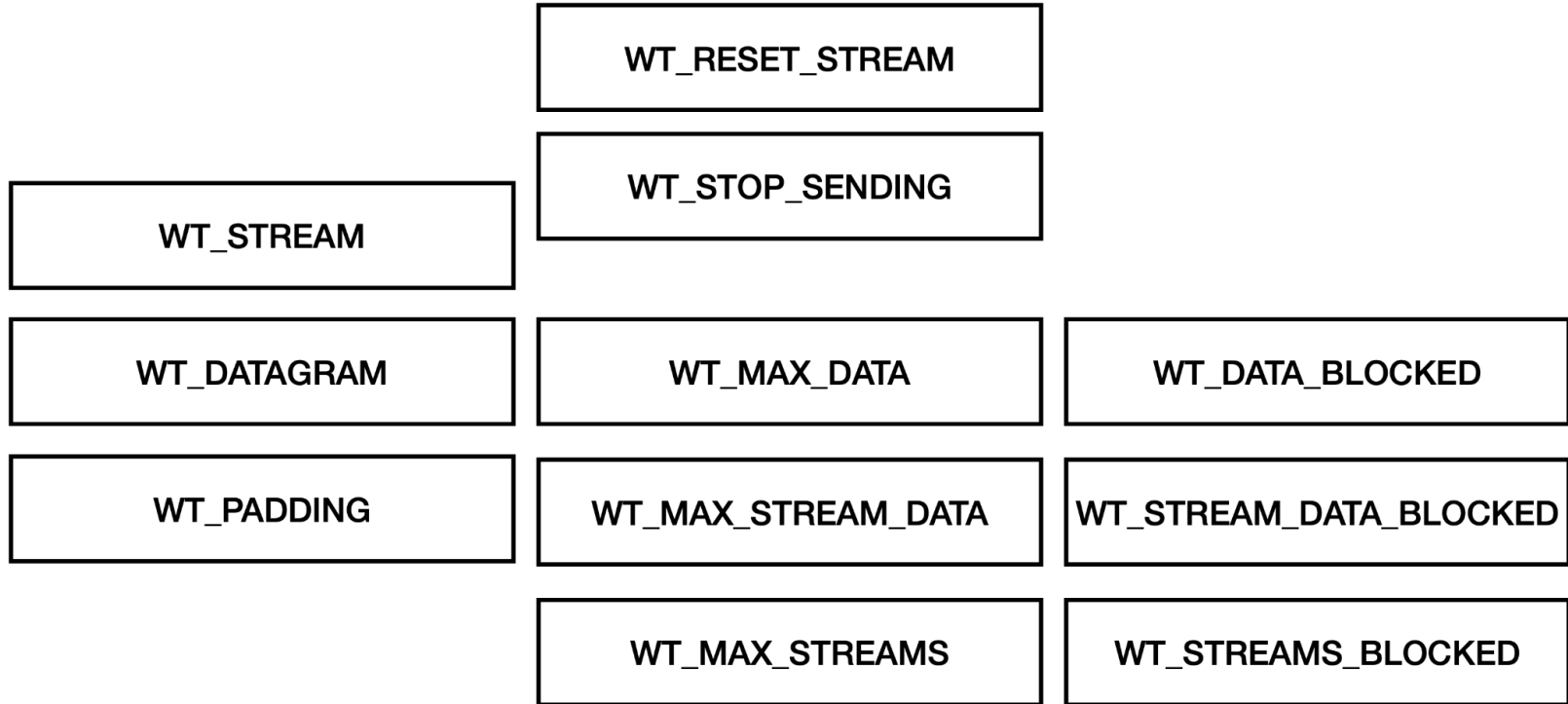
Reset Stream

Stop Sending

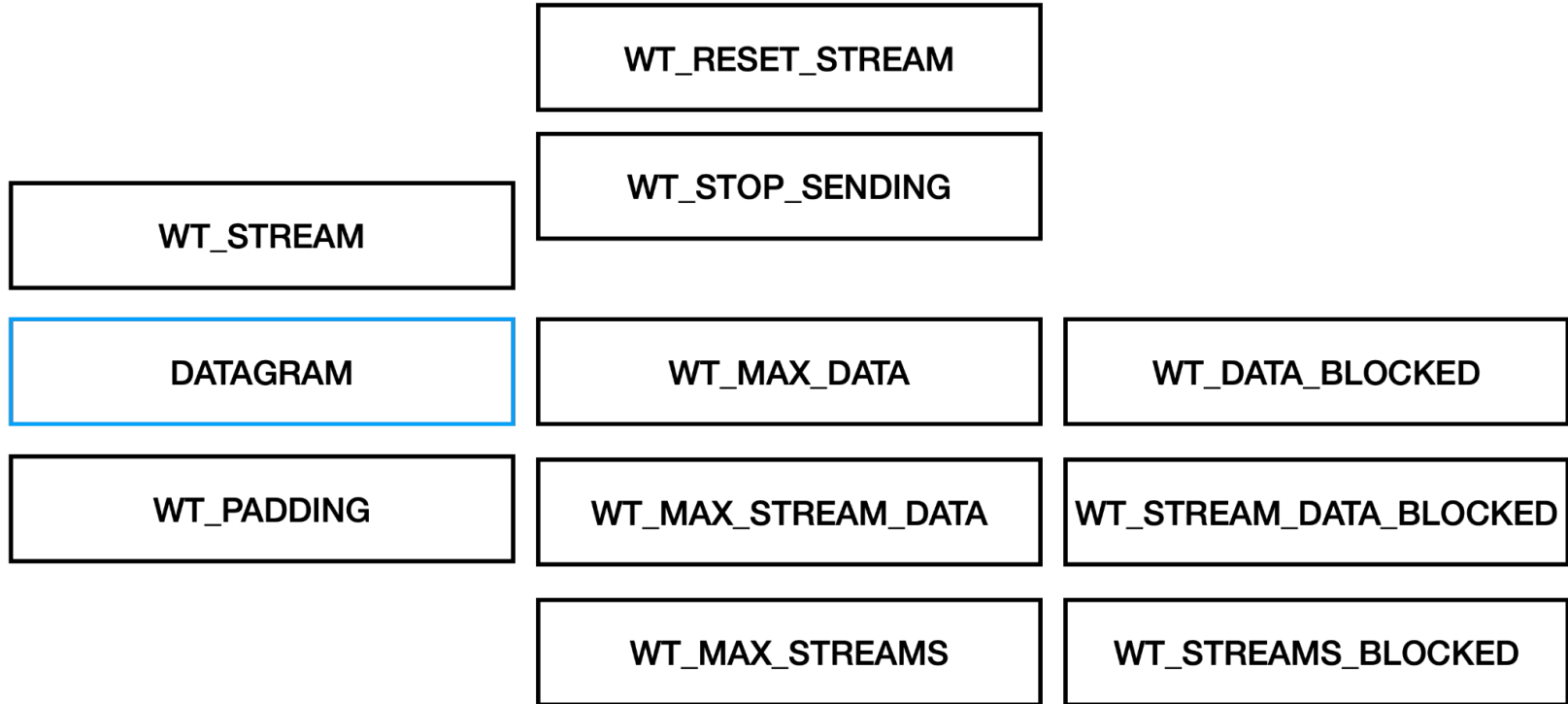
Stream

Max [Stream] Data [Blocked]

Capsules in HTTP/2



Capsules in HTTP/2



Flow Control in HTTP/3

Opportunity to reuse flow control capsules in HTTP/3

More on this later

Using native features

Common capsule definition that can opportunistically “explode” to native features?

Pros

- Single conceptual model

- Extensions can automatically work for H3/H2

- H1 support for free

Using native features

Cons

Most common case, H3, now has two modes

Close WT Session cannot be “exploded”

Extensions cannot retroactively “explode”

Per-capsule requirement for how to send it,
e.g. datagram is always an H3 datagram

Capsule-Protocol

An intermediary can identify the use of the capsule protocol either through the presence of the Capsule-Protocol header field (Section 3.4) or by understanding the chosen HTTP Upgrade token.

Upgrade token “webtransport” is defined to support capsules

Flow Control in HTTP/3

SETTING to limit number of sessions

Settings

SETTINGS_WEBTRANSPORT_MAX_SESSIONS
replaces SETTINGS_ENABLE_WEBTRANSPORT

When set to 0, no WebTransport

Flow Control in HTTP/3

SETTING to limit number of sessions

Limit number of streams within a session with
MAX_STREAMS

Flow Control in HTTP/3

SETTING to limit number of sessions

Limit number of streams within a session with
MAX_STREAMS

Ordering complexities: streams that are
closed “before” being opened

Flow Control in HTTP/3

SETTING to limit number of sessions

Limit number of streams within a session with
MAX_STREAMS

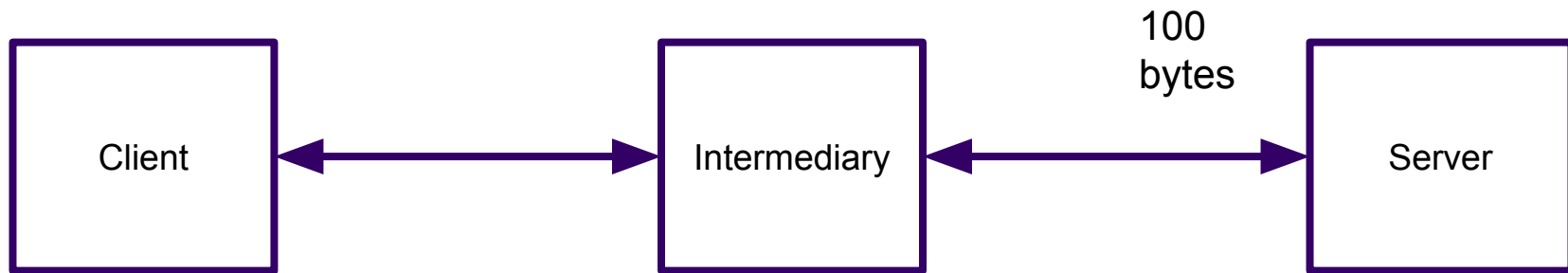
No additional limits for bytes at this time

Flow Control and Intermediaries

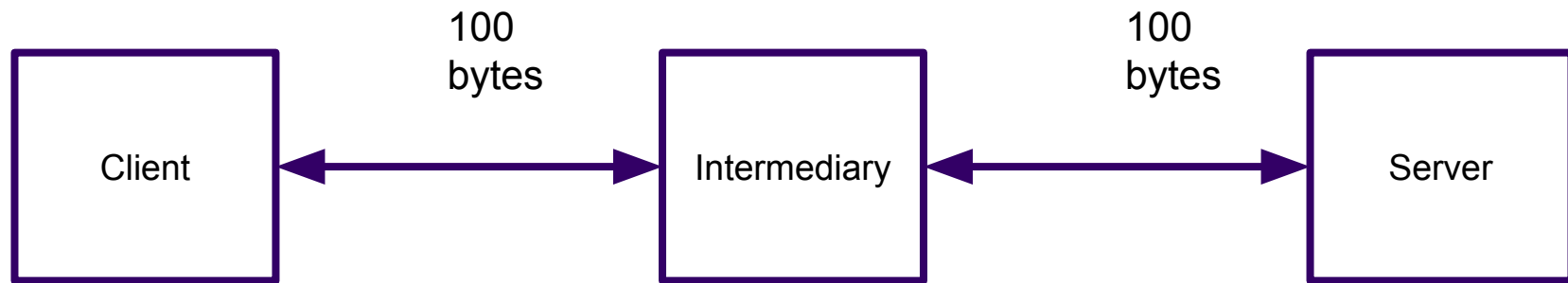
Conceptually, flow control is terminated at an intermediary

In practice, you can usually just forward limits onward

Flow Control and Intermediaries



Flow Control and Intermediaries



Summary

H2 should use capsules

H3 should use capsules, share with H2

Capsules always use native features if possible

H3/H2 get setting for max sessions

H3 gets stream limit within session

WebTransport overview

WebTransport over HTTP/3

(40 minutes)

Victor Vasiliev

<https://datatracker.ietf.org/doc/html/draft-ietf-webtrans-http3>

Overview draft updates

- PR#5 (common operations) has been merged.

HTTP/3 draft updates

Notable merged PRs:

- Add a reset error code for closing streams due to session closure (#75)
- Clarify interactions with HTTP/3 GOAWAY (#76)

Issue 61: HTTP redirects

“Redirect handling: Applications need to specify how redirects are expected to be handled”
(RFC 9205, Section 4.3)”

WebTransport MUST/SHOULD/MAY/SHOULD NOT/MUST NOT follow redirects?

Issue 71: Stream Frame Ordering

On bidirectional streams, are peers allowed to send any frames before
`WEBTRANSPORT_SESSION` frame?

(#48 is similar question for unidirectional)

Issue 77: resets and half-closed streams



Scenario:

- Client opens a WebTransport data stream
- Client resets the stream before it's associated with a WebTransport session.

What happens to the other side of the stream?

Issue #78: closing the session

What is the expected order of things happening when the session is closed?

- Proposal 1: initiator sends a capsule, a FIN, peer responds with a FIN
- Proposal 2: initiator sends a capsule, a FIN and a STOP_SENDING

PR #74: SETTINGS_MAX_WEBTRANSPORT_SESSIONS

Discussed during Design Team output

Pending question: do we keep
SETTINGS_ENABLE_WEBTRANSPORT?

Other pending PRs

- Add a capsule to drain a WebTransport session (#79)
- Clarify when the client can open streams and send datagrams (#80)

Hums, Wrap-up, and Summary (15 minutes)

Bernard Aboba

David Schinazi

Thank you

Special thanks to:

The Secretariat, WG Participants & ADs