**3GPP TSG-CT WG3 Meeting #134 *C3-242178r1***

**Changsha, China, 15-19 April 2024**

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| --- |
| *CR-Form-v12.2* |
| **CHANGE REQUEST** |
|  |
|  | **29.520** | **CR** | **0884** | **rev** | **1** | **Current version:** | **18.5.0** |  |
|  |
| *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)*.* |
|  |

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| ***Proposed change affects:*** | UICC apps |  | ME |  | Radio Access Network |  | Core Network | **X** |

|  |
| --- |
|  |
| ***Title:***  | alignment of MLModelMonitorNotify |
|  |  |
| ***Source to WG:*** | ZTE |
| ***Source to TSG:*** | CT3 |
|  |  |
| ***Work item code:*** | eNA\_Ph3 |  | ***Date:*** | 2024-04-08 |
|  |  |  |  |  |
| ***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-16 (Release 16)Rel-17 (Release 17)Rel-18 (Release 18)Rel-19 (Release 19)* |
|  |  |
| ***Reason for change:*** | There are misalgnements of MLModelMonitorNotify between the mainbody and openAPI file:* immReports attribute is of single MLModelMonitorNotify data type, however in the openAPI file, the array of MLModelMonitorNotify is defined.
* In the procedure description and the resource definition, Nnwdaf\_MLModelMonitor\_Notify request includes a single MLModelMonitorNotify data type, however in the openAPI file, the array of MLModelMonitorNotify is defined.
 |
|  |  |
| ***Summary of change:*** | Align the openAPI file with mainbody to change array of MLModelMonitorNotify to single. |
|  |  |
| ***Consequences if not approved:*** | Misalgnement of MLModelMonitorNotify between the mainbody and openAPI file. |
|  |  |
| ***Clauses affected:*** | 5.6.6.2.3, A.7 |
|  |  |
|  | **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:*** | This CR introduces a backwards compatible correction to the OpenAPI file of the Nnwdaf\_MLModelMonitor API. |
|  |  |
| ***This CR's revision history:*** |  |

**Additional discussion(if needed):**

**Proposed changes:**

\*\*\* 1st Change \*\*\*

##### 5.6.6.2.3 Type MLModelMonitorSub

Table 5.6.6.2.3-1: Definition of type MLModelMonitorSub

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | Data type | P | Cardinality | Description | Applicability |
| modelIds | array(Uinteger) | M | 1..N | The ML model IDs. |  |
| notificationUri | Uri | M | 1 | Notification target address. |  |
| notifCorrId | string | M | 1 | Notification correlation identifier. |  |
| modelMetric | MLModelMetric | O | 0..1 | The ML model metrics to calculate the accuracy information. |  |
| accuThreshold | Uinteger | O | 0..1 | Accuracy reporting threshold. Indicates the threshold upon the crossing of which (in either ascending or descending direction) the accuracy information needs to be reported. |  |
| eventReportReq | ReportingInformation | O | 0..1 | Represents the reporting requirements of the event subscription.If omitted, the default values within the ReportingInformation data type apply. |  |
| immReports | MLModelMonitorNotify | O | 0..1 | Immediately reported ML model Monitoring notifications. It may only be provided in the HTTP POST response of a subscription creation/update and only if the immediate reporting flag was set to "true" in the HTTP POST request. |  |
| suppFeat | SupportedFeatures | C | 0..1 | List of Supported features used as described in clause 5.1.8.It shall be present in the POST request if at least one feature defined in clause 5.1.8 is supported, and it shall be present in the POST response if the NF service consumer included the"suppFeat" attribute in the POST request. |  |

\*\*\* 2nd Change \*\*\*

# A.7 Nnwdaf\_MLModelMonitor API

openapi: 3.0.0

info:

 title: Nnwdaf\_MLModelMonitor

 version: 1.0.0-alpha.2

 description: |

 Nnwdaf\_MLModelMonitor API Service.

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externalDocs:

 description: 3GPP TS 29.520 V18.5.0; 5G System; Network Data Analytics Services.

 url: https://www.3gpp.org/ftp/Specs/archive/29\_series/29.520/

servers:

 - url: '{apiRoot}/nnwdaf-mlmodelmonitor/v1'

 variables:

 apiRoot:

 default: https://example.com

 description: apiRoot as defined in clause 4.4 of 3GPP TS 29.501

security:

 - {}

 - oAuth2ClientCredentials:

 - nnwdaf-mlmodelmonitor

paths:

 /registrations:

 post:

 summary: Create a new Individual NWDAF ML Model monitoring registration resource.

 operationId: CreateNWDAFMLModelMonitoringRegistration

 tags:

 - registrations (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: Create a new Individual NWDAF ML Model monitoring registration resource.

 content:

 application/json:

 schema:

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

 headers:

 Location:

 description: >

 Contains the URI of the newly created resource, according to the structure

 {apiRoot}/nnwdaf-mlmodelmonitor/<apiVersion>/registrations/{registrationId}.

 required: true

 schema:

 type: string

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /registrations/{registrationId}:

 delete:

 summary: Delete an existing Individual NWDAF ML model monitoring registration.

 operationId: DeleteNWDAFMLModelMonitoringRegistration

 tags:

 - Individual NWDAF ML model monitoring registration (Document)

 parameters:

 - name: registrationId

 in: path

 description: String identifying a registration to the Nnwdaf\_MLModelMonitor Service.

 required: true

 schema:

 type: string

 responses:

 '204':

 description: >

 No Content. The Individual NWDAF ML Model monitoring registration matching the

 registrationId was deleted.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /subscriptions:

 post:

 summary: Create a new Individual NWDAF ML model monitoring Subscription.

 operationId: CreateNWDAFMLModelMonitoringSubscription

 tags:

 - NWDAF ML model monitoring Subscriptions (Collection)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '201':

 description: Create a new Individual NWDAF ML model monitoring Subscription resource.

 headers:

 Location:

 description: >

 Contains the URI of the newly created resource, according to the structure

 {apiRoot}/nnwdaf-mlmodelmonitor/<apiVersion>/subscriptions/{subscriptionId}

 required: true

 schema:

 type: string

 content:

 application/json:

 schema:

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

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 callbacks:

 myNotification:

 '{$request.body#/notificationUri}':

 post:

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 responses:

 '204':

 description: The receipt of the Notification is acknowledged.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 /subscriptions/{subscriptionId}:

 put:

 summary: Update an existing Individual NWDAF ML model monitoring Subscription resource.

 operationId: UpdateNWDAFMLModelMonitoringSubscription

 tags:

 - Individual NWDAF ML model monitoring Subscription resource (Document)

 requestBody:

 required: true

 content:

 application/json:

 schema:

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

 parameters:

 - name: subscriptionId

 in: path

 description: String identifying a subscription to the Nnwdaf\_MLModelMonitor Service.

 required: true

 schema:

 type: string

 responses:

 '200':

 description: >

 The Individual NWDAF ML model monitoring Subscription resource was modified successfully

 and a representation of that resource is returned.

 content:

 application/json:

 schema:

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

 '204':

 description: >

 The Individual NWDAF ML model monitoring Subscription resource was modified

 successfully.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '411':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/411'

 '413':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/413'

 '415':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/415'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '501':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/501'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

 delete:

 summary: Delete an existing Individual NWDAF ML model monitoring Subscription.

 operationId: DeleteNWDAFMLModelMonitoringSubscription

 tags:

 - Individual NWDAF ML model monitoring Subscription (Document)

 parameters:

 - name: subscriptionId

 in: path

 description: String identifying a subscription to the Nnwdaf\_MLModelMonitor Service

 required: true

 schema:

 type: string

 responses:

 '204':

 description: >

 No Content. The Individual NWDAF ML model monitoring Subscription resource matching the

 subscriptionId was deleted.

 '307':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/307'

 '308':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/308'

 '400':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/400'

 '401':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/401'

 '403':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/403'

 '404':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/404'

 '429':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/429'

 '500':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/500'

 '501':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/501'

 '502':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/502'

 '503':

 $ref: 'TS29571\_CommonData.yaml#/components/responses/503'

 default:

 $ref: 'TS29571\_CommonData.yaml#/components/responses/default'

components:

 securitySchemes:

 oAuth2ClientCredentials:

 type: oauth2

 flows:

 clientCredentials:

 tokenUrl: '{nrfApiRoot}/oauth2/token'

 scopes:

 nnwdaf-mlmodelmonitor: Access to the Nnwdaf\_MLModelMonitor API

 schemas:

 MLModelMonitorReg:

 description: Represents a ML Model monitoring registration.

 type: object

 properties:

 consumerId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/NfInstanceId'

 consumerSetId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/NfSetId'

 modelId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 modelAccuInd:

 type: boolean

 description: >

 Indicates the ML Model accuracy transfer indication. Set to "true" to indicate that the

 monitoring of the accuracy of the ML model is supported, otherwise set to "false".

 Default value is "false" if omitted.

 suppFeat:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

 required:

 - modelId

 oneOf:

 - required: [consumerId]

 - required: [consumerSetId]

 MLModelMonitorSub:

 description: >

 Represents parameters to request the modification of a ML Model monitoring registration.

 type: object

 properties:

 modelIds:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 minItems: 1

 description: Represents the ML Model IDs.

 notificationUri:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uri'

 notifCorrId:

 type: string

 description: Notification correlation identifier.

 modelMetric:

 $ref: 'TS29520\_Nnwdaf\_MLModelProvision.yaml#/components/schemas/MLModelMetric'

 accuThreshold:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 eventReportReq:

 $ref: 'TS29523\_Npcf\_EventExposure.yaml#/components/schemas/ReportingInformation'

 immReports:

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

 suppFeat:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/SupportedFeatures'

 required:

 - modelIds

 - notificationUri

 - notifCorrId

 MLModelMonitorNotify:

 description: Represents notifications on events that occurred.

 type: object

 properties:

 notifCorrId:

 type: string

 description: Notification correlation identifier.

 modelAccuInfos:

 type: array

 items:

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

 minItems: 1

 description: The accuracy related information of the ML model.

 anaFeedbacks:

 type: array

 items:

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

 minItems: 1

 description: The analytics feedback information.

 accuMeetInd:

 type: boolean

 description: >

 Set to "true" to indicate that the analytics accuracy of the ML model meet the

 requirement of accuracy for the ML model. Otherwise, default value is "false" if

 omitted.

 required:

 - notifCorrId

 anyOf:

 - required: [modelAccuInfos]

 - required: [anaFeedbacks]

 MLModelAccuracyInfo:

 description: Represents the ML Model accuracy information.

 type: object

 properties:

 modelId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 deviation:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Float'

 inferenceNum:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 adrfId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/NfInstanceId'

 adrfSetId:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/NfSetId'

 dataSetTag:

 $ref: 'TS29575\_Nadrf\_DataManagement.yaml#/components/schemas/DataSetTag'

 modelMetric:

 $ref: 'TS29520\_Nnwdaf\_MLModelProvision.yaml#/components/schemas/MLModelMetric'

 mlModelAcc:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 monitorInterval:

 $ref: 'TS29122\_CommonData.yaml#/components/schemas/TimeWindow'

 required:

 - modelId

 AnalyticsFeedback:

 description: Represents the analytics feedback.

 type: object

 properties:

 events:

 type: array

 items:

 $ref: 'TS29520\_Nnwdaf\_EventsSubscription.yaml#/components/schemas/NwdafEvent'

 minItems: 1

 description: Indicates the Analytics IDs that were used to take this action.

 modelIds:

 type: array

 items:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/Uinteger'

 minItems: 1

 description: Indicates the ML Model identifier that were used to take this action.

 groundDataImpactInd:

 type: boolean

 description: >

 Indication whether the action will affect on ground truth data. Set to "true" to

 indicate that the action will affect on ground truth data. Otherwise set to "false",

 default value is "false" if omitted.

 timeStamp:

 $ref: 'TS29571\_CommonData.yaml#/components/schemas/DateTime'

 required:

 - events

 - modelIds

\*\*\* End of Changes \*\*\*