**3GPP TSG-SA5 Meeting #154 *S5-241953d1***

Changsha, China, 15 - 19 April 2024

|  |
| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **28.105** | **CR** | **0130** | **rev** | **1** | **Current version:** | **18.3.0** |  |
|  |
| *For* [***HE******LP***](http://www.3gpp.org/3G_Specs/CRs.htm#_blank)*on using this form: comprehensive instructions can be found at* [*http://www.3gpp.org/Change-Requests*](http://www.3gpp.org/Change-Requests)*.* |
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|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network | **X** | Core Network | **X** |

|  |
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|  |
| ***Title:***  | Rel-18 CR TS 28.105 correct the description of MLEntity related IOCs |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | S5 |
|  |  |
| ***Work item code:*** | AIML\_MGT |  | ***Date:*** | 2024-03-19 |
|  |  |  |  |  |
| ***Category:*** | F |  | ***Release:*** | Rel-18 |
|  | *Use one of the following categories:****F*** *(correction)****A*** *(mirror corresponding to a change in an earlier release)****B*** *(addition of feature),* ***C*** *(functional modification of feature)****D*** *(editorial modification)*Detailed explanations of the above categories canbe found in 3GPP [TR 21.900](http://www.3gpp.org/ftp/Specs/html-info/21900.htm). | *Use one of the following releases:Rel-8 (Release 8)Rel-9 (Release 9)Rel-10 (Release 10)Rel-11 (Release 11)…Rel-15 (Release 15)Rel-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)* |
|  |  |
| ***Reason for change:*** | There are some errors in the Figure 7.2a.1.1-1.According to the relationship, the MLEntity is name contained of MLEntityRepository, it is unnecessary to define the attribute mlEntityRef in MLEntityRepository.The description related with the relation in each IOCs are missing. |
|  |  |
| ***Summary of change:*** | * Correct the Figure 7.2a.1.1-1 with remove “or”, and corresponding PlanUML code.
* Remove the attribute mlEntityRef from MLEntityRepository
* Add description of its relation in each IOCs.
 |
|  |  |
| ***Consequences if not approved:*** | It is unclear of AI/ML management. |
|  |  |
| ***Clauses affected:*** | 7.2a.1.1, 7.2a.2.1.1, 7.2a.2.2.1, 7.2a.2.2.2, 7.2a.2.3.1, A.5, B.2.1 |
|  |  |
|  | **Y** | **N** |  |  |
| ***Other specs*** |  | **X** |  Other core specifications  | TS/TR ... CR ...  |
| ***affected:*** |  | **X** |  Test specifications | TS/TR ... CR ...  |
| ***(show related CRs)*** |  | **X** |  O&M Specifications | TS/TR ... CR ...  |
|  |  |
| ***Other comments:*** | https://forge.3gpp.org/rep/sa5/MnS/-/blob/TS\_28.105\_CR0130\_Rel-18\_correct\_the\_description\_of\_MLEntity\_related\_IOCs/OpenAPI/TS28105\_AiMlNrm.yaml |
|  |  |
| ***This CR's revision history:*** |  |

|  |
| --- |
| **1st modified section** |

## 7.2a Common information model definitions for AI/ML management

### 7.2a.1 Class diagram

#### 7.2a.1.1 Relationships



Figure 7.2a.1.1-1: Relations for common information models for AI/ML management

#### 7.2a.1.2 Inheritance

Figure 7.2a.1.2-1: Inheritance Hierarchy for common information models for AI/ML management

### 7.2a.2 Class definitions

#### 7.2a.2.1 MLEntity

##### 7.2a.2.1.1 Definition

This IOC represents the ML entity. ML model or ML entity are not subjects for standardization. It isname-contained by MLEntityRepository.

The MLEntity may contain 3 types of contexts - TrainingContext, ExpectedRunTimeContext and RunTimeContext which represent status and conditions of the MLEntity. These contexts are of mLContext <<dataType>>, see clauses 7.4.3 and 7.5.1 for details. It also contains a reference named retrainingEventsMonitorRef which is a pointer to ThresholdMnonitor MOI. This indicates the list of performance measurements and the corresponding thresholds that are monitored and used to identify the need for re-training by the MnS Producer. After the MLEntity MOI has been instantiated, the MnS Consumer can request MnS producer to instantiate a ThresholdMonitor MOI and update the reference in the MLEntity MOI that can be used by the MnS producer to decide on the re-training of the MLEntity. The MnS producer can be ML Training MnS producer or ML Inference MnS Producer.

##### 7.2a.2.1.2 Attributes

Table 7.2a.2.1.2 -1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable  | isWritable | isInvariant | isNotifyable |
| mLEntityId | M | T | F | F | T |
| inferenceType | M | T | F | F | T |
| mLEntityVersion | M | T | F | F | T |
| expectedRunTimeContext | M | T | T | F | T |
| trainingContext | CM | T | F | F | T |
| runTimeContext | O | T | F | F | T |
| supportedPerformanceIndicators | O | T | F | F | T |
| mLCapabilitiesInfoList | M | T | F | F | T |
| **Attribute related to role** |  |  |  |  |  |
| retrainingEventsMonitorRef | O | T | T | F | T |
| sourceTrainedMLEntityRef | CM | T | F | F | T |

##### 7.2a.2.2.3 Attribute constraints

Table 7.2a.2.2.3-1

|  |  |
| --- | --- |
| Name | Definition |
| trainingContext Support Qualifier | Condition: The trainingContext represents the status and conditions related to training and should be added when training is completed. |
| sourceTrainedMLEntityRef Support Qualifier | Condition: The MLEntity MOI containing this attribute represents an ML entity loaded to an inference function. |

##### 7.2a.2.2.4 Notifications

The common notifications defined in clause 7.6 are valid for this IOC, without exceptions or additions.

#### 7.2a.2.2 MLEntityRepository

##### 7.2a.2.2.1 Definition

The IOC MLEntityRepository represents the repository that contains the ML entities . It is name-contained by SubNetwork orManagedElement.

The MLEntityRepository MOI may contain one or more MLEntity(s).

##### 7.2a.2.2.2 Attributes

Table 7.a.2.2.2 -1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable | isWritable | isInvariant | isNotifyable |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

##### 7.2a.2.2.3 Attribute constraints

None.

##### 7.2a.2.2.4 Notifications

The common notifications defined in clause 7.6 are valid for this IOC, without exceptions or additions.

#### 7.2a.2.3 MLEntityCoordinationGroup

##### 7.2a.2.3.1 Definition

This IOC represents the group of ML entities, which can be trained and tested jointly and used to perform inference in a coordinated way. It is name-contained by MLEntityRepository.

One ML entity may have dependencies on one or more of the other ML entities of the same group.

One group is associated with at least two ML entities.

##### 7.2a.2.3.2 Attributes

Table 7.2a.2.3.2-1

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Support Qualifier | isReadable  | isWritable | isInvariant | isNotifyable |
|  |  |  |  |  |  |
| **Attribute related to role** |  |  |  |  |  |
| memberMLEntityRefList | M | T | F | F | T |

##### 7.2a.2.3.3 Attribute constraints

None.

##### 7.2a.2.3.4 Notifications

The common notifications defined in clause 7.6 are valid for this IOC, without exceptions or additions.

|  |
| --- |
| **Next modified section** |

# A.5 PlantUML code for Figure 7.2a.1.1-1: Relationships for common information models for AI/ML management

@startuml

skinparam ClassStereotypeFontStyle normal

skinparam ClassBackgroundColor White

skinparam shadowing false

skinparam monochrome true

hide members

hide circle

'skinparam maxMessageSize 250

skinparam nodesep 60

class ManagedEntity <<ProxyClass>>

class MLEntityRepository <<InformationObjectClass>>

class MLEntity <<InformationObjectClass>>

class MLEntityCoordinationGroup <<InformationObjectClass>>

ManagedEntity "1" \*-- "\*" MLEntityRepository : <<names>>

MLEntityRepository "1" \*-- "\*" MLEntity: <<names>>

MLEntityRepository "1" \*-- "\*" MLEntityCoordinationGroup: <<names>>

MLEntityCoordinationGroup "\*" -r-> "2..\*" MLEntity

note left of ManagedEntity

 This represents the following IOCs:

 ManagedElement or

 SubNetwork

 end note

|  |
| --- |
| @enduml**Next modified section** |

## B.2.1 OpenAPI document "TS28105\_AiMlNrm.yaml"

<CODE BEGINS>

openapi: 3.0.1

info:

 title: AI/ML NRM

 version: 18.3.0

 description: >-

 OAS 3.0.1 specification of the AI/ML NRM

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externalDocs:

 description: 3GPP TS 28.105; AI/ML Management

 url: http://www.3gpp.org/ftp/Specs/archive/28\_series/28.105/

paths: {}

components:

 schemas:

#-------- Definition of types-----------------------------------------------------

 MLContext:

 type: object

 properties:

 inferenceEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 dataProviderRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 RequestStatus:

 type: string

 enum:

 - NOT\_STARTED

 - IN\_PROGRESS

 - SUSPENDED

 - FINISHED

 - CANCELLED

 - CANCELLING

 ModelPerformance:

 type: object

 properties:

 inferenceOutputName:

 type: string

 performanceMetric:

 type: string

 performanceScore:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Float'

 decisionConfidenceScore:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Float'

 ProcessMonitor:

 description: >-

 This data type is the "ProcessMonitor" data type defined in âœgenericNrm.yamlâ

 with specialisations for usage in TS 28.105.

 type: object

 properties:

 status:

 type: string

 progressPercentage:

 type: integer

 minimum: 0

 maximum: 100

 progressStateInfo:

 type: string

 resultStateInfo:

 type: string

 AIMLManagementPolicy:

 description: >-

 This data type represents the properties of a policy for AI/ML management.

 type: object

 properties:

 thresholdList:

 type: array

 items:

 $ref: 'TS28623\_ThresholdMonitorNrm.yaml#/components/schemas/ThresholdInfo'

 SupportedPerfIndicator:

 type: object

 properties:

 performanceIndicatorName:

 type: string

 isSupportedForTraining:

 type: boolean

 isSupportedForTesting:

 type: boolean

 ManagedActivationScope:

 oneOf:

 - type: object

 properties:

 dNList:

 type: array

 items:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 - type: object

 properties:

 timeWindow:

 type: array

 items:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/TimeWindow'

 - type: object

 properties:

 geoPolygon:

 type: array

 items:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/GeoArea'

 MLCapabilityInfo:

 type: object

 properties:

 inferenceType:

 type: string

 capabilityName:

 type: string

 mLCapabilityParameters:

 description: A map (list of key-value pairs) for an inferenceType and capabilityName

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/AttributeNameValuePairSet'

 AvailMLCapabilityReport:

 type: object

 properties:

 mLCapabilityVersionId:

 type: array

 items:

 type: string

 expectedPerformanceGains:

 type: array

 items:

 $ref: '#/components/schemas/ModelPerformance'

 mLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 InferenceOutput:

 type: object

 properties:

 inferenceOutputId:

 type: array

 items:

 type: string

 inferenceType:

 type: string

 inferenceOutputTime:

 type: array

 items:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DateTime'

 # FIXME, isOrder/isUnique both as True

 inferencePerformance:

 $ref: '#/components/schemas/ModelPerformance'

 outputResult:

 description: A map (list of key-value pairs) for Inference result name and it's value

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/AttributeNameValuePairSet'

#-------- Definition of types for name-containments ------

 SubNetwork-ncO-AiMlNrm:

 type: object

 properties:

 MLTrainingFunction:

 $ref: '#/components/schemas/MLTrainingFunction-Multiple'

 MLTestingFunction:

 $ref: '#/components/schemas/MLTestingFunction-Multiple'

 MLEntityRepository:

 $ref: '#/components/schemas/MLEntityRepository-Multiple'

 MLUpdateFunction:

 $ref: '#/components/schemas/MLUpdateFunction-Multiple'

 AIMLInferenceFunction:

 $ref: '#/components/schemas/AIMLInferenceFunction-Multiple'

 ManagedElement-ncO-AiMlNrm:

 type: object

 properties:

 MLTrainingFunction:

 $ref: '#/components/schemas/MLTrainingFunction-Multiple'

 MLTestingFunction:

 $ref: '#/components/schemas/MLTestingFunction-Multiple'

 MLEntityRepository:

 $ref: '#/components/schemas/MLEntityRepository-Multiple'

 MLUpdateFunction:

 $ref: '#/components/schemas/MLUpdateFunction-Multiple'

 AIMLInferenceFunction:

 $ref: '#/components/schemas/AIMLInferenceFunction-Multiple'

#-------- Definition of concrete IOCs --------------------------------------------

 MLTrainingFunction-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 mLEntityRepositoryRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 MLTrainingRequest:

 $ref: '#/components/schemas/MLTrainingRequest-Multiple'

 MLTrainingProcess:

 $ref: '#/components/schemas/MLTrainingProcess-Multiple'

 MLTrainingReport:

 $ref: '#/components/schemas/MLTrainingReport-Multiple'

 ThresholdMonitors:

 $ref: 'TS28623\_ThresholdMonitorNrm.yaml#/components/schemas/ThresholdMonitor-Multiple'

 MLTrainingRequest-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 inferenceType:

 type: string

 candidateTrainingDataSource:

 type: array

 items:

 type: string

 trainingDataQualityScore:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Float'

 trainingRequestSource:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 requestStatus:

 $ref: '#/components/schemas/RequestStatus'

 expectedRuntimeContext:

 $ref: '#/components/schemas/MLContext'

 performanceRequirements:

 type: array

 items:

 $ref: '#/components/schemas/ModelPerformance'

 cancelRequest:

 type: boolean

 suspendRequest:

 type: boolean

 mLEntityToTrainRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 mLEntityCoordinationGroupToTrainRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 MLTrainingProcess-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 priority:

 type: integer

 terminationConditions:

 type: string

 enum:

 - UPDATED\_IN\_INFERENCE\_FUNCTION

 - INFERENCE FUNCTION\_TERMINATED

 - INFERENCE FUNCTION\_UPGRADED

 - INFERENCE\_CONTEXT\_CHANGED

 progressStatus:

 $ref: '#/components/schemas/ProcessMonitor'

 cancelProcess:

 type: boolean

 suspendProcess:

 type: boolean

 trainingRequestRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 trainingReportRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 mLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 MLTrainingReport-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 areConsumerTrainingDataUsed:

 type: string

 enum:

 - ALL

 - PARTIALLY

 - NONE

 usedConsumerTrainingData:

 type: array

 items:

 type: string

 modelconfidenceIndication:

 type: integer

 modelPerformanceTraining:

 type: array

 items:

 $ref: '#/components/schemas/ModelPerformance'

 modelPerformanceValidation:

 type: array

 items:

 $ref: '#/components/schemas/ModelPerformance'

 dataRatioTrainingAndValidation:

 type: integer

 areNewTrainingDataUsed:

 type: boolean

 trainingRequestRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 trainingProcessRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 lastTrainingRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 mLEnityGeneratedRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 mLEntityCoordinationGroupGeneratedRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 mLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 MLTestingFunction-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 mLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 MLTestingRequest:

 $ref: '#/components/schemas/MLTestingRequest-Multiple'

 MLTestingReport:

 $ref: '#/components/schemas/MLTestingReport-Multiple'

 MLTestingRequest-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 requestStatus:

 $ref: '#/components/schemas/RequestStatus'

 cancelRequest:

 type: boolean

 suspendRequest:

 type: boolean

 mLEntityToTestRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 mLEntityCoordinationGroupToTestRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 MLTestingReport-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 modelPerformanceTesting:

 type: array

 items:

 $ref: '#/components/schemas/ModelPerformance'

 mLTestingResult:

 type: string

 testingRequestRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 MLEntityLoadingRequest-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 requestStatus:

 $ref: '#/components/schemas/RequestStatus'

 cancelRequest:

 type: boolean

 suspendRequest:

 type: boolean

 mLEntityToLoadRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 MLEntityLoadingPolicy-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 inferenceType:

 type: string

 policyForLoading:

 $ref: '#/components/schemas/AIMLManagementPolicy'

 mLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 MLEntityLoadingProcess-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 progressStatus:

 $ref: '#/components/schemas/ProcessMonitor'

 cancelProcess:

 type: boolean

 suspendProcess:

 type: boolean

 resumeProcess:

 type: boolean

 MLEntityLoadingRequestRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 MLEntityLoadingPolicyRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 LoadedMLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 MLEntity-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 type: object

 properties:

 mLEntityId:

 type: string

 inferenceType:

 type: string

 mLEntityVersion:

 type: string

 expectedRunTimeContext:

 $ref: '#/components/schemas/MLContext'

 trainingContext:

 $ref: '#/components/schemas/MLContext'

 runTimeContext:

 $ref: '#/components/schemas/MLContext'

 supportedPerformanceIndicators:

 $ref: '#/components/schemas/SupportedPerfIndicator'

 mLCapabilitiesInfoList:

 type: array

 items:

 $ref: '#/components/schemas/MLCapabilityInfo'

 retrainingEventsMonitorRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 sourceTrainedMLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 MLEntityRepository-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 type: object

 - type: object

 properties:

 MLEntity:

 $ref: '#/components/schemas/MLEntity-Multiple'

 MLEntityCoordinationGroup:

 $ref: '#/components/schemas/MLEntityCoordinationGroup-Multiple'

 MLEntityCoordinationGroup-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 type: object

 properties:

 memberMLEntityRefList:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 ## 7.3a.4.1 IOC

 MLUpdateFunction-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 availMLCapabilityReport:

 $ref: '#/components/schemas/AvailMLCapabilityReport'

 mLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 MLUpdateRequest:

 $ref: '#/components/schemas/MLUpdateRequest-Multiple'

 MLUpdateProcess:

 $ref: '#/components/schemas/MLUpdateProcess-Multiple'

 MLUpdateReport:

 $ref: '#/components/schemas/MLUpdateReport-Multiple'

 MLUpdateRequest-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 type: object

 properties:

 performanceGainThreshold:

 type: array

 items:

 $ref: '#/components/schemas/ModelPerformance'

 newCapabilityVersionId:

 type: array

 items:

 type: string

 updateTimeDeadline:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/TimeWindow'

 requestStatus:

 $ref: '#/components/schemas/RequestStatus'

 mLUpdateReportingPeriod:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/TimeWindow'

 cancelRequest:

 type: boolean

 suspendRequest:

 type: boolean

 mLUpdateProcessRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 mLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 MLUpdateProcess-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 type: object

 properties:

 progressStatus:

 $ref: '#/components/schemas/ProcessMonitor'

 mLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 mLUpdateRequestRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 mLUpdateReportRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 MLUpdateReport-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 type: object

 properties:

 updatedMLCapability:

 $ref: '#/components/schemas/AvailMLCapabilityReport'

 mLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 mLUpdateProcessRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Dn'

 AIMLInferenceFunction-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 activationStatus:

 type: string

 enum:

 - ACTIVATED

 - DEACTIVATED

 managedActivationScope:

 $ref: '#/components/schemas/ManagedActivationScope'

 usedByFunctionRefList:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 mLEntityRef: # FIXME S5-240805,S5-240917 both define here

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-ncO'

 - type: object

 properties:

 AIMLInferenceReport:

 $ref: '#/components/schemas/AIMLInferenceReport-Multiple'

 AIMLInferenceReport-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 inferenceOutputs: #stage 2: attribute table name as: aimlInferenceOutputs FIXME

 type: array

 items:

 $ref: '#/components/schemas/InferenceOutput'

 minItems: 1

 mLEntityRef:

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 AIMLInferenceEmulationFunction-Single:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/Top'

 - type: object

 properties:

 attributes:

 allOf:

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-Attr'

 - type: object

 properties:

 AIMLInferenceEmulationReportRefs: # FIXME stage 2 of IOC AIMLInferenceEmulationReport missing

 $ref: 'TS28623\_ComDefs.yaml#/components/schemas/DnList'

 - $ref: 'TS28623\_GenericNrm.yaml#/components/schemas/ManagedFunction-ncO'

#-------- Definition of JSON arrays for name-contained IOCs ----------------------

 MLTrainingFunction-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLTrainingFunction-Single'

 MLTrainingRequest-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLTrainingRequest-Single'

 MLTrainingProcess-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLTrainingProcess-Single'

 MLTrainingReport-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLTrainingReport-Single'

 MLEntity-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLEntity-Single'

 MLEntityRepository-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLEntityRepository-Single'

 MLEntityCoordinationGroup-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLEntityCoordinationGroup-Single'

 MLTestingFunction-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLTestingFunction-Single'

 MLTestingRequest-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLTestingRequest-Single'

 MLTestingReport-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLTestingRequest-Single'

 MLEntityLoadingRequest-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLEntityLoadingRequest-Single'

 MLEntityLoadingProcess-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLEntityLoadingProcess-Single'

 MLEntityLoadingPolicy-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLEntityLoadingPolicy-Single'

 MLUpdateFunction-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLUpdateFunction-Single'

 MLUpdateRequest-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLUpdateRequest-Single'

 MLUpdateProcess-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLUpdateProcess-Single'

 MLUpdateReport-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/MLUpdateReport-Single'

 AIMLInferenceFunction-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/AIMLInferenceFunction-Single'

 AIMLInferenceReport-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/AIMLInferenceReport-Single'

 AIMLInferenceEmulationFunction-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/AIMLInferenceEmulationFunction-Single'

#-------- Definitions in TS 28.104 for TS 28.532 ---------------------------------

 resources-AiMlNrm:

 oneOf:

 - $ref: '#/components/schemas/MLTrainingFunction-Single'

 - $ref: '#/components/schemas/MLTrainingRequest-Single'

 - $ref: '#/components/schemas/MLTrainingProcess-Single'

 - $ref: '#/components/schemas/MLTrainingReport-Single'

 - $ref: '#/components/schemas/MLEntity-Single'

 - $ref: '#/components/schemas/MLEntityRepository-Single'

 - $ref: '#/components/schemas/MLEntityCoordinationGroup-Single'

 - $ref: '#/components/schemas/MLTestingFunction-Single'

 - $ref: '#/components/schemas/MLTestingRequest-Single'

 - $ref: '#/components/schemas/MLTestingReport-Single'

 - $ref: '#/components/schemas/MLEntityLoadingRequest-Single'

 - $ref: '#/components/schemas/MLEntityLoadingProcess-Single'

 - $ref: '#/components/schemas/MLEntityLoadingPolicy-Single'

 - $ref: '#/components/schemas/MLUpdateFunction-Single'

 - $ref: '#/components/schemas/MLUpdateRequest-Single'

 - $ref: '#/components/schemas/MLUpdateProcess-Single'

 - $ref: '#/components/schemas/MLUpdateReport-Single'

 - $ref: '#/components/schemas/AIMLInferenceFunction-Single'

 - $ref: '#/components/schemas/AIMLInferenceReport-Single'

 - $ref: '#/components/schemas/AIMLInferenceEmulationFunction-Single'

<CODE ENDS>

|  |
| --- |
| **End of modified sections** |