**3GPP TSG-SA5 Meeting #158 *S5-247153***

Orlando, USA, 18 - 22 November 2024

**Source: Huawei, CATT, Ericsson**

**Title: pCR TR 28.874 Update generic solution of time based configuration for NTN scenarios**

**Document for: Approval**

**Agenda Item: 6.19.15**

# 1 Decision/action requested

***The group is asked to discuss and agree on the proposal.***

# 2 References

[1] 3GPP TR 28.874: Study on management aspects of NTN – Phase 2

# 3 Rationale

This contribution proposes to update the generic solution of time-based configuration with more clear influence on NRM.

# 4 Detailed proposal

This document proposes the following changes in TR 28.874 [1].

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| **1st Change** |

##### 5.1.1.3.5 Potential solution #<4>: Pre-configuration based on single time window

To avoid adding time window for each IOC (e.g., EP\_NgC, EP\_N2, EP\_RP\_EPS, NRCellCU, NRCellDU), the pre-configuration can be done based on single time window which covers all MOIs that are valid/activated during this time window.

Following is one example to illustrate valid instances for different time windows.



Figure 5.1.1.3.5-1: Example to illustrate valid instances for different time windows.

In this use case, instances of EP\_NgC, EP\_N2, EP\_RP\_EPS, NRCellCU, NRCellDU can be configured into different time windows. A new IOC may be introduced to capture relation of a certain time window and corresponding activated instances in NTN scenarios.

The relationship diagram between the new IOC (named NTNTimeBasedConfig) and NTNFunction that is defined in TS 28.541 is shown in Figure 5.1.1.3.5-x.



Figure 5.1.1.3.5-x: NRM fragment for NTNTimeBasedConfig

The NTNTimeBasedConfig IOC includes attributes defined in the Table 5.1.1.3.5-x and 5.1.1.3.5-y.

Table 5.1.1.3.5-x: attributes for NTNTimeBasedConfig IOC

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Attribute name | S | isReadable | isWritable | isInvariant | isNotifyable |
| ntnTimeWindow | O | T | T | F | T |
| Attribute related to role |  |  |  |  |  |
| managedNTNEntityRefList | O | T | T | F | T |

Table 5.1.1.3.5-y: attributes properties for NTNTimeBasedConfig IOC

| Attribute Name | Documentation and allowedValues | Properties |
| --- | --- | --- |
| ntnTimeWindow | It provides the time windows (including start time and end time) within which the configuration for NTN is valid. | type: TimeWindowmultiplicity: 1isOrdered: N/AisUnique: N/AdefaultValue: NoneisNullable: False |
| managedNTNEntityRefList | It contains the list of MOIs that are activated/valid for NTN scenario under certain time duration, including possible modification of attributes. | type: managedNTNEntityInfomultiplicity: \*isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: True |
| managedNTNEntityInfo.entityRef | It contains the reference to MOI that is activated/valid for NTN scenario under certain time duration. The class of MOIs includes one or more of following IOCs:EP\_NgC, EP\_N2, NRCellCU, NRCellDU,NRSectorCarrier,SectorEquipmentFunction,NRCellRelation | type: DNmultiplicity: 1isOrdered: N/AisUnique: TruedefaultValue: NoneisNullable: False |
| managedNTNEntityInfo.*XXX* | In case the reference MOI in the entityRef is of type … *(copy each attribute in the reference MOI for modification)* | type: *XXX*multiplicity: 0..1isOrdered: N/AisUnique: N/AdefaultValue: None isNullable: True |

To fill the managedNTNEntityRefList in NTNTimeBasedConfig IOC, instances of EP\_NgC, EP\_N2, NRCellCU, NRCellDU, etc., are previously created by Provisioning MnS producer for NTN scenarios with assigned DN respectively. DNs that are valid within same time window are grouped to a managedNTNEntityRefList which is used for NTNTimeBasedConfig IOC instantiation.

NOTE: The detail of attributes for NTNTimeBasedConfig IOC needs further investigation in normative phase.

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| **Next Change** |

##### 5.1.2.3.3 Potential solution #<3>: Pre-configuration based on single time window

The solution for NTN pre-configuration based on single time window can refer to description in clause 5.1.1.3.5.

In this use case, different instances of NRSectorCarrier and SectorEquipmentFunction can be associated to different time windows which reflects to their valid duration.

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| **Next Change** |

##### 5.2.1.3.2 Potential solution #<2>: Pre-configuration based on single time window

The solution for NTN pre-configuration based on single time window can refer to description in clause 5.1.1.3.5.

In this use case, different instances of NRCellRelation can be associated to different time windows which reflects to their valid duration.

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| **Next Change** |

##### 5.2.2.3.2 Potential solution #<2>: Pre-configuration based on single time window

The solution for NTN pre-configuration based on single time window can refer to description in clause 5.1.1.3.5.

In this use case, different instances of NRCellDU which includes nTNTAClist introduced in clause 5.2.2.3.1 can be associated todifferent time windows which reflects to their valid duration.

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| **Next Change** |

##### 5.4.1.3.3 Potential solution #<3>: Pre-configuration based on single time window

The solution for NTN pre-configuration based on single time window can refer to description in clause 5.1.1.3.5.

In this use case, different instances of EP\_N4 can be associated to different time windows which reflects to their valid duration.

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| **Next Change** |

##### 5.5.1.3.2 Potential solution #<2>: Pre-configuration based on single time window

The solution for NTN pre-configuration based on single time window can refer to description in clause 5.1.1.3.5.

In this use case, different IP configuration data can be associated todifferent time windows which reflects to their valid duration.

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| **Next Change** |

ANNEX A

## A.x NTNTimeBasedConfig diagram

@startuml

hide empty members

skinparam ClassStereotypeFontStyle normal

hide circle

skinparam class {

BackgroundColor White

ArrowColor Black

BorderColor Black

}

skinparam linetype ortho

'skinparam BoxPadding 40

skinparam nodesep 2

class NTNFunction <<InformationObjectClass>>

class NTNTimeBasedConfig <<InformationObjectClass>>

class ManagedNTNEntity <<ProxyClass>>

NTNFunction "1" \*-- "\*" NTNTimeBasedConfig: <<names>>

NTNTimeBasedConfig "\*" <--> "\*" ManagedNTNEntity

note right of ManagedNTNEntity

Represents the folllowing IOCs:

EP\_NgC,

EP\_N2,

EP\_N4,

NRCellCU,

NRCellDU,

NRSectorCarrier,

SectorEquipmentFunction,

NRCellRelation

end note

@enduml

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| **End of changes** |