

# Debugging and Testing HTTP/2

Masakazu Kitajo  
maskit@apache.org

# Current status of our HTTP/2 implementation

- 53 bugs have been fixed since v5.3.0
  - It account for 17% of all bugs.
- 11 unresolved bugs remain
  - And we still have not implemented all features.
- Tests for HPACK
  - Regression test for Huffman coding
- Tests for HTTP/2
  - h2spec

We have tests, but is it enough?  
Developers should know how to test and debug.

# Differences between HTTP/1.1 and HTTP/2

- Binary protocol
- Header compression (HPACK)
- A number of parameters

These differences make testing and debugging HTTP/2 harder.

# TS-4321: H2 truncates certain contents on master

## Problem:

- Response body is truncated

## Condition:

- Accessed with HTTP/2
- Response from origin server is chunked and has certain size

How can we reproduce it? How can we test it? What could we do?

# How can we reproduce the issue?

- Try with both HTTP/2 and HTTP/1.1
- Send requests for various contents
- Send various requests for a content

# How can we reproduce the issue? (cont.)

	HTTP/1.1	HTTP/2
Simple requests	curl	curl / nghttp
Hand crafted requests	telnet / nc	nc* / openssl*
Step by step interaction	telnet	h2i / h2cli

\*Requires special training

# curl / nhttp

- Recent versions of curl has support for HTTP/2
- nhttp is a client for HTTP/2

Caution: nhttp doesn't show what we want in some cases.

Use Wireshark/tcpdump if you really want to know what frames are transferred exactly.

# nc / openssl

- nc is still usable.
- openssl **command** can be use.

```
openssl s_client -connect docs.trafficserver.apache.org:443 -alpn h2 < request.bin
```

This is the last resort.



# h2i / h2cli

- Interactive H2 clients.
- Makes your debugging easier.

It works. But how about tests?

# Pain points

- nghttp does only right things
    - We cannot send malformed frames nor header blocks.
  - Binary test scenario is not human friendly
    - 10101110101...
  - CLI doesn't work with CI
    - If Jenkins was a AI
- We don't have tools for testing HTTP/2.

# Conclusion: We need something!

- TSQA
- Something new?

# Thanks

## Questions?

- Masakazu Kitajo
- [maskit@apache.org](mailto:maskit@apache.org)
- IRC: maskit
- GitHub: maskit