**3GPP TSG-SA5 Meeting #145-e *S5-225141***

e-meeting, 15 - 24 August 2022

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| --- |
| *CR-Form-v12.1* |
| **CHANGE REQUEST** |
|  |
|  | **28.541** | **CR** | **0757** | **rev** | **-** | **Current version:** | **17.7.0** |  |
|  |
| *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:***  | Update stage2 and stage3 definition for FeasibilityCheckAndReservationJob |
|  |  |
| ***Source to WG:*** | Huawei |
| ***Source to TSG:*** | S5  |
|  |  |
| ***Work item code:*** | adNRM |  | ***Date:*** | 2022-07-21 |
|  |  |  |  |  |
| ***Category:*** | **F** |  | ***Release:*** | Rel-17 |
|  | *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:*** | 1. In Cluase 6.3.37 the term "FeasibilityCheckAndReservationJob" is used, however, in J.4.3 OpenAPI part, the term "FeasibilityCheckJob" is used.
2. In J.4.3, the "->" is used for the description for several attributes (e.g. FeasibilityResult), which should be updated to ">-".
3. Attribute "recommendedRequirements" is defined as optional attribute, it is confuse for MnS producer whether needs to provide the recommendedRequirements when receives a feasibility check request.
 |
|  |  |
| ***Summary of change:*** | 1. Update the term "FeasibilityCheckJob" with "FeasibilityCheckAndReservationJob" in openAPI part.
2. Update the "->" with ">-"
3. Introduce the attribute "requirementsRecommendation" in FeasibilityCheckAndReservationJob to represent MnS consumer's request for requirements recommendation.
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|  |  |
| ***Consequences if not approved:*** | Some errors exists in stage 2 and stage 3 definition for FeasibilityCheckAndReservationJob. |
|  |  |
| ***Clauses affected:*** | 6.3.37.1, 6.3.37.2,6.4.1,J.4.3 |
|  |  |
|  | **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:*** | ForgeLink: <https://forge.3gpp.org/rep/sa5/MnS/-/tree/TS28.541_Rel17_CR0757_Update_stage2_and_stage3_definition_for_FeasibilityCheckAndReservationJob>  |
|  |  |
| ***This CR's revision history:*** |  |

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| --- |
| **1st Change** |

### 6.3.37 FeasibilityCheckAndReservationJob

#### 6.3.37.1 Definition

This IOC represents a feasibility check and reservation job for network slicing related requirements (i.e. ServiceProfile for network slice related requirements, SliceProfile for network slice subnet related requirements) to determine whether the network slicing related requirements can be satisfied. It can be name-contained by SubNetwork.

When the MnS Consumer derives the network slicing related requirements (i.e. ServiceProfile, SliceProfile), before request the MnS producer to allocate or modify an NSI or NSSI, MnS consumer may express a feasibility check and reservation job requirement for the specified network slicing related requirements to MnS producer.

To express a feasibility check and reservation job requirement for specific network slicing related requirements (i.e. ServiceProfile, SliceProfile), MnS consumer needs to request MnS producer to create a FeasibilityCheckAndReservationJob instance on the MnS producer side with the network slicing related requirements specified, and to execute the feasibility check and resource reservation process.

For deletion of feasibility check and reservation job, the MnS consumer needs to request the MnS producer to delete the FeasibilityCheckAndReservationJob instance on the MnS producer side.

Attribute "resourceReservation" is used to represent MnS consumer's requirements for resource reservation for corresponding network slicing related requirements (i.e. ServiceProfile, SliceProfile). In case the value is "True", which means MnS producer needs to reserve corresponding resources when the feasibility check result is feasible. In this case, attribute "requestedReservationExpiration" is used to represent MnS's requirements for the validity period of the resource reservation, which is specified by MnS consumer. While "reservationExpiration" is used to represent the actual validity period of the resource reservation, which is specified by MnS producer based on requested reservation expiration from MnS consumer and its own reservation capabilities. After the period expires, no guarantees are given for the resources associated to the corresponding network slicing related requirements (i.e. ServiceProfile, SliceProfile). In case the value by is "False" which means MnS producer only check the feasibility for corresponding network slicing related requirements, no guarantee for the corresponding resources.

Attribute "recommendationRequest" is used to represent MnS consumer's request for recommended requirements when the feasibility check result for corresponding network slicing related requirements (i.e. ServiceProfile and SliceProfile information) is infeasible. In case the value is "True", which means MnS producer needs to derive the value of "recommendedRequirements" as recommended network slicing related requirements (i.e. ServiceProfile and SliceProfile information) which can be supported by the MnS producer when the feasibility check result is infeasible and provide these recommendations to MnS consumer. The value of "recommendedRequirements" is a list of [attributeName of network slicing related requirements (i.e. ServiceProfile, SliceProfile), recommendedValueRange].To obtain the progress information of a feasibility check job, MnS consumer needs to request MnS producer to query the values of attribute "processMonitor".

To obtain the feasibility check result of a feasibility check job, MnS consumer needs to request MnS producer to query the values of attribute “feasibilityResult” and “inFeasibleReason” when the feasibility check job is finished. If the feasibility check result indicated as feasible, MnS consumer can request MnS producer to allocate a network slice or network slice subnet with the checked network slicing related requirements (i.e. ServiceProfile or SliceProfile). In case the feasibility check result is unfeasible, MnS consumer may update the network slicing related requirements, and may trigger the feasibility check job again.

To obtain the resource reservation status, MnS consumer need to request MnS producer to query the value of the attribute "resourceReservationStatus ".

MnS producer will use the reserved resources to satisfy the corresponding network slicing related requirements in the allocation request. In case to use the reserved resources, MnS consumer will use the same ServiceProfileId or SliceProfileId value (which is obtained/queried from the FeasibilityCheckAndReservationJob) as input parameters for allocation request. .

Editor's Note: the association mechanism for reserved resource and allocation may need to be updated based on further investigation.

#### 6.3.37.2 Attributes

The FeasibilityCheckAndReservationJob IOC includes attributes inherited from Top IOC (defined in TS 28.622[30]) and the following attributes:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | S | isReadable | isWritable | isInvariant | isNotifyable |
| sliceProfile | CM | T | T | F | T |
| serviceProfile | CM | T | T | F | T |
| resourceReservation | O | T | T | F | T |
| recommendationRequest | CO | T | T | F | T |
| requestedReservationExpiration | O | T | T | F | T |
| processMonitor | M | T | F | F | T |
| feasibilityResult | M | T | F | F | T |
| inFeasibleReason | O | T | F | F | T |
| resourceReservationStatus | O | T | F | F | T |
| reservationFailureReason | O | T | F | F | T |
| reservationExpiration | O | T | F | F | T |
| recommendedRequirements | O | T | F | F | T |

Editor's Note: how to model the EP\_Transport information in the FeasibilityCheckAndReservationJob IOC is FFS, which can be used to support/enable TN part feasibility check.

#### 6.3.37.3 Attribute constraints

|  |  |
| --- | --- |
| Name | Definition |
| sliceProfile Support Qualifier | Condition: The feasibilitycheckjob is used to check the feasibility for network slice subnet related requirements. |
| serviceProfile Support Qualifier | Condition: The feasibilitycheckjob is used to check the feasibility for network slice related requirements. |
| recommendationRequest Support Qualifier | Condition: The capability of providing recommendedRequirements is supported by MnS producer |

#### 6.3.37.4 Notifications

The common notifications defined in subclause 6.5 are valid for this IOC, without exceptions or additions.

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| **2nd Change** |

### 6.4.1 Attribute properties

| Attribute Name | Documentation and Allowed Values | Properties |
| --- | --- | --- |
| …… |  |  |
| processMonitor | An attribute describes the process monitoring information of the feasibility check job. See correddponding processMonitor definition in TS 28.622[30]. | type: ProcessMonitormultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| feasibilityResult | An attribute which specifies the feasibility check result for the feasibility check job. This attribute is configured by MnS producer and can be read by MnS consumer. The feasibilityResult is configured once the "status" is "FINISHED"Allowed Value: FEASIBLE: which means the specified network slicing related requirements (i.e. ServiceProfile, SliceProfile) can be satisfied by the MnS producer.InFEASIBLE: which means the specified network slicing related requirements (i.e. ServiceProfile, SliceProfile) cannot be satisfied by the MnS producer. | type: Enummultiplicity: 0..1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| inFeasibleReason | An attribute that specifies the additional reason information if the feasibility check result is infeasible. This attribute can be absent if the feasibility check result is feasibile. Allowed Value: the detailed content (Enum Value) for the inFeasibleReason is not defined in the present document. | type: Enummultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: True |
| resourceReservation | An attribute represents MnS consumer's requirements for resource reservation.Allowed Value: TRUE: MnS producer need to reserve corresponding resources  FALSE (DeaultValue): no guarantee for the corresponding resources. | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: False |
| recommendationRequest | An attribute represent MnS consumer's request for recommended network slice related requirements Allowed Value: TRUE: MnS producer need to derive and provide the recommended network slicing related requirements  FALSE (DeaultValue): no guarantee for derive and provide the recommended network slicing related requirements. | type: Booleanmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: False |
| requestedReservationExpiration | An attribute which specifes MnS consumer's requirememts for the validity period of the resource reservation. The value of requestedReservationExpiration is specified by MnS consumer. | type: Timestampmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: False |
| reservationExpiration | An attribute which specifes the actual validity period of the resource reservation. After the period expires, no guarantees are given for the resources associated to the corresponding network slicing related requirements (i.e. ServiceProfile, SliceProfile). which is specified by MnS producer based on requested reservation expiration from MnS consumer and its own reservation capabilities. In case MnS produer have the enpugh capability to satisfy MnS consumer's reservation requirememts, the value of reservationExpiration is same as requestedReservationExpiration. | type: Timestampmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: False |
| resourceReservationStatus | An attribute which specifies the resource reservation result for the feasibility check job. This attribute is configured by MnS producer and can be read by MnS consumer.Allowed Value: RESERVED: which means the resources for the specified network slicing related requirements (i.e. ServiceProfile, SliceProfile) is reserved.UNRESERVED: which means the resources for the specified network slicing related requirements (i.e. ServiceProfile, SliceProfile) is not reserved.USED: which means the reserved resource for the specified network slicing related requirements is used. | type: Enummultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: False |
| recommendedRequirements | An attribute which specifies the recommended network slicing related requirements (i.e. ServiceProfile and SliceProfile information) which can be supported by the MnS producer.This information is provided when the feasibility check result is infeasible. This information can be used by MnS consumer to adjust the network slicing related requirements.  | type: Stringmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: False |
| reservationFailureReason | An attribute that specifies the additional reason information if the reservation is failed. This attribute can be absent if the reservation is successful. Allowed Value: the detailed content (Enum Value) for the reservationFailureReason is not defined in the present document. | type: Enummultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneallowedValues: N/AisNullable: True |

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| **3rd Change** |

## J.4.3 OpenAPI document "TS28541\_SliceNrm.yaml"

openapi: 3.0.1

info:

 title: Slice NRM

 version: 17.7.0

 description: >-

 OAS 3.0.1 specification of the Slice NRM

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externalDocs:

 description: 3GPP TS 28.541; 5G NRM, Slice NRM

 url: http://www.3gpp.org/ftp/Specs/archive/28\_series/28.541/

paths: {}

components:

 schemas:

#------------ Type definitions ---------------------------------------------------

 Float:

 type: number

 format: float

 MobilityLevel:

 type: string

 enum:

 - STATIONARY

 - NOMADIC

 - RESTRICTED MOBILITY

 - FULLY MOBILITY

 SynAvailability:

 type: string

 enum:

 - NOT SUPPORTED

 - BETWEEN BS AND UE

 - BETWEEN BS AND UE & UE AND UE

 PositioningAvailability:

 type: array

 items:

 type: string

 enum:

 - CIDE-CID

 - OTDOA

 - RF FINGERPRINTING

 - AECID

 - HYBRID POSITIONING

 - NET-RTK

 Predictionfrequency:

 type: string

 enum:

 - PERSEC

 - PERMIN

 - PERHOUR

 SharingLevel:

 type: string

 enum:

 - SHARED

 - NON-SHARED

 NetworkSliceSharingIndicator:

 type: string

 enum:

 - SHARED

 - NON-SHARED

 ServiceType:

 type: string

 enum:

 - eMBB

 - RLLC

 - MIoT

 - V2X

 SliceSimultaneousUse:

 type: string

 enum:

 - ZERO

 - ONE

 - TWO

 - THREE

 - FOUR

 Category:

 type: string

 enum:

 - CHARACTER

 - SCALABILITY

 Tagging:

 type: array

 items:

 type: string

 enum:

 - PERFORMANCE

 - FUNCTION

 - OPERATION

 Exposure:

 type: string

 enum:

 - API

 - KPI

 ServAttrCom:

 type: object

 properties:

 category:

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

 tagging:

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

 exposure:

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

 Support:

 type: string

 enum:

 - NOT SUPPORTED

 - SUPPORTED

 DelayTolerance:

 type: object

 properties:

 servAttrCom:

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

 support:

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

 DeterministicComm:

 type: object

 properties:

 servAttrCom:

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

 availability:

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

 periodicityList:

 type: string

 XLThpt:

 type: object

 properties:

 servAttrCom:

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

 guaThpt:

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

 maxThpt:

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

 MaxPktSize:

 type: object

 properties:

 servAttrCom:

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

 maxsize:

 type: integer

 MaxNumberofPDUSessions:

 type: object

 properties:

 servAttrCom:

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

 nOofPDUSessions:

 type: integer

 KPIMonitoring:

 type: object

 properties:

 servAttrCom:

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

 kPIList:

 type: string

 NBIoT:

 type: object

 properties:

 servAttrCom:

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

 support:

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

 RadioSpectrum:

 type: object

 properties:

 servAttrCom:

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

 nROperatingBands:

 type: string

 Synchronicity:

 type: object

 properties:

 servAttrCom:

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

 availability:

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

 accuracy:

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

 SynchronicityRANSubnet:

 type: object

 properties:

 availability:

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

 accuracy:

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

 Positioning:

 type: object

 properties:

 servAttrCom:

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

 availability:

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

 predictionfrequency:

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

 accuracy:

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

 PositioningRANSubnet:

 type: object

 properties:

 availability:

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

 predictionfrequency:

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

 accuracy:

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

 UserMgmtOpen:

 type: object

 properties:

 servAttrCom:

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

 support:

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

 V2XCommModels:

 type: object

 properties:

 servAttrCom:

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

 v2XMode:

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

 TermDensity:

 type: object

 properties:

 servAttrCom:

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

 density:

 type: integer

 NsInfo:

 type: object

 properties:

 nsInstanceId:

 type: string

 nsName:

 type: string

 EmbbEEPerfReq:

 type: object

 properties:

 kpiType:

 type: string

 enum:

 - NUMOFBITS

 - NUMOFBITS\_RANBASED

 req:

 type: number

 UrllcEEPerfReq:

 type: object

 properties:

 kpiType:

 type: string

 enum:

 - INVOFLATENCY

 - NUMOFBITS\_MULTIPLIED\_INVOFLATENCY

 req:

 type: number

 MIoTEEPerfReq:

 type: object

 properties:

 kpiType:

 type: string

 enum:

 - MAXREGSUBS

 - MEANACTIVEUES

 req:

 type: number

 EEPerfReq:

 oneOf:

 - $ref: '#/components/schemas/EmbbEEPerfReq'

 - $ref: '#/components/schemas/UrllcEEPerfReq'

 - $ref: '#/components/schemas/MIoTEEPerfReq'

 EnergyEfficiency:

 type: object

 properties:

 servAttrCom:

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

 performance:

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

 NSSAASupport:

 type: object

 properties:

 servAttrCom:

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

 support:

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

 SecFunc:

 type: object

 properties:

 secFunId:

 type: string

 secFunType:

 type: string

 secRules:

 type: array

 items:

 type: string

 N6Protection:

 type: object

 properties:

 servAttrCom:

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

 secFuncList:

 type: array

 items:

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

 CNSliceSubnetProfile:

 type: object

 properties:

 maxNumberofUEs:

 type: integer

 dLLatency:

 type: number

 uLLatency:

 type: number

 dLThptPerSliceSubnet:

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

 dLThptPerUE:

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

 uLThptPerSliceSubnet:

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

 uLThptPerUE:

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

 maxNumberOfPDUSessions:

 type: integer

 coverageAreaTAList:

 type: integer

 resourceSharingLevel:

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

 dLMaxPktSize:

 type: integer

 uLMaxPktSize:

 type: integer

 delayTolerance:

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

 synchronicity:

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

 sliceSimultaneousUse:

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

 reliability:

 type: number

 energyEfficiency:

 type: number

 dLDeterministicComm:

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

 uLDeterministicComm:

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

 survivalTime:

 type: number

 nssaaSupport:

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

 n6Protection:

 $ref: '#/components/schemas/N6Protection'

 RANSliceSubnetProfile:

 type: object

 properties:

 coverageAreaTAList:

 type: integer

 dLLatency:

 type: number

 uLLatency:

 type: number

 uEMobilityLevel:

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

 resourceSharingLevel:

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

 maxNumberofUEs:

 type: integer

 activityFactor:

 type: integer

 dLThptPerSliceSubnet:

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

 dLThptPerUE:

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

 uLThptPerSliceSubnet:

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

 uLThptPerUE:

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

 uESpeed:

 type: integer

 reliability:

 type: number

 serviceType:

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

 dLMaxPktSize:

 type: integer

 uLMaxPktSize:

 type: integer

 nROperatingBands:

 type: string

 delayTolerance:

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

 positioning:

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

 sliceSimultaneousUse:

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

 energyEfficiency:

 type: number

 termDensity:

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

 survivalTime:

 type: number

 synchronicity:

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

 dLDeterministicComm:

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

 uLDeterministicComm:

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

 TopSliceSubnetProfile:

 type: object

 properties:

 dLLatency:

 type: integer

 uLLatency:

 type: integer

 maxNumberofUEs:

 type: integer

 dLThptPerSliceSubnet:

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

 dLThptPerUE:

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

 uLThptPerSliceSubnet:

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

 uLThptPerUE:

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

 dLMaxPktSize:

 type: integer

 uLMaxPktSize:

 type: integer

 maxNumberOfPDUSessions:

 type: integer

 nROperatingBands:

 type: string

 sliceSimultaneousUse:

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

 energyEfficiency:

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

 synchronicity:

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

 delayTolerance:

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

 positioning:

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

 termDensity:

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

 activityFactor:

 type: integer

 coverageAreaTAList:

 type: integer

 resourceSharingLevel:

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

 uEMobilityLevel:

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

 uESpeed:

 type: integer

 reliability:

 type: number

 serviceType:

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

 dLDeterministicComm:

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

 uLDeterministicComm:

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

 survivalTime:

 type: number

 ServiceProfile:

 type: object

 properties:

 serviceProfileId:

 type: string

 plmnInfoList:

 $ref: 'TS28541\_NrNrm.yaml#/components/schemas/PlmnInfoList'

 maxNumberofUEs:

 type: number

 dLLatency:

 type: number

 uLLatency:

 type: number

 uEMobilityLevel:

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

 sst:

 $ref: 'TS28541\_NrNrm.yaml#/components/schemas/Sst'

 networkSliceSharingIndicator:

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

 availability:

 type: number

 delayTolerance:

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

 dLDeterministicComm:

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

 uLDeterministicComm:

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

 dLThptPerSlice:

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

 dLThptPerUE:

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

 uLThptPerSlice:

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

 uLThptPerUE:

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

 dLMaxPktSize:

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

 uLMaxPktSize:

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

 maxNumberofPDUSessions:

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

 kPIMonitoring:

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

 nBIoT:

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

 radioSpectrum:

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

 synchronicity:

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

 positioning:

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

 userMgmtOpen:

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

 v2XModels:

 $ref: '#/components/schemas/V2XCommModels'

 coverageArea:

 type: string

 termDensity:

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

 activityFactor:

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

 uESpeed:

 type: integer

 jitter:

 type: integer

 survivalTime:

 type: number

 reliability:

 type: number

 maxDLDataVolume:

 type: string

 maxULDataVolume:

 type: string

 sliceSimultaneousUse:

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

 energyEfficiency:

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

 nssaaSupport:

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

 n6Protection:

 $ref: '#/components/schemas/N6Protection'

 SliceProfile:

 type: object

 properties:

 serviceProfileId:

 type: string

 plmnInfoList:

 $ref: 'TS28541\_NrNrm.yaml#/components/schemas/PlmnInfoList'

 cNSliceSubnetProfile:

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

 rANSliceSubnetProfile:

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

 topSliceSubnetProfile:

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

 IpAddress:

 oneOf:

 - $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Ipv4Addr'

 - $ref: 'TS28623\_ComDefs.yaml#/components/schemas/Ipv6Addr'

 LogicalInterfaceInfo:

 type: object

 properties:

 logicalInterfaceType:

 type: string

 enum:

 - VLAN

 - MPLS

 - Segment

 logicalInterfaceId:

 type: string

 ServiceProfileList:

 type: array

 items:

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

 SliceProfileList:

 type: array

 items:

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

 FeasibilityResult:

 description: >-

 An attribute which specifies the feasibility check result for the feasibility check and reservation job.

 type: string

 enum:

 - FEASIBLE

 - INFEASIBLE

 InFeasibleReason:

 description: >-

 An attribute that specifies the additional reason information if the feasibility check result is infeasible.The detailed ENUM value is FFS.

 type: string

 RecommendationRequest:

 description: >-

 An attribute represents MnS consumer's request for recommended network slice related requirements.

 type: boolean

 RecommendedRequirements:

 description: >-

 An attribute that specifies the recommended network slicing related requirements (i.e. ServiceProfile and SliceProfile information) which can be supported by the MnS producer.

 type: string

 ResourceReservation:

 description: >-

 An attribute represents MnS consumer's requirements for resource reservation.

 type: boolean

 RequestedReservationExpiration:

 description: >-

 An attribute which specifes MnS consuner's requirements for the validity period of the resource reservation.

 type: string

 ResourceReservationStatus:

 description: >-

 An attribute which specifies the resource reservation result for the feasibility check job.

 type: string

 enum:

 - RESERVED

 - UNRESERVED

 - USED

 ReservationExpiration:

 description: >-

 An attribute which specifes the actual validity period of the resource reservation.

 type: string

 ReservationFailureReason:

 description: >-

 An attribute that specifies the additional reason information if the reservation is failed.

 type: string

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

 MnS:

 oneOf:

 - type: object

 properties:

 SubNetwork:

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

# - type: object

# properties:

# ManagedElement:

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

 SubNetwork-Single:

 allOf:

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

 - type: object

 properties:

 attributes:

 allOf:

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

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

 - type: object

 properties:

 SubNetwork:

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

 NetworkSlice:

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

 NetworkSliceSubnet:

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

 EP\_Transport:

 $ref: '#/components/schemas/EP\_Transport-Multiple'

 NetworkSliceSubnetProviderCapabilities:

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

 FeasibilityCheckJob:

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

 NetworkSlice-Single:

 allOf:

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

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 networkSliceSubnetRef:

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

 operationalState:

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

 administrativeState:

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

 serviceProfileList:

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

 NetworkSliceSubnet-Single:

 allOf:

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

 - type: object

 properties:

 attributes:

 allOf:

 - type: object

 properties:

 managedFunctionRefList:

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

 networkSliceSubnetRefList:

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

 operationalState:

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

 administrativeState:

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

 nsInfo:

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

 sliceProfileList:

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

 epTransportRefList:

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

 priorityLabel:

 type: integer

 networkSliceSubnetType:

 type: string

 enum:

 - TOP\_SLICESUBNET

 - RAN\_SLICESUBNET

 - CN\_SLICESUBNET

 EP\_Transport-Single:

 allOf:

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

 - type: object

 properties:

 attributes:

 type: object

 properties:

 ipAddress:

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

 logicalInterfaceInfo:

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

 nextHopInfo:

 type: string

 qosProfile:

 type: string

 epApplicationRefs:

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

 NetworkSliceSubnetProviderCapabilities-Single:

 allOf:

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

 - type: object

 properties:

 attributes:

 type: object

 properties:

 dLlatency:

 type: integer

 uLlatency:

 type: integer

 dLThptPerSliceSubnet:

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

 uLThptPerSliceSubnet:

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

 coverageAreaTAIList:

 type: array

 items:

 type: string

 FeasibilityCheckAndReservationJob-Single:

 allOf:

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

 - type: object

 properties:

 attributes:

 type: object

 properties:

 profile:

 oneOf:

 - $ref: '#/components/schemas/SliceProfile'

 - $ref: '#/components/schemas/ServiceProfile'

 resourceReservation:

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

 recommendationRequest:

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

 requestedReservationExpiration:

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

 processMonitor:

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

 feasibilityResult:

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

 inFeasibleReason:

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

 resourceReservationStatus:

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

 reservationFailureReason:

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

 reservationExpiration:

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

 recommendedRequirements:

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

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

 SubNetwork-Multiple:

 type: array

 items:

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

 NetworkSlice-Multiple:

 type: array

 items:

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

 NetworkSliceSubnet-Multiple:

 type: array

 items:

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

 EP\_Transport-Multiple:

 type: array

 items:

 $ref: '#/components/schemas/EP\_Transport-Single'

 NetworkSliceSubnetProviderCapabilities-Multiple:

 type: array

 items:

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

 FeasibilityCheckJob-Multiple:

 type: array

 items:

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

#------------ Definitions in TS 28.541 for TS 28.532 -----------------------------

 resources-sliceNrm:

 oneOf:

 - $ref: '#/components/schemas/MnS'

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

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

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

 - $ref: '#/components/schemas/EP\_Transport-Single'

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

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

|  |
| --- |
| **End of Change** |