Industry Data Exchange AEMO -AEMO Gateway Software

NEM Reform Foundational & Strategic initiatives

Technical Deep Dive

02 Aug 2023

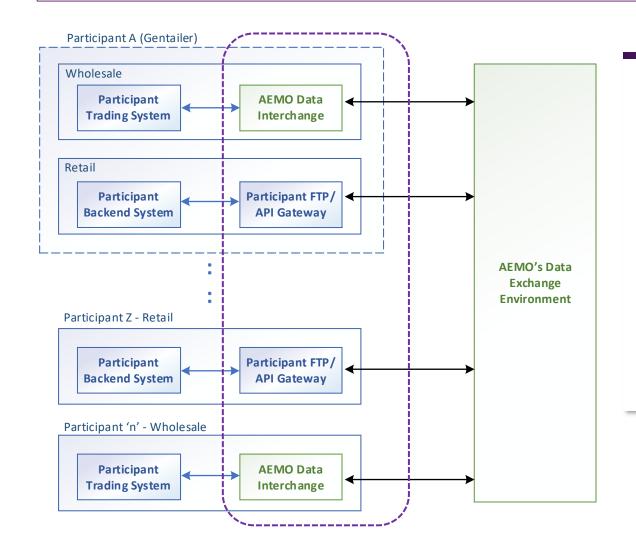


What is Gateway Software?



Gateway Definition

Software hosted in the Participant landscape which plays a crucial role in communicating with the AEMO IDX Environment in the agreed channels, protocols, and patterns.



Key Messages:

- Gateway software connects Participants' systems and AEMO
 Data Exchange Environment on the agreed protocols, channels, and patterns that are specific to each of the markets
- Gateway connects to AEMO Data Exchange Environment on the agreed AuthN & AuthZ patterns and security mechanisms (e.g. https mTLS connections)
- 3) Gateway implements schema validations
- 4) Gateway manages the generation and delivery of message-level acknowledgements
- 5) Current State-All Participants have a Gateway Functionality which they can have their own gateway or AEMO-supplied software that is currently offered for each of the markets
- 6) Future State All Participants can continue to operate gateway - they can either use their own gateway or AEMO-supplied software that is currently offered for each of the markets



Current State

Current software definitions

Current gateway landscape

Retail

Wholesale

Current software definitions



Current AEMO-Suppled Software

AEMO currently offers the following software hosted in the Participant landscape to communicate with the AEMO NEM Retail and Wholesale environments through **FTP only.**

Participant Batcher software (Batcher)

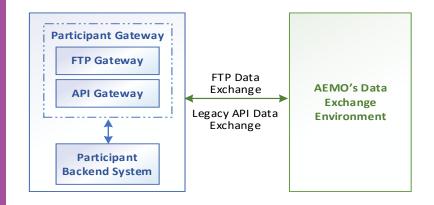
- Provides a simple batch interface to MSATS and B2B by removing the detail of the file handshaking and leaving participants to deal with the raw .zip files only.
- The Participant Batcher software transfers files from and to the MSATS and B2B participant file shares using FTP.
- The Participant Batcher software does the entire message acknowledgement and file manipulations as required by the batch file interfaces.
- The intended users for the Participant Batcher software are:
 - Participants having a Participant ID to access AEMO's IT systems.
 - Participants in the retail market interfacing with the MSATS system.
 - B2B Hub participants interfacing with the B2B e-Hub, including B2B users interfacing with the AEMO Network Outage Scheduler (NOS) and the High-Speed Monitoring (HSM) system

Participant Data Replication Batcher (pdrBatcher)

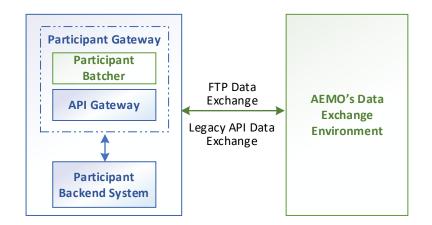
- Provides a file transfer solution for transferring files to and from AEMO's participant file server to the participant's local Data Interchange folders.
- The pdrBatcher software transfers files from and to Wholesale participant file shares using FTP.
- A prime use for the pdrBatcher is a simple interface to the wholesale market system to collect CSV files published to a participant's directory on the participant file server. A companion product, the Participant Data Replication Loader (pdrLoader), can parse those files into a local database instance, implementing the Electricity or Gas Data Model.
- pdrBatcher can also be used to submit files to the processing of AEMO market systems.
- The intended users for the PdrBatcher software are:
 - Participants replicating data between AEMO's Wholesale Market Systems and their RDBMS conforming to the Electricity and Gas Data Models.

Gateway Landscape -Current state

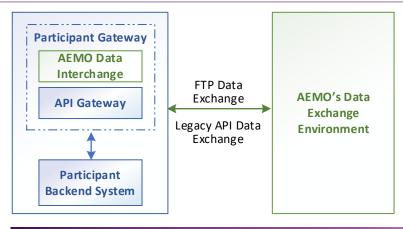




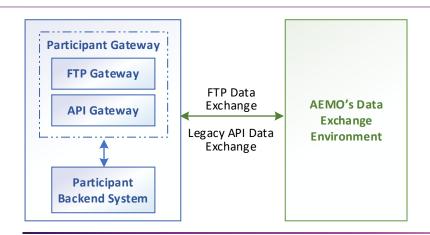
Participants are operating their own gateways for managing inbound and outbound data



- Participants are operating ParticipantBatcher, an AEMO-supplied software to perform hokey-pokey FTP data exchange
- Participants are operating their own data exchange software for exchanging data via API



- Participants are operating AEMO Data Interchange Software (pdrBatcher, pdrLoader & pdrMonitor), an AEMO supplied software suite to exchange data via API
- Participants are operating their own data exchange software for exchanging data via API



Participants are operating their own gateways for managing inbound and outbound data



AEMO Gateway Software

AEMO Gateway Software Overview

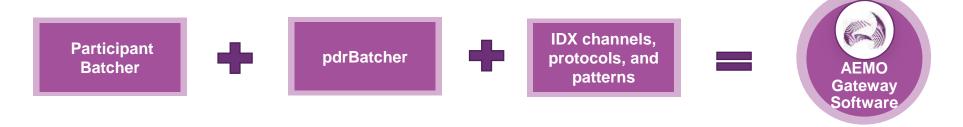
AEMO Gateway Software Capabilities

Participant end state landscape

AEMO Gateway Software



AEMO proposes providing Industry with a new AEMO-Supplied software product that combines the Participant Batcher, pdrBatcher capabilities and is extended to support the target state AEMO IDX Environment.



Why is it part of the IDX Transition strategy?

Opting for the AEMO Gateway Software streamlines the transition, minimise disruption, and maximise operational continuity. It acts as a protective layer, insulating participants' existing systems from the brunt of change while bridging the gap to the IDX target state. Its native connectivity to the AEMO Data Exchange Environment, customisable integration patterns and payload translation capabilities significantly reduce technical complexities. It shall be designed as a common software solution across all markets (NEM, WEM, DER) and fuels (gas).

Gateway Principles

- The AEMO Gateway Software provides standard gateway capabilities, including efficient protocol conversion.
- It is designed to support new participants during the transition by maintaining compatibility with legacy protocols.
- Backward compatibility is crucial, with payload conversion capabilities to aid change and transition management.
- To align with the IDAM roadmap, the software supports the latest IDAM patterns, ensuring secure and efficient identity and access management.
- The AEMO Gateway Software can be extended by Participants, for example, to add personalised validations and Transformations.

AEMO Gateway Software



AEMO has assessed the foundational capabilities of the AEMO Gateway Software, designed to unify and simplify interaction with AEMO's centralised data exchange platform

- Event Channel Connector Client code to establish an event notification channel for outbound messages
- · Restful API Includes client code for calling a Restful API
- File Connector A connector to manage File-based connections (SFTP, FTP, blob storage etc.) and Integration
- Streaming Connectors Client code to connect to a streaming service
- Other Connectors As per Industry requirements
- Support for Legacy Patterns Support for legacy Hokey Pokey FTP file exchange patterns

Data Handling & Transformation

Connectivity &

Integration

- Payload Transformation Supports payload transformation (aseXML > JSON, JSON > aseXML, NEM13/12 > AEMO CSV)
 & file compression
- Validation Performs schema validations & contains plug-in modules for business validations (B2B Validation Module etc.)

Flow & Priority Management

AEMO Gateway Software

- Flow Control Manages flow control mechanisms to handle events like stop files & watermarks
- Priority Management Manages outbound messaging pull based on event metadata and priority configuration

Configuration & Monitoring

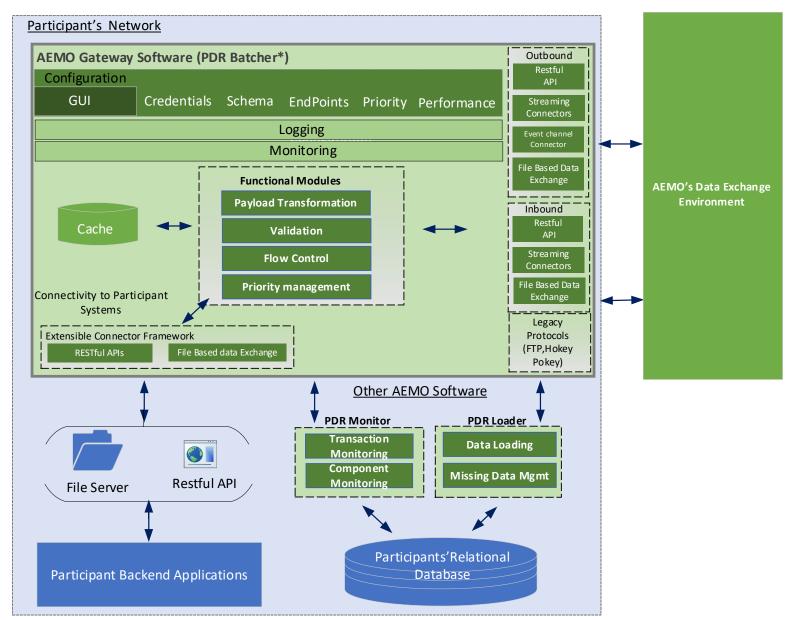
- **Configuration** Drives all functionality within the AEMO Gateway Software, such as credentials, schema, endpoints, priority, & performance
- Monitoring Provides an interactive interface allowing participants to configure & monitor their AEMO Gateway Software instance & Hub Message Events.
- **User Interface -** Graphical user interface screens to manage configuration.

Logging & Error Management

- Logging Provides intuitive file-based logging for each step performed & a flexible logging framework based on participant preference (SNMP, DB etc.)
- Cache Built-in storage for error handling & event queuing.

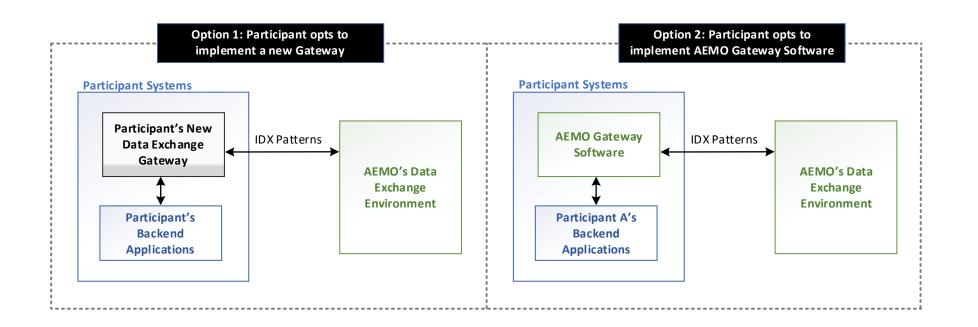
AEMO Gateway Software





Participant End state Landscape





AEMO's Systems / Software

Participants' Systems

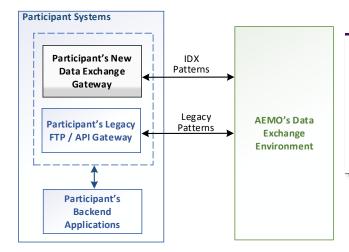
Transition Phase: AEMO Gateway Software





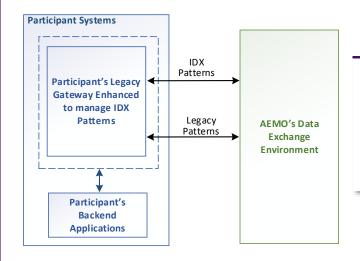
Transition options

Option 1a: Participants choose to implement their own new gateway



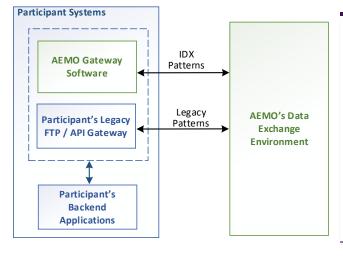
- New gateway will manage IDX patterns
- Legacy gateway will manage legacy patterns
- Participants have to keep enhancing their gateways when future changes are introduced

Option 1b: Participants choose enhance their current gateway



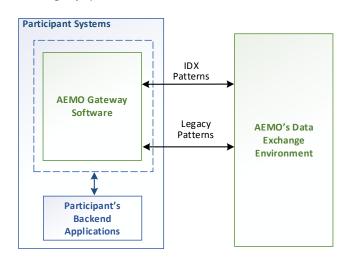
- Participants enhanced current gateway will support new IDX and legacy patterns
- Participants have to keep enhancing their gateways when future changes are introduced

Option 2a: Participants implement and host AEMOs gateway software to manage IDX pattern



- AEMO Gateway Software will manage IDX patterns
- Legacy gateway will manage legacy patterns
- Post transition, AEMO gateway software will manage all interactions with AEMO
- AEMO will provide periodic updates when there are enhancements to the data exchange mechanisms

Option 2b: Participants implement and host the AEMOs gateway software to manage IDX patterns and legacy patterns

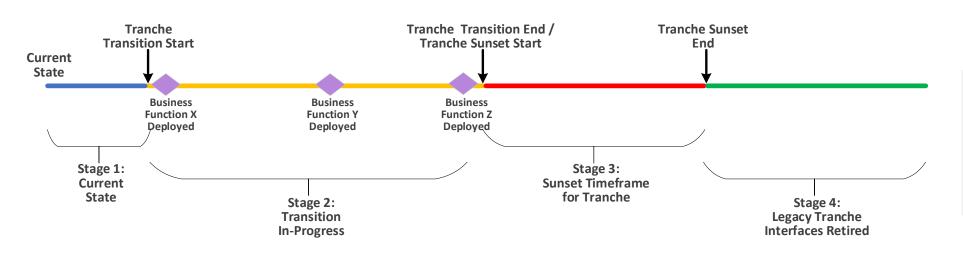


- AEMO Gateway Software will manage IDX patterns and legacy patterns
- Will help new Participants to implement this gateway that can manage the current state and future state and enable a smoother transition
- Provides an opportunity for the existing Participants to implement this before migrating to IDX patterns to minimise the opex and prepare for the transition
- AEMO will provide periodic updates when there are enhancements to the data exchange mechanisms

AEMO Gateway Software - Industry Use Cases



Next, we will present Industry use case views of how participants Gateway Software would likely support the transition from the current state to the IDX Target State. We will provide a stage sequence that consists of four stages: (1) Current State, (2) Transition In-Progress, (3) Sunset Timeframes, and (4) Post Sunset Timeframes. The ultimate goal is for every participant to transition to IDX Patterns for all NEM Wholesale and Retail Business Functions before Stage 4 commences.



Note: These stages are representative sequences; the actual Tranches and details will be determined with Industry consultation.

We'll discuss two distinct perspectives:

- where Participant A implements a new gateway software (option 1a), and
- where Participant A implements AEMO gateway software (option 2a).

We will focus on a Market Segment view of transition use cases and how the Gateway Software would need to configure to transition to the Target State progressively. To help you visualise and prepare for the transition process in a manner that fits best with your operations and needs.

Next Steps





- Consider whether your organisation can identify any other AEMO Gateway Software capabilities we've missed that have a material impact on the Business Case?
- AEMO welcomes any feedback from the Technical and Business Focus Group to NEMReform@aemo.com.au priori to the next session (4C).



Please reach out



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<u>AEMO | NEM Reform Foundational & Strategic Initiatives Focus Group</u>





For more information visit

aemo.com.au