FIX Performance Session Layer

V 1.1 Release Candidate 1

Technical Proposal

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v0.1

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Document History

Revision	Date	Author	Revision Comments
v0.1	Dec. 17, 2018	Don Mendelson Silver Flash LLC	Initial draft

1 Introduction

The High Performance Working Group was formed with the goal of improving the fit-for-purposefulness of FIX for high performance.

Recent improvements in the speed of hardware, software, and network connections (such as in co-location solutions) are putting pressure on the FIX protocol and highlighting some inefficiencies of the current version of the protocol (e.g., excessive echoing of input values, inefficient encoding). New financial applications such as high-frequency trading and market data feeds pose new performance requirements. In recent years, several financial organizations have avoided the performance limitations of FIX and introduced new proprietary protocols that are optimized for speed. These proprietary interfaces have been offered, sometimes along with a FIX interface, to support high-speed transactions and/or data feeds.

The current performance limitations of FIX can be removed by making changes and additions at multiple levels of the protocol. At the *application* level, there is a need to define less-verbose versions of some FIX messages and to streamline the message flow. At the *presentation* level, there is a need to provide new encodings that are faster and more compact than the traditional Tag=Value encoding of FIX. At the *session* level, there is a need to specify a new lightweight session protocol with basic recovery options. The High Performance Working Group is drafting a set of specifications and guideline documents to address all these aspects.

FIX Performance Session Layer (FIXP) is a lightweight protocol designed to replace FIXT for high performance use cases. It supports both point-to-point exchange of application messages as well as multicasts for market data and the like.

Notable FIXP features:

- Negotiable delivery guarantees, supporting asymmetrical flows
- Separates session identifier from business entity identifiers
- Well isolated from other layers:
    - Binary encoding, but wire format independent for both session and application messages
    - Transport independent; works on TCP streams as well as datagram-oriented transports. Additionally, a usage profile is described in this Release Candidate for FIXP over WebSocket.

FIXP is currently in public of Draft Standard version 1.0. Version 1.1 Release Candidate 1 enhances the specification without making any breaking changes.

1.1 Authors

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2 Requirements

New requirements for this Release Candidate beyond those already specified for earlier releases.

2.1 Business Requirements

2.1.1 WebSocket Transport

WebSocket is am IETF protocol that consists of an opening HTTP handshake followed by basic message framing, layered over TCP.

Advantages of WebSocket:

- Familiar web connectivity and configuration
- May be used in combination with Transport Layer Security (TLS) for authentication, privacy, and non-repudiation
- Asynchronous messaging conducive to high performance. Like FIXP, WebSocket protocol imposes no session-layer headers on application messages.

However, WebSocket by itself lacks control of message delivery guarantees, and does not support durable sessions that survive transport disconnection. FIXP over WebSocket provides the advantages of WebSocket plus negotiation of delivery guarantees and durable sessions, if desired. Since WebSocket is a message framing protocol, no additional framing protocol like Simple Open Framing Header is needed.

2.2 Technical Requirements

2.2.1 Mapping FIXP Messages to WebSocket

FIXP version 1.1 RC1 provides a usage guide for WebSocket. No new message types are required. One FIXP message is rendered unnecessary when used with WebSocket since usage of its Close message is practically identical to FIXP's Terminate message.

All other FIXP messages are used in the same way with WebSocket as with straight TCP. Thus, recoverable and idempotent flows have the usuals behavior.

3 Issues and Discussion Points

Even after the enhancements of version 1.0 Release Candidate 1, the following issues remain for future discussion.

3.1 Out-of-Band Recovery

The working group discussed various scenarios for recovery of lost messages via a side channel. This may be required for one-way transports, such as UDP multicast. It may also be desirable for performance reasons to keep recovery out of the critical path of message flow for high performance trading. Although this is achievable with FIXP, we have deferred adding specific features to the protocol to support it until there is a demonstrated need and proven solution.

3.2 Session Fault Tolerance

Another area of possible future enhancement is handling of technical faults. FIXP might provide a protocol for fail-over to a backup transport to carry on a trading session, or protocol rules would be defined for firing actions on faults, such as order cancel on disconnect.

4 References

Reference	Version	Relevance	Normative
FIX Performance Session Layer Technical Specification	Draft Standard	Published for public review August 2018	Yes

5 Relevant and Related Standards

Related Standard	Version	Reference location	Relationship	Normative
Simple Open Framing Header	Draft Standard		Optional usage at presentation layer	
Simple Binary Encoding	v1.0		Optional usage at presentation layer	

6 Intellectual Property Disclosure

Related Intellection Property	Type of IP (copyright, patent)	IP Owner	Relationship to proposed standard
None			

7 Definitions

Term	Definition

8 Deliverables

8.1 Specifications

Full specifications for FIXP are available in separate document *FIX Performance Session Layer: Release Technical Standard – v1.1 RC1*.

8.2 Resources

8.2.1 SBE Message Schema for FIXP

File name SBEschemaForFIXP.xml

8.2.2 Repository File for FIXP

File name FixRepositoryForFIXP.xml

Appendix A - Usage Examples

Examples are provided in the specification document.

Appendix B – Compliance Strategy

Not yet developed.

