

h2spec

A conformance testing tool for HTTP/2 implementation

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Who's this guy? :-)

- **Platform Engineer @ Yahoo! JAPAN**
 - *Beacon platforms, Data pipelines*
 - *We process around 10 billion requests a day with HTTP*
- **Japanese HTTP/2 Community**
 - *RFC7540 Japanese Translation, HPACK Test Cases*



What is h2spec?

- **Command-line testing tool for HTTP/2 implementation**
 - *h2spec sends the HTTP/2 frames that are conformed to the spec*
 - *It contains the **71 test cases** that include “edge cases”*
- **Most of HTTP/2 implementations are using h2spec !**
 - *nghttp2, H2O, Traffic Server, mod_h2, Deuterium, OpenLiteSpeed...*
- **Of course, it's open source !**
 - <https://github.com/summerwind/h2spec>

What is h2spec?

```
⚡$ ./h2spec -p 8888
```

3.5. HTTP/2 Connection Preface

- ✓ Sends invalid connection preface

4.2. Frame Size

- ✓ Sends large size frame that exceeds the SETTINGS_MAX_FRAME_SIZE

4.3. Header Compression and Decompression

- ✓ Sends invalid header block fragment

5.1. Stream States

5.1.1. Stream Identifiers

- ✓ Sends even-numbered stream identifier
- ✗ Sends stream identifier that is numerically smaller than previous
 - The endpoint MUST respond with a connection error of type `PROTOCOL_ERROR`.
Expected: GOAWAY frame (Error Code: `PROTOCOL_ERROR`)
Connection close
Actual: DATA frame

5.1.2. Stream Concurrency

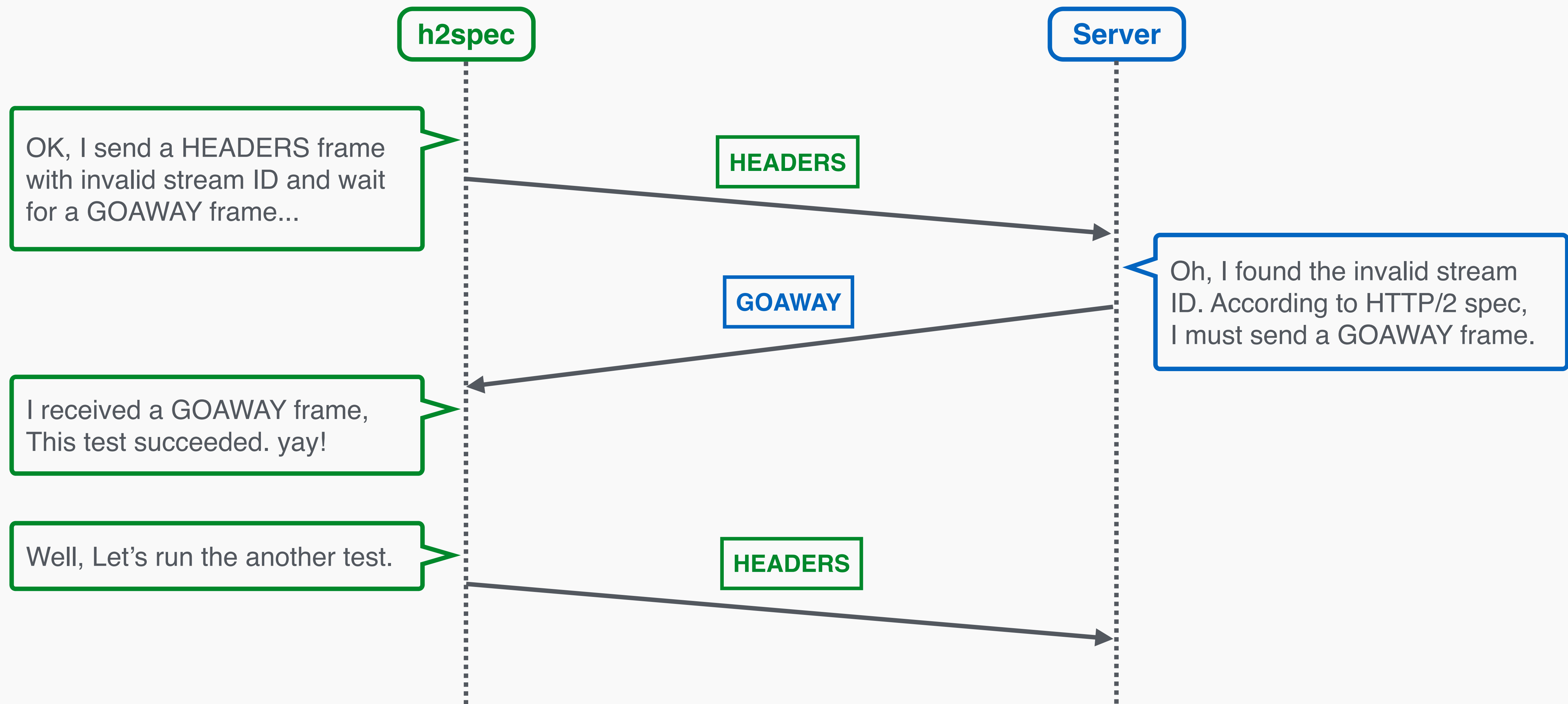
- ✓ Sends HEADERS frames that causes their advertised concurrent stream limit to be exceeded

5.4. Error Handling

5.4.1. Connection Error Handling

- ✓ Receives a GOAWAY frame

How h2spec works



Why I built the h2spec?

- **It's so hard to test HTTP/2 implementations :-)**
 - *All developers need to implement the test cases for various conditions*
 - *Frames, Stream states, Compression context...*
- **Let's reuse our test cases!**
 - *I want to make HTTP/2 implementation much easier*
 - *You can share the "edge" test cases by h2spec*

Future plans

- More test cases for HPACK & HTTP
- HTTP/2 Client testing mode

Conclusion

- h2spec is a conformance testing tool for HTTP/2 implementation
- HTTP/2 implementations is hard to test, so let's share the test cases to make it easier!
- I will add the test cases for HTTP/2 clients as well, feedbacks are welcome!

Thanks!