

MHHS – ARCHITECTURE WORKING GROUP: PRODUCT DESCRIPTION

MARKET-WIDE HALF HOURLY SETTLEMENT

Document Properties

Version	Date	Author	Comments
0.3	8 th September 2020	AWG Tech Lead	Draft
0.4	19 th April 2021	AWG Tech Lead	Scope of artefacts clarified

Related Documents

Reference	Name	
1	OFGEM AWG Terms of Reference	https://www.elexon.co.uk/documents/groups/awg/awg-terms-of-reference/
2	OFGEM TOM Development Principles	https://www.elexon.co.uk/documents/groups/ccdg/ccdg-awg-ofgems-tom-development-principles/

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1 Product Summary and Purpose

The Architecture Working Group (AWG) will provide a recommendation to Ofgem, concerning the structural technology architecture which will be requirements for the successful data integration between market participants, which will deliver the Market-Wide Half-Hourly Settlement (MHHS) market model. This will be achieved by:

- Identifying the market participant services and roles and where they must interact in order to implement the Design Working Group (DWG) Target Operating Model (TOM)
- Identifying the data items and data exchanges which enable MHHS to meet its critical business objectives
- Identifying the impacted business processes which will be exercised by industry participant IT systems
- Constructing a reference architecture that can be used as a blueprint across industry participants to understand the overall technology requirements

The purpose of the architecture product is to allow all impacted market participants to both understand and use the outputs of the AWG as the starting point for the next phase of the MHHS technology programme. This will allow the next phase to:

1. Undertake a high-level design and technology component selection that is appropriate for all impacted market participants
2. Enable later implementation phases for the required designs
3. Allow market participants to assess the impact to their own internal technology systems

The following table illustrates the phases and some of the main activities to be undertaken for the overall MHHS programme. This defines the scope of the AWG in relation to its products.

Table 1 - Technology Programme Phases

Phase	Purpose	Undertaken by
Architect	Enterprise/Business Architecture Identify strategic industry/business requirements Identify the structural technology approach Obtain industry agreement	AWG
Design	Identify functional requirements Technology component selection Implementation Architecture (System design or High-level design)	Further industry design group/forum Cross-industry Technology teams Industry testing specialists
Build	Low level specifications Application Development & test	
Test	Integration and whole-system testing	
Operate	Production support and BAU Issue resolution	Market participants (internal or external services)

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2 Product Composition

To meet the stated architecture purpose and to enable proceeding activities in the overall technology programme, the MHHS TOM requirements must be understood and documented in a methodology which is familiar to technology projects and teams.

2.1 Reference Architecture

The main architectural deliverable of the AWG will be a reference architecture (RA) that is suitable for MHHS. It will be capable of enabling delivery of MHHS across the industry.

The RA provides the following benefits for MHHS:

- Defines a common architecture view which can be understood by all architecture/technology functions
- Identifies the structural technology approach needed to solve MHHS
- Allows for standardisation of technology components and/or infrastructure
- Defines a technology vocabulary (or design language) to enable effective communication between participants across industry
- Defines common standards (e.g. security, data) to be adopted across multiple target environments
- Lowers the time taken to complete the design and other implementation phases

2.2 Architecture Artefacts

To complete the appropriate level of analysis and investigation to deliver the RA, the AWG shall:

- Describe the MHHS market model using various architecture views
- Describe the OFGEM Terms of Reference deliverables as architecture products

The scope of these artefacts as part of the AWG discovery phase is to enable selection of the RA. As an RA is a pattern or style of architecture and not a design document, the artefacts were created with the detail necessary to frame the RA discussion and no further.

Some of the architecture artefacts that provide these views contain lower-level details. These can be carried forward to other phases of the programme and either be expanded or used to prime later activities.

Table 2: Architecture Artefacts

Artefact	Architecture View	Description
Architecture Principles	Enterprise	Describes the high-level goals of architecture and how it should align to business needs. The principles are applicable to the entirety of the MHHS technology programme.
Data Architecture Standards	Enterprise	Describes the high-level goals for data management applicable to the entirety of the MHHS technology programme.
Security Guidelines	Enterprise	Describes the security concerns that are applicable to the entirety of the MHHS technology programme, within the context of information security and UK security standards bodies.

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Market Model (Business Strategy)	Enterprise	Defines the market segments, services and the market roles which perform them. Used to immediately identify the types of participants and functions impacted by MHHS.
Communication Diagram	Enterprise	Identifies the market participants and shows the main data entity flows between them. Used to set the high-level scope for data integration.
Capability Model	Enterprise	For each market role, expresses their business purpose and the abilities that are required for the creation and/or delivery of MHHS services. Used to provide the link between the business strategy and the Process Models (BPM) which describe impacted activities.
Level-0 BPM List	Business	Describes the relevant processes and activities that are required by the business capabilities in order to achieve MHHS. Used to identify if a market participant performs actions impacted by MHHS.
Business Process Model (BPM)	Business	Defines the business process flows and the integration requirements (data synchronisation) between market participants. Used to show the difference between the current and target methods of integration to identify where change must be affected.
Data Catalogue	Data	Lists all data items that are required for integration, to deliver the market model. Used to apply multiple architecture perspectives to the data being synchronised, for example governance, security, semantics, meta-data, etc.
Logical Data Model	Data	A formal model that describes data entities and data items with some basic business rules determining aspects of the relationships within the data. Used to clarify the holistic structure of the data to avoid misinterpretation, as interface specifications may contain only sub-sets.
Interface Specification	Data	Defines the types of data contracts for each integration shown in the communication diagram. Specifies the interoperability requirements for data exchange. Used to identify the frequency and sizes impacting data synchronisation.
Interface Sequence Diagram	Data	Defines the expected order of data exchanges between market participants. Used to describe the types and sequence of interfaces needed to achieve a particular data synchronisation.

The majority of these artefacts are *target-state* views, as the AWG is mainly concerned with depicting future requirements. However, in some cases *current-state* views are also needed in order to identify what will be different. This will help market participants to better understand and plan for the effort required to implement MHHS.

2.3 Recommendation Document

The main documentary deliverable of the AWG will be an accompanying recommendation paper. This purpose of this document is to:

- Explain the choice of reference architecture
- Identify any alternatives and the reasons why they were not selected
- Identify any risks or constraints which may prevent successful implementation
- Describe how possible changes in the future may impact the architecture

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3 Product Requirements

The requirements for the AWG Product have been derived from the AWG Terms of Reference and aligned with Elexon as part of the Architecture Working Group.

Table 3 - Product & Requirements Matrix

#	Requirement	Architecture Artefact
1	The AWG recommendations will include information relating to the changes to the registration systems and the interface with the Meter Point Administration Service	Communication Diagram Interface Specification Business Process Model
2	The AWG recommendations will include information relating to the interfaces with the Data Communications Party	Communication Diagram Interface Specification Business Process Model
3	The AWG recommendations will include information relating to the interfaces between the new services of the TOM	Communication Diagram Interface Specification Data Catalogue
4	The AWG recommendations will include information relating to the system changes relating to the BSC central settlement systems	Market Model Communication Diagram Interface Specification Logical Data Model
5	The AWG recommendations will include information relating to the transfer of data between Registration, the new TOM services, and Central Settlement Services	Communication Diagram Interface Specification Data Catalogue Interface Sequence Diagram
6	The AWG recommendations will be consistent with the AWG principles	Architecture Principles Data Architecture Standards Security Guidelines
7	The AWG recommendations will be consistent with the CCDG recommendations	Market Model Capability Model Level-0 BPM List
8	The AWG recommendations will be consistent with the overall MHHS project objectives, TOM design principles and TOM development principles	Market Model Architecture Principles
9	The AWG recommendations will be consistent with the Design Working Group Preferred TOM design and transition	Market Model Capability Model Level-0 BPM List

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	principles (unless a change is requested by Ofgem)	
10	The AWG recommendations will be consistent with the Ofgem Data and Security Principles and guidance for the following NCSC Secure by Design Principles	Data Architecture Standards Security Guidelines
11	The AWG recommendations will include accompanying evidence and rationale, including a risk assessment on the recommendations and the identified impacts on industry parties and end consumers	AWG Recommendation Document Reference Architecture
12	The AWG recommendations will include dependencies on other work areas under the Significant Code Review on Settlement Reform, other SCR, and other industry initiatives	AWG Recommendation Document Reference Architecture

Note: Since the formation and kick-off activities of the AWG, the architectural scope has been extended to include all market participants that are affected by MHHS and where settlement data is impacted.

3.1 Dependencies

The following table identifies any dependencies which may impact completion of the architecture products.

Table 4 – Architecture Product Dependencies

#	Dependency
1	Finalisation of the DWG preferred TOM
2	Completion of the Code Change and Development Group (CCDG) detailed TOM recommendations
3	Completion of the Central Switching Service (CSS) end state Due to planning milestones, MHHS will be implemented after CSS, therefore CSS processes are considered <i>current-state</i> for the purposes of the MHHS architecture.

3.2 Target Audience

The target audience for the AWG architecture products include the Industry participants as shown in the table below.

Table 5 - Architecture Product Target Audience

Participant	Reason
Supplier	Must make coordinated IT system changes
Supplier Agents	Must make coordinated IT system changes
DNO	Must make coordinated IT system changes
DCC	Must provide Smart Meter Reading capability

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Elxon	Must make coordinated IT system changes
Technology Vendors	Undertake and manage IT system changes on behalf of others

3.3 Stakeholder Engagement

The AWG recommendations report will be created by the AWG. The AWG will consult upon the recommendations with industry and therefore may make changes to the recommendation, following the responses to the consultation.

4 MHHS Technology Programme

As shown above in *Table 1 - Technology Programme Phases*, the AWG products will feed into the follow-on design, build and test phases of the overall MHHS programme.

4.1 Design

A further industry working group will be required to undertake the high-level design activities. This will involve extending the AWG outputs to a further level of detail that must be appropriate to document and agree the following:

- Technology component selection (hardware / software / services)
- Functional specifications
- Implementation Architecture / System design

4.2 Build & Test

The high-level design can be used by market participants for implementation (development) or modification of their IT systems and processes to meet the overall MHHS requirements.

There must be coordination of development and testing between any impacted central services or components, and the impacted market participants, to ensure an optimal transition towards the MHHS target-state.

4.3 Indicative Time Scales

The AWG will take approximately 18 months from its inception, to determine the appropriate technology approach and to consult with industry.

The high-level design may take approximately 6 months in order to extend the AWG products towards an implementation architecture.

The Build and Test phases will vary in duration, depending on the scope of the recommended architecture, the implementation details, the availability of participants, any required central services, or other industry change that may result from the AWG outputs.