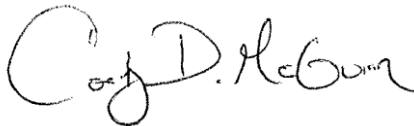January 13, 2017

Dear ANNA DSB Product Committee Secretariat,

FIX Trading Community[1] appreciates the opportunity to provide the ANNA-DSB Product Committee with comments in response to the Technology and Operations Consultation Paper Phase 1.

We thank you for the opportunity to respond to this request for comment. Please see our responses to your questions on the pages that follow below. Please note that not all questions were applicable for us to answer and in those cases we have noted so. We would be more than happy to meet directly to discuss the feedback attached and provide any clarification where needed.

Sincerely,

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[1] FIX Trading Community is a not-for-profit, industry standards organization that sits at the heart of the global electronic trading community. It is industry-driven, independent and neutral, with a membership that is comprised of over 270 firms from the global financial services industry. The organisation aims to address the business challenges impacting the trading community through the use of standards. Central to these efforts is the continuous development and promotion of the Financial Information eXchange ("FIX") Protocol, the non-proprietary, free and open de-facto messaging standard used for pretrade, trade and post-trade communication globally. It is used in all asset classes including equities, derivatives, foreign exchange and fixed income. FIX is utilized by virtually every major stock exchange and investment bank as well as the world's largest mutual funds and money managers, and thousands of information technology providers, smaller investment firms and regulatory bodies across the globe.

General Comments and Responses

3   Key Operational Processes

Q1: The DSB proposes to allow the creation of ISINs for OTC Derivatives through the website. Do you think that ISIN generation should be possible over the web?   If not, please describe your reasoning and provide evidence to support your points. the business use case to support your need.

The option should be explored especially if there is a demand for a simpler means of obtaining an ISIN for requestors who are "low volume" requestors. However, a challenge may be in obtaining the ISIN value itself once assigned, in a manner that would minimize human error in transcribing the resulting ISIN from the web interface on to a piece of paper - not very "STP". It would be the responsibility of the requestor to ensure accuracy in that transcription.

FIX recommends consideration of a RESTful API that could be readily integrated into a multitude of existing applications. This RESTful API could then also be used trivially to provide a Web Browser User Interface for manually creating or querying ISINs. The service would just not be for smaller participants, it would also use to support market operations, technical testing, and other parts of the trading life cycle.

Q2: The DSB proposes to use 0500 UTC to define the start of a new day. Do you think that this time is correct as the starting point for the new subscriptions for ISINs? If not, please explain your reasoning with evidence.

It is unclear on why 0500 UTC is being proposed - an explanation should have been provided for the rational. 0500 UTC is the middle of the trading day in Asia (e.g. Hong Kong it would be 1300, 1600 Sydney, and 1400 Tokyo - major currency markets). Whilst the ISIN requirement for reporting is primarily mandated by ESMA, we encourage the DSB to think globally and what impacts these timings may have operationally across the globe.

While it is recognized that there is no ideal business day "roll-over" time, the choice selected should aim to minimize operational burden and allow market participants to plan accordingly the timings of their requests for ISINs.

FIX recommends that the ANNA DSB align itself with global trading hours, which would start Monday morning in Asia and then progress through the other two major trading regions, London/Europe, and the Americas.

Q3: The DSB will roll at the end of each day to perform housekeeping tasks etc. This means that all subscriptions and connections will need to be re-established each day. Does this model affect any key business requirements from the industry? If so, please explain including business use cases and any other evidence.

Housekeeping tasks are necessary and that "downtime" window needs to be carefully selected - as pointed out in the response for Q2.

It is not clear based upon knowledge of the ANNA DSB core infrastructure why there needs to be a daily system outage? This seems to be outmoded thinking. Many markets and infrastructures operate continuously for 5.5 days. Modern markets are continuous. The need to assign OTC derivatives ISINs is global and 24 hour, the service provided by ANNA DSB should operate in the same manner.

Requiring daily system resets, a remnant of the old exchange model of trading, will create additional, albeit possible minor, operational encumbrance on market participants that is not warranted given the stateless, continuously available, web architecture application infrastructure in use for the ANNA DSB.

Q4: The file download service permits users to retrieve all the ISINs created to-date. This data is split by asset class (as defined above in the 'file download' process description) and by date. Is this categorization sufficient to meet the industry's needs? If not, please explain, including business use cases and any other evidence.

Assuming the asset classes are aligned with the ISDA taxonomy, which is highly trading desk centric, this seems to be an optimal way to provide batch access to the data.

Q5: Are there processes / use-cases that the DSB has not proposed above but are important to allow the industry to meet the regulatory requirements for ISINs for OTC derivatives? If so, please describe the business use case and explain and evidence why it is necessary.

From a technical operations perspective, the ANNA DSB appears to be architected, except for the proposed daily reset which seems anachronistic, to meet a wide variety of regulatory identifier requirements, not just those known now for OTC derivatives. A key principle put forth by representatives of ISDA, which is shared by the FIX Trading Community, is the principle that the identifiers used for regulatory reporting should be the same identifiers used for market operations. If the financial identifier proposed as part of the regulations is not sufficient to support market operations, it should strongly be reconsidered, given the cost burden to implement redundant identifier mechanisms and the increased operational costs in operating such as system.

3.1 Record Format

Q6: Do you know any products that cannot be represent using a JSON record? If so, please provide evidence to support your point.

JSON in and of itself is an encoding technology. Whether any of the ISIN OTC products can or cannot be represented in JSON is up to the product expression and the templates or schema. Nearly every business sector has adopted JSON, which is an extensive object model in JavaScript syntax, without limitation. The JSON format offers advantages for a modern web based architecture that will require modifications and enhancements to the list of data elements used to uniquely define a financial instrument. The simplicity, the extensibility, and the ubiquity of JSON make it an ideal candidate for capture the list of attributes required to uniquely identify a financial instrument.

To further emphasis the value of JSON and its continued diffusion within financial technology subsector of Communications and Information Technology (CIT) sector, the FIX Trading Community has created technical standard for the JSON encoding of FIX.
http://www.fixtradingcommunity.org/pg/file/fplpo/read/3731121/encoding-fix-using-json-user-guide-rc1

Within the ISO TC68 Financial Services Technical Committee, work is being completed for the rules to implement ISO 20022 messages in JSON. It would not be an exaggeration to say that nearly every major bank globally has one or more projects for web based APIs that use a JSON payload.

Q7: As stated above, the DSB will provide access to the set of JSON templates through the File Download service. Will you require access to the templates via FIX or any other method? If so, please describe your requirement and provide evidence as to why it is necessary.

We would encourage the DSB to look beyond anachronistic file downloads and look to a modern web API for provision of the JSON schema files. Another novel, but again simple approach, would be to make all the JSON schema files available in a distributed version control system, such as Git. GitHub would be a strong candidate for maintaining and versioning the JSON Schemas.

It is possible to distribute the JSON schemas via the FIX standard, but the question would be is this necessary to do so? The FIX Trading Community did not conduct a survey of members to determine interest. From a convenience standpoint, there is merit in having all communication activity over a single active channel (mechanism). As FIX is widely adopted by derivatives exchanges for the creation of identifiers for complex listed derivatives products, and as these organizations and market participants are a portion of the community that will be integrating the ANNA DSB service, it makes sense for ANNA DSB to have a FIX service. If the ANNA DSB FIX service is deployed as planned, it would also seem to follow that provision of distribution of the JSON Schemas would be applicable over this same channel.

4   Demo Connectivity

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Q9: What functions / processes from those above would you want to test and in what order of priority?

The FIX Trading Community will defer to market participants. There does not seem to be sufficient functionality defined by the ANNA DSB to warrant a phased rollout in terms of testing of the ANNA DSB operations. However, given the complexity and the quantity of financial instrument types that must be supported by the ANNA DSB to support industry compliance with the ESMA standards, that a phased approach to asset classes may be necessary. The market, in conjunction with ESMA, may wish to create a prioritized list by asset class, possibly based upon the perceived level of system risk or some other metric, not excluding complexity in defining the attributes that will uniquely identify a product.

5   UAT On-boarding Approach

Q10: When do you think your institution will be ready to connect to the DSB UAT platform (If you wish to do so)? Please note that answers to this question will NOT be published and will be used to understand the size of the requirement for on-boarding support and to identify peak periods.

We have no comment on this question.

Q11: Do you think the above approach for on-boarding stakeholders onto the UAT platform allows the industry sufficient scope to test and validate their connectivity and functionality before the regulatory deadline? If not, please suggest an alternative approach and why you consider it more suitable.

ANNA DSB may want to consider the adoption of an automated certification environment to reduce the time requirement for testing. There are solutions available for managing testing and certification in an automated manner that could be deployed to help ensure the market is ready within the timeframes set by ESMA.

Q12: How many FIX connections / COMPIDs does your organization expect to establish with the DSB?

We have no comment on this question.

Q13: Currently, the DSB is not planning to conduct a coordinated UAT with multiple market participants interacting with the system simultaneously. Do you think a coordinated test would have value? If so, would you consider being part of such a test? Please explain your reasoning and what combination of tests you think would be important to conduct in such a scenario.

Most venues have moved to provide coordinated industry wide tests. The randomized and often erroneous use of the system by market participants has been proven repeatedly to expose errors not detectable using conventional testing techniques. Therefore, it is the opinion of the FIX Trading Community that the ANNA DSB considers building their automated testing environment so that it inherently and at nearly no additional cost or resources, supports multiple participants testing with the system simultaneously.

6   Capacity

Q14: Do you agree with the assumptions made to infer the total number of messages sent by the DSB? If not, please explain your reasoning and provide evidence where possible.

The actual volumetric data will be driven by the support for operational as well as regulatory identifier creation. The methodology employed by the ANNA DSB to come up with volumetric engineering data appears to be sound. These appear to be the basic requirements; systems are usually built to support some multiple of the volumetric estimates. It does not appear from this consultation paper that a multiplication factor has been defined for the testing and deployment of the ANNA DSB.

The ANNA DSB appears to be looking at total capacity over 1 one year period and breaks it down mathematically to total capacity per day (20m). DSB is silent on peak behavior here (-> chapter 8) which maybe an omission. Is the assumption that the access to the DSB system will NOT be evenly distributed over any time period? If so, there will be peak times where a message rate per second is relevant to determine capacity of the "FIX network". It seems that this section 6 is not about disk capacity but network capacity. The total number of messages is not relevant for network capacity unless it is assumed that there is an even load throughout the day. There is also no distinction between capacities for message traffic versus file traffic (download). Are these services separate or can one impact the other?

7   Proposed Infrastructure Build

Q15: Do you agree that the cloud is the most appropriate approach for infrastructure implementation for the DSB? If not, please detail your objections and provide evidence where possible.

The use of cloud services can be the most cost effective approach and as stated can assist in meeting time frames. We recommend that the ANNA DSB provide the information security and resiliency plans early in the process, this should include precautions and policies to secure user and firm data.

Q16: As stated above, the DSB is initially planning to use two or more datacentres located in different countries in Europe. Do you have any specific objections or concerns with this approach? If so, please detail your points and provide evidence where possible.

Should the choice of multiple data centers globally be considered? Also, should ANNA DSB, given the proximity to venues and the venue participants, look to a cloud hosting solution that is located within the specialized data centers for financial markets, such as New York, Chicago, London, Frankfurt, Hong Kong. The benefit to the ANNA DSB is the service will be collocated with a number of other market infrastructures and venues.

8   Performance and Throughput

Q17: Is there a scenario where 1000ms is not a low enough latency threshold for the DSB to respond with an ISIN? If so, please provide the detail, including the business use case and the process steps to highlight the point at which the latency affects events.

There is the potential that this 1 second delay could cause a processing delay in actively traded instruments. Given modern financial technology infrastructures and venues assigning identifiers for complex derivatives strategies in microseconds instead of milliseconds, this service level seems conservative and anachronistic.

Q18: Is there a scenario where a maximum time-lag of 1 minute to respond to a burst affects the ability of the market participant to proceed with its trading activity? If so, please provide the scenario detail.

While we don't have specific scenario details for this, however 1-minute lag time is considered quite long in the era of electronic trading. The 1 minute response should be considered unacceptable for a modern web based system that simply returns identifiers based upon a set of attributes.

Q19: Are there other performance and throughput variables that you feel aren't listed here and that will have a significant impact on cost or the service quality? If so, please list and describe them and their effect.

60,000 for one minute seems low and that 1 minute is long, as the "normal" load is assumed to be over 20,000 or >230 per second (20m divided by 960 minutes) when assuming 16h operation, and an even distribution of the 20m total messages over the 24h period. Assuming an 8h operational window of participants accessing the DSB, this would double these numbers. To make things worse, it is possible that the bulk of the 20m may be spread out over a few key hours. Assuming 4 key hours would bring the "normal" load to over 83,000 messages per minute over multiple hours which do not fit to the notion of "bursts". It is unclear what the basis for the 20m is, but that together with an assumed distribution is the key here. We hope there is some misinterpreting of the volumetric data here.

9   Availability

Q20: Are there market participants who must access the DSB outside of the hours specified above to meet the industry's immediate requirement? If so, please explain for what purpose and why this must take place outside those hours.

Further emphasizing our response to Q3, why is any modern-day service, which will likely encompass global trading, not being implemented using the stateless, continuous behavior of the underlying technology to provide at a minimum a 24x5.5 service. What truly seems to be built here is a bespoke, costly system that is Eurocentric and will put the Eurozone at a disadvantage in terms of quality of market and ease of use for derivatives trading.

Q21: If the view is to extend the availability hours to allow global access, we may need to extend the system hours to 24 x 5.5. This will increase the support cost of the utility. Please specify and demonstrate any business use cases that require the DSB, in this first phase, to be running and supported for 24 x 5.5.

With the availability of low cost management platform and global access to operational resources, the costs should not be inordinate to move from 16x5 to 24x5.5. Given the anticipated volume of identifiers that will be issued, shouldn't the additional cost be incremental instead of multiplicative and certainly less than linear rates of increase in terms of added costs?

Q22: Are there other availability variables that you feel aren't listed here and that will have a significant impact on cost or the service quality? If so, please list and describe them and their effect.

99.9% (2.36 standard deviations) for a real time system upon which trading seems to be a bit archaic for 2017. 15 hours down time is a high number for the modern venues, which will rely on the ANNA DSB for assignment of identifiers. Perhaps 3 standard deviations is a better first year target.

10 Security

Q23: Do you think the DSB being implemented in the cloud will prevent your ability and/or willingness to connect to the service? If so, please explain and evidence your reasoning.

The reality is a vast number of market participants have moved many of their trading support systems to Amazon Web Services and are collocated in the major financial data centers already. This should not be a concern. Although theoretically the creation of an ISIN for an OTC derivative is a form of market information leakage, it is not as though confidential or proprietary data is being released. Privacy is of less concern, after all the ANNA DSB's function is to make readily available public information, than the susceptibility for the ANNA DSB to be identified as a point for distributed denial of service attacks, with the intent to disrupt the orderly operation of the OTC markets. The likelihood of such an attack should be anticipated given the antipathy for the banking sector and the sophistication of groups interested in undermining or disrupting the sector.

10.1 Penetration test.

Q24: The DSB intends to execute 1,2 and 5 before launch and then conduct 3 on an annual basis.

Do the you think this provides a sufficient test of the system's defences against penetration? If not, please explain your reasoning and provide references to industry standards or best practices to support your response.

There would be merit in increasing the number of test cycles performed. In addition, the monitoring of known exploits and maintaining critical updates to open source products should be part of regular operations, near daily.

Q25: In addition, the DSB will execute a quarterly vulnerability scan or after any significant change. Do you think this frequency provides a sufficient test of the system's defences against penetration? If not, please explain your reasoning and provide references to industry standards or best practices to support your response.

The ANNA DSB should also engage with services that provide early identification of things such as zero day exploits or other vulnerabilities.

Q26: Are there other security variables that you feel aren't listed here and that will have a significant impact on cost or the service quality? If so, please list and describe them and their effect.

Denial of service attacks should be a test case as this will have significant impact service quality and system availability.

11 Connectivity

Q27: The DSB is also investigating alternative connection types:

- *Leased line*
- *Access via third party networks such as BT Radianz*
- *Direct Cross-connect*

Please indicate if any of these other options would be preferable to your institutions.

If ANNA DSB is considering offering the service via a cloud service, it may not be possible to offer network access via lease lines or third party VPN. Securing the network communication via SSL and/or TLS would be critical.

Q28: If you are considering a third-party network, which vendors are you considering? Please note that answers to this question will NOT be published – this question is to inform the DSB regarding any possible prioritization of third-party network connectivity.

We have no comment on this question.

Q29: Are there other connectivity variables that you feel aren't listed here and that will have a significant impact on cost or the service quality? If so, please list and describe them and their effect.

We have no comment on this question.

12 Storage

Q30: Is 7 years' audit log retention sufficient to meet your company data retention policy needs? If not, please explain why they should be stored for longer and provide evidence to your reply.

We have no comment on this question.

Q31: Is 7 years' audit log retention too long and therefore incurring unnecessary costs? If so, please explain why a shorter period is sufficient and provide evidence to your reply.

We have no comment on this question.

Q32: Currently, ISINs will be retained permanently and be available in the same way as a brand new ISIN. Is there an age at which an ISIN can be archived away from the main data set? If so, please explain your reasoning and the access requirement for such an archive.

Archiving depends on whether the ISIN is still in use or not. There should be in the data record a means to capture whether the ISIN is still active or not, and if not active as-of when.

Q33: Are there other aspects of storage requirements that you feel aren't listed here and that will have a significant impact on cost or the service quality? If so, please list and describe them and their effect.

The permanent archival of all requests within a NoSQL data store can provide a very valuable research database, thing Big Data, in analyzing market behavior and market activity. While restrictions would be required to facilitate access to this information, its preservation should be considered. The database of requests for ISINs might become more valuable than the database of ISIN identifiers itself.

13 Disaster Recovery

Q34: Is a recovery time of 4 hours sufficiently fast enough for you to meet your requirements for obtaining OTC Derivative ISINs? If not, please detail the business cases that evidence this.

Considering that if this were to happen during the middle of a trading day, the market would need to operate without assigning identifiers and then establish a separate process for assigning the identifiers, it does seem like an incredible long outage for a modern service level agreement. Given the nature of the technology being used for the ANNA DSB, why isn't something measured in minutes not only obtainable, but desirable for the SLA?

Q35: There will be an annual internal system failover test. Should there be a separate failover test with the industry to enable participants to test their failover procedures? If so, please indicate how often this should occur.

Market participant failover and recovery is often one of the tests for certification at modern exchange venues. However, given that the system is largely a request/reply system with idempotent responses to each request, failover of market participants is likely not necessary.

Q36: Are there other disaster recovery aspects that you feel aren't listed here and that will have a significant impact on cost or the service quality? If so, please list and describe them and their

effect.

Data replication across physical locations to ensure that persistent identifier data (and as mentioned earlier – the likely more valuable request information) should be implemented and tested.

13.1 HA – High Availability

Q37: Is the additional cost (at most double) appropriate, considering the risks of not providing this level of resiliency?

This level of resiliency is minimally required. Often more than one instance is available at each location in practice.

Q38: Given the objective to use at least two geographical locations for the system, do you have any specific locations that should not be considered? If so, please explain why and provide evidence where possible.

As mentioned in Q16, there are financial markets specific data centers that can address many of the concerns and place the ANNA DSB within a service level framework accepted by the financial markets. London and Frankfurt would be reasonable choices if limited to two locations. Why not a third site that is available with an unidentified location to further enhance security?

14 Implementation Steps

Q39: What other key technical milestones does your organization need to know regarding the implementation of the DSB? Please explain your reasoning and also indicate the date by when you would need that information.

We have no comment on this question.

Q40: The DSB production service will run in parallel to the UAT and only certified users will be permissioned to connect to the DSB production. The DSB is planning to utilize the UAT environment to complete certification. Do you agree to this approach? If not, please explain your reasoning and provide evidence where possible.

In practice implementing certification environments, there should be two environments made continually available for firm testing, an instance of the current system in production, and an instance of the next version of the system that is planned to be released. Firms have repeatedly asked when these topics have been discussed within FIX community held events for a continuously available testing environment. Testing is often done at all hours. It can be argued that the test environment needs to be made available for more time than the system under test. Testing is often outsourced to different geographical regions.