**ภาคผวก A09  
โปรไฟล์เพื่อการเชื่อมโยงข้อมูล DM\_OMS**

การพัฒนาเชื่อมโยงข้อมูลระหว่างซอฟต์แวร์จำเป็นต้องมีข้อกำหนดกลางเพื่อการเชื่อมโยงข้อมูล มาตรฐาน ไออีซี ซิม หรือ IEC CIM (Common Information Model) เป็นมาตรฐานสากลเพื่อการเชื่อมโยงข้อมูลเกี่ยวกับ การจำหน่ายกระแสไฟฟ้าและการบริหารไฟฟ้าขัดข้อง ที่สำคัญได้แก่ IEC-61970 และ IEC-61968 มาตรฐานสากลดังกล่าวจัดทำขึ้นเพื่อใช้เป็นข้อกำหนดกลางในการรับส่งข้อมูลระหว่างซอฟต์แวร์ที่แตกต่างกัน เพื่อลดเวลา ลดค่าใช้จ่าย และเพิ่มประสิทธิภาพในการพัฒนาเชื่อมโยงข้อมูลระหว่างกัน ปัจจุบันผลิตภัณฑ์ซอฟต์แวร์ที่พัฒนาขึ้นเพื่อสนับสนุนการปฏิบัติระบบไฟฟ้าและบริหารไฟฟ้าขัดข้อง มักมีความสามารถในการเชื่อมโยงข้อมูลตามมาตรฐานนี้

โปรไฟล์เพื่อการเชื่อมโยงข้อมูล (CIM Profile) คือ ข้อกำหนดขอบเขตและคุณลักษณะเฉพาะของข้อมูลภายใต้บริบทหนึ่ง ประกอบด้วย ชื่อข้อมูล ความหมายและรูปแบบข้อมูล เพื่อใช้ในการพัฒนาระบบเชื่อมโยงข้อมูลภายใต้วัตถุประสงค์หนึ่ง ตัวอย่างโปรไฟล์มาตรฐาน ได้แก่ IEC-61970-452, IEC-61970-453, IEC-61970-456 องค์กรสามารถกำหนดโปรไฟล์ที่เหมาะสมกับบริบทของตนได้ โดยการกำหนดรายการข้อมูลเฉพาะส่วนที่จำเป็นสำหรับการเชื่อมโยงข้อมูลภายใต้บริบทนั้น มักมีขนาดเล็กและง่ายต่อการพัฒนา โปรไฟล์การเชื่อมโยงข้อมูลนี้จัดทำขึ้นตามมาตรฐานสากล IEC-61970-501 จัดทำขึ้นโดยใช้ซอฟต์แวร์เครื่องมือเพื่อใช้สร้างโปรไฟล์ อาทิ เช่น CIMtool เป็นต้น

เอกสารนี้อธิบายโปรไฟล์เพื่อการเชื่อมโยง ระบบ DM ชื่อว่า DM\_OMS หรือเนมสเปส ชื่อเต็มว่า

CIM profile: [http://pea.co.th/cim/profile/DM\_OMS#](http://pea.co.th/cim/profile/DM_OMS)

ประกอบด้วย เอกสารดังนี้

1. เอกสารอธิบายโปรไฟล์ : DM\_OMS.rtf, DM\_OMS.html
2. แฟ้มเอกสารอิเล็กทรอนิกส์ ข้อกำหนดโปรไฟล์ : DM\_OMS.owl
3. แฟ้มเอกสารอิเล็กทรอนิกส์ IEC-61970-501 : DM\_OMS.legacy-rdfs
4. แฟ้มเอกสารอิเล็กทรอนิกส์ IEC-61968-100 : DM\_OMS.part100-ed2.xsd

ผู้รับจ้างต้องดำเนินการศึกษา ทบทวนและสอบทาน ข้อกำหนดโปรไฟลน์นี้ กับผู้ที่เกี่ยวข้องกับซอฟต์แวร์ที่จะเชื่อมโยงนั้น ปรับข้อกำหนดโปรไฟล์ให้สอดคล้องกับความต้องการของผู้เกี่ยวข้องและเสนอขอรับความเห็นชอบก่อนการดำเนินการ

**DM\_OMS\_Profile Profile**

Profile namespace: http://pea.co.th/cim/profile/DM\_OMS#

**Concrete Classes**

**Asset**

Tangible resource of the utility, including power system equipment, various end devices, cabinets, buildings, etc. For electrical network equipment, the role of the asset is defined through PowerSystemResource and its subclasses, defined mainly in the Wires model (refer to IEC61970-301 and model package IEC61970::Wires). Asset description places emphasis on the physical characteristics of the equipment fulfilling that role.

**Native Members**

|  |  |  |  |
| --- | --- | --- | --- |
| **name** | **mult** | **type** | **description** |
| initialCondition | 1..1 | string | Condition of asset at last baseline. Examples include new, rebuilt, overhaul required, other. Refer to inspection data for information on the most current condition of the asset. |
| initialLossOfLife | 1..1 | [PerCent](#PerCent) | Percentage of initial life expectancy that has been lost as of the last life expectancy baseline. Represents(initial life expectancy - current life expectancy) / initial life expectancy. |
| inUseState | 1..1 | [InUseStateKind](#InUseStateKind) | Indication of whether asset is currently deployed (in use), ready to be put into use or not available for use. |
| kind | 1..1 | [AssetKind](#AssetKind) | Kind of asset. Used in description of asset components in asset instance templates. |
| lifecycleState | 1..1 | [AssetLifecycleStateKind](#AssetLifecycleStateKind) | Current lifecycle state of asset. |
| lotNumber | 1..1 | string | Lot number for this asset. Even for the same model and version number, many assets are manufactured in lots. |
| purchasePrice | 1..1 | [Money](#Money) | Purchase price of asset. |
| retiredReason | 1..1 | [RetiredReasonKind](#RetiredReasonKind) | Reason asset retired. |
| serialNumber | 1..1 | string | Serial number of this asset. |
| type | 1..1 | string | Utility-specific classification of Asset and its subtypes, according to their corporate standards, practices, and existing IT systems (e.g., for management of assets, maintenance, work, outage, customers, etc.). |

**EndDevice**

Asset container that performs one or more end device functions. One type of end device is a meter which can perform metering, load management, connect/disconnect, accounting functions, etc. Some end devices, such as ones monitoring and controlling air conditioners, refrigerators, pool pumps may be connected to a meter. All end devices may have communication capability defined by the associated communication function(s). An end device may be owned by a consumer, a service provider, utility or otherwise.

There may be a related end device function that identifies a sensor or control point within a metering application or communications systems (e.g., water, gas, electricity).

Some devices may use an optical port that conforms to the ANSI C12.18 standard for communications.

**Native Members**

| **name** | **mult** | **type** | **description** |
| --- | --- | --- | --- |
| mRID | 1..1 | string | Master resource identifier issued by a model authority. The mRID is unique within an exchange context. Global uniqueness is easily achieved by using a UUID, as specified in RFC 4122, for the mRID. The use of UUID is strongly recommended.For CIMXML data files in RDF syntax conforming to IEC 61970-552, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements. |
| aliasName | 1..1 | string | The aliasName is free text human readable name of the object alternative to IdentifiedObject.name. It may be non unique and may not correlate to a naming hierarchy.The attribute aliasName is retained because of backwards compatibility between CIM relases. It is however recommended to replace aliasName with the Name class as aliasName is planned for retirement at a future time. |
| inUseState | 1..1 | [InUseStateKind](#InUseStateKind) | Indication of whether asset is currently deployed (in use), ready to be put into use or not available for use. |
| kind | 1..1 | [AssetKind](#AssetKind) | Kind of asset. Used in description of asset components in asset instance templates. |
| lifecycleState | 1..1 | [AssetLifecycleStateKind](#AssetLifecycleStateKind) | Current lifecycle state of asset. |
| lotNumber | 1..1 | string | Lot number for this asset. Even for the same model and version number, many assets are manufactured in lots. |
| name | 1..1 | string | The name is any free human readable and possibly non unique text naming the object. |
| purchasePrice | 1..1 | [Money](#Money) | Purchase price of asset. |
| retiredReason | 1..1 | [RetiredReasonKind](#RetiredReasonKind) | Reason asset retired. |
| serialNumber | 1..1 | string | Serial number of this asset. |
| ActivityRecords | 1..\* | [ActivityRecord](#ActivityRecord) | All activity records created for this asset. |
| AssetInfo | 1..1 | [AssetInfo](#AssetInfo) | Data applicable to this asset. |
| ErpInventory | 1..1 | [ErpInventory](#ErpInventory) |  |
| Names | 1..\* | [Name](#Name) | All names of this identified object. |
| ServiceLocation | 1..1 | [ServiceLocation](#ServiceLocation) | The sevice location at which the assets exist |

**Meter**

Physical asset that performs the metering role of the usage point. Used for measuring consumption and detection of events.

**Native Members**

|  |  |  |  |
| --- | --- | --- | --- |
| **name** | **mult** | **type** | **description** |
| mRID | 1..1 | string | Master resource identifier issued by a model authority. The mRID is unique within an exchange context. Global uniqueness is easily achieved by using a UUID, as specified in RFC 4122, for the mRID. The use of UUID is strongly recommended.For CIMXML data files in RDF syntax conforming to IEC 61970-552, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements. |
| amrSystem | 1..1 | string | Automated meter reading (AMR) or other communication system responsible for communications to this end device. |
| connectionCategory | 1..1 | string | A code used to specify the connection category, e.g. low voltage, where the meter operates. |
| initialCondition | 1..1 | string | Condition of asset at last baseline. Examples include new, rebuilt, overhaul required, other. Refer to inspection data for information on the most current condition of the asset. |
| initialLossOfLife | 1..1 | [PerCent](#PerCent) | Percentage of initial life expectancy that has been lost as of the last life expectancy baseline. Represents(initial life expectancy - current life expectancy) / initial life expectancy. |
| installCode | 1..1 | string | Installation code. |
| inUseState | 1..1 | [InUseStateKind](#InUseStateKind) | Indication of whether asset is currently deployed (in use), ready to be put into use or not available for use. |
| kind | 1..1 | [AssetKind](#AssetKind) | Kind of asset. Used in description of asset components in asset instance templates. |
| name | 1..1 | string | The name is any free human readable and possibly non unique text naming the object. |
| MeterReadings | 1..\* | [MeterReading](#MeterReading) | All meter readings provided by this meter. |
| Names | 1..\* | [Name](#Name) | All names of this identified object. |

**Inherited Members**

| **name** | **mult** | **type** | **description** |
| --- | --- | --- | --- |
| mRID | 1..1 | string | see [EndDevice](#EndDevice) |
| aliasName | 1..1 | string | see [EndDevice](#EndDevice) |
| inUseState | 1..1 | [InUseStateKind](#InUseStateKind) | see [EndDevice](#EndDevice) |
| kind | 1..1 | [AssetKind](#AssetKind) | see [EndDevice](#EndDevice) |
| lifecycleState | 1..1 | [AssetLifecycleStateKind](#AssetLifecycleStateKind) | see [EndDevice](#EndDevice) |
| lotNumber | 1..1 | string | see [EndDevice](#EndDevice) |
| name | 1..1 | string | see [EndDevice](#EndDevice) |
| purchasePrice | 1..1 | [Money](#Money) | see [EndDevice](#EndDevice) |
| retiredReason | 1..1 | [RetiredReasonKind](#RetiredReasonKind) | see [EndDevice](#EndDevice) |
| serialNumber | 1..1 | string | see [EndDevice](#EndDevice) |
| ActivityRecords | 1..unbounded | [ActivityRecord](#ActivityRecord) | see [EndDevice](#EndDevice) |
| AssetInfo | 1..1 | [AssetInfo](#AssetInfo) | see [EndDevice](#EndDevice) |
| ErpInventory | 1..1 | [ErpInventory](#ErpInventory) | see [EndDevice](#EndDevice) |
| Names | 1..unbounded | [Name](#Name) | see [EndDevice](#EndDevice) |
| ServiceLocation | 1..1 | [ServiceLocation](#ServiceLocation) | see [EndDevice](#EndDevice) |

**Abstract Classes**

**AssetInfo**

Set of attributes of an asset, representing typical datasheet information of a physical device that can be instantiated and shared in different data exchange contexts:

- as attributes of an asset instance (installed or in stock)

- as attributes of an asset model (product by a manufacturer)

- as attributes of a type asset (generic type of an asset as used in designs/extension planning).

**Native Members**

|  |  |  |  |
| --- | --- | --- | --- |
| **name** | **mult** | **type** | **description** |
| CatalogAssetType | 1..1 | [CatalogAssetType](#CatalogAssetType) | Asset information (nameplate) for this catalog asset type. |

**CatalogAssetType**

a Assets that may be used for planning, work or design purposes.

**Native Members**

|  |  |  |  |
| --- | --- | --- | --- |
| **name** | **mult** | **type** | **description** |
| estimatedUnitCost | 1..1 | [Money](#Money) | Estimated unit cost (or cost per unit length) of this type of asset. It does not include labor to install, construct or configure it. |
| kind | 1..1 | [AssetKind](#AssetKind) | Kind of asset (from enumerated list). |
| stockItem | 1..1 | boolean | True if item is a stock item (default). |
| type | 1..1 | string | Description of type of asset. |

**ErpInventory**

Utility inventory-related information about an item or part (and not for description of the item and its attributes). It is used by ERP applications to enable the synchronization of Inventory data that exists on separate Item Master databases. This data is not the master data that describes the attributes of the item such as dimensions, weight, or unit of measure - it describes the item as it exists at a specific location.

**Native Members**

|  |  |  |  |
| --- | --- | --- | --- |
| **name** | **mult** | **type** | **description** |
| mRID | 1..1 | string | Master resource identifier issued by a model authority. The mRID is unique within an exchange context. Global uniqueness is easily achieved by using a UUID, as specified in RFC 4122, for the mRID. The use of UUID is strongly recommended.For CIMXML data files in RDF syntax conforming to IEC 61970-552, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements. |
| aliasName | 1..1 | string | The aliasName is free text human readable name of the object alternative to IdentifiedObject.name. It may be non unique and may not correlate to a naming hierarchy.The attribute aliasName is retained because of backwards compatibility between CIM relases. It is however recommended to replace aliasName with the Name class as aliasName is planned for retirement at a future time. |
| name | 1..1 | string | The name is any free human readable and possibly non unique text naming the object. |
| status | 1..1 | [Status](#Status) |  |

**MeterReading**

Set of values obtained from the meter.

**Native Members**

|  |  |  |  |
| --- | --- | --- | --- |
| **name** | **mult** | **type** | **description** |
| UsagePoint | 1..1 | [UsagePoint](#UsagePoint) | Usage point from which this meter reading (set of values) has been obtained. |

**Name**

The Name class provides the means to define any number of human readable names for an object. A name is b>not/b> to be used for defining inter-object relationships. For inter-object relationships instead use the object identification 'mRID'.

**Native Members**

|  |  |  |  |
| --- | --- | --- | --- |
| **name** | **mult** | **type** | **description** |
| name | 1..1 | string | Any free text that name the object. |
| IdentifiedObject | 1..1 | [IdentifiedObject](#IdentifiedObject) | Identified object that this name designates. |
| NameType | 1..1 | [NameType](#NameType) | Type of this name. |

**UsagePoint**

Logical or physical point in the network to which readings or events may be attributed. Used at the place where a physical or virtual meter may be located; however, it is not required that a meter be present.

**Native Members**

|  |  |  |  |
| --- | --- | --- | --- |
| **name** | **mult** | **type** | **description** |
| mRID | 1..1 | string | Master resource identifier issued by a model authority. The mRID is unique within an exchange context. Global uniqueness is easily achieved by using a UUID, as specified in RFC 4122, for the mRID. The use of UUID is strongly recommended.For CIMXML data files in RDF syntax conforming to IEC 61970-552, the mRID is mapped to rdf:ID or rdf:about attributes that identify CIM object elements. |
| name | 1..1 | string | The name is any free human readable and possibly non unique text naming the object. |

**Enumerations**

**AssetKind**

Kinds of assets or asset components.

|  |  |
| --- | --- |
| **name** | **description** |
| breakerAirBlastBreaker | Air blast circuit breaker. |
| breakerBulkOilBreaker | Bulk oil circuit breaker. |
| breakerInsulatingStackAssembly | Breaker insulating stack assembly (for live tank breaker). |
| breakerMinimumOilBreaker | Minimum oil circuit breaker. |
| breakerSF6DeadTankBreaker | SF6 dead tank breaker. |
| breakerSF6LiveTankBreaker | SF6 live tank breaker. |
| breakerTankAssembly | Breaker tank assembly. |
| other | Other type of Asset. The type attribute may provide more details in this case. |
| transformer | Transformer. |
| transformerTank | Transformer tank. |

**AssetLifecycleStateKind**

Lifecycle states an asset can be in.While the possible lifecycle states are standardized, the allowed transitions are not - they are intended to be defined by the business process requirements of local implementations.

|  |  |
| --- | --- |
| **name** | **description** |
| disposedOf | Asset disposed of. |
| manufactured | Asset manufactured. |
| purchased | Asset purchased. |
| received | Asset received. |
| retired | Asset retired. |

**RetiredReasonKind**

Reason asset retired.

|  |  |
| --- | --- |
| **name** | **description** |
| environmental | Retired due to environmental reasons. |
| excessiveMaintenance | Retired due to excessive maintainance issues. |
| facilitiesUpgrade | Retired due to facility upgrade. |
| failed | Retired because of failure. |
| obsolescence | Retired due to obsolescence. |
| other | Retired due to other reasons. |
| sold | Retired and sold. |

**Datatypes**

**Money**

Amount of money.

XSD type: decimal

**PerCent**

Percentage on a defined base. For example, specify as 100 to indicate at the defined base.

XSD type: float