



FIX Performance Session Layer Release Candidate 4 Technical Proposal

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Document History

Revision	Date	Author	Revision Comments
RC4 v0.1	April 11, 2018	Don Mendelson Silver Flash LLC	Initial draft
v0.2	April 19, 2018	Don Mendelson Silver Flash LLC	Updated resources section
v0.3	May 2, 2018	Don Mendelson Silver Flash LLC	Moved some background material from the technical specification to the proposal.

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

1.1 Protocol Motivation

The idea to provide an open-standard high-performance session layer with SoupBinTCP as its source came from two simultaneous sources.

1. The BVMF (Brazil) began investigating SoupBinTCP as a lightweight and simple alternative for market data delivery due to issues with Multicast IP infrastructure at member firms. The idea to align packet types to existing FIX message types was created during a meeting prior to the start of the High Performance Working Group.
2. Pantor Engineering prototyped a solution for high performance computing that used FAST datatypes (without field operators) carried over a SoupBinTCP session. Anders Furuhed presented the concept at the FIX Nordic event.

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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 In-Band Delivery of Message Templates

For high performance, users of FIXP wish to encode application messages using SBE, GPB, or other binary encodings that are controlled by schemas or templates. To ensure that clients have access to the latest message template versions, a provision was added to FIXP to deliver templates in-band. This is an optional feature of the protocol. It may be used either for point-to-point or multicast sessions and it supports all FIX encodings. (GitHub issue #25)

2.2 Technical Requirements

2.2.1 Documentation Clarifications

Ambiguous wording in the specification was clarified for these issues:

- Issue #28: Clarify security recommendations
- Issue #35: Sending a Sequence message on None flow is a protocol violation
- Issue #38: Initiator and acceptor in "Terminate Response"

- Issue #49: Clarification NextSeqNo
- Issue #51: Define idempotent flow over multicast
- Issue #56: Transport termination on session Terminate
- Issue #57: Protocol Violations: Session level messages before session is Established
- Issue #58: Terminate Response should be revised
- Issue #59: Handling incoming messages while waiting for Terminate response
- Issue #61: Is "Finished Receiving message without Finished Sending" protocol violation?
- Issue #65: Keepalive interval is the outer limit of silence

3 Issues and Discussion Points

Even after the enhancements of Release Candidate 4, 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 Release Candidate 4 Technical Specification		Specification submitted with this proposal	Yes

5 Relevant and Related Standards

Related Standard	Version	Reference location	Relationship	Normative
Simple Open Framing Header	Draft Standard	www.fixtrading.org/standards/fix-sofh	Optional usage at presentation layer	Yes
Simple Binary Encoding	Technical Standard	www.fixtrading.org/standards/sbe	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 Candidate 4 Technical Specification* (www.fixtrading.org/standards/fixp).

8.2 Resources

The following resources are available in GitHub project [FIXTradingCommunity/fixp-specification](https://github.com/FIXTradingCommunity/fixp-specification) (requires a free GitHub user ID).

8.2.1 SBE Message Schema for FIXP

XML file [SBEschemaForFIXP.xml](#) defines the encoding of FIXP session messages in Simple Binary Encoding version 1.0. It conforms to the XML schema for SBE message schemas

8.2.2 Repository File for FIXP

XML file [FixRepositoryForFIXP.xml](#) defines the FIXP session messages in the format of FIX Repository 2010 Edition.

Appendix A - Usage Examples

Examples are provided in the specification document.

Appendix B – Compliance Strategy

Not yet developed.