

OIE Scenario 32 – Pull Historical Condition Data and State Events from CMS to O&M

The ORM (Operational Risk Management system) needs to be able to request historical measurements, alarms, events, and test data from a Condition Monitoring (historian) System when performing CBM diagnosis/prognosis to determine the entire state of process or equipment. The retrieved information may be stored by the ORM for an extended period of time to perform analytics. The ORM is used as a typical example of an O&M system(s) that make use of such historical data.

Actors

Condition Monitoring System	The CMS (historian) responds to queries on the non-real-time data, alarms, and events archived from portable devices, test systems, or LIMS.
Operational Risk Management System	The ORM system queries the CMS regarding non real-time data, alarms, and events archived in the CMS from portable devices, test systems, and LIMS.

Data Content

Historical test and measurement data with timestamp and data quality, events, and alarms. LIMS data must also include test sample meta-data and test component results.

The query for historical test, measurement, event, or alarm data sent from the ORM to the CMS historian may include any relevant contextual data, such as:

- Physical/virtual measurement location(s) of interest at which measurements were taken
- Functional location(s) of interest
- Serialized asset(s) of interest
- Material item(s) of interest (for LIMS measurements)
- Device(s)/transducer(s) of interest that took the measurement
- Measurement source(s)/data collector(s) of interest from which the measurement data was published

The data sent from the CMS historian to the ORM System comprises historical measurement data including:

- The measurement/data value or LIMS data (i.e., test, test component results, and sample meta-data)
- The timestamp at which the value was acquired
- The data quality
- Any associated events
- Any associated alarms

Additionally, contextual data may be provided in the response, which may comprise any of the following:

- The physical/virtual measurement location at which the measurement was taken
- The functional location
- The serialized asset
- The material item
- The device/transducer that took the measurement
- The measurement source/data collector from which the measurement data was published
- Any Agent(s) and/or AgentRole(s) associated with a test, sample, or an event/alarm (e.g., person who acknowledged an alarm, performed the test, or collected the sample)

MIMOSA CCOM Reference Types

For the purposes of reference data management, the following MIMOSA CCOM types may be referenced:

- AgentRoleType
- AgentType
- AssetType
- PropertyType/PropertyDefinition
- CalculationType
- DataQualityType
- EnumerationItem
- EventType
- HighlightType (for alarm visualization)
- MeasurementLocationType
- MeasurementSourceType
- PostScalingType
- RegionType (for alarming)
- SegmentType
- SeverityLevelType (for alarm regions)
- TestType (for Test / LIMS measurements)
- TestComponentType (for Test / LIMS measurements)
- TransducerAxisDirectionType
- TransducerType
- UOMQuantity/UnitOfMeasure

NOTE For versions of MIMOSA CCOM prior to 4.1, the types referring to 'Property' use the term 'Attribute' instead.

System Interoperability Events

This scenario requires the sending/receipt of the following Events:

- [Pull Historical Measurement Data](#)
- [Pull Historical Test and Sample Data](#)
- [Pull Historical Alarm and State Event Data](#)

Data Formats

The data requested by O&M system(s) and the response by the CMS must comply with MIMOSA CCOM BODs.

Infrastructural Components

ISBM

The communication between all systems occurs via the ISBM using request-response services.

Implementation Requirements

The O&M system(s) must implement a client for ISBM Consumer Request and Channel Management (GetChannel operation only) Services. The O&M system(s) may implement the ISBM Notify Listener Service for message notification.

The CMS (historian) must implement a client for the ISBM Provider Request and Channel Management (GetChannel operation only) Services. The CMS must respond to all requests. The CMS (or historian) may implement the ISBM Notify Listener Service for message notification.

Suggested Channel/Topic Configuration

A channel should be created for install requests and should conform to the following format:

```
/Enterprise/Enterprise Subdivision/.../ISO18435:D1.2/Request
```

For example:

```
/Demo Enterprise/Refinery A/Area A/Light Ends Area/ISO18435:D1.2/Request
```

As outlined in the document [ISBM Guidelines](#), topics should match the message content. Correspondingly, the following topic format should be used:

```
OIIE:S32:V1.2/StandardSchemaName{:Version}
```

For example:

```
OIIE:S32:V1.2/CCOM-XML:GetMeasurements:V1.0  
OIIE:S32:V1.2/CCOM-JSON:GetMeasurements:V1.0  
OIIE:S32:V1.2/CCOM-XML:GetActualEvents:V1.0  
OIIE:S32:V1.2/CCOM-JSON:GetActualEvents:V1.0  
OIIE:S32:V1.2/CCOM-XML:GetTriggeredRegions:V1.0  
OIIE:S32:V1.2/CCOM-JSON:GetTriggeredRegions:V1.0
```

SDAIR

The Scenario may require the use of an SDAIR in the following capacities:

- Registry of contextual data including any or all of the following: functional location tags, serialized assets, measurement locations, measurement device/transducer tags, and measurement sources/data collectors

CIR

The CIR is used to keep track of the object mappings between all systems.

Suggested Categories Configuration

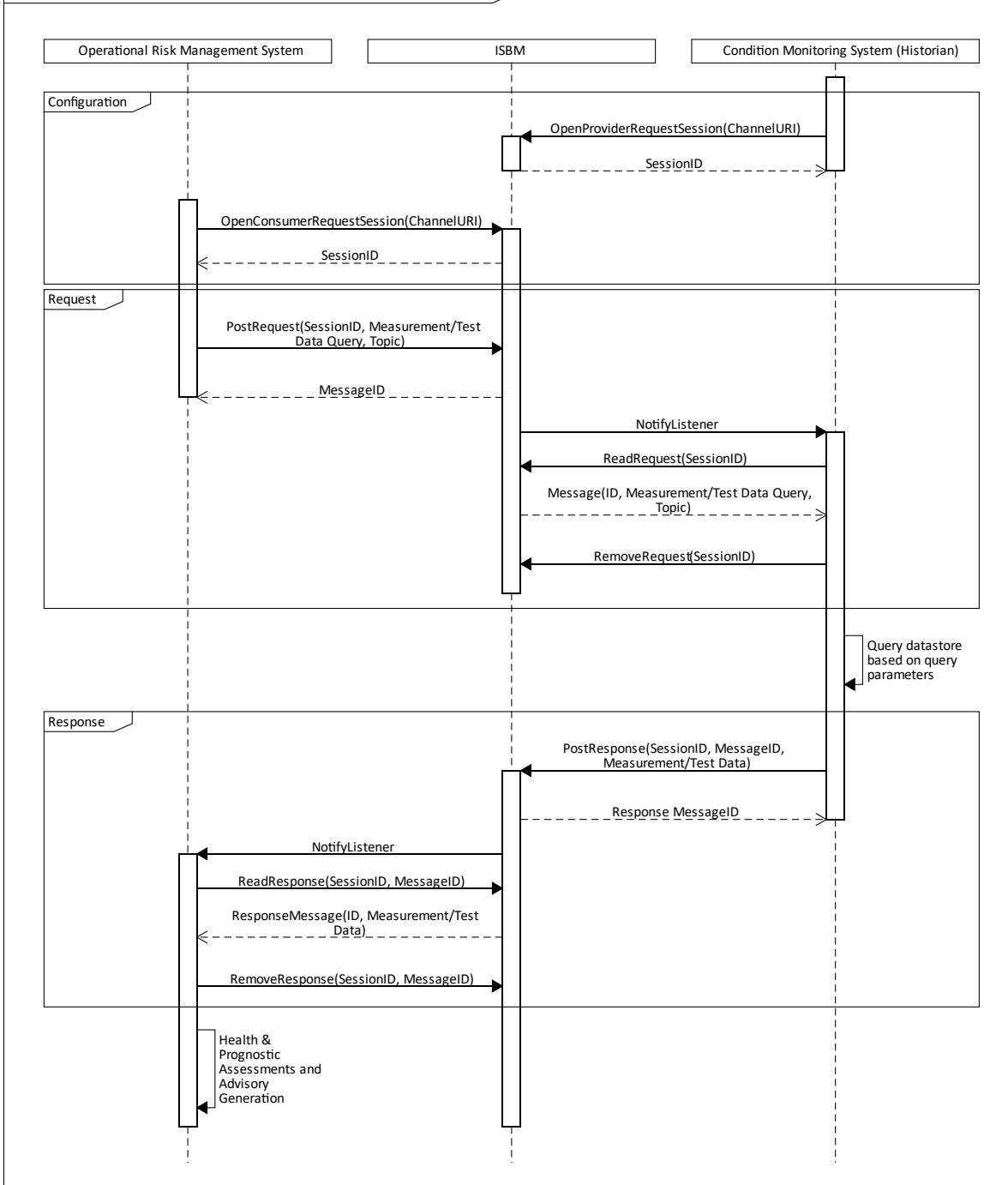
The following CIR categories are suggested:

Data Type	MIMOSA CCOM Categories
Measurement Location “Tags”	Measurement Location
Functional Locations	Segment
Serialized Assets	Asset
Material items	Material Item
Devices/Transducers	Transducer
Data Collectors	Measurement Source
Agents	Agent
Engineering Units	UOM Quantity

Event Sequence

The following diagram represents a simplified set of exemplar interactions between the systems required to achieve this Scenario. The system actors are assumed to have OIIE/ISBM adaptors implemented as required, with services according to the ISBM Implementation Requirements described above. For simplicity, it is assumed that each system/adaptor implements the optional Notify Listener service.

OIE Scenario 32: Pull Historical Condition Data and State Events from CMS to O&M



Version Applicability/Alignment

Scenarios describe general data requirements and, hence, they are aligned to specific versions of CCOM and/or other MIMOSA standards. For example, older versions of CCOM may not include the data elements required by newer Scenarios, while older Scenarios may become obsolete or have their data requirements change over time.

This Scenario is applicable to the following versions of CCOM:

- CCOM 3.x (part of OSA-EAI 3.x)
- CCOM 4.x

NOTE Use of 'x' in the version number indicates a variable version. For example, "4.x" indicates applicability to all versions of CCOM with the MAJOR version '4', regardless of MINOR and PATCH versions.

Document Versioning

Version	Date	Major Changes
1.2	2020-12-11	Updated to use OpenO&M template. Added detail around the LIMS data.
1.1	2019-02-16	Updated to revised Use Case Architecture. Completed the definition.
1.0	2019-02-09	Imported from old draft use case documentation.