

Market Interface Technology Enhancements Working Group (MITE WG)



IDX Only Session

Wednesday 4 September 2024
(2:00pm to 5:00pm)





We acknowledge the Traditional Custodians of the land, seas and waters across Australia. We honour the wisdom of Aboriginal and Torres Strait Islander Elders past and present and embrace future generations.

We acknowledge that, wherever we work, we do so on Aboriginal and Torres Strait Islander lands. We pay respect to the world's oldest continuing culture and First Nations peoples' deep and continuing connection to Country; and hope that our work can benefit both people and Country.

'Journey of unity: AEMO's Reconciliation Path' by Lani Balzan

AEMO Group is proud to have delivered its first Reconciliation Action Plan in May 2024. 'Journey of unity: AEMO's Reconciliation Path' was created by Wiradjuri artist Lani Balzan to visually narrate our ongoing journey towards reconciliation - a collaborative endeavour that honours First Nations cultures, fosters mutual understanding, and paves the way for a brighter, more inclusive future.

Read our
RAP



Housekeeping

1. This meeting will be recorded for minute taking purposes
2. Please mute your microphone, this helps with audio quality as background noises distract from the conversation.
3. Use the 'Raise hand' function should you wish to speak to an item.
4. Use the 'Chat' function for any other questions or comments you may have.
5. In attending this meeting, you are expected to:
 - Not only represent your organisation's interests but also the interests of Industry and its customers
 - Have an open mindset
 - Contribute constructively
 - Be respectful, both on the call and in the chat

1. Welcome

Blaine Miner



Objective of today's session

The MITE WG has been established to define and develop Technical Procedures/guides for IDAM, IDX and Portal Consolidation. These initiatives seek to deliver foundational capability supporting interactions between participants and AEMO and based on the agreed scope to transition* or enable decisions on transitioning of existing business services

This workshop aims to:

- Re-Cap Target State Concepts
- Re-Cap Target State Architecture
- Re-cap Terminology and Definitions
- Business Function end points

[Link to the target state pack established in consultation with the industry stakeholders](#)

The ask of participants:

- Invite and share this pack with your technical experts who will support the MITE WG / FG process to provide context and background to concepts, architecture, capabilities, terminology and definitions
- Leverage the materials referenced from the prior FASI working group on which this pack has been developed.
- Engage in the workshop – questions are welcome

Agenda

#	Indicative Timings	Topic	Presenter
1	2:00pm-2:05pm	Welcome	Blaine Miner / Graeme Windley
2	2:05pm-2:10pm	Actions	Blaine Miner
3	2:10pm-2:15pm	Focus Group update	Andrew Bell
4	2:15pm-2:30pm	Industry Data Exchange	Andrew Bell
5	2:30pm-3:00pm	Re-Cap Target State Concepts Re-Cap Target State Architecture	Andrew Bell
6	3:00pm-3:30pm	IDX Terminology and Definitions	Antonio Ramos
	3:30pm-3:45pm	Updates to the Conceptual Target State Architecture	Antonio Ramos
7	3:45pm-4:50pm	Business Function End Points	Sri Gundu
8	4:50pm-5:00pm	General Business and Next Steps	Blaine Miner
	Appendix	Appendix A: AEMO Competition Law Meeting Protocol Appendix B: Upcoming Working Group and Focus Group Topics Appendix C: Worked Examples	

2. Actions

Blaine Miner



Actions

Description	Responsible	Status	Comments
AEMO to include the link to the MITE webpage as part of the notes	AEMO	Closed	Link was provided in the August meeting notes
Confirm exact dates and lengths supporting the Sept and Oct IDX and IDAM FG sessions	AEMO	Closed	Session details have been provided in this pack.
Add a third column to the 'Proposed Future Topics' slides, to indicate which month a topic is proposed to be discussed	AEMO	Open	Slide has been added to this pack and will be presented during the session
Sept and Oct IDX and IDAM external FG nominations close Friday 16 Aug	WG Coordinators	Closed	Thank you for considering and submitting your organisation's nominations.

Notes

Blaine Miner reviewed the Actions with participants and Noted that the timeline view (Slide 11) provided in this pack and discussed closes this open action:

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3. Focus Group update

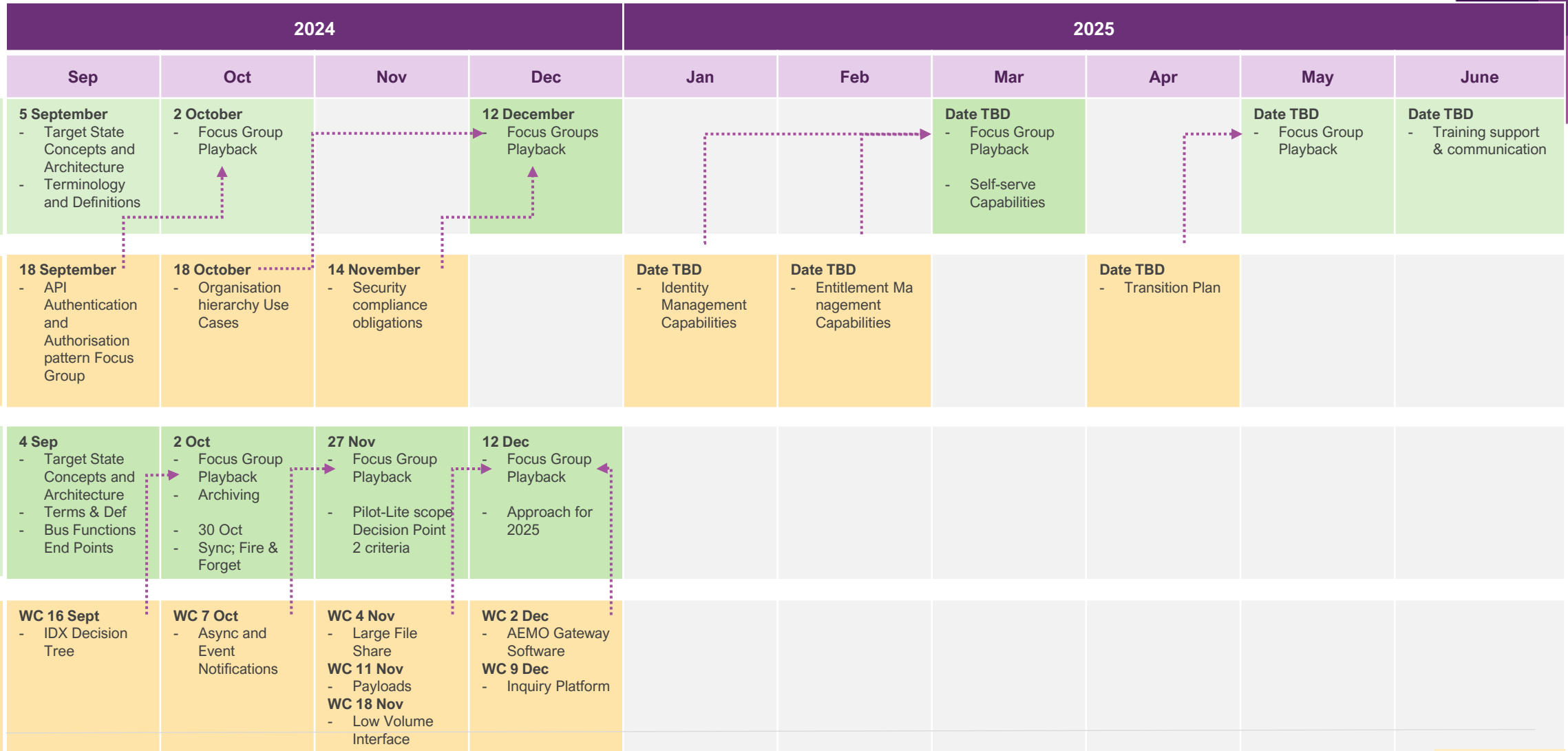
Blaine Miner



Focus Group update

- AEMO called for nominations for 4 initial Focus Groups at the last MITE WG meeting
 - IDX: Decision Tree Focus Group and IDX Asynchronous and Event Notification Group
 - IDAM: API Authentication & Authorisation Patterns and Organisation Hierarchy Use Cases
- We genuinely appreciated the time, consideration, and the quality of the nominations we received.
- To enable the Focus Groups to be as efficient and effective as possible, based on our previous experiences (and our preference to have face-to-face sessions), AEMO capped attendance to 12-13 representatives.
- AEMO received 30-40 nominations from almost 20 organisations for each of the four Focus Group topics, and in many cases received multiple nominations from the same organisation.
- We regretted that some of your nominations would not be able to contribute directly to the FGs, but we are committed to ensuring that every WG organisation will have the opportunity to contribute and provide feedback at the WG meetings when the FGs present their draft materials.
- In determining the proposed FG attendees, AEMO sought to balance:
 - representation across participant types and
 - ensuring the required skill mix to support each topic.

Strawman Timeline for upcoming IDAM / IDX Sessions



Legend WC: Week Commencing Working Group Sessions Focus Group sessions

*These proposed dates are indicative dates

Notes

- Blaine Miner spoke to the focus group update slides
- AEMO noted the following questions and responses:
 - **Question:** When will the tech specs be available to participants? Participants want to know when to invest. **Response:** AEMO responded in chat with *'we provided a target date of end of March 2025 as per the PCF pack in March (as highlighted by Ranjan). Please note this is dependent on the results and outputs of all these consultations planned for 2025 this year (7 x FG and 5 x WG), so we will firm up how we are tracking as we go through the engagements this year.'*

4. Industry Data Exchange

Andrew Bell

[Link to the target state pack established in consultation with the industry stakeholders](#)




Industry Data Exchange (IDX) Scope

Industry Data Exchange: A unified data exchange mechanism to support exchanging data between energy stakeholders and AEMO.

Background: AEMO's existing data exchange systems have been variously acquired over the last 10-15 years, and use inconsistent standards, protocols and formats. AEMO's markets are also undergoing significant transformation, resulting in new data exchange needs. AEMO is introducing new data exchange patterns without a target state and roadmap which is inhibiting participants from modernising their systems and quantifying the benefits of their investments. This Initiative will conceptualise unified data exchange standards, patterns, protocols, payload formats and channels to support market and domain-agnostic, streamlined, secure, reliable, scalable centralised data exchange platform.

Following areas will be explored during the IDX foundation phase.

In Scope	Out of Scope
<ul style="list-style-type: none">✓ Data Exchange between AEMO and energy stakeholders across NEM, WEM and Gas market to support the technical capabilities of the foundation phase<ul style="list-style-type: none">• Inbound and Outbound transactions• Connectivity methods• Protocols to connect to AEMO systems• Payload formats• AEMO data exchange systems that Participants connect to• Data exchange standards & patterns✓ Interactions via all supported channels (current & future)	<ul style="list-style-type: none">× Control systems communications and interactions× Direct device communications and interactions× Transition of existing business services



Establishing the foundational Capabilities

The technical capabilities of the Target state foundation are intended to be suitable for Data Exchange between AEMO and energy stakeholders across NEM, WEM and Gas

IDX Transition

Decision Point 2

Decision Point 2 will consider the migration of legacy services. This involves developing a business case taking lessons and experience from the foundational delivery and pilot to firm up understandings of impacts and costs associated with transition.

IDX 2021 Workshop Summary

Below is a summary of the key pain points from Business and Technical focus group discussions, classified into themes according to the challenges they pose to IDX services.

Complexity and inconsistency

- Protocols, formats and standards are inconsistent and unnecessarily convoluted.
- Lack of consistent standards across Systems / Fuels / Jurisdictions

Define Roadmap

- There is no clear data exchange roadmap for future capabilities.
- Legacy exchange methodologies & need for data exchange roadmap definitions (target & transition state)

Manage Cost-Effective Change

- Provide cost effective centralised services to reduce industry cost
- Mandatory schema updates are costly, aseXML schema version change mandates industry to upgrade the aseXML schema even if the Participants do not have any procedural impact to the changes.

Opportunities in the Future

- Near real-time visibility of critical market transactions.
- Enhanced security for data exchange and centralised access management.
- Improved speed to market of business and regulatory changes.
- Improved management of higher volumes of market data.
- Improve developer experience.
- Harmonised data exchanges between participants and AEMO market systems
- Improved customer outcomes.
- Better transparency of future maintenance costs for data exchange systems
- Unified data exchange standards across markets, fuels and jurisdictions.

For AEMO to consider

- Event-based solution - Markets using AEMO-provided integrated data model (NEM) incur less cost than those not using (Gas or WEM).
- Alternate data consumption pattern - Consumption of queryable & interoperable data in a simple & standard way.
- B2M and B2B systems integrated to provide operational and industry efficiency, reducing resources, time and cost involved in delivering the service.

Notes

- Andrew Bell spoke to the Industry Data exchange slides
- AEMO noted the following questions and responses:
 - **Question:** Was the pain point analysis being done with NEM as the focus? **Response:** AEMO responded that other markets have been engaged through internal conversation and other industry forums and will continue to be engaged to elicit specific use cases and other potential pain points
 - **Question:** What are the costs associated with AEMO Gateway software? **Response:** AEMO responded that the costs of the AEMO Gateway software are included in the current fee structure for participants.

5. Re-cap Target State Concepts

Andrew Bell



AEMO IDX Environment

Pain points	Proposed Principle(s)	Target State Concept
<p><i>Industry raised pain-point:</i></p> <ul style="list-style-type: none"> • Managing Cost-Effective Change. • Provide centralised services to reduce industry cost and complexity. • Lack of consistent standards across Systems / Fuels / Jurisdictions. • Security model needs to be standardised. <p><i>AEMO's reading of Industry pain points:</i></p> <ul style="list-style-type: none"> • AEMO and stakeholders must allocate more resources, such as time, money, and personnel, to manage and maintain multiple IDX mechanisms. • Inconsistent authentication and decentralised authorisation make managing IDX security and access control across various channels, protocols, and patterns challenging. 	<ul style="list-style-type: none"> • A standard set of Industry agreed on channels, protocols, patterns, and capabilities to meet the end-to-end IDX needs across all Fuels, Markets and Domains. • Alignment to IDX cyber security best practices. • Unified Low Volume Interface (LVI) to support IDX for smaller stakeholders. 	<p>A centralised AEMO IDX Environment to support IDX between stakeholders provide the following:</p> <ul style="list-style-type: none"> • AEMO-hosted channels through which to initiate Inbound and Outbound data submission and receipt. • Data Exchange Environment services guaranteeing confidentiality, integrity, and availability. • A hub providing business function-specific services. • Improve cyber resilience: <ul style="list-style-type: none"> • Unified authorisation and authentication leveraging IDAM. • Adoption of secure modern IDX protocols (e.g. OAuth). • Unified LVI supporting Inbox/Outbox message management, transaction logging and archiving.

Decision Trees

Pain Points	Proposed Principle(s)	Target State Concept
<p><i>Industry raised pain-point:</i></p> <ul style="list-style-type: none">• Cost and complexity.• Lack of alternative data exchange mechanisms <p><i>AEMO's reading of Industry pain points:</i></p> <ul style="list-style-type: none">• AEMO offers multiple patterns for the same regulated transactions, each with different infrastructure requirements. This creates unnecessary complexity.• Management multiple patterns, most of which have had zero uptake (B2BMessagingSync, B2BMessagingPull, B2MMessagingPull), has high ongoing operational and implementation costs for AEMO and, in turn, industry.	<ul style="list-style-type: none">• For each use case, a single channel and protocol is to be offered.	<ul style="list-style-type: none">• The IDX platform will offer multiple channels and protocols. However, for each specific use case, an industry-agreed-upon decision tree for data exchange will lead to the selection of a single channel and protocol.

Outbound Data

Pain points	Proposed Principle(s)	Target State Concept
<p><i>Industry raised pain-point:</i></p> <ul style="list-style-type: none"> • Cost and complexity. <p><i>AEMO's reading of Industry pain points:</i></p> <ul style="list-style-type: none"> • Requires stakeholders to create and manage API gateways, networking setups and troubleshooting efforts at their cost. • Current patterns depend on the recipient system's uptime; availability issues result in suboptimal FIFO delivery to clear queued messages. • Participants currently have no option to configure message delivery orders. • Requirement to implement additional cyber security controls to allow external connectivity by AEMO. 	<ul style="list-style-type: none"> • Minimise ongoing IT change for stakeholders in the data delivery processes while reducing their costs and efforts associated with the transition to IDX. • Empower stakeholders with the ability to prioritise the order of data delivery, providing maximum control over the data reception process. • Provide near real-time visibility of critical market transactions. 	<ul style="list-style-type: none"> • AEMO-hosted Outbound Pull using Event-Driven Integration shall be the foundation of outbound data delivery. <div data-bbox="1538 544 2035 733" data-label="Diagram"> <pre> sequenceDiagram participant AEMO participant Recipient AEMO-->>Recipient: Notify outbound message ready Recipient->>AEMO: Pull Message upon receipt of event AEMO->>Recipient: Deliver requested message Recipient->>Recipient: Configure the priority of message pull </pre> </div> <ul style="list-style-type: none"> • By hosting Outbound Pull endpoints within the AEMO IDX environment, the infrastructure requirements for stakeholders are minimised, reducing their costs and maintenance efforts. • Event Notifications enable stakeholders to subscribe to messages for real-time reception, eliminating the need to poll the AEMO-hosted Outbound data endpoint. This approach supports real-time messaging, with a particular emphasis on asynchronous responses.

Business Function Transactions

Pain Point	Principle	Target State Concept
<ul style="list-style-type: none"> Disparate payload formats across fuels, markets and domains that don't accommodate the flexibility for change (e.g., JSON for wholesale, aseXML retail, AEMO CSV vs other embedded CSV formats). 	<ul style="list-style-type: none"> Modern payload standards shall be implemented for new services or services unregulated by Procedures. 	<ul style="list-style-type: none"> Unified modern payload standards for all fuels, markets, and domains for Transactional and Bulk Data messages.
<ul style="list-style-type: none"> As Procedural changes to a transaction cascade change to the entire schema, stakeholders must undertake non-functional updates to maintain compliance with the supported schema. For Retail Schema, versioning to the header increases implementation time and cost to the extent that AEMO extends support for the previous version (n-1). 	<ul style="list-style-type: none"> Stakeholders not impacted by a Procedural change should not be required to perform updates to their market integration solutions. 	<ul style="list-style-type: none"> IDX versioning to be managed at the business function level.
<ul style="list-style-type: none"> Difficult and costly to perform schema upgrades (e.g., parkbox to manage schema upgrades). 	<ul style="list-style-type: none"> Uninterrupted business services across the market and Procedural change. 	<ul style="list-style-type: none"> Enabled on-demand transformations of outbound content.
<ul style="list-style-type: none"> For Inquiry services, stakeholders must undertake non-functional updates despite the query parameters or results attributes remaining unchanged (e.g., applications undertaking NMID be updated with schema change). 	<ul style="list-style-type: none"> Processes consuming inquiry services that have no dependencies on new data introduced via Procedural change should not need to be updated. 	<ul style="list-style-type: none"> Inquiry services can utilise standard data exchange protocols such as GraphQL to shield consumers from changes in the underlying data source

Data Payload

Adopting business-function-specific schemas and endpoints for Retail markets offers an opportunity to unify IDX schema across all markets and domains, making them more modern and effective.

Characteristics	Option 1 Transition Retail B2B and B2M to Unified IDX Schema	Option 2 Retain aseXML schema for Retail B2B and B2M
Market	Retail B2B and B2M	Retail B2B and B2M
Definition	<ul style="list-style-type: none"> Adopt business-function-specific schemas and endpoints. Transitioning Retail B2B and B2M to modular schemas aligned with modern payload standards. Implementing unified IDX schemas across all AEMO fuels, markets, and domains. 	<ul style="list-style-type: none"> Adopt business-function-specific schemas and endpoints. Retail B2B and B2M transactions would continue using: <ul style="list-style-type: none"> aseXML, preserving industry-specific data structures. Various CSV formats embedded in aseXML for bulk data. All other markets and domains transition to a unified IDX schema aligned with modern payload standards.
Transactional Message Format	JSON	aseXML
Bulk Data Format	AEMO CSV	MDFF and other miscellaneous CSV formats.
Inquiry Services	Use a modern open-source query language such as GraphQL serviced using JSON format.	Retain aseXML query format (e.g. NMID).
Deviations from Principles of IDX		<ul style="list-style-type: none"> A unified set of Industry agreed on channels, protocols, patterns, payloads and capabilities to meet the end-to-end IDX needs across all Fuels, Markets and Domains. Modern payload standards shall be implemented for all new services or services unregulated by Procedures.
Extensibility	Changes to be built on a widely adopted standard with extensive tools, libraries, and community.	Changes continue to be built indefinitely on aseXML, a niche payload standard,.

Target State – Extension of AEMO Supplied Data Exchange Software

Pain Point	Principle	Target State Concept
<ul style="list-style-type: none"> Disparate AEMO-supplied data exchange software with unique features across markets, e.g. participantBatcher supporting NEMRetail interactions and pdrBatcher and pdrLoader suite supporting NEMWholesale interactions. AEMO data exchange software is not continuously enhanced by introducing new channels, protocols and patterns, e.g. participantBatcher is not enhanced to support data exchange via API channel. Industry feedback indicated broad support from stakeholders that AEMO-supplied data exchange software should be further extended and enhanced to deliver value and assist with Industry cost takeout. 	<ul style="list-style-type: none"> Unified AEMO-supplied data exchange software must support the proposed IDX data exchange channels, protocols and patterns across markets. 	<ul style="list-style-type: none"> Unified data exchange software must provide a mechanism to support multiple inbound & outbound data exchange patterns, channels and protocols; adhering to the agreed decision tree outcomes. Unified data exchange software must be highly configurable to meet the specific requirements of organisations utilising it, e.g. Participants must have the ability to configure the priority of outbound messages to be processed. (e.g., high-priority service orders are processed over other transaction groups). Ability to deploy the data exchange software on-prem or major cloud providers.

Notes

- Andrew Bell spoke to the Recap Target State Concepts
- AEMO noted the following questions and responses:
 - **Question:** Can we elaborate on unified AEMO-Supplied Data exchange software **Response:** AEMO responded that confirming the existing pdrBatcher/pdrLoader/Data Model concepts are a continuing part of the target state. If you are using this software you would need to upgrade pdrBatcher to the new "AEMO gateway" which is an enhanced version of pdrBatcher that adds support for the new IDX protocols/channels.
 - **Question:** Just confirming we are just defining terms and these use cases are not yet confirmed therefore are just examples? **Response:** AEMO responded with a Yes, these are examples for discussion purposes only.
 - **Question:** What do we classify as large? **Response:** AEMO responded, with regard to size, will be addressing this during the focus group conversation on decision trees.

6. Terminology and Definitions

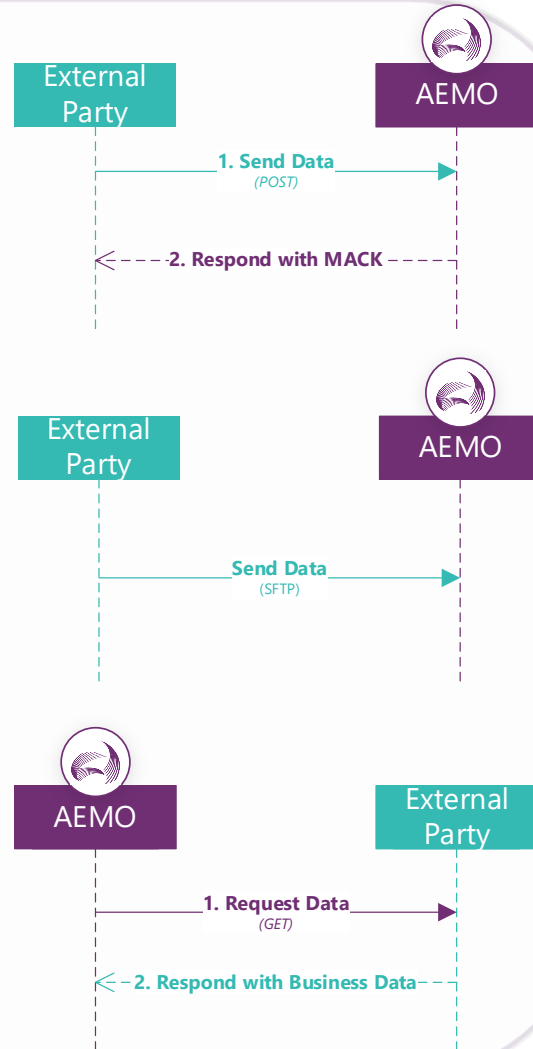
Antonio Ramos



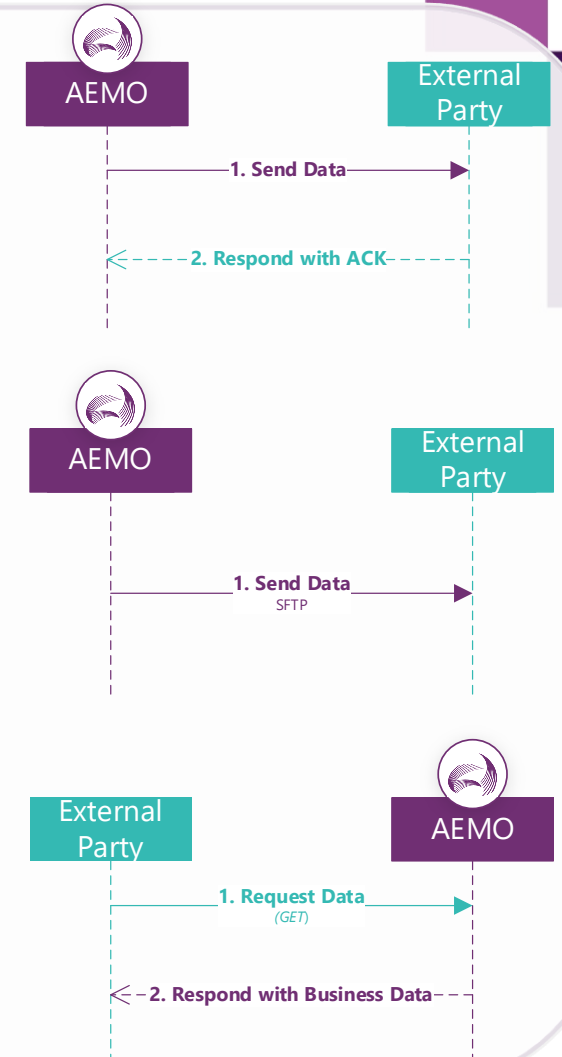
Terminology and Definitions

Data Direction: In the context of IDX, Inbound and Outbound refer to the direction of business documents from AEMO's perspective.

Inbound: AEMO is the recipient of the business document. The business document is delivered to AEMO, whether it is pushed to AEMO or pulled by AEMO from an external party through an API GET request.



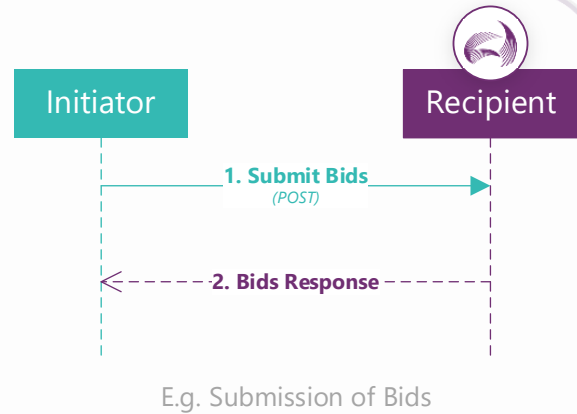
Outbound: The external party is the receiver of the business document. A business document is delivered from AEMO, whether it is pushed by AEMO or pulled by an external party through an API GET request.



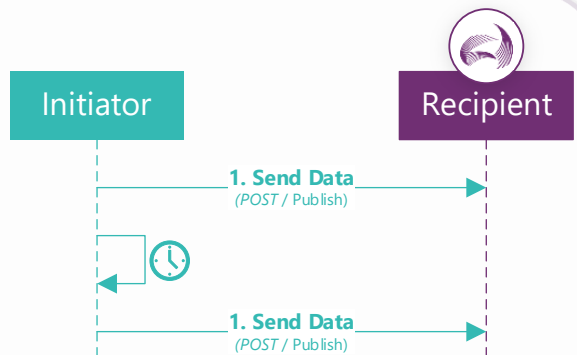
Terminology and Definitions

Message Exchange Pattern: From an IDX perspective, the message exchange patterns are at the business process level, not at the transaction exchange level.

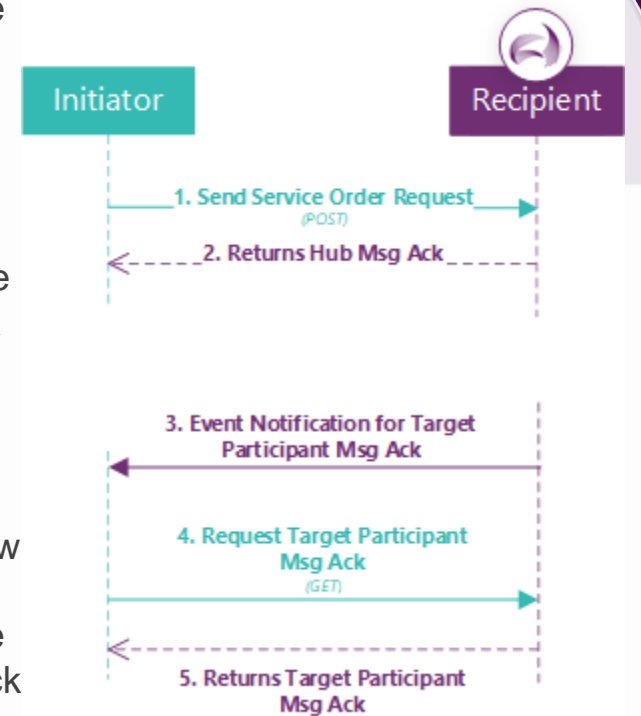
Synchronous: The initiator sends the request message and is blocked (waits) until the business document response is received. The connection between the initiator and recipient remains open during this period until the configured timeout. The recipient sends the business document response message using same connection.



Fire and Forget: The initiator sends the request message with no expectation of handling a response message. The initiator does not wait for the response in order to continue operating.



Asynchronous: The initiator sends the request message without waiting for an immediate response. After sending the request message, the connection between the initiator and recipient will be closed. The response, which could be a resulting business document, or the result of business validations will be received separately. The recipient will establish a new connection to send the response message, and the initiator will set up a callback process to handle the response.



Terminology and Definitions

Communication Channel: Medium used for the transmission of messages between systems

Channel	Description	Use Cases
RESTful API	A web-based communication channel that conforms to REST architectural principles, utilising standard HTTP methods (GET, POST, PUT, DELETE) to interact with resources. The representation of resources, available endpoints, and methods is defined in a RESTful API schema.	Submit Bids
Inquiry Service	An API-based channel that enables clients to request specific data structures using a query language. This allows clients to retrieve only the necessary data and reducing the amount of data transferred. It also shields consumers from changes in the underlying data source.	NMI Discovery
File Transfer	A file-based transfer channel designed to securely and reliably transfer large files or payloads between organisations that are too large to be sent via API (HTTP)	Large file scenarios
User Interface (UI)	A web-based portal channel, providing the capability to interact with AEMO systems, input data, receive feedback, and perform tasks.	Low Volume Interface

Notes

- Antonio Ramos spoke to the Terminology and Definitions slides
- AEMO noted the following questions and responses:
 - **Question:** The definitions didn't include anything around the Streaming or Event Notification patterns - is that because they are less settled in terms of specific implementation direction? **Response:** AEMO responded that the definitions covered the most commonly used patterns. Topics such as Streaming & Event Notification patterns (new capabilities) and the use cases/technologies to support these patterns are planned to be discussed in the Decision Tree Focus Group (streaming) & Async Focus Groups (event notification channel).
 - **Question:** How settled is GraphQL from an Inquiry Service? Will this be dependent on Apollo Federation 2 or bound to version 1 semantics ? **Response:** AEMO responded that the GraphQL guard-rails & principles: This will be covered in the Decision Tree Focus Group session, GraphQL Technical aspects: Apollo Federation 2 or binding to version 1 semantics - This will be covered in the Inquiry Services Focus Group session

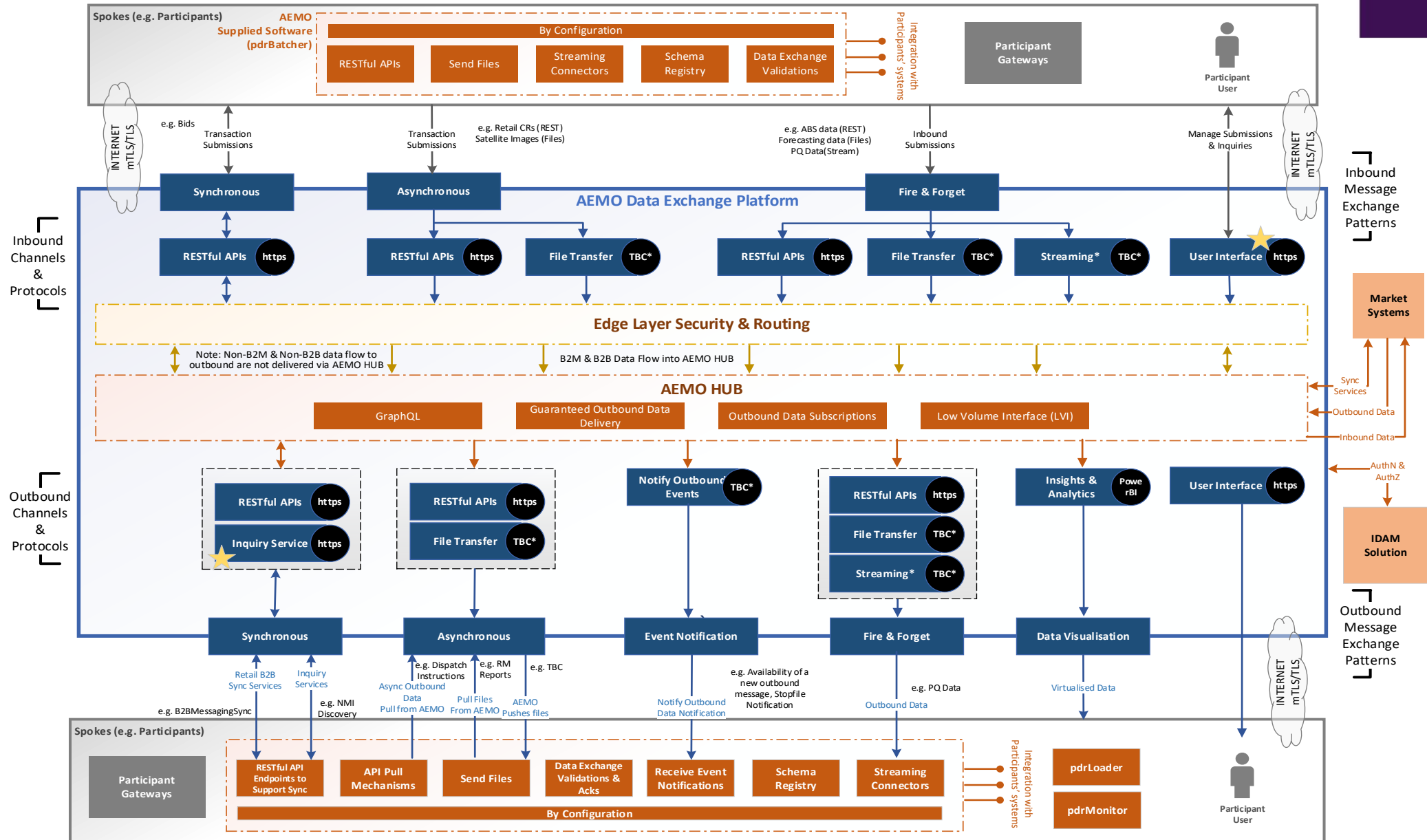
7. Updates to the Conceptual Target State Architecture



Antonio Ramos



Conceptual Target State Architecture



Notes

- Antonio Ramos spoke to the Conceptual Target State Architecture slide
- AEMO noted the following questions and responses:
 - **Question:** Should the following part of the diagram relating to the AEMO Gateway be a single box? **Response:** AEMO responded that the gateway can be considered as suite of discrete products. We are not intending to merge the existing applications into a monolith application.



7. Business Functions End Points



Sri Gundu



Business Function End Points

Business functions in the IDX target state have been developed to address key pain points identified by the industry.

Specific areas of analysis and discussion points in this section are:

- Current Endpoint related pain points identified in previous workshops with industry
- Definitions and Guidelines for IDX target state Business Function Endpoints
- Business Function API Endpoint examples – Current state vs IDX future state
- API Resources and associated payloads

Business Function Endpoints – Current Pain Points

Current state: A single API endpoint & FTP folder structures support multiple business functions. The schema that support these business functions contains transactions across multiple domains as illustrated in the example below

	Current State API Endpoint	Current State FTP Folder Structure	Problem Statement / Pain Point																																																								
Overview	<p>https://...../ws/B2BMessagingAsync/1.0/messages https://...../ws/B2BMessagingAsync/1.0/messageAcknowledgements</p> <p>Supports exchange of variety of B2B transaction groups using a single API endpoint; such as SORDs, MTRDs, CUSTs, SITEs, OWNXs</p>	<p>MSATS Participant Server</p> <ul style="list-style-type: none"> <ParticipantID> <ul style="list-style-type: none"> Inbox <i>Inbound B2B files such as SORDs, MTRDs, CUSTs, SITEs</i> Outbox <i>Outbound B2B files such as SORDs, MTRDs, CUSTs, SITEs</i> 	<p>A single Endpoint and schema implements multiple procedures (Business Functions)</p>																																																								
	<p>API endpoints & folder structure support exchange of B2B data in aseXML; schema encapsulating transactions for all B2B & B2M transactions</p>																																																										
Schema Upgrade	<p>B2B Schema Changes – Current State</p> <table border="1"> <thead> <tr> <th></th> <th>Power of Choice aseXML_r36</th> <th>Mandatory?</th> <th>Life Support Notifications aseXML_r38</th> <th>Mandatory?</th> <th>Planned Interruption Notification (PIN) aseXML_r41</th> <th>Mandatory?</th> <th>Shared Fuse One-Way Notification aseXML_r43</th> </tr> </thead> <tbody> <tr> <td>RB</td> <td>aseXML_r36</td> <td>P</td> <td>aseXML_r38</td> <td>P</td> <td>aseXML_r41</td> <td>P</td> <td>aseXML_r43</td> </tr> <tr> <td>DNSP</td> <td>aseXML_r36</td> <td>P</td> <td>aseXML_r38</td> <td>P</td> <td>aseXML_r41</td> <td>P</td> <td>aseXML_r43</td> </tr> <tr> <td>MP</td> <td colspan="2">aseXML_r36</td> <td colspan="2">n-2</td> <td colspan="2">aseXML_r41</td> <td>n-2</td> </tr> <tr> <td>MDP</td> <td colspan="2">aseXML_r36</td> <td colspan="2">n-2</td> <td colspan="2">aseXML_r41</td> <td>n-2</td> </tr> <tr> <td>MC</td> <td colspan="2">aseXML_r36</td> <td colspan="2">n-2</td> <td colspan="2">aseXML_r41</td> <td>n-2</td> </tr> <tr> <td>ENM</td> <td>aseXML_r36</td> <td>P</td> <td colspan="2">aseXML_r38</td> <td colspan="2">n-2</td> <td>aseXML_r43</td> </tr> </tbody> </table> <p>To remain Procedurally compliant, Participants with impacted business functions must move to the latest schema</p> <p>Participants with business functions unimpacted by Procedural change can delay changing their schema version, staying on n-1 until their version becomes an unsupported n-2</p>			Power of Choice aseXML_r36	Mandatory?	Life Support Notifications aseXML_r38	Mandatory?	Planned Interruption Notification (PIN) aseXML_r41	Mandatory?	Shared Fuse One-Way Notification aseXML_r43	RB	aseXML_r36	P	aseXML_r38	P	aseXML_r41	P	aseXML_r43	DNSP	aseXML_r36	P	aseXML_r38	P	aseXML_r41	P	aseXML_r43	MP	aseXML_r36		n-2		aseXML_r41		n-2	MDP	aseXML_r36		n-2		aseXML_r41		n-2	MC	aseXML_r36		n-2		aseXML_r41		n-2	ENM	aseXML_r36	P	aseXML_r38		n-2		aseXML_r43	<ol style="list-style-type: none"> 1) If a participant is not required to subscribe to the procedural changes, they are still required to go through the mandatory schema upgrade 2) If a participant's back-end systems are schema bound, then they are impacted by schema changes that don't relate to their transactional needs in the market 3) Throttling is applied at the B2B messaging layer and not the individual transaction groups, causing inefficient flow control management for high priority transactions across transaction groups.
	Power of Choice aseXML_r36	Mandatory?	Life Support Notifications aseXML_r38	Mandatory?	Planned Interruption Notification (PIN) aseXML_r41	Mandatory?	Shared Fuse One-Way Notification aseXML_r43																																																				
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ENM	aseXML_r36	P	aseXML_r38		n-2		aseXML_r43																																																				
Flow Control	<p>Flow control (throttling) is applied @ the B2B message exchange level and not @ the transaction group level</p>	<p>Flow control (round robin counts) is applied against all B2B messages and not @ the transaction group level</p>																																																									

Business Functions – Definition and Guidelines

Definition

- A group of related transactions that share key resources

Guidelines

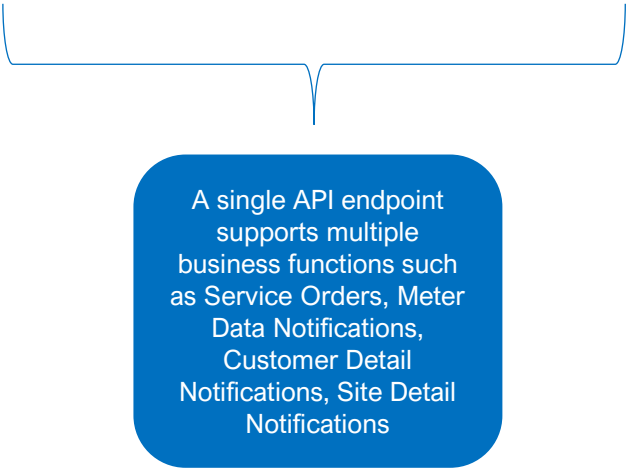


- Can be defined by a Single Procedure (or)
- Can be defined by MMS Data Model package (or)
- Not mix unrelated business transactions under a single business function
- Each Business function will have one or more discrete services
- Can span markets when leveraging common resource /procedure
- The resources under Business Function can contain technical and business transactions (e.g.: msg acks)

Benefits

- Protects Participants not impacted by the procedural change .
- Provides Flexibility for Participants to manage connections based on the Business process.
- Throttling can be applied based on interface requirements at a more specific level.
- Additional flexibility to enable transition and future implementation of services .
- Flexibility in implementing additional security measures like payload encryption can be applied based on the data classification-based security requirements .

Business Function Endpoints – Example

This example illustrates how the current state API endpoints are to be redefined using the target state business function guidelines. An example of B2BMessagingAsync is used. For illustration purposes: Transaction Group is assumed as a Business Function and four of the B2B Transaction groups are represented here

Current State API Endpoint	IDX API Endpoint Definition Guidelines	IDX Large File Share Guidelines
<p data-bbox="104 504 718 568">https://...../ws/B2BMessagingAsync/1.0/<resources></p>  <p data-bbox="231 743 593 1053">A single API endpoint supports multiple business functions such as Service Orders, Meter Data Notifications, Customer Detail Notifications, Site Detail Notifications</p>	<p data-bbox="868 504 1485 568">https://...../NEMRetail/serviceOrder/v1/<resources></p> <p data-bbox="868 601 1485 665">https://...../NEMRetail/meterDataNotifications/v1/<resources></p> <p data-bbox="868 705 1485 769">https://...../NEMRetail/customerDetailNotifications/v1/<resources></p> <p data-bbox="868 809 1485 873">https://...../NEMRetail/siteDetailNotifications/v1/<resources></p>  <p data-bbox="996 996 1358 1125">API endpoints are defined for the identified business functions</p> <p data-bbox="812 1158 1454 1203">Note: API URL/URI Naming Standards (e.g. versioning, camelCases) will be published at a later stage</p>	 <ul style="list-style-type: none"> Folder: NEMRetail <ul style="list-style-type: none"> Folder: <ParticipantID> <ul style="list-style-type: none"> Folder: Inbox Folder: <Business Function 1> Folder: <Business Function n> Folder: Outbox <ul style="list-style-type: none"> Folder: <Business Function 1> Folder: <Business Function n>

The next section covers the guidelines for defining the <resources> of an API endpoint and the schemas/payload types that the business function endpoints must support

Business Function API Endpoints – Resources and the associated payloads

An API end point may have one or more resources. This section illustrates the guidelines for defining the <resources> of an API endpoint and the schemas associated to support the business function. Two options were considered, and these options are illustrated using an example of ‘Energy FCAS Bids’ as a business function.

Guiding principle: The schema(s) are to be defined at the business function level. Schema(s) do not implement transactions belonging to multiple business functions. This will allow the change impact to a limited number of Participants who consume the impacted business function and doesn’t require all the Participants to go through a mandatory schema upgrade (as explained in the problem statement slide)

Market: NEM Wholesale
Business Function: Energy & FCAS Bids
Business Function API: <https://.../NEMWholesale/energyFCASBids/ v1/ <resources>>
Supported functionalities required:

Use Case	API Method	Payload Format
Retrieve a submitted Bid	GET	JSON
Retrieve the list of bids for the input criteria	GET	JSON
Retrieve the details of a submission	GET	JSON
Retrieve the list of submissions for the input criteria	GET	JSON
Submit a bid	POST	JSON
Retrieve private outbound reports	GET	AEMOCSV
Retrieve public outbound reports	GET	AEMOCSV

For illustration purposes it is assumed that 1) outbound reports will be delivered in AEMOCSV format 2) outbound reports will be pulled from AEMO. These details will be consulted and confirmed with the industry as part of next few WG/FG sessions & DP2 (Decision Point 2)

Business Function API Endpoint – Resources – Summary Options Analysis

During the analysis performed on Business Endpoints AEMO identified 2 potential options for how to implement schemas on an API Endpoint. AEMO wants to review these options with the MITEWG and perform a poll to determine the preferred option.

Option A: Implementing a single schema for each payload type (e.g. JSON, AEMOCSV)

Use Case	API Method	API Definition	Proposed Payload Schema
Retrieve a submitted Bid	GET	/NEMWholesale/energyFCASBids/v1/transactions/bids/<refid>	JSON1
Retrieve list of submissions for the input criteria	POST	/NEMWholesale/energyFCASBids/v1/transactions/submissions	JSON1

In this option a business function must only support a distinct schema for each payload type. Multiple transactions belonging to a business function, sharing the same payload type are to be bundled under one schema.

Option B: Implementing multiple schemas for each payload type (e.g. JSON, AEMOCSV)

Use Case	API Method	API Definition	Proposed Payload Schema
Retrieve a submitted Bid	GET	/NEMWholesale/energyFCASBids/v1/bids/<refid>	JSON1
Retrieve list of submissions for the input criteria	GET	/NEMWholesale/energyFCASBids/v1/submissions	JSON2

In this option the implementation of a schema is specific to each of the sub-functions of a Business Function.

Subsequent slides provide these option details

Business Function API Endpoint – Resources – Option A

Guiding Principle: A business function must only support a distinct schema for each payload type. Multiple transactions belonging to a business function and sharing the same payload type are bundled under one schema.

Market: NEM Wholesale

Business Function: Energy & FCAS Bids

Business Function API: <https://.../NEMWholesale/v1/energyFCASBids/<resource group>/<resources>>

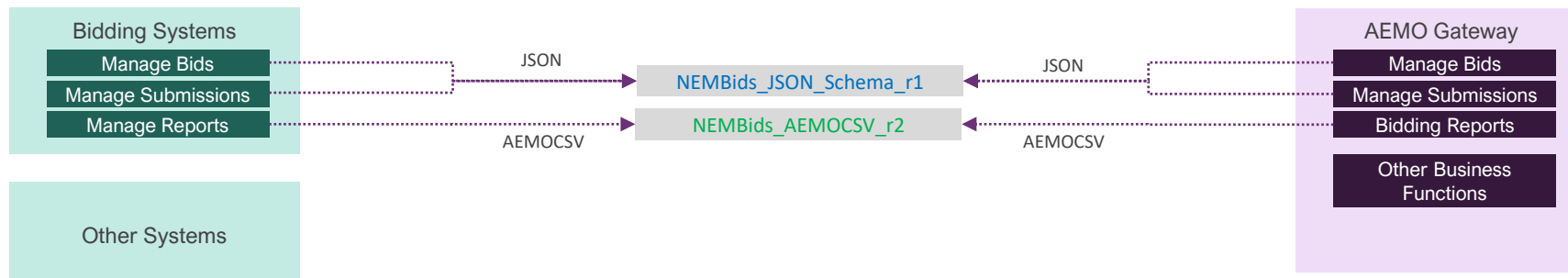
Supported functionalities required:

Use Case	API Method	API Definition	Proposed Payload Format
Retrieve a submitted Bid	GET	/NEMWholesale/energyFCASBids/v1/transactions/bids/<refid>	JSON
Submit a bid	POST	/NEMWholesale/energyFCASBids/v1/transactions/bids	JSON
Retrieve list of bids for the input criteria	GET	/NEMWholesale/energyFCASBids/v1/transactions/bids	JSON
Retrieve details of a submission	GET	/NEMWholesale/energyFCASBids/v1/transactions/submissions/<refid>	JSON
Retrieve list of submissions for the input criteria	GET	/NEMWholesale/energyFCASBids/v1/transactions/submissions	JSON
Retrieve private outbound reports	GET	/NEMWholesale/energyFCASBids/v1/reports/private	AEMOCSV
Retrieve public outbound reports	GET	/NEMWholesale/energyFCASBids/v1/reports/public	AEMOCSV

NEMBids_JSON_Schema_r1

NEMBids_AEMOCSV_r2

How does this option impact AEMO & Participants?



AEMO & Participants' systems manage distinct schemas for each payload types for a business function. Schema validations are applied based on the <resource group> under the business function

Business Function API Endpoint – Resources – Option A

How are schema versions managed within a business function? In the example below; a change is required to ‘submissions’ sub-function where a new attribute is added to schema of that transaction.

Before the Schema Change:

Use Case	API Method	API Definition	Proposed Payload Format	Schema Version
Retrieve a submitted Bid	GET	/NEMWholesale/energyFCASBids/v1/transactions/bids/<refid>	JSON	
Retrieve list of bids for the input criteria	GET	/NEMWholesale/energyFCASBids/v1/transactions/bids	JSON	
Submit a bid	POST	/NEMWholesale/energyFCASBids/v1/transactions/bids	JSON	NEMBids_JSON_Schema_r1
Retrieve details of a submission	GET	/NEMWholesale/energyFCASBids/v1/transactions/submissions/<refid>	JSON	
Retrieve list of submissions for the input criteria	GET	/NEMWholesale/energyFCASBids/v1/transactions/submissions	JSON	
Retrieve private outbound reports	GET	/NEMWholesale/energyFCASBids/v1/reports/private	AEMOCSV	NEMBids_AEMOCSV_r1
Retrieve public outbound reports	GET	/NEMWholesale/energyFCASBids/v1/reports/public	AEMOCSV	2

After the Schema Change (e.g. Add a new attribute to ‘submissions’ sub-function):

Use Case	API Method	API Definition	Payload Format	Schema Version
Retrieve a submitted Bid	GET	/NEMWholesale/energyFCASBids/v1/transactions/bids/<refid>	JSON	
Retrieve list of bids for the input criteria	GET	/NEMWholesale/energyFCASBids/v1/transactions/bids	JSON	
Submit a bid	POST	/NEMWholesale/energyFCASBids/v1/transactions/bids	JSON	NEMBids_JSON_Schema_r2
Retrieve details of a submission	GET	/NEMWholesale/energyFCASBids/v1/transactions/submissions/<refid>	JSON	
Retrieve list of submissions for the input criteria	GET	/NEMWholesale/energyFCASBids/v1/transactions/submissions	JSON	
Retrieve private outbound reports	GET	/NEMWholesale/energyFCASBids/v1/reports/private	AEMOCSV	NEMBids_AEMOCSV_r2
Retrieve public outbound reports	GET	/NEMWholesale/energyFCASBids/v1/reports/public	AEMOCSV	

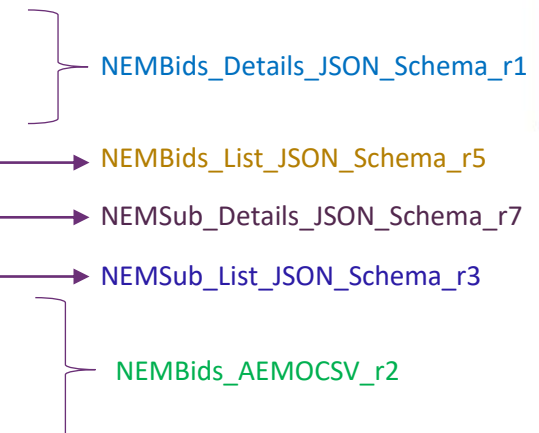
Changes to the schema of ‘submissions’ sub-function will require next version of the business function schema to be delivered. In this example; change of schema will also impact other sub-functions such as ‘bids’. However, such a **schema change is limited to the Participants consuming energyFCASBids business function only** (and not all Participants). Also, this option allows the definition of base object (within the schema) which is common to all sub-functions under a business function. The base object can be inherited to schemas of multiple transactions within the business function; **efficiently managing the schemas within a business function.**

Business Function API Endpoint – Resources – Option B

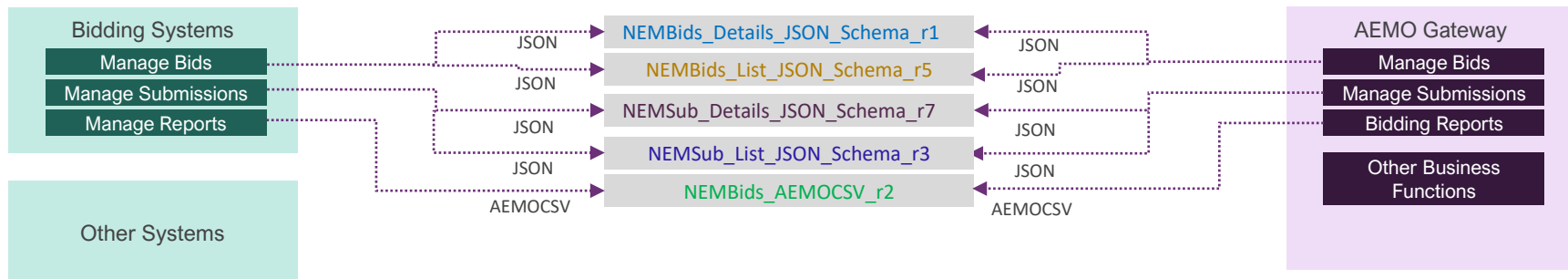
Guiding Principle: Implement schemas specific to each of the sub-functions of a Business Function.

Market: NEM Wholesale
Business Function: Energy & FCAS Bids
Business Function API: <https://.../NEMWholesale/v1/energyFCASBids/<resources>>
Supported functionalities required:

Use Case	API Method	API Definition	Proposed Payload Format
Retrieve a submitted Bid	GET	/NEMWholesale/energyFCASBids/v1/bids/<refid>	JSON
Submit a bid	POST	/NEMWholesale/energyFCASBids/v1//bids	JSON
Retrieve list of bids for the input criteria	GET	/NEMWholesale/energyFCASBids/v1/bids	JSON
Retrieve details of a submission	GET	/NEMWholesale/energyFCASBids/v1/submissions/<refid>	JSON
Retrieve list of submissions for the input criteria	GET	/NEMWholesale/energyFCASBids/v1/submissions	JSON
Retrieve private outbound reports	GET	/NEMWholesale/energyFCASBids/v1/privateReports	AEMOCSV
Retrieve public outbound reports	GET	/NEMWholesale/energyFCASBids/v1/publicReports	AEMOCSV



How does this option impact AEMO & Participants?



AEMO & Participants' systems must manage schema @ the sub-function level for a given business function. The schema are to be applied based on the entire URI of the API endpoint

Business Function API Endpoint – Resources – Option B

How are schema versions managed within a business function? In the example below; a change is required to ‘submissions’ sub-function where a new attribute is added to schema of that transaction.

Before the Schema Change:

Use Case	API Method	API Definition	Payload Format	Schema Version
Retrieve a submitted Bid	GET	/NEMWholesale/energyFCASBids/v1/bids/bids/<refid>	JSON	NEMBids_Details_JSON_Schema_r1
Retrieve list of bids for the input criteria	GET	/NEMWholesale/v1/energyFCASBids/v1/bids/bids	JSON	NEMBids_List_JSON_Schema_r5
Submit a bid	POST	/NEMWholesale/v1/energyFCASBids/v1/bids/bids	JSON	NEMSub_Details_JSON_Schema_r7
Retrieve details of a submission	GET	/NEMWholesale/v1/energyFCASBids/v1/bids/submissions/<refid>	JSON	NEMSub_List_JSON_Schema_r3
Retrieve list of submissions for the input criteria	GET	/NEMWholesale/v1/energyFCASBids/v1/bids/submissions	JSON	NEMBids_AEMOCSV_r2
Retrieve private outbound reports	GET	/NEMWholesale/v1/energyFCASBids/v1/reports/private	AEMOCSV	
Retrieve public outbound reports	GET	/NEMWholesale/v1/energyFCASBids/v1/reports/public	AEMOCSV	
















After the Schema Change (e.g. Add a new attribute to ‘submissions’ sub-function):

Use Case	API Method	API Definition	Payload Format	Schema Version
Retrieve a submitted Bid	GET	/NEMWholesale/energyFCASBids/v1/bids/bids/<refid>	JSON	NEMBids_Details_JSON_Schema_r1
Retrieve list of bids for the input criteria	GET	/NEMWholesale/energyFCASBids/v1/bids/bids	JSON	NEMBids_List_JSON_Schema_r5
Submit a bid	POST	/NEMWholesale/energyFCASBids/v1/bids/bids	JSON	NEMSub_Details_JSON_Schema_r7
Retrieve details of a submission	GET	/NEMWholesale/energyFCASBids/v1/bids/submissions/<refid>	JSON	NEMSub_List_JSON_Schema_r4
Retrieve list of submissions for the input criteria	GET	/NEMWholesale/energyFCASBids/v1/bids/submissions	JSON	NEMBids_AEMOCSV_r2
Retrieve private outbound reports	GET	/NEMWholesale/energyFCASBids/v1/reports/private	AEMOCSV	
Retrieve public outbound reports	GET	/NEMWholesale/energyFCASBids/v1/reports/public	AEMOCSV	

Changes to the schema of ‘submissions’ will require next version of the sub-function schema to be delivered. In this example; **change of schema will only impact the consumers of a particular sub-function within a business function** and the schema of other sub-functions are not impacted. However, multiple schemas and versions must be managed for a given business function. If a base schema @ the business function level is inherited to the sub-functions, it becomes difficult to manage the versions and sync the changes to multiple sub-functions within a business function; thereby making the **schema change management process very cumbersome.**

Business Function API Endpoint – Options Comparison



Criteria	Current State	Target State Option A	Target State Option B
Minimises mandatory schema changes for Participants who do not consume the impacted business function			
Localises schema change to a specific sub-function of a business function when changes are introduced to a specific transaction within a business function			
Minimises the overhead of maintaining multiple schemas and versions within a business function; thereby improves operational efficiency			
Efficient management of schemas for a business function e.g. leveraging a base schema that can be inherited into sub-functions under a business function			
AEMO & Participants' system changes (integration layer and downstream/upstream applications) to effectively apply schema validations in run time @ the business function level			



AEMO is requesting Participants to share their feedback on the target state guidelines to define the Business Function API endpoints (i.e. Participants' preference on the above options). AEMO is also seeking the Participants to share their views on alternate options that AEMO must consider.

Business Function - API Endpoint definition options Poll



AEMO seeks feedback on the preferred option based on the details provided today:

- **Option A** – Implementing a single schema for each payload type
- **Option B** – Implementing multiple schemas for each payload type
- **Unsure**, after engaging internal stakeholders I will contact AEMO within the next week with my preference

AEMO will run a Poll and review the results:

Notes

- Sri Gundu spoke to the Business Function Endpoint slides
- AEMO noted the following questions and responses:
 - **Question:** can this endpoint go down to the next level? **Response:** Yes they can, but this is a post Decision Point 2 discussion around Business process and Transition
 - **Question:** XML already has Transaction Version. Has consideration been given to use this instead of the Schema version? Why is it not being used? **Response:** AEMO responded stating that irrespective of transaction version, if a change is made to the Schema participants will need to adopt the new schema, in the *current* state for all business functions the schema is used for, in the *future* state just for the specific business function endpoint the schema is applied to.
 - **Question:** Will it be possible to share how the implementation of option A / B will be for NEMretail? or is it just applicable for wholesale? **Response:** AEMO responded that the examples provided were for wholesale but this also applies for NEM. **ACTION:** AEMO to create a slide to demonstrate the NEMRetail use case for both Option A and Option B.
 - **ACTION:** Participants asked if AEMO can provide a link to the AEMO Gateway Software

[Link to AEMO Gateway Software](#)

8. General Business and Next Steps



NEMReform@aemo.com.au



[NEM Reform Program Consultative Forum](#)



General Business and Next Steps

MITE Working Group Forward Plan		
Purpose		Timing
Archiving	IDX <ul style="list-style-type: none"> Review Recommendations from the IDX Decision Tree focus group if available Industry requirements for “Archiving” 	2 October
“Sync” Pattern & “Fire & Forget” Pattern	IDX <ul style="list-style-type: none"> Review Recommendations from the IDX Decision Tree focus group if available Industry requirements for “Archiving” 	30 October

Focus Group Forward Plan		
Purpose		Timing
Deep Dive Focus Group	IDX <ul style="list-style-type: none"> Data Exchange Decision Tree 	17 September
Deep Dive Focus Group	IDX <ul style="list-style-type: none"> Async Pattern Event Notifications 	9 October

For those organisations who voted to provide their preference after engaging internal stakeholders AEMO requests that this be provided via email by the 11th of September. AEMO will collate these responses and share with the MITEWG on the 2nd of October.



If you have any feedback to share on the topics presented today, please send us through to NEMReform@aemo.com.au.





For more information visit

aemo.com.au

Appendix A

AEMO Competition Law - Meeting Protocol



AEMO Competition Law Meeting Protocol

AEMO is committed to complying with all applicable laws, including the Competition and Consumer Act 2010 (CCA). In any dealings with AEMO, all participants agree to adhere to the CCA at all times and to comply with appropriate protocols where required to do so.

AEMO has developed meeting protocols to support compliance with the CCA in working groups and other forums with energy stakeholders. Before attending, participants should confirm the application of the appropriate meeting protocol.

To access the full protocol at AEMO's website, visit: <https://aemo.com.au/en/consultations/industry-forums-and-working-groups>

Appendix B

Upcoming Working Group and Focus Group Topics



IDX MITE Working Group Session “Archiving”

The objective of this working group session is to discuss the high-level overview of target state archiving processes.

Message archival discussion points:

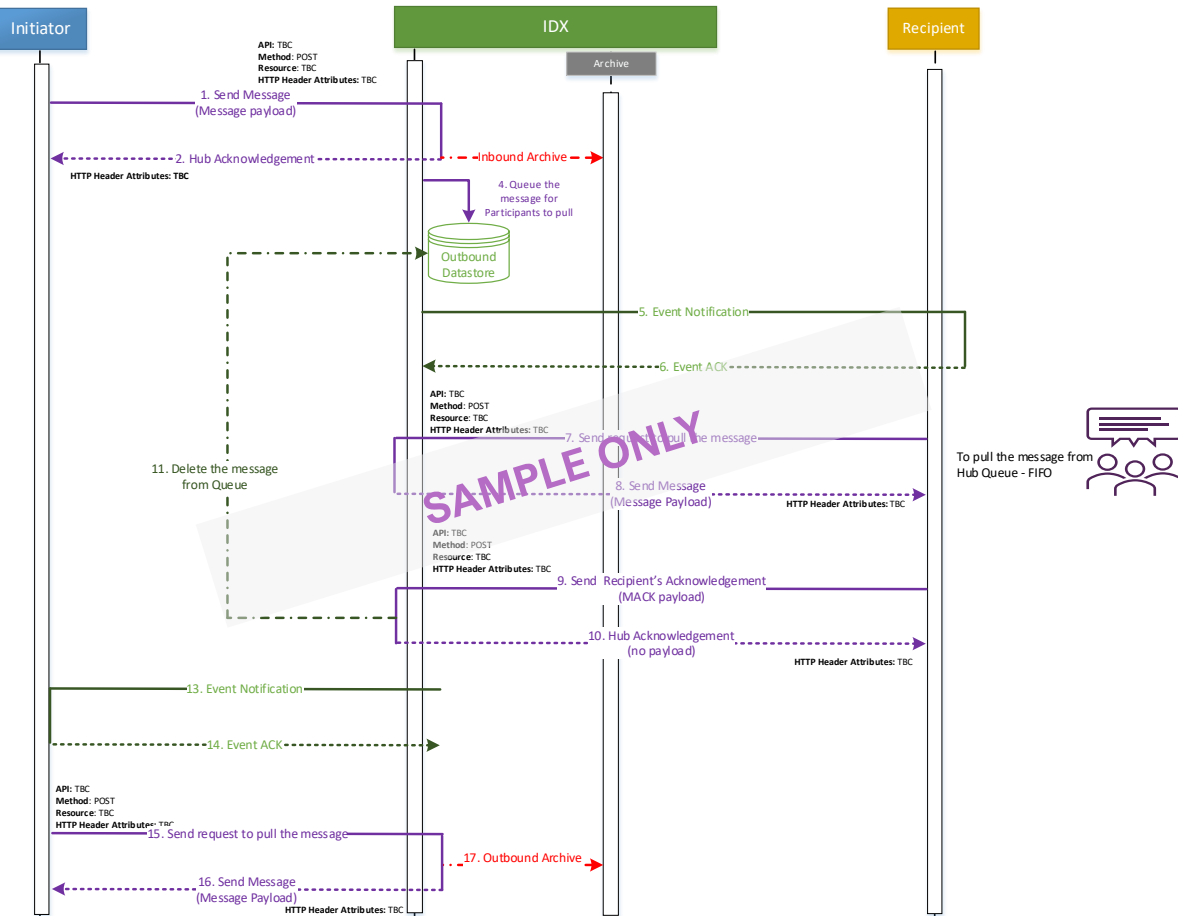
- Archive Rules for **Inbound** and **Outbound** archive
- Access to the Archive and other archive tools:
 - Day Zips
 - Consolidated Archive
 - Retention Periods for Archive
 - Existing and Future state access to Archive

Audience Skill Set

- Technical Leads / Gateway / Support teams
- Integration Architecture Teams (Market Interface Specific)

Topics for discussion

- High level overview of target state archiving solution
- Current use cases (Day zip etc) for archiving solution across NEM Retail & NEM Wholesale
- Drafting requirements/use cases for target state archiving solution for NEM Retail & NEM Wholesale.



This working group discussion will be relevant to all stakeholders who participate in exchanging data between AEMO and energy stakeholders

IDX Focus Group: Decisions Trees

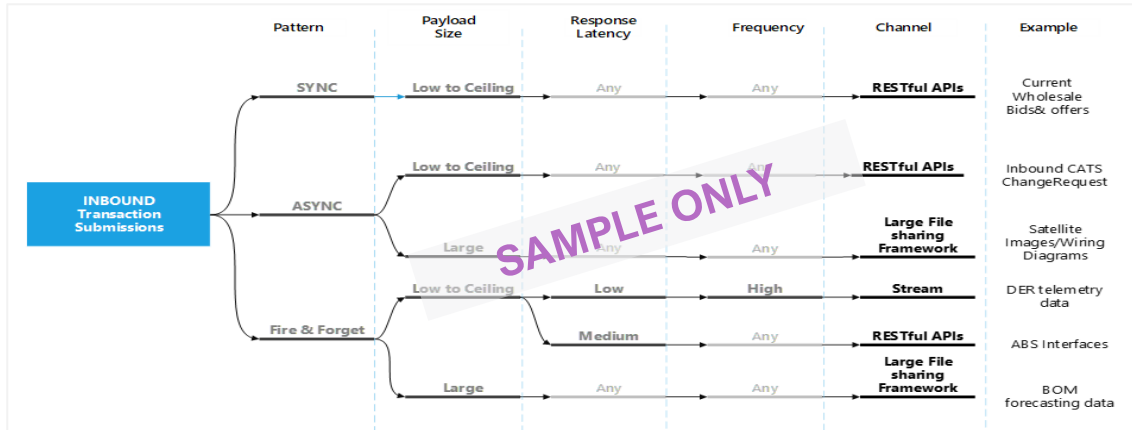
The objective of this focus group meeting is to assess the principles and attributes / parameters that contribute to the development of proposed Decision Trees.

- A Decision Tree is an artefact that guides AEMO and Industry through choosing an appropriate integration channel (e.g. APIs) and protocols (e.g. https) for a given use case; aligning to the following target state principle agreed in the business case phase – *“For each use case, a single channel and protocol is to be offered”*
- Please refer to the Target state pack: [Target State Proposal for Technical Focus Groups \(aemo.com.au\)](https://aemo.com.au) (slide 44)



Audience Skill Set for Focus Group Discussion

- Technical Leads
- Integration Architecture Teams (Market Interface Specific)



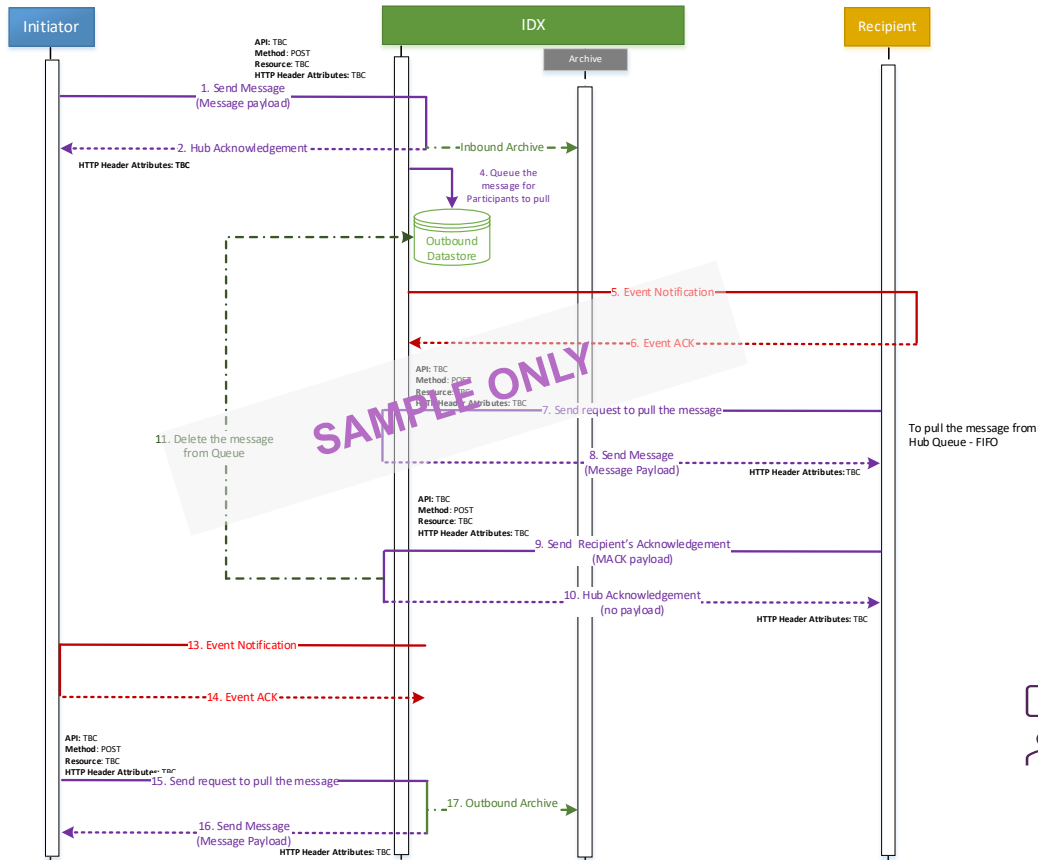
Topics for discussion

- Objective of developing ‘Decision Trees’
- Principles used to develop Decision Trees
- Number/ Categories of Decision Trees to be developed (e.g. Decision Tree for Inbound, Outbound, Payload formats etc)
- Attributes or parameters that contribute to the selection of a channel e.g. selecting the channel (e.g. APIs) based on parameters such as size of the payload, response time to the request
- Decision Tree for each of the categories identified

This Focus group discussion will be relevant to all stakeholders who participate in exchanging data between AEMO and energy stakeholders

IDX Focus Group Session “Async and Event Notifications”

The objective of this focus group is to review an End to End Asynchronous pattern (including events) and discuss technical topics related to this type of data exchange.



Asynchronous data exchange patterns are used for business processes that require a multi-legged approach to facilitate a data exchange.

Asynchronous Inbound discussion points:

- Push data to IDX
- API, Method and Resource
- HTTP Header attributes
- Acknowledgements

Asynchronous Outbound discussion points:

- Pull data from IDX
- API, Method and Resource
- HTTP Header attributes
- Acknowledgements

Event Notification is the interface delivery pattern presented in the target state which delivers events such as outbound message notification and other event types.

Event notification Discussion points:

- Event Interface, Event Payload
- Event Acknowledgements, Event Optionality



Audience Skill Set for Focus Group Discussion

- Technical Leads
- Integration Architecture Teams (Market Interface Specific)

Topics for Discussion

- A draft end to end business use case for asynchronous flow
- Sequence diagram demonstrating the Asynchronous pattern (including events) to support the end to end business case.
- Interface requirements for Asynchronous pattern (including events).

This Focus group discussion will be relevant to all stakeholders who participate in exchanging data between AEMO and energy stakeholders

Appendix C

Worked examples



Business Function API Endpoints – NEM Retail examples

Market: NEM Retail

Business Function: serviceOrders

Business Function API: <https://.../NEMRetail/serviceOrders/v1/> <resources>

Supported functionalities required:

Use Case	API Method	API Definition	Schema Version
Submit a service order message	POST	NEMRetail/serviceOrders/v1/transactions/messages	SORD schema version*
Retrieve a service order message	GET	NEMRetail/serviceOrders/v1/transactions/messages	SORD schema version*
Submit a service order MACK	POST	NEMRetail/serviceOrders/v1/transactions/MACK	SORD schema version*
Retrieve a service order MACK	GET	NEMRetail/serviceOrders/v1/transactions/MACK	SORD schema version*

Market: NEM Retail

Business Function: NMIDiscovery

Business Function API: <https://.../NEMRetail/NMIDiscovery/v1/> <resources>

Supported functionalities required:

Use Case	API Method	API Definition	Schema Version
Submit NMID Async Message - Request	POST	NEMRetail/NMIDiscovery/v1/transactions/messages	NMID schema version*
Retrieve NMID Async Message - Outbound	GET	NEMRetail/NMIDiscovery/v1/transactions/messages	NMID schema version*
Submit NMID Async MACK - Outbound MACK	POST	NEMRetail/NMIDiscovery/v1/transactions/MACK	NMID schema version*
Submit NMID Synchronous Message - Request & Response		NEMRetail/NMIDiscovery/v1/inquiry/messages	NMID GraphQL schema version

*Regarding payload format version , it could be JSON schema version or SORD specific aseXML schema version based on the outcomes from DP2 (Transition)