ANNA-DSB

Technology and Operations Consultation Paper 1

19th December 2016

1 Executive Summary

- European legislation MiFID II/MiFIR & MAR have specified the use of ISIN for all the instruments in-scope, including OTC Derivatives moving to trade on an EU Trading Venue
- ANNA, after discussions with the industry and ISO, have set up the Derivatives Service Bureau (DSB) to deliver global, permanent and timely ISINs to OTC Derivatives
- This document is part of a broader public consultation approach the DSB is using to ensure industry input to key aspects of the service, including: product definition and the fee model
- This consultation paper is focused on important parts of the technological and operational parts of the DSB
- The criteria used to identify those parts explicitly covered were whether the variable has a cost impact and whether the DSB was using an industry standard approach to address it
- The timelines are compressed for the DSB as a whole to meet the regulatory deadline. This consultation period is also further squeezed. The DSB is moving toward implementation on the following;
    - Demo – available now; currently being rolled out to the industry
    - UAT – End of Q1 2017
    - Production – End of Q3 2017
- Responses to this Technology and Operations consultation paper should be sent to the DSB Secretariat by COB 13th January 2017

Contents

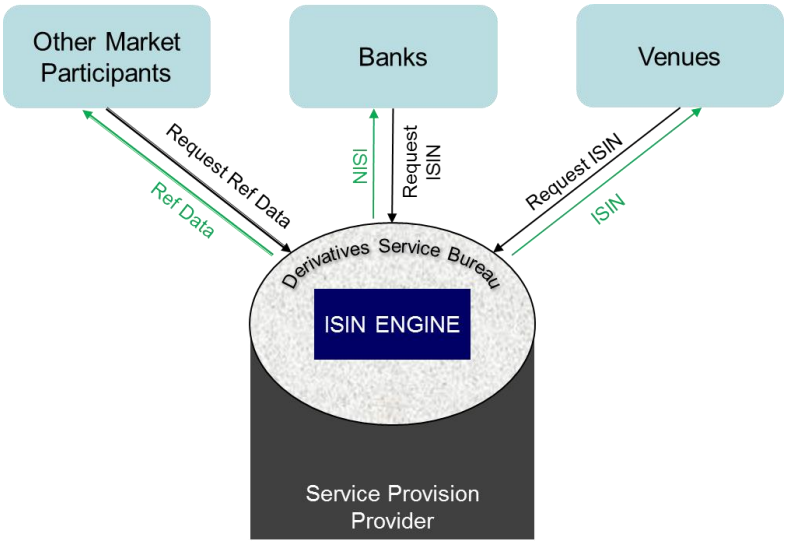
2 Introduction

2.1 Background

The Association of National Numbering Agencies ("ANNA"), a corporation organized under the laws of Belgium, are founding the Derivatives Service Bureau (DSB), for the issuance and maintenance of International Securities Identification Numbers (ISINs) for OTC Derivatives. The DSB will rely on an automated platform capable of allocating ISINs in near real-time.

The European Union's MiFID II/MiFIR regulations take effect on 2nd Jan 2018 and mandate the use of ISINs to identify OTC derivatives listed on a European trading venue.

Below is a high-level diagram of the expected interaction with the DSB:



2.2 DSB Approach

The DSB will consult with the industry as appropriate to ensure that its operational and technological processes and costs meet the industry's needs without compromising the fundamental service it is required to provide.

This consultation is focused on the Technological and Operational aspects of the DSB. Currently the DSB is in the midst of an RFP process to appoint an infrastructure service provider (Service Provision Provider - SPP). The SPP will be focused on providing and supporting the core infrastructure for the DSB including such items such as servers, network, data storage, receipt and distribution of network data.

2.3 Organization of this report and feedback to the consultation

This report is organized in a number of sections that cover key aspects of technical and operational aspects of the DSB:

- Section 3: Details the key operational processes or business use-cases supported by the DSB

- Section 4: Details the availability and conditions for FIX connectivity to the DSB Demo
- Section 5: Details the proposed approach to on-board stakeholders into the DSB UAT environment
- Section 6: Details key aspects of the capacity of the system
- Section 7: Details key aspects of performance and throughput of the system
- Section 8: Details key aspects of the availability of the system
- Section 9: Details key security aspects of the system
- Section 10: Details key aspects of connectivity to the system
- Sections 11 and 12: Detail key aspects of storage and disaster recovery of the system
- Section 13: Details the schedule of the implementation steps for the DSB

Specific questions have been included in each section but more general comments are invited if the respondent thinks it necessary.

Note that some of the sections included have been selected because they have a direct bearing on the costs that the DSB will incur. The fee model to support this cost is subject to a future consultation paper.

In making comments and responding to questions, it would be helpful if respondents consider the following:

- Whether the values supplied for any metrics or measurements will be sufficient (or are over-blown) to meet the expectations for the DSB service
- Whether the details in the consultation report are sufficiently clear and what other details and specifications would, in your opinion, add value
- Evidence of why alternative values are more appropriate, preferably from within the financial industry itself but other parallel examples

General comments and responses to the specific questions are requested by 13th January 2017 and should be sent to the secretariat at DSB-TO-secretariat@etradingsoftware.com.

Respondents should note that:

- Responses will be published and attributed unless there is a specific request for anonymity
- Once the final document is published, subsequent questions and clarifications will also be published as part of Q&A documentation

3 Key Operational Processes

The following was laid out in the ANNA DSB Connectivity Specifications (http://www.anna-web.org/anna-releases-connectivity-specifications-derivatives-service-bureau/) as part of the technical interface definition. As part of this consultation, the DSB has articulated the key processes using business parlance to allow the industry to understand what the current proposed capability of the DSB will be:

Process Name	Notes / Description	Method
Request Single ISIN	The system will allow a user to submit the required set of attributes and request an ISIN. Currently this function is hosted at the demo website: https://www.anna-dsb.com/demo/ The system will return an ISIN with the associated relevant attributes.	Access via FIX or the website
Request the definition for an ISIN	The system will allow a user to submit an ISIN and request the associated relevant attributes. The system will return the ISIN with the associated relevant attributes.	Access via FIX or the website
Request to receive OTC ISINs	The system will allow a user to request to receive all the ISINs created from the start of day. The system will return a snapshot of all the ISINs and their associated data attributes created from the start of day (UTC time)	Access via FIX
Request to receive OTC ISINs plus updates	The system will allow a user to request to receive all the ISINs created from the start of day and also receive all future ISINs going forward as they are created. The system will return a snapshot of all the ISINs and their associated attributes created from the start of day PLUS will send updates of subsequent ISINs going forward. All requests will end when the DSB closes for the day and users will need to resubmit the request	Access via FIX
Download all files	The system will allow a user to download all the ISINs that have been created up until the end of day yesterday. The ISIN data is stored in a series of files that are split by asset class and by date. Asset classes are: Interest Rates, Credit, Equity, Commodities & FX. An example of this file structure can be found via the download function on the Demo website: https://www.anna-dsb.com/demo/	File download service

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.

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.

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.

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.

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.

3.1 Record Format

The DSB proposes to maintain records in the JSON (JavaScript Object Notation) format. This is because it is an open, non-proprietary standard data exchange format that is widely adopted in the financial industry. In addition, it is both lightweight and human and machine-readable. More details on JSON can be found below:

- The JSON Data Interchange Standard is ECMA-404
- Each record is a valid JSON instance according to a JSON template (http://json-schema.org/)

The JSON template provides basic validation of the records as well as documentation of their structure. The templates are created based on the specifications defined by the DSB Product Committee.

The DSB will provide access to the set of JSON templates through the File Download service.

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

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.

4 Demo Connectivity

From February 1st 2017, the DSB will make FIX connectivity to the Demo environment available. Stakeholders will be able to connect using the specifications released in October 2016 [ANNA DSB Connectivity Specifications - http://www.anna-web.org/anna-dsb-connectivity-specifications/]. This will enable market participants to develop and test their FIX connections and messages. It is not meant to serve as a test for the instrument data itself because the new product definitions will not

be implemented into Demo until late February 2017 at the earliest. Other key conditions of the test include:

- Only SSL connectivity will be supported
- The platform will have reduced performance and capacity compared to the production environment.
- As new releases are implemented into the Demo environment, the test ISIN data may need to be deleted

The DSB will open the list for connectivity to the Demo environment on 16th January 2017.

Please note that responses to these questions will NOT be published and will be used to understand the size of the requirement and estimate a sequence for connectivity to the DSB Demo.

Q8: The DSB will send out connection details for the Demo by 24th January 2017 to those organizations who are ready and sequenced to connect. Will your organization wish to connect to the DSB Demo using FIX between February and April 2017? If so, can you indicate when you will be ready to do so?

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

5 UAT On-boarding Approach

When the UAT environment is available for the industry to test the web GUI and FIX activity at the beginning of April 2017, the DSB will begin the on-boarding process of registered stakeholders.

The DSB will sequence the on-boarding process on a first-come, first-serve basis and give priority to those stakeholders required to provide ISINs.

The DSB UAT on-boarding list will open on 1st March 2017.

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.

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.

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

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.

6 Capacity

The system must be able to support the following minimum capacity requirements for the FIX network:

Variable	Notes / Description	Est. Value
Firms	The total number of firms that are connected to the DSB at any one time during the operating hours.	200
Daily Messages	The total number of messages supported by the network per day. A message is defined as an appropriate FIX message sent to the DSB. Assumption of 20m new OTC derivatives over a 12 month period. This is based on 12 months of SDR data for the number of transactions for rates, equity and credit derivatives. The DSB notes that the first ISIN level is unlikely to be defined at this level of granularity. This number was doubled to take account of commodities and FX and introduce some spare capacity. With 200 firms, assuming a single connection per firm, that implies a total number of messages (assuming all firms request ISIN updates across all asset classes) of 4bn messages annually. There are approximately 250 annual business days, that implies a daily message count of 16m per day. See 'ANNA DSB. FIX Interface Specifications' for specification of the message type itself: (http://www.anna-web.org/anna-dsb-connectivity-specifications/) .	16m / day

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.

7 Proposed Infrastructure Build

The DSB proposes to build the system infrastructure using cloud based technology. The reasons for this are:

- Given the tight timelines for production cloud offers quick infrastructure build out.
- Allows flexibility to scale the infrastructure (servers, storage etc.) down and up quickly depending on resource utilisation
- Allows for automatic software and security updates ensuring that the system remains patched to the latest version
- Allows for an agile approach to infrastructure build out with a choice of technology solutions ranging from virtual to dedicated hosted servers encompassing multi-tenant to single tenanted solutions. The system can be built out utilising one, some or all of these solutions should the system require
- Facilitate resiliency in the system with no single point of failure by utilising datacentres in different locations. These are planned to be Europe
- No data centre maintenance or rack space costs

We will be delivering an IT security document detailing the policies, procedures and infrastructure employed in protecting the system.

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.

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.

8 Performance and Throughput

The system must be able to support the following minimum throughput requirements.

- Delivery is defined as the message leaving the DSB or being queued within the system if the user is unable to receive the message
- The DSB performance and throughput is focused on those variables in the context of the DSB infrastructure and software itself. Because each of the connecting firms will have their own different internal infrastructures and connectivity configuration, it is not possible for the DSB to give a complete time for 'the creation of an ISIN' from a business perspective. What the DSB can determine is how long any messages, once received by the DSB infrastructure, take to be processed and responded to

Variable	Notes / Description	Est. Value
Latency	99% of all messages routed through the system are to be processed and delivered (to a maximum of 200 recipients) in the following interval (after receipt). This time measures the elapsed time from when the incoming message hits the DSB Firewall and the outgoing message hits the DSB Firewall.	1,000ms
Bursts	The system must be able to receive, process and deliver this number of messages in a burst to 200 users within one minute	60,000

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.

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.

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.

9 Availability

The DSB is designed to be a global 24 x 7 system. However, given the initial focus of industry on European regulatory requirements, it may be possible to reduce start-up operating costs, and hence

user fees, by focusing support around the European time zone. This will allow the DSB to delay incurring the extra cost for global support to when it is required by the industry.

The below are the proposed system availability hours for the DSB production environment.

Variable	Notes / Description	Est. Value
System hours	Hours and days for which the system will be available. The start time will be Monday 0500 UTC and the end time will be Friday 2100 UTC. These have been proposed to maximize access from EMEA	16 x 5
Availability	SLA must be for at least X% of the available hours	99.9% (this implies a total down-time for a year of 15hours

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.

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.

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.

10 Security

This section details some of the key requirements for the system security.

Variable	Notes / Description	Interface
Authentication	All access must be authenticated using a password / certificates. All passwords and/or certification must conform to industry best practice. Eg. be at least 8 characters long. Password must be stored in encrypted form, eg. as salted hashed, and never be cached or displayed.	All connections
Permitted Access	Access to any of the system components is possible only from certain pre-defined IP/Addresses.	FIX
SSL Encryption or VPN	All external communication [i.e. communication with external systems] to / from the system are encrypted using TLS version 1.1 minimum (SSL / SSH) at least 128 bits AES or RC4 [see connectivity requirement]. The web UI will utilise https://	All direct connections Web UI

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.

10.1 Penetration test.

As per the PCI data security standards https://www.pcisecuritystandards.org/documents/Penetration_Testing_Guidance_March_2015.pdf it states "penetration testing must be performed at least annually and after any significant change—for example, infrastructure or application upgrade or modification—or new system component installations." We are proposing to follow this recommendation. There are a number of different tests that can be completed:

1. Application-layer testing: Testing that typically includes websites, web applications, thick clients, or other applications.
2. Network-layer testing: Testing that typically includes external/internal testing of networks (LANS/VLANS), between interconnected systems, wireless networks, and social engineering.
3. White-box testing: Testing performed with knowledge of the internal structure/design/implementation of the object being tested.
4. Grey-box testing: Testing performed with partial knowledge of the internal structure/design/implementation of the object being tested.
5. Black-box testing: Testing performed without prior knowledge of the internal structure/design/implementation of the object being tested.

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.

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.

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.

11 Connectivity

As specified in the ANNA-DSB FIX Specification (referred to earlier in section #), the DSB will support a direct FIX connection to access the DSB and the OTC Derivative ISIN reference database.

Variable	Notes / Description	Est. Value
VPN	System can be accessed through VPN. External communication that are tunnelled through encrypted VPN may not be SSL encrypted.	The VPN must provide an encryption that is at least as secure as SSL 128 bits AES.
SSL	System can be accessed through internet SSL connection. With a minimum TLS version of 1.1	

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.

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.

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.

12 Storage

This section details key aspects of the system's storage requirements:

Variable	Notes / Description	Est. Value
Period for all system change and audit logs to be kept	The system will retain all audit logs (including change logs and FIX message logs) for a minimum of X years	7 years
Period for ISINs and their reference data to be kept	The system will retain ISINs and their reference data for a minimum of Y years	Permanently

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.

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.

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.

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.

13 Disaster Recovery

This section details the key aspects of the system's disaster recovery requirements:

Variable	Notes / Description	Est. Value
Recovery Time	In the event of a disaster event and the system goes down. Once the disaster recovery event has been declared the infrastructure will be up and running in a maximum of this many hours	4 hours
Failover Test Frequency	The DSB will aim to execute a failover test on a set frequency	Annual

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.

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.

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.

13.1 HA – High Availability

We are planning to build a resilient HA (high availability, active - active) system with at least two geographically separate, connected systems. This is to ensure that if there is a problem on one side that they system will remain up and available on limited resilience.

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

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.

14 Implementation Steps

These are the high level implementation steps with a description of events with timeframes.

- As more detail is known, the DSB will publish this to the industry
- The UAT environment will be subject to down-time if issues require it for remediation

Implementation Step	Description	Time Frame
Draft FIX API published	The draft FIX API details published and presented on ANNA DSB website	7th November 2016
Open DSB Demo Connection List	The DSB opens the list for applications from firms to connect to the Demo using FIX	16th January 2016
Demo Connectivity Details available	The detailed parameters will be available for those scheduled to connect to the DSB Demo	24th January 2017
SPP vendor selected	SPP selected and starting to build out the UAT environment	1st February 2017
DSB DEMO Connectivity Testing	Priority users can connect to and use the DSB Demo over FIX to test their systems	1st February 2017
UAT Connection Details available	Connection details will be available for those market participants who have been scheduled for on-boarding.	1st March 2017
Open DSB UAT Connection List	The DSB opens the list for applications from firms to connect to the UAT over the web and FIX	1st March 2017
UAT Environment Live	Make UAT environment available for participants to test connection and functionality	1st April 2017
Production Go-Live	DSB Production environment ready for connection by industry participants	2nd October 2017

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.

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.

15 Appendix

15.1 Questions

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.

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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.

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.

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.

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.

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

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.

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.

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.