Market Interface Technology Enhancements Working Group (MITE WG)

Wednesday 29 January 2025

(1:00pm to 4:30pm AEDT)

This meeting will be recorded for minute taking purposes.

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 cover:

- Foundation "HOW" Validation:
  - Approach to proving Foundation capability
  - Foundation "HOW" – MVP Use Cases (R1)
  - Foundation "HOW" – Foundation Use Cases (R2)
  - Decision Tree Mapping
- Decision Point 2 "WHAT" - criteria
- Focus Group playback IDX: Async Pattern

The ask of participants:

- Invite and share this pack with your technical experts who will support the MITE WG process
- Review the approach to proving Foundation capability, the proposed Use Cases to support this and the criteria for Decision Point 2
- Provide your inputs on the outcomes, polls and results as presented
- Engage in the workshop – questions are welcome

Link to the target state pack established in consultation with the industry stakeholders

Agenda

#	Indicative Timings	Topic	Presenter
1	1:00pm-1:05pm	Welcome	Blaine Miner
2	1:05pm-1:35pm	Approach to proving Foundation Capabilities	Andrew Bell
3a	1:35pm-1:55pm	Foundation Criteria “HOW” – BPQD (R1)	Andrew Bell
3b	1:55pm-2:45pm	Foundation Criteria “HOW” – Foundation (R2)	Andrew Bell
4	2:45pm-3:05pm	Decision Tree Mapping – Current Business Scenarios	Sri Gundu
	3:05pm-3:15pm	Break	
5	3:15pm-3:45pm	Decision Point 2 criteria “WHAT”	Andrew Bell
6	3:45pm-4:15pm	Focus Group playback IDX: Async Pattern	Sri Gundu
7	4:15pm-4:45pm	Focus Group playback IDX: Flow Control	Sri Gundu
8	4:15pm-4:45pm	Future Topics	Blaine Miner
9	4:15pm-4:50pm	Forward Plan	Blaine Miner
10	4:55pm-5:00pm	General Business and Next Steps	Blaine Miner
	Appendix	Appendix A: AEMO Competition Law - Meeting Protocol Appendix B: Proposed Use Cases, test services and pattern coverage	

Note: While the intent is to cover all agenda items, in the event that more time is needed to engage on Foundation and Decision Point 2 criteria than allowed in the agenda we may defer Async / part of Async to a future session.

2. Approach to Proving Foundation Capabilities

Andrew Bell

Approach to defining measure to validate foundation criteria (the "HOW")

AEMO proposes to collaboratively establish the measures needed to confirm the Foundation capabilities and DP2

Session 1 (30th Oct)	Intervening workshops	Session 2 (today)	Session 3	Design / development / testing / measurement	Resulting outputs
Define criteria for validation of Foundation (the 'WHAT')		Define use cases to satisfy Foundation criteria (the 'HOW')		Delivery of capability and execution (testing) to provide measures for Foundation	Industry test strategy and reports, AEMO test reports
Provide overview of criteria for DP2 (over and above what is required for Foundation)	Take inputs from other FG and WG sessions e.g. payloads, large file pattern, etc.	Define criteria for validation of DP2 (the 'WHAT')	Define measures to satisfy DP2 criteria (the 'HOW')	Delivery of capability and execution (testing) to provide measures for DP2	Refined inputs to DP2 business case, additional testing as required

- Foundation 'How': In this session 2, we are seeking to define the Use Cases to validate the criteria identified (the 'WHAT') in session 1.
- DP2 'What': In this session 2 we will define the criteria needed for DP2 over and above Foundation. While we will endeavour to capture any measures mentioned today regarding, we ask members to focus on the definition of the use case criteria themselves.

Foundation use case approach

AEMO is seeking to collaborate with industry to align on a set of use cases to validate the Foundation criteria defined in session 1.

In the coming slides we will cover:

- A recap of the outcomes of the criteria workshop
- Proposed principles and assumption to guide selection of use cases
- Anticipated progressive deployment of capability
- Proposed mapping of capability to use case topics
- Strawman use cases to support those topics
- The approach to future capabilities not deployed in foundation

Re-cap Foundation Criteria "What"

In a previous MITE WG session on the 30th Oct, we collaborated to define the criteria that will validate the IDX Foundation (the 'WHAT'). Today, we follow up on the next steps on the foundation criteria where we now aim to develop the measures (the 'HOW').

Here's a re-cap on what we previously discussed;

Patterns

Ten industry patterns have been proposed for IDX:

- Sync API
- Async API Inbound
- Async API Outbound
- Async Large File Inbound
- Async Large File Outbound
- Fire & Forget API Outbound
- Fire & Forget Large File Outbound
- Inquiry Flat
- Inquiry Dynamic (Flexible)
- Event Notifications

Capabilities

A number of criteria to cover common IDX capabilities as well as specific IDX capabilities including:

- IDAM
- Policies
- Archiving
- Non-repudiation
- Logging and monitoring
- Payloads
- Fan in and out
- Flow control

Non-functionals

A number of non-functional criteria were put forward and further extended following feedback post the working group to include:

- Performance
- Availability
- Scalability
- Security
- Connectivity
- Error handling

Non-matrix criteria

Key non matrix criteria included:

- Technical standards – including specifications and decision tree for business functions
- Governance – including standing up a governance body and working groups.

Foundation HOW: Proposed Principles

- Each Use Case may validate multiple criteria and capabilities; Use Cases will be selected on the basis of complimentary coverage to validate all criteria.

- In proving out foundation capabilities we are not seeking to define nor validate end state (DP2) services; AEMO propose to align with industry on the measures to verify capability rather than the services themselves.

- AEMO will publish summary results from use case testing of capabilities to demonstrate validation of criteria and summarise results from participant testing into a consolidated report.

- Use Cases deployed into Pre-Prod are to be rolled back after the trial period; transition to production will only be considered under DP2.

- AEMO will use the AEMO gateway software for any testing performed within AEMO to simulate participant interactions and enable validation of the gateway software.

Considering the above proposed principles, are these reasonable?

Foundation HOW: Assumptions

- Participant testing will occur in Pre-Production – there is no need for an additional industry sandbox.

- IDX services that are tested will leverage the new IDAM, participants will need to establish the services in the new IDAM platform to complete testing.

- Industry testing/participation in foundation testing will be optional; AEMO will need to provide responder equivalent capability to support B2B scenarios during testing and may need to simulate participant testing for some use cases.

- The Decision tree will be applied to legacy services to define new IDX services noting this is ahead of DP2, these definitions may be revised through DP2.

- Whilst we are designing for the energy market, the initial focus of IDX Foundation is the NEM market noting the significant majority of capability is common to all markets. Criteria for functions only identified as required by other markets will be included where practical to do so.

Use case approach

- A summary view of IDX criteria has been developed to group criteria and assist in verifying coverage.
- Scenarios have been identified and proposed to cover key criteria with a view to maximising coverage while minimising the total aggregate number of scenarios.
- Some scenarios may require more than one use case to cater for specific variants in functionality or to provide sufficient certainty on criteria.
- AEMO has identified a strawman option for each use case to validate with industry and is seeking to collaborate with industry to assess the following:
  - Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
  - Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
  - Are there alternate use cases / approaches industry would like to propose?

IDX Criteria - Summary View

Note: Participants may opt to use their own gateways instead of AEMO Gateway Software

Performance, reliability, error handling etc

Supported deployment options (VM, container)

Non Functionals

Deployment Options

AEMO Gateway Software

- APIs
- Large File Share
- Inquiry
- Common Data Exchange Capabilities
- Manage Payload & Formats
- Xform Framework
- Manifest, Recon & Retrigger
- Inbound Message Processing
- Outbound Message Processing
- Event Notifications
- Flow Control
- Participant System Integration
- Configuration & Priority Management
- Legacy Channels & Protocols

Gateway Enabled capabilities to support IDX data exchange for identified business services

IDX Platform Non Functionals

Direction

- Inbound
- Outbound

Direction of the business document

Channels

- APIs
- Large Files
- Inquiry Flexible
- LVI
- Event Notification

Channel for a business service is identified using the decision tree

Performance, reliability, error handling etc

Specific Capabilities

- Manage Payloads - JSON
- Manage Payloads - AEMOCSV
- Manage Payloads - Unstructured
- Transformation – On-Demand
- Transformation – Subscription Based
- Message Enrichment, Fan-in & Fan-Out
- Orchestration & Routing
- Flow Control
- Event Notifications
- Manifest & Retrigger Process
- Business Message Logs
- Developer Experience

Context dependent capabilities applicable to only specific business services

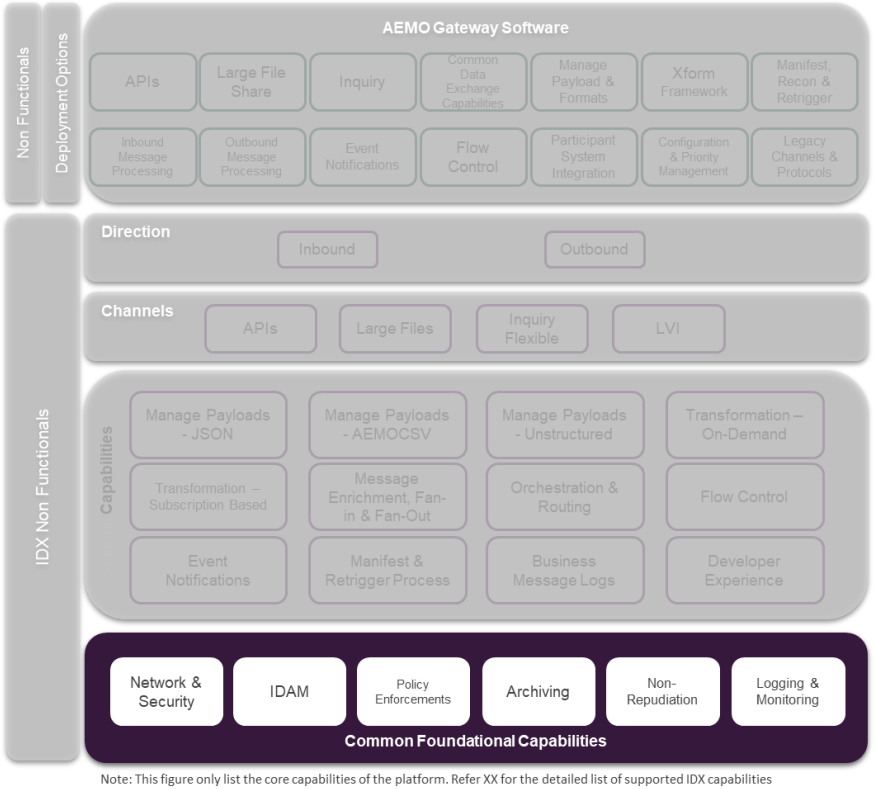
Common Foundational Capabilities

- Network & Security
- IDAM
- Policy Enforcements
- Archiving
- Non-Repudiation
- Logging & Monitoring

Fundamental capabilities applicable to all business services exchanged via IDX

Common Foundational capabilities

The table below is a snippet of the foundational capabilities discussed during the "WHAT" session. Common foundation capabilities are applicable to all business services or use cases utilising the IDX platform.

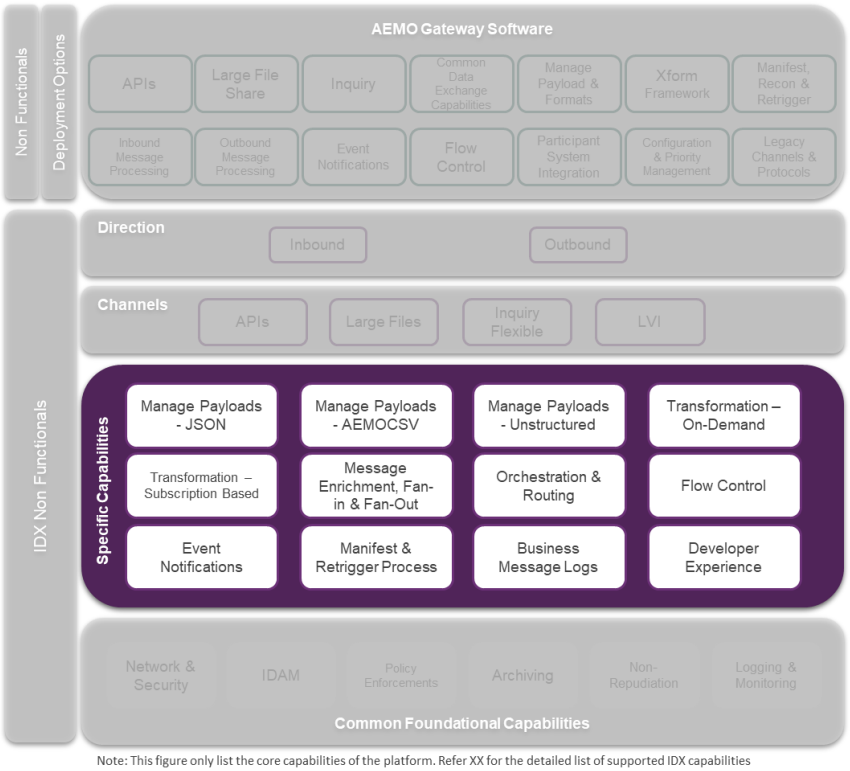


Note: This figure only list the core capabilities of the platform. Refer XX for the detailed list of supported IDX capabilities

Capability Category	Capability Details & Criteria
Network Connectivity and Security	Connectivity: MarketNet & Internet
	Certificate Management
	Transport Layer Security
IDAM	IDAM Authentication & Authorisation Patterns
Policies	Encryption & encoding
	Flow control & spike management
	Round Robin
	Virus & malware scans
	Enforce file/message size limitations
	Enforce file masking
	Onboarding
Archiving	Archiving
Non-Repudiation	Non-Repudiation
Logging & Monitoring	Capture Technical Audit Logs
	Monitoring

Specific Foundational Capabilities

The table below is a snippet of the foundational capabilities discussed during the "WHAT" session. Not all business services use all these listed capabilities. Multiple scenarios and underlying use cases are required to validate the full suite of capabilities.

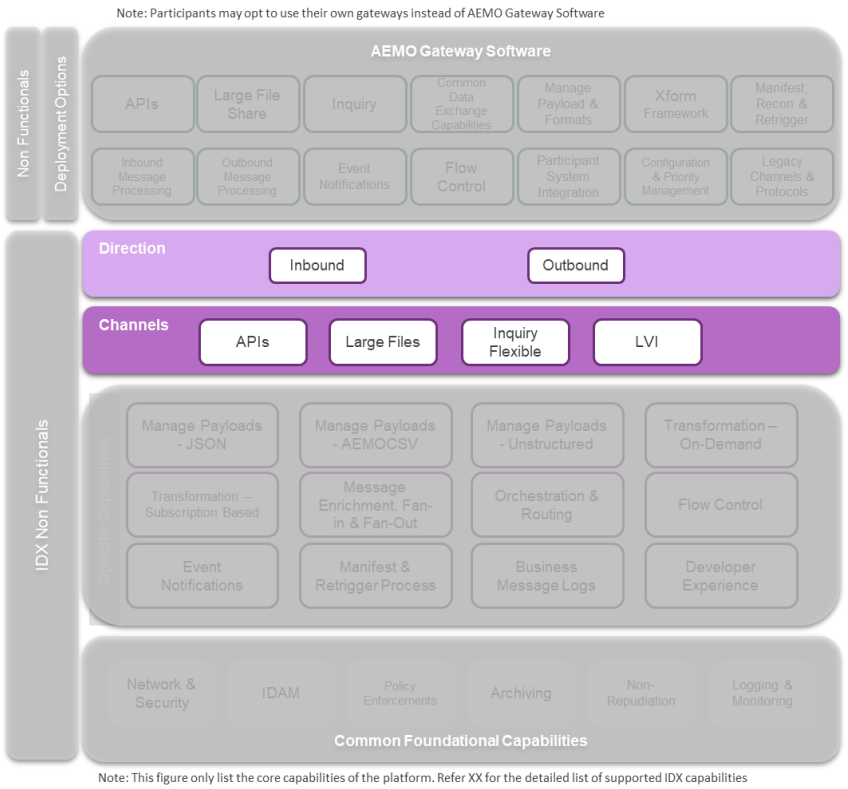


Note: This figure only list the core capabilities of the platform. Refer XX for the detailed list of supported IDX capabilities

Capability Category	Capability Details & Criteria
Payloads	Payload compression
	JSON payload data exchange
	AEMOCSV payload data exchange
	Unstructured payloads
	Schema validations
Transformation	On-Demand transformation
	Hub transformation based on opt-in version
	Support for 'n' & 'n-1'
Message Enrichment	Message enrichment
Fan In & Out	Fan-out
	Fan-In
Orchestration & Routing	Orchestration
	Routing
Flow Control	Manage outbound message delivery limits
Event Notifications	Trigger outbound message event notification
	Flow control notifications
	System health & notifications
Manifest & Reconciliation Process	Patterns where message exchange will logged for Manifest Process
	Reconciliation process for the messages/files transacted using the patterns:
	Retrigger transactions
Business Logs	Manage message acknowledgements
	Business Message & Transaction Logs
Enhance Developer Experience	Developer experience (API, MFT Portals, Data dictionary, system documentation)

Channels and Direction Criteria

Use Cases will be selected on the basis of complimentary coverage to validate all channels, protocols, patterns for the exchange of inbound and outbound data.



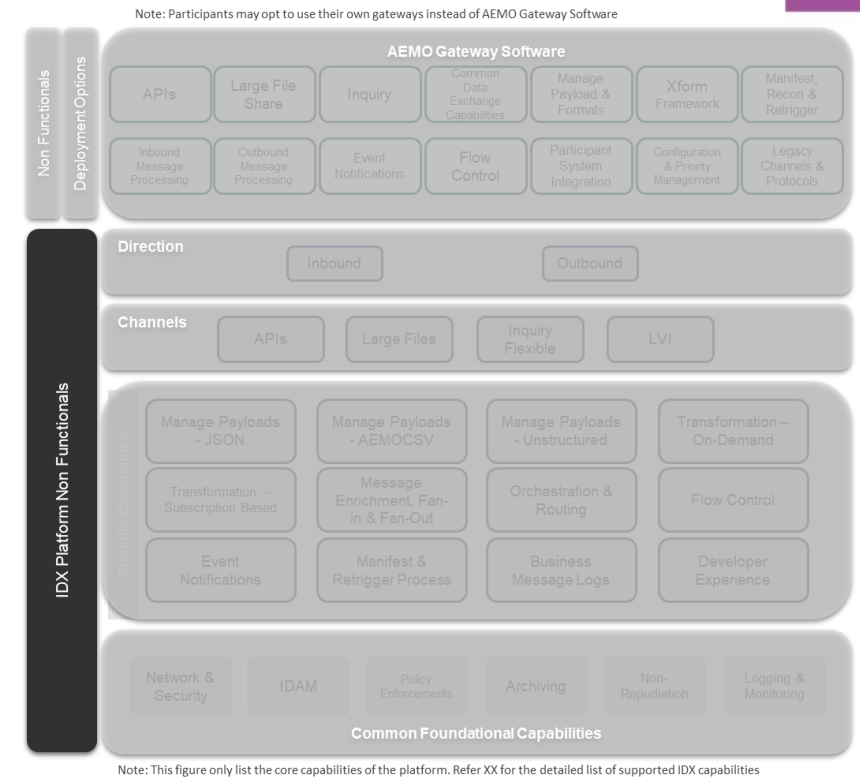
Channel	Direction	Data Exchange Patterns	Validation Coverage
API	Inbound	Asynchronous	✓
		Synchronous	✗
		Fire & Forget	✗
	Outbound	Asynchronous	✓
		Fire & Forget	✗
Large Files	Inbound	Asynchronous	✓
		Fire & Forget	✗
	Outbound	Asynchronous	✓
		Fire & Forget	✓
Inquiry Flat	Outbound	Synchronous	✗
Inquiry Flexible	Outbound	Synchronous	✓
LVI	Inbound & Outbound	Manage Data Exchange via LVI	✓

Validation coverage is limited to definitive set of scenarios and not to test all scenarios listed in the table above e.g. API Async and sync patterns are the same; difference being the payload in the http response – business document (sync) vs MACK (Async). Testing Async pattern must suffice to validate the data exchange pattern. AEMO is seeking industry's feedback on this approach to optimise coverage while containing test effort.

IDX Platform Non-Functional Criteria

AEMO recommends to test the following non-functional test scenarios in AEMO's performance test environment by using AEMO Gateway Software as sender's and/or recipient's gateway solution. AEMO will share the results of performance tests with the industry for review & validation.

Criteria	Details
Scalability	1) Performance & volume 2) Platform scalability
Availability	1) Service levels 2) Fail-over scenarios 3) Planned maintenance / upgrades
Recoverability	1) Ability of the platform to recover from unplanned outages
Security	1) Security tests such as penetration tests
Connectivity	1) Establish event notification channel connections & sessions 2) Durability of event notification channel & sessions
Error Handling	1) Simulation of business exceptions e.g. NACK 2) Simulation of technical exceptions e.g. read timeouts,
Self-Accreditation	1) Accreditation to connect to IDX platform, channels & patterns Note: Business accreditations for B2B transactions will be scoped and covered post DP2
Responder	1) Responder functionality to support Participants test B2B data exchange test cases e.g. PQD

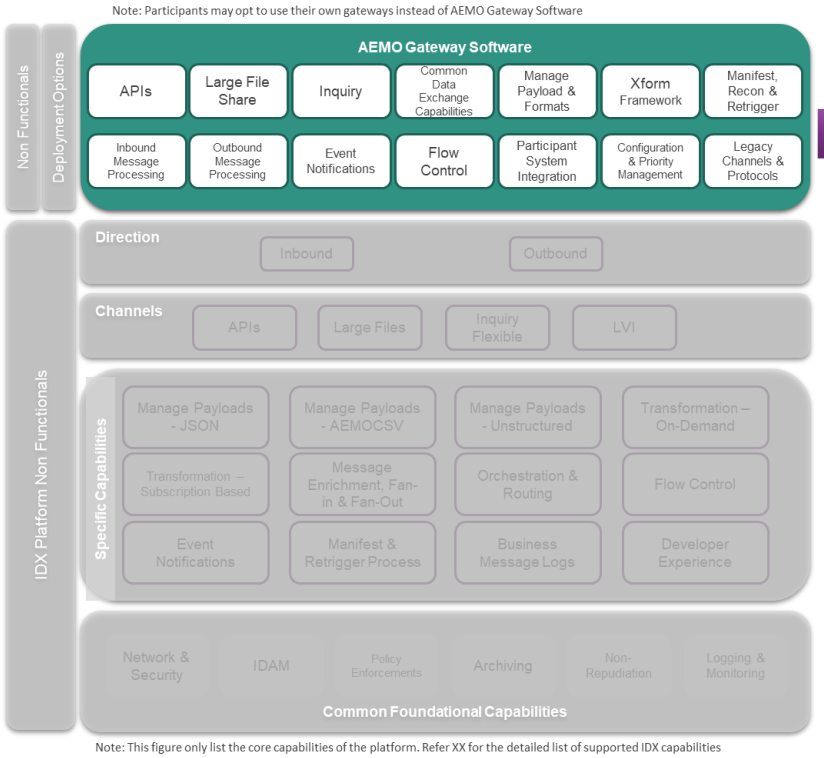


AEMO is seeking feedback from the Participants on the following:

1) Approach that AEMO performs the above tests and shares the results/evidence with the Participants
2) Are there any other non-functional criteria that are to be validated?

AEMO Gateway Software - Functional Criteria

Use Cases will be selected on the basis of complimentary coverage to validate not just the IDX platform but also the AEMO Gateway Software. However, Participants can choose to use gateway(s) of their choice when validating the foundational use cases.



AEMO is seeking Participants' views on other capabilities that need to be tested / validated; considering their current pain points in managing the gateway software(s).

Capability Category	Capability Details & Criteria
Channels, Protocols & Patterns	API: Covering Sync, Async and Fire & Forget data exchange patterns
	Large File: Covering Async and Fire & Forget data exchange patterns
	Inquiry Flexible: Ability to request subset of the response data
	Events: Receive, send, manage and orchestrate actions from an event
Common Data Exchange Capabilities	Common data exchange capabilities to connect to the IDX platform. Refer 'Common Foundational Capabilities' for details
Payloads	Payload compression
	Manage JSON, AEMOCSV & Unstructured payloads
	Schema validations
Transformation Framework	Framework for Participants to implement transformations (integration between AEMO Gateway Software and Participants' backend systems). Where applicable, AEMO will supply the transformation modules that can be plugged into the framework for this testing phase Ability to integrate other plug-ins such as Validation Module (EVM)
Inbound & Outbound Message Processing	Inbound data submission Outbound message processing based on an event Outbound message processing by polling IDX in regular intervals
Event Notifications	Manage data exchange based on variety of events such as outbound event notification, flow control notifications, system health notifications
Participant System Integration	Ability to connect AEMO Gateway Software with Participants' systems using the supported integration methodologies (e.g. API, MQ, fileshare)
Configuration & Priority Management	Ability to configure AEMO Gateway Software capabilities using the configuration management module. Also, the ability to define the priority of outbound data processing by configuration
Manifest, Reconciliation & Retrigger Process	Ability to extend the manifest, reconciliation and retrigger process across all business services

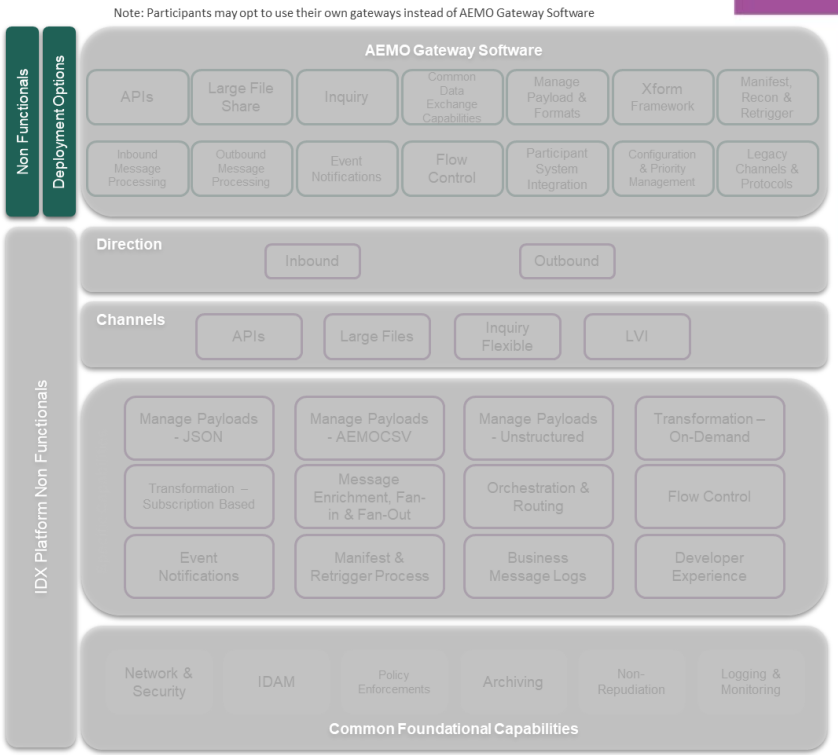
Note: This table only lists the core IDX capabilities that AEMO Gateway Software supports/to be validated. Other standard capabilities such as logging capability are not covered in the above table. However, AEMO's internal testing will be extended to testing all these capabilities.`

AEMO Gateway Software – Other Non-Functional Criteria

AEMO has identified a number of non functional criteria to validate the AEMO Gateway software, while many mirror the IDX platform capability additional criteria specific to potential participant deployment options have also been put forward.

Criteria	Details
Non-Functional Criteria	1) Refer 'IDX Platform Non-Functional Criteria'; applicable test scenarios – Scalability, Availability, Recoverability, Security, Connectivity, Error Handling
Supported Deployment Methods	1) Virtual Machines 2) Containerised Platforms 3) DevSecOps
Operating Systems	1) Support for multiple operating systems
Security	1) Ability to store the configuration details encrypted 2) Ability to integrate with vaults using standard protocols

Note: Other capabilities such as payload signing & verifying, encryption, encoding, decoding, decryption, compression and de-compression will be tested when validating the business scenarios. No specific NFR tests are required.



AEMO is seeking Participants' views on other capabilities that need to be tested / validated; considering their current pain points in managing the gateway software(s).

Foundation capability deployment

AEMO anticipates Foundation capability to be delivered and made available for validation as follows:

MVP / Power Quality Data release:

- Limited to the protocol, pattern and capabilities required to support Power Quality Data.
- Includes AEMO Gateway Software to support Power Quality Data protocol, pattern and capabilities.

Foundation release:

- Increments on the MVP / Power Quality Data release.
- Includes additional protocols, patterns and capabilities.
- Includes updated AEMO Gateway Software.

DP2 release (to be confirmed – beyond the scope of this workshop):

- Existing NEM Market business services re-deployed onto IDX.

Future releases (to be confirmed – beyond the scope of this workshop):

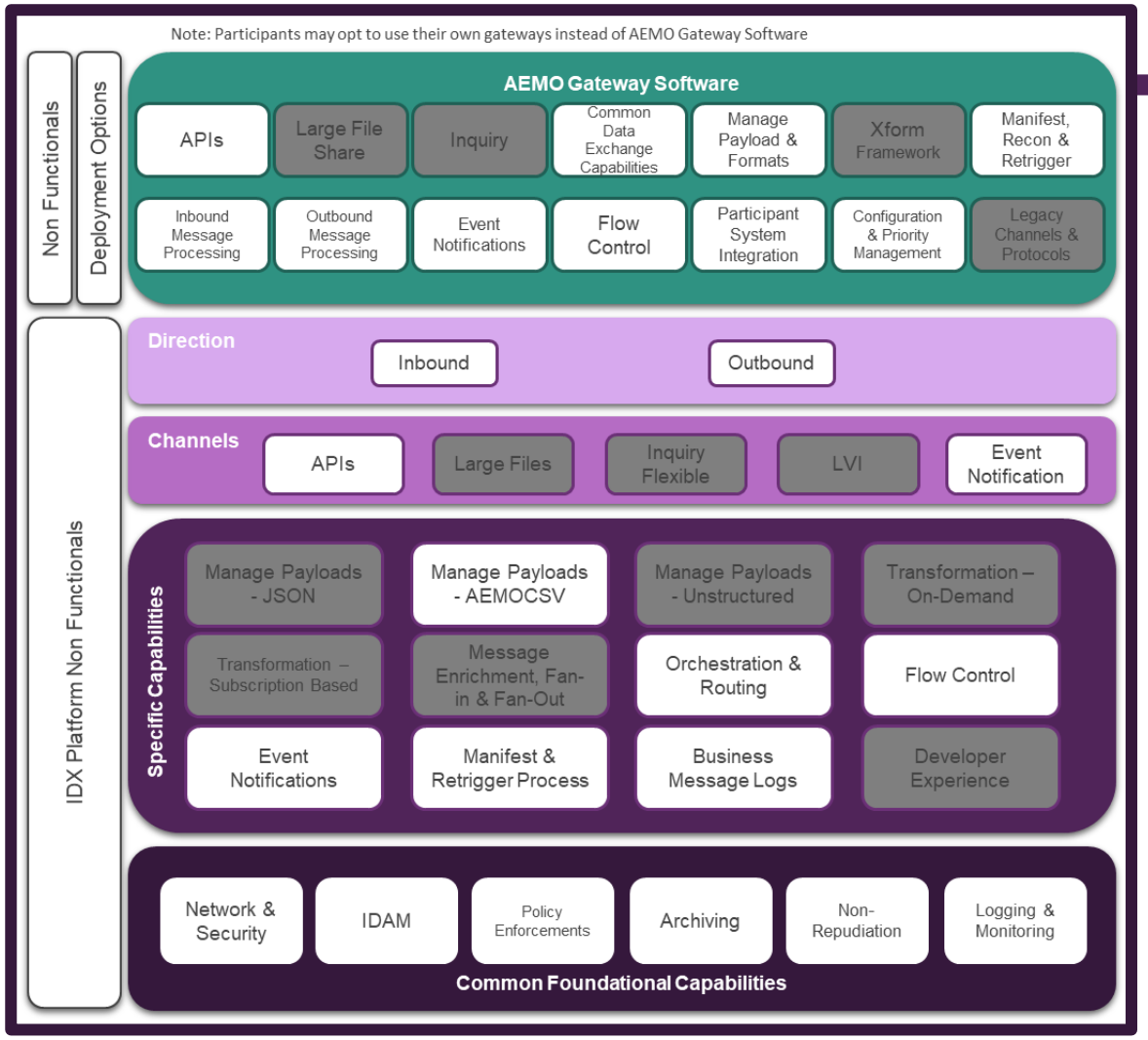
- Capabilities designed but for which no use case has yet been identified, such as streaming, would be delivered at the time a use case requiring this capability is identified and agreed to proceed.

3a. Foundation Criteria "How" - PQ Data Use Cases (R1)

Andrew Bell

PQD Scenario Overlay

Power Quality Data (PQD) business scenario will validate the functional capabilities as illustrated below. This test will be limited to validating the minimal data exchange capabilities required for the MSR Project. The remaining capabilities will be tested as part of Foundation.



What will be validated by PQ Data?

Channels

- API
- LVI
- Event Notification
- Large File
- Dynamic Enquiry

Other

- NFRs & deployment options

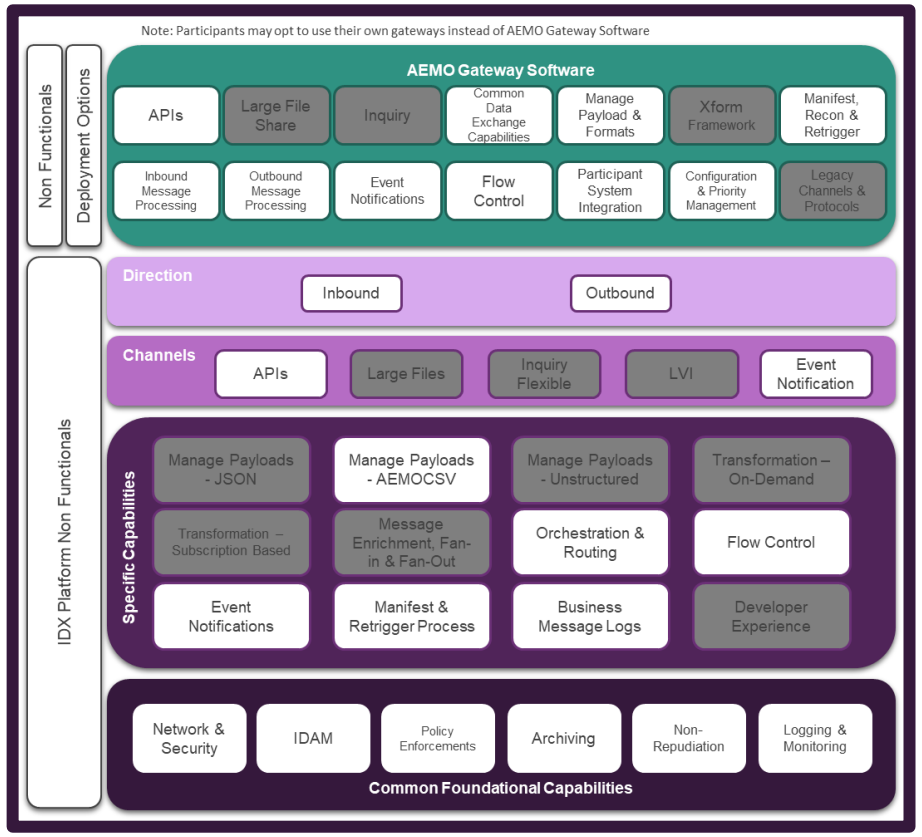
Capabilities

- Common capabilities
- Specific capabilities

Patterns

- Async API Inbound
- Async API Outbound

Use case 1: PQD – Guaranteed Delivery

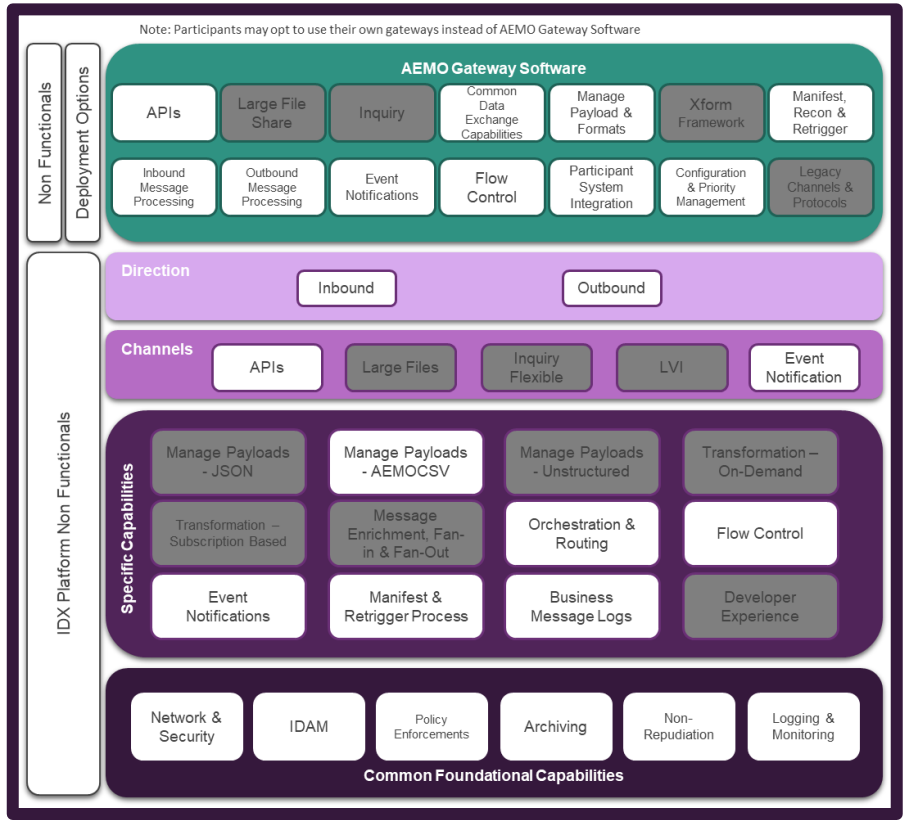


Approach area	Details
Proposed use case	Power Quality Data
Channels	APIs & Event Notification Channel
Pattern	Asynchronous - Inbound & Outbound
Supported Payload Format	AEMOCSV
Market involved	NEM
Roles involved	MDP (initiator), DNSP (recipient)
Proposed test approach	Service deployed to pre-production
Supporting tools	No responder, No LVI
AEMO Gateway	Available

Measures	Details
1	Transaction initiated by MDP is delivered to DNSP
2	Messages are archived upon successful receipt of MACK
3	Ability to retrigger the delivery the PQD via manifest & reconciliation process

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Use case 2: PQD – Non Functionals



Approach area	Details
Proposed use case	PQD
Market involved	NEM
Roles involved	MDP (initiator), DNSP (recipient)
Proposed test approach	Simulated tests in AEMO's performance test environments. Results shared with industry
Supporting tools	N/A
AEMO Gateway	Used by AEMO for simulation & NFR testing of gateway software

Measures	Details
1	NFRs for IDX Platform & AEMO Gateway Software meet agreed success criteria
2	AEMO Gateway software supports deployment options

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Poll 1 – PQ Data use cases:

For the two PQ Data use-cases (guaranteed delivery and non-functional testing), we believe this will provide good coverage to validate many IDX capabilities. This service will be tested in conjunction with other IDX use-cases to ensure all IDX capabilities are thoroughly tested.

Use-Case 1: Guaranteed Delivery

- Pattern: Asynchronous API Inbound and Outbound
- Channels: RESTful API and Event Notification
- Payload Format: AEMOCSV
- Market: NEM

Measures:
1. Transaction initiated by MDP is delivered to DNSP
2. Messages are archived upon successful receipt of MACK
3. Ability to retrigger the delivery the PQD via manifest & reconciliation process

Use-Case 2: Non-Functional Testing

- Pattern: Asynchronous API Inbound and Outbound
- Channels: RESTful API and Event Notification
- Payload Format: AEMOCSV
- Market: NEM

Measures:
1. NFRs for IDX Platform & AEMO Gateway Software meet agreed success criteria
2. AEMO Gateway software supports deployment options

Do the proposed use-cases for PQD cover the key criteria, and are the measures proposed providing sufficient coverage?

Option A: Yes, I am comfortable with the PQ Data use-cases providing coverage across those key criteria.

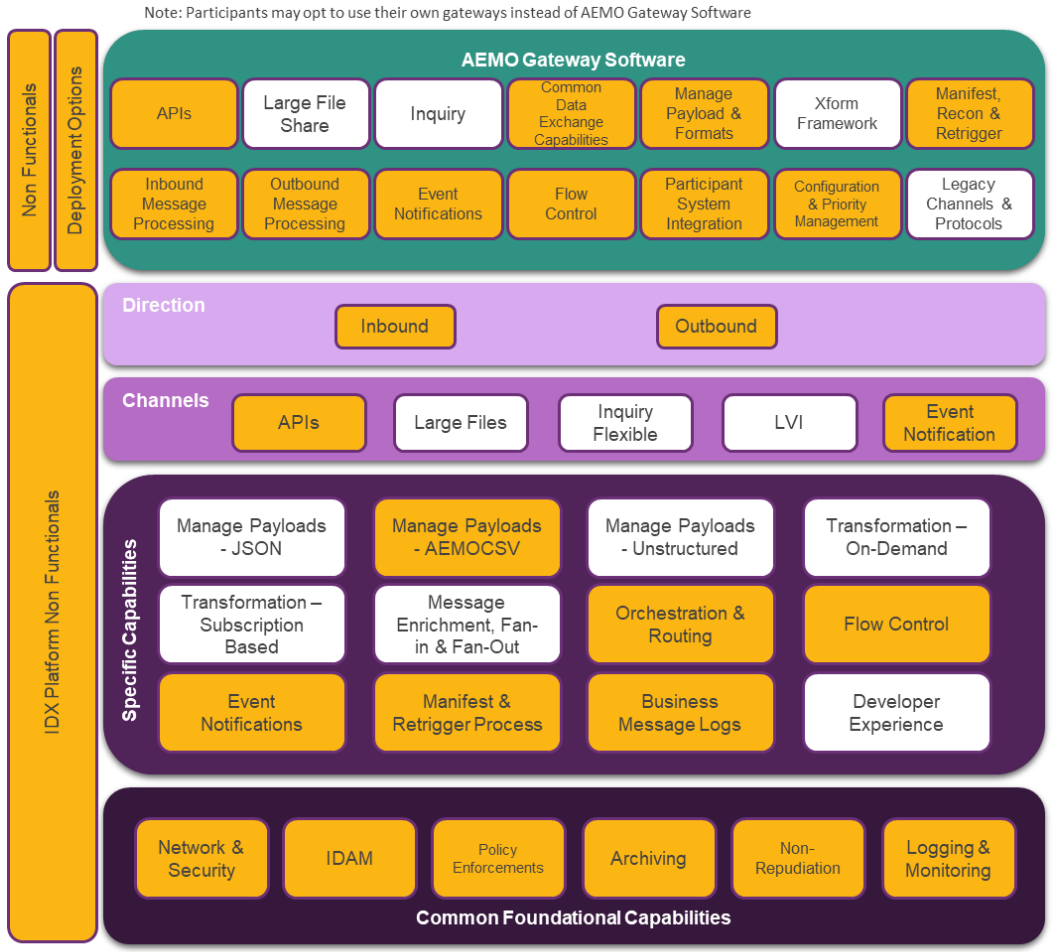
Option B: No, I require further internal assessment within my organisation, or I have additional use-cases, services or clarifications required, and will reply by COB Wednesday 12 February with details.

3b. Foundation Criteria "How" - Foundation Use Cases (R2)

Andrew Bell

Foundation Scenario Overlay & Validation Approach

Foundation Scenario Overlay



Note: This figure only list the core capabilities of the platform. Refer XX for the detailed list of supported IDX capabilities

- Capabilities validated in PQD are validated in Foundations as well
- Capabilities validated in Foundations and not in PQD
- Capabilities validated in PQD and not in Foundations

Validation Approach

1. **Identify business scenarios to validate the capabilities that weren't validated in PQD as illustrated in the 'Foundation Scenario Overlay'**

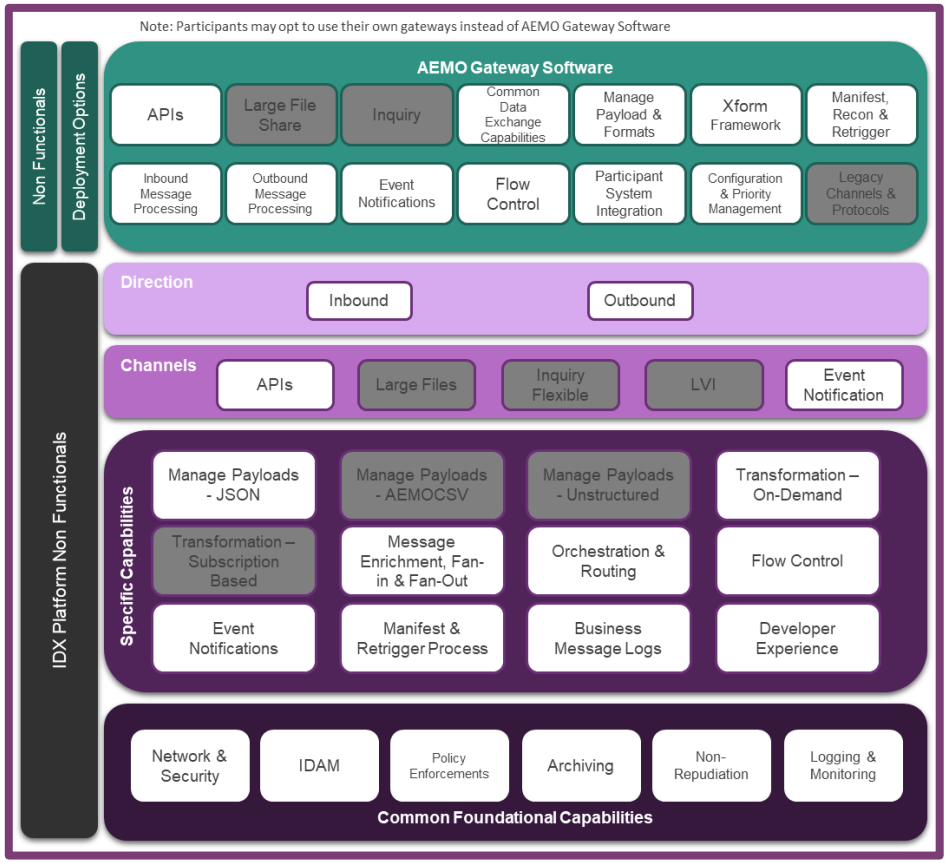
   Business scenarios that validate the above criteria will re-validate common capabilities already validated in PQD

2. **For each of the business scenarios from step 1, identify a minimum set of use cases to cover any variations in functionality / capability**

Proposed Foundation Scenarios

Scenario#	Scenario Name	Use Case#	Channel	Pattern	Payload Format
Scenario 1	Fan Out	UC 1.1	API	Asynchronous	JSON
		UC 1.2	Large File Share	Fire & Forget	AEMOCSV
Scenario 2	B2B Data Exchange	UC 2	API	Asynchronous	JSON
Scenario 3	B2M Outbound Data Delivery	UC 3.1	API	Asynchronous	AEMOCSV
		UC 3.2	Large File Share	Fire & Forget	JSON
		UC 3.3	Large File Share	Asynchronous	AEMOCSV
		UC 3.4	API	Asynchronous	Unstructured
Scenario 4	Inquiry Service	UC 4	Inquiry	Synchronous	JSON
Scenario 5	LVI	UC 5	NA	NA	NA
Scenario 6	Foundation Non-Functional	UC 6	NA	NA	NA
Scenario 7	AEMO Gateway Software Legacy Functionality Regression Test	UC 7	Legacy channels	NA	NA

Use case 1.1: Fan Out (API)

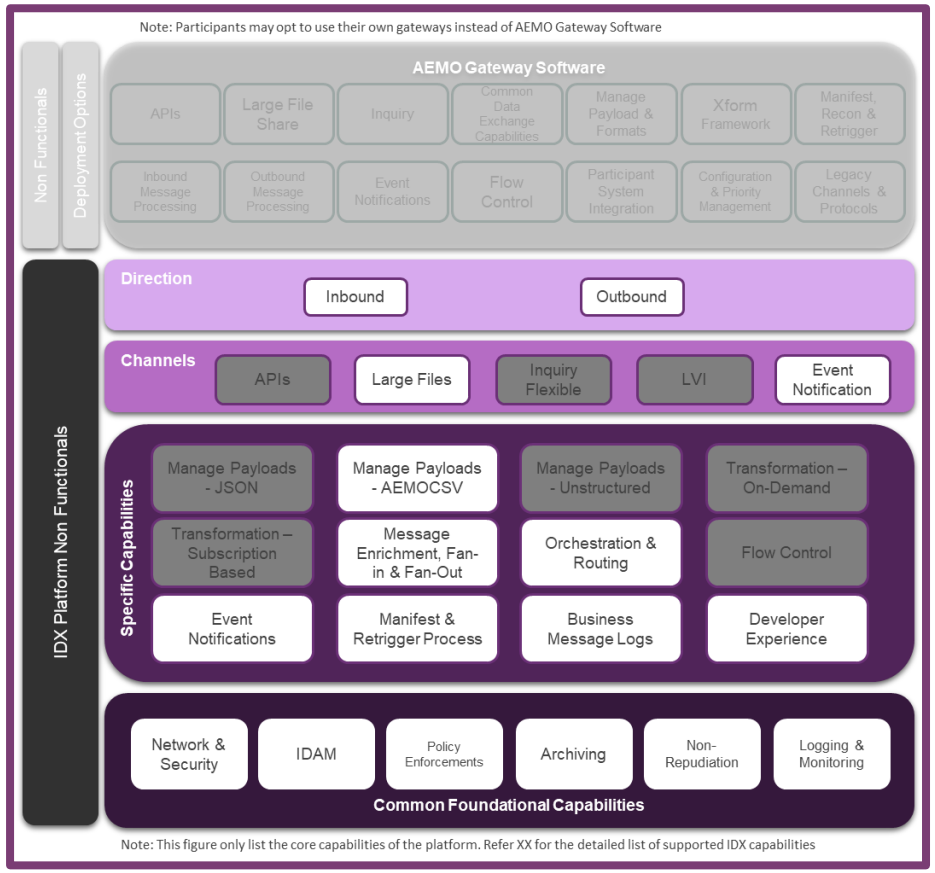


Approach area	Details
Proposed use case	Dynamic Operating Envelope (DOE) – B2B
Channels	APIs & Event Notification Channel
Pattern	Asynchronous - Inbound & Outbound
Supported Payload Format	JSON
Market involved	NEM
Roles involved	NEM DSO (initiator), NEM aggregators (recipient)
Proposed test approach	Service deployed to pre-production
Supporting tools	Responder provided
AEMO Gateway	Available

Measures	Details
1	IDX platform receives DOE from DSO, identifies Aggregators to whom DOE needs to be sent to, splits the inbound message to multiple messages (one for each of the identified Aggregators), enriches the message with the recipient (Aggregator) and delivers it to the associated Aggregators

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Use case 1.2: Fan Out (Large File Share)

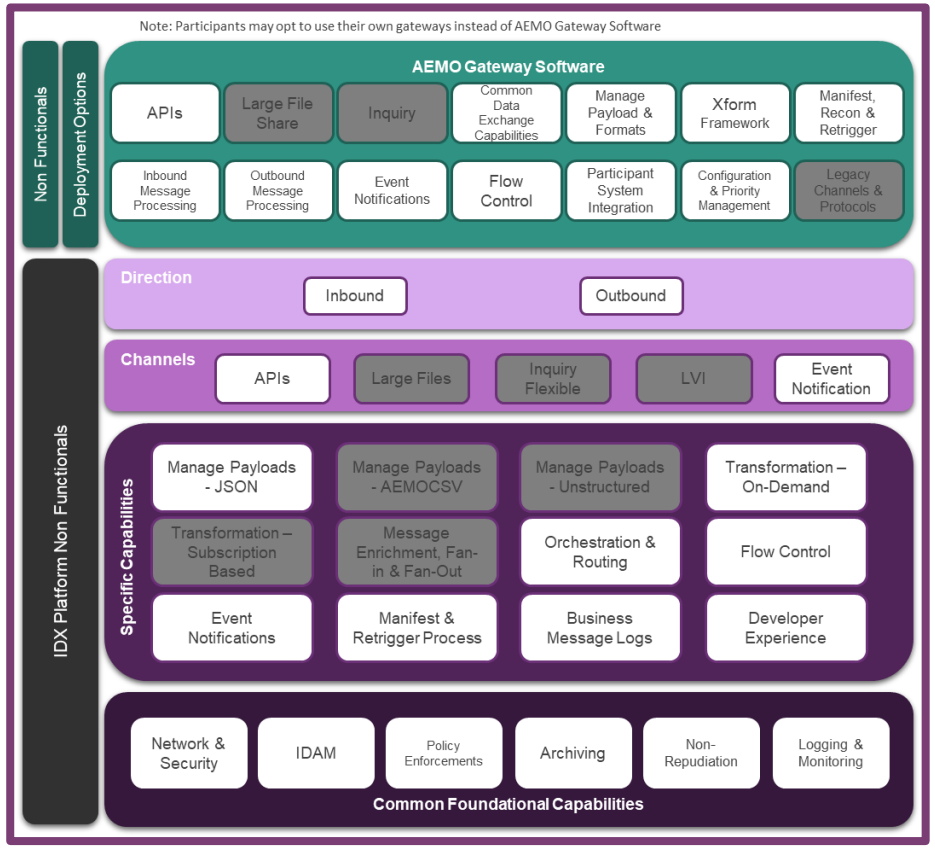


Approach area	Details
Proposed use case	MIRN Listing – B2B
Channels	Large File Share & Event Notification Channel
Pattern	Fire & Forget - Inbound & Outbound
Supported Payload Format	AEMOCSV
Market involved	Gas Retail
Roles involved	Gas Distributor (initiator), Gas Retailers (recipient)
Proposed test approach	AEMO internal testing with results shared to industry
Supporting tools	N/A
AEMO Gateway	N/A

Measures	Details
1	MIRN Listing from the Distributor is fanned (copy) out to all the Gas Retailers
2	Outbound message is deleted by the Recipient (or) as per the TTL
3	Outbound message is process based on the event (or) periodic polling

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Use case 2: B2B Data Exchange

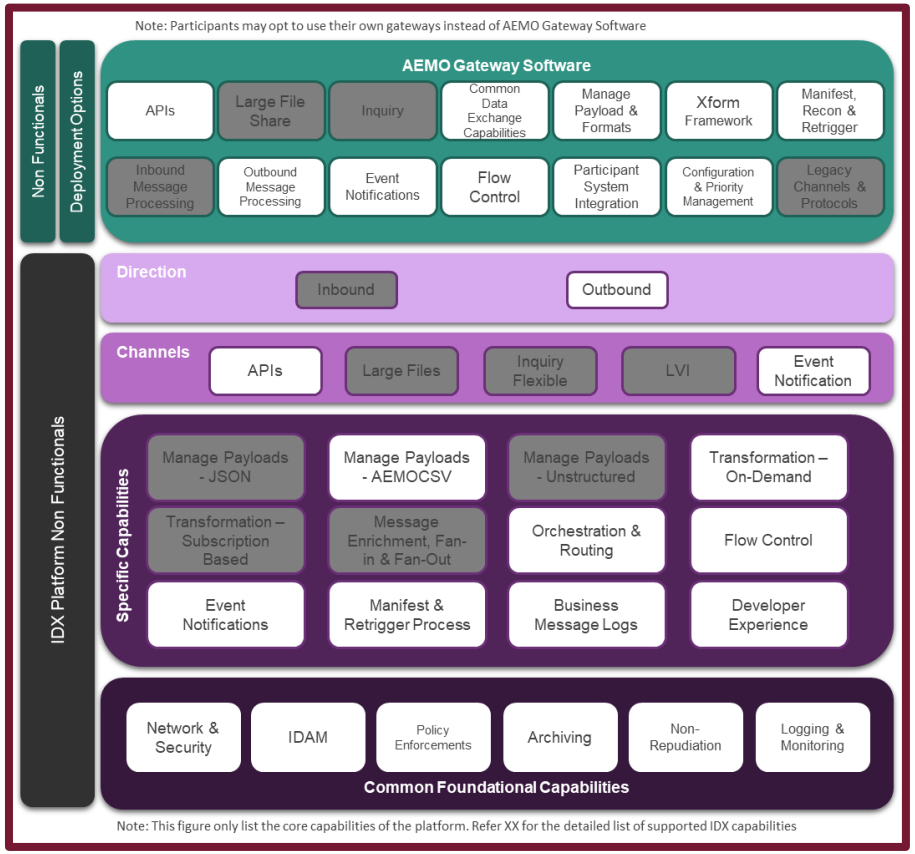


Approach area	Details
Proposed use case	Planned Interruption Notification – B2B OWNX
Channels	APIs & Event Notification Channel
Pattern	Asynchronous - Inbound & Outbound
Supported Payload Format	JSON
Market involved	NEM Retail
Roles involved	Retailer / MC / MPB (initiator) to DNSP (recipient)
Proposed test approach	Service deployed to pre-production
Supporting tools	Responder available
AEMO Gateway	Available

Measures	Details
1	Transaction initiated by initiator is delivered to recipient
2	Messages are archived upon successful receipt of MACK
3	Ability to retrigger the delivery of B2B messages via manifest & reconciliation process
4	Validation of flow control process

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Use case 3.1: B2M Outbound Data Delivery – API & AEMOCSV

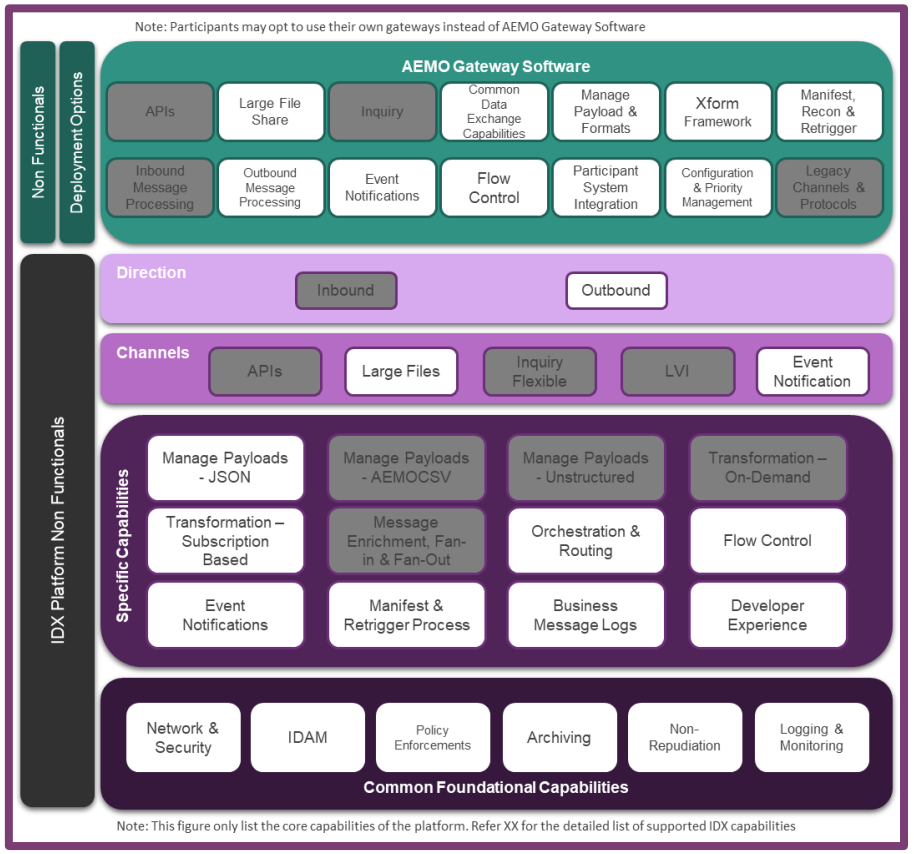


Approach area	Details
Proposed use case	MTPASA Reports
Channels	APIs & Event Notification Channel
Pattern	Asynchronous - Outbound
Supported Payload Format	AEMOCSV
Market involved	NEM Wholesale
Roles involved	AEMO (initiator), Generators / Retailers (recipient)
Proposed test approach	Service deployed to pre-production
Supporting tools	N/A
AEMO Gateway	Available

Measures	Details
1	AEMOCSV payloads generated by AEMO systems are delivered to recipients via API channel
2	On-demand transformation of AEMOCSV payloads

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Use case 3.2: B2M Outbound Data Delivery – Large File Share & JSON

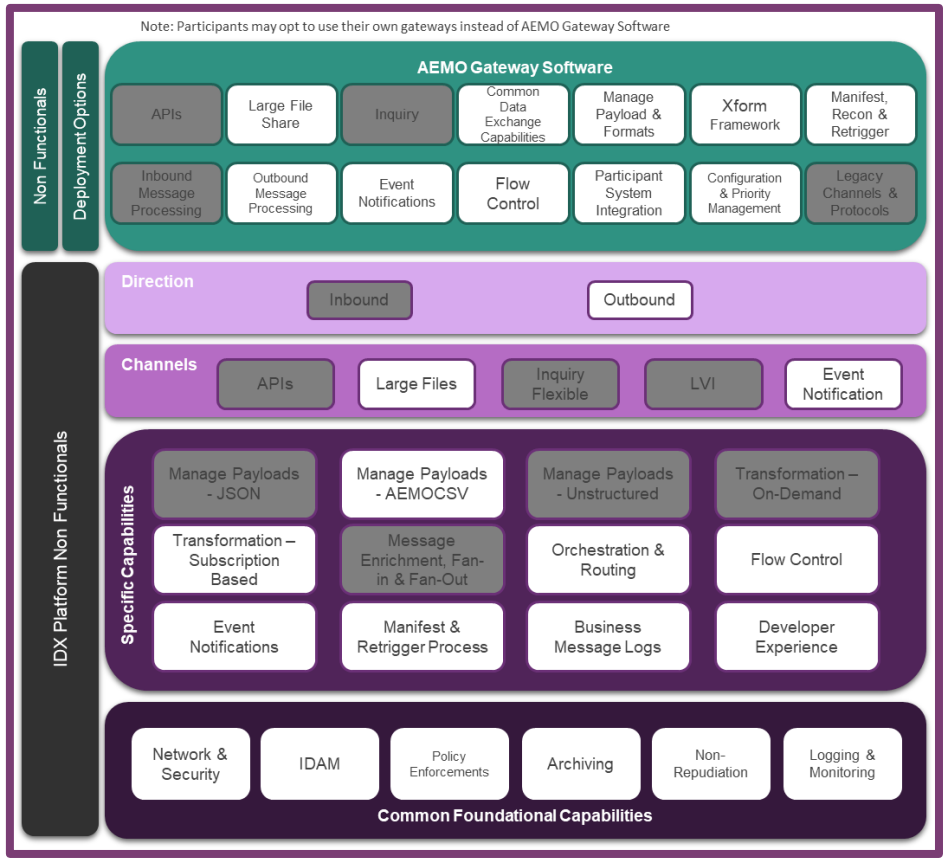


Approach area	Details
Proposed use case	Retail Snapshot Reports
Channels	Large File Share & Event Notification Channel
Pattern	Asynchronous – Outbound
Supported Payload Format	JSON
Market involved	NEM Retail
Roles involved	AEMO (initiator), Any Retail Participant (recipient)
Proposed test approach	Service deployed to pre-production
Supporting tools	N/A
AEMO Gateway	Available

Measures	Details
1	IDX Large file share solution delivers JSON payloads to the recipients
2	AEMO Gateway solution successfully processes JSON payloads using the Large File Share protocols
3	Payload version of the generated AEMOCSV report; as opted-in by the recipient
4	AEMO Gateway Software transformation framework is validated

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Use case 3.3: B2M Outbound Data Delivery – Large File Share & AEMOCSV

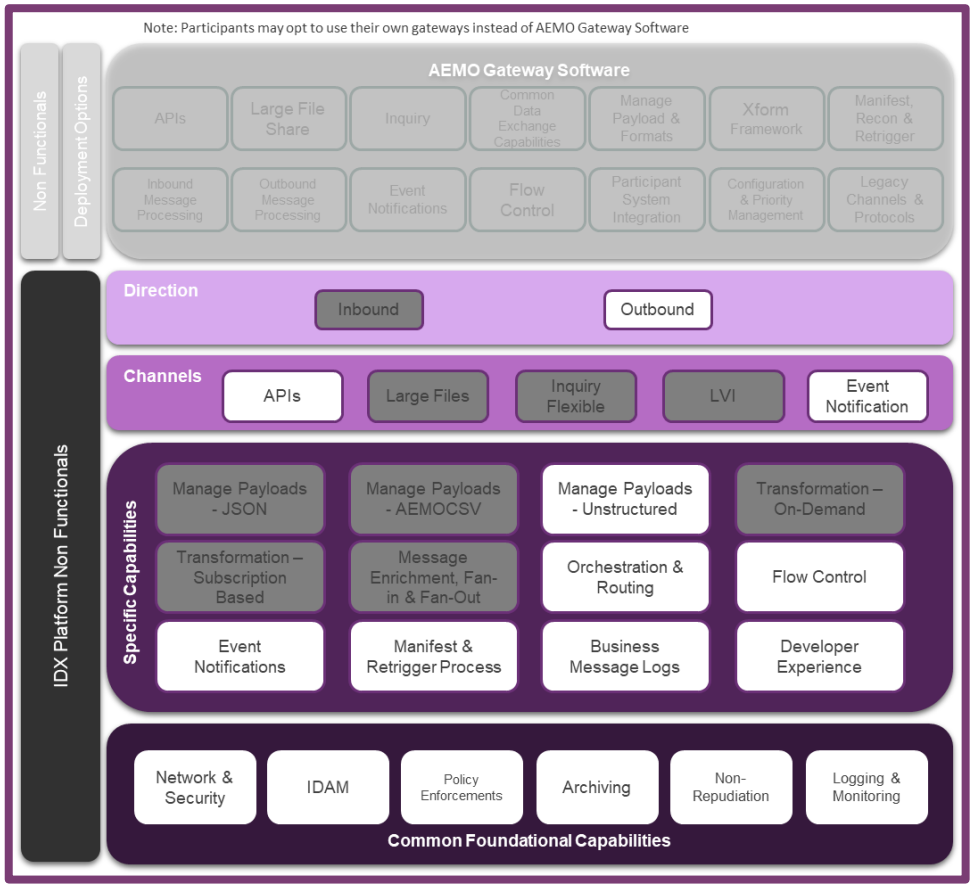


Approach area	Details
Proposed use case	Next Day Dispatch Reports
Channels	Large File Share & Event Notification Channel
Pattern	Asynchronous – Outbound
Supported Payload Format	AEMOCSV
Market involved	NEM Wholesale
Roles involved	AEMO (initiator), Generators / Traders (recipient)
Proposed test approach	Service deployed to pre-production
Supporting tools	N/A
AEMO Gateway	Available

Measures	Details
1	Outbound reports are successfully pulled by recipient and archived upon receiving the MACK
2	Validation of asynchronous data exchange pattern using the large file share solution
3	Payload version of the generated AEMOCSV report; as opted-in by the recipient

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Use case 3.4: B2M Outbound Data Delivery – API & Unstructured

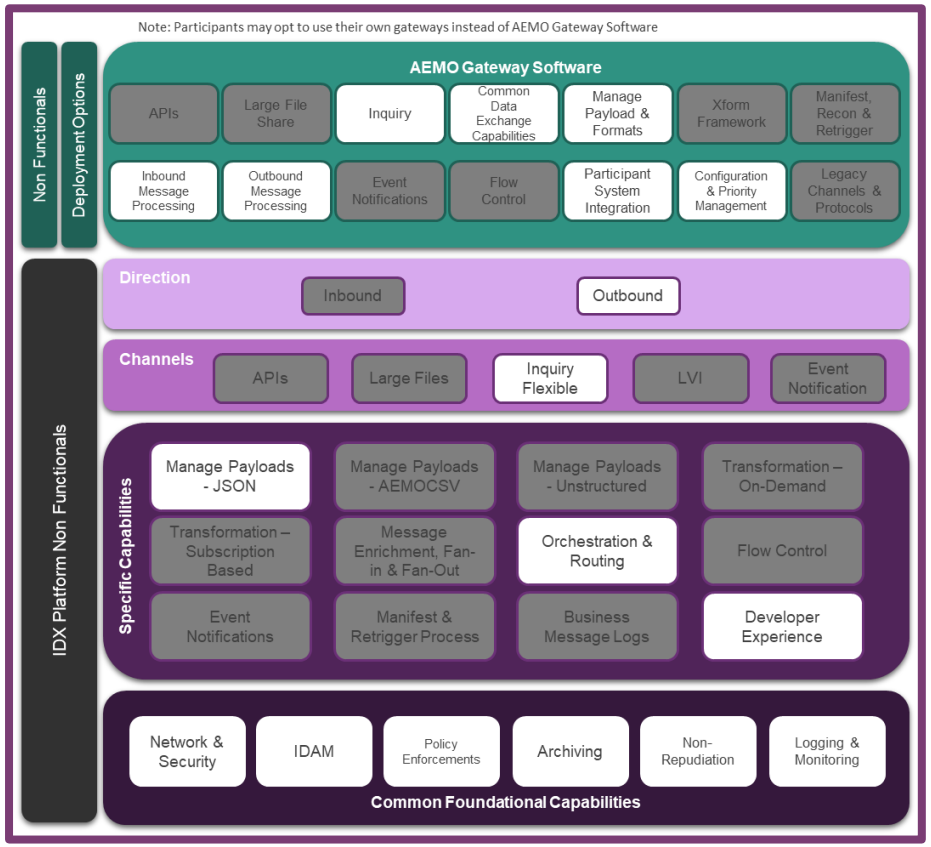


Approach area	Details
Proposed use case	Delivery of Settlement PDF Reports
Channels	API & Event Notification Channel
Pattern	Asynchronous – Outbound
Supported Payload Format	Unstructured (PDF)
Market involved	NEM Wholesale
Roles involved	AEMO (initiator), Generators / Retailers (recipient)
Proposed test approach	AEMO internal testing with results shared to industry
Supporting tools	N/A
AEMO Gateway	N/A

Measures	Details
1	PDF reports are successfully delivered to the recipient
2	PDF reports are archived upon receiving a MACK
3	Non-repudiation capability for the unstructured data

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Use case 4: NMI Discovery – Inquiry Services

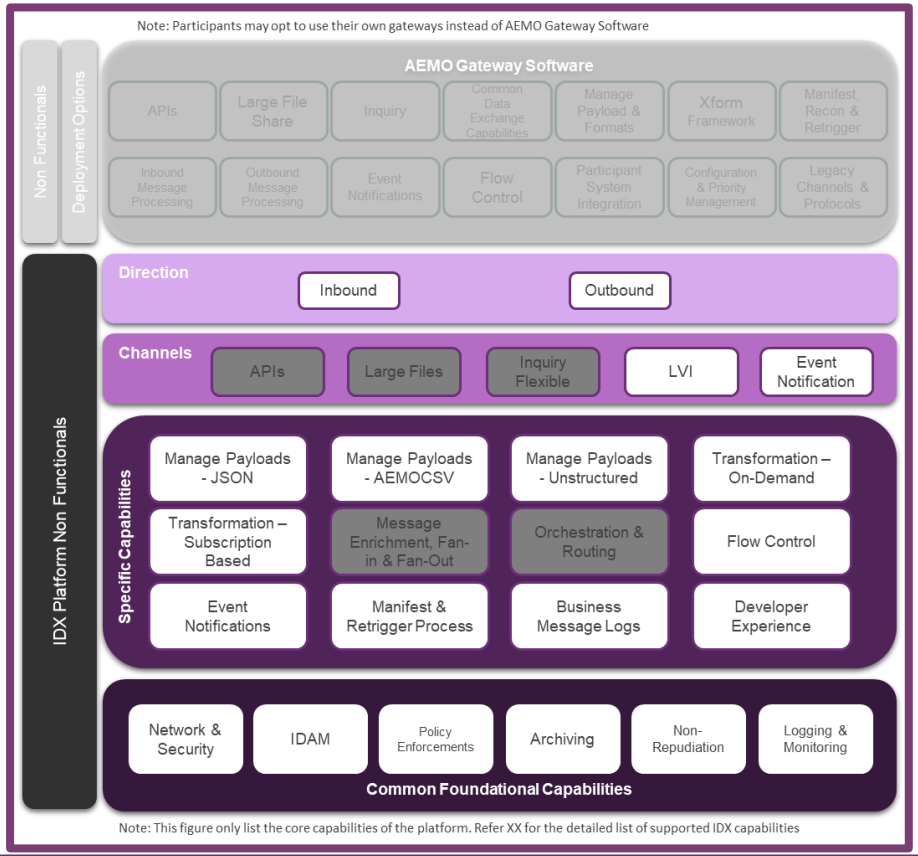


Approach area	Details
Proposed use case	Synchronous NMI Discovery – B2M
Channels	API (GraphQL)
Pattern	Inquiry Flexible – Outbound
Supported Payload Format	JSON
Market involved	NEM Retail
Roles involved	Any Retail Participant having access to Discovery Services
Proposed test approach	Service deployed to pre-production
Supporting tools	N/A
AEMO Gateway	Available

Measures	Details
1	AEMO delivers response payload with the attributes as requested in the GraphQL request
2	Inquiry Flexible pattern specific exception scenarios e.g. hierarchical structures must have minimum attributes in the GraphQL request
3	Average response time of the service is under the agreed and accepted limits
4	Ability to define the attributes that are required in the business responses for GraphQL services; by configuration

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Use case 5: Low Volume Interface (LVI)

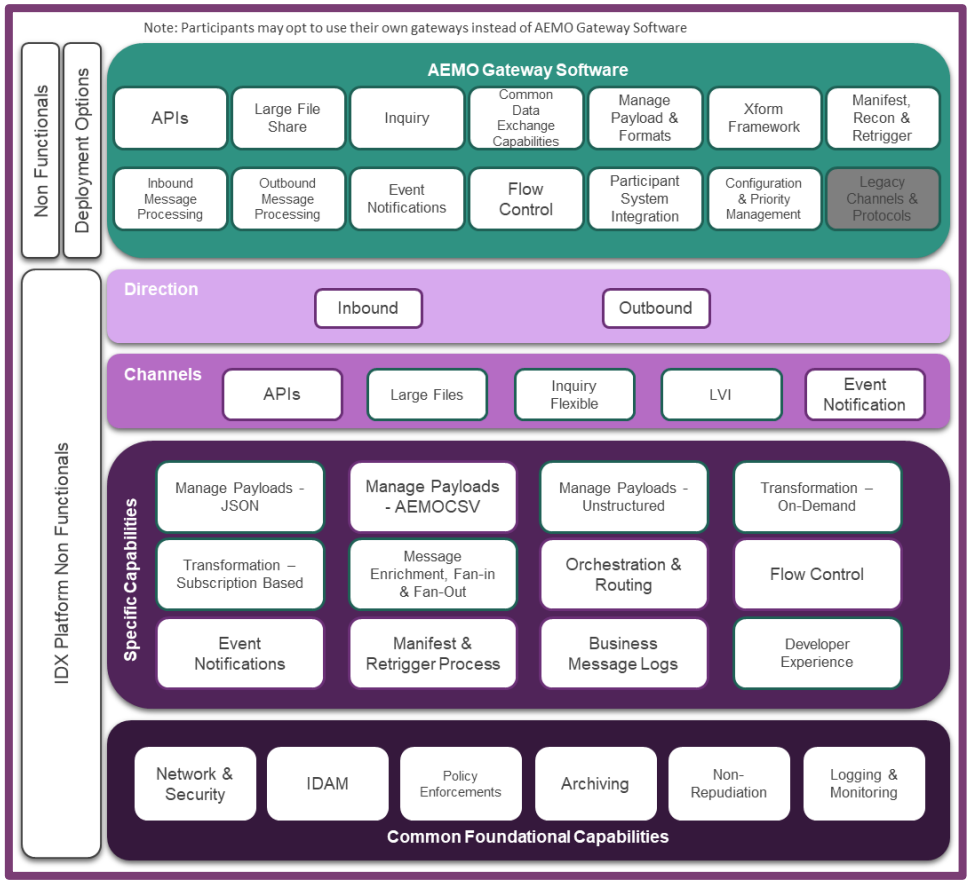


Approach area	Details
Proposed use case	LVI to manage industry data exchange
Channels	LVI
Pattern	Asynchronous, Fire & Forget
Supported Payload Format	JSON, AEMOCSV, Unstructured
Market involved	NEM Retail, NEM Wholesale, Gas Retail
Roles involved	All participants covered in UC#1.1 through UC4
Proposed test approach	Service deployed to pre-production
Supporting tools	N/A
AEMO Gateway	N/A

Measures	Details
1	Participants successfully submit inbound B2B and B2M messages – Large Files & Non-Large payloads covering JSON, AEMOCSV and Unstructured formats
2	Participants process their outbound messages including MACKing – Large Files & Non-Large payloads covering JSON, AEMOCSV and Unstructured formats. LVI outbound event notifications sent using the nominated email id
3	Average response time (submit and process outbound messages) is under agreed and accepted limits
4	View logs and monitor IDX system processes including flow controls via LVI
5	Participants nominate payload version # and channels for each of the business service
6	Self-manage entitlements for the various service accounts

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Use case 6: Foundation – Non Functionals

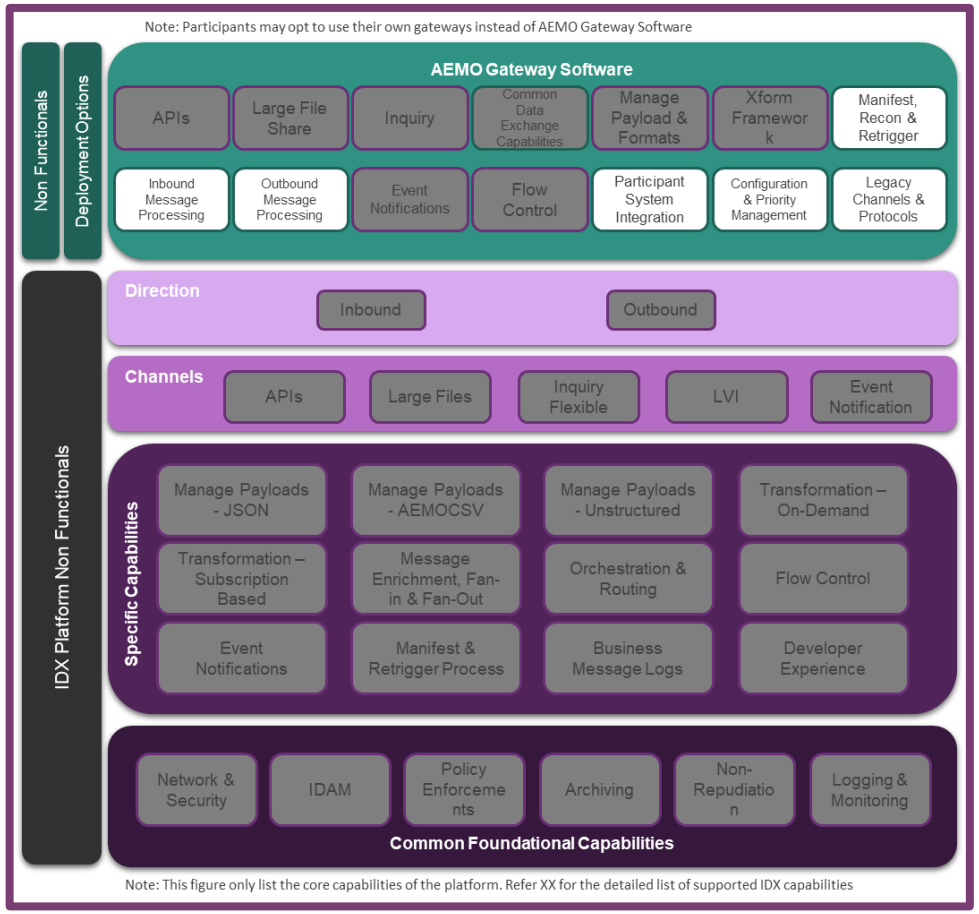


Approach area	Details
Proposed use case	Foundation Non Functionals – Running all foundation use cases concurrently
Market involved	NEM Retail, NEM Wholesale, Gas Retail
Roles involved	Refer UC#1.1 through UC#5
Proposed test approach	Processing 1X production volumes for the performance test Processing 1.5X production volumes for the volume test Processing 2X production volumes for the stress test Simulate other NF tests as documented in IDX-Non-Functional Criteria Simulated tests in AEMO's performance test environments. Results shared with industry
Supporting tools	LVI including self-management of accreditation process
AEMO Gateway	Used by AEMO for simulation & NFR testing of gateway software

Measures	Details
1	NFRs for IDX Platform & AEMO Gateway Software meet agreed success criteria
2	AEMO Gateway software supports deployment options & scales for the processing volumes

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Use case 7: AEMO Gateway Software Legacy Functionality Regression Test



Approach area	Details
Proposed use case	Regression test legacy functionality (e.g. FTP to wholesale participant server) of AEMO Gateway Software
Market involved	NEM Wholesale
Roles involved	Participants using gateway software in UC1.1 through 5 (or) other participants using AEMO gateway software in preprod
Proposed test approach	Regression testing of the legacy functionality to support the BAU data exchange patterns Service deployed to pre-production
Supporting tools	N/A
AEMO Gateway	Yes; both functional and non-functional regression tests

Measures	Details
1	Solution is backwards compatible; all the legacy functional capabilities are available along with the IDX capabilities
2	Performance and scalability of legacy data exchange mechanisms are not compromised with the introduction of IDX capabilities

1. Does the proposed use case sufficiently cover the key criteria? Are the measures proposed appropriate for validation?
2. Is the approach acceptable – are participants not involved comfortable to accept the results from this testing as validating this capability?
3. Are there alternate use cases / approaches industry would like to propose?

Summary of Capability Coverage for the chosen use cases

To demonstrate functional coverage, key capabilities have been assessed against channels and the use cases plotted out Test cases proposed for AEMO internal testing (with evidence provided) have been tagged to make clear the overlay of test cases proposed to support participant validation

Channel	Common Capabilities	Manage Payloads – JSON	Manage Payloads – AEMOCSV	Manage Payloads - Unstructured	Xformation OnDemand	Xformation Subscription	Fan-Out & Enrichment	Orchestration & Routing	Flow Control	Event Notifications	Manifest & Retrigger Process	Message Logs	Developer Experience	AEMO GWY
API Async	✓	DOE – B2B			DOE – B2B		DOE – B2B	DOE – B2B	DOE – B2B	DOE – B2B	DOE – B2B	DOE – B2B	DOE – B2B	DOE – B2B
		OWNX–B2B			OWNX–B2B			OWNX–B2B	OWNX–B2B	OWNX–B2B	OWNX–B2B	OWNX–B2B	OWNX–B2B	OWNX–B2B
			MTPASA		MTPASA			MTPASA	MTPASA	MTPASA	MTPASA	MTPASA	MTPASA	MTPASA
			PQD – B2B					PQD – B2B	PQD – B2B	PQD – B2B	PQD – B2B	PQD – B2B	PQD – B2B	PQD – B2B
				Settlement PDF Reports				Settlement PDF Reports	Settlement PDF Reports	Settlement PDF Reports	Settlement PDF Reports	Settlement PDF Reports	Settlement PDF Reports	Settlement PDF Reports
Large File Share Async	✓		Next Day Dispatch			Next Day Dispatch		Next Day Dispatch	Next Day Dispatch	Next Day Dispatch	Next Day Dispatch	Next Day Dispatch	Next Day Dispatch	Next Day Dispatch
Large File Share Fire & Forget	✓		MIRN Listing – B2B				MIRN Listing – B2B	MIRN Listing – B2B		MIRN Listing – B2B	MIRN Listing – B2B	MIRN Listing – B2B	MIRN Listing – B2B	MIRN Listing – B2B
		Retail Snapshot		Retail Snapshot		Retail Snapshot		Retail Snapshot	Retail Snapshot	Retail Snapshot	Retail Snapshot	Retail Snapshot	Retail Snapshot	Retail Snapshot
Inquiry Sync Services	✓	NMI Discovery						NMI Discovery					NMI Discovery	NMI Discovery
LVI	✓	Multiple Use Cases	Multiple Use Cases	Multiple Use Cases	Multiple Use Cases	Multiple Use Cases			Multiple Use Cases	Multiple Use Cases	Multiple Use Cases	Multiple Use Cases	Multiple Use Cases	
Gateway Software Regression Testing	N/A													BAU Inbound & Outbound Test Cases

PreProd and industry tested

AEMO tested with evidence

Poll 2 – Foundation use cases:

AEMO has proposed 7 additional use-cases as part of Foundation to thoroughly test and validate the remaining criteria for IDX Foundation. Although many of the use-cases overlap in terms of capabilities tested, all 7 use-cases provide full coverage of all IDX Foundation capabilities.

Use-Cases to validate remaining capabilities

- Fan Out
- B2B Data Exchange
- B2M Outbound Data Delivery
- Inquiry Service
- LVI
- Foundation Non-Functional
- AEMO Gateway Software with Legacy Functionality Regression Test.

Business Services used to complete Use-Case validation

- DOE – B2B
- OWNX – B2B
- MT PASA
- PQD – B2B
- Settlement PDF Reports
- Next Day Dispatch
- MIRN Listing – B2B
- Retail Snapshot
- NMI Discovery

Do the proposed Foundation use-cases cover the remaining key criteria, and are the measures proposed providing sufficient coverage?

Option A: Yes, I am comfortable with the Foundation use-cases providing coverage across those key criteria.

Option B: No, I require further internal assessment within my organisation, or I have additional use-cases, services or clarifications required, and will reply by COB Wednesday 12 February with details.

Foundation non matrix criteria

Foundation: Governance

The **IDX Foundation Phase** will be required to deliver technical documentation and standards and to ensure there is a governance model in place to support it the IDX platform that will span across Fuels and Markets.

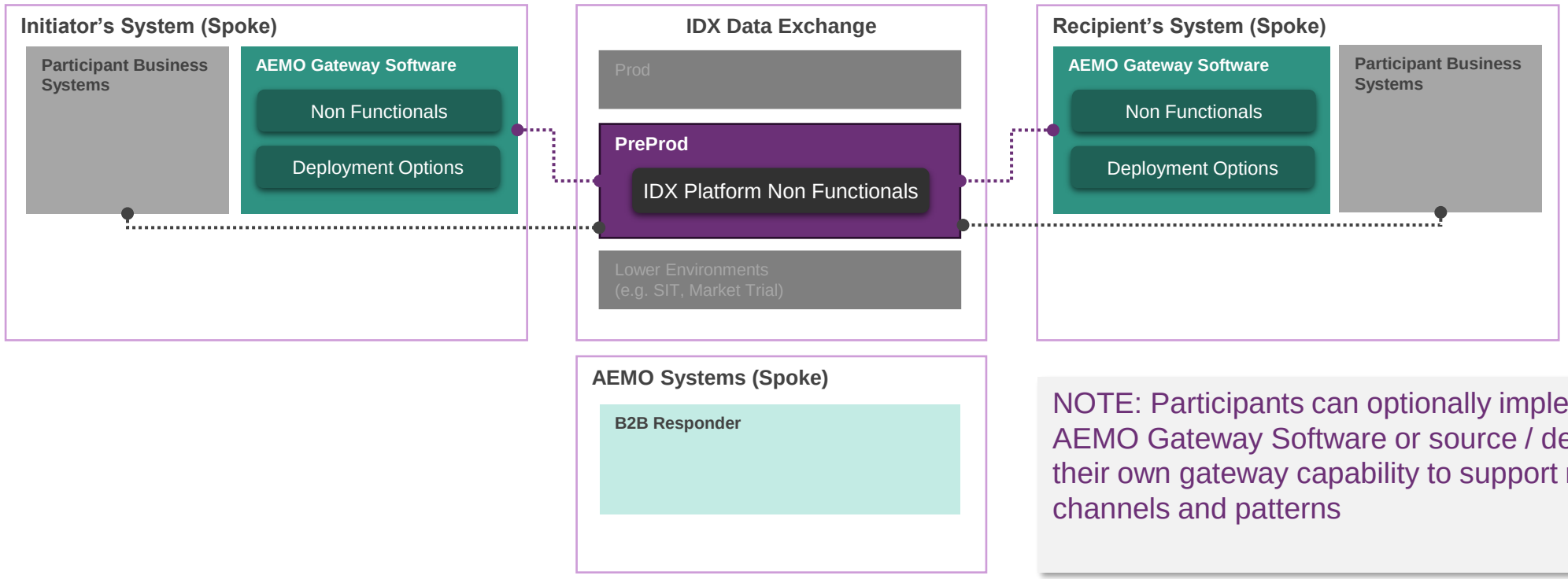
IDX Foundation: Governance	Criteria
Technical standards	• Technical Specifications established • IDX decision tree branches and outcomes defined
Governance	• IDX Governance body established • Working Group appointed to develop and maintain technical standards

Environment Approach

Which environment(s) which will be used for validating IDX Foundation capabilities

Environments Approach

AEMO propose to leverage the Pre-Production environment for industry testing (use-case validation) of the IDX Foundation capabilities.



NOTE: Participants can optionally implement the AEMO Gateway Software or source / develop their own gateway capability to support new IDX channels and patterns

4. Decision Tree Mapping

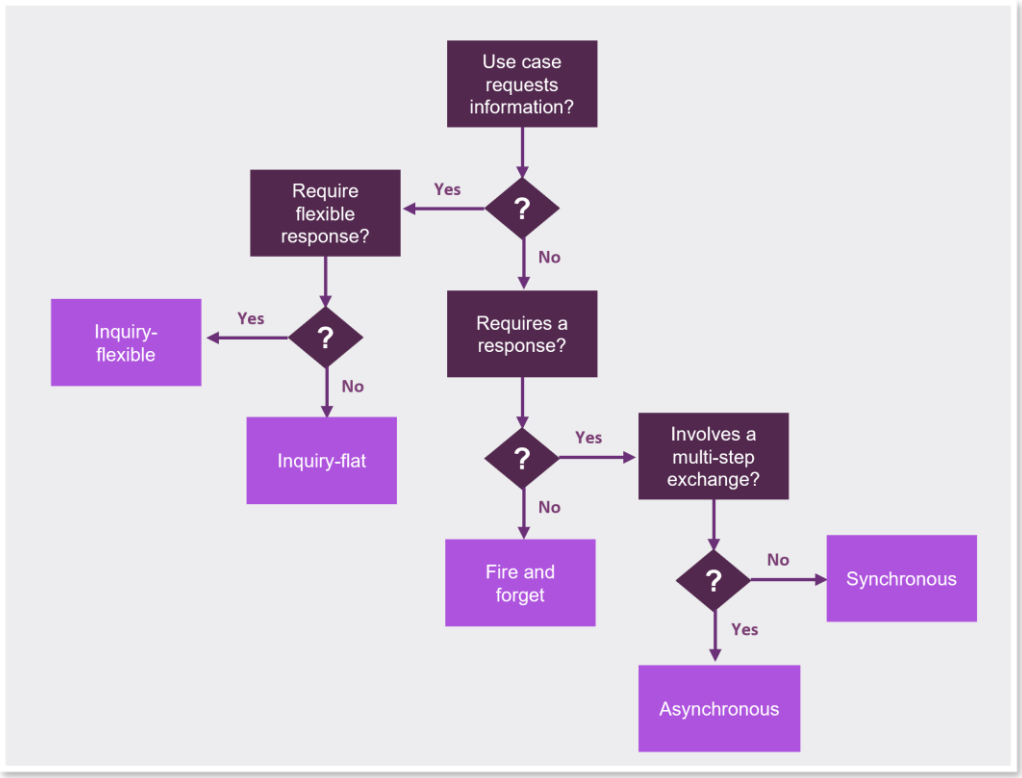
A draft mapping of Business Services to the Decision Tree

Sri Gundu

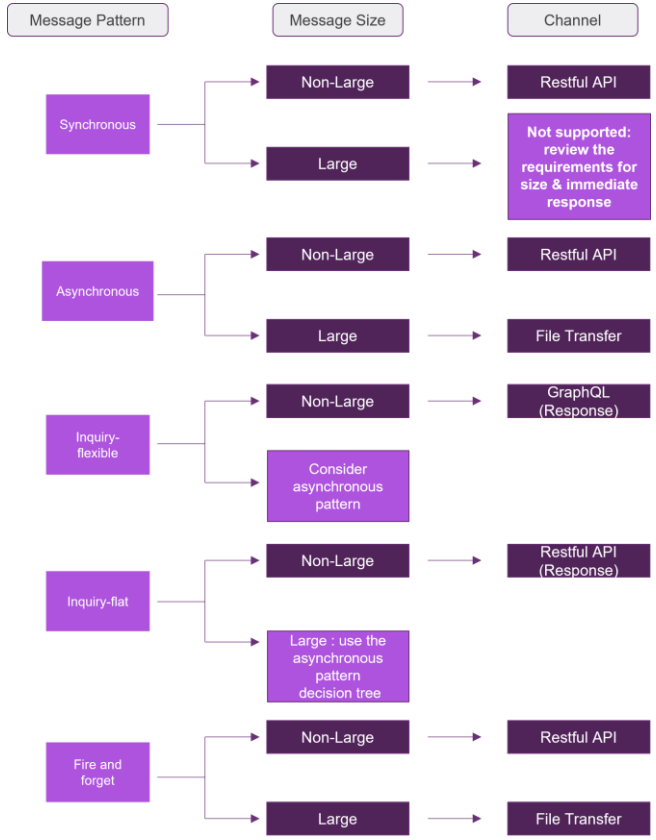
Re-cap of Decision Tree 1/2

The IDX Decision Tree will be used for all new and transitioning business functions to determine the channel and pattern that the business function will use on IDX.
The following slides outline an ***initial and draft*** view of existing NEM business functions and what may be their IDX channel and pattern. AEMO will work with the industry to determine all business function mappings to channels and patterns as part of DP2.

Step 1: Determine the Pattern for the business function



Step 2: Determine the Channel for the business function



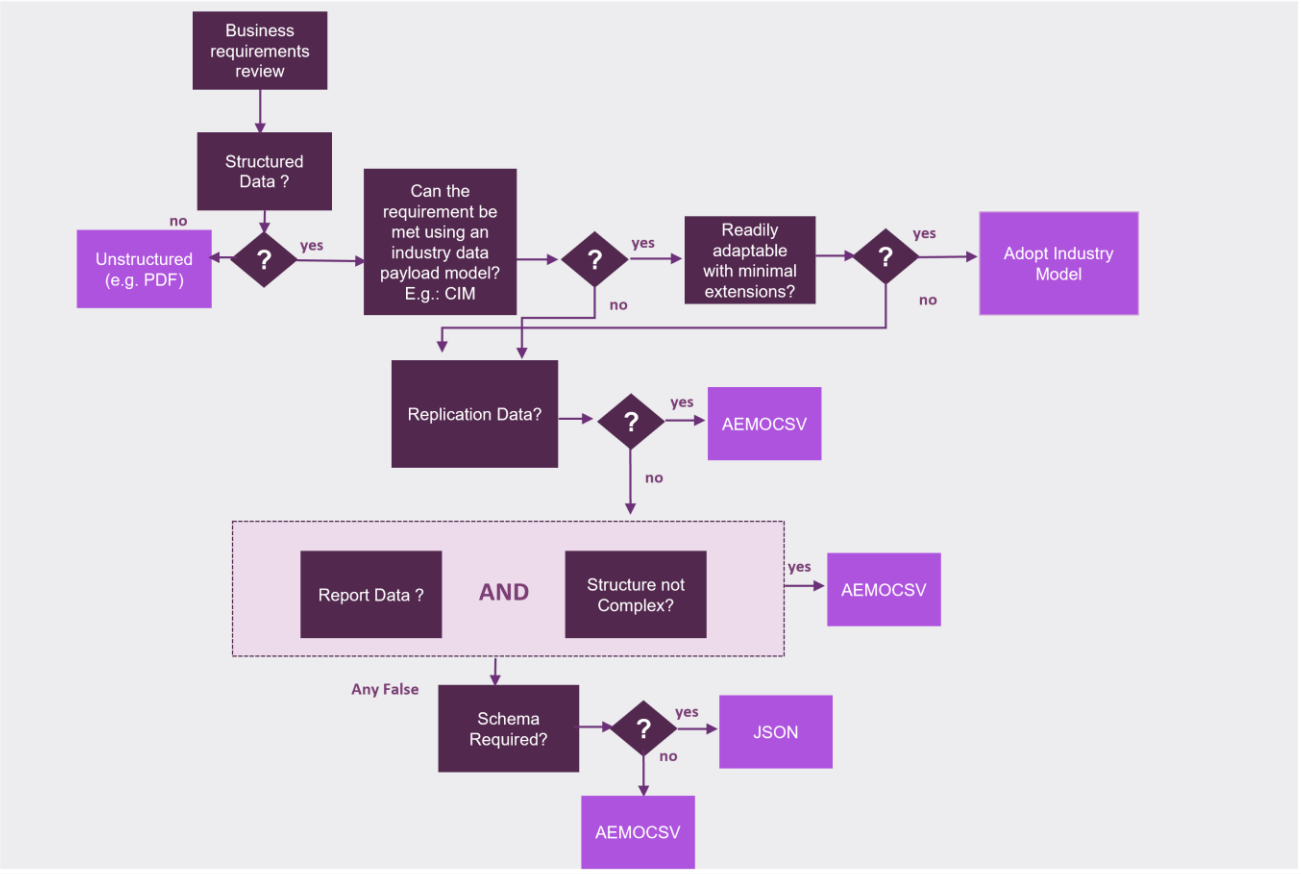
- **Decision Tree to illustrate the scenarios how a use case is assessed to determine which pattern it should follow**

- **For the decision tree to function this process must result in a consistent determination of pattern for like use cases**

Re-cap of Decision Tree 2/2

Once the pattern and channel is determined for the business functions, the payloads on transitioning business function will be reviewed and mapped to the IDX payload structure.
The summary slide outlines an ***initial and draft*** view of existing NEM business functions and what may be their IDX payloads.
AEMO will work with the industry to determine all business function and endpoint mappings to IDX payloads as part of DP2.

Step 3: Determine the Payload required for the business function endpoints



- **The Payload Decision Tree is used to determine what payload a particular endpoint on a business function should be mapped to.**

NEM Business Function Overview 1/2

The following table is a ***draft and initial*** summary of the business functions mapped to the channel, pattern and payloads which may pertain to those business functions. Business functions may have multiple services (e.g. CATS Change Requests, CATS Reports) within the function that are mapped independently to their own channels and patterns.

Market Segment	Business Function	Sub-Type	RESTful API				Large File		GraphQL
			Synchronous	Asynchronous	Inquiry Flat	Fire and Forget	Asynchronous	Fire and Forget	Inquiry Flexible
NEM Wholesale	Ancillary Service	Ancillary Service Contract Data		✅JSON					
	Constraints	Constraint library definitions		✅JSON					
		Constraint invocations					✅AEMO CSV		
	Current Day Trading	Bids	✅JSON						
		Dispatch		✅AEMO CSV					
		Market Notices		✅AEMO CSV					
		P5MIN		✅AEMO CSV					
		Pre-Dispatch					✅AEMO CSV		
	Plant Operations	PD PASA					✅AEMO CSV		
		ST PASA					✅AEMO CSV		
		Voltage instructions		✅JSON					
	Forecasting	Demand Forecasts					✅AEMO CSV		
		Wind Generation Forecasts					✅AEMO CSV		
		Solar Generation Forecasts					✅AEMO CSV		
	Market Suspensions & Administrative Price Events	Market Suspensions & Administrative Price Events		✅JSON					
	Network	Network*		✅JSON					
	Participant Registration	Participant Registration		✅JSON					
	Prudentials	Prudentials					✅AEMO CSV		
	Settlements	Billing					✅AEMO CSV		
		Metering Data					✅AEMO CSV		
		Settlement Data		✅Unstructured					
	Residue Auction data	Offers	✅JSON						
		Auction outcomes		✅JSON					
	MT PASA	MT PASA Input Data		✅JSON					
		MT PASA Solution Data					✅AEMO CSV		

NEM Business Function Overview 2/2

The following table is a ***draft and initial*** summary of the business functions mapped to the channel, pattern and payloads which may pertain to those business functions. Business functions may have multiple services (e.g. CATS Change Requests, CATS Reports) within the function that are mapped independently to their own channels and patterns.

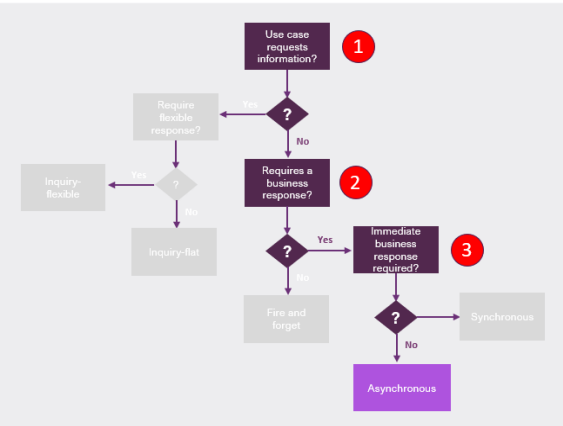
Market Segment	Business Function	Sub-Type	RESTful API				Large File		GraphQL
			Synchronous	Asynchronous	Inquiry Flat	Fire and Forget	Asynchronous	Fire and Forget	Inquiry Flexible
Retail B2M	CATS	Change Requests		✓ JSON					
		Reports		✓ JSON					
	NMID - Real time Lookup	NMID Real time Lookup							✓ JSON(TBC*)
	NMID - Batched	NMID for multiple NMI Lookup		✓ JSON					
	Meter Data Reports (MDMT)	Meter Data RM Reports		✓ JSON					
Retail B2M & B2B	Meter Reads (MTRD & MDMT)	MDMT Meter Reads		✓ JSON					
		MTRD Meter Reads to AEMO		✓ AEMOCSV					
		B2B MTRD Meter Reads**		✓ AEMOCSV					
B2B	Service Orders (SORD)	Metering Service Works		✓ JSON					
		Re-energisation		✓ JSON					
		De-energisation		✓ JSON					
		Special Reads		✓ JSON					
		Other Service Orders		✓ JSON					
	Customer Details & Site Access Notifications (CUST & SITE)	Customer Details Request & Notifications		✓ JSON					
		Life Support Request & Notifications		✓ JSON					
		Site Access Request & Notifications		✓ JSON					
	One Way Notifications (OWNP & OWNX)	Shared Fuse Notification				✓ JSON			
		Notice of Metering Works				✓ JSON			
		Meter Fault & Issue Notification				✓ JSON			
		Planned Interruption Notification				✓ JSON			
		Network Tariff Notification				✓ JSON			
		Meter Exchange Notification				✓ JSON			
	Remote Services (MRSR)	Remote Service Request & Response		✓ JSON					
	Notified Parties (NPNX)	Notified Parties		✓ JSON					
	Peer-to-Peer (PTPE)	Peer-to-Peer via Hub		✓ JSON					
	Other Markets (HSMD, FLTS etc)	High Speed Monitoring		✓ JSON					
		Faults & Outages		✓ JSON					

* NMID Real time lookup may fit GraphQL pattern, which will be determined during DP2.

**B2B MTRD Meter Reads, NEM13 will be retained for basic meters

Worked Example: MTRD Transaction Group-MDN

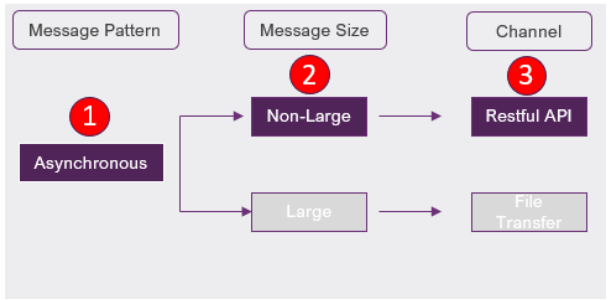
Step 1: Determine the *Pattern* for the business function



Decision tree for *Pattern* applied : *Asynchronous*

1. Meter Data is being submitted, not requested
2. A business response (TACK) is required
3. The business response is not passed immediately, as it has further steps in the process to be completed

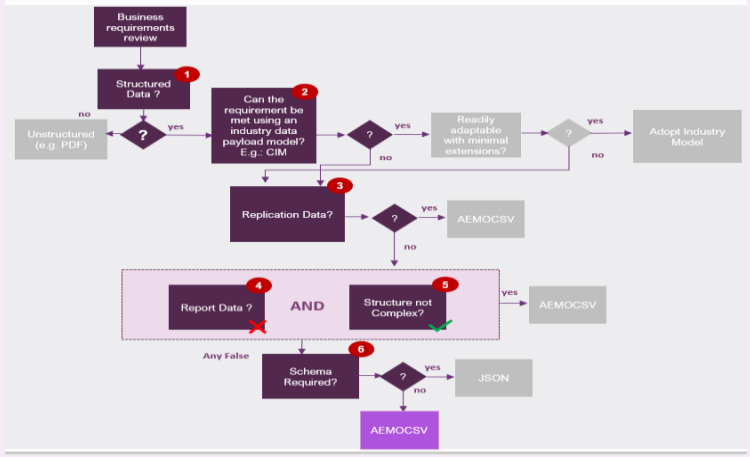
Step 2: Determine the *Channel* for the business function



Decision tree for *Channel* applied : *RESTful API*

1. MDN transactions can be bundled and limited to 1MB file size. Integrity of the data can be maintained by chunking the payloads into sizes of 1MB. Using the 'Message Size Decision Tree', message size = 'Not Large'
2. Channel to be used is RESTful API

Step 3: Determine the *Payload* required for the business function endpoints



Decision tree for *Payload* applied to *Meter Data Notification* : *AEMO CSV*

1. Data output is structured? – Yes
2. Can the requirement be met using an industry data payload model? – No
3. Replication Data– No
4. Report Data – No
5. Structure Not Complex – Yes
6. Schema Required - No

Worked Example: MTRD Transaction Group

Applying the decision tree process to rest of the transactions within MTRD Business function the high-level API endpoint details are as follows.

Market: NEM Retail
Business Function: Meter Reads (MTRD Transaction Group)
Business Function API: https://.../NEMRetail/v1/B2BMeterReads/<resource group>/<resources>
Supported functionalities required:

Use Case	API Method	API Definition	Proposed Payload Format
Send meter reads to the B2B Recipient (messages & TACKs)	POST	NEMRetail/V1/**B2BMeterReads**/transactions/meterDataNotification	AEMOCSV
Retrieve meter reads from the B2B Sender (messages & TACKs)	GET	NEMRetail/**B2BMeterReads/**v1/transactions/meterDataNotification	AEMOCSV
Send Provide Meter Data Request (messages & TACKs)	POST	NEMRetail/**B2BMeterReads/**v1/transactions/provideMeterData	JSON
Retrieve Provide Meter Data Request (messages & TACKs)	GET	NEMRetail/**B2BMeterReads/**v1/transactions/provideMeterData	JSON
Send Verify Meter Data Request (messages & TACKs)	POST	NEMRetail/**B2BMeterReads/**v1/transactions/verifyMeterData	JSON
Retrieve Verify Meter Data Request	GET	NEMRetail/**B2BMeterReads/**v1/transactions/verifyMeterData	JSON

NOTE: *NEM13 would be retained to support basic meters*

Business Function Sub-Type	Payload Format	Justification
meterDataNotification	AEMOCSV	Structured output that is not complex and no schema is required
provideMeterData	JSON	Structured output that is not complex, but requires a schema
verifyMeterData	JSON	Structured output that is not complex, but requires a schema

We are on Break

5. Decision Point 2 criteria "WHAT"

Andrew Bell

RECAP: Criteria for validation – Foundation vs Decision Point 2

The FaSI Business Case has been scoped to deliver IDX Foundation for all energy markets and enable a 'Decision Point 2' on the transition of NEM legacy services. This division was established to allow for greater certainty regarding industry costs and timelines to transition NEM legacy services.

IDX Foundation

The purpose of the **IDX Foundation Phase** is to deliver industry data exchange foundational capability that efficiently supports upcoming new reforms in a secure and extensible way.

Foundational capability includes
- All patterns and channels
- Connectivity and security (noting this leverages IDAM)
- Payload formats
- AEMO Gateway Software
- Platform capabilities

Additional topics for consideration may include:
- Non-functional requirements
- Participant capabilities
- Governance

Foundation provides capability to be leveraged for new data exchange services for all existing and any emerging markets and fuels under AEMO's remit, including **NEM, WEM and Gas jurisdictions**.

Enabling Decision Point 2 (NEM legacy data exchange services)

Decision Point 2 (DP2) assesses the case for transition of NEM legacy data exchange services for Retail and Wholesale.

Considerations for Decision Point 2 include:
- Application of new patterns and channels to legacy services
- Payload format decisions
- Transition strategy
- Enabling capabilities supplied by AEMO
- Industry timelines and costs
- Interoperability

Decision Point 2 only contemplates transition of NEM legacy data exchange services, with the output of the decision point being a business case. Criteria is therefore constrained to the inputs to developing this business case, noting criteria to validate transition itself would be developed within the scope of the DP2 business case.

Overview of Decision Point 2 Criteria

Decision Point 2 (DP2) assesses the case for the transition of NEM legacy data exchange services for Retail and Wholesale. In advance of resolving the Transition Strategy to be considered under DP2, this overview is intended to kick start thinking on the additional criteria which might be required over and above those for Foundation to enable DP2.

Additional criteria for Decision Point 2 may include:

- The re-defined Business Services
- Transition enabling capabilities requiring validation
- Extended non functionals beyond foundation

Non matrix / readiness criteria may include:

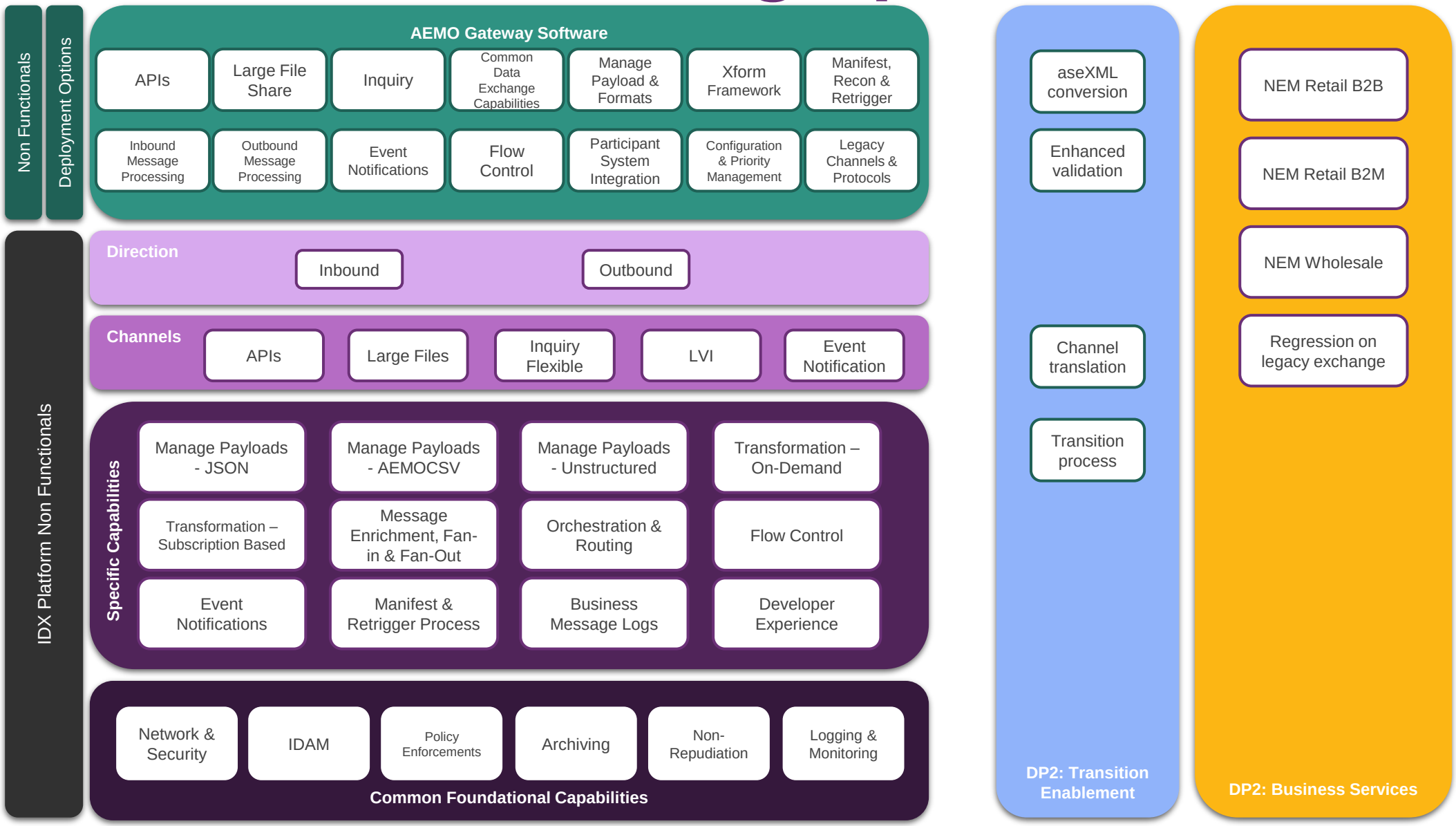
- Business case approved
- Technical guidelines completed
- Procedural updates completed
- IDX governance in place
- Transition strategy agreed

This introduction is intended to kick start thinking on the delta criteria for DP2 noting we have a separate session planned to finalise criteria to validate (the 'WHAT'), as well as a separate session to then develop the measures (the 'HOW').

While we will endeavour to capture any measures in a parking lot, we ask participants to focus on the definition of the criteria themselves.

***Note: Decision Point 2** only contemplates transition of NEM legacy data exchange services, with the output of the decision point being a business case. Criteria therefore are constrained to the inputs to developing this business case, noting criteria to validate transition itself would be developed within the scope of the DP2 business case.

DP2 Criteria building upon foundation

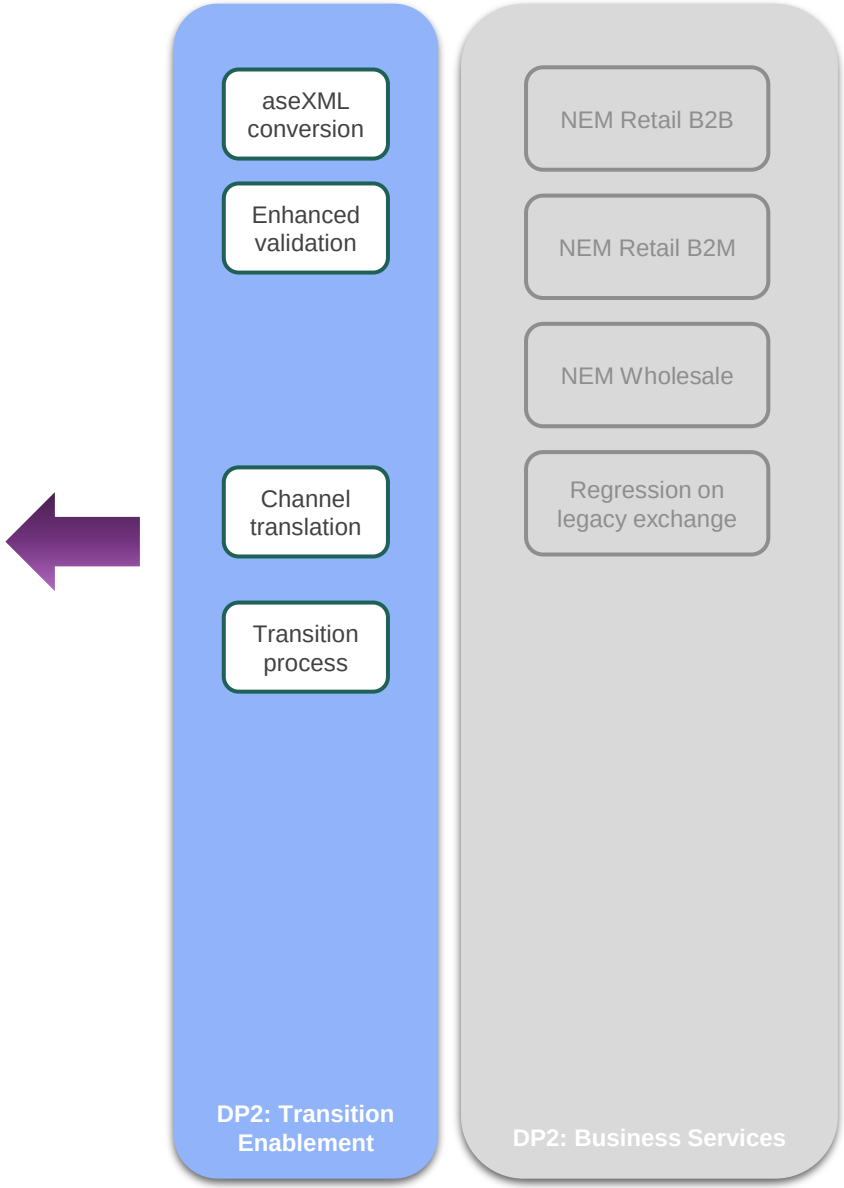


Capabilities validated in Foundation - re-validated in DP2

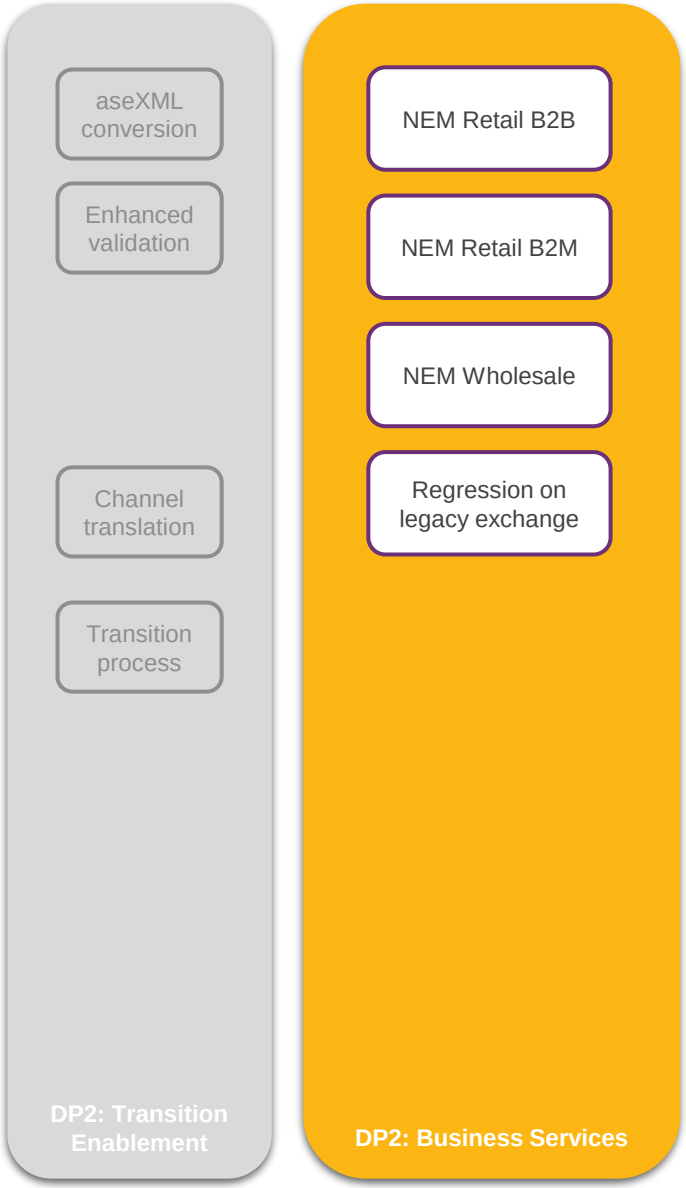
DP2 specific capabilities and business services

DP2 Transition enablement

Topic	Criteria
AEMO Gateway aseXML conversion	• AEMO Gateway Software enables backwards compatibility converting new payloads to legacy payloads
AEMO Gateway Enhanced validation	• AEMO Gateway Software supports deployment of Enhanced Validation Module • AEMO Gateway Software supports participant defined enhanced validations
IDX Channel translation	• IDX enables channel translation between participants on legacy and participants on the new IDX channels and payloads
DP2 Transition process	• Participants can enable IDX services in the IDX platform to switch from legacy to IDX on a per business service basis • Any further transition enabling capabilities identified as required for DP2 operate



DP2 Business Services

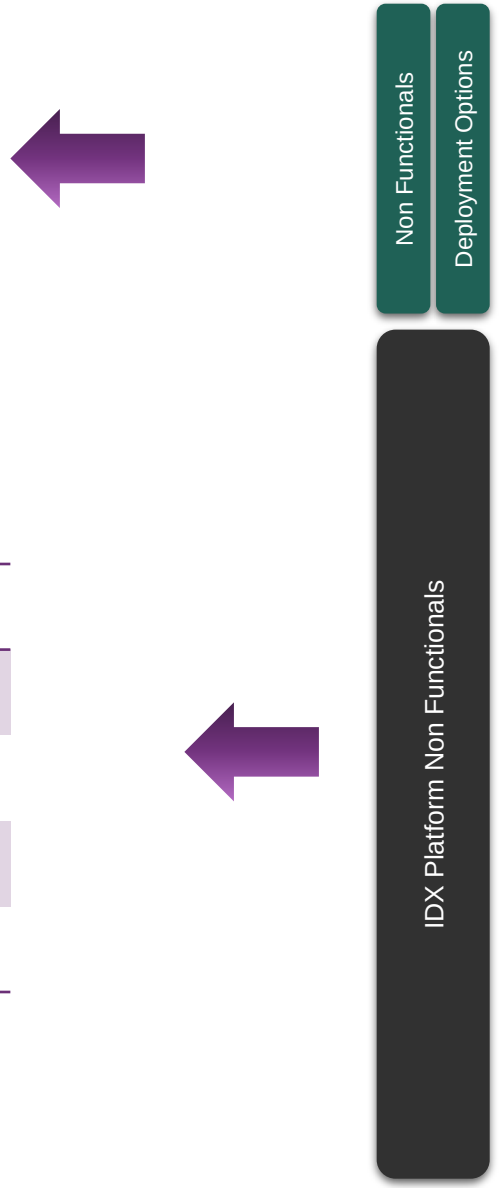


Topic	Criteria
NEM Retail B2B	• All NEM Retail B2B Services are available, functional and performant across all transaction groups and transactions
NEM Retail B2M	• All NEM Retail B2M Services are available, functional and performant
NEM Wholesale	• All NEM Wholesale Services are available, functional and performant
Regression on legacy exchange	• Existing NEM legacy data exchange continues to operate

Extended non functionals

Topic	Criteria
AEMO Gateway non functionals	Scalability & recoverability for NEM IDX services

Topic	Criteria
IDX Platform non functionals	Scalability – supporting NEM IDX services
	Availability – supporting NEM IDX services
	Recoverability – supporting NEM IDX services
	Responder – supporting NEM IDX services



Poll: DP2 Validation Criteria

In your opinion, does the Validation Criteria for DP2 cover the key criteria required to validate DP2 (over and above what has been validated in PQD and Foundation releases)?

Option A: Yes, the coverage will satisfy the decision to be made.

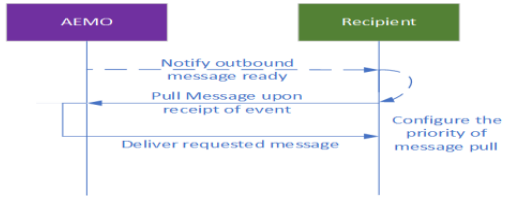
Option B: Additional criteria or clarifications required as today's discussion.

Option C: Require further internal assessment within my organisation, will reply by Wednesday 12th February.

6.Focus Group playback IDX: Async Pattern

Sri Gundu

Async Pattern – Outbound Data Exchange

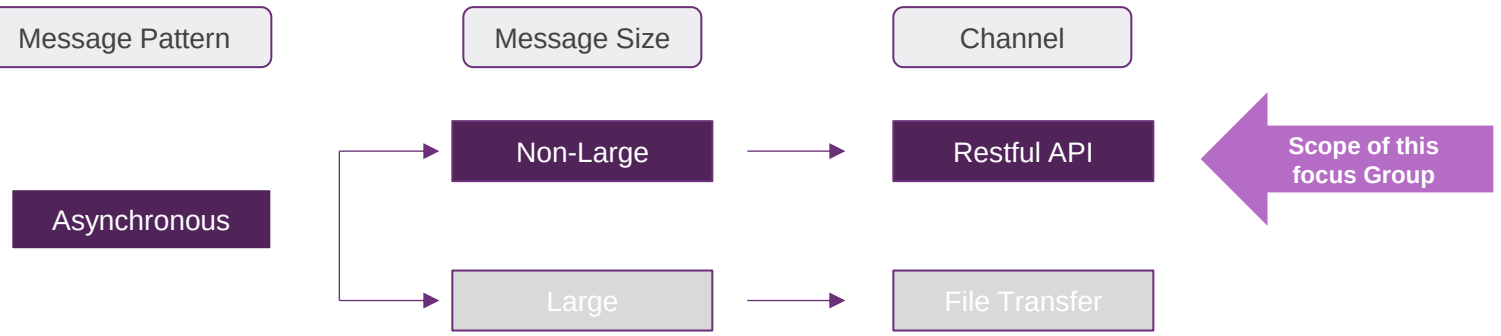
Pain points	Proposed Principle(s)	Target State Concept
Industry raised pain-point: • Cost and complexity. *AEMO's reading of Industry pain points:* • Requires stakeholders to create and manage API gateways, networking setups and troubleshooting efforts at their cost. • Current patterns depend on the 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.	• Minimise ongoing IT change for stakeholders in the data delivery processes while reducing their costs and efforts associated with the transition to IDX. • Provide near real-time visibility of critical market transactions. • Empower stakeholders with the ability to prioritise the order of data delivery, providing maximum control over the data reception process.	• AEMO-hosted Outbound Pull using Event-Driven Integration shall be the foundation of outbound data delivery.  • 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.

Async Pattern- Definition & Scope

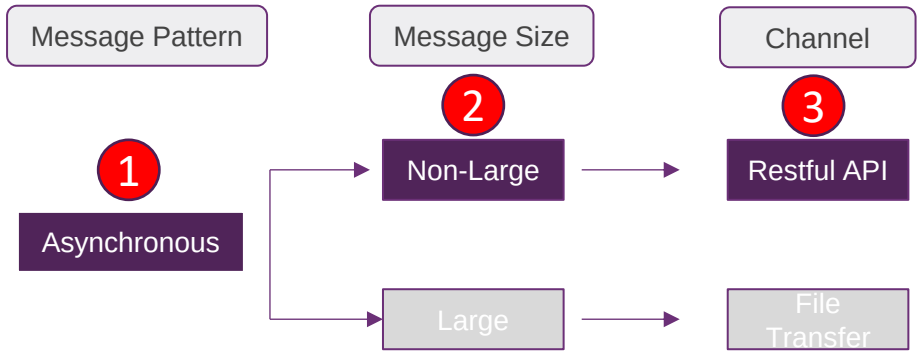
Definition

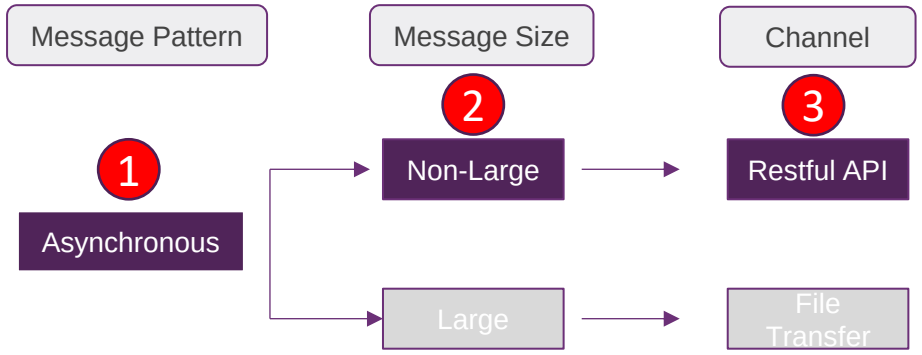
Additional processes or validations are required to enable a response to the request. For each interface required to support the process, decision tree is applied to determine a channel. It follows a multi-legged approach to deliver the business response.

Decision Tree



Async Pattern –Participant Initiated use case





Use Case: NEM Retail RM Reports

Leg 1

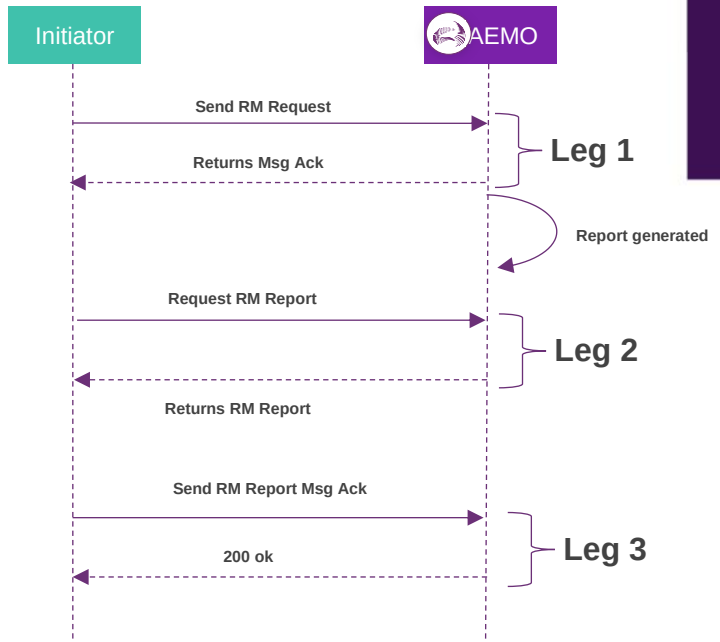
1. RM Report fits the Asynchronous pattern
2. RM Report(RM17) Request file size is less than 1MB, message size = 'Not Large'
3. Channel to be used is Restful

Leg 2

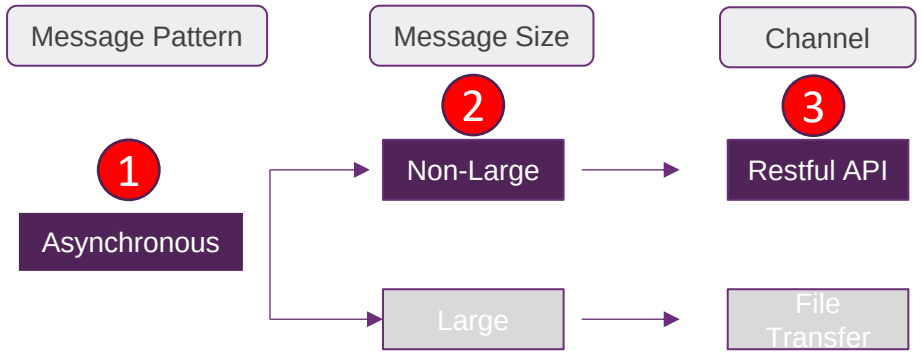
1. It is another leg in an overall Asynchronous pattern
2. RM Report (RM17)file size is less than 1MB, message size = 'Not Large'
3. Channel to be used is Restful

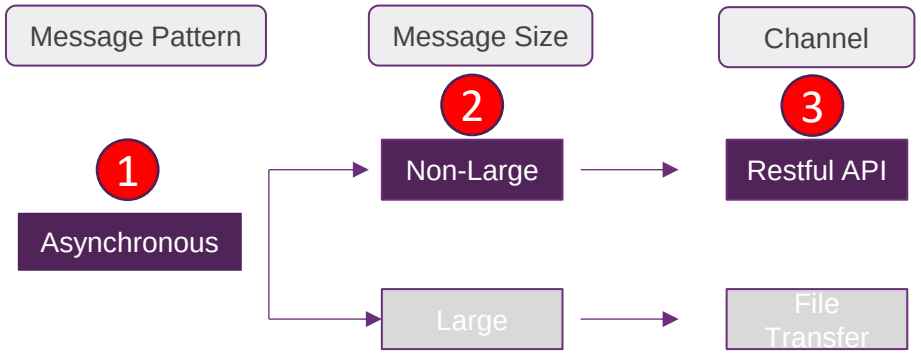
Leg 3

Likewise , for leg 3 the channel is restful



Async Pattern –AEMO Initiated use case





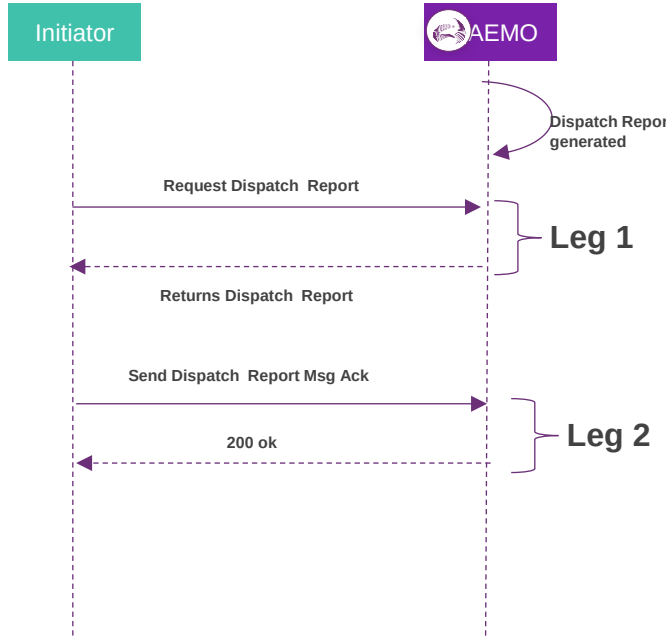
Use Case: NEM Wholesale Dispatch Reports

Leg 1

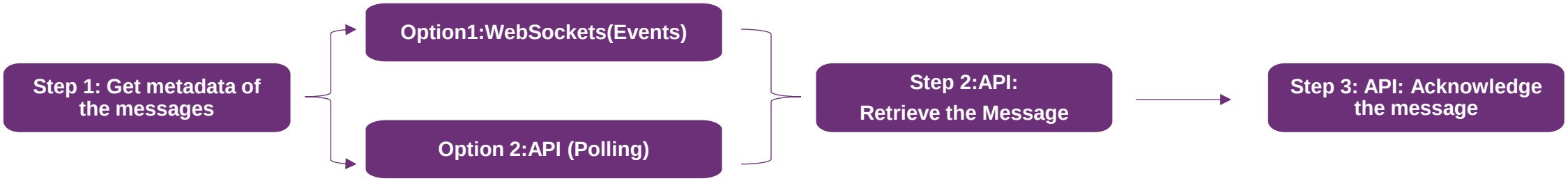
1. Dispatch Report fits the Asynchronous pattern
2. Dispatch Report file size can be limited less than the payload threshold* , message size = 'Not Large'
3. Channel to be used is Restful

Leg 2

1. It is another leg in an overall Asynchronous pattern
2. Message ack size is less than the payload threshold* , message size = 'Not Large'
3. Channel to be used is Restful

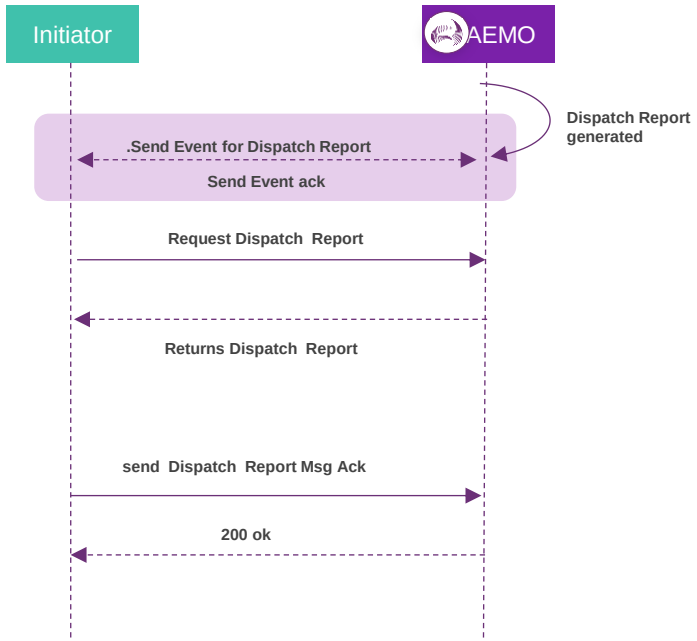


Async Pattern - Events & API polling



Participants have the flexibility of choosing one of the options which best suits their use case. Furthermore, participants will have the ability to choose either option for a specific Business Function, or participants could implement both (for example - to provide redundancy).

Option 1 : Get metadata of the messages-Web sockets (Events)



Event Notification Endpoint

Event Notification	protocol	Web Socket URL
Web Socket Interface endpoint for NEM Market	WSS	xxxxxxxxx

Business Function API Endpoint

Market: NEM
Business Function: Dispatch Reports
Business Function API: https://.../NEM/DispatchReports/v1/<resource group>/<resources>

Use Case	API Method	API Definition
Retrieve Dispatch Report from AEMO	GET	NEM/**DispatchReports**/V1/reports/private
Send message Ack for Dispatch Report	POST	NEM/**DispatchReports**/V1/reports/acks

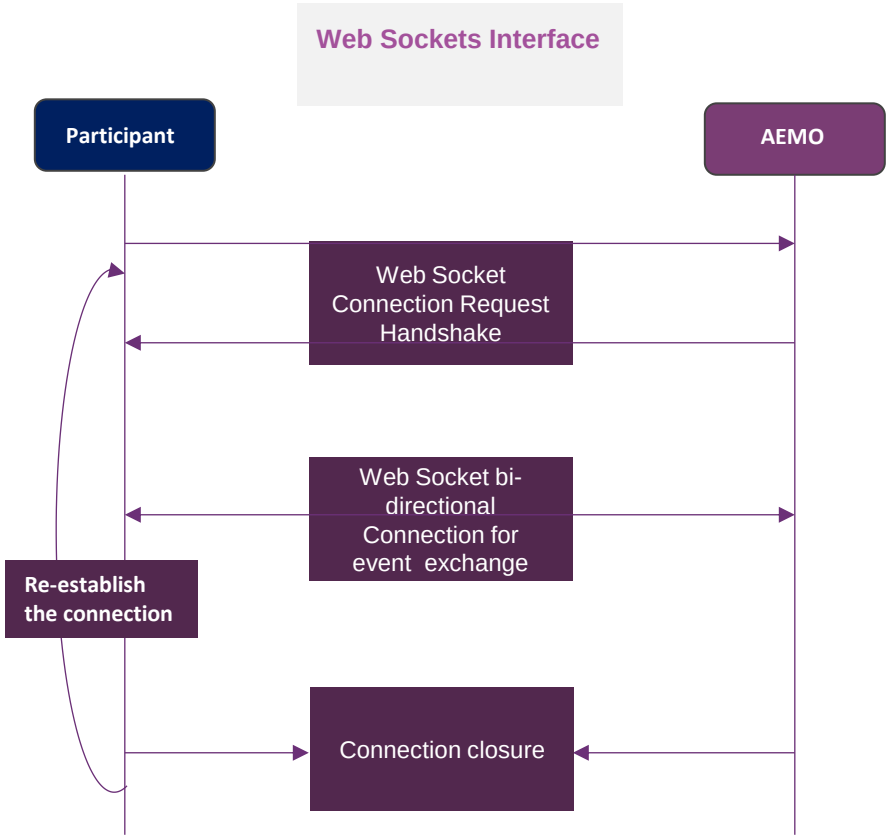
URLs presented here are sample only, actual URLs will be published as a part of technical specification

Option 1:Web Socket Interface (Event Notification Channel)

Functionality	Details
Subscription	• The process is explained in the next slide with examples
Web Socket Connection	• Security Pattern for getting access to web socket endpoint will be discussed in IDAM Focus Group** • Execute the request to establish the connection to the web socket endpoint • AEMO Validates the request and establishes the web socket Connection • One websocket endpoint per Market .
Data Exchange	• For all the subscribed Outbound Business Function Messages AEMO • Sends an Event Message for each C retrieving. AEMO Generated Draft Event Message structure Participant Response Draft Event Ack structure


```
{
    "Version": 1,
    "BusinessFunction": "DISPATCH",
    "EventType": "OUTBOUND_NOTIFICATION",
    "EventId": "e5858748-ca26-48c0-893d-1f6cfd700cc8",
    "EventDate": "2024-07-05T09:55:10.000+10",
    "MessageDomain": "NEM",
    "MessageId": "e5858748-ca26-48c0-893d-1f6cfd700cc8",
    "MessageType": "DISPATCHIS_LEGACY",
    "MessageMetadata": [
        {
            "Name": "settlement_date",
            "Value": "2024-07-05T10:00:00.000+10"
        },
        {
            "Name": "priority",
            "Value": "HIGH"
        }
    ]
}
```

```
{
    "Version": 1,
    "BusinessFunction": "DISPATCH",
    "EventType": "NOTIFICATION_ACK",
    "EventId": "e5858748-ca26-48c0-893d-1f6cfd700cc8",
    "EventDate": "2024-07-05T09:55:10.000+10",
    "Status": "Received"
}
```

Subscription to web sockets

Principles

- Subscription to event channel is optional
- Participants can choose the level of access to any given websocket service account i.e. they can span participant Ids & Business functions

Subscribing to the event notification channel and entitlements via IDAM

- The OrgAdmin/PA can create service accounts for web socket channel in IDAM
- The OrgAdmin/PA has the option of allocating all the Business Functions or a subset available for a Participant ID to the service account .
- The OrgAdmin/PA can create multiple service accounts for WebSockets ,and can allocate unique combination of Participant ID-Business function across those accounts
- The OrgAdmin/PA can allocate multiple Participant ID –Business Functions to a single service account

Options for allocating Business functions to service accounts

Option 1

- One participant ID-business function –event notification is allocated to one Service account only

Event acks are easy to manage as they are delivered only on one account

Worked Examples

Web socket Service account	Participant ID-Business Functions Entities
SA1	(PD1-SORD),(PD1-MTRD)
SA2	(PD1-CATS),(PD1-CUST)

Option 2

- One business function –event notification can be allocated to multiple accounts

Provides redundancy on the events .

Race condition issues arise while doing event acks.

Web socket Service account	Participant ID-Business Functions Entities
SA1	(PD1-SORD),(PD1-MTRD)
SA2	(PD1-SORD), (PD1-CATS),(PD1-CUST)

FG Participants -recommended option

Subscription to WebSockets-examples

Participant ID	Available Business Functions
PID1	SORD,MTRD,CATS,CUST

Subscribing to the event notification channel and creating service accounts via IDAM

Web socket Service account	Participant ID-Business Functions Entities
SA1	(PD1-SORD),(PD1-MTRD)
SA2	(PD1-CATS),(PD1-CUST)

PA can create multiple service accounts for WebSockets, and can allocate unique combination of Participant ID-Business function across those accounts

Subscription to WebSockets-examples

Participant ID	Available Business Functions
PID1	SORD,MTRD,CATS,CUST

Participant ID	Available Business Functions
PID2	SORD,MTRD,CATS,CUST

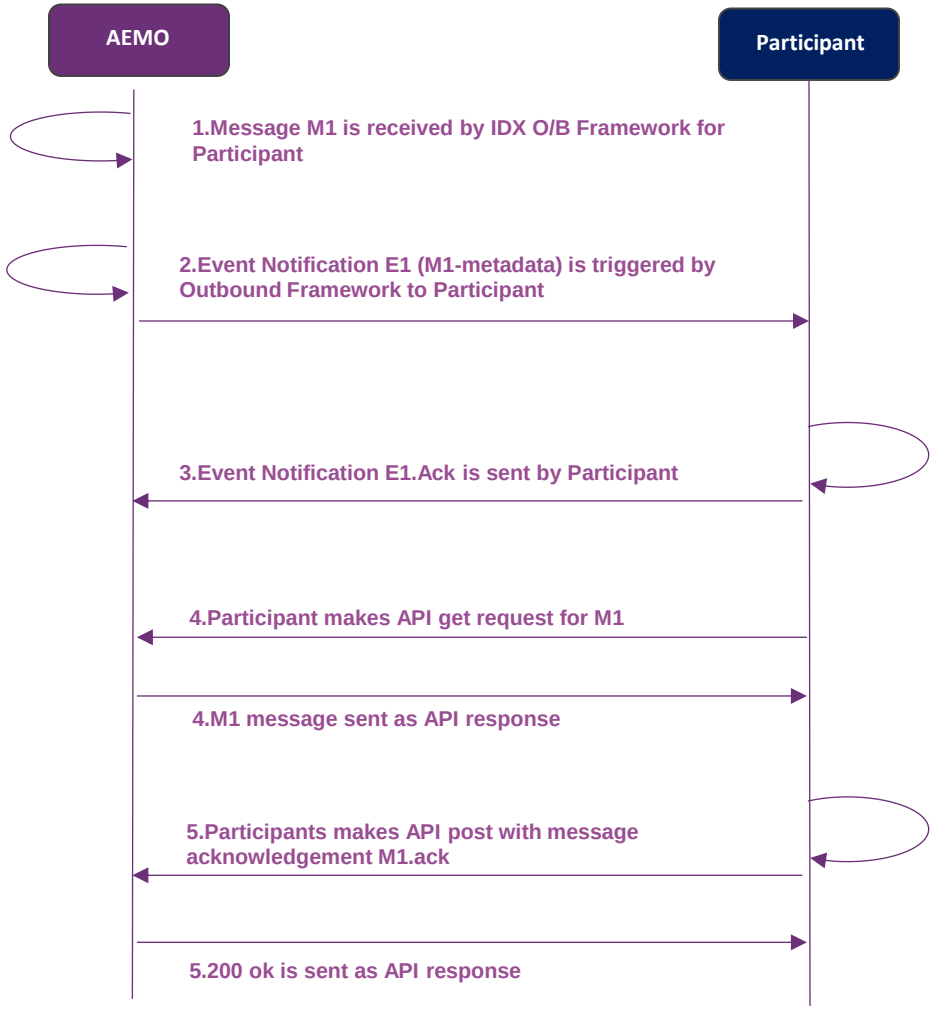
Subscribing to the event notification channel and creating service accounts via IDAM

Web socket Service account	Participant ID-Business Functions Entities
SA1(Vendor1)	(PID1-SORD),(PID2-SORD)
SA2(Vendor2)	(PID1-MTRD),(PID2-CUST)

Vendor 1 manages SORD for participant PID1 and Participant PID2

Vendor 2 manages MTRD ,CUST for participant PID1 and Participant PID2

Async Pattern – Scenario1: Happy Path



AEMO IDX –Outbound Framework

Outbound Message	Event Notification	Event Ack	Message Ack
M1	-	-	-

Outbound Message	Event Notification	Event Ack	Message Ack
M1	E1	-	-

Outbound Message	Event Notification	Event Ack	Message Ack
M1	E1	E1.Ack	-

Outbound Message	Event Notification	Event Ack	Message Ack
M1	E1	E1.Ack	-

Outbound Message	Event Notification	Event Ack	Message Ack
M1	E1	E1.Ack	M1.ack

Participant Gateway

Participant Inbound	Participant Outbound
-	-

Participant Inbound	Participant Outbound
E1	-

Participant Inbound	Participant Outbound
E1	E1.Ack

Participant Inbound	Participant Outbound
E1,M1	E1.Ack

Participant Inbound	Participant Outbound
E1,M1	E1.Ack,M1.ack

In this scenario, the AEMO IDX has an Outbound Message for a participant (this could be a B2B or a B2M message).
The following outlines the happy path (successful notification delivery, acknowledgement and retrieval of the message) scenario.

Clean-up (deletion/removal) of events, acknowledgements and messages on the AEMO IDX Hub is not covered in the above scenario.

Async Pattern - Scenario2: Web socket connection alive - No Event Acks

AEMO IDX –Outbound Framework

Outbound Message	Event Notification	Event Ack	Message Ack
M1	-	-	-

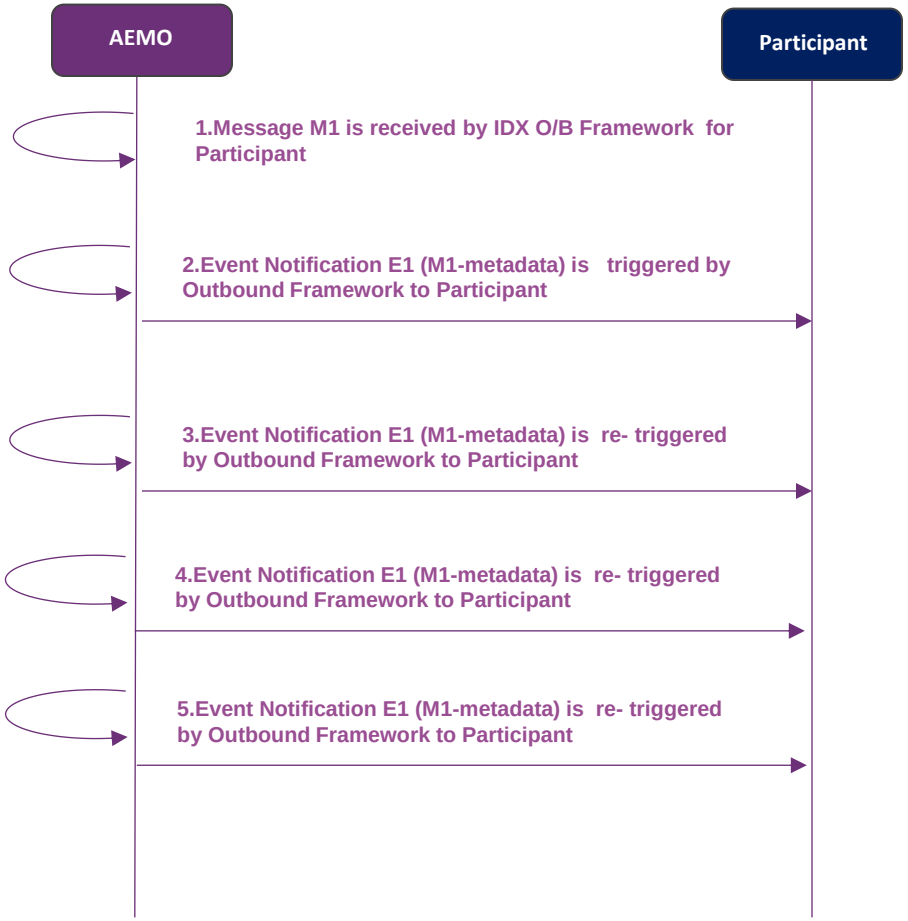
Outbound Message	Event Notification	Event Ack	Message Ack
M1	E1(count 1)	-	-

Outbound Message	Event Notification	Event Ack	Message Ack
M1	E1(count 2, retry 1)	-	-

Outbound Message	Event Notification	Event Ack	Message Ack
M1	E1(count 3, retry 2)	-	-

Outbound Message	Event Notification	Event Ack	Message Ack
M1	E1(count 4, last retry)	-	-

Outbound Message	Event Notification	Event Ack	Message Ack
M1	~~E1 (event expired)~~		-



Participant Gateway

Participant Inbound	Participant Outbound
-	-

Participant Inbound	Participant Outbound
E1	-

Participant Inbound	Participant Outbound
E1	-

Participant Inbound	Participant Outbound
E1	-

Event Notification is re-triggered if Event ack is not received or Msg Ack is not received

Event Notification is re–triggered a maximum 3 times in an exponential back-off process, with subsequent delays in larger windows.

Async Pattern - Scenario3: Web socket Connection down – Events Draining

AEMO IDX –Outbound Framework

Outbound Messages	Event Notification
M1-DISPATCH	E8
M4-SORD	E7
M1-DISPATCH	E6
M3-SORD	E5
M1-DISPATCH	E4
M2-SORD	E3
M1-SORD	E2
M1-DISPATCH	E1

message and event delivery

Once the web socket is re-established, events will then be drained

Events Draining

Dispatch (LIFO)	SORD (FIFO)
E8 (newest)	E2 (oldest)
E6	E3
E4	E5
E1 (oldest)	E7 (newest)

draining

draining

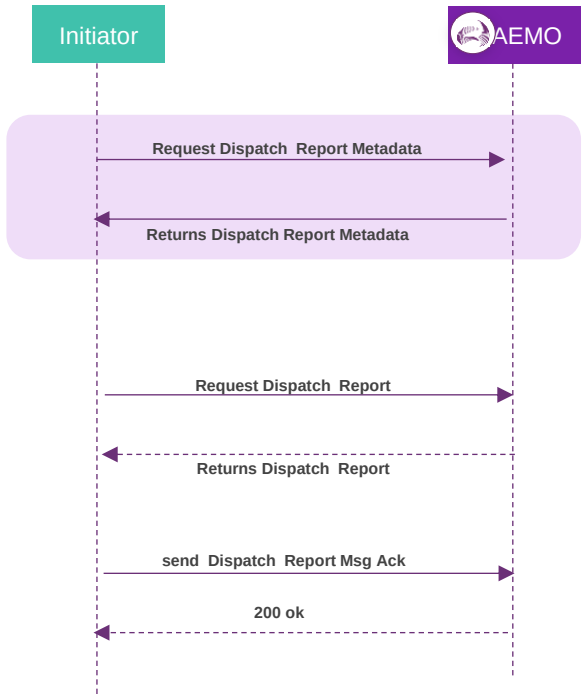
- SORD business function default is FIFO, and Dispatch default sort order is LIFO
- Default Priority of Dispatch Business Function is higher than SORD, so Dispatch Events are drained first, and then SORD

- The events above are drained in the following order: (Dispatch - LIFO) E8,E6,E4,E1 then (SORD - FIFO) E2,E3,E5,E7

Default business function sort order is applied (FIFO/LIFO) for pending events.

A default priority will be established for all Business functions and draining will happen based on this.

Option 2: Get metadata of the messages –API (Polling)



Business Function API Endpoint

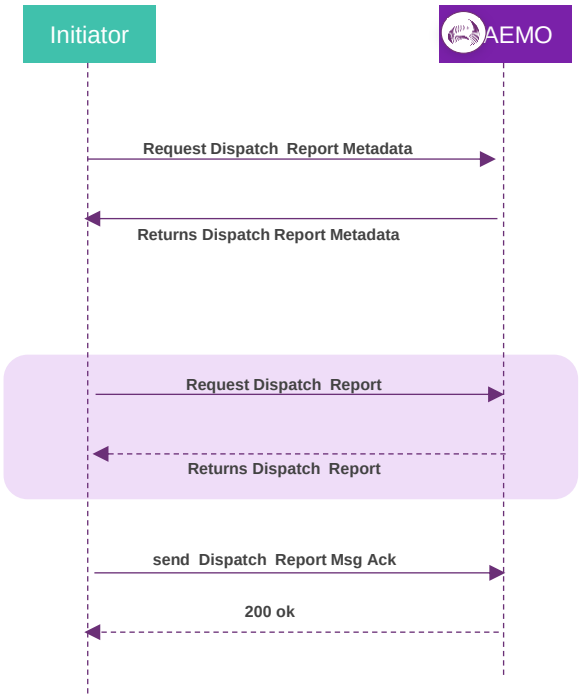
Market: NEM
Business Function: Dispatch Reports
Business Function API: https://.../NEM/DispatchReports/v1/<resource group>/<resources>

Use Case	API Method	API Definition
Retrieve metadata of the private dispatch messages in the outbound store	GET	NEM/**DispatchReports**/V1/reports /private/getMetadata?

Functionality	Details
Security	• Authentication & Authorisation will follow the OAUTH Client Credentials token pattern
Query parameters :Filtering & Sorting	• Message metadata (priority,messageType ,fromParticipant)

Order of the message is established for a Business function (FIFO or LIFO) during the endpoint creation and will be published in the technical specification .

Step 2: Retrieve the Message



Business Function API Endpoint

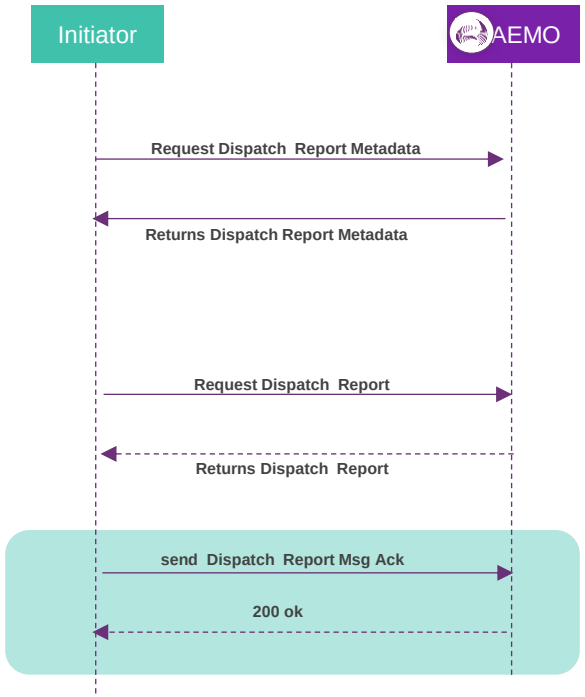
Market: NEM
Business Function: Dispatch Reports
Business Function API: https://.../NEM/DispatchReports/v1/<resource group>/<resources>

Use Case	API Method	API Definition
Retrieve the private dispatch report message in the outbound store for the specific message Id	GET	NEM/**DispatchReports**/V1/reports /private/getMessage?messageId=xxxx

Functionality	Details
Security	• Authentication & Authorisation will follow the OAUTH Client Credentials token pattern
Query parameters	• Message identifier (message Context Id) • Payload Version (n,n-1)-On Demand Payload Transformation
Concurrency	• Multiple threads to retrieve messages are supported within the throttle limits.

Message Bundling is not supported by AEMO Hub

Step 3: Acknowledge the message



Business Function API Endpoint

Market: NEM
Business Function: Dispatch Reports
Business Function API: https://.../NEM/DispatchReports/v1/<resource group>/<resources>

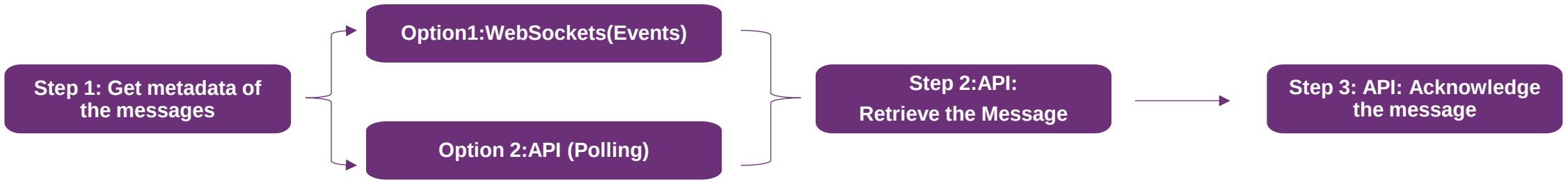
Use Case	API Method	API Definition
Send message acks for Dispatch reports	POST	NEM/**DispatchReports**/V1/reports/acks

Functionality	Details
Security	• Authentication & Authorisation will follow the OAUTH Client Credentials token pattern
Data Exchange	• Message acknowledgement

Message acknowledgement is always in Json format and transferred in the same channel as the message

Option 1 & Option 2 : Events & API polling

Events	API Polling
Multiple Business functions can be on one channel	Need to have individual requests for each Business function
A separate client code for web socket channel	Same technical set up can be used to retrieve a messages for all business functions
Event based so time critical messages are handled efficiently	Depends on the polling period
Participant based prioritisation of picking messages	Participant based prioritisation of picking messages



Participants have the flexibility of choosing one of the option which best suits for their use case , even have the ability to choose a specific option for a specific Business function and can also implement both as redundancy .

7. Focus Group playback
IDX: Flow Control

Sri Gundu

Flow Control :Principles & Processes

Principles

- The primary purpose of IDX is to function as an Industry Data Exchange, not to act as a storage medium for market data.
- To ensure efficient and cost-effective operation of the Industry Data Exchange, Participants using the exchange will be required to submit and consume messages from queues in the IDX framework to avoid the IDX Hub from being overloaded.

To achieve the objectives of the above principles, we have the following flow control processes IDX

Throttling	Throttling is the process of controlling the rate of requests that consumer (Participant) can make to a resource, it is implemented to protect the performance and quality of service of the resource.
Inbound limits	Business function based specific Inbound limits, i.e. limit on number of inbound messages that are allowed for a specific business function
Outbound flow control	Process to manage the number of pending outbound messages for a Participant to be picked up and acknowledged.
TTL	Specific Expiry times set for the messages in the outbound store to be moved into archive upon non –acknowledgement of being processed.

The above process is explained with scenarios in the subsequent slides

Flow Control :Throttling Process

Throttling is the process of controlling the rate of requests that consumer (Participant) can make to a resource ,it is implemented to protect the performance and quality of service of the resource .

Throttling by channel

	Current Throttling	IDX-Foundation
API- Push (from AEMO)	• The default outbound API throttling setting of e-Hub is 'IMMEDIATE' i.e. the messages received from the Initiator is sent to Recipient as and when received. • the Participants may choose to receive only definite number of messages from e-Hub i.e. request e-Hub to throttle its outgoing messages.	*IDX Foundation only has API Pull *
API -Pull /Post	• Participant -based quotas for all the business functions (due to single endpoint for all Business functions)	• Participant -based quotas based on the business function • Enhanced throttling at the resource level or method level based on Business function requirements (e.g.: submit bids)
FTP(Current) /LargeFileShare(IDX)	• No throttling	• Participant -based quotas based on the business function **Implication:** **Responsibility once the threshold is breached moves to the Participant ,** **It is up to participant to queue the data and submit within the limits**

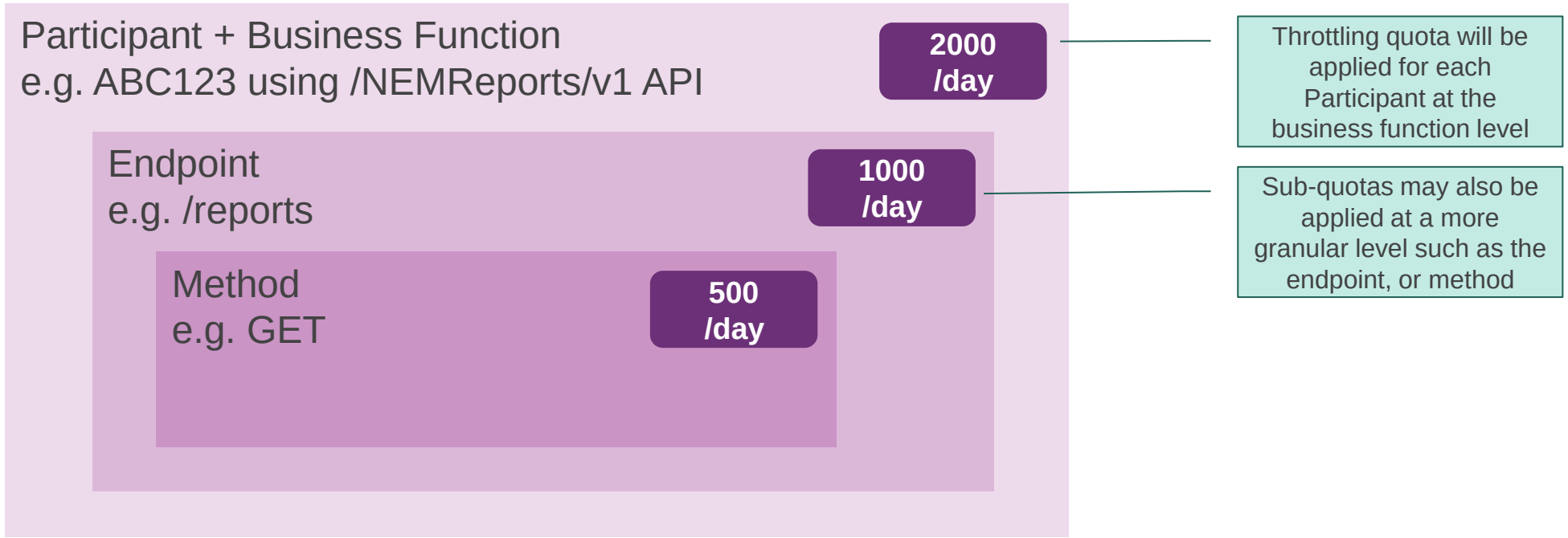
Error responses by channel

API –Pull/Post	• http error code 4xx with error details.	• http error code 4xx with error details.
FTP(Current) /LargeFileShare(IDX)	• No throttling	• Acknowledgement file with error details.

Flow Control :Throttling Process - API

Throttling for APIs on IDX will, firstly, be a conjunction of the Participant and the Business Function.
Therefore, Business Functions (i.e. a specific API) will be throttled for each individual Participant.

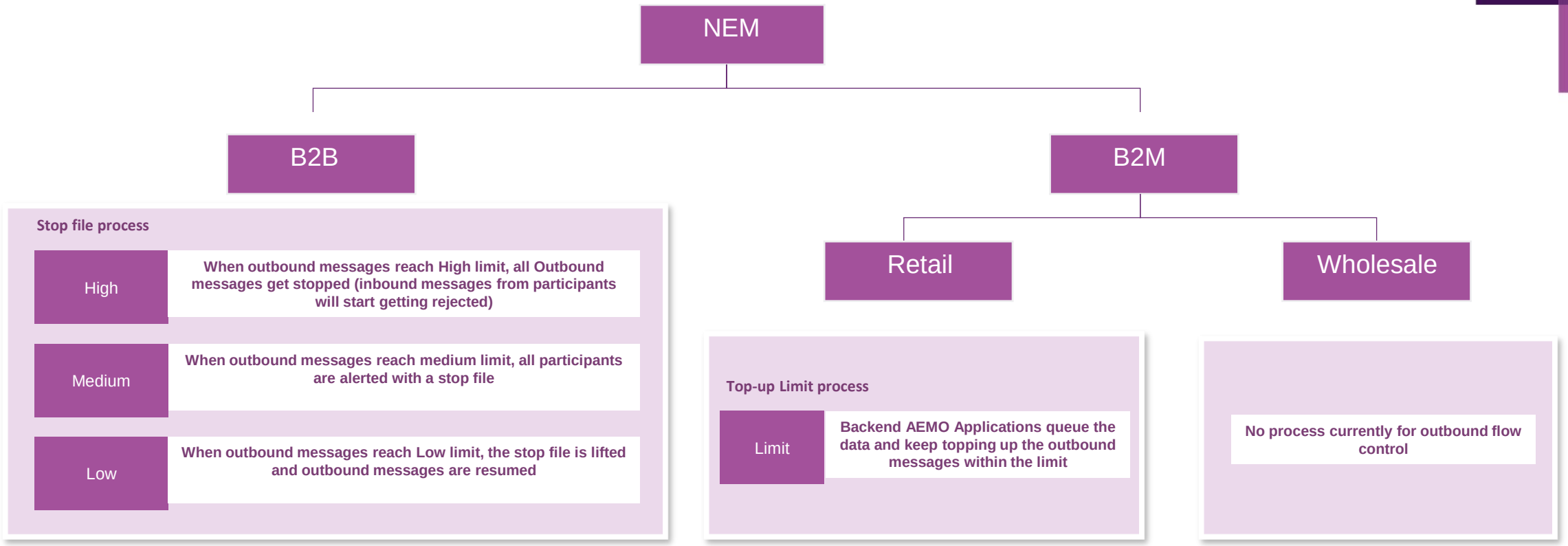
Each business function may also have throttling applied at a more granular level, such as method (e.g. GET) and endpoints (e.g. /reports). These will be defined for each business function with industry consultation.



Flow control-Inbound Limits

	Current (only for NEM Retail B2M)	IDX-Foundation
Process	Transaction limits allow participants to manage the submission and receipt of MSATS files to prevent the application of Stop Files. When the Transaction limits are reached then stopfile is issued. If a stop file is imposed MSATS stops processing files for the Transaction: Change Request or Change Request Notification. Other Transactions are processed. NSRD Notification or Response reasons. MSATS does not process any CATS Change Request transactions with Change Reason Codes: 5070 or 5071. Other Transactions are processed. Outbox files. MSATS only processes Meter Data Notification Transactions. Report requests. MSATS does not process any Report Request Transactions. Other Transactions are processed. All Upper Limits are reset at midnight. Participants can temporarily increase their Change Request and Change Request Notifications Upper Limits to the maximum allowed in the MSATS.	• It will be driven by business requirements and will be implemented accordingly • Alert notifications will be generated at the flow control API endpoint
Notification	FTP : stop files (.stp file in stop folder) API : hub message mgmt API (push or pull) (.stp file) LVI	Web sockets – event notification (if subscribed) API : flow control API Email LVI

Flow Control :Outbound flow control process –NEM (Current)



Pain Points

- Processing outbound messages across a single business function impacts all business functions
- Regarding Wholesale, due to subscription based outbound, a large number of messages are piled up and only cleaned up by a TTL process.

Flow Control: Outbound flow control process –NEM Retail B2B

Stop file process

Flow control is provided through water marks and stop files for a participant. The water mark levels control the flow of files into the inbox and outbox.

The **Flow Control Configuration** section displays the low, medium and high-water mark levels:

- If the number of unacknowledged files in an outbox exceeds the medium watermark, a stop file is sent to all participants into their Stopbox to inform them that a Participant is running behind in acknowledging files.
- If the high watermark is exceeded, the B2B e-Hub creates a stop file (Holding.stp) in the participants outbox and ceases to deliver files to their outbox.
- When sufficient files have been acknowledged, and the number of unacknowledged files falls below the low watermark, the B2B e-Hub removes the stop and warning files to resume delivering files again.

Flow control for pending outbox message acks :
If the .acks delivered to Participants' outbox is not deleted and reaches the threshold ; the inbound AEMO file handlers do not process inbound files (i.e. the Participants' inbound submissions). The inbound batch handlers stop processing any inbound data for the Participant.

The above process is explained with scenarios in the subsequent slides

Flow control - Outbound Flow Control process B2B - IDX

The pain point is addressed in the target state and current process remains the same in IDX Foundation for all B2B Business functions

	Current	IDX-Foundation
Principle	Configured At PID level (includes all business functions)	At Participant level, per business function per channel
Water Marks	Low – e.g. 20 Medium – e.g. 80 High – e.g. 100	Watermarks for messages & message acks agreed as per above for each business function per channel
Process	• When pending messages reach medium watermark a warning file is created in the stop folder for all participants. • When pending messages reach high watermark holding Stop file is created in the participant outbox and inbound B2B messages for the participant are rejected.	• Change to the current process: when the high watermark breached stop message will also be in the stopfile endpoint along with the medium water mark alert • Additional outage feature provided in LVI • Notification provided for message acks threshold breach. Applies to : Async Pattern (B2B)- API & LargeFileShare Fire & Forget Pattern* (B2B) -API & LargeFileShare
Notification	FTP : stop files API : hub message mgmt API (push or pull) Email LVI	Web sockets :stop file events API endpoint (Pull) Email LVI

The outbound flow control process in IDX Foundation across different channels and Patterns are explained with scenarios in the subsequent slides

Options for stop file process in LargeFileShare

In IDX the stopfile process will be at *PID+BusinessFunction+Channel* combination

Option 1

Stop file process is managed within LargeFileShare channel

- Similar to existing process on the FTP channel
- Stop file process available in the same channel

Trigger	Process
Medium threshold breached warning stop file	Creates a stop file in the stop file folder for a specific participant-business function, and makes it available to all Participants.
High Threshold Breached	Creates a stop file for the participant in the participant's outbound folder for that business function.

Option 2

Stop file process is unified across API and LargeFileShare channels via API

- Unified process across channels for managing stop file across the entire market (B2B)

Trigger	Process
Medium threshold breached warning stop file	Creates a stop message for the impacted participant-business function and makes it available to all Participants at the stopfile API endpoint.
High Threshold Breached	Creates a stop message for the participant in the participant-business function available in the stopfile API endpoint.

FG -Participants voted equally for both options so AEMO will implement stop file notification in both i.e. stop file in large file channel and it will also be available at the Stop file API endpoint

Flow control-outbound flow control process -B2M (Nem Retail)

Top up process

The Current Outbound Flow control in NEM Retail B2M is a maximum of 300 files across all the business functions.

The Backend Application (MSATS) keeps throttling the outbound messages (using queuing) as per the Participant consumption and always ensures the maximum number of files available for pick up are 300.

Flow control for pending outbox message acks is managed by throttling Inbound messages once the Outbound msg acks reach maximum limit.

The above process is explained with scenarios in the subsequent slides

Flow control - Outbound Flow control process B2M - IDX

	Current-B2M	IDX-Foundation
Process	Top process 300 limit across all business functions in B2M	• Same process enhanced to apply different thresholds for individual business functions. • Same process will be extended to Wholesale business functions. • Values to be determined during DP2 on transition and during definition of new business services to be deployed to IDX. Industry consultation will apply.
Notification	No alerting mechanism	Web sockets : Alert events * API endpoint : Alert message* (for outbound threshold reached) Email LVI

Flow Control : Recommendations for IDX

	B2B	B2M (Retail & Wholesale)
Throttling	Will be specific to each business function, may also be applied at multiple levels within a business function (e.g. resource, method)	
Outbound Flow Control	• Watermark process • Threshold based control for Message acks • Thresholds specific to each business function and channel • Flow control API endpoint with web sockets events • LVI • Email	• Top up process • Threshold based control for Message acks • Thresholds specific to each business function and channel • Flow control API endpoint with web sockets events • LVI • Email
Inbound Limits	• Will be specific to each business function • Flow control API endpoint with web sockets events • LVI • Email	
TTL	Will be specific to each business function	
Outage Feature	Participants can configure an outage window in LVI which automatically stops message processing across all business functions for the participant.	

Do participants have any additional requirements or capability AEMO should evaluate as part of Flow Control

Next Steps

Approach to defining and measuring criteria

AEMO will return to stakeholders after considering the inputs from today's discussions, plus the outcomes from upcoming FG & WG sessions. **Session 3** is scheduled for **Wed 5 March**. The subsequent details will be produced as part of implementation.

Session 1 (today)	Intervening workshops	Session 2	Session 3	Design / development / testing / measurement	Resulting outputs
Define criteria for validation of Foundation (the 'WHAT')		Define measures to satisfy Foundation criteria (the 'HOW')		Delivery of capability and execution (testing) to provide measures for Foundation	Industry test strategy and reports, AEMO test reports
Provide overview of criteria for DP2 (over and above what is required for Foundation)	Take inputs from other FG and WG sessions e.g. payloads, large file pattern, etc.	Define criteria for validation of DP2 (the 'WHAT')	Define measures to satisfy DP2 criteria (the 'HOW')	Delivery of capability and execution (testing) to provide measures for DP2	Refined inputs to DP2 business case, additional testing as required

Please provide any further feedback from your organisation on the validation criteria for the Foundation capability and high-level Decision Point 2 Criteria via email to NEMReform@aemo.com.au by **COB 12th February**.

8. Future Topics

Blaine Miner

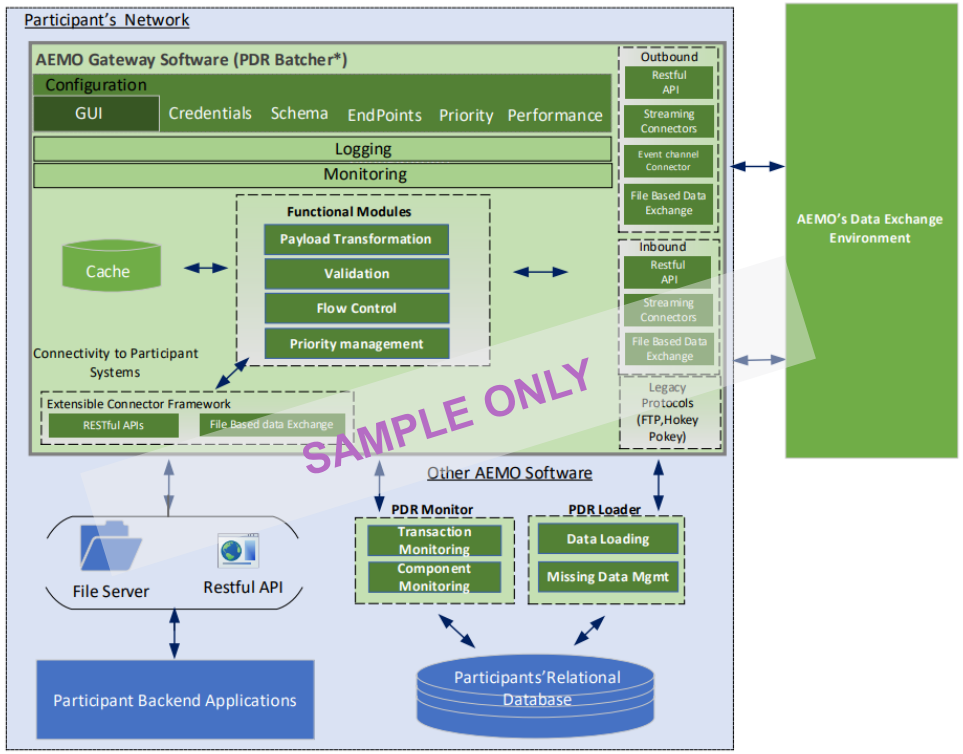
IDX Future Topics

IDX Focus Group Session: AEMO Gateway Software

Friday 14th February, 1:00pm – 4:00pm AEDT

Nominations closed

The objective of this focus group session is to discuss capabilities to be delivered by the AEMO Gateway Software, which is proposed to combine the Participant Batcher, pdrBatcher capabilities and is extended to support the target state AEMO IDX Environment.



This focus group discussion will be relevant to all stakeholders who currently use pdrBatcher, and participants who may look to use AEMO Gateway Software to integrate with services transitioned to the new IDX platform.

The **AEMO Gateway Software** will be participant-side software, developed by AEMO, to allow participants to easily interface with new services on the IDX platform. Primarily the AEMO Gateway Software will offer the same services as pdrBatcher does today and allow the translation of existing integration to the new IDX patterns.

Sample business drivers for consideration in the focus group are:

- As part of transition, reduce or remove the need for participants to "recode" their integrations to AEMOs new IDX patterns.
- Support participants using the existing pdrBatcher software.
- Allow 3rd party integrators a cost-effective mechanism to integrate their applications into IDX.

Audience Skill Set

- Technical leads from participants using pdrBatcher.
- Technical/business leads who wish to use existing integration patterns during transition.

Topics for discussion

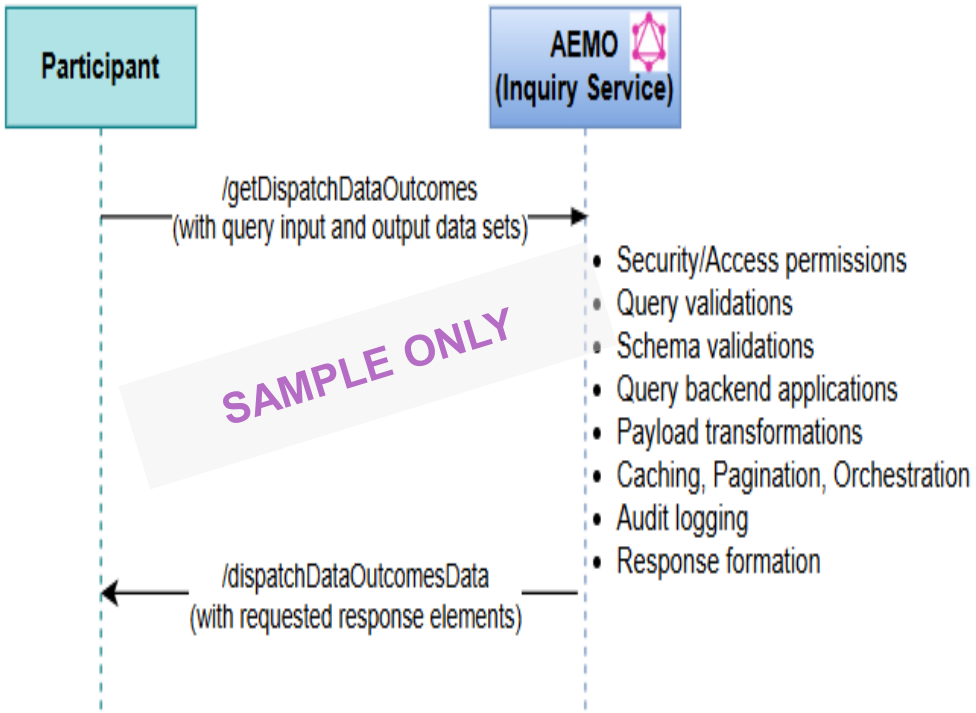
- Scope of the AEMO Gateway Software
- Existing pdrBatcher features
- Capabilities required by the AEMO Gateway Software e.g.:
  - Connectivity and integration services
  - Data handling and Transformation
  - Flow and priority management
  - Configuration and monitoring
  - Logging and error management

IDX Focus Group Session: "Inquiry Service"

Friday 21 February, 2025, 1:00pm – 4:00pm AEDT

Nominations closed

The objective of this focus group session is to discuss capabilities to be delivered in the IDX Inquiry Service.



The **Inquiry Service** uses a query language framework for APIs, such as GraphQL, enables clients only retrieve data they are interested in, removing the dependencies on new data introduced.

Sample business drivers for consideration in the focus group are:

- The capability for clients to define the structure of their response by customising the request query.
- To addresses over-fetching challenges where a large dataset is returned by an API, but only a subset of the fields may be of interests to the client.

Audience Skill Set

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

Topics for discussion

- Demonstrate current use case(s) that require the over fetching of data.
- A draft end to end business use case for Inquiry Service flow.
- Sequence diagram demonstrating the Inquiry Service to support the end-to-end business case.
- Interface requirements for implementing the Inquiry Service.
- Discuss on the Proof-of-concept outcomes.

This focus group discussion will be relevant to all stakeholders who participate in exchanging data between AEMO and energy stakeholders via user interfaces

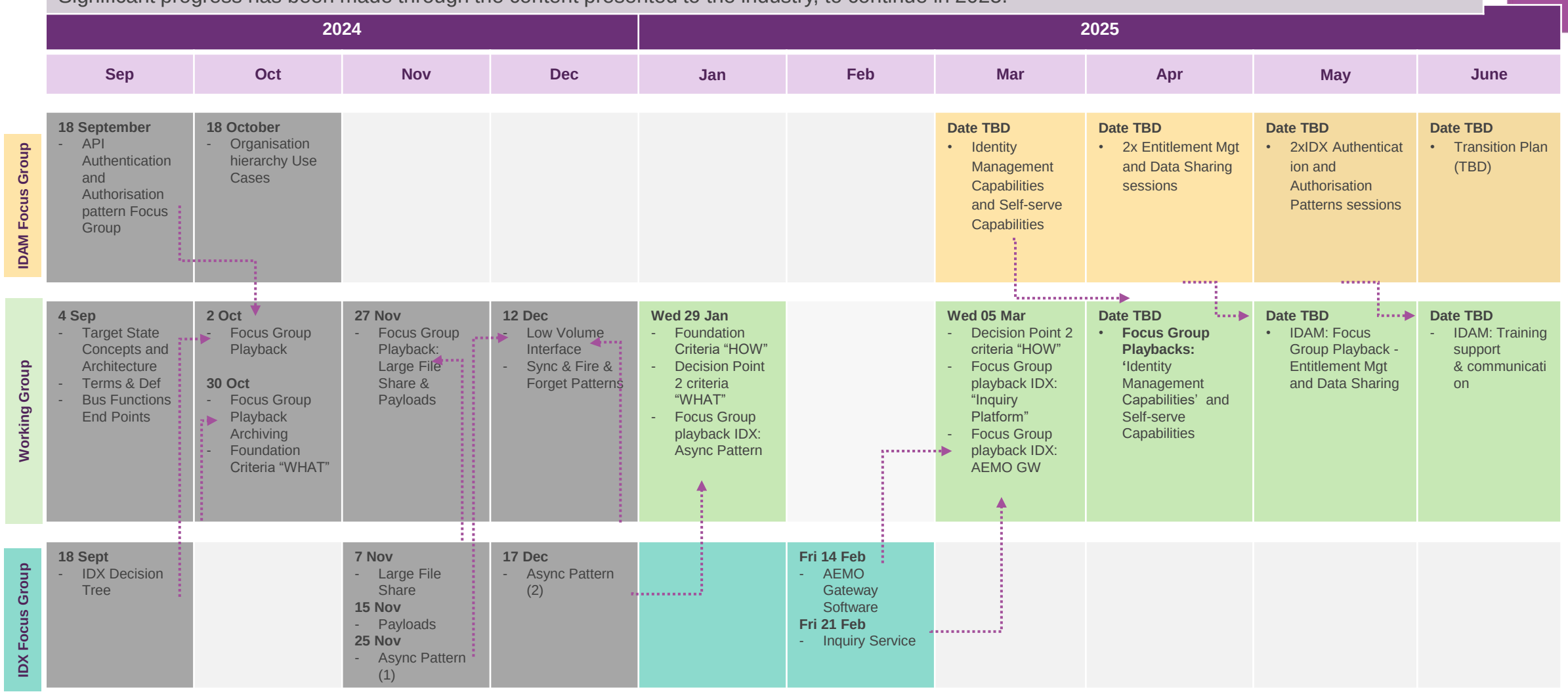
9. Forward Plan

Blaine Miner

Indicative Timeline for Upcoming Sessions
(as at 22 Jan 2024)

Industry Consultation Status

Significant progress has been made through the content presented to the industry, to continue in 2025.

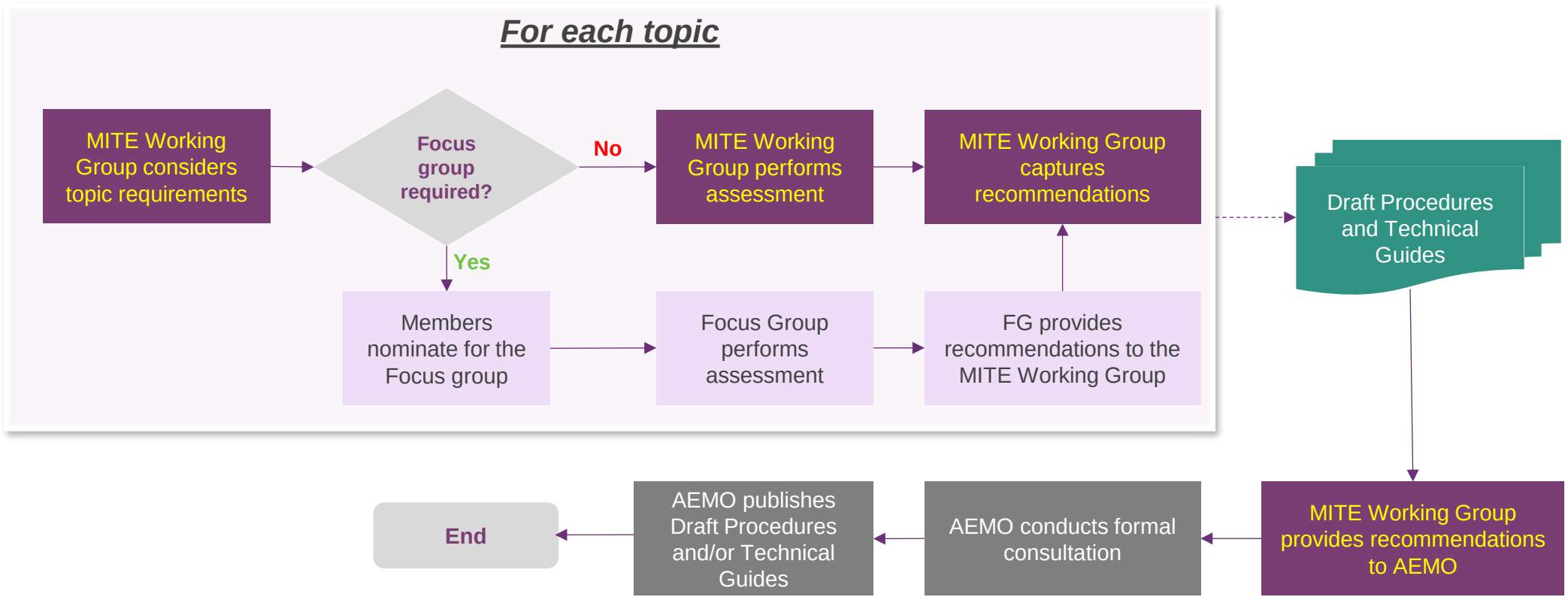


*These proposed dates are indicative dates

10. General Business and Next Steps

NEMReform@aemo.com.au

Consultation Workshop Structure



MITE Working Group

- **Actively participate** in highly technical workshop discussions to assess options, co-design draft deliverables.
- **Review key drafts** of documentation prepared by the Focus Group.
- **Consult** internally within own organisation to test, socialise and ultimately champion.

Focus Group (as required)

- **Co-design** draft deliverables for consultation with working group members
- **Actively participate** in the Focus Group workshops and activities
- **Participate** in **highly technical discussions**, including engaging within their business prior, to provide detailed responses to matters under discussion
- **Champion** technical discussions with their peers and within own organisations

General Business and Next Steps

MITE Working Group Forward Plan

Stream	Content	Timing
IDX	• Decision Point 2 criteria “HOW” • Focus Group playback IDX: Inquiry Service • Focus Group playback IDX: AEMO Gateway Software	**05 March 2025**

Focus Group Forward Plan

Stream	Topic	Timing
IDX	AEMO Gateway Software Focus Group	**14 February 2025**
IDX	Inquiry Service Focus Group	**21 February 2025**

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

Proposed Use Cases, test services and pattern coverage

Proposed use-cases, test services and pattern coverage

The below table outlines the proposed use-cases and test services that can ensure we have covered all IDX Patterns as part of establishing IDX Foundation.

Channels	Pattern	NEM Wholesale				NEM Retail B2B	NEM Retail B2M		Gas B2B	DER
		Next Day Dispatch	MTPASA	Settlement Report	PQD*	OWNX	Snapshot Report	NMID - Type 2	MIRN Listing	DOE
API	Sync API									
	Async API Inbound	✓			✓	✓				✓
	Async API Outbound	✓		✓	✓	✓				✓
	Fire & Forget API Outbound									
	Inquiry Flat API									
Large File	Async Large File Inbound		✓							
	Async Large File Outbound		✓				✓		✓	
	Fire & Forget Large File Outbound									
Inquiry Dynamic	Inquiry Dynamic							✓		
Event Notifications	Event Notifications	✓	✓	✓	✓	✓				✓
LVI	-	Use-cases 1.1 through to use-case 4								

Key
PreProd and industry tested
Production and industry tested
AEMO tested with evidence

* Power Quality Data (PQD) will be taken through to production. As a new service, technically this is not part of IDX Foundation, however it will provide a useful results to validate various patterns and capabilities of IDX.

Summary of capabilities coverage 1/2

The below table outlines the proposed test services that can be used to ensure we have covered all IDX capabilities as part of establishing IDX Foundation.

Feature Category	Features / Capabilities	NEM Wholesale				NEM Retail B2B	NEM Retail B2M		Gas B2B	DER
		Next Day Dispatch	MTPASA	Settlement Report	PQD*	OWNX	Snapshot Report	NMID - Type 2	MIRN Listing	DOE
Network Connectivity and Security	Connectivity: MarketNet & Internet	✅	✅	✅	✅	✅	✅	✅	✅	✅
	Certificate Management	✅	✅	✅	✅	✅	✅	✅	✅	✅
	Transport Layer Security	✅	✅	✅	✅	✅	✅	✅	✅	✅
IDAM	IDAM Authentication & Authorisation Patterns	✅	✅	✅	✅	✅	✅	✅	✅	✅
Policies	Encryption & encoding	✅	✅	✅	✅	✅	✅	✅	✅	✅
	Flow control & spike management	✅	✅	✅	✅	✅	✅	✅	✅	✅
	Round Robin	✅	✅	✅	✅	✅	✅	✅	✅	✅
	Virus & malware scans	✅	✅	✅	✅	✅	✅	✅	✅	✅
	Enforce file/message size limitations	✅	✅	✅	✅	✅	✅	✅	✅	✅
	Enforce file masking	✅	✅	✅	✅	✅	✅	✅	✅	✅
	Onboarding	✅	✅	✅	✅	✅	✅	✅	✅	✅
Archiving	Archiving	✅	✅	✅	✅	✅	✅	✅	✅	✅
Non-Repudiation	Non-Repudiation	✅	✅	✅	✅	✅	✅	✅	✅	✅
Logging & Monitoring	Capture Technical Audit Logs	✅	✅	✅	✅	✅	✅	✅	✅	✅
	Monitoring	✅	✅	✅	✅	✅	✅	✅	✅	✅

Key

- PreProd and industry tested
- Production and industry tested
- AEMO tested with evidence

Summary of capabilities coverage 2/2

The below table outlines the proposed test services that can be used to ensure we have covered all IDX capabilities as part of establishing IDX Foundation.

Feature Category	Features / Capabilities	NEM Wholesale				NEM Retail B2B	NEM Retail B2M		Gas B2B	DER
		Next Day Dispatch	MTPASA	Settlement Report	PQD*	OWNX	Snapshot Report	NMID - Type 2	MIRN Listing	DOE
Payloads	Payload compression	✓	✓	✓	✓	✓	✓	✓	✓	✓
	JSON payload data exchange					✓	✓	✓		✓
	AEMOCSV payload data exchange	✓	✓		✓				✓	
	Unstructured payloads			✓		✓				
	Schema validations				✓	✓	✓	✓		✓
Transformation	On-Demand transformation									✓
	Hub transformation based on opt-in version						✓		✓	
	Support for 'n' & 'n-1'						✓		✓	✓
Message Enrichment	Message enrichment								✓	✓
Fan In & Out	Fan-out								✓	✓
	Fan-In									
Orchestration & Routing	Orchestration	✓	✓	✓	✓	✓	✓	✓	✓	✓
	Routing	✓	✓	✓	✓	✓	✓	✓	✓	✓
Flow Control	Manage outbound message delivery limits	✓	✓	✓		✓	✓			
Event Notifications	Trigger outbound message event notification	✓	✓	✓		✓	✓		✓	✓
	Flow control notifications (e.g. stop files)	✓	✓	✓		✓	✓		✓	✓
	System health & notifications	✓	✓	✓		✓	✓		✓	✓
Manifest & Reconciliation Process	Patterns where message exchange will logged for Manifest Process	✓	✓	✓		✓	✓		✓	✓
	Reconciliation process for the messages/files transacted using the patterns:	✓	✓	✓		✓	✓		✓	✓
	Retrigger transactions	✓	✓	✓	✓	✓	✓		✓	✓
Business Logs	Manage message acknowledgements	✓	✓	✓		✓	✓		✓	✓
	Business Message & Transaction Logs	✓	✓	✓	✓	✓	✓		✓	✓
Enhance Developer Experience	Developer experience (API, MFT Portals, Data dictionary, system documentation)	✓	✓	✓		✓	✓	✓	✓	✓

Key

- PreProd and industry tested
- Production and industry tested
- AEMO tested with evidence