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## Issue 95 ‘Assessing the continued use of TIBCO service as a source of data for market participants’ Options Paper

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Summary	<p>TIBCO is based on a legacy on premise infrastructure with high maintenance costs to BSC Parties, furthermore the requirements for license and High Grade line has been a barrier to customers who previously expressed interest in the service.</p> <p>The infrastructure will become unsupported and create scaling limitations for adding new data, with frequent unplanned outages. Elexon is currently redeveloping the Balancing Reporting Mechanism Service (BMRS) onto cloud infrastructure to address the scalability, stability and reduce costs for our customers.</p> <p>Among the endpoints, Elexon will provide an alternative to TIBCO and BMRS Data Push Service. The Issue 95 group are invited to agree that a BSC modification should be raised to remove the obligations to provide BMRA data via the High Grade line, thereafter begin the decommissioning of TIBCO targeted for December 2023.</p>
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### 1. Issue 95 - Background

- 1.1 Elexon is currently modernising its technology and building a cloud based solution for its BSC Agents systems as part of Elexon Kinnect. The initial focus has been on three BSC Agents: Central Registration Agent (CRA), Settlement Administration Agent (SAA) and the Balancing Mechanism Reporting Agent (BMRA). The Kinnect Insights Solution is being implemented to replace the BMRS and over the next 18 months it will continue to migrate data across to the new platform. The Insights Solution will provide three endpoints for accessing data: a website for interactive users, RESTful APIs and a real-time data subscription service for the Insights Solution, referred to as Insights Realtime Information Service (IRIS). Elexon's data strategy is to unify data structures across all its endpoints and ease onboarding for all our users through open source protocols, avoiding proprietary licensed software to reduce both central and BSC Parties cost.
- 1.2 The current TIBCO service is built on legacy systems and provides BMRS data close to real-time. Customers receiving TIBCO data require both a High Grade line and a TIBCO license. These requirements have long been recognised as a potential barrier for new entrants, particularly the lead time, costs and bandwidth restrictions of the High Grade line. Since 2014, the current BMRS has offered a Data Push Service (DPS) as a cost effective alternative to TIBCO and consequentially there have been no new TIBCO subscriptions since this date. The overall number of TIBCO users has also decreased by over 50%, leaving around 20 organisations with active subscriptions.
- 1.3 While Elexon has continued to maintain TIBCO for the current subscribers, the service can no longer be sustained efficiently and economically (further detail in section 2). The current TIBCO set-up is based upon “on premise” communications hardware and is not readily supported by cloud based architecture, therefore it would add significant complexity to migrate this to Kinnect in its current form. In addition to this, the legacy architecture will run out of support unless a significant technical upgrade is carried out.
- 1.4 Recognising the effort in maintaining current implementation and the Elexon drive to optimise costs for industry with a cloud based architecture, [Issue 95 ‘Assessing the continued use of TIBCO service as a source of data for market participants’](#) was raised to assess the continued use of TIBCO and High Grade requirements for BMRS data.

### 2. Design for future real time messaging service

- 2.1 Elexon has accelerated development of an alternative to TIBCO on the new platform and has started the prototype for IRIS. A demonstration was provided to the BMRS Change Board Meeting on 21 July 2022 with a view to on-board a few users from August 2022. The Insights Solution's IRIS has been designed and engineered to address the following issues with both DPS and TIBCO:
- 2.1.1 **Scalability and Stability** – The Legacy architecture severely limits vertical and horizontal scaling and the constraint on bandwidth means neither TIBCO nor DPS users receive the complete data.<sup>1</sup> This limitation would also restrict future data issued via the legacy endpoints. IRIS will deliver all datasets in a scalable cloud-native architecture with a minimum of 99.9% uptime.
- 2.1.2 **Data Consistency** – Data reconciliation is quite challenging due to structure mismatch between TIBCO, DPS and BMRS APIs. The TIBCO Relay service provides some archive capability but outage recovery is often a challenge for customers. The IRIS solution's JSON schema matches the Insights API and the two can be used interchangeably.
- 2.1.3 **Costs** - High operational costs of the legacy architecture are passed on to all market participants and end consumers. TIBCO users bear additional costs for proprietary software and the required leased network lines. The legacy charging model meant Elexon has not ring fenced operational costs for TIBCO, resulting in all BSC Parties funding the majority of the operational costs. Whilst it is hard to isolate costs, due to shared infrastructure across central systems, an estimate is provided below. A full assessment will be required to provide an accurate view and some residual costs will continue until all legacy applications are fully migrated.

2.1.4

Cost Item	Yearly Charge	Recovery Mechanism
		Specific Charges to Parties (TIBCO Users) = £50k
TIBCO Licence Charges	£118.5k	
		Balance = £68.5k paid under Funding Share
Extended Support	£76k	100% paid under Funding Share
BSC Systems Hosting /Infrastructure	£405k	100% paid under Funding Share

- 2.1.5 IRIS will be free to end users and its dedicated Elexon Infrastructure costs are low in comparison, currently estimated at £20k/year<sup>2</sup>, based on current set up. Using IRIS will significantly reduce cost both to all BSC Parties whilst current TIBCO users will additionally avoid licensing costs.
- 2.1.6 **Onboarding Experience** – In practice due to the high cost, lead time and network constraint, TIBCO is effectively closed to new subscribers. IRIS will ease onboarding with website registration flow and ready-to-go downloadable clients. Connection can be established within 10 minutes and the subscription established with 1 day development effort (notwithstanding the effort to integrate the new endpoint within customers' processes).
- 2.2 The IRIS will continue to add data and will officially launch in November 2022. It will offer opportunities to participants to use the prototype from September 2022. This should allow time to onboard new users, assess the service and start the migration.
- 2.3 The existing BMRS APIs, DPS and website will be replaced by the Insights Solution, and users will need to transition to the new APIs, website and IRIS before the BMRS can be decommissioned from beginning of 2024. Unlike the other endpoints, TIBCO and High Grade service obligations are defined in the BSC, therefore a Modification is required to remove the obligations.
- 2.4 With TIBCO, Elexon have seen evidence of newer entrants attempting to implement TIBCO and giving up due to the requirement of high grade line. *"For us, the leased line requirement was a major barrier to being able to adopt the TIBCO option. We are a relatively small, but growing company with no long-term physical location from which to install the leased line. In the past 5 years we have moved between three different office premises*

<sup>1</sup> Large XML files such as Actual Generation by Generation units is not sent via TIBCO. Output useable files are also restricted (2-156 weeks ahead)

<sup>2</sup> IRIS does incur additional overheads on other services (e.g. increase logging, network bandwidth) which are difficult to isolate

as our headcount has grown. Each of these have also been managed office space where we don't own or maintain the network infrastructure. We also have no on-premises infrastructure (e.g., servers, databases, etc), but host everything on the AWS cloud. The options we considered were to try and find a middleman of sorts to proxy the connection through, or to see if we could use something like AWS Direct Connect to interface with the provider (Vodafone) straight into our AWS network – or any other cloud provider or datacentre. The first option is similar to how we interact with National Grid for participating in the balancing mechanism, so we thought there may be businesses who could offer that service already. But we could not find any. So, we explored the second option. After an initial couple of meetings with Elexon and CGI representatives, we were ultimately left waiting on Vodafone to respond for 6+ months. At this point, we gave up asking for further updates.' (Outlook Energy, 2022).

### 3. Options

#### Raise a BSC modification to remove obligations to provide BMRS data via the High Grade line using TIBCO

- 3.1 This involves removing obligations for Elexon to provide BMRS data via the High Grade service using TIBCO. This will explicitly uncouple BMRS from 'Grades of Service' from BSC Section V, URS and BMRS Service Description, This will not affect provision of other central system data via the High Grade service, only BMRS.
- 3.2 Following this, as a consequence of the Modification, Elexon will begin decommissioning of TIBCO from December 2023. The existing API, DPS and TIBCO users will need to migrate to the new platform, using the new APIs and IRIS. Elexon has extended TIBCO support until December 2023 therefore the service should be decommissioned before this date to avoid incurring significant additional costs.  
  
Note: users are encouraged to adopt the new platform earlier, as the TIBCO service can no longer provide a complete data set.
- 3.3 The new solution will have a lower central infrastructure cost and the new service will be free without proprietary software licensed cost and leased lines. A full comparison of the functional and non-functional capabilities is shown in the appendix 1.

#### Other options considered

##### *Upgrading TIBCO and legacy on premise infrastructure*

- 3.4 Elexon investigated an option which would upgrade the TIBCO software on legacy system to enable the continued support of TIBCO. The current timescales is beyond 2023, therefore the whole purpose of maintaining the legacy system will be to provide TIBCO data via the High Grade Line. This would result in significant operational cost to maintain and operate TIBCO. This option does not represent a 'no change option', TIBCO version will need to be upgraded as well as underlying constraints with future datasets.
- 3.5 Elexon believe in providing improved user experiences when accessing our data and reducing costs for all parties in doing so; maintaining a solution only available to a few users is not viable.

##### *Implementing TIBCO on Insights Cloud platform*

- 3.6 Elexon also investigated the possibility of porting TIBCO to the Insights Solution platform using cloud technology. Implementation, aligned to modern data standards, would mean replicating IRIS using proprietary software. This option was dismissed as it is equally disruptive, increases the number of endpoints as well as central costs and BSC Parties costs.

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## Appendices

### Appendix 1 – IRIS Functional and Non Functional comparison

#### Functional comparison

	TIBCO (High-Grade)	DPS (Low-Grade)	IRIS
Data Format	Named value pair/XML	XML	JSON
Protocol(s)	Proprietary	OpenWire Stomp AMQP 1.0	AMQP 1.0, AMQP-over-WebSockets Rest APIs (optional)
Durable Messages	No	Yes	Yes
Authentication	None	API Token	OAuth 2.0
Archive Capability	TIBCO Relay	TIBCO Relay / BMRS API	Insights API
Data Coverage	Fixed	Fixed	Growing, platform of choice

#### Non Functional comparison

	TIBCO (High-Grade)	DPS (Low-Grade)	IRIS
Cost (Industry)	●	●	●
Cost (User)	●	●	●
Scalability	●	●	●
Message Durability	●	●	●
Latency	●	●	●
Uptime	●	●	●

- Maximum message size (IRIS): 100MB
- Median time to publish: 3.5 seconds
- Fully managed cloud infrastructure
- Durability: 99.9% uptime