

# Understanding FIX certification today

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**Certification is a term used in a number of ways in the world of FIX, often with very different expectations. Is it a tool, a service, or a requirement? Is it a process, a test, or a document?**

For many, especially those new to FIX, certification is misunderstood, avoided, or just plain confusing. Why all this extra work? Isn't the FIX Protocol a standard? Well, sort of!

FIX is flexible and open. And that's the rub. Once FIX session management was accepted as reliable and FIX engines were readily available, connections and trading began. But that happened with both the open FPL collaboration, which has produced more precise versions, and with closed collaboration, as a necessity just to make the connectivity productive.

Maintenance introduces entropy, so as these FIX implementations began working and evolving, they adapted to needs that would ensure survival. This happened opportunistically in various sub-communities. And, like the many varieties of finches in the Galapagos, many subspecies arose that didn't socialize across the varieties even though they had nearly the same genetics. There was no dictating source like ISO or SWIFT to generalize or establish best practices, much less specify or enforce compliance.

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To be clear, this diversity didn't happen because of working 'in a vacuum' but, rather, the opposite. The driving need for a reliable automated trading language meant adoption so rapid that a synthesis of best practice took a back seat to solving problems.

So FPL, being partly responsible for this explosion, began to look at certification in order to reduce the now inevitable

rework and extensive testing necessary to implement a new relationship. Their first effort didn't work out very well. However, the notion of certification did catch on with tool vendors, internal developers, and outsourcing services providing certification capabilities to private firms and centralized services. And FPL is at it again with an effort to roll out a new certification program.

So I would like to step back to examine the fundamentals and understand what certification really means, how the concept applies to FIX, and what forms it takes in the community today. FIX certification is alive and well; it is valid and useful. Though not a panacea, certification can definitely reduce the pain of establishing and maintaining business relationships using FIX.

### Concept and definition of certification

Let's consider the English definition and root of the word.

**Certify (verb)** 1. Confirm truth or accuracy of something. 2. Prove quality of somebody or something. [14th century. Via French *certifier* from late Latin *certificare*, literally 'to make certain,' from Latin *certus*.]

A certificate, then, would be defined as a document that serves as official evidence, that shows conformity to a standard, or that shows qualification (see sidebar).

For FIX, it seems that our definition of certification is the result of a process to prove the quality of a FIX implementation in two different ways: first, as a level of conformity to the published standard and also to indicate a valid functional capability.

FIX certification is not static, it is not a paper tiger: it requires the dynamic exercise of a real system.

Accepting our definition for FIX certification, what is this certification process? In all aspects, given that it exercises a real system, it is a form of software testing. Certification is

### CERTIFICATION?

Certification, as a term, is only moderately consistent in application. Some examples:

- In some companies, certification is considered a part of the product assurance internal testing and includes compliance with such things such as Unix security baselines and configuration management standards.
- In the FPL community, certification has meant a centrally defined and controlled test process to help encourage, if not require, compliance to FIX Protocol and business practice.
- For the International Standards Organisation (ISO), certification is a rigorous assessment of standards compliance conducted by a chartered and validated team of experts.
- For a large number of engineering disciplines, it means passing a very detailed and exhaustive test based on a published body of knowledge.
- Several vendors such as Microsoft, Oracle, and CISCO have formal certification programs that require intensive training and a rigorous battery of tests.
- FIX vendors offer various services and tools for certification, while ECNs and other centralised FIX services require certification for access to the system.

separated from other test processes by its the comparison to a standard definition of form, function, or practice. Certification is considered separate from functional qualification or counterparty testing in that it specifically compares an implementation to a documented standard that is applicable across projects, businesses, or systems.

So what is the object of this certification service? The FIX implementation is the combination of an Order Management System and FIX Engine to exchange FIX messages with another FIX implementation using some form of telecommunication. Certification will indicate an implementation's capability, at that point in time, to perform at some level of conformance to the specification of standard and business practice. I think it is important to note that the certification itself is, by definition, limited by the quality of the certification test, limited to the scope of the specification, and would be impacted in the future by any change in either the FIX implementation or the specification.

Obviously, the FIX Protocol specification is the basis for comparison. The protocol describes primarily syntax, or how the messages are constructed. It also tells us something about the meaning intended by the messages with some workflows described.

However, it is just not comprehensive enough to understand the full intentions of a FIX business message exchange. The FIX Protocol is fairly complete in session management, something unique to FIX in that it provides for confident delivery of the message content, or payload, in the FIX message exchange.

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What about how the business uses FIX? This has been the most difficult component in terms of broad standardization, but has some degree of standardization in various overlapping pockets of the community. Part of the problem can be illustrated by the growth in richness of expression and complexity of the FIX Protocol. In Figure 1 there are many overlapping rings that represent, in a Venn diagram, the many different securities business domains that could use FIX. FIX 4.0 was limited in coverage, but the protocol has grown in complexity and reach with each new version. From FIX 4.0 through FIX 4.4, the specification has grown in sheer bulk from some 64 pages to seven volumes of 65, 39, 101, 159, 113, 286, and 99 pages, respectively! The current version has primarily expanded based on gap analysis in business practices for allocations, fixed income and derivatives.

### Securities Business Domains with FIX Potential

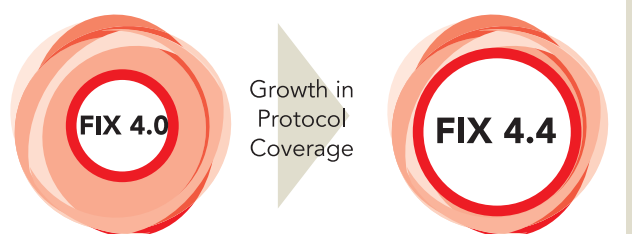


Figure 1: The securities industry has many domains that could benefit from FIX. The protocol has grown significantly to be applicable to many more business domains.

This growth is bound to continue as experience with FIX implementation in these areas contributes to improvements and reduced ambiguity. We already understand that the fixed income gap is not completely filled by FIX 4.4 since implementers are regularly adding new user-defined fields to deal with the complexity of fixed income.

The standardized expression of fundamental business practices will continue to be the most profound challenge to be met if FIX is to achieve widespread interoperability.

### FORMS OF FIX CERTIFICATION

#### Vendors – services and tools

Vendors provide tools that can be used for internal testing or for a firm to set up their own testing site. Vendors also offer outsourcing of their tools by setting up a service, building, and running the certification tests on behalf of their clients. Almost all services offer standard checking for protocol compliance, looking at mandatory fields, enumerated values and general syntax. Customization, to include proprietary processing, extensions, or restrictions, is often required if the service or tool is to achieve the advertised value.

Vendors may provide emulators or simulators that support testing against markets, ECNs, and exchanges before migrating a system to a live connection. For software developers, this is invaluable. To verify a Rules of Engagement (RoE) agreement between counterparties, a customized test can reduce time to complete pre-production tests and reduce the risk of a production problem. Internal tools offer flexibility in supporting everything from code testing to assessing new trading strategies. External services tend to focus on relationships between counterparties, but are also widely used for testing software changes.

The return on investment of the external service tends to lie in the participation and commitment of the firm outsourcing the certification. The quality of certification is governed by the vendor’s product implementation and by any customization done on behalf of, or by, the customer. It is my notion that, in many firms, the full capability of these services is not yet being realized.

#### Private certification

Some advanced buy-side firms require new customers to execute a certification step prior to pilot testing the relationship. Sort of, ‘if you want our business, then verify

compliance with our systems'. So the buy-side drives the bargain. The sell-side must accommodate buy-side demands and have a further incentive to deliver high availability with low risk. The net impact is that sell-side software developers must maintain many similar implementations or very complex single implementations. This introduces a lot of collateral overheads that reduces profit to the sell-side and increases fees to the buy-side. On top of this, if a buy-side really is interested in connecting with a sell-side because of their offerings, this situation introduces delays while they wait for the sell-side to make the necessary accommodation for the buy-side. Vendors are providing better and better FIX engines, but there is still the issue of change management and expanding to new relationships, especially as FIX expands globally.

Private certification is usually very specific and proprietary and may be manual, use in-house systems, vendor tools, or use a vendor's service organization. The fragmentation of this situation is one of the biggest contributors to the dialects and variances between FIX Implementation, but also has been a source of innovation and creativity.

### Centralized services

ECNs, FIX hubs and other centralized services tend to use a certification process as a requirement to engage new subscribers and approve the exchange of live, production level traffic. This is purely pragmatic. The new user needs to comply with a specification and demonstrate functional capability in order to avoid problems, delays and dissatisfaction for the user, and sometimes to reduce the risk of disruption to the central service. While the certification process may reveal conflicts and require changes for the user, the advantages of the central service means that, once certified, the interoperability with counterparties or the service itself is very clean and the value proposition of the service can be realized.

### FPL's FIX certification

The current FIX certification program is trying a different approach, leveraging the most advanced FIX specification yet, FIX 4.4, and limiting the scope to fixed income. These fixed income folks would mostly be new users of FIX without entrenched FIX 'habits.' The program intends to support session protocol certification for all versions of FIX as well, since this area is the most consistent in application of the protocol. Whether FPL's certification effort can extend back to older protocols and

equities is a big question – the diversity of implementation and resistance to change may restrict the opportunity.

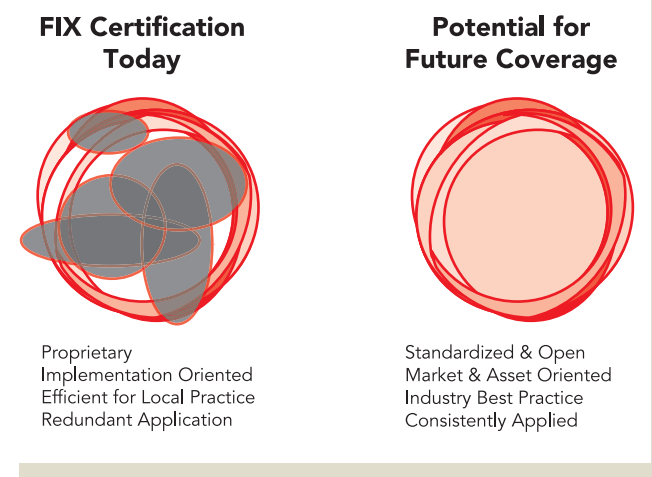


Figure 2: FIX certification as it exists today, and the coverage that is hoped for with a standardized certification definition.

While limiting itself to basic message flow, the program is taking best practices to a new level, building on both the fixed income gap analysis and The Bond Market Association's plain English documents. An ambitious undertaking, if successful this effort will introduce a new facet to the publication of FIX protocols: a detailed workflow that supports both implementation and testing to certify fundamental usage. FPL is also trying to ride the fence by having multiple certifiers provide this basic certification service. It is hoped that this brings openness with a consensus that retains the spirit of the FIX Protocol while introducing a level of standardized implementation that can be a platform for FIX market innovation, growth, and efficiency (Figure 2).

**However, much like the FIX Protocol itself, certification has a lot of diversity and is hampered by a lack of definition for best practice, coupled with few initiatives to express best practice in the language of the protocol itself.**

## Role in the business cycle

Has it been said enough? Software expresses and animates the business. Given the nature of both software and the business, change is a constant. Whether a certification tool for in-house developers or FPL's global certification effort, these initiatives are intended to control and mitigate the cost of change. For software development and maintenance, certification reduces rework and the risk of production level failure. The cost savings are obvious. For new or changing business relationships, reducing the timeline to verify the RoE agreement and get to active trading saves direct labor as well as opportunity costs.

I suggest that certification be implemented as follows in the business cycle:

1. Identify the business relationship
2. Agree on the Rules of Engagement
3. Plan a project to establish and validate interoperability
4. Develop or change the FIX implementation
5. Certify each counterparty
6. Qualify proprietary capabilities, functions or restrictions unique to the RoE
7. Authorize production capability

Re-run the cycle whenever things change, such as business process, systems, or updates to vendor software. Software engineers call it regression testing: making sure what you fixed didn't break something else!

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You'll note that, with global standardization, step 4, 'Develop or change the FIX implementation' gets smaller and smaller. With more globally accepted standards for a business area and accepted best practice, the connectivity and message exchange becomes a commodity and competition focuses on fees, creativity, opportunities, efficiencies and content. Business standardization, coupled with certification, introduces mobility in the market and customer-service-driven features.

## Conclusions

Certification in the FIX community is alive and well, serving and helping a significant number of FIX users. However, much like the FIX Protocol itself, certification has a lot of diversity and is hampered by a lack of definition for best practice, coupled with few initiatives to express best practice in the language of the protocol itself. Standardization of best practice is the next evolution in the industrialization of the securities industry. The FIX Protocol has bootstrapped the evolution; standardized fundamental business practices can power the success. Many other industries have gone through this process. It is difficult and takes a lot of collaboration. Skeptics will abound. But standardization brings a net result in efficiency that historically produces bountiful results. I believe we are still in the infancy of this change.

More FIX users will adopt and utilize certification as a component of the business cycle. There is growing recognition that best practice definitions are needed with buy-side involvement. Eventually, certification definitions will be a required component of the FIX specification.

The advent of FIXML for listed derivatives clearing by the Chicago Mercantile Exchange, and XML emergence for standards definition such as ISO 15022 (now called UNIFI ISO 20022) shows the technical wave of the future. But certification and best practice definition will remain valuable, regardless of whether the implementation is the traditional FIX Protocol or the XML equivalent. Ultimately, it is still software and we must test it. FIX certification is a valid component of testing that can be useful in most implementations. With an industry accepted, detailed, and well-maintained definition of best practice, FIX certification can become a commodity, reducing risk and the cost of investment for all FIX implementations. **FIX**