**3GPP TSG-SA5 Meeting #145-e *S5-225466***

e-meeting, 15 - 24 August 2022

**Source: Huawei, Ericsson**

**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 support for management of management function.

**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 |

From the list of IOCs above, the yellowed management functions are modelled as MnFs to be managed:

* 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

TS 28.533 has defined 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).

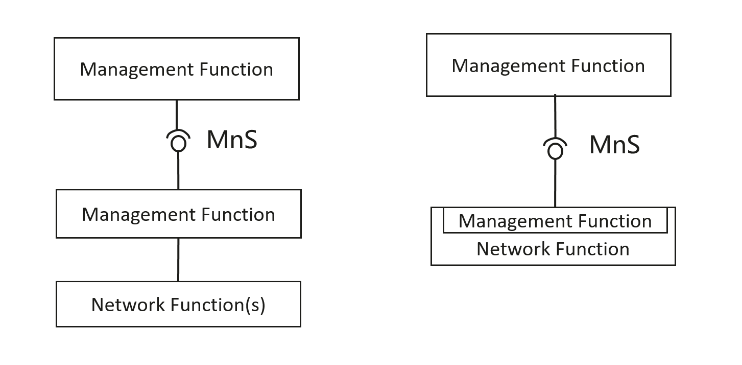
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Figure 4.x-1: Examples of MnS deployment scenario

**Observation:**

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

Proposal**:**

1. Consider to add ManagementFunction IOC as root IOCs which allow those MnFs to be managed to inherit from.
2. Add descriptions to show the relation between ManagementNode and related management functions.

# 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).

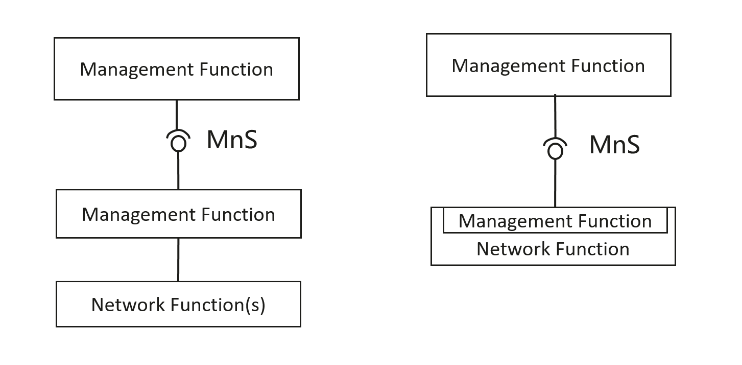
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Figure 4.x-1: Examples of MnS deployment scenario

* 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 as specified in TS 28.622 are used 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). (Note: This description is to be updated to replace use of EM)

### 4.x.2 Potential solutions

This clause provides the description of using NRM to represent management of management function, network function, and network element.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 deployment scenarios of Management Functions above , 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:

* IOC for 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,
* IOC for 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

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, and a number of management functions. |
| 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 the following IOCs which could be used to represent MnFs to be managed. The modelling is not changed for existing functions to keep the backward compatibility.

|  |  |  |  |
| --- | --- | --- | --- |
| **TS** | **IOC** | **Inheritant from** | **Contained by** |
| TS 28.541 | 1. CPCIConfigurationFunction 2. CESManagementFunction 3. CCOFunction | Top | 1. ManagedEntity(SubNetwork/ManagedElement/NRCellDU/ManagementNode) 2. ManagedEntity(SubNetwork/ManagedElement/NRCellCU/ManagementNode) 3. SubNetwork/ManagementNode |
| TS 28.104 | MDAFunction | ManagedFunction | MDAEntity (SubNetwork/ManagedElement/ManagedFunction/ManagementNode) |
| TR 28.105 | AIMLTrainingFunction | ManagedFunction | ManagedEntity(Subnetwork/ManagedElement/ManagementFunction/ManagementNode) |
| TS 28.536 | AssuranceClosedControlLoop | Top | SubNetwork/ManagedElement/ManagementNode |

Editors’ Note: whether the MnFs to be managed IOCs are needed to be inherited from a same root IOC is FFS.