**3GPP TSG-SA5 Meeting #144-e *S5-224161***

e-meeting, 27 June - 1 July 2022

**Source: Huawei**

**Title: TR 28.925 Add description on MnFs to be managed**

**Document for: Approval**

**Agenda Item: 6.8.1.5 FS\_eSBMA\_WoP#5**

# 1 Decision/action requested

***The group is asked to discuss and approval.***

# 2 References

[1] 3GPP draft TR 28.925: Study on enhancement of service based management architecture

# 3 Rationale

This contribution proposes to discusss the different types of managed entities.

**Discussion: Collection of IOCs defined in specifications:**

For management of 5G, the following IOCs have been defined in different specifications:

|  |  |  |  |
| --- | --- | --- | --- |
| **TS** | **IOC** | **Inheritant from** | **Contained by** |
| TS 28.622/28.623 | MnsAgent  TopX | TopX | SubNetwork  - |
| ManagedElement | TopX/ManagedElement\_ | MeContext |
| ManagedFunction | TopX/Function\_ | - |
| SubNetwork | TopX/Domain\_ | - |
| ManagementNode | TopX/ManagementSystem\_ | SubNetwork |
| Link | TopX/TopologicalLink\_ | - |
| 1. MeContext 2. VsDataContainer 3. EP\_RP 4. ManagedNFService 5. ThresholdMonitor 6. HeartbeatControl 7. NtfSubscriptionControl 8. AlarmList 9. PerfMetricJob 10. TraceJob 11. FileDownloadJob 12. MnsRegistry 13. MnsInfo 14. Files 15. File | Top | 1. SubNetwork 2. Top 3. ManagedFunction 4. ManagedFunction 5. ManagedEntity(SubNetwork/ManagedElement/ManagedFunction) 6. NtfSubscriptionControl 7. ManagedEntity(SubNetwork/ManagedElement) 8. ManagedEntity(SubNetwork/ManagedElement) 9. ManagedEntity(SubNetwork/ManagedElement/ManagedFunction) 10. ManagedEntity(SubNetwork/ManagedElement/ManagedFunction) 11. ManagedEntity(SubNetwork/ManagedElement) 12. Subnetwork 13. MnsRegistry 14. ManagedEntity(SubNetwork/ManagedElement/PerfMetricJob/TraceJob) 15. Files |
| TS 28.541 | NR NRM including NR network resource related IOCs  5GC NRM IOCs | ManagedFunction | ManagedElement |
|  | NRNetwork  EUtraNetwork | SubNetwork |  |
|  | NetworkSlice  NetworkSliceSubnet  EP\_Transport | Top | SubNetwork  SubNetwork  SubNetwork |
|  | 1. DANRManagementFunction, 2. DESManagementFunction, 3. DRACHOptimizationFunction, 4. DMROFunction, 5. DPCIConfigurationFunction, 6. CPCIConfigurationFunction, 7. CESManagementFunction, 8. DLBOFunction, 9. CCOFunction, 10. CCOWeakCoverageParameters, CCOPilotPollutionParameters, CCOOvershootCoverageParameters, CCOParameters 11. NRFreqRelation, 12. NRCellRelation, 13. NRFrequency 14. RRMPolicy\_ 15. CommonBeamformingFunction, 16. Beam 17. OperatorDU, 18. NROperatorCellDU, 19. RimRSGlobal, 20. RimRSSet | Top | 1. GNBCUCPFunction 2. ManagedEntity(SubNetwork/ManagedElement/GNBCUCPFunction/NRCellCU) 3. ManagedEntity(SubNetwork/ManagedElement/GNBDUFunction/NRCellDU) 4. ManagedEntity(SubNetwork/ManagedElement/GNBCUCPFunction/NRCellCU) 5. ManagedEntity(SubNetwork/ManagedElement/NRCellCU) 6. ManagedEntity(SubNetwork/ManagedElement/NRCellDU) 7. ManagedEntity(SubNetwork/ManagedElement/NRCellCU) 8. ManagedEntity(SubNetwork/ManagedElement/NRCellCU) 9. SubNetwork 10. CCOFunction 11. NRCellCU 12. NRCellCU 13. NRNetwork 14. RRMPolicyManagedEntity 15. NRSectorCarrier 16. CommonBeamformingFunction 17. - 18. - 19. SubNetwork 20. RimRSGlobal |
|  | QFQoSMonitoringControl  GtpUPathQoSMonitoringControl  Configurable5QISet  FiveQiDscpMapping  PredefinedPCCruleSet  Dynamic5QISet  EcmConnectionInfo | Top | -  -  SubNetwork/ManagedElement  Configurable5QISet |
| TS 28.104 | MDAFunction | ManagedFunction | MDAEntity (SubNetwork/ManagedElement/ManagedFunction) |
| MDARequest  MDAReport | Top | MDAFunction  MDAFunction |
| TR 28.105 | AIMLTrainingFunction | ManagedFunction | ManagedEntity(Subnetwork/ManagedElement/ManagementFunction) |
| AIMLTrainingRequest  AIMLTrainingReport  AIMLTrainingProcess | Top | AIMLTrainingFunction  AIMLTrainingFunction  AIMLTrainingFunction |
| TS 28.312 | Intent | Top | ManagedEntity(Subnetwork) |
| TS 28.536 | AssuranceClosedControlLoop  AssuranceGoal | Top | SubNetwork/ManagedElement  AssuranceClosedControlLoop |
| TS 28.538 | EdgeDataNetwork | Top | SubNetwork |
| EASFunction  EASRequirements  ECSFunction  EESFunction | ManagedFunction | EdgeDataNetwork  EASFunction  SubNetwork  EdgeDataNetwork |

**Observation 1:**

There are following models currently used as root model for inheritance:

1. Top\_
2. Top
3. TopX
4. ManagedFunction
5. ManagedElement\_
6. Function\_
7. Domain\_
8. ManagementSystem\_
9. TopologicalLink\_
10. Subnetwork

**Observation 2:**

IOCs don’t all serve the same purposes, but there is no clear grouping and categorization of those IOCs according to different purposes (e.g. management of NE/NF, management of D-SON function running on NE level, management of vendor provided management function, etc.). It would improve SA5 specification readability if the grouping could be indicated in the specification.

**Observation 3:**

1. IOCs ManagedElement/ManagedFunction carry the managed information corresponding to vendor provided NE/NF(s).
2. IOCs MnSAgent/ManagementNode carry the managed information corresponding to vendor provided MnS Producer(s). However, the relation between ManagementNode IOC with the other management function IOCs are not elaborated in the specifications.

**Analysis:**

The IOCs specified in SA5 could be grouped into the following four categories:

1. IOCs supporting the management of network resources:

(e.g. GNBDUFunction/GNBCUUPFunction/GNBCUCPFunction etc.)

1. IOCs supporting the management of distributed functions which run on NEs:

(e.g. DANRManagementFunction, DESManagementFunction, etc.)

1. IOCs supporting the management of management functions provided by MnS producer:

(e.g. AssuranceClosedControlLoop, MDAFunction, AIMLTrainingFunction, intent, etc.)

1. IOCS supporting common management purposes:

(e.g. ThresholdMonitor, HeartbeatControl, NtfSubscriptionControl,AlarmList, etc.)

Proposal**:** Add the four categories of IOCs to improve the readability of NRMs.

# 4 Detailed proposal

It proposes to make the following changes to TR 28.910 [1].

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

## 4.8 Issue #8: Use of Models in SBMA

### 4.8.1 Description

**The following existing concepts are related to SBMA:**

* TS 28.533 Management Function: A Management Function (MnF) is a logical entity playing the roles of MnS consumer and/or MnS producer. Management Function can be deployed as a separate entity or embedded in Network Function to provide MnS(s).

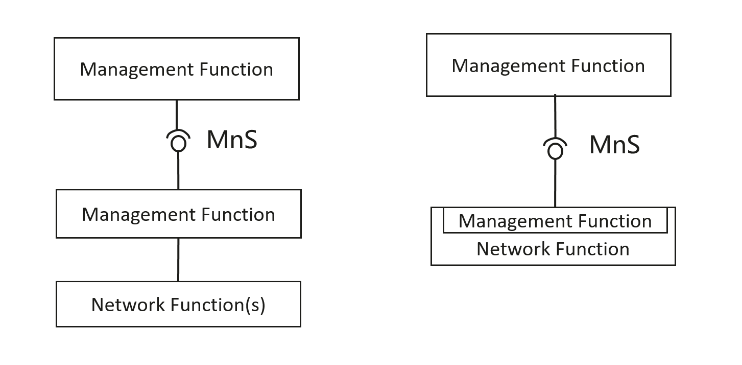
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Figure 4.x-1: Examples of MnS deployment scenario

* TR 21.905 Network Element: A discrete telecommunications entity which can be managed over a specific interface e.g. the RNC.
* TS 28.533 / TS 23.501 Network Function: A 3GPP adopted or 3GPP defined processing function in a network, which has defined functional behaviour and 3GPP defined interfaces.

**The following IOCs are specified to represent Network Element and Network Function:**

* TS 28.622 ManagedElement IOC: This IOC represents telecommunications equipment or TMN entities within the telecommunications network providing support and/or service to the subscriber. A ManagedElement IOC is used to represent a Network Element defined in TS 32.101[1] including virtualization or non-virtualization scenario.
* TS 28.622 ManagedFunction IOC: This IOC is provided for sub-classing only. It provides attribute(s) that are common to functional IOCs. Note that a ManagedElement may contain several managed functions, a managed function may contain other managed functions as specified for the specific subclass. This IOC can represent a telecommunication function either realized by software running on dedicated hardware or realized by software running on NFVI.

**The following IOCs are specified to represent Management Function provided by MnS Producer:**

* TS 28.622 MnsAgent IOC: The MnsAgent represents the MnS producers, incl. the supporting hardware and software, available for a certain management scope that is related to the object name-containing the MnS Agent.
* TS 28.622 ManagementNode IOC: This IOC represents a telecommunications management system (EM) within the TMN that contains functionality for managing a number of ManagedElements (MEs). (This description maybe updated)

### 4.x.2 Potential solutions

This clause provides the description of using NRM to represent management of management function, network function, and network element.

**There are following different types of models to be managed.**

1. IOCs supporting the management of network resources:

(e.g. GNBDUFunction/GNBCUUPFunction/GNBCUCPFunction etc.)

1. IOCs supporting the management of distributed functions which run on NEs:

(e.g. DANRManagementFunction, DESManagementFunction, etc.)

1. IOCs supporting the management of management functions provided by MnS producer:

(e.g. AssuranceClosedControlLoop, MDAFunction, AIMLTrainingFunction, intent, etc.)

1. IOCS supporting common management purposes:

(e.g. ThresholdMonitor, HeartbeatControl, NtfSubscriptionControl,AlarmList, etc.)

Editor’s Note: which IOCs can be root IOCs, what can be contained under each type of IOCs are FFS.

Management Function could be deployed in following different deployment scenarios:

* The Management Function can be deployed in management system, including
  + The Management Function deployed in domain management system.
  + The Management Function deployed in cross domain management system.
* The Management Function deployed in Network Element.

From the three types of Management Functions, Management Functions deployed in domain management system and Management Function deployed in Network Element need to be managed as managing network node in 3GPP management system. The way of managing the Management Function are modelled in corresponding management function IOC.

ManagementNode IOC represents a telecommunications management system within the TMN provided by vendor that contains management functionalities for managing a number of ManagedElements (MEs)

The Management Functions are managed by corresponding management function IOC as defined in TS 28.541, TS 28.104, TS 28.105, TS 28.536 and TS 28.312:

* Management of D-SON function:
* D-SON of ANR in TS 28.541 DANRManagementFunction IOC
* D-SON Energy Saving (ES) functions in TS 28.541 DESManagementFunction IOC
* D-SON RACH functions in TS 28.541 DRACHOptimizationFunction,
* D-SON MRO functions in TS 28.541 DMROFunction,
* D-SON PCI Configuration functions in TS 28.541 DPCIConfigurationFunction,
* D-SON LBO functions in TS 28.541 DLBOFunction,
* Management of management functions:
* EM centralized SON Energy Saving (ES) functions in TS 28.541 CESManagementFunction IOC
* EM centralized-SON PCI Configuration functions in TS 28.541 CPCIConfigurationFunction,
* EM centralized-SON Energy Saving (ES) functions in TS 28.541 CESManagementFunction,
* EM centralized-SON CCO functions in TS 28.541 CCOFunction
* MDAFunction in TS 28.104
* AIMLTrainingFunction in TS 28.105
* AssuranceClosedControlLoop in TS 28.536
* Common supporting models for management operation purposes:
* VsDataContainer
* EP\_RP
* ManagedNFService
* ThresholdMonitor
* HeartbeatControl
* NtfSubscriptionControl
* AlarmList
* PerfMetricJob
* TraceJob
* FileDownloadJob
* MnsRegistry
* MnsInfo
* Files
* File

Editor’s note: other management functions to be added with working progress. The criteria for identifying what kind of ManagementFunction should be managed is FFS.

The following table captures the relation between the concepts and related models**:**

|  |  |
| --- | --- |
| **Concepts** | **Illustration of Related Management Models** |
| TS 28.622 ManagementNode | A telecommunications management system within the TMN provided by vendor that contains management functionalities for managing a number of ManagedElements (MEs) are represented by ManagementNode IOC defined in TS 28.622. |
| TS 28.533 Management Function | The corresponding XXXManagementFunction IOC is used to support the managing of XXXMnF. |
| TR 21.905 Network Element | A network element is represented by ManagedElement IOC defined in TS 28.622. |
| TS 28.533 / TS 23.501 Network Function | A Network function is represented by ManagedFunction IOC defined in TS 28.622. |

It’s recommended to document the descriptions of ManagementFunction IOCs and related MnF to improve the readability in Rel-18.